MANAGEMENT PLAN

# CABIN JOHN REGIONAL PARK

MONTGOMERY COUNTY, MARYLAND
DEPARTMENT OF PARK & PLANNING

Project Manager Final Draft Report
October 13, 2000

MANAGEMENT PLAN

# CABIN JOHN REGIONAL PARK

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*[Note: The following was copied from the Rock Creek Regional Park final version and will need to be changed to reflect the current make-up of the boards and commissions at the time the plan is reviewed and approved]*

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## 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 Cabin John Regional Park (CJRP) provides Montgomery County with a contiguous forested area which protects a large portion of the Cabin John Creek stream valley and creates opportunity for protection, enhancement and restoration of natural resources. However, the park also serves as a recreational resource for the County. The development of some of these recreational resources, if not carefully planned and managed, could compromise natural resource protection initiatives within the park. 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 with the strong commitment to preserve sensitive natural resources within its regional parks and throughout the county parklands.

Cabin John Regional Park is approximately 530 acres in size. Currently, the total land area that can be considered for active use development, based on an analysis of environmental constraints, is approximately 162 acres, of which 137 acres are currently already maintained as developed resource areas. Thus, there are approximately 360 remaining acres of natural areas that offer a haven for many different species of plants and animals; provide numerous environmental benefits including water and air quality enhancement, ground-water recharge, and stormflow moderation; and provide the public with recreational enjoyment, and historical and archaeological interpretation opportunities. The purpose of the Natural Resources Management Plan (NRMP) for Cabin John 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 NRMP for Cabin John 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 make specific recommendations and provide a cost and priority scheme for the enhancement and restoration of existing resources and the preservation of sensitive areas;
- To provide environmental foundation/justification for the Master Plan; and
- To evaluate and integrate, when feasible, the objectives of area Master Plans with the NRMP.

## I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

The NRMP options presented in this report are not intended to be all inclusive. The intent of the recommendations is to aid in the management of natural resources on the property, point out areas of concern which are not part of the park's day to day maintenance operations, and prioritize corrective actions that can be implemented with operational budgets or Capital Improvement Plan (CIP) 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 recommendations contained in the NRMP are general in nature. These recommendations suggest ways to mitigate some of the more subtle problems associated with overuse within the park, but do not point out a specific area where a corrective action project could be implemented.

## B. INVENTORY OF NATURAL RESOURCES

Although monitoring and inventory work at Cabin John 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 Parks and Planning, 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.

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 M-NCPPC Environmental Planning Unit (EPU) and the Natural Resources Management Unit (NRMU), both of the County-wide Planning Division of M-NCPPC. .

# I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

Of the 530 total acreage of CJRP, approximately 330 acres are forested and 200 acres are maintained as open areas or are in old field habitat. Surrounding land use has 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 mining had impacted the existing landscape. More recently, the development of stormwater management infrastructure, recreational development projects and utility and transportation corridors have stressed the native communities within the boundaries of the park.

The inventory data used to assess the current condition of existing natural resources on-site were compiled in digital format, using a comprehensive layer strategy. The ultimate objective of compiling the data in digital format was to build GIS coverage by linking ARC-compatible data to existing spatial entities in a relational database. More simply put, the data can be used to simulate numerous developed and natural resource scenarios, store information and provide a simple and effective means for facilitating management and planning objectives within the park.

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

## 1. GEOLOGY

The geologic formations that underlie Cabin John 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 Cabin John 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 rocks vary from locale to locale, they are very similar from a land-forming perspective.

The majority of Cabin John Regional Park is underlain by the western sequence of the Wissahickon Formation. Within the park, the Wissahickon is in gradational contact with the Boulder Gneiss, also known as the Sykesville Formation, a granitic appearing crystalline rock which extends from the southeastern corner of Carroll County into east-central Montgomery County, where it narrows and fingers out just east of Rockville. The western sequence of the Wissahickon forms a broad northeastern-trending belt of metasedimentary rock which extends from Fairfax County Virginia, through Maryland and into southeastern Pennsylvania. The contact with the Sykesville Formation marks a change from massive granitic-appearing rock (Sykesville) to pelitic schist with thin psammitic interbeds.

The Wissahickon Formation is not exposed and therefore the thickness of the formation is not clear, however investigations by Fisher, 1963, indicate that the formation is at least 14,000 feet thick along the Potomac River, with original thicknesses likely being much greater. Pelitic schist with interbedded psammitic rocks constitute the bulk of the western sequence. The pelitic rocks dominate most of the

section, but locally they are subordinate. According to Fisher, 1963, roughly 3,000 feet of the section is predominately metasandstones, and about 11,000 feet is mainly pelitic. Minor amounts of calc-silicate rock, chiefly as relict concretions, and a few mafic interbeds occur in various parts of the sequence.

The western Wissahickon rocks have diversified textures and mineralogy, owing not only to the variety of original rocks but to their present differences in metamorphic grade. Within the park, where metamorphic grade is low, the phyllites and fine-grained pelitic schists are composed chiefly of quartz, muscovite and chlorite. Paragonite occurs sparingly in some of the more aluminous schists and albite is found in those that are richer in quartz. The associated psammitic rocks consist chiefly of quartz, plagioclase, muscovite, and chlorite, with various minor accessory minerals.

Understanding the geology of Cabin John Regional Park can indicate potential uses or limitations to certain land use practices within the park. Most rocks found in the surface or near surface of CJRP are exposed to physical, chemical and biological conditions much different from those prevailing at the time the rocks were formed. Because of the interactions of these conditions, the rock is gradually weathered into soil. The weathering of these rocks into their base minerals is a determining factor in the overall chemical structure of a soil and thus the composition and vitality of vegetative communities. Generally, the three major rock formations present underlying CJRP weather to form a thick saprolite (Froelich, 1975). The thickness of this saprolite zone is highly dependent on surficial processes, with the deeper saprolite zones occurring along ridgetops and along large flat expanses within park, such as the area occupied the existing ball fields.

## 2. TOPOGRAPHY

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). NMAS standards require that 90 % of contours should be accurate to within one-half of a contour interval, 90 % of finite cultural objects should be accurate to within 30 inches and 90 % of plotted spot elevations should be accurate to within one fourth of a contour interval. 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. The new base information for the park was compiled for several reasons. These include:

- To aid in the design and implementation of new projects which would include both natural resource and development oriented applications;
- To determine how the park has changed over time; and
- To provide accurate base information for use in a relational database.

In general, CJRP is characterized by rolling topography with elevations ranging from 210 to 354 feet. Steep slope areas are generally concentrated above the toe of the slope of the drainages occurring throughout the park, but especially surrounding Cabin John Creek. A few steep slope areas are isolated

from the stream drainage features on-site. In total, there are approximately 75 acres of parkland occupied by steep slopes ranging from 15-25% and approximately 125 acres of parkland occupied by steep slope areas which have greater than 25% slopes. This acreage translates to approximately 41% of the park which is occupied by slopes greater than 15%. These slope ranges are important because they generally indicate areas of unstable slopes and highly erodible soils. This 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 must be expanded to include the entire steep slope area.

