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Brian ✓

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MONITORING AND CENSUSING OF RUNNING BUFFALO CLOVER POPULATIONS-1995  
(Trifolium stoloniferum)

Final Report for the Ohio Division of Natural Areas & Preserves  
Ohio Department of Natural Resources  
March 20, 1996

Marjorie S. Becus  
9628 Union Cemetery Road  
Loveland, Ohio 45140

## MONITORING AND CENSUSING OF RUNNING BUFFALO CLOVER POPULATIONS-1995

### Summary

**OBJECTIVES:** The objectives this year included monitoring of the permanently marked plots at Shawnee Lookout Park for the sixth year to study population dynamics, establishing a new plot in Newberry Wildlife Sanctuary to study the production and survival of daughter plants, and to census various populations in southwestern Ohio to record changing populations sizes.

**METHODS:** 1. The square-meter plots at Shawnee Lookout Park were visited in April, May, July and September. All plants within the plots were mapped on graph paper. 2. A square-meter plot was established at Newberry and all mother plants, daughter plants, stolons and flowers were mapped during visits in May, July and September. 3. Various other Ohio populations were visited in May. Counts or estimates of the number of individual plants were made.

**RESULTS:** The Miami Fort plot contained 36 plants in April, 34 in May, 28 in July and 44 in September. Although the number of plants in this plot has decreased from a high count of 134, the colony has spread over a larger area. The plots at Cabin View and Bobcat Ridge picnic areas contained no plants for a second year and very few nearby plants.

The Newberry plot was selected to include plants with stolons in order to study daughter plants. The daughter plants were mapped, but it will require another year or more to learn their fate.

Many of the southwestern Ohio populations were visited in May and counts or estimates were made of the population sizes. Slight to large increases from last year in numbers of individual plants were found in most populations. Two new populations of running buffalo clover were discovered in 1995. One is the Lake Property at Miami Whitewater Forest which is included in this report and the other is the Lawrence County population.

### RECOMMENDATIONS:

1. The Hamilton County Park District should continue the suggested mowing schedule at the Miami Fort in order to optimize flowering and maturing of the clover seeds.
2. In Newberry Wildlife Sanctuary the groundwork has been laid to follow the lives of the daughter plants. One or two more years of monitoring this plot is needed.
3. Mitchell Memorial Park should be revisited to search for clover plants.
4. Ten Ohio running buffalo clover populations should be censused for the next five years to meet the suggested guidelines agreed upon at the 1995 Running Buffalo Clover Conference. This work will be shared with ODNR-DNAP.

# MONITORING AND CENSUSING OF RUNNING BUFFALO CLOVER POPULATIONS-1995

## INTRODUCTION

Running Buffalo Clover (Trifolium stoloniferum) is a federally endangered species once believed to be extirpated, but rediscovered in 1985. Ohio is one of five states where this plant is currently found, and one of only three states with more than one natural population. This is the seventh year of monitoring running buffalo clover in the Hamilton County Park District, and the longest on-going study in progress anywhere.

## OBJECTIVES

This year's study included monitoring for the sixth year permanently marked plots in Shawnee Lookout Park to study population dynamics; establishing and monitoring a new plot at Newberry Wildlife Sanctuary in order to study the production and survival of daughter plants; and censusing most of the populations in southwestern Ohio to record the increase or decrease in numbers of individuals in these populations.

## METHODS

1. The three permanently marked square meter plots at Shawnee Lookout Park were visited in April, May, July, and September. All plants observed within the plots were mapped on graph paper at each visit.
2. A new square meter plot was marked with metal stakes at Newberry Wildlife Sanctuary. This population was selected because it is in a relatively undisturbed woods in contrast to the Shawnee Lookout Park plots which are in picnic and other open mowed areas. The Newberry plot was also selected to contain only a few plants, but plants with stolons. The rooted crowns, stolons, flowers and daughter plants were mapped on graph paper in May, July and September.
3. Various other Ohio populations were visited in May and counts or estimates were made of the population sizes.

## RESULTS AND DISCUSSION

1. Two of the Shawnee Lookout Park plots had no clover plants for the second year. These were at the Cabin View and Bobcat Ridge picnic areas.
2. The Miami Fort plot count which has varied from 22 plants to 134 during the five years of monitoring, contained 36 plants in April, 34 in May, 28 in July and 44 in September. Seeing a slight increase in numbers in September is encouraging as this indicates first year plants from seeds. (See the DNAP graph on page 5, of the five years of monitoring this plot.)

Following the plants in this plot has helped to better understand the life cycle of running buffalo clover. Increases in numbers of plants in late summer are usually followed by similar numbers the next spring, while decreases in numbers of plants in the late summer indicate that many of these plants have completed their normal life expectancy of three years and have not been replaced by younger plants.

The Miami Fort population as a whole has dramatically increased in numbers of individuals over the past seven years (100-110 in 1988 to 1040 in 1995). The marked plot is only a sample and although the number of clover plants within this plot has decreased, the colony of which the plot is a part, has spread over a larger area. New colonies have been found on the Miami Fort and some small colonies have experienced dramatic increases in number of individuals.

