

THE NUMERICAL STATUS OF SOME MAMMALS
THROUGHOUT HISTORIC TIME IN THE
VICINITY OF BUCKEYE LAKE, OHIO¹

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While examining literature for references to the flora, avifauna and general conditions throughout historic time² in the vicinity of Buckeye Lake, Ohio, for my report upon the birds of that area, I collected data on the numerical status of several mammal species. Between the years 1922 and 1935 I interviewed many of the old residents of the Buckeye Lake area and obtained their impressions of the time of disappearance or numerical changes in abundance of several mammal species during the period from 1860 to 1935. Between 1922 and 1933 I also made personal observations upon several mammal species.

Before proceeding with the mammal records it is necessary to give a brief history of the changes which have taken place in the vicinity of the present Buckeye Lake. Gist (1893: 42), Smith (1870: 21) and others have indicated that before 1800 the area now covered by the waters of Buckeye Lake was a "Great Swamp." This swamp contained one or more small glacial lakes which were surrounded by cranberry-sphagnum-red maple bogs, considerable brush, and swamp forests of the elm-ash-soft maple type. Extending immediately northwest of the "Great Swamp" was another which later became known as "Bloody Run Swamp." This latter swamp extended to the present site of Kirkersville and contained a mixture of cranberry-sphagnum-red maple-poison sumac bog-swamps, alder-red ozier brush communities, and swamp forests of the elm-ash-soft maple-pin oak type. The adjacent country northeast, east and south of the present Buckeye Lake was principally rolling upland, with glaciated hills less than one hundred and fifty feet in height. The better drained portions of the uplands contained tall forests which seemingly were principally of the oak-hickory-hard maple-chestnut type (Smith, 1870: 20 and Schaff 1905:

¹For information concerning the flora, avifauna and general conditions in the Buckeye Lake area during historic time see my forthcoming report on "The Birds of Buckeye Lake, Ohio," *Misc. Publ., Mus. Zool., Univ. Mich.*

²For the region under treatment historic time extends from January, 1751, to the present.

82-89). The less well-drained lower slopes and intervalles contained a beech-maple forest type. The writings of Smith (1870: 21 and 168), Hill (1881: 199) and others indicate that the Great and Bloody Run swamps and adjacent uplands were a favored hunting ground of the Indians before 1800, and that two important Indian trails passed beside this hunting ground.

The Great and Bloody Run swamps and adjacent uplands, hereafter referred to as "the Buckeye Lake area" or "the area," was little affected by the white man until after 1800. The settling of the area, removal of the forest, and cultivating of land (particularly uplands) became pronounced shortly after 1800, and by 1820 several towns, such as Newark (1802), Granville (1806), Thornville (1815), Lancaster (1800), and Somerset (1807), had been established. Drastic changes in the Great Swamp began in 1826 with the building of the canal and the "Old Reservoir." The reservoir was filled with water in 1830, thereby eliminating most of the Great Swamp. In 1836 construction was begun on the "New Reservoir," immediately west of the first one, and it was filled with water a few years later.³ The building of the National Road across the northern edge of the area was started in 1825 and completed a few years later. The canal, reservoirs, and National Road greatly hastened the settling of the country, the removal of the forests, and the general modification of the topography. By 1840 the forests of the uplands had been cut over, the Great Swamp was water-covered, and only the Bloody Run Swamp remained in a more or less primitive state.

Changes were almost as drastic during the period from 1850 to 1900 as in the preceding fifty years. In 1855 the third major method of transportation, the railroads, was added. All three agencies of transportation greatly increased the accessibility of the area, opened markets for farm produce, and in general caused an ever increasing amount of forest and brush removal. During this period attempts were made at draining portions of the hitherto inaccessible Bloody Run Swamp.

The operation of interurban electric lines beginning in 1901 considerably increased the number of persons annually visiting the area, and also augmented the amount of hunting. By 1914 the automobile had become a profound influence in modifying

³The reservoirs were first known as the Licking Summit Reservoirs, later as Licking Reservoir; in 1894 an Act of the Legislature changed the name to Buckeye Lake.

the roads and all other features of the area, besides greatly increasing the number of visitors. Between 1900 and 1930 the Bloody Run Swamp, the last partially unmodified section, was almost entirely drained, de-brushed and deforested. The final result of deforestation, de-brushing, draining, flooding and cultivating, and the making accessible of the land to large numbers of people has resulted in (1) the entire elimination of the "Great Swamp" and the creation of the present Buckeye Lake, (2) removal of all forests except secondary remnants, and (3) draining and cultivation of the Bloody Run Swamp until today its once distinctive flora and fauna is essentially that of the immediately adjoining region.

