GEMS OF THE SEVERN

PART II

AN INVENTORY OF SUBWATERSHEDS

INTRODUCTION

The Severn River watershed, which comprises 70 square miles, is naturally separated into 50 subwatersheds (Table 1)[*1]. As shown in Figure 1 (Part 1)[*2], these are the drainage basins of the major tributaries which flow directly into the Severn. Part II of "Gems of the Severn" which follows contains detailed descriptions of natural areas in each of these 50 subwatersheds -- thus 50 subsections.

For purposes of user accessibility and convenience, each natural area within the 50 subsections is described through a system of separate categories. The category system (Table 2)[*3] is standardized and consistent for each subwatershed and was chosen to facilitate data retrieval of specific types of information for specific areas.

For example, assume the user needed information on rare or sensitive plant species for Mill Creek (subwatershed #47). The table of contents for Part II[*4] will list for the reader the page numbers covering the Mill Creek subwatershed. Referring to the Mill Creek categories entitled "Natural Heritage Elements" and "Noteworthy Plant Species," one might find information on officially recognized rare plants, or plants that for some other reason are unique to the Severn. Referring next to the category entitled "Isolated features," one may find listings for unique plants that are within the subwatershed but which are isolated and not located within the boundaries of a recognized natural area.

Thus, Part II was designed for a useage similar to that of an encyclopedia; users will not necessarily have to read the entire text of a subwatershed to

*1-Table 1 is on page 28 above.
*2-Figure 1 is map and matrix inside back cover.
*3-Table 2 is on page 30 above.
*4-The table of contents for Part II is on page 8 above.

locate a particular topic of interest or concern. For a detailed description of how the reader can use the information in each category, how that information was obtained, its significance, limitations, and precision, refer to Part I.*1

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*1-Part I begins on page 22.

SUBWATERSHED #1

Name: Lake Ogleton (Howell's Creek, 1667; Cat Hole Creek, 1846)

Location: Extreme downstream subwatershed on the south shore of the Severn River; between Heron Lake on the north and Tolly Point on the south; borders the Chesapeake Bay.

Natural Areas: This subwatershed includes five separate natural areas: 1) Baltimore and Annapolis Railroad Embankment; 2) Lake Ogleton tidal (draw) marshes; 3) Bay Ridge Woods; 4) Lands End; 5) Annapolis Roads Woods.

NATURAL AREA #1

Name: Baltimore and Annapolis Railroad Embankment

Geographical Limits: From the head of tidewater at Lake Ogleton, west to Bay Ridge Road; bounded on the north by developed lots on Old Bay Ridge Road and Pinecrest Drive, on the south by developed lots on Mainsail Drive and the back of Gerrior's Nursery; generally at the point where the B&A RR crossed the main freshwater branch feeding Lake Ogleton.

Total Acreage: 12.0 acres

Ecological Classification: Complete ecotype; this includes four ecotypes: 1) Shrub swamp; 2) Uplands and steep slopes; 3) Tidal (cove) marsh; 4) Floodplain forest.

Ecotype #1: Shrub swamp - upstream of the B&A RR embankment.

Acreage: 2.5 acres

Flora: The dominant vegetation type is lizard's tail; other common species in the herbaceous layer include black snakeroot, yellow waterlily, and skunk cabbage; associated with these are shrub size red maple and river birch trees in the very wet central portion of the swamp. Around the slightly higher and drier perimeter of the swamp, larger red maple (ca. 30 ft. in height) and sour gum trees occur along with rattlesnake ferns in the herbaceous layer.

Ecotype #2: Uplands and steep slopes - a 200 ft. wide transition zone surrounding the shrub swamp and several acres of steep slopes between the swamp and Lake Ogleton, including the wooded RR embankment.

Acreage: 3.5 acres

Flora: Very healthy, mature woodland of northern red oak, tulip poplar, white oaks, sour gum, and sweet gum trees. Scattered sycamore trees also in the canopy layer; ironwood and American holly are common understory trees. The average DBH of the larger trees is ca. 12-24 in. In general, the hardwood trees colonizing the embankment are smaller than elsewhere in this ecotype.

Ecotype #3: Tidal (cove) marsh - head of Lake Ogleton tidewater cove.

Acreage: 2.0 acres

Flora: Almost exclusively cattails; very minor occurrences of common reed; the steep wooded slope on the south side of the cove forms an intact transition zone some 50-100 ft. in width. Inland, the cattail marsh merges abruptly with the wooded slopes; an intermediate shrub swamp which is usually typical in this landscape position is noticeably absent.

Ecotype #4: Floodplain forest - a small stream valley spurs from the tidewater cove just to the north of, and contiguous with, the cattail cove marsh (Ecotype #3).

Acreage: 4.0 acres

Flora: Although not investigated in detail, tree species appear to be similar to those in Ecotype #2; red maple trees could be observed in the floodplain forest where it merged with a cattail marsh near tidewater. Further field investigation is needed.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees

Big Trees: At an elevation of 20 ft. (msl), on the wooded transition along the south side of the shrub swamp (Ecotype #1), there is a tulip poplar ca. 10 ft. CBF.

Historic Features: 1) A series of old pathway footstones leads to a groundwater seep along the south transition zone of the shrub swamp. Apparently, the seep was a source of drinking water for an old homestead near the top of the wooded slope. 2) The community of Annapolis Roads (circa 1926) is inventoried on the County Historic Site Survey as AA 949. 3) The Bay Ridge spur line of the Baltimore & Annapolis Railroad was constructed in 1886.

Archeological Features: None registered

Wildlife: Groundwater invertebrates were collected as they flowed from the seep site.

Scenic Qualities: A vantage point atop the RR embankment offers views of Lake Ogleton and the cattail marsh through openings in the canopy layer toward the east, and a complete panorama of the lizard's tail shrub swamp and densely

wooded transition zone to the west. The relief change from the crest of the embankment to the adjoining ecotypes (a vertical drop of 27 ft.) is dramatic and provides an excellent, high lookout over all ecotypes from one location.

Geology: The Aquia Fm. underlies the uplands, and alluvium (deposited during the last 100 years) of the shrub swamp. From the occurrence of tulip poplars and northern red oaks (trees requiring very fertile soils) on the slopes, the Aquia Fm. may have high concentrations of glauconite at this location. The shrub swamp upstream of the RR embankment is an excellent example of an "alluvial drowned valley." The freshwater branch on the downstream side, is an equally fine example of an "entrenched stream channel" (refer to page of Part I for definitions). It appears that after the RR embankment was constructed (1886), a small pond formed on the upstream side; with time it was infilled with alluvium and ecotypes have undergone successional changes since.

Soils: Monmouth fine sandy loam and sandy loam soils are found on uplands and steep slopes; unmapped alluvial soils occur in the shrub swamp. As evidenced by tulip poplar and northern red oak trees, soils on the uplands and steep slopes are unusually fertile for Aquia Fm. soils in this part of the watershed.

Topography: Moderate (5-15%) slopes border the shrub swamp and stream valleys. The RR embankment crest is 27 feet (msl), and its earthen slopes approach 100%; the flatter uplands are at an elevation of 20-25 ft. (msl).

Contiguity: This natural area is completely isolated from other natural areas. However, only houses (the combined depths of 2 lots) on either side of Ogleton Road separate this natural area from the 32-acre Annapolis Roads Woods (Natural Area #4). Wildlife species interaction (especially birds) between the two natural areas is a possibility.

Other: A groundwater seep is exposed at the base of the slope bordering the south side of the shrub swamp (ca. 150 ft. west of the RR embankment). Water from the seep flows into shrub swamp. Groundwater invertebrates were collected at the site. This was possibly a source of drinking water for an old homestead atop the adjacent 25 ft. hill. The RR embankment is of local scenic and transportation value to communities of Annapolis Roads and Beale Manor. Many residents use the foot trail atop the RR embankment for commuting between communities and for leisure walking. This natural area functions to physically separate, and thus preserve the independent identities of both communities. Field review - 6/10/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970); recommended for "natural use area"; 2) DNR Tidal Wetland Boundaries (1970); "cattail, smooth cordgrass" = 0.6 acres; 3) U.S. Fish and Wildlife Service 1979, National Wetlands Inventory; "palustrine, forested, broad-leaved deciduous" = 10.1 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 4 minor (1-5 ac.) landowners.

Land Use: Residential-Low, (1/2 - 2 units/ac.)

Residential Communities: Beale Manor and Annapolis Roads

Problems: On the last field visit to the site (9/5/86) surveyors flagging was observed as was stockpiled pipe (ca. 48 in. dia.) - possible storm sewer line (?). Ongoing impacts include heavy dumping on the side of the shrub swamp; however, this appears to have been an isolated incidence and did not happen recently; it could be cleaned up with minimal effort and funding. Scattered littering, mostly confined to an area around the foot path atop the RR embankment is a minor problem. There is no proposed residential development.

Preservation Options: Conservation easements, mutual covenants, and/or conservation cooperatives through contact with a relatively small number of minor (1-5 ac.) landholders are possibilities. Ecotype #2 - tidal cove marsh - is currently protected under Maryland Wetlands Act (1970).

Future Use: Passive recreation, outdoor education, and restricted sightseeing may all have merit. Stormwater management (an ancillary function), buffer (separates and preserves individual identities of Beale Manor and Annapolis Roads), and scientific monitoring are current uses.

NATURAL AREA #2

Name: Lake Ogleton tidal (draw) marshes

Geographical Limits: Fifteen separate, small (0.2 - 1.0 acre) draw marshes somewhat evenly spaced around the perimeter of Lake Ogleton.

Total Acreage: 6.0 acres

Ecological Classification: Incomplete ecotype; this includes one ecotype: 1) Tidal (draw) marsh. Most of the draw marshes do not have transitional zones, but abruptly front developed lots on the shores of Lake Ogleton.

Ecotype #1: Tidal (draw) marsh

Acreage: Draw marshes range in size from 0.2 to 1.0 acre.

Flora: Marsh grasses found at the margins of Lake Ogleton vary in percentages, but invariably consist of cattail, smooth cordgrass, common reed, groundselbush, and marshelder. Further inland, vegetation becomes more shrub-like; swamp rose, cynos, swamp azalea, and small shrubby black willow and red maple trees. Still further inland small hardwood trees occur; red maples, alders, black willow, and white ash. The distinct zonation from grasses to shrub to small hardwoods with distance inland is common to most of the draw marshes. In a few cases, for several hundred feet further inland, small u-shaped swales are contiguous linear extensions of the draw marshes. These swales support typical floodplain forest vegetation; red maple, sweet gum, river birch.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) Communities of Bay Ridge (circa 1882) and Annapolis Roads (circa 1926); Anne Arundel County Historic Sites Survey numbers AA 950 and AA 949, respectively.

Archeological Features: None registered

Wildlife: Abundant red-winged blackbirds were observed.

Scenic Qualities: The distinct wetland plant zonation displays textural and color contrasts with distance inland.

Geology: Alluvium underlies the tidal marsh and probably contains significant amounts of glauconite eroded from adjacent Aquia Fm. deposits. Several sand spits have accreted from jutting points in the direction of long-shore drift; these sand spits have been colonized with marsh grasses.

Soils: The draw marshes are mapped in the tidal marsh series.

Topography: In essence, the draw marshes are at sea level.

Contiguity: The draw marshes are isolated from other natural areas and each other. Some draw marshes have linear inland extensions of floodplain forests for several hundred feet (small u-shaped stream valleys).

Other: Field review - 6/10/86

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "marshelder, groundselbush, cattail, smooth cordgrass" = 3.1 acres; 2) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 4.1 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), several lot (< 1 ac.) owners.

Land Use: Natural Features (Open Space)

Residential Communities: Annapolis Roads, Bay Ridge, Beale Manor

Problems: Ongoing problems include scattered trash that has floated into the marsh (e.g., styrofoam cups, beer cans, etc.). Most scenic qualities are disrupted by the close proximity of developed lots (lack of transition zones evident on this regard). General noise from the many shoreline residences and outboard motors is also a problem. There are no pending projects or proposed residential developments.

Preservation Options: The draw marshes are currently protected under the Maryland Wetlands Act (1970); Conservation cooperatives with lot owners to enlist broad-based citizen support for protection of the subwatershed, and for Severn watershed in general, is an option.

Future Use: A wetland wildlife reservation and passive recreation (birdwatching from a canoe is excellent) are obvious uses.

NATURAL AREA #3:

Name: Bay Ridge Woods

Geographical Limits: Bounded by West Lake Drive on the east, Farragut Road on the west and south, and the back of developed lots of Catrina Road on the north. Generally at the entrance to the community of Bay Ridge.

Total Acreage: 38.0 acres

Ecological Classification: Complete ecotype; this includes one ecotype: 1) Uplands.

Ecotype #1: Uplands

Acreage: 38.0 acres

Flora: A cursory field examination from the perimeter of the property revealed this natural area to be an intact, somewhat mature hardwood forest composed of tulip poplar, white oak, sweet gum, and sour gum trees in the canopy layer.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: Although no examples were observed from the perimeter of property, there is a distinct possibility that a few "Big Trees" or "Old Trees" occur in this natural area. Further investigation is needed.

Historic Features: 1) The community of Bay Ridge (circa 1882); Anne Arundel County Historic Sites Survey AA 950. Bay Ridge was originally settled as one of many Chesapeake Bay summer resorts accessible by steamboat: in 1886 a spur of the B&A RR reached Bay Ridge, making it much more accessible. The resort boasted a hotel, 1,000 foot pier, and a boardwalk.

Archeological Features: None registered

Wildlife: Additional field work needed for adequately comment.

Scenic Qualities: Bay Ridge Woods provides a shaded, canopy-covered prommenade (Farragut Drive) into the historically significant community of Bay Ridge.

Geology: The natural area is equally divided between the Aquia Fm. on the north and the Talbot Fm. on the south.

Soils: Monmouth loamy sand and fine sandy loam soils cover the natural area.

Topography: Relatively flat, (2 - 5%) slopes occur over most place at an elevation of 20-47 ft. (msl).

Contiguity: This natural area is completely isolated from other natural areas and bordered on all sides by relatively dense residential development.

Other: The woodland physically separates the historic community of Bay Ridge from the more comtemporary developments to the north. Thus, the woodland helps preserve the independent and historic identity of Bay Ridge. The woodland also enhances the appeal of Bay Ridge by functioning as a natural entrance way into the community (not unlike "Oak Alley" prommenades of many southern plantation homes). Without the woodland, the historic qualities of Bay Ridge (older architecture, stately trees, narrow lanes) would be assimilated into the modern residential developments to the north. Field review - 6/10/86.

Previous Listings: None

LAND CONSERVATION

Ownership Type: Private (multiple), corporate; 100s of platted, but as yet undeveloped subdivision lots owned both by a corporation and private individuals.

Land Use: Residential-Low (1/2 - 2 units/ac.)

Residential Communities: Bay Ridge, Annapolis Cove

Problems: Insufficient field work to adequately comment on the ongoing problems. Because the lots are platted and zoned for subdivision development, this is an ever-present possibility, but nothing has been planned to date. No pending projects.

Preservation Options: All options short of acquisition could be applicable; however, with the large number of lot owners, implementation of any option will be complex. Contact with critical landowners and other lot owners working through the Bay Ridge Community Association is one suggestion. Apparently, many of the individual lots are owned by present residents of Bay Ridge who may be very receptive to conservation cooperatives, limited-term easements, or covenants. The value of the natural area in protecting the historical identity of Bay Ridge should be emphasized to the community association and lot owners. Rezoning to a Natural Features (Open Space) land use designation should be promoted during the County upcoming comprehensive rezoning.

Future Use: A buffer (present capacity) and passive (community) recreation are current uses that should continue.

NATURAL AREA #4

Name: Lands End

Geographical Limits: Bounded by the Severn River on the east, Carrollton Drive on the west and south, and Lyon Drive on the north.

Total Acreage: 13.0 acres

Ecological Classification: Altered green area; this includes two ecotypes: 1) Uplands; 2) Tidal marsh.

Ecotype #1: Uplands

Acreage: 12.0 acres

Flora: The canopy layer is characterized by chestnut oaks, virginia pines, scarlet oaks, and white oaks. Black locust, staghorn sumac and sassafras are common understory species. The herbaceous layer in places has been heavily disturbed by Japanese honeysuckle. A two acre open field supports various species of old field vegetation. In general, most vegetation in this natural area shows at least some signs of disturbance.

Ecotype #2: Tidal marsh

Acreage: 1.0 acre

Flora: The processes of long-shore drift and sand accretion have created a broad strand beach and a spit at the Lands End peninsula. On a portion of the 100-200 ft. wide strand beach, a tidal marsh of ca. one acre has colonized. This is a healthy and tall marsh dominated by common reed, cattail, and smooth cordgrass.

Natural Heritage Elements: 1) Along a portion of the intact beach of Lands End and/or possibly along the heavily disturbed Bay Ridge beach, "climbing dogbane" was identified in 1943. The exact site of this identification is uncertain, but based on the level of man's disturbance of Bay Ridge beach, it was probably along the Lands End beach. Climbing dogbane is rated B2/X, highly State rare, a population has not been found or recorded in Maryland since 1950. The probability of it still occurring at this site is questionable.

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) Lands End is considered within the historic community of Annapolis Roads (AA 949, circa 1926) by the County Historic Sites Survey. Ruins of the old Annapolis Roads Club House have been undermined by bluff erosion and are now scattered along the beach; large concrete pieces of foundation and floor slab can be readily observed. The historical significance of the club house is unknown.

Archeological Features: 1) A large shell midden is exposed in the 30 ft. bluff. This site is registered with the MHT as AA 158, the Old Annapolis Roads Club Site. It was surveyed in 1959 and described as a "shell midden and dark earth overlying yellow sand." Recent undermining of large trees at the bluff's edge has exposed either an extension of the midden or a separate midden associated with the original. During the field visit, the same "dark earth and shell midden" were readily exposed over ca. 300 ft. of the bluff. The shell layer and underlying dark earth were ca. 1.5 - 2.0 ft. thick. The vantage point atop the 30 ft. bluff overlooking both the Chesapeake and Severn was an obvious attraction to the paleo-indians who occupied this site. The site should be extensively surveyed by the Archeology Division of the MHT before it is completely lost to bank erosion which appears to be occurring quite rapidly.

Wildlife: During field work, no significant movement of wildlife was observed. The DNR in 1978 identified this area as an osprey nesting site. Although no osprey were observed, the site still looks to be a conducive nesting habitat.

Scenic Qualities: Lands End is one of the most outstanding vantage points on the Severn River. From atop the 30 ft. bluff, one can clearly see both far up the Chesapeake Bay along the Eastern Shore and well upstream on the Severn. From just offshore, the orange, red, and yellow sediments in the bluff and the 30 ft. wide, clean sand beach are outstanding. This is one of the largest and least disturbed beaches on the Severn.

Geology: A 30 ft., nearly vertical outcrop of the Aquia Fm. dominates this natural area. Recent undermining of trees at the bluff's edge has exposed unweathered glauconitic "greensands." This is an excellent site for study of geomorphic processes, including mass wasting, long-shore drift, and spit accretion. The sand spit forming "Lands End" is not, but should be, mapped as alluvium.

Soils: Monmouth loamy sand soils cover the uplands; the tidal marsh is mapped as Coastal Beaches. The Monmouth - urban land complex soils on the former site of the old Annapolis Roads Club House are highly disturbed soils.

Topography: The majority of the site is 25-35 ft. (msl) and has slopes of 0 - 5%. The 30 ft. high bluff is nearly vertical. One small ravine has slopes approaching 15%. The strand beach and sand spit are 0 - 5 ft. (msl).

Contiguity: Except for isolated houses and Carrollton Road, this site is contiguous to the 32-acre Annapolis Roads Woods (Natural Area #5) and the Annapolis Roads Golf Course. There may very well be wildlife species interaction between the two natural areas.

Other: Field review - 6/10/86

Previous Listings: 1) Scenic Rivers in Maryland (1970); recommended as a "natural use area"; 2) DNR Tidal Wetlands Boundaries (1970); "cattail, smooth cordgrass, and common reed" = 0.6 acre.

LAND CONSERVATION

Ownership Type: Private (single), one major (> 5 ac.) landowner.

Land Use: Residential-Low (1/2 - 2 units/ac.)

Residential Communities: Lands End, Annapolis Roads

Problems: Ongoing impacts include overuse and abuse by the general public. The bluff is accessible by 4-wheel drive vehicles which have greatly disturbed a portion of the site. This is a locally popular spot for bonfires, parties, etc. and heavy littering (beer cans and general picnic trash) from "weekenders" is a problem. Japanese honeysuckle is overwhelming native vegetation in some areas. Erosion of the bluff, although a natural process and not in itself harmful, is destroying the archeological site. The natural area was also

heavily disturbed in the past by activities of the old Annapolis Roads Club. Although the site is very much a "disturbed green area," it has other valuable natural and historical attributes.

Preservation Options: Natural Features (Open Space) land use designation (consideration during upcoming comprehensive rezonation) is a possibility. Conservation easements, mutual covenants, and conservation cooperatives have potential. Considering the ownership by a sole critical landowner, these could be extremely viable options and relatively easy to pursue.

Future Use: Passive recreation and scientific monitoring are obvious future uses.

NATURAL AREA #5

Name: Annapolis Roads Woods

Geographical Limits: Bounded on the north and east by the Annapolis Roads Golf Course and on the south and west by developed lots on Ogleton Road.

Total Acreage: 32.0 acres

Ecological Classification: Complete ecotype; this includes one ecotype: 1) Uplands.

Ecotype #1: Uplands

Acreage: 32.0 acres

Flora: A cursory field examination from the perimeter of the property revealed this natural area to be an intact mature hardwood forest composed of chestnut oaks and white oaks at the higher, well drained elevations. A small swale toward the center of the property supports tulip poplar, sweet gum, and scattered northern red oak and beech trees. Red maples in the very bottom of the swale were observed.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: Although no examples were observed from the perimeter of the property, there is a distinct possibility that a few "Big Trees" or "Old Trees" occur in this natural area. Future investigation is needed.

Historic Features: 1) The community of Annapolis Roads (circa 1926); Anne Arundel County Historic Sites Survey AA 949.

Archeological Features: None registered

Wildlife: Additional field work needed for adequate comment.

Scenic Qualities: The dense shade offered by the large trees of this natural area makes for a pleasant automobile ride down the narrow-laned Ogleton Drive.

Geology: The Aquia Fm. underlies the entire natural area.

Soils: Monmouth loamy sands and fine sandy loams cover the steep slopes and uplands; mixed alluvial land covers the bottom of the small swale in the center of the property.

Topography: The flatter uplands are 45-50 ft. (msl). The steep (ca. 15%) slopes associated with the swale in the center of the property range in elevation from 10-35 ft. (msl).

Contiguity: Only houses (the combined depths of 2 lots) on either side of Ogleton Road separate this natural area from the B&A RR embankment (Natural Area #1). Only isolated houses and Carrollton Road separate Annapolis Roads Woods from Lands End (Natural Area #4). Wildlife species interaction between the three natural areas is highly possible.

Other: Without Annapolis Roads Woods, the historic and scenic community of Annapolis Roads (circa 1926), nestled between the golf course and the north shore of Lake Ogleton, would lose its appeal as a hidden enclave. The scenic appeal of the community as perceived while driving down the narrow-laned, well shaded Ogleton Road is greatly enhanced by Annapols Roads Woods. Field review - 6/10/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970); recommended as a "natural use area."

LAND CONSERVATION

Ownership Type: Private (single), one major (> 5 ac.) landowner.

Land Use: Natural Features (Open Space)

Residential Communities: Annapolis Roads

Problems: There are no pending projects or proposed residential development. Insufficient field work was done to comment on the ongoing impacts.

Presevation Options: The woods are currently designated a Natural Features (Open Space) area and protected to the extent that this land use classification will not allow residential development. However, golf courses are also classified as "Natural Features" and theoretically Annapolis Roads Woods could be developed as an expansion of the Annapolis Roads G.C. under this land use designation. In addition, protection though land use and zoning regulations can only be considered temporary due to potential changes in designations with periodic rezonings and zoning appeals. Considering a sole critical landowner holds the entire tract, conservation easements, mutual covenants, and conservation cooperatives would be relatively simple to pursue.

Future Use: Passive recreation and a buffer (current function) have merit.

ISOLATED FEATURES

Archeological Features: 1) The MHT archeological site AA 159 is located within a developed area of the subwatershed. It is described as an Archaic Period chips site; 2) MHT Quad File site no. 11 is a subaqueous site just offshore from Tolly Point where historic artifacts were dredged up.

Exceptional Trees: 1) The Compendium of Natural Features (1975) and the Upland Natural Areas Study (1977) both plotted the State Champion crepe myrtle as being on the Severn River side of Bay Ridge beach. This mapping was incorrect. The tree is actually located on the Chesapeake Bay side of Bay Ridge (89 Bay Drive) and is not within the Severn River watershed.

Big Trees: 1) The former State Champion Virginia pine tree is located in the subwatershed, at 114 River Drive in Bay Ridge. In 1973, the dimensions of this tree were: CBH, 8 ft. 6 in.; height, 77 ft.; spread, 49 ft.

SUBWATERSHED #2

Name: Chase Pond/Heron Lake (Otter Lake, 1961)

Location: Bounded on the north by the Back Creek subwatershed and on the south by the Lake Ogleton subwatershed.

Natural Areas: This subwatershed includes two natural areas: 1) Heron Lake; 2) Chase Pond.

NATURAL AREA #1

Name: Heron Lake

Geographical Limits: Confined to the immediate environs of the lake proper. The lake is located west of the Severn River, north of Lyon Drive, and east and south of Clairborne Road.

Total Acreage: 6.1 acres

Ecological Classification: Incomplete ecotype; this includes three ecotypes: 1) Tidal tributary; 2) Tidal (cove) marsh; 3) Tidal marsh.

Ecotype #1: Tidal tributary ("lake")

Acreage: 5.0 acres

Flora: Smooth cordgrass in the form of a narrow fringe marsh occurs around ca. 20% of the shoreline perimeter (the remainder of the shoreline is developed; i.e., bulkheads, piers, etc.). About 20% of the lake perimeter is buffered by a narrow wooded upland.

Ecotype #2: Tidal (cove) marsh

Acreage: 0.4 acre

Flora: A smooth cordgrass/cattail marsh is located at the south end of the lake and is relatively intact.

Ecotype #3: Tidal marsh

Acreage: 0.7 acre

Flora: A strand beach at the north end of the lake is colonized with a common reed marsh of ca. 0.7 acre.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) Heron Lake is considered a part of the historic community of Annapolis Roads (circa 1926); County Historic Sites Survey AA 949.

Archeological Features: None registered

Wildlife: None observed. The DNR (1978) recorded an osprey nesting site in this area.

Scenic Qualities: The natural area is very secluded with unobtrusive residential development (quiet).

Geology: The Aquia Fm. underlies the uplands; the strand beach and tidal wetlands are composed of recent alluvium. Heron Lake was once completely open to the Severn River, however, littoral drift and strand beach accretion has subsequently sealed it except for one small gut.

Soils: Monmouth loamy sands cover the uplands surrounding the lake. Tidal marsh soils cover the wetlands cove. Coastal beach soils comprise the strand beach.

Topography: Uplands surrounding the lake range in elevation from 5 to 20 ft. (msl) and have slopes of 5-15%. The strand beach is 3.0 ft. (msl) in elevation.

Contiguity: This natural area is adjacent to the Chase Pond (Natural Area #2), but partially separated by three residences.

Other: Field review - 6/10/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, cattail" = 0.4 acre; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "palustrine, emergent, narrow-leaved persistant, seasonal" = 0.46 acre.

LAND CONSERVATION

Ownership Type: Private (multiple); 4 lot (< 1 ac.) owners; 1 major (> 5 ac.) landowner. One corporate landowner.

Land Use: Residential - Low (1/2 - 2 units/ac.)

Residential Communities: Annapolis Roads

Problems: No pending projects. No proposed residential developments. Although the area has been significantly developed, no ongoing man-induced or natural impacts are occurring (i.e., the area has been stable for some time since the residential development).

Preservation Options: The Maryland Tidal Wetlands Act (1970) currently protects the marsh areas. Contact with lot owners concerning conservation cooperatives, and with the critical landowner concerning conservation cooperatives, conservation easements, and mutual covenants, is essential.

Future Use: Passive recreation and stormwater management (current function) have merit.

NATURAL AREA #2

Name: Chase Pond

Geographical Limits: The natural area is confined to the lake proper and its immediate environs. The lake is bounded by Clairborne Road on the south, Severn River on the east, Beach Road developments on the north, and Annapolis Roads Apartments on the west.

Total Acreage: 5.4 acres

Ecological Classification: Incomplete ecotype; this includes two ecotypes: 1) Freshwater pond; 2) Tidal marsh.

Ecotype #1: Freshwater pond (the specific salinity of the water is questionable).

Acreage: 5.0 acres

Flora: Smooth cordgrass, arrowhead and other wetlands line ca. 50% of the shoreline (i.e., a narrow fringe marsh). About half of the pond perimeter is bordered by a 25-50 ft. wide upland wooded transition zone. The western and northeastern shores of the pond are intensely developed.

Ecotype #2: Tidal marsh

Acreage: 0.4 acre

Flora: A common reed marsh has established on a 200 ft. wide strand beach separating Chase Pond from the Severn River.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) The southern shore of the pond is within the historic community of Annapolis Roads (circa 1926); County Historic Sites Survey AA 949.

Archeological Features: 1) MHT Quad File site no. 6 yielded one 3/4 in. grooved axe.

Wildlife: None observed. The DNR (1978) recorded an osprey nesting site in this area.

Scenic Qualities: Despite heavy development on parts of the pond's shore, the scenic quality is not as disrupted as it could potentially be.

Geology: The Aquia Fm. underlies the uplands surrounding the pond; the strand beach is composed of recent alluvium. The 1878 Atlas of Anne Arundel County shows Chase Pond being an open tidewater tributary of the Severn River. Since then, littoral drift and strand beach accretion completely sealed the pond from the river.

Soils: Monmouth loamy sands cover the surrounding uplands. Coastal Beach soils comprise the strand beach.

Topography: The strand beach is extremely flat at 5.0 ft. (msl). The uplands have moderate slopes (5-10%) and range in elevation from 5-12 ft. (msl).

Contiguity: This natural area is adjacent to Heron Lake (Natural Area #1), but partially separated by three residences.

Other: Field review - 6/10/86.

Previous Listings: 1) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "palustrine, emergent, narrow-leaved persistent, seasonal and seasonal saturated" = 0.6 acre.

LAND CONSERVATION

Ownership Type: Private (multiple); 4 lot (< 1 ac.) owners, one minor (1-5 ac.) landowner. One corporate landowner.

Land Use: Residential - Low (1/2 - 2 units/ac.), south shore.
Residential - Low-Medium (2-5 units/ac.), north shore.

Residential Communities: Annapolis Roads, Annapolis Roads Apartments

Problems: No pending projects. No proposed residential development. However, a large apartment company owns a significant portion of the remaining natural area around the pond; the possibility of future expansion of the apartment complex is very definite. Ongoing problems include scattered littering and heavy use of the developed shoreline by man.

Preservation Options: Conservation cooperatives with lot owners and the minor landowner are options. Contact with the corporate owner concerning future plans is suggested; possibilities of retaining the vegetated transition zone in the case of additional apartment construction should be explored.

Future Use: Passive recreation and stormwater management (current function) have merit.

ISOLATED FEATURES

Exceptional Trees

Big Trees: 1) Just to the south of Carrollton Road is a basswood tree which is considered a Big Tree", and possibly an "Old Tree" and "Historic Tree". The tree measures 18 ft. 2 in. CBH, and has an estimated spread of 90 ft., and an estimated height of 90 ft. Basswood is a non-native species and the subject tree was probably planted by affluent owners of an old homestead located on the nearby hillcrest. Large ginkgo (non-native) trees found at the site support the theory of this being a former homestead. Besides being of historical significance, the homestead may have been of the 18th century which could make the tree in excess of 200 years old (i.e., an "Old Tree"). The current State Champion basswood tree has a CBF of 18 ft. 11 in.; a height of 100 ft.; and a spread of 90 ft. The Chase Pond basswood tree is very close to these dimensions and should be officially measured by the DNR Urban Forestry Program. In total points, there is a good possibility that the Chase Pond tree surpasses the current champion. Restricted sightseeing is a potential future use.

Archeological Features: 1) MHT site AN 546 - Elktonia Beach - no information given.

SUBWATERSHED #3

Name: Back Creek (Hills Back Creek, 1781; Beasleys Creek, 1667)

Location: Bounded on the north by the Spa Creek subwatershed, on the south by the Chase Pond/Heron Lake subwatershed. It is completely within the southernmost portion of the City of Annapolis.

Natural Areas: This subwatershed includes one natural area: 1) SPCA Wildlife Sanctuary.

NATURAL AREA #1

Name: SPCA Wildlife Sanctuary

Geographical Limits: Bounded by developed lots on Warren Drive to the north, Paddington Place (SPCA Kennels) on the west, developed lots on Dogwood Road to the southwest, Georgetown Elementary School East on the the south, and Windwhisper Lane on the southeast and east.

Total Acreage: 12.3 acres

Ecological Classification: Complete ecotype; this includes four ecotypes: 1) Tidal (cove) marsh; 2) Floodplain forest; 3) Uplands and steep slopes; 4) Uplands and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 1.1 acres

Flora: At the head of Back Creek is a cove marsh dominated by cattail; rose-mallow, smooth cordgrass, and hightide bush are also found.

Ecotype #2: Floodplain forest

Acreage: 2.9 acres

Flora: Two freshwater branches feeding the cove marsh are confined to narrow floodplains which extend inland from Back Creek to the perimeter of the natural area. The more saturated soils at the center of the floodplain support black willow, river birch, and red maple trees in the canopy layer. The shrub layer is composed of alder, multiflora rose, spicebush, dogwood and elderberry. These shrub species become increasingly more common toward the cove marsh; a small transitional shrub swamp is located between the marsh and floodplain forest. The margins of the floodplain near the base of the surrounding slopes are higher and less saturated; tulip poplar,

sweet gum, red maple, sycamore, and white ash dominate the forest here. Floating marsh pennywort and royal fern can be found in ponded areas near the branches.

Ecotype #3: Uplands and steep slopes

Acreage: 6.8 acres

Flora: Two upland promontories, one owned by the SPCA in the central portion of the natural area and one privately owned in the southern portion, are relatively undisturbed and support native plant species. The crests and upper slopes of the promontories are characterized by chestnut oak, mockernut hickory, southern red oak, and white oaks (canopy trees that thrive in well-drained, dry, sandy soils); dogwood, mountain laurel, pink azalea, American holly, and blueberry are common in the shrub layer. The lower slopes of the promontories support tulip poplar, black gum, northern red oak, and beech trees, with viburnum in the shrub layer. Sour gums delineate the boundary between the floodplain and lower slopes. Most of the promontory trees are second growth and have DBHs of ca. 12-18 in.

Ecotype #4: Uplands and steep slopes

Acreage: 1.5 acres

Flora: The promontory at the northern portion of the natural area has been heavily disturbed by tree clearing in the past. After the disturbance, the open areas were colonized by black locust, black cherry, raspberry, and sweet gum trees. Black gum, sassafras, chestnut oak (multiple-trunks) and loblolly pine also occur. The promontory is undergoing successional changes to a vegetation more indicative of Ecotype #3. However, Japanese honeysuckle, English ivy, trumpet vine, poison ivy, and greenbrier are competing with the successionary trees.

Natural Heritage Elements: 1) Floating marsh pennywort - C, State declining.

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None recorded

Archeological Features: 1) Immediately adjacent to the SPCA natural area was MHT archeological site AN 157. It is described as an "important site, a shell heap with lanceolate points and rhyolite chips." This was one of the six key Severn River sites used by Wright (1973) to describe the "Archeological Sequence in the Middle Chesapeake Region." The site was 500 ft. long and 300 ft. wide and contained five oyster shell concentrations and burnt artifacts (perhaps from a cremation). The site is noted for its mockley net - impressed body sherds. A few blue rhyolite chips, green jasper chips, and a grinding-stone fragment were found. A piece of worked turtle shell, two fragments of antler tine projectile points, oyster shells, clams shells, and remains of blue crab, deer, and turkey were also found. The site was totally destroyed by house construction in 1957-58.

Wildlife: The SPCA natural area is one of the very few remaining productive wildlife habitats within the City of Annapolis. Wildlife management plans by the SPCA should help maximize wildlife diversity in the future. A great blue heron was observed in the tidal marsh.

Scenic Qualities: Extremely rapid changes in ecotypes and relief offer a nice contrast that can be observed from a single location atop the central promontory. Many juxtaposed intact ecotypes in this compact area enhance its scenic attributes.

Geology: The Aquia Fm. underlies the uplands and steep slopes; alluvium forms the floodplain and tidal marsh. The channel of the freshwater branch has changed courses in the recent past. Distinct floodplain landforms and processes can be observed. Abandoned channels partially filled with water greatly increase the habitat diversity (one of these abandoned channels supports floating marsh pennywort).

Soils: Monmouth loamy sands cover the undisturbed promontories. Monmouth-urban land complex soils cover the disturbed promontory. Mixed alluvial land covers the floodplain. Tidal marsh soils cover the cove marsh.

Topography: The flat crests of the promontories range in elevation from 20-32 ft. (msl). Slope stepness of the promontories ranges from 5-15%. The floodplain floor is 2-4 ft. (msl) in elevation, the marsh 0-0.5 ft. (msl).

Contiguity: This natural area is completed isolated from other natural areas and surrounded by dense residential development. Aquatic species interaction between Back Creek and the SPCA tidal marsh is occurring.

Other: Field review - 4/19/88

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "red maple, cattail, smooth cordgrass" = 1.0 acre; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 1.3 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 9 lot (< 1 ac.) owners; corporate (10 lots); institutional; community; quasi-public.

Land Use: Residential - Low-Medium (2-5 units/ac.)

Residential Communities: Georgetown Grove, Victor Haven, Green Acres

Problems: There are no pending projects nor proposed residential developments. However, 10 undeveloped lots on Windwhisper Drive in Georgetown Grove are owned by a development company. The probability of these lots being developed in the near future appears great. The southern and southeastern boundaries of the natural area are being impacted by local children using the area as a playground; trampled vegetation, soil compaction, erosion from foot trail overuse, and scattered littering are associated with this. Persistent barking of dogs in

the SPCA kennels presents some noise problems on the northern boundaries of the natural area. Non-native plant species overtaking native vegetation on the disturbed promontory (Ecotype #4) is a problem.

Preservation Options: Contact with all landowners of the natural area adjacent to the SPCA property is essential. The SPCA owns the core (5.5 acres) of the natural area; the adjacent undeveloped lots to the south and east double its size. Without these adjacent lots, the efforts of the SPCA to make their property a wildlife sanctuary will be greatly undermined. The development company should be contacted concerning future plans of the 10 undeveloped lots. The Georgetown Grove Homeowners Association should be contacted concerning these lots in their subdivision, as well as their "open space" area. Victor Haven Community Association and Georgetown Elementary School East should be contacted also. No specific preservation options can be suggested (or ruled out) without additional information about the fate of the undeveloped Georgetown Grove lots. However, all parties involved should be brought together as soon as possible to discuss mutual interests and the preservation of the SPCA wildlife sanctuary. Newspaper "good deed" awards may have application here. Volunteers are needed by SPCA to construct nature trails, build nesting boxes, and help remove honeysuckle, other non-native vegetation, and trash. Supportive newspaper coverage may help the SPCA toward their commendable cause. Besides recruiting volunteers, public recognition of the wildlife sanctuary may make it more appealing to adjacent lot owners to preserve their land.

Future Use: The SPCA Wildlife Sanctuary will be ideal for passive recreation, outdoor education, and a forest and wetlands wildlife reservation. The proposed construction of a freshwater pond to increase habitat diversity will have an ancillary function of stormwater management.

ISOLATED FEATURES

Exceptional Trees

Big Trees: 1) The DNR "Big Tree Inventory" lists a common wild black cherry tree at 905 Bay Ridge Road. The tree has a CBH of 11 ft. 3 in., a height of 83 ft. 8 in., and a spread of 51 ft.

Wetlands: Two small coves on the north side of Back Creek support tidal wetlands of ca. 0.5 acre each: 1) DNR Tidal Wetlands Boundaries (1970); "cattail/smooth cordgrass"; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine intertidal, emergent, narrow-leaved persistent, irregular."

Historic Features: 1) County Historic Sites Survey AA 772 - Mt. Zion Methodist Church (circa 1860) (Eastern Avenue at 2nd Street in Eastport). Conditions: "altered from original structure, good condition, original site." Significance: "education, religion, social/humanistic"; 2) County Historic Sites Survey AA 804 - John Wesley United Methodist Church (Annapolis Neck) (circa 1875). Condition: "good, altered, original site." Significance: "religion" (Forest Drive at Bay Ridge Avenue).

Archeological Features: 1) MHT site AA 156 - Greens Farm. Artifacts found at this scattered village area include shell, potsherds, and chert chips; 2) MHT Quad File site no. 7 - Wright's Collection (Smithsonian).

SUBWATERSHED #4

Name: Spa Creek (Spaw Creek, 1834; Carrol's Creek, 1781; Acton's Creek, 1769; Spar Cove, 1694; Todd's Creek, 1667).

Location: Bounded by the College Creek subwatershed on the north and the Back Creek subwatershed on the south: within the heart of the City of Annapolis.

Natural Areas: This subwatershed includes two natural areas: 1) Truxton Park; 2) WYRE Wetlands.

NATURAL AREA #1

Name: Truxton Park

Geographical Limits: Bounded by Spa Creek on the north, Spa Cove on the west, baseball fields on Hill Top Lane to the south, and Primrose Road to the east.

