FOREST COVER AND DEER POPULATION DENSITIES IN EARLY NORTHERN WISCONSIN

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Information located in government reports, early travel journals, and newspapers has been very important in the reconstruction of the history of the white-tailed deer (*Odocoileus virginianus*) in early northern Wisconsin. The literary researches and interpretations of Swift (1946), Schorger (1953) and Dahlberg and Guettlinger (1956) have provided the foundation for many of the presently accepted ideas concerning the history of the deer in northern Wisconsin. From their analyses of the available historical literature, these writers seem to hold in common the belief that white-tailed deer were very rare or absent in much of northern Wisconsin prior to 1850, or before the advent of extensive logging and settlement. The lack of suitable summer deer range is thought to have been the major factor in limiting the deer to low population densities in northern Wisconsin, and that furthermore, the deer herd increased in size only after there was an increase in the summer deer range following removal of the mature forest communities by white man.

It seems evident that the mature upland forest communities composed of sugar maple (*Acer saccharum*)\(^2\), yellow birch (*Betula lutea*), hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*) which existed in northern Wisconsin prior to 1850 could not have provided satisfactory summer range for deer. Such forest communities which exist today are known to provide poor summer deer range. It is also clear that the great increase in the deer population, which reached an explosive peak in the 1880's, was a direct result of the extensive removal of merchantable timber throughout the northern portion of the state. There is considerable doubt, however, about the validity of the widely held idea that deer were rare in northern Wisconsin before the disturbance of the forests by white man.

In elaborating on this doubt concerning deer population densities in early northern Wisconsin, a question arises which is concerned with the actual nature of the forested landscape in northern Wisconsin before the cutting era. This question requires very close examination, as estimates of the number of deer originally inhab-

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\(^1\) Present address: Oregon College of Education, Monmouth, Oregon.

\(^2\) Nomenclature for plant species follows Gleason (1932).
iting northern Wisconsin have been based on the type of habitat which supposedly existed in early times. Estimates as low as 10 deer per square mile have been made (Dahlberg and Guettinger, 1956) for northern Wisconsin. If northern Wisconsin actually had been covered with a vast uninterrupted virgin forest, such a low estimate of deer density would probably be accurate. Such a forest, however, did not exist in northern Wisconsin. Generalized descriptions of the forest vegetation in northern Wisconsin prior to 1850 are available in many local descriptions. Some of the early accounts portray some parts of northern Wisconsin as being heavily forested (Roth, 1898; Irving, 1880; Sweet, 1880); in such areas only a low number of deer, if any, could have been supported.

In contrast to these reports, there are several very good descriptions which reveal that there were present, in northern Wisconsin and adjacent Upper Michigan, prior to 1850, extensive areas not covered with mature forests, but with pioneer and secondary forest communities composed of jack pine (Pinus banksiana), aspen (Populus tremuloides and P. grandidentata) and white birch (Betula papyrifera). Forest communities composed of these species are known to provide excellent summer deer range.

Two written accounts were made by Capt. T. J. Cram (1841, 1842), who traveled through northeastern Wisconsin while on a government assignment to survey the Wisconsin-Michigan border. In an area in the vicinity of the upper Menominee River, Cram (1841) describes the vegetation as follows:

"All the timber which was once pine has been consumed by fire, as far as the eye can reach, all round on every side. The prospect is one of a broken landscape of barren hills, studded here and there with charred pine stubs with scarcely a living tree except the second growth of white birch and poplar."

Cram (1842) describes another area located near the Wisconsin-Michigan border:

"These highlands are in the process, owing to the destructive ravages of fires, of fast approaching to prairie, such as exists in the southern and western parts of the Territory, and leave little doubt, in the mind of the close observer, of the cause of these prairies."

The mention of fires in these accounts by Cram is very significant. It is very likely that since there was no one in northern Wisconsin to control forest fires, those which did occur must have destroyed large areas of timber before they stopped. A statement by Aulneau (1736) indicates that Indians were responsible for some fires in the Lake Superior region.

"I journeyed nearly all the way through fire and a thick stifling smoke, which prevented us from even once catching a glimpse of the sun. It was the savages who in hunting had set fire to the woods, without imagining, however, that it would result in such a terrible conflagration."
Fires, arising either from natural causes or through the intentional activities of Indians, would have created suitable summer deer range. Cram (1841) makes several references to deer in the northeastern part of Wisconsin, and in one particular instance he mentions that deer were present in great abundance and were hunted by Indians for winter food.

Another source of information relating to the forest cover in northern Wisconsin prior to 1850 is the written account of Dr. J. G. Norwood (1852), a professional geologist who traveled through northwestern and northcentral Wisconsin during the years 1847 and 1848. Although Norwood was particularly interested in the geology of northern Wisconsin, he made many references to the native vegetation. Of an area approximately twenty-five miles south of Fond du Lac (presently, Superior, Wisconsin), Norwood gives the following description:

“A good deal of it is prairie, covered with wortleberry bushes (Vaccinium) and strawberry vines; while in the low grounds, hazel abounds. Small pines, birch and scrubby oak succeeded, with strips of sugar maple. From this point to Kettle River, the country presents a succession of small lakes, swamps, meadows and ridges, covered with birch and small pines.”