## 3. HYDROLOGY

Hydrology sources within Cabin John Regional Park are abundant and center around Cabin John Creek which divides the property into two similar sized parcels on each side of its valley. Cabin John Creek and all of its tributaries within the park are located within the Washington Metropolitan sub-basin (Modified Federal Designation). Streams of the Washington Metro Watershed drain south to the Potomac River. The Washington Metro Watershed sub-basin contains approximately 491 miles of first-order streams, 120 miles of second-order streams and 78 miles of third-order streams.

On a more local scale to the park, Cabin John Creek is a medium to large size, third-order Piedmont tributary to the Potomac River. It is comprised of 12 sub-basins which drain approximately 25 square miles of high density residential, commercial, forested and agricultural lands in central Montgomery County. The streams headwaters are located amidst heavily urbanized areas of Rockville. The major tributaries within the drainage basin in order of drainage area size include Booze Creek, Old Farm Creek, Buck Branch, Thomas Branch, Ken Branch, Snakeden Branch, Congressional Country Club Tributary and Bogley Branch.

The Cabin John watershed contains a mixture of good to poor quality stream systems based on their biologic indicators (DEP, 1995). The subwatersheds draining to Cabin John Regional Park contain fair and poor quality streams which include Bogley Branch, Old Farm Branch, Lower Old Farm Branch and the Upper Mainstem. Of these tributary systems, only Buck Branch, Ken Branch and the Congressional Country Club Tributaries, which are located south of CJRP, were characterized as having "good" stream condition.

The mainstem of Cabin John Creek enters CJRP from a culvert under Interstate 270 just south of the Montrose Road interchange and flows south through primarily forested land prior to exiting park property and entering the Cabin John Stream Valley Park (CJSVP). Cabin John Creek is protected through the park by the forests and undeveloped land. The stream is further protected south of CJRP by CJSVP which extends south of Democracy Boulevard to the streams confluence with the Potomac River.

Within the park three main tributary systems augment flow to Cabin John Creek. These include Bogley Branch which drains approximately 0.78 square miles of primarily residential and institutional land in Rockville, Old Farm Branch and Lower Old Farm Branch which drain approximately 3.78 square miles of mixed use lands in the eastern portion of the watershed and Snakeden Branch which drains approximately 0.95 square miles of primarily residential land to the west of the park.

## I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

The Montgomery County Department of Environmental Protection (DEP) and the M-NCPPC, Montgomery County Department of Park and Planning, Natural Resources Management Group (NRMU) jointly maintain 11 sampling sites in the upper Cabin John watershed, of which 3 stations are located within or just adjacent to CJRP boundaries. The Metropolitan Washington Council of Governments (COG) and the Maryland Biological Stream Survey (MBSS) completed by the Maryland Department of Natural Resources, Chesapeake Bay and Watershed Programs also have conducted studies within the Cabin John watershed. All of this data along with some field verification was used to provide the stream morphology, fisheries and benthic macroinvertebrate information found below.

### a. Stream Morphology

Stream channels develop their shape, size, slope and other morphological features as a result of the interaction of flowing water on the materials in the stream's valley. A stream is the manifestation of a process of energy transformation in which the potential energy of elevation is transformed into the kinetic energy of flowing water.

The shape of the channel is the result of a complex interaction of eight major variables which include bankfull width, bankfull depth, velocity, discharge, channel gradient, sediment load, sediment size, and channel roughness. A change in any one of these variables results in concurrent change in other variables, and usually results in channel alterations. Stream channels are self-adjusting over time, just as an alteration in the drainage basin, climatic change, or an alteration in the vegetative cover in the drainage basin have a resulting and measurable influence on channel shape and behavior.

Within the park boundaries, the COG study data indicated problem areas associated with major stream channel erosion along Lower Old Farm Creek from Club Road to Cabin John Creek and on the mainstem of Cabin John Creek between Tuckerman Lane and Democracy Boulevard. Within these reaches, areas which contained severe stream channel erosion areas 100 linear feet or greater in size were identified; these areas are marked on the NRMP site plan. Mainstem and tributary reaches of Cabin John Creek exhibited moderate to somewhat low bank erosion potential based on an evaluation of channel materials. A quantitative study of bank erosion was not conducted as part of the RSAT sampling procedure. Uncharacteristically high stream channel incision was noted within the park on the lower Old Farm Creek and on Snakeden Branch. According to the COG study, the mainstem and tributary systems of the Cabin John watershed have experienced downcutting on the order of 1.5 to 4.0 feet on average (COG, 1995). There were no estimates in the report regarding the current rate of downcutting within this reach.

### b. Fisheries Information

Three fisheries sampling sites are located within CJRP. Of the three sites, one is located on Old Farm Creek near the Interstate 270 culvert (CJOF-204), and two are located on the mainstem of Cabin John Creek, one north of Tuckerman Lane (CJCJ-202) and one south of Tuckerman Lane almost equidistant between the PEPCO transmission line right-of-way and Democracy Boulevard (CJCJ-302). These sites were sampled in 1996 using electrofishing methodology. Results of the fisheries study were tabulated using an index of biological integrity. Results for the fisheries component of the IBI indicated that the station on Old Farm Creek and the mainstem section below Tuckerman Lane were rated as being in fair

biological condition, while the mainstem station above Tuckerman Lane was rated as being in good biological condition. Three removals at CJCJ-302 netted a total of 18 different fish species (196 individuals) of which 10 species were pollution tolerant, 7 species were intermediately tolerant, and 1 species (longnose dace) was intolerant to pollution. Three removals at CJCJ-202 netted a total of 11 different fish species (331 individuals) of which 5 species were pollution tolerant, 5 species were intermediately tolerant, and 1 species (longnose dace) was intolerant to pollution. Three removals at CJOF-204 netted a total of 10 different fish species (198 individuals) of which 5 species were pollution tolerant, 4 species were intermediately tolerant, and 1 species (longnose dace) was intolerant to pollution. Overall, Station CJOF-204 was rated as having good habitat condition for fish but was rated as having only a fair biological condition based on an index of biological integrity. Specific fisheries Information for Cabin John Creek within the park are included in Appendix F.1.

### c. Benthic Macroinvertebrate Summary

Benthic macroinvertebrates are generally defined as animals without backbones that are large enough to prevent being passed through a No. 30 standard sieve. These invertebrates have historically been used as indicators of water quality because they are a ubiquitous and diverse group of sedentary and relatively long-lived species, which often respond predictably to human watershed perturbations. Importantly, a stream's biological community normally responds to and is reflective of prevailing water quality and in-stream habitat conditions (COG, 1996).