Total Acreage: 53.3 acres

Ecological Classification: Altered green area; this includes 13 ecotypes: 1) Freshwater (cove) marsh; 2) Wooded swamp; 3) Floodplain forest; 4) Uplands and steep slopes; 5) Old field; 6) Tidal (cove) marsh; 7) Floodplain forest; 8) Tidal (fringe) marsh; 9) Uplands and steep slopes; 10) Uplands; 11) Uplands and steep slopes; 12) Tidal (draw marsh); 13) Ravine bottom.

Ecotype #1: Freshwater (cove) marsh - (located in the southern portion of the park).

Acreage: 2.2 acres

Flora: One of two small branches feeding Spa Cove was dammed with an earthen embankment many years ago. From the embankment (adjacent to the confluence with Spa Cove) upstream for ca. 600 ft. is a freshwater marsh dominated by common reed. This marsh probably formed after a small open water body behind the embankment was infilled with sediment.

Ecotype #2: Wooded swamp

Acreage: 0.5 acre

Flora: At the headward margin of the common reed marsh (Ecotype #1) is a wooded swamp dominated by red maple trees (DBHs ca. 12-18 in.) in the canopy layer and silky dogwood and poison sumac trees forming a sparse understory. Soils in this small transitional area are very wet, and probably remain saturated most of the year.

Ecotype #3: Floodplain forest

Acreage: 3.2 acres

Flora: Upstream from the wooded swamp (Ecotype #2) is a floodplain forest with an extremely rich and diverse herbaceous layer. Soils are wet, but not saturated, and support a healthy canopy layer, including red maple, tulip poplar, sweet gum, and northern red oak trees. Silky dogwood is the common understory species. This area should be most noted for its rich herbaceous plants, including New York fern (very tall), marsh fern (infrequent), and Virginia creeper (infrequent). Other common species include netted chain fern, cut-leaf grapefern, spicebush, black snakeroot, and seed (rattle) box. Lycopodium, hollow stem joe-pye-weed, winterberry, sensitive fern, skunk cabbage, elderberry, maple leaf viburnum, jewelweed, arrow arum, and false solomon's seal are less common. The size and diversity of the herbaceous plants indicates a very rich, moist setting conducive to sensitive plants requiring strict water and light regiemes.

Ecotype #4: Uplands and steep slopes

Acreage: 11.0 acres

Flora: Uplands and slopes form the remainder of the watershed feeding the small branch which flows into the common reed marsh (Ecotype #1). Vegetation varies drastically depending on the topographic setting and soil moisture conditions. The dry, sandy, well-drained uplands and ridge crests support canopy trees such as chestnut oak, scarlet oak, mockernut hickory, pitch pine, and Virginia pine. Some of the chestnut and scarlet oaks are quite mature, having DBHs of ca. 12-18 in. Sand hickory trees were also observed, but are very infrequent. Mountain laurel is the dominant shrub layer plant, and huckleberry the dominant herbaceous plant. Swales and broad ravine bottoms which separate ridge crests are composed of moist, rich, fine-grained soils. Mature tulip poplar, white oak, northern red oak, sweet gum and willow oak trees are common. Several of the tulip poplar and white oak trees were quite large; DBHs ca. 12-24 in., with infrequent examples >24 in. One white oak has a CBH of ca. 14 ft. Witch hazel and ironwood are common in the understory. Bracken fern, periwinkle (naturalized, very common), bayberry, and native trumpet honeysuckle are found in the herbaceous layer.

Ecotype #5: Old field

Acreage: 5.1 acres

Flora: Between the common reed marsh (Ecotype #1) and the Spa Cove tidal marsh (Ecotype #6) is a ridge crest dominated by old field successional growth. Old field vegetation includes willow oak, sweet gum, white pine, Virginia pine, and apple trees, all less than 20 ft. in height. Butterfly weed, bastard toadflax and Maryland golden aster are herbaceous layer species.

Ecotype #6: Tidal (cove) marsh

Acreage: 5.2 acres

Flora: At the head of Spa Cove is an extremely healthy tidal marsh of 3.7 acres dominated by smooth cordgrass, cattail, and common reed. Hibiscus, three square, cynos and altern are also present. These species are well intermixed in discrete zonated patches with small open water areas interspersed among the grasses. This species/water intermixing is a sign of high productivity and provides excellent wildlife habitat. The cove marsh is protected with a wooded transition zone (ca. 1.5 acres) on the western adjacent slope.

Ecotype #7: Floodplain forest

Acreage: 4.2 acres

Flora: From the head of the cove marsh (Ecotype #6) south to Hilltop Lane is a floodplain forest. Observation from the perimeter of the floodplain revealed a mature hardwood forest of red maple, ash, and river birch. Further field work is needed.

Ecotype #8: Tidal (fringe) marsh

Acreage: 1600 linear ft. along the Spa Cove shoreline

Flora: The western perimeter of the park borders Spa Cove from the cove marsh (Ecotype #6) north to Spa Creek. The interface between land and water is an intact fringe marsh composed of arrow arrum, mallow, and smooth cordgrass. This healthy fringe marsh denotes stable and ecologically productive shoreline conditions.

Ecotype #9: Uplands and steep slopes

Acreage: 7.9 acres

Flora: The steep slopes bordering Spa Cove have very dry, sandy, well-drained soils low in nutrients. These slopes support a forest which is, almost without exception, composed of chestnut oak and Virginia pine trees, with a chestnut oak understory. Mountain laurel in the shrub layer, and cowwheat, trailing arbutus, early low blueberry, and black huckleberry in the herbaceous layer are common. The landward side of the fringe marsh at the very base of the slope is characterized by sourgum trees. Scattered chinquapin shrubs occur near the lower portion of the slope. Inland from the Spa Cove slope, the uplands in the central portion of the park support a dry deciduous forest of chestnut oak, scarlet oak and scattered southern red oak. Many of these trees are mature, with DBHs ranging from 18-24 in. Isolated communities of cranefly orchid and ladyslipper orchid occur in this ecotype.

Ecotype #10: Uplands

Acreage: 6.8 acres

Flora: "Lookout Point" at the northern end of the park bordering Spa Creek supports a mature chestnut oak forest. Mountain laurel is the dominant shrub species. Many of the chestnut oak trees are rather large (DBHs 18-24 in.).

Ecotype #11: Uplands and steep slopes

Acreage: 4.0 acres

Flora: The eastern portion of "Lookout Point" near the public boat landing has been highly disturbed within the last 10 years. Some native trees (e.g., chestnut oaks) have not been damaged, but many of the trees on the slopes and the shrub and herbaceous layers have been completely destroyed.

Ecotype #12: Tidal (draw) marsh

Acreage: 0.4 acre

Flora: A small shoreline indentation on Spa Cove on the western edge of the park supports an intact tidal wetland. Wetland species include horned pond weed, common reed, arrow arum, duck horn, Canada weed, and frost weed.

Ecotype #13: Ravine bottom

Acreage: 2.8 acres

Flora: Extending landward from the draw marsh (Ecotype #12) is a broad ravine (swale) containing rich, moist soils. Tulip poplar (DBHs 12-24 in.) characterizes the canopy layer. Bloodroot, herbaceous smilax (plants requiring rich soils), and a diverse wildflower assemblage, including trout lilies, golden cordillias, spring beauty, and dutchman's breeches are common herbaceous plants. The above plants testify to the fertility of the soils in this cool, shady ravine bottom in the north-central portion of the park.

Natural Heritage Elements: 1) Sand Hickory - C, State declining; 2) Chinquapin - C, State declining; 3) Whorled water pennywort - B2, highly State rare, in danger of extinction in Maryland; 4) Yellow passionflower - C, State declining.

Noteworthy Plant Species: 1) Maryland golden aster - uncommon in Anne Arundel County; 2) Cranefly orchid - "uncommon on the Coastal Plain" (Brown and Brown, 1984); 3) Early flat topped aster - "not commonly seen in the County" (David H. Williams, personal communication).

Exceptional Trees

Big Trees: 1) White oak - CBH ca. 14 ft., height ca. 90 ft., spread ca. 90 ft.; located between the swimming pool and Truxton Park Road; 2) Southern red oak - CBH ca. 14 ft., height ca. 100 ft., spread ca. 80 ft.; located on the side of "Graveyard Hill" off Hilltop Lane; two other southern red oaks nearby have CBHs of ca. 9 ft. These red oaks are probably associated with the Primrose Hill farm and the Hesselius estate and grave site. This would make the biggest red oak both an "Old Tree" and "Historic Tree". Further historical research is required.

Historic Features: 1) The Bay Ridge spur of the Baltimore-Annapolis Railroad (circa 1886) crossed Truxton Park at "Lookout Point." The sunken RR bed is lined with catalpa trees and readily apparent, although all evidence of the Spa

Creek RR bridge is gone; 2) An earthen embankment crosses the common reed cove marsh (Ecotype #1) near its confluence with Spa Cove. The exact historic significance and age of the embankment is unknown. It could have been a former crossing ("land bridge") over the small branch built by the owners of an old farmstead located nearby (Primrose Hill?); 3) Graveyard Hill (58 ft. msl), located just off Hill Top Lane, is the burial site of Mary and John Hesselius, owners of Primrose Hill during the mid-1700s. Their children and parents were buried with them in the arch-top brick and stone crypt. The crypt is enclosed with an impressive iron-railed fence. The crypt was vandalized during the 1960s and the remains of the Hesselius family were removed. Presently the crypt is empty, open, and in a state of general disrepair; the iron-railed fence is rusted and its gate broken.

Archeological Features: None registered

Wildlife: The Spa Cove marsh (Ecotype #6) is probably the healthiest and largest wetland wildlife habitat within the City of Annapolis.

Scenic Qualities: The Spa Cove tidal wetlands (Ecotype #6) display a plant species interspersion which is visually appealing. The contrasts in the texture, size, and color of the different wetland plants and the intermixing of open water is exceptional. The vantage point from atop a small wooden bridge that crosses the marsh makes the scenic qualities even more impressive.

Geology: The Aquia Fm. underlies the uplands and steep slopes; alluvium forms the floodplains and fresh and tidal marsh areas. The earthen embankment that crosses the common reed marsh (Ecotype #1) offers a good example of "alluvial drowning". The elevation of the marsh surface on the upstream side of the embankment is ca. 3-4 ft. higher than the marsh surface on the downstream side. This differential may be an indicator of the general age of the embankment.

Soils: Monmouth loamy sand and fine sandy loam soils cover the steep slopes and uplands. Mixed alluvial soils comprise the floodplains and the common reed marsh (Ecotype #1). Tidal marsh soils cover the Spa Cove wetlands (Ecotype #6).

Topography: The flat (2-5% slopes) uplands in the interior of the park range in elevation from 25-52 ft. (msl). The broad ravines (Ecotypes #4 and #13) have moderately steep (5-15%) slopes and range in elevation from 5-25 ft. (msl). The very steep (> 15%) slopes bordering Spa Cove drop abruptly from 25 ft. (msl) to the water. The elevation of the wetlands is 0.5 - 5 ft. (msl).

Contiguity: The Truxton Park natural area is surrounded by intense residential development and is not contiguous with other natural areas. Aquatic species interchange between the Spa Cove wetlands and Spa Cove and Spa Creek is occurring.

Other: In spite of extremely heavy use, Truxton Park contains several intact ecotypes of high ecological value. It is the most important natural area remaining within the City of Annapolis. The wildflower assemblage is exceptional. Field review - 8/5/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "cattail, smooth cordgrass, common reed, rosemallow, red maple, ash" = 3.4 acres; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estaurine, emergent, narrow-leaved persistent, irregular" = 4.6 acres; "palustrine, forested, broad-leaved deciduous, temporary" = 2.8 acres.

LAND CONSERVATION

Ownership Type: City government, 68.1 acres; corporate, 5 lots; quasi-public (ca. 1-2 acres); private (single), one major (> 5 ac.) landowner.

Land Use: Truxton Park proper is classed as "Natural Features" (Open Space). The floodplain forest (Ecotype #7) and the 1.5 acre transitional zone of Spa Cove wetlands (Ecotype #6) are classed as "Residential - Medium" (5-10 units/ac.).

Residential Communities: Truxton Heights

Problems: 1) The trail and foot path system through the park suffers from overuse; too many trails; trails in areas not conducive to foot traffic (e.g., highly erosive slopes); in general, a poorly laid out trail network; the construction of trails by volunteer citizen groups without the advice and planning assistance of a qualified naturalist; 2) Parts of the park (especially the old field area (Ecotype #5) are abused by motorcycles; 3) Several abandoned cars in the old field area present a safety problem to children and should be removed; 4) Trash dumping along the fringes of the Spa Cove wetlands (the end of Truxton Park Road near the pump station) has been stopped but is still a potential problem; 5) Shore erosion control (gabions) at Lookout Point has destroyed much riparian habitat; 6) The clearing of wooded slopes at Lookout Point to "open up the view" of Spa Creek has destroyed native habitats and promoted the growth of non-native species; 7) Sediment and erosion control devices on Lookout Point were not constructed in ways compatible with the natural setting and have needlessly destroyed much native vegetation; 8) Residential development on the western side of the Spa Cove wetlands is destroying the wooded transitional zone vital to the productivity and scenic qualities of the wetland; 9) Abuse and vandalism of Graveyard Hill in general, and the crypt and iron-railed fence especially; in its present state the crypt is a safety hazard for children; 10) English ivy, a non-native species, is killing native vegetation in Ecotype #4; 11) Over the last ca. 15 years, common reed has progressively replaced the more productive species (e.g., cattail) in the Spa Cove wetlands; 12) Erosion problems on the steep slopes bordering Spa Cove (in large part due to improperly located foot trails); 13) A small (12 in. dia.) stormwater pipe is discharging high sediment loads into the wooded swamp (Ecotype #2) and killing red maple, poison sumac and other hardwood trees. Currently, a successionary change to vegetation suited to slightly drier conditions (e.g., sweet gum and willow oak) is occurring; 14) Scattered occurrences of saplings being cut and holes dug.

Preservation Options: The transitional area to the Spa Cove wetlands (Ecotype #6) and the floodplain forest (Ecotype #7) are private properties that add considerable acreage to the natural areas of Truxton Park. Every effort should be made to ensure their protection. No preservation options for this can be suggested (or ruled out) without contact with the landowners. Acquisition by the City to add natural area acreage to Truxton Park may be a viable option. In

general, to insure adequate maintenance and protection of the natural areas in Truxton Park, all future activities and construction by Annapolis Recreation and Parks should be in conjunction with the advice and assistance of a qualified naturalist; these plans should also be reviewed by the Annapolis Environmental Affairs Commission for approval.

Future Use: Passive recreation and outdoor education are current uses. Restricted use and recognized species areas (in the most environmentally compatible settings) should be promoted in a comprehensive Truxton Park management plan.

NATURAL AREA #2

Name: WYRE Wetlands

Geographical Limits: Bounded by the head of Spa Creek on the east, developed lots on Homewood Lane and Meares Court (Gentry) on the west, developed lots on Silopanna Road and WYRE Radio Station on the south, and Bates Jr. High School and the Spa Road Incineration Plant on the north.

Total Acreage: 15.3 acres

Ecological Classification: Complete ecotype; this includes three ecotypes: 1) Tidal (cove) marsh; 2) Floodplain forest; 3) Shrub swamp and wooded swamp.

Ecotype #1: Tidal (cove) marsh

Acreage: 2.8 acres

Flora: At the head of Spa Creek is cove marsh dominated by common reed, smooth cordgrass, and cattails. Smartweed, hibiscus, and cynos are also present. Further inland, the wetland contains shrub vegetation including alders and black willow.

Ecotype #2: Floodplain forest

Acreage: 1.0 acre

Flora: Inland from the Spa Creek cove marsh (Ecotype #1) is a narrow floodplain forest composed of red maple, river birch, and black willow trees. The floodplain forest extends upstream to just west of Spa Road.

Ecotype #3: Shrub swamp and wooded swamp

Acreage: 11.5 acres (2.7 of which is mapped as tidal wetlands and thus protected by State Law).

Flora: Just to the west of Spa Road the floodplain (Ecotype #2) broadens into a shrub swamp composed of red maple, ash, alders, and river birch (more detailed field work is needed to detemine if the cause for this shrub swamp was associated with "alluvial drowning" after the construction of Spa Road). Marshelder, grounselbush, and cattails also occur in the swamp. Two small branches feed the shrub swamp. Separate "fingers" of

floodplain forests are associated with these branches. Cursory field work indicates that alder, red maple, and ash occur in one of the floodplains. Further field work is highly recommended.

Natural Heritage Elements: Insufficient field work for adequate comment

Noteworthy Plant Species: Insufficient field work for adequate comment

Exceptional Trees: None observed

Historical Features: None registered

Archeological Features: None registered

Wildlife: Additional field work needed, but the shrub swamp appears to be an exceptional habitat for birds.

Scenic Qualities: No significant observations made.

Geology: The Aquia Fm. underlies the adjacent uplands; alluvium forms the cove marsh, floodplain forest, and shrub swamp.

Soils: Mixed alluvial soils cover the shrub swamp and floodplains. Monmouth fine sandy loam and loamy sand soils cover the adjacent uplands. Tidal marsh soils cover the cove marsh.

Topography: The shrub swamp, floodplain and cove marsh range in elevation from 0.5 to ca. 10 ft. (msl).

Contiguity: The shrub swamp/wooded swamp (Ecotype #3) is for the most part separated from the tidal marsh (Ecotype #1). The narrow floodplain (Ecotype #2) does, however, physically connect the two, and some species interaction via the lowland corridor may occur.

Other: Field review - 8/7/86.

Previous Listings: 1) DNR Wetland Boundaries (1970): "common reed, cattail, smooth cordgrass, marshelder, groundselbush, red maple, white ash" = 6.3 acres; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, emergent, narrow-leaved persistent, irregular" = 12.8 acres; "palustrine, forested, broad-leaved deciduous, temporary and seasonal" = 10.0 acres; "palustrine, scrub/shrub, broad-leaved deciduous, temporary" = 2.5 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 9 lot (< 1 ac.) owners; city government; corporate; institutional.

Land Use: Residential - Medium (5-10 units/ac.)

Residential Communities: Gentry, Truxton Heights

Problems: There is one pending State Highway Administration project wich has the potential to impact this natural area. The name of the project is "Maryland 665 Relocated, Patuxent Blvd." It will include replacement of Forest Drive with a 4-lane divided highway from Spa Road to Bywater Road. This construction will be immediately upstream of Ecotype #3. Final engineering and advanced right-of-way acquisition are underway. No proposed residential development is known. Insufficient field work has been done to evaluate ongoing impacts.

Preservation Options: Approximately half of the area is currently protected under the State Wetlands Law. Not enough is known about the landowners to suggest a preservation option. However, immediate contact with each landowner is imperative.

Future Use: Possibilities include wetland wildlife reservation, scientific monitoring, buffer (current function; i.e., separates the community of Gentry from adjacent communities); stormwater management (current function; i.e., the shrub swamp probably traps much of the sediment above Spa Road); restricted sightseeing (see Isolated Features).

ISOLATED FEATURES

Archeological Features: 1) MHT site AN 502 - Glassworks, 19th century - yielded artifacts which include glass fragments and brick bats; 2) MHT Quad File site no. 12; no specific information available, described only as being "surveyed by William Clark."; 3) MHT site AN 501 - Saunders 18th Century House - is the location of an excavated root cellar which provided artifacts dating 1710-1810; these included one feather edge creamware, two late delftware, three pipestems, one pipe bowl, and many others; a six ft. diameter oak tree (species unknown) is associated with this site.

Historic Features: 1) County Historic Sites Survey AA 169 - Primrose Farm. The structure's condition is described as "good, unaltered, original site." Built in 1732 by the Hesselius family, it is significant for agriculture and architecture. John and Mary Hesselius occupied the house (which is on Hill Top Lane directly across from Truxton Park) in the mid-1700s. John Hesselius is recognized as one of America's earliest and most significant native born portrait painters; 2) An old mill stone recut for crushing tanbark is on the property of Green Street School. Perhaps this is part of a tanning works thought to have been operated by Hyde on the Shaw's shop site. This is an interesting relic of local industry.

Exceptional Trees

Big Trees: 1) The ca. 6 ft. diameter oak tree (species unknown) associated with the Saunders 18th Century house qualifies as both a "Big Tree" and an "Old Tree". The oak may be as old as 275 years (the artifacts at the Saunders house date back to 1710). The historical significance of this tree requires further research. The tree should be identified as to species and officially measured and included into the "Big Tree Inventory"; 2) A horsechestnut tree located adjacent to the Governor's House is listed in the "Big Tree Inventory." It dimensions are CBH, 9 ft. 4 in.; height, 85 ft; and spread 56 ft. The horsechestnut is declining rapidly.; 3) The former State Champion hercules club tree is located on the grounds of the William Paca House. Dimensions are: CBH, one ft. 10 in.; height, 14 ft.;

spread, 8 ft. This tree is now included in the "Big Tree Inventory"; 4) The former State Champion white (grey) brich is located on Weems Court, State Circle. Dimensions are: CBH, 5 ft.; height, 74 ft.; spread, 36 ft. This tree is now included in the "Big Tree Inventory."

Old Trees: 1) A 225 year old white oak tree (1000 Moss Haven Road) made the "Bicentennial Trees" list in 1975; 2) A 200+ year mulberry tree (William Paca House) also made the "Bicentennial Trees".

Wetlands: At the head of Hawkins Cove, a small tributary to Spa Creek, there is a 0.5 acre tidal wetland (draw marsh) composed mostly of cattail and smooth cordgrass; just inland of the draw marsh is a narrow floodplain forest of ca. 1.0 acre (U.S. Fish & Wildlife Service 1979, National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" and "palustrine, forested, broad-leaved deciduous, temporary").

SUBWATERSHED #5

Name: College Creek (Cemetery Creek, 1905: Graveyard Creek, 1834; Covey Creek, Sprigg's Creek, Robert's Creek, 1781; Deep Cove, 1769; Brever's Cove, 1694; Dorseys Creek, 1667)

Location: Bounded on the north by the Weems Creek subwatershed and on the south by the Spa Creek subwatershed. The confluence of College Creek and the Severn River is located at the U.S. Naval Academy.

Natural Areas: This subwatershed includes two natural areas: 1) Naval Academy Promontory; 2) Adams Park Learning Center Promontory.

NATURAL AREA #1

Name: Naval Academy Promontory

Geographical Limits: Bounded by College Creek on the south and east, College Cove on the north, and Rowe Boulevard on the west.

Total Acreage: 7.6 acres

Ecological Classification: Complete ecotype; this includes three ecotypes: 1) Uplands; 2) Tidal (fringe) marsh; 3) Tidal (draw) marsh.

Ecotype #1: Uplands

Acreage: 7.0 acres

Flora: The promontory is dominated by a mature hardwood forest consisting primarily of chestnut oak, white oak, and black oak. Many of these trees have DBHs of 12-24 in. and have an estimated age in excess of 100 years. The periphery of the promontory supports southern and northern red oaks as well. The major understory species are flowering dogwood, and sassafras in the open areas near the water. The herbaceous layer, though not especially diverse, is ca. 100% native, with very few alien weeds present. The quality of herbaceous plants is very high and consists of species considered indicative of rich, undisturbed environments. Such species include rattlesnake weed, partridge berry, Solomon's seal, spotted wintergreen, jack-in-the-pulpit, and mayapple. Native vines include trumpet creeper, trumpet (native) honeysuckle, summer grape, and Virginia creeper. For the most part, the shrub layer is sparse; chinquapin, wintergreen, staghorn sumac, and wild pink azalea are examples.

Ecotype #2: Tidal (fringe) marsh

Acreage: 2100 linear feet (0.4 mi.)

Flora: From Rowe Boulevard to the College Cove marsh (Ecotype #3) the shoreline perimeter supports a well-developed fringe marsh consisting of arrow arum, groundselbush, rose mallow, and seaside goldenrod. The vitality of these wetland plants is due to minimal disturbance from boat-generated waves and stable, vegetated slopes adjacent to the fringe marsh.

Ecotype #3: Tidal (draw) marsh

Acreage: 0.2 acre

Flora: At the head of College Cove (the northernmost portion of the natural area) is a draw marsh consisting primarily of common reed.

Natural Heritage Elements: 1) Chinquapin - C, State declining.

Noteworthy Plant Species: 1) One American chestnut tree (height ca. 27 ft. and DBH ca. 5 in.) - uncommon throughout the region; 2) Wild sarsaparilla - "infrequent in the Coastal Plain" (Brown and Brown, 1984).

Exceptional Trees

Big Trees: 1) A very large sauls oak (white oak x chestnut oak hybrid) is located in this natural area. This tree appears to be larger than the current State Champion sauls oak (6 ft. 5 in. CBH, 65 ft. height, 56 ft. spread). The College Creek sauls oak should be officially measured by the DNR Urban Forestry Program and declared State Champion if it is larger.

Historic Trees: Several of the large chestnut oak trees in a glade area bordering College Cove may have historical significance to the Naval Academy. The glade area may have been an old site for admiral's picnics and other leisure outings. Further historical research is needed.

Historic Features: 1) County Historic Sites Survey AA 763 -Maryland Route 450 Bridge over College Creek. The condition of the bridge is described as being "good, unaltered, original site." The early 20th century bridge is significant for its engineering and is a "rare kind of moveable bridge; one of only three in the County." Although the bridge is not physically located on the promontory, it dominates the visual landscape on the eastern and northeastern portion of the natural area and is intimately associated with its historic and scenic integrity. 2) The old Baltimore and Annapolis Railroad grade (circa 1886) adjacent to Rowe Boulevard is still readily visible.

Archeological Features: None registered

Wildlife: Although no exceptional wildlife observations were made during field work, the promontory offers a variety of wildlife habitat types, including open woodland, glades, thickets, and wetlands.

Scenic Qualities: The open woodlands and glades offer extended, uninterrupted views through the natural area. The vegetational layering is distinct (canopy, understory, shrub, and herbaceous layers are marked). The panoranic view of Annapolis' least disturbed creek is exceptional; complete views over ca. 270° from the tip of the promontory - quite a vantage point.

Geology: The Aquia Fm. underlies the uplands; alluvium forms the College Cove wetlands. The land/water interface is a good example of the relationship between bank stability and natural (native) vegetation. The obvious lack of erosion is in large part due to the protection afforded by the vegetation on the banks. Wave energy dissipation due to the buffering of the fringe marsh and undisturbed vegetation on the banks of the promontory can be readily observed.

Soils: Monmouth fine sandy loam soils occur over the majority of the site. The part of the natural area immediately adjacent to Rowe Boulevard is mapped as Monmouth - urban land complex. The Monmouth soils appear never to have been severely disturbed by man. The last minor disturbance was when the Baltimore and Annapolis Railroad was constructed in 1886. Intact soils of this nature are a very uncommon occurrence in the Severn River watershed and almost unheard-of within the city limits of Annapolis.

Topography: The flat (0-2% slopes), plateau-like uplands range in elevation from 24 ft. in the northernmost portion of the natural area to 10 ft. at the crest of the steep (> 15%) slopes that drop abruptly to the water's edge.

Contiguity: This natural area is adjacent to another (smaller) wooded promontory (Natural Area #2). However, Rowe Boulevard separates the two, and may disrupt most wildlife interaction. Aquatic species interaction between the wetlands and College Creek is occurring. For the most part, this natural area is totally isolated and within a densely developed area.

Other: The wooded promontory serves the function of a scenic transitional zone which protects the cultural identity of the Historical District of Colonial Annapolis from contemporary developments to the north. Without this natural buffer the Historic District would loose its distinct and separate appearance and become assimilated into the recent development north of College Creek. The wooded peninsula also functions as a scenic entrance way or promenade into Annapolis and actually enhances its scenic and historic appeal. The promontory is the most intact of the five remaining natural areas within the City of Annapolis. Field review - 7/28/86.

Previous Listings: 1) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.3 acre.

LAND CONSERVATION

Ownership Type: Federal government/institutional: State government; corporate.

Land Use: Government/Institutional

Residential Communities: None

Problems: The Naval Academy Athletic Association (NAAA) has expressed interest in constructing a hotel/conference center on the promontory. No formal proposals have yet been offered nor permits applied for, and the project is still in preliminary planning stages. Ongoing impacts include scattered littering and growth of non-native species along the periphery of the natural area near Rowe Boulevard. Constant noise from vehicles passing on Rowe Boulevard at high

speeds detracts somewhat from the serenity of the natural area. A State Highway Administration project is replacing the historic Route 450 bridge over College Creek. The project is entitled "Maryland 450, King George Street". At the time of this writing, construction was underway.

Preservation Options: Preservation options and the ultimate fate of the wooded promontory will depend on the outcome of the proposed NAAA project. If the hotel is not built, every effort should be made to work with the Naval Academy and the State to insure the preservation of the natural area in perpituity. Protection of the two low-clearance bridges downstream of the natural area will guarantee the continued restriction of the size and frequency of boats in the creek. The low amount of boat-generated wakes has helped in the protection of the stable shoreline and fringe marsh of the promontory (and the protection of College Creek in general).

Future Use: Buffer, currently one of the most important functions of the wooded promontory (i.e., physical separation protects the cultural and historical identify of Colonial Annapolis from the contemporary structures north of the natural area); outdoor education; passive recreation.

NATURAL AREA #2

Name: Adams Park Learning Center Promontory

Geographical Limits: Bounded by College Creek on the east and south, Peter's Cove on the north, and Adams Park Learning Center on the west.

Total Acreage: 3.4 acres

Ecological Classification: Altered green area; this includes two ecotypes: 1) Uplands; 2) Tidal (draw) marsh.

Ecotype #1: Upland

Acreage: 2.8 acres

Flora: The promontory is dominated by a mature hardwood forest consisting primarily of chestnut oak, white oak, black oak and scarlet oak trees. Many of these have DBHs of 18-24 in. The major understory species include dogwood and chestnut oak. Mountain laurel and wintergreen are found in the shrub layer. The herbaceous layer has been disturbed, apparently by heavy foot traffic from students of the school; a heavy oak leaf ground litter is the dominant feature in place of herbaceous plants.

Ecotype #2: Tidal (draw) marsh

Acreage: 0.6 acre

Flora: A healthy draw marsh at the head of Peter's Cove consists of common reed, cattail, arrow arum, and smooth cordgrass.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) The Bay Ridge spur of the old Baltimore & Annapolis Railroad (circa 1886) crossed the head of Peter's Cove (Ecotype #2); evidence of the bridge is gone but the lineations where the bed was located are still apparent on the landward edge of Ecotype #1.

Archeological Features: MHT site AN 153 - The "College Creek site;" the sole artifact found was a contracting stem point.

Wildlife: None observed

Scenic Qualities: The promontory is an outstanding vantage point from which to view almost all of College Creek, St. John's College, St. Mary's Cemetery, and parts of Colonial Annapolis. From the tip of the promontory a 270° view of the relatively undisturbed shorelines of College Creek is possible. The view of this natural area from Rowe Boulevard contributes greatly to the scenic integrity and intact natural appearance of College Creek.

Geology: The Aquia Fm. underlies the uplands; alluvium forms the draw marsh.

Soils: Monmouth loamy sands cover the uplands, tidal marsh soils cover the draw marsh.

Topography: The uplands are relatively flat (5-10% slopes) and range in elevation from 30 ft. (msl) at the landward margin of the promontory to 20 ft. (msl) at the crest of the slope along the shoreline periphery. The slope drops abruptly to the water's edge. The draw marsh ranges in elevation from sea level to ca. 2 ft. (msl) further inland.

Contiguity: This natural area is adjacent to the Naval Academy promontory (Natural Area #1), but wildlife interaction due to Rowe Boulevard is diminished greatly. Aquatic species interaction between the draw marsh (Ecotype #2) and College Creek is occurring. For the most part, the natural area is isolated and surrounded by intense development.

Other: Although an intact fringe marsh is not as prevalent as in Natural Area #1, the shoreline (ca. 1200 linear feet) of the promontory is relatively stable and well vegetated. The wooded promontory acts as a transition zone separating Colonial Annapolis from contemporary development to the north. Field review - 7/28/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass" = 0.6 acre; 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estaurine , intertidal, emergent, narrow-leaved persistent, irregular" = 1.0 acre.

LAND CONSERVATION

Ownership Type: Institutional; private (multiple), 5 lot (< 1 ac.) owners; State government.

Land Use: Residential - High (> 10 units/ac.)

Residential Communities: Windmills of Annapolis

Problems: There are no pending projects. Continued development of lots bordering the west side of Peter's Cove is an immediate problem; these lots form a valuable transitional zone that protects the draw marsh (Ecotype #2) at the head of Peter's Cove. Ongoing impacts include heavy foot traffic in the upland area.

Preservation Options: Conservation cooperatives or mutual covenants with the lot owners have potential. Contact with the Board of Education is very important. Because the Adams Park School owns the majority of the promontory, preservation options (many are potentially viable) should be relatively uncomplicated to pursue. The draw marsh is currently protected under State Tidal Wetlands Law.

Future Use: Possibilities include outdoor education; passive recreation; stormwater management (a current function of the draw marsh); and buffer (currently helps separate and protect the cultural and historical identity of Colonial Annapolis from contemporary developments to the north).

ISOLATED FEATURES

Historic Features: 1) St. Annes Cemetery (circa 1826); hundreds of graves dating back to the 18th century which bear names of historically noteworthy people (restricted sightseeing - potential future use); 2) County Historic Survey Site AA 764 - Route 450 bridge over the Severn River. The condition of the early 20th century bridge is described as "good, altered, original site." It is significant for its engineering; "the only opening bridge in the County to be associated with steel arched spans - a graceful impression of structural engineering."

Archeological Features: Seven MHT sites: 1) AN 156 - Cady Cove - a shell heap yielding chips; 2) AN 157 - Back Creek - produced points, chips, and bones; 3) AN 239 - Meadow Point - provided unnamed artifacts; 4) AN 214 - Calvary United Methodist Church - produced quartz artifacts, scrapers, projectile points, and charred bone; 5) AN 342 - Arundel Estates; 6) AN 154 - Taylor Avenue site- provided one rhyolite chip; 7) Quad File site no. 1 - no details.

Wetlands: DNR Tidal Wetlands Boundaries (1970): 1) Near the head of College Creek - "smooth cordgrass, marshelder, groundselbush" = 0.2 acre; 2) Shady Lake - "smooth cordgrass, cattail, marshelder, groundselbush" = 0.6 acre. U.S. Fish & Wildlife Service (1979), National Wetlands Inventory: 1) The floodplain of the small freshwater branch feeding College Creek, near Taylor Avenue -"plaustrine, forested, broad-leaved deciduous, temporary" = 3.0 acres; "palustrine scrub shrub, broad leaved deciduous/emergent, narrow-leaved persistent, seasonal saturated" = 0.3 acre; 2) Shady Lake - "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.3 acre.

Exceptional Trees

Big Trees: 1) The Liberty Tree located on the campus of St. John's College is the most famous tree in the watershed and has received national recognition (former State and National Champion). This exceptional tulip poplar is on the "Big Tree Inventory", the "Bicentennial Trees" list, and

certainly qualifies as a "Historic Tree". The dimensions of the Liberty Tree are: circumference at 2 ft. above the ground, 32 ft. 3 in.; CBH, 28 ft. 5 in.; height, 105 ft.; spread, 74 ft. 6 in. Since 1956 the circumference has grown 1 ft. 10 in.; since 1886, 2 ft. 11 in. The tree is probably close to 400 years old and has been a centerpiece for historical events in Maryland and Annapolis for over 200 years.

Natural Heritage Elements: 1) Sand hickory - C, State declining. Located on the grounds of the Calvary United Methodist Church.

SUBWATERSHED #6

Name: Weems Creek (Howards Creek, 1769; Warner's Creek, 1769; Norwood's Creek, 1667).

Location: Bounded by the Cove of Cork subwatershed on the north and the College Creek subwatershed on the south. The northernmost subwatershed in the City of Annapolis. It is immediately south of and parallels U.S. Route 50.

Natural Areas: This subwatershed includes two natural areas: 1) Hock Tract; 2) Priest Point.

NATURAL AREA #1

Name: Hock Tract

Geographical Limits: Bounded by Weems Creek on the south, west, and east, and by Route 50 on the north.

Total Acreage: 34.0 acres

Ecological Classification: Complete ecotype; this includes four ecotypes: 1) Uplands; 2) Steep slopes; 3) Tidal (cove) marsh; 4) Tidal (draw) marsh.

Ecotype #1: Uplands

Acreage: 20.0 acres

Flora: A mature forest dominated by tulip poplar (DBHs 18-24 in.) and white oak (many large examples - DBHs 24-36 in.). Northern red and black oaks are minor constituents. A healthy understory of flowering dogwood and American holly is present. Spicebush is common in the shrub layer, mayapple and Virginia creeper in the herbaceous layer. The thick, fine-grained, rich soils of the flat uplands also support a wide variety of other herbaceous plants, including sensitive fern, trumpet honeysuckle, showy orchis, bloodroot, rattlesnake fern, Indian pipe, Christmas fern, and New York fern.

Ecotype #2: Steep slopes

Acreage: 10.0 acres

Flora: The steep (> 15%) slopes bordering Weems Creek are much drier, sandier, less fertile, and more exposed than the interior uplands (Ecotype #1). The dominant canopy tree on the slopes is chestnut oak. Mockernut hickory, scarlet oak, white oak, and tulip poplar are minor constituents of the canopy layer. Sassafras, flowering dogwood, and chestnut oak form the

canopy layer. Mountain laurel, maple-leaved viburnum, shadbush, and blueberry are dominant species of a thick shrub layer. The herbaceous layer is sparse and a heavy oak leaf ground litter is present.

Ecotype #3: Tidal (cove) marsh

Acreage: 3.5 acres

Flora: The dominant species include cattail, smooth cordgrass, groundsel-bush, and rosemallow. The zonation and interspersion of these species is distinct, as is the intermixing of small tidal channels and open water bodies. Red maple and ash occur further inland, first as shrubs and increasing in size at the mouth of Cowhide Branch.

Ecotype #4: Tidal (draw) marsh

Acreage: 0.5 acre

Flora: The eastern boundary of the Hock Tract is a small tidal tributary of Weems Creek. At the head of this small cove (visible from Route 50) is a draw marsh composed mostly of cattail, smooth cordgrass, and arrow arum.

Natural Heritage Elements: None observed

Noteworthy Plant Species: 1) Rue-anemone - "common in the midland and mountain areas, but rare in the Coastal Plain" (Brown and Brown, 1984); 2) Showy orchis - "usually infrequent" (Brown and Brown, 1984); 3) Maidenhair fern - "occurs only occasionally on the Coastal Plain" (Reed, 1953).

Exceptional Trees

Big Trees: 1) One white oak ca. 60 in. DBH; 2) One American chestnut ca. 30 ft. in height.

Historic Features: None observed

Archeological Features: 1) MHT site AN 148 - The Hock Tract Site - is a small shell heap with quartz chips and bones.

Wildlife: Although no extraordinary wildlife features were observed, the undisturbed condition of the natural area and a variety of ecotypes and vegetational layers provides an excellent wildlife habitat. White-tailed deer are commonly seen and a pair of bald eagles have been sighted, although this sighting is unconfirmed.

Scenic Qualities: The abrupt rise of the heavily wooded slope, as seen from the water, dominates the visual landscape of Weems Creek upstream of Rowe Boulevard. Assuredly, the aesthetic nature of the tract is highly valued by citizens residing across the creek. The view of Weems Creek from atop the Hock Tract is lengthy and unrestricted - a nice lookout.

Geology: The Aquia Fm. underlies the uplands and steep slopes; alluvium forms the tidal marsh areas. The richness of the thick, fine-grained soils in the interior uplands may indicate a locally high concentration of glauconite in the sediments.

Soils: Collington fine sandy loam soils cover the interior uplands, eastern peripheral slopes, and slopes of two small ravines in the central portion of the property. Monmouth fine sandy loam soils cover the peripheral slopes on the western portion of the tract. The soils of the interior uplands appear to have undergone minimal disturbance.

Topography: The interior, relatively flat (5-10% slopes) uplands range from 72 ft. (msl) near Route 50 to 25 ft. (msl) at the crest of the steep peripheral slopes. The peripheral slopes, from their crest to the water's edge, are very steep (15-40%). The cove marsh (Ecotype #3) ranges in elevation from sea level to ca. 2 ft. (msl) further inland.

Contiguity: Immediately north of Route 50 is a forested area of ca. 10 acres. This area was mapped as part of the Hock Tract in the Compendium of Natural Features (1975). It is doubtful whether significant wildlife species (other than birds) can commute across the heavily traveled Route 50. Additional field work is needed to evaluate this adjacent site. Aquatic species interaction between the tidal wetlands and Weems Creek is occurring.

Other: The Hock Tract is of tremendous value as a buffer which protects the serenity of Weems Creek and the residences on the southern shore from Route 50. The tidal shoreline is intact; the well vegetated slopes are relatively stable. Field review - 8/8/86.

Previous Listings: 1) The Nature Conservancy (date unknown) first described the Hock Tract as the Weems Creek "living science museum."; 2) The Catalog of Natural Areas (1968); 3) The DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, cattail, and rose-mallow" = 4.0 acres; 4) The Compendium of Natural Features (1975) - "a virgin forest"; 5) The Uplands Natural Area Study (1977); 6) The U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 3.0 acres; "palustrine, forested, broad-leaved deciduous, temporary" = 0.5 acre; "estuarine, intertidal, flat, regular" = 1.0 acre; 7) A Greenway Strategy for Weems Creek (1982); 8) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: State government

Land Use: Natural Features (Open Space)

Residential Communities: Admiral Heights, Mariners Cove, houses off Kirkley Road

Problems: State Highway Administration project "1-68 (US 50/301), John Hanson Highway" calls for widening of Route 50 to 6 lanes. Final engineering and Right-of-Way are underway for this project. No residential development is proposed at this time. Ongoing impacts include growth of non-native species (English ivy and Japanese honeysuckle). Scattered littering is also apparent

but not a severe problem. The most significant impact is the constant deafening noise from traffice on Route 50. The noise is more severe on the flat interior uplands than on the steep slopes which are somewhat protected and further away. The impact of the noise on wildlife productivity is unknown but worthy of investigation in a more formal study.

