

FINAL FAUNAL SURVEY REPORT

For

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



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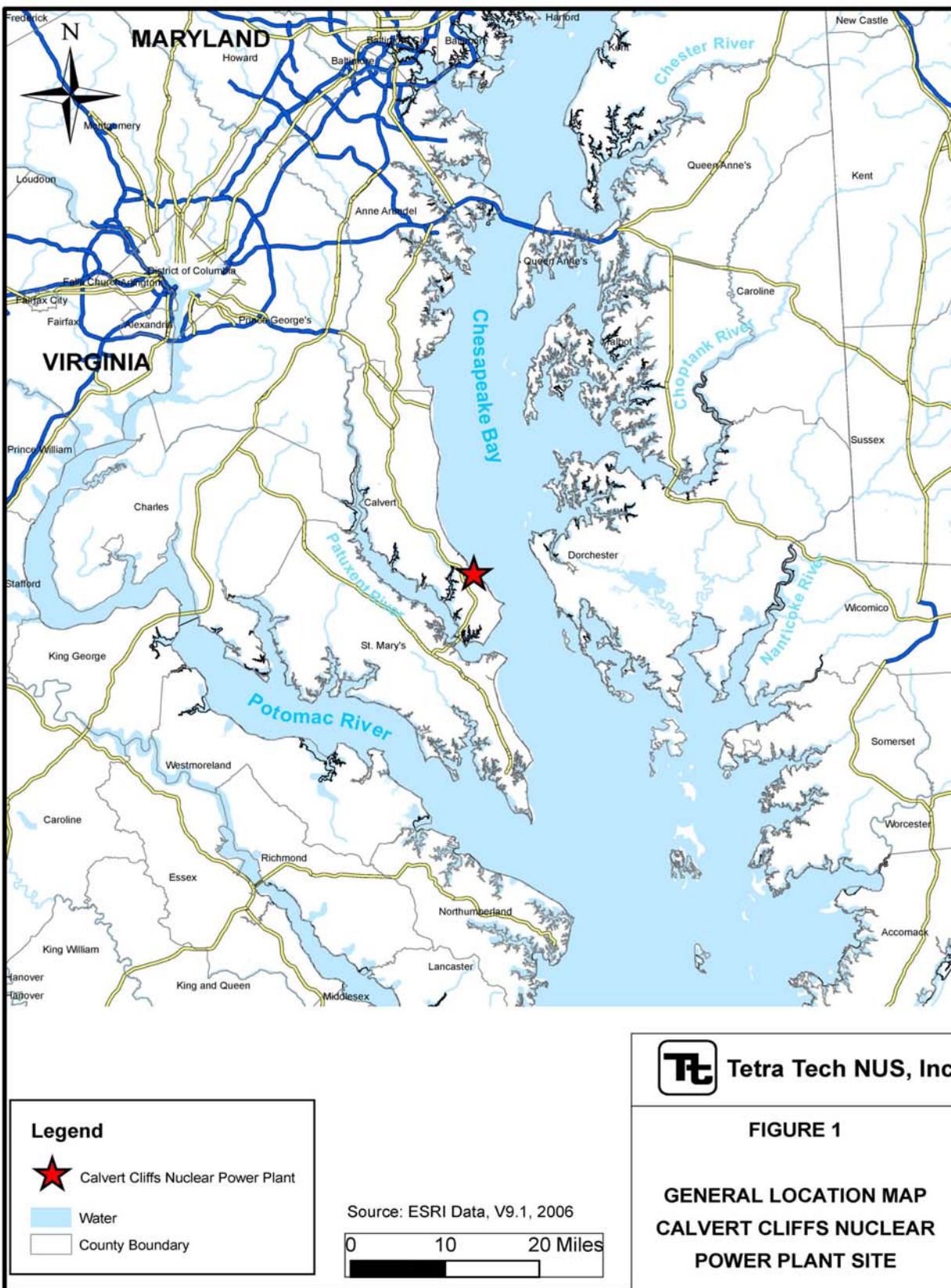
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INTRODUCTION

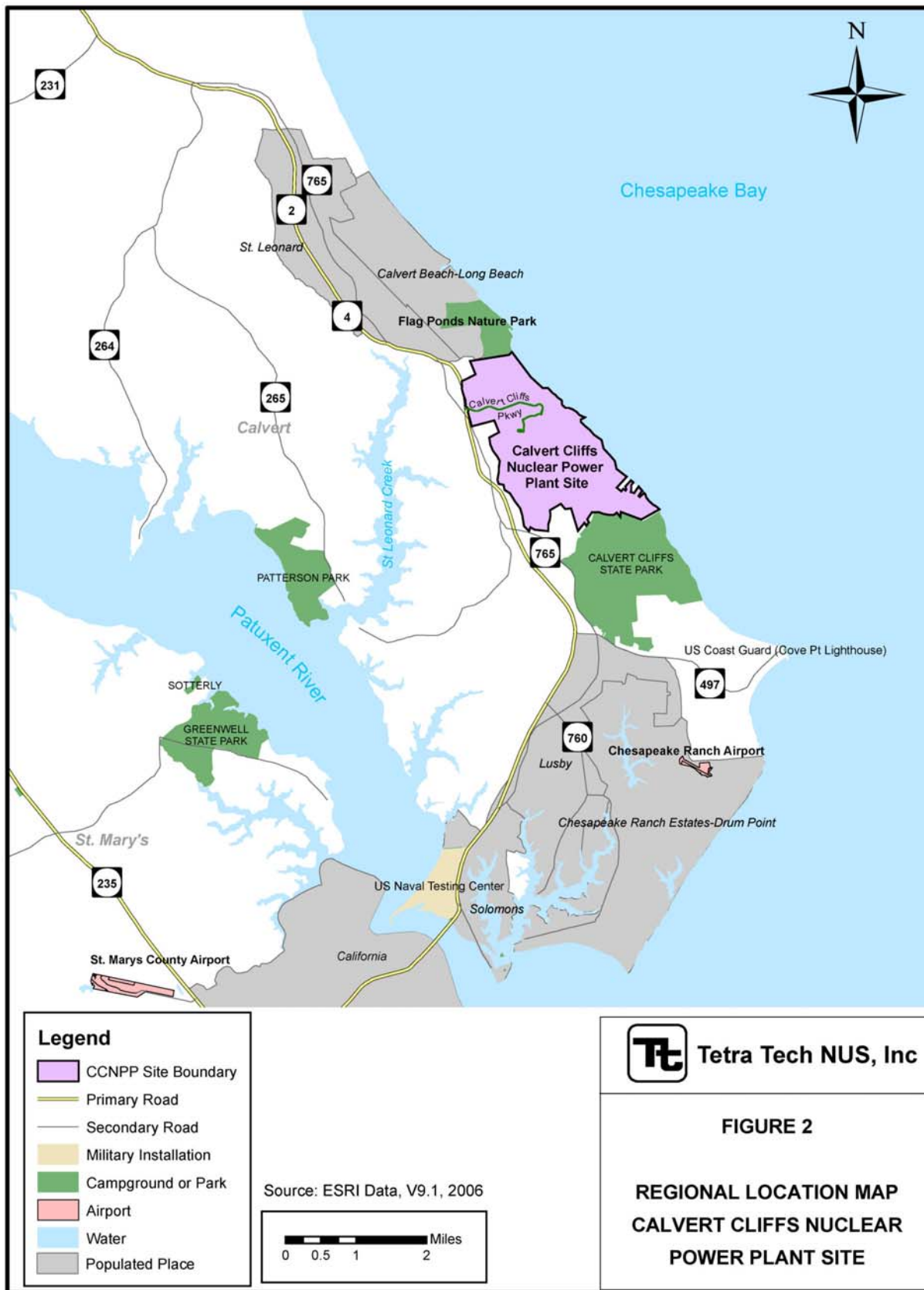
This Faunal Survey Report addresses a tract of land on the Calvert Cliffs Nuclear Power Plant (CCNPP) Site in Calvert County, Maryland, where UniStar Nuclear Development, LLC (UniStar) is considering construction of a new nuclear power plant unit. Development of the new plant would require approval by 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 impact 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 environmental impacts. This report provides background data on existing fauna intended 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 and 2). 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 facilities include various cabins, outbuildings, swimming pool, softball field, tennis courts, and a fishing pond formerly used by Constellation employees and their families.