The use of macroinvertebrates to assess the water quality of a stream has been well established (Hilsenhoff, 1987; Bode et al., 1991; Plafkin et al., 1990). Because certain macro invertebrates are extremely sensitive to the levels of organic pollution, silt, water temperature, and dissolved oxygen in a stream section (Barbour et al., 1991; Hilsenhoff, 1987; Bode et al., 1991; and Plafkin et al., 1990), and because their mobility is limited to a short segment of stream, they are very well suited for assessing site-specific impacts (upstream-downstream studies). Their short (usually one year) but complex life cycles make them particularly useful to determine sudden changes in water quality.

Because particular macroinvertebrates require specific water quality levels, determining the specific composition of the sample and their level of tolerance to pollution becomes important. A modified Hilsenhoff Biotic Index (HBI, 1987) was used to summarize the overall pollution tolerance of the benthic macro invertebrate community with a single value. The tolerance values for HBI range from 0 to 10, increasing as water quality decreases. Thus, if the sample was rated with an HBI of 3, this would indicate that the water quality was better than if the sample rated an HBI of 5.

Of the three stations monitored for benthic macroinvertebrates in Cabin John Regional Park, all were considered to have poor biological condition based on the Index of Biological Integrity (IBI). The station CJCJ-302 had a low percentage of EPT individuals (4%) and low IBI scores for # EPT Taxa (3), total # hydropsyche & cheumatopsyche/EPT individuals (88%) and abundance of shredders/total number of individuals (1%). Station CJCJ-202 is located near Goya Drive in the northern portion of the park.

The station had very low IBI scores for all IBI metrics with the exception of abundance of scrapers/(scrapers+filter collectors). Station (CJOF-204) is located on the Old Farm Tributary just downstream of the Interstate 270 culvert. This station could not be scored using the IBI method because less than 100 individuals were collected. Only five taxa were represented in the sample.

### d. First-order Streams and Springs

First-order streams and springs are located throughout the park. These features generally form in topographically low positions where shallow ground-water intercepts the ground surface. These areas 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. Currently the locations of the spring inception points have not been accurately mapped by field delineation.

### e. 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, groundwater recharge, waterfowl and wildlife habitat, energy source (peat), fishing and shellfishing, recreation and aesthetics.

Wetland areas are present along the stream valley areas within the park. Wetland mapping for the park was completed using data from the National Wetlands Inventory (NWI). The NWI mapping is compiled using either remote sensing or infra-red 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 with the exception of limited wetland delineation conducted in proximity to developed resource projects such as the ice rink expansion.

## 4. Cover Types

The 530 acre Cabin John Regional Park is predominantly forested but is bisected by roads, trails and utility line rights-of-way. Historical land use has been the main factor for the distribution of variant cover types throughout the park.

### a. Forest Cover Types

The northern section (all acreage north of Tuckerman Lane) of Cabin John Regional Park can be characterized as a forested area where the overall level of deer damage, gypsy moth damage, and exotic invasive species infestation is very high. Most of the stream valley in the northern section is dominated by tulip poplar, red maple, and sycamore with diameter at breast height (DBH) of 15-18". Scattered trees

are up to 30" DBH, but the overwhelming majority are not. Areas beyond the flood plain are generally dominated by mixed oak in the 15-18" DBH range. The campground area (close to Interstate 270 and Tuckerman Lane) is the best quality woods in the northern section.

The central section (all acreage south of Tuckerman Lane and north of the PEPCO right-of-way is largely comprised of park facilities (playgrounds, picnic areas, play-railroad, parking lots, maintenance yard). The mixed oak dominated areas surrounding the developed areas and maintenance yard have trees in the 16-20"DBH range. Forested sections bordering Cabin John Creek, the railroad tracks and the powerline right-of-way are dominated by tulip poplar (with a number of 23-25" DBH trees), and spicebush.

The southern section (all park acreage south of the PEPCO right-of-way) generally has a much higher quality forested portion than the northern or central section. The wooded acreage extending directly south of the powerlines and west of the baseball area is possibly the highest quality forest stand in Cabin John Regional Park. The stream valley here is dominated by tulip poplar in the 20" DBH range (many 25-30" DBH specimen measured); mixed oak (16-20"DBH) dominate all areas except the lowland areas adjacent to the Cabin John Creek. The shrub understory includes many large winterberry and pinxter azaleas; the herbaceous level is lush and is overall a less exotically invaded area than the northern section of Cabin John. The woods just north of Democracy Boulevard near Locust Grove Nature Center must have been exceptionally impressive before damaged by the gypsy moth. The mixed oaks here are in the 16-30" DBH range, with a few surviving giants measuring 46-49" DBH. Tulip poplar, red maple and sycamore dominate areas bordering Cabin John Creek with many significant sized trees; huge witch hazels with multiple trunks of 3-4" DBH were measured. Unfortunately, damage done by deer and gypsy moths, along with the heavy invasive exotic component has greatly lowered the quality of these woods. The southernmost section combines a disturbed tulip poplar floodplain (directly south of Democracy Boulevard) with a beautiful mixed oak forest (includes large mountain laurel, fringetrees and American beech) on top of the hill above Seven Locks Road and Democracy Boulevard. Forest stands were delineated by the M-NCPPC Natural Resources Management Unit (NRMU). The DRAFT FSD text, along with a species inventory is contained in Appendix F.3.

### b. Old Field Cover / Young Forest Cover

Of the "green" portion of Cabin John Regional Park, 5.38 acres are occupied by unmaintained fields or "old fields" returning to forest. These areas of young weedy forest range in age from approximately 10 to 20 years. Though the exact species composition of these sections varies, trees commonly observed include black cherry, red cedar, American sycamore, sassafras, red maple, box elder, a variety of young oak species, tulip poplar, American elm, and Virginia pine. Tree sizes ranged from 2" to 6" DBH, with scattered larger trees, especially along old fence rows. The understory in these young forests is usually overrun with exotics, including honeysuckle species, multiflora rose, bittersweet, tearthumb, and crown vetch.

### c. Maintained Field

Approximately 190 acres of the CJRP property are maintained as fields through periodic mowing and maintenance.

## I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

### 5. Soils

Soil mapping information for CJRP was derived from the *Soil Survey of Montgomery County* (NRCS, 1995). There are fourteen mapped soil types located within the park representing eleven 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 located along the floodplain and stream valleys of Cabin John Creek and its tributaries. All other soils within the park are upland soils, however the Gaila silt loam(1B, 1C), the Glenelg silt loam (2B, 2C), the Glenville silt loam (5B), the Brinklow-Blocktown channery silt loam (16D) and the Blocktown channery silt loam (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.

#### 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 document directs inclusion of highly erodible soils into open space or conservation in the site planning process.

