



MANAGEMENT PLAN
BLACK HILL REGIONAL PARK

MONTGOMERY COUNTY, MARYLAND
DEPARTMENT OF PARK & PLANNING

May 9, 2002

TABLE OF CONTENTS – PUBLIC HEARING DRAFT – JANUARY 6, 2000

IV. NATURAL RESOURCE MANAGEMENT PLAN ACTION STATEMENT FOR THE PARK'S NATURAL RESOURCES

A.	Overview of Natural Resources	IV-1
B.	Inventory of Natural Resources	IV-2
C.	Primary Issues	IV-13
D.	Summary of Natural Resources Management Recommendations	IV-34
E.	Facility Management Plan	IV-35

LIST OF TABLES:

TABLE IV-1:	SUMMARY OF NATURAL RESOURCE MANAGEMENT ACTION STATEMENTS	IV-35
TABLE IV-2:	MAINTENANCE IMPLICATIONS FOR RECREATIONAL DEVELOPMENT ACTION STATEMENTS	IV-37

LIST OF GRAPHICS:

NATURAL RESOURCE MANAGEMENT PLAN BLACK HILL REGIONAL PARK
NATURAL RESOURCE INVENTORY BLACK HILL REGIONAL PARK

IV. NATURAL RESOURCE MANAGEMENT PLAN

**IV. MANAGEMENT PLAN ACTION STATEMENTS FOR THE PARK'S NATURAL RESOURCES****A. OVERVIEW OF NATURAL RESOURCES**

In rapidly developing areas, the responsible management of land resources requires an attempt to attain an acceptable equilibrium between new development needs and the preservation of natural resources. The property occupied by Black Hill Regional Park (BHRP) provides Montgomery County with a large, contiguous natural area for natural resource protection, enhancement and restoration. However, the park also provides recreational functions that, if not carefully planned and managed, may compromise preservation and conservation initiatives. With this in mind, the Maryland-National Capital Park and Planning Commission (M-NCPPC) is tasked with balancing the varied recreational needs of county residents along with the strong commitment to preserve sensitive natural resources within its regional parks and throughout county parklands.

The purpose of the Natural Resources Management Plan (NRMP) for Black Hill Regional Park, as presented in this document, is to provide a comprehensive approach to managing the important natural resources contained within the park to ensure their preservation for current and future generations.

The primary objectives of the Natural Resource Management Plan for Black Hill Regional Park are:

- To identify, quantify, and assess existing natural resource areas through the use of mapping and field inventory;
- To identify primary issues regarding natural resources protection, enhancement, and restoration needs and opportunities based on an analysis of the inventory findings;
- To specify actions to be taken and provide a cost and priority scheme for the enhancement and restoration of existing resources;

IV. NATURAL RESOURCE MANAGEMENT PLAN

- To provide environmental data and input during the Master Plan process to be used in formulating the Master Plan Action Statements; and
- To evaluate and integrate, when feasible, the objectives of area Master Plans with the NRMP.

The NRMP actions presented in this report are not intended to be all-inclusive. The intent of the action statements are to aid in the management of natural resources on-site, identify problem areas which can be fixed through the incorporation of management objectives into the park routine maintenance program, and prioritize corrective actions that can be implemented with operational budgets or capital improvement proposals. Understanding that parklands can be over-managed subsequent to a land use disturbance is an important theme of the NRMP. In many situations, the most practical and effective management program for a forest, meadow or stream valley is to allow natural processes to prevail. Some of the management action statements specified in the NRMP are general in nature. These action statements suggest ways to mitigate some of the more subtle problems associated with overuse within the park, but do not necessarily point out a specific area where a corrective action project could be implemented.

B. NATURAL RESOURCE INVENTORY

Although monitoring and inventory work at Black Hill Regional Park is on-going, large amounts of data exist for the park in various forms. These data provided the foundation for compiling the Natural Resource Inventory (NRI), which will be revised and updated as new data are collected, and as more detailed studies are conducted at the park. M-NCPPC, Department of Park and Planning, Natural Resources Management Unit (NRMU) and the Environmental Planning Division (EPD), the Maryland Department of Natural Resources Fisheries Service (DNR-FS) and the Biodiversity Program (DNR-BP) (formerly the Heritage & Biodiversity Conservation Program), the Montgomery County Department of Environmental Protection (DEP), the Natural Resources Conservation Service (NRCS), the Metropolitan Washington Council of Governments (COG), the United States Geological Survey (USGS) and the general public all provided natural resource data for the NRI. These data included:

- Existing mapped information, such as floodplain, wetland, forest stand, soil, topographic, geologic information, etc.;
- Specific floral and faunal field inventories for terrestrial (vegetation and breeding birds) and aquatic (fish, macroinvertebrates, stream habitat, stream morphology and aquatic vegetation) habitats;
- Existing published and non-published literature provided by a variety of sources; and,
- Personal communications with representatives from the agencies listed above.

 IV. NATURAL RESOURCE MANAGEMENT PLAN

Natural resource constraints were determined in accordance with the guidance provided by the *Guidelines for Environmental Management of Development in Montgomery County*, (M-NCPPC, 1997) and *Trees, A Technical Manual: Guidance for the Implementation of Montgomery County's Forest Conservation Law* (M-NCPPC, July 1992). Additional guidance was provided by the staff of Environmental Planning Unit (EPU) and the Natural Resources Management Unit (NRMU), both of the Countywide Planning Division of M-NCPPC.



Black Hill Regional Park is approximately 1,338 acres in size, not including Little Seneca Lake (505 acres), which is owned and primarily managed by the Washington Suburban Sanitary Commission (WSSC). Of this acreage, approximately 950 acres are currently constrained by environmental buffers and existing developed resources currently occupy 104 acres.

Black Hill Regional Park offers a sense of seclusion and closeness to nature that few public areas in Montgomery County can match. The park, however, is not problem free from an environmental perspective. Surrounding land uses have directly and indirectly impacted the park by modifying existing surface and ground-water flow regimes and disturbing perimeter vegetative species composition. As is characteristic of much of the Piedmont of Maryland, past land use has played the largest role in shaping the composition of natural resources within the park. Earlier in the century, activities such as timber harvests, agricultural production and other land uses had impacted the existing landscape. More recently, the development of Little Seneca Lake, stormwater management infrastructure, recreational development projects, utility and transportation corridors and residential and commercial development projects outside the park boundaries have stressed the native vegetative communities within the boundaries of the park. One of the most insidious natural resource problems encountered in the park is the abundance and variety of invasive/exotic species which are out-competing native species for resources in many areas of the park. This information was considered during the development of action statements in the Master Plan.

The following sections provide specific information on existing natural resources within the park's boundaries.

1. Geology

The geologic formations that underlie Black Hill Regional Park, while perhaps not of prime importance in developing an appropriate Natural Resource Management Plan, are of interest to help better understand the characteristics of other more manageable natural resources in the park, such as soils, streams, and wetlands. The majority of Montgomery County, including the land underlying Black Hill Regional Park, is located within the Piedmont Physiographical Province of the United States. This Province extends from Alabama to New Jersey, and is characterized by upland watersheds that are underlain by a variety of fractured igneous and metamorphic rocks. While the composition of these

IV. NATURAL RESOURCE MANAGEMENT PLAN

rocks varies from locale to locale, they are very similar from a land-forming perspective.

Over geologic time, these rocks have weathered in place, creating a mantle of unconsolidated materials. The thickness of these materials varies throughout the park, but is typically between 0-20 feet in stream valleys and low-lying areas where it has been removed by erosion. On slopes, the overburden is generally between 20-50 feet, and in upland areas it can be greater than 50 feet thick.

Black Hill Regional Park is located within the Ijamsville Phyllite formation. The name was taken from Ijamsville, a small community 6 miles southeast of Frederick, Maryland, where this rock formation was quarried for roofing slate. The Ijamsville formation consists chiefly of silvery phyllite and green to purple phyllite and slate interbedded with metasiltstone and metagraywacke. A few white quartzite beds also occur. Most of the quartzites are only a few inches to a few feet thick, but toward the western side of the formation at least one quartzite bed is known to be more than 50 feet thick. These rocks generally weather to well-drained loamy soils.

2. Topography

BHRP is characterized by rolling topography with elevations ranging from 320 to 560 feet. Steep slope areas are generally concentrated above the toe of the slope of the drainage ways occurring throughout the park, but especially surrounding Little Seneca Lake on the east side of the Ten Mile Creek arm and on the Little Seneca Creek arm of the lake, south of Picnic Lane. Based on slope ranges assigned to soils on the property, approximately 40 percent of the park has slopes in 15 to 25 percent range. Steep slopes are important because they are potential areas of unstable slopes and highly erodible soils. This fact has important implications to planning of developed resources, including trails. In addition, if the steep slope is adjacent to a stream, the M-NCPPC defined buffer along the stream is expanded to include the entire steep slope. All of these factors were considered during the development of the Master Plan.

A digital topographic and planimetric map of the entire park property was compiled using high resolution photogrammetric output and imaging techniques in the winter of 1996. All photogrammetric mapping for this project conformed to National Map Accuracy Standards (NMAS). The base map shows the locations of existing structures, topography at 2-foot contour intervals, surface hydrology and existing planimetric features such as trails, stockpile areas and other features.

3. Hydrology

Surface water resources are abundant within Black Hill Regional Park. Three named tributaries and numerous unnamed tributaries provide surface flow and groundwater discharge to Little Seneca Lake. In addition, several wetland areas are evident adjacent to streams, at the heads of existing springs, at the toe of steep slopes and in isolated depressions which receive frequent surface or subsurface flow. In addition to the fast moving waters, Little Seneca Lake, which is located entirely within the park's boundary, offers a complex deep-water hydrologic feature for park users and wildlife.

a. Stream Systems

IV. NATURAL RESOURCE MANAGEMENT PLAN

All of the waters within Black Hill Regional Park are centrally located within the Washington Metropolitan sub-basin (Modified Federal Designation). These tributaries, in order of drainage area size to Little Seneca Lake, include Little Seneca Creek (Drainage Area - 10.8 mi²), Ten Mile Creek (Drainage Area - 5.7 mi²) and Cabin Branch (Drainage Area - 1.2 mi²). The three major tributaries drain south to Little Seneca Lake and all are abbreviated by Little Seneca Dam. The majority of the stream mileage within the park was flooded in 1984 by Little Seneca Lake, although small remnants of each stream system remain (within the park) to the north of the three forebays to the lake. Little Seneca Creek re-emerges within the park boundaries below Little Seneca Dam.

(1) *State Designated Water Uses*

The Maryland Department of the Environment (MDE) applies specific water use designations for streams and other waters of the State. Each use designation has a specific set of standards developed to ensure protection of the specific use. Information on stream classifications is provided in Appendix F-1.