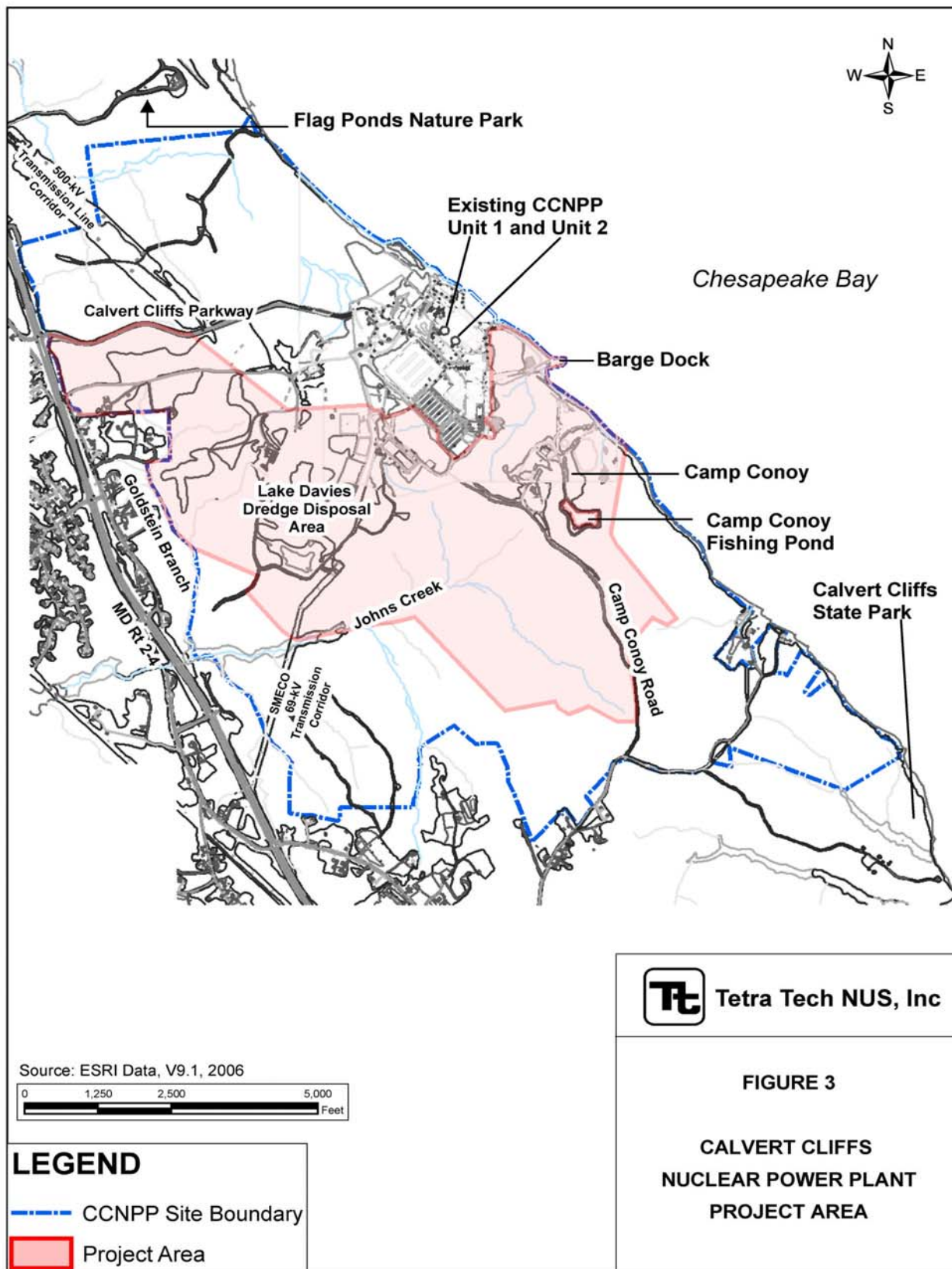
Under current plans, the new generating unit(s) and associated construction and operation-phase facilities would be located within an area of the CCNPP Site south and west of the existing CCNPP Units 1 and 2, termed for convenience in this report the "Project Area" (Figure 3). Elevations in the Project 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. John's Creek flows roughly west and exits the western perimeter of the Project Area and then the western perimeter of the CCNPP Site. It then flows west to 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



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Terrestrial habitats on the Project Area and elsewhere on the CCNPP Site are described in detail (as plant communities) in a separate flora report (Tetra Tech NUS, 2007a), and wetlands in the Project Area are delineated and described in a separate wetland delineation report (Tetra Tech NUS, 2007b). The Camp Conoy area consists of lawns, old field, and patches of mixed deciduous forest and bottomland deciduous forest. Much of the eastern, southern, and western parts of the Project Area as well as areas of the CCNPP Site south, west, and north of the Project Area consist of mixed deciduous forest dominated by tulip poplar (*Liriodendron tulipifera*), chestnut oak (*Quercus prinus*), white oak (*Quercus alba*), black oak (*Quercus velutina*), and American beech (*Fagus grandifolia*). Most canopy trees are between 10 and 24 inches (25 and 64 centimeters) inches in diameter at breast height. Some areas of upland deciduous forest have been logged within the past 10-30 years and presently support a dense thicket of deciduous trees (mixed deciduous regeneration forest) plus some Virginia pine (*Pinus virginiana*).

Low, narrow areas adjoining streams support bottomland deciduous forest dominated by sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and black gum (*Nyssa sylvatica*). For areas where the wetland delineation was performed (Tetra Tech NUS, 2007b), the flora report distinguishes between poorly drained and well-drained bottomland deciduous forest. Elsewhere on the CCNPP Site, the poorly drained and well-drained phases of the bottomland deciduous forest are not distinguished. A few areas along the streams, especially along the main stem of Johns Creek where beaver activity is prevalent, support herbaceous marsh vegetation.

Much of the northern part of the Project Area consists of old field habitat and small patches of forest in areas that have been disturbed by construction and operation of the existing CCNPP units, including disposal of dredge spoils, and on transmission line corridors and land previously farmed. The area where dredge spoils were deposited is called Lake Davies, which is now largely drained and includes upland areas used for equipment and materials storage for existing operations and old field habitat, some poorly drained sites, and old sediment basins on its periphery. Poorly drained areas are mostly covered by a dense stand of phragmites (*Phragmites australis*), with occasional wax myrtle (*Myrica cerifera*) and groundsel tree (*Baccharis halimifolia*) shrubs. Old field habitats are dominated by upland grasses such as tall fescue (*Festuca arundinacea*), upland cover plants such as sericea lespedeza (*Lespedeza cuneata*), brambles such as common blackberry and wineberry, and wildflowers such goldenrods and asters.

METHODOLOGY

J. Peyton Doub, PWS, CEP, made late spring, summer, and fall faunal observations while onsite between May and October 2006. The observations were made concurrently with other natural resource investigations, including vegetation community mapping and characterization efforts, wetland delineation, and rare plant surveys of the Project Area. Mr. Doub returned in January 2007 to make winter season

observations and in April 2007 to make early spring observations. Faunal observations included direct sightings of fauna and noting of sign indicative of fauna such as sounds, tracks, burrows, chewed vegetation, and scat. The dense distribution of wetlands that were delineated and the need to traverse a diversity of vegetated areas to characterize vegetation ensured that each major habitat was visited multiple times over the course of the investigation.

Although the faunal survey addresses the entire CCNPP Site, most of the faunal observations are from the Project Area because that is where the most time was spent in the field performing the various natural resource survey tasks. The terrestrial habitats on the remainder of the CCNPP Site are similar to those in the undeveloped areas of the Project Area; hence, the observations discussed below can be considered representative of the entire CCNPP Site and adjoining lands.