The Cabin John Regional Park contains two erodible soil types, as defined in Appendix F.2 C of the Environment Guidelines document. They are the Brinklow-Blocktown channery silt loam (16D) and the Blocktown channery silt loam (116E). These soils are located on steep slopes and are generally contiguous with the stream valleys and drainage features throughout the property.

#### 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 were also evaluated.

The limitations for all development options (trails, playground, picnic and camping areas) generally posed the same limitations for development with a few exceptions. Severe limitations to development of paths and 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.

## 6. Habitats of Rare Threatened and Endangered Species

Cabin John Regional Park was surveyed for rare, threatened and endangered species several times, most recently during the summer of 1996, to determine the presence of rare and uncommon plant occurrences throughout the park. Rare and uncommon plant species were located within the park in two areas of the park. These areas were named by the Maryland National Heritage Program as the Campground Biodiversity Area (CBA) and Cabin John Biodiversity Area (CJBA). The CBA encompasses the entire northern section of Cabin John Regional Park north of Old Farm Creek and the CJBA occupies the area south of the PEPCO right-of-way to a point approximately 400 feet to the north of Democracy Boulevard. The boundaries of the areas are included on the NRMP site plan.

The CJBA is proposed for protection because it contains a small population of shingle oak (Quercus imbricaria). Shingle oak is a watchlist species which is found in Maryland in only a few sites outside of Montgomery County. The following is a list of the field verified rare and uncommon plant occurrences noted in the CBA and the CJBA.

**Table I-1 Rare and Uncommon Plant Occurrences**

Campground Biodiversity Area (CBA)

| Scientific Name | Common Name | Status |
|---|---|---|
| Aristolochia serpentaria | Virginia snakeroot | Watchlist, State |
| Castanea pumila | Chinquapin | Watchlist, State |
| Chamaelirium luteum | Devil's bit | Watchlist, State |
| Geum vernum | Spring avens | Watchlist, State |

Cabin John Biodiversity Area (CJBA)

| Scientific Name | Common Name | Status |
|---|---|---|
| Quercus imbricaria | Shingle oak | Watchlist, State |

**Source: Maryland Department of Natural Resources: BiodiversityProgram**

### 7. Breeding Bird Surveys

Breeding bird surveys were conducted in Cabin John 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 and "DC Birdscape" developed by the United States Fish & Wildlife Service. All surveys were conducted within "safe dates" as described in the Maryland/DC Breeding Bird Atlas Project Handbook, 1983-1987 (MOS & DNR, 1983) thus all birds observed were presumed to be nesting. Thirty, five-minute counts were used for the survey / All individuals seen or heard were recorded. The habitats surveyed were riparian floodplain forests, upland forest, open fields (mowed, cultivated or grazed uplands), hedgerows and edge. Survey plots were randomly chosen. Data on species and densities were gathered in a format compatible with the County's Geographical Information System (GIS) data base. 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.4. Additional information on breeding bird species is included in the bird checklist for the park, also included in Appendix F.4.

## 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 Cabin John 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 recommendations 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 recommendations were based on visual observations during site visits to the property, communications with park and planning staff and a compilation of existing literature recommendations. For recommendations which would require funding, cost and future staffing requirements are provided.

As mentioned in the NRI, Cabin John 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, rare, threatened and endangered species and their habitats, forests, wetlands and other sensitive natural resources are also addressed below.

## 2. High Priority General Recommendation

### a. Trail Stabilization

*Issue*

The natural trails within Cabin John 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. Many of these areas are located adjacent to Cabin John Creek where trail damage has been caused by misuse of the trail system by users wandering off the trails and into sensitive natural areas. When the overlying organic soils erode away and the mineral soils get compacted plants have a difficult time attaining water and nutrients from the soil and become stressed. Additional stresses from physical damage associated with trampling also contribute to the demise of plant material in the stream valley. 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.

*Recommendations*

The presence of large areas of highly erodible soils in Cabin John Regional Park, and the county and state wide concerns for water pollution by sediment erosion, were prime considerations in developing management recommendations for both park maintained and non-park maintained, "peoples choice" trails.

- Trails should be more clearly marked and delineated in the field by use of local stones, logs or more structural materials;

- A trail construction and design expert should be retained to recommend solutions for specific trail problem areas in the park, as they occur. 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 recommended management or design modifications which will provide the best long-term benefit to the park;

- Encourage volunteer "trail watch," or "adopt a trail" programs where organizations or individuals could monitor or maintain portions of a trail system. Participants could also serve to educate users on proper trail use within the park; and

- Recommend that public education about the potential environmental damages caused by "going off designated trails" be accelerated. This can be accomplished by making use of information kiosks and signage, trail postings and interpretive programs.

## I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

### b. Trail Development

*Issue*

In keeping with the natural resource management plan objectives to restore degraded communities and maintain the park at or below the conservation to development ratio, trail recommendations which 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 Cabin John 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 and character of proposed trail opportunities.

Currently, the Master Plan proposes a few natural surface trail connectors through the park which have the potential to impact existing natural communities. These include the proposed natural surface recreation trails north of Tuckerman Lane, along Snakeden Branch and near the indoor tennis court building.

*Recommendations*

All of the new trails proposed for this project have commonalities. They all are fully or partially located in forested areas, most have stream crossings associated with them, and they all are located in areas where existing maintained or un-maintained trails are common. The recommendations for siting these trails, if they are to be built, include the following;

- 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;

- When possible, trail patterns should consider utilizing existing maintained and un-maintained trail or utility 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;

- In forested situations it is recommended that root pruning and supplemental root fertilizers for tree protection precede mechanized disturbance for trail development;

- 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;

- Switchbacks should be used in areas where steep slope crossings are unavoidable; and

- Runoff diversion structures should be used in steep slope areas. These features should be located to minimize erosion potential and should consider safety issues.

### c. Invasive Exotic Species Management

*Issue*

Among the most wide-spread problems within the park is the invasion of native habitats by invasive exotic plant 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.

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 forest canopy and soil disturbance. The link between alien plant intrusion and land use has important implications for management.

*Recommendations*

Since most invasive species of plants 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 available soil moisture, available light, landscape position and other microclimatic features; however, the goal of all planting projects within the park should be to recreate ecologically healthy environments.

Ideally, 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 greatest threat to the native communities. These may be exotics that replace dominant species, exotics that reduce indigenous species diversity, exotics that significantly alter ecosystem function, exotics that persist indefinitely as reproducing or clonally spreading populations and exotics that are expanding locally. 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 by afforded by "armoring" the edge of the high quality area with shade species.

Additional recommendations for controlling the spread of invasive species include:

- Avoid soil disturbance within stable forest communities;

- Allow canopies to close over artificial pathways;
- Close unnecessary trails to traffic by piling brush or dropping unhealthy canopy trees on the existing trail;
- Direct development of new park facilities away from sensitive natural areas; and
- Implement pro-active measures such as herbicide applications, prescribed burns, or mechanical removal in certain areas.