Preservation Options: The State Highway Administration appears to be adamant about retaining title to the Hock Tract (it is common practice for the SHA to retain properties adjacent to existing highways for possible future additions/expansions to those factilities). The SHA should be encouraged, in conjunction with the DNR, to develop ecologically protective management plans for the Hock Tract. The tidal wetlands are currently protected under State law.

Future Use: Possibilities include scientific monitoring (a study of the impacts of severe noise on wildlife may prove useful; results and recommendations could be applicable to many natural areas in the watershed also subject to noise problems), passive recreation, outdoor education, and buffer (current function).

NATURAL AREA #2

Name: Priest Point (Weems Point, 1846)

Geographical Limits: Bounded by Weems Creek on the south, developed lots of Riverview Manor to the west, the Severn River to the east, and Route 50 to the north. This is the northern point at the confluence of Weems Creek and the Severn River.

Total Acreage: 17.0 acres

Ecological Classification: Altered green area; this includes two ecotypes: 1) Uplands; 2) Bluff.

Ecotype #1: Uplands

Acreage: 17.0 acres

Flora: A hardwood forest consisting of tulip poplar, white oak, and black oak occurs on the more level interior uplands. The steeper slopes near the water consist of chestnut oak, Virginia pine, blackjack oak, and mockernut hickory. Understory species include sassafras and dogwood (more field work is needed).

Ecotype #2: Bluff

Acreage: 800 linear feet

Flora: A 40 ft., nearly vertical bluff facing the Severn River is located on the northern portion of the property. Vegetation includes chestnut oaks at the crest of the bluff, and staghorn sumac, black locust, sassafras, mountain laurel, and shadbush along the vegetated upper portion of the slope (more on-site field work is needed).

Natural Heritage Elements: 1) Sand hickory - C, State declining. Additional field work is needed.

Noteworthy Plant Species: Insufficient field work for adequate comment.

Exceptional Trees: From the water, several hardwoods appear quite large (further on-site field work needed).

Historic Features: None recorded

Archeological Features: 1) MHT site AN 146 - Prospect Point - produced chips.

Wildlife: Additional field work required.

Scenic Qualities: The wooded shoreline is quite extensive and produces an attractive, natural entrance to Weems Creek. The 40 ft. bluff exposing orange, red, and yellow sediments of the Aquia Fm. has a majestic appearance from the waters of the Severn.

Geology: The Aquia Fm. underlies the entire natural area except for alluvium (sands) which forms of a narrow beach at the base of the bluff and along the shore of the point.

Soils: Collington fine sandy loam soils cover most of the natural area. Cut and fill land is mapped on the point proper.

Topography: The relatively flat (2-5% slopes) interior uplands range in elevation from 55 ft. (msl) near Route 50 to 25-40 ft. (msl) at the crest of the steep slopes near the water. The 40 ft. bluff along the Severn River near Route 50 is nearly vertical. The 25 ft. slopes along Weems Creek and near the point are not vertical, but are still very steep (ca. 40%).

Contiguity: With Route 50 to the north and development to the west, this natural area is, for the most part, completely isolated from other natural areas. There is probably significant interaction of aquatic wildlife with Weems Creek and the Severn River.

Other: The natural area is of value to residents of Wardour for scenic qualities and as a Route 50 buffer. Field review - 8/8/86.

Previous Listings: 1) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.5 acre; 2) A Greenway Strategy for Weems Creek (1982).

LAND CONSERVATION

Ownership Type: Institutional

Land Use: Natural Features (Open Space)

Residential Communities: Riverview Manor, Wardour

Problems: State Highway Administration project "U.S. 50/301, Blue Star Memorial Highway." The phase to widen the Severn River Bridge is currently underway. The phase to widen Route 50 to 6 lanes from the bridge to Rowe Boulevard is undergoing final engineering and right-of-way. Constant, severe

noise from Route 50 and the bridge is the most significant ongoing impact. Several permanent structures on the site detract from its otherwise undisturbed nature. No residential development is currently proposed.

Preservation Options: Conservation easements, mutual covenants, and conservation cooperatives are all possibilities. With a sole landowner, any preservation option should be relatively uncomplicated to pursue.

Future Use: Possibilities include passive recreation (current function for the priests of the Redemptorist Order) and buffer (current funtion; visual and sound screen between Wardour and Route 50).

ISOLATED FEATURES

Wetlands: Four draw marshes are found on the south shore of Weems Creek. DNR Tidal Wetlands Boundaries (1970): 1) "cattail" = 0.3 acre; 2) "cattail/red maple/ash" = 0.2 acre; 3) "cattail, smooth cordgrass" = 0.2 acre; 4) "marshelder, groundselbush, smooth cordgrass, meadow cordgrass, spikegrass" = 0.5 acre. Two of these draw marshes are identified by the U.S. Fish & Wildlife Service (1979), National Wetlands Inventory: 1) Admiral Heights Cove: "estuarine, intertidal, flat, regular" = 0.5 acre; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 1.0 acre; "palustrine, forested, broad-leaved deciduous, temporary" = 1.0 acre; 2) A small cove on the south shore of Weems Creek just upstream from Rowe Boulevard; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.2 acre. The freshwater stream feeding Weems Creek is named Cowhide Branch. The branch extends upstream from Weems Creek to the vicinity of the Annapolis Mall and is mapped by the U.S. Fish & Wildlife Service, National Wetlands Inventory (1979) as "palustrine, forested, broad-leaved-deciduous, temporary" = 7.0 acres. Two small branches which feed Cowhide Branch are mapped under the same designation and are 2.0 acres each. Additional field work is needed in the narrow floodplain of Cowhide Branch and adjacent wooded slopes.

Historic Features: The County Historic Sites Survey records six sites in the Weems Creek subwatershed: 1) AA 765 - the Ridgely Avenue bridge over Weems Creek - is described as being in "good condition, original site and unaltered." The early 20th century bridge is significant for its engineering and being "only one of three rare moveable bridges in the County;" 2) AA 928 - The Baltimore & Annapolis Railroad Bridge over the Severn River. This late 19th century bridge is currently owned by the Wardour Community Association. Plans have been prepared for removal of the bridge and construction is underway; 3) AA 895 - Three Mile Oak; 4) AA 736 - Fowlers United Methodist Church - was built in 1871 and is described as being in "excellent condition, altered and moved." It is significant for its religious, humanistic, and social attributes; 5) AA 136 - Howard's Inheritance - described as one of the few 1-1/2 story gambrel roofed dwellings in the County which dates to the late 18th century. The property is connected to early Puritan settlers and Samuel Howard, son of Cornelius Howard, who left Virginia in 1649 following religious persecution. Samuel Howard patented the property in 1699; 6) AA 771 - Mt. Olive Church Site - was built in 1870 and its condition is described as "excellent, altered and moved." It is significant for educational, religious and social attributes.

Archeological Features: Four MHT sites: 1) AN 147 - Weems Creek Site; 2) AN 149 - Weems Creek IV - produced one point, chips and one sherd; 3) AN 211 - Peakes Farm - is a shell heap; 4) AN 150 - The Skorpas Site - produced Archaic quartz chips.

Exceptional Trees: The Compendium of Natural Features Information (1975) mapped the location of an exceptional tree (no. 820) in the southern portion of the Weems Creek subwatershed. The tree could not be located. Further inquiry and information is needed to determine if it still exists, and if so, its location.

Old Trees: 1) Located at 9 Wilson Road are three white oak trees listed as "Bicentennial Trees". White Oak no. 1 is presently 220 years old and nos. 2 and 3 are 210+ years old.

Problems: Preliminary plans to construct a hospital, church, and a large subdivision on Bestgate Road could have impacts on the subwatershed in terms of loss of natural areas (Cowhide Branch and environs) and stormwater/sedimentation problems downstream.

SUBWATERSHED #7

Name: Cove of Cork (Porter's Cove, 1769)

Location: Bounded by the Luce Creek subwatershed on the north and the Weems Creek subwatershed on the south. Immediately north of U.S. Route 50 near the western side of the Severn River bridge.

Natural Areas: This subwatershed includes one natural area: 1) The Island.

NATURAL AREA #1

Name: The Island

Geographical Limits: The Island is found immediately beyond the confluence of the Cove of Cork and the Severn River.

Total Acreage: 1.0 acre

Ecological Classification: Microsystem; this includes one ecotype: 1) Island.

Ecotype #1: "Island" (acutally a shifting sandbar)

Acreage: 1.0 acre

Flora: Three large (ca. 35-40 ft. in height) and 8-10 small (ca. 10-15 ft. in height) eastern red cedars assume the dominant position on the "high" (ca. 3.2 ft. msl) sandy core of the island which trends in a NW-SE direction. Scattered stands of wild black cherry, black locust, and hightide bush occur in the shrub layer. Tidal marsh grasses are the dominant vegetation over the lower (0.5 - 1.0 ft. msl) elevations surrounding the island's core. Smooth cordgrass, cattail, and rosemallow are interspersed among several small patches of open water.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None registered

Archeological Features: None registered

Wildlife: The marsh grasses were teeming with several species of small birds during the on-site visit.

Scenic Qualities: The island is an added physical dimension in the visual landscape which is noted by hundreds of people who drive over the Severn River bridge daily. The ecological conditions of the island offer a distinct contrast to the adjacent wooded slopes of the mainland.

Geology: The island appears to be composed entirely of alluvial sands winnowed in a downdrift direction by longshore currents. The island is actually a sand spit loosely connected to the mainland. Marsh grasses loosely connect the island to the mainland in shallow areas where the spit was breached. Although portions of the island are eroding, other areas are accreting as the sand spit migrates in a downdrift direction. Based on old aerial photographs, the process is accelerating and the overall net effect of this shifting may be a small loss in area.

Soils: Tidal marsh soils cover the entire natural area.

Topography: The central core of the island stands slightly higher (ca. 3.0 ft. msl) than the surrounding marsh grasses (0.5 - 1.0 ft. msl).

Contiguity: Being nearly an island, the natural area is largely physically separated from other areas. The adjacent mainland is mostly developed. There is probably much interaction of birdlife between the island and other natural areas. Aquatic species interaction is also probably very high.

Other: The island is a local landmark for boaters and many who view it from the Route 50 bridge. For drivers going in a westerly direction, the island is one of the most noticeable features within close viewing range. Field review - 8/8/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, marshelder, groundselbush" = 1.8 acres. 2) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent" = 0.7 acre.

LAND CONSERVATION

Ownership Type: Unknown

Land Use: Natural Features (Open Space)

Residential Communities: Dreams Landing, Lindamoor on the Severn

Problems: No pending projects or proposed residential development. Ongoing problems include scattered littering and general overuse/abuse by local boaters. Constant, severe noise from passing bridge traffic is the most noticeable impact detracting from the natural qualities of the island.

Preservation Options: The majority of the island is currently protected under State Wetlands law.

Future Use: Passive recreation (current function).

ISOLATED FEATURES

Wetlands: A small cove marsh is located at the head of the Cove of Cork. DNR Tidal Wetlands Boundaries (1970); "cattail, smooth cordgrass" = 0.3 acre. U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.4 acre. A narrow floodplain forest originating at Ridgely Avenue and terminating at the cove marsh at the head of the Cove of Cork requires further investigation. The U.S. Fish & Wildlife Service (1979), National Wetlands Inventory maps this floodplain as "palustrine, forested, broad-leaved deciduous, temporary" = 2.0 acres.

Archeological Features: Two MHT sites: 1) AN 144 - Cove of Cork site - is a 500 x 100 ft. shell heap where two sherds were found. 2) AN 145 - Severn River Bridge site - chips found.

Natural Heritage Elements: 1) A grove of hemlock trees - C, State declining, is located on the north-facing slope of the Cove of Cork, adjacent to the west bound lanes of Route 50. Hemlocks are a disjunct species on the Coastal Plain of Maryland. The native range is in much cooler, mountainous regions to the north and west. The disjunct population of the Cove of Cork is reproducing well in association with large chestnut oaks. The State Highway Administration project "U.S. 50/301, Blue Star Memorial Highway" which calls for 6-laning Route 50 could impact the hemlocks if special efforts are not made by the SHA to protect them.

SUBWATERSHED #8

Name: Luce Creek (Howard's Creek, 1860; Luce's Creek 1846; Hammonds Creek, 1667)

Location: Bounded by the Martins Pond subwatershed on the north and the Cove of Cork subwatershed on the south.

Natural Areas: Little detailed field work was performed in the Luce Creek subwatershed and few comments on specific natural areas can be given. However, the shoreline of this tidal tributary is remarkably intact considering the proximity of Annapolis. The slopes bordering the north shore of Luce Creek appear to be intact and require additional field work to determine their extent and significance, especially as an addition to, and transition for, the Martins Pond natural area.

ISOLATED FEATURES

Wetlands: Three separate tidal wetlands are recognized by the DNR Tidal Wetlands Boundaries (1970): 1) A cove marsh at the head of Luce Creek, "cattail, smooth cordgrass" = 1.1 acres; 2) A draw marsh leading to a small tidal tributary on the south shore of Luce Creek, "cattail, smooth cordgrass" = 0.3 acre; 3) A draw marsh leading to a small tidal tributary on the south shore of Luce Creek near its confluence with the Severn River, "smooth cordgrass" = 0.2 acre. The U.S. Fish & Wildlife Service (1979), National Wetlands Inventory maps the cove marsh at the head of Luce Creek as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.8 acre. The U.S. Fish & Wildlife Service (1979), National Wetland Inventory maps the small freshwater branch feeding Luce Creek as "palustrine, forested, broad-leaved deciduous, temporary" = ca. 4.0 acres. This narrow floodplain forest runs from Severn Grove Road near Bestgate Road to Luce Creek. The floodplain and possible wooded ravine slopes adjacent to it require further investigation.

Archeological Features: Two MHT sites: 1) AN 142 - Luce Creek Kiln - an 18th century brick kiln - where piles of scattered brick remains were observed. 2) AN 143 - Luce Creek Site. This is one of the six key sites used by Wright (1973) to develop "An Archeological Sequence in the Middle Chesapeake Region, Maryland." It is described as "the only pure site of Selby Bay Complex on the Severn that is undisturbed - a valuable site." This is a large shell heap 120 ft. long and 35 ft. wide. Artifacts include net-impressed vessels, exotic stone projectile points, grinding stones, and a worked box turtle carapace, probably a cup. Radio carbon dates from a piece of deciduous wood charcoal registered A.D. 580 (1370 B.P. $\pm$ 120).

Geology: Just south of the Luce Creek - Severn River confluence is a near vertical bluff exposing ca. 45 ft. of weathered Aquia Fm. sediments. The exposure is a dominant scenic feature both when viewed from the water, and when traveling westward on Route 50.

Other: The MHT noted freshwater springs in association with archeological site AN 143. These springs require further investigation, especially for the study of groundwater invertebrates.

Previous Listings: 1) Scenic Rivers in Maryland (1970) recommended Luce Creek for a "natural use area." 2) The Compendium of Natural Features (1975) recognized the Luce Creek brick kiln for its significance to colonial industry and included part of the wooded slopes on the north shore of Luce Creek in its 140-acre Severn Forest.

LAND CONSERVATION

Problems: No pending projects. The level of on-site field work is insufficient to evaluate ongoing problems. Proposed residential development includes "Luce Creek Estates" (#39-85). This development has been filed with the County Office of Planning and Zoning and is in the presubmittal stage of subdivision review. The development corporation proposing this owns ca. 145 acres in the Luce Creek and Martin's Pond subwatersheds.

SUBWATERSHED #9

Name: Martins Pond (Whitehurst Lake, 1978; Hammonds Lake, 1984)

Location: Bounded by the Saltworks Creek subwatershed on the north and the Luce Creek subwatershed on the south.

Natural Areas: This subwatershed includes one natural area: 1) Martins Pond Forest.

NATURAL AREA #1

Name: Martins Pond Forest

Geographical Limits: The entire subwatershed, except for minor, isolated residential and cut over areas is in a natural state. The subwatershed is bounded by Porters Hill Road on the south, Severn Grove Road on the west and north, and the Severn River on the east.

Total Acreage: 72.4 acres

Ecological Classification: Environmental complex; this includes five ecotypes: 1) Tidal tributary; 2) Tidal (draw) marsh; 3) Ravine bottom; 4) Steep slopes; 5) Uplands.

Ecotype #1: Tidal tributary (Martins Pond proper)

Acreage: 13.2 acres (not included as part of total acreage).

Ecotype #2: Tidal (draw) marsh

Acreage: 0.3 acre

Flora: At the head of Martins Pond is a draw marsh composed of cattail, arrow arum, and rosemallow. The marsh grasses grade into a narrow shrub swamp transitional zone further inland. The very small shrub zone is comprised of swamp rose and elderberry. The draw marsh is uncharacteristically small for the geographical setting.

Ecotype #3: Ravine bottom

Acreage: 5.2 acres

Flora: Immediately inland from Ecotype #2 is a broad ravine bottom and a smaller side ravine which spurs off to the south. Vegetation inhabiting the ravine bottom includes species which can only tolerate very rich, moist soils and cool, shaded climates. The canopy layer consists of fully mature tulip poplar, bitternut hickory, and northern red oak trees (some examples

with DBHs 24-30 in.). A very rich and diverse herbaceous layer includes wild hydrangea, rattlesnake fern, bloodroot, evergreen woodfern, richweed, wild yam, herbaceous smilax, black snakeroot, Christmas fern, and mayapple. The shrub layer is characterized by spicebush and pawpaw. Further inland, the main ravine broadens and more sunlight reaches the exposed ravine bottom. A change in plants to those tolerating warmer, less shady environments occurs; sycamore, white ash, red maple, and white oak trees in the canopy layer and shrub-like holly trees. In general, the herbaceous layer is less diverse and prosperous than that of the narrow, shady ravine bottom just downstream.

Ecotype #4: Steep slopes

Acreage: 30.6 acres

Flora: The very steep (15 - 100%) slopes rising from the ravine bottom and the shoreline of Martins Pond are composed of very well drained, dry, sandy soils. These harsh conditions support a fully mature forest composed, almost without exception, of chestnut oak trees (DBHs 18-24 in). The understory includes chestnut oaks and dogwood. The shrub layer is dominated by mountain laurel. Maple-leaved viburnum, blueberry, pink azalea, and large examples of witch hazel are other shrub species. Trailing arbutus and false Solomons seal are typical species in the sparse herbaceous layer.

Ecotype #5: Uplands

Acreage: 36.3 acres

Flora: The crest of the very steep slopes ranges from 60-80 ft. (msl). From the crest of the slopes outward to the subwatershed drainage divide, relatively flat (5 - 10% slopes) uplands with fine-grained, rich soils occur. A mature canopy layer is composed of tulip poplar, northern red oak, and white oak trees, many having DBHs of 18-24 in. Wild yam, solomons seal and mayapple are common in the herbaceous layer.

Natural Heritage Elements: None observed

Noteworthy Plant Species: 1) Wild hydrangea - "common in the midlands and mountains, rare in the Coastal Plain" (Brown and Brown, 1972).

Exceptional Trees

Big Trees: 1) The Compendium of Natural Features (1975) documented a "Great White Oak" tree in the subwatershed. However, it was not located during field work for this report. Further inquiry and investigation is needed. 2) Although no extremely large trees were observed, the forest is fully mature and a host of sizable (DBHs >24 in.) trees were noted. There is a distinct possibility that additional field work could reveal some exceptionally big trees.

Historic Features: 1) MHT archeological site AN 141 - The Martins Pond Site - is probably the most important and recognized site in the Middle Chesapeake Region. The site is included on the County Historic Sites Survey (AN 725) and officially designated on the National Register of Historic Places. 2) Two historic grave sites are located on a 67 ft. (msl) steeply wooded promontory

on the south side of the pond. One Sarah Hollins and her young son (probably died together in an accident) were buried here in 1878. The headstones and footstones are in relatively undisturbed condition. The historical significance of this site is unknown but warrants further research.

Archeological Features: Three MHT sites: 1) AN 139 - Severn Forest Site - a shell heap where quartz sherds and rhyolite chips were found. 2) AN 140 - Martins Pond Kiln - an 18th century brick kiln, an important reflection of colonial industry. 3) AN 141 - Martins Pond Site - described by the MHT as a 150 x 30 ft. shell heap with sherds, bones, chips, fireplaces, shell concentrations, and hammerstones; a deep, good, important site; produced the evidence for a Middle - Late Woodland Culture sequence on the west bank of the Chesapeake (see Historical Features above). This was perhaps the most important of Wright's (1973) six Severn River sites. The deeply stratified small midden provides the crucial evidence for the sequential ordering of phases. Five distinct and separate cultural stratums were distinquished and a host of artifacts specific to each were collected. Radiocarbon analysis of charcoal samples from zones 2 and 4 yielded dates of A.D. 80 (1870 B.P. ±125) and A.D. 1900 (50 B.P. ±100), respectively.

Wildlife: 1) In general, this large (> 70 acres) intact environmental complex offers diverse and intermixed ecotypes ideal for full survival and reproduction of wildlife. Many of the mammals and birds indigenous to the Severn watershed should be able to prosper in this subwatershed. The pond's shoreline is amazingly intact and undisturbed. The limited size of the subwatershed and minimal erosion have resulted in reduced sedimentation, and the pond remains relatively deep and of good water quality. Aquatic species habitat is exceptional. 2) The Upland Natural Area Study (1977) recognized this as a "habitat area of unusual significance to a bird community." Osprey, great blue heron, and other large birds have frequently been observed. Signs of white-tailed deer were observed during field work as well.

Scenic Qualities: The extremely high (60-80 ft. msl) and steep (15-100%) slopes overlooking a completely intact, heavily wooded tidal tributary offer one of the most asethetically gratifying views in the entire Severn River watershed. A 60 ft. (msl) promontory (the location of the gravesites) offers an unrestricted view of St. Conrad's Friary Bluff on the north shore of the Severn. The steep slopes descending straight to waters' edge support a thick population of mountain laurel and (when this species is in bloom) is a breathtaking sight from the water. The Upland Natural Areas Study (1977) aptly described the subwatershed as being an "unusually scenic area, an exceptional visual experience."

Geology: The Aquia Fm. underlies the steep slopes and uplands. Alluvium forms the ravine bottom and draw marsh. Owing to the rich vegetation assemblage on the uplands (Ecotype #5) and thick, fine-grained, fertile soils, the Aquia Fm. in this area may have a locally high concentration of glauconite. The rich alluvium in the ravine bottom (Ecotype #3) is probably a result of erosion and redeposition of these Aquia sediments. A 50 ft., nearly vertical bluff facing the Severn River is located on the northern promontory of the subwatershed. This bluff offers an undisturbed exposure of weathered Aquia sediments; an outstanding vantage point from which to gaze up or down the river.

Soils: Collington fine sandy loam soils are found throughout the upland and slope areas. Alluvium composed of reworked Collington soils occupies the ravine bottom. Tidal marsh soils are found in the draw marsh. The insitu soils of the

uplands and reworked soils of the ravine bottoms are extremly rich and productive. The soils on the uplands are relatively undisturbed, thick, and moist - pedologic conditions not commonly seen on uplands in the watershed.

Topography: The relatively flat (5 - 10% slopes) uplands range in elevation from 100 - 120 ft. (msl) near the drainage divide to 60 - 80 ft. (msl) at the crest of the very steep (15-100%) slopes. In some cases these slopes drop almost vertically to the water's edge of Martins Pond. The rugged topography and total relief (change in elevation over distance) is one of the subwatersheds' most noteworthy attributes. The relatively minor amount of foot traffic has helped to keep the slopes intact and undisturbed. Any development on these very steep slopes could have tremendous impacts to slope stability, sediment erosion and the water quality of the pond.

Contiguity: The Martins Pond natural area is contiguous to Severn Forest (Saltworks Creek subwatershed) to the north and a wooded promontory on Luce Creek to the south. The Compendium of Natural Features (1975) listed 140 acres as the combined natural area of these three sites. Although some of this acreage has been lost to development since that study, the areas adjacent to Martins Pond add to its value as a wildlife habitat.

Other: The tidewater cove is noteworthy for its lack of siltation and unusual depth relative to subwatershed size. Field review - 7/22/88.

Previous Listings: 1) Scenic Rivers in Maryland (1970); entire subwatershed recommended for a "natural use area." 2) DNR Tidal Wetlands Boundaries (1970): "smooth cordgrass, marshelder, and groundsel bush" = ca. 1.0 acre (most of the other tidal wetlands occupied the sand spit at the entrance of the pond which has since been lost to erosion). 3) Compendium of Natural Features (1975) - noted a "great white oak", the colonial brick kiln, and the Martins Pond archeological site. 4) Upland Natural Areas Study (1977) - "a beautiful natural area, and plant community of unusual age or maturity." 5) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.7 acre. 6) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Corporate; private (multiple), 4 lot (< 1 ac.) owners, 3 minor (1-5 ac.) landowners, and 4 major (>5 ac.) landowners.

Land Use: The northern slopes of Martins Pond and the ravine bottom (Ecotype #3) are mapped as Natural Features (Open Space). The remainder is Low - Residential (1/2 - 2 units/ac.).

Residential Communities: Severn Forest

Problems: No pending projects. The proposed Luce Creek Estates (#39-85) residential development is in the presubmittal stage of subdivision review with the County Office of Planning and Zoning. This development, as now proposed, covers the vast majority of the Martins Pond natural area. Ongoing problems include tree cutting in a side ravine bottom (Ecotype #3) and the growth of Japanese honeysuckle (ca. 2 acres). A small cutover area on the uplands on the south side of the subwatershed (ca. 2 acres).

Preservation Options: Immediate contact with the Luce Creek Estates development corporation is essential. No preservation options can be suggested without knowing the makeup and attitude of this corporation and their future plans for Luce Creek Estates.

Future Use: Possibilities include wildlife monitoring and a forest wildlife reservation.

SUBWATERSHED #10

Name: Saltworks Creek (Salt Pan Creek, 1860: Dildick Creek, 1846; Underwood's Creek, 1667)

Location: Bounded by the Clements Creek subwatershed on the north and the Martins Pond subwatershed on the south.

Natural Areas: Little detailed field work was performed in the Saltworks Creek subwatershed and few specific comments on natural areas can be given. However, the upland woods bordering Martins Pond to the south may be intact and requires additional field work to determine its extent and significance - especially as an addition to, and transition for, the Martins Pond natural area. In addition, the cove marsh at the head of Saltworks Creek is one of the larger and more ecologically valuable marshes in the Severn River watershed. The marsh displays distinct plant zonation and contains a relatively abundant station of cardinal flower (a rather noteworthly marsh species) in addition to saltmarsh fleabane and royal fern. This marsh, as well as the entire subwatershed warrants further field investigation.

ISOLATED FEATURES

Archeological Features: Three MHT sites: 1) AN 138 - Saltworks I Site - produced one scraper and chips. 2) AN 137 - Saltworks II Site - produced sherds and chips and is associated with a spring. 3) AN 278 - Chord - a Woodland Culture shell heap producing one split pebble.

Wetlands: The DNR Tidal Wetlands Boundaries (1970) recognizes two occurrences of tidal marsh. 1) A small draw marsh on the south shore near the upper portions of Saltworks Creek which is noted for a white form of kosteletskya and its magnolia border; "smooth cordgrass" = 0.2 acre. 2) A rather large cove marsh at the head of the creek; "cattail, smooth cordgrass, mudflat" = 3.0 acres. The U.S. Fish and Wildlife Service (1979) , National Wetlands Inventory also recognized this rather large cove marsh; "estuarine, intertidal, flat, regular" = 2.8 acres; "estuarine, intertidal, emergent, narrow-leaved deciduous, irregular" = 3.8 acres. In addition they recognize the floodplain forest of Cabin Neck Branch feeding Saltworks Creek; "palustrine, forested, broad-leaved deciduous, temporary" = 34.4 acres; "palustrine, emergent, narrow-leaved persistent" = 1.0 acre; "palustrine, forested/scrub shrub, broad-leaved deciduous, seasonal tidal" = 5.5 acres. Cabin Neck Branch has quite an extensive (40.9 acres) non-tidal wetland that requires additional field work.

Problems: The County Office of Public Works is planning to dredge Saltworks Creek within the next three years (1989). The County's plans should be reviewed in reference to the cove marsh at the head of Saltworks Creek. Plans should ensure that this wetland will not be impacted directly or indirectly by the proposed dredging.

Previous Listings: 1) The Upland Natural Areas Study (1977) and the Compendium of Natural Features (1975) recognized ca. 15 acres of upland woods adjoining Martins Pond (i.e., Severn Forest). 2) Scenic Rivers in Maryland (1970) recommended the entire subwatershed (save Epping Forest) become a "natural use area."

Geology: A 55 ft. (msl), nearly vertical bluff that faces the Severn River on the south side of Saltworks Creek offers a clear exposure of weathered sediments of the Aquia Fm.

Other: The MHT archeological site AN 137 is associated with a spring. Additional investigation should try to locate this spring and determine its historical and biological (invertebrate study) significance.

SUBWATERSHED #11

Name: Clements Creek (Clements' Creek, 1846; Marshs' Creek, 1769; Hockley Creek, 1769; Howard's Creek, 1667)

Location: Bounded by the Brewer Creek subwatershed on the north and the Saltworks Creek subwatershed on the south.

Natural Areas: Little detailed field work was performed in the Clements Creek subwatershed and few comments on specific natural areas can be given.

ISOLATED FEATURES:

Archeological Features: Five MHT sites 1) AN 134 - Worthington Farm - is a Late Woodland Phase site producing finely broken shell, dark earth, sherds. 2) AN 135 - Clements Creek Site - a shell midden offering great preservation of material. 3) AN 136 - Epping Forest Site - produced fire cracked rocks, quartz chips, scraper, points, and one potsherd. 4) AN 565 - Bachand Site - a Middle-Late Woodland Culture Shell midden with Accokeek cord marked vessels, Rappahannock Fabric impressed vessels. 5) AN 564 - Baker Caly Site - two Woodland Phase shell middens, both 10-12 in. thick; several prehistoric points, flakes, an axe head, and bone fragments were found.

Wetlands: Four separate occurrences of tidal wetlands are recognized by the DNR Tidal Wetlands Boundaries (1970): 1) A cove marsh at the head of Clements Creek; "smooth cordgrass" = 0.5 acre. 2-3) Two draw marshes at the heads of small coves on the south shore of Clements Creek; "cattail, smooth cordgrass" = 0.3 and 0.4 acre respectively. 4) "Marshelder/groundselbush" off a small point at the Severn River confluence = 0.4 acre. The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also recognizes the cove marsh at the head of Clements Creek; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.3 acre. They also identify the floodplain forest of Hockley Branch feeding Clements Creek; "palustrine, forested, broad-leaved deciduous, temporary" = 24.0 acres. The two branches forming Hockley Branch are both over a mile in length and require further field investigation.

Other: The Community of Saefern owns three recreation areas (ravines) in the subwatershed. The Saefern Community Association should be contacted concerning future uses and environmentally conscious management plans. A freshwater pond is located in one of these recreation areas.

SUBWATERSHED #12

Name: Brewer Creek (Brewer's Creek, 1846; Wyatts' Creek, 1667)

Location: Bounded by the Brewer Pond subwatershed on the north and the Clements Creek subwatershed on the south. The community of Sherwood Forest is located on the north shore of the creek.

Natural Areas: This subwatershed includes one natural area: 1) Sherwood Forest Woods.

NATURAL AREA #1

Name: Sherwood Forest Woods

Geographical Limits: Bounded by developed lots in The Downs subdivision to the south, Sherwood Forest Road to the west and north, and the community of Sherwood Forest to the east.

Total Acreage: 164.7 acres

Ecological Classification: Environmental complex; this includes six ecotypes: 1) Uplands and Steep slopes; 2) Ravine bottom; 3) Meadow; 4) Shrub swamp; 5) Floodplain forest; 6) Tidal (cove) marsh.

Ecotype #1: Uplands and steep slopes

Acreage: 140.7 acres

Flora: Mature tulip poplar and beech trees are dominant along the upper slopes and commonly occur on the ridge crests in association with chestnut oaks (DBHs 12-18 in.) and Virginia pine trees. The occurance of Virginia pine in selected areas is a good indicator of hardwood clear-cutting on ridge crests (former pastureland) in the past. Northern red oak and white oak also occur along the upper slopes but are infrequent, possibly owing to selective cutting in the past. Sycamore and mockernut hickory are minor canopy components as well. The understory is characterized by dogwood and ironwood trees. The shrub layer is sparse and very open. Almost no greenbrier or non-native species occur, indicating very minimal disturbance in the recent past. Rattlesnake fern, New York fern, winterberry, and running cedar (consistently associated with Virginia pine) are typical in the herbaceous layer. These ferns are usually found in ravine bottoms because they require cool, shady, moist conditions. Their occurrence on upland slopes and ridge crests along with tulip poplar and beech trees attests to the rich, moist pedologic conditions and thoroughly shaded, cool climatic conditions of this natural area.

Ecotype #2: Ravine bottom

Acreage: 13.4 acres

Flora: Tulip poplar is the dominant canopy tree; sizes are not unusually large (average DBH 12-18 in.), but a few obtain sizes in excess of 24 in. DBH. Beech is a common tree and ranges in size from 12-18 in. DBH. Northern red oak, white oak, and mockernut hickory are infrequent and may have undergone selective cutting in the past. Red maple is also common and some examples are quite large (24 in. DBH). Ironwood, sweetgum and dogwood are present in the understory, and spicebush and pawpaw are the most common shrubs in an otherwise sparse shrub layer. The herbaceous layer is one of the richest and most diverse in all of the Severn watershed. Rare and noteworthy herbaceous plants that require a strict regimen of shade, water, cool temperatures, and little disturbance flourish on the ravine bottoms of this natural area. Shining club moss occurs extensively on flat open areas of ravine bottoms (the largest and best developed station of this species known to exist in the watershed). Lady fern, netted chain fern, pseudo china upright smilax, Christmas fern, New York fern, whorled wild yam, and partridge berry also occur on ravine bottoms. Even more sensitive woody plants are found in the very well shaded, wettest, and richest soils of small, narrow ravines; species include silvery spleenwort, bloodroot, maidenhair fern, black snakeroot, wild hydrangea, rattlesnake orchid, and glade fern.

Ecotype #3: Meadow

Acreage: 2.8 acres

Flora: The dam of the Sherwood Forest pond was breached several years ago, draining the water and leaving a lake bed that was subsquently colonized by grasses. More field work is needed to identify these and other wetland vegetation on the lake bed. Apparently these grasses offer a suitable habitat for birds, as many different species were observed during field work. The dry lake bed is also serving as a stormwater/sedimentation trap. A small splay of coarser sediments is accumulating at the head of the dry pond. Apparently, as confined flood waters of Howards' Branch flow out onto the unconfined lake bed, water velocity and carrying capacity is reduced, and the coarser sediments are deposited.

Ecotype #4: Shrub swamp

Acreage: 1.4 acres

Flora: A grove of shrub vegetation occurs at the head of the Sherwood Forest pond; red maple, river birch, alders, elderberry, skunk cabbage, and poison sumac.

Ecotype #5: Floodplain forest

Acreage: 4.9 acres

Flora: The floodplain of Howards' Branch downstream of the Sherwood Forest pond and upstream of Brewer Creek is heavily wooded. A cursory examination revealed a thick forest of red maple, sweet gum and ash. Skunk cabbage is also present. Further field work is needed.

Ecotype #6: Tidal (cove) marsh

Acreage: 1.5 acres

Flora: The transition between the floodplain forest (Ecotype #5) and Brewer Creek is a cove marsh composed of cattail, arrow arum, smooth cordgrass and common reed.

Natural Heritage Elements: 1) Glade Fern - B3, State rare, in danger of extinction in Maryland - occurs as a very large, well developed station. This may, in fact, be one of the three largest stations of glade fern in the State of Maryland. 2) Smilax pseudochina - B3, State rare, in danger of extinction in Maryland (tentative identification).

Noteworthy Plant Species: 1) Silvery spleenwort - "uncommon on the Coastal Plain" (Reed, 1953); 2) Rattlesnake orchid - not commonly observed in the Severn River watershed; 3) Maidenhair fern - "only occasionally observed on the Coastal Plain" (Reed, 1953); 4) Wild hydrangea - "common in the midlands and mountains, rare in the Coastal Plain" (Brown and Brown, 1972).

Exceptional Trees

Big Trees: 1) Chestnut oak - CBH 11 ft. 6 in.; 2) Beech - CBH 9 ft. 1 in. with engravings interpreted to be from the early 1930s.

Historic Features: 1) The community of Sherwood Forest (circa 1914) is listed on the County Historic Sites Survey as AA 941, and the Sherwood Forest Clubhouse as AA 941A. When originally settled, the community had no access to rail transportation and had to be self sufficient; they developed their own post office, store, waterworks, golf course, and tennis courts. Strict covenants govern the small inconspicuous residences and help maintain a unique blend of development and natural wooded character. 2) The southern portion of the subwatershed was the site of Reisingers' Steam Saw (circa 1860). Much of the material for this saw probably originated from the Sherwood Forest Woods natural area.

Archeological Features: None registered

Wildlife: No particularly outstanding wildlife observations were made during field work. From indirect observation (signs), a sizable deer population feeds in these woods. In general, given the acreage and undisturbed character of these woods, it should provide outstanding habitat for a diverse suite of wildlife species.

Scenic Qualities: The very sparse shrub layer allows unrestricted, long views under a very dense canopy. This, combined with very rugged topography and an amazingly rich, diverse herbaceous layer make for a very scenic natural area. Individual rays of sunlight that manage to penetrate the thick canopy accentuate this scenery.

Geology: The Aquia Fm. underlies the uplands; alluvium forms the dry lake bed, floodplain, and tidal marsh of Howard's Branch. The rich, fine grained soils of this natural area may indicate a local concentration of glauconite in the Aquia sediments. On the very highest (150-170 ft. msl) ridge crests are outcrops of the Calvert Fm. This geologic formation produces extremely rich soils and is the least common formation in the Severn River watershed. Howard's Branch and smaller side ravines provide evidence of "stream piracy", lateral channel migration, adjustment to changes in base level, and offer perhaps the finest fluvial geomorphic landforms in the entire watershed. A 10 ft. vertical and undercut drop in a ravine bottom produces a waterfall in a small tributary of Howard's Branch. Waterfalls are uncommon in the Severn watershed and this one may be the largest.

Soils: Monmouth fine sandy loam soils cover the ridge crests and slopes; Butlertown silt loams and Monmouth clay loams cover the highest ridge tops (of the Calvert Fm.); mixed alluvial soils cover the lake bed and floodplain: tidal marsh soils cover the cove marsh. Pedologic conditions in the Sherwood Forest Woods are at the highest end of the richness/fertility spectrum of all soils in the watershed, a very uncommon occurrence.

Topography: The highest elevations in the subwatershed (150-175 ft. msl) are along Sherwood Forest Road - the drainage divide between Brewer Pond and Brewer Creek. Ridge crests between small ravines are ca. 140 ft. (msl) in elevation. Steep (15-40%) slopes from the ridge crests to the ravine bottoms (ca. 60 ft. msl) are typical. In general, the topography is rugged and changes in elevation over distance are extreme.

Contiguity: The Sherwood Forest Woods is a southerly extension of a much larger natural area complex extending northward through the Brewer Pond, Hopkins Creek, Maynadier Creek, and Plum Creek/Gumbottom Branch subwatersheds. Besides Severn Run, this complex is the largest contiguous natural area in the Severn River watershed. Only Sherwood Forest Road (a two-lane highway used only by residents of Sherwood Forest) separates the Brewer Creek natural area. The impact of the road on wildlife species migration is probably very minimal.

Other: The cool, moist, shady ravine bottoms and very rich soils of the Sherwood Forest Woods are very similar to ravines in Chase Creek and Ray's Pond subwatersheds. These ravines are unique to the Severn in reference to a combination of temperature, soil moisture, soil productivity, and terrain. Ravines such as these are rare in occurrence in the Coastal Plain. The microclimates of these ravines provide refugia for plant species not commonly found on the warm Coastal Plain and insure the survival of other plants considered rare in the State of Maryland. Field review - 7/17/86.

Previous Listings: 1) The cove marsh at the head of Brewer Creek was recognized by the DNR Tidal Wetlands Boundaries (1970); "cattail, smooth cordgrass" = 1.0 acre. 2) The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also mapped this cove marsh; "palustrine, emergent, narrow-leaved persistent, seasonal saturated" = 2.7 acres. They also recognized the non-tidal wetlands of Howard's Branch; "palustrine, forested, broad-leaved deciduous, temporary" = 11.6 acres.

LAND CONSERVATION

Ownership Type: Community; private (multiple), 25 lot (< 1 ac.) owners, 1 minor (1-5 ac.) landowner, 2 major (> 5 ac.) landowners.

Land Use: The floodplain of Howard's Branch is categorized as Natural Features (Open Space); the remainder of the natural area is Residential - Rural (1/2 or less units/ac.).