From this description it is clear that such an area would provide very satisfactory summer deer range. Norwood also describes the area in the vicinity of the east branch of the Chippewa River (Iron County) as a sand barren with a few stunted pines and occasional patches of coarse grass being the only vegetation supported on the high ground.

Of the area between Lac du Flambeau and Trout Lake (Vilas County), Norwood states:

“... the portage passes for some distances over a sand plain supporting a few scattering pines. The surface of the ground is literally covered with wintergreen.”

At the end of this portage, Norwood states:

“Trout Lake ... is surrounded by drift hills, from 25 to 40 feet high, supporting a sparse growth of small pines and birches.”

At the headwaters of the Wisconsin River (northeastern Vilas County), Norwood describes the area as follows:

“The country ... is open, bearing thickets of small birch, a few stunted pines scattered through them. Occasionally, a solitary large pine was seen standing in a sandy knoll, 20-30 feet above the level of the river. Below the last rapids the country is made up of sand, supporting tolerably good growths of pine, birch and aspen.”

Continuing his travels down the Wisconsin River, Norwood describes an area in northern Oneida County.
"A narrow strip of small pines line the banks of the river at intervals; but, as you recede into the country, there are few trees of any size to be seen. Clumps of very small birch and pine are scattered over it."

Additional descriptions of parts of northern Wisconsin are found in an account made by Owen (1848) who was a government geologist. Owen gives this description of an area in Douglas County in northwestern Wisconsin.

"The whole extent of the upper rapids of the Brule (River) must be seven or eight miles by the river; they are not so continuous as those below, having in some places nearly a mile of still water intervening. At their head are open woods of pine and aspen poplar and on the southwest large tamaracks."

"The river now expands itself into a double or triple its former width, with very little current. It is bounded by low ridges, with a growth of small pines and aspen poplar."

Also in Douglas County, at the headwaters of the St. Croix River, Owen states:

"The shore at the northern extremity is low, but on the east and west it is bounded by ridges twenty to thirty feet high, on which the growth is chiefly birch."

In the vicinity of Lac Court Oreilles (Sawyer County), Owen describes the area as follows:

"The country becomes more open, the dense pine forest gives place to a more stunted growth of evergreen and aspen. The general face of the country, however, for four or five miles before reaching the lake is very little elevated above high water mark and it supports only such growth as flourish in swamp ground. A few stunted and half decayed pine were the only trees visible."

Also in Sawyer County, Owen states:

"The Namekagon river is about fifteen to twenty paces wide, with banks from eight to twelve feet high. The prevailing growths are pine and birch, usually of small size. The undergrowth is level and the wood open."

Schoolcraft (1855) gives a short description of an area located near the point where the Montreal River flows into Lake Superior. This description was made in 1820 in an area now part of Iron County.

"A bank of red clay, of twenty or thirty feet in depth, overlays the rock, covered with a young growth of birch and poplar. There are no large, or apparently old trees seen along this part of the coast."

Whittlesey (1849) supplies some descriptions of the south shore of Lake Superior. He describes the vegetation of an area in Upper Michigan, on the north side of the Penoki range, as follows:

"The timber is very close, though not high, and the soil appears to be good. It produces in the moist places native grass of good quality, and on the dry portions dwarf pine, aspen, balsam and birch."
Whittlesey also describes a portion of the area between the Bad River and Brule River.

"In the central part of the tract under notice the surface and the mass of the hills or mountains are composed of soft materials, sand and light gravel, producing large white and yellow pines, and in places where sand predominates, large fields of huckleberries, growing among scattered cypress and dwarf pines, many miles in extent."

"On the dry portions of the red clay, which is here, as usual, on Lake Superior, but little rolling, we find the aspen, birch and white pine. On the sandy, huckleberry lands, where pine is of moderate thickness, large districts have been overrun with fire, leaving a vast forest of blackened trunks, producing upon the mind a vivid impression of solitude and desolation."

Outside of the state of Wisconsin proper, but in the Lake States region, Agassiz (1850) supplies some interesting descriptions of the native vegetation. In the vicinity of the Michipicotin River (Ontario), Agassiz describes the forests as follows:

"Contrary to my expectations, and to what had been told me of the country, the forests are not remarkably dense and there is rarely any difficulty in penetrating except the cedar swamps. We never penetrated far into the interior, which is said to be in general thinly wooded."

Agassiz also gives a description of the landscape in the vicinity of St. Ignace (Michigan), observed by him while making a portage.