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

### d. Protection of Rare, Threatened and Endangered Species and their Habitats

*Issue*

The Montgomery County Park system suffers from many specific and wide-spread 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).

*Recommendation*

Past and present land use practices often guarantee that some problems will remain as continued threats to native habitats. The increasing demands of an expanding population assures that forests and other natural communities will continue to be fragmented into ever smaller bits and pieces, until they are too small or isolated to self perpetuate (DNR, NHP 1993).

The Campground Biodiversity Area and the Cabin John Biodiversity Area identified in the NRI encompasses the northern section of the park. 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 these areas should consider the recommendations 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;

- Discourage illegal ATV and mountain bike use by posting park boundary;
- Establish a long term RTE species monitoring program;
- Monitor local deer population and its 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 recommendations above should be considered a high priority for the implementation of all new development oriented projects. Since the recommendations 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 recommendations is generally not difficult or costly to include in a development oriented application.

**e. 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 make 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.

*Recommendation*

It is recommended that steep slope areas be avoided during site planning activities, whenever possible. 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, it is recommended that the park 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 archaeologic 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 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.

### f. Locust Grove Nature Center

*Issue*

The Locust Grove Nature Center provides environmental education programs for school and scout groups and others. These programs usually include a 1/2 hour inside session followed by an outdoor hike in the park or occasionally at another host park. A variety of programs cater to people of all age groups and provide a valued service to the community.

*Recommendations*

The area of the park managed by staff at the Locust Grove Nature Center should continue to be managed as is. This includes the three meadows near the nature center, the songbird and bluebird shelter areas and the multitude of interpretive programs which are conducted at the center on a daily basis. It is recommended, however, that the nature center document the management strategies for maintaining these areas for the future use, especially if management personnel change over the years. Funding should also be appropriated for new trail maps which promote proper trail use.

## 3. Specific Natural Resource Management Recommendations

### a. Meadow Management

*Issue*

Cabin John Regional Park has a low diversity of habitat types within its boundaries when compared with other regional parks within the Montgomery County regional park system. The park is predominantly forested, which is good, however there are several areas that are currently maintained as meadows or are un-maintained meadows succeeding to forest. Several of these areas should be managed as meadows for the long term. Currently, most grasslands in Maryland are dominated by perennial cool season grasses and introduced species such as fescue. This was not always the case. Warm-season grasses made up most of the grasslands that existed in Maryland prior to the extensive use of fescue for cattle grazing and agricultural stabilization. Since the early 1970's, the decline of upland game and grassland birds have been sending a message to landowners and regulators throughout Maryland. Warm season grassland plantings are thought to be largely responsible for the recent rebound of upland birds in the Mid-West. These grasses have tremendous value as pasture forage, are considerably more palatable, produce significantly higher weight gain and are available as forage during the dry summer months. The target

species for this type of management will likely be native songbirds such as meadowlarks, grasshopper sparrows and other upland songbirds, as well as upland gamebirds such as quail and turkey. It should be noted here that upland game birds are not likely to utilize these areas unless there are local populations in proximity to the management area.

*Recommendations*

There are at least two areas which should be targeted for meadow management within the park boundaries. These include an upland, ridgetop meadow area south of the transmission line right of way in the western portion of the park and a portion of the bottomland meadow area below the Locust Grove Nature Center. 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.

The maintenance of warm season grassland habitat is more labor intensive than many other types of management since you are constantly battling succession. The Maryland Department of Natural Resources, Wildlife and Heritage Division and the United States Department of Agriculture, Natural Resources Conservation Service have produced habitat program recommendations for upland game and grassland bird nesting and brood cover which appear in Appendix F.5. These guidelines give specific direction for the establishment of native warm-season grasses. These guidelines include seeding recommendations for both upland and lowland soils, provide information on soil prep and planting dates and give information on post planting maintenance. The upland site will require more intense management because it is already in its later stages of succession. The initial soil preparation for this site will require initial bushog treatments followed by a fall herbicide treatment to discourage the existing woody growth.

After the warm season grasslands have been developed (usually 2-4 years), the sites should be revisited by a wildlife biologist to determine if appropriate nesting, escape and brood cover is available for target species. Changes in the maintenance strategy may be made at this time based on the current utilization of the area.

*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. With equipment rental and labor, the total first year cost is estimated at $2,700.

**b. Streambank Erosion Monitoring**

*Issue*

All of the streams within CJRP show signs of degradation from some pre-development reference. It should be understood that it is not possible to restore the stream systems to a pre-development

equilibrium without cost-prohibitive measures which would approach 'un-developing' the watershed, however partial restoration or stabilization of urban or semi-urban stream systems or stream segments can be achieved with careful planning. This planning includes evaluating the entire watershed, or sub-watershed supplying the stream. Areas of failing storm water management facilities, or areas in need of additional stormwater management facilities should first be identified. Next, areas of the stream that are degraded should be mapped and prioritized based on the level of degradation and positive and negative impacts on downstream areas. The level of degradation should be determined not only by visual observation, but by sound quantitative information. Finally, a comprehensive restoration plan can be developed that ensures a total environmental solution.

Presently, a broad range of structural and non-structural techniques exist for both stabilizing eroding stream banks and enhancing physical instream habitat. Structural measures include, but are not limited to, the following: rip-rap (placed, imbricated and traditional), parallel pipe systems, boulder placement, rootwads, wing deflectors, half logs, log check dams, jack dams, k-dams, bank covers, and rock vortex weirs. Non-structural bioengineering techniques include the use of coconut fiber rolls and/or mats in combination with vegetative plantings, live fascines, live willow stakings and brush bundles, etc. A third approach relies on the establishment of stream class-specific meander patterns and stream channel geometry for both enhancing bank stability and instream habitat (COG, 1996). Specific areas recommended for restoration activities are described below and illustrated in the accompanying NRMP map.

*Recommendations*

COG identified two areas within park boundaries which have severe stream channel erosion conditions. The first area lies on Lower Old Farm Creek from I-270, west to the confluence with Cabin John Creek. This section of stream drains primarily residential developments east of the park. There are approximately 1,200 feet of severely eroded channel within this reach which were targeted for stream channel stabilization by COG. Much of this reach near the confluence of Cabin John Creek has already been stabilized by large diameter rip-rap. The apparent problem area is located approximately 1,200 feet downstream from the park property boundary near the I-270 culvert. The recommended methodology for stabilization included placed and imbricated rip-rap; stone wing deflectors; root wads and boulder placement.