Within the boundaries of Black Hill Regional Park, Little Seneca Creek has two water use designations. Between Little Seneca Lake and the B&O Railroad Bridge, the stream is designated as USE I-P. According to the State designation, USE I-P waters are suitable for water contact sports, play and leisure time activities where the human body may come in direct contact with the surface water, fishing, the growth and propagation of fish (other than trout), other aquatic life, and wildlife, agricultural water supply, industrial water supply, and public water supply (COMAR 26.08.02.02). Above Little Seneca Lake, the stream is designated as USE IV-P waters. This designation applies to waters that are capable of holding or supporting adult trout for put and take fishing, and that are managed or have the potential to be managed as a special fishery by periodic stocking and seasonal catching. The designation is also consistent for use as a public water supply. In this case, the stream drains to the Potomac River, which is the water source for much of the population of the Washington D.C., metropolitan area. Ten Mile Creek and Cabin Branch are designated as USE I-P. A more detailed explanation of stream use classifications is provided in Appendix F.1.

(2) *Stream Morphology Summary*

Within the park boundaries, a qualitative evaluation of stream channel morphology was conducted on Little Seneca Creek, Ten Mile Creek and Cabin Branch. Each stream segment was walked in its entirety within the park boundaries to determine the general stream morphology condition, to document areas of stream bank instability, to determine the composition of bed materials and to evaluate the condition of the riparian buffers surrounding each stream system. In summary, all of the stream systems above Little Seneca Lake were morphologically responding in their lower reaches to the backwater influence from Little Seneca Lake. In general terms, the backwater influence of the lake created an extended depositional area where the stream systems appear to be aggrading. Farther up each stream system, where the lake no longer exerts an influence on the streams, the channels were varied in their morphology based on the existing site conditions and upgradient land uses. Cabin Branch seemed to display the greatest sensitivity to upgradient land use as several areas of unstable banks, channel incision and erodible bank materials were noted. Ten Mile Creek and both the upper and lower sections of Little Seneca Creek appeared stable in profile with well vegetated banks protecting primarily cohesive bank

IV. NATURAL RESOURCE MANAGEMENT PLAN

materials (silts and clays).

(3) *Stream Fisheries Information*

Fish sampling stations within the Ten Mile Creek and Little Seneca Creek headwaters were monitored in 1994 and 1995 using electrofishing techniques. Twenty sampling locations were sampled in all, with two of sampling stations being located within the park (DEP, 1995). Sampling within the park revealed the presence of five commonly found fish species, indicating a relatively high quality fish community in both Little Seneca Creek and Ten Mile Creek. Potomac and mottled sculpin and longnose dace are intolerant of pollution and fantail darters and roside dace are intermediately tolerant. These species were found in the overwhelming majority of the samples gathered in 1994 and 1995.

The presence of other species such as yellow bullheads and various species of sunfish in both stream systems may indicate some degradation of water quality, or may simply be the result of the proximity of the streams to Little Seneca Lake and of the presence of numerous farm ponds located within the Little Seneca Creek drainage. Yellow bullheads and various members of the sunfish family were found in nearly every sample gathered from Ten Mile Creek and Little Seneca Creek from 1994 and 1995.

One species formerly found in Little Seneca Creek is the smallmouth bass, which was found in small numbers in 1992 but has not been found since. The loss of this species is more likely due to the loss of suitable habitat than to water quality problems.

(4) *First-Order Streams and Springs*

First-order streams and springs are located throughout the park. These areas generally form in topographically low positions where shallow ground water intercepts the ground surface. Springs are important as cold water recharge zones to streams. They often are associated with rare and uncommon plant and animal species, and offer water quality benefits to receiving water bodies. The locations of pre-historic and archeological sites are also often centered around springs or small first order streams. The locations of the spring inception points have not been accurately mapped by field delineation, however the extent of the hydrology features determined through photo-interpretation can be used as a rough guide for determining the inception points of spring locations throughout the park.

IV. NATURAL RESOURCE MANAGEMENT PLAN

b. Little Seneca Lake

With funding from the Washington Suburban Sanitary Commission (WSSC), the Fairfax County Water Authority and the District of Columbia, Little Seneca Lake was impounded in 1984 and filled to its normal pool elevation by 1985. The Lake was constructed as a water supply resource for the Washington metropolitan area, functioning as a low flow augmentation mechanism for the Potomac River, a primary water source for water users in the Washington D.C. Metropolitan area. At present, the Potomac River (without support from reservoir releases and direct supply reservoirs on the Patuxent and Occoquan Rivers) provides sufficient supplies under normal climatic and water use conditions (ICPRB, 1997). However, it is expected that Little Seneca Lake will be used to augment Potomac flows during increased demand and/or drought periods in the future.



WSSC owns all water and land extending below the 392 foot contour, which includes the entire area of what is now known as Little Seneca Lake and a significant portion of the shoreline surrounding the Lake (normal pool elevation 385 feet). The Maryland Department of Natural Resources Fisheries Service (DNR-FS), M-NCPPC, Montgomery County Department of Park and Planning and the Interstate Commission on the Potomac River Basin (ICPRB) are also cooperatively involved in specific lake management tasks. WSSC is responsible for the management of lake level and discharge temperature throughout the year as well as dam monitoring, sedimentation management, emergency response, zebra mussel management, flood control and drought management. WSSC monitors 19 piezometers within the dam as well as 8 monument structures which were placed to monitor dam movement. To date, no substantial seepage or movement of the dam has occurred. Article IV of the Interagency Agreement between the M-NCPPC and WSSC (dated June 1983) indicates WSSC's legal lake management responsibilities. This document is enclosed in Appendix F.2. WSSC in conjunction with ICPRB, conducts yearly testing of the emergency response plan by simulating extreme drought conditions and conducting a paper exercise for the release of augmentation flows downstream. ICPRB is responsible for determining when water demand and supply ratios are sufficient in the Washington D.C. metropolitan area to warrant a release of storage water in Little Seneca Lake to augment the flows in the Potomac River. WSSC manages the water level in Little Seneca Lake on a seasonal basis. Warm water operations consist of lowering the lake level from an elevation of 385 feet to 384.5 feet above sea level. This allows some free board to capture small rainfall events as well as storing much inflow from more intense events.

Warm surface spillover does occur from intense storm events, but cold water withdrawals from lower lake levels serve to moderate downstream temperatures. Lake intakes are controlled remotely by opening and closing three sluice gates which are located at elevations 340 feet, 355 feet and 370 feet respectively. The lowest gate is opened in the summer and the highest gate is open in the spring. The primary reason for management of the sluice gates is to maintain the viability of the downstream cold-

IV. NATURAL RESOURCE MANAGEMENT PLAN

water fishery.

M-NCPPC currently manages access, boating activities and organization of recreational activities such as fishing tournaments and interpretive programs. M-NCPPC is also responsible for the existing aquatic vegetation management program which was initiated primarily due to the proliferation of Hydrilla, an invasive non-native aquatic weed species which has taken over much of the shoreline of Little Seneca Lake. Hydrilla is selectively controlled through the use of an aquatic herbicide in high use areas of the park such as the boat launch, the boat rental area and popular fishing areas. The legal responsibilities of M-NCPPC in regard to lake management appear in Article V of the Interagency Agreement (Appendix F.2).

(1) *Lake Sedimentation*

A recent sedimentation survey conducted by WSSC indicates that Little Seneca Lake has an annual volume loss capacity of approximately 35.6 acre-feet per year (0.29% of the lakes total volume) due to sedimentation. This is based on the original contours of the lake calculated in 1983 compared to new bathymetric information collected in 1996 by WSSC contractors (WSSC, 1997).

(2) *Lake Fisheries*

DNR manages the popular fishery within the lake, which has become one of the highest quality warm water fisheries in Montgomery County. The lake is currently managed as a trophy bass lake allowing anglers to creel up to 5 bass per day under 11 inches in length, or 4 bass per day under 11 inches and one bass over 15 inches in length. The lake was stocked with tiger muskie in 1992, 1993, 1995, 1996 and 1997. The stockings have resulted in a productive tiger muskie fishery. The most recent electrofishing survey has indicated that several year classes of the stocked muskie still exist within the lake with better than anticipated growth. This is thought to be primarily due to the presence of an ample population of white sucker, a primary tiger muskie forage. The lake also supports an excellent panfish fishery composed of bluegill/redear sunfish and black and white crappie. Progress reports compiled by DNR for 1996, 1997 and 1998 appear in Appendix F.3. These reports include data from bass reproductive surveys, stocking events and spring and fall electro-fishing surveys. The results of these recent surveys continue to offer encouraging results for the success of the Little Seneca Lake fishery. In addition, a history of fisheries management for Little Seneca Lake and proposed fisheries management for the future, as proposed by DNR, Fisheries Service, is included in Appendix F.3.

c. Wetlands

Wetlands provide many functions that are becoming highly valued by people. Water quality benefits of wetlands include sediment removal, oxygen production, nutrient cycling, chemical and nutrient absorption, aquatic productivity and microclimate regulation. Socio-economic values include flood control, ground-water recharge, waterfowl and wildlife habitat, energy production (peat), fishing and shellfishing, recreation and aesthetics.

Wetland areas are present along the stream valley areas within the park and in isolated areas which contain the appropriate hydrologic and soil conditions. Wetland mapping for the park was completed

IV. NATURAL RESOURCE MANAGEMENT PLAN

using data from the United States Department of the Interior Fish and Wildlife Services National Wetlands Inventory (NWI). The NWI mapping is compiled using either remote sensing or infrared aerial photography ranging in scale from 1:40,000 to 1:80,000. Limited field truthing was conducted to supplement the investigation. According to the NWI maps, Montgomery County had 9,699 acres of wetlands, or about 3.1 percent of the county land coverage (USFWS, 1995). Currently wetlands within the park have not been field verified or surveyed.

4. Cover Types

Historical land use has been the main factor for the distribution of variant cover types throughout Black Hill Regional Park. Approximately 75 percent of the park is under forest cover, 10 percent is characterized as old field habitat, 8 percent is mowed field, and 7 percent is occupied by developed resources, including trails.

a. Forest Cover Types

Within Black Hill Regional Park, there are approximately 1,185 acres of forest cover. The majority of this forest cover was logged and/or pastured as recently as 30 to 40 years ago.