CHANGES IN NUMERICAL STATUS OF SOME MAMMALS

American Elk (*Cervus canadensis canadensis*) was recorded as late as 1755 by Smith (1870: 20-21) and were perhaps present until a few years later.

Several Bison (*Bison bison pennsylvanicus*) were killed in this area or the immediate vicinity in 1755 (Smith, 1870: 21). According to Smith the species was quite numerous in eastern Ohio between 1755 and 1759, and was much hunted.

American Beaver (*Castor canadensis*) was probably present in 1755. While traveling with the Indians in the general vicinity of Buckeye Lake, Smith (1870) frequently observed the trapping and catching of beaver. Schaff (1905: 113-114) mentioned the existence of a beaver dam "about three feet high and seventy-five feet long," and beaver meadow, which he saw a few miles east of Kirkersville when he was a boy (1840-1858). Schaff (104) had "no doubt" that Bloody Run Swamp was enlarged by beavers damming Bloody Run, but gave no evidence to support this theory. He was "inclined to think" that beaver "disappeared with the Indians or perhaps sooner." The early extinction of the beaver, bison, and elk may not have been entirely the work of the white man, since some of the Indians of eastern Ohio had guns and steel traps during the early years of the eighteenth century. Smith (1870: 24 and 60) repeatedly mentioned that the Indians used guns and steel traps between 1755 and 1759. Schaff (1905: 116-117) suggested that "as soon as fire arms were substituted for bows and arrows, and steel traps for simple wooden devices and dead falls, the destruction of game must have gone on rapidly." Possibly over-hunting by Indians, or Indians and white men, caused the elk, bison and

beaver to disappear in the area before the pioneer farmer and his destruction of primeval conditions became a factor.

Panthers (*Felis concolor couguar*) are frequently referred to in the literature but generally it is not clear whether the name "panther" refers to this species or the bobcat. *Felis concolor couguar* was in the general vicinity of the area in 1805 and was probably in the Great and Bloody Run swamps for several years thereafter. Smucker (1876: 45) related that in the autumn of 1805 Jacob Wilson, who was then living within a mile of Newark, treed with his dogs and then killed a "huge panther" that had previously raided his pig pen and carried away a pig. Brayton (1882: 8) considered this animal to have been *Felis concolor*.

Bobcats (*Lynx rufus rufus*) are indicated by the literature references as probably having been rather numerous, and they presumably remained in the large wooded and swampy areas after the panther had been extirpated. However, no reliable data of the actual capture of the bobcat in the area has been found. Many of the older residents claim that their fathers killed bobcats in Bloody Run Swamp as late as 1860. Schaff (1905) did not mention this species as occurring between 1840 and 1858.

American Otter (*Lutra canadensis canadensis*) was mentioned by Hill (1881: 176) as occurring in "considerable numbers" in the swamps of Licking County in early historic times. Kirtland (1838: 176) stated that it was common in Ohio as late as 1838. Schaff (1905: 97) related that between 1840 and 1858 "Otter tracks were often seen in the snow as they crossed to and from the Reservoir [Buckeye Lake] to the creek [Bloody Run]."

Black Bears (*Euarctos americanus americanus*) are mentioned in many undated references. They were apparently present until at least 1825 and possibly as late as 1840 (Hill, 1881: 176; and Graham, 1883, Pt. 5: 13). Schaff (1905: 91) claimed that bear, as well as beaver, buffalo, elk and deer had disappeared before his time (1840-1858). Graham (1883, Pt. 5: 314) stated that "Bears were very numerous about the original lakes and swamps. Indians and whites alike made it a business to hunt and kill them. In very early time, bears from other parts of the county were chased into the swamps and lowlands, where the Reservoir [Buckeye Lake] now is. They could not always be followed up successfully, and sometimes their capture had to be given up." Like the Indians before them, the early pioneers