Residential Communities: Sherwood Forest, The Downs

Problems: 1) Howard's Branch was dammed many years ago by the community of Sherwood Forest for a source of potable water. In the early 1980s, the dam was breached at the spillway and the pond drained. The property of the now dry lake bed is owned by The Downs community. In 1984, the president of The Downs community association formally requested that the County Office of Public Works repair the dam and re-create the pond. In the 1987 fiscal budget, $87,000 was appropriated for Public Works to design for a full replacement of the dam. A previous study by Public Works to simply repair the dam breach was rejected by the SCS for lack of detailed geotechnical data on the existing earthen embankment. Monies have been projected in the FY 1988 capital budget for construction, however, this has yet to be approved by the County Executive and Council. In order for the County to be able to fund this project, which is on private property, it will have to become a public use facility. Apparently the communities of The Downs and Sherwood Forest have tentatively approved ingress-egress of the public on their property. However, before the County will issue any funds for the initial design, a feasibility/legality study concerning public recreation on private property and the use of private roads by the public will be conducted. As of this writing, the County was conducting this study. Inquiries should be made to find out if the entire constituencies of both communities are aware of the plans to rebuild the pond for public use. In the past, requests by a sole representative of a community association for governmental agencies to perform expensive studies have been granted. However, after such studies were completed, the projects could not be implemented because they failed to earn the majority support of the community. Any study requested of a governmental agency by a community should have majority support of that community before general taxpayers funds are used to conduct the study. Otherwise, studies for projects may be conducted (at taxpayers expense) that have no real chance of ever gaining support of a community and ever coming to fruition. 2) Ongoing problems in the natural area include continuing development of lots in the Downs subdivision that abut Howard's Branch. Other ongoing problems include stormwater runoff into Howard's Branch from The Downs subdivision. However, much of the problem is being abated by several small check dams. These dams appear to be working and are minimally impactive to the ecological and scenic integrity of the natural area. As in-channel sediment control devices must be built in natural areas, the compatible types used in Howard's Branch should be employed. 3) Although no plans have been formally proposed to develop Clumber, 11 lots owned by the Sherwood Forest Co., the lots are platted on the tax map and the potential for development exists. Development of these lots would severely impact one of the most fragile ravines in the entire Severn River watershed. The potential for destruction of State rare and noteworthy plant species is high. Construction of one residence in this fragile area was taking place at the time of field work for this study. Even though the structure was being constructed in a somewhat environmentally

compatible way, it was still opening up the canopy and exposing the fragile herbaceous layer to increasing amounts of sunlight. Continued construction will inevitably lead to the introduction of non-native species and destruction of the fragile herbaceous layer. 4) At the request of the president of the Sherwood Forest community association, the Maryland Forest Service conducted a forest resource management plan in 1982. The plan divided this natural area into five stands of trees and proposed a schedule for selective cutting between 1984 and 1999. The study was conducted with the understanding that the Sherwood Forest community wanted to manage their woods for fiber production, wildlife habitat and to enter into a Forest Conservation and Management Agreement. Apparently, this plan has yet to gain majority support of the community and to date no plans have been proposed to cut the Sherwood Forest Woods.

Preservation Options: Mutual covenants, conservation easements, and conservation cooperatives are all potential tools in the case of the Sherwood Forest community and the other major private landowners. The developed lots of The Downs subdivision that back up to Howard's Branch are rather deep. The undeveloped portions of the rear of these lots are extremely valuable as protective transition zones of the Sherwood Forest Woods. At present, Howard's Branch is buffered well from these houses. However, any further encroachment towards the branch could significantly disrupt the ecological and scenic integrity of the natural area. Contact with each lot owner is imperative. Conservation cooperatives may be a viable option in this case.

Future Use: Possibilities include identified species area, sanctuary (as part of Brewer Pond/Sherwood Forest Woods), and a forest wildlife reservation.

SUBWATERSHED #13

Name: Brewer Pond (Richardson's Creek, 1769; Rockhold's Creek, 1667)

Location: Bounded by the Hopkins Creek subwatershed on the north and the Brewer Creek subwatershed on the south. The community of Sherwood Forest is located along the southeastern portion of the subwatershed. The northern portion fronts Round Bay.

Natural Areas: This subwatershed includes one natural area: 1) Brewer Pond Woods.

NATURAL AREA #1

Name: Brewer Pond Woods

Geographical Limits: Bounded by Round Bay on the north, the Severn River and the community of Sherwood Forest on the east, Sherwood Forest Road to the south, and a farm road (the drainage divide between Brewer Pond and Hopkins Creek subwatersheds) to the west.

Total Acreage: 394.1 acres

Ecological Classification: Environmental complex; this includes eight ecotypes: 1) Uplands and steep slopes; 2) Ravine bottom; 3) Shrub swamp; 4) Floodplain forest; 5) Wooded swamp; 6) Tidal (cove) marsh; 7) Tidal tributary; 8) Tidal wetlands.

Ecotype #1: Uplands and steep slopes

Acreage: 334.2 acres

Flora: Chestnut oak (12-18 in. DBH) is the dominant canopy tree on the ridge crests and upper portions of slopes. Virginia pine (12 in. DBH) is a common associate on ridge crests that were cleared for pasture earlier in this century. Beech (6-10 in. DBH) is also a common tree on ridge crests and increases in size (12-24 in. DBH) and frequency on the lower portions of slopes. Sweet gum (very common) and tulip poplar (infrequent) occur on the lower portions of the slopes. Several of the sweet gum trees were the largest observed in the Severn River watershed. Northern red oak and white oak are infrequent, possibly owing to selective cutting in the past. Where white oaks do occur, they are rather large (24 in. DBH) and nearer the lower portions of slopes. The understory layer is very thick and composed of American holly (abundant - especially on south facing and exposed warmer slopes), beech, sweet gum, and chestnut oak (on ridge tops). The shrub layer is well developed on the upper slopes and ridge crests where it is dominated by the ubiquitous mountain laurel. On the lower slopes, the shrub layer is almost non-existent, especially underneath the beech canopy

where it is completely open. The herbaceous layer, although well developed, is not as rich and diverse as it is in the neighboring Brewer Creek subwatershed. Spotted wintergreen is common on the ridge tops and upper slopes that are dry and well-drained. Wild yam, lady slipper orchid and maple-leaved viburnum require the cooler, wetter conditions which are offered on the mid and lower slopes.

Ecotype #2: Ravine bottom

Acreage: 22.0 acres

Flora: Sweet gum is a very common canopy tree in the moist, rich soils of the ravine bottoms which grade imperceptively into the floodplain of Arthur's Run further downstream. Unquestionably these were the largest sweet gum trees observed during the course of field work (one example measured 8 ft. 7 in. CBH and was ca. 115 ft. tall and many others were ca. 18-24 in. DBH and ca. 100 ft. tall). Beech occupies the highest areas of the ravine bottoms and obtains sizes approaching 24 in. DBH (a few apparently older examples approached 30 in. DBH). The much smaller beech on the ridge tops and upper slopes may indicate selective cutting practices which left beech trees in the less accessible ravine bottoms. Tulip poplar occurs, but is not as frequent as might be expected given the rich, moist soils of this natural area. The scattered occurrences of tulip poplar (12-18 in. DBH) may indicate selective cutting in the past. Red maple is abundant on ravine bottoms and increases in frequency in a downstream direction as soils become wetter. Bitternut hickory occurs but is infrequent. Ironwood, sweet gum and dogwood form a relatively thick understory layer. Spice bush and pawpaw are common in the open shrub layer. The herbaceous layer is well developed. Dewberry, New York fern, evergreen wood fern, lady fern, broad beech fern, and netted chain fern are common. The narrow ravine bottoms further upstream are covered with an extremely thick oak leaf ground litter.

Ecotype #3: Shrub swamp

Acreage: 1.4 acres

Flora: At the confluence of Arthur's Run and another major ravine, a shrub swamp occurs. Large red maples are dead or dying, and smaller shrub trees such as river birch, poison sumac, and red maple are developing. Several areas of standing water and sandy berms have formed (probably in the recent past). The exact natural or man-induced causes for the development of this shrub swamp are unknown, but it has added to the habitat diversity of the natural area. Spice bush, skunk cabbage, arrowwood, fox grape, and cinnamon fern are common plants in the shrub swamp.

Ecotype #4: Floodplain forest

Acreage: 6.8 acres

Flora: Downstream from the shrub swamp, Arthur's Run widens and transforms from a wide ravine bottom to a large, broad floodplain in the true sense. Red maple is the dominant tree while sweet gum, although still common, decreases in prominence. River birch, holly, and sycamore trees

also occur, but not as frequently as red maple. At the interface between the very wet center of the floodplain and the marginal colluvial slopes which are higher and drier, sour gum trees prevail. Evidently, sour gum trees require large amounts of water, but their root systems can not tolerate constant soil saturation in the floodplains. Many sour gum trees appear quite old (>100 years) but were still relatively stunted (DBH 12-16 in.). Beech trees occur just to the slope side of the sour gums which delineate the floodplain/slope interface. Arrowwood, pawpaw, skunk cabbage, cinnamon fern and tearthumb have adapted well to the wet floodplain soils of Arthur's Run.

Ecotype #5: Wooded swamp

Acreage: 4.5 acres

Flora: Downstream from the floodplain forest (Ecotype #4) soil conditions become even more saturated and a full wooded swamp occurs. River birch is the dominant tree species and obtains sizes up to 24 in. DBH. These were the largest river birch trees observed during field work -one example measured 7 ft. 8 in. CBH, ca. 50 ft. in height, and 40 ft. in spread. Sycamore and American holly are also present, but infrequent and smaller (12 in. DBH). Skunk cabbage and cinnamon fern are prolific in the herbaceous layer.

Ecotype #6: Tidal (cove) marsh

Acreage: 2.0 acres

Flora: At the head of Brewer Pond (the mouth of Arthur's Run) is an exceptionally handsome tidal marsh composed of rose mallow, three square, cattails, smooth cordgrass and smartweed. The interspersion of zonated patches of these species is high, creating an outstanding habitat for waterfowl and wildlife in general. The transitional shrub swamp that typically occurs on the upstream side of cove marshes is absent, although scattered shrubs of swamp azalea are present.

Ecotype #7: Tidal tributary

Acreage: 22.0

Flora: Brewer Pond is one of the few remaining Severn tidal tributaries in an almost undisturbed condition. The shallow depths and almost impassable opening into the pond have greatly restricted boat traffic. This has helped preserve an excellent example of an extensive, intact tidal fringe marsh along the pond's perimeter. In general, the water quality and condition of the pond are very uncommon among Severn River tidal tributaries.

Ecotype #8: Tidal wetlands

Acreage: 1.2 acres

Flora: The mouth of Brewer Pond is almost completely sealed by a sand spit. This spit supports a variety of wetland vegetation including smooth cordgrass, cattail, arrow arum, and rose mallow. This spit is extremely important to the seclusion and ecological protection of Brewer's Pond.

Natural Heritage Elements: 1) Fruiting American chestnut - C, State declining.

Noteworthy Plant Species: None observed

Exceptional Trees:

Big Trees: 1) White oak - CBH 11 ft. 9 in., ca. 110 ft. in height, 60 ft. spread.

Old Trees: Two examples of beech trees on the lowest portions of the slope bordering Arthur's Run may have been as old as 200 years (as indicated by bark pattern and morphology).

Historic Trees: A shell of a dead American chestnut tree had a CBH of 10 ft. 8 in. This and many other stumps give evidence to the tremendous sizes and frequency of this once dominant tree species.

Historic Features: 1) The Sherwood Forest community (circa 1914) is listed on the County Historic Sites Survey as AA 941.

Archeological Features: 1) MHT site AN 133 - Brewer Point - produced a typical Archaic point.

Wildlife: The size, diversity of habitats, isolation, and undisturbed quality of this natural area make it perhaps the most conducive to wildlife survival and reproduction of any in the entire Severn River watershed. This natural area is one of the few remaining that can support the larger mammals indigenous to the watershed. Evidence (tracks, ruttings, droppings) of white-tailed deer indicate that there is quite a large population surviving in the Brewer Pond/Brewer Creek/Hopkins Creek subwatershed complex. The small shrub swamp (Ecotype #3) supports healthy populations of woodpeckers (in dying tree trunks) and green frogs. Osprey, blue heron, and overwintering swans are frequently observed in and around Brewer Pond. The DNR (1978) identified a permanent osprey nesting site here. On several occasions in the recent past, pairs of bald eagles have been identified (unofficially) while feeding over Brewer Pond. In general, this natural area supports a wide variety of bird species as well as various mammals.

Scenic Qualities: The 150-160 ft. (msl) uplands in the northern portion of the natural area afford an exceptional vantage point from which the entire Round Bay section of the Severn River can be viewed unrestricted. Conversely, from the waters of Round Bay, the heavily wooded steep slopes dropping nearly straight down to the water's edge form a majestic view. Brewer Pond, its pristine wetlands, and the heavily wooded steep slopes bordering it can be described in one word - tranquil. In terms of overall scenic integrity, Brewer Pond subwatershed is the most isolated and undisturbed in the entire Severn River watershed; there is practically no evidence of outside disturbance (no

trash, no human footpaths, no foreign noise, no non-native vegetation). There is only solitude. One can still view the natural area in much the same way that the prehistoric Indians viewed it.

Geology: The Aquia Fm. underlies the majority of the slopes and uplands. However, the Monmouth Fm. is exposed at lower elevations of the slopes bordering Round Bay. Alluvium forms the floodplain, shrub swamp and tidal marshes. The lower portion of Arthur's Run flows through one of the widest and most extensive floodplains in the watershed. A small remnant of a fluvial terrace borders Arthur's Run in its middle reach. This terrace is ca. 10-15 ft. above floodplain elevation and may be correlative with the Talbot Fm. At the highest elevations (160-175 ft. msl) along the ridge crest near Sherwood Forest Road, remnants of the Calvert Fm. are exposed. Outcrops of the Calvert Fm. produce extremely fertile edaphic conditions and are uncommon in the watershed.

Soils: Monmouth fine sandy loams occur on most of the uplands and almost entirely on the slopes. At the highest elevations (150-175 ft.), the more uncommon Marr fine sandy loam, Butlertown silt loam, and Monmouth clay loam soils occur, perhaps as a reflection of the parent material from which they were formed, the Calvert Fm. The diatomaceous silt of the Calvert Fm. produces soils with rich edaphic properties. Plants which normally are confined to moist, cool, rich ravine bottoms grow here - northern red oak, bitternut hickory, ironwood, pawpaw, hay-scented fern, rattlesnake fern and New York fern. Rich plant species such as these occurring on the apex of a 160 ft. ridge crest is a very uncommon occurrence in the watershed.

Topography: The subwatershed divide along Sherwood Forest Road is relatively flat (2-5% slopes) and ranges in elevation from ca. 170 ft., to 150 ft. (msl) at the crests of the steep slopes. The slopes drop abruptly (15-100%) to the ravine bottoms, Arthur's Run floodplain, Brewer Pond and Round Bay, and range in elevation from 0 to 65 ft. (msl). The entire subwatershed should be considered extremely rugged terrain.

Contiguity: The 390+ acres of the Brewer Pond natural area are fully contiguous with the Hopkins Creek natural area to the west and the Brewer Creek natural area to the south. The contiguity of these large natural areas is mandatory for the survival of many wildlife species which require large undisturbed expanses.

Other: Small individual pastures occur along the western perimeter (drainage divide) of the subwatershed. The interface between forest and open areas contributes to the value of this area as a wildlife habitat and enhances its scenic quality. Numerous small enclosed openings such as those along the Farm road result in a substantial amount of forest edges. Field review - 7/17/86.

Previous Listings: 1) Survey of Ecologically Important Areas of the Chesapeake Bay Region (1974) - identified 408 hectares of mature woodland in this natural area. 2) The Compendium of Natural Features (1975). 3) The Upland Natural Areas Study (1977) - recognized significant vistas and unusual land/water interfaces. 4) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 3 major (> 5 ac.) landowners, 1 minor (1-5 ac.) landowner; community; corporate.

Land Use: The majority of the natural area is classified as Natural Features (Open Space). The southeastern portion, near Sherwood Forest, is classed as Residential Rural (1/2 or less units/ac.).

Residential Communities: Sherwood Forest

Problems: No pending projects. Two minor (< 4 lots) residential developments are proposed: 1) Minor subdivision 103-82: 2) Minor subdivision 72-81. The Brewer Pond Joint Venture owns 50 acres; details are unknown, but the potential for development appears likely. Ongoing problems include intensive water skiing at high speeds on Brewers Pond. Intensive skiing on such a small water body with such shallow depths has the potential to cause severe impacts to riparian and benthic ecosystems. In addition, it is a potential threat to the safety and lives of others who use the pond for passive recreational purposes. The DNR should investigate the situation and consider posting highly restrictive speed limits at the entrance to the pond.

Preservation Options: Brewer Pond is a prime example of a very limited number of major landowners holding a very large natural area. Preservation options should be relatively uncomplicated. Mutual covenants, conservation easements, and conservation cooperatives all appear to be viable, but personal consultation with the six parties involved is essential. The potential gain in terms of protecting a large and valuable natural area, with possibly a limited amount of effort, is great. Most of the natural area is designated as Natural Features (Open Space) by the County. Howevever, the amount of protection this designation offers against development, especially over the long-term, is unknown.

Future Use: Possibilities include a sanctuary, forest wildlife reservation, and scientific monitoring.

SUBWATERSHED #14

Name: Hopkins Creek (Sunken Island Creek, 1935; Camden Creek, 1860: Camden's Creek, 1846; Sunken Ground Creek, 1769).

Location: Bounded by the Maynadier Creek subwatershed on the north and the Brewer Pond subwatershed on the south.

Natural Areas: This subwatershed includes one natural area: 1) Hopkins Creek Woods.

NATURAL AREA #1

Name: Hopkins Creek Woods

Geographical Limits: At present, the entire subwatershed is relatively undeveloped, with only ten residences located along the periphery of the subwatershed. It is bounded by a farm road (the drainage divide between Brewer Pond and Hopkins Creek subwatersheds) to the east, Round Bay and the Beehive Beach community to the north, Sherwood Forest Road and Generals Highway to the south, and the drainage divide between Maynadier and Hopkins subwatersheds (Belvoir ridge crest) to the west. River Road bisects this natural area.

Total Acreage: 304.1 acres

Ecological Classification: Environmental complex; this includes eight ecotypes: 1) Uplands and steep slopes; 2) Tidal (draw) marsh; 3) Floodplain forest; 4) Tidal (draw) marsh; 5) Floodplain forest; 6) Shrub swamp/"bog"; 7) Tidal (cove) marsh; 8) Uplands and steep slopes.

Ecotype #1: Uplands and steep slopes

Acreage: 235.8 acres

Flora: Between the farm road to the east and River Road to the west are heavily wooded uplands and steep slopes (listed as part of the Brewer Pond natural area in the DNR Upland Natural Areas Study, 1977). The mature hardwood forest (avg. DBH of most trees = 18 in.) consists of chestnut oak on the drier ridge crests and upper slopes, and white oak, black oak, tulip poplar, and beech on the mid and lower portions of the slopes. Tulip poplar is the dominant tree in the cooler, moist ravines. Flowering dogwood and chestnut oak are the main understory components in the drier, steep areas, with ironwood and sweet gum in the more fertile ravines. Mountain laurel is the most common shrub in the chestnut oak areas, while maple-leaved viburnum, pawpaw, and spicebush are common shrubs in moister areas. Spotted wintergreen, trailing arbutus, and blueberry are common

plants in the drier, steeply sloped areas: Christmas fern, mayapple, rattlesnake fern, and netted chain fern occur in the cooler, moist ravine areas.

Ecotype #2: Tidal (draw) marsh

Acreage: 0.5 acre

Flora: A small cove on the eastern side of Hopkins Creek has a draw marsh of smooth cordgrass, cattail, and rose mallow at its head. This marsh is recognized on the DNR Tidal Wetlands Boundaries (1970).

Ecotype #3: Floodplain forest

Acreage: 3.4 acres

Flora: The upstream extension of the draw marsh (Ecotype #2) is a wooded floodplain forest that penetrates into the western portion of Hopkins Creek Woods (Ecotype #1). More field is needed in this ecotype. The U.S. Fish & Wildlife Service, National Wetlands Inventory (1979) maps this floodplain as "palustrine, forested, broad-leaved-deciduous, temporary tidal."

Ecotype #4: Tidal (draw) marsh

Acreage: 2.7 acres

Flora: Along the Round Bay shoreline of Hopkins Creek Woods (Ecotype #1) are two small coves with draw marshes (1.2 and 1.5 ac.) at their landward margins. Vegetation includes cattail, smooth cordgrass, rosemallow, arrow arum, groundselbush, marshelder and swamp azalea. Both the U.S. Fish and Wildlife Service (1979) and the DNR (1970) identified these draw marshes as tidal wetlands.

Ecotype #5: Floodplain forest

Acreage: 37.5 acres

Flora: From just north of Generals Highway to the head of Hopkins Creek, there is a large, broad floodplain through which David's Run flows. In actuality, two streams flow through this floodplain. The larger branch is David's Run which is entrenched 2-3 ft. into the floodplain at its eastern edge near River Road. David's Run flows directly into Hopkins Creek via a pipe under River Road and is fed by ravines on the east side of the road (Ecotype #1). The second stream is much smaller and intermittent in nature. It flows along the western edge of the floodplain and is fed by the ravines in Belvoir Woods (Ecotype #8). The flow from this stream feeds a small bog-like shrub swamp (Ecotype #6) which was probably formed as a result of partial damming by the construction of River Road in the previous century. This broad floodplain has very rich soils and supports a mature hardwood canopy of tulip poplar, sweet gum, white oak, and beech trees. Ironwood, sweet bay magnolia, and flowering dogwood form a dense understory. The shrub layer is characterized by spice bush and occasional greenbrier. The herbaceous layer is rich and diverse, and species are zonated according to subtle changes in topography on the floodplain floor. The floodplain in general is wetter on the western side, and skunk cabbage (very large and

abundant), cinnamon fern, and hay-scented fern flourish. The central and eastern portion of the floodplain are slightly higher and less moist and supports mayapple, club moss (extensive), New York fern, rattlesnake fern, and scattered skunk cabbage. Clubmoss occurs as small patches on hummocks. The U.S. Fish & Wildlife Service, National Wetlands Inventory (1979) identified this floodplain as 30.5 acres of "palustrine, forested, broad-leaved deciduous, temporary."

Ecotype #6: Shrub swamp/"bog"

Acreage: 3.6 acres

Flora: The small intermittent branch on the western side of the floodplain (Ecotype #5) feeds a wetland located on the Baltimore Gas and Electric Co. power line, just upstream of River Road. The acidic soils of this wetland are saturated and the water table is permanently at the surface. This shrub swamp is "bog-like" in that sphagnum moss occurs in scattered patches, but not as a thick mat as in true bogs. A scattered shrub layer consists of red maple, buttonbush, swamp azalea, and swamp magnolia. The wooded border of the "bog" at the edge of the powerline is delineated by sour gum trees. Willow oak, sweet gum, and pin oak (one very large example) occur just outside the sour gum line. The U.S. Fish & Wildlife Service, National Wetlands Inventory (1979) labels this non-tidal wetland as "palustrine, scrub shrub, broad-leaved deciduous/emergent, narrow-leaved persistent, seasonal saturated."

Ecotype #7: Tidal (cove) marsh

Acreage: 7.4 acres

Flora: At the head of Hopkins Creek an extensive cove marsh occurs. Species are well zonated and interspersed as individual patches and include cattail, smooth cordgrass, marshelder, groundselbush, rose mallow, and hibiscus. The landward edges of the marsh grasses are characterized by willow, alder, and swamp azalea. Extensive, intact cove marshes such as this are not commonly found in the watershed. The DNR and the U.S. Fish and Wildlife Service both mapped this tidal wetland.

Ecotype #8: Uplands and steep slopes (Belvoir Woods)

Acreage: 126.8 acres

Flora: The steep slopes and uplands bordering the western edge of the broad floodplain (Ecotype #5) support a fully mature hardwood forest. Beech dominates the lowest portions of the slopes. Tulip poplar, American holly, white oak, sweet gum, and northern red oak occur on the middle portions of the slopes and in cool ravine bottoms. Chestnut oak and scattered Virginia pine trees are located on the upper, well drained slopes. Mountain laurel and black huckleberry are common shrubs under the chestnut oak canopy.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) River Road was the 19th century route to Baltimore via the ferry at Whitney's Landing.

Archeological Features: Five MHT sites: 1) AN 167 - John Halls Grave - an empty arched brick crypt. 2) AN 161 - Hopkins Knoll - an Archaic Culture shell heap 100 x 50 ft. where sherds, points, chips, scrapers, and a hammer stone were collected. 3) AN 131 - Hopkins Creek I - a 400 x 20 ft. shell heap where sherds, chips and a hammer stone were found; a Woodland Culture site. 4) AN 130 - Hopkins Creek II - two separate shell middens where sherds and scrapers were found; described as a rather rich site. 5) AN 132 - Sahlin Site - one of the six key sites of Wright (1973). Eight vessels, jasper chips, oyster shells, deer, bird, and turtle remains, and three garfish scales were collected. The site represents the Sullivan Cove Phase of paleo indian (A.D. 1100) occupation. The small midden and shell heap of the Sahlin site is characteristic of the Sullivan Cove Phase.

Wildlife: No particularly noteworthy wildlife observations were made during field work. However, a natural area of this size and ecotype diversity should be considered an exceptional habitat, especially for larger mammals that require such areas.

Scenic Qualities: The relatively open, thickly shaded floodplain (Ecotype #5) provides a tranquil backdrop for a slow drive down the sinuous course of River Road.

Geology: The Aquia Fm. and Monmouth Fm. underlie the uplands and steep slopes. The Calvert Fm. underlies the highest portions of the farm road and Belvoir ridge crests. Alluvium forms the floodplains, wooded swamp, and tidal marsh. The "bog-like" shrub swamp is an excellent example of "alluvial drowning" caused by an earthen embankment (i.e., River Road, circa pre-1860). An ca. 75 ft. cliff on the shoreline of the natural area faces Round Bay, due south of St. Helena Island.

Soils: Monmouth fine sandy loams - an extensive occurrence on uplands and steep slopes; Mixed alluvial land covers the floodplain (Ecotype #5); Tidal marsh soils cover the draw and cove marshes.

Topography: The highest ridges (Belvoir drainage divide and the farm road) are relatively flat (2-5% slopes) and range in elevation from 177 to 140 ft. (msl). From the crest of the very steep slopes (15-40%) to the ravine bottoms is a drop of ca. 120 ft. The broad floodplain ranges from 50 ft. (msl) near its head to 5 ft. (msl) at River Road.

Contiguity: The Hopkins Creek natural area is fully contiguous with the Brewer Pond natural area to the south and the Maynadier natural area to the north. River Road probably has only a negligible impact on wildlife species migration through this large environmental complex.

Other: The Baltimore Gas and Electric Co. transmission line right-of-way increases the open-wooded edge effect. Near the mouth of Hopkins Creek is a sand spit/island named Little Point Island. Field review - 7/22/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970). 2) Upland Natural Areas Study (1977) - included Sherwood Forest (Ecotype #1) as a part of the Brewer Pond natural area. 3) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory.

LAND CONSERVATION

Ownership Type: Private (multiple), 7 lot (< 1 ac.) owners, 4 minor (1-5 ac.) landowners, 4 major (> 5 ac.) landowners: institutional; county government; corporate.

Land Use: Ecotype #1 - Natural Features (Open Space); Residential - Rural (1/2 or less units/ac.) over the remainder of the subwatershed.

Residential Communities: Beehive Beach, Locksley, Kalmia Ridge

Problems: No major projects are pending. However, during the next 5-10 years, as the western side of the Severn undergoes additional development, there will be pressure to enlarge River Road (e.g., construction of shoulders and straightening some of the tight turns) to accommodate increasing traffic demands. Scattered littering along River Road, and windthrow (several large trees uprooted by a tornado?) were the only impacts observed during field work. The Belvoir development (F-078-83) will cover ca. 102 acres in the Hopkins Creek subwatershed (e.g., Belvoir Woods - Ecotype #8).

Preservation Options: Voluntary private landowner preservation tools (conservation easements, mutual covenants, conservation cooperatives) should be viable options with the critical landowners. Active involvement during the development of Belvoir will be necessary to insure that impacts to the fragile floodplain of David's Run (Ecotype #5) are kept to a minimum. Ecotype #1 is classified as Natural Features (Open Space) on the County Land Use Map, but the actual level of protection offered by this designation is uncertain, especially over the long-term. The tidal wetlands are protected under State law.

Future Use: Ecotype #1 - as part of Brewer Pond sanctuary/forest wildlife reservation; Hopkins Creek tidal cove marsh - wetland wildlife reservation, scientific monitoring; David's Run floodplain - wetland wildlife reservation, scientific monitoring, restricted sightseeing (from vehicles traveling River Road). Shrub swamp/bog (Ecotype #6) - stormwater management (current function and probably an even more valuable function in the future, with the development of Belvoir).

SUBWATERSHED #15

Name: Maynadier Creek (Maynardier Creek, 1977; Manderes Creek, 1949; Little Round Bay Creek, 1846; Galloway's Creek, 1667)

Location: Bounded by the Hopkins Creek subwatershed to the south and the Little Round Bay "Upper Shore" subwatershed to the north.

Natural Areas: This subwatershed includes one natural area: 1) Maynadier Creek (Round Bay Bog/Deep Ditch Branch Woods).

NATURAL AREA #1

Name: Maynadier Creek (Round Bay Bog/Deep Ditch Branch Woods)

Geographical Limits: At present, the core of this subwatershed is relatively undisturbed, with most of the development occurring along the periphery of Generals Highway and Herald Harbor Road. The subwatershed is bounded on the north by Herald Harbor Road, on the west and southwest by Generals Highway, on the east by River Road, and on the southeast by the drainage divide between Maynadier Creek and Hopkins Creek subwatersheds (Belvoir ridge crest).

Total Acreage: 758.7 acres

Ecological Classification: Environmental complex; this includes 10 ecotypes: 1) Bog; 2) Wooded swamp; 3) Uplands and steep slopes; 4) Tidal (cove) wetlands; 5) Floodplain forest; 6) Uplands; 7) Floodplain forest; 8) Uplands; 9) Floodplain forest; 10) Uplands and steep slopes.

Ecotype #1: Bog (Round Bay/cranberry bog)

Acreage: 1.5 acres

Flora: The actual true bog area of the highly acclaimed Round Bay Bog is confined to a 75 ft. x 850 ft. transmission line right-of-way owned by the Baltimore Gas and Electric Company. The bog is most noted for its unusual plant community growing out of a dense mat of sphagum moss. Cranberry and Virginia chain fern are the most dominant species. Table 4, compiled by Sipple (1977) provides a detailed list of plants identified in this botanically rich and diverse area of unique ecological quality in the Severn River watershed.

Ecotype #2: Wooded swamp (magnolia swamp)

Acreage: 87.7 acres

Table 4. Vegetation of Round Bay Bog

Acer rubrum	Red Maple
Alnus serrulata	Common Alder
Amelanchier sp.	Juneberry
Carex lurida	Sedge
C. stricta	Tussock Sedge
C. spp.	Sedges
Cuscuta sp.	Dodder
Decondon verticillatus	Swamp Loosestrife
Elecocharis obtusa	Blunt Spikerush
Eupatorium purpureum	Joe-pye-weed
E. sp.	Thoroughwort
Hypericum canadense	St. John's-wort
H. virginicum	Marsh St. John's-wort
Juncus abortivus	Rush
J. canadensis	Rush
J. effusus	Rush
Lilium superbum	Turk's-cap Lily
Liquidambar styraciflua	Sweetgum
Lyonia ligustrina	Maleberry
Magnolia virginiana	Sweet Bay Magnolia
Osmunda cinnamomea	Cinnamon Fern
Panicum verrucosum	Warty Panic Grass
Parthenocissus quinquefolia	Virginia Creeper
Peltandra virginica	Arrow-arum
Pogonia ophioglossoides	Rose Pogonia
Polygonum arifolium	Halberdleaf Tearthumb
P. sagittatum	Arrowleaf Tearthumb
P. sp.	Smartweed
Pyrus sp.	Chokeberry
Rhus vernix	Poison Sumac
Rhododendron viscosum	Swamp Azalea
Rhynchospora chalarocephala	Beak-rush
Rubus sp.	Dewberry
Sagittaria latifolia	Broadleaf Arrowhead
Scirpus rubricosus	Bulrush
Solidago sp.	Goldenrod
Sparganium sp.	Burreed
Symplocarpus foetidus	Skunk Cabbage
Typha latifolia	Broadleaf Cattail
Vaccinium macrocarpon	Large Cranberry
V. sp.	Blueberry
Woodwardia areolata	Net-veined Chain Fern
W. virginica	Virginia Chain Fern

(See Siple, 1977)

Flora: Both upstream and downstream of Round Bay Bog (Ecotyped #1), is a very broad alluvial valley dominated by red maple, sweet gum, black gum, poison sumac, and sweetbay magnolia. These trees are barely larger than shrubs (DBHs 9-12 in.). A thick, true shrub layer consists of swamp azalea, clethra, sweetbay magnolia, and buttonbush. The saturated soils support a thin but diverse herbaceous layer including, cinnamon fern, royal fern, smilax pseudo-china, skunk cabbage, arrow-arum, and broadleaf arrowhead.

Ecotype #3: Uplands and steep slopes (Belvoir Woods)

Acreage: 199.1 acres

Flora: The uplands adjacent to the broad alluvial valley of the wooded swamp (Ecotype #2), and three upland outliers surrounded by alluvium, are blanketed with a mature hardwood forest. The rich, moist soils of these uplands support a forest of beech, white oak, northern red oak, tulip poplar, mockernut hickory, sweet gum, and black oak. The DBHs of most of these range from 12 to 24 in. The understory layer is composed of beech, ironwood, flowering dogwood, and American holly. A sparse shrub layer of American holly and maple-leaved viburnum shadows a very diverse and rich herbaceous layer; species include indian cucumber root, false solomons seal, mayapple, shining club moss, herbaceous smilax, rattlesnake fern, and wild yam. The thick, diverse assemblage of herbaceous plants attests to very fertile and moist upland soils.

Ecotype #4: Tidal (cove) wetlands

Acreage: 10.0 acres

Flora: At the head of Maynadier Creek (the mouth of Deep Ditch Branch and the Round Bay alluvial valley) is an extensive and intact cove marsh. Wetland plant species are well zonated and interspersed; these include cattail, smooth cordgrass, smartweed, three square, cynos, hibiscus, meadow cordgrass, and spike grass. This is one of the largest and least disturbed marshes in the entire Severn River watershed.

Ecotype #5: Floodplain forest

Acreage: 22.0 acres

Flora: The south fork of Deep Ditch Branch flows through an intact floodplain forest. The U.S. Fish and Wildlife Service, National Wetlands Inventory (1979) recognizes 13.8 acres of this non-tidal wetland: "palustrine, forested, broad-leaved deciduous, temporary." Additional field work is needed to inventory the ecological attributes of this extensive (ca. 1.5 miles in length) floodplain forest.

Ecotype #6: Uplands

Acreage: 125.8 acres

Flora: The uplands feeding the south fork of Deep Ditch Branch are cloaked with a mature deciduous forest which appears to be relatively undisturbed. More field work is required.

Ecotype #7: Floodplains forest

Acreage: 5.6 acres

Flora: Two "misfit" alluvial valleys (formed by stream piracy) are located between the south fork of Deep Ditch Branch (Ecotype #5) and the broad alluvial valley of Round Bay Bog (Ecotype #2). It is quite possible that these unique geomorphic settings could be the home of unusual plant communities and ecotypes. Additional field work is urgently needed.

Ecotype #8: Uplands

Acreage: 233.8 acres

Flora: The uplands feeding the north fork of Deep Ditch Branch are cloaked with a mature deciduous forest which appears to be relatively undisturbed. More field work is required.

Ecotype #9: Floodplain forest

Acreage: 4.0 acres

Flora: A small, broad ravine bottom between Hopkins Creek (Davids Run) and Round Bay supports a forest of red maple, tulip poplar, northern red oak and sweet gum (DBHs ca. 12-18 in.). An understory of flowering dogwood, sweet gum, and ironwood, and a shrub layer of American holly and maple-leaved viburnum are relatively sparse. Skunk cabbage is prolific in the herbaceous layer, while cinnamon fern and royal fern are less common.

Ecotype #10: Uplands and Steep slopes

Acreage: 36.1 acres

Flora: The uplands feeding the small stream which flows through Ecotype #9 support a mature deciduous forest of beech, tulip poplar and sweet gum. Mayapple, shinning club moss, New York fern, and rattlesnake fern are common plant species of a rich and diverse herbaceous layer.

Natural Heritage Elements: 1) Purple pitcher plant - B3, State rare, in danger of extinction in Maryland; 2) American cranberry - C, State declining; 3) Branched bartonia - C, State declining; 4) Rose pognoia orchis - C, state declining; 5) Halberd-leaved greenbrier - C, State declining; 6) Loose headed beaked-rush - B3, State rare; 7) Bog Fern - C, State declining.

Noteworthy Plant Species: 1) Cranefly orchid - "infrequent on the Coastal Plain" (Brown and Brown, 1984).

Exceptional Trees: None observed

Historic Features: The County Historic Sites Survey recognizes five sites in this natural area: 1) AA 183 - Belvoir (Scott's Plantation, Bellevoir, and Belle Voir are alternate spellings and names). The condition of Belvoir (circa 1690) is described as "good, unaltered and original site". Its areas of significance include political and architecture. Belvoir, high above the

Severn, is a two-story house built in the shape of a "squat T". The architectural evolution of Belvoir illustrates the development of an early Maryland manor-type house, of the late seventeeth century into a mid-eighteenth-century house. Belvoir's illustrious history includes General Rochambeau, Francis Scott Key, John Ross, Dr. Upton Scott, Colonel Maynadier and the Marquis de Lafayette. The scope of this report does not allow for a full description of this extremely significant historic site. Its inclusion on the National Register of Historic Places does, however, indicate its level of importance. 2) AA 184 - Belvoir graveyard - contains many graves of historically significant figures of the 1700s and 1800s. 3) AA 181 - Wanbaugh House - also called the Henry house; this 18th century, architecturally significant structure is described as being in "good, unaltered condition on its original site". 4) AA 182 - St. Paul's Chapel (circa 1800s) - is listed on the National Register of Historic Places.

Archeological Features: Five MHT sites: 1) AN 567 - Maynadier I - is a Late Woodland Culture site where numerous oyster shells, quartz points, and ferrugenous sandstone flakes were collected. This site is currently threatened by development and an immediate investigation was recommended. 2) AN 568 -Maynadier II - is a Late Woodland Culture shell midden 300 ft. x 40 ft. in area. This site is also threatened by development. 3) AN 572 - Maynadier III - is a Late Woodland Culture shell midden 6 ft. x 50 ft. in area. One shell tempered sherd, one hammerstone, one brick fragment, and 17 other sherds were collected at the site. 4) AN 129 - Cranberry Swamp - is an Archaic Culture site 100 ft. x 50 ft in area. Sherds, points, chips, scrapers, and hammerstones were collected. This site is described as the only ideally suited Early Woodland Culture site on the Severn and the best site on the Severn. 5) AN 128 - Little Round Bay or Maynadier Creek site - is an Early Woodland Archaic site some 100 ft. in diameter and no more than 0.7 ft. thick. It is described as the best example of Marcey Creek Series on the Severn and is one of the six key sites of Wright (1973). Artifacts at this site include an extensive array of vessels, triangular points, polished bone awls, pitted stone, plain obtuse-angle pottery pipe,and chips of quartz, quartzite, rhyolite, jasper, and flint. From this site, most of the evidence for the Little Round Bay Phase (A.D. 1300) was established.

Wildlife: The large acreage formed by the diverse and relatively undisturbed ecotypes of this natural area make it a very important site for wildlife. During field work a diverse assemblege of birdlife was observed in the bog, swamp, and marsh areas. Signs of deer were also noted. The open pasture land created by the Baltimore Gas and Electric Company transmission line adds to the habitat diversity of this natural area.

Scenic Qualities: The colors produced by the diverse and extremely unique herbaceous plant assemblage of Round Bay Bog (Ecotype #1) are quite attractive. Although not especially scenic, the cleared transmission line right of way allows for a vivid appreciation of the extreme topographic relief in this natural area. The large tidal marsh (Ecotype #4) offers an excellent color and texture contrast of grasses that can only be fully appreciated from the waters of Maynadier Creek.

Geology: The Aquia Fm. and Monmouth Fm. underlie the majority of the upland areas. An small exposure of the Calvert Fm. caps the Belvoir ridge crest. An extensive exposure of alluvium forms in the bog, swamp, and marsh areas. Archeological site AN 128 is located on a long sandy ridge that is surrounded by

recent alluvium. This ridge stands at 10 ft. (msl) and probably represents a sand spit formed at the mouth of a former tidewater tributary (Deep Ditch Branch) when sea level was higher than present. There is geomorphic evidence for three cases of "stream piracy" in the Maynadier Creek subwatershed which has produced "misfit valleys" and "alluvial islands." These are not only unique geomorphic features but also may produce uncommon ecological settings conducive to rare species. Deep Ditch Branch at one time flowed in the broad alluvial valley that new contains Round Bay Bog. However, at some unknown time in the geologic past a small tributary, eroding headward, captured the main artery of Deep Ditch Branch, diverting it around the broad alluvial valley and directly into Maynadier Creek. Compared to the size of the tributaries and watershed feeding the broad alluvial valley, it is anomolously large. The valley was probably formed by downcutting of the larger Deep Ditch Branch when it still flowed through the valley. After diversion, with a minimal amount of inorganic sediment input from the smaller ravines feeding it, the broad valley aggraded with organic material and became a bog. The construction of River Road in the 1800s, and the subsequent ponding of water behind it, probably helped create the present saturated conditions of the wooded swamp and bog within the valley. The capture of Deep Ditch Branch also created an "alluvial island" of the Aquia Fm., surrounded on one side by alluvium in the misfit valley and on the other by the present floodplain of Deep Ditch Branch. The second case of "stream piracy" happened when a small tributary of the broad alluvial valley, eroding headward, captured the flow of another small stream flowing into Deep Ditch Branch. The diversion of this tributary into the broad alluvial valley produced another "misfit valley" and "alluvial island". The third case of streamn piracy has resulted in an "alluvial island" totally within the broad valley just upstream of the bog. In all three cases, unique geomorphic features were produced and should be investigated for the possible occurrence of uncommon or rare plants and animals.