Mixed oak forests dominate much of the forested portion of Black Hill Regional Park. Tulip poplar forests with red maple as a co-dominant also provide a large percentage of the forested acreage on the park property. Chestnut oak, tulip poplar, and Virginia pine forest types occupy the remainder of the forest cover on the property. The largest, contiguous forested blocks in the park are found in the northeast section of park and are bordered to the north by West Old Baltimore Road, to the northeast by I-270, to the east and west by private property, and to the south by the park office, park maintenance yard and Little Seneca Lake. The entrance road to the park (about 70 feet wide and 1.5 miles long) was located on an old logging road directly through the middle of this forest block. Likewise, some of the highest quality mixed oak and chestnut oak woods in the park exist in the area which is now on the end of the Picnic Lane, divided by roads, asphalt trails and utility rights-of-way.

A heavy deer browse line is evident in most of the forested areas within the park and damage to the native plant population is obvious. Past gypsy moth infestations have also damaged the existing oak/hickory forests; in some areas the damage is substantial.

Despite the problems with an overpopulation of deer, gypsy moth damage, and the invasion of exotic species in fields and old fields, the forested areas of Black Hill Regional Park do have a number of noteworthy characteristics which distinguish it from many other M-NCPPC park properties. Though the weedy alien species run rampant in the fields, the forested sections of the park are less overrun with exotic species than are many Montgomery County park properties. Many more American chestnut (some 6-10" dbh individuals) and chinquapin specimens (a "watch list" species) were noted in Black Hill Regional Park than on most park properties within Montgomery County. There are also several sections dominated by large (18+" dbh) American beech. Where the native herbaceous plant population exists in forested areas, it is often more lush and diverse than the majority of M-NCPPC park properties.

IV. NATURAL RESOURCE MANAGEMENT PLAN

b. Old Field Cover / Young Forest Cover

Of the 1,482 acre "green" portion of Black Hill Regional Park, 148 acres are occupied by fields or "Old Fields" returning to forest. Thickets of Japanese honeysuckle, bush honeysuckle, multiflora rose, and tree of heaven, among other invasive exotic species, often dominate these old fields. This cover type is important to the park as an alternative habitat type, however these areas are in some cases providing habitat for many non-native species of plants and animals which thrive along the edge and gap communities which are no longer managed for agricultural production.

c. Maintained Field

Approximately 118 acres of the park property are maintained as old field through periodic mowing and maintenance. The primary reason for mowing these fields is to prevent the growth and spread of exotic thistle species, as mandated by the Maryland Department of Agriculture.

d. Developed Areas

Developed areas including buildings, roads, parking areas, trails, and recreational areas occupy approximately 104 acres of the park.

e. Little Seneca Lake

Little Seneca Lake, although not owned by the M-NCPPC, is approximately 505 acres in size. Additional natural resource information on the lake is located in the Section IV-3 (Hydrology).

5. Soils

Soil mapping information for the park was derived from the *Soil Survey of Montgomery County* (NRCS, 1995). There are twenty mapped soil types located within the park, representing twelve separate soil series.

a. Hydric Soils

Hydric soils are developed under conditions sufficiently wet to support the growth and regeneration of hydrophytic vegetation. These soils are saturated, flooded, or ponded for a long enough period of time to develop anaerobic conditions in the upper portions of the profile. Some soil series, designated as hydric, have phases that are not hydric depending on water table, flooding, and ponding characteristics.

The Hatboro (54A) and Baile (6A) silt loams are recognized by Natural Resources Conservation Service (NRCS) as hydric soils. These soils are generally located along the floodplain and stream valleys of the stream systems on-site. All other soils within the park are upland soils, however the Gaila silt loam (1C), the Glenelg silt loam (2B), the Glenville silt loam (5B), the Brinklow-Blocktown channery silt loam (16D) and the Blocktown channery silt loam (116C, 116D, 116E) all have the potential for Baile hydric inclusions when located around drainage swales and depressions in the landscape. The Codorus silt loam (53A) has the potential for Hatboro inclusions in certain landscape positions.

IV. NATURAL RESOURCE MANAGEMENT PLAN

b. Highly Erodible Soils

Highly erodible soils are soils which are classified as having a severe hazard of erosion by the NRCS, based on the erodibility index of a soil mapping unit. The *Environmental Guidelines, Guidelines for Environmental Management of Development in Montgomery County* (M-NCPPC, 1997) directs inclusion of highly erodible soils into open space or conservation in the site planning process.

The Black Hill Regional Park contains two erodible soil types. They are the Brinklow-Blocktown channery silt loam (16B, 16C, 16D) and the Blocktown channery silt loam (116C, 116D, 116E). These soils are located on steep slopes and are generally contiguous with the stream valleys and drainage features throughout the property. Highly erodible soils are delineated on the NRI site plan.

c. Miscellaneous Limitations

The NRCS has defined limitations for certain types of development associated with individual soil types. For park planning purposes, development of paths and trails, playgrounds, picnic areas and camp areas were analyzed to determine if these types of development are potentially subject to limitations for all soil types. The shrink/swell capacity of the soils was also evaluated.

Limitations to development of trails associated with wetness will likely be encountered, as expected, in the areas underlain by the Baile, Hatboro and Glenville soil series. These soils also pose severe wetness limitations for development of picnic and campground areas and playgrounds. Gaile silt loam and Occoquan silt loam on 8-15 percent slopes have severe limitations due to erosion potential.

Severe slope and depth to bedrock limitations were noted for construction of park facilities above the Blocktown Channery silt loam. Playground areas were discouraged in the Gaila, Glenelg and Blocktown Channery soils due to the frequent occurrence of small stones.

The shrinking of a soil when dry and the swelling of a soil when wet is a good indication of the potential of that soil to do damage to roads, dams, building foundations and other structures. It can also damage planted roots. Of the fourteen soil series within the park boundaries only the Baile and Brinklow-Blocktown Channery soils had a moderate shrink-swell potential. Other soils were listed as having a low probability of having shrink-swell capabilities. In general, the Brinklow-Blocktown Channery silt loam and the Baile series soils are located along the main drainage ways throughout the park property.

6. Habitats of Rare Threatened and Endangered Species

Black Hill Regional Park was surveyed for rare, threatened and endangered species several times, most recently during the Spring of 1998, to determine the presence of rare and uncommon plant occurrences throughout the park. There were no State or Federally listed threatened or endangered species identified in the park during the surveys, however, rare and uncommon plant species were located within an area of the park named by the Maryland Department of Natural Resources, Biodiversity Program as the Black Hill Biodiversity Area (BHBA). The BHBA encompasses an area surrounding the Little Seneca Dam

IV. NATURAL RESOURCE MANAGEMENT PLAN

near the original "Black Hill." The boundaries of the areas are included on the NRMP site plan.

The BHBA is proposed for protection because it contains two "Watchlist" plant species. These include *Commelina virginica* (Virginia dayflower) and *Arisaema dracontium* (green dragon).

In addition to the above mentioned plant species, uncommon species of dragonflies such as *Enallagma basidens*, *Somatochlora linearis* and *Nasiaeschna pentacantha* which are scarce throughout Maryland and *Aeshna umbrosa*, which is uncommon in Montgomery County have been observed within specific areas of the park. RTE species surveys are generally conducted every two years at Black Hill Regional Park.

7. Breeding Bird Surveys

Breeding bird surveys were conducted in Black Hill Regional Park in June of 1997 as part of the County's *Breeding Bird Mapping and Census* project. The protocol is adapted from the *National Breeding Bird Survey* developed by the United States Fish & Wildlife Service. Fifty-two, five minute point counts were conducted at locations throughout the park in all habitats. All individuals seen or heard were recorded. Data on species and population densities were gathered in a format compatible with the County's Geographic Information System (GIS) database. This census method allows staff to generate a list of breeding species and, more importantly, to map bird distribution within the park. Census points are identified on the mapping portion of the NRI and a summary of point count data is included in Appendix F.5. Additional information on breeding bird species is included in the bird checklist for the park, also included in Appendix F.5.

Black Hill Regional Park has become the host of a large population of wintering waterfowl in all arms of the Lake. The naturalist staff has kept weekly counts of waterfowl during the winter season and has identified important concentration areas. An example of waterfowl count information is contained in Appendix F.5 along with a map of important concentration areas. In addition, bald eagle sitings have become a regular occurrence from November to May. As nesting eagles become more established in the Washington D.C. Metropolitan area (nesting has occurred in recent years at Great Falls and Tridelphia Reservoir), Little Seneca Lake, with its excellent fishery, could become an important year-round feeding site for the bald eagle. Likewise, the lake provides feeding habitat and potential nesting habitat for ospreys, which are frequently seen at the park during the spring and summer migration.

IV. NATURAL RESOURCE MANAGEMENT PLAN

C. PRIMARY ISSUES**1. Basis for Priorities and Overview of Natural Resource Management Issues**

The following section presents the main issues regarding natural resource protection and management within Black Hill Regional Park. An overview of the issues is presented and followed by a list and description of some of the general natural resource issues within the park. General issues are natural resource problems which are prevalent throughout the park, therefore specific management action statements are not targeted for a defined area or habitat within the park. This section is followed by a number of action oriented management items, which if implemented could mitigate some of the problems noted in the park. These natural resource related management issues and action statements are based on visual observations during site visits to the property, communications with park and planning staff and a compilation of existing literature action statements. For action items which would require funding, cost and future staffing requirements are provided.

As mentioned in the NRI, Black Hill Regional Park has a variety of habitats. One of the common problems throughout most of the park is the colonization by invasive exotic species of plants which are competing with native plants for resources. The management of wildlife, uncommon plant species and their habitats, forests, wetlands and other sensitive natural resources are presented below.

2. General Actions**a. Steep Slopes and Hydric and Highly Erodible Soils***Issue*

Steep slopes and hydric and highly erodible soils impose limitations to development which may affect the suitability for recreation. Restrictive features such as wetness, slope and soil texture makes soils susceptible to flooding, erosion, and frost heave. These factors can also affect the soil's ability to support vegetation which could otherwise stabilize the soil.

Action

Steep slope areas should be avoided during site planning activities, whenever possible. The projects and policies specified in the Master Plan generally avoid steep slope areas. In areas where development in steep slope areas is unavoidable, minimization of impacts through creative design techniques and the construction of retaining walls or bioengineering solutions should be utilized. Steep slope locations are shown on the NRMP site map. In designing development oriented projects within the park, should be considered with slightly more stringent environmental standards similar to those which are followed in Montgomery County's Special Protection Areas. This would impose expanded wetland buffers, would require accelerated forest conservation and would impose limitations on impervious areas. In addition, expansion of buffers around springs and seeps throughout the property should be considered due to the unique environmental and archaeological resources which are often found in these areas. These more stringent standards would not preclude the park from development, but would require a more stringent

IV. NATURAL RESOURCE MANAGEMENT PLAN

analysis of environmental constraints associated with development oriented applications. Many times features such as trails, which provide great benefits to park users, must be located in environmentally sensitive areas such as along stream valleys. Trails should continue to be evaluated on a case-by-case basis to determine the best alignment which minimizes environmental impacts to these areas. The more stringent environmental regulations would not preclude this type of development, but would ensure the most environmentally sensitive alignment is chosen and, if impacts are unavoidable, will ensure an acceptable engineering solution is selected to minimize environmental impacts.

