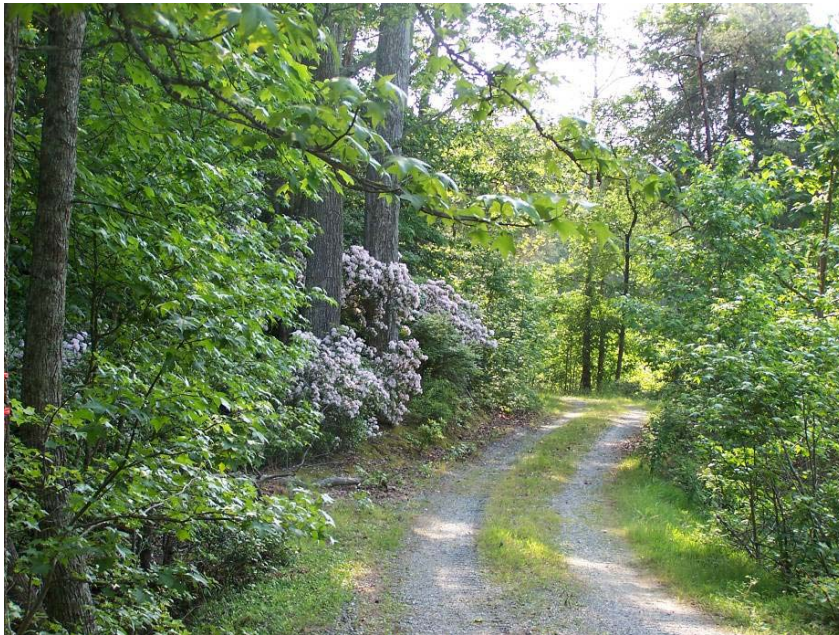


FINAL FLORA SURVEY REPORT

For

**Proposed UniStar Nuclear Project Area
Calvert Cliffs Nuclear Power Plant Site
Calvert County, Maryland**



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May 2007

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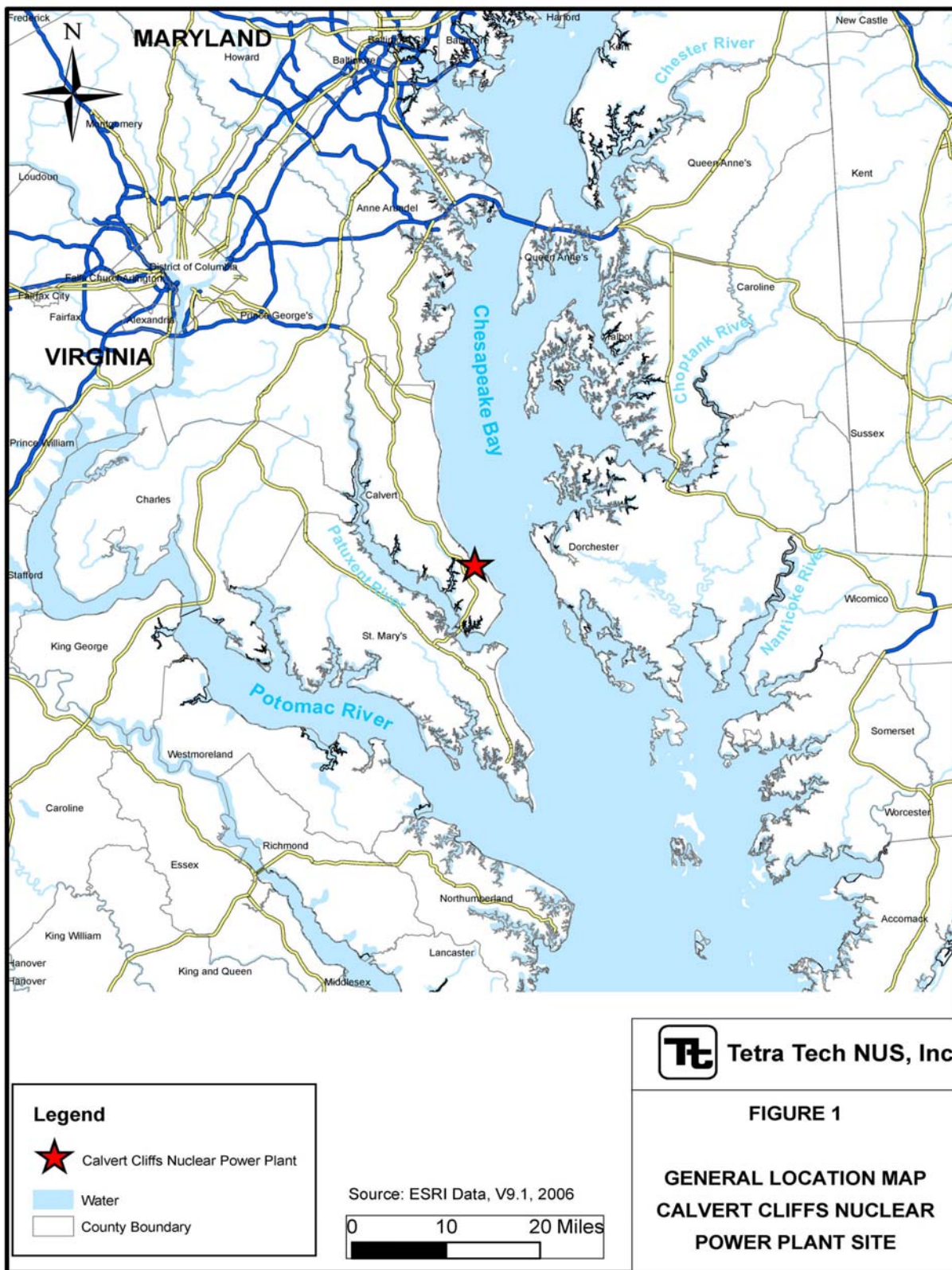
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INTRODUCTION

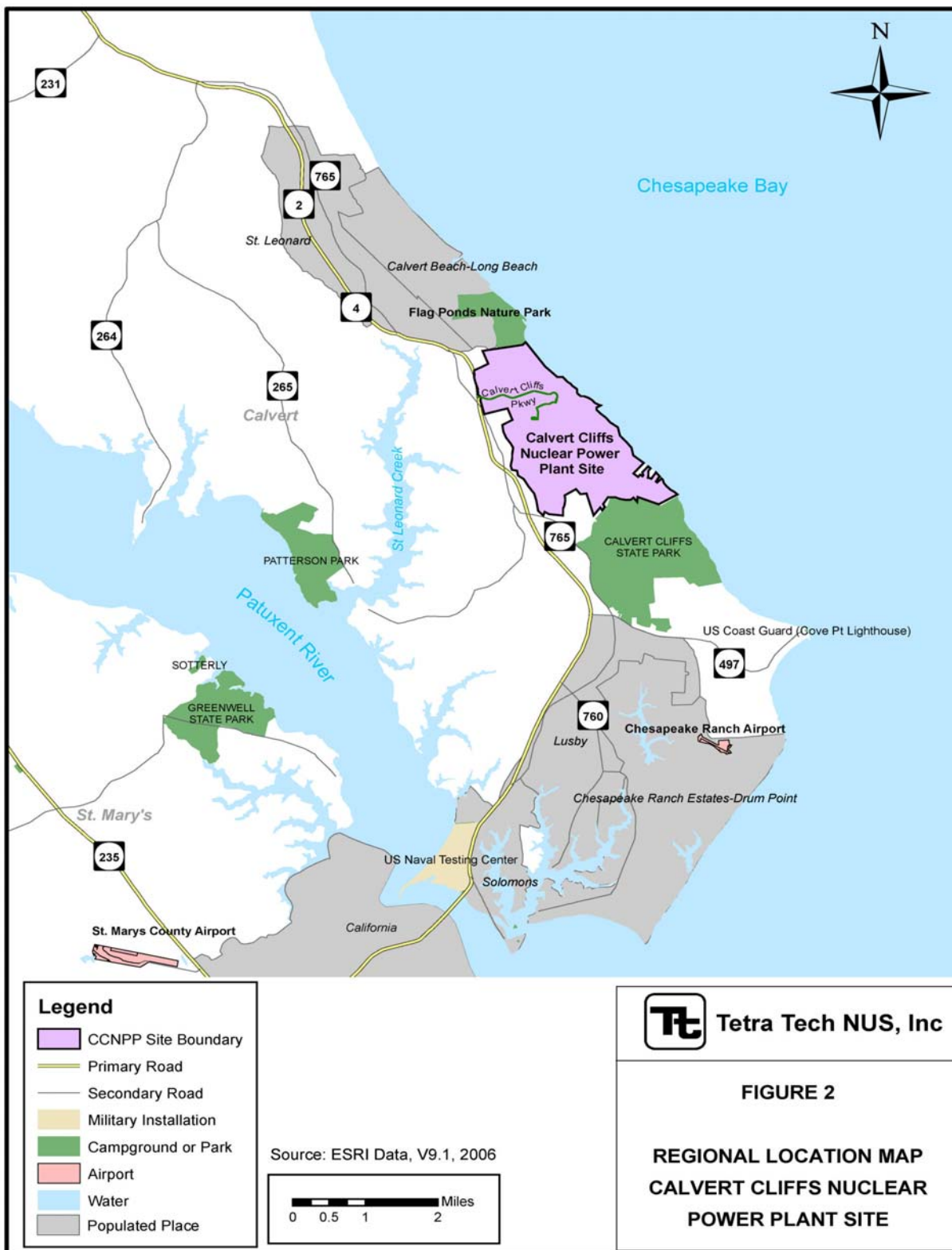
This Flora Survey Report presents the results of studies to describe and map plant communities on Constellation Energy's (Constellation's) Calvert Cliffs Nuclear Power Plant (CCNPP) Site in Calvert County, Maryland, including a tract of land on which UniStar Nuclear Development, LLC is considering the construction of a new nuclear power plant unit. Development of the new plant would require approval by the U.S. Nuclear Regulatory Commission (NRC) of a combined (construction and operating) license application (COLA), including an Environmental Report (ER), which documents the safety and environmental analyses for the facility. Plant development would also require approval by the Maryland Public Service Commission (PSC) of an application for a Certificate of Public Convenience and Necessity (CPCN), which similarly documents project environmental impacts. This report provides background data on existing vegetation resources to support these environmental impact assessments.

The CCNPP Site consists of 2,057 acres (832 hectares) on the western shore of the Chesapeake Bay in Calvert County (Figures 1, 2 and 3). The two existing CCNPP units (Units 1 and 2) are located in the east-central part of the CCNPP Site. The remainder of the CCNPP Site not associated with the existing power plant facilities is predominantly forest with some cleared land. The Chesapeake Bay shoreline (eastern perimeter) consists mostly of steep cliffs with little beach area. South of the existing units is a former recreational area known as Camp Conoy. Camp Conoy is accessed using a single-lane paved roadway (Camp Conoy Road) that runs north from the southern perimeter of the CCNPP Site. Camp Conoy contains various cabins, outbuildings, swimming pool, softball field, tennis courts, and a fishing pond formerly used by Constellation employees and their families.