Soils: Mixed alluvial soils cover the floodplains and the broad alluvial valley. Monmouth fine sandy loams predominate over most of the uplands in the natural area. Collington fine sandy loams occur on the Belvoir ridge crest where the Calvert Fm. outcrops. In general, upland soils throughout the subwatershed are moist, rich and thick. Soils in the bog (Ecotype #1) are acidic and highly organic in nature.

Topography: The uplands along the tops of ridges are relatively flat (5-10% slopes) and range in elevation from 190 to 125 ft. (msl). The slopes are very steep (15-40%) and range in elevation from 125 to 10 ft. (msl). The broad alluvial valley ranges in elevation from 35 ft. (msl) at its head to 5 ft. (msl) near River Road.

Contiguity: This subwatershed is fully contiguous with the Hopkins Creek natural area to the south, and the Plum/Gumbottom Branch natural area to the north. Herald Harbor Road may have a slight effect on the migration of wildlife between the Plum/Gumbottom and Maynadier subwatersheds.

Other: Just offshore of the large tidal marsh (Ecotype #4) in Maynadier Creek is a "sunken" island which is actually a small sandbar covered with a thick stand of red cedar trees. Field Review - 7/22/86.

Previous Listings: 1) Catalog of Natural Areas (1968) - "haven for a wide variety of birdlife." 2) Scenic Rivers in Maryland (1970) - recommended Deep Ditch Branch and Round Bay Bog for "natural use areas". 3) DNR Tidal Wetlands

Boundaries (1970) - "cattail, smooth cordgrass" = 10.1 acres. 4) Survey of the Ecologically Important Areas of the Chesapeake Bay Region (1974) - recommended for "special consideration." 5) Compendium of Natural Features (1975). 6) Upland Natural Areas Study (1977) - "rare, remnant or unique species of plants." 7) Recommended Areas of Critical State Concern in Anne Arundel County (1977) - "unusual plant community." 8) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory - "palustrine, forested, broad-leaved deciduous, temporary and seasonal" = 82.8 acres; "palustrine, forested, broad-leaved deciduous/scrub shrub, temporary" = 34.9 acres. 9) Natural Heritage Program (1983 and 1985) - "ecologically sensitive area." 10) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Corporate; county government; quasi-public; institutional; and private (multiple), 1 lot (< 1 ac.) owner, 6 minor (1-5 ac.) landowners, 12 major (> 5 ac.) landowners.

Land Use: Ecotype #1 (Round Bay Bog) is designated as Natural Features (Open Space) and an Area of Critical State Concern. The remainder of the natural area is Rural-Residential (1/2 or less units/ac.), but is a Suggested Park.

Residential Communities: Crownsville, Gotts

Problems: No pending major projects. The proposed Belvoir development (F-078-83), as planned, will contain 22 single family dwelling units and cover ca. 72 acres. The proposed Cranberry development (F-185-84) will cover approximately 220 acres. Ongoing problems include 1) growth of red maple trees in and near Round Bay Bog (Ecotype #1), which if not controlled will eventually produce enough shade to kill rare bog plants which require the exposure provided by the transmission line; 2) Haphazard cutting of trees toward the periphery of the Belvoir property; 3) Future herbicide spraying and maintenance grading by the Baltimore Gas and Electric Co; 4) Scattered littering along the transmission line; 5) Introduction of non-native bog plants.

Preservation Options: Voluntary landowner preservation tools (conservation easements, mutual covenants, conservation cooperatives) are viable, especially with the critical landowners. Contact with all landowners is imperative. The development of Cranberry and Belvoir subdivisions must be done with the utmost of care and should be scrutinized to insure that the impacts to Round Bay Bog are kept to a minimum. The Baltimore Gas and Electric Company should be contacted concerning future maintenance of the power-line.

Future Use: Possibilities include a sanctuary, scientific monitoring, recognized species area, forest wildlife reservation, and a wetland wildlife reservation.

SUBWATERSHED #16

Name: Little Round Bay "Upper Shore" (includes the following small coves and promontories: Long Point, 1769; Marriott's Cove, 1846; Sommers Point, 1978; Crystal Cove, 1978; Browns Cove, 1846 or Galloway's Creek, 1769; Mathiers Point, 1979).

Location: Bounded by the Fox Creek subwatershed on the north and the Maynadier Creek subwatershed on the south. The north shore of Round Bay from Long Point south to the mouth of Maynadier Creek (Mathiers Point).

Natural Areas: Little detailed field work was performed in the Little Round Bay "Upper Shore" subwatershed and few comments on specific natural areas can be given.

ISOLATED FEATURES

Wetlands: The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory maps the following wetlands: 1) Brown's Cove - "estuarine, intertidal emergent, narrow-leaved persistent, irregular" = 1.0 acre; "palustrine, forested, broad-leaved deciduous, temporary tidal" = 2.0 acres. 2) Small freshwater branch feeding Brown's Cove - "palustrine, forested, broad-leaved deciduous, temporary" = 1.5 acres. 3) Crystal Cove - "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.3 acre. The DNR Tidal Wetlands Boundaries (1970): 1) Browns Cove - "cattail, smooth cordgrass" = 0.8 acre. 2) Crystal Cove - "smooth cordgrass" = 0.4 acre.

Historic Features: 1) The County Historic Sites Survey lists John Brown's House (site) as AA 954.

Archeological Features: Seven MHT sites: 1) AN 566 - River Road House Site -an early 19th century stone foundation and debris from the house. This was a tract of "Norwoods Fancy" bought by John Norwood in 1659. The house was built in 1811 but demolished in the 1970s. A kaolin pipe bowl was found. The site is described as having good potential for intact archeological features and deposits of the 19th century. 2) AN 124 - Browns Cove - is a 400 x 100 ft. site where sherds, points, blades and chips were found. A high quality Marcey Creek (Late Woodland) site. 3) AN 125 - Browns Cove III - a 300 x 200 ft. site where points, knives, scrapers, chips and a 3/4 in. grooved axe were collected. Described as a very good, deep deposit and an excellent site. 4) AN 123 -Burners Island/Browns Cove - a Selby Bay Complex site where sherds, points, chips, and scrapers were collected. Described as a superior site. 5) AN 122 - an unnamed site where chips were found. 6) Quad File site no. 1 - Long Point - three 3/4 in. grooved axes and a celt were collected. 7) Quad File site no. 4 - an unnamed shell heap.

Other: Adjacent to archeological site AN 566, a small spring head was identified.

Residential Communities: Palisades on the Severn, Herald Harbor

SUBWATERSHED #17

Name: St. Helena Island

Location: Bounded by the Little Round Bay "Upper Shore" subwatershed to the north, Maynadiers Creek and Hopkins Creek subwatersheds to the southwest, and the Brewer Pond subwatershed to the south. The island is situated in the center of Little Round Bay.

Natural Areas: The subwatershed includes one natural area: 1) St. Helena Island.

NATURAL AREA #1

Name: St. Helena Island

Geographical Limits: The island proper as described above.

Total Acreage: 9.0 acres (the total acreage of the island is 17.1)

Ecological Classification: Complete ecotype; this includes two ecotypes: 1) Uplands; 2) Tidal wetlands.

Ecotype #1: Uplands

Acreage: 6.8 acres

Flora: A mature hardwood forest dominated by chestnut oak trees covers the uplands of the island. White oak, black oak, tulip poplar, sweet gum, and mockernut hickory are less common trees. Most trees range in size from ca. 18 in. to 24 in. DBH. The understory consists of chestnut oak, dogwood and sweet gum. Mountain laurel is the predominant shrub species.

Ecotype #2: Tidal wetlands

Acreage: 2.2 acres

Flora: Wetlands vegetation occurs on sand spits protruding from points and across cove inlets, and in ponds formed behind the spits. Accretion of sand spits on the western side and northern tip of the island has enclosed small coves, creating small tidal ponds 1-2 ft. in depth. Vegetation includes cattail, swamp azalea, arrow arum, smooth cordgrass, swamp rose, and rosemallow. An unidentified green algae grows on the bottom of the small ponds and on the numerous pieces of driftwood that have washed over the spits into the ponds.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) The entire area of St. Helena Island is included in the County Historic Sites Survey as site AA 940. The main house on the island is significant architecturally as an excellent example of a Federal Revival structure, specifically patterned after Homewood in Baltimore. The structure was built between 1929 and 1931, and with its landscaped setting, is part of an early 20th century movement in architecture which recreated American Georgian and Federal, English Country House and French (Norman) architecture. The house boasts an octagonal, two-story rotunda, from which branch rooms with mahogany floors, marble fireplaces, and fine detailing. It also has an intriguing history as a playground for the very rich. The house was the fantasy of Paul Burnett, a Baltimore lawyer and insurance executive who, in 1931, commissioned large skipjacks to carry tons of bricks necessary to build it. Quixotic projects abound, including a log cabin and a line of sentry boxes set in a serpentine brick wall. Inhabitants maintained a deer park, kept a pen of terrapins for soup, and searched for Indian artifacts still to be found on the island. A conical roofed, circular brick water tower (ca. 50 ft. tall) on the northern point of the island has an observation deck just beneath the roof. Several other homes, mostly on the southern end of the island, once served as a camp for handicapped children and later as short-lived gambling houses. On the southeast tip of the island, the shell of a long pier that served the large tour boats that brought the gamblers still stands. Five cubical bunker type houses, evidently for storing the gear from the large boats, are built into the side of a steep slope near the pier. In all, there are 22 structures (five main buildings and 17 outbuildings on 8.1 acres), a water/observation tower and six piers (one very large) on the island. The mystery, intrigue, and eccentricity, of the island rival its historical significance. Paul Burnett even built seven safes into the house and buried into the hillside. No one knows why. The island is currently being nominated for the National Register of Historic Places.

Archeological Features: Two MHT sites: 1) AN 126 - St. Helena Island I - sherds, chips, and grooved axes were collected. Described as a Late-Early Woodland Culture site, rich but not ideal. 2) AN 127 - St. Helena Island II - also a Late-Early Woodland Culture site.

Wildlife: During the site visit, a great blue heron, two Canada Geese and several kingfishers were observed near the small ponds behind the sand spits. Several snakes and turtles were also seen. The DNR recorded (1978) an osprey nest site on the island.

Scenic Qualities: The island has several extraordinary scenic qualities. First, the near vertical buffs on the western, northern, and northeastern portions of the island range from 30 to 50 ft. in height. Capped by tall, mature chestnut oaks, the bluff, tan, and orange strata offer dramatic topography. The more recessed buffs on the eastern side of the island are heavily vegetated with black locust, staghorn sumac, Virginia pine, chestnut oaks, and sassafras. Viewed from afar, in the middle of Round Bay, these vegetated slopes, and the isolated island as a whole, are stately and almost regal in appearance. Secondly, the island is an exceptional vantage point from which to view Round Bay and Little Round Bay. From atop the island, it is possible to scan almost

all points on the compass. The wooded bluffs of Brewer Pond are especially majestic. Glimpses of Belvoir atop its 192 ft. mount are also possible from the island.

Geology: The Monmouth Fm. underlies the uplands and bluffs; alluvium forms the sand spits and fringe wetlands. The bluff on the western portion of the island offers excellent exposures of the Monmouth Fm. Greenish gray sediments were observed where recent slumping had exposed unweathered material. The western side, at the base of the bluffs, also supports a clean sandy beach, 10-15 ft. wide.

Soils: The flat (2-5% slopes) plateau-like uplands in the interior of the island are covered by Monmouth fine sandy loams. The steep slopes along the perimeter are covered by Monmouth clay loam soils.

Topography: The maximum elevation on the island (52 ft. msl) is on the northern tip, and is the foundation for the water/observation tower. The interior uplands are relatively flat (2-5% slopes) and range in elevation from 25-52 ft. (msl). Steep slopes around the periphery of the island range from 15% to near vertical.

Contiguity: Being an island, this natural area is physically separated from other natural areas to the south and southwest. However, the island appears to be an attractive feeding spot for large birds that probably inhabit the extensive natural areas to the south.

Other: St. Helena Island and Little Round Bay are anomalous from a geomorphological standpoint in that they form a two mile wide bay in an otherwise narrow and straight river. The arcuate pattern of Little Round Bay is very similar to the shape of a meander bend in a river. During a time when sea level was lower and the Severn was a fast flowing freshwater river in this area, Little Round Bay may have been a meander bend in the river. The symmetry of concavity on the bluffs bordering Little Round Bay and the bathemetry of the river are geomorphic evidence in support of this theory. The extremely anomalous shape and dimensions of Little Round Bay were not formed by random chance, but by some basic geomorphic processes. River meandering and cutoff appear to be the most obvious explanation. Field review - 7/14/86.

Previous Listings: None

LAND CONSERVATION

Ownership Type: Private (multiple), 1 minor (1-5 ac.) landowner and 1 major (> 5 ac.) landowner; corporate.

Land Use: Natural Features (Open Space)

Residential Communities: None

Problems: No pending projects or proposed development, however, corporate ownership suggests that additional lots may be developed in the future. Ongoing impacts are very minimal except for occasional trespassers attracted by the mystical air of the island.

Preservation Options: Voluntary preservation options on part of the private landowners should be extremely viable (i.e., conservation easements, mutual covenants, conservation cooperatives). Efforts toward preserving the island should be relatively uncomplicated due to the small (4) number of landowners. Immediate contact with the corporate owners to find out their future plans is essential.

Future Use: Possibilities include restricted sightseeing, passive recreation, and scientific research (especially promising for study of introduced species and their reproduction and feeding habits); St. Helena Island because of its total isolation from outside influences and its intact ecological state appears to be ideal for controlled experimental study of animals.

SUBWATERSHED #18

Name: Fox Creek (Old Place Creek, 1980; Otter Pond, 1846)

Location: Bounded by the Little Round Bay "Upper Shore" and St. Helena Island subwatersheds to the south and Valentine Creek subwatershed to the north. The creek is situated south of Kyle Point and north of Long Point.

Natural Area: This subwatershed includes one natural area: 1) Fox Creek.

NATURAL AREA #1

Name: Fox Creek

Geographical Limits: Bounded by Dogwood Terrace to the west, Kyle Road to the north, Long Point Road to the south, and the Severn River to the east.

Total Acreage: 39.3 acres

Ecological Classification: Complete ecotype; this includes five ecotypes: 1) Tidal tributary; 2) Steep slopes; 3) Tidal (cove) marsh; 4) Wooded swamp; 5) Steep slopes.

Ecotype #1: Tidal tributary

Acreage: 14.0 acres (not included as part of the total acreage)

Flora: The creek proper is a relatively intact tidal tributary with only limited development on its south shore. A well developed fringe marsh occurs around most of this undisturbed cove. It is protected by a very narrow inlet at its confluence with the Severn.

Ecotype #2: Steep slopes

Acreage: 17.9 acres

Flora: An intact, mature hardwood forest occurs on the steep slopes of the undeveloped northern shore of Fox Creek and as a narrow transition zone on the south shore between the creek and scattered houses on Long Point Road. More field work is needed, especially on the ca. 14 acres of the Kyle Point (northern) shore.

Ecotype #3: Tidal (cove) marsh

Acreage: 3.5 acres

Flora: A cove marsh at the head of Fox Creek consists of arrow arum, swamp rose, cattail, floating marsh pennywort, and smooth cordgrass. Further inland, shrub species dominate. These include swamp rose, elderberry, poison sumac, red maple, and sweet gum.

Ecotype #4: Wooded swamp

Acreage: 5.4 acres

Flora: From the tidal wetlands upstream to Dogwood Terrace is a small freshwater branch flowing through an extremely wet alluvial bottom (swamp). The floodplain of this wooded swamp varies greatly in width, degree of saturation, sun exposure, and plant species. Three zones are recognized. First, near Dogwood Terrace the floodplain is 300-400 ft. in width, and a ca. 2 acre swamp with extremely wet and acidic soils occurs. Vegetation in this zone is exposed to the sun frequently, the floodplain bottom being too wide for canopy trees on the adjacent slopes to offer shade. Small trees, slightly larger than shrubs include red maple, sweet gum, sweet bay magnolia, American holly, and sour gum (near the toe of the adjacent slopes). Characteristic shrubs include swamp azalea, winterberry, and spicebush. A very thick herbaceous layer includes white violets, arrowhead, burreed, and scattered patches of spagnum moss. The sphagnum moss attests to the very wet and acidic soil conditions in this zone. Downstream, the floodplain narrows to a width of 40-80 ft. and a second zone occurs. Species are similar to the first zone except that trees are larger, no sphagnum occurs, soils are drier, and the large trees on the slopes offer more shade. In the third zone the floodplain again widens to 300-400 ft. and an extremely dense shrub thicket of swamp azalea, spicebush, and alders occurs. Soils in this zone are totally saturated. Overall, this wooded swamp supports a diverse plant assemblage and one of the most dense shrub thickets encountered during field work. Skunk cabbage and greembrier were unexplainably absent under conditions where they normally occur.

Ecotype #5: Steep slopes

Acreage: 12.5 acres

Flora: The lower portions of the broad slopes (5-15%) bordering the swamp forest (Ecotype #4) support a forest of sweet gum, American holly (abundant), tulip poplar, white oak, and short-leaf pine. The lower portions of the slopes near the swamp are less steep and composed of finer-grained, moister soils than the upper portions of the slopes. Sour gums and American holly demarcate the interface between the slope and swamp forest. Clethra is common in the shrub layer. The upper portions of the slopes are composed of sandier, drier soils and support a forest of chestnut oak, sweet gum, tulip poplar, southern red oak, and black oak. Mountain laurel and small dogwood form the shrub layer. This mixture of rich and impoverished soils may be due to an intermixing of a thin layer of rich, fine grained sediments (Monmouth Fm.) at the surface and very sandy infertile sediments (Magothy Fm.) just below the surface. In general, the south-facing slope has a more open understory than the north-facing slope, probably due to greater exposure to sunlight.

Natural Heritage Elements: 1) Redheadgrass - B1/X, regionally rare, a population has not been reported in Maryland since 1950. This observation was made in 1926 and the probability of redheadgrass still occurring is remote. 2) Purple pitcher plant - B3, State rare, in danger of extinction in Maryland. This species was previously recorded but was not found during field work for this study. 3) Floating marsh pennywort - C, State declining.

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) An old logging embankment of unknown age parallels the northern fringe of the wooded swamp.

Archeological Features: 1) MHT site AN 121 - Kyle Point Site - quartzite and rhyolite chips were collected.

Wildlife: The contiguous natural area of Fox Creek, for a relatively small area, appears to support a healthy population of wildlife species. Raccoon, garter snake, woodpecker, grey squirrel, rabbit, and a wide variety of birdlife were observed.

Scenic Qualities: The tidal tributary is one of the least disturbed in the Severn watershed and emits a peaceful air. Its steep wooded shoreline is attractive.

Geology: The Monmouth Fm. underlies the slopes; alluvium forms the wooded swamp and tidal wetlands.

Soils: Mixed alluvial soils cover the swamp forest. Tidal marsh soils cover the cove marsh. Collington fine sandy loams and Romford loamy sands cover the slopes.

Topography: The slopes are moderately steep (5-15%) and descend in elevation from 40 to 0 ft. (msl). The wooded swamp ranges in elevation from 8 ft. (msl) near Dogwood Terrace to 0.5 ft. (msl) near the head of Fox Creek.

Contiguity: The Fox Creek natural area is totally confined within the developed community of Herald Harbor. Because of its healthy wetlands and undisturbed character, Fox Creek is probably important for aquatic species breeding and interaction with the Severn River.

Other: Field review - 7/22/86

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass" = 1.6 acres. 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, narrow-leaved persistent, irregular" = 2.8 acres; "palustrine, forested, broad-leaved deciduous, seasonal saturated" = 6.0 acres; "estuarine, intertidal, flat" = 1.8 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 9 lot (< 1 ac.) owners, 1 minor (1-5 ac.) landowner, 1 major (> 5 ac.) landowner.

Land Use: Residential-Low (1/2 - 2 units/ac.)

Residential Communities: Herald Harbor

Problems: No pending major projects or proposed developments have been registered. Ongoing impacts include: 1) the growth of Kudzu vines in the wooded swamp adjacent to the earthen embankment of Dogwood Terrace; 2) evidence of heavy foot traffic by local residents (although overused, the paths and natural area did not appear to be abused by the local citizenry); 3) a few houses on the slope crest are visible from the wooded swamp. These houses are even more exposed during winter when trees are devoid of foliage. The exposure of these structures detracts somewhat from the scenic quality and solitude of the natural area.

Preservation Options: Conservation cooperatives appear to be viable options for the lot owners. Conservation cooperatives, mutual covenants, and conservation easements may be potential options for the critical landowner. Immediate contact with the critical landowner is essential for protection of this natural area. Tidal wetlands are currently protected under State law.

Future Use: Possibilities include passive recreation, outdoor education, scientific monitoring, and stormwater management (a current function of the wooded swamp - Ecotype #4).

SUBWATERSHED #19

Name: Valentine Creek (Plum Creek, 1769 - apparently this name was initially given to both Plum and Valentine Creeks and later the southeast fork was renamed Valentine Creek)

Location: Bounded by the Plum Creek subwatershed to the north and the Fox Creek subwatershed to the south.

Natural Areas: This subwatershed includes one natural area: 1) Valentine Creek.

NATURAL AREA #1

Name: Valentine Creek

Geographical Limits: Bounded by Herald Harbor subdivision to the east and southeast, Herald Harbor Road to the south, Valentine Creek Road (new subdivision) and Whitney's Landing Farm to the west, and the community of Sunrise Beach to the north.

Total Acreage: 64.4 acres

Ecological Classification: Currently being transformed from a complete ecotype to an altered green area. This includes five ecotypes: 1) Tidal (cove) marsh; 2) Wooded swamp; 3) Tidal (cove) marsh; 4) Wooded swamp; 5) Uplands and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 6.4 acres

Flora: Valentine Creek has two large coves at its headward margin. The cove on the southern side is characterized by well zonated and interspersed stands of marsh vegeation, including smooth cordgrass, three square, cattail, groundselbush and common reed. Further inland is a shrub swamp of red maple, swamp rose, swamp azalea, alder, bulrush, and sweet pepperbush. This cove marsh is one of the larger and more intact examples on the Severn.

Ecotype #2: Wooded swamp

Acreage: 9.0 acres

Flora: Inland from the cove marsh (Ecotype #1) is a wooded swamp containing small trees, including black willow, alder, wild cherry, black gum, sweet gum, and sweet bay magnolia. Rattlesnake fern, cinnamon fern, skunk cabbage, and netted chain fern are common in the herbaceous layer.

Ecotype #3: Tidal (cove) marash

Acreage: 3.0 acres

Flora: At the head of the western cove of Valentine Creek is a tidal marsh consisting of cattails, smooth cordgrass, arrow arum, and three square. Just inland the grasses grade into a shrub layer composed of swamp rose, buttonbush, red maple, arrowhead, and swamp azalea.

Ecotype #4: Wooded swamp

Acreage: 6.0 acres

Flora: Inland of the cove marsh (Ecotype #3) is a wooded swamp of red maple, black willow, ash, alder, and river birch. In the herbaceous layer skunk cabbage is very common while scattered observations of sphagnum moss were made.

Ecotype #5: Uplands and Steep slopes

Acreage: 40.0 acres

Flora: Between the two cove marshes and their associated wooded swamps, is an extensive, mature hardwood forest. On the upper slopes and ridge crests, chestnut oak (DBH 12-18 in.) dominates. White oak, scarlet oak, pitch pine, and Virginia pine are secondary trees. Chestnut oak, American holly, and sweet gum occur in the understory, while the shrub layer is composed of vaccinium, black huckleberry, mountain laurel and American holly. The herbaceous layer is very sparse with infrequent occurrences of lady slipper orchid. The moister, cooler swales and ravines are composed of tulip poplar, sweet gum, and scattered beech in the canopy and dogwood and sweet gum in the understory. American holly dominates the shrub layer. Presently, a 78-acre residential development called Valentine Creek is being constructed and will cover the majority of these slopes and uplands.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None recorded

Archeological Features: Two MHT sites: 1) AN 120 - Valentine Creek - two Stony Creek sherds collected. 2) AN 561 - Bottle Wreck - a 19th century two-masted schooner at the bottom of Valentine Creek. The schooner has a collapsed upper deck and many scuba divers have foraged through the ship and removed most of its cache of 19th century seamless bottles.

Wildlife: Many different species of birds were observed in the wetland areas.

Scenic Qualities: The scenic quality of the otherwise pristine cove marshes has been severely diminished by the encroachment of residential development to the edge of the wetland. The upland areas (Ecotype #5) that are not being developed are quite intact and appealing to the senses.

Geology: The Aquia Fm. underlies the uppermost crests of the ridges. The Monmouth Fm. underlies the lower elevations on the ridge crests and upper portions of the slopes. The Magothy Fm. underlies the lower portions of slopes near Valentine Creek. Alluvium forms the cove marshes and wooded swamps.

Soils: Collington fine sandy loam soils cover the ridge crests and upper slopes. Rumford loamy sand and Sassafras fine sandy loams cover the mid and lower portions of slopes. Mixed alluvial soils cover the wooded swamps. Tidal marsh soils cover the cove marshes.

Topography: The moderately steep (5-15% slopes) uplands range in elevation from ca. 150 to 100 ft. (msl). The steep (15-40%) slopes range in elevation from ca. 100 ft. (msl) to between 25 ft. and 0.5 ft. (msl). The wooded swamps range in elevation from 10 ft. (msl) to 0.5 ft. (msl) near the cove marshes.

Contiguity: Although the Valentine Creek natural area is being fragmented by the development of the Valentine Creek subdivision, a small portion of the western side of the forested uplands (Ecotype #5) will still be contiguous to the floodplain forest of Plum Creek. The extensive wetlands in the coves of Valentine Creek are probably important breeding grounds for aquatic species and for the interaction of these species with the Severn River.

Other: Field review - 7/9/86

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970): "smooth cordgrass, three square" = 9.0 acres. 2) Upland Natural Areas Study (1977) - "a stream and marginal wetland habitat area of unusual significance to a bird community." 3) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory - "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 10.7 acres; "estuarine, intertidal, flat" = 5.6 acres; "palustrine, forested, broad-leaved deciduous, temporary" = 9.0 acres.

LAND CONSERVATION

Ownership Type: Corporate, private (single)

Land Use: The tidal wetlands and wooded swamps are classified as Natural Features (Open Space). The eastern most portion of the uplands (Ecotype #5) is Residential-Low (1/2 - 2 units/ac.), and the western portion, Residential-Rural (1/2 or less units/ac.).

Residential Communities: Sunrise Beach, Herald Harbor, Valentine Creek

Problems: No major projects are pending. Proposed development includes 78 acres currently being developed as the Valentine Creek subdivision. However, of the 78 acres, over half will remain as either open space or for recreational use by the community. The remainder will be divided into 34 residential lots. Valentine Creek subdivision (plats 2-5) is registered with the County as no. F40-80. In addition, a single large lot on the northern shore of Valentine

Creek (adjacent to Ecotype #3) will be developed by a development company (minor subdivision no. 300-81). Ongoing impacts include scattered littering from adjacent communities.

Preservation Options: The tidal cove marshes are presently protected by State law. The Valentine Creek subdivision development company should be contacted immediately concerning their attitude and intentions for the open space and recreational areas.

Future Use: Passive recreation, outdoor education, and a wetlands wildlife reservation all appear to have merit.

SUBWATERSHED #20

Name: Plum Creek/Gumbottom Branch (Plumb Creek, 1846)

Location: Bounded by the Arden Pond and Cypress Branch subwatersheds to the north and the Valentine Creek subwatershed to the south. The subwatershed is in, and adjacent to the southern portion of Whitney's Landing Farm.

Natural Areas: This subwatershed includes one natural area: 1) Plum Creek/Gumbottom Branch.

NATURAL AREA #1

Name: Plum Creek/Gumbottom Branch

Geographical Limits: In general, this natural area is bounded by Sunrise Beach Road to the north, Herald Harbor Road to the south, General's Highway to the west, and the community of Sunrise Beach and Plum Creek (tidal tributary) to the east. Old Herald Harbor Road bisects this natural area.

Total Acreage: 682.0 acres

Ecological Classification: Environmental complex; this includes 10 ecotypes: 1) Tidal (cove) marsh; 2) Floodplain forest; 3) Ravine bottom; 4) Steep slopes; 5) Shrub swamp; 6) Steep slopes; 7) Floodplain forest; 8) Uplands and steep slopes; 9) Floodplain forest; 10) Uplands and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 2.0 acres

Flora: At the head of Plum Creek is a cove marsh consisting of cattail, common reed, smooth cordgrass, and arrow arum. Inland, a very thin shrub swamp sequence of red maple and swamp rose occurs.

Ecotype #2: Floodplain forest

Acreage: 12.0 acres

Flora: From the cove marsh (Ecotype #1) upstream to Miner Road is a relatively dry floodplain with localized areas of saturation. The floodplain, in general, increases in wetness downstream from Miner Road. The alluvial soils are, almost without exception, colonized by red maple trees (12-18 in. DBH). Skunk cabbage and cinnamon fern are frequent in the herbaceous layer. As soil conditions become more saturated in a downstream direction, river birch, alder, buttonbush, wild cherry, and blackberry occur.

Ecotype #3: Ravine bottom

Acreage: 2.0 acres

Flora: Just upstream of the cove marsh (Ecotype #1), on the north side of the Plum Creek floodplain, is a secluded side ravine with steep slopes and a flat, rich, and moist bottom. A handsome grove of tulip poplars (DBHs 18-24 in.) keeps the ravine under almost constant shade. The understory and shrub layers are almost nonexistent. The herbaceous layer is extremely rich and diverse. Species inlcude black snakeroot, tree club moss, Indian cucumber root, royal fern, evergreen woodfern, cinnamon fern, hayscented fern, sweet white violets, rattlesnake fern, and rattlesnake plantain orchid. The very steep, 60 ft. slopes forming this ravine support black oaks and scarlet oaks near the slope crest and on the 60 ft. terrace. Mature chestnut oaks and mountain laurel dominate the mid slope area. The canopy trees on the slopes and the very tall (100+ ft.) tulip poplars keep this ravine under almost perpetual shade and provide the micro-climatic conditions necessary to support a herbaceous layer of exceptional quality.

Ecotype #4: Steep slopes

Acreage: 9.0 acres

Flora: The broad, relatively gradual (5-15%) slopes flanking either side of the Plum Creek floodplain (Ecotype #2) support a very mature hardwood forest of uncommon character. The upper portions of these slopes are well drained and composed of relatively dry, sandy soils. These soils support chestnut oaks in the canopy layer and mountain laurel in the shrub layer. The middle portions of the slopes are characterized by sweet gum, tulip poplar, and white oak trees. The lower portions of the slopes, adjacent to the wet floodplain soils, support mature American holly, sour gum, and sweetbay magnolia trees and a herbaceous layer of wintergreen, clubmoss, cinnamon fern, evergreen wood fern, and royal fern. The American holly trees were the largest examples seen throughout field work for this report. The sour gums, although not exceptionally large (ca. 18 in. DBH), displayed extremely thick and weathered bark. The sweetbay magnolia trees are the largest examples known to exist in the Severn River watershed. Several magnolias are so large that they could potentially rival the current state champion. The consistently straight alignment of American holly, sour gum, and sweetbay magnolia trees of exceptional size along the slope/floodplain interface is a striking feature rarely seen in the watershed.

Ecotype #5: Shrub swamp

Acreage: 22.0 acres

Flora: Upstream (west) of Miner Road is a classic shrub swamp with a very dense and diverse vegetational assemblage. Soils in this swamp are saturated and small areas of standing water also occur. Plant species include willow oak, yellow waterlilies, red maple (extensive), river birch, swamp rose, alder (abundant), arrowwood, sweetbay magnolia (large), buttonbush, swamp azalea, American holly, burreed, bulrush, clethra, and

netted chain fern. The shrubs and trees appear to be very old, especially several sweetbay magnolias. Overall, the swamp is a thick, almost impenetrable layer of diverse shrub vegetation.

Ecotype #6: Steep slopes

Acreage: 37.0 acres

Flora: On either side of the shrub swamp are intact wooded slopes which act as a protective transitional zone for the swamp. These slopes are invaluable to the protection of the shrub swamp. More field work is needed in this ecotype.

Ecotype #7: Floodplain forest

Acreage: 37.0 acres

Flora: The floodplain of Gumbottom Branch upstream of Old Herald Harbor Road is an intact non-tidal wetland composed of mature hardwood trees. There are actually two large branches from Old Herald Harbor Road to Generals Highway which account for the 37 acres. More field work is needed in this ecotype.

Ecotype #8: Uplands and Steep slopes

Acreage: 207.0 acres

Flora: The area which drains into the floodplain of Gumbottom Branch is a contiguous intact woodland. More field work is required.

Ecotype #9: Floodplain forest

Acreage: 38.0 acres

Flora: The main branch of Plum Creek runs from the intersection of Herald Harbor Road and Generals Highway to the shrub swamp (Ecotype #5). The floodplain of this creek is an extensive lowland corridor of intact non-tidal wetlands (hardwood trees). Further field work is needed in this extensive natural area.

Ecotype #10: Uplands and Steep slopes

Acreage: 316.0 acres

Flora: The area which drains into the floodplain of Plum Creek is a contiguous intact woodland. More field work is required.

Natural Heritage Elements: None observed

Noteworthy Plant Species: 1) Rattlesnake plantain orchid - not commonly seen in the Severn River watershed.

Exceptional Trees

Big Trees: 1) Sweetbay magnolia - several examples should be officially measured for State Champion competition. 2) American holly - a few specimens ca. 16-18 in. DBH.

Old Trees: Sour gum - several examples displayed exceptionally thick and weathered bark and could possibly be as old as 150+ years; one particular tree could be as as old as 200 years.

Historic Features: The County Historic Sites Survey lists three sites in this natural area: 1) AA 178 - Part of Providence - a house built in the 1800s that is significant for its architectural style; described as being in "excellent condition, altered, and at its original site". 2) AA 180 - Stefanelli Tenant House - another 1800s house noted for its architecture. The condition of the building is described as "deteriorated, unaltered, and original site". 3) AA 181 - The Henry or Wanbaugh House - a 1700s house described as architecturally significant and in "good, unaltered condition and on its original site". On the point between Valentine and Plum Creeks, a "glass sand" site is noted on the 1878 map. The extent and historical significance of the mining works requires further research. Several old logging road embankments and cuts are still visible on the lower slopes (Ecotype #4) near the Plum Creek floodplain below Miner Road.

Archeological Features: 1) MHT site AN 119 - Gumbottom Branch - a shell and dark earth midden 75 x 20 ft. A Late Woodland Culture site. Rhyolite chips, shell tempered sherds, and fabric impressed sherds were collected. Described as a good place to do extensive work.

Wildlife: The shrub swamp (Ecotype #5) is a bird habitat of exceptional quality and size. Many different species were observed during field work. The size (682 acres) of the entire natural area makes it a valuable habitat for the larger indigenous animals which require extensive areas for survival.

Scenic Qualities: The small ravine (Ecotype #3) is scenic for its large, densely clustered, and remarkably straight tulip poplars, which (without a scale factor) resemble California redwoods. This, in combination with a rich and diverse herbaceous layer, an open understory, and very steep side slopes, provides an atmosphere of a secluded "hidding place". The floodplain of Plum Creek (Ecotype #2) is especially attractive due to the large and very old sweetbay magnolia, sour gum, and American holly trees which line the edge of the slope with amazing regularity.

Geology: Alluvium forms the floodplains, shrub swamp, and tidal marsh. The Magothy Fm. underlies the slopes bordering the shrub swamp (Ecotype #5) and Plum Creek floodplain (Ecotype #4). The Monmouth Fm. underlies the uplands and steep slopes at elevations between 60 and 100 ft. (msl). The Aquia Fm. outcrops on uplands and steep slopes at elevations greater than 100 ft. (msl). The glass sand mining works of the late 1800s were located on one of the southern most outcrops of the Magothy Fm. The shrub swamp (Ecotype #5) is an excellent example of "alluvial drowning" caused by Miner Road. Below Miner Road, Plum Creek is entrenched ca. one ft. into the floodplain floor. The difference in elevation on either side of the road is ca. 3 ft. From the size and age of the trees in the shrub swamp, and from the lack of evidence of recent ecotype change (i.e., dying or dead trees), the adjustments due to the placement of the Miner

Road embankment have been complete for some time. Miner Road was probably part of the old River Road to Whitney's Landing Ferry and may be as old as 150 years. Large shrub swamps that have been in ecotype equilibrium for many years are rare in the Severn watershed.

Soils: Mixed alluvial soils cover the floodplains. Swamp soils cover the shrub swamp and floodplain downstream of Miner Road. Evesboro loamy sands, Sassafras fine sandy loams, and Romford loamy sands cover the slopes and uplands at elevations less than 60 ft. (msl). Collington fine sandy loams cover the slopes and uplands greater than 60 ft. (msl) in elevation.

Topography: The uplands and steep slopes in Ecotypes #8 and #10 range in elevation from 185 ft. (msl) to 60 ft. (msl), and in general have steep (15%) and very steep (15-40%) slopes. The slopes bordering the shrub swamp and floodplain below Miner Road are only relatively steep (10-15%) and range in elevation from ca. 5 ft. (msl) to 60 ft. (msl). The shrub swamp is almost level at 8.0 ft. (msl) and the floodplain below (Ecotype #2) ranges in elevation from 5.0 to 0.5 ft. (msl).

Contiguity: There is some fragmentation within this large natural area. The sand pit just north of Cox Road, off Sunrise Beach Road, separates the shrub swamp (Ecotype #5) from the Gumbottom Branch floodplain and adjacent uplands (Ecotypes #7 and 8). A cleared area on the drainage divide between the Plum Creek and Gumbottom Branch subwatersheds and scattered residences along Old Herald Harbor Road separate Ecotypes #7 and 8 from #9 and 10. The very large Maynadier natural area to the south is separated from this natural area by only the new Herald Harbor Road and a few scattered houses along it. Wildlife species migration is probably only slightly disrupted by this. Combined, these two natural areas form a contiguous environmental complex over some 1300 acres. Considering the contiguous Hopkins Creek to Brewer Creek natural area to the south, the Gumbottom Branch/Plum Creek natural area forms the northern extent of the largest unbroken environmental complex in the Severn River watershed.

Other: There is a free flowing spring associated with archeological site AN 119. The U.S. Fish & Wildlife Service, National Wetlands Inventory (1979) lists a fresh water pond of ca. 2 acres in the Plum Creek floodplain (Ecotype #9). Field review - 7/9/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970) - recommended the floodplains of both Gumbottom Branch and Plum Creek and their immediate uplands as "natural use areas". 2) DNR Tidal Wetlands Boundaries (1970); "cattail, smooth cordgrass" = 2.0 acres. 3) The Upland Natural Areas Study (1977) - listed 21 acres of the shrub swamp (Ecotype #5). 4) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, flat" = 2.8 acres; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 3.8 acres; "palustrine, forested, broad-leaved deciduous, temporary, seasonal, seasonal tidal" = 88.7 acres; "palustrine, forested/scrub shrub, broad-leaved deciduous, seasonal saturated" = 11.0 acres; "palustrine, emergent, narrow-leaved persistent, temporary, seasonal" = 9.9 acres; "palustrine, open water, semipermanent, diked/impounded" = 2.0 acres 5) Natural Heritage Program (1983) - the shrub swamp (Ecotype #5) and its protective transitional zone (Ecotype #6) are recognized as a "ecologically sensitive area".

LAND CONSERVATION

Ownership Type: Private (multiple), 52 lot (< 1 ac.) owners in the natural area downstream of Miner Road. Private (multiple), 4 minor (1-5 ac.) landowners, 17 major (> 5 ac.) landowners; State and county government; community - in the area upstream of Miner Road.

Land Use: The floodplains and shrub swamp are classified as Natural Features (Open Space). The uplands and slopes upstream of Miner Road are listed as Residential-Rural (1/2 or less units/ac.). The slopes bordering the floodplain below Miner Road (Ecotype #4) are classified as Residential-Low (1/2 - 2 units/ac.).

Residential Communities: Sunrise Beach, Harbor Oaks, Waterbury Heights, Tall Timbers

Problems: No major projects are pending. Proposed residential development includes: 1) An addition to Waterbury Heights (major subdivision no. F223-82) which will cover 18 acres of the Gumbottom Branch natural area upstream of Herald Harbor Road. 2) Cavalier Estates and the Valentine Creek subdivision will cover c.a. 15 and 31 acres of the Plum Creek natural area (major subdivision numbers F1-74 and F40-80, respectively). No significant ongoing problems were observed, however, much of this natural area was not covered in the field. The impacts of the sand mining operation located upstream of the shrub swamp are unknown.

Preservation Options: The State-owned Whitney's Landing Farm covers c.a. 80 acres in this natural area; the State of Maryland should be encouraged to develop proper maintenance programs for this tract which insure its protection. The 52 landowners with lots surrounding the floodplain downstream of Miner Road may be receptive to conservation cooperatives. Major landowners should be contacted concerning conservation easements, mutual covenants, and conservation cooperatives.