Avoidance and minimization of impacts to these sensitive areas should be a high priority for all development activities within the park.

b. Protection of Rare, Threatened and Endangered Species (RTE) and their Habitats

Issue

As stated in Section 6 above, there are have been no State or Federally listed threatened or endangered species found within the park to date. Rare and uncommon species have been found within the Black Hill Biodiversity area. The Montgomery County Park system suffers from many specific and widespread threats to its native vegetation and natural communities. These threats, both immediate and potential, differ little from one park to another. If high quality natural communities and native diversity are to be stabilized, these threats must be recognized and long term management strategies implemented. Past and present land use practices often guarantee that some problems will remain as continued threats to native habitats (DNR, Natural Heritage Program (now Biodiversity Program) 1993).



Action

The protection of rare, threatened and endangered species within the park is more than a goal of the M-NCPPC park system, it is a national initiative promulgated by federal and state legislation. All activity within the Black Hill Biodiversity Area (see NRMP plan) should consider the action statements of the Maryland Department of Natural Resources, Biodiversity Program which include:

- Allow early successional areas to revert naturally to mature forest;
- Avoid soil and canopy disturbance;

IV. NATURAL RESOURCE MANAGEMENT PLAN

- Discourage illegal ATV use by posting park boundary;
- Establish a long term RTE species monitoring program;
- Monitor local deer population and the associated impact on native vegetation;
- Discourage future utility construction through the park; and
- Avoid, minimize or mitigate additional trail construction impacts within the protection areas.

The general action statements above should be considered a high priority for the implementation of all new development oriented projects, especially within the Black Hill and Cabin Branch Biodiversity areas. Since the action statements are general in nature, the cost for this task cannot be determined, however; the goal of protection of rare, threatened and endangered species habitats through general management action statements is generally not difficult or costly to include in a development oriented application. Cost of continuing to monitor local deer populations is addressed in the wildlife management section of this report.

The Black Hill Biodiversity Area (BHBA) identified in the NRI site map encompasses a portion of the southernmost section of the park. With the possible exception of trail development, development activities within this portion of the park should be strictly avoided in the Park Master Plan. Trail siting in this area should be conducted with input from DNR, BP personnel and M-NCPPC Natural Resource Management Staff to ensure impacts to RTE species and habitats are avoided.

c. Wildlife Management*Issue*

Other than man, no single species has had a greater impact on the existing structure of forest communities in Maryland than the White Tailed Deer. High deer populations over time can pose a major threat to the natural diversity of herbaceous and woody plants in Black Hill Regional Park and Montgomery County. In general, deer prefer to browse on native species to exotics and as a result are compounding the negative effect that invasive exotic species exert over native species within the park. As crepuscular organisms, deer are not often seen damaging forest structure and diversity, however the evidence of their activity is clearly evident when carefully looking at browse lines, and other population evidence found throughout the park. Other countywide concerns related to deer damage include the high number of deer-related automobile accidents, loss of agricultural crops and home landscapes. The Montgomery County Department of Park and Planning has developed a formal white-tail deer management plan that endorses data collection to determine locations of problems; provides educational programs to alert homeowners to protective strategies for their property; conducts studies of population dynamics; and forms cooperative efforts between state and county road agencies to maximize road safety. The objective of the program is to manage deer populations at appropriate levels to preserve the natural diversity of flora and fauna within the county. Management efforts have been implemented in several parks including Little Bennett Regional Park and the Agricultural History Farm Park and will

IV. NATURAL RESOURCE MANAGEMENT PLAN

gradually be expanded into other parks as prioritized through collection and analysis of deer impact data. Currently, study plots and deer exclosures have been established within Black Hill Regional Park and over two years of population data have been collected. Recent aerial surveys using forward looking infrared technology (FLIR) technology have also been conducted in the park. In addition, data on automobile accidents have been collected in the vicinity of the park. Action statements for deer management within parks are made on an annual basis.

The gypsy moth has also historically been a pest in Black Hill Regional Park. Gypsy moth damage from past years is still evident throughout the park. Because of the high stocking of oaks, Black Hill Regional Park is especially susceptible to gypsy moth damage. A large portion of the park's forest was severely damaged by gypsy moths in 1988 and as a result a sizable portion of the mature oak population was lost. A full pesticide treatment was conducted in the park in 1989, and spot treatments have been conducted since then. Currently, the M-NCPPC's arborist is responsible for overseeing the spray program which is conducted by the Maryland Department of Agriculture (MDA). When the arborist is alerted by park staff of substantial egg masses or the onset of tree defoliation, the arborist will inspect the site and determine if MDA should be called to determine if treatment is necessary. MDA will then visit the site and determine the abundance of egg masses per acre. The condition of adjacent properties and spray programs will also determine the need to spray. If treatment is determined to be necessary, MDA will recommend treatment areas. The M-NCPPC will have final approval authority for the treatment of these areas and the selection of an insecticide for gypsy moth control. Historically, M-NCPPC has used Bt (*Bacillus thuringiensis*), a naturally occurring microorganism, to control the gypsy moth. The microorganism is a stomach poison to moths which causes feeding to cease and mortality occurs. The material is non-toxic and its application is consistent with M-NCPPC's Integrated Pest Management policies. Other chemical alternatives such as Dimilin, Sevin and Imidan have been discouraged in the parks due to their toxicity to non-target organisms (Rose, Personal Communication, 1998). Information regarding recognition of the gypsy moth and other general information can be found in Appendix F.6.

If the quality of the vegetation and integrity of natural communities is to be stabilized and maintained over the long term, acceptable methods of deer and gypsy moth control must be found and implemented (DNR, 1997). Current policies in effect for the control of the gypsy moth should be continued for the park, however the program should be written specifically for the park. The written program should include a formal record keeping program which will keep track of treatments and egg mass counts so that if park management should change over time, future managers will be alerted as to the cyclic characteristics of the pest within BHRP.

In addition to deer and the gypsy moth, management of beaver, geese and groundhogs should be considered for funding in the future. Beaver sign is evident throughout the three main drainage ways to the park. The Ten Mile Creek arm of the park above Little Seneca Lake is plagued by repeated beaver activity which creates problems for trail users and maintenance vehicles fording the stream to maintain the trails to the west side of the Lake. It should be noted however, that beaver activity in this area is actually encouraging habitat for uncommon species of dragonflies mentioned in section IV.B.6. Activities associated with beaver management in this area should consider the affect that development oriented proposals will have on the dragonfly populations in this area.

Little Seneca Lake provides habitat for large numbers of waterfowl. Waterfowl concentration areas have

IV. NATURAL RESOURCE MANAGEMENT PLAN

been mapped on and around the lake. Problems arise from time to time when waterfowl congregate in active use recreation areas such as boat docks, boat mooring sites, picnic areas and trails. Their droppings can litter active use areas to the point where it becomes very unsightly, and in some cases a health hazard. There have been many techniques tried to rid pond and lake property owners of an over abundance of geese, most of which show poor results. Geese are very territorial creatures, usually returning to the same area every year. Using proven techniques, geese can be trained to stay out of specific areas.

Action

It is an action item of this plan that a comprehensive wildlife management plan be completed for the park. This plan would be park specific and document areas where active management is needed. Management action statements would likely address population monitoring and management of deer, beaver, geese, gypsy moth and other species in order to address specific problems such as those mentioned above. The plan would also include action statements for habitat improvements including vegetation management and the placement of wildlife nesting structures for target species. Long-term monitoring programs should be established to evaluate the impacts of management, maintenance and recreational activities on wildlife.

d. Trail Issues*Issue*

The natural trails within Black Hill Regional Park are generally in good overall condition, especially when compared with some of the older, more heavily used regional parks. As with all trails, however, they need regular maintenance and occasional repair. Routine trail monitoring is completed by M-NCPPC to determine areas in need of maintenance and/or repair. Along with this program, trails were walked as part of the Master and Management planning process to determine areas where immediate maintenance was required.

Action

There were no areas noted with severe trail maintenance problems in the park. It should be noted that 1997 was a very dry year and trail conditions were likely at an optimum during site visits. It is anticipated that several areas, especially in the steeper sloping sections of the Cabin Branch and Osprey Heights trail systems, will require maintenance or modification during wet or even average climatic conditions. The presence of large areas of highly erodible soils in Black Hill Regional Park, and the county and state wide concerns for water pollution by sediment erosion, were prime considerations in developing management action statements for both park maintained trails and informal trails not maintained by the park. These action statements include:

IV. NATURAL RESOURCE MANAGEMENT PLAN

1. Realign or fix problem areas as quickly as possible to discourage users from forming new trails around problem areas. Close by-pass routes after repairs are made to the designated route.
2. Retain a Trail Construction and Design Expert / Firm to recommend solutions for specific trail problem areas in the park when they develop. With the variety of options available for trail repair, including realignment, closure, steps, geotred, ditching, waterbars, etc., it is advisable to have an experienced expert recommend management or design modifications which will provide the best long-term benefit to the park.
3. Continue to expand and promote participation in the volunteer programs where individuals and organizations monitor or maintain portions of a trail system. Participants could also serve to educate users on proper trail use within the park, a duty currently conducted by the Park Police. The program should establish a schedule for the volunteer trail monitoring program. It is recommended that designated trail be monitored two times per year in late Spring and in the early Fall. This schedule should rotate every year such that seasonal variations in trail condition can be addressed (*i.e.* some trail problems may naturally stabilize during the dryer seasons).
4. Accelerate public education about the potential environmental damages caused by “going off designated trails”. This can be accomplished by making use of information kiosks and signage, trail postings and interpretive programs.

In keeping with the natural resource management plan objectives to restore degraded communities and maintain the park at or below the 1/3:2/3 development to conservation ratio, trail implementation should emphasize minimizing impacts by applying a strict management policy for proposed trail development projects. The spread of invasive exotic species, which can be documented throughout Black Hill Regional Park, has been shown to be directly related to soil and canopy disturbance. Additional concerns related to the protection of rare, threatened and endangered species and their habitats should influence the feasibility, character, and precise alignment of proposed trail opportunities.