RESULTS

Faunal observations are summarized in Table 1. The table provides separate observational data for four general areas of the Project Area, as follows (Figure 4):

1. The Camp Conoy Area, consisting of lands south of the existing CCNPP reactors and east of Camp Conoy Road. This area consists mostly of upland deciduous forest with narrow strips of bottomland deciduous forest along streams that flow directly to the Chesapeake Bay. Lands surrounding the recreational facilities of Camp Conoy support mowed lawns. This area also includes the Camp Conoy Fishing Pond, a small, shallow impoundment of less than 5 acres (2 hectares) in surface area on an unnamed Chesapeake Bay tributary.
2. The Johns Creek Area, consisting of lands west of Camp Conoy Road and south of the Lake Davies Dredge Spoil Area that drain to Johns Creek or its headwater tributaries. Most of this area consists of upland deciduous forest. Narrow zones of bottomland deciduous forest adjoin Johns Creek and its headwaters. Felling of trees and construction of dams by beavers have converted many areas adjoining Johns Creek into marshes dominated by various sedges, rushes, and bulrushes.

Table 1
List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
Mammals						
<i>Canis latrans</i>	Coyote	D				Doglike carnivore. Maryland is not in the traditionally reported range, but the range has long been recognized as spreading south along the East Coast (Hamilton and Whittaker, 1979). Observed briefly, in low light of evening July 31, 2006 (Photo 1) on dirt road surrounding Camp Conoy Fishing Pond.
<i>Castor canadensis</i>	Beaver	D, A	GV	GV	GV	Large herbivorous rodent that fells trees to construct lodges and dams (Hamilton and Whittaker, 1979). Evidenced by many gnawed trees (Photo 2) and dams on small streams throughout the Project Area, which are killing many trees in riparian wetlands. Largest beaver dams and greatest number of gnawed trees are on Johns Creek in western part of Project Area. Directly observed in Camp Conoy Fishing Pond at dusk in April 2007.

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Lynx rufus</i>	Bobcat	D				Carnivore. More adaptable to forest disturbance and presence of humans than most wild North American cats (Hamilton and Whittaker, 1979). Questionable sighting on August 1, 2006 north of Camp Conoy during this study. CCNPP site personnel have reported seeing bobcat on the CCNPP Site
<i>Marmota monax</i>	Woodchuck	B				Large herbivorous rodent that forms extensive underground burrows (Hamilton and Whittaker, 1979). Burrows observed at multiple locations.
<i>Odocoileus virginianus</i>	White-Tailed Deer	D, T	D, Sc	D, T	D, T	Large herbivore that browses lower vegetation in and at edge of forests and feeds on acorns and other nuts in the fall (Hamilton and Whittaker, 1979). Observed numerous times throughout Project Area (Photo 3). Pest species in most of rural and suburban Maryland (Fergus, 2003).
<i>Procyon lotor</i>	Eastern Raccoon		T	T		Nocturnal carnivore that commonly dwells in hollow trees (Hamilton and Whittaker, 1979). Tracks noted in this study in mudflat in wetlands

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Sciurus carolinensis</i>	Gray Squirrel	D				Herbivorous rodent that favors areas with oaks but is generally tolerant of urbanization (Hamilton and Whittaker, 1979). Observed multiple times (Photo 4). Favors areas with mast trees, such as oaks
<i>Sylvilagus floridanus</i>	Eastern Cottontail	D				Herbivorous. Prefers forest edges and clearings to forest interiors (Hamilton and Whittaker, 1979). Observed frequently in grassy and old field habitats in the Project Area.
<i>Tamias striatus</i>	Eastern Chipmunk		D			Herbivorous. Prefers forest edges and clearings to forest interiors. Can construct extensive underground burrows (Hamilton and Whittaker, 1979).
<i>Urocyon cinereoargenteus</i>	Gray Fox	A				Omnivore. Prefers forest habitat. Often dens in hollow trees or fallen logs (Hamilton and Whittaker, 1979). Small mammals form a part of its diet. Observed by CCNPP environmental staff.
Birds						
<i>Agelaius phoeniceus</i>	Red-Winged Blackbird				D	Favors marshes and riparian habitats. Feeds mostly on insects and seeds (Ehrlich <i>et al.</i> , 1988). Observed around ponds in Lake Davies Area.

Table 1
List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Archilochus colubris</i>	Ruby-Throated Hummingbird	D	D			Breeds in forests and open areas with scattered trees. Neotropical migrant. Feeds on spiders and tree sap from woodpecker drilling (Ehrlich <i>et al.</i> , 1988). Observed multiple times during summer.
<i>Ardea herodias</i>	Great Blue Heron	H, T, D	D, H			Wading bird. Feeds mostly on fish but also eats nestlings and small mammals (Ehrlich <i>et al.</i> , 1988). Observed frequently, especially at Camp Conoy Fishing Pond (Photo 5).
<i>Baeolophus bicolor</i>	Tufted Titmouse	H	H			Breeds in forest, scrub, and riparian areas. Winter resident (Ehrlich <i>et al.</i> , 1988). Heard frequently.
<i>Branta canadensis</i>	Canada Goose	D				Feeds on plants and insects (Ehrlich <i>et al.</i> , 1988). Pest species in some areas (Fergus, 2003). Observed in summer on Camp Conoy Fishing Pond.
<i>Bubo virginianus</i>	Great Horned Owl	H	H			Mainly a nocturnal carnivore. Favors tree cavities and abandoned raptor nests, as well as large fallen logs and crevices in rocks (Ehrlich <i>et al.</i> , 1988).
<i>Buteo jamaicensis</i>	Red-Tailed Hawk				D, H	Raptor. Nests in large trees. Feeds mainly on rodents but also on amphibians, crayfish, and fish (Ehrlich <i>et al.</i> , 1988).

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Buteo lineatus</i>	Red-Shouldered Hawk	D	H	D, H	D	Designated as FIB (MDNR, 2000). Raptor. Diet consists mostly of rodents, snakes, lizards, insects, and sometimes snails (Ehrlich <i>et al.</i> , 1988). Observed frequently.
<i>Cardinalis cardinalis</i>	Northern Cardinal	H	H, D	D, H		Year-round resident. Breeds in thickets, undergrowth, and riparian areas (Ehrlich <i>et al.</i> , 1988). Observed frequently.
<i>Carduelis tristis</i>	American Goldfinch	H		H	H	Breeds in fields, open woodland, and riparian woodland. Winters in southeastern United States, northern Mexico, and Caribbean (Ehrlich <i>et al.</i> , 1988).
<i>Cathartes aura</i>	Turkey Vulture				D	Carrion feeder breeding in open habitats (Ehrlich <i>et al.</i> , 1988). Observed frequently flying overhead.
<i>Charadrius vociferous</i>	Killdeer					Breeds in fields, meadows, pastures, mudflats, and freshwater margins (Ehrlich <i>et al.</i> , 1988). Seen in parking lot next to UniStar office, outside of Project Area.
<i>Coccyzus americanus</i>	Yellow-Billed Cuckoo	H	H			Breeds in open woodland with dense undergrowth and in riparian woodland and thickets (Ehrlich <i>et al.</i> , 1988). Forest interior bird, neotropical migrant
<i>Contopus virens</i>	Eastern Wood-Pewee	H	H	H	H	Neotropical migrant. Breeds in forests and forest edges (Ehrlich <i>et al.</i> , 1988). Heard frequently.

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Coragyps atratus</i>	Black Vulture					Carrion feeder. Observed in June along Camp Conoy Road south of CCNPP Site (Photo 6).
<i>Corvus brachyrhynchos</i>	American Crow	H	H			Year-round resident. Breeds in open fields and tidal flats. Feeds on insects, seeds, nuts, carrion, eggs, and small vertebrates (Ehrlich <i>et al.</i> , 1988). Heard frequently.
<i>Corvus cryptoleucus</i>	Fish Crow	H				Breeds in coastal areas and along major watercourses (Ehrlich <i>et al.</i> , 1988). Commonly associated with coastal areas. Heard in Camp Conoy Area.
<i>Cyanocitta cristata</i>	Blue Jay	H	H	H	H	Year-round resident. Breeds in forests, open woodland, and residential areas. Commonly associated with oaks; feeds on acorns (Ehrlich <i>et al.</i> , 1988). Heard frequently throughout Project Area.
<i>Dendroica petechia</i>	Yellow Warbler		D		D	Habitat generalist. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Questionable sighting in scrub around pond in Lake Davies Area in September 2006. Difficult to conclusively identify in fall after loss of breeding plumage. Also observed in April 2007 in Johns Creek Area (Photo 7).