3. A plot was marked in Newberry Wildlife Sanctuary to include several plants with stolons. At the first visit in May, four mother plants were mapped with their long stolons and flowers. Two simple (no stolons or flowers) plants were mapped.

In July the four mother plants were relocated. Three simple plants were present. More stolon growth had occurred and nine daughter plants were present. Most of the daughter plants were on the same stolons which had produced flowers in May.

In September, the four mother plants and three simple plants were again relocated. Nine daughter plants were present. Six of the daughters were the same as the ones mapped in July and three were different. Also two new plants apparently not associated with any stolons were observed. These two plants were assumed to be from germinated seeds of the previous year. The purpose of monitoring this plot is to see how the daughter plants develop. Continued monitoring should show whether the daughter plants will become mothers in 1996 or need another year to mature.

3. Census of Ohio running buffalo clover populations included in this study:

Hamilton County Park District

Site	# Plants 1995 (1994)	1995 # Flowering Stems	1995 Date
<u>Shawnee Lookout Park:</u>			
Bobcat Ridge and Cabin View	71 (59)	5 (mowed)	May
Miami Fort	1040 (636)	223	May
Oxbow	10 (5)	no count	April
<u>Miami Whitewater Forest:</u>			
Parcours	2 (3)	0	May
Lake property	91 no count	143	May
<u>Newberry Wildlife Sanctuary</u>	191 (172)	66	May
<u>Mitchell Memorial Forest</u>	0 (0)	0	May
<b>Hamilton County Parks Total:</b>	<b>1405 (875)</b>	<b>437</b>	

Census of running buffalo clover populations not in the parks:

Site	# Plants 1995 (1994)	# Flowering Stems	1995 Date
Promont	46 (66)	22	May
Gatch	27 (24)	3 (mowed)	May
Cincinnati Nature Center	6 (6)	0	May
Fankhauser	80-100 (*)	no count	August

\* not counted in 1994

Discussion of some of these populations:

Bobcat Ridge and Cabin View picnic areas have previously been considered as two populations, but according to the recent definition established at the 1995 Running Buffalo Clover Conference, different populations of running buffalo clover are those more than one half mile apart, therefore these two picnic area populations are now considered as one. Only seven plants were found at Cabin View this year. These are along the edge of the woods, which is a relatively new location for the clover.

The Oxbow population of four plants was found in 1994 on the flood plain of the Great Miami River within the Oxbow wetlands area. Ten plants with stolons were counted in April 1995.

The Lake Property is a newly acquired acreage expanding the size of Miami Whitewater Forest. The clover was found in May 1995 by Denis Conover while doing a plant inventory for the HCPD. This population consists of two colonies of clover growing in a dirt road in the woods. Flowering was profuse.

The population of running buffalo clover in Mitchell Memorial Park had 235 plants in 1992 and appeared to be an extremely robust population. The site was not visited in 1993 and no clover could be found in 1994 or 1995. Some of the soil previously supporting growth of clover plants, was chopped up with a hoe in 1995 in hopes of stimulating dormant seeds. The site should be revisited to look for new clover.

The clover plants at Promont were marked and not mowed after flowering. On July 7, 10 fruits remained and seeds could be felt in each fruit.

A few more clover plants were found on the Gatch property. This lawn is frequently mowed, making it difficult to find the clover and it would be unlikely that fruits could mature. Much of the Gatch property is being developed, but in a recent conversation with Ann Gatch, she assured me that the family would never sell the ca 1820 stone house and lawn (site of the clover).

The Cincinnati Nature Center clover was transplanted from the Fankhauser population in 1990. The same six plants have come up for the last three years. No stolons or flowers have been seen.

The Fankhauser population appears to be stable at the present time. At the time of the visit, the lawn had been recently mowed and the plants were difficult to find. The total was estimated to be 80-100 plants. One seedling was found. Dr. Fankhauser reports that when clover flowers are evident, he avoids mowing the flowering plants.

Conclusion: Most of the clover populations which were inventoried in 1995 showed increases in numbers of individuals. The Promont population decreased because of an unfortunate disturbance of the clover. Hopefully as a plant of disturbance, this population will rebound.