considered the bear an important article of food. With the introduction of live stock and cultivation of crops the bear and other once important food animals became "vermin." Consequently methods were employed to decrease their numbers or extirpate them from the area. One method of reducing their numbers was through community or circular hunts such as were described by the Rev. Timothy Howe (Schaff, 1905: 148-152; and Smucker, 1876: 49-52) and Samuel Park (Hill, 1881: 604). One of these hunts, which took place between 1823 and 1825, was most graphically described by Howe. He related that a tract of land which embraced "Gibbon's Deadening"⁴ in Harrison Township, Licking County, was chosen for a hunt. Shortly before the actual hunt was to take place the Surveyor of Licking County surveyed the area to be hunted and outlined it by blazing trees. On the day of the hunt, most of the people of the community for miles around came to the deadening, and after all had assembled, the members of the party were placed in a line which completely encircled the area to be hunted. Some of the hunters were on horseback while the remainder were afoot, and at a signal, the entire assemblage began to march toward a given center, driving the game before them. When the circle became sufficiently small, the better marksmen were sent into the circle to shoot whatever game it might contain. At this particular hunt the bag consisted of "one large black bear, three wolves, forty-nine deer, sixty or seventy turkeys, and one owl" (Schaff, 1905: 151).

Timber Wolves (*Canis lupus*) were frequently mentioned, and were indicated as present in 1823 (Schaff, 1905: 151) and probably for several years thereafter. Hill (1881: 176) wrote that a bounty of as much as four dollars was paid for the scalp of a large wolf, according to the record of the Licking County Commissioners. Graham (1883: 201) states that in 1815 a den of cub wolves was captured in Hopewell Township, Perry County.

White-tailed Deer (*Odocoileus virginianus*) were unquestionably very numerous until at least 1825, and are frequently mentioned in the literature (Hill, 1881: 176; Graham, 1883,

⁴A "deadening" was a section of forest in which the trees had been girdled, causing them to die. After the trees had been dead for several years, and many of their limbs had fallen off, the dead timber was chopped down or burned and the land cleared of logs and brush, preparatory to farming. In the interim between the girdling of trees and clearing of land, a brush-thicket habitat invaded the area, providing excellent cover for the larger mammals.

Pt. 3: 15 and Pt. 5: 314). Schaff (1905: 151) recorded the killing of forty-nine deer in the "vermin drive" related above. He also stated (p. 91) that deer had disappeared from Bloody Run Swamp before his time (1840-1858). However, the older residents who were interviewed claimed that deer were present in Bloody Run Swamp until about 1855.

Raccoons (*Procyon lotor lotor*) were apparently very numerous throughout all of central Ohio, for they were mentioned as frequently as the deer. Smith (1870) repeatedly touched on the abundance of raccoons in eastern Ohio between 1755 and 1759, and indicated that the Indians trapped them in large numbers. Schaff (1905: 97) stated that "raccoons and opossums were numerous" during the 1840 to 1858 period. The old market hunters and sportsmen claim that the raccoon was more diurnal in early historic times than it is today. As late as 1885, according to these men, one to twelve raccoons could be killed per day during late summer by walking along the banks of streams and shooting them as they searched for crayfish and other food. The men also stated that there has been a rather steady decrease in the numbers of raccoons from 1885 to the present day, coincidentally with the decrease in size and amount of forest remnants, and a reduction in the number of large den trees. This decrease in raccoon numbers has occurred in spite of ever increasing restrictions in hunting.

The Gray Fox (*Urocyon cinereoargenteus cinereoargenteus*), a woodland inhabitant and seemingly a rather stupid animal, was apparently very common in early historic time. Its abundance and the absence or extreme scarcity of the red fox in those times is frequently mentioned in early Ohio literature. Kirtland (1838: 176) stated that the gray fox was "very abundant" at the coming of the white man, and that it disappeared "before the advancement of civilization." Of the red fox he wrote that it "was unknown in this region of country [Ohio] until the introduction of the white population," but that by 1838 it had become "a common and troublesome inhabitant." The older residents give the time of final extermination of the gray fox in the Buckeye Lake area as between 1855 and 1875. Writing of his experiences in Bloody Run Swamp between 1840 and 1858, Schaff (1905: 97) states that by that time gray foxes had disappeared.

