

# DELAWARE

## A HISTORY OF THE FIRST STATE

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## NATURAL HISTORY

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primitive forest remain in the state. About 30% of the area of the state is forested, the proportion of woodland being greater in the south, and probably not exceeding 15% in the Piedmont Plateau region. On the Coastal Plain, by the damming of small streams, numerous permanent ponds have been created, and these with their natural margins support an extensive fauna and flora. The sea-beach areas, sand-bar strip, and adjacent salt-marshes bordering the Atlantic are largely state-owned; they have been little modified, and support the limited fauna and flora characteristic of such situations.

In Delaware, the larger mammals, black bear, Virginia deer, and beaver, have been extinct for many years;<sup>1</sup> otter and mink survive; foxes, raccoons, opossums, and smaller mammals are generally distributed; a few pairs of bald eagles still nest within the state; the abundance of game birds and game fish has been affected by human agency; but lying as it does in the path of the annual migrations, and with conditions still favorable to permanent residence, Delaware possesses a rich bird fauna, and of fish—as yet little studied—probably as many species as in the past.

## IV. NOTES ON THE VEGETATION OF DELAWARE

By Edgar T. Wherry\*

Delaware lies in a section of the United States which before the coming of the white man was largely covered by forests, with local areas of shrub- and grass-land along streams, in marshes, and in places where some peculiar soil condition was unfavorable to the growth of trees. While a considerable part of the land was cleared for agriculture, and the trees have been repeatedly cut in what forests were allowed to remain, Nature tends to reoccupy cut-over land and abandoned fields with vegetation which ultimately comes to resemble that of primeval days. It is accordingly possible to form a picture of the normal vegetation of the state by observing areas which have remained undisturbed long enough to permit of such reversion.

Two Asiatic invasions have, however, somewhat distorted the picture. The American chestnut (*Castanea dentata*), once a prominent member of the forests, has been prevented from coming back by a fungus introduced from Asia, which injures and ultimately kills such sprouts and young plants as come up. Then, the Japanese honeysuckle (*Lonicera japonica*), a rampant, subevergreen vine, has for some years been spreading so rapidly and in such profusion as to kill out not only small herbs and shrubs, but even

<sup>1</sup> In recent years deer have been reported, and the beaver has been reintroduced. See section on animals and birds, below.

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good-sized trees. It is to be hoped that someone interested in the conservation of our American native plants will bring from Asia a parasite which will hold this weed in check.

In a broad way the vegetation of Delaware may be treated under four headings,—northwestern, central, southern, and coastal.

The northwestern area occupies the upper quarter of New Castle County. It lies in the Piedmont physiographic province, where crystalline rocks outcrop, yielding stony loam soils relatively rich in plant nutrients. The streams flow rapidly over rocky beds, often in well-developed ravines. Here the normal vegetation is oak forest (formerly oak-chestnut) characterized by upland oaks, especially black (*Quercus velutina*), red (*Quercus rubra*), and white (*Quercus alba*). Admixed with the oaks are various proportions of ash (especially *Fraxinus americana*), beech (*Fagus grandifolia*), hickory (*Carya ovata* and others), maple (*Acer rubrum*) and tulip (*Liriodendron tulipifera*). On north-facing ravine slopes there may also be the chestnut oak (*Quercus montana*) and the evergreen hemlock (*Tsuga canadensis*). The only other evergreen is red-cedar (*Juniperus virginiana*) which grows naturally in tension zones between forest and grass-land and often invades old fields.

What is here designated the central area occupies the southern part of New Castle and much of Kent County. Physiographically this is in the Coastal Plain, where the underlying geological formations are strata of unconsolidated sand, clay, and shell-marl. Here the streams are sluggish, and tend to form broad marshy valleys instead of ravines. Oak forest is here dominant too, although lowland species of oaks are more frequent, — as pin (*Quercus palustris*), Spanish (*Quercus falcata*) and willow (*Quercus phellos*). With them occur two trees known as gums, although they are not related: black or sour gum (*Nyssa sylvatica*) and red or sweet gum (*Liquidambar styraciflua*). Instead of hemlock, pines are now locally present where the cover of deciduous trees is not too dense, mostly scrub (*Pinus virginiana*) with some yellow (*Pinus echinata*) and pitch (*Pinus rigida*). In the broader valleys the forests are interrupted by areas of shrub-thicket and grass-land.

The southern area, approximately coextensive with Sussex County, is likewise in the Coastal Plain, but conditions are somewhat different. The soil is on the whole more sandy, and becomes acidified more readily. The forests contain more of the lowland species of oaks, including water oak (*Quercus nigra*) and pines are more abundant, locally indeed dominating the scene, the chief species being loblolly pine (*Pinus taeda*). Two broad-leaved evergreens, holly (*Ilex opaca*) and magnolia (*Magnolia virginiana*) are also conspicuous, sometimes growing into good-sized trees. Along streams sphagnum bogs and cypress swamps are developed, the characteristic species of the latter being bald-cypress (*Taxodium distichum*).

Along much of the east margin of the state occurs the fourth vegeta-

tional region, the Coastal Strip, a mile or less in width. On the dunes and marshes here grass-land is dominant, with local shrub-thickets but relatively little forest. Two of the striking shrubs are northern bayberry (*Myrica pennsylvanica*) with glossy aromatic leaves and waxy berry-like fruits, and groundsel-tree (*Baccharis halimifolia*), which is covered in autumn with silvery tufts of pappus, favoring wind-dispersal of the tiny dry fruits. On sandy hummocks red-cedar (*Juniperus virginiana*) occasionally grows into large sprawling trees.