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Dryocopus pileatus</i>	Pileated Woodpecker		H	D, H		Designated as FIB (MDNR, 2000). Breeds in forest, open woodland, and wooded suburbs. Feeds mostly on insects but also fruit, nuts, and sap (Ehrlich <i>et al.</i> , 1988). Heard and observed frequently in forested parts of Project Area.
<i>Dumetella carolinensis</i>	Gray Catbird	D, H	H	H	D, H	Breeds in dense brush, shrubland, wooded suburbs and forest edge. Avoids deep forest. Feeds on spiders and berries (Ehrlich <i>et al.</i> , 1988). Heard and observed frequently throughout Project Area.

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Haliaeetus leucocephalus</i>	Bald Eagle	D, H				Raptor; federal and state threatened species. Four nest currently known to exist on CCNPP Site as of Spring 2007 (Figure 5), of which three (all except northern most nest) were confirmed active in March/April 2007 by the Principle Investigator of this survey (Camp Conoy nest) or CCNPP environmental staff (nests west of Johns Creek Area and south of Camp Conoy area). CCNPP environmental staff observations in April 2007 indicated that the northern most nest was inactive. The single nest in the Project Area, observed in April 2007, is in a Virginia pine tree near southwest corner of baseball field in Camp Conoy Area (Photo 8). Parent bald eagles observed circling the nest (Photo 9). This nest did not exist in 2006, but bald eagles were observed flying overhead of Camp Conoy during summer 2006. Observed flying over Chesapeake Bay in January 2007. CCNPP staff report that bald eagles are commonly observed onsite along the shoreline overhead or perched in trees on cliff tops.

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List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Helmitheros vermivorus</i>	Worm Eating Warbler		D			Breeds in ravines and hillsides in thick deciduous forest. Feeds on insects. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Observed once, in June 2006, in headwaters area of Johns Creek.
<i>Hylocichla mustelina</i>	Wood Thrush		H			Breeds in forest, especially near water. Feeds on spiders and fruit. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Heard multiple times during summer 2006 in forested areas in headwaters of Johns Creek.
<i>Larus delawarensis</i>	Ring-Billed Gull					Breeds on coasts. Feeds on fish, insects, worms rodents, and eggs (Ehrlich <i>et al.</i> , 1988). Observed flying over developed area associated with existing nuclear reactors.
<i>Melanerpes carolinus</i>	Red-Bellied Woodpecker	H	H			Breeds in upland and riparian forest, swamps, and towns. Nests in dead trees (snags) Feeds on insects, nuts, and fruit (Ehrlich <i>et al.</i> , 1988). Heard frequently in forested parts of Project Area.
<i>Melospiza melodia</i>	Song Sparrow	H				Breeds in dense vegetation near water, marshes, and forest edges. Feeds on seeds, berries, and crustaceans and mollusks near coast (Ehrlich <i>et al.</i> , 1988). Heard in Camp Canoy Area.

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Mimus polyglottos</i>	Northern Mockingbird		D			Habitat generalist. Feeds on crayfish, sowbugs, snails, small vertebrates, and berries (Ehrlich <i>et al.</i> , 1988). Observed in Johns Creek Area.
<i>Pandion haliaetus</i>	Osprey	D				Raptor. Feeds primarily on fish but also eats small mammals (Erlich <i>et al.</i> , 1988). Observations in this study limited to areas near cliffs. CCNPP environmental staff report that osprey are commonly observed along the shoreline at CCNPP and that current or recent nesting sites at CCNPP include Barge Dock pylons and light poles at Camp Conoy and the existing CCNPP cooling water intake structure.
<i>Picoides pubescens</i>	Downy Woodpecker	H	H			Breeds in upland and riparian forest. Feeds on insects, fruit, seeds, and sap. Winter resident (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Heard frequently in forested portions of Project Area. Difficult to distinguish from Hairy Woodpecker.
<i>Picoides villosus</i>	Hairy Woodpecker	H	D		D	Breeds in upland and riparian forest. Feeds on insects, fruit, seeds, and sap. Winter resident (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Seen and heard frequently in forested portions of Project Area (Photo 10). Difficult to distinguish from Downy Woodpecker.

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	H				Breeds in forest edges, riparian thickets, and forest. Feeds on insects, seeds, acorns, and berries (Ehrlich <i>et al.</i> , 1988). Heard in Camp Conoy Area.
<i>Piranga olivacea</i>	Scarlet Tanager	H, D	H	H		Breeds in forests. Feeds on insects, berries, and invertebrates. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Heard frequently in May, June, and July.
<i>Poecile carolinensis</i>	Carolina Chickadee	H, D	H	D, H		Breeds in forests, riparian areas, swamps, and thickets. Feeds on spiders and seeds (Ehrlich <i>et al.</i> , 1988). Observed frequently.
<i>Protonotaria citrea</i>	Prothonotary Warbler	D	D			Breeds in lowland and riparian forests. Feeds on insects and snails. Neotropical migrant Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000).
<i>Quiscalus quiscula</i>	Common Grackle	H		H		Breeds in open areas with scattered trees. Feeds on insects, crustaceans, invertebrates, fish, eggs, fruit, grain, and nuts. Winters in US (Ehrlich <i>et al.</i> , 1988).
<i>Sayornis phoebe</i>	Eastern Phoebe	D				Breeds in open and riparian forest, ravines, and farmland. Feeds on berries, seeds, small fish and frogs. Winters in Mexico (Ehrlich <i>et al.</i> , 1988).

Table 1
List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Sialia sialis</i>	Eastern Bluebird				D	Nests in tree cavities and abandoned woodpecker holes. Faces competition with introduced European starling (Fergus, 2003). CCNPP staff maintains eastern bluebird nesting boxes on the CCNPP Site, including Project Area.
<i>Sitta canadensis</i>	Red Breasted Nuthatch	H		H		Breeds in forest, especially coniferous forest with decaying large trees. Feeds on conifer seeds (Ehrlich <i>et al.</i> , 1988). Heard infrequently.
<i>Sitta carolinensis</i>	White-Breasted Nuthatch	D, H	H		H	Breeds in forest and forest edges, especially forests with decaying large trees. Winter resident (Ehrlich <i>et al.</i> , 1988). Heard frequently.
<i>Sphyrapicus varius</i>	Yellow-Bellied Sapsucker		BH			Breeds in forest. Feeds on sap, fruit, and nuts. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Distinctive borings in tree. Distinctive boreholes observed in multiple trees in Johns Creek Area (Photo 11).
<i>Spizella passerina</i>	Chipping Sparrow	D				Breeds in forests, thickets, and forest edges. Feeds primarily on seeds (Ehrlich <i>et al.</i> , 1988).
<i>Tachycineta bicolor</i>	Tree Swallow	D, H				Breeds in open areas and forest edges, especially near water. Feeds on insects and berries. Neotropical migrant (Ehrlich <i>et al.</i> , 1988).

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Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Thryothorus ludovicianus</i>	Carolina Wren	H	H			Breeds in open forest and farmland. Feeds on seeds, invertebrates, and small vertebrates. Winter resident (Ehrlich <i>et al.</i> , 1988). Heard frequently.
<i>Tringa melanoleuca</i>	Greater Yellowlegs	D				Breeds in Canada and Alaska and winters in tropics (Ehrlich <i>et al.</i> , 1988). Passes through Maryland in migration. Feeds on aquatic insects, worms, crustaceans, mollusks, and fish (Ehrlich <i>et al.</i> , 1988). Observed in stormwater pond near existing Barge Dock (Photo 12)
<i>Turdus migratorius</i>	American Robin	H	H			Habitat generalist. Feeds on fruit, worms, and insects (Ehrlich <i>et al.</i> , 1988). Observed frequently.
<i>Vireo olivaceus</i>	Red-Eyed Vireo	H	H	H		Breeds in forests and suburbs. Feeds on insects and fruit. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Heard frequently in summer.
<i>Wilsonia citrina</i>	Hooded Warbler		D			Breeds in forests on ravines and hillsides. Feeds on insects. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Designated as FIB (MDNR, 2000). Single observation in forest interior land in headwaters to Johns Creek.