"After proceeding some distance through rank grass and undergrowth, we came to the bluff, which was a very stiff fifteen minutes climb. This brought us onto a table land covered principally with scrub pine, which is much like our common pitch pine. This table land was dry, sandy and thinly covered with wood, with wide openings covered only by scanty, withered grasses. The fire had been through in several places and here woodpeckers and black flies abounded. This seems, from what we heard, to be the general characteristic of the interior except on the water courses."

There is some historical information (Bersing, 1956) which indicates that deer were captured by Indians using fences or corrals built specially for that purpose. The word "Mitchigan" is an Ojibwa word meaning "a wooden fence to catch deer near its banks" and refers to the practice of building fences near lakes and rivers to capture deer. A body of water in Vilas County, called Fence Lake, received its name as a result of the fences built there by Indians for capturing deer. It is not thought probable that Indians would have built such fences to capture only a few deer.

Foster and Whitney (1850) describe the use of fences by Indians in capturing deer in Upper Michigan:

"Within this township the Machigamig (River) receives from the right its two principal tributaries, the Mitchikau or Fence river, and the Nebegominiwini or Night-watching river. The origin of these names, as explained by our voyageurs, was this: At one time the deer were observed to be very numerous about the mouth of the former river, and the Indians, to
secure them, built a fence from one stream to the other. They (the deer) would follow rather than overlap this barrier, until they were entrapped by their concealed foe. This method of capturing deer is also practiced on the Menominee."

Foster and Whitney also describe the landscape of an area near the Brule and Machigamig Rivers in Upper Michigan:

"Fires have swept through the woods which once covered the surface, so effectively as to leave hardly a living tree. Blackened trunks rise up on every side as far as the eye can reach. Over this dreary waste the birch and aspen have sprung up."

A description of wind damage near Ontanagon, Michigan, is also supplied by Foster and Whitney:

"Thunderstorms of great violence are not unusual; and the large tracts of prostrate timber frequently met with in the forests, and known as 'windfalls', indicate the path of the tornado."

The information given in these accounts permits one to conclude, with good reason, that large areas existed in northern Wisconsin and Upper Michigan prior to 1850 which were not in mature forest. There are, of course, other historical accounts which describe some parts of northern Wisconsin as covered with mature forests; even the writers listed above describe some areas as having mature forests. To achieve the most accurate picture of the forest communities in early northern Wisconsin, it is necessary to combine all the vegetation descriptions which are available.

There seems little doubt that the early northern Wisconsin landscape was actually a mosaic of forest community types, with mature, secondary and pioneer communities interspersed. The intervention of natural catastrophes, particularly fire, prevented the development of a vast, unbroken virgin forest. From what is presently known about the summer range requirements of the whitetailed deer, any of the areas described in the historical accounts given in this paper would have provided excellent summer deer range. If early deer population densities are to be estimated from habitat conditions, and this seems entirely justifiable, then the evidence supports the idea that deer could not have been scarce in northern Wisconsin prior to 1850. It is more likely that deer were "rare" only in a relative sense, compared with the abnormally high densities which built up after extensive cutting, man-made fires and predator control.

The original land survey records for the northern Wisconsin area provide some idea of the general proportion of forest community types at about 1850 (Curtis, 1959). Approximately 2,340,000 acres were covered with pine barrens; about 2,269,500 acres were covered with pine forests; mesic hardwood forests covered about
11,741,000 acres, of which approximately 1,000,000 acres was in aspen. If it is considered that the pine barrens, pine forests and aspen forests provided satisfactory summer deer range, then nearly 5.5 million acres of summer range were present.

The original land survey records also reveal that there were approximately 2,241,000 acres covered with lowland forest communities in northern Wisconsin. Although no differentiation of types was made in these survey reports, forests composed of tamarack (Larix laricina), black spruce (Picea mariana), balsam fir (Abies balsamea), white cedar (Thuja occidentalis) and black ash (Fraxinus nigra) were the most common. Christensen’s review (1954) review of the historical accounts relating to the winter deer range in northern Wisconsin has revealed that white-tailed deer have used lowland swamp communities, particularly those dominated by white cedar, from the earliest times for which historical records are available. There is no evidence that the winter yarding behavior of the deer is a recently acquired characteristic; it is very probable that the deer have always possessed this behavior. There was apparently a sufficient number of lowland swamp communities in early northern Wisconsin to meet the winter range requirements of the deer which were present at that time. Prior to 1850, the deer population density in northern Wisconsin could not have been limited by the winter range. More recently, however, the winter range in northern Wisconsin has played a very important role in limiting the deer density. The area of white cedar communities has decreased greatly. The present acreage of white cedar swamps is approximately 182,000 acres (Wisconsin Forest Inventory, 1958); if it is considered that white cedar occupied but one-third of the lowland areas in northern Wisconsin in 1850 (ca. 747,000 acres), which may be taken as a minimum, the decrease of cedar swamps amounts to more than 75%.

REFERENCES CITED

Agassiz, L. 1850. Lake Superior: Its physical character, vegetation animals, compared with those of other and similar regions. Boston. 428 pp.