Plant geographers are especially interested in species which reach a limit of their range in a given area, and in the environmental factors which prevent further migration. Delaware is noted for the number of "southern" plants which enter the state, but so far as known do not occur (as natives) farther north. Two of the trees mentioned earlier, water oak, with its tiny wedge-shaped leaves, and bald-cypress, the conifer which drops not only its leaves but also branchlets in fall, are to be so classified. There are also two small trees or large shrubs reported as barely entering Sussex County,—the red-bay (*Persea borbonia*), a relative of the tropical avocado, and horse-sugar (*Symplocos tinctoria*), which has leaves so rich in aluminum compounds as to have a "sweet-sour" taste.

Perhaps the most notable shrub of the state is the fall-alder (*Alnus maritima*), which blooms in September instead of March, as do other species; this is fairly common along the estuaries of eastern Sussex County and adjacent Maryland, but is believed to grow otherwise only along tributaries of the lower Mississippi River. Also deserving mention here is the low evergreen shrub, box huckleberry (*Gaylussacia brachycera*) which grows mostly in the Appalachian Mountains, reaching an eastern limit at two localities in Sussex County.

Herbaceous plants of general southern range which reach northern limits here are more numerous, and ten of them may be cited as especially interesting: southern woolly-amaranth (*Froelichia floridana*), a white-woolly annual found in barren places, even along railroads; the brilliant red fire-pink (*Silene virginica*) which extends nearly to Wilmington; annual swamp buttercup (*Ranunculus oblongifolius*), which has rather small though numerous yellow flowers; brownhair shoestring-pea (*Tephrosia spicata*), a creeping member of the pea family with reddish flowers; tall yellow milkwort (*Polygala cymosa*), rare in moist sands around Ellendale; eastern star-jasmine (*Trachelospermum difforme*), a vine with tiny yellow starry flowers; eastern hornless milkweed (*Acerates longifolia*), with abundant small white flowers; pine-gerardia (*Gerardia linifolia*), a member of the snapdragon family with cord-like rootstocks which parasitize pine trees, producing delicate lilac flowers in autumn; southern water-lobelia (*Lobelia boykinii*), a pale-violet flowered aquatic; and smooth elephants-foot (*Elephantopus nudatus*), a composite with small lavender flower-heads.

Fewer "northern" species reach southeastern limits here, but three

especially notable ones are worthy of mention. These comprise: the pale yellow eastern globe-flower (*Trollius laxus*) which was found many years ago in a swamp near Wilmington; green pyrola (*Pyrola chlorantha*), occasional in the pine-lands; and maystar (*Trientalis borealis*) which occurs rarely in the Sussex County bogs.

## V. DELAWARE ANIMAL AND BIRD LIFE

The following list of animals and birds found in present-day Delaware is compiled from the mimeographed booklet, *Our Animals Birds & Fish of Delaware*,<sup>1</sup> with additions (September 1946) to the small animals by Donald MacCreary of the University of Delaware Agricultural Experiment Station,<sup>2</sup> and to the birds by Clayton M. Hoff of Wilmington and Charles A. Bicking<sup>3</sup> of Marshallton.

### ANIMALS

*Rodentia*.-- Cottontail rabbit, muskrat (ponds and marsh areas); gray squirrel; red squirrel (northern Delaware); flying squirrel; fox squirrel (nearly extinct in Delaware); woodchuck; beaver (long since trapped out, but reintroduced in 1936). Mice: red-backed; meadow; pine; northern white-footed; house (introduced with earliest settlers); Stone's lemming; Carolina jumping. Rats: rice (occasionally seen); Norway (common brown); black (scarce, driven out by Norway rat).

<sup>1</sup> Issued by the state Board of Game and Fish Commissioners, Dover, 1939. See also Warren C. Newton, *The Vertebrate Fauna of Delaware*, unpublished B.S. thesis, 1916, University of Delaware Library.

<sup>2</sup> See his "Some Ectoparasites, Excluding Ixodoidea, of Delaware Mammals," *Journal of Economic Entomology*, 38: (1):26.

<sup>3</sup> The following note about a great American ornithologist who got his start in Delaware is contributed by Mr. Bicking.

"Although it is not widely known among lovers of Audubon's bird paintings, that great artist was preceded by another able student and artist of American bird life, Alexander Wilson. Wilson, though less of an artist, was indisputably a greater scientist. His struggles and his successes in producing his *American Ornithology* endear him to us as an American and as a common man. Audubon could never quite forget the legend of his own royal birth.

"Alexander Wilson, a Scotchman, first landed in America at New Castle in 1794. In the woods near the road from New Castle to Philadelphia he had his first glimpses of the colorful bird life of America. Near Wilmington, as he trudged along the road toward the home of his friends the Grays of Gray's Ferry, near Philadelphia, he shot a red-headed woodpecker. He thought that this was the most beautiful bird he had ever seen.

"At Gray's Ferry, encouraged by the scientific interest of his friends there, he began to study and paint the birds which had so caught his fancy on that first walk through the woods and over the hills of New Castle County. Our first American ornithologist set the pattern of his life work when he first set foot on Delaware soil."