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List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Zenaida macroura</i>	Mourning Dove	H				Habitat generalist. Feeds primarily on seeds. Neotropical migrant (Ehrlich <i>et al.</i> , 1988). Heard frequently.
Reptiles						
<i>Agkistrodon contortrix</i>	Copperhead	A	A		D	Venomous snake. Favors dry rocky habitat near streams, wetlands, and floodplains (Behler, 1979). Anecdotal evidence from contractor and CCNPP staff for Camp Conoy and Johns Creek areas. Observed directly in September 2006 on shore of uppermost of the old sediment basins in Lake Davies Area.
<i>Carphophis amoenus</i>	Worm Snake	A				Non-venomous snake. Common in forested or grassy hillsides near streams and at edge of fields (Behler, 1979). Freshly killed specimen reportedly found in forest habitat in spring 2006 by CCNPP environmental staff.
<i>Coluber constrictor constrictor</i>	Northern Black Racer		D	D		Non-venomous snake. Common in old fields, grassland, brush, open woodland, rocky wooded hillsides, pine flatwoods, and along grassy-bordered streams (Behler, 1979). Observed multiple times in Project Area.

Table 1
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Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Malaclemys terrapin</i>	Eastern Diamondback Terrapin		D			Favors salt marsh estuaries, tidal flats, and lagoons behind barrier beaches (Behler, 1979). Single specimen observed August 1, 2006 in shallow non-tidal headwater reach of Johns Creek. Sighting was not in the species' preferred habitat.
<i>Nerodia sipedon</i>	Northern Water Snake		D			Non-venomous snake. Occurs in various freshwater bodies and salt marshes (Behler, 1979).
<i>Terrapene carolina carolina</i>	Eastern Box Turtle	R	D, R	D		Common in moist forested areas, wet meadows, pastures, and floodplains (Behler, 1979). Observed multiple times.
Amphibians						
<i>Acris crepitans</i>	Northern Cricket Frog	D	D	D		Favors ponds with dense vegetation and slow moving streams (Behler, 1979). Observed in large numbers along stream banks
<i>Bufo americanus</i>	American Toad	H	D			Common in a variety of habitats (Behler, 1979). Heard frequently in May and June.
<i>Hyla crucifer</i>	Spring Peeper	H	H			Common in wooded areas near ponds and swamps. Hibernates under logs and loose bark. Breeds in early spring (Behler, 1979). Heard abundantly around the Camp Conoy Fishing Pond and Johns Creek area in April 2007.
<i>Order Caudata</i>	Salamander	D	D			Observed frequently.

Table 1
List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

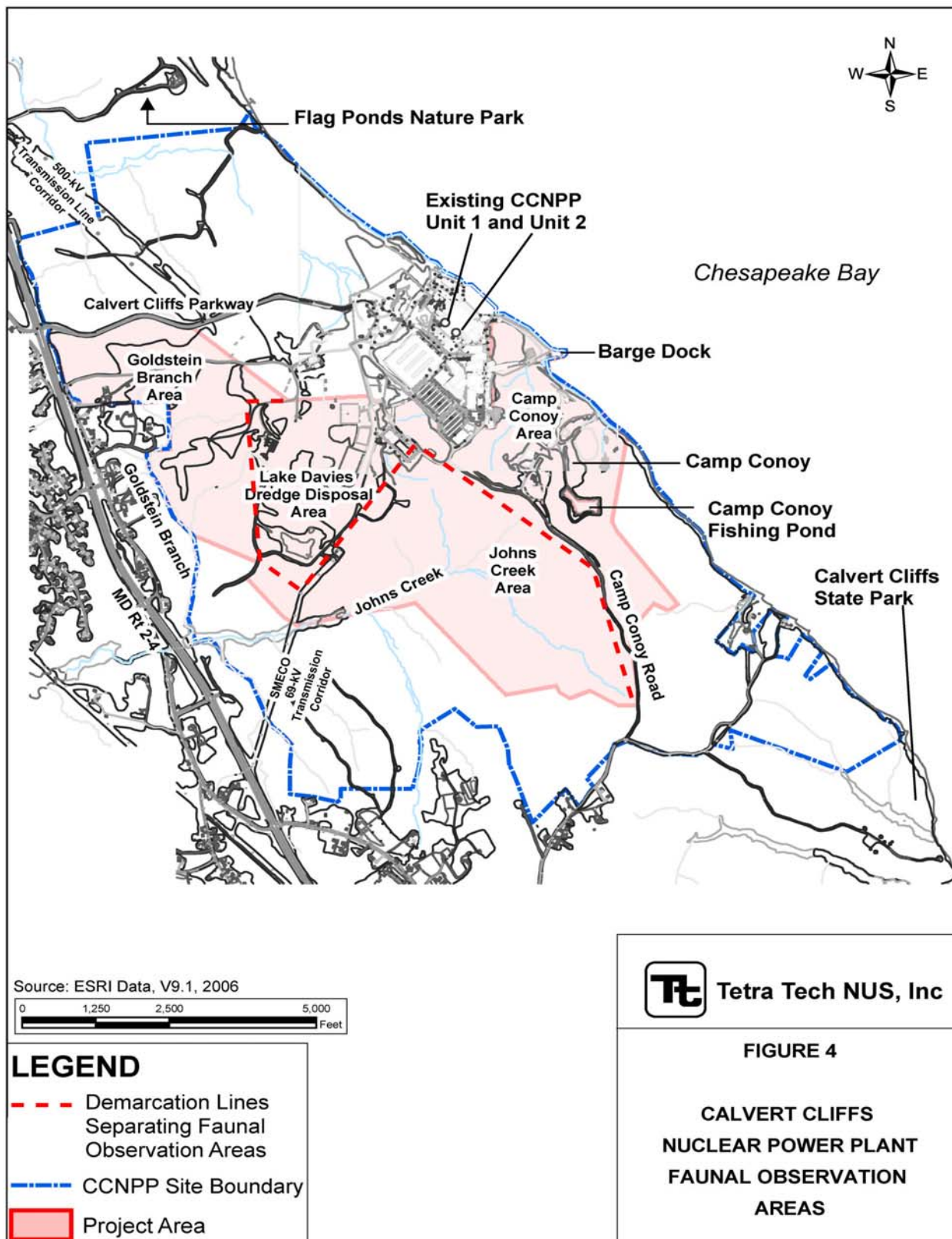
Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Pseudacris triseriata</i>	Chorus Frog	H	H			Common in dry and wet grassy areas, woodlands, and swamps (Behler, 1979). Heard frequently in May.
<i>Rana clamitans</i>	Green Frog	H	H			Favors areas near shallow water, springs, swamps, streams, and ponds and may be found around fallen trees (Behler, 1979). Heard frequently in May and June.
Other						
<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle					Federal Threatened, State Endangered. Occupies beach/shoreline habitat. Not observed in this study. Known to occasionally occur on CCNPP site only on shoreline/beach near northern site boundary (Knisley 2006).
<i>Cicindela puritana</i>	Puritan Tiger Beetle	S				Federal Threatened, State Endangered. Occupies beach/shoreline and cliff habitat. Not observed in this study. Known to occur on CCNPP site only on suitable shoreline/beach/cliff habitat southward from the CCNPP Barge Dock (Knisley, 2006).
<i>Danaus plexippus</i>	Monarch Butterfly	D				Favors meadows, old fields, and roadsides, especially where milkweeds grow (Farrand, 2003).
<i>Libellula lydia</i>	White Tail Dragonfly	D				Occurs in marshes and weedy ponds (Farrand, 2003).

Table 1
List of Fauna Observed on and near the Proposed UniStar Project Area
Calvert County, Maryland, May 2006 – April 2007

Scientific Name	Common Name	Camp Conoy Area	Johns Creek Area	Goldstein Branch Area	Lake Davies Area	Notes
<i>Order Decapoda</i>	Crayfish			B		
<i>Pterourus glaucus</i>	Tiger Swallowtail Butterfly	D	D			Occurs in forests, clearings, gardens, and roadsides (Farrand, 2003).
<i>Suborder Zygoptera</i>	Damselfly		D			Found around ponds, marshes, and hallow streams (Farrand, 2003).
<i>Tibicen canicularis</i>	Dog Day Cicada	H	H			Occurs in various habitats. Sings during hot days of late summer (Farrand, 2003). Heard frequently in August and September 2006.