This area appears to be a very good candidate for a proactive stream restoration opportunity, however, prior to undertaking a costly enhancement program, erosion rates should be calculated to determine the rate of stream bank loss using quantitative data gathered for at least two years (preferably three) to establish bank erosion rates. Data should be collected at least once per year. It is recommended that a bank profile be created by establishing a control rebar in the stream bed and measuring perpendicularly in increments from that point to the top of each bank. Permanent cross sections should also be established in this area to monitor channel movement over time.

It is also recommended that a clear objective for future stabilization and restoration projects be established for the Cabin John watershed. Is the objective to enhance fisheries habitat? If so, what types of habitat structures are lacking and what species should the restoration be targeted? If the objective is to

reduce sediment losses from exposed stream banks to the Potomac river than this should be identified as the main objective of stream stabilization and restoration projects within the watershed. Other objectives such as aesthetic enhancement, protection of developed resources or other habitat modifications could also be the objective of these projects, but without clear direction on the objective, several design options are possible.

COG identified an area of severe stream channel erosion conditions on the mainstem of Cabin John Creek between Tuckerman Lane and Democracy Boulevard. Approximately 700 feet of severely eroded stream channel was identified by COG as a part of this study. The specific area is located approximately 1,100 feet downstream of the Snakeden Branch confluence to 750 feet upstream of Democracy Boulevard. The area of concern has relatively poor accessibility for heavy machinery.

This area of Cabin John Creek lies just below the confluence of Cabin John Creek and Old Farm Creek. Cabin John Creek has markedly different stream morphology features below the confluence as Old Farm Creek adds approximately 3.87 square miles of drainage area to the Cabin John mainstem. The stream widens significantly and displays a higher degree of downcutting when compared with the upgradient area. Degradation associated with previous development has not been adequately mitigated in this stream reach.

COG has recommended a range of measures for selective bank stabilization. These include stabilization of approximately 3,800 linear feet of bank using a combination of both bioengineering techniques such as wood or stone wing deflectors and rootwads and more traditional engineering techniques such as using placed and imbricated rip-rap and boulders.

This area is located within a dense riparian forest which runs through probably the most sensitive and aesthetically pleasing section of CJRP. Stabilization/Restoration of this area would require significant disturbance to the riparian forest within the park. Heavy equipment access would be needed along the floodplain which would likely require significant tree cutting, grading and overall disturbance. With the existing flashy low regime at CJRP, the effectiveness of bioengineering solutions using non-mechanized installation would be likely be poor.

As is the case for Old Farm Creek, a more quantitative study is recommended to determine the need for costly stabilization measures. This would include establishing several cross sections along the reach, performing profile and cross section analyses, and calculating erosion rates at several locations along each bank. Although the channel is incised, the channel may not be contributing significant erosion from its banks downgradient areas due to the type of bank materials. It is possible that the stream has channelized significantly to accommodate the urbanization in its upgradient watershed, if this is the case the benefit of a stabilization of restoration project could be quite small in terms of reducing sediment loads to the Potomac River. The price of a full blown restoration on this stream reach would be substantial. At least two years worth of data should be collected and a consensus on the objective of restoration should be determined prior to mobilization for stream channel restoration. The NRMP will recommend the locations and the type of sampling which should be conducted.

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*Cost*

(1) Lower Old Farm Creek

The need for restoration of this stream reach is dependent on a compilation of monitoring data, however this appears to be the highest priority of the stream sites due to the type of bank materials and the apparently elevated incision rates in this channel reach. Monitoring should be conducted by staff in the Natural Resource Management Unit. It is not anticipated that additional staffing will be required for this activity. The stream erosion monitoring can be conducted once per year. If bank erosion monitoring data concludes that erosion rates along this reach are elevated, stream channel restoration of this reach should be considered a moderate priority issue pending the objective of the restoration. Monitoring of this stream reach could be conducted by a consultant for approximately $3,600 per year. Existing M-NCPPC staff could likely conduct monitoring at a decreased cost of approximately $2,000.

(2) Tuckerman Road and Democracy Boulevard

Considering the residual effects of restoration of this reach (wetland and floodplain impacts, riparian forest impact), this stream segment would likely be of lower priority for restoration than the Old Farm Creek segment. If monitoring conducted by staff in the Natural Resource Management Unit indicates that erosion rates along this reach are elevated, stream channel restoration of this reach should be considered a moderate to low priority issue pending the objective of the restoration.

### c. Stormwater Management

*Issue*

There are several stormwater management issues which should be addressed related to existing and proposed facilities at CJRP. All storm flows are currently conveyed through a series of natural and man-made structures, eventually discharging to Cabin John Creek. The bulk of the stormwater leaving the CJRP property is generated from the area near the ice rink and ballfields. This stormwater is directed from the impervious surfaces (parking lots, roads, ice rink, etc.) to channelized conveyance structures to the north which coalesce to form a tributary to CJRP. The channels are deeply incised, some showing recent erosion as evidenced by the exposed tree roots which have been undercut.

In addition to quantity concerns, several areas of non-compliance were noted with the CJRP maintenance facility and were documented during inspections conducted by M-NCPPC staff in the Fall of 1996. These inspections were conducted to maintain compliance with the Maryland Department of the Environment's National Pollution Discharge Elimination System (NPDES) regulations (promulgated by the Montgomery County Department of Environmental Protection).

*Recommendations*

The non-compliance issues specific to the Cabin John maintenance yard resulted in the following corrective action recommendations.

- Institute a routine clean-out program of the three oil/grit separators and the sand filter;
- Remove scattered debris (drums, rusting metal, tires, treated wood. etc.) from storm water runoff area by removing from premises (recycle) or store under covered shelters;
- Install a vent in the pesticide storage area;
- Cover vehicle fueling station in maintenance yard;
- Perform routine maintenance activities including;
    - avoid performing vehicle maintenance operations outdoors
    - provide yearly training sessions in good housekeeping
    - conduct routine NPDES inspections
    - store waste oil, antifreeze in closed containers
    - Eliminate open drain buckets of oil
    - have absorbents on hand to clean-up spills, leaks
    - utilize secondary containment in fluid storage areas

A copy of the revised Stormwater Pollution Prevention Plan for the Cabin John maintenance yard appears in the Appendix F.6. A concept schematic for the vehicle washing unit is also included in the Appendix F.6.

The existing stormwater conveyance channels near the ice rink which are causing new erosion should be diverted to nearby channels which are more stable. The older channels have incised to a point where very little erosion is currently taking place. Channel materials are composed primarily of fine grained materials and the channels are further stabilized by herbaceous and woody root material. The newer channels are characterized by obvious channel incision caused by accelerated runoff from the road system. The location of these areas is documented on the NRMP site plan. Preliminary stormwater management planning for the ice rink expansion project is currently addressing these issues as part of the overall design process for the facility.

*Cost*

Cost of completing the items above is estimated at $4,000.