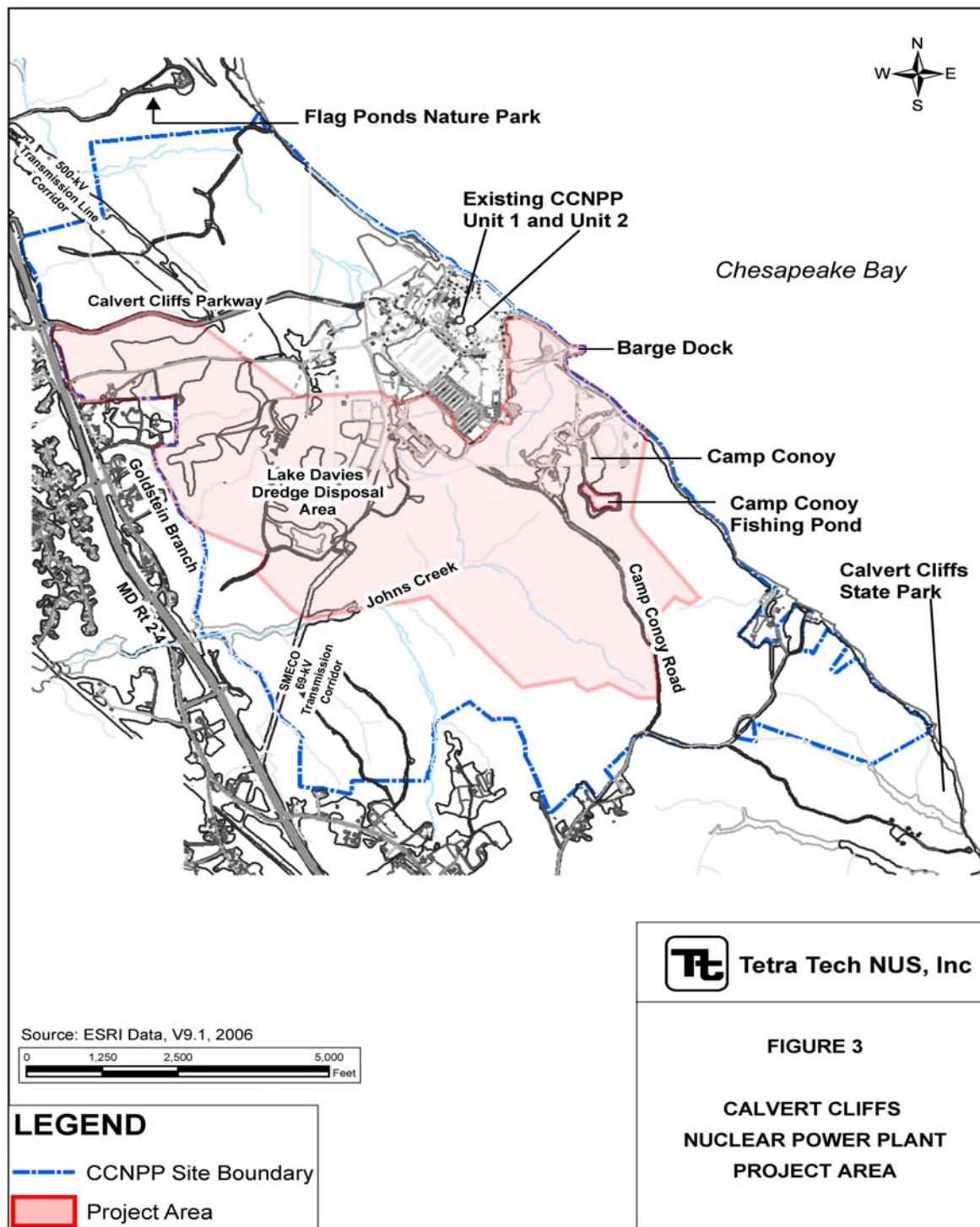
Under current plans, the new generating unit and associated facilities would be located within an area of the CCNPP Site south and west of the existing CCNPP Units 1 and 2, termed for convenience in this report the "Project Area" (Figure 3). Elevations in the Project Area range from sea level to nearly 150 feet (46 meters) (USGS, 1987). Topography is rolling, dissected by a dendritic pattern of stream valleys. Slopes on the sides of the stream valleys frequently exceed 15 to 25 percent. Slopes elsewhere are gentle. Most lands east of Camp Conoy Road drain east, directly into the Chesapeake Bay. Most lands west of Camp Conoy Road drain into a system of headwaters that coalesce to form the west-flowing Johns Creek. After exiting the western perimeter of the Project Area, Johns Creek flows west to the western perimeter of the CCNPP Site and then St. Leonard Creek, a tidal tributary of the Patuxent River. Lands in the northern part of the Project Area drain to Goldstein Branch, a tributary of Johns Creek (USGS, 1987). Tidal water on the CCNPP Site is limited to the Chesapeake Bay shoreline; all streams on the Project Area, and elsewhere on the CCNPP Site, are non-tidal (MDNR, 2005 and onsite observations in 2006).



k:\gproject\calvertcliffs\maps\Figure 1 Gen Loc Map A.mxd



k:\gproject\calvertcliffs\maps\Figure 2 wetlands report original.MXD



This report includes characterization of vegetation resources for the entire CCNPP Site, with particular emphasis on the Project Area. This report complements a faunal survey report (Tetra Tech NUS, 2007a), rare plant report (Tetra Tech NUS, 2007b), and wetland delineation report (Tetra Tech NUS, 2007c) performed at the same time for the Project Area.

METHODOLOGY

J. Peyton Doub, PWS, CEP, made flora observations in the Project Area between early May and early October 2006 and in the remainder of the CCNPP Site in early January 2007. Mr. Doub returned to the Project Area to make observations of early spring flowering plants in mid-April 2007. The observations were made concurrent with the conduct of other natural resource investigations, including delineating and characterizing wetlands and identifying terrestrial wildlife. On-the-ground observations of vegetation on the entire CCNPP Site and data from the formal wetland delineation study of the Project Area, were coupled with imagery from black and white vertical aerial photographs dated April 1993 (Terraserver, 2006) and undated color infrared vertical aerial photographs from the 1990s, provided by CCNPP personnel (CCNPP, Undated) to identify and map plant communities on the CCNPP Site. Mr. Doub drove the extensive fire road system throughout the CCNPP Site and walked densely vegetated areas and roadless areas as necessary to determine the composition and approximate boundaries of differing plant communities. Each plant species observed in each plant community type was noted (Table 1). Table 1 also notes the various field guides and taxonomic references used to identify and describe the observed plant species.

PLANT COMMUNITY DESCRIPTIONS

Plant communities consist of repeating groups of associated plant species that may display either discrete geographic boundaries between adjoining plant communities or diffuse or transitional gradations (Mueller-Dombois and Ellenberg, 1974). Discrete boundaries often reflect boundaries between areas of differing land use history (e.g., the position of former farm fields and woodlots); while transitional gradations, termed “ecotones”, generally reflect gradual changes in physical site characteristics such as soil types or hydrology. Specific combinations of associated plant species are commonly referred to as “plant community types” or “associations”. Individual spatial occurrences of a plant community type (association) are commonly referred to as “stands”.

The vegetation on the CCNPP Site can be broadly differentiated into the plant community types described below and shown on Figure 4. Ecotones between these plant community types exist; hence, the plant community type boundaries shown on Figure 4 are approximations. Each plant community consists of

vertically distinct layers of vegetation referred to as vegetative strata. The vegetative strata used in the descriptions are defined as follows:

- Canopy: woody plants over 20 feet (6 meters) in height and over 5 inches (13 centimeters) in diameter at breast height.
- Subcanopy (Sapling): woody plants over 20 feet (6 meters) in height and under 5 inches (13 centimeters) in diameter at breast height.
- Shrub: woody plants over 3 feet (0.9 meters) in height and under 20 feet (6 meters) in height.
- Groundcover (Herb): woody and non-woody plants (including forbs, grasses, graminoides [grass-like plants such as sedges and rushes], ferns, and bryophytes [mosses]) under 3 feet (0.9 meters) in height.

These definitions, which were initially developed for wetland delineation purposes (FICWD, 1989), provide a useful framework for general characterization of most vegetation in the eastern United States.

Lawns and Developed Areas (L/DA Column in Table 1, Gray in Figure 4). Lawns and developed areas occur over a broad area in the east-central part of the CCNPP Site (surrounding the two existing CCNPP reactor units) and in Camp Conoy. The two existing reactors and the associated buildings, parking lots, and other pavements form a broad area of impervious surfaces that lack vegetation. Where vegetation exists close to these facilities, it generally consists of regularly mown grass, ornamental landscaping, or sparse coverage by ruderal (weedy) grasses and forbs growing amid gravel or compacted soils. Camp Conoy includes several athletic fields and other lawn areas surrounding recreational facilities.

Other than scattered trees and shrubs planted as ornamental landscaping, the lawns on the CCNPP Site consist only of a groundcover stratum. Most of the lawns consist of cool season grasses (grasses that typically seed during spring and fall) such as tall fescue (*Festuca arundinacea*), bluegrass (*Poa pratensis*), large crabgrass (*Digitaria sanguinalis*), and Bermuda grass (*Cynodon dactylon*). Common broadleaf weeds typical of lawns are also present, such as white clover (*Trifolium repens*), broadleaf plantain (*Plantago major*), dandelion (*Taraxicum officinale*), and yellow hawkweed (*Hieracium pretense*). Many of the grasses and forbs are annual plants, i.e., plants that live for only one growing season and reestablish the following growing season only through seeding. Examples include large crabgrass and barnyardgrass (*Echinochloa crus-galli*). Others, such as tall fescue and common dandelion, are perennial and persist over multiple growing seasons. Many of the grasses and broadleaf weeds in the lawns are non-native species introduced from Eurasia.

The lawns of Camp Conoy were regularly mowed through the 2005 growing season but left unmowed throughout 2006. If continued to be unmowed, the dominant cool-season lawn grasses would be gradually displaced by warm-season grasses (grasses that typically seed during summer) and broadleaf herbaceous plants (forbs), converting to an old field plant community (described below). The process by which plant communities change floristic composition over time in the absence of physical disturbance is termed succession.

The lawns and developed areas on the CCNPP Site generally provide poor wildlife habitat, although the faunal survey noted several mammals and birds on the lawns at Camp Conoy (Tetra Tech NUS, 2007a). The proximity of the lawns and developed areas on the CCNPP Site to extensive areas of forest, wetland, and old field vegetation explains the abundance of wildlife in what would otherwise constitute poor habitat. The Camp Conoy lawns had been regularly mowed up through the end of the 2005 growing season, but no mowing was conducted in 2006. The grasses remained short until the middle of the 2006 growing season, when they went to seed. By the end of the 2006 growing season, the lawns had begun to transition to old field vegetation and may have attracted some wildlife favoring old field vegetation.

Old Field (OFV Column in Table 1, Yellow and Light Brown in Figure 4). Old field vegetation establishes in physically disturbed areas (such as abandoned farm fields and lawns) in the eastern United States following abandonment but before the establishment of forest cover (Mueller-Dombois and Ellenberg, 1974). In contrast to the cool season grasses and annual broadleaf forbs that are common in lawns and cultivated areas, old field vegetation typically consists of dense patches of perennial warm-season grasses and perennial forbs with scattered shrubs and tree seedlings and saplings. Vegetative strata include a dense groundcover and sparse or patchy shrub stratum, with widely scattered trees or tree saplings in places. There are no distinct tree canopy or subcanopy strata.