Legend:

A Anecdotal evidence
B Burrow
BH Bore holes
D Direct observation
GV Gnawed vegetation
H Heard (song or call)
R Relict (e.g., cast-off shell)
S Suspected
Sc Scat
T Tracks



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3. The Goldstein Branch Area, consisting of lands west of the Lake Davies dredge spoil area that drain into Goldstein Branch. Most of this area consists of upland deciduous forest with narrow zones of bottomland deciduous forest adjoining Goldstein Branch and its headwaters. As in the Johns Creek Area, felling of trees and construction of dams by beavers have converted some bottomland deciduous forest into marshes dominated by various sedges, rushes, and bulrushes. Some small areas of recently (within the past ten years) cultivated cropland that now supports old field vegetation are also present.
4. Lake Davies Area. This area consists of the Lake Davies dredge spoil area in the northeastern part of the Project Area as well as adjoining areas of old field vegetation. As previously noted, well-drained areas of Lake Davies are used for equipment and materials storage, and remaining habitats include poorly drained sites and old sediment basins dominated by *Phragmites*.

Table 1 lists each species observed in each area together with key information on the biology and habitat of the species observed. Identifying observations by area is more meaningful than identifying by habitat type. The foremost reason is the fact that most mammals, birds, and reptiles are mobile, and their presence in an area usually reflects the composition of habitats in that area (e.g. extensive contiguous forest vs. forest fragmented by non-forest) rather than the presence of a single habitat type. Furthermore, many faunal observations, especially for birds and amphibians, reflect hearing calls from a distance. Sometimes, the exact habitat from which a call originated was not apparent. Many bird observations consisted of observing birds in flight overhead; the exact habitat the observer was standing in on the ground at the time of the observation is irrelevant.

Mammals

Deer: White-tail deer (*Odocoileus virginianus*) and their sign were observed throughout the Project Area (see Cover Photo and Photo 3). The mix of forest, old field, wetland, and open water vegetation in the Project Area provides ideal deer habitat (Hamilton and Whittaker, 1979). White-tail deer have become a pest species over most rural and suburban areas of Maryland, including Calvert County, and over-browsing has substantially damaged forest understory and suburban landscape vegetation in many parts of the state (Fergus, 2003). Although large groups of deer were observed throughout the Project Area, there was little visible over-browsing of forest understory vegetation. However, CCNPP Environmental staff has observed heavy browse damage on vegetation on forest edges around the existing developed areas of the site. No hunting of deer or other game is allowed on the CCNPP Site.

Beavers: Beavers (*Castor canadensis*) have reportedly been often observed by CCNPP environmental staff, and were directly observed at dusk on April 18, 2007 in the Camp Conoy Fishing Pond. The large

number of freshly gnawed trees (Photo 2) in the wetlands adjoining Johns Creek and Goldstein Branch and numerous beaver dams attest to the presence of a substantial beaver population. Many of the gnawed trees are dead or declining, and water backed up behind beaver dams has caused additional trees in those wetlands to decline or die. Open areas amid the dead and declining trees have become dominated by sedges, rushes, bulrushes, and other herbaceous vegetation typical of freshwater marshes. It appears as if beaver activity in the last several years has converted substantial areas of forested wetland vegetation along Johns Creek and Goldstein Branch to freshwater marsh vegetation. Increased levels of flooding of riparian lands in recent years caused by increased beaver populations has lead to trapping programs by wildlife agencies in Maryland and Virginia (Fergus, 2003)

Other Mammals: Other observed mammals include gray squirrel (*Scuirus carolinensis*) (Photo 4), eastern cottontail rabbit (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*). The squirrels and rabbits are regionally common and were observed on multiple occasions in the Camp Conoy Area, and both likely occur frequently throughout the CCNPP Site. Raccoons are also locally common but were observed only by tracks in 2006, but a specimen was sighted in April 2007 along Camp Conoy Road. The coyote (Photo 1) was observed on a dirt road that circles the Camp Conoy Fishing Pond. The traditionally recognized range for coyote does not include Maryland (Hamilton and Whittaker, 1979), but CCNPP environmental staff report that the species has been recently sighted in Calvert County. Drillers performing geotechnical investigations reported seeing a fox den, most likely a gray fox (*Urocyon cinereoargenteus*), east of the pond. Additionally, what appeared to be a bobcat (*Lynx rufus*) was briefly observed in a forested area north of Camp Conoy. This sighting was uncertain, but is consistent with anecdotal observations made by CCNPP personnel. Bobcats are reclusive and favor large areas of forest vegetation without human disturbance (Fergus, 2003).

None of the mammal species observed during this survey or anecdotally reported by CCNPP personnel to occur on the CCNPP site are designated as threatened or endangered on the federal or state level, or candidates for such listing. An Environmental Review conducted by the Maryland Department of Natural Resources (MDNR) in 2006 for the UniStar Project at the CCNPP Site did not identify the potential for occurrence of any endangered, threatened, or other special status mammal species (MDNR, 2006).

The ranges of several other small mammal species, including various species of mice, rats, voles, and shrews, include Calvert County (Hamilton and Whittaker, 1979). Such species are not readily observed when walking a site, and typically require the setting of traps or other more intensive field observation methods to ascertain their presence. The fact that these species, or their sign, were not observed in the field and hence listed in Table 1 should not be interpreted as evidence that the species do not occur on the CCNPP Site.