**d. Reforestation**

*Issue*

The majority of CJRP is forested and the areas which are not forested are generally developed by recreational facilities such as the ice rink, tennis courts, ballfields, picnic area, etc. The inventory of old field successional areas indicate that there are only a small number of areas which would be potentially

suitable for reforestation areas. These include an area just south of the PEPCO right-of-way and west of Cabin John Creek which is currently undergoing afforestation naturally; an area just north of the tennis facility which is currently managed as a meadow; and another area east of the tennis facility which is also undergoing natural afforestation. These areas are currently providing needed habitat diversity to the natural landscapes within the park.

*Recommendations*

The areas that are suitable for reforestation efforts within the park are generally small areas along the floodplains of Cabin John Creek which have been impacted by natural events such as gypsy moth infestation and changes in water regimes from upstream development or beaver activity. An area along Cabin John Creek, just to the south of Tuckerman Lane appears to have been impacted by beaver damage. This area appears suitable for riparian reforestation. The area is relatively small, has good access and appears to have suitable alluvial soils for planting. The area has been regenerating well on its own, however woody material appears patchy and could use some "help" in the form of hearty, native container stock.

In addition to the two areas mentioned above, it is recommended that reforestation of the stream edge in the meadow below the tennis facility be accomplished with a mix of shrub and canopy species which would serve as shading to Cabin John Creek. It is recommended that this forested stream buffer should extend between 25 and 50 feet from the streams edge. Live staking of the streambanks in this area is also recommended. The incorporation of these plantings should be able to accommodate the existing trail alignment.

*Cost*

The cost of reforestation, assuming approximately 2 acres of riparian forest corridor are to be reforested along Cabin John Creek is estimated at $12,800. The elevated per acre cost is due to poor access and working conditions along the stream valley.

**e. Pond Management**

*Issue*

An area just downgradient of the maintenance facility and abutting the PEPCO right-of-way is another area which has been impacted by beaver activity. The area is currently inundated with water to a maximum depth of 2-3 feet. The area has also been impacted by the construction of the power line, the maintenance facility haul road and associated infrastructure. Largely by accident, the area provides aquatic habitat diversity to the park in the form of amphibian and waterfowl habitat as well as wetland plant and animal habitat. The area is inundated throughout much of the year, but always in the winter. In effect, the area functions as a greentree reservoir, providing habitat for wintering migratory bird species as well as deer, turkey, raccoon and other furbearers.

The intent for this area is to enhance winter forage for waterfowl by encouraging the growth of fringe annual herbaceous species such as rice cutgrass and smartweed. Minimal management effort would be required for this activity. There is also suitable acreage within the area for woody plantings of water loving tree and shrub species.

*Cost*

Estimated cost for seeding and perimeter tree and shrub planting in this area is dependent on the degree of cover desired. Costs for seeding and limited tree and shrub planting could be as low as $2,500 for the first planting season, and annual supplements in subsequent years estimated at $200 per year.

### f. Emergent Wetland Enhancement and Education Area

*Issue*

An emergent wetland area originating from a spring seep near the Locust Nature center harbors a diverse array of aquatic plant and animal species. This area is used as an interpretive area for nature center users while providing habitat and water quality attributes to the watershed. The accessibility to the area, the small grading and engineering requirements and the wetland to watershed area ratio indicate that the site has good potential for wetland enhancement /enlargement.

*Recommendations*

Cost sharing arrangements are possible because wetland mitigation acreage is scarce in the area, thus the expansion of the wetland area could potentially be funded by an outside source if that was consistent with the policies/objectives of M-NCPPC. Enhancement would likely involve minor grading and subsequent planting of emergent and scrub-shrub vegetation. Forested plantings could also be considered since forested mitigation is generally requested by MDE. The park would benefit from having an expanded interpretive area with multiple habitat types and the watershed would benefit from the addition of wetland acreage within the drainage. A boardwalk type footpath would allow use of the site for interpretive purposes if wetland expansion is undertaken.

*Cost*

Market value for wetland creation in Maryland is generally between $35,000 and $60,000 per acre for design, construction and planting. Since the creation area will require minimal grading, the cost should be on the low end of the range, however, costly emergent planting will likely add significant cost to the project. Assuming 0.5 acres of creation is available, approximately $22,000 should be allocated for the development of additional wetlands in this area.

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### g. Spring Identification

*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.

*Recommendations*

Since the locations of these sensitive environmental features have such 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 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.

*Priority and Cost*

The cost of this survey is estimated at $2,000. This includes field identification, surveying and data compilation. This is a moderate priority item, especially if additional recreational complexes such as playgrounds or picnic areas are planned within the park boundaries.

### h. Invasive/Exotic Species Management

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.

Only one existing area within CJRP was targeted for pro-active management. This area, lies along the southern edge of the PEPCO transmission line right-of-way. The right-of-way serves as a breeding ground for the spread of invasive exotic species. The southern aspect of the right-of-way receives the most sunlight and therefore is plagued by a higher degree of invasive exotic cover. Since the right-of-way is an open corridor (maintained by periodic mowing) sunlight can penetrate into the forest understory allowing the spread of invasives into the existing high priority forests. Since the forests along the south side of the right-of-way corridor 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 canopy trees which will quickly provide shade to the forest edge.

*Cost*

The cost of edge armoring for the approximately 1,600 linear foot section of right-of-way is estimated at $10,000.

**i. Active Use Canopy Protection Areas**

*Issues*

Picnic areas and other high use areas located beneath forest canopies have unique management implications required to protect the shade trees which make the areas so appealing. Protection of the fragile fibrous root systems of these trees is required for proper nutrient and mineral uptake necessary for normal growth and vitality of the canopy trees in the area.

*Recommendations*

It is recommended that these areas be aerated and mulched in the spring mid-summer of each year by lightweight equipment or hand application. It is also recommended that use of the most popular picnic sites be rotated to accommodate restoration in these areas.

*Cost*

This task should not require additional staffing requirements or CIP requisition. Mulch cost is estimated at $16 per yard. The area required for mulch application is approximately $2,100 per year for materials.

**j. Fish Blockages**

*Issue*

Fish blockages prevent the movement of fish species through a given stream reach. Blockages may be natural as in the case of log jams or bedrock features, or they may by unnatural as in the case of culvert blockages, utility pipes or debris.

*Recommendations*

It is highly recommended that fish blockages resulting from manmade or natural structures be field located and removed to allow the tributaries of Cabin John Creek to benefit from the existing fish assemblages in the mainstem reach. The intent is not to remove good habitat structure, but to allow the normal migration of fish to supporting habitats which may be currently under-utilized. In areas where man-made blockages such as exposed water and sewer pipes, or high culverts are the principal source of the blockages, responsible parties should be notified to take corrective actions.

*Cost*

The cost of periodically locating and dismantling fish blockages is estimated at $2,000/year.