Two main floristic types of old field vegetation occur on the CCNPP Site. The first (Yellow on Figure 4) is located over most of the dredge spoil disposal area commonly referred to as “Lake Davies”. The dredge spoils extend west from the existing reactors across the west-central part of the CCNPP Site. The other old field vegetation (Light Brown on Figure 4) occurs in several areas, including:

- scattered forest clearings around the perimeter of the Lake Davies dredge spoils;
- former farm land, located primarily in the vicinity of Road B and including a large, prairie-like area northwest of the existing power block area;
- electric transmission corridors;

- along roadsides; and
- on steep cliffs abutting the Chesapeake Bay where gradual erosion has prevented the establishment of permanent forest cover.

Constellation reports that farming practices were discontinued on former agricultural land on the CCNPP Site within the past ten years and that much of this land is currently in the Maryland Conservation Reserve Enhancement Program (CREP) and maintained by mowing every few years. Some other Old Field vegetation communities on the site are also artificially maintained (e.g., on the electric transmission corridors).

The old field vegetation on the dredge spoils (Yellow on Figure 4) consist of a dense stand of the invasive exotic grass, phragmites (*Phragmites australis*) (Photo 1). Phragmites is a perennial grass that can grow to more than 10 feet (3 meters) tall and commonly infests brackish and fresh tidal and non-tidal marshes. It does not generally establish in well-drained old fields but is common on well-drained dredge spoil piles in coastal areas (Marks *et al.*, 1993). Its presence over much of the Lake Davies dredge spoil disposal area is likely a result of propagules (seeds and rhizome fragments) contained in the dredge spoils when they were initially excavated out of the Chesapeake Bay. Other plants typical of old fields, such as common blackberry (*Rubus allegheniensis*) and tall fescue, are also common on the dredge spoils, but they are not as prevalent as phragmites. Shrubs typical of the upper edge of brackish coastal marshes such as groundsel tree (*Baccharis halimifolia*) and wax myrtle (*Myrica cerifera*) also occur frequently amidst the phragmites on the dredge spoils. These too may have originated from seeds or other propagules contained in the dredge spoils at the time of initial excavation.

Phragmites also dominates vegetation in several wetland areas lacking substantial cover by trees and shrubs. These areas are considered to be herbaceous marsh vegetation, described below (HVM Column in Table 1, Light Blue in Figure 4). The composition of associate (non-dominant) plant species in phragmites-dominated vegetation on uplands and wetlands differs substantially.

The other old field vegetation on the CCNPP Site (Light Brown on Figure 4) is highly variable in floristic composition. Photo 2 depicts old field vegetation on the corridor of the 500-kV transmission line connecting to the CCNPP Switchyard. Photo 3 depicts old field vegetation near the existing CCNPP Barge Dock southeast of the existing CCNPP units. Many localized areas of this vegetation are dominated by tall fescue, sericea lespedeza (*Lespedeza cuneata*), common blackberry, Canada goldenrod (*Solidago canadensis*), and asters (*Aster* spp.). Tall fescue is a coarse, non-native, cool-season grass that forms dense, deep-rooted tufts. It is widely used for erosion control and is a component of most seed mixes approved for erosion control by the State of Maryland (MDE, 1994).

Sericea lespedeza is a non-native leguminous forb that is widely planted for erosion control and for soil improvement (Ohlenbusch and Bidwell, 2001). Although regarded as beneficial for their soil conservation properties, both plants also aggressively compete with native vegetation and are regarded as invasive exotic plants by the State of Maryland (MDNR, 1997).

Most areas of old field vegetation on the CCNPP Site are in close proximity to forest vegetation and thus provide good habitat for wildlife favoring forest edges and patchy forest and old field landscapes. The most example of wildlife favoring such landscapes is white-tail deer (*Odocoileus virginianus*). Numerous white-tail deer were observed in old field habitats in the Camp Conoy and Lake Davies areas of the CCNPP Site in 2006 and early 2007 (Tetra Tech NUS, 2007a). Phragmites is recognized as being a generally poor food source for most wildlife (Thunhorst, 1993); hence, the extensive stands of phragmites in the Lake Davies area undoubtedly constitute poorer wildlife habitat than the more diverse old field habitat elsewhere on the CCNPP Site. Some of the larger patches of old field vegetation lacking phragmites, especially the fields northwest of the existing facilities, the former agricultural fields in the western part of the CCNPP Site, and the open areas directly south of the Lake Davies areas might provide habitat for birds favoring grassland habitat such as eastern meadowlarks (*Sturnella magna*) and bobolinks (*Dolichonyx oryzivorus*). Populations of grassland-favoring species have experienced recent declines in the eastern United States due to loss of pastures and old fields to more intensive cropping, urban development, and regenerating forest vegetation (Askins, 2000).

Mixed Deciduous Forest (MDF Column in Table 1, Light Green in Figure 4). Most forested uplands on the CCNPP Site support deciduous forest whose canopy is dominated by tulip poplar (*Liriodendron tulifera*); chestnut oak (*Quercus prinus*); white oak (*Quercus alba*); red oaks such as black oak (*Quercus velutina*), southern red oak (*Quercus falcata*), and scarlet oak (*Quercus coccinia*); American beech (*Fagus grandifolia*); and Virginia pine (*Pinus virginiana*). All are regionally indigenous to, and common in, southern Maryland (Brown and Brown, 1972). Photo 4 depicts a typical area of mixed deciduous forest on a slope west of Camp Canoy Road in the central part of the CCNPP Site. Many of the canopy trees exceed 18 inches (46 centimeters) in diameter at breast height. Some of the larger oak, tulip poplar, and American beech trees exceed 30 inches (76 centimeters) in diameter at breast height and meet the State of Maryland definition for a specimen tree (MDNR, 1997). These larger trees typically occur on slopes adjoining streams. Other frequently-occurring canopy trees include hickories such as pignut hickory (*Carya glabra*) and bitternut hickory (*Carya cordiformis*), red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), swamp chestnut oak (*Quercus michauxii*), and black gum (*Nyssa sylvatica*).

The subcanopy stratum in the mixed deciduous forest on the CCNPP Site generally consists of widely scattered American holly (*Ilex opaca*), flowering dogwood (*Cornus florida*), and saplings of canopy species. The shrub stratum generally consists of dense patches of mountain laurel (*Kalmia latifolia*),

pawpaw (*Asimina trilobata*), smaller American holly saplings, and smaller saplings of canopy species. The presence of saplings of canopy tree species in the understory (subcanopy and shrub strata) of a forest is typical of a climax plant community, i.e., a plant community whose floristic composition is expected to remain relatively constant over an extended period of time unless a disturbance event occurs (Mueller-Dombois and Ellenberg, 1974). Most of the mountain laurel is shrub-sized, but some individuals are greater than 20 feet (6 meters) in height (i.e., part of the subcanopy) and more than 3 inches (8 centimeters) in trunk diameter. The cover photo to this report depicts some large mountain laurels, in flower in May 2006, in the understory of mixed deciduous forest immediately east of the Camp Conoy Fishing Pond. Likewise, most of the American holly consists of sapling-sized trees that form part of the subcanopy, but a few larger individuals are over 5 inches (13 centimeters) diameter at breast height and extend into the tree canopy.

Of the three dominant understory (subcanopy and shrub) species in the mixed deciduous forest on the CCNPP Site, mountain laurel and American holly tend to dominate on slopes, while pawpaw tends to dominate on flatter uplands closer to the Chesapeake Bay. Mountain laurel is common throughout Maryland, especially on rocky or sandy soils (Brown and Brown, 1972). Its high density throughout much of the mixed deciduous forest understory on the CCNPP Site may reflect the predominantly sandy soils there (SCS, 1971). American holly is also common on sandy soils in Maryland's coastal plain, which includes the CCNPP Site, but pawpaw is reportedly infrequent in Maryland (Brown and Brown, 1972). However, CCNPP environmental staff note that pawpaw is common in southern Calvert County. Its density in the understory of certain areas of mixed deciduous forest on the CCNPP Site may therefore be anomalous. It does reportedly favor rich wooded habitats (Brown and Brown, 1972), which may explain why it is more frequent in the eastern part of the CCNPP Site, where soils are leveler and richer.

Canopy cover ranges between about 60 and 80 percent in most areas in the mixed deciduous forest. Ground cover is generally sparse other than for scattered seedlings of canopy, sapling, and shrub species. Some herbaceous plants that occur in scattered patches include partridgeberry (*Mitchella repens*), Christmas fern (*Polystichum acrostichoides*), common violet (*Viola papilionacea*), and large whorled pogonia (*Isotria verticillata*). Although more prevalent in the bottomland deciduous forest plant communities (described below), some patches of New York fern (*Thelypteris noveboracensis*) extend from the bottomlands onto slopes supporting mixed deciduous forest.

Canopy trees have fallen over in scattered locations throughout the mixed deciduous forest. Many of the fallen trees are Virginia pines, a short-lived and weak-wooded tree species especially prone to wind and ice damage. Virginia pine grows rapidly on dry, sterile soils in Maryland (Brown and Brown, 1972) and can become dominant in young forests but gradually yields over time to longer lived deciduous trees such as oaks, hickories, and beeches (Eyre, 1980). Color infrared aerial photographs from the 1990s

(CCNPP, Undated) indicate a greater frequency of pine trees in the mixed deciduous forest canopy on the CCNPP Site than suggested by the 2006 observations. Most of the fallen Virginia pines observed in 2006 were still standing in the 1990s.

Not all of the fallen trees are Virginia pine, however. Several fallen tulip poplars and oaks, some larger than 20 inches (51 centimeters) in diameter at breast height, were also observed at scattered locations. Some of the canopy gaps created by these large fallen trees are as large as 10,000 square feet (929 square meters) or more. Sunlight penetration to the ground in the gaps caused by fallen trees has led to the establishment of locally dense understory and groundcover. Vegetation in the gaps typically consists of a dense tangle of mountain laurel and American holly with canopy hardwood saplings, plus a dense groundcover of vines such as catbrier (*Smilax glabra*), common greenbrier (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), and Virginia creeper (*Parthenocissus quinquefolia*).

The mixed deciduous forest on the CCNPP Site generally corresponds to Forest Cover Type 59 (Yellow Poplar – White Oak – Northern Red Oak) identified by the Society of American Foresters (Eyre, 1980). Yellow poplar is another common name for tulip poplar. White oak is one of the most frequently occurring trees in the mixed deciduous forest on the CCNPP Site. Northern red oak (*Quercus rubra*), which is more common in the western parts of Maryland (Brown and Brown, 1972), does not occur frequently on the CCNPP Site, but other red oak species with similar site requirements and benefits to wildlife are frequent. These species include black oak and southern red oak. In some localized areas, tulip poplar occurs almost exclusively in the forest canopy and the forest trends toward Forest Cover Type 57 (Yellow Poplar). In some other localized areas, especially on steeper slopes adjoining streams, the forest trends toward Forest Cover Type 44 (Chestnut Oak). Chestnut oak occurs frequently throughout the mixed deciduous forest but is especially frequent on slopes.