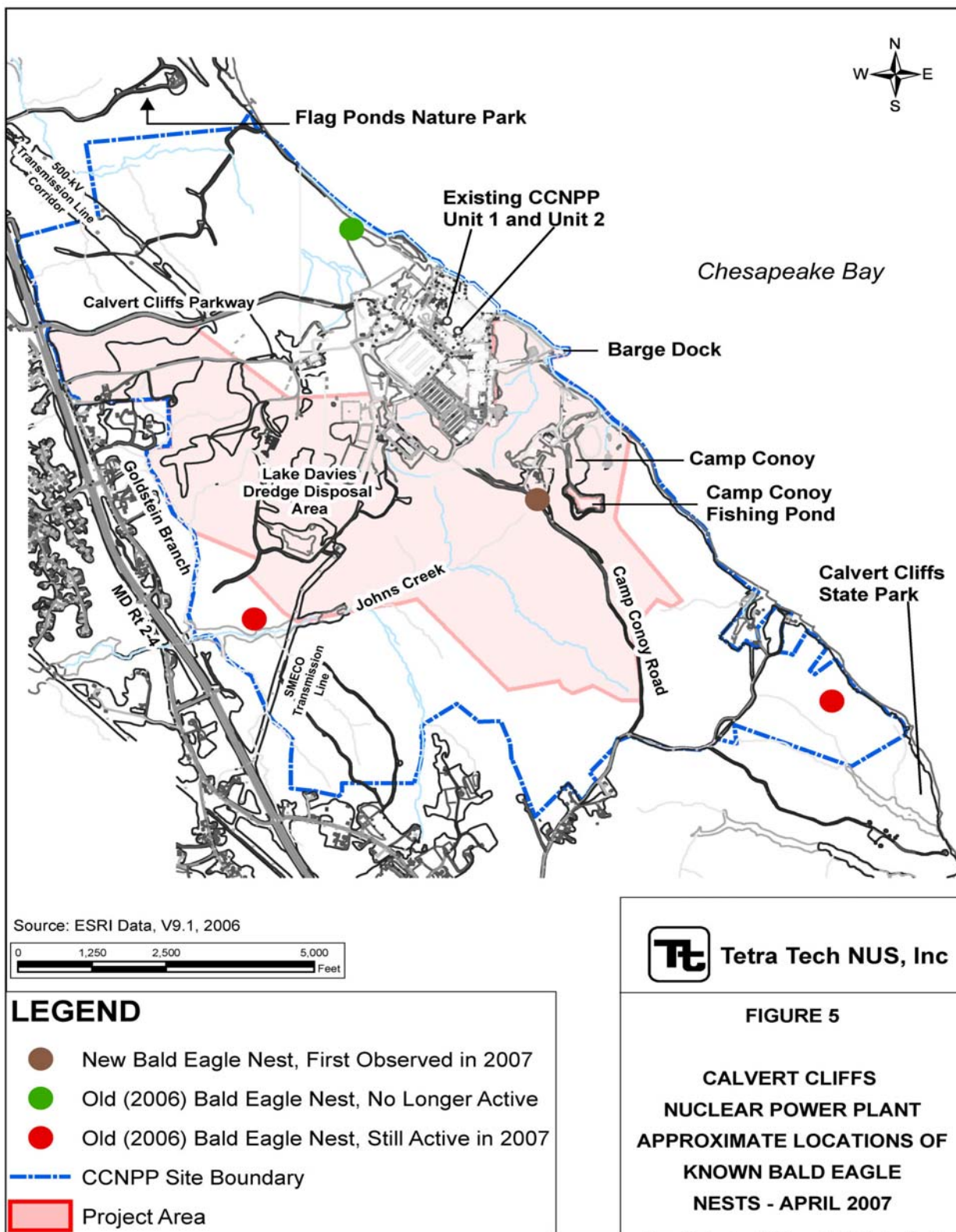
Birds

A large number of bird species were observed on the Project Area, including raptors (birds of prey), bald eagles and osprey, carrion feeders (vultures), waterfowl and wading birds, and passerine birds (songbirds). Although Table 1 does not list every bird species whose range is known to include Calvert County, it does represent a large and representative cross section of the birds known to occur in Calvert County. The only occurrence reports for bird species identified by the MDNR in their Environmental Review for the CCNPP Site and vicinity were the bald eagle and, collectively, forest interior bird species (FIBS).

Bald Eagle: The bald eagle, a federal and state threatened species, is the only bird species observed during this survey or anecdotally reported by CCNPP personnel to occur on the CCNPP site that is designated threatened or endangered on the federal or state level, or candidates for such listing. As of the end of 2006, three bald eagle nests were known to exist on the CCNPP Site (Figure 5). All were outside of the Project Area. In April 2007, a new active bald eagle nest was observed in a Virginia pine tree close to Camp Conoy Road, near the southwestern corner of a baseball field. Parent bald eagles were observed circling the nest, suggesting that it was active and contained eggs or recently hatched chicks. However, one of the previously recognized nests (Photo 13, the one in the northern part of the CCNPP Site) was reported by CCNPP environmental staff to be inactive in April 2007.

Bald eagles prefer to nest in tall trees within sight of lakes, rivers, and other open waters (Fergus, 2003). The optimal bald eagle nesting habitat on the CCNPP Site is therefore the forested areas at the top of the cliffs overlooking the Chesapeake Bay. Two of the known nesting locations are in such areas, to the north and south of the Project Area. The Camp Conoy nest is more than 1,500 feet (457 meters) inland from the Chesapeake Bay but is within sight of the Camp Conoy Fishing Pond. The western nest is situated even farther inland but directly adjoins a large marshy area with pools of open water formed by beaver dams on Johns Creek. The mixture of forest cover and open water present throughout the CCNPP Site and surrounding region therefore provides potentially suitable bald eagle habitat.

Forest-Interior Birds (FIBS): Several FIBS were observed in the large tracts of forest land in the eastern and southern parts of the Project Area. These include scarlet tanager (*Piranga olivacea*), red-eyed vireo (*Vireo olivaceus*), wood thrush (*Hylocichla mustelina*), and worm-eating warbler (*Helminthos vermivorus*). FIBS are bird species 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 30-40 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 best FIBS habitat on the CCNPP Site occurs mostly in the southern, southwestern, and northern parts of the Site. The open fields and fragmented forest cover surrounding the existing developed area (CCNPP Units 1 and 2), the Lake Davies dredge materials disposal area, and Camp Conoy do not provide quality FIBS habitat. The Project Area is situated outside of the extensive areas of FIBS habitat in the northern and southwestern parts of the CCNPP Site.

Other Birds: A large number of other bird species were observed by direct sight or by sound (call) and are listed in Table 1. These species are broadly discussed by group below.

Other Carnivorous Birds: Several other birds of prey were observed in and close to the Project Area. Red-shouldered hawks (*Buteo lineatus*) were observed either directly or by call (sound) in all areas of the Project Area, and a red-tailed hawk (*Buteo jamaicensis*) was also heard calling while flying near the dredge spoil area. A great horned owl (*Bubo virginianus*) was heard hooting in the upland forest cover along Johns Creek and in the upland forest just south of the Camp Conoy Fishing Pond.

Carrion-Feeding Birds: Turkey vultures (*Cathartes aura*) were observed flying high over the dredge spoil area. Turkey vultures are carrion feeders that typically fly high over the landscape and do not land until a carcass is discovered (Ehrlich *et al.*, 1988). A black vulture (*Coragyps atratus*), also a carrion feeder, was observed on the side of Camp Conoy Road south of the CCNPP Site, approximately one mile (1.6 kilometers) south of the gate to Camp Conoy (Photo 6).

Geese, Waterfowl, and Wading Birds: Canada geese (*Branta canadensis*) were observed on the Camp Conoy Fishing Pond. It is unclear whether the observed geese were part of a migratory or resident population (most likely, resident). Identical in morphology, the migratory geese move north and south with the seasons, while the resident geese remain in one locale year round. Large numbers of resident geese have become pests at many lakes in rural and suburban Maryland, discouraging other wildlife and depositing a large amount of droppings (scat) in the water and along the shoreline (Fergus, 2003).

However, Canada geese do not appear to have reached pest status anywhere in the Project Area, including at the Camp Conoy Fishing Pond.

Great blue herons (*Ardea herodias*) were observed on and close to the Camp Conoy Fishing Pond on several occasions (Photo 5). Great blue herons are large (3 to 5 feet [0.9 to 1.5 meters] in height) wading birds that stand in shallow water or marsh vegetation and impale fish with their long bills. They are visually impressive because of their large size and colorful plumage. Numbers of great blue herons are reportedly increasing in Maryland and Virginia, perhaps as a result of the recent proliferation of beaver dams (Fergus, 2003). Other common wading birds in freshwater marshes near the Chesapeake Bay include the great egret (*Casmerodius albus*) and green heron (*Butoroides striatus*) (White, 1989).

Non-FIB Passerine Birds: Other passerine species observed in and around the Project Area include American robins (*Turdus migratorius*), northern cardinals (*Cardinalis cardinalis*), northern mockingbirds (*Mimus polyglottos*), gray catbirds (*Dumetella carolinensis*), blue jays (*Cyanocitta cristata*), and American goldfinches (*Carduelis tristis*). Unlike FIBS, these species are habitat generalists that can be found in most rural and suburban landscapes in eastern North America (Ehrlich *et al.*, 1988).

Reptiles and Amphibians

None of the reptile or amphibian species observed during this survey or anecdotally reported by CCNPP personnel to occur on the CCNPP site are designated threatened or endangered on the federal or state level, or candidates for such listing.

Reptiles: Several snakes and turtles were observed at various locations on the Project Area. An eastern diamondback terrapin (*Malaclemys terrapin*) was observed in an upper reach of the channel of Johns Creek, in the south-central part of the Project Area. Once common in brackish and fresh water bodies close to the Chesapeake Bay, the eastern diamondback terrapin has suffered population declines caused by hunting and habitat loss (PWRC, 2003). The marshy wetlands along Johns Creek provide good habitat for this species. Eastern box turtles (*Terrapene carolina carolina*), and remains of the shells of eastern box turtles, were noted in several forested areas throughout the Project Area.

