

IMPACT OF DEER ON NATURAL AREAS FINAL REPORT (1995)

By Denis G. Conover, Ph.D. (Contractual Researcher Hamilton County Park
District)



Deer Exclusion Fence At Shawnee Lookout (June, 1995)

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In late March, 1994 a plot was laid out in order to study the impact of white-tailed deer (*Odocoileus virginianus*) on natural vegetation in Miami Whitewater Forest (see Final Report : Impact of Deer on Natural Areas, November 15, 1994 by D.G. Conover). This plot is located on a south-facing slope in the woods north of Mt. Hope Rd. just west of the radio tower (see Map 1). This site was chosen because it is secluded, yet accessible by vehicle, aiding in the transport of the exclusion fence to the site. The study area appears to harbor a fair number of deer. Five deer were seen in close proximity to the plot on the day that it was laid out and deer droppings and deer tracks have been found within the open plot on several occasions.

The plot is 80 feet (24.4 meters) long and 40 feet (12.2 meters) wide (see Figure 1). The plot is divided into two sections: a control side that will remain accessible to deer, and an experimental side that excludes deer. Each side contains five one meter diameter (0.8 m²) subplots in which vegetation was monitored during the 1994 growing season prior to erection of the deer exclusion fence. The Land Management staff erected a fence around the experimental side of the plot during January, 1995. The fence is 8 ft. high with 6 in. square mesh. This fence should exclude deer from the plot, but will allow free passage of other herbivores such as rabbits and groundhogs.

A similar experiment with a deer exclusion fence was established at Shawnee Lookout in January, 1995 (see Figure 2). The deer study plot at Shawnee Lookout is located southeast of Lawrenceburg Road (see Map 2). The study area appears to harbor a fair number of deer. An active deer trail runs through the open plot. Deer droppings and deer tracks have been found within the open plot on several occasions. Vegetation was not monitored at this site prior to erection of the deer exclusion fence.

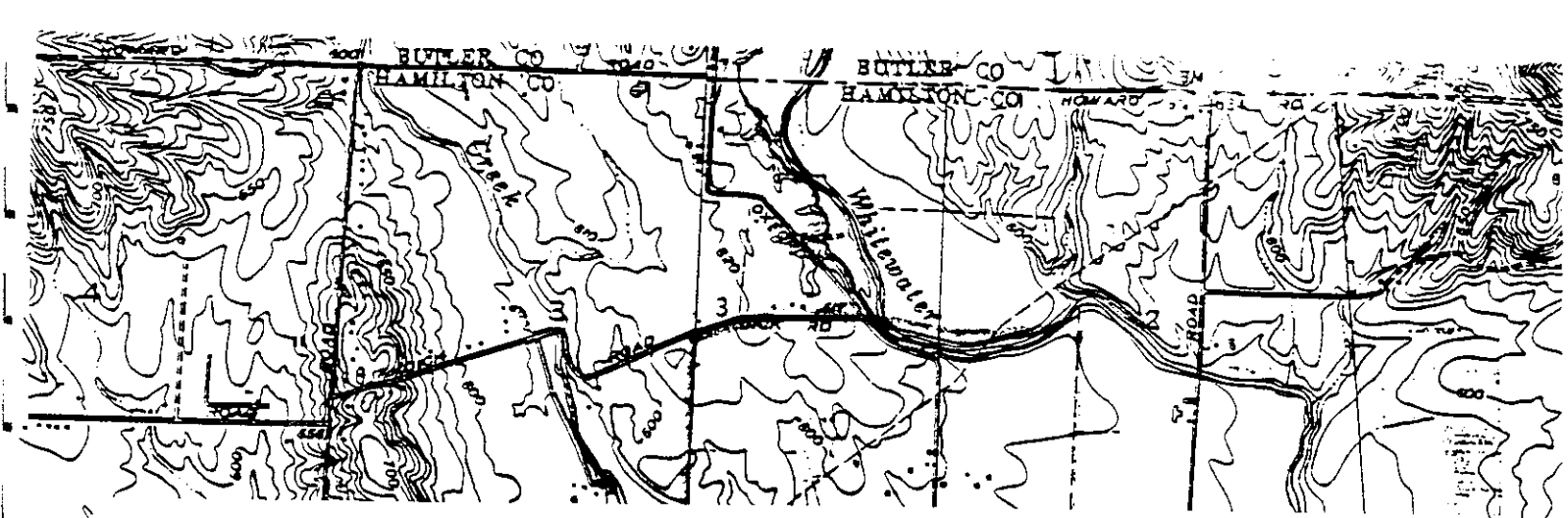
Vegetation was monitored in the control and experimental plots at Miami Whitewater Forest and Shawnee Lookout during 1995. Vegetation in the plots at Miami Whitewater Forest during 1995 (Table 2) can be compared with the 1994 data (Table 1). The 1994 growing season was quite dry, but some herbaceous vegetation came up in the plots. Herbaceous species included spring beauty (*Claytonia virginica*), Dutchman's breeches (*Dicentra cucullaria*), cutleaved toothwort (*Dentaria laciniata*), garlic mustard (*Alliaria officinalis*), bedstraw (*Galium sp.*), purple woodsorrel (*Oxalis violacea*) and mayapple (*Podophyllum peltatum*). Woody vegetation included seedlings and saplings of hickory (*Carya spp.*),