The large tracts of mixed deciduous forest on the CCNPP Site, especially those in the Johns Creek watershed and in the southern, southwestern, and northern part of the Site, provide habitat for forest interior bird species (FIBS). Several FIBS were observed in the Johns Creek watershed during a faunal study conducted in 2006 and 2007 (Tetra Tech NUS, 2007). These include scarlet tanager (*Piranga olivacea*), red-eyed vireo (*Vireo olivaceus*), wood thrush (*Hylocichla mustelina*), and worm-eating warbler (*Helmitheros vermivorus*). FIBS are birds that require (or strongly prefer) large unbroken tracts of forest cover to forage and breed. It is theorized that FIBS are detrimentally affected by competition with more aggressive bird species in open and forest edge settings (Askins, 2000; Ehrlich *et al.*, 1988). Many FIBS nests near forest edges in the eastern United States have been observed to contain eggs of the brown cowbird (*Molothrus ater*), a prolific bird that lays its eggs in the nests of other species (nest parasite). Parents of parasitized nests expend resources to nurture the cowbird eggs and nestlings instead of their own. Most FIBS are also neotropical migrants that spend the spring and summer breeding season in

North America and winter in the tropics of Central and South America. Many FIBS have experienced substantial population declines over the past 30 to 40 years that are thought to be attributable both to increased fragmentation of forest due to urban sprawl in North America and the clearing of forest for timber and agriculture in the tropics (Askins, 2000; Ehrlich *et al.*, 1988). The State of Maryland has designated FIBS protection as a key goal in the management of lands around the Chesapeake Bay (Maryland DNR, 2000).

The mixed deciduous forest, especially that on steeper slopes adjoining stream valleys, contains many large trees with hollows and cavities that provide nesting and denning sites for wildlife such as squirrels, woodpeckers, and snakes. The mixed deciduous forest also contains dead trees and trees with dead limbs that provide valuable foraging sites for woodpeckers and snags that provide roosting sites for hawks and other raptors. The many oaks provide an abundance of acorns that are an important source of mast (nuts) for masting (nut-eating) species such as blue jays and squirrels. These conclusions are supported by the numerous observations of hawks, blue jays, owls, woodpeckers, and squirrels in the 2006 and 2007 fauna study (Tetra Tech NUS, 2007).

Mixed Deciduous Regeneration Forest (MDF Column in Table 1, Dark Green in Figure 4). Several areas of relatively level highlands that formerly supported mixed deciduous forest (described above) have been subjected to timber harvest activities within the past 10-30 years. These areas presently support dense stands of pole-sized (less than 12 inches [30 centimeters] in diameter at breast height) deciduous trees and Virginia pines (Photo 5). Specimen trees are not present. The predominant deciduous trees consist of many of the same species as the canopy of the mixed deciduous forest, especially tulip poplar, oaks, sweet gum, red maple, and Virginia pine. Virginia pine is generally more frequent in the regenerating forest than in adjoining areas of mature mixed deciduous forest. The regenerating forest lacks distinct subcanopy or shrub strata but does contain scattered mountain laurel, American holly, and other species typical of the subcanopy and shrub layers of mature mixed deciduous forest. Little groundcover is present other than along fire roads or other gaps in the canopy. Like the mixed deciduous forest from which it is derived, the mixed deciduous regeneration forest on the CCNPP Site generally corresponds to Forest Cover Type 59 (Yellow Poplar – White Oak – Northern Red Oak) identified by the Society of American Foresters (Eyre, 1980).

The mixed deciduous regeneration forest on the CCNPP Site has grown sufficiently tall to provide cover for FIBS, but it lacks the large old trees with cavities, hollows, and dead limbs that attract the diversity of wildlife described for the mature mixed deciduous forest. Because of the greater pine component and younger oaks that can not yet produce large acorn crops, the mixed deciduous forest does not provide as good a supply of mast (nuts) to mast-feeding species such as blue jays and squirrels. The red-breasted nuthatch, a species that has a distinct preference for pine habitat, was heard on the CCNPP Site during

the faunal study (Tetra Tech NUS, 2007). Its presence might be attributable to the dense pine saplings in many areas of mixed deciduous regeneration forest. As the deciduous saplings gradually mature and supplant the pines through natural succession forest, the mixed deciduous regeneration forest is expected to regain many of the habitat properties of mixed deciduous forest.

Well-Drained Bottomland Deciduous Forest (WD BDF Column in Table 1, Light Red in Figure 4).

Areas of well-drained soils in lowlands adjoining Johns Creek, Goldstein Branch, their headwaters, and other streams on the CCNPP Site support bottomland deciduous forest dominated by tulip poplar, American beech, sweet gum, black gum, and red maple (Photo 6). This vegetation is transitional between the mixed deciduous forest on the adjoining upland slopes and the bottomland hardwood forest in wetter bottomland areas. The subcanopy consists mostly of saplings of the canopy species plus some American holly. The shrub layer is generally sparse, although some mountain laurel cover extends in from the adjoining upland slopes. While groundcover is generally sparse, patches of New York Fern occur.

The well-drained bottomland deciduous forest on the CCNPP Site generally corresponds to a variant of Forest Cover Type 57 (Yellow Poplar), defined as Sweet Gum-Yellow Poplar by the Society of American Foresters (Eyre, 1980). This variant forest vegetation is described as occurring in wetter forest locations in Maryland and southward. In contrast to the poorly drained bottomland deciduous forest described below, the well-drained bottomland deciduous forest does not meet the regulatory definition for a wetland, as defined as of February 2007 in 33 CFR 328. It is, however, located in the outer edges of floodplains subject to infrequent brief periods of inundation during periods of heavy rainfall.

The well-drained bottomland deciduous forest on the CCNPP Site shares many of the wildlife habitat properties described for mixed deciduous forest, including the presence of old trees and trees with cavities, hollows, and dead limbs. The areas of well-drained bottomland deciduous forest on the CCNPP Site are small and narrow, but are positioned adjacent to extensive tracts of mixed deciduous forest. Thus the well-drained bottomland deciduous forest and adjoining mixed deciduous forest provide good FIBS habitat.

Poorly Drained Bottomland Deciduous Forest (PD BDF Column in Table 1, Dark Red in Figure 4).

Areas of poorly-drained seasonally saturated soils in lowlands adjoining Johns Creek, Goldstein Branch, their headwaters, and other streams on the CCNPP Site support bottomland hardwood forest dominated by red maple, sweet gum, and black gum (Photo 7). The subcanopy consists of saplings of the same species. The shrub layer is generally sparse. The groundcover is dense throughout, dominated by ferns such as New York Fern, sensitive fern (*Onoclea sensibilis*), and royal fern (*Osmunda regalis*); sedges and rushes such as tussock sedge (*Carex stricta*), eastern bur-reed (*Sporangium americanum*), and soft rush

(*Juncus effusus*); and forbs such as lizard tail (*Saururus cernuus*) and skunk cabbage (*Symplocarpus foetida*).

The poorly drained bottomland deciduous forest on the CCNPP Site generally corresponds to Forest Cover Type 108 (Red Maple) defined by the Society of American Foresters (Eyre, 1980). It is transitional between the well-drained bottomland deciduous forest described above and the herbaceous marsh vegetation described below. The boundaries between these plant communities in the floodplains of creeks on the CCNPP Site are not sharply defined by topography, but instead reflect slight differences in micro-topography, soil properties, and the presence of beaver dams in the stream channels.

The poorly drained bottomland deciduous forest on the CCNPP Site is subject to extended periods of soil saturation and inundation and meets the regulatory definition for a wetland, as defined as of February 2007 in 33 CFR 328. The upper elevation boundary of most areas of poorly drained bottomland deciduous forest on the CCNPP Site typically adjoins non-wetland vegetation such as well-drained bottomland deciduous forest or mixed deciduous forest, and generally corresponds to the wetland delineation boundary.

The well-drained and poorly drained bottomland deciduous forest plant community types are quite similar and differ floristically primarily with respect to understory and groundcover differences resolved during the wetland delineation. In the area where the wetland delineation was conducted, i.e., the Project Area, the two bottomland deciduous forest plant communities are distinguished on Figure 4. It was not, however, possible to accurately delineate the boundaries between the two bottomland deciduous forest community types where precise boundary point coordinate data were not collected for wetland boundaries. Therefore, Figure 4 uses a single “bottomland deciduous forest” plant community type (Purple) for areas of bottomland deciduous forest vegetation in areas of the CCNPP Site outside of where the wetland delineation was performed.

The poorly drained bottomland deciduous forest on the CCNPP Site shares many of the wildlife habitat properties described for mixed deciduous forest, including the presence of old trees and trees with cavities, hollows, and dead limbs. As wetlands, the poorly drained bottomland deciduous forest also provide amphibian habitat (Tiner, 1998), as evidenced by the frequent observation of a diversity of amphibians on the CCNPP Site in 2006 and 2007 (Tetra Tech NUS, 2007a). As described for well-drained bottomland deciduous forest, the areas of poorly drained bottomland deciduous forest on the CCNPP Site are small and narrow, but are positioned adjacent to extensive tracts of mixed deciduous forest. Thus the bottomland deciduous forest and adjoining mixed deciduous forest provide good FIBS habitat.

Flooding from beaver activities has killed many mature trees in the poorly-drained bottomland deciduous forest in the floodplain of Johns Creek and its tributaries in the west-central part of the CCNPP Site. The dead trees provide valuable snags used by raptors such as hawks and eagles to visually survey the surrounding landscape for possible prey. The dead trees also provide good foraging sites for woodpeckers such as the pileated woodpecker (*Dryocopus pileatus*) that scavenge dead trees for carpenter ants and other insect prey. The frequent observation of pileated woodpeckers on the CCNPP Site in 2006 and 2007 (Tetra Tech NUS, 2007a) may be at least partially attributable to the many dead trees in the floodplain of Johns Creek and its tributaries.

Herbaceous Marsh Vegetation (HMV Column in Table 1, Light Blue in Figure 4). Herbaceous marsh vegetation occurs throughout much of the broad bottomland adjoining Johns Creek in the western part of the CCNPP Site as well as in localized gaps in the forest cover in the narrower bottomlands adjoining the Johns Creek headwaters, Goldstein Branch, and other streams. This vegetation is dominated in many places by phragmites (Photo 8). Phragmites commonly forms dense stands in disturbed wetland settings (Marks *et al.*, 1993). Its predominance in unshaded marshy areas along Johns Creek, Goldstein Branch, and its tributaries in the western part of the CCNPP Site is the result of flooding caused by beaver dams. Many dead or severely declining deciduous tree stems (generally red maple and sweet gum) remain amidst the phragmites; the rapid death of these trees may have been the disturbance that allowed colonization of the affected area by phragmites. Broad areas of wetlands dominated by phragmites also surround the large largest of the old sediment basins in the southern part of the Lake Davies dredge spoils disposal area (Photo 9) as well as the two smaller basins down-gradient (west) of that basin.

Other areas of herbaceous marsh vegetation on the CCNPP Site are dominated by sedges, rushes, and bulrushes; lizard tail, which forms localized dense patches; and various other wetland forbs such as dotted smartweed (*Polygonum punctatum*), Pennsylvania smartweed (*Polygonum pensylvanicum*), jewelweed (*Impatiens capensis*), and halberd-leaved tearthumb (*Polygonum arifolium*). These areas include a marshy fringe surrounding the shore of the Camp Conoy Fishing Pond (Photo 10), two smaller impoundments on the stream carrying the outflow from the Camp Conoy Fishing Pond to the Chesapeake Bay (Photo 11), the constructed Wetland Mitigation Area near the 500-kV transmission corridor, and a marshy fringe surrounding a stormwater pond immediately west of the CCNPP Barge Dock on the Chesapeake Bay serving the existing reactors.