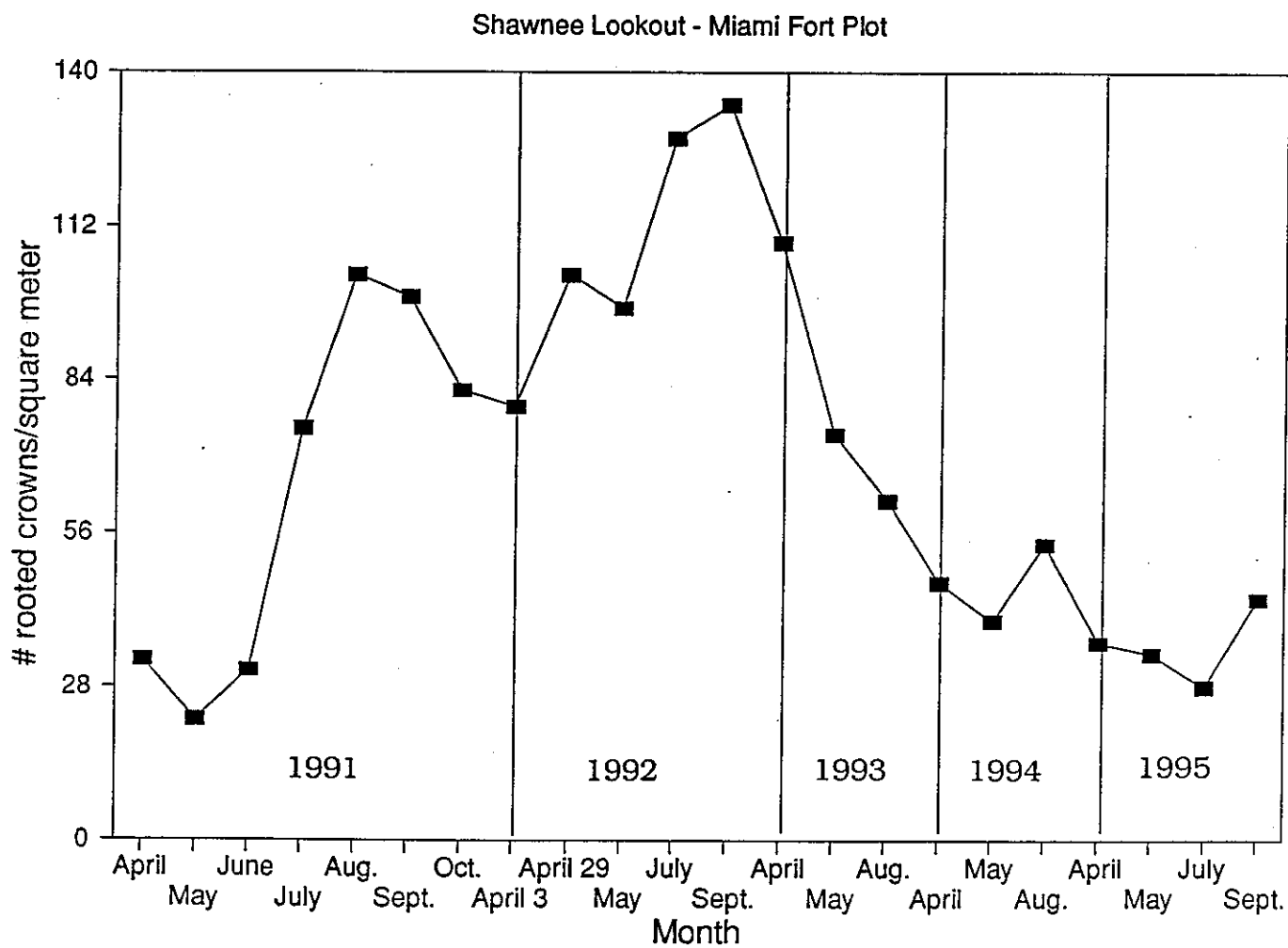
Two new populations were discovered in 1995. These are the Lake property which is included in this report and a disjunct population in Lawrence County, Ohio.

As agreed at the December 1995 Running Buffalo Clover Conference in Cincinnati, 10 populations of clover should be censused for five years in order to determine increases or decreases in population sizes as well as survival of the populations. We want to see if these populations are self-sustaining, and if any management practices should be implemented. For example, eight Ohio populations were found in 1988. Today only four of these are still in existence. Only two of those eight populations are stable or expanding (Fankhauser and the Miami Fort). It is important to continue censusing running buffalo clover populations until we understand what constitutes a self-sustaining population and there are sufficient number of these self-sustaining populations known.

#### RECOMMENDATIONS

1. The mowing schedule at the Miami Fort should be continued indefinitely. This schedule calls for mowing around April 18th and again the first week of May. Then mowing should be curtailed until July when the clover seeds should be mature. Mowing is then done once or twice in the late summer and fall.
2. The marked plot at Newberry Wildlife Sanctuary should be monitored for another year and perhaps two years, until the life history of daughter plants is better understood.
3. Mitchell Memorial Park should be revisited to search for clover plants.
4. A census should be made of ten Ohio running buffalo clover populations each year for five years.

Figure 1. Number of rooted crowns per square meter at the Shawnee Lookout -Miami Fort plot during the 1991 - 1995 growing seasons.



ACKNOWLEDGEMENTS:

I wish to thank Beverly McGuire for her help in monitoring the clover at Newberry Wildlife Sanctuary and keeping me informed when the Newberry stream was impassable. Thanks to John Klein for working with me on HCPD clover and sharing clover information. I am indebted to ODNR-DNAP for funding this project and including me in other running buffalo clover adventures. Thanks to Kathleen Cochrane DNAP for preparing the graph of my data from the Miami Fort plot.