black cherry (*Prunus serotina*), Virginia creeper (*Parthenocissus quinquefolia*), greenbriar (*Smilax spp.*), ash (*Fraxinus spp.*), hop-hornbeam (*Ostrya virginiana*), sugar maple (*Acer saccharum*), flowering dogwood (*Cornus florida*), oak (*Quercus spp.*), grape (*Vitis spp.*) and poison ivy (*Rhus radicans*). The canopy consists mainly of sugar maple (*Acer saccharum*), oaks (*Quercus velutina*, *Q. borealis* and *Q. alba*), hickories (*Carya ovata* and *C. cordiformis*), white ash (*Fraxinus americana*), black cherry (*Prunus serotina*) and beech (*Fagus grandiflora*). Other vegetation present in the fenced plot, but not within the subplots includes jumpseed (*Tovara virginiana*), hackberry (*Celtis occidentalis*), grape (*Vitis sp.*) and white licorice (*Galium circaezans*). The same types of vegetation were present in the Miami Whitewater plots during 1995. There were no marked differences between the vegetation in the plots during 1994 and 1995 and there were no marked differences in species composition or plant height between the fenced in and the open plots at Miami Whitewater Forest (see photographs). There were, however, some signs of deer browsing on *Viburnum* (*Viburnum sp.*) and dogwood (*Cornus sp.*) twigs, and clipping of mayapple (*Podophyllum peltatum*) leaves in the unfenced plot.

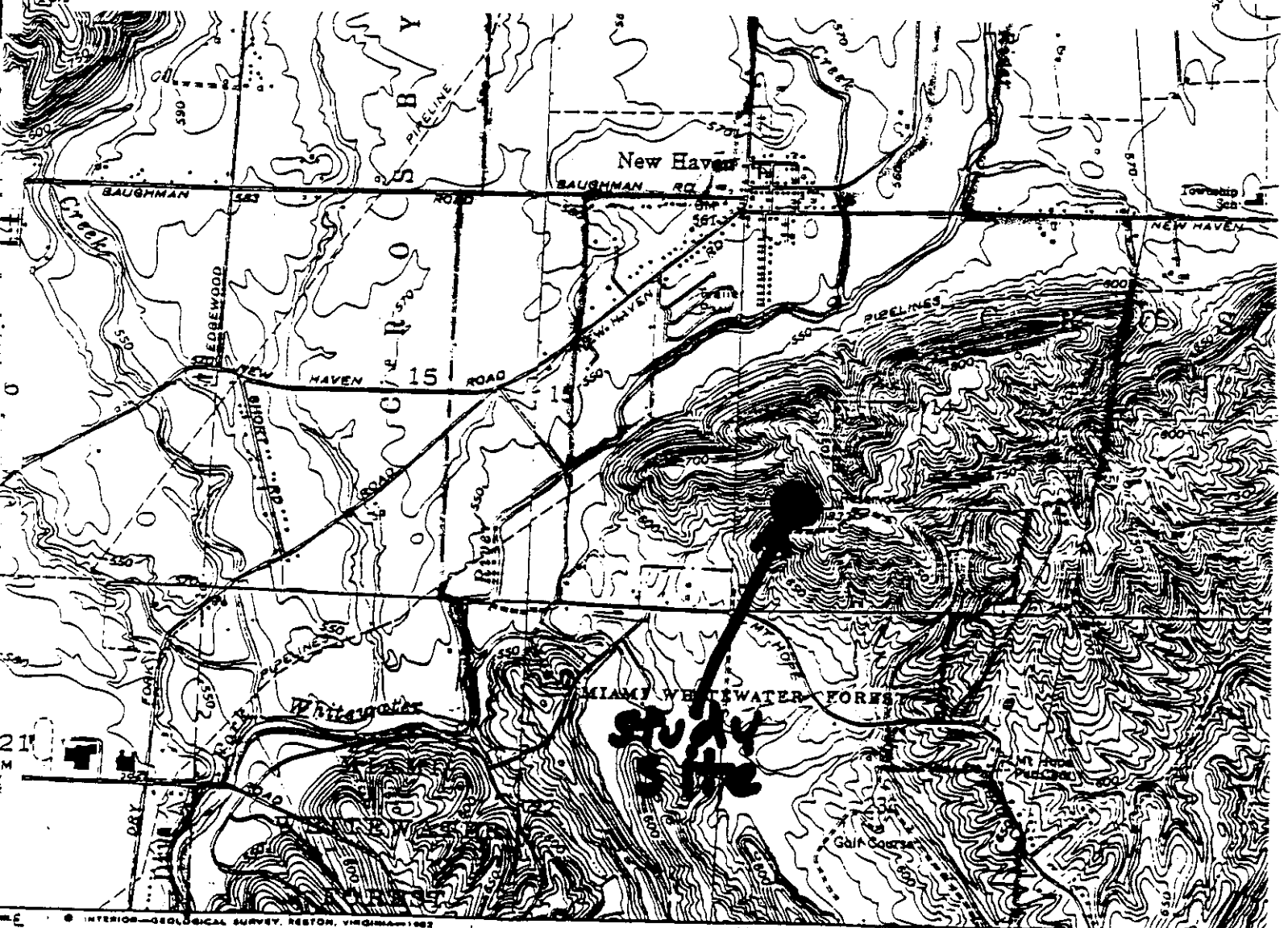
Vegetation was also monitored in the control and experimental plots at Shawnee Lookout during 1995 (Table 3). The vegetation here is quite different from that at the Miami Whitewater site. Herbaceous species included: white snakeroot (*Eupatorium rugosum*), Miami mist (*Phacelia purshii*), wild rye (*Elymus sp.*), violets (*Viola spp.*), bedstraw (*Galium aparine*), false mermaid (*Floerkea proserpinacoides*), purple dead nettle (*Lamium purpureum*), enchanter's nightshade (*Circaea lutetiana*), gill-over-the-ground (*Glechoma hederaceae*), common chickweed (*Stellaria media*), and ivy-leaved speedwell (*Veronica hederifolia*). Woody vegetation included seedlings and saplings of box elder (*Acer negundo*), Ohio buckeye (*Aesculus glabra*), grape (*Vitis sp.*), and sugar maple (*Acer saccharum*). The forest canopy at this site consists mainly of box elder (*Acer negundo*). Other vegetation present in the fenced plot, but not within the subplots included tall ironweed (*Vernonia altissima*), tall nettle (*Urtica procera*), nodding fescue (*Festuca obtusa*), jumpseed (*Tovara virginiana*), poke (*Phytolacca americana*), black locust (*Robinia pseudoacacia*), Joe-pie-weed (*Eupatorium maculatum*), Philadelphia fleabane (*Erigeron philadelphicus*), dodder (*Cuscuta sp.*), purple cress (*Cardamine douglassii*), giant ragweed (*Ambrosia trifida*), garlic mustard (*Alliaria officinalis*) and Ohio buckeye (*Aesculus glabra*). Other vegetation present in the unfenced plot, but not within the subplots included tall ironweed (*Vernonia altissima*), yellow Corydalis (*Corydalis flavula*) and grape (*Vitis sp.*). There were no marked differences in species composition or plant height between the fenced-in and the open plots at Shawnee Lookout during 1995 (see photographs). There were, however, some signs of deer browsing on clearweed (*Pilea pumila*) and honewort (*Cryptotaenia canadensis*) in the unfenced plot.