Although herbaceous marsh vegetation (marshes) are not as widespread over the CCNPP Site as forested wetlands (poorly drained bottomland deciduous forest), its scattered presence increases the diversity of habitat available for wetland wildlife. Examples of wildlife that prefer marshes to forested wetlands include wading birds such as the great blue heron (*Ardea herodias*) and green heron (*Butorides virescens*), waterfowl such as the black duck (*Anas rubripes*), and other species such as the marsh wren

(*Cistothorus palustris*) and red-winged blackbird (*Agelaius phoeniceus*) (Tiner, 1998). The great blue heron was spotted on multiple occasions in the herbaceous marsh vegetation surrounding the Camp Conoy Fishing Pond. Like the forested wetlands, the marshes on the CCNPP Site also provide amphibian habitat.

Successional Forest Vegetation (SFV Column in Table 1, Dark Brown in Figure 4). Scattered areas on the CCNPP Site support forest cover dominated by fast-growing hardwoods such as black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*), sweet gum, big-tooth aspen (*Populus grandidentata*) and pines such as Virginia pine and loblolly pine (*Pinus taeda*). All are native, fast-growing trees that rapidly form patches of forest cover in old fields, waste areas, roadsides, and fence rows in eastern and central Maryland (Brown and Brown, 1972). Other native tree species with scattered seedlings and saplings in old field vegetation on the Project Site include black cherry, eastern red cedar (*Juniperus virginiana*), and sweet gum. Non-native tree species present as scattered seedlings and saplings in old field vegetation on the Project Site include tree of heaven (*Ailanthus altissima*) and paulownia (*Paulownia tomentosa*). Although both tree species are listed as invasive exotic plants by the State of Maryland (MDNR, 1997), neither has formed dense patches on the Project Site.

Several small stands of black locust saplings, generally less than 8 inches (20 centimeters) in diameter at breast height, have become established on the Lake Davies dredge spoils and around developed areas associated with existing facilities on the CCNPP Site. Trees in these stands are of generally uniform height without differentiation into distinct canopy and subcanopy strata typical of mature forests. The sparse, mottled shade cast by black locust has allowed dense old field vegetation to persist beneath the canopy cover.

While uplands in the southern part of the CCNPP Site generally comprise large, contiguous stands of mixed deciduous forest and mixed deciduous regeneration forest (where subject to relatively recent logging activity, as previously described), scattered small patches of successional forest vegetation also occur (Photo 12). The presence of building foundations and remnant ornamental vegetation in these areas suggest that they are former home sites or farmsteads that were abandoned several decades ago.

An area of relatively level land in the north-central part of the CCNPP Site, north of the Calvert Cliffs Parkway, appears to be former agricultural land upon which a dense stand of successional forest dominated by Virginia pine and loblolly pine saplings has developed (Photo 13). This area may have been agricultural land in the middle twentieth century but does not appear to have been used agriculturally during the last three decades. The agricultural history of this area is evidenced by an abandoned wooden barn that remains standing near the northern CCNPP Site perimeter. Portions of this area appear to contain planted loblolly pine.

Most of the successional forest vegetation in the central and eastern parts of the CCNPP Site generally corresponds to Forest Cover Type 50 (Black Locust) identified by the Society of American Foresters (Eyre, 1980). The pine-dominated successional forest vegetation near the northern CCNPP Site perimeter better corresponds to Forest Cover Type 79 (Virginia Pine), while the patches of successional forest vegetation in the southern part of the CCNPP Site appear to best correspond to Forest Cover Type 64 (Sassafras-Persimmon) (Eyre, 1980). Most of the successional forest vegetation on the CCNPP Site has too sparse a canopy to provide favorable FIBS habitat. The open character of the successional forest vegetation appears to generally favor forest edge wildlife. Areas with black cherry trees likely attract berry feeding birds such as chickadees (*Parus* spp.) and cedar waxwings (*Bombycilla cedrorum*), and dense areas of pine saplings may be attractive to species such as red-breasted nuthatch (*Sitta canadensis*) that favor coniferous forest habitats.

FLORAL COMPOSITION

Table 1 lists the individual plant species observed in each plant community on the CCNPP Site. The table presents separate lists for trees, shrubs, vines and brambles, sedges and rushes, ferns, seedless vascular plants, mosses, grasses, and forbs (broadleaf herbs). Conducting the field work over the course of a growing season (from early May to early October in 2006, with additional site visits in early January and mid April of 2007) reduced the probability of missing plant species capable of identification only during narrow seasonal time frames. Trees, shrubs, vines, and brambles can be identified at any time of year, regardless of whether the observation was made when leaves, flowers, or fruits were present. The other plant categories are herbaceous plants that do not display aboveground parts at all seasons, or require the presence of flowers or fruits to properly identify even when aboveground plant parts are present.

The notes provided in Table 1 indicate that most of the plant species observed on the CCNPP Site are regionally indigenous to southern Maryland and typical of the habitats in which they were observed. As is typical in the eastern United States, the floral composition of lawns, old fields, and successional hardwood forests on the CCNPP Site is a mixture of native plant species and naturalized plant species introduced from Eurasia. Invasive exotic plant species and rare, threatened, and endangered plant species are discussed below.

Invasive Exotic Plant Species. Several plant species identified as invasive exotic plants by the State of Maryland (MDNR, 1997) were observed on the CCNPP Site. These include phragmites, Japanese stiltgrass (*Microstegium vimineum*), tall fescue, sericea lespedeza, bush honeysuckle (*Lonicera* sp.), tree of heaven, and paulownia. The most prevalent invasive exotic plant on the Project Site is phragmites,

which infests most of the old field vegetation on the dredge spoils and the herbaceous marsh vegetation adjoining Johns Creek and other streams. Phragmites has reduced the diversity of plant cover in those plant communities and adversely affected their value as food and cover for wildlife. Another invasive exotic plant, Japanese stiltgrass, forms scattered patches in the groundcover of some forested areas on the CCNPP Site. It mostly occurs in areas with a history of soil disturbance, such as along the sides of roadways and trails. Where it occurs, it has likely discouraged the development of other more ecologically valuable groundcover (Marks *et al.*, 1993). The other invasive exotic plants are not widespread in any of the plant communities and do not appear to be jeopardizing the overall diversity and value of plant cover on the CCNPP Site.

The forested plant communities on the CCNPP Site consist mostly of regionally indigenous trees, shrubs, and herbaceous plants. As noted above, the invasive exotic plant Japanese stiltgrass occurs in areas with a history of soil disturbance, such as along the sides of roadways and trails. Japanese stiltgrass is a grass originally native to Asia that can rapidly form dense groundcover in disturbed forested areas, including both forested uplands and forested wetlands. It generally can only establish following groundcover disturbance caused by soil erosion, flooding and scour, or trampling by walkers or machinery (Tu, 2000). This may explain its frequent occurrence near streams on the CCNPP Site where erosion and sedimentation have occurred and along current or abandoned trails or fire roads. But most forested areas on the CCNPP Site away from areas of ground disturbance display a regionally typical groundcover without Japanese stiltgrass.

Rare, Threatened, and Endangered Plant Species. The occurrence of rare, threatened, and endangered plant species is addressed in a separate report (Tetra Tech NUS, 2007b). All such plants observed in the plant communities during the floral survey are, however, noted in Table 1.

