

HACKLEBARNEY NATURAL AREA  
MANAGEMENT PLAN

New Jersey Department of Environmental Protection  
Division of Parks and Forestry  
Office of Natural Lands Management  
CN 404  
Trenton, New Jersey 08625

Prepared by:  
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June, 1988

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COMMISSIONER

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF PARKS AND FORESTRY

MANAGEMENT PLAN FOR HACKLEBARNEY NATURAL AREA

TAKE NOTICE that Richard T. Dewling, pursuant to the Natural Areas System Act, N.J.S.A. 13:1B-15.12a et seq., and N.J.A.C. 7:2-11.8, has adopted the recommendations of the Natural Areas Council regarding the management plan for Hacklebarney Natural Area.

The Hacklebarney Natural Area is located in Chester and Washington Townships, Morris County, in Tewksbury Township in Hunterdon County, and in Bedminster Township in Somerset County, on land owned by the Department of Environmental Protection and administered by the Division of Parks and Forestry through Hacklebarney State Park. The purpose of the management plan is to identify specific long and short term management techniques which are necessary to achieve the designation objective of the Natural Area. For Hacklebarney Natural Area, the designation objective is preservation of a river ravine and northern hemlock/mixed hardwood forest, and a rare species habitat.

The Natural Areas Council reviewed the staff recommendations and public comments at their meeting on July 9, 1986. By unanimous resolution, the Natural Areas Council adopted recommendations for management and has submitted these recommendations in the form of a management plan to the Commissioner of the Department of Environmental Protection.

Copies of the adopted plan may be obtained from:

Department of Environmental Protection  
Division of Parks and Forestry  
Office of Natural Lands Management  
CN 404  
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Trenton, New Jersey 08625

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Date: 6/22/88

Richard T. Dewling for  
RICHARD T. DEWLING, Commissioner  
Department of Environmental Protection

## ABSTRACT

Hacklebarney Natural Area, located within Hacklebarney State Park, became incorporated into the Natural Areas System in 1975. The natural area was formerly referred to as Lamington River Natural Area - Segment A. The majority of the natural area is located in Chester and Washington Townships, Morris County. Smaller portions lie within Tewksbury Township, Hunterdon County and Bedminster Township, Somerset County. This area is within the Highlands physiographic province. The natural area portion of the State Park was designated to the System for preservation of a river ravine and northern hemlock/mixed hardwood forest. In addition, the area contains rare species habitats.

This management plan has been developed pursuant to N.J.A.C. 7:2-11.1 et seq. which mandates that such plans be prepared for all areas designated to the Natural Areas System. Management is aimed at prescribed uses and practices that will be allowed and implemented in order to maintain and, if practicable, enhance the natural features which the site contains.

The following is a summary of major management techniques recommended in this plan. Chapter III should be consulted for detailed information on prescribed management techniques.

### Classification

Hacklebarney Natural Area is classified as a Conservation Preserve which means that the area will be managed such that habitat manipulation is permissible in order to preserve a plant or animal species, community type or ecosystem.

### Boundaries

The former natural area boundaries included the day use section of the Park and 113 acres across the river for a total of approximately 338 acres.

In keeping with the designation objective, the revised boundaries include all of the State Park property along the Black River corridor. The natural area also includes easements on Black River Fish and Game Club property where the property borders the river. The revised natural area consists of approximately 465 acres.

### Human Uses

Current uses within the natural area will be allowed to continue with the exception of illegal vehicle use.

Access to the Black River Fish and Game Club property for public usage is only by their permission. The only allowable public use is for educational and scientific purposes.

The Administering Agency should attempt to hire the additional support personnel required to keep the natural area well maintained and adequately patrolled.

The Administering Agency shall advise the Office of Natural Lands Management and the Natural Areas Council once each year concerning the quality of the natural features within Hacklebarney Natural Area.

#### Man-made Features

Future projects anticipated for the natural area include road repairs, a new water line to restroom #3 and trail realignment.

Park personnel will continue to replace, remove and relocate picnic sites and its associated equipment as part of the Park's routine maintenance program.

The temporary use of portable hunting blinds and tree stands is permitted. Constructed tree stands left by hunters shall continue to be removed.

#### Habitat Manipulation

Trees or parts of trees which have fallen across trails, roads or picnic sites and block passage or become safety hazards may be removed and used elsewhere in the natural area for trail delineation or other purposes.

Any habitat manipulation necessary for future projects must be kept to a minimum. Rare plants must not be removed. Plans for significantly altering the habitat must be presented to the Office of Natural Lands Management and the Natural Areas Council.

#### External Features

The water quality of Trout Brook and Black River could be affected by pollution emanating from the Combe Fill South Landfill located at the headwaters of Trout Brook. A conceptual engineering design for cleanup and closure of the landfill has recently been completed. The State Division of Hazardous Site Mitigation will forward water quality sampling results to the Office of Natural Lands Management.

Increased groundwater pumping near the headwaters of the Black River may affect stream flow in the natural area. Inclusion in the New Jersey Wild and Scenic Rivers System would set water quality and flow standards that would have to be maintained, thereby monitoring the amount of groundwater being pumped from the headwaters of the river. A study to determine the river's feasibility for inclusion will be conducted cooperatively by the Upper Raritan Watershed Association and the Office of Natural Lands Management.

The fish population in Rinehart and Trout Brooks should be occasionally monitored by the Division of Fish, Game and Wildlife to determine the impact of upstream development on the streams' aquatic biota.

#### Recommended Research

Populations of threatened plant species shall be mapped with their exact locations kept confidential from the public. These populations shall be

periodically monitored by the Office of Natural Lands Management to assess their need for additional management.

Several research proposals are outlined which could aid significantly in determining future management strategies within the natural area.

#### Public Participation and Education

Because Hacklebarney is an ideal natural area for interpretation, the Administering Agency should consider providing a naturalist for the Park staff. Consideration for a new interpretive center should be included in any future development plans.

NATURAL AREAS COUNCIL

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This management plan was written and prepared by Larry S. Miller of the Office of Natural Lands Management. The author expresses his gratitude to the following persons for their contributions towards the completion of this document: The Natural Areas Council, Richard F. Barker, Robert J. Cartica, Chester Township Planning Board, Russell A. Cookingham, John J. Garcia, Jr., Frank F. Guidotti, John E. Kuser, Hermia M. Lechner, John Mocerri, Carl R. Nordstrom, M. Allen Northup, David R. Peifer, James C. Sciascia, David B. Snyder, Robert H. Soldwedel, Wade Wander and Olin D. White, Jr. Special thanks are reserved for Charles H. Sary, Superintendent of Hacklebarney State Park, whose genuine concern, helpfulness and support were instrumental in the development of this plan.

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## INTRODUCTION

This management plan for the Hacklebarney Natural Area will describe the resource features of this site and then prescribe uses and practices that will be allowed and implemented to maintain and, if practicable, enhance these features.

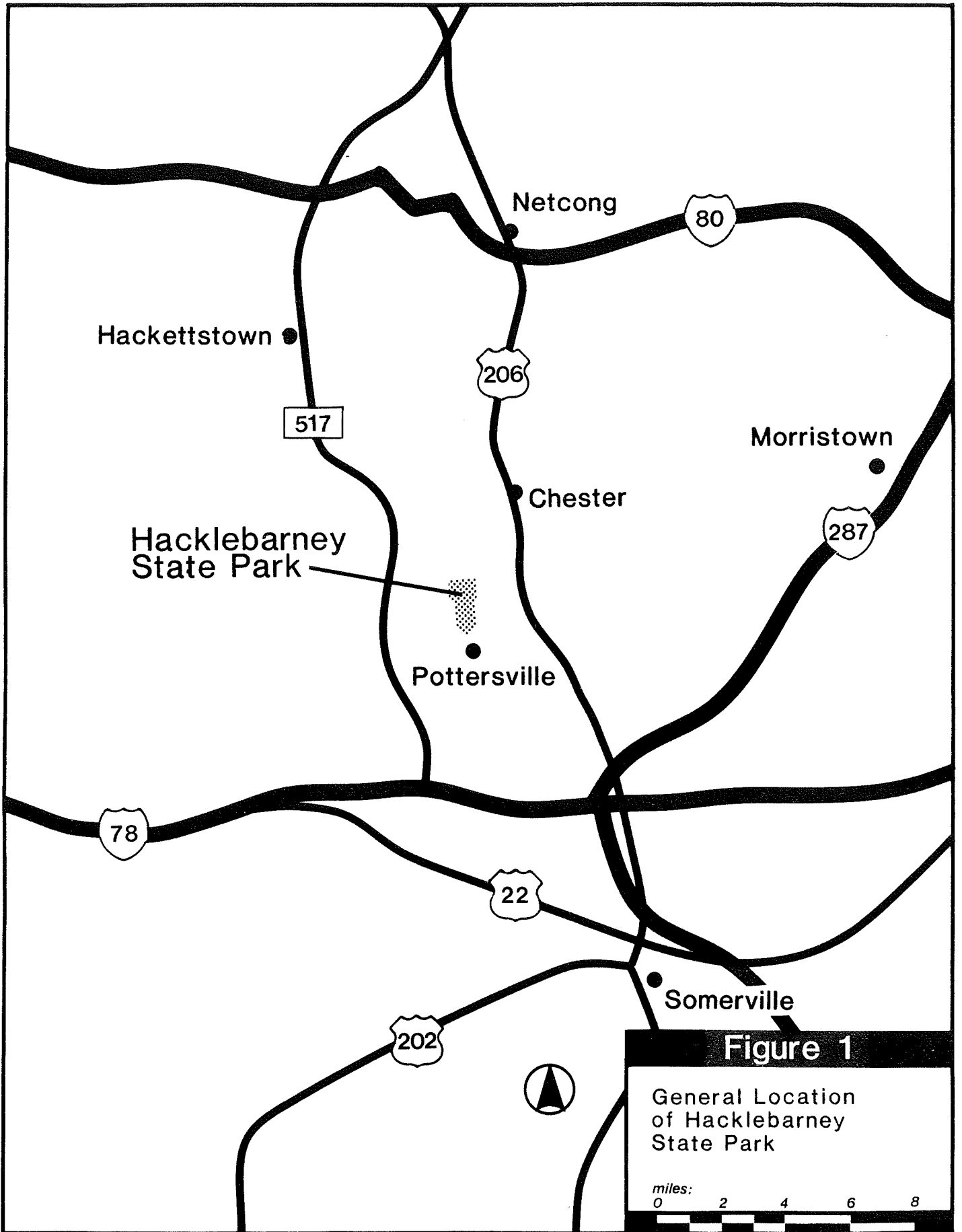
Creation of the Natural Areas System was mandated under the Natural Areas System Act of 1976 (N.J.S.A. 13:1B-15.12a et seq.). A "Natural Area" is defined as "an area of land or water, owned in fee simple or held as a conservation easement by the Department, which has retained its natural character, although not necessarily completely undisturbed, or having rare or vanishing species of plant and animal life, or having similar features of interest which are worthy of preservation for present and future residents of the State" (Appendix A, N.J.A.C. 7:2-11.3).

Hacklebarney Natural Area (formerly referred to as Lamington River Natural Area - Segment A) is located about three miles southwest of Chester Borough within Hacklebarney State Park. The Park is within Chester and Washington Townships, Morris County; Bedminster Township, Somerset County; and Tewksbury Township, Hunterdon County. This area is part of the Highlands physiographic province of New Jersey. Figure 1 shows the general location of Hacklebarney State Park. The former and revised natural area boundaries are indicated in Figure 2. An explanation for the revision of the boundaries can be found in the Management Issues and Techniques section.

The Minsi Indians, who migrated from the West approximately 6,000 years ago, were the first humans to inhabit the Hacklebarney area. White settlers arrived in the early eighteenth century, attracted by the area's abundance of natural resources: fertile soil, forests, swift flowing streams, limestone and later, iron (Fowler, et al., 1976).