In conclusion, as yet there are no obvious differences in vegetation between the fenced-in and the unfenced plots at Miami Whitewater Forest and Shawnee Lookout. It may take one or more additional

growing seasons for this to occur. The information collected in this 1995 survey will provide baseline data for future reference and comparisons.



MAP 1. MAP SHOWING THE LOCATION OF THE PLOT FOR STUDYING THE IMPACT OF DEER ON VEGETATION AT MIAMI WHITEWATER FOREST

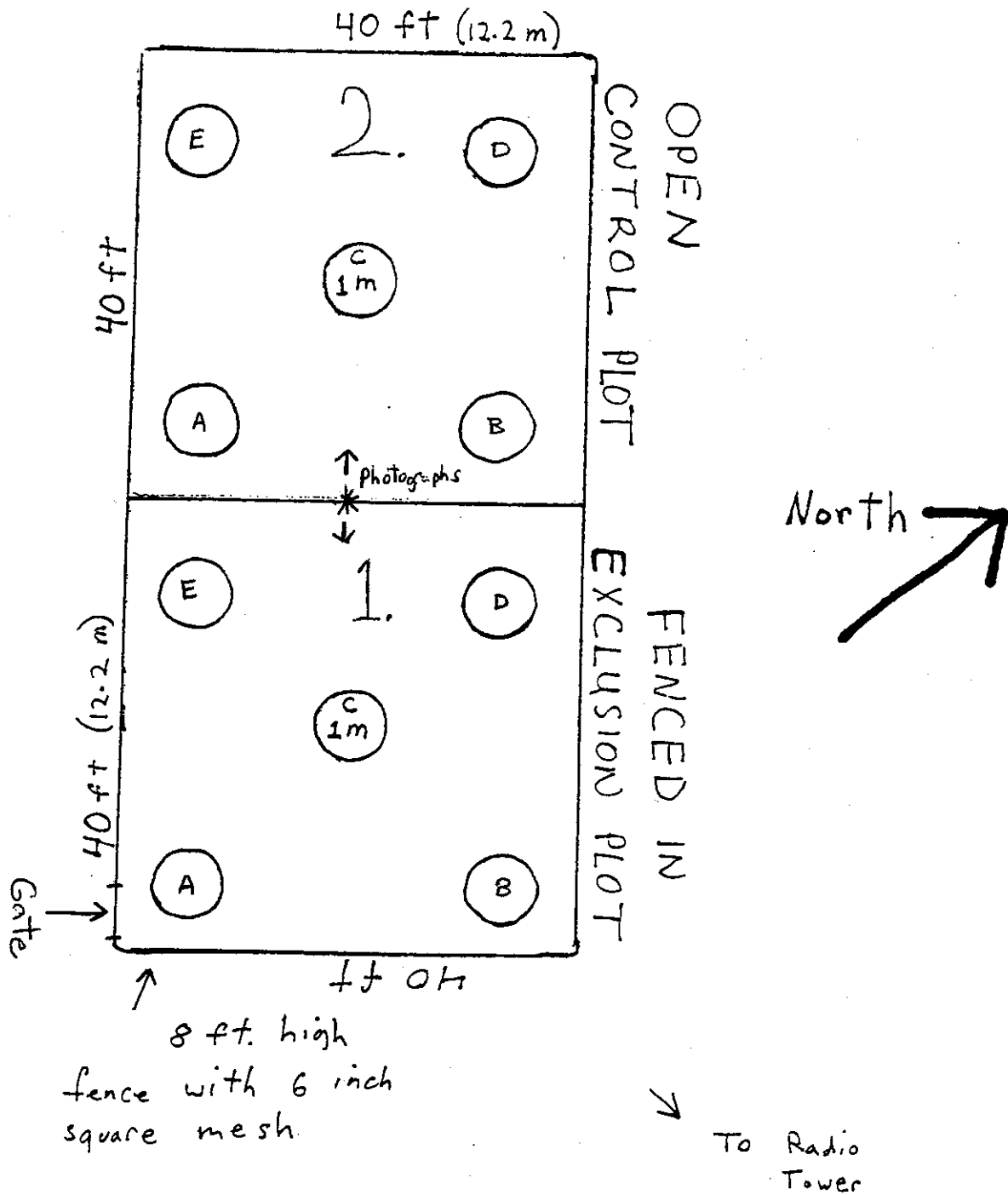


ROAD CLASSIFICATION

Primary highway,
Light-duty road, hard or
improved surface

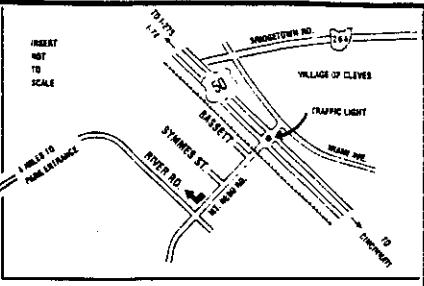
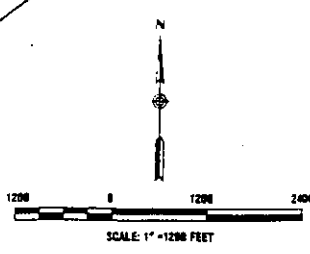
Mapped, edited, and published by the Geological Survey
in cooperation with the Defense Mapping Agency
Revised in cooperation with State of Ohio agencies
Control by USGS, NOS/NOAA, and City of Cincinnati