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Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|-----------------------------|-------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| TREES | | | | | | | | | | |
| <i>Acer rubrum</i> | Red Maple | | | X | X | X | X | X | X | Common in most forested habitats in Maryland (Brown and Brown, 1972). Frequent in forested wetlands on CCNPP Site; occasional elsewhere. |
| <i>Ailanthus altissima</i> | Tree of Heaven | | X | | | | | | X | Common in dry habitats lacking dense shade (Brown and Brown, 1972). On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Albizzia julibrissin</i> | Mimosa | | X | | | | | | | Cold sensitive. Distribution in Maryland generally limited to southern Maryland (Brown and Brown, 1972). On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Betula lenta</i> | Black Birch | | | X | X | | | | | Common in Maryland Piedmont and western Maryland but rare in southern Maryland (Brown and Brown, 1972). Observed in upper Johns Creek watershed. |
| <i>Carpinus caroliniana</i> | Ironwood | | | X | X | X | | | | Common along streams in Maryland but reportedly rare in Coastal Plain (Brown and Brown, 1972). Frequent subcanopy tree in bottomland forests on CCNPP Site, esp. outside wetland boundary |
| <i>Carya cordiformis</i> | Bitternut Hickory | | | X | | | | | | Occurs in moist woods and bottomlands in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Carya glabra</i> | Pignut Hickory | | | X | X | | | | | Common in dry woods and pastures in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Cornus florida</i> | Flowering Dogwood | | | X | X | | | | | Common in old fields and acidic woods in Maryland (Brown and Brown, 1972). Subcanopy tree in forests. Heavy recent losses in Maryland due to dogwood anthracnose. Limited to occasional occurrence on CCNPP Site. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|--------------------------------|------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Fagus grandifolia</i> | American Beech | | | X | X | X | | | | Common in rich, moist woods throughout Maryland (Brown and Brown, 1972). Frequent in mature forests throughout CCNPP Site. |
| <i>Fraxinus pennsylvanicus</i> | Green Ash | | | | | X | X | | | Common in moist woods in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Ilex opaca</i> | American Holly | | | X | X | X | | | | Common in moist, sandy woods in Maryland's Coastal Plain (Brown and Brown, 1972). Mostly a subcanopy evergreen tree on CCNPP Site; a few large trees in canopy in MDF |
| <i>Juniperus virginiana</i> | Eastern Redcedar | | X | | | | | | X | Common on dry soils throughout Maryland. Especially common on limestone soils (Brown and Brown, 1972). Occurrence on CCNPP Site limited to open areas. |
| <i>Liquidambar styraciflua</i> | Sweet Gum | | X | X | X | X | X | X | X | Common throughout CCNPP Site, especially in bottomlands and areas of rich soils, as is typical for the Maryland Coastal Plain (Brown and Brown, 1972). |
| <i>Liriodendron tulipifera</i> | Tulip Poplar | | | X | X | X | | | X | Common on rich soils throughout Maryland (Brown and Brown, 1972). Common throughout forested uplands on CCNPP Site; nearly pure stands in places. |
| <i>Magnolia virginiana</i> | Sweetbay | | | | | | X | | | Occurrence in Maryland limited to understory in swampy forests and stream banks (Brown and Brown, 1972). Observed once along a tributary to Johns Creek in southwestern part of CCNPP Site. |
| <i>Nyssa sylvatica</i> | Black Gum | | | X | X | X | X | X | | Common in upland and wetland woods throughout Maryland (Brown and Brown, 1972). Frequent in bottomland forests on CCNPP Site, infrequent in upland forests. Widely spaced seedlings and saplings only in HMV on Site. |
| <i>Paulownia tomentosa</i> | Paulownia | | X | | | | | | X | Occurs in waste areas in Maryland (Brown and Brown, 1972). On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|------------------------------|--------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Pinus taeda</i> | Loblolly Pine | | X | X | X | | | | X | Occasional only on CCNPP Site. More common on Eastern Shore and areas in southern Maryland near tidal waters (Brown and Brown, 1972). |
| <i>Pinus virginiana</i> | Virginia Pine | | X | X | X | | | | X | Successional tree of dry uplands in Maryland (Brown and Brown, 1972). Most common pine on CCNPP Site. More common in younger than mature forests. |
| <i>Platanus occidentalis</i> | American Sycamore | | | | | X | X | | | Occurs mainly in bottomlands and along streams in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Populus grandidentata</i> | Bigtooth Aspen | | X | | | | | | X | Occurs in woods, thickets, and swamps in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Prunus serotina</i> | Black Cherry | | X | X | X | | | | X | Common in fencerows, thickets, and woods throughout Maryland (Brown and Brown, 1972). Most common on CCNPP Site in SFV. |
| <i>Quercus alba</i> | White Oak | | | X | X | X | | | | Common in forested uplands throughout Maryland but also occurs in wetter forests (Brown and Brown, 1972). Common in MDF throughout CCNPP Site. |
| <i>Quercus coccinea</i> | Scarlet Oak | | | X | X | | | | | Common upland oak in most of Maryland but reportedly less common in southern Maryland (Brown and Brown, 1972). One of several red oaks occurring on uplands on the CCNPP Site. |
| <i>Quercus falcata</i> | Southern Red Oak | | | X | X | | | | X | Common in moist and dry woods in Coastal Plain of Maryland (Brown and Brown, 1972). One of several red oaks occurring on uplands on the CCNPP Site. |
| <i>Quercus michauxii</i> | Swamp Chestnut Oak | | | | | X | | | | Occurs in low woods along streams in Maryland. Not common in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|-----------------------------|---------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Quercus palustris</i> | Pin Oak | | | | | X | X | | | Occurs in bottmlands throughout Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Quercus prinus</i> | Chestnut Oak | | | X | X | | | | | Common in dry, gravelly, sandy, and rocky soils in Maryland (Brown and Brown, 1972). Most common oak on sloping uplands on CCNPP Site. |
| <i>Quercus shumardii</i> | Shumard's Oak | | | | | X | | | | Infrequent in Maryland (Brown and Brown, 1972). State Threatened. Specimens located in low forest along Johns Creek (Tetra Tech, 2007b). |
| <i>Quercus stellata</i> | Post Oak | | X | | | | | | | Occurs on poor, dry soils in most of Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Quercus velutina</i> | Black Oak | | | X | X | | | | | Occurs in dry and moist forests in Maryland, but more common to west (Brown and Brown, 1972). One of several red oaks occurring on uplands on CCNPP Site. |
| <i>Robinia pseudoacacia</i> | Black Locust | | X | | | | | | X | Occurs in roadsides, old fields, and woods throughout Maryland. More common in western Maryland (Brown and Brown, 1972). Localized dense clusters on CCNPP Site, especially on Lake Davies dredge spoils and adjoining developed areas |
| <i>Salix nigra</i> | Black Willow | | X | | | | X | X | | Common in bottomlands and stream banks in Maryland (Brown and Brown, 1972). As expected, common in wetland forests on CCNPP Site. But its frequency on well drained dredge spoil is unusual. |
| <i>Sassafras albidum</i> | Sassafras | | X | X | X | X | | | X | Occurs in woods, fence rows, and old fields in Maryland (Brown and Brown, 1972). Observed in several locations on CCNPP Site but not abundant anywhere. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|------------------------------|-------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Ulmus rubra</i> | Slippery Elm | | | | | X | X | | | Occurs in rich soils in Maryland, but uncommon on Maryland's Coastal Plain (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| SHRUBS | | | | | | | | | | |
| <i>Alnus serrulata</i> | Common Alder | | | | | | X | X | | Common in wet soils along streams and in floodplains throughout Maryland (Brown and Brown, 1972). Not abundant on CCNPP Site. |
| <i>Amelanchier</i> sp. | Shadbush | | | X | | X | X | | | Various species common in wet and dry forests in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Aralia spinosa</i> | Hercules Club | | X | | | | | | | Common in rich open woods and along streams in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Asimina trilobata</i> | Pawpaw | | | X | X | X | | | | Occurs in rich woods in Maryland but reportedly infrequent (Brown and Brown, 1972). Dense patches observed in understory, especially on mesic upland soils in eastern part of CCNPP Site. Unexpectedly common in well-drained but moist forests throughout CCNPP Site, especially eastern areas. |
| <i>Baccharis halimifolia</i> | Groundsel Tree | | X | | | | | | | Common in salt marshes and brackish shores in Maryland (Brown and Brown, 1972). Frequent occurrence on Lake Davies dredge spoils may reflect propagules in the spoil |
| <i>Castanea dentata</i> | American Chestnut | | | X | | | | | | Most mature specimens killed by chestnut blight but stump sprouts still common in Maryland (Brown and Brown, 1972). Occurrence on CCNPP Site limited to occasional sprouts in MDF from root systems left from trees killed by blight |
| <i>Gaylussacia baccata</i> | Black Huckleberry | | | X | X | | | | | Common in dry forests throughout Maryland (Brown and Brown, 1972). Localized dense patches observed on CCNPP Site. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|-----------------------------|--------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Kalmia latifolia</i> | Mountain Laurel | | | X | X | X | | | | Common in acid soils in rocky or sandy settings in Maryland (Brown and Brown, 1972). Forms dense understory on slopes in MDF throughout CCNPP Site. Exceptionally large and dense patches throughout much of the MDF on CCNPP Site. |
| <i>Lindera benzoin</i> | Spicebush | | | X | | | | | | Common in damp woods in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Lonicera</i> sp. | Bush Honeysuckle | | X | | | | | | X | On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Lyonia mariana</i> | Staggerbush | | | X | | | | | | Common in moist and dry forests in Maryland's Coastal Plain (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Myrica cerifera</i> | Wax Myrtle | | X | | | | | | | Occurs in sandy swamps and wet woods in Maryland's Coastal Plain (Brown and Brown, 1972). Frequent occurrence on dredge spoils in Lake Davies area on CCNPP Site may reflect propagules in the spoil |
| <i>Rhododendron</i> spp. | White Azalea | | | X | | | | | | Occurs in variety of forest settings in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Rosa multiflora</i> | Multiflora Rose | | X | | | | | | X | On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Vaccinium corymbosum</i> | Highbush Blueberry | | | | | X | X | | | Occurs in swamps, bogs, and moist woods in Maryland (Brown and Brown, 1972). Frequent in forested wetlands along streams throughout CCNPP Site. |
| <i>Viburnum</i> spp. | Arrowwood | | | X | | X | X | | | Common in thickets and woods in moist soils in Maryland (Brown and Brown, 1972). Unexpectedly infrequent on CCNPP Site. May reflect the exceptional density of pawpaw in habitats otherwise favorable to arrowwood. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|------------------------------------|----------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Viburnum nudum</i> | Possum Haw | | | | | | X | X | | Occurs in moist soils, open woods, thickets, and swamps in Maryland (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| VINES AND BRAMBLES | | | | | | | | | | |
| <i>Lonicera japonica</i> | Japanese Honeysuckle | | X | | | | | | X | Invades woods, fence rows, and fields in Maryland, and can kill tree seedlings (Brown and Brown, 1972). On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Not prevalent anywhere on CCNPP Site. |
| <i>Parthenocissus quinquefolia</i> | Virginia Creeper | | | X | X | X | | | X | Typically occurs in rich woods and on cliffs and rocky banks. Often wraps around trees and fenceposts (Brown and Brown, 1972). Frequent and widespread, but scattered, occurrence on CCNPP Site. |
| <i>Rubus allegheniensis</i> | Common Blackberry | | X | | | | | | X | Typically occurs in roadsides, fields, and thickets in wet or dry soil but not in shade (Brown and Brown, 1972). Scattered occurrence in old fields and successional hardwood forests on CCNPP Site. |
| <i>Rubus flagellaris</i> | Dewberry | | X | | | | | | | Occurs throughout Maryland in old fields, pastures, thickets, and woods edges, especially on dry or poor soils (Brown and Brown, 1972). Common in Maryland in moist thickets and fields, less common in woods (Brown and Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Rubus occidentalis</i> | Black Raspberry | | X | | | | | | X | Common in Maryland in moist thickets and fields, less common in woods (Brown and Brown, 1972). Limited to occasional occurrence in old field areas on CCNPP Site. |
| <i>Rubus phoenicolasius</i> | Wineberry | X | X | | | | | | X | Introduced species that has invaded roadsides and thickets in Maryland (Brown and Brown, 1972). On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

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|-------------------------------|-------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Smilax glabra</i> | Catbrier | | X | X | X | X | | | X | Typically occurs in open woods, thickets, and old fields (Brown and Brown, 1972). Scattered, localized dense tangles occur throughout most upland forest on CCNPP Site. |
| <i>Smilax rotundifolia</i> | Common Greenbrier | | X | X | X | X | | | X | Habitat generalist (Brown and Brown, 1972). Frequent occurrence on CCNPP Site but less frequent than <i>Smilax glabra</i> . |
| <i>Toxicodendron radicans</i> | Poison Ivy | | X | X | X | X | | | | Occurs abundantly in thickets, open woods, sandy and rocky places, and fencerows (Fernald, 1970). Unexpectedly infrequent on CCNPP Site. Occurs on CCNPP Site mainly as vines wrapped around trees. |
| <i>Vitis</i> spp. | Wild Grape | | | X | | X | X | | | Various species with widespread scattered occurrence on CCNPP Site. |
| SEDGES AND RUSHES | | | | | | | | | | |
| <i>Carex crinita</i> | Fringed Sedge | | | | | | X | X | | Perennial. Grows in clumps in wet places (Brown, 1979). Limited to occasional occurrence in wetlands on CCNPP Site. |
| <i>Carex intumescens</i> | Bladder Sedge | | | | | | X | X | | Perennial. Grows in clumps in wet places (Brown, 1979). Common in open areas in wetlands on CCNPP Site, especially along Johns Creek and its tributaries. |
| <i>Carex lurida</i> | Lurid Sedge | | | | | | X | X | | Perennial. Grows in clumps in wet places (Brown, 1979). Common in open areas in wetlands on CCNPP Site, especially along Johns Creek and its tributaries. |
| <i>Carex stricta</i> | Tussock Sedge | | | | | | X | X | | Perennial. Grows in big tussocks in wet places (Brown, 1979). Provides food for wading birds, songbirds, and ducks (Thunhorst, 1993). Common in open areas in wetlands on CCNPP Site, especially along Johns Creek and its tributaries. |

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List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

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|---------------------------|--------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Cyperus esculentus</i> | Yellow Nutsedge | | | | | | | X | | Perennial. Grows in damp, sandy soil. Weed in agricultural areas (Brown, 1979). Provides food for waterfowl, game birds, songbirds, and mammals (Thunhorst, 1993). Limited to occasional occurrence in wetlands on CCNPP Site. |
| <i>Juncus effuses</i> | Soft Rush | | | | | | X | X | | Perennial. Grows in wet places (Brown, 1979). Provides food for wild fowl, waterfowl, game birds, marsh birds; cover for waterfowl, and spawning grounds for fish (Thunhorst, 1993). Localized dense patches occur in wetlands throughout CCNPP Site. |
| <i>Juncus tenuis</i> | Path Rush | | X | | | | | | | Perennial. Grows in fields, thickets, swamps, paths, and pavement cracks (Brown, 1979). Provides food for waterfowl, game birds, marsh birds, songbirds, and muskrats, and spawning grounds for fish (Thunhorst, 1993). Limited to occasional occurrence on CCNPP Site. |
| <i>Scirpus americanus</i> | Common Threesquare | | | | | | | X | | Perennial. Grows in freshwater, brackish, and salt marshes (Brown, 1972). Provides food and cover for wild fowl, wading birds, shorebirds, muskrats, and fish (Thunhorst, 1993). Observed in patches in beaver-flooded marshes along Johns Creek and its tributaries. |
| <i>Scirpus atrovirens</i> | Green Bulrush | | | | | | | X | | Perennial. Grows in wet places (Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Scirpus cyperinus</i> | Woolgrass | | | | | | | X | | Perennial. Grows in clumps in wet places (Brown, 1972). Provides food and cover for waterfowl, wading birds, shorebirds, muskrats, and fish (Thunhorst, 1993). Occasional patches in open wetlands on CCNPP Site. |

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|-----------------------------------|-----------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Sparangium americanum</i> | Eastern Bur-reed | | | | | | X | X | | Perennial. Grows nontidal marshes, shallow waters, and muddy shores (Thunhorst, 1993, Brown, 1979). Provides food for waterfowl, muskrats, and beavers (Thunhorst, 1993). Occurs in frequent dense patches on CCNPP Site, especially along Johns Creek and its tributaries. |
| FERNS | | | | | | | | | | |
| <i>Asplenium platyneuron</i> | Ebony Spleenwort | | X | | | | | | | Typically occurs in shaded woods, fields, talus slopes, and along stream banks in well-drained soils (Cobb <i>et al.</i> , 2005). Limited to occasional occurrence on CCNPP Site. |
| <i>Athyrium felix-femina</i> | Lady Fern | | | | | | X | | | Common in moist woods, swamps, thickets, and fields (Cobb <i>et al.</i> , 2005). Limited to occasional occurrence on CCNPP Site. |
| <i>Botrychium dissectum</i> | Cut-Leaved Grape Fern | | | X | | | | | | Typically occurs in a variety of dry and moist habitats (Cobb <i>et al.</i> , 2005). Limited to occasional occurrence on CCNPP Site. |
| <i>Onoclea sensibilis</i> | Sensitive Fern | | | | | | X | X | | Typically occurs in open swamps, wet areas, marshes, and low woods (Cobb <i>et al.</i> , 2005). Occurs as localized dense patches on CCNPP Site primarily in the wetter part of forested wetlands. |
| <i>Osmunda cinnamomea</i> | Cinnamon Fern | | | | | | X | | | Typically occurs in swamps, wet woods, and wet meadows (Cobb <i>et al.</i> , 2005). Scattered patches in forested wetlands on CCNPP Site. |
| <i>Osmunda regalis</i> | Royal Fern | | | | | | X | X | | Typically occurs in swamps, low woods, wet meadows, stream banks, marshes, and bogs, typically in acid soils (Cobb <i>et al.</i> , 2005). Scattered patches in wetlands on CCNPP Site. |
| <i>Polystichum acrostichoides</i> | Christmas Fern | | | X | | X | | | | Typically occurs in moist or dry, shady forests (Cobb <i>et al.</i> , 2005). Frequent on upper part of stream banks in forested areas on CCNPP Site. |

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|--|--------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Thelypteris noveboracensis</i> | New York Fern | | | | | X | X | | | Typically occurs in sunny spots in mixed woodlands, drier edges of swamps, vernal seeps in ravines, and near streams (Cobb <i>et al.</i> , 2005). Forms extensive dense groundcover over large areas of MDF adjoining wet areas as well as at the upper edge of forested wetlands on the CCNPP Site. |
| <i>Thelypteris palustris</i> | Marsh Fern | | | | | | X | | | Typically occurs in moist, sunny areas in full sun and partial shade in swamps, bogs, marshes, open woodlands, wet meadows, and along ditches (Cobb <i>et al.</i> , 2005). Limited to occasional occurrence on CCNPP Site. |
| SEEDLESS VASCULAR PLANTS (OTHER THAN FERNS) | | | | | | | | | | |
| <i>Equisetum</i> sp. | Horsetail | | | | | | | X | | Various species occur typically in wetland habitats (Cobb <i>et al.</i> , 1972). Occasional on fringe of Camp Canoy Fishing Pond |
| <i>Lycopodium tristachyum</i> | Ground Cedar | | | X | | | | | | Typically occurs in dry, sandy, shaded areas (Cobb <i>et al.</i> , 2005). Widely scattered but dense patches, especially near pines, on CCNPP Site. |
| MOSSES | | | | | | | | | | |
| <i>Polytrichum</i> sp. | Haircap Moss | | | | | | X | X | | Localized dense patches, especially in seepage areas near the upper ends of tributaries to Johns Creek. |
| <i>Sphagnum</i> sp. | Sphagnum Moss | | | X | X | X | X | | | Localized occurrence only on CCNPP, in variety of wet and dry settings. |
| GRASSES | | | | | | | | | | |
| <i>Agrostis alba</i> | Redtop | X | X | | | | | | | Non-native perennial typically occurring in fields and roadsides (Brown, 1979). Despite non-native status, not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Scattered patches in grassy upland areas on CCNPP Site. |
| <i>Andropogon glomeratus</i> | Lowland Broomsedge | | | | | | | X | | Warm season grass. Limited to occasional occurrence on CCNPP Site. |

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|-----------------------------------|-------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Andropogon virginicus</i> | Broomsedge | X | X | | | | | | | Perennial grass typically occurring in dry fields (Brown, 1979). Frequent patches in grassy uplands on CCNPP Site. |
| <i>Cynodon dactylon</i> | Bermuda Grass | X | X | | | | | | | Non-native perennial lawn grass typically occurring in yards, fields, and waste places (Brown, 1979). Despite non-native status, not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Frequent patches in grassy uplands on CCNPP Site. |
| <i>Dichanthelium clandestinum</i> | Deertongue Grass | | | | | | X | X | | Native perennial typically occurring in thickets, forest edges, shores, waste places, and gardens (Brown, 1979). Localized dense patches on CCNPP Site. |
| <i>Digitaria sanguinalis</i> | Large crabgrass | X | | | | | | | | Non-native annual grass typically occurring in waste places, lawns, and gardens (Brown, 1972). Despite non-native status, not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Frequent in lawn areas on CCNPP Site. |
| <i>Echinochloa crus-galli</i> | Barnyard Grass | | X | | | | | X | | Non-native annual grass typically occurring in waste areas and fields (Brown, 1979). Despite non-native status, not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Festuca arundinacea</i> | Tall Fescue | X | X | | | | | | X | Non-native perennial. On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Dense patches in lawns and fields on CCNPP Site as well as as groundcover in areas of SHF on Site. |
| <i>Glyceria grandis</i> | Reed Meadow Grass | | | | | | X | X | | Native perennial typically occurring in wet places (Brown, 1979). Scattered clumps in forested wetlands and in marshes on CCNPP Site. |
| <i>Leersia oryzoides</i> | Rice Cut Grass | | | | | | | X | | Native perennial typically occurring in wet places (Brown, 1979). Occasional in marshes on CCNPP Site. |

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|--------------------------------|----------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Microstegium vimineum</i> | Japanese Stilt Grass | | X | X | X | X | X | | | On Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Localized dense patches in groundcover of well-drained forests on CCNPP Site. |
| <i>Panicum dichotomiflorum</i> | Fall Panicum | | X | | | | | | | Native annual grass typically occurring in roadsides and waste places (Brown, 1972). Limited to occasional occurrence on CCNPP Site. |
| <i>Panicum virgatum</i> | Switchgrass | | X | | | | | | | Native perennial grass typically occurring in sandy roadsides and at the upper edge of salt marshes (Brown, 1979). Warm season grass. Limited to occasional occurrence on CCNPP Site. |
| <i>Phragmites australis</i> | Phragmites | | X | | | | X | X | | On Maryland NHP List of Invasive Exotic Plants. Forms extensive dense stands in open wetlands and over most of the Lake Davies dredge spoils. |
| <i>Phyllostachys</i> sp. | Bamboo | X | | | | | | | | Non-native perennial grass. Ornamental plantings at Camp Conoy. Occasional only on CCNPP Site. |
| <i>Poa pratensis</i> | Bluegrass | X | | | | | | | | Typically occurs in fields, roadsides, lawns, and shores (brown, 1972). Localized areas on lawns on CCNPP Site. |
| <i>Setaria faberii</i> | Giant Foxtail | | X | | | | | | | Non-native (Brown, 1979), but not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Scattered patches on CCNPP Site. |
| <i>Setaria viridis</i> | Green Foxtail | | | | | | X | X | | Non-native (Brown, 1979), but not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Scattered patches on CCNPP Site. |
| <i>Sorghastrum nutans</i> | Indian Grass | | X | | | | | | | Native perennial grass typically occurring in fields and dry roadsides (Brown, 1979). Occasional in dry areas around edge of Camp Conoy Fishing Pond. Warm season grass. Occasional on CCNPP Site. |
| <i>Sporobolus asper</i> | Tall Dropseed | | | X | | | | | | Native perennial grass typically occurring in dry open soil (Brown, 1979). Small patches in MDF north of Camp Conoy Fishing Pond. |

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|---------------------------------|--------------------|------|-----|-----|------|-------|-------|-----|-----|--|
| <i>Typha latifolia</i> | Common Cattail | | | | | | | X | | Native perennial grass that can be invasive (Thunhorst, 1993) but not included on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Dense patches in marshes on CCNPP Site. |
| FORBS | | | | | | | | | | |
| <i>Actinomeris alternifolia</i> | Wingstem | | X | | | | | | | Typically occurs in rich thickets and borders of woods (Fernald, 1970). Dense patches in former cultivated fields in western part of CCNPP Site |
| <i>Apocynum cannabinum</i> | Indian Hemp | | X | | | | | | | Typically occurs in open ground, thickets, and borders of woods (Fernald, 1970). Frequent scattered individuals on CCNPP Site. |
| <i>Arisaema triphyllum</i> | Jack in the Pulpit | | | | | X | X | | | Typically occurs in wet woods, swamps, and peat bogs of piedmont and coastal plain (Fernald, 1970). Widely scattered individuals in floodplains along streams throughout CCNPP Site. |
| <i>Aster divaricatus</i> | Wood Aster | | | X | | | X | | | Typically occurs in dry woods and clearings (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Aster lateriflorus</i> | Calico Aster | | X | | | | | | | Typically occurs in dry to moist fields, clearings, thickets, and shores (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Aster pilosis</i> | Heath Aster | | X | | | | | | | Typically occurs in dry thickets, clearings, fields, and roadsides (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Bidens</i> spp. | Tick Trefoil | | | | | | X | X | | Could not identify to species. Differing species occur in various settings, primarily wetlands and moist areas in eastern United States (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Boehmeria cylindrica</i> | False Nettle | | | | | X | X | X | | Typically occurs in moist or shady ground (Fernald, 1970). Frequent scattered occurrence in wetlands on CCNPP Site. |

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|----------------------------------|-------------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Centrosema virginianum</i> | Spurred Butterfly Pea | | | | | | | X | | Typically occurs in sandy woods and fields (Fernald, 1970). State Rare plant. MDNR occurrence record for this species on CCNPP Site along upland fire roads, possible specimens observed in unlikely habitat at edge of wetlands adjoining Johns Creek in western part of CCNPP Site. Both locations are near crossing by Southern Maryland Electric Cooperative 69kV transmission line (Tetra Tech 2007b). |
| <i>Chrysopsis mariana</i> | Maryland Golden Aster | | X | | | | | | | Typically occurs in dry sandy or rocky woods and openings (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Cirsium discolor</i> | Field Thistle | X | | | | | | | | Non-native but not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Limited to occasional occurrence on CCNPP Site. |
| <i>Commelina communis</i> | Asiatic Dayflower | | | X | | | | | | Non-native but not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Frequent small patches on CCNPP Site. |
| <i>Daucus carota</i> | Queen Anne's Lace | | X | | | | | | | Typically occurs in dry fields and waste places (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Elephantopus carolinianus</i> | Carolina Elephants Foot | | X | X | | | | | | Distinct cauline leaves distinguish this plant from the state rare <i>E. tomentosa</i> . Occurs in several distinct patches in upland settings on CCNPP Site. |
| <i>Eupatorium altissimum</i> | Tall Boneset | | X | | | | | | | Typically occurs in calcareous shores, bluffs, open woods, clearings, and prairies (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Eupatorium coelestinum</i> | Mistflower | | X | | | | | | | Typically occurs in low woods, damp thickets or clearings, and borders of streams (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Eupatorium fistulosum</i> | Joe-Pye Weed | | | | | | | X | | Typically occurs in damp thickets and meadows (Fernald, 1970). Localized dense patches in marshes on CCNPP Site. |

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|---------------------------------|-----------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Eupatorium hyssopifolium</i> | Hyssop-leaved Boneset | | X | | | | | | | Typically occurs in dry or moist open woods, clearings, and fields (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Fragaria virginiana</i> | Wild Strawberry | | X | | | | | | | Typically occurs in fields, open slopes, and borders of woods (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Geranium</i> spp. | Wild Geranium | | | X | | | | | | Could not identify to species. Differing species occur in various wet and dry, forested and open habitats in eastern United States (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Heterotheca subaxillaris</i> | Camphorweed | | | X | | | | | | Typically occurs in sandy soil (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Hieracium pratense</i> | Yellow Hawkweed | X | X | | | | | | | Typically occurs in clearings, pastures, and grasslands (Fernald, 1970). Non-native but not on Maryland NHP List of Invasive Exotic Plants |
| <i>Hieracium venosum</i> | Rattlesnake Weed | | | X | | | | | | Typically occurs in open woods and clearings (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Hypericum perforatum</i> | Common St. John'swort | | X | | | | | X | | Fringe area surrounding Camp Conoy Fishing Pond. Limited to occasional occurrence on CCNPP Site. |
| <i>Impatiens capensis</i> | Jewelweed | | | | | | X | X | | Typically occurs in wet or springy places (Fernald, 1970). Frequent scattered occurrence in wetlands on CCNPP Site. |
| <i>Isotria verticillata</i> | Large Whorled Pogonia | | | | | X | | | | Typically occurs in acid woods (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Lespedeza cuneata</i> | Sericea Lespedeza | | X | | | | | | X | Non-native, has spread from cultivation to roadsides (Fernald, 1970). Some dense patches on CCNPP Site. |
| <i>Lysimachia ciliata</i> | Fringed Loosestrife | | | | | | | X | | Typically occurs in low grounds, thickets, rich woods, and shores (Fernald, 1970). Marshy fringe around Camp Conoy Fishing Pond |

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|---------------------------------|--------------------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Mimulus ringens</i> | Monkey Flower | | | | | | | X | | Typically occurs in shores, meadows, and wet places (Fernald, 1970). Observed in marshy areas fringing the two small ponds east of Camp Conoy Fishing Pond. |
| <i>Mitchella repens</i> | Partridgeberry | | | X | X | X | | | | Typically occurs on dry or moist knolls in woods (Fernald, 1970). Frequent but scattered dense patches in upland forests on CCNPP Site. |
| <i>Oxalis stricta</i> | Wood Sorrel | X | | | | | | | | Typically occurs in dry, open sites (Fernald, 1970). Frequent in lawn areas on CCNPP Site. |
| <i>Plantago major</i> | Common Plantain | X | | | | | | | | Non-native, typically occurs on roadsides (Fernald, 1970). Can be weedy (Fernald, 1970), but not on Maryland NHP List of Invasive Exotic Plants (MDNR, 1997). Frequent in lawn areas on CCNPP Site. |
| <i>Polygonum arifolium</i> | Halbard-leaved Tearthumb | | | | | | | X | | Typically occurs in wetlands, especially tidal marshes (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Polygonum pennsylvanicum</i> | Pennsylvania Smartweed | | | | | | X | X | | Typically occurs in damp shores, thickets, clearings, and disturbed soils (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Polygonum punctatum</i> | Dotted Smartweed | | | | | | | X | | Typically occurs in wetlands, shores, and swamps (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Potentilla simplex</i> | Common Cinquefoil | | X | | | | | | | Typically occurs in dry or moist fields, thickets, and open woods (Fernald, 1970). Scattered patches on CCNPP Site. |
| <i>Rumex crispus</i> | Curly Dock | | X | | | | | | | Non-native, typically occurs in roadsides, waste ground, ditches, and open shores (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Salvia lyrata</i> | Lyre-Leaved Sage | X | | | | | | | | Typically occurs in sandy open woods and clearings (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |

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| <i>Saururus cernuus</i> | Lizard Tail | | | | | | X | X | | Typically occurs in swamps and shallow waters (Fernald, 1970). Dense patches in wetter areas along Johns Creek and other streams |
| <i>Sisyrinchium</i> spp. | Blue-eyed Grass | | | X | | | | | | Could not identify to species. Differing species occur in various wet and dry, forested and open habitats in eastern United States (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Solanum carolinense</i> | Horse Nettle | | X | | | | | | | Typically occurs in sandy openings, fields, and waste places (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Solidago canadensis</i> | Canada Goldenrod | | X | | | | | | | Typically occurs in moist to dry thickets, roadsides, clearings, and slopes (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Solidago elliotii</i> | Elliott's Goldenrod | | | | | | X | | | Typically occurs in swamps and wet thickets (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Solidago speciosa</i> | Showy Goldenrod | X | X | X | | | | | | Typically occurs in dry to moist thickets, open woods, and prairies (Fernald, 1970). Listed as Threatened by the State of Maryland. Frequent patches in upland forests and forest edges in Camp Conoy area (Tetra Tech, 2007b) |
| <i>Symplocarpus foetida</i> | Skunk Cabbage | | | | | | X | | | Typically occurs in wet meadows or swampy woods and thickets (Fernald, 1970). Localized patches in forested wetlands on CCNPP Site. |
| <i>Trifolium repens</i> | White Clover | X | | | | | | | | Typically occurs in grasslands, roadsides, and open pastured woods (Fernald, 1970). Non-native but not on Maryland NHP List of Invasive Exotic Plants. Frequent scattered patches on CCNPP Site. |
| <i>Taraxicum officinale</i> | Common Dandelion | X | X | | | | | | | Typically occurs in lawns, grasslands, and open grounds (Fernald, 1970). Scattered occurrence on CCNPP Site, especially lawns. |

Table 1
List of Plant Species Observed, Project Site, Calvert County, Maryland, May-October 2006, January 2007, April 2007

| Scientific Name | Common Name | L/DA | OFV | MDF | MDRF | WDBDF | PDBDF | HMV | SFV | Notes |
|---------------------------|-----------------|------|-----|-----|------|-------|-------|-----|-----|---|
| <i>Urtica dioica</i> | Stinging Nettle | X | | | | | | | | Typically occurs in waste places and roadsides (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Viola blanda</i> | White Violet | | | | | X | X | | | Typically occurs in rich deciduous woods (Fernald, 1970). Limited to occasional occurrence on CCNPP Site. |
| <i>Viola papilionacea</i> | Common Violet | | | X | | X | X | | | Typically occurs in damp woods, meadows, and roadsides (Fernald, 1970). Frequent scattered occurrence in most forested areas on CCNPP Site. |

HMV: Herbaceous Marsh Vegetation

OFV: Old Field Vegetation

MDRF: Mixed Deciduous Regeneration Forest

WDBDF: Well-Drained Bottomland Deciduous Forest

L/DA: Lawns/Developed Areas

MDF: Mixed Deciduous Forest

PDBDF: Poorly Drained Bottomland Deciduous Forest

SFV: Successional Forest Vegetation

"X" indicates that the species was observed in the indicated plant community type.

Bold "X" indicates that the species was observed to be dominant in all or a significant portion of the indicated plant community type.



Photo 1
Old Field Vegetation – Phragmites
Lake Davies Dredge Spoil Disposal Area
September 2006



Photo 2
Old Field Vegetation
550-kV Transmission Line Corridor in North Part of CCNPP Site
January 2007



Photo 3
Old Field Vegetation
Barge Area
June 2006

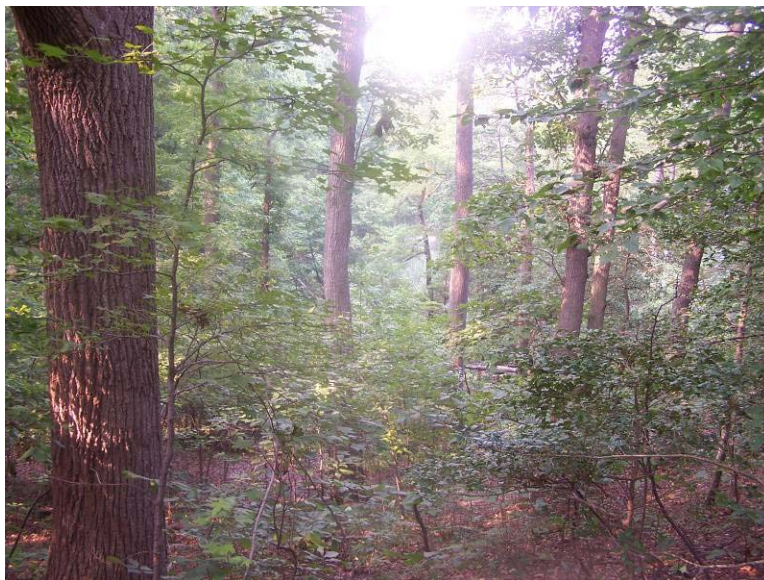


Photo 4
Mixed Deciduous Forest
Slope West of Camp Conoy Fishing Pond
July 2006



Photo 5
Mixed Deciduous Regeneration Forest
Area Northwest of Camp Conoy
July 31, 2006



Photo 6
Well-Drained Bottomland Deciduous Forest (Right)
Adjoining Stream Channel (Left)
West-Central Part of CCNPP Site



Photo 7
Bottomland Deciduous Forest
Unnamed Headwater Near Southwestern Corner of CCNPP Site
January 2007



Photo 8
Phragmites in Forest Clearing in Wetland West of Camp Conoy Fishing Pond
June 2006



Photo 9
Herbaceous Marsh Vegetation Dominated by Phragmites
Vegetated Fringe Surrounding Upper Basin
Lake Davies Dredge Spoils Disposal Area
September 2006



Photo 10
Marshy Fringe Surrounding Camp Conoy Fishing Pond
May 2006



Photo 11
Herbaceous Marsh Vegetation
Impoundment East of Camp Conoy Fishing Pond
July 31, 2006



Photo 12
Successional Hardwood Forest
Area Southeast of Camp Conoy Road
January 2007



Photo 13
Successional Hardwood Forest
Former Agricultural Field in North-Central Part of CCNPP Site
Structure to Right is Abandoned Barn
January 2007