The Red Fox (*Vulpes fulva fulva*) was apparently very rare in early historic time. In relating his experiences while hunting

the red fox (on horseback and with packs of hounds) in the area and vicinity, Schaff (1905: 97) gave the impression that this species was numerous between 1840 and 1858. William Harlow, Stephen Holtzberry, and other old residents have informed me that this inhabitant of the field-brush-remnant forest community was very numerous during the period from 1860 to 1900 but that it has since decreased in numbers. A few considered the decrease as great; others thought it was rather slight.

Gray Squirrels (*Sciurus carolinensis*) were not definitely recorded in the area before 1820, but it is assumed that this forest-inhabiting species was present from 1751 to 1820 and possibly was as abundant then as it was between 1823 and 1875. Schaff (1905: 97) mentioned that black squirrels (presumably a phase of the gray squirrel), gray squirrels, and flying squirrels (*Glaucomys volans volans*) were "in every wood" during his boyhood (1840-1858). By 1807 (Jones, 1898: 168) this squirrel had become such a nuisance to the farmer that the Ohio Legislature passed an Act requiring every person within the state, subject to payment of tax, to furnish a specified number of squirrel scalps within a given period (tails were usually substituted for scalps). If the evidence of kill was not produced the penalty was the same as that for a delinquent tax payer. Despite this persecution the squirrels "ocasionally" became exceedingly numerous.

One method of reducing the number of gray squirrels was by competitive hunts. Such hunts were frequently comprised of two companies or sides and the company killing the greatest number of animals usually won a prize. Hill (1881: 605) mentioned such a hunt which occurred in 1822, when for a day and a half, one group hunted in Granville Township, Licking County, and the other in Union Township (in the Buckeye Lake area) of the same county. In this hunt only rifles were used and the result was the killing of more than 3,800 squirrels (a little over nineteen hundred on a side). This number seems very large, but does not compare with the incredible number killed in the famous Franklin County squirrel hunt of August 10, 1822. It is claimed that in this hunt, which lasted a day, about two hundred men killed 19,650 squirrels (Jones, 1898: 172; and Hill, 1881: 605). Despite the persistent persecution and hunting of gray squirrels their numbers remained very large in the Buckeye Lake area, according to the old residents, until about

1880. After 1880 the forest remnants became too small and isolated to support the former large numbers and a decided decrease began. By 1910 the status of this squirrel had changed from that of a nuisance to that of a sporting game mammal. Despite ever increasing restrictions on its capture, the species disappeared from the area before 1920. The late game protector Earl McPeak told me that the last gray squirrel he saw, which had been killed in the area, was taken in the fall hunting season of 1918. During my investigations in the area between 1922 and 1933 I saw none and heard of no one who had seen any. Despite much persecution this animal remained immensely abundant as long as the environmental factors were sufficient. It became extirpated from the area when the amount of available habitat was at its lowest ebb, although the animal itself was receiving the greatest amount of legal protection from hunting and persecution that it had at any period of historic time.

Fox Squirrels (*Sciurus niger rufiventer*) were originally rare or absent over large areas of Ohio. The absence of references to this squirrel in early Ohio literature forces one to this conclusion. Schaff (1905) gave no indication of the presence of the animal between 1840 and 1858, although he frequently mentioned other squirrel species. The older residents of the area do not remember this conspicuous species between 1860 and 1870. Some claimed that it appeared in the area about 1875 and that it showed a rather consistent increase in numbers until 1900 to 1910. After 1915 a slight decrease was noted. These statements seem plausible when it is remembered that the fox squirrel is chiefly an inhabitant of grove-like forests (often an oak-hickory association) of rather small extent, surrounded by brush or cleared land. Such conditions were unusual before 1825, increased greatly in amount between 1830 and 1900, and began to decrease after 1900. During my investigations from 1922 to 1933 the fox squirrel population of the Buckeye Lake area showed a decrease, which was coincident with the continued removal of the remnant forests and the over-grazing of the woodlands. In this period hunting was judged to be of less importance as a detrimental agent than were other factors.