A copperhead (*Agkistrodon contortrix*), a venomous snake, was observed on the shore of one of the old Lake Davies sediment basins, and other copperheads were reportedly observed by drilling contractor personnel working in the Camp Conoy and Johns Creek Areas in 2006. Northern black racers (*Coluber constrictor constrictor*) were observed in upland forest locations along Johns Creek and Goldstein Branch, and a northern water snake (*Nerodia sipedon*) was observed in a headwater channel to Johns Creek. A dead eastern worm snake (*Carphophis amoenus*) was observed in the Project Area by a

CCNPP environmental staff in 2006. Some other snakes found in southern Maryland include the northern scarlet snake (*Cemophora coccinea copei*), northern ringneck snake (*Diadophis punctatus edwardsi*), corn snake (*Elaphe guttata guttata*), smooth earth snake (*Virginia valeriae valeriae*), eastern hognose snake (*Heterodon platyrhinos*), molesnake (*Lampropeltis calligaster rhombomaculata*), coastal plain milk snake (*Lampropeltis triangulum temporalis*), eastern milk snake (*Lampropeltis triangulum triangulum*), eastern king snake (*Lampropeltis getulus getulus*), queen snake (*Regina septemvittata*), rough green snake (*Opheodrys acstivus*), northern brown snake (*Storeria dekayi dekayi*), northern red-belly snake (*Storeria occipitomaculata occipitomaculata*), eastern ribbon snake (*Thamnophis sauritus sauritus*), and eastern garter snake (*Thamnophis sirtalis sirtalis*) (Hepburn, Undated). The rainbow snake (*Farancia erytrogrammas*), known to occur in neighboring Charles County, is thought to no longer occur in Calvert County (Hepburn, Undated; Brown, personal communication).

No occurrence records for reptile species on or near the CCNPP Site were identified by the MDNR in their Environmental Review for the project (MDNR, 2006).

Amphibians: The abundant wetland habitats situated throughout the Project Area and remainder of CCNPP Site provide habitat for amphibians. Large numbers of spring peepers (*Hyla crucifer*) were heard around the Camp Conoy Fishing Pond and Johns Creek headwaters in April 2007. Large numbers of northern cricket frogs (*Acris crepitans*) were heard in the forested wetlands along streams in the Johns Creek, Camp Conoy, and Goldstein Branch Areas throughout the summer. Calling from northern chorus frogs (*Pseudacris triserata*) and green frogs (*Rana clamitans*) were heard around Lake Conoy and Johns Creek during May and June. These frogs also likely occur in wetlands around Goldstein Branch and its headwaters and old Lake Davies sediment basins, which were not visited until later in the summer and fall when frog calling is infrequent. Some other amphibians that are common in southern Calvert County in habitats occurring in the Project Area include the leopard frog (*Rana pipiens*), pickerel frog (*Rana palustris*), southern cricket frog (*Acris gryllus*), green tree frog (*Hyla cinerea*), gray tree frog (*Hyla versicolor*), American toad (*Bufo americanus*), Fowlers toad (*Bufo woodhousei*), and spadefoot toad (*Scaphiopus holbrookii*) (Brown, personal communication). The eastern narrowmouth toad (*Gastrophryne carolinensis*) was reportedly observed at Cove Point, approximately one mile (1.6 kilometers) south of the CCNPP Site, in the 1960s (Brown, personal communication). No occurrence records for amphibian species were noted by the MDNR for the CCNPP Site and vicinity in their Environmental Review for the project (MDNR, 2006).

Invertebrates

Several butterflies, dragonflies, and damselflies were observed in flight in various parts of the Project Area. Although the investigators noted insects when observed, the observational techniques were not

intended to note small or hard to observe insects or insect larvae and other benthic invertebrates inhabiting soil or sediments.

The Northeastern Beach Tiger Beetle (*Cicindela dorsalis*) and Puritan tiger beetle (*Cicindela puritana*), both of which are federally threatened and state endangered species, are the only invertebrate species noted by the MDNR in their Environmental Review for the project as having occurrence records on the CCNPP Site that are designated threatened or endangered on the federal or state level, or candidates for such listing (MDNR, 2006). Neither species was observed during this survey. However, specific surveys for these species conducted by others indicate that *C. dorsalis*, which inhabits shoreline beach areas, occurs on the CCNPP site only occasionally at the northern site border, and *C. puritana*, which inhabits shoreline beach areas and adjacent cliffs, occurs on the CCNPP site only in suitable shoreline/beach/cliff habitat south of the CCNPP Barge Dock, from the middle of the Camp Conoy Area southward (Knisely, 2006).

REFERENCES

Askins, R. A., 2000. *Restoring North America's Birds*. Second Edition, Yale University Press, New Haven, Connecticut.

Behler, J. L., 1979. *National Audubon Society Field Guide to North American Reptiles and Amphibians*. Alfred A. Knopf, New York, New York.

Brown, A., 2007. Personal communication on January 8, 2007 between Andy Brown of Calvert County Natural Resource Department and Peyton Doub of Tetra Tech NUS, Inc. Subject: reptiles and amphibians of Calvert County.

Ehrlich, P. R., D. S. Dobkin, and D. Wheye, 1988. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. Simon and Shuster, New York, New York.

Farrand, J., Jr., 2003. *National Audubon Society Pocket Guide to Insects and Spiders*. Chanticleer Press, Inc., New York, New York.

Fergus, C., 2003. *Wildlife of Virginia and Maryland and Washington, D.C.* Stackpole Books, Mechanicsburg, Pennsylvania.

Hamilton, W. J. and J. O. Whittaker, Jr., 1979. *Mammals of the Eastern United States*. Comstock Publishing Associates, Ithaca, New York.

Hepburn, R. L., Undated. *Snakes of Southern Maryland*. Flyer prepared by R. Lloyd Hepburn, Volunteer Naturalist, Battle Creek Cypress Swamp, Calvert County, Maryland.

Knisley, C. B., 2006. *Current Status of Two Federally Threatened Tiger Beetles at Calvert Cliffs Nuclear Power Plant, 2006*. Report of survey conducted by C. Barry Knisley, Ph.D. for Constellation Generation Group.

MDNR (Maryland Department of Natural Resources), 2000. *A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area*. Maryland Department of Natural Resources, Annapolis, Maryland, June.

MDNR (Maryland Department of Natural Resources), 2005. MDNR wetland data (DNR_Wetlands) for Calvert County. Maryland Department of Natural Resources - Geographic Information Services Division. Posted November 29, 2005 at www.msgic.state.md.us/techtool.

MDNR (Maryland Department of Natural Resources), 2006. *Environmental Review for Constellation Energy's Calvert Cliffs Nuclear Power Plant Site, Lusby, Calvert County, Maryland*. Letter: Lori A. Byrne (MDNR) to R.M. Krich (UniStar Nuclear), July 31, 2006.

PWRC, 2003. *The Diamondback Terrapin in the Chesapeake Bay*. Available at <http://www.pwrc.usgs.gov/products/sciencebriefs/sb01sm.pdf>. Patuxent Wildlife Research Center, Laurel, Maryland.

Tetra Tech NUS, 2007a. *Final Flora Survey Report for Proposed UniStar Nuclear Project Area, Calvert Cliffs Nuclear Power Plant Site, Calvert County, Maryland*. May 2007.

Tetra Tech NUS, 2007b. *Final Wetland Delineation Report for Proposed UniStar Nuclear Project Area, Calvert Cliffs Nuclear Power Plant Site, Calvert County, Maryland*. May 2007.

USGS (US Geological Survey), 1987. *Cove Point, Maryland 7.5-Minute Topographic Quadrangle*.

White, C. P., 1989. *Chesapeake Bay – A Field Guide*. Tidewater Publishers, Centreville, Maryland.



Photo 1
Coyote on Road Circling Camp Conoy Fishing Pond
July 2006



Photo 2
Beaver-Felled Tree near Johns Creek
October 2006



Photo 3
White-Tail Deer on Ball Field in Camp Conoy
July 2006



Photo 4
Gray Squirrel in Camp Conoy Area
July 2006



Photo 5
Great Blue Heron on Shore of Camp Conoy Fishing Pond
July 2006



Photo 6
Black Vulture on Camp Conoy Road South of CCNPP Site
June 2006



Photo 7
Yellow Warbler along Upper Reach of Johns Creek
April 2007



Photo 8
New (2007) Bald Eagle Nest in Camp Conoy
April 2007



Photo 9
Bald Eagle Circling New (2007) Nest in Camp Conoy
April 2007



Photo 10
Hairy Woodpecker in Forested Area Just West of Camp Conoy
April 2007



Photo 11
Distinctive Yellow Bellied Sapsucker Drill Holes
Along Upper Reach of Johns Creek
April 2007



Photo 12
Greater Yellowlegs in Pond near Existing Barge Dock
June 2006



Photo 13
Inactive Bald Eagle Nest in Northern Part of CCNPP Site
April 2007