



2019 Beaver Population Report

January 2020

Beaver (*Castor canadensis*) were historically found throughout the state of Ohio but were extirpated by 1830. In the 1930s, beaver began to recolonize the state. Since that time, the Ohio Division of Wildlife has used various methods to track the beaver population as it has grown and expanded.

Annual Beaver Surveys

The Division of Wildlife relies on the results of aerial surveys to estimate beaver population size. The current survey methods and locations were established in 2013. Each year, up to 54 25-square-mile survey plots are surveyed by aircraft between November and January. The plots are each assigned to a category (high, moderate, or low beaver potential) based on the availability of aquatic habitat (wetlands, lakes, ponds, rivers, and/or streams) within the plot. The number of plots surveyed in each category reflects the amount of total available habitat in that category within the state.

Within each survey plot the locations of active beaver colonies are marked based on the presence of a lodge or bank den. The surrounding habitat type is noted, and if a food cache is present, the size of the cache is noted. Since 2014, observers have also counted the number of muskrat houses present in each survey plot.

For each year, we tabulated the number of beaver colonies detected in each survey category and divided each by a correction factor of 0.81 to account for imperfect detection of beaver colonies on aerial surveys (Payne 1981). Colony density within each category was calculated based on the total area surveyed within that category. The density within each category was then expanded to a statewide colony estimate based on the total area within the state that falls into each category. Beaver colonies typically consist of a family group which in autumn includes an adult male and adult female, kits that were born that year, and the young of the

previous year. We estimated the total statewide population size by multiplying the number of colonies by the average number of beavers per colony (i.e. 5.85; Svendsen 1980).

In 2019, surveys were conducted from Nov. 12 to Nov. 21. All 54 plots were surveyed, and a total of 161 beaver colonies were observed (Figure 1). Food caches were observed at 93% of colonies. Colonies were most often located in strip-pit ponds (formed as a result of past surface mining activity; 34%) or streams (32%), followed by ponds (22%), wetlands (8%), and lakes (4%).

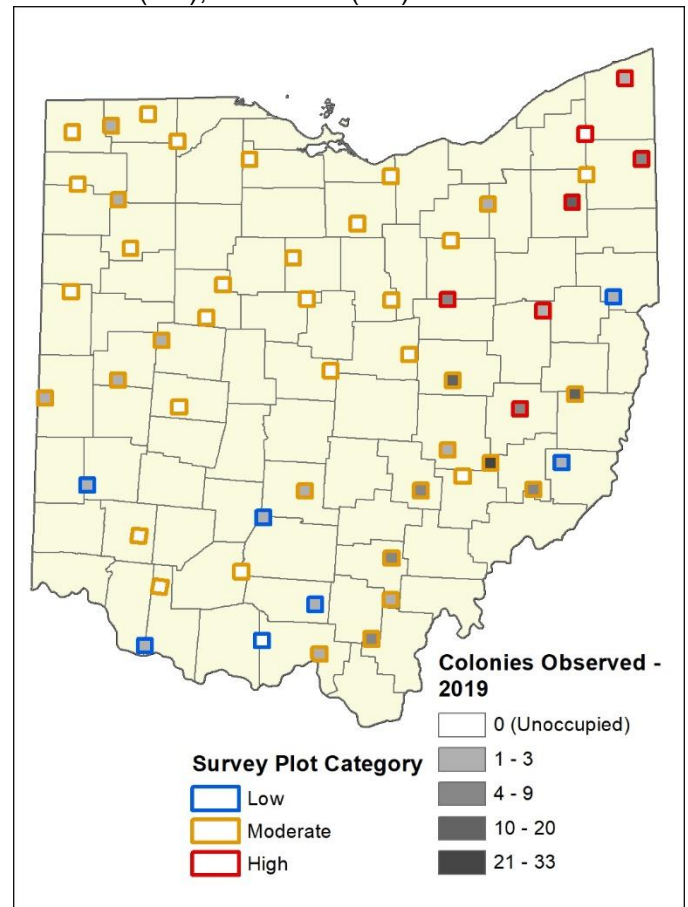


Figure 1. Beaver colony survey plots by category (high, moderate, or low beaver potential), and the number of colonies observed on surveys in November 2019.

The statewide occupancy rate (i.e. percentage of survey plots with at least 1 beaver colony observed) was 53% in 2019, an increase from 48%

in 2018. Since 2013, occupancy in moderate category survey plots has exhibited a declining trend, while occupancy in low category survey plots has increased (Figure 2).

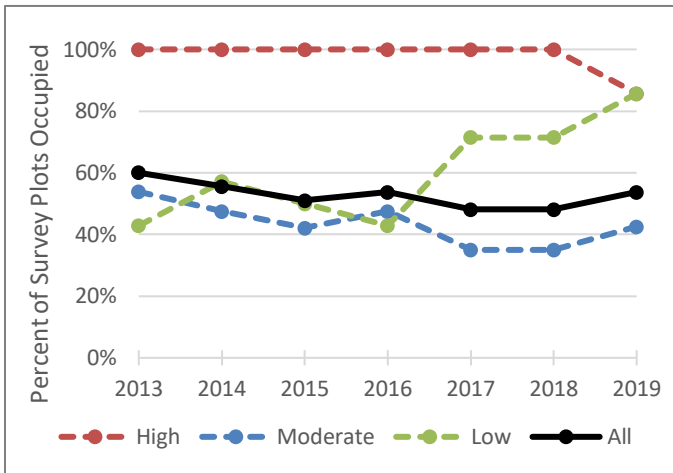


Figure 2. Beaver occupancy rates in all surveyed plots, and plots grouped by category (high, moderate, or low beaver potential) as observed on aerial surveys in 2013 to 2019.

The estimated statewide colony density in 2019 was 0.115 colonies per square mile, a decline from 0.125 in 2018 and 0.182 in 2017. Similar to occupancy rates, estimated density in the moderate category of survey plots has declined in recent years (Figure 3).

Beavers remain most abundant in eastern Ohio, as evidenced by higher colony density and occupancy on survey plots there, as compared to survey plots in the central and western portions of the state (Figure 1). The majority of area in the state (74%) falls in the moderate survey category. This

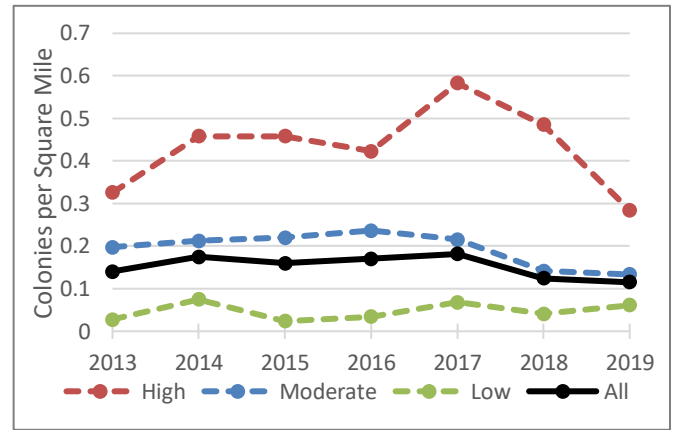


Figure 3. Estimated statewide beaver colony density, and estimated density for each survey category (high, moderate, or low beaver potential) as observed on aerial surveys in 2013 to 2019.

classification only accounts for available aquatic habitat, however other factors may impact beaver occupancy and density.

We grouped survey plots based of the existing dominant vegetation type (woody or herbaceous). We found, within the moderate survey plots, density was 22% greater in the plots dominated by woody vegetation than in plots dominated by herbaceous vegetation (Table 1). While this is not unexpected based on beaver life history, it highlights a potential to refine our population estimate by incorporating additional habitat variables. Future research efforts may focus on using locations of beaver colonies from past surveys to re-evaluate and enhance our current survey and population estimation methods based on beaver habitat use in Ohio.

Table 1. 2019 aerial beaver survey results, and estimates of colony density, by survey plot category (high, moderate, or low beaver potential), and dominant vegetation type within the survey plot, and statewide colony estimates by survey plot category.

Habitat Category	Dominant Vegetation Type	Number of Plots Surveyed	Number of Colonies Observed	Occupation Rate	Estimated Density (Colonies/Mi ²)	Statewide Colony Estimate
High		7	41	86%	0.2844	737
	Herbaceous	1	9	100%	0.4351	
	Woody	6	32	83%	0.2592	
Moderate		40	111	43%	0.1334	3,043
	Herbaceous	24	7	25%	0.0141	
	Woody	16	104	69%	0.3107	
Low		7	9	86%	0.0610	967
	Herbaceous	2	2	100%	0.0475	
	Woody	5	7	80%	0.0664	
All		54	161	54%	0.1151	4,747

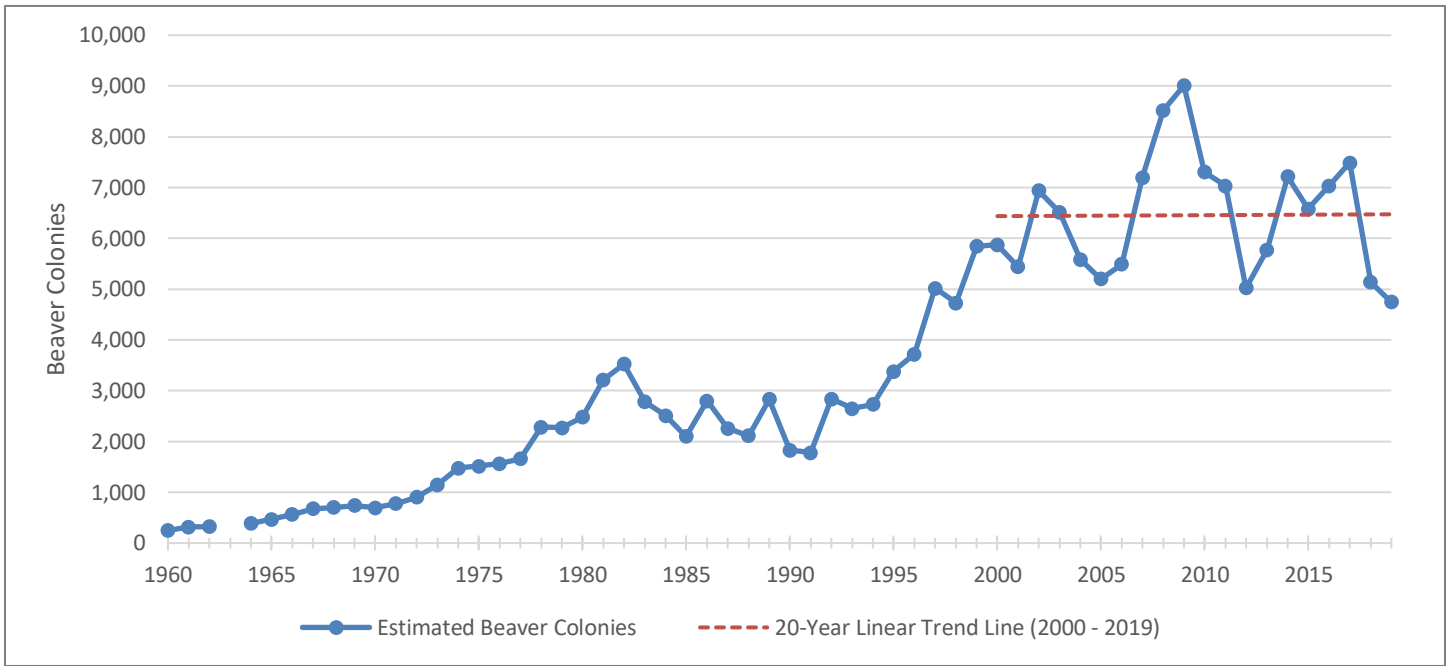


Figure 4. Estimated number of beaver colonies in Ohio from 1960-2019.

Surveys in the fall of 2019 resulted in a statewide estimate of 4,747 colonies, and an estimated population size of 27,768 beavers. The estimated number of beaver colonies in the state increased steadily from the 1950s to the early 2000s (Figure 4). Over the past 20 years, there have been annual fluctuations in statewide beaver colony estimates, some of which may be because of changes in survey methods. The 2019 colony estimate was the lowest estimated number of colonies in Ohio since 1998, however, the overall trend over the past 20 years has been stable. Beavers are now abundant and widespread in Ohio, and ongoing management based on the best available science will help to ensure the continued success of this ecologically important furbearing species.

Beaver Harvest

By 1961, beaver populations were well established in several northeast Ohio counties, and the Division of Wildlife established the first modern-day beaver harvest season. That year, 130 beavers were harvested in three counties. As beaver populations have increased and expanded, so have opportunities to harvest beaver in Ohio. Since the 2011-2012 trapping season, participation in beaver trapping and estimates of beaver harvest have been estimated based on results from the annual

fur taker survey. This questionnaire survey is sent out annually to anyone who purchases an Ohio fur taker permit.

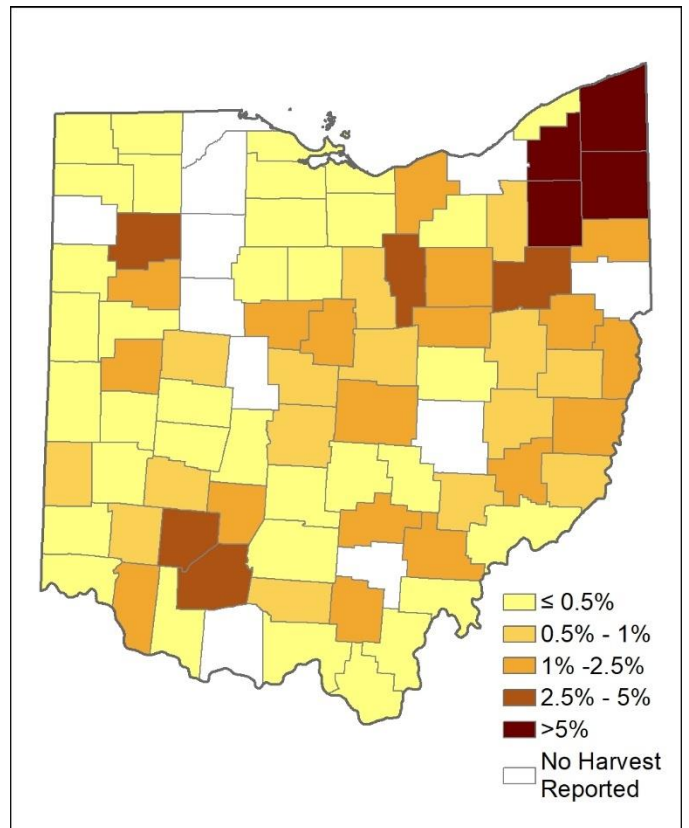


Figure 5. Percentage of total reported beaver harvest by county on 2018-2019 fur taker surveys.

During the 2018-2019 season, 9.1% of survey respondents indicated that they targeted beaver during the trapping season. For those that targeted beaver, the average harvest per trapper was 6.3 beavers, an increase from the previous year's average of 5.6 beavers. Assuming that survey respondents are representative of all fur taker permit holders, this results in an estimated statewide harvest of 7,929 beavers. Beavers are now harvested statewide, although harvest rates remain highest in northeast Ohio (Figure 5).

Survey results indicate a declining trend in the average harvest per trapper over the past eight seasons (Figure 6). The estimated number of trappers targeting beaver in the state has also declined over this time period, resulting in an overall declining trend in statewide beaver harvest. These trends however do not account for removal of beavers by nuisance control operators.

Beaver activity in an area can have positive impacts on an ecosystem, such as the creation of new habitat for fish and wildlife and decreasing erosion. However, a beaver's habitat-altering activity can also cause damage and conflicts with people through flooding and damage to trees and crops. With declining participation in beaver trapping during the season, nuisance control

operators may see an increased demand for removal services throughout the remainder of the year.

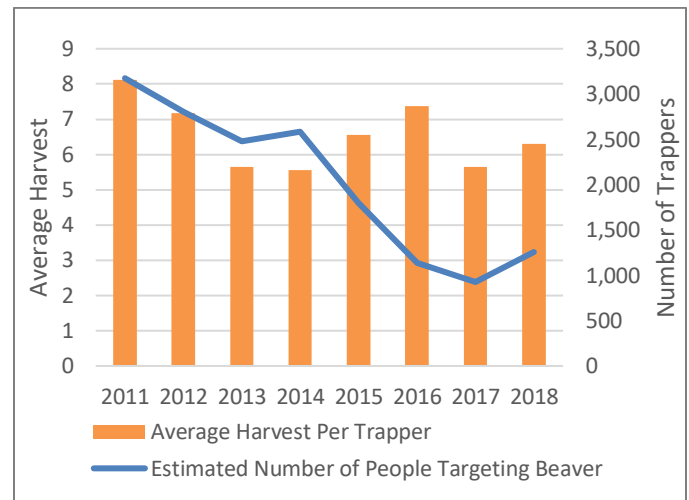


Figure 6. Estimated number of people targeting beaver during the harvest season, and average harvest per trapper based on responses to annual fur taker surveys.

References

- Payne, N. F. 1981. Accuracy of aerial censusing for beaver colonies in Newfoundland. *Journal of Wildlife Management* 45:1014–1016.
- Svendsen, G. E. 1980. Population parameters and colony composition of beaver (*Castor canadensis*) in southeast Ohio. *American Midland Naturalist* 104:47–56.