Cottontails (*Sylvilagus floridanus mearnsii*) were apparently of little importance to the early pioneers, for the early records of rabbits in the area are few and vague. Curiously, Schaff (1905) did not mention the rabbit in his recollections of the area

between 1840 and 1858. Despite the lack of definite records it seems safe to assume that the species was present before 1800, at least about forest edges, in brush lands, and in forest openings. Obviously this inhabitant of open, woodland remnants, brushlands and fields must have greatly increased in abundance with the augmentation of favorable conditions. The old residents have informed me that despite much trapping, hunting and other persecution the cottontail was very numerous during the period from 1860 to 1895, especially in the occasional or cyclic "rabbit years;" and that by 1910 the cleaning up or grazing of woodlands, brushlands and fields, and draining of swamps, had resulted in a decrease in numbers. This decimation has continued, in spite of increased protection. I noted a gradual decrease between 1922 and 1933. In this period the rabbit became rather uncommon on the most over-grazed and highly cultivated farms, and especially in the uplands where the fertility of the soil was low.

Muskrat (*Ondatra zibethica zibethica*) was surely present about the original glacial lakes and swamps of the area, although there is a lack of definite early records. Writing of conditions between 1840 and 1858, Schaff (1905: 97) mentioned that "along Bloody Run and Licking [South Fork of Licking River] muskrats abounded." By 1850, after completion of the reservoirs and the subsequent establishment of large cattail marshes, the species had probably become very numerous. According to the old residents this mammal was abundant during the period from 1860 to 1910, and the trapping of the animal for its fur was the principal occupation of several men during the latter half of the period. The residents state that muskrats have become reduced in numbers in recent years coincidentally with the decrease in area of marshland, and in spite of increased hunting restrictions. Between 1922 and 1933 I observed the draining of several swamps and marshes, by which the amount of available habitat in the area was materially reduced and the number of muskrats was consequently decreased.

Nothing has been found concerning the abundance of mice in the area in early historic time, although mouse concentrations have been mentioned in early literature for other sections of Ohio. The Field Mouse (*Microtus pennsylvanicus pennsylvanicus*) and the Northern Deer Mouse (*Peromyscus leucopus noveboracensis*) are no doubt the species principally referred to. During several years in the period from 1922 to 1933 I noted

marked concentrations of mice, usually in isolated areas of 50 acres or less. The farmers claimed that they first heard of or began seeing these concentrations about 1915, that they were increasing in size and numbers, and that they were not of yearly occurrence.

GENERAL CONCLUSIONS

Several conclusions can be gleaned from these mammal records. The elk, bison, and beaver became rare or were extirpated from the area coincidentally with the coming of the white man. The use of guns and steel traps by the Indians seems to have been a determining factor in the early elimination of these species.

The black bear, white-tailed deer, timber wolf, otter, panther, and bobcat were present between 1751 and 1820. They were extirpated from the area between 1820 and 1850, contemporaneously with the flooding of the "Great Swamp," the beginning of the destruction of Bloody Run Swamp, and the removal of the upland forests.

Such medium-sized mammals as the raccoon, gray fox, and gray squirrel which were inhabitants of the forest or were tolerant of forest conditions, are at present greatly reduced in numbers or have been extirpated.

Mammals that are not chiefly forest inhabitants, such as the fox squirrel and rabbit, are assumed not to have been numerous before 1825; to have increased greatly with a moderate deforestation and the establishment of much brushland and fields; to have reached a climax in abundance during the period from 1850 to 1900 when such conditions were most prevalent; and to have decreased in numbers with the advent of over-grazing and modern "cleaning up" farming.

This study of the literature and unpublished data suggests that the large, wide-ranging, chiefly forest inhabiting species were first extirpated; that the forest-brush inhabiting, moderate-sized species were next extirpated; and that species of the open woodlands, brush and fields occur at present. We therefore postulate that the modifications in topography and flora made by the white man throughout historic time have been reflected in the changing numerical status of the mammalian species. With few possible exceptions the numerical increase or decrease of a species closely followed the increase or decrease

in the amount of its habitat,⁵ except in so far as the species was unduly hunted or persecuted. If the species was not given sufficient protection it became exterminated before its environment was destroyed.

⁵Species having cyclic abundance probably do not show the effects of changing environment as rapidly as do non-cyclic species, but the general trend is the same.

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