Future Use: The shrub swamp (Ecotype #5) may be best used for a wetland wildlife reservation, scientific monitoring and, its present function, a natural stormwater management area. The extensive uplands, slopes, and floodplains upstream of the shrub swamp may be best suited for passive recreation, outdoor education, and a forest wildlife reservation. The slopes, ravine, and floodplain downstream of Miner Road may best be suited for a wetland wildlife reservation and a recognized species area.

SUBWATERSHED #21

Name: Arden Pond

Location: Bounded by the Plum Creek/Gumbottom Branch subwatershed to the south and the Cypress Branch subwatershed to the north. The subwatershed is completely within the community of Sunrise Beach.

Natural Areas: This subwatershed includes one natural area: 1) Arden Pond.

NATURAL AREA #1

Name: Arden Pond

Geographical Limits: Bounded by developed lots on the following streets within the community of Sunrise Beach: Shore Drive to the east and north, Omar Drive to the south, and Waterview Drive and Dockser Drive to the west. Immediately across the Severn River from the Rock Point natural area (the Bluff Point subdivision).

Total Acreage: 5.5 acres

Ecological Classification: Microsystem; this includes three ecotypes: 1) Freshwater pond; 2) Shrub swamp; 3) Ravine bottom.

Ecotype #1: Freshwater pond

Acreage: 0.5 acre

Flora: The freshwater pond, albeit small, is a fully functioning natural area with an intact fringe marsh around its perimeter. Spyradella and several other aquatic plants are abundant. Water willow, yellow waterlilies, and buttonbush are common along the edges of the pond.

Ecotype #2: Shrub swamp

Acreage: 0.7 acre

Flora: At the head of the pond is a shrub swamp consisting of swamp azalea, yellow waterlilies, and water willow.

Ecotype #3: Ravine bottom

Acreage: 4.3 acres

Flora: Upstream of the shrub swamp (Ecotype #2) is a steep sloped ravine which feeds the pond. The slopes and bottom of the ravine support an intact woodland. Further field work is required.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) Apparently, the pond owes its origin to glass sand mining; it was probably an old pit mined during the late 1800s.

Archeological Features: 1) MHT site AN 491 - sand mine site - a 19th century historic glass sand cave located at the base of the quarry pit (Arden Pond) in the side of a steep slope. The main room in the mine is 200 ft. wide. The main entrance (now sealed) was 40 x 6 ft. Another opening in the ceiling (possibly an air shaft) was 5 x 6 ft. The mine ceased operations in 1909, but the cave remained open for many years after. The mine is now sealed for safety reasons. Reports from the 1930s and 1940s make mention of light hookups, pick marks and grafitti dating back to the late 1800s.

Wildlife: A pair of muskrats were observed during field work, and apparently the pond is undisturbed enough to support a wide variety of wildlife.

Scenic Qualities: Although completely surrounded by residential development, the slopes of the pond and ravine are heavily wooded and houses are set far back from the slope crest. At the level of the pond little outside disturbance is noticeable. The natural area is also surprisingly trash free considering the close proximity of the adjacent development. The ravine and pond should be considered important scenic features for the community of Sunrise Beach.

Geology: The Potomac Fm. (sand-gravel facies) underlies on the lower ravine slopes; the Magothy Fm. underlies the upper slopes. The sediments of the Magothy and Potomac Fms. in the area were apparently free enough of impurities and high enough in silica content to be mined as "glass sand". This is the southernmost outcrop of the Potomac Fm. in the watershed.

Soils: Evesboro loamy sand soils cover the slopes of the ravine; mixed alluvial soils cover the shrub swamp.

Topography: The ravine bottom is between 3 and 10 ft. (msl). The ravine slopes are steep (15%) and range in elevation from 50 to 3-10 ft. (msl). The pond is at an elevation of 3 ft. (msl).

Contiguity: The natural area is completely isolated from others by the community of Sunrise Beach.

Other: The natural area should be considered important to the local community. Field review - 7/14/86.

Previous Listings: 1) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory; "palustrine, forested, broad-leaved deciduous, temporary" = 3.7 acre: "palustrine, open water, diked, impounded" = 0.3 acre.

LAND CONSERVATION

Ownership Type: Private (multiple), 19 lot (< 1 ac.) owners.

Land Use: Residential-Low (1/2 - 2 units/ac.)

Residential Communities: Sunrise Beach

Problems: No pending projects or proposed developments are known. Ongoing impacts include scattered littering from users of Arden beach located immediately across Shore Drive from the pond.

Preservation Options: Conservation cooperatives, possibly working through the Sunrise Beach Community Association, appear to be the most viable option.

Future Use: Possibilities include passive recreation, outdoor education, and stormwater management (current function).

SUBWATERSHED #22

Name: Cypress Branch

Location: Bounded by the Indian Creek Branch subwatershed on the north and by the Arden Pond and Gumbottom Branch/Plum Creek subwatersheds on the south.

Natural Areas: This subwatershed includes one natural area: 1) Cypress Branch.

NATURAL AREA #1

Name: Cypress Branch

Geographical Limits: Bounded by Evergreen Road to the west and north, the Maryland Veterans Cemetery and Severnview Drive (Arden on the Severn subdivision) to the south, and the Severn River to the east. A large portion of this natural area lies within State-owned property (Whitney's Landing Farm and the Veterans Cemetery).

Total Acreage: 48.7 acres

Ecological Classification: Complete ecotype: this includes four ecotypes: 1) Tidal (draw) marsh; 2) Floodplain forest; 3) Steep slopes; 4) Uplands.

Ecotype #1: Tidal (draw) marsh

Acreage: 0.7 acre

Flora: At the confluence of Cypress Branch and the Severn River is a draw marsh (Cypress Branch flows directly into the Severn and there is no tidal tributary typical of other subwatersheds). Marsh vegetation in this draw consists of cattail, common reed, and peltate pennyworts. Just inland from this intact wetland is a deltaic mudflat. This lobe of unconsolidated sediment at the mouth of Cypress Branch may indicate a recent increase in erosion and sediment transport in the upper parts of the subwatershed.

Ecotype #2: Floodplain forest

Acreage: 7.0 acres

Flora: Upstream of the draw marsh, rich and diverse nontidal wetland vegetation colonizes the floodplain floor of Cypress Branch. The floodplain upstream (west) of the State-owned Whitney's Landing Farm (ca. 1 acre) is highly disturbed. But from the State property line downstream, the natural area is undisturbed and intact. The uppermost part of the floodplain is much higher in elevation and there is no defined stream

channel. Vegetation here includes river birch (large), sycamore, and black walnut trees. Further downstream the soil moisture increases and the canopy changes to alders, red maple, and black willow trees. The shrub layer is very dense in spots and the herbaceous layer increases in diversity; this includes elderberry, dewberry, arrowwood, and jewelweed. Further downstream the soils become very wet and there is a well defined stream channel. Vegetation here includes sphagnum moss, spicebush, American holly, sweet pepperbush, alders, and cinnamon fern.

Ecotype #3: Steep slopes

Acreage: 28.5 acres

Flora: Intact wooded slopes border both sides of the floodplain through its entire length. Chestnut oaks are common on the crests of the slopes where soils are dry and well-drained. Further down the slopes, where soils are richer and wetter, tulip poplars and sweet gum trees are found. The lowest portions of the slopes are comprised of rich and moist soils, and tulip poplars dominate. At the interface between the floodplain and the slopes, sweet bay magnolia, sour gum, and American holly trees flourish. Rattlesnake fern, hay-scented fern, and New York fern are frequent herbaceous plants on the rich lower slopes. Wild sarsaparillia is abundant on the slopes near the draw marsh (Ecotype #1).

Ecotype #4: Uplands

Acreage: 13.0 acres

Flora: From the slope crest outward are very flat, sandy, and well-drained uplands. On State-owned property (Whitney's Landing Farm to the north and the Veteran's Cemetery to the south), the uplands appear to have been cutover in the recent past. The canopy layer here is composed of southern red oak, sweet gum, and chestnut oak trees, most of which are small (DBH ca. 6 in.). Downstream of the State-owned land, the uplands are much narrower but are intact and show little sign of disturbance. Vegetation is dominated by mature chestnut oak trees (DBH 18-24 in.) with abundant mountain laurel in the shrub layer.

Natural Heritage Elements: None observed

Noteworthy Plant Species: 1) Wild sarsaparillia - not frequently seen in the Severn River watershed.

Exceptional Trees: None observed

Historic Features: 1) The 1878 "Atlas of Anne Arundel County, Maryland" notes a stone quarry adjacent to Cypress Branch. This may have been a localized concentration of ironstone which was indurated from groundwater flowage through the Magothy Fm. The historic significance of this quarry requires further investigation. 2) The former ferry landing at Whitney's Landing (the terminus of River Road) was also adjacent to Cypress Branch, as depicted on the 1878 map. 3) About half way upstream on the branch, an old logging road embankment (and adjacent cuts in the slopes) crosses the floodplain. The embankment (ca 2 ft. in height) is still very much intact but appears not to have much impact on flow or sediment transport.

Archeological Features: 1) MHT site AN 118 - Sunrise Beach site - a small (100 ft. in diameter, 8 ft. deep) shell heap. Quartz and chert chips were collected.

Wildlife: Although no extraordinary wildlife observations were made, many different bird species, frogs, squirrels, and turtles were seen, and the natural area appears to be a diverse and well functioning wildlife habitat. The edge-effect caused by the Whitney's Landing Farm pasture greatly increases habitat diversity.

Scenic Qualities: The steep, chestnut oak-covered slopes near the draw marsh are a special attraction due to the proliferation of wild sarsaparillia.

Geology: The Magothy Fm. underlies most of the uplands and steep slopes. Alluvium occurs on the floodplain floor. The Potomac Fm. (sand-gravel facies) outcrops on the lowest elevations at the base of the floodplain slopes near the Severn River.

Soils: Bibb silt loam soils cover the floodplain. Collington fine sandy loam, Evesboro loamy sand, and Rumford loamy sand soils cover the steep slopes. Sassafras fine sandy loams cover the uplands.

Topography: The floodplain ranges in elevation from 35 ft. (msl) in its upper reaches to 2.0 ft. (msl) near its mouth. The gradient of this floodplain is steeper than the floodplains of most other branches in the watershed. The slopes (Ecotype #3) are steep (15%) and range in elevation from ca. 70 ft. (msl) to 2-35 ft. (msl). The uplands are flat (2-5% slopes) and range in elevation from 70-80 ft. (msl).

Contiguity: The pasture lands of Whitney's Landing Farm and the Veteran's Cemetery connect Cypress Branch to the Indian Creek Branch natural area to the north and the Gumbottom Branch natural area to the south. Although probably less conducive to wildlife migration than intact woodland, the pastures still offer wildlife an avenue to commute between the natural areas. Birdlife movement is probably impacted only slightly, and certain species may even prosper due to the open fields. Sunrise Beach Road, Evergreen Road, and a chain-link fence around the Veterans Cemetery are the only major obstacles to the movement of animals.

Other: On the shores of the Severn River, between Cypress Branch and the Arden Pond, there once were extensive tunnel-mining works. These mines, after abandonment, were apparently a local attraction for children, but also a safety hazard. These glass sand tunnels or caves (now sealed) are still an important feature of the Severn's heritage; a link between geology, history, and local commerce. More research on these caves should be conducted. A spring in a cliff face is associated with archeological site AN 118. Field review - 7/4/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970) - recommended the State-owned portion of Cypress Branch (as well as all of Whitney's Landing Farm) as a "natural use area". 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "palustrine, forested, broad-leaved deciduous, temporary" = 12.0 acres; "palustrine scrub shrub, broad-leaved deciduous, seasonal tidal" = 1.8 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 20 lot (< 1 ac.) owners, 2 major (> 5 ac.) landowners; State government.

Land Use: The downstream half of the floodplain (Ecotype #2) is classified as Natural Area (Open Space); the upstream half of the floodplain and its adjacent slopes and uplands are classified as Residential-Rural (1/2 or less units/ac.); the uplands and slopes bordering the downstream half of the floodplain are classified as Residential-Low (1/2 - 2 units/ac.).

Residential Communities: Sunrise Beach, Arden on the Severn.

Problems: No major projects or developments have been proposed. However, surveyor's flagging was observed on the uplands bordering the north side of Cypress Branch near the Severn. This may indicate future development of some kind. Ongoing impacts include 1) a cleared and otherwise highly disturbed area of the floodplain (Ecotype #2) just upstream of the State-owned portion; 2) Near the downstream portion of the floodplain, much trash, heavily used foot paths, and children's projects (treehouses, excavations, etc.) were observed; 3) Dumping on the Whitney's Landing Farm property at the edge of the adjacent subdivision.

Preservation Options: The State of Maryland should be encouraged to develop environmentally sensitive management plans for Whitney's Landing Farm. The lot owners should be contacted concerning conservation cooperatives (possibly through their community association). Conservation easements, mutual covenants, and conservation cooperatives may all be viable options for the major landowners.

Future Use: Outdoor education, passive recreation, and a buffer (its current function of separating adjacent communities) may be appropriate future uses for Cypress Branch.

SUBWATERSHED #23

Name: Indian Creek Branch (Indian Creek, 1769).

Location: Bounded on the north by the Sewell Spring Branch subwatershed and on the south by the Cypress Branch subwatershed.

Natural Areas: This subwatershed includes one natural area: 1) Indian Creek Branch.

NATURAL AREA #1

Name: Indian Creek Branch

Geographical Limits: In general, this natural area is bounded by Sunrise Beach Road and Evergreen Road to the southeast, Generals Highway to the southwest, Indian Landing Road and the Indian Landing Estates subdivision to the northwest, and Arlington Echo Outdoor Education Center and the Severn River to the northeast.

Total Acreage: 309.6 acres

Ecological Classification: Environmental complex; this includes seven ecotypes: 1) Tidal tributary; 2) Tidal (cove) marsh; 3) Shrub swamp; 4) Wooded swamp; 5) Floodplain forest; 6) Steep slopes; 7) Uplands.

Ecotype #1: Tidal tributary

Acreage: 6.0 acres (not included in the total acreage)

Flora: The tidal cove proper is relatively intact with a minor amount of development. The residential development that is present (save one house) is high up on the bank, well off the water, and hardly visible from the cove. An intact fringe marsh of smooth cordgrass, arrow arum, and cattail attests to the healthy nature of the cove.

Ecotype #2: Tidal (cove) marsh

Acreage: 1.6 acres

Flora: At the head of the tidal cove is an intact cove marsh with diverse vegetation and highly visible plant zonation. Plant species include arrow arum, cattail, smooth cordgrass, marshelder, groundselbush, and three square.

Ecotype #3: Shrub swamp

Acreage: 1.4 acres

Flora: Inland from the cove marsh is a classic example of a tidal shrub swamp. The soils in this swamp are totally saturated with pockets of standing water. Trees include red maple, magnolia, and poison sumac. Herbaceous and smaller shrub vegetation includes skunk cabbage (large and prolific), sweet white violets, high bush blueberry, and dewberry. Fallen red maple trees block the channel and stream valley in many places. Overall, the shrub thickets are extremely dense and almost impenetrable.

Ecotype #4: Wooded swamp

Acreage: 26.4 acres

Flora: Upstream of the shrub swamp for ca. one mile is an intact wooded swamp across the 200-300 ft. wide alluvial valley bottom. The vegetation in this swamp is clearly zonated in both an upstream (linear) and lateral (cross sectional) direction as a function of soil moisture. The vegetational diversity due to almost imperceptible changes in elevation and moisture is remarkable. The canopy trees in the swamp include Atlantic white cedar (large), red maple (stunted), magnolia, and poison sumac in the wettest downstream areas. Sweet gum, alders, sycamore, and black willows increase in frequency in an upstream direction. Shrub and herbaceous vegetation is very dense. Species include skunk cabbage (abundant), sweet white violets, sweet pepperbush, high bush blueberry, dewberry, greenbrier, swamp rose, club moss (abundant), sphagnum moss, floating marsh pennywort, cinnamon fern, arrowwood, and swamp azalea.

Ecotype #5: Floodplain forest

Acreage: 21.1 acres

Flora: With distance upstream, the soil moisture conditions become drier and the alluvial bottom vegetation changes from species tolerant of saturated conditions to floodplain species requiring slightly drier soils. The canopy layer is characterized by tulip poplar, sweet gum, beech, and sycamore. A thick understory of American holly, dogwood, ironwood, and magnolia occurs. Shrub and herbaceous vegetation are given almost constant shade because of the narrowing valley and canopy trees on the adjacent slopes. Species include hay-scented fern (abundant), sensitive fern, dewberry, running cedar, sphagnum moss (in isolated patches), Christmas fern, New York fern, Japanese honeysuckle, purple joe-pye weed, wintergreen, spicebush, and jack-in-the-pulpit. The soil conditions in the floodplain are very rich and moist.

Ecotype #6: Steep slopes

Acreage: 115.5 acres

Flora: The steep (15-40%) slopes bordering either side of the swamp and floodplain from Generals Highway to the Severn River are completely intact and display diverse vegetational assemblages. On the upper portions of the slopes near the crests, the soils are extremely dry, well-drained, and

sandy. Chestnut oak, mockernut hickory, saul oak (infrequent), sand hickory (infrequent), blackjack oak, white oak, black oak, and scarlet oak are trees tolerant of such conditions which are present. The understory is sparse and the shrub layer is characterized by mountain laurel, American holly (abundant), chinquapin, and sheep laurel (infrequent). Trailing arbutus is common in the herbaceous layer. The lower portions of the slopes have finer-grained soils which are moister and more fertile. Pitch pine, tulip poplar, beech, sweet gum, American holly, sycamore, sweetbay magnolia, and sour gum (at the swamp interface) are common trees. Silky dogwood and ironwood are understory trees. The shrub layer is sparse with sassafras and persimmon. The herbaceous layer is characterized by bracken fern, lady slipper orchid, climbing fern, Christmas fern, running cedar, and New York fern.

Ecotype #7: Uplands

Acreage: 143.6 acres

Flora: Outward from the slopes are very flat, dry, and sandy uplands. Southern red oak and post oak trees dominate. Many of these oaks are quite large (DBH ca. 24 in.).

Natural Heritage Elements: 1) Climbing fern - B2, highly State rare, in danger of extinction in Maryland. The station of climbing fern is 15 x 40 ft. in size and found in a drier than normal setting for this species. It is sparse throughout the station. 2) Floating marsh pennywort - C, State declining, watch list. 3) Sheep laurel - C, State declining. 4) Sand Hickory - C, State declining. 5) Chinquapin - C, State declining. 6) Atlantic white cedar - C, State declining, watch list; 12-15 occurrences, two are quite large.

Noteworthy Plant Species: 1) Saul oak - tree not commonly seen on the Coastal Plain of Maryland. Saul Oak is a crossbreed species, white oak and chestnut oak.

Exceptional Trees:

State Champion: 1) Two occurrences of Atlantic white cedar: a) CBH, 49 in., height, ca. 65 ft., spread, ca. 12 ft; b) CBH, 70 in., height, ca. 50 ft., spread, ca. 12 ft. Currently there is no State Champion Atlantic white cedar. The two large specimens in the Indian Creek Branch natural area are the two largest known to exist in the County. The DNR, Urban Forestry Division should officially measure each tree and declare the largest as State Champion until a bigger one is found. 2) A very large post oak tree occurs on Indian Landing Road in front of an older residence. The approximate measurements are, CBH, 11.0 ft., spread, 70 ft., height, 65 ft. Currently no State Champion post oak tree exists. The DNR, Urban Forestry Division should officially measure this tree and declare it as State Champion until a larger tree is found.

Old Tree: An American holly tree with a bark pattern and thickness that appeared to be very old was observed. Based on the development of the bark and the large size, this holly tree is probably at least 150 years old and could very well be 200 years.

Historic Tree: From the Generals Highway intersection east for ca. 0.75 mi. Indian Landing Road is lined with 22 very large and apparently old post oak and southern red oak trees. The exact origin and historical significance of these trees is not certain, but it is said that the grandfather of the late Fletcher Joyce, a prominent resident of the area, was especially protective of them. Further investigation into the age, origin, and historical significance of the Indian Landing Road "oak alley" is needed.

Historic Features: 1) The slopes (Ecotype #6) are laced with old logging roads (embankments and cuts). The entire floodplain and wooded swamp must have been logged at least once in the earlier part of this century. 2) A site of old bricks piled in a heap possibly could have been a farmer's well. The appearance of the bricks suggested that the site may be over 50 years old.

Archeological Features: None registered

Wildlife: The shrub swamp is an impressive bird habitat. Numerous different species, including pileated woodpecker, green heron, great blue heron, and warblers were observed. The shrub swamp and floodplain supports a significant deer population. Many signs of deer were observed.

Scenic Qualities: The extremely dense thickets of the shrub and wooded swamps produce a remote and isolated atmosphere in this natural area. The steep wooded slopes in juxtaposition with the well zonated cove marsh provide a dramatic contrast in topography and vegetation. Atop the slope crest at the head of the cove there is a dramatic vista which overlooks the gradations from cove marsh to shrub swamp to wooded swamp.

Geology: The Magothy Fm. underlies most of the uplands and steep slopes in the natural area. The Potomac Fm. (sand-gravel facies) outcrops at the lower elevations on the slopes near the Severn River. The Aquia Fm. and Monmouth Fm. occur in the upper portions of the subwatershed.

Soils: Bibb silt loam soils cover the floodplain and wooded swamp. Tidal marsh soils cover the shrub swamp and cove marsh. Evesboro sandy loam soils and sassafras fine sandy loam soils are found on the slopes. The uplands are characterized by Rumford loamy sand soils and Sassafras fine sandy loam soils.

Topography: The alluvial valley bottom of Indian Creek Branch drops in elevation from 50 ft. (msl) at Generals Highway to 0.5 ft. (msl) at the cove marsh. The slopes (Ecotype #6) are steep (15-40%) and range in elevation from 80 ft. (msl) to the level of the alluvial bottom (0.5 - 50 ft. msl). The uplands are flat (< 2% slopes) and range in elevation from 105 - 80 ft. (msl).

Contiguity: The Indian Creek Branch natural area is connected to the Cypress Branch natural area to the south by the open pastures of Whitney's Landing Farm. The Severn Run NEA to the north is connected by a smaller strip of woodland (uplands) between Arlington Echo and Indian Landing Estates. Evergreen Road (to the south) and Indian Landing Road (to the north) probably have only minor impacts on wildlife movement between these adjacent natural areas.

Other: Although not listed in the total acreage of this ecological complex, the wooded uplands (Ecotype #7) are bordered by extensive pastures and fields. These open areas are very important transitional zones which both protect and

enhance the natural area. Overall, the wildlife habitat due to the extensive linear footage of the pasture/woodland interface (the "edge effect") is greatly enhanced. Field review - 6/3/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970) - recommended the entire reach of Indian Creek Branch and adjacent slopes as a "natural use area". 2) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, red maple, ash, marshelder, groundselbush" = 2.3 acres. 3) Upland Natural Areas Study (1977) - described the extensive swamp as a rare natural area with unique species of plant and unsually scenic. 4) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine, intertidal, flat" = 1.8 acre; "estuarine intertidal, scrub shrub, broad-leaved deciduous/emergent, narrow-leaved persistent, seasonal saturated and irregular" = 3.7 acres; "palustrine, forested, broad-leaved deciduous, seasonal tidal, temporary, and seasonal" = 35.8 acres. 5) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: County government, State government; private (multiple), 34 lot (< 1 ac.) owners, 6 minor (1-5 ac.) landowners, 8 major (> 5 ac.) landowners.

Land Use: The shrub swamp (Ecotype #3), wooded swamp (Ecotype #4), and floodplain forest (Ecotype #5) are mapped as Natural Features (Open Space). The uplands and slopes on the south side of the tidal tributary are mapped as Residential-Low (1/2 - 2 units/acre). The remainder of the natural area is mapped as Residential-Rural (1/2 or less units/acre).

Residential Communities: Arden on the Severn, Indian Landing Estates

Problems: Major projects include the current construction of I-97 by the SHA which crosses the upper portions of this subwatershed. Sediment runoff from the construction site has the potential to be a problem. Proposed residential development includes 18 lots of Indian Landing Estates (no. F-4-77, plats 1 and 2); Two minor developments on the 16.9 acre tract strategically located between Whitney's Landing Farm and the Severn Run NEA (MS 122-80 and MS 86-065); one minor subdivision of 8 lots, MS-226-80; North Fork Property - 4 lots, MS 199-82. Ongoing problems include: 1) The overuse of Arlington Echo Outdoor Education Center. The 24 acres of the Center, much of which is in a natural state, is at capacity in reference to students and permanent structures. Additional acreage for expansion is desperately needed if the ecology of the Center is to remain in a natural state. 2) The 16.9 acre tract strategically located between Whitney's Landing Farm and the Severn Run NEA is under application for rezoning to smaller lot sizes. This property is the link between Arlington Echo, Severn Run NEA, and Whitney's Landing Farm. 3) Heavily traveled foot trails and some motorcycle traffic are minor problems in the floodplain (Ecotype #5) and drier parts of the wooded swamp (Ecotype #4). 4) Several deer stands and other signs of hunting were observed. Hunting with rifles with residences in close proximity could pose a potential safety hazard. 5) Two stormwater outfalls discharge into the wooded swamp but appear to be causing only minor impacts. 6) A very large drainage channel discharges into the wooded swamp. This channel carries runoff from the Jehovahs Witness Church parking lot. Excessive erosion of the channel banks is resulting in deposition of a lobe of sandy sediments at the confluence of the channel and Indian Creek Branch. Vegetation in this area of

ca. one acre is being transformed to species tolerant of more xeric conditions. 7) Houses in Indian Landing Estates back up to the crest of the slopes flanking the wooded swamp. However, the visual and ecological impacts are relatively minor.

Preservation Options: The State of Maryland should be encouraged to develop environmentally sensitive management plans for Whitney's Landing Farm. Conservation cooperatives could be pursued with lot owners of Indian Landing Estates and Arden on the Severn who have property bordering the natural area. The 16.9 acre tract separating the two large State properties is vital to any future plans of linking the Severn NEA and Whitney's Landing Farm. This property should receive top priority in future preservation initiatives. In 1986, in a letter to the County and State, the SRC urgently recommended this as one of five areas of environmental importance to be preserved through appropriate action. In this letter, the SRC stated, "We recommend purchase of approximately 50 acres of land bounded by Arlington Echo, Indian Landing Road (the edge of the NEA), and Whitney's Landing Farm and extending as far southwest as is feasible along the wooded stream corridor of the Indian Creek Branch. Easements to protect appropriate adjacent properties from tidewater to the upper watershed are highly desirable."

Future Use: The floodplain, wooded swamp and shrub swamp could become a wetland wildlife reservation and an identified species area. The slopes and uplands could become a forest wildlife reservation and a passive recreation area. Selected portions throughout the natural area are ideally suited for outdoor education. This natural area and other areas of Whitney's Landing Farm have great potential for expansion of the Arlington Echo Outdoor Education Center.

ISOLATED FEATURES

Geolgoy: A steep, isolated 189 ft. (msl) hill rises from the edge of open fields near the intersection of Sunrise Beach Road and Old Herald Harbor Road. The hill is dominated by a mature chestnut oak forest. Geologically, the hill is unique; it is the northernmost isolated outcrop (termed an "outlier") of the Monmouth Fm. in the County. The relief of the mount is dramatized by the extremely flat and cleared fields of the Magothy Fm. which surround it. The present landowner, should be contacted concerning the future use of the property. Preliminary contact with the landowner was positive in reference to preservation of the hill as a natural area.

Historic Features: The upper portion of the Indian Creek Branch subwatershed is wealthy in terms of historical sites. Eight sites are recognized on the County Historic Sites Survey. They include: 1) AA 884-Rosary manor; 2) AA 926 - Cecil/Bond House; 3) AA 883 - Dr. Harry Baldwin Gantt House; 4) AA 177 - Bunker Hill - an 1800s house signficant for its agriculture, architecture, commerce, and social/humanitarian assets. The house and grounds have always been well maintained. Outbuildings and slave quarters adjacent to the house are seldom seen in such good condition. The main house reflects growth of a family and the drastic change in fashion and means in the span of a century. The setting of Bunker Hill is of special note. It is situated on ca. 54 acres of cultivated land with various species of trees and plants. It is also significant for its association with William Henry Baldwin and the Baldwin Family who were prominent in the County and Baltimore as businessmen, politicians and philanthropists in the 1800s. Increases in highway expansion and associated development are

currently threatening the historic and rural character of the site. 5) AA 177A - Bunker Hill slave cabin - is described as in "good condition, altered, and on its original site". The early 1800s cabin is significant for its architecture and remarkable state of preservation. 6) AA 107 - Baldwin Memorial United Methodist Church - was built in 1890 and is the third church to stand on the site. It is a significant landmark of the Severn Cross Roads. The excellent condition, religious aspects, and architecture of the church are significant. Especially noteworthy is the stained glass window above the altar which was designed by Louis Comfort Tiffany. It was built with stone quarried from Maryland. 7) AA 108 - Cross Roads School House - built in 1850, the structure is significant for education and architecture. 8) AA 176 - Cross Roads Church, Parish Hall or the Baldwin Memorial Church. This church is significant for its architecture, religious background, and its function as a community entertainment and meeting place. The church was moved from its original site across Generals Highway but is still in good and unaltered condition. It is a good example of country church architecture combined with mid-19th century "Carpenters Gothic" detailing applied to a much earlier form. Its molded battens, tiny arches, and louvered vent shutters are creative and well executed embellishments of an 18th century church plan. The Indian Landing Boat Club is the only other isolated historic feature within the subwatershed.

SUBWATERSHED #24

Name: Three Islands

Location: Found near the upstream limits of the tidewater on the Severn River. Bounded on the south shore of the Severn by the Indian Landing Boat Club and Arlington Echo, and on the north shore by Ben Oaks.

Natural Areas: This subwatershed includes three natural areas: 1) Indian Landing Island I; 2) Indian Landing Island II; 3) Obrecht's Island.

NATURAL AREA #1

Name: Indian Landing Island I

Geographical Limits: Surrounded by the tidewater of the Severn River, this island is approximately 400 ft. due east of the Indian Landing Boat Club on the south shore

Total Acreage: 0.5 acre

Ecological Classification: Altered green area; this includes two ecotypes: 1) Upland; 2) Tidal (fringe) marsh.

Ecotype #1: Upland (Island)

Acreage: 0.4 acre

Flora: A high (3.0-4.5 ft. msl) plateau forming the central core and majority of the island is colonized by red cedars (15 ft. in height), pitch pine, wild black cherry, black locust, and persimmon trees. In total, there are about 15 trees, 20-30 ft. in height, which stabilize the island. Scrub pines, honeysuckle trumpet vine, and poison ivy are other forms of vegetation commonly found.

Ecotype #2: Tidal (fringe) marsh

Acreage: 0.1 acre

Flora: The perimeter of the island, especially the southern and western sides which are actively accreting, is colonized by swamp rose, swamp azalea, cattail, hightide bush, smooth cordgrass, and common reed.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: The "Carr Log House" was moved to the island by the Indian Landing Boat Club and is recognized by the County Historic Sites Survey as site AA 889. At the time of this writing, the house was being investigated by the County Historic Sites Surveyor. Currently there is no indication as to the age of the structure and it will be very difficult to date. Presently the house is "boarded up" and has not been occupied for some time, although it was until recently used by the Indian Landing Boat Club for organized social functions.

Archeological Features: 1) MHT site AA 117 - Indian Landing I - a Late Woodland shell heap which is interpreted to have been a small indian village or campsite. Jasper chips, sherds, lanceolate and side notched points of rhyolite, quartz chips, sand and tempered chord marked sherds, and quartz tempered sherds were artifacts found at this site.

Wildlife: An osprey was observed flying away from the island during the approach by canoe.

Scenic Qualities: Although the vegetation on the island has no special scenic qualities, the physical presence of a green landmass in the river provides a special dimension and depth, and adds to the geographical variety of the riverscape.

Geology: The core of the island is composed of a semi-consolidated and compacted clay, interbedded with lenticular lenses of sand. These deposits are comparable to sediments found on Obrechts Island (Natural Area #3) and the low river terraces at the very head of the Severn River. Indian Landing Island I probably represents remnants of a former Severn River floodplain deposited during the Pleistocene Epoch. The longest fetch length for wind generated waves is to the south and east of the island. The north and west sides of the island are relatively protected from waves due to the proximity (400 ft.) of the mainland. As a result, the highest energy zone of the island, the southeast tip, is actively eroding. Evidence for this includes an eroding and undercut ledge (3-4 ft. in height), exposed roots of trees protruding in the ledge, and a gravel beach (the finer grained sands having been winnowed away). Conversely, the north and east portion of the island is actively accreting. Evidence includes the formation of a broad sand spit and colonization by marsh vegetation. Overall it appears that erosion on the southeast tip is being approximately balanced by deposition on the northwest tip of the island. The island for the most part is in equilibrium in terms of surface area and is slowly migrating to the northwest.

Soils: The island is unmapped by the SCS, but it is quite probable that soils are similar to those found on the low river terraces at the head of the Severn River (i.e., Evesboro loamy sands).

Topography: The core of the island which covers ca. 80% of the land area is a very flat (0-1% slope) plateau ranging in elevation from 3.0 to 4.5 ft. (msl). The northwest tip of the island is a flat sand spit one ft. (msl) and less in elevation.

Contiguity: The island is completely separated from other natural areas. However, it may be attractive as a stopover point for large birds migrating between larger natural areas.

Other: The island is a significant landmark and point of reference for boaters on the Severn River, and apparently has been so throughout historic times. Field review - 8/1/86.

Previous Listings: None

LAND CONSERVATION

Ownership Type: Private (single)

Land Use: Unmapped - should probably be mapped under the Natural Features (Open Space) category.

Residential Communities: None

Problems: No major projects or residential developments are proposed for the island. Ongoing problems include minor stresses from recreational boaters, and the use of the island for social activity by the Indian Landing Boat Club. There is one screened-in picnic shed on the island which was built by the boat club for social activities. Overall, the island is in relatively good condition from a standpoint of trash, vandalisim, and general stress from the public. This may be due to the two large "no trespassing" signs and the close proximity of the owner - the boat club.

Preservation Options: Because of sole ownership by a long-established social club, conservation easements and mutual covenants are obvious options which may be relatively easy to pursue.

Future Use: Restricted sightseeing due to the unique nature of the island has potential. Because of the size of the island, overuse and stress could be a problem, however. Indian Landing Island I has potential as a permanent osprey nest site. Artificial nesting arrangements (e.g., a tall pole with a cartwheel on the top) have been successful elsewhere in the County. With public cooperation, artificial nest sites may also be successful here.

NATURAL AREA #2

Name: Indian Landing Island II

Geographical Limits: Surrounded by the tidewater of the Severn River, this island is approximately 600 ft. southeast of the Holly Farms peninsula and 850 ft. east of Indian Landing Island I.

Total Acreage: 0.06 acre (2,400 $ft.^2$).

Ecological Classification: Altered green area; this includes one ecotyped: 1) Beach.

Ecotype #1: Beach (Island)

Acreage: 0.06 acres

Flora: A 10 x 30 ft. area in the center of the island is stabilized by approximately 10 scrub trees, including black willow, wild black cherry, and black locust. Other vegetation includes poison ivy, trumpet vine and hightide bush.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None recorded

Archeological Features: 1) MHT site AA 116 - Indian Landing II - is a Late Woodland shell heap, which at the time of the survey was described as "extensive". Artifacts found at the site included New York sherds and triangular points.

Wildlife: No significant observations were made.

Scenic Qualities: The island is composed entirely of fine-medium grained, unconsolidated quartz sand and forms one of the most classic "bathing beaches" on the Severn. The scenic quality of the island's "clean" beach is an attraction for a multitude of recreational boaters who use (and overuse and abuse) the island for sunbathing, picnics, and bonfires.

Geology: The exact origin of the island is unknown. Its geographical position relative to a large meander scar on the north shore of the Severn, and the bathmetry of the river, suggest that the island is a remnant of a low-lying river terrace. The island may have been a point bar on the convex side of a meander bend in a Pleistocene-age Severn River. Indian Island II may have, until the recent past, looked much like Island I. The semi-consolidated sands and clays were, however, eroded, and what remains today are reworked, winnowed sands of a once more consolidated island.

Soils: This island is unmapped by the SCS, but probably should be classified as Coastal Beach soils.

Topography: The island is flat and ranges in elevation from sea level to 2.0 ft. at the vegetated center.

Contiguity: The island is isolated from other natural areas.

Other: Field review - 8/1/86.

Previous Listings: None

LAND CONSERVATION

Ownership Type: Private (single)

Land Use: Unmapped, but should probably be classified under the Natural Features (Open Space) category.

Residential Communities: None

Problems: There are no proposed projects or pending developments. Ongoing problems include overuse and abuse by recreational boaters who use the island for picnics, sunbathing, and bonfires. These boaters have left a tremendous amount of trash including literally 100s of beer cans. Broken glass and charcoal remains also mar the island's white beach. The vegetation on the island has been abused; there are broken and sawed branches and defoliated shrubs as evidence. Another, more serious problem is the rapid erosion of the island, which inpart is probably caused by the overuse and stress from boaters. Measurements made from aerial photography and topographic maps from the 1970s show the island as being 6,800 ft.^{2} or 0.16 acres in area and having an elevation of 5.0 ft. Observations made during field work in the summer of 1986 revealed that the island was only 2.0-3.0 feet in elevation and only 2,400 ft.^{2} or 0.06 acres in area. The unconsolidated material forming the island and the minimal amount of stabilizing vegetation make it highly susceptable to natural erosion processes and the destructive acts of man.

Preservation Options: Preservation of Indian Landing Island II will have to address the erosion and human abuse problems. At current erosion rates, the island may be gone in a relatively short period of time if measures are not taken. Measures such as vegetation "replants" and strict enforcement of "no trespassing" laws are possibilities, but will require the close cooperation of the Indian Landing Boat Club, the MD DNR, and others.

Future Use: Because of the extremely unstable condition of the island at this time, all future uses that are in anyway stressful to the island should be avoided. At such time as the island is stabilized and the sand is replenished, activities such as restricted sightseeing may be acceptable, but only under stringent enforcement of environmentally compatible regulations.

NATURAL AREA #3

Name: Obrecht's Island

Geographical Limits: Surrounded by the tidewater of the Severn River, this island is approximately 400 ft. due east of Pointfield Landing and 800 ft. northwest of the Indian Landing Boat Club.

Total Acreage: 6,000 ft.^{2} (0.14 acre)

Ecological Classification: Altered green area; this includes one ecotype: 1) Upland.

Ecotype #1: Upland (Island)

Acreage: 0.14 acre

Flora: Eight trees approximately 20 ft. in height form the nucleus of the vegetation on the flat plateau of the island. Species include blackjack oak, Virginia Pine, wild black cherry, and black locust. Hightide bush and smooth cordgrass form a fringe marsh which surrounds the island.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None recorded

Archeological Features: 1) MHT site AA 115 - Obrechts Island - is a shell and hard earth midden. Artifacts collected at the site include sherds, jasper chips, and cordmarked sherds. Pieces of shell from this midden were observed during field work.

Wildlife: No significant observations were made.

Scenic Qualities: Although the island is not especially scenic unto itself, the presence of a natural landmass in the middle of the river provides geographical variety and an added dimension to the scenic riverscape in the upper part of the Severn.

Geology: The island is composed of semi-consolidated clays and interbedded lenses of sand. The flatness of the island at a 5.0 ft. elevation; a highly weathered, deep, and well developed soil profile; lithologic similarity with other low river terraces; and the proximity to those terraces, suggests that Obrecht's Island is a remnant of a Pleistocene-age floodplain of the Severn River.

Soils: The island is unmapped by the SCS, however, the soils which are well developed, may be Evesboro loamy sands.

Topography: The island forms a small terrace, with a very flat surface at an elevation of 5 ft. (msl). A steep, in some places vertical, ledge around the perimeter accentuates the plateau character of the island.

Contiguity: The island is separated from other natural areas, but could function as a stopover point for birds of prey (e.g., osprey) that inhabit the lower Severn Run NEA area.

Other: Field review - 8/1/86.

Previous Listings: None

LAND CONSERVATION

Ownership Type: Private (single)

Land Use: Unclassified, but should probably be under the Natural Features (Open Space) category.

Residential Communities: None

Problems: No projects or developments are pending. Ongoing problems are relatively minor; almost no trash or other signs of human stress were observed. Evidence suggests that very minor amounts of erosion are occurring.

Preservation Options: Private, single ownership should make conservation easements, mutual covenants and conservation cooperatives attractive possibilities.

Future Use: Restricted sightseeing is a possibility. Obrecht's Island may have potential as a permanent osprey nest site. Artifical nesting arrangements (e.g., a tall pole with a cartwheel at the top) have been successful elsewhere in the County. With public cooperation, nest sites may also be successful on Obrecht's Island.

SUBWATERSHED #25

Name: Sewell Spring Branch

Location: Bounded by the Severn Run (Jabez Branch) subwatershed to the north and the Indian Creek Branch subwatershed to the south.

Natural Areas: This subwatershed includes one natural area: 1) Sewell Spring Branch.

NATURAL AREA #1

Name: Sewell Spring Branch

Geographical Limits: This natural area is bounded by Generals Highway and Robert Crain Highway (Route 3) to the west, Indian Landing Road to the south, the Severn River to the east, and Severn Run to the north.

Total Acreage: 346.7 acres

Ecological Classification: Ecological complex; this includes seven ecotypes: 1) Tidal (draw) marsh; 2) Shrub swamp; 3) Wooded swamp; 4) Floodplain forest; 5) Steep slopes; 6) Uplands; 7) Uplands and Steep slopes.