Currently, the Master Plan proposes a few new regional trail connectors in the park, both hard and natural surface, which have the potential to impact existing natural communities. These include the greenway connections up the Ten Mile Creek and Little Seneca Creek stream valleys to connect Little Bennett Regional Park and Ovid Hazen Wells Parks, the hard surface trails proposed along Lake Ridge Drive, from the boat ramp to Clarksburg Road, along the southern boundary of the property, and the proposed natural surface trails from the park entrance to Clarksburg Road, from Osprey Heights Loop to Clarksburg Road, and along the lake west of Park Headquarters. In addition, several connectors from communities surrounding the park are proposed. Many of these trails have been sited to utilize existing disturbed areas, such as utility corridors, existing roads and old roads to minimize disturbance to natural areas. The general action statements for siting these trails include the following.

IV. NATURAL RESOURCE MANAGEMENT PLAN

1. Avoidance and minimization techniques should be used to site all stream and wetland crossings. Trails should be sited to minimize impact to steep slopes, highly erodible soils, hydric soils, wetlands and floodplains.
2. When possible, trail patterns should consider utilizing existing maintained and unmaintained trail corridors for the proposed alignment. Although this is not always the best solution from an environmental management perspective, often these trails offer a good solution because the herbaceous communities have already been impacted, soil compaction has occurred and generally these trails minimize topographic constraints.
3. In forested situations, it is recommended that root pruning and supplemental root fertilizers for tree protection precede mechanized disturbance for trail development.
4. Avoid significant grade cutting to construct trails; if excessive fill is needed for trail construction, fibrous tree roots should be exposed to some form of aeration. In addition, other tree protection measures such as crown reduction, retaining walls, raised trails, and tree protection fencing should be used on a case-by-case basis during construction of the proposed trail.
5. Climbing turns or switchbacks should be used in areas where steep slope crossings are unavoidable.
6. Sidehill construction should be considered to minimize erosion when traversing steep slope areas. Runoff diversion structures should be used when necessary for ascents of steep slope areas. These features should be located to minimize erosion potential and should consider safety issues. Within the next few years, M-NCPPC will be developing a Trail Implementation Guide, which will provide detailed development guidelines and updated design standards for both hard and natural surface trails.

e. Preservation of Ten Mile Creek Area and the Historic Maughlin House*Issue*

The Ten Mile Creek arm of the park is defined as all of the park holdings west of Clarksburg Road (Rt. 121) bridge. Currently, the only developed resources within the Ten Mile Creek arm of the park are natural surface trails. This portion of the park is a diverse natural area containing multiple habitat types including old field, open water, a high quality stream system, upland and bottomland forests, wetlands, and other habitat types. The area is also home for a large population of wintering waterfowl, raptors and various furbearers. The area provides a sense of seclusion which is unmatched by the rest of the park and possibly the rest of the park system within Montgomery County. The Clarksburg Master Plan considers the special qualities of the Ten Mile Creek area in the Environmental Plan. The plan calls for the protection of this watershed by emphasizing low density land use patterns and emphasizing utilization of appropriate Best Management Practices (BMPs) to protect water quality.

IV. NATURAL RESOURCE MANAGEMENT PLAN

Action

In harmony with the action statements of the Clarksburg Master Plan, M-NCPPC staff, and strong public opinion, it is recommended that the Ten Mile Creek arm of the park, outside the Boyds area be preserved as a natural area for the long-term. Any future acquisitions of existing structures in this area may also be excluded from this action statement. This designation would discourage the development of structures, roadways, picnic areas, playgrounds and other more active types of recreational facilities from the area. Developed resources should be limited to perimeter disturbances associated with trailhead access and parking features and carefully planned trail systems such as the proposed natural surface and trails recommended as part of the Master Plan.

It is also recommended that adjoining parcels in the Ten Mile Creek watershed be targeted for purchase as they become available.

f. Invasive/Exotic Species Management

Issue

Among the most wide-spread problems within the park is the invasion of native habitats by invasive/exotic species. These species have been introduced by man, either by design or accident, from other continents during the past several centuries. Though not all introduced exotic species have become invasive, the success of a few species is more than enough to jeopardize almost every native habitat. Because many of these invasive species produce berries, such as the bush and vine honeysuckles and multiflora rose, they are still frequently proposed as valuable plants for wildlife. This perspective, however, is a very short-sighted one, because with the continued loss of habitat diversity, there will also be the loss of a representative range of native birds and other wildlife.

The establishment and spread of aliens is often related to human activities, such as roadwork, utility rights-of-way, and grazing. These activities typically cause fragmentation of vegetation and soil disturbance. The link between alien plant intrusion and land use has important implications for management.

Action

Since most invasive species are shade intolerant, the most effective method of reducing the abundance of invasive species is to create shade, which generally involves implementing planting plans which utilize fast growing, laterally branching species. Of course, planting plans should be designed foremost to accommodate specific site characteristics such as soils, wetness, available light and other microclimates; however, the goal of all planting projects within the park should be to recreate ecologically healthy environments.

A restoration project should consist entirely of indigenous species. Any new planting plan should include a strategy for controlling the spread of exotics which would include ongoing management, monitoring and evaluation. The highest priority should be given to the exotic plant that poses the

IV. NATURAL RESOURCE MANAGEMENT PLAN

greatest threat to the native communities. When implementing planting plans, great care should be taken to ensure that control programs cause minimal disturbance to indigenous species. Native species compete more successfully when resource areas are allowed to mature without disturbance, allowing natural conditions to inhibit the growth and propagation of aliens.

Forested areas should be targeted for protection from exotic species intrusion. To more completely isolate forest interiors from nearby alien seed sources, buffers should be considered for existing forested areas. Young forests and fields adjacent to high quality natural areas should be allowed to succeed to mature forests, thus increasing distances from forest interiors to alien seed sources (DNR, 1997). Additional strategic protection of high quality natural areas may be afforded by "armoring" the edge of the high quality area with shade species.

Additional general action statements for controlling the spread of invasive species include.

1. Conduct an inventory to determine areas that are overgrown with invasive/exotic species and areas which are susceptible to invasion.
2. Establish control plots to determine the effectiveness of various treatment options.
3. Inspect edge areas on susceptible plots to determine the feasibility of chemical treatment.
4. Establish thresholds of tolerance (stem counts per unit area) for invaded areas. These thresholds will differ based on the resource you are protecting.
5. Implement cultural methods of control, if feasible. These include physical removal, perimeter plantings, tilling, burning etc.
6. Record effectiveness of cultural controls based on control plots on a yearly basis.
7. Implement chemical control strategies only if cultural control is determined to be ineffective.
8. Record effectiveness of chemical controls based on control plots on a yearly basis.
9. Target one overgrown area per year for remediation. Revisit the site yearly to maintain, until native plant species gain competitive advantage.
10. Develop a specific, long-term exotic/invasive management strategy or plan which identifies problem areas, establishes study plots and recommends proactive management measures.

IV. NATURAL RESOURCE MANAGEMENT PLAN

It is recommended that the first study area be the area just to the west of the visitor center and the area approximately 1,000 feet south of the maintenance facility. The locations of these areas are marked on the NRMP site plan. In most cases total control of invasive species is not practical in terms of time and cost, therefore it is important to target areas that are either threatening an existing high priority area or are so overrun with exotics that they are out competing the existing native species canopy for sunlight and nutrients. In some cases, it is better to manage small patches of invasive species before they spread to native species, as opposed to targeting large overrun areas that have only a small probability of success. The exception would be when a controlled burn could be used as a management tool.

The general action statements above should be a high priority for the implementation of all new planting and developed resource siting. Since the action statements are general in nature the cost for this task cannot be determined, however; the goal of protection of native plant species through general management action statements is generally not difficult or costly to include in a development or planting oriented implementation.

g. Arboriculture and Horticulture

Issue

Along with park staff, M-NCPPC arborists currently maintain trees within high use areas of BHRP to provide a safe environment for park users. The areas that require maintenance at BHRP include picnic areas, paved trails, roads, playgrounds, boat accesses, etc. Any hazardous condition (i.e. a hanging branch, dead limb, dead tree, etc.) which could be considered a hazard is removed. Dead trees are only removed if they are considered a hazard, otherwise they are left for their inherent wildlife value. Paved trails are maintained every three years or as necessary. Vertical clearance is maintained at 12 feet while trail width is maintained at 3 feet from the existing trail edge. Natural surface trails are maintained on a call-in basis. Currently there are 16 staff members that maintain all of the parks in the M-NCPPC park system. Current workloads often necessitate subcontracting work to the private sector. Arborists and horticulturists also plant trees, shrubs and herbaceous plants within Montgomery County's parks.

Action

Landscape trees and other plants should be inspected on a routine basis for health assessments, pruning needs and risk evaluations. This would require a more proactive strategy which incorporates on-site staff and M-NCPPC arborists to evaluate trees prior to them developing a problem or hazard. The program in the park would be in concert with ongoing tree management programs being developed on a park-wide basis. A database of trees (outside existing contiguous forests) is currently being developed which will determine the timing of routine inspections within each park. The inspections will focus on both management of trees (scaffold branch establishment, double leader pruning, etc.) and hazard tree identification. Priorities for management will be implemented based on the routine assessments. This will reduce the need for repeated hazard tree management visits and also reduce the potential for future liability and litigation associated with hazard trees.

IV. NATURAL RESOURCE MANAGEMENT PLAN

In terms of plantings, first consideration for planting are native species or cultivars of native species. Remnant non-native landscape plants exist within the park from the original landscape design which was adopted in the late 1980's. It is a consensus among horticulturists and arborists within M-NCPPC that future plantings use native plant material or cultivars of native material. Only in extenuating circumstances should exotic, non-native species be considered for landscape plantings within the park. An example of a circumstance which would require exotic planting would be some of the plantings around the visitors center which are used to attract hummingbirds. Additionally, future plant management selections should be made in accord with M-NCPPC's IPM policy (i.e. only those plants which are pest and disease resistant and are culturally suited to the particular site should be used). Tree selections should be made with long term goals and maintenance in mind and should be selected and sited appropriately.

The Master Plan currently proposes over 10 miles of new trails within the park. Once built, the maintenance of these trails along with the more proactive approach of routinely inspecting landscape trees will add significantly to the workload for the M-NCPPC arborist. The maintenance associated with new trails, especially hard surface trails, is generally higher shortly after construction of the trails due to root compaction, tree scarring, etc. It is recommended that additional arborists be added to the existing staff to keep up with the existing workload.

3. Specific Natural Resource Management Action Items

a. Submerged Aquatic Vegetation (SAV) Management

Issue

In the shallow areas of Little Seneca Lake where light can penetrate to the lake bottom, several species of submerged aquatic vegetation (SAV) exist. The stocking of vegetation has traditionally been dominated by hydrilla, an exotic species from southeast Asia that first appeared in the United States in the 1960's. Hydrilla is often considered a nuisance aquatic plant because its prolific growth can create dense, impenetrable mats of vegetation which impose limitations on recreational use of lakes, rivers and canal systems.

Since Little Seneca Lake is currently managed as a trophy bass fishery, a healthy amount of vegetative cover in the lake is desirable. Although hydrilla is an exotic species, it, like all SAV, provides habitat for small invertebrates and fish. Hydrilla appears to have considerable forage value to waterfowl (USFWS, 1990, USACOE, 1987, Hench et al. 1994). This potential benefit should be understood in determining management strategies for aquatic vegetation in the lake. The goal of aquatic vegetation management should not be total eradication, but control of vegetation in direct use areas, leaving less-utilized areas alone for nutrient and habitat buffers, shoreline stabilization and as cover habitat for the excellent fishery at the park. This approach, which is currently utilized by M-NCPPC staff, is integral to the theme of integrated lake management and essential to promote the lakes use by overwintering waterfowl and bald eagles as well as the lake's productive fishery.

Action

IV. NATURAL RESOURCE MANAGEMENT PLAN

Vegetation monitoring should be conducted, as it currently is by M-NCPPC, in the spring and throughout the summer for potential problems. The timing of selective aquatic treatments can be extremely important for effective control of certain exotic species without severely hampering native species growth. Controlling exotics when biomass levels are low has proven more environmentally sound because large shifts in levels of dissolved oxygen and other impacts of organic decay are better controlled (NALMS, 1997). Locations of target treatment areas which have been treated in the past are shown on the NRMP site map. These include the area around the boat docks, the boat launch and several popular fishing areas near the Clarksburg Road Bridge and the Little Seneca Creek arm of the Lake. Sonar, a fluridone based aquatic herbicide, has been used effectively over the last several years to treat these areas. Sonar is a systemic herbicide which limits the formation of carotene. In the absence of carotene, chlorophyll is rapidly degraded by sunlight. Herbicidal symptoms of Sonar should appear in seven to ten days after treatment, appearing as chlorotic growing points in the plants.

Treatments should be conducted by staff certified as an Aquatic Pest Control Applicator by the Maryland Department of Agriculture. Applications of aquatic pesticides into waters of Maryland require a Toxic Material Permit (TMP) which can be obtained through the Maryland Department of the Environment (MDE).

Cost

The cost of Sonar in the slow release pelletized (SRP) formulation is approximately \$850.00 for a 40 lb. pail. Generally the treatment area in Little Seneca Lake is approximately 10 acres (Rose, Personal Communication). Assuming an average depth of the treatment area of 3 feet, approximately 160 - 320 lbs. of Sonar SRP would be required per treatment. This translates into a material cost of approximately \$10,000 per treatment, when considering labor. Equipment cost and manpower costs should also be figured into the total cost of the treatments. Currently, M-NCPPC provides their own manpower for the treatments. Hiring an outside consultant which has been done in the past adds significant cost to the treatment, therefore it is recommended that an M-NCPPC staff member maintain an aquatic pesticide applicator certification through the Maryland Department of Agriculture.

b. Cabin Branch Watershed Management*Issue*

Within the park, Cabin Branch is currently characterized by moderately unstable banks which consist of erodible bank materials in several reaches. These reaches are generally located upstream of the zone of backwater influence from Little Seneca Lake. The current land use patterns within the Cabin Branch watershed have stabilized over recent time and the stream system appears to be in the later stages of adjusting to those changes. Although the area contains some unstable reaches, the characteristics of the surrounding watershed, the poor access for construction equipment, and small extent of the problem areas should not warrant stream stabilization or restoration efforts at this time. However, the stream system within Cabin Branch is likely to be highly sensitive to changes in upgradient land use which has been proposed in the Clarksburg Master Plan. Development proposals such as the Clarkmont

IV. NATURAL RESOURCE MANAGEMENT PLAN

development could have substantial adverse impacts to the Cabin Branch drainage basin which may cause rapid stream morphological changes, increased sedimentation of the Little Seneca Lake forebay from upgradient sources and in-stream bank scour and accelerated channel downcutting.

Action

It is recommended that the Cabin Branch watershed be closely monitored to determine the effect that upgradient construction may have on the stream and its tributary system. The Clarksburg Special Protection Area (SPA) is currently located just to the north of the Cabin Branch drainage basin. Small portions of the Cabin Branch watershed are already included as part of the SPA. The special considerations for development in the SPA should help mitigate the impacts associated with development in the watershed. These considerations include compliance with more stringent environmental planning objectives such as expanded environmental buffers, limitations on impervious area, and expanded and accelerated forest conservation. Although the portion of the Cabin Branch Watershed within Black Hill Regional Park is not located within the SPA, it is recommended that the park adopt similarly strict standards for development projects within this watershed. This includes the proposed hard and natural surface trail systems extending along Lake Ridge Drive and the natural and hard surface trails proposed in the utility corridors along the west side of the Little Seneca Lake forebay downgradient of Cabin Branch. It is recommended that several stream monitoring stations be installed upgradient of the existing swinging bridge which spans Cabin Branch. These stations should be installed prior to the development of the private holdings upgradient of the park. Baseline bank erosion rates should be established along with cross sections which would monitor channel movement over time.

Cost

The cost of establishing and monitoring stream stations, assuming a consultant would be retained to conduct the monitoring, would be approximately \$1,600 per year. If the Natural Resources Management Unit conducts the monitoring it would require approximately 32 additional man-hours per year to gather, compile and analyze the data.

c. Institute a Volunteer Water Quality Monitoring Program in Little Seneca Lake*Issue*

Little Seneca Lake is a very young lake which has not been plagued by severe aquatic weed and algae problems to date. The lake benefits from a relatively short water residence time due to the large water contributing watershed (>19mi²) and associated high baseflow contributions from Little Seneca Creek, Ten Mile Creek, Cabin Branch and other lake-direct tributaries. Data gathered by WSSC indicates that some degree of stratification occurs near the spillway of the lake which helps to maintain the downstream trout fishery.

IV. NATURAL RESOURCE MANAGEMENT PLAN

As the lake ages, it is expected that ecological changes in the lake will occur. These changes will likely be subtle and unnoticed by the untrained eye. As organic and inorganic sediments accumulate in the lake and low oxygen conditions persist in the hypolimnion, chemical and biological changes should be expected. These changes may include changes in trophic state and nutrient cycling characteristics, changes in plant and algae composition, and changes in the overall water clarity. Throughout the country, volunteer monitoring programs have been successful at alerting lake managers to potential lake problems. The cost of the volunteer program development is generally minimal, but long-term data collection can be invaluable in the diagnosis of lake problems over time.

Action

The streams draining to Little Seneca Lake are currently being monitored through a cooperative arrangement between M-NCPPC and Montgomery County DEP. The only routine monitoring locations on the Lake itself are near the spillway where WSSC monitors discharge, dissolved oxygen and temperature at the depths that correspond to the locations of the three sluice gates, the flume and the water surface elevation. In addition, WSSC monitors sediment accumulation and the presence of the zebra mussel throughout the Lake. Currently, there are no water quality monitoring stations on the main body of the Lake. It is recommended as part of this plan that a series of water quality monitoring stations be established in the deeper portions of each arm of the Lake. A buoy or shoreline marker should permanently mark the locations of the stations. These stations should be sampled from May through September at as frequent an interval as possible. Funding for sampling will determine the list of parameters to be sampled, however at a minimum, sampling parameters should include conducting dissolved oxygen and temperature profiles at fixed increments from the surface to the bottom of the lake. Chlorophyll a, planktonic algae and total phosphorus testing are also recommended in near surface waters. The backbone of the monitoring program should be secchi depth testing to determine seasonal water clarity changes and year to year variances. In addition, the extent of aquatic vegetation including filamentous and unicellular blue-green algae should be documented within each arm of the lake. Changes in the densities of aquatic vegetation throughout the growing season should also be noted. If sufficient money is appropriated, a hydrolab-style continuous recording water quality station would be useful to document changes in general water quality parameters over time and during storm events.

Planktonic algae are often used as indicators for water quality problems in lakes and reservoirs. Sampling would require collecting near surface samples in preserved containers and delivering them to a lab which specializes in phytoplankton identification. These labs can permanently mount the samples for historical comparison. Examples of these types of laboratories appear in Appendix F.7. Climatic conditions during sampling and the immediate week prior to sampling should also be recorded to determine if conditions may have been caused by a recent storm event or other weather related incident. All results from this testing should be recorded in a computer database and distributed to WSSC and M-NCPPC aquatic plant control personnel for review. M-NCPPC, NRMU staff have already gathered information regarding a sampling program which has a volunteer component. The action statements above may change slightly as a result of the findings of the NRMU data search. The recommended locations of lake monitoring are shown on the NRMP site map.

IV. NATURAL RESOURCE MANAGEMENT PLAN

Cost

The sampling program would require the purchase of a boat, an outboard motor, safety equipment, dredge samplers, Kemmerer water sampler bottles, secchi disks and potentially continuous recording data water quality instruments. The cost for this equipment is estimated to be approximately \$10,000 assuming only one continuous recording Hydrolab-style device is purchased. The monitoring program will require significant up-front capital costs, but sampling during subsequent year would likely be minimal, especially if volunteers become involved with the sampling.

d. Meadow Management*Issue*

Black Hill Regional Park has a high diversity of habitat types within its boundaries. Although the park is predominantly forested, there are approximately 214 acres of land in old field habitat or currently maintained as open fields. These areas were predominantly agricultural lands as recently as the mid-1980's when the park was created. In order to best manage the meadows within the park system, it is necessary to know what species of wildlife or plant communities to manage for, the locations and sizes of the most suitable management parcels and a determination of how the proposed management changes will affect existing wildlife and plant community populations in the park. Currently, with the exception of two periodically mowed areas near the Western Peninsula, the management of meadows within the park has been to allow natural processes to prevail. The meadows near the Western Peninsula are currently being managed, as required by law, to control the growth and spread of various exotic thistle species. Management includes periodic mowing and limited herbicide application in the fields. In the past, several other management options were exercised in other meadow areas of the park but have been discontinued due primarily to time and manpower limitations.

Currently, there is an extreme shortage of warm season grassland (WSG) habitat in Maryland. This has resulted in declines in upland game and grassland birds such as quail, meadowlarks, grasshopper sparrows, among others. Ideal nesting cover for these types of species consists of scattered clumps of herbaceous plants interspersed with bare soil or soil with only a light litter layer (DNR, Planning for Wildlife Information Series). The following presents some benefits of warm season grasses:

- WSG habitats produce a high volume of forage production and superior habitat for several wildlife species;
- Once established, WSG require very little maintenance;
- WSG use nitrogen more efficiently than cool-season grasses, making additional fertilization unnecessary;
- WSG are sod forming, soil building, deep rooted plants that provide excellent control over erosion;

IV. NATURAL RESOURCE MANAGEMENT PLAN

- Properly managed and maintained WSG should not need replanting. Poor stands can be rejuvenated using proper management techniques;
- Dense, vigorous stands should not need weed control; and
- WSG are tolerant of soil extremes. A pH level that is above or below neutral can be tolerated.

Action

The Maryland Department of Natural Resources, Fish, Heritage and Wildlife Division and the Wildlife Biologist for M-NCPPC were contacted to determine the best use for meadow areas within the park based on local wildlife populations and the need for specific species habitats within the State of Maryland. There are four potential management action statements within the park for meadow and old field areas, including 1) natural regeneration; 2) periodic mowing and maintenance; 3) reforestation planting; and 4) specific management for a target wildlife or plant species.

It appears that some of the meadow areas west of the Ten Mile Creek arm of the park would be suitable for the management of warm season grassland habitat; however, prior to implementing a management program it is recommended that a staff biologist conduct an assessment of the proposed management areas to determine if adequate nesting, escape and brood cover is available for the target species.

With the shortage of warm season grass cover in the State, it appears that this would be a logical choice for management. The management of these grasslands can be difficult and trial and error should be expected. The first step in the process is to prepare the soil for planting using a combination of herbicide application and disking. The sod will then need to be removed prior to broadcast planting. A nurse crop used to stabilize the soil and help keep weeds down without competing with the WSG will need to be selected and broadcast with the WSG mix. In addition to establishment, post planting maintenance will be required which involves mowing to control annual weeds and a prescribed or controlled burn to maintain and rejuvenate the plot after three years.

Cost

The cost of typical seed mixes is generally less than \$100.00 per acre. There are three methods of planting which may require special equipment such as a Rangeland (Chaffey seed) drill or a no-till cutter which could be rented on a weekly basis for about \$100/day. Staff time is estimated at 160 hours for establishment of the grasses during the first year and 32 hours per year for maintenance during subsequent years.

IV. NATURAL RESOURCE MANAGEMENT PLAN

e. Reforestation Areas*Issue*

The majority of Black Hill Regional Park is forested, naturally reforesting or currently being managed as meadow. There are; however, several areas which could be suitable for proactive reforestation efforts. This objective is in concert with the objectives of the Environmental Plan outlined in the Clarksburg Master Plan (p. 144) which designates a forested buffer along all streams.

The main obstacles to reforestation projects within Black Hill Regional Park are deer browse, invasive species competition, allelopathic influence of established fescue turf varieties, maintenance of the reforestation site and other natural predation and disease potential.

Action

Three areas were selected for potential proactive reforestation. These areas were all near the southern section of the park near the Clarksburg Road Bridge. These areas were thought to be somewhat secluded from deer, showed signs of productive soils, were accessible for planting and maintenance and were located in a popular fishing area where pedestrian traffic may discourage forage of deer and other browsers in the general area.

Cost

Estimated cost for a contractor to reforest these areas, using 1-inch caliper containerized stock is approximately \$4,200 per acre for the approximately 14-acre site. Maintenance associated with the project would be approximately \$600 per acre, bringing the total (assuming three years of maintenance) to approximately \$84,000. If M-NCPPC staff or volunteers are utilized the cost may be lower.

f. Invasive/Exotic Species Management*Issue*

See Section IV-3.3.f.

Action

Only one existing area within Black Hill Regional Park was targeted for pro-active management. This area is located along the northern edge of the Osprey Heights Loop adjacent to a priority forest stand. The old field area encircled by the Osprey Heights trail serves as a breeding ground for the spread of invasive exotic species. The southern aspect of the right-of-way appears to receive the most sunlight and therefore is plagued by a higher degree of invasive exotic cover. Since the field is an open area, allowing sunlight to penetrate the forest understory, the spread of invasive species has encroached significantly on the existing forest on-site. Since the forests along the south side of the field are forest stands and areas considered to have a high priority for retention, protection measures should be implemented, if possible.

One method which is available for this area is to “armor” the edge of the forest with fast growing,

IV. NATURAL RESOURCE MANAGEMENT PLAN

canopy trees which will quickly provide shade to the forest edge. The area of proactive edge armoring is defined on the NRMP site plan.

Cost

The cost of edge armoring for the approximately 750 linear foot section of old field habitat is estimated at \$3,800.

g. First Order Streams and Springs

Issue

The locations of first order streams and springs exert a large influence on the constraints associated with environmental buffers found throughout the property. Currently, the locations of springs have been located by analyzing topographic information and making a best guess at probable inception points.

Action

Since the locations of these sensitive environmental features have a large influence on the use of the property, they should be field located and surveyed to get a more realistic idea of the constraints associated with the property. A number of potential springs have been targeted for field verification, as illustrated on the NRMP site plan.

The locations of springs should be verified and surveyed in the field by an experienced wetland Ecologist, Hydrologist or Hydrogeologist. The locations of these features should represent a conservative estimate and should consider the time of year variations in stream flow. It is recommended that this task be conducted during the winter months.

Based on the new information, the configuration of the stream valley buffer will change. Changes should be made and incorporated in the digital database for future planning purposes.

Cost

The cost of this survey is estimated at \$3,000. This includes field identification, surveying and data compilation.

h. Lakeshore Housing - Interpretive Programming

Issue

Residents living in the high density residential properties near the eastern boundary of the park should be informed of the effects that the use of their properties could have on the lake. The dumping of fish tanks into lakes has been blamed for common carp and invasive aquatic weed infestations in many lakes throughout the country. Improper use of fertilizers near the lakeshore has been blamed for aquatic weed and algae blooms which are known to be limited by the availability of phosphorus, a component of most

IV. NATURAL RESOURCE MANAGEMENT PLAN

fertilizers and detergents which can activate plant growth at very low concentrations. Proper disposal of lawn clippings, fertilizers, wash-water, used motor oil and other household chemicals is especially crucial in the lakeshore environment where very little buffer exists between lakeshore communities and the aquatic environment.

Action

It is recommended that an interpretive program be developed to alert lake-shore homeowners to the ramifications of these types of actions. At a minimum, a flyer or pamphlet should be distributed to these homeowners describing their responsibilities as environmentally friendly shoreline property owners.

Cost

It is estimated that the cost of flyer preparation and the development of an interpretive program be approximately \$2,000.

4. Natural Resource Implications of Development Oriented Proposals

Based on an analysis of environmental buffer constraints within the park and access issues, the bulk of the potentially developable land lies along the existing ridgeline which is loosely defined by Lake Ridge Drive. Other accessible and non-environmentally constrained land is located west of the Cabin Branch arm of the lake near the park police headquarters and the area known as the western peninsula. It should be noted that most of the developable land located along Lake Ridge Drive is located within high priority forest stands which should be retained, if possible. Although there are some additional patches of suitable development acreage available throughout the park, the access to these areas is limited and the associated environmental externalities (road construction, utility development, tree clearing, etc.) which could occur as a result of accessing these areas would likely outweigh the benefit of developing these small parcels. The locations of areas outside environmental buffers areas are shown in a red dot fill pattern on the NRMP site map.

The following are summaries of the natural resource comments regarding development activities proposed as part of the Master Plan. These comments were considered in the formulation of the Master Plan Action Statements.

a. Maintenance Facility

The current footprint for the proposed maintenance facility lies within an old field area near the Field Crest Spur. Although detailed field investigations have not been conducted as part of the Master Plan process, detailed investigations have been conducted in the maintenance facilities concept facility planning process. The area is located outside any environmental buffers as they appear on the current mapping. According to preliminary concept plans, environmental impacts associated with the construction of the maintenance facility include minimal forest clearing impacts, the creation of approximately 1.5 acres of impervious surface over previous old field cover, soil disturbance and the development of stormwater management infrastructure. The site lies in a primarily flat area where minimal grading is necessary. The NRMP endorses this proposed siting due to the minimization of

IV. NATURAL RESOURCE MANAGEMENT PLAN

environmental impacts, as indicated by the Preliminary Concept Plans.

Because the development of the maintenance facility will require a development plan, a sediment control permit, stormwater management planning, and compliance with the Forest Conservation Act regulations (MD DNR, 1991) will be required. A detailed forest stand delineation and forest conservation plan will need to be completed for the project. Although the site is not known to contain hydric soils, a wetland delineation will also be required to determine if any isolated wetland areas exist in the vicinity of the proposed development. These issues will be addressed during the project development process.

b. Expansion of Picnic Lane

The parking and road infrastructure for the utilization of the southern portion of Picnic Lane as a small picnic area is already in place, therefore the major environmental impacts associated with expansion have already been realized. Furthermore, current plans call for utilizing the existing parking area for development of the picnic area, thus minimizing or eliminating tree clearing and additional environmental impacts. If additional picnic sites are needed within the forest on the interior of the loop road, they should be sited in the area mapped as having a lower priority forest (see NRI site plan). Depending on the degree of impact proposed, the site may require a forest stand delineation and a forest conservation plan. Regardless of the requirement, it is also recommended that the picnic plots be engineered to minimize forest clearing and avoid specimen tree impacts to the greatest extent practical. Chinquapin oak (*Quercus muhlenbergii*) is known to exist in the general area of Picnic Lane. The forest stand delineation should focus on determining if this watchlist species is present in the area proposed for impact. If siting sites adjacent to specimen and significant trees is determined to be unavoidable, these trees should be preserved during and after construction by using the following tree protection techniques. For construction details regarding these techniques, the reader should refer to the *Trees, Approved Technical Manual*, 1992.

1. Vertical mulching and root fertilization techniques to a distance which extends beyond the critical root zone of the existing tree. The critical root zone for specimen trees can be roughly defined by using the simple formula (1" dbh = 1.5' Radius of the Critical Root Zone). The multiplier for non-specimen trees is 1.0" instead of 1.5".
2. Crown reduction
3. Root pruning
4. Tree root aeration
5. Physical structures such as retaining walls and raised sidewalks

Tree protection fence will also be required to protect trees outside the limits of disturbance in these areas.

c. Parking and Access to Ten Mile Creek Arm of Park

IV. NATURAL RESOURCE MANAGEMENT PLAN

Two locations have been recommended for parking areas for access to the Ten Mile Creek arm of Black Hill Regional Park. These include a gravel parking lot off of Ten Mile Creek Road and a second location along Clarksburg Road near the Cool Spring Run trail head. Without acquisition of a portion of a nearby residential property, the Ten Mile Creek area would require the expansion of existing parking to the west of Ten Mile Creek Road, which based on current mapping would impact the wetland buffer, the 100-year ultimate floodplain and existing forested areas. Based on these impacts, the action statements of this plan is to only provide parking in this area if the property acquisition is feasible. The Cool Spring Run area is also recommended for a gravel parking lot and offers more flexibility in siting and offers minimal environmental constraints for development. This premise was based on engineering a small parking area (6 spaces) with room to turn around a horse trailer.

d. Crossing of Ten Mile Creek

To access the trail systems west of the Ten Mile Creek (Osprey Heights Loop, Turkey Hill Loop and Lake View Loop), park staff and trail users currently must cross Ten Mile Creek. The area of the current crossing is situated in a backwater area of the lake where beaver activity is common. During certain times of the year, the combination of flooding, beaver activity and changes in channel dynamics make the stream difficult to cross for both trail users and park maintenance vehicles. The Master Plan recommends adding a bridge crossing of Ten Mile Creek in this area. An evaluation of alternative routes to the west side of the Ten Mile Creek arm of the park indicates that all other access is through private land-holdings to the west of the park. Since the floodplain of Ten Mile Creek is quite broad from the current ford site all the way north to the park boundary, it appears that from an environmental perspective, the existing crossing would be the best location for a future crossing structure, barring acquisition of private holdings west of the park and engineering constraints associated with the bridge itself.

e. Greenway Connections to Little Bennett Regional Park and Ovid Hazen Wells Recreational Park

The Clarksburg Master Plan recommends future greenway connections between Black Hill Regional Park, Little Bennett Regional Park and Ovid Hazen Wells Recreational Park by two separate trail systems. Based on an analysis of natural resource impacts, it is recommended that the connection to Little Bennett Regional Park in the planned Ten Mile Creek Greenway be made on the east side of the creek. In some locations it would be advisable to expand the currently proposed acquisition boundaries to better accommodate the trail. An old road bed was discovered beginning just south of the ford which seemed to follow the proposed property line for the greenway. The natural surface trail could follow that alignment for some distance. Where the road ends, the trail could logically follow 25-50 feet just inside the property edge and be bridged and boardwalked at the appropriate locations. The exact trail alignment and locations of bridges and boardwalks have not been identified at this time. South of the ford, the trail is recommended to connect to the Black Hill trail through a piece of private property which is proposed for acquisition.

Several possible Greenway connections exist to Ovid Hazen Wells Park. The most environmentally sensitive solution, which is recommended in the Park Master Plan, would be to use existing paved and

IV. NATURAL RESOURCE MANAGEMENT PLAN

unpaved trail systems or the proposed hard surface trail system along Lake Ridge Drive, within the park, to move north through the park to West Old Baltimore Road. From there the road right-of-way would be used to move east through the I-270 underpass to the Little Seneca stream valley and then proceed north through or adjacent to the stream valley.

f. Crystal Rock Drive at Proposed Extension of Black Hill Trail

The Black Hill Trail pavement currently stops at a point just south of the historic mill site. A paved section of a neighborhood trail system exists at the back yards of the homes on the northern side of Churchill Town Sector. There is no pavement connection to Lake Ridge Drive at that point. It is recommended to pave the remaining section of unpaved trail providing that the tree canopy is not disturbed significantly. The unpaved section of trail is wide but the canopy is largely closed. With today's technology and trail building methods it is possible to construct a trail using end on construction methods so that a narrower limit of disturbance can be maintained. Few, if any, trees should have to be cut down. Several areas will need boardwalk style crossings, and because the area is within the 100-year floodplain, a waterway construction and wetland permit may be needed for the project. Also, stormwater management facilities will have to be incorporated into the plan for paving, perhaps in the form of vernal pool enhancements.

g. Paved Trail along Lake Ridge Drive

From a natural resource perspective, disturbing the forest edge along the existing paved entrance road is much more favorable than cutting forest and paving the interior and existing unpaved Field Crest Spur and Hard Rock trails, or even constructing a new trail. This plan recommends a single paved trail on one side of Lake Ridge Drive (rather than on both sides) which should follow along the eastern edge of Lake Ridge Drive. In some areas it may be appropriate to move the trail into the forest in order to avoid some large specimen trees along the road edge. Stormwater management to accommodate the additional pavement could be provided by enhancing the existing grassed waterway or incorporating other stormwater management techniques. More difficult engineering will likely be required near the contact station where steep slopes are encountered.

D. SUMMARY OF NATURAL RESOURCES MANAGEMENT PLAN ACTION STATEMENTS

Responsible natural resource management within Black Hill Regional Park is vital to the success of the park as a multi-purpose facility. The following table summarizes the action statements, corrective actions, costs and cost appropriation strategy associated with the activity.

Table IV-1: Summary of Natural Resource Management Action Statements

IV. NATURAL RESOURCE MANAGEMENT PLAN

area on the west side designated as hiking only, and a few areas closed to equestrians, are open to pedestrians as well as mountain bicycles and equestrians. All hard surface trails are open to bicycles and pedestrians, including rollerskaters.

At present, almost all of the park's natural surface trails are open to hikers, equestrians and mountain bikers. Allowed uses are signed at all trail heads and trail intersections. Due in large part to the good design, high and dry terrain and moderate usage levels, the multiple use designation has worked well for this trail system, with few complaints from citizens or reported accidents. Multi-use is recommended to continue on the existing and proposed natural trails, with a few exceptions. Trail use designations are depicted on the Trail Development Plan included in this report.

2. MAINTENANCE IMPLICATIONS OF THE MASTER PLAN FOR RECREATIONAL DEVELOPMENT

Current maintenance standards adopted by the M-NCPPC park managers include provisions that improvements to the parks be easy to maintain, repair and access. This includes an explicit requirement for the use of sound planning and design principles as well as durable materials.

The action statements contained within the Master Plan will increase maintenance requirements regardless of how well these guidelines are adhered to, due to the increased trail mileage, the additional boat ramp, and picnic areas, increased visitor's center space, and expanded playground as well as other planned improvements.

The following section summarizes predicted maintenance increases as determined by the Park Manager and other M-NCPPC staff involved in the maintenance of the park.

3. STAFFING AND OPERATIONAL REQUIREMENTS

Table IV-2 below reflects the estimated increase in maintenance activities for selected action statements. Only those action statements that are anticipated to actually increase maintenance are shown.

IV. NATURAL RESOURCE MANAGEMENT PLAN

Table IV-2: Maintenance Implications for Recreational Development Action Statements

Number	Location – Description	Manhour Required (per year)	Comments
1.a.	Picnic Areas – Picnic Lane picnic areas.	240	Note a
1.b.	Picnic Areas – Adventure Playground with additional parking.	232	Note b
2.b.	Little Seneca Lake – Boat access point & ADA accessible fishing pier.	60	Note c
2.e.	Little Seneca Lake – Boat dry mooring sites.	28	Note d
3.d.	Trails and Greenways – Amenities including trail head/rest areas	52	Note e
3.e.	Trails and Greenways	324	Note f
5.c.	Park Support Maintenance Facility	78	Note g

The total increase in manpower for the regional park is 1,014 man-hours per year or the equivalent of 0.50 full time employees.

Notes:

- a. Restrooms: 1½ hours per day, 4 days per week, 30 weeks per year = 180 man-hours per year
Shelters: 1 hour per day, 2 days per week, 30 weeks per year = 60 man-hours per year
- b. Season: 1 hour per day, 7 days per week, 30 weeks per year = 210 man-hours per year
Off-season: 1 hour per day, 1 day per week, 22 weeks per year = 22 man-hours per year
- c. 2 hours per week, 30 weeks per year = 60 man-hours per year
- d. 4 hours per day, 1 day per month, 30 weeks per year = 28 man-hours per year
- e. 1 hour per week, 52 weeks per year = 52 man-hours per year
- f. Trails and Greenways
Additional manpower requirements would be needed for trails as proposed as follows for routine patrol, policing of litter, removing incidental tree debris and mowing along edges of trails. This included in most cases the additional effort for trail heads and rest areas unless noted:

Hard Surface Trails

Currently 2 hours per week on average for 5.04 miles. Expected increase will be 2 hours per week due to 100 % increase in hard surface trail length
2 hours per week, 52 weeks per year = 104 man-hours per year

In addition, for the regular tree crew maintenance of the trail facilities, based on a review of recent work records, approximately 44 man-hours per mile per year are required for inspection and maintenance efforts including removal of downed material and normal preventive removals of limbs and branches. For the proposed addition of approximately 5 miles, the increased efforts for the tree crews will be 5 miles x 44 man-hours/mile/year = 220 man-hours per year.

Natural Surface Trails

Currently 5 hours per month on average for 9.68 miles. Expected increase will be negligible due to minimal net increase in natural surface trail length

Totaling all trail related efforts results in a maximum of 324 man-hours per year.

- g. 1½ hours per week, 52 weeks per year = 78 man-hours per year

4. MAINTENANCE PLAN FOR BLACK HILL REGIONAL PARK

IV. NATURAL RESOURCE MANAGEMENT PLAN

Appendix G.5 contains a detailed Maintenance Program for the regional park that is based on standards implemented by M-NCPPC in 1992, and is reflective of the existing and proposed conditions in the park. This program also reflects the increased staffing levels identified in the previous section.

5. PLANNED LIFE CYCLE REPLACEMENT PROGRAM [PLAR]

The Montgomery County Park Commission has taken steps in recent years to institute a Planned Life-cycle Asset Replacement [PLAR] system wherein regular replacement and maintenance activities are tracked and programmed into the Capital Improvements Program [CIP] based on anticipated life cycle criteria.

For example, the normal useful life for a shingle roof is approximately twenty years. The PLAR system should keep track of when the last replacement was made and alert park maintenance staff when to schedule periodic inspections for assessing the need for future replacements as well as assure adequate funds are put into place far enough ahead of time.

A study was recently completed by M-NCPPC to determine how to best implement a comprehensive version of the system to more efficiently manage the asset replacement, inspection, renovation, repair, and on-going maintenance of all "man-made structures" in the county-wide park system. In order to satisfy this need, the PLAR management system must be capable of establishing and maintaining an organized, automated database of all park facilities, assets and components and providing related automated systems.

This will require a significant effort but the consensus among M-NCPPC staff is that an enterprise-wide system that brings together current and historical data that can be shared between divisions would assist with the strategic planning interests as well as the tactical maintenance interests of a park such as Black Hill Regional Park. Improving the quality, availability and flow of project information between the many involved groups should be the first major goal of the PLAR program.

Appendix G.5 includes the summary report from this effort that explains the proposed components and interaction so the system and details an initial phase of implementation.