FIGURE 1. PLOT FOR STUDYING THE IMPACT OF DEER ON VEGETATION AT MIAMI WHITEWATER FOREST

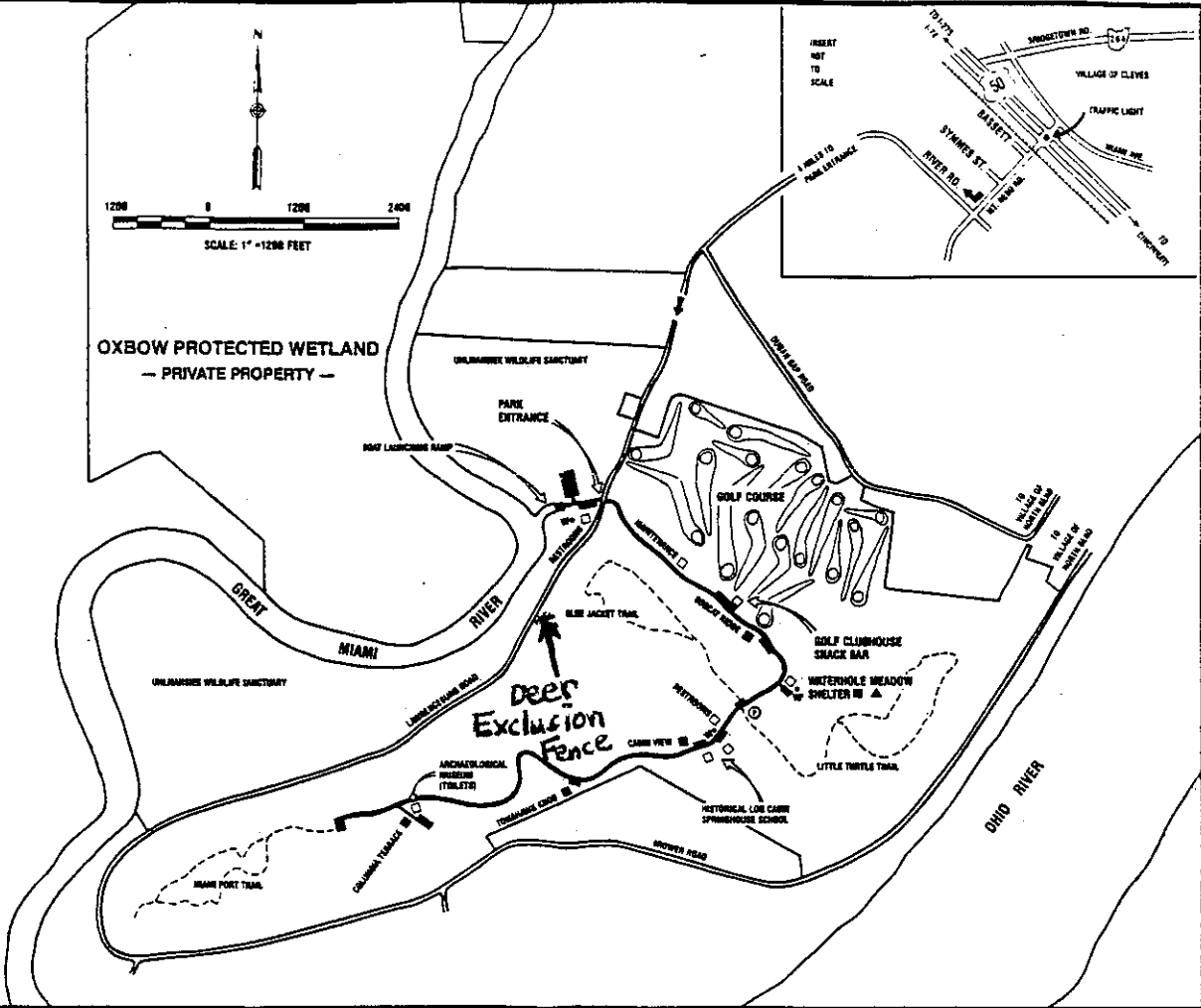


MAP 2. MAP SHOWING THE LOCATION OF THE PLOT FOR STUDYING THE IMPACT OF DEER ON VEGETATION AT SHAWNEE LOOKOUT

SHAWNEE LOOKOUT



- LEGEND**
- PICNIC AREA
 - ▲ RESERVABLE AREA
 - Ⓟ PLAYGROUND
 - ▬ PARK ROADS/PARKING
 - - - FOOT TRAILS
 - ≡ WATER
 - BUILDING/SHELTER



THE PRINTING COST OF THIS GUIDE HAS BEEN PARTIALLY FUNDED BY THE DUPONT FORT HILL PLANT "MAKE EVERY DAY EARTH DAY"