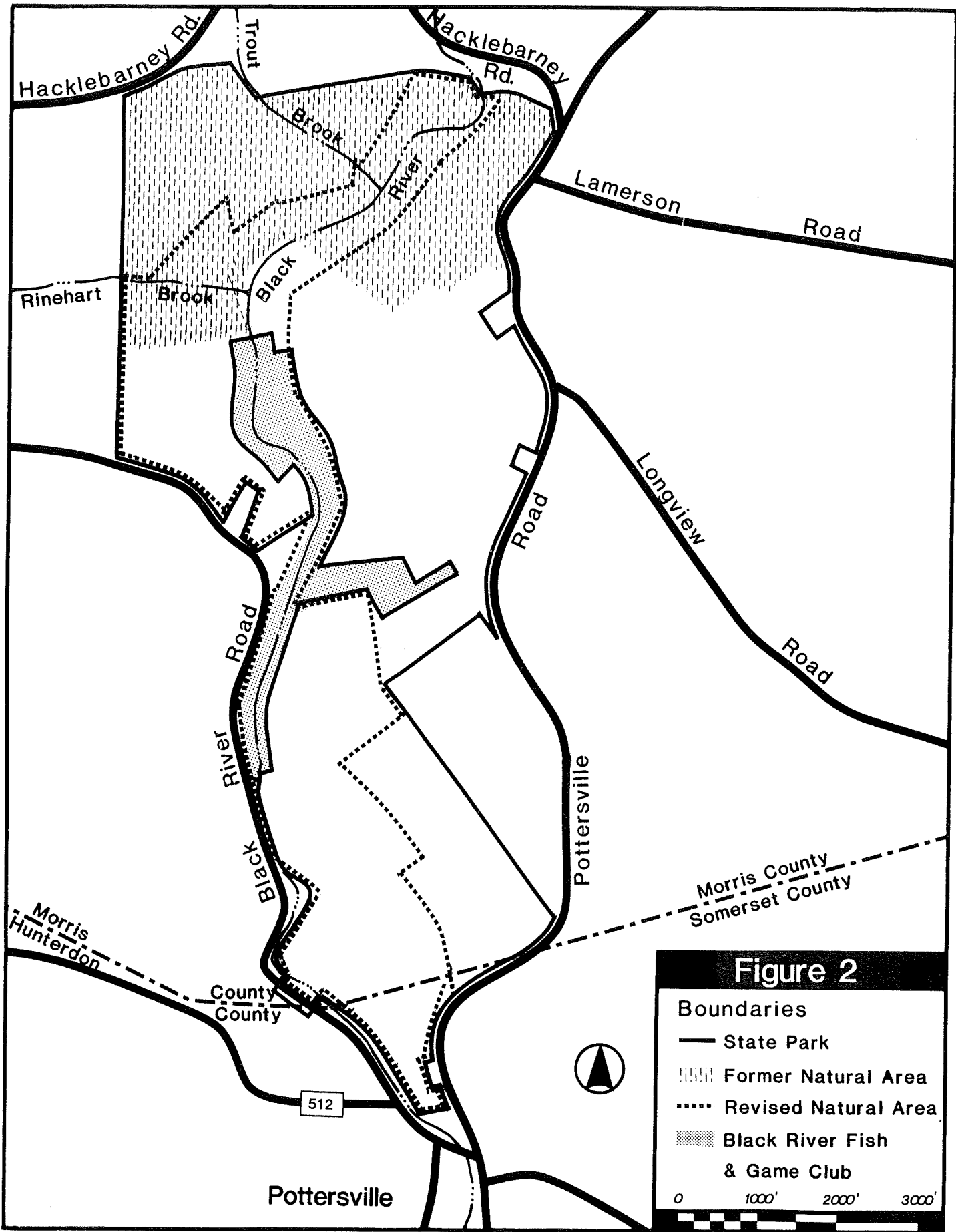
Although there was only one known iron mine within the current Park boundaries, Chester Township and Chester Borough were the center of extensive iron mining operations between the years 1865-1890. The largest and longest lived mines were the Hacklebarney Mines, just north of the State Park. The Wortman Mine was the southernmost of Chester's mines, and is within the Park boundaries. It was started during the peak of the iron boom in 1872 or 1873 by Alpheus Beemer of Dover. Because the mining was exploratory, there was not a significant amount of land disturbed (Lowenthal, 1980).

Hacklebarney State Park was established in 1924 when Adolphe E. Borie donated 32 acres of land to the State as a memorial to his mother, Susan P. Borie and his niece, Susan R. Patterson. The eastern portion (113 acres) of the original natural area was conveyed to the State in 1967 by Anita Merle-Smith Knight. Through Green Acres acquisition, 380 acres were acquired from 1964 to 1974. Additional acreage was obtained through donations and capital purchases bringing the current Park acreage to 892 acres (January 1, 1988 acreage report, Division of Parks and Forestry). In the central portion of the Park, the river corridor is owned by the Black River Fish and Game Club (Figure 2). In 1982, the State entered into agreements with the Fish and Game Club giving the State conservation easements on their property.



**Figure 1**  
General Location  
of Hacklebarney  
State Park

miles:  
0 2 4 6 8



**Figure 2**

**Boundaries**

- State Park
- Former Natural Area
- ..... Revised Natural Area
- ▨ Black River Fish & Game Club

0 1000' 2000' 3000'

The land surrounding Hacklebarney is still predominantly rural with agriculture, including apple orchards, and large-lot residential housing being the major land uses.

The designation objective for this natural area under the Administrative Code includes "preservation of a river ravine and northern hemlock/mixed hardwood forest, and rare species habitat" (N.J.A.C. 7:2-11.12). The Administrative Code also mandates the preparation of this management plan.

The Administering Agency for Hacklebarney Natural Area is the Division of Parks and Forestry, State Park Service, through Hacklebarney State Park. The Administering Agency shall be responsible for management of the natural area, including those physical actions and enforcement measures identified in this plan, in order to achieve the designation objective.

## SITE DESCRIPTION

### Topography and Geology

Hacklebarney State Park lies within the Highlands physiographic province. The topography of the Park is typical of the Highlands with ridges that are rounded or flat-topped and narrow, stream cut valleys. The slopes at Hacklebarney vary from moderately sloping to very steep hillsides and ravine walls. The highest point is 800 feet above sea level in the northwestern part of the Park and the lowest is 225 feet at the southern most boundary. The steepest slopes occur in the northern and southern sections going from the ridges down to Rinehart Brook and the Lamington (Black) River. For brevity in this plan, the Lamington (Black) River will hereafter be referred to as Black River, the most commonly used name for the river north of Pottersville.

Geologically, the bedrock in the vicinity of Hacklebarney includes metamorphic and igneous rock of Precambrian age, quartzite of Cambrian age and conglomerate of Triassic age (Harper, 1980). The Precambrian rocks include amphibolite, hornblende, gneiss, hypersthene-quartz-andesine gneiss and marble. Hardyston quartzite is the rock type found from the Cambrian period. The conglomerate rocks formed at the southern end of the Park are made up of sands and gravels from the Triassic age (Harper, 1980).

The large boulders found in Trout Brook, Rinehart Brook and other small tributaries of the Black River were probably formed from boulders splitting from the underlying bedrock under permafrost conditions. These boulder areas were not part of a terminal moraine.

An interesting feature of the 200-foot deep ravine in Hacklebarney is that it now carries water which at one time flowed northward to the Rockaway River. Prior to the Wisconsin glaciation, a drainage divide immediately north of Route 24 separated water flowing northward to the Rockaway River from water flowing southward to the Raritan River. During glaciation, ice advanced southward as far as Ironia, blocking northward flow and formed a lake 6 miles long covering the present Black River Wildlife Management Area. The water rose within the lake until it reached a level at which it could spill across the drainage divide north of Route 24 and into the Black River (Harper, 1980).

### Soils

The following information on soil series was obtained from the Soil Survey Report for Morris County, New Jersey (U.S. Department of Agriculture, 1976a). The two predominant soil associations found in Hacklebarney are the Edneyville-Parker-Califon association and the Parker-Edneyville association. The soils in the Edneyville series are found on the tops and sides of ridges that are gently sloping to steep (up to 25% slope) and are well-drained. The Parker series is also found on the tops and sides of ridges but the slopes

can be up to 35% and be part of a rock outcrop, such as can be found along the Black River. Parker soils are excessively drained and very gravelly.

The Califon series is nearly level to strongly sloping, containing moderately well drained to somewhat poorly drained soils. They are located in drainageways, depressions and at the bases of slopes. Texturally, all three soils are loams and sandy loams with fairly large amounts of gravel and stones. The Parker-Edneyville association differs from the Edneyville-Parker-Califon association due to its steeper slopes and more rocky texture.

At the extreme southern end are several soils not found elsewhere in the Park. The Udifluvents and Ochrepts series' are deep, somewhat poorly drained to well drained loamy soils that are 3-8 feet above the stream flow (U.S. Department of Agriculture, 1976b). The Edneyville and Parker series' are also found in this area.

The soil in Hacklebarney is fairly well stabilized by rocks, roots and vegetation, but because the steeper areas have thin soil cover, they are vulnerable to erosion whenever that cover is destroyed.

#### Surface Hydrology and Water Quality

Hacklebarney State Park lies within the Raritan River Drainage Basin, the Black River Sub-basin and the Upper Raritan Watershed. The primary streams that flow into the Black River are Trout Brook and Rinehart Brook on the northwestern side of the Park. There are several much smaller feeder streams entering the Park and a larger tributary just upstream from Hacklebarney.

Storm water runoff at Hacklebarney is relatively high due to the numerous steep slopes with relatively well-drained soils at the higher elevations, and poorly drained and/or impervious soils at the base of slopes. The discharge rate over 57 years (1921-1978) was 55.6 cubic feet/second at the U.S. Geological Survey gaging station on the Black River near Pottersville (N.J. Department of Environmental Protection, 1978). The flow rates are greater here than in the northern part of the Park due to several tributaries entering the river upstream. The Park has no permanent areas of slow-moving or still waters. Although the Black River is fast-flowing, the steep, rocky ravine walls have kept the river from significantly changing its course or manipulating its margins.

Groundwater in the vicinity of Hacklebarney is unpredictable due to the complex and difficult path it must follow through fractures, joints and solution openings (David R. Peifer, Executive Director, Upper Raritan Watershed Association, personal communication).

Water quality at Hacklebarney is generally good in the Black River and the Rinehart and Trout Brooks. However, Trout Brook and Black River are potentially being impacted from the Combe Fill South Landfill located in Chester and Washington Townships (David R. Peifer, personal communication). This and other impacts on water quality will be discussed in more detail under Features of Potential Impact.



## Vegetation

The vegetation of Hacklebarney Natural Area consists of three distinct plant communities typical of the Highlands section of northern New Jersey. These communities include the mixed oak/hardwood forest, hemlock-mixed hardwood forest and the transitional forest that occurs in old fields. These vegetation patterns came about through manipulation by man. Fowler, et al. (1976) compiled much of the following history of vegetation for the Hacklebarney area.