## D. NATURAL RESOURCE IMPLICATIONS OF DEVELOPMENT PROPOSALS

Based on an analysis of environmental buffer constraints within the park and access issues, there are very few contiguous areas suitable for development within Cabin John Regional Park. The only truly suitable development areas have already been developed to a large extent by the active use areas, the picnic areas and the maintenance facility. Although there are some patches of suitable development acreage available throughout the park, the access to these areas is limited and the associated environmental externalities which could occur as a result of accessing these sites and bringing utilities and other infrastructure to these areas would likely outweigh the benefit of developing these small parcels for recreation. Fragmentation of existing contiguous greenspace is a nationwide concern for the proper movement and of both plant and animal species throughout a given range. The proper movement of species throughout this range, will theoretically allow for the exchange of genetic information among species and subspecies maximizing genetic diversity. The park system provided by M-NCPPC provides an excellent example of urban greenway initiative that provide extended greenspace corridors which maximize the opportunity for species movement and genetic transfer. The Cabin John greenway system extends from the Montrose Road interchange on Interstate 270 all the way to the Potomac River. Movement is stalled by the presence of Tuckerman Lane, Democracy Boulevard, Bradley Boulevard, River Road, the Capital Beltway, Cabin John Parkway and Mac Arthur Boulevard which bisect and fragment the park.

The greenway system has already been impacted by road networks, some which have predated the development of the greenways. Further development within the greenway system should be sited carefully with the idea of keeping as much of the current natural character of the park intact. The west side of Cabin John Creek in CJRP, with the exception of the maintenance facility has remained undeveloped. With limited access and the current continuity of this corridor, the western portion of the park should remain undeveloped. Consideration for promulgation of this initiative should be considered for CJRP.

### a. Expansion of Existing Ice Rink Facility & Parking Area

According to preliminary concept plans, environmental impacts associated with the construction of the new ice rink facility will include limited forest clearing associated with the new ice rink footprint, stormwater management infrastructure, and expanded parking areas. According to the concept plans, the ice rink will require minor clearing just to the south of the existing facility. The parking area will require additional clearing south of the access road to the park. Stormwater management infrastructure will likely require limited clearing in the area just north of the ballfields located at the end of the access roadway. A detailed forest stand delineation was conducted on a portion of the CJRP property which was proposed for development (CEM, 1996). A Preliminary Forest Conservation Plan (FCP) has been submitted and approved by M-NCPPC, EPD. Wetlands were also delineated on the portion of the

property proposed for development. According to a review of the concept plans, no wetland impacts were proposed.

**b. Expansion of Existing Tennis Facility & Parking Area**

Existing concept plans indicate the expansion of the tennis facility will include a net gain of 36 parking spaces and 6 additional tennis courts. Environmental impacts include the removal of approximately 0.33 acres of existing forest for tennis courts and stormwater management and the addition of significant impervious area. The building was sited to minimize infringement on the stream buffer shown on the NRMP site plan. There are approximately 200 feet of non-constrained development area to the west of the existing facility and approximately 350 feet of area fronting the southwest corner of the building which is non-constrained. The current footprint for the facility makes the best use of the non-constrained area for expansion.

**c. East West Trail Corridor Connecting Regional Trails South of Seven Locks Road**

Current plans for providing a East-West trail corridor to regional trails south of Seven Locks Road, will utilize the existing PEPCO right-of-way which contains a maintained crossing of Cabin John Creek for access to the west. However, in the event that this alignment cannot be used, an alternative alignment has been proposed which would require an additional crossing of Cabin John Creek and impacts to an expansive riparian wetland system on both sides of Cabin John Creek. It is strongly recommended that if the PEPCO right-of-way cannot be used, a new crossing location be selected which minimizes impacts to riparian wetland areas along the creek. An area near the Locust Grove Nature center meadow appears to be a suitable alternative for the crossing.

The new crossing would require authorizations from MDE (Non-tidal Wetlands and Waterways Permit and a Waterway Construction Permit) and potentially authorizations from the United States Army Corps of Engineers (MD General Permit) if the bridge is constructed as a culvert instead of as a pile supported structure.

The Department of Permitting Services of Montgomery County would also require a building permit which would require an environmental review. The anticipated time for requisition of all of these permits would depend on the design, however it would likely take between 200 and 300 days and a significant amount of engineering and technical support.

**d. Sewer Utility to Overnight Campground**

The optimum alignment for sewer and water utility for the overnight campground would be along the existing roadway which parallels Cabin John Creek. Impacts to forest resources on-site would be minimal and buffer impacts would be temporary.

## I. NATURAL RESOURCE MANAGEMENT PLAN FOR CABIN JOHN REGIONAL PARK

### e. Natural Surface Recreation Trail North of Tuckerman Lane

The proposed trail north of Tuckerman Lane would require 4-5 stream crossings and potential impacts to non-tidal wetlands. The alignment will also require at least temporary disturbance of the forest understory and potentially a handful of canopy trees. Since the trail will be a natural surface trail, these impacts can be minimized through careful alignment planning and by minimizing the use of heavy equipment for trail creation. Trail development in this area should follow the recommendations presented in Section IV.C.2.b.

## E. SUMMARY OF NATURAL RESOURCES MANAGEMENT RECOMMENDATIONS

Responsible natural resource management within Cabin John Regional Park is vital to the success of the park as a multi-purpose park facility. The park is currently very heavily used, perhaps overused on a regional scale. In order to perpetuate the use of the park's natural attractions, the following recommendations should be considered for the long-term management of the CJRP natural resources.

The following table summarizes the recommendations, corrective actions, costs and cost appropriation strategy associated with the activity.

**Table IV.2 Summary of Specific Natural Resource Management Recommendations**

| Priority | Action | Location | Cost | CIP | Additional Staffing Requirements |
|---|---|---|---|---|---|
| High | Meadow Management | Bottomland and Upland Sites | $2,700 | Y | Park Staff |
| High | Streambank Erosion Monitoring | Cabin John Creek and Old Farm Creek | $2,000 | N | M-NCPPC Staff + Seasonal Hire |
| High | Stormwater Management | Maintenance. Facility | $4,000 | Y | Contractor |
| Moderate | Reforestation | Along Cabin John Creek | $12,800 | Y | Contractor or Staff |
| Moderate | Pond Management | Near Maintenance Facility | $2,500 | N | Park Staff |
| Moderate | Emergent Wetland Enhancement and Education Area | Below L. Grove Nat. Center | $22,000 | Y | Contractor |
| Moderate | Survey Spring Areas | Throughout Park | $2,000 | N | Existing Staff |
| Low | Invasive/Exotic Species Management | Along PEPCO ROW | $10,000 | Y | Contractor |
| Low | Active Use Canopy Protection Areas | Picnic Area | $2,100 | N | Park Staff + Seasonal Hire |
| Low | Locate Fish Blockages | Throughout Park | $2,000 | N | Existing Staff |