Ecotype #1: Tidal (draw) marsh

Acreage: 0.8 acre

Flora: The confluence of Sewell Spring Branch and the Severn River is not characterized by a tidal cove as is the case in most of the other large subwatersheds. The freshwater branch flows directly into the Severn, through a small draw marsh (a former tidal inlet now fully infilled with sediment). The draw marsh is characterized by swamp rose, arrow arum, arrowhead, rosemallows, cattails, smooth cordgrass, and common reed. The salinity of this marsh is much less than other cove marshes due to its proximity to the freshwater input of the Severn Run.

Ecotype #2: Shrub swamp

Acreage: 2.0 acres

Flora: Inland from the draw marsh (Ecotype #1) is a shrub swamp displaying vivid plant zonation, both in a lateral and upstream direction. The core of the shrub swamp is dominated by silky dogwood. To either side are open water areas colonized by waterlilies. Upstream, skunk cabbage, arrowhead, and rosemallows grade into small red maples, yam root, elderberry and cinnamon fern. The headward limit of the swamp is a 3 ft. wide "land bridge" (an earthen embankment once possibly used for a mill dam, logging

trail, or dirt road). The perimeter of the shrub swamp at the interface with the adjacent slopes is characterized by mature sour gum, pitch pine, and holly trees, with thick patches of greenbrier in the shrub layer.

Ecotype #3: Wooded swamp

Acreage: 4.0 acres

Flora: Upstream of the "land bridge" is an extremely dense wooded swamp with completely saturated soils and small patches of standing water. A majority of this swamp is located in an anomolous acurate "bight" in the side of the adjacent slope to the south. Vegetation in this "bog-like" swamp includes, red maple, magnolia, American holly, swamp azalea (very large), skunk cabbage, and sphagnum moss. The occurrence of skunk cabbage and sphagnum moss at the same location is very uncommon and implies a unique set of soil moisture conditions.

Ecotype #4: Floodplain forest

Acreage: 12.6 acres

Flora: Progressively in an upstream direction the elevation of the alluvial bottom increases and the water table drops. As this happens, American holly trees increase in size and sour gum trees begin to colonize the center of the floodplain. Further upstream, tulip poplars prosper in the canopy layer as do New York fern and club moss in the herbaceous layer. Even further upstream, as the valley narrows and the stream entrenches, tulip poplar (DBH 18-24 in.), sycamore, and white oak trees become well established on the drier floodplain soils. The narrowness of the valley and the shade offered by the tulip poplars produces very shady conditions and a rich herbaceous layer. Jewel weed, hay-scented fern and rattlesnake fern are very dense, while spicebush dominates the shrub layer.

Ecotype #5: Steep slopes

Acreage: 70.0 acres

Flora: Slopes bordering the floodplain forest (Ecotype #4) support mature trees with a diversity of shrubs and herbaceous plants. Near the base of the slopes, pitch pine, tulip poplar and white oak are found in the canopy layer. Lady slipper orchids, wintergreen, and trailing arbutus are found in the herbaceous layer. The upper portions of the slopes are drier and well drained and support chestnut oak, scarlet oak, sheep laurel, and mountain laurel.

Ecotype #6: Uplands

Acreage: 221.2 acres

Flora: On either side of the steep slopes (Ecotype #5) are wide expanses of very flat, sandy uplands supporting an intact forest. Southern red oak, Virginia pine, post oak, and blackjack oak are common trees. Chinquapin, and mountain laurel are typical shrub plants.

Ecotype #7: Uplands and steep slopes

Acreage: 36.1 acres

Flora: Very steep slopes and uplands bordering the Severn River are contiguous to the Sewell Spring Branch uplands (Ecotype #6). These uplands and slopes are very well drained and sandy. Pitch pines are very common, as are chestnut oaks. Blackjack oak, chinquapin, sheep laurel, trailing arbutus, scarlet oak, and Virginia pine are also plant species frequently found.

Natural Heritage Elements: 1) Chinquapin - C, State declining. 2) Sheep laurel - C, State declining. 3) Brown-fruited rush- B3, State rare; this observation was described as being located in "soft-bottom marsh near the head of Severn River and mouth of Severn Run". The brown-fruited rush was observed in 1951 and its present existence is questionable. 4) Red turtlehead -B2, highly State rare; this observation was described as occurring in "moist woods near the Severn River at Highway 301". Further inquiry and field observation is needed. However, the last sighting was in 1949 and the probability of the species still existing may be small.

Noteworthy Plant Species: None observed

Exceptional Trees:

Big Trees: Two pitch pine trees are listed on the Maryland "Big Tree Inventory": 1) CBH, 5 ft. 9 in., height, 70 ft., spread, 58 ft.; 2) CBH 7 ft., height, 63 ft., spread, 39 ft. In addition, two other large trees were observed during field work: 1) Sour gum, CBH, 90 in., height, 70 ft., spread, 60 ft.; 2) Shortleaf pine, CBH, 6 ft. 4 in., height, 85 ft., spread, 35 ft. The current State Champion shortleaf pine has dimensions of CBH, 9 ft. 10 in., height, 58 ft., and spread, 40 ft. The Shortleaf Pine should be officially measured by the DNR Urban Forestry Division for State Champion competition.

Historical Features: The County Historic Sites Survey records five historic structures in the subwatershed; two are within or immediately adjacent to the natural area. 1) AA 175 - Brooksby Point is an 18th century house of extreme historical significance. The structure itself is in good condition, altered and on the original site. It is important for its architecture and religious heritage. Brooksby Point is associated with the origins of the Methodist Episcopal Church in America. It was the home of John Sewell who used it as a Methodist meeting hall prior to formulation of the formal church. Bishop Francis Asbury preached in this house on occasion. The home is also an original land grant from Charles II in 1662. Sewell Spring Branch owes its name to the methodist paster who once called Brooksby Point his home. 2) AA 875 - Roscommon or John C. Green House - was constructed in 1917 and is in good condition, altered, and on its original site. Roscommon embodies characteristics of the transition between Queen Anne style and later 20th century movements. It was built by the Summerfields and Baldwins of Bunker Hill. 3) An old stone root cellar (?) made of locally indigenous ironstone was observed during field work. This stone foundation is inset into the side of a slope near the Severn River. The age of the site is unknown, but based on the type and condition of the brick it appeared to be at least 50 years in age. 4) Brookesby's Point, located at

the mouth of the Severn River, was a 1681 original land grant. There is some likelihood that a landing or bridge once existed at this point, and that it may have been the head of navigation at that time.

Archeological Features: 1) MHT site AN 114 - a quartz chips site.

Wildlife: The Sewell Spring Branch natural area, because of its exceptionally intact and completely undisturbed nature, provides an excellent habitat for wildlife, especially those species not tolerant of stresses of man. Species such as fox, owl, deer, hawk, osprey, great blue heron, and muskrat were observed during field work. Sewell Spring Branch should be noted for its value as a wildlife sanctuary for an abundant number a species as well as species that require large, undisturbed tracts.

Scenic Qualities: The view from atop the very steep slopes bordering the Severn River is dramatic due to the topographic relief and the opportunity to gaze both up and down the Severn for long distances. From the water, the steep wooded slopes form a large arcuate meander bend at the head of the Severn River and provides a broad panoramic scene. This wooded slope is one of the largest intact section of shoreline remaining on the Severn River.

Geology: The majority of the natural area is underlain by the Magothy Fm. The Potomac Fm., both the sand-gravel and silt-clay facies, outcrops on the lower portions of the slopes bordering the Severn River and along Sewell Spring Branch. The extensive arcuate meander bend at the head of the Severn River is geomorphic evidence which indicates the larger dimensions of the ancient river. A low (10-15 ft. msl) fluvial terrace, the tip of Brookesby's Point near the mouth of the Severn Run, provides evidence for the former elevation of the Severn's floodplain during the Pleistocene Epoch. Other remnants of this terrace include Pointfield Landing, Indian Landing Island I, and Obrecht's Island.

Soils: Sassafras fine sandy loam and Rumford loamy sand soils cover the steep slopes and uplands of the natural area. Bibb silt loam soils cover the floodplain of Sewell Spring Branch. The low fluvial terrace is characterized by Evesboro loamy sands.

Topography: The elevation of the very flat (0-2%) uplands (Ecotype #5) ranges from 80 to 107 ft. (msl). The slopes of Sewell Spring Branch and those bordering the Severn River (Ecotype #7) are very steep (15-40%) and range in elevation from 100 to 0 ft. (msl). The floodplain of Sewell Spring Branch is relatively steep, dropping from ca. 80 ft. (msl) at General's Highway to sea level at its mouth.

Contiguity: The Sewell Spring Branch natural area is connected to the Indian Creek Branch natural area by a narrow strip of woodland broken only by Indian Landing Road. To the north and west, the natural area is connected to the large wooded swamp at the head of the Severn Run. Route 3, however, probably has a significant impact on the interaction of wildlife species between the two areas.

Other: One of the most appealing aspects of this natural area is its almost complete intact nature. Between Generals Highway and the Severn River almost no influence of man is noticeable. The few foot trails that are evident show no signs of overuse or abuse and almost no litter or garbage was observed. The wooded uplands (Ecotype #6) are flanked by open pastures. The "edge effect" of

these open areas contributes significantly to the wildlife habitat of the natural area, as well as to increasing its effective size and providing a protective transition zone. The arcurate "bight" in the south slope bordering Sewell Spring Branch could have been a borrow area for fill used to construct the land bridge across the branch near its mouth. The borrow area formed an impoundment that progressively filled to become a fresh marsh/bog. It was later invaded by red maples, hence demonstrating succession. The "bight" may also be natural, having been formed by lateral erosion of the branch. Regardless of its origin, the "bight" is an interesting feature that has resulted in the formation of a unique "bog-like" wetland. Field review - 6/17/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970); recommended as a "natural use area". 2) Compendium of Natural Features (1975); the entire natural area was suggested as part of the Severn Run Natural Environment Area; 3) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass = 0.4 acre; 4) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "estuarine emergent, narrow leaved persistent, irregular" = 0.9 acre; "palustrine, forested, broad-leaved deciduous, temporary and seasonal tidal" = 20.1 acres.

LAND CONSERVATION

Ownership Type: State government; corporate; institutional; private (multiple), 1 lot (< 1 ac.) owner, 5 minor (1-5 ac.) landowners, 13 major (> 5 ac.) landowners.

Land Use: The natural area outside of the Severn Run NEA is classified as Rural Residential (1/2 or less units/ac.).

Residential Communities: Cedarcroft

Problems: Major projects that could impact the natural area include the construction of I-97 and the dredging (County Public Works) of the upper Severn River (for Pointfield Landing boat traffic). The latter could have a significant impact on the water quality of the draw marsh (Ecotype #1) as well as the wetlands at the mouth of the Severn River. Proposed development includes only one minor subdivision, a lot registered as MS-86-047. Ongoing impacts are very minimal.

Preservation Options: The ownership pattern (a small number of minor and major landowners) makes this natural area appealing for conservation easements, mutual covenants, and conservation cooperatives. Extension of the Severn Run NEA up the Sewell Spring Branch valley through acquisition is also a possibility.

Future Use: The natural area lends itself well to being utilized as a sanctuary, as well as for outdoor education (current function) and a forest and wetland wildlife reservation area.

ISOLATED FEATURES

Historic Features: Two structures located in the upper portion of the subwatershed (west of Generals Highway) are included in the County Historic Sites Survey. 1) AA 926 - The Cecil/Bond House; 2) AA 883 - The Dr. Harry Baldwin Gnatt House.

SUBWATERSHED #26

Name: Severn Run

Location: Bounded on the south by the South River watershed, on the west by the Patuxent River watershed, on the north by the Patapsco River watershed, and on the east by the Magothy River watershed.

Natural Areas: This large (24 mi.^{2}) subwatershed includes numerous natural areas located within the following smaller separate subwatersheds: 1) Picture Spring Branch, 2) Jabez Branch, 3) Wells Branch, 4) Broad Branch, 5) Delmont Road Branch, 6) Beaver Creek, 7) Reece Road Branch, 8) Jackson Grove Road Branch and 9) Barry's Branch.

Special Note: In 1980, CH_2M Hill prepared a comprehensive Watershed Management Plan of the Severn Run for Anne Arundel County. The present study will not cover the entire Severn Run subwatershed in detail because of time and manpower limitations and in an effort to avoid duplication of work. Until further detailed field investigation can be accomplished, the reader should therefore refer to the findings of the CH_2M Hill study, the majority of which is still appropriate. However, because of the imminent environmental stresses caused by two major highway construction projects (I-97 and Route 32) and other developments, and because of its extreme importance as a wildlife and fisheries habitat, the authors thought it necessary to include the Jabez Branch natural area in their detailed field review. The authors still recognize the remainder of the Severn Run for the tremendous role it plays in the water quality of the Severn River and the natural areas still present there. The largest of these natural areas is, of course, the Severn Run Natural Environmental Area (NEA). This 1400+ acre area was purchased through DNR Program Open Space funds and is now managed by the Maryland Forest, Park and Wildlife Service. The wildlife and fisheries habitat, water quality buffering, and recreation and outdoor education areas provided by the Severn Run NEA are extremely important to the environmental integrity of the entire Severn River watershed. In addition, the Severn Run subwatershed contains several significant historic areas which would be recognized. Some of these include the Jacob L. Dicus Grist and Sawmill (circa 1860); Pumphrey and Cecil's Grist and Sawmill (circa 1860); and the Billheimer Residence and Barn (circa 1800s). Several Natural Heritage plants (e.g., climbing fern-highly State rare, in danger of extinction in Maryland) are also known to occur. Because of the known natural areas, historic sites, threatened and endangered plants, and other important ecological and cultural characteristics in the Severn Run subwatershed, it should be an area of highest priority for field investigations that follow this study. For these investigations, the smaller subwatersheds (e.g., Picture Spring Branch) of the Severn Run provide a natural organizational framework similar to the one utilitized in this report.

NATURAL AREA #1

Name: Jabez Branch (includes a large tributary named Warfields Branch which bifurcates in a southeasterly direction, going under Route 3 to the headwater area near Route 32).

Geographical Limits: Bounded on the southeast by the Sewell Spring Branch drainage divide and Route 32, on the northeast by the Severn Run NEA, on the north and northwest by Dicus Mill Road, and on the southwest by Maryland Route 175.

Total Acreage: 1151.45 acres (118.9 acres within Severn Run NEA)

Ecological Classification: Ecological complex; this includes five ecotypes: 1) Floodplain forest; 2) Shrub swamp; 3) Freshwater ponds; 4) Steep slopes; 5) Uplands.

Ecotype #1 : Floodplain forest

Acreage: 131.2 acres (note, only 109.0 acres of this total, from Hog Farm Road to the Severn Run, was surveyed in the field). The remaining acreage includes the floodplain of Warfield's Branch between Route 3 and its confluence with Jabez Branch.

Flora: This 300-400 ft. wide floodplain is characterized by relatively dry soils, somewhat untypical for most Severn River floodplains. The canopy layer is composed of magnolia, red maple (abundant), river birch, tulip poplar, cottonwood, sycamore, sweet gum, American Holly, black oak, and bitternut hickory trees, which on average were 12 in. DBH. The entire floodplain appears to have been cutover at least twice in the last 150 or so years. The last time appears to have been in the early part of this century, probably for agricultural endeavors. Understory trees include ironwood, wild cherry, sweet gum, sliky dogwood, and American holly. The shrub layer consists of wild azalea, elderberry, chiquapin, sheep laurel, sweet pepper bush, green briar (abundant and large), and blueberry. The herbaceous layer is composed of skunk cabbage (abundant), sweet white violets, club moss, cinnamon fern (near seeps at the base of slopes), lady slipper orchid, mayapple, tearthumb, woodfern, and wintergreen. The lower portion of Warfield's Branch floodplain appears very wet in places, with dead tulip poplars standing in areas of ponded water.

Ecotype #2: Shrub swamp

Acreage: 30.0 acres

Flora: The shrub swamp located immediately upstream of Ecotype #1, between Maryland Route 32 and Hog Farm Road, is characterized by saturated soils, a water table at the surface, and areas of standing water. This "drowned alluvial valley" upstream of Hog Farm Road is characterized by alders, black willows, red maples (stunted), black gum, wild cherry, and bitternut hickory trees which on average are only slightly larger than shrubs. Tulip poplar trees that were observed were stunted or either dead or dying due to the saturated soil conditions. Plants found in the herbaceous layer include mushrooms, Indian cumcumber root, jack-in-the-pulpit, skunk cabbage, lady slipper orchid, sphagnum moss, woodfern, mayapple, tearthumb,

cinnamon fern, blueberry bush, sweet white violets and dewberry. The Severn Run Watershed Management Study (1980) recognized this shrub swamp as an environmentally sensitive area.

Ecotype #3: Freshwater ponds

Acreage: Three ponds, each less than 0.25 acre

Flora: Three freshwater ponds were created after runoff from the adjacent slopes was trapped between the toe of the slope and the embankment of the old Drum Point Railroad (circa 1880s). The water in these ponds is extraordinarily clear and free of suspended sediment (almost tanic in color). The fringe vegetation around the perimeter of these ponds is dominated by waterlily. Cattail and leatherleaf are other plant species found along the edges of these ponds.

Ecotype #4: Steel slopes

Acreage: 447.6 acres

Flora: Steep (> 15%) slopes which flank the floodplain of Jabez Branch and its major tributaries are very well drained and for the most part composed of rich soils. Mature hardwood forests dominate these slopes. Canopy trees include tulip poplar (lower portions of slopes), scarlet oak, chestnut oak, white oak, southern red oak, and pitch pine. These trees average between 12 and 18 in. DBH. Understory trees include flowering dogwood and fringe tree. Other vegetation includes field horsetail, mountain laurel, and pink azalea.

Ecotype #5: Uplands

Acreage: 541.9 acres

Flora: The relatively flat, sandy uplands in the subwatershed support mature forests composed of sand hickory, pitch pine, Virginia pine, sweet gum, post oak, mockernut hickory, and southern red oak trees. Shrub vegetation includes trailing arbutus, mountain laurel, black huckleberry, blueberry, and dangleberry. Portions of the uplands are composed of finer-grained soils, richer in nutrients. These areas are dominated by mature tulip poplar trees with fringe trees, and field horsetail in places.

Natural Heritage Elements: 1) Sheep laurel - C, State declining; 2) Chinquapin - C, State declining; 3) Leatherleaf - B3, State rare: 4) Sand hickory - C, State declining.

Noteworthy Plant Species: 1) Stiff club moss - "species protected in western states" (CH_2M Hill, 1980); 2) Fringe tree (Steiber, 1971 and Brown and Brown, 1972).

Exceptional Trees: None observed

Historic Features: The County Historic Sites Survey recognizes two sites within the Jabez Branch Natural Area and six additional sites within the subwatershed which are not included in the natural area proper (see Isolated Features for these six). 1) AA 879 - Edgar E. Adams Farm; 2) AA 889 - Johns Mills Farm.

3) The embankment of the Drum Point Railroad (circa 1887) runs down the eastern margin of the floodplain along the toe of the adjacent slope. The earthern embankment, which is 5-7 ft. high and 4-5 wide at the crest, crosses over to the west side of the floodplain near the Severn Run and heads upstream toward Dicus Mill Road. The embankment is still intact and a very prominent feature of the floodplain. The Drum Point Railroad was being built to shuttle resort commuters during the late 19th century. However, the venture went bankrupt and the railroad was never completed. The remains of the wooden pier railroad bridge over Jabez Branch is still intact and a very interesting engineering and historical feature.

Archeological Features: 1) MHT site AN 183 represents two archaic period hunting camps. Artifacts collected include nine archaic period arrows, seventeen rhyolite chips, five granite chips, one scraper, and one wood engraving tool. These two sites are interpreted as being camp sites for teams of Archaic Period hunters. These hunters used the steep valley slopes of Jabez Branch to their advantage. Beginning in the lower end of the floodplain floor, they chased game upstream into the range of bow hunters poised at the upper end of the valley.

Wildlife: Jabez Branch should be recognized as the only native brook trout stream in Anne Arundel County and the only one wholly within the Coastal Plain of Maryland. The uniqueness of this designation should be underscored considering the proximity of the fragil natural area to highly populated and rapidly developing commercial areas and transportation corridors (for a detailed inventory of the water quality and fisheries of Jabez Branch contact the Freshwater Fisheries section of the Maryland Tidewater Administration). However, the ability of the watershed to maintain its excellent water quality and to function as a true refugium for a vulnerable fish population will be severely tested over the next several years. Two major highway construction projects (I-97 and Route 32) within the subwatershed will place unprecedented stresses on the ecological equilibrium of the hydrological stream system and fisheries habitat. Efforts to protect this natural area (see Preservation Options) should be of highest priority considering the significant disturbances in the subwatershed. No significant terrestrial wildlife observations were made during field work, however, in the lower part of Jabez Branch (near the Severn Run confluence) many sightings of osprey have been made. Secondary signs of a significant deer population were also made. A large undisturbed natural area of this type which is contiguous to even larger undisturbed natural areas (i.e., the Severn Run NEA) is undoubtedly a very important habitat for many wildlife species.

Scenic Qualities: A footpath atop the crest of the Drum Point Railroad embankment offers a good vantage point to view most of the diverse wetland vegetation of the shrub swamp (Ecotype #2)upstream of Hog Farm Road. The sluggish, meandering, clear waters of Jabez Branch and adjacent small patches of standing water (also very clear) in the swamp are a sight not commonly observed in the Severn River watershed. The freshwater ponds (formed by waters trapped between the railroad embankment and the valley slopes) are important scenic features because of the dense and unsual wetland vegetation along the fringes of the ponds. The dark-stained, highly acidic waters of these ponds (dark tarns) are both somber and entrancing; they provide a visual experience which is unique to the watershed.

Geology: The majority of the uplands are underlain by the Magothy FM. The Potomac FM. is the second most common outcrop in the natural area. The upstream limits of the subwatershed and one section in the center of the subwatershed are underlain by the Monmouth FM. A broad wedge of alluvium forms the floodplain of Jabez Branch. The classic example of alluvial valley drowning and stream entrenchment caused by an embankment crossing a stream is found in the Jabez Branch floodplain. Hog Farm Road was probably built across Jabez Branch in the late 1800s or early 1900s. The earthen embankment across the floodplain has drastically altered the base level of Jabez Branch both upstream and downstream of the road. Upstream of Hog Farm Road, a thick wedge of unconsolidated sediments has been deposited and a shrub swamp has formed. The flat gradient of the floodplain caused by this alluvial drowning has forced Jabez Branch to become a sluggish meandering stream, not unlike the Severn Run near its mouth. Standing on Hog Farm Road, a 6-8 ft. drop to the downstream side of the embankment can be observed. This extreme gradient differential has caused Jabez Branch to entrench itself 5-7 ft. into the floodplain surface below the "dam". Insitu sediments of the Potomac Fm. (silt-clay facies) can be observed in the sides of the "trench" carved by Jabez Branch. In other words, the branch has eroded down completely through the alluvium covering the floodplain floor. The entrenchment of the branch has lowered the local water table in the floodplain and explains the relatively dry conditions untypical of most floodplains in the watershed. Jabez Branch has also deposited sandy berms on either side of its channel. These berms, formally called "natural levee ridges," are formed during floods as the water deposits its heaviest sediments immediately adjacent to the channel. These ridges are 6 in. to 2 ft. in elevation and have an impact on the type and distribution of vegetation in the floodplain.

Soils: Bibb silt loam soils are found in the floodplain of Jabez Branch. Sassafras fine sandy loams cover the majority of the slopes in the natural area. Rumford laomy sand soils cover the majority of the uplands. In general, the soils of the Jabez Branch subwatershed are finer grained and richer in nutrients than the dry sandy soils typical of the Severn Run watershed. These rich soils explain the occurrence of plant species commonly found in areas of richer soils in the lower part of the watershed.

Topography: The relatively flat uplands (2-5% slopes) range in elevation from 120-160 ft. (msl). The steep (> 15%) slopes flanking Jabez Branch and its tributaries range in elevation from 140 to 20 ft. (msl). The general gradient of the Jabez Branch floodplain, disregarding the Hog Farm Road anomalies, is about 56 ft./mi. (a drop from ca. 160 to 20 ft. over a length of 2.5 miles).

Contiguity: The Jabez Branch natural area is contiguous to the Severn Run NEA. The core of the natural area below Route 32 is fully contiguous and basically functions as part of the NEA. The outlying areas which are in a natural condition are somewhat fragmented, being separated by roads such as Gambrills and Route 32. The impact that these roads, especially Route 32, have on species migration is unknown.

Other: The freshwater ponds (Ecotype #3) are unique geomorphic features and support rare and unique assemblages of vegetation. These areas deserve special recognition. Jabez Branch has been formally recognized by the DNR as a natural trout stream. Field review - 6/7/86.

Previous Listings: 1) The Catalog of Natural Areas (1968) includes this natural area as part of the Severn River Headwaters area. 2) Scenic Rivers in Maryland (1970); a large portion of the Jabez Branch natural area was recommended for a "natural use area". 3) Compendium of Natural Features (1975); the downstream portions of Jabez Branch were recognized as ecologically significant. 4) Recommended Areas of Critical State Concern in Anne Arundel County (1977); a significant portion of the present natural area, as either nontidal wetlands or buffer area, was recommended as a critical for State concern. 5) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; 102.4 acres of nontidal wetlands mapped in 10 different classifications. 6) Severn Run Watershed Management Study (1980); three large areas mapped as environmentally sensitive. 7) Areas of Critical State Concern (1981); the lower portions of Jabez Branch are included as part of the Severn Run NEA. 8) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 13 lot (< 1 ac.) owners, 23 minor (1-5 ac.) landowners, 31 major (> 5 ac.) landowners; corporate; institutional.

Land Use: Natural Features (Open Space) in the Severn Run NEA; Rural Residential (1/2 or less units/ac.) makes up the remainder of the natural area, expect for the area between Routes 32 and 175 and Gambrills and Burns Crossing Roads which are Low Residential (1/2 - 2 units/ac.).

Residential Communities: Gambrills, Cecil Avenue, Bretton Woods, KOA Campground

Problems: Jabez Branch is currently one of the most stressed subwatersheds in the Severn River in terms of man's activity. It will continue to undergo much stress for at least several years. Major projects either ongoing or proposed include: 1) The current construction of Interstate 97 and its impact on sedimentation. 2) The pending expansion of Maryland Route 32 which will involve 4-laning the present 2-lane highway where it crosses Jabez Branch. This will involve construction immediately within the confines of the Jabez Branch floodplain. 3) The possibility still exists that a borrow site for I-97 fill material will be located within the subwatershed (past attempts to use a tract between Route 32 and Hog Farm Road for excavation purposes were averted). 4) Currently, a large pasture off Hog Farm Road contains what appears to be large underground storage tanks (the type used by gasoline stations). Further investigation into these tanks, plans for their ultimate fate, and possible toxic runoff into Jabez Branch should be investigated. 5) Currently, project planning for the upgrading of Maryland Route 3 from Route 450 to Route 32 is underway by the SHA. The northern reaches of this project will be in the Jabez Branch subwatershed. The following residential developments have been proposed in and immediately adjacent to the Jabez Branch Natural Area:

Type	Registration No.	Lots
Minor Subdivision	86-143	1
Minor Subdivision	192-79	1
Major Subdivision	223-81 (property 1)	
Major Subdivision	223-81 (property 2)	
Major Subdivision	F 148-76	Sec. 1
Major Subdivision	F 148-76	Sec. 3 (plat 1)
Major Subdivision	F 148-76	Sec. 4
Major Subdivision	F 148-76	Sec. 5 (plats 1-3)
Minor Subdivision	14-81	Parcel A
Minor Subdivision	13-8	Parcel B
Minor Subdivision	203-81	1
Minor Subdivision	248-81	1 (parcel 2)
Minor Subdivision	248-81	1 (parcel 5A-H)
Minor Subdivision	248-81	1 (parcel 6)

Ongoing problems in the natural area include: 1) severe dumping (trash, cars, major appliances, etc.) in the ravines of two major tributaries to Jabez Branch (at the point where these tributaries cross Hog Farm Road). 2) Noise problems in the upstream part of the shrub swamp (Ecotype #2) from cars passing at high speeds on Route 32; the noise however, becomes imperceptible further downstream near Hog Farm Road. In general, it can be said that the core of the natural area (Ecotypes #1 and #2) is in a relatively undisturbed condition.

Preservation Options: State acquisition of at least the core (Ecotypes #1 and #2) of the Jabez Branch natural area for inclusion as an expansion of the Severn Run NEA is a possibility. In light of extreme development pressures forecast for Jabez Branch, acquisition may be the most prudent option. If acquisition of the core area does take place, every effort should be made to contact landowners (especially the critical ones) of adjoining areas about conservation easements, cooperatives, and mutual convenants. In 1986, in a letter to the County and State, the SRC urgently recommended this area as one of five environmentally important areas to be preserved through appropriate County and State action. In the letter the SRC stated, "we recommend that approximately 200 acres of contiguous land in the Jabez Branch watershed be acquired to extend the Natural Environment Area to Route 32 at this time." The letter also recommended that "every advantage be taken of other opportunities for acquisition and protective agreements in the Severn Run watershed."

Future Use: As part of the Severn Run NEA, Jabez Branch would be ideal for outdoor education, and passive recreation.

ISOLATED FEATURES

Historic Features: Six structures are recognized by the County Historic Sites Survey: 1) AA 170 - Billheimer Residence - is a 19th century building (and barn) described as being in "good condition, unaltered, and on its original site". It is significant for its architecture. 2) AA 744 - Frame Cabin - is another 19th century structure which is in "good condition, altered, and on its original site". 3) AA 876 - Church of God of Anderson (Indiana) - was built in 1921 and is recognized as being significant as a relatively unaltered version of the small, rural church. 4) AA 878 - the Schaub House. 5) AA 886 - Earl Patterson House and shed. 6) AA 887 - Emory L. Wilburn Farm.

Problems: Because of its proximity to intense areas of construction, Warfield's Branch will be impacted by the I-97 project more so than other areas in the Jabez Branch subwatershed. The lower portion of Warfield's Branch appears to be very wet in places, with dead and dying tulip poplars in areas of standing water.

SUBWATERSHED #27

Name: Pointfield Branch (a small intermittent stream flows through the Pointfield Landing Recreation Area and into the Severn; although no name officially exists, the name "Pointfield Branch" is herein suggested)

Location: Bounded by the Severn Run watershed on the west and the Bear Branch subwatershed on the east. Generally, this small subwatershed is located to the east of Maryland Route 3, to the south of Benfield Road, to the west of Pointfield Landing, and to the north of the mouth of the Severn Run.

Natural Areas: This subwatershed includes one natural area: 1) Pointfield Landing Recreation Area and environs.

NATURAL AREA #1

Name: Pointfield Landing Recreation Area and environs

Geographical Limits: Bounded by Benfield Road to the north, 11 developed lots on Old Orchard Circle and Point Field Drive (Pointfield subdivision) to the east, the Severn River to the south, and the eastern boundary of the Severn Run NEA and three platted but undeveloped lots of the proposed Pointfield West subdivision to the west.

Total Acreage: 12.7 acres (5.6 of which are in the Pointfield Landing Recreation Area)

Ecological Classification: Complete ecotype; this includes six ecotypes: 1) Tidal (draw) marsh; 2) Shrub swamp; 3) Wooded swamp; 4) Floodplain forest; 5) Steep slopes; 6) Uplands.

Ecotype #1: Tidal (draw) marsh

Acreage: 1.3 acres (within the Severn Run NEA)

Flora: Located at the mouth of Pointfield Branch is a draw marsh recognized by the DNR Tidal Wetlands Boundaries (1970) as "smooth cordgrass, cattail, groundselbush, marshelder."

Ecotype #2: Shrub swamp

Acreage: 0.5 acre (the boundary between the draw marsh, Ecotype #1, and this shrub swamp is the approximate boundary between the Severn Run NEA to the south and the Pointfield Landing Recreation Area to the north)

Flora: Upstream of the draw marsh (Ecotype #1) and located at the approximate center of a broad lowland (alluvial fan) forming this natural area is a shrub swamp. Characterized by a dense shrub growth of arrowwood, elderberry and other shrubs, it also contains many black willows.

Ecotype #3: Wooded swamp

Acreage: 0.8 acre

Flora: This ecotype is marked by standing water and a forest canopy of red maple. The acidic soils flanking the base of the adjoining slopes contain sweetbay magnolia and cinnamon fern.

Ecotype #4: Floodplain forest (as a geomorphic landform, the southern half of this ecotype should be considered an alluvial fan, the northern half a ravine)

Acreage: 5.5 acres

Flora: Upstream of the wooded swamp (Ecotype #3), an area paralleling Pointfield Branch is subject to overflow of stormwater and, as a result, rich topsoil carried from the upperslopes (Ecotype #5) has been deposited. These soils support sycamore, river birch, ash (white or green), and red maple. A separate ravine system which carries very large volumes of stormwater from Route 3 also is responsible for great amounts of sandy subsoil being deposited on the southwestern part of the floodplain (alluvial fan). This is a destructive process and, as such, plant reproduction is spotty, with a scattering of weedy species. Pitch pines, which probably marked the lower end of this floodplain are dying out. Upstream from the alluvial fan, the floodplain transforms into more of a ravine bottom. The soils are sandier and better drained, and plant growth is more typical of rich soils than wet ones. Tulip poplar is, by far, the dominant tree. A few intolerant species, such as blackcherry, are found, but are rapidly declining under the increasing tuliptree canopy. Other woody plants include black haw, spicebush, flowering dogwood and a few small hickories, probably pignut. Japanese honeysuckle is well established, but not a nuisance.

Ecotype #5: Steep slopes (the northeast facing slopes are formed by 3 platted, but as yet undeveloped, lots in the proposed Pointfield West subdivision; the southwest facing slopes are formed by the wooded portions of 11 developed lots in Pointfield Landing)

Acreage: 4.3 acres

Flora: The southwest facing slopes of the ravine are characterized by very sandy soils which are excessively drained, acidic and of rather low fertility. This area was heavily cut over perhaps 40 to 50 years ago, resulting in a fairly dense growth of mixed oaks. Chestnut oak, the dominant tree, sprouts readily from the stump, explaining the many multiple-trunked examples. A typical section, extending downslope, would include, in order: Virginia pine, scarlet oak, black oak, chestnut oak, black huckleberry, southern red oak, mountain laurel, white oak, American holly and finally, tuliptree. The opposite northeast facing slopes support some rather handsome examples of various oaks, especially black oaks. Chestnut and scarlet oaks are less dominant trees, and Christmas fern grows

in the cool, shady coves. The transitional area between the dry slopes and the wet floodplain (Ecotype #4) and wooded swamp (Ecotype #3) has soils which are more moist than those of the slopes, but drier than those of the floodplain and swamp. Sour gum, greenbriar, clethra, and highbush blueberry is especially characteristic in this area. American holly, red maple, and tuliptree are quite common, the larger specimens often arching out over the lower swamp growth.

Ecotype #6: Uplands

Acreage: 0.3 acre

Flora: A nearly imperceptible ridge extends across the floodplain (Ecotype #4) and was apparently used as a logging road long ago. Plant growth on this interesting landform is similar to the transitional area between the slopes and the floodplain. Mixed oaks, red maple, and a very heavy growth of shrubs and greenbriar are common. Two species of clubmoss were also noted. Though the uniform margin of this lineation suggests that it might be the work of man, the overall breadth and silty nature of the deposit indicates that it is not. This rise partially dams the valley, and evidence of recent ponding was noticed. A deep stream channel which skirts the margin of this deposit appears to be slowly lengthening, thus permitting stormwater, with its load of silt and sand, to be carried to tidewater.

Natural Heritage Elements: 1) Sand hickory - C, State declining; 2) Sheep laurel - C, State declining.

Noteworthy Plant Species: 1) Cranefly orchid - "uncommon on the Coastal Plain (Brown and Brown, 1984).

Exceptional Trees: None observed.

Historic Features: The low embankment that crosses the lowland (Ecotype #6) near the Severn River is likely a remnant of agricultural/logging days and requires further investigation.

Archeological Features: None registered

Wildlife: Both osprey and great blue heron were observed adjacent to the mouth of Pointfield Branch. In general, this natural area appears to be an exceptional bird habitat.

Scenic Qualities: The subtle changes in topography and corresponding changes in soil moisture, texture, and fertility produce outstanding vegetational transitions which are quite alluring. Standing at the apex of this natural area (Ecotype #2, the shrub swamp) one can observe the distinct alignment of the horseshoe-shaped uplands and the gradual rise of the lower level vegetation which colonizes the alluvial fan inside of the "horseshoe."

Geology: The Magothy Fm. underlies the steep slopes (Ecotype #5). Technically the remainder of this natural area is alluvium. The majority of this natural area appears to be an arcuate meander scar created by lateral erosion of the Severn Run, probably during the last glacial period (low stand of sea level) of the Pleistocene Epoch. Subsequently, this meander "bight" has been infilled as

a large alluvial fan from deposits carried by Pointfield Branch. Depositional processes forming this fan have probably increased dramatically over the last 150 or so years (due to both agricultural clearing during the late 1800s/early 1900s and, more recently, urbanization).

Soils: The alluvial fan area (Ecotype #s 1-4) is mapped as Bibb silt loam soils. The upper portion of the floodplain (Ecotype #4, the ravine bottom) and the steep slopes are mapped as Evesboro and Galestown loamy sands (12-40% slopes).

Topography: The broad alluvial fan (Ecotype #s 1-4) ranges in elevation from sea level at the Severn River to 18 ft. (msl) at the point where the floodplain (Ecotype #4) is confined to a ravine bordered by steep slopes (Ecotype #5). From this point to Benfield Road, the ravine bottom rises quickly to 54 ft. (msl). The steep (15-40%) slopes (Ecotype #5) rise abruptly from the ravine floor to ca. 80 ft. (msl).

Contiguity: This natural area is fully contiguous to the Severn Run NEA to the west and south (across the Severn River).

Other: Alluvial fan vegetational sequences such as the one displayed in the Pointfield Landing Recreational Area are most uncommon in the Severn River watershed. The subtle changes in topography and thus edaphic conditions illustrate a fine example of an intact series of lowland plant progressions. The natural area should be recognized as having considerable aeshetic value to adjoining lot owners. Its capacity for stormwater control helps protect the water quality of the Severn River as well. Recent development trends in the area also suggest that this natural area will become increasingly important as a green buffer, shielding the Pointfield Landing Community from the noise and other impacts of neighboring subdivisions. Field review - 6/19/86.

Previous Listings: 1) Scenic Rivers in Maryland (1970) recommended the entire subwatershed as a "natural use area". 2) The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory mapped 1.7 acres as "palustrine, forested, broad-leaved deciduous, seasonal (and temporary)".

LAND CONSERVATION

Ownership Type: Private (multiple), 14 lot (< 1 ac.) owners; community (subdivision).

Land Use: The entire natural area is mapped as Natural Features (Open Space).

Residential Communities: Pointfield Landing

Problems: No major projects or proposed developments are recorded for the natural area proper; however, increased runoff with construction of I-97 could have a significant impact on this natural area. Ongoing problems include: 1) storm drains which cause some scouring, but do not greatly threaten the site unless the volumes should be increased; 2) littering, as evidenced by a fair amount of trash noticed during field work; and 3) growth of Japanese honeysuckle (a non-native species) which is not a significant nuisance.

Preservation Options: The surrounding slopes (Ecotype #5) of this lowland corridor are essential to the scenic integrity and ecological diversity of the site. The southwest facing slopes are formed by the "green" (back) portion of 11 developed lots in Pointfield Landing. The owners of these adjoining lots should be contacted concerning conservation cooperatives. The northeast facing slopes are formed by three platted, but as yet undeveloped, lots of the proposed (1981) Pointfield West subdivision. The development company which owns these lots has expressed a desire to develop them in the future. The status of this subdivision should be updated and confirmed. Cooperative efforts with the development company should be pursued immediately. The Pointfield Landing Community Association should also be contacted concerning future management or other plans for the recreational area. Such things as a clean-up campaign, guided nature walks, nature appreciation programs for the young, and an overall program for development of community education, interest, and support for the natural area are possibilities.

Future Use: The area could be designated as a stormwater management area (its current valuable function). Outdoor education and passive recreation may also be viable future uses.

ISOLATED FEATURES

Historical Features: A blacksmith shop of unknown age was located in the subwatershed.

Archeological Features: 1) MHT site AN 113 - Obrecht's - covers a 1000 ft. long and 100 ft. wide area. It was a triple occupation village covering the entire Woodland Period. Artifacts found include net impressed cord marked, chick-ahoming plain, and fabric impressed sherds; points, chip; and bone fragments.

SUBWATERSHED #28

Name: Bear Branch (this name is much used, but no official map source exists for substantiation).

Location: Bounded by the Pointfield Branch subwatershed to the west and the Cool Spring Branch subwatershed to the east. Generally, this large subwatershed is located to the east of the Pointfield Landing and Hillendale subdivisions and Maryland Route 3, to the west of the Ben Oaks and Quail Run subdivisions and Governor William Stone Parkway, and to the north of Larbo Road.

Natural Areas: Little detailed field was conducted in this subwatershed and specific information on its natural areas can not be given.

ISOLATED FEATURES

Natural Heritage Elements: 1) Lobaria evencirans (a lichen) - C, State declining. Said to be located at Bent Oak near Benfield. The species was last observed in 1915.

Archeological Features: Three MHT sites: 1) AN 344 - a subaqueous site dredged at the mouth of Bear Branch; a Woodland Period site described as a drowned low terrace; triangular points were found. 2) Quad File site No. 5 - T.D. Jones collection (1901). 3) Quad File site no. 3 - Rev. Ft.