FIGURE 2. PLOT FOR STUDYING THE IMPACT OF DEER ON VEGETATION AT SHAWNEE LOOKOUT

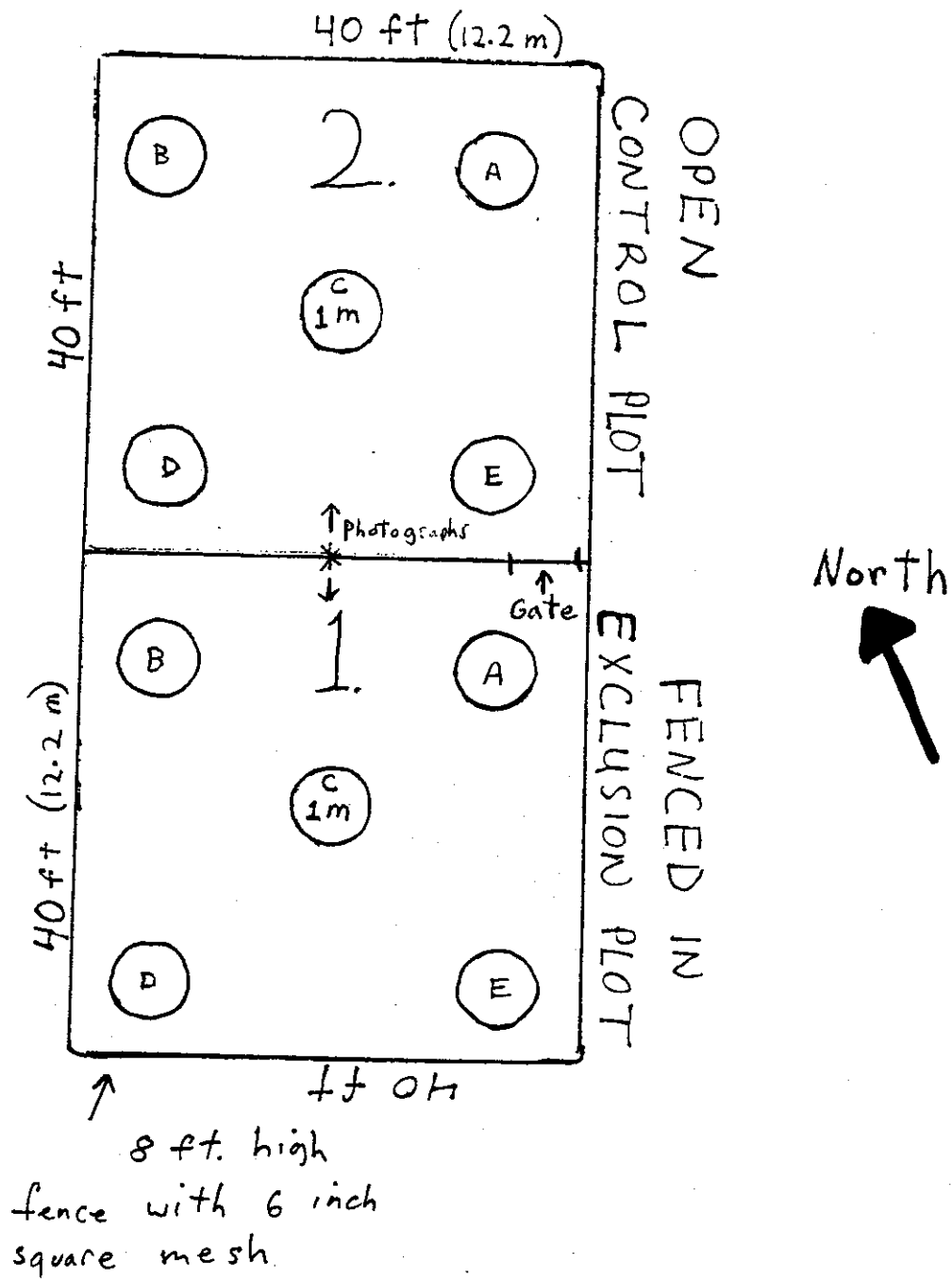


TABLE 1. MIAMI WHITEWATER FOREST 1994

CHECK-LIST OF VASCULAR PLANT SPECIES FOUND IN DEER IMPACT STUDY PLOTS AT MIAMI WHITEWATER FOREST BASED ON OBSERVATIONS MADE DURING THE 1994 GROWING SEASON BY DR. DENIS G. CONOVER

KEY: * = Woody species; s = seedling; t = sapling or tree (base diameter > 5 mm)

NOTE: 1A-1E are the sample sites located within the area to be fenced in. 2A-2E are the sample sites located within the control area to be left open. Canopy consists mainly of sugar maple, and various oaks and hickories.

1994 Survey Dates: April 2, 11, 25; May 5, 28; June 25; August 20; October 5

Number of Plants Appearing During Season Per Location:

| Scientific Name (Common Name) | FENCED IN | | | | | UNFENCED | | | | |
|---|-----------|----|----|----|----|----------|-----|----|----|----|
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| * <i>Acer saccharum</i> (Sugar maple) | 1s | 1s | 0 | 1s | 1s | 6s | 0 | 3s | 0 | 1s |
| <i>Alliaria officinalis</i> (Garlic mustard) | 33 | 30 | 4 | 27 | 2 | 12 | 15 | 30 | 40 | 20 |
| * <i>Carya</i> sp. (Hickory) | 0 | 0 | 1t | 0 | 1t | 0 | 0 | 0 | 1t | 0 |
| <i>Claytonia virginica</i> (Spring beauty) | 12 | 40 | 20 | 40 | 36 | 28 | 50 | 44 | 40 | 16 |
| * <i>Cornus florida</i> (Dogwood) | 0 | 0 | 0 | 0 | 0 | 0 | 10s | 1s | 0 | 0 |
| * <i>Crataegus</i> sp. (Hawthorn) | 0 | 0 | 0 | 0 | 0 | 0 | 1s | 0 | 0 | 0 |
| <i>Dentaria laciniata</i> (Cut-leaved toothwort) | 0 | 3 | 11 | 7 | 5 | 45 | 0 | 10 | 0 | 14 |
| <i>Dicentra cucullaria</i> (Dutchman's breeches) | 20 | 25 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Eupatorium rugosum</i> | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| * <i>Fraxinus</i> sp. (Ash) | 2s 1t | 0 | 1s | 0 | 0 | 1s | 0 | 0 | 0 | 0 |
| <i>Galium</i> sp. (Bedstraw) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| * <i>Ostrya virginiana</i> (Hop-hornbeam) | 4s | 0 | 0 | 0 | 0 | 2s | 2s | 2s | 0 | 0 |

TABLE 1. MIAMI WHITEWATER FOREST 1994

| Scientific Name (Common Name) | Number of Plants Appearing During Season Per Location: | | | | | | | | | |
|--|--|----|----|----|----|----------|----|----|----|----|
| | FENCED IN | | | | | UNFENCED | | | | |
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| <i>Oxalis purpurea</i> (Purple woodsorrel) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| <i>Oxalis stricta</i> (Yellow wood-sorrel) | 1 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 1 |
| * <i>Parthenocissus</i> <i>quinquefolia</i> (Virginia creeper) | 1t | 0 | 0 | 0 | 1t | 3t | 4s | 0 | 1s | 2s |
| <i>Podophyllum peltatum</i> (Mayapple) | 0 | 2B | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 9 |
| <i>Polygonatum</i> sp. (Solomon's seal) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Prunus serotina</i> (Wild black cherry) | 2s | 0 | 0 | 2s | 1s | 2s | 0 | 0 | 0 | 0 |
| * <i>Quercus</i> sp. (Oak) | 0 | 0 | 0 | 0 | 0 | 0 | 1s | 1s | 0 | 0 |
| * <i>Rhus radicans</i> (Poison ivy) | 0 | 0 | 0 | 0 | 0 | 0 | 1s | 0 | 2s | 0 |
| * <i>Smilax</i> sp. (Greenbriar) | 0 | 2s | 0 | 0 | 0 | 1s | 0 | 0 | 0 | 0 |
| * <i>Viburnum</i> sp. (Viburnum) | 0 | 0 | 0 | 0 | 0 | 6s | 0 | 0 | 0 | 0 |
| * <i>Vitis</i> sp. (Grape) | 0 | 0 | 0 | 0 | 0 | 2s | 0 | 0 | 1s | 0 |

TABLE 2. MIAMI WHITEWATER FOREST 1995

CHECK-LIST OF VASCULAR PLANT SPECIES FOUND IN DEER IMPACT STUDY PLOTS AT MIAMI WHITEWATER FOREST BASED ON OBSERVATIONS MADE DURING THE 1995 GROWING SEASON BY DR. DENIS G. CONOVER

KEY: * = Woody species; s = seedling; t = sapling or tree (base diameter > 5 mm)

NOTE: 1A-1E are the sample sites located within the fenced-in area. 2A-2E are the sample sites located within the control area to be left open. Canopy consists mainly of sugar maple, and various oaks and hickories.

1995 Survey Dates: April 8; May 13; June 9; July 26; August 20; September 8; October 6; November 24

Number of Plants Appearing During Season Per Location:

| Scientific Name (Common Name) | FENCED IN | | | | | UNFENCED | | | | |
|---|-----------|----|----|----|----|----------|----|----|----|----|
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| * <i>Acer saccharum</i> (Sugar maple) | 2s | 1s | 1s | 1s | 2s | 2s | 0 | 3s | 0 | 1s |
| <i>Alliaria officinalis</i> (Garlic mustard) | 20 | 15 | 7 | 13 | 2 | 6 | 10 | 15 | 30 | 2 |
| * <i>Carya</i> sp. (Hickory) | 2s | 0 | 1t | 0 | 1t | 0 | 0 | 0 | 1t | 0 |
| <i>Claytonia virginica</i> (Spring beauty) | 7 | 5 | 1 | 30 | 30 | 10 | 10 | 15 | 10 | 9 |
| * <i>Cornus florida</i> (Dogwood) | 0 | 0 | 0 | 0 | 0 | 0 | 9s | 1s | 0 | 0 |
| * <i>Crataegus</i> sp. (Hawthorn) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Dentaria laciniata</i> (Cut-leaved toothwort) | 0 | 3 | 1 | 4 | 6 | 15 | 0 | 3 | 0 | 10 |
| <i>Dicentra cucullaria</i> (Dutchman's breeches) | 18 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Eupatorium rugosum</i> (White snakeroot) | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| * <i>Fraxinus</i> sp. (Ash) | 2s 1t | 0 | 1s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Galium</i> sp. (Bedstraw) | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 1 | 0 |

TABLE 2. MIAMI WHITEWATER FOREST 1995

| Scientific Name (Common Name) | Number of Plants Appearing During Season Per Location: | | | | | | | | | |
|--|--|----|----|----|----|----------|----|----|----|----|
| | FENCED IN | | | | | UNFENCED | | | | |
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| * <i>Ostrya virginiana</i> (Hop-hornbeam) or Elm (<i>Ulmus</i> sp.) | 4s | 2s | 0 | 0 | 1s | 2s | 2s | 2s | 1s | 0 |
| <i>Oxalis purpurea</i> (Purple woodsorrel) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Oxalis stricta</i> (Yellow wood-sorrel) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| * <i>Parthenocissus</i> <i>quinquefolia</i> (Virginia creeper) | 2t | 0 | 0 | 1s | 1t | 3t | 4s | 0 | 1s | 3s |
| <i>Podophyllum peltatum</i> (Mayapple) | 0 | 15 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 9 |
| <i>Polygonatum</i> sp. (Solomon's seal) | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Prunus serotina</i> (Wild black cherry) | 1s | 0 | 0 | 1s | 1s | 2s | 0 | 1s | 0 | 1s |
| * <i>Quercus</i> sp. (Oak) | 0 | 0 | 1s | 0 | 0 | 0 | 1s | 1s | 0 | 0 |
| * <i>Rhus radicans</i> (Poison ivy) | 0 | 0 | 3s | 1s | 1s | 0 | 3s | 3s | 2s | 4s |
| * <i>Smilax</i> sp. (Greenbriar) | 0 | 2s | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| * <i>Viburnum</i> sp. (Viburnum) | 0 | 0 | 0 | 0 | 0 | 0 | 2s | 0 | 0 | 0 |
| * <i>Vitis</i> sp. (Grape) | 1 | 0 | 0 | 0 | 0 | 2s | 1s | 0 | 1s | 0 |

TABLE 3. SHAWNEE LOOKOUT 1995

CHECK-LIST OF VASCULAR PLANT SPECIES FOUND IN DEER IMPACT STUDY PLOTS AT SHAWNEE LOOKOUT BASED ON OBSERVATIONS MADE DURING THE 1995 GROWING SEASON BY DR. DENIS G. CONOVER

KEY: * = Woody species; s = seedling; t = sapling or tree (base diameter > 5 mm)

NOTE: 1A-1E are the sample sites located within the fenced-in area. 2A-2E are the sample sites located within the control area to be left open. Canopy consists mainly of box elder.

1995 Survey Dates: April 8; May 13; June 9; July 26; August 20; October 6; November 17, November 24

Number of Plants Appearing During Season Per Location:

| Scientific Name (Common Name) | FENCED IN | | | | | UNFENCED | | | | |
|--|-----------|----|----|----|----|----------|----|----|----|----|
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| * <i>Acer negundo</i> (Box elder) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1s |
| * <i>Acer saccharum</i> (Sugar maple) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1s | 0 |
| * <i>Aesculus glabra</i> (Ohio buckeye) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1s |
| <i>Alliaria officinalis</i> (Garlic mustard) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| <i>Allium vineale</i> (Field garlic) | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 |
| <i>Asarum canadense</i> (Wild ginger) | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Aster</i> spp. (Asters) | 0 | 0 | 5 | 0 | 0 | 2 | 0 | 2 | 0 | 0 |
| <i>Cardamine douglassii</i> (Purple cress) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>Cardamine parviflora</i> (Bittercress) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>Chaerophyllum procumbens</i> (Spreading chervil) | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 |
| <i>Circaea lutetiana</i> (Enchanter's nightshade) | 2 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 4 |
| <i>Convolvulus</i> sp. (Bindweed) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

TABLE 3. SHAWNEE LOOKOUT 1995

| Scientific Name (Common Name) | Number of Plants Appearing During Season Per Location: | | | | | | | | | |
|--|--|-----|----|-----|-----|----------|-----|----|----|-----|
| | FENCED IN | | | | | UNFENCED | | | | |
| | 1A | 1B | 1C | 1D | 1E | 2A | 2B | 2C | 2D | 2E |
| <i>Corydalis flavula</i> (Yellow corydalis) | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Cryptotaenia canadensis</i> (Honewort) | 1 | 0 | 0 | 0 | 0 | 2 | 5 | 1 | 1 | 2 |
| <i>Elymus</i> sp. | 0 | 11 | 0 | 0 | 1 | 0 | 5 | 4 | 6 | 5 |
| <i>Eupatorium rugosum</i> | 18 | 15 | 15 | 23 | 6 | 20 | 11 | 8 | 15 | 12 |
| <i>Floerkea proserpinacoides</i> (False mermaid) | 15 | 30 | 25 | 40 | 100 | 50 | 0 | 0 | 0 | 100 |
| <i>Galium aparine</i> (Bedstraw) | 9 | 8 | 2 | 2 | 3 | 4 | 6 | 3 | 1 | 1 |
| <i>Geum canadense</i> (White avens) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Glechoma hederaceae</i> (Gill-over-the-ground) | 4 | 0 | 15 | 50 | 0 | 0 | 0 | 0 | 0 | 12 |
| <i>Lamium purpureum</i> (Purple dead nettle) | 30 | 20 | 20 | 0 | 0 | 15 | 25 | 10 | 30 | 15 |
| <i>Phacelia purshii</i> (Miami mist) | 0 | 0 | 0 | 0 | 0 | 5 | 6 | 5 | 0 | 0 |
| <i>Pilea pumila</i> (Clearweed) | 8 | 10 | 1 | 0 | 6 | 14 | 14 | 25 | 10 | 10 |
| <i>Polygonum persicarium</i> (Smartweed) | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Polygonum virginianum</i> (Virginia smartweed) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| <i>Ranunculus abortivus</i> (Crowfoot) | 3 | 4 | 10 | 5 | 2 | 0 | 0 | 10 | 4 | 5 |
| <i>Sanicula gregaria</i> (Clustered snakeroot) | 1 | 2 | 0 | 13 | 5 | 0 | 8 | 7 | 1 | 0 |
| <i>Stellaria media</i> (Common chickweed) | 60 | 40 | 50 | 0 | 50 | 60 | 40 | 50 | 50 | 70 |
| Unknown forb seedlings | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| <i>Veronica hederaefolia</i> (Ivy-leaved speedwell) | 120 | 100 | 60 | 100 | 50 | 60 | 100 | 50 | 50 | 70 |

PHOTOGRAPHS

See Figures 1 and 2 for the locations where the photographs were taken.

PHOTO 1. FENCED PLOT AT MIAMI WHITEWATER FOREST (JUNE 9, 1995)

PHOTO 2. UNFENCED PLOT AT MIAMI WHITEWATER FOREST (JUNE 9, 1995)

PHOTO 3. FENCED PLOT AT SHAWNEE LOOKOUT (JUNE 9, 1995)

PHOTO 4. UNFENCED PLOT AT SHAWNEE LOOKOUT (JUNE 9, 1995)



PHOTO 1. FENCED PLOT AT MIAMI WHITEWATER FOREST (JUNE 9, 1995)



PHOTO 2. UNFENCED PLOT AT MIAMI WHITEWATER FOREST (JUNE 9, 1995)



PHOTO 3. FENCED PLOT AT SHAWNEE LOOKOUT (JUNE 9, 1995)



PHOTO 4. UNFENCED PLOT AT SHAWNEE LOOKOUT (JUNE 9, 1995)