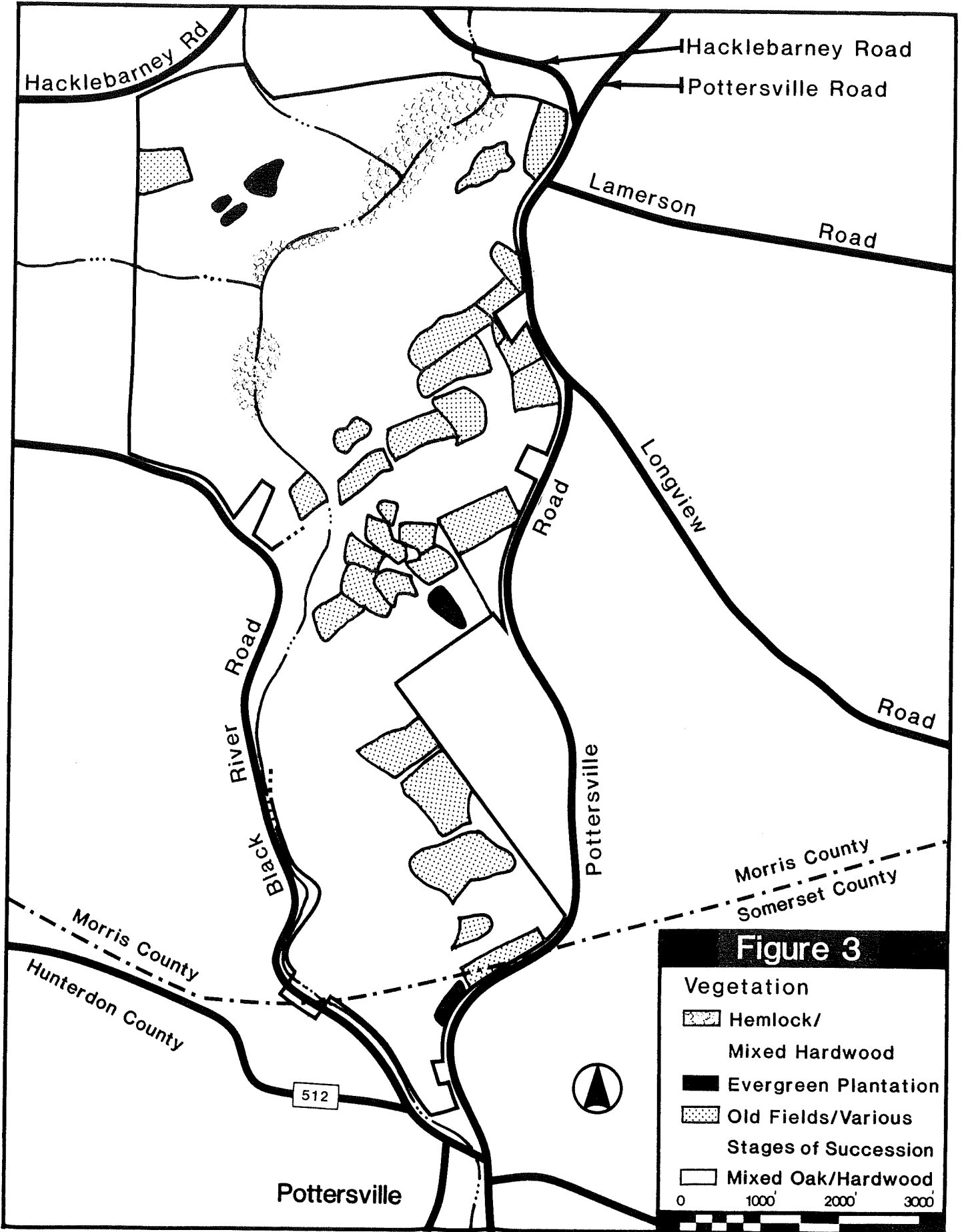
Indians in the area and white settlers both burned the understory of the forest; the Indians for ease of travel and to encourage game and the settlers to allow their farm animals to graze more freely. The settlers also cleared and cultivated any agriculturally suitable areas. During the 1800's, the woodlands were cut frequently for fuel, fences, railroad ties and charcoal production to supply forges and furnaces in the area. After the introduction of coal in the late 1800's, the demand for trees as fuel diminished. During that time, the Hacklebarney area was considered part of the oak-chestnut forest region because the chestnut trees were as abundant then as oaks are now. Many trees of the existing mature forest may date from this period, particularly the hemlock forests. During the early 1900's, the area attracted a number of large estate owners. Because farming or forestry operations were not always the primary concern, the estate forests were allowed to develop and evergreen plantations and small ponds became part of the estate improvements.

In the 1940's, the area forests were once again altered. The chestnut trees were eliminated by the chestnut blight which spawned the current mixed oak/hardwood forest. In addition, the 1940's and World War II brought about a demand for farmland which increased the cultivated acreage. Following the cultivation of this land in the 1940's and 1950's, the fields were abandoned and resulted in the successional fields seen today.

An unpublished list of herbaceous plants of the section of Hacklebarney State Park that was, prior to this plan, the Hacklebarney Natural Area (Appendix B), was compiled during Spring and Summer of 1980 by M. Allen Northup, former seasonal naturalist at Hacklebarney. The habitat for plant communities within the boundaries of the current natural area should contain most or all of the plants found within the former natural area (Northup, personal communication).

The vegetative community types within the natural area are depicted in Figure 3. It is important to note that Figure 3 indicates only general locations of these community types. Field checking the entire area was not possible.

The following brief description of communities and their more common flora was determined by the following: field visits in early Spring 1986, interpretation of aerial photographs, and by traverse line data used by M. Allen Northup to compile the plant list. Additional information was obtained from Fowler, et al. (1976) and Robichaud and Buell (1973).



### Mixed Oak/Hardwood Forest

This is the most common community type in the natural area and can be found in scattered areas along the river ravine in the northern part of the natural area and along the entire southern length of the Black River corridor. Any well-drained, moderate to steep slopes and lower hilltops that are not in a successional field situation would be within this forest community.

The forest canopy consists of red, white and black oak (Quercus rubra, Q. alba and Q. velutina), red maple (Acer rubrum) and various hickories (Carya spp.). On the moister, richer upland slopes there are tulip trees (Liriodendron tulipifera) and beech (Fagus grandifolia). White ash (Fraxinus americana) is often found along the edges of fields. Much of the forest has another layer of smaller understory trees, the predominant one being flowering dogwood (Cornus florida). Other common understory trees are sassafras (Sassafras albidum) and hop-hornbeam (Ostrya virginiana).

The shrub layer is dominated by maple-leaved viburnum (Viburnum acerifolium) which is found in the better-drained soils. Black haw (V. prunifolium) can also be found in this type of habitat. In the moister areas, spicebush (Lindera benzoin), arrowwood (V. dentatum) and witch hazel (Hamamelis virginiana) are the abundant shrubs.

The groundcover varies with the season. Plants flowering in the spring include mayapple (Podophyllum peltatum), violets (Viola spp.), spring-beauty (Claytonia virginica), Jack-in-the-pulpit (Arisaema triphyllum) and Solomon's seal (Polygonatum pubescens). In late summer and fall, the grasses, ferns, sedges, asters and goldenrods are among the more conspicuous plants.

Some ecologists believe that without man's influence and under the present climatic conditions, the upland vegetation of this area would become sugar maple-mixed hardwood forest (Buell, et al., 1966). This forest type is a more diverse vegetative community than the mixed oak forest.

### Hemlock-Mixed Hardwood Forest

This forest community occurs in the steep ravine along the Black River in the upper part of the river corridor. Hemlock (Tsuga canadensis) requires the shaded, cool and moist conditions of the ravine and its steep slopes. The largest concentration of this forest type is on both sides of the river where Trout Brook enters the Black River. It then continues northward to the Park boundary. A sparser hemlock community occurs near the confluence of Rinehart Brook and the river and continues southward into Black River Fish and Game Club property (Figure 3). More than half of the trees are hemlock. Sharing the canopy with the hemlocks are beech, red maple, red oak, yellow birch (Betula lutea) and sweet birch (B. lenta). A stand of black ash (Fraxinus nigra) about one-quarter mile upstream from Rinehart Brook contains the largest reported black ash tree in New Jersey (Porcella, 1984). According to John E. Kuser, the Rutgers University Dendrology instructor who reported the tree, black ash is very uncommon for this area (personal communication).

The hemlock's fallen needles create a very acidic soil condition, which, combined with the year-round low light levels reaching the ground, inhibits the development of undergrowth vegetation. The shrubs that do exist in the understory, although they are sparse and scattered, include mountain laurel (Kalmia latifolia), viburnum, spicebush and blueberry (Vaccinium spp.). Among the few herbs covering the ground are partridge berry (Mitchella repens), false lily-of-the-valley (Mayanthemum canadense) and various mosses.

#### Old Fields

The least extensive community type in the natural area are the old fields. These abandoned fields, which are in an early to mid-successional stage, are adjacent to the river corridor near the center of the natural area. Red cedar (Juniperus virginiana) and red maple are the dominant trees along with large-toothed aspen (Populus grandidentata), sassafras and wild cherry (Prunus serotina) as other primary trees.

Shrubs and vines include hawthorn (Crataegus spp.), Japanese honeysuckle (Lonicera japonica) and poison ivy (Rhus radicans). Some of the plants making up the herbaceous groundcover are barberry (Berberis spp.), goldenrods and little bluestem grass (Andropogon scoparius).

#### Wildlife

The surrounding agricultural lands and the abundance of old fields within the Park offer an excellent food source for many mammals and bird species. In addition, these species utilize the area for cover, den and nesting sites. The Black River draws many animals to the natural area as a water source as well as providing habitat for several species of reptiles and amphibians.

The following summaries for mammals, reptiles and amphibians were taken from Fowler, et al. (1976) and the Division of Fish, Game and Wildlife (James C. Sciascia, memorandum).

#### Mammals

The upland forest can be expected to contain Eastern chipmunk (Tamias striatus), Eastern gray squirrel (Sciurus carolinensis), red squirrel (Tamiasciurus hudsonicus), Southern flying squirrel (Glaucomys volans), gray fox (Urocyon cinereoargenteus), red fox (Vulpes vulpes), opossum (Didelphus virginiana), porcupine (Erethizon dorsatum), mice, shrews and bats. Species occurring nearer the river in the mixed oak forest most likely include mink (Mustela vison), raccoon (Procyon lotor) and Eastern gray squirrel. The most conspicuous species throughout this community is the whitetail deer (Odocoileus virginianus). Deer is also the most sought-after game species at Hacklebarney.

The hemlock forest has most of the same species found in the mixed oak forest. However, the total number of species are fewer due to the sparse understory found in the hemlock community. Many of the mammals pass through this forest to get to the river. In addition to the species previously

mentioned, the river otter (Lutra canadensis) may inhabit the steep, rocky slopes of the hemlock forest.

The successional fields support a variety of mammals including woodchuck (Marmota monax), Eastern cottontail rabbit (Sylvilagus floridanus), mice, moles, shrews, striped skunk (Mephitis mephitis) and many of the same species found in the upland forest including the whitetail deer.

#### Reptiles and Amphibians

Among the land reptiles the natural area can support are Eastern box turtle (Terrapene carolina carolina), Northern brown snake (Storeria dekayi dekayi), Eastern garter snake (Thamnophis sirtalis sirtalis), black rat snake (Elaphe obsoleta obsoleta) and Eastern milk snake (Lampropeltis triangulum triangulum). In the river and streams are snapping turtle (Chelydra serpentina) and Northern water snake (Natrix sipedon sipedon).

Several species of salamanders are likely to occur including slimy salamander (Plethodon glutinosus glutinosus), Northern dusky salamander (Desmognathus fuscus fuscus and Northern two-lined salamander (Eurycea bislineata bislineata), their habitats being in the river ravine. The red-backed salamander (P. cinereus cinereus) and spotted salamander (Ambystoma maculatum) can be found in the more upland forests. The green frog (Rana clamitans melanota) and pickerel frog (Rana palustris) are characteristically found in brooks such as the Trout and Rinehart. In the moist, wooded areas wood frog (Rana sylvatica) is most likely to occur. American toad (Bufo americanus) is also a probable dweller in the natural area.

#### Fish

Electrofishing data (Department of Environmental Protection, 1969) and personal communication with Robert Soldwedel of the Division of Fish, Game and Wildlife have provided information for this summary. The Black River electrofishing data includes such species as American eel (Anguilla rostrata), white sucker (Catostomus commersoni), longnose dace (Rhinichthys cataractae), pumpkinseed (Lepomis gibbosus) and rock bass (Ambloplites rupestris). The Black River is also stocked with hatchery-reared trout; brown and rainbow trout (Salmo trutta, S. gairdneri) and brook trout (Salvelinus fontinalis). The Black River from the Route 206 bridge to its confluence with Rinehart Brook is classified as trout maintenance waters. From its confluence with Rinehart Brook to the Camp Brady Bridge in Bedminster, the Black River meets the standards as trout production waters. Trout production waters are those in which the natural reproduction of trout occurs while trout maintenance waters are those which are capable of supporting trout year-round but where no natural reproduction occurs.

Brook trout are naturally reproducing in both the Rinehart and Trout Brooks. The entire lengths of both streams are classified as trout production waters by the Division of Fish, Game and Wildlife. In addition to brook trout, electrofishing at Rinehart Brook produced brown trout, longnose dace and blacknose dace (Rhinichthys atratulus). Trout Brook produced blacknosed dace, brook trout and a single largemouth bass (Micropterus salmoides) using the same method. The lower part of the river in the natural

area may support fallfish (Semolilus corporalis) as well as the above species. A large number of fallfish were caught at Pottersville Bridge just below Hacklebarney.

The Black River is stocked with trout once before opening day and the next seven weeks thereafter. There is also a fall stocking of trout in the river. Trout and Rinehart Brooks are stocked once before trout season and twice after opening day.

### Birds

The most current, although partial, list of bird sightings for Hacklebarney State Park was compiled in the late 1970's by Wade Wander of the New Jersey Audubon Society (Appendix C). The field sightings were conducted at various times throughout those years primarily by Mr. Wander along with input from several other reliable sources. The majority of his sightings were from the northern section of the Park (Wade Wander, personal communication).

Many of the birds here are migratory, particularly warblers, waterbirds and raptors. There are a variety of habitats for breeding populations as well as migratory and wintering species. The hemlock forest has resident birds such as the blue jay (Cyanocitta cristata), belted kingfisher (Ceryle alcyon) and tufted titmouse (Parus bicolor). Waterbirds that frequent the slower-moving waters of the river and streams include Canada goose (Branta canadensis), wood duck (Aix sponsa), American black duck (Anas rubripes) and mallard (A. platyrhynchos).

The mixed oak/hardwood forest which contains understory, shrub and herb layers provides a breeding habitat for a large variety of birds. These include owls (e.g., great horned owl - Bubo virginianus), woodpeckers (e.g., downy woodpecker - Picoides pubescens) and Passeriformes (e.g., scarlet tanager - Piranga olivacea, white-breasted nuthatch- Sitta carolinensis and wood thrush - Hylocichla mustelina). A resident game bird of this community is the ruffed grouse (Bonasa umbellus).

A few of the resident species found in the successional fields are the rufous-sided towhee (Pipilo erythrophthalmus), field sparrow (Spizella pusilla) and Eastern meadowlark (Sturnella magna). Breeding species include indigo bunting (Passerina cyanea), prairie warbler (Dendroica discolor) and American woodcock (Scolopax minor).

### Endangered/Threatened Plant Species

The New Jersey Natural Heritage Program has identified the following three known rare plant species populations within Hacklebarney Natural Area.

Dirca palustris (leatherwood)  
Obolaria virginica (Virginia pennywort)  
Panax quinquefolius (American ginseng)

Because of the sensitivity of this information, the exact mapped locations of these threatened plant populations will not be provided in this report.

Dirca palustris is known to exist in the natural area in several locations along the Black River. This species has 6 to 20 known occurrences statewide and is imperiled in New Jersey mostly due to habitat destruction (N.J. Natural Heritage Program, 1987).

Obolaria virginica and Panax quinquefolius both occur in the upland forest within the day use portion of the natural area. O. virginica is also known from only 6 to 20 stations and is considered imperiled in the State. P. quinquefolius is rare but not yet imperiled in New Jersey, but may be soon if current trends continue. There are 20 to 50 occurrences of this species statewide (N.J. Natural Heritage Program, 1987).

### Endangered/Threatened Wildlife Species

The Office of Endangered and Nongame Species, Division of Fish, Game and Wildlife, has indicated there are no confirmed records of endangered or threatened species at Hacklebarney. This does not, however, preclude the possibility that special status species exist there (James C. Sciascia, Division of Fish, Game and Wildlife, memorandum).

The Nongame Office has indicated that Hacklebarney lies within the range of several rare species. Based on the type of habitat available in the natural area, it is possible that the following endangered (E) and threatened (T) species may occur here:

wood turtle (Clemmys insculpta) (T)  
 long-tailed salamander (Eurycea longicauda) (T)  
 Cooper's hawk (Accipiter cooperii) (E)  
 cliff swallow (Hirundo pyrrhonota) (E, breeding population only)  
 red-shouldered hawk (Buteo lineatus) (T)  
 great blue heron (Ardea herodias) (T)  
 barred owl (Strix varia) (T)  
 red-headed woodpecker (Melanerpes erythrocephalus) (T)  
 bobolink (Dolichonyx oryzivorus) (T)

An endangered species is defined as a species "whose prospects for survival in New Jersey are in immediate danger because of a loss or change of habitat, over-exploitation, predation, competition or disease. Immediate assistance is needed to prevent extinction. A threatened species is defined as one which "may become endangered if conditions surrounding the species begin or continue to deteriorate (N.J. Department of Environmental Protection, 1987)."

The bird list (Appendix C) includes sightings for some of the special status species listed above. These include the endangered Cooper's hawk and the threatened great blue heron, red-shouldered hawk, red-headed woodpecker, and bobolink. These species, in addition to the barred owl and cliff swallow, are potential breeders at Hacklebarney. Other endangered and threatened species (breeding populations only) contained in Appendix C are

the Northern harrier (Circus cyaneus) and the osprey (Pandion haliaetus), both of which were probably migrant when sighted.

### Man-made Features

Figures 4 and 5 contain the locations of man-made features within the natural area. The majority of these features are located within the day use area portion of the natural area. The day use area is an area designated for recreation with no overnight use. Figure 5 depicts the day use area and its man-made features which include a restroom facility, numerous picnic tables, grills, trash cans and drinking fountains. In addition, there are a number of trails, dirt roads and four footbridges crossing the Trout and Rinehart Brooks.

South of the day use portion of the Park is the Black River Fish and Game Club, on which the State has easements. The natural area within their boundaries includes a trail that courses along the river, several dirt roads, a small footbridge, a picnic pavilion and a small clubhouse.

Across the river on the eastern side are footpaths created by hunters and fishermen. There are also some dirt roads around old fields which were created when the area was used for agriculture. Hunters have built tree stands in some of the hunting areas. However, the stands are removed whenever possible by park staff (Charles H. Sary, Superintendent, Hacklebarney State Park, personal communication).

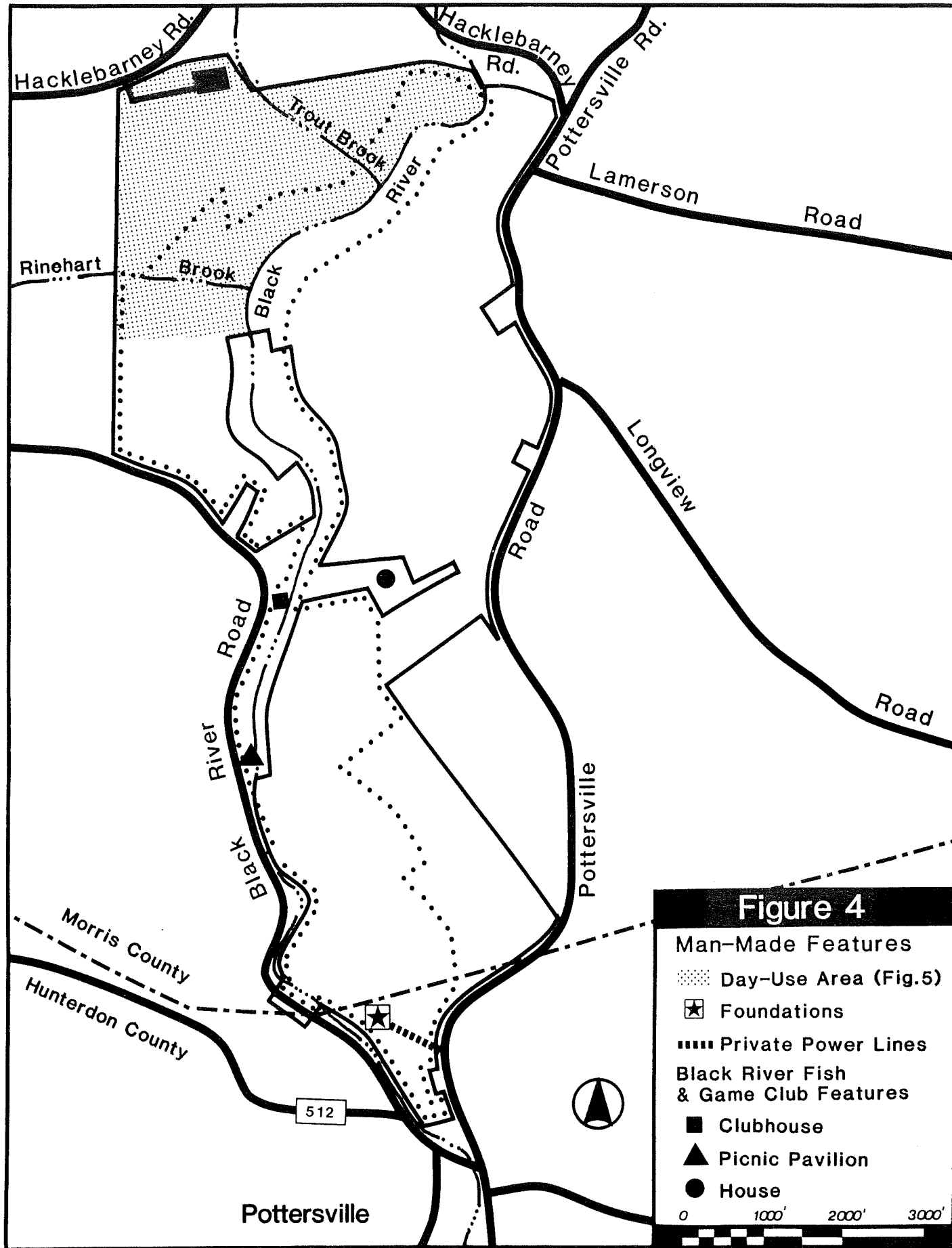
In the day use area, the trail that extends along the banks of the river is often rocky and, at times, hard to follow. Picnic sites are scattered along the course of the trail with only one or a few tables per site. The trail along the boundary of the natural area between Rinehart and Trout Brooks couples as a road for maintenance vehicles. There are a number of picnic sites along this road/trail. The natural area boundary trail between Trout Brook and the Park boundary is a scenic footpath on the side of a slope overlooking the ravine. There is also a dirt road/trail coming down the slope near the park boundary which services the picnic site along the river at that end of the day use area.

On the western side of the river, along the Black River Fish and Game Club easement, the Club has a small clubhouse with a small dirt road leading to it. Further down the river, the Club has a picnic pavilion with a small dirt road and dirt parking area. These facilities are for use by their members only.

### Features of Potential Impact

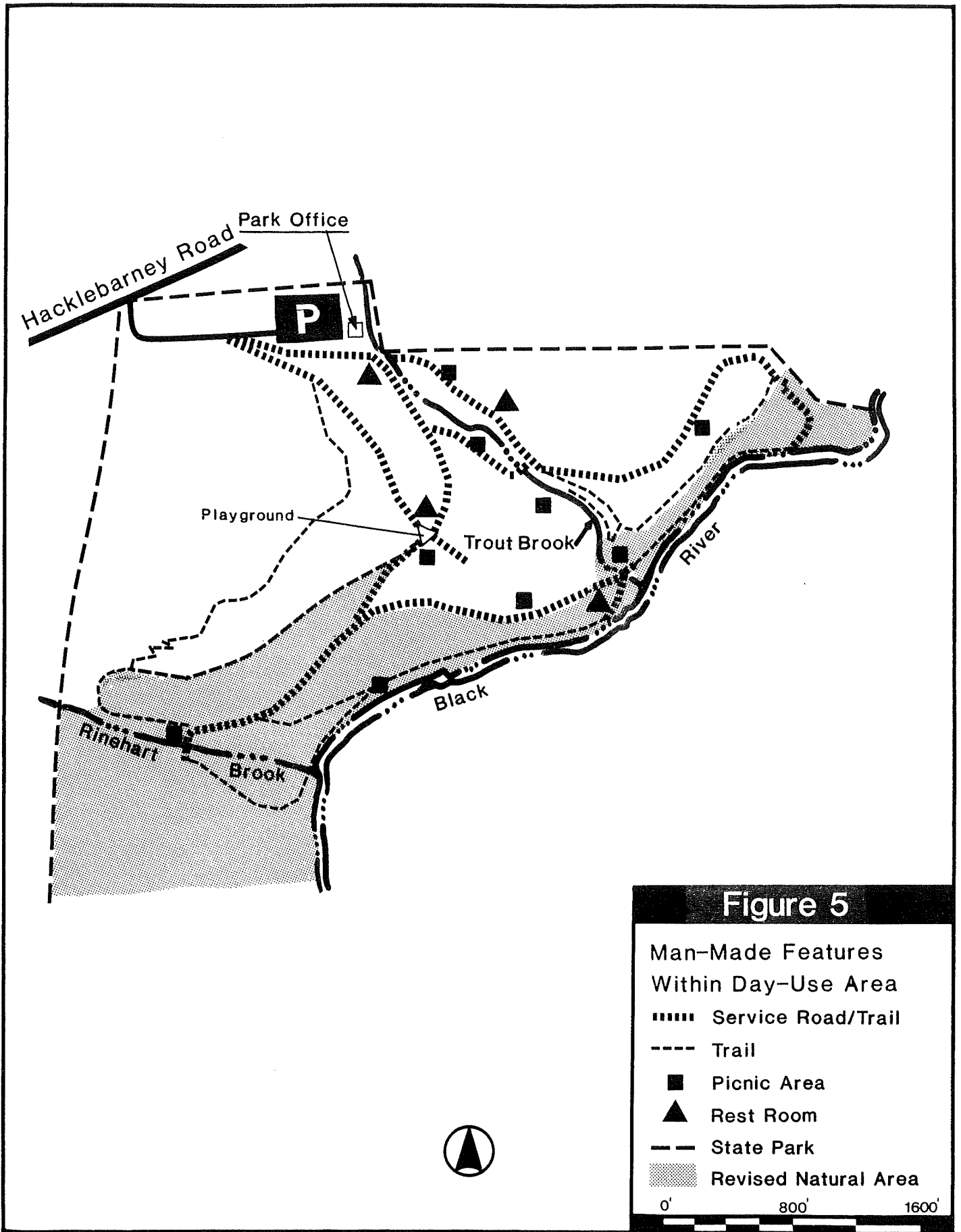
This section will discuss those external and internal features which have or could potentially have an effect on the integrity of the natural area. These include a landfill, an industrial park, increased groundwater pumping, housing developments, the day use area and the Black River Fish and Game Club.





**Figure 4**

- Man-Made Features**
- ☐ Day-Use Area (Fig.5)
  - ☐ Foundations
  - ▬ Private Power Lines
- Black River Fish & Game Club Features**
- Clubhouse
  - ▲ Picnic Pavilion
  - House
- 0 1000' 2000' 3000'



Although the Combe Fill South Landfill is approximately two miles upstream from the confluence of Trout Brook and Black River, because of its location on the headwaters of Trout Brook, it is potentially impacting the natural area. The landfill has been closed since September 1981 and is currently on the EPA Superfund list for toxic cleanup. A conceptual engineering design has been completed outlining the procedures for cleanup and closure. Recently, a contract has been awarded for detailed engineering plans.

Early in 1981, the Department of Environmental Protection and the Upper Raritan Watershed Association conducted water quality testing on surface and groundwater adjacent to the landfill. The results indicated that 33 organic chemicals were found, five of which are known carcinogens (Kurtz, 1983).

At the request of the Division of Fish, Game and Wildlife, the Division of Water Resources collected macroinvertebrate samples from different locations on Trout Brook and the Black River in 1983. The results indicated that Trout Brook near the landfill was in a "grossly degraded condition." Toxic pollutants emanating from the site were detrimental to the aquatic biota. At a sampling station approximately one mile downstream, there were favorable stream conditions. Further downstream, Trout Brook had good water quality and supported diverse benthic communities with typical trout stream organisms (Kurtz, 1983).

On March 21, 1985 the Department of Environmental Protection collected surface water and sediment samples from three locations on Trout Brook and two locations on the Black River. All but one of the samples was from within the Park. There were no priority pollutants detected at any sampling location and none of the compounds observed exceeded the national average for contaminant concentrations in sediments. This summary from the Division of Waste Management indicates that recreational uses and fishing in Trout Brook and Black River should not cause adverse health impacts (N.J. Department of Environmental Protection, 1985).

According to David R. Peifer, Upper Raritan Watershed Association, the 1985 report by the Department did not look at the physical degradation of the stream. Iron-fixing bacteria, sewage worms, etc. could be devastating the stream bottom communities. The large amounts of algae on the rocks in Trout Brook indicate that the stream is unnaturally enriched (David R. Peifer, personal communication).

Sampling conducted for the Remedial Investigation/Feasibility Study in August-October 1985 revealed little or no contamination of surface water on the Black River within Hacklebarney. There was, however, elevated concentrations of priority pollutant chemicals in stream sediments of the Black River. One of the sources is the Combe Fill South Landfill (Lawler, Matusky and Skelly Engineers, 1986).

Another external influence which may impact the natural area is groundwater pollution thought to be emanating from the Cleveland Industrial Park off of Parker Road. Petroleum solvents were apparently dumped there and may have caused homeowners' wells to be contaminated along Black River Road (David R. Peifer, personal communication). The impact or potential impact on the natural area and its streams is currently unknown.

The increased pumping of groundwater by the Morris County Municipal Utilities Authority near the headwaters of the Black River may affect stream flow in the natural area. This is due to the increased development in the headwaters area. A decreased stream flow can cause increased siltation and also increases the chances for pollutants to build up in the river. Its effect on Hacklebarney is not currently known.

Because of the hilly topography at Hacklebarney, its river and streams are particularly susceptible to runoff, erosion and sedimentation problems. Runoff from new housing developments is becoming an increasing problem. Developments upstream on Rinehart Brook could affect the quality of this trout production stream. The impact of new developments on the water quality within the natural area is not known.

Internal features which could have a potential impact on the natural area include the day-to-day activities within the day use area. Maintenance/garbage trucks use the dirt roads on the perimeter of the natural area causing increased erosion potential. Many of the picnic sites have compacted soil and are denuded of vegetation. Although there are garbage cans, a certain amount of litter has to continually be removed from the area. The restroom and drinking fountain water lines could also have a detrimental effect on the natural area (e.g., lines bursting, etc.).

A loss of hemlocks in the ravine is occurring within the natural area. There is a 4-5% loss of hemlocks after a hard winter. This is due to several factors including windthrows and the thin soil not being able to support some of the large trees (Charles H. Sary, personal communication). Thus far, regeneration of hemlocks in the ravine indicates that the ravine is maintaining its hemlock forest.

The Black River Fish and Game Club facilities, including the clubhouse and picnic pavilion, have the same potential for impact as the different features of the day use area. The State's conservation easements on Fish and Game Club land will also have a profound effect on the natural area. The provisions of the easements include:

- No public hunting or fishing allowed.
- State has the right of access, by the Club's permission, to inspect the property.
- School classes and other groups will be allowed at the discretion of the Club.
- Easement cannot be dissolved without Commissioner's approval.
- If Club dissolves, and the Club activities cease, the property shall become vested to the State in fee.

## MANAGEMENT ISSUES AND TECHNIQUES

### Rules and Regulations

A portion of the Natural Areas System Rules (N.J.A.C. 7:2-11.1 et seq.) appears in Appendix A. An important function of these rules is to provide general interim management guidelines for all natural areas. An "interim management practice" means any use, activity or management conducted within a natural area prior to adoption of a management plan. Upon preparation of a management plan, interim management guidelines may continue or may be superceded by management techniques more appropriate to fulfill the designation objective of the natural area. The following analysis will outline management uses contrary or supplemental to existing rules. Appendix A should be consulted by managers for guidance on issues not covered below.

### Designation Objective and Classification

The designation objective for Hacklebarney Natural Area includes "preservation of a river ravine and northern hemlock/mixed hardwood forest, and rare species habitat" and, at the time of rule preparation, the area was assigned an interim classification of Conservation Preserve. This classification reflects an initial view that, in order to attain the designation objective, the natural area should be managed such that habitat manipulation is permissible in order to preserve a plant or animal species, community type or ecosystem. As will be discussed below, habitat manipulation may be needed in the natural area, particularly the day use area. In addition, the easements on Black River Fish and Game Club property that are within the natural area are subject to the following condition: "No trees, shrubs or other vegetation now existing within the easement area shall be removed or destroyed, except according to a plan prepared by a professional forester, it being the intent of the parties hereto to retain the property as much as possible in an unimproved condition." Although the intent is not to manipulate the habitat, the deed does allow for manipulation within Fish and Game Club property. Therefore, the entire natural area will continue to be classified as a Conservation Preserve.

The following is an analysis of issues, problems and management activities which are required to achieve the objectives listed above. These topics are treated separately both for convenience and to accentuate their importance. However, these issues should not be considered independent of each other. Techniques are based in part on consultation with appropriate agencies and the Natural Areas Council, and are designed to adequately maintain and, if possible, enhance the quality of the natural area.

Throughout this section, the Division of Parks and Forestry, State Park Service, through Hacklebarney State Park, shall serve as the Administering Agency, being responsible for effectuating the management techniques outlined in this plan.

## Boundaries

### Issues

1. The former natural area boundaries included the entire day use section of the Park and 113 acres across the river for a total acreage of approximately 338 acres (Figure 2). Because the Park office, parking lot, Superintendent's home, maintenance garage, playground, restrooms and numerous picnic facilities were included, the adequacy of the original boundaries had to be considered. Much of this area and the field portions of the acreage across the river are not necessary to meet the designation objective of preserving the river ravine, hemlock/mixed hardwood forest and known rare plant species. Since the time the original natural area boundaries were delineated, the Park has increased its acreage, either by deed or by easement, and now includes more of the Black River corridor. With the additions of the river corridor, it is now possible to include this land in the natural area.
2. The Black River Fish and Game Club owns property on the river corridor between the large northern and southern portions of the Park. The State has conservation easements on Fish and Game Club property in Hacklebarney.

### Techniques

1. By revising the boundaries to include primarily the river corridor, the designation objective would be affirmed because the hemlock/mixed hardwood forest is in the river ravine as are the known rare plant species. The revised natural area consists of approximately 465 acres (Figure 2). For more detail on the natural area boundary within the day use area, see Figure 5.
2. Most of the Black River Fish and Game Club property will be included as part of the natural area. However, all terms and conditions outlined in the easement agreements must be adhered to in the management of the natural area. Provisions of the easements are included under Features of Potential Impact.

## Human Use

### Issues

1. Current major uses include activities such as fishing, hunting, picnicking and hiking. Other uses are birdwatching, photography, nature study, cross country skiing, a few weddings and occasional illegal use by off-road vehicles (particularly the 3-wheel all terrain vehicles). The above uses must be examined to determine whether they could conflict with the designation objective.

2. A function of the Natural Areas System is to provide areas for ecological research and study.
3. Attendance in the day use area has increased almost 25% since fiscal year 1985. October and November are the busiest months due primarily to the fall foliage. Hacklebarney is also included on the State's official fall foliage tour. The next busiest months are April-May because of the heavy influx of visitors that are fishing, hiking and picnicking. Summer attendance is also up since people being turned away at Round Valley are being directed to Hacklebarney. With the increased usage and the natural area's increased acreage, provisions must be made for keeping a quality level of maintenance and enforcement.

### Techniques

1. The above are legitimate uses on State owned property, with the exception of use by recreational motor vehicles. Trout stocking in the Black River, Trout Brook and Rinehart Brook will be allowed to continue as stated in the interim management practices (Appendix A). If cross-country skiing and hiking are confined to the designated trails, there should not be any adverse impacts to the vegetation. Motor vehicle use by authorized Department of Environmental Protection personnel for maintenance, garbage pickup, emergencies, trout stocking, etc. will be allowed to continue in the natural area.
2. The Black River Fish and Game Club is an area where the only allowable public use is for educational and scientific purposes as stated in the easement agreements. This would allow the area to be used for ecological research and study. However, access to the Club's area is only by their permission. In addition, access for collection of specimens is not permitted. Another area that could be used for ecological research and study is the southern section of the natural area. This area has no development and use levels are very low except during hunting season.
3. The Administering Agency should attempt to hire the additional support personnel required to keep the area well maintained and adequately patrolled.
4. The Administering Agency shall advise the Office of Natural Lands Management and the Natural Areas Council once each year concerning the quality of the natural features within Hacklebarney Natural Area. Information needed to ascertain these qualities will be left to the discretion of Park personnel. Any concerns indicating potential or actual degradation of the area should include appropriate recommendations for resolving the situation.

## Man-made Features

### Issues

1. The day use portion of the natural area contains the following features: a restroom, numerous picnic tables, grills, trash cans, four footbridges, drinking fountains, maintenance roads and hiking trails (Figures 4 and 5). Within Black River Fish and Game Club property, there are a few short roads, trails, a small clubhouse and a picnic pavilion (Figure 4). In addition, an occasional tree stand has been constructed by hunters on various sites throughout the area.
2. Service roads must continue to be used by park personnel for maintaining the facilities, emergencies and for trash removal. However, many of these roads are in need of repair.
3. It is anticipated that a water line leading to restroom #3 and its associated drinking fountain will be replaced. The current system is antiquated, having been built in the 1930's. The line is corroded and has many leaks which wastes water and increases erosion on the steep slopes.
4. Picnicking (with picnic sites) is not normally associated with New Jersey natural areas. However, the picnic sites are in the ravine and picnicking has been one of the major uses since the 1930's. Park personnel have always relocated picnic tables and replaced picnic equipment when deemed necessary.
5. The Park Superintendent has proposed better delineation and realignment of the trail that runs along the river in order to make the trail easier to follow.
6. Currently, Hacklebarney personnel are removing hunting platforms (tree stands) whenever possible.

### Techniques

1. Future budget proposals for Hacklebarney include a maintenance project to repair roads in the day use area. If and when this project is funded, roads shall not be paved and road widths should be maintained to allow a width sufficient enough for a service vehicle to be able to pass a line of people walking on the road. The contractor's scope of work should include means whereby the firm does the least amount of vegetative damage as possible.
2. The Administering Agency has proposed that a new water line will consist of black rolled PVC and will be placed above ground due to the rockiness of the soil. The pipe will be buried under any roads or trails that need to be crossed. The current lines are also above ground but were backfilled to bury them. These old pipes



will not be removed. Digging them up would probably cause more damage to the vegetation than if left alone; especially since plants have grown around and over the old lines. Water line repairs should be completed with the least amount of damage to the vegetation as possible, as determined by the Park Superintendent. Any impact to populations of rare plants is prohibited.

3. Picnicking will remain as a viable use in the natural area. Park personnel will continue to replace, remove and relocate picnic sites and its associated equipment as part of the Park's routine maintenance program. Several tables in the natural area need to be relocated. The picnic table near the confluence of Rinehart Brook and the Black River should be relocated to an area nearer vehicle access to facilitate trash removal. Another site which should be relocated is the site on a "peninsula" that juts out into the Black River. This outlying site is visually unattractive and will be eventually destroyed by high water from the river.
4. Realignment of the trail should be allowed to occur provided there is no significant habitat alteration and no removal of rare plants. Plans for realignment shall be reviewed by the Natural Areas Council.
5. Constructed tree stands left by hunters shall continue to be removed. However, State Park Service Rules and Regulations state "The temporary use of portable hunting blinds and tree stands is permitted in authorized hunting areas, provided they are immediately removed by the hunter after use" (N.J.A.C. 7:2-2.19). In addition, the Division of Fish, Game and Wildlife considers the use of tree stands to be a more effective and safer deer hunting technique than hunting at ground level. Therefore, the use of portable hunting blinds and tree stands will be permitted in the natural area.

## Habitat Manipulation

### Issues

1. After a hard winter, trees, particularly hemlocks, sometimes fall across trails, roads and picnic sites in the day use area.
2. Some habitat manipulation may necessarily result from installation of the new water line, road improvements and trail realignment.

### Techniques

1. Trees or parts of trees which have fallen across trails, roads and picnic sites and block passage or become safety hazards may be removed and used elsewhere in the natural area for trail delineation or other purposes.
2. Any habitat manipulation must be kept to a minimum. Rare plants must not be removed. If there are plans for significantly altering

habitat, plans must be presented to the Office of Natural Lands Management and the Natural Areas Council.

## External Features

### Issues

1. The water quality of Trout Brook and Black River could be affected by pollution emanating from the Combe Fill South Landfill located at the headwaters of Trout Brook.
2. Increased groundwater pumping near the headwaters of the Black River may affect stream flow in the natural area. This may increase the siltation and buildup of pollutants in the river.
3. The Cleveland Industrial Park off of Parker Road and the Combe Fill South Landfill may be sources of groundwater pollution affecting homeowners' wells in the area. At this time, it cannot be determined whether or not the pollutants are affecting the natural area.
4. New housing developments near Rinehart Brook upstream from the natural area may be degrading the trout supporting capabilities of the brook. Trout Brook's capabilities may also be in jeopardy due to the Combe Fill South Landfill.

### Techniques

1. The State Division of Hazardous Site Mitigation has recently awarded a contract for a detailed engineering design for cleanup and closure of Combe Fill South Landfill. Remediation work will include capping the landfill and a groundwater pumping system. The results from any further water quality sampling in the vicinity of Hacklebarney State Park will be forwarded to the Office of Natural Lands Management (Michael Hornsby, Division of Hazardous Site Mitigation, personal communication).
2. The Upper Raritan Watershed Association and the Office of Natural Lands Management shall cooperatively conduct a study to determine the Black River's feasibility for inclusion in the New Jersey Wild and Scenic Rivers System. Inclusion in the System would set water quality and flow standards that would have to be maintained, thereby monitoring the amount of groundwater being pumped from the headwaters of the river.
3. Testing of the drinking well at Hacklebarney by the Division of Water Resources should continue on a periodic basis to assure the public and the Division of Parks and Forestry that the water supply is potable.
4. The fish population in Rinehart Brook and Trout Brook should be occasionally monitored by the Division of Fish, Game and Wildlife

to determine the impact of upstream development on the stream's aquatic biota.

5. The Office of Natural Lands Management will support attempts by the Upper Raritan Watershed Association or other agencies to acquire or gain easements on upstream corridors.

### Recommended Research

#### Issues

1. The three known threatened plant species within Hacklebarney State Park are all located within the natural area. Provisions to protect these species must be implemented.
2. Hacklebarney State Park provides potential habitat for a number of threatened or endangered species of wildlife. There are, however, no confirmed records of any of these species.
3. Other than the preliminary bird and plant lists, a comprehensive inventory of biota has not been undertaken.
4. Is the regeneration of hemlocks keeping pace with the number being lost each year?

#### Techniques

1. Populations of threatened plant species shall be mapped with their exact locations kept confidential from the public. The locations will be provided to the Park Superintendent for reference. These populations shall be periodically monitored by the Office of Natural Lands Management to assess their need for additional management.
2. An inventory of endangered and threatened wildlife populations is needed as an additional management tool.
3. Qualified individuals and groups should be encouraged to conduct research to inventory the biota and to gather data that will aid in the continued management of the site.
4. Research to determine if the hemlock-mixed hardwood forest is being maintained in its present form would help in properly managing for the preservation of the hemlock ravine. State Forestry Services could be an integral part of any subsequent management for the hemlock forest.

## Public Participation and Education

### Issues

1. Hacklebarney State Park previously had a seasonal naturalist and, with the increased visitation, the naturalist may once again be a viable position to consider.
2. Many school groups, college classes, etc., use Hacklebarney as an outdoor classroom. Much of the data gathered by instructors and students could provide information that would be helpful in managing the area and be informative to park visitors.

### Techniques

1. The Administering Agency should again consider providing Hacklebarney with a naturalist. Because spring and fall are such busy times of the year and with cross country skiing becoming more popular, a full time position should be considered. Currently, the nature center is located in the park office cellar. Consideration for a new interpretive center should be included in any future development plans. Hacklebarney would be an ideal natural area for interpretation because of the good trail system, the river corridor and the more isolated southern section of the park.
2. A naturalist could compile all data collected by various groups and individuals along with the naturalist's own inventories. This should help in the future management of the natural area.

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APPENDIX AINTERIM MANAGEMENT PRACTICES FOR NATURAL AREAS

From Natural Areas System Rules  
(N.J.A.C. 7:2-11.1 et seq.)

7:2-11.9 INTERIM MANAGEMENT PRACTICES

- (a) Interim management practices shall be implemented by the administering agency, provided that:
  - 1. The practice will have no direct or indirect adverse impact on natural features of concern;
  - 2. The administering agency notifies the secretary of the Council, in writing, no later than 30 days after initiating the practice;
  - 3. Approval of the Commissioner is not required by provision elsewhere in this subchapter; and
  - 4. The practice is consistent with terms of any conservation easement held by the Department.
- (b) Interim management practices which require the approval of the Commissioner shall first be submitted to the Council for its review and recommendation.
- (c) Upon finding that an interim management practice listed below at (e) or (f) would be detrimental to achieving a specific designation objective, the Council shall recommend to the Commissioner the substitution of a more appropriate interim management practice. Should the Commissioner concur with the recommendation of the Council, the Commissioner may approve substitution by a more appropriate interim management practice.
- (d) Where there are conflicts between general practices described below at (e) and practices specific to a natural area classification described below at (f), the latter shall apply.
- (e) The following interim management practices apply generally to all natural areas:
  - 1. Natural area boundaries shall be made clearly evident by posting signs at a maximum density of ten signs per mile; entrance points shall be posted to indicate to users that they are entering a natural area; boundary signs shall be of a standard size and format as approved by the Commissioner and provided by the Division;
  - 2. Boundary fences that are needed to protect the natural area may be installed provided the fence shall not have a

- detrimental effect on movement of wildlife, air circulation, or other natural conditions;
3. Vehicular access lanes may be maintained within a natural area but may not be enlarged in any manner except upon approval of the Commissioner.
  4. Existing firebreaks within a natural area may be maintained for safety purposes; temporary firebreaks made by mowing, raking, plowing or wetting, may be used in conjunction with prescribed burning for habitat management;
  5. Existing structures may be maintained in a natural area but may not be enlarged; new structures, of a temporary nature, may be constructed for research purposes in accordance with N.J.A.C. 7:2-11.10;
  6. No measures, such as cutting of grass, brush, or other vegetation, thinning of trees, opening of scenic vistas, or planting, shall be taken to alter natural processes or features for the purpose of enhancing the beauty or neatness of a natural area;
  7. Except as otherwise provided in this section, there shall be no introduction, removal or consumptive use of any material, product, or object to or from a natural area; prohibited activities include grazing by domestic animals, farming, gathering of plants or parts thereof, mining or quarrying, and dumping, burying, or spreading of garbage, trash, or other materials; structures or materials may be removed as follows:
    - i. Old interior fences may be removed, giving consideration to leaving posts to mark boundaries between former land uses;
    - ii. Rubbish or any other waste material may be removed; and
    - iii. Structures having no historic, scientific or habitat value may be demolished and removed unless such structures are deemed essential for administrative purposes;
  8. Water levels within a natural area shall not be altered except to restore water levels which have been altered due to a sudden natural phenomena or man-induced conditions off-site; routine repairs to existing water control structures may be undertaken but the structures may not be enlarged;
  9. All wildfires shall be brought under control as quickly as possible; after a fire within a natural area, there shall be no cleanup or replanting except as approved by the Commissioner to achieve the designation objective or for reasons of health and safety;



10. Prescribed burning, to eliminate safety hazards and to manage habitat, may be conducted upon review of a proposal for prescribed burning by the Council and approval by the Commissioner; use of vehicles and equipment shall be specified in the proposal for prescribed burning;
11. Erosion control within a natural area shall not be undertaken except to restore existing grades which have been altered due to a sudden natural phenomena or man-induced conditions within or beyond the natural area;
12. Habitat manipulation may be undertaken if preservation of a particular habitat type or species of native flora or fauna is included in the designation objective of the natural area and the prior approval of the Commissioner is obtainable;
13. Gypsy moth control activities may be implemented as an interim management practice after approval by the Commissioner; the Commissioner shall review a control plan only after the State Forester has determined that egg mass counts and prior year defoliation indicates that tree mortality will be severe without intervention; to the extent practicable, biological controls, rather than chemical means, shall be used to control gypsy moths;
14. There shall be no physical manipulation of a natural area or application of chemicals known as adulticides for the purpose of controlling mosquitos; the application of larvacides may be permitted in salt marshes only and only as follows:
  - i. The application of Bacillus thuringensis var. israeliensis (BTI) may be initiated by a mosquito control agency at any time; and
  - ii. The application of other larvacides may be initiated upon approval by the Commissioner of a specific plan submitted by a mosquito control agency; the plan shall identify the specific area where an application will be made, the types and amount of larvacide to be applied, the need for the application, and the reason why BTI cannot be used for this application;
15. Research activities and the collection of specimens may only be conducted in accordance with N.J.A.C. 7:2-11.10 and upon approval of the administering agency; and
16. Public use of natural areas shall be allowed only to the extent and in a manner that it will not impair natural features; the administering agency may restrict access and use as necessary to protect the natural area; the following are permissible public uses:
  - i. Hunting, trapping, and fishing are permitted in accordance with N.J.A.C. 7:25-5 and 7:25-6; except for the stocking of fish and game, habitats may not be

manipulated for the purpose of enhancing hunting, trapping, or fishing;

ii. Occasional camping along trails, boating, and swimming may be permitted in specified locations of natural areas in accordance with N.J.A.C. 7:2-2, 7:2-5, 7:2-7, 7:2-8, and 7:25-2, and are further limited as follows:

- (1) No permanent structures may be erected;
- (2) No motorized methods of boating or camping are permitted;
- (3) Trailside shelters of the type called lean-tos are permitted, but there may not be two such shelters within three miles of each other; and

iii. Existing trails may be maintained, but not enlarged in any manner, by the administering agency to allow public use and prevent erosion, trampling of vegetation beyond the trails, and other deterioration as follows:

- (1) New trails or enlargement of existing trails for interpretive purposes may be initiated subsequent to review of a plan by the Council and approval of that plan by the Commissioner;
- (2) Rare plants may not be removed for the purpose of maintaining existing or constructing new trails; and
- (3) To the extent possible, natural materials shall be used on and along trails; and

iv. All pets shall be kept caged or leashed and under immediate control of the owner except that dogs used while legally hunting shall be exempt from the leashing requirement.

(f) The following interim management practices, unless superseded by an adopted management plan, apply to the appropriate specified natural area classifications:

1. Location markers identifying interpretation points of interest may be installed except within ecological reserves;
2. Trail blazes may be used within any natural area;
3. Existing vehicular access lanes may not be enlarged in any manner within an ecological reserve;
4. New vehicular access lanes may be constructed only within buffer areas and upon approval by the Commissioner;

5. New structures and enlargement of existing structures may be undertaken by the administering agency only within buffer areas, provided the structures directly or indirectly contribute to the designation objective;
6. The alteration of natural processes or features for the purpose of enhancing public use of the natural area may be conducted by the administering agency only within buffer areas; and
7. The following management practices shall not be permitted within ecological reserves:
  - i. New, existing, or temporary firebreaks;
  - ii. Construction of new trails;
  - iii. Alteration or restoration of water levels;
  - iv. Prescribed burning;
  - v. Erosion control measures;
  - vi. Gypsy moth control activities; and
  - vii. Manipulation of vegetation and wildlife habitats.



## Liliaceae (Lily Family)

<i>Allium canadense</i>	F	Wild Garlic
<i>A. vineale</i>	F	Field Garlic
<i>Hemerocallis fulva</i>	F	Day-lily
<i>Lilium canadense</i>	B	Canada Lily
<i>Polygonatum biflorum</i>	S	Solomon's seal
<i>Smilacina racemosa</i>	S,U	False Solomon's seal
<i>Uvularia perfoliata</i>	S	Perfoliate bellwort
<i>U. sessilifolia</i>	S	Wild Oat
<i>Veratrum viride</i>	B	False Hellebore

## Amaryllidaceae (Amaryllis Family)

<i>Hypoxis hirsuta</i>	F	Yellow stargrass
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## Iridaceae (Iris Family)

<i>Iris versicolor</i>	B	Blue flag
<i>Sisyrinchium angustifolium</i>	F	Blue-eyed grass

## Orchidaceae (Orchis Family)

<i>Cypripedium acaule</i>	S	Stemless Lady-slipper
<i>Epipactis hellborine</i>	S	Helleborine
<i>Goodyera pubescens</i>	S	Rattlesnake plantain
<i>Orchis spectabilis</i>	S	Showy Orchis

## Urticaceae (Nettle Family)

<i>Urtica dioica</i>	B	Stinging nettle
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## Aristolochiaceae (Birthwort Family)

<i>Asarum canadense</i>	S	Wild ginger
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## Polygonaceae (Buckwheat Family)

<i>Polygonum pensylvanicum</i>	F	Pinkweed
<i>Tovara virginiana</i>	B	Virginian Jumpseed

## Phytolaccaceae (Pokeweed Family)

<i>Phytolacca americana</i>	B,F	Pokeweed
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## Portulacaceae (Purslane Family)

<i>Claytonia virginica</i>	B	Spring-beauty
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## Caryophyllaceae (Pink Family)

<i>Silene cucubalus</i>	G	Bladder-campion
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## Ranunculaceae (Crowfoot Family)

<i>Actaea pachypoda</i>	S,U	White Baneberry
<i>Anemone quinquefolia</i>	S,U	Wood anemone
<i>A. virginiana</i>	F,U	Thimbleweed
<i>Anemonella thalictroides</i>	S,U	Rue-anemone
<i>Caltha palustris</i>	B	Marsh Marigold
<i>Cimicifuga racemosa</i>	S	Black Snakeroot
<i>Hepatica americana</i>	S	American Hepatica
<i>Ranunculus acris</i>	F	Common Buttercup
<i>Thalictrum dioicum</i>	B,S	Early Meadow-rue
<i>T. polygamum</i>	B	Tall Meadow-rue

## Berberidaceae (Barberry Family)

<i>Caulophyllum thalictroides</i>	S	Blue Cohosh
<i>Podophyllum peltatum</i>	B,U	May apple

## Papaveraceae (Poppy Family)

<i>Sanquinaria canadensis</i>	S	Bloodroot
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## Saxifragaceae (Saxifrage Family)

<i>Saxifraga virginiana</i>	S	Early Saxifrage
<i>Tiarella cordifolia</i>	S	Foamflower

## Rosaceae (Rose Family)

<i>Agrimonia</i> spp.	G	Agrimony
<i>Fragaria virginiana</i>	F	Strawberry
<i>Geum canadense</i>	U	White Avens
<i>Potentilla recta</i>	F	Upright Cinquefoil
<i>P. simplex</i>	F	Common Cinquefoil
<i>Rosa multiflora</i>	F	Multi-flora rose
<i>Rubus odoratus</i>	S	Flowering Raspberry
<i>Spiraea tomentosa</i>	F	Hardhack

## Leguminosae (Pulse Family)

<i>Amphicarpa bracteata</i>	B,S	Hog-peanut
<i>Desmodium canadense</i>	F	Showy Tick-trefoil
<i>D. nudiflorum</i>	S,U	Naked-flowered Tick-trefoil

## Balsaminaceae (Touch-Me-Not Family)

<i>Impatiens capensis</i>	B	Jewel-weed
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## Guttiferae (St. John's-Wort Family)

<i>Hupericum canadense</i>	B,F	Canadian St. John's-wort
<i>H. perforatum</i>	F	Common St. John's-wort

## Violaceae (Violet Family)

<i>Viola rotundifolia</i>	S	Round-leaved Yellow Violet
<i>V. blanda</i>	S	Sweet White Violet
<i>V. incognita</i>	S	Unknown Violet
<i>V. palmata</i>	S	Wood Violet
<i>V. papilionacea</i>	S	Meadow Violet
<i>V. pennsylvanica</i>	S	Smooth Yellow Violet
<i>V. triloba</i>	S	Three-lobed Violet

## Onagraceae (Evening-primrose Family)

<i>Circaea quadrisulcata</i>	B,S	Enchanter's Nightshade
<i>Epilobium coloratum</i>	F	Purple-leaved Willow-herb
<i>Oenothera biennis</i>	F	Evening-primrose

## Oraliaceae (Ginseng Family)

<i>Panax quinquefolium</i>	U	Ginseng
<i>P. trifolium</i>	U	Dwarf Ginseng

## Umbelliferae (Parsley Family)

<i>Daucus carota</i>	F	Queen Anne's Lace
<i>Osmorhiza longistylis</i>	S	Sweet Cicely

## Pyrolaceae (Wintergreen Family)

<i>Chimaphila maculata</i>	S,U	Spotted Wintergreen
<i>Pyrola elliptica</i>	S	Wild Lily-of-the-Valley
<i>Monotropa uniflora</i>	S,U	Indian pipe

## Ericaceae (Heath Family)

<i>Gaultheria procumbens</i>	S	Checkerberry
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## Primulaceae (Primrose Family)

<i>Lysimachia ciliata</i>	B	Fringed Loosestrife
<i>L. quadrifolia</i>	U	Whorled Loosestrife

## Asclepiadaceae (Milkweed Family)

<i>Asclepias exaltata</i>	B	Smooth Milkweed
<i>A. syriaca</i>	F	Common Milkweed

## Convolvulaceae (Convolvulus Family)

<i>Convolvulus sepium</i>	F	Hedge-bindweed
<i>Cuscuta gronovii</i>	B	Dodder

## Boraginaceae (Borage Family)

<i>Myosotis laxa</i>	B	Forget-me-not
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## Labiatae (Mint Family)

<i>Collinsonia canadensis</i>	B,S	Stoneroot
<i>Monarda fistulosa</i>	F	Horse mint
<i>Prunella vulgaris</i>	F,U	Self-heal
<i>Scutellaria lateriflora</i>	F	Skullcap

## Solanaceae (Nightshade Family)

<i>Solanum carolinense</i>	F	Horse-nettle
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## Scrophulariaceae (Figwort Family)

<i>Chelone glabra</i>	B	Turtlehead
<i>Linaria vulgaris</i>	F	Butter-and-eggs
<i>Melampyrum lineare</i>	U	Cow-wheat
<i>Mimulus ringens</i>	B	Monkey-flower
<i>Pedicularis canadensis</i>	U	Common Lousewort
<i>Penstemon</i> spp.	F	Penstemon
<i>Verbascum thapsus</i>	F	Common Mullein

## Orobanchaceae (Broom-rape Family)

<i>Conopholis americana</i>	S	Squawroot
<i>Epifagus virginiana</i>	S,U	Beechdrops

## Phrymaceae (Lopseed Family)

<i>Phryma leptostachya</i>	B	Lopseed
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## Rubiaceae (Madder Family)

<i>Mitchella repens</i>	S,U	Partridgeberry
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## Campanulaceae (Bluebell Family)

<i>Campanula rotundifolia</i>	B,F	Bluebell
<i>Lobelia inflata</i>	F,U	Indian tobacco
<i>L. spicata</i>	F	Pale-spike lobelia

## Compositae (Composite Family)

<i>Achillea millefolium</i>	F	Common Yarrow
<i>Anaphalis margaritacea</i>	F	Pearly everlasting
<i>Antennaria neglecta</i>	F	Pussy-toes
<i>Aster divaricatus</i>	B,F	Whitewood Aster
<i>A. lowrieanus</i>	B	Lowrie's Aster



<i>A. novae-angliae</i>	F	New England Aster
<i>A. sagittifolius</i>	U	Arrow-leaved Aster
<i>Centaurea maculosa</i>	F	Spotted Knapweed
<i>C. nigra</i>	F	Black Knapweed
<i>Cirsium vulgare</i>	F	Bull thistle
<i>Chrysanthemum leucanthemum</i>	F	Ox-eye daisy
<i>Cichorium intybus</i>	F	Chicory
<i>Erigeron annuus</i>	F	Daisy fleabane
<i>Eupatorium purpureum</i>	S	Joe-pye weed
<i>E. rugosum</i>	S,U	White Snake root
<i>Helianthus decapetalus</i>	U	Ten petal Sunflower
<i>H. divaricatus</i>	F,U	Woodland Sunflower
<i>Hieracium paniculatum</i>	U	Panicled hawkweed
<i>H. pratense</i>	F	King devil
<i>H. venosum</i>	S,U	Rattlesnake weed
<i>Krigia biflora</i>	F	Dwarf Dandelion
<i>Prenanthes altissima</i>	B	Rattlesnake-root
<i>Rudbeckia hirta</i>	F	Black-eyed Susan
<i>R. laciniata</i>	B	Green-headed coneflower
<i>Senecio aureus</i>	B	Golden Ragwort
<i>Solidago caesia</i>	S	Blue-stem Goldenrod
<i>S. flexicaulis</i>	B	Flexuous-stemmed Goldenrod
<i>S. graminifolia</i>	F	Grass-leaved Goldenrod
<i>S. juncea</i>	F	Early Goldenrod
<i>S. rugosa</i>	F	Rough-stemmed Goldenrod
<i>Taraxacum officinale</i>	F	Dandelion
<i>Veronia noveboracensis</i>	F	Ironweed

### Trees

Simple listing of plants observed without regard to location.

#### Pinaceae (Pine Family)

<i>Tsuga canadensis</i>	Canadian Hemlock
<i>Pinus strobus</i>	White Pine
<i>Juniperus virginiana</i>	Red Cedar

#### Fagaceae (Beech Family)

<i>Quercus alba</i>	White Oak
<i>Q. coccinea</i>	Scarlet Oak
<i>Q. palustris</i>	Pin Oak
<i>Q. prinus</i>	Chestnut Oak
<i>Q. rubra</i>	Red Oak
<i>Q. velutina</i>	Black Oak
<i>Castanea dentata</i>	American Chestnut (sapling only)
<i>Fagus grandifolia</i>	Beech

## Ulmaceae (Elm Family)

*Ulmus americana* American Elm

## Salicaceae (Willow Family)

*Populus grandidentata* Large-toothed Aspen  
*P. tremuloides* Quaking Aspen  
*Salix discolor* Pussy Willow  
*S. nigra* Black Willow  
*S. spp.* Willow

## Juglandaceae (Walnut Family)

*Carya glabra* Pignut Hickory  
*C. ovata* Shagbark Hickory  
*C. tomentosa* Mockernut Hickory  
*Juglans cinerea* Butternut  
*J. nigra* Black Walnut

## Corylaceae (Hazel Family)

*Betula lenta* Black Birch  
*B. lutea* Yellow Birch  
*B. populifolia* Gray Birch  
*Carpinus caroliniana* American Hornbeam

## Magnoliaceae (Magnolia Family)

*Liriodendron tulipifera* Tulip Poplar

## Lauraceae (Laurel Family)

*Sassafras albidum* White Sassafras

## Rosaceae (Rose Family)

*Prunus avium* Sweet Cherry  
*P. serotina* Black Cherry  
*P. virginiana* Choke-cherry

## Leguminosae (Pulse Family)

*Robinia pseudo-acacia* Black Locust

## Aceraceae (Maple Family)

*Acer rubrum* Red Maple  
*A. saccharum* Sugar Maple

## Tiliaceae (Linden Family)

*Tilia americana*  
*T. heterophylla*

American Basswood  
 White Basswood

## Nyssaceae (Sour Gum Family)

*Nyssa sylvatica*

Black Gum

## Cornaceae (Dogwood Family)

*Cornus florida*  
*C. racemosa*  
*C. stolonifera*

Flowering Dogwood  
 Gray Dogwood  
 Red Osier

## Oleaceae (Olive Family)

*Fraxinus americana*  
*F. pennsylvanica*

White Ash  
 Green Ash

Shrubs

## Myricaceae (Wax-Myrtle Family)

*Comptonia peregrina*

Sweet Fern

## Corylaceae (Hazel Family)

*Alnus serrulata*  
*Corylus americana*

Smooth Alder  
 Hazelnut

## Berberidaceae (Barberry Family)

*Berberis canadensis*

American Barberry

## Lauraceae (Laurel Family)

*Lindera benzoin*

Spicebush

## Rosaceae (Rose Family)

*Amelanchier* spp.  
*Crataegus* spp.  
*Rubus allegheniensis*  
*R. flagellaris*  
*R. occidentalis*  
*R. odoratus*  
*R. phoenicolasius*

Shadbush  
 Hawthorn  
 Common Blackberry  
 Northern Dewberry  
 Black Raspberry  
 Purple-flowering Raspberry  
 Wineberry

## Anacardiaceae (Cashew Family)

Rhus glabra	Smooth Sumac
R. typhina	Staghorn Sumac

## Aquifoliaceae (Holly Family)

Ilex verticillata	Black Alder
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## Clethraceae (White Alder Family)

Clethra alnifolia	Sweet Pepperbush
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## Ericaceae (Heath Family)

Kalmia latifolia	Mountain Laurel
Rhododendron nudiflorum	Pinxter-flower Azalea
Vaccinium augustifolium	Lowbush Blueberry
V. corymbosum	Highbush Blueberry
Gaylussacia baccata	Black Huckleberry
G. frondosa	Dangleberry

## Caprifoliaceae (Honeysuckle Family)

Sambucus canadensis	Common Elderberry
Diervilla lonicera	Bush Honeysuckle
Viburnum acerifolium	Maple-leaved Viburnum
V. dentatum	Arrowwood
V. prunifolium	Black haw

Vines

## Liliaceae (Lily Family)

Smilax rotundifolia	Common Greenbrier
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## Anacardiaceae (Cashew Family)

Rhus radicans	Poison Ivy
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## Celastraceae (Staff-tree Family)

Celastrus scandens	American Bittersweet
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## Vitaceae (Vine Family)

Parthenocissus quinquefolia	Virginia Creeper
Vitis spp.	Wild Grape

## Caprifoliaceae (Honeysuckle Family)

Lonicera japonica	Japanese Honeysuckle
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APPENDIX CPreliminary List of Birds Sighted  
at Hacklebarney State Park - Late 1970's

List Compiled by Wade Wander

<u>Species</u>	<u>Common Name</u>
Ardea herodias	Great Blue Heron
Butorides striatus	Green-backed Heron
Branta canadensis	Canada Goose
Aix sponsa	Wood Duck
Anas rubripes	American Black Duck
Anas platyrhynchos	Mallard
Cathartes aura	Turkey Vulture
Pandion haliaetus	Osprey
Circus cyaneus	Northern Harrier
Accipiter striatus	Sharp-shinned Hawk
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Buteo lineatus	Red-shouldered Hawk
Buteo platypterus	Broad-winged Hawk
Buteo jamaicensis	Red-tailed Hawk
Falco sparverius	American Kestrel
Phasianus colchicus	Ring-necked Pheasant
Bonasa umbellus	Ruffed Grouse
Charadrius vociferus	Killdeer
Gallinago gallinago	Common Snipe
Scolopax minor	American Woodcock
Columba livia	Rock Dove
Zenaida macroura	Mourning Dove
Coccyzus erythrophthalmus	Black-billed Cuckoo
Coccyzus americanus	Yellow-billed Cuckoo
Otus asio	Screech Owl
Bubo virginianus	Great Horned Owl
Chordeiles minor	Common Nighthawk
Chaetura pelagica	Chimney Swift
Archilochus colubris	Ruby-throated Hummingbird
Ceryle alcyon	Belter Kingfisher
Melanerpes erythrocephalus	Red-headed Woodpecker
Melanerpes carolinus	Red-bellied Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker
Picoides pubescens	Downy Woodpecker
Picoides villosus	Hairy Woodpecker
Colaptes auratus	Northern Flicker
Dryocopus pileatus	Pileated Woodpecker
Contopus virens	Eastern Wood-Pewee
Sayornis phoebe	Eastern Phoebe
Myiarchus crinitus	Great Crested Flycatcher

<u>Species</u>	<u>Common Name</u>
<i>Tyrannus tyrannus</i>	Eastern Kingbird
<i>Progne subis</i>	Purple Martin
<i>Tachycineta bicolor</i>	Tree Swallow
<i>Hirundo rustica</i>	Barn Swallow
<i>Cyanocitta cristata</i>	Blue Jay
<i>Corvus brachyrhynchos</i>	American Crow
<i>Parus atricapillus</i>	Black-capped Chickadee
<i>Parus bicolor</i>	Tufted Titmouse
<i>Sitta canadensis</i>	Red-breasted Nuthatch
<i>Sitta carolinensis</i>	White-breasted Nuthatch
<i>Certhia americana</i>	Brown Creeper
<i>Thryothorus ludovicianus</i>	Carolina Wren
<i>Troglodytes aedon</i>	House Wren
<i>Troglodytes troglodytes</i>	Winter Wren
<i>Regulus satrapa</i>	Golden-crowned Kinglet
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher
<i>Sialia sialis</i>	Eastern Bluebird
<i>Catharus fuscescens</i>	Veery
<i>Catharus ustulatus</i>	Swainson's Thrush
<i>Catharus guttatus</i>	Hermit Thrush
<i>Hylocichla mustelina</i>	Wood Thrush
<i>Turdus migratorius</i>	American Robin
<i>Dumetella carolinensis</i>	Gray Catbird
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Bombycilla cedrorum</i>	Cedar Waxwing
<i>Lanius excubitor</i>	Northern Shrike
<i>Sturnus vulgaris</i>	European Starling
<i>Vireo griseus</i>	White-eyed Vireo
<i>Vireo solitarius</i>	Solitary Vireo
<i>Vireo flavifrons</i>	Yellow-throated Vireo
<i>Vireo olivaceus</i>	Red-eyed Vireo
<i>Vermivora pinus</i>	Blue-winged Warbler
<i>Vermivora peregrina</i>	Tennessee Warbler
<i>Vermivora ruficapilla</i>	Nashville Warbler
<i>Parula americana</i>	Northern Parula
<i>Dendroica petechia</i>	Yellow Warbler
<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler
<i>Dendroica magnolia</i>	Magnolia Warbler
<i>Dendroica tigrina</i>	Cape May Warbler
<i>Dendroica caerulescens</i>	Black-throated Blue Warbler
<i>Dendroica coronata</i>	Myrtle Warbler
<i>Dendroica virens</i>	Black-throated Green Warbler
<i>Dendroica fusca</i>	Blackburnian Warbler
<i>Dendroica discolor</i>	Prairie Warbler
<i>Dendroica palmarum</i>	Palm Warbler
<i>Dendroica castanea</i>	Bay-breasted Warbler
<i>Dendroica striata</i>	Blackpoll Warbler

<u>Species</u>	<u>Common Name</u>
Mniotilta varia	Black-and-white Warbler
Setophaga ruticilla	American Redstart
Seiurus aurocapillus	Ovenbird
Oporornis formosus	Kentucky Warbler
Geothlypis trichas	Common Yellowthroat
Wilsonia canadensis	Canada Warbler
Piranga olivacea	Scarlet Tanager
Cardinalis cardinalis	Northern Cardinal
Pheucticus ludovicianus	Rose-breasted Grosbeak
Passerina cyanea	Indigo Bunting
Pipilo erythrophthalmus	Rufous-sided Towhee
Spizella arborea	American Tree Sparrow
Spizella passerina	Chipping Sparrow
Spizella pusilla	Field Sparrow
Passerella iliaca	Fox Sparrow
Melospiza melodia	Song Sparrow
Melospiza georgiana	Swamp Sparrow
Zonotrichia albicollis	White-throated Sparrow
Junco hyemalis	Dark-eyed Junco
Dolichonyx oryzivorus	Bobolink
Agelaius phoeniceus	Red-winged Blackbird
Sturnella magna	Eastern Meadowlark
Quiscalus quiscula	Common Grackle
Molothrus ater	Brown-headed Cowbird
Icterus galbula galbula	Northern Oriole
Pinicola enucleator	Pine Grosbeak
Carpodacus purpureus	Purple Finch
Carpodacus mexicanus	House Finch
Carduelis flammea	Common Redpoll
Carduelis tristis	American Goldfinch
Coccothraustes vespertinus	Evening Grosbeak
Passer domesticus	House Sparrow