Wetlands: The DNR Tidal Wetlands Boundaries (1970) recognizes a draw marsh at the mouth of Bear Branch; "smooth cordgrass" = 0.5 acre. The U.S. Fish & Wildlife Service (1979), National Wetlands Inventory also maps this draw marsh; "estuarine intertidal, narrow-leaved persistent, irregular" = 0.5 acre. In addition, they recognize the floodplain forest of Bear Branch upstream of the draw marsh; "palustrine broad-leaved deciduous forests and shrub swamps" = ca. 15 acres.

Previous Listings: Scenic Rivers in Maryland (1970). The portion of the subwatershed south of Bennfield Road was recommended as a "natural use area".

Problems: A portion of the Bear Branch stream valley below Old Benfield Road has been altered by installation of a sewer line. However, natural vegetation is slowly regenerating in this area and a "hands-off" policy is essential to allow natural recuperation to continue.

SUBWATERSHED #29

Name: Cool Spring Branch (this is thought to be the correct name, but no official map source exists for substantiation.

Location: Bounded by the Bear Branch subwatershed to the west and the Chartwell Branch subwatershed to the east.

Natural Areas: Little detailed field work was conducted in this subwatershed and specific information on its natural areas can not be given. A small wetland area above about Benfield Blvd. warrants additional field work.

ISOLATED FEATURES

Historic Features: 1) AA 900 - Col. Myers House - is listed on the County Historic Sites Survey.

Archeological Features: 1) MHT site AN 112 - Ben Oaks/Cool Spring Cove Site - is an Early, Middle - Early, Late Woodland Period site which was a small village or campsite. Artifacts found include sherds, lanceolate and side notched points of rhyolite, quartz chips, sand tempered cordmarked sherds, and quartz tempered plain sherds.

Previous Listings: Scenic Rivers in Maryland (1970). The subwatershed south of Benfield Road was recommended as a "natural use area".

Problems: Nearly the entire stream corridor has been destroyed. Flow in the lower portion is discharged via an underground pipe.

SUBWATERSHED #30

Name: Chartwell Branch (this name is suggested, but no official map source exists for substaintiation).

Location: Bounded by the Cool Spring Branch subwatershed to the west and the Stevens Creek subwatershed to the east. Chartwell Branch originates at a small silted-in pond beyond St. Ives Drive and then flows through two ponds on the Chartwell Golf Course. The branch continues through the remnant of Seviers Millpond and thence to the Severn. Generally, the subwatershed is located to the east of the communities of Chatham Hills, Chartwood, Shirleys Choice, and Fox Hollow; and to the west of the communities of Hampton Manor, Kilmarnock, and Chartwell.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be made. The upper portion of a relic millpond is bordered by pitch pines. The waters of the shallow pond are dark stained and the pond has promise as an interesting botanical site. Additional field work is recommended.

ISOLATED FEATURES

Natural Heritage Elements: 1) Atlantic white cedar - C, State declining. This small grove occurs near the mouth of Chartwell Branch.

Historic Features: 1) Chartwell Branch was the site of C.R. Sevier's water-powered sawmill (1878). The relic millpond is still readily apparent. 2) Liberty Sand & Gravel Co. (1912) was also located on the branch, near its mouth.

Geology: Geomorphic evidence indicates that Chartwell Branch originally flowed through Stevens Creek (Litz Lake) before it reached the Severn River. Chartwell Branch may have been captured by a Pleistocene-age Severn River as it migrated eastward and eroded into the bank on the north shore (note the relic arcuate meander scar still evident at the mouth of Chartwell Branch). Another theory suggests that "stream pirarcy" may have been man-induced in the 18th century. (i.e., dredged for the operation of C.R. Sevier's sawmill, possibly to increase the gradient of the stream and generate more water power).

Wetlands: The DNR Tidal Wetlands Boundaries (1970) recognizes a draw marsh at the mouth of Chartwell Branch; "smooth cordgrass, marshelder, groundselbush" = 0.7 acre. 2) U.S. Fish & Wildlife Service (1979), National Wetlands Inventory also maps this draw marsh; "estuarine, intertidal, narrow-leaved persistent, irregular" = 0.7 acre; In addition, they recognize the floodplain forest upstream of the draw marsh; palustrine, forested, broad-leaved deciduous, seasonal and temporary" = ca. 5 acres.

Problems: Although the upper part of the millpond exists, the lower portion has been filled by sedimentation caused by severe erosion in a ravine affected by road runoff. Dredging of the cove at the mouth of Chartwell Branch has been proposed by the County DPW.

SUBWATERSHED #31

Name: Stevens Creek

Location: Bounded by the Chartwell Branch subwatershed on the north and the Forked Creek subwatershed on the south.

Natural Areas: Little detailed field work was done on this subwatershed. However, it did receive a cursory site visit and general statements can be made about two intact ecotypes. 1) Litz Lake (alias, Lakeland Pond and Perkins Pond) is a scenic freshwater pond ca. 2.5 acres in size. The lake is surrounded by intact, steep wooded slopes. It is bounded on the south by Lakeland Drive and on the north by a magnolia swamp. Litz Lake was formed in 1914 by the construction of the earthen embankment on which Lakeland Drive now sits. 2) A magnolia swamp ca. 1.0 acre in size is located at the head of Litz Lake. It contains a significant stand of sweetbay magnolia in addition to Atlantic white cedars and large pitch pine trees. The swamp is surrounded by a transitional zone of steep wooded slopes. The northern (upstream) margin of the swamp is demarcated by Holly Hill Road.

ISOLATED FEATURES

Natural Heritage Elements: 1) Atlantic white cedar - C, State declining; 2) Watershield - C, State declining.

Historic Features: 1) Liberty Sand & Gravel Co. operated in this area (circa 1912). 2) County Historic Sites Survey - AA 924 - Eagleston's Range.

Geology: Geomorphic evidence indicates that Chartwell Branch once flowed through the now "misfit valley" of Litz Lake on the way to its mouth at Stevens Creek. Chartwell Branch may have been captured by the Severn River during the Pleistocene Epoch as the Severn migrated eastward. A large arcuate meander scar formed by the Severn is still apparent on the north shore at the present-day mouth of Chartwell Branch. Or, the "stream piracy" may have been man-induced in the 18th Century (i.e., a small channel may have been excavated between Chartwell Branch and the Severn for C.R. Sevier's sawmill; this was possibly done to increase the gradient of Chartwell Branch and create greater water power (hydraulic head) via a quicker route to the Severn). The diversion of Chartwell Branch upstream of Litz Lake (by whatever cause) explains the origin of the anomalously large stream valley now occupied by Litz Lake and the magnolia swamp.

Previous Listings: 1) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "palustrine forested, scrub shrub, broad-leaved deciduous, seasonal tidal = 1.0 acre; "palustrine emergent, narrow-leaved persistent, seasonal saturated = 0.5 acre.

SUBWATERSHED #32

Name: Forked Creek (Fork Creek, 1846)

Location: Bounded by the Stevens Creek subwatershed on the north and by the Yantz Creek subwatershed on the south.

Natural Areas: This subwatershed includes one natural area: 1) Rock Point.

NATURAL AREA #1

Name: Rock Point

Special Note: At the time of this writing, Rock Point was being developed as "Bluff Point". As planned, 32 single family homes will be built on the 62.75 acre tract; eight or nine homes annually through 1990. The eastern portion of the development will support 13 homes on 1/2 to 3/4 acre plots. On the western portion, the Rock Point promontory which fronts the Severn River, lots from 19 homes will be as large as 3-1/2 acres. Grading over a large portion of Rock Point for one home site has already leveled much of the promontory by ca. 30 ft. Prior to the Bluff Point development, many significant ecotypes and natural features existed on this property (see "Natural Areas of Highest Priority for Preservation", SRC, 1986). Based on review of construction plats, conversation with the developer, and visits to the site, the ecotypes described below will not be directly displaced by development. The ultimate impact that development will have on these ecotypes will probably take several years to manifest and assess.

Geographical Limits: Bounded by the Severn River and Rock Cove to the west, Forked Creek and Holly Point to the south, Benfield Road to the east, and Carrollton Manor to the north. In the future, it will be confined within the boundaries of the Bluff Point subdivision.

Total Acreage: The property is 62.75 acres. The exact size of the natural area that will remain after development will have to be evaluated after full completion of the subdivision (1990).

Ecological Classification: Altered green area; this includes two ecotypes: 1) Freshwater pond; 2) Freshwater pond.

Ecotype #1: Freshwater pond and immediate environs

Acreage: This is one of the three largest freshwater ponds on the Severn River at 4.0 acres. The acreage of its surrounding transitional zone will have to be assessed after completion of the subdivision.

Flora: The pond is presently surrounded by a sizeable transition zone of thick shrubs which grade into intact, steep wooded slopes. A small intact grove of mature Atlantic white cedar trees is located near the dam of the pond (the developer has vowed to protect these cedars).

Ecotype #2: Freshwater pond (Blue Lake) and immediate environs

Acreage: Blue Lake is ca. 0.5 acre in size. The bogs and wetlands which surround it are ca. 1.0 acre in size. The acreage of the surrounding transitional zone will have to be assessed after completion of the subdivision.

Flora: Blue Lake is a shallow freshwater pond located in an abandoned sand pit. The water in the pond is of unusual clarity. It is surrounded by bogs, shrub thickets, and steep wooded slopes. Vegetation of the bog area includes three-way sedge, yellow-eyed grass, large cranberry, spatulate-leaved sundew, sphagnum, and bog clubmoss. The shrub thicket border of the bog contians leucothoe and highbush blueberry with scattered sheep laurel. The developer has vowed to protect the Blue Lake area and is currently using sediment control measures around its perimeter.

Natural Heritage Elements: 1) Cranberry - C, State declining; 2) Atlantic white cedar - C, State declining; 3) Sheep Laurel - C, State declining.

Noteworthy Plant Species: 1) Bog clubmoss - rare in Anne Arundel County.

Exceptional Trees: None observed

Historic Features: The former location of the Riverside Brick Co. (circa 1917) and Brenan Sand Co. (circa 1917). The unique clay, glass sand, and sandstone deposits of this area were important to local glass and brick industries. Many tools and other artifacts of these operations are still apparent at the site.

Archeological Features: 1) MHT site AN 111 - Forked Creek - chip artifacts were found.

Wildlife: Prior to development, the Sackett property was an important bird habitat for large birds, including night herons, great blue herons, and osprey. The significance of this area as a bird habitat will probably be reduced after development. The freshwater pond (Ecotype #1) is known to contain eastern chain pickerel.

Scenic Qualities: From the 62.5 ft. promontory of Rock Point, the entire length of the Severn River to the Chesapeake Bay can be observed. This is one of, if not the best panoramic vantage points on the Severn River. Blue Lake and its surrounding bog area, with unique and variable vegetation, water clarity, and solitude, combined with the ambiance of the historical mining ruins, offers a visual experience unique to the Severn.

Geology: The ridge crests at elevations greater than 30 ft. are underlain by the Magothy FM. Slopes at elevations less than 30 ft. are the sand-gravel facies of the Potomac FM. Areas near sea level are mapped as silt-clay facies of the Potomac FM. The only outcrop of "Arundel clay" (a clay well suited for brickmaking) on the Severn River estuary occurs in this natural area. Glass sand and sandstone deposits of high enough quality for commercial purposes also outcrop in juxtaposition with Arundel clay on Rock Point. Rock Cove on the north shore of Rock Point is a classic example of a relic arcuate meander scar

(or "bight") which probably was formed during the Pleistocene Epoch by the Severn River. A near vertical, 45 ft. bluff on Rock Point is an interesting geologic feature.

Soils: Rock Point and the areas around Blue Lake are mapped by the SCS as cut and fill land, probably due to theextensive mining in this area. The slopes bordering the freshwater pond (Ecotype #1) are covered by Evesboro loamy sands.

Topography: The summit of Rock Point is 62.5 ft. (msl) in elevation. The slopes, from this summit to the Severn River, are very steep (40 to 100%) in places. The relatively flat (5-10% slopes) uplands bordering the pond (Ecotype #1) range in elevation from 50 to 80 ft. (msl). The slopes descending to the freshwater pond (5 ft. msl) are very steep (15-40%).

Contiguity: The natural areas that remain after completion of the development will be isolated features within the subdivision.

Other: Field review - 3/19/86

Previous Listings: 1) Scenic Rivers in Maryland (1970) - recommended as a "natural use area" with an activity center. 2) Upland Natural Area Study (MD. 1977); 3) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "palustrine open water, intermittently exposed, diked, impounded" = 4.0 acres; "palustrine forested, scrub shrub, broad-leaved deciduous, seasonal" = 0.5 acres;"palustrine, open water, intermittently, excavated" = 0.5 acre; 4) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (single); to become private (multiple) with covenants when the 32 lots are completely developed and sold.

Land Use: Residential-Low (1/2 - 2 units/ac.). Sacketts Pond is mapped as a Natural Features (Open Space).

Residential Communities: Bluff Point

Problems: After construction of Bluff Point, overuse of the very fragile Blue Lake bog area by community residents could be a problem. Overuse of the open space area around Sacketts Pond could also create erosion and runoff problems.

Preservation Options: Restrictive covenants are planned for each lot to prevent additional clearing of vegetation or resubdivision after initial development. Strict adherance to these covenants should be required. Special efforts should be made to ensure that the wooded slopes of Sacketts Pond are completely protected from alteration. Cooperation should be initiated with the developer concerning the Blue Lake area, the Atlantic white cedar grove, and the steep slopes of the freshwater pond (Ecotype #1). Regulated usage plans that will protect the environmental integrity of these areas should be developed.

Future Use: The freshwater pond (Ecotype #1) - has potential for passive recreation, Blue Lake and the Atlantic white cedar grove as a recognized species preserve. Highly restrictive usage of the Blue Lake area for outdoor education and scientific monitoring should be adopted due to its fragile character.

ISOLATED FEATURES

Ecological: A /.0 acre tract located across Forked Creek from Rock Point was recently offered to the Maryland Environmental Trust for a conservation easement. The tract is known as "Laurel on the Severn". The natural features of this tract are unknown, but save for one house, it appears to be completely wooded. It also contains a small tidal pond ca. 0.25 ac. in size and a small tidal wetland of cattails and smooth cordgrass. Further investigation concerning the status of the easement and the ecology of the site is needed.

Archeological: AN 543 - East Forked Creek Site - a prehistoric shell midden, no artifacts found.

Historical: Two (2) shoreline sand pits apparently existed immediately downriver from Forked Creek.* These sites may be ecologically and historically significant and should be investigated. One of these pits could be the tidal pond on the Halle property (see above).

* see U.S. Coast and Geodetic Survey, Aug. 1948, "Chesapeake Bay - Severn and Magothy Rivers."

SUBWATERSHED #33

Name: Yantz Creek (Cedar Creek, 1961; Yanch's Creek, 1886; Yance's Cove, 1846)

Location: Bounded on the south by the Sullivan Cove subwatershed and on the north by the Forked Creek subwatershed.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be made. Heavy residential development occurs over the majority of the subwatershed. However, several wetland areas, one large cove marsh in particular, require further field investigation.

ISOLATED FEATURES

Wetlands: Three tidal wetland areas are recognized by the DNR Tidal Wetland Boundaries (1970): 1) A small tidal pond (Cedar Pond) located on Cedar Point is 0.7 acre in size; about 0.25 acre of this is covered by "common reed and smooth cordgrass". 2) A broad, 0.25 acre fringe marsh of "cattails, common reed, and smooth cordgrass" is located on the north shore of Yantz Creek adjacent to the West Severna Park Marina. 3) A large cove marsh is located on the south side of the community swimming pool. This cove marsh appears to be relatively undisturbed and supports a stand of "smooth cordgras" ca. 2.0 acres in size. 4) A fourth wetland area ca. 1.0 acre is size is unmapped. It is located immediately between the marina and the swimming pool and supports common reed and cattail. The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory recognizes six wetland areas in the Yantz Creek subwatershed. 1) Cedar Pond is mapped as "palustrine, open water, intermittently exposed/ permanent". 2) The large cove marsh south of the community swimming pool is mapped as "estuarine, intertidal, scrub shrub, broad-leaved deciduous/emergent, narrow-leaved persistent, irregular, seasonal tidal". The remaining four wetland areas are small floodplain forests located in ravine bottoms along the north shore of Yantz Creek. They are each less than one acre in size and are classified as "palustrine, forested, broad-leaved deciduous, temporary."

Historic Features: The U.S. Geological Survey Quadrangle for Round Bay has a ship wreck mapped at the mouth of Yantz Creek. The historical significance of this wreck is unknown but should be investigated further.

Archeological Features: Three MHT sites: 1) AN 110 - Yantz Creek - chips , a chisel, and quartz artifacts were found. 2) AN 109 - Cedar Pond - chips and leached sherds were found; believed to be a small camp. 3) AN 108 - Cedar Point - a 300 ft. long, 100 ft. wide small village site. A very rich Late Woodland deposit; artifacts found include Marcey Creek plain, Acokeek cordmarked, Chickahoming cordmarked, net impressed fabric, impressed and incised. Points found include Potomac Creek points. (both parallel stem and sidenotched) chips, scrapers, and incised sherds.

Natural Heritage Elements: Atlantic white cedar - C list, State declining. Several cedars occur at the head of Yantz Creek, just behind and to the north of the West Severna Park Marina.

SUBWATERSHED #34

Name: Sullivan Cove (Sullivan's Cove, 1846)

Location: Bounded on the south by the Round Bay Shore subwatershed and on the north by the Yantz Creek subwatershed.

Natural Area: This subwatershed includes one natural area: 1) Sullivan Cove.

NATURAL AREA #1

Name: Sullivan Cove Marsh

Geographical Limits: Bounded on the west by the Severn River, on the north by developed lots fronting Water Street (Severna Park), on the east by developed lots fronting Old County Road, and on the south by developed lots fronting Round Bay Road (Round Bay subdivision).

Total Acreage: 25.1 acres

Ecological Classification: Environmental complex; this includes six ecotypes: 1) Tidal marsh; 2) Tidal marsh; 3) Tidal marsh; 4) Freshwater pond/marsh/bog/swamp; 5) Uplands; 6) Steep slopes.

Ecotype #1: Tidal marsh

Acreage: 7.0 acres

Flora: The largest of three distinctly separate cells of tidal marsh is located north of Park Road which bisects Sullivan Cove. Approximately 3.0 acres of the area is a shallow tidal pond intermixed with marsh grasses. The dominant vegetation is smooth cordgrass; other species include cattail, groundselbush, marshelder, and common reed.

Ecotype #2: Tidal marsh

Acreage: 1.7 acres

Flora: Another separate tidal marsh cell is impounded by Park Road to the north, Henkle Lane to the south, three residences immediately to the west, and a small forested promontory to the east. Approximately half of this marsh is a shallow tidal pond; the other half is dominated by smooth cordgrass. A few Atlantic white cedars occur along the perimeter of this marsh.

Ecotype #3: Tidal marsh

Acreage: 1.0 acre

Flora: The third tidal marsh is enclosed by Henkle LN. to the north, forested uplands of Round Bay to the east and south, and a low sand spit separating the Severn River to the east. Smooth cordgrass is the predominant plant, while smartweed, cattail, and spikegrass constitute minor components.

Ecotype #4: Freshwater pond/marsh/bog/swamp

Acreage: 2.0 acres

Flora: A fourth marsh is surrounded by forested uplands on three sides, and blocked from the exchange of tidal waters by Park Road on its fourth side to the north. As a result, the salinity of the impounded water is low enough to support freshwater plants, including fragrant white waterlily, spatulate-leaved sundew, and yellow-fringed orchis. Toward the back (south) of the marsh, vegetation grades into that typical of a bog (i.e., sphagnum mosses). Behind the bog, a small, but healthy stand of Atlantic white cedar occurs. Associated with the cedar stand are sweetbay magnolia, blackgum, pitch pine, red maple, red chokeberry, possumhaw viburnum, cinnamon fern, royal fern, and blueberry. Slightly inland from the cedar stand, fresh swamp plants occur. These include black willow, poison sumac, arrowwood, alder, winterberry, sensitive fern, and netted chain fern.

Ecotype #5: Uplands (wooded sandy lowlands)

Acreage: 3.0 acres

Flora: Wooded sandy lowlands surround much of the perimeter area of the above marshes (Ecotypes #1-4). These lowlands are a transition between the marshes and the steep wooded slopes (Ecotype #6). The sandy lowlands support a large variety of shrubs, hollies, and other woody plants to form a dense thicket surrounding the wetlands. Plants common on these lowlands include blackjack oak, scarlet oak, chinquapin, sand hickory, Virginia pine, persimmon, Eastern red cedar, American holly, inkberry, swamp leucothoe, sheep laurel, shadbush, and black huckleberry.

Ecotype #6: Steep slopes

Acreage: 10.4 acres

Flora: Surrounding the sandy lowlands (Ecotype #5) are steep wooded slopes. These wooded slopes are the key to the ecological and scenic integrity of the Sullivan Cove marsh. They provide an invaluable transitional zone which protects and isolates the marsh areas from the densely developed areas of Round Bay and Severna Park. Xeric vegetation typical of these intact wooded slopes includes chestnut oak, black oak, white oak, and southern red oak in the canopy layer; flowering dogwood and American chestnut in the understory; mountain laurel and pink azalea in the shrub layer; and trailing arbutus in the herbaceous layer.

Natural Heritage Elements: 1) Atlantic white cedar - C, State declining. 2) Sheeplaurel - C, State declining. 3) Sand hickory - C, State declining. 4) Yellow fringed orchis - C, State declining. 5) Chinquapin - C, State declining.

Noteworthy Plant Species: 1) Yellow fringed orchis - the only station known to exist on the Severn and, thus, warrants added significance.

Exceptional Trees: None observed

Historic Features: None registered

Archeological Features: None registered

Wildlife: Sullivan Cove marsh is one of the most significant waterfowl habitats in the entire Severn River watershed. Numerous species of waterfowl frequent this area. These include white and glossy ibis; little blue, great blue, green, black-crowned, and yellow-crowned night herons; warblers, thrushes, vireos, tanagers, and catbirds. Bald eagles were observed here twice in 1977 and osprey were seen here in 1986. Sullivans Cove is also a very important spawning ground and habitat for fish, including killfish, fundulus (a small minnow), and yellow perch. As a breeding ground for fish and birds, Sullivans Cove has a far reaching beneficial impact on the entire Severn River estuary. It is especially important considering the rare occurrence of such marsh areas in the estuary.

Scenic Qualities: Several aspects of the Sullivan Cove marsh make it very appealing as a scenic observation point: Size (one of the largest unbroken tidal marshes on the Severn); Interspersion (a high intermixing of open water and grasses); Seclusion (thick wooded uplands provide a dense backdrop and block out most foreign sights and sounds); Bird life (the many different species of birds readily apparent provide a special visual and audio experience); Highly variable and closely intermixed plant life (from a single point on Park Road, one may observe plants from salt marsh, fresh marsh, wooded swamp, and sandy upland habitats).

Geology: Alluvium sediments underlies the wetland areas (Ecotypes #1-4). The lower portions of the wooded slopes (Ecotype #6) and the sandy lowlands (Ecotype #5) are underlain by the Magothy Fm. The upper portions of the wooded slopes are underlain by the Monmouth Fm. Two fine examples of sand spit accretion occur at Sullivan Cove. To a large extent, these spits were the cause of the formation of at least two of the marshes (Ecotypes #1 and 3). The spits are also important to the continued stability of these marshes. They provide a buffer against the high energy waves of the Severn and help maintain a balanced interchange of tidal waters to the marshes. Examples of what Sullivan Cove probably looked like in its early stages of development can be found at Browns Cove and Brewer Pond. If left to evolve naturally, areas with actively accreting sand spits such as these will probably develop into marshes which resemble Sullivan Cove.

Soils: Tidal marsh and mixed alluvial soils cover Ecotypes #1-4. Collington fine sandy loam soils cover the remainder of the natural area.

Topography: The crests of the steeply (15-40%) wooded slopes (Ecotype #6) are at an elevation of 50-70 ft. (msl). The base of the steep slopes are at an elevation of ca. 10 ft. (msl). From 10 ft. (msl) to 3 ft. (msl) the sandy lowlands occur (Ecotype #5). These lowlands have gradual (2-5%) slopes. The marsh areas are level to nearly level, with the water elevations of the ponds ranging from 0.5 to 1.1 ft. (msl).

Contiguity: The landward side of the Sullivan Cove natural area is completely encompassed by intense residential development. There is a high amount of interaction with other bird and fish habitat areas both in and out of the Severn River watershed. There is probably direct interaction of bird and fish species with the tidal marsh on the north shore of Sullivans Cove (see Isolated Features below).

Other: Field review - 3/19/86

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, common reed, groundselbush, marshelder, cattail" = 11.7 acres. 2) Recommended Areas of Critical State Concern in Anne Arundel County (1978). 3) U.S. Fish and Wildlife Service (1979); National Wetlands Inventory; "estuarine intertidal, emergent, narrow-leaved persistent, irregular" = 11.4 acres; "palustrine, open water, semipermanent, diked/impounded" = 0.4 acre. 4) Areas of Critical State Concern (1981). 5) Natural Heritage Program (1983) - ca. 40 acres mapped as an ecologically sensitive area . 6) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: County government (13.6 acres); private (multiple), 13 lot (< 1.0 ac.) owners, 6 minor (1-5 ac.) landowners, 1 major (> 5.0 ac.) landowner; community (4.95 ac.).

Land Use: The entire Sullivans Cove natural area is mapped as Natural Features (Open Space) and is a designated Critical Area.

Residential Communities: Round Bay, Severna Park

Problems: No major projects are scheduled. One lot is presently proposed for development. It is located between Old County Road and Henkle Lane and is registered with the County Office of Planning and Zoning as MS 305-84. This lot is located at the very margin of the wooded slopes (Ecotype #6) and should not impact the natural area. Dumping and vandalism in the area of Park Road has occurred in the past.

Preservation Options: Acquisition of the remaining marsh area (Ecotype #1), to complement the 13.5 acres presently owned by the County, is one possible alternative. Conservation easements or mutual covenants on the remaining 11.9 acres of privately owned land is another alternative worth pursuing. The steeply wooded slopes (Ecotype #6) should receive equal emphasis for protection efforts. Without the wooded transition areas, the ecological and scenic integrity of the marsh areas will be significantly impaired. In 1986, in a letter to the County and State, the SRC urgently recommended this as one of five areas of environmental importance to be preserved by appropriate County and State action. In the letter, the SRC stated, "we recommend acquisition of approximately 15 acres of contiguous wetlands and uplands. Adjacent appropriate property might be protected by easements."

Future Use: Scientific monitoring, outdoor education, wetland wildlife reservation, and recognized species preserve are all potential future uses. These future uses can only be successful if formal management plans are

established for the entire natural area. Conservation cooperatives with private landowners will be necessary to implement management plans and to reduce dumping and vandalism.

ISOLATED FEATURES

Wetlands: A 1.6 acre tidal marsh directly across Sullivan Cove from the main tidal marsh requires further investigation. This marsh is located in a cove whose entrance was restricted by the accretion of a sandspit (very similar in origin to Sullivan Cove marsh). The marsh is mapped by the DNR Tidal Wetlands Boundaries (1970) as " smooth cordgrass, meadow cordgrass, spikegrass, marshelder, and groundselbush."

Exceptional Trees

State Champion: 1) The State Champion blackjack oak is located on 134 Round Bay Rd. The tree has a CBH of 8 ft., 1 in., a height of 82 ft., and a spread of 62 ft. In actuality, however, this tree may be a "bushes" oak (black oak-blackjack oak hybrid).

Historic Features: Two sites listed on the County Historic Site Survey are located in the subwatershed. 1) AA 132 - Carter's Bluff (Linstead House) - is a 1800s house in good condition and significant for its architecture. M. Linstead and Jno. Linstead were the original owners. 2) AA 131 - Boone Homestead - is an 1800s house described as in "good condition, unaltered, and on its original site." The name Boone is associated with the nearby community of Boone (the precursor to Severna Park) which was a depot for the old Baltimore Annapolis Railroad.

Archeological Features: Two MHT sites: 1) AN 106 - Sullivans Cove - is an Early-Late Woodland/Archaic Culture shell midden 120 ft. x 50 ft. to a depth of 8 in. Artifacts found include shell tempered cordmarked plain, dowel impressed, incised sherds, points, blades, choppers, and lozenge shaped points. This site was described by the MHT as "good" and was a key site used by H.T. Wright (1973) in his formulation of the Middle Chesapeake Region archeological sequence. This is the type location for the establishment of the Sullivan Cove Phase (circa A.D. 1100-900) of the sequence. Food remains found at the site include oyster shells, mammal, reptile, and bird bones, and garfish scales. The proportions of different food remains found indicate that oysters and a variety of other animals were exploited by the indians, and that fish were not. This, and the settlement pattern of small middens suggests the periodic movement of a number of small groups between shellfish gathering and possibly horticultural localities. 2) AN 107 - Sullivans Cove Archaic Site - artifacts found include broad bladed sidenotched points, two parallel-side stems, quartz chips, and quartz scrapers. This site was also classified as a "good" site by the MHT.

Geology: A near vertical bluff over 50 ft. in elevation exposes the northern-most occurrence of the Monmouth Fm. on the eastern shore of the Severn River. This bluff is located on Cooks Point, where the northern shore of Sullivan Cove meets the Severn River (off Boone Trail in Linstead on the Severn).

SUBWATERSHED #35

Name: Round Bay Shore

Location: Bounded on the north by the Sullivan Cove subwatershed and on the south by the Ringgold Cove subwatershed.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be made. In general, the subwatershed is almost completely developed and there are practically no natural areas remaining. However, the steep slopes covered by chestnut oaks immediately downriver from Round Bay and adjacent to Old County Road may be significant from both an ecological and scenic standpoint. These slopes require further field investigation.

ISOLATED FEATURES

Historic Features: 1) The community of Round Bay (circa 1907) originated as a railroad resort on the old Baltimore-Annapolis line and has an interesting history. 2) "Mount Misery", a 154 ft. (msl) hill in Round Bay, was a fortified observation post for Union troops (New York volunteers) during the Civil War. From atop Mount Misery, sentries could see approaching ships on both the Severn and Magothy Rivers. The origin of the name "Mount Misery" implies intrigue, but is apparently not attributable to the Civil War, having first appeared on a map in the 1840s. 3) MHT site AA 779 - Wayman's Good Hope African Methodist Church (circa 1889) - is described as being in "excellent condition but has been altered and moved from the original site". It is the only African Methodist Church in the northern portion of the County, and only one of four in the entire County. The cemetery off Hoyle Lane near Route 2 is located in a wooded area near the former site of the church and bears graves from the 1800s.

Geology: "Tower Hill," a 114 ft. (msl) knoll in Round Bay, is the northwesternmost extension of the Aquia Fm. on Broadneck. Tower Hill was apparently the upper end of the "Broadneck Island" at a time in the geologic past when the sea covered the flat plains of Olde Severna Park. A subaqueous extension of Eaglenest Point ca. 1500 ft. out into the Severn River is an interesting geomorphic feature. Possibly, this underwater ridge is the extension of an arcuate meander scar formed by the Severn River at a time during the Pleistocene Epoch when sea level was lower than present. The cuspate configuration of the shoreline from Eaglenest Point to Swan Point is also an interesting landform. This may also be an erosional remnant formed by meandering of the Severn River during the Pleistocene Epoch.

Other: The origin of the name "Eaglenest Point" is interesting. The name first appears on a map in 1667. Whether this point initially garnered its name for eagles that inhabitated it is unknown. No record of eagle sightings (either historic or modern) at this point are known to exist. "Chalybeate Springs", once located on Severn River Road, was an interesting a feature of Round Bay in

SUBWATERSHED #36

Name: Ringgold Cove (Ringold Cove, 1860; Ringgold's Cove, 1846)

Location: Bounded on the south by the Aisquith Creek subwatershed and on the north by the Round Bay Shore subwatershed.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be made. However, two natural areas are known to exist: 1) The dense woods of the Sonneborn tract (65.3 acres); 2) A ravine and steep slopes at Swan Point (ca. 16 acres); more details are required, but is appears that the ravine, adjoining slopes, and a cliff may be a significant natural area.

ISOLATED FEATURES

Wetlands: Three separate tidal wetland areas are recognized by the DNR Tidal Wetlands Boundaries (1970): 1) A marsh of 0.5 acre at Swan Point is composed of "smooth cordgrass, marshelder, and groundselbush." 2) A draw marsh of 0.8 acre at the head of Ringgold Cove is composed of "smooth cordgrass, meadow cordgrass, and spikegrass." 3) A draw marsh of 0.8 acre on the south shore of Ringgold Cove is composed of "marshelder, groundselbush, and switchgrass." Two of the above wetland areas are mapped by the U.S. Fish and Wildlife Service (1979), National Wetlands Inventory. The Swan Point marsh and the marsh at the head of Ringgold are both classified as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular."

Historic Features: 1) It has been said that the Sonneborn tract was used for some sort of patriotic activity during World War II. Further inquiry on this subject is needed. 2) Ringgold Cove probably takes its name from an early landowner, as is the case with most creeks on the Severn. The Ringgold family was once quite prominent in Maryland. The first known occurrence of the name on a map is 1860.

Archeological Features: Three MHT sites: 1) AN 105 - Rugby Hall Estates - an Early-Late Woodland village. Artifacts found include sherds, chips, and a numerous projectile points. 2) AN 562 - Cromwell Site - a Prehistoric shell midden; no artifacts were found, but the site should be tested to determine its exact nature and extent. 3) AN 563 - Rugby Site - a Prehistoric shell midden; no artifacts were found, but the site should be tested to determine its exact nature and extent.

Geology: Two cliffs on the banks of the Severn River offer extensive exposures of Aquia Fm. sediments: A 120 ft. (msl) cliff upriver from Swan Point near the Sonneborn property; E. Jefferson Crum's Cliff, ca. 100 ft. (msl) in elevation, is located just downriver from Rugby Hall.

Other: A spring is located at the base of the cliff at archeological site AA 105.

Problems: The 65.3 acre Sonneborn tract is slated for development. Originally it was scheduled to be developed as 33 lots (subdivision no. 85-180, project no. 85-090). This proposal was withdrawn and another, named "Swan Point", was resubmitted for 76 single family units on 109 total acres. As of this writing, Swan Point was in the "presubmittal" stage of subdivision review and registered as MS-036-86. If constructed, this project will destroy the Sonneborn tract and other adjacent natural areas. The Sonneborn tract is characterized by steep slopes, moist ravine bottoms, and a mature hardwood forest featuring tulip poplar, northern red oak, and white oak. There is a likelihood that exceptional trees, natural heritage elements, noteworthy plant species, and prime faunal habitats are located on the Sonneborn tract. A detailed field inventory should be conducted as soon as possible. Presently not enough information is available to adequately evaluate the potential environmental losses associated with the development of Swan Point. The subdivision application should be carefully reviewed, especially in regards to the very steep (> 25%), erodible, and environmentally fragile slopes.

SUBWATERSHED #37

Name: Aisquith Creek (Asquith Creek, 1949; Aisquith's Creek, 1846; Crouch's Creek, 1667)

Location: Bounded on the south by the Rays Pond subwatershed and on the north by the Ringgold Cove subwatershed.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be made. However, at least two significant natural areas are known to exist: 1) Steep slopes and wooded ravines on the Glen Oban side of Aisquith Creek are covered with chestnut oak and mountain laurel; 2) A 58 acre farm consisting of rolling fields separated by three heavily wooded, steep ravines. These ravines support particularly handsome, old growth timber, with large black walnut trees and paw paw in evidence. Further field investigation of these two areas is urgently needed.

ISOLATED FEATURES

Wetlands: Three tidal wetland areas are identified by the DNR Tidal Wetlands Boundaries (1970): 1) A sand spit at the entrance of Aisquith Creek is colonized by "smooth cordgrass, marshelder, and groundselbush" and is 0.4 acre in size. 2) A draw marsh at the head of the ravine separating the 58 acre farm from Rugby Hall. This marsh is 0.3 acre in size and composed of "smooth cordgrass" grading into scrub size red maple and ash. 3) At the head of the ravine extending from a small freshwater pond is a 0.5 acre draw marsh of "smooth cordgrass and cattail." The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also recognizes these three wetlands, respectively as 1) "estuarine, intertidal, beach, bar, sand" = 0.4 acre; 2) "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.7 acre; 3) "palustrine, forested, broad-leaved deciduous, seasonal tidal" = 1.8 acres.

Historic Features: 1) MHT Historic Site Survey AA 952 -Wroxeter-on-the-Severn (also called Baugh mansion, Uchllyn on Severn, and Rugby Hall) - was built by Edmund P. Baugh, Philadelphia industrialist, in about 1905. The estate consisted of about 550 acres, reaching from Rays Pond to Ringgold Cove. The mansion is indicative of an important, if brief, era in the development of the Severn. 2) The 58 acre farm is one of the last small agricultural areas left on the Severn. Small farms such as this were characteristic of the Severn in the late 1800s and early 1900s. Preservation of one of the last examples of an important agricultural era on the Severn is vital to the preservation of the overall historical heritage of the river.

Archeological Features: Four MHT sites: 1) AN 101 - Aisquith Creek - one sherd crumb was found. 2) AN 102 - Aisquith Creek - shell tempered sherds, chips were found. 3-4) Arnold Point Cove I and II - an Indian village shell midden where sand and shell tempered sherds, points, chips, and bones were found.

Geology: The southern extension of E. Jefferson Crum's cliff provides an excellent exposure of Aquia Fm. sediments ca. 100 ft. (msl) in elevation. Large terraces at elevations of 20 ft. and 70 ft. (msl) occur at the 58 acre farm,

Aisquith Drive, and the Baugh mansion. The 20 ft. terraces may be depositional in origin and correllative with the terraces at the head of the Severn River. The 70 ft. terraces may be erosional (wave-cut benches), formed when sea level was higher, and correllative with the Talbot Fm. on Broadneck.

Problems: The present ownership of the 58 acre farm is listed as a "joint venture", indicating likelihood of residential development. The owners should be consulted about their attitudes and future intentions toward the farm. At the same time, a detailed field inventory of the two natural areas should be conducted. There is a definite possibility that these areas may contain exceptional trees, natural heritage elements, noteworthy plant species, and prime faunal habitats. Presently, not enough information is available to adequately evaluate the potential environmental losses associated with future development.

Other: A freshwater pond of ca. 0.3 acre is located near the head of a very steep, densely wooded ravine extending toward Glen Oban. The small pond contributes to the ecological diversity of this natural area and contains bluegills and bass.

Exceptional Trees

Big Trees: 1) The Rugby Poplar, located near Rugby Hall, has (1977) a CBH of 21 ft. 3-1/2 in. This tuliptree should be officially measured by the DNR Urban Forestry Program and listed on the "Big Tree Inventory". Although the exact age of this huge poplar is unknown, it is assuredly at least 250 years in age. It may very well be historically significant as well. Further research is needed.

SUBWATERSHED #38

Name: Ray's Pond (Mill Pond, 1985; Ray Pond, 1979)

Location: Bounded on the south by the Chase Creek subwatershed and on the north by the Aisquith Creek subwatershed.

Natural Areas: This subwatershed includes one natural area: 1) Ray's Pond.

NATURAL AREA #1

Name: Ray's Pond

Geographical Limits: Bounded on the west by the Severn River, on the north by 12 developed lots fronting Glen Oban Drive, on the east by the right-of-way for the old Baltimore-Annapolis Railroad, and on the south by the pasture on Joyce Lane and by of a few developed lots on the north side of the Joyce peninsula (Ashby).

Total Acreage: 124.2 acres

Ecological Classification: Environmental complex; this includes seven ecotypes: 1) Tidal tributary; 2) Tidal (draw) marsh; 3) Shrub swamp; 4) Ravine bottom; 5) Freshwater pond; 6) Steep slopes; 7) Uplands; 8) Pastures.

Ecotype #1: Tidal tributary

Acreage: 15.0 acres (not included in the total acreage)

Flora: Ray's Pond is an extremely shallow tidal "pond" divided by sandbars into "inner" and "outer" halves. The shoreline is almost entirely in a natural state, there being no boats, only two small piers, and practically no houses visible from the water. Ray's Pond is the most undeveloped tidal "pond" on the north shore of the Severn River, and one of only four left on the entire river. With a combination of seclusion, good water quality, limited boat access, and varied fish and wildlife habitats, Ray's Pond provides an oasis of pristine habitat in an otherwise heavily developed area. In terms of the Severn River watershed, this unimpacted tidal pond is extremely unique. Access into Ray's Pond is presently limited to very shallow draft boats and canoes due to the -6 in. of water at mean low water at the mouth of the pond. This limited access has maintained the pond in its present pristine condition, and protected the inner areas from high wave energies generated on the Severn River. The shallow entrance depth curtails excessive human disturbance, and maintains the pond as an excellent nursery area for white perch, yellow perch, and striped bass. Maryland has placed a great importance on reviving the striped bass fishery, and many knowledgeable observers of Maryland's fisheries are expressing grave concern over the current condition of white perch stocks in the Bay and its tributaries, particularly the Severn River. An extensive bed of submerged aquatic vegetation (SAV) presently rims the

pond. This SAV is dependent on the low wave energies and good water quality presently exhibited (the majority of the above description of Ray's Pond was provided by John W. Gill of the U.S. Fish and Wildlife Service).

Ecotype #2: Tidal (draw) marsh

Acreage: 2.1 acres

Flora: Four tidal marshes at the mouths of the four ravines (Ecotypes #4) show considerable variety in form and vegetation. Vegetation typical of these draw marshes includes mallow, marshelder, groundselbush, smooth cordgrass, cattail, arrow arum, and common reed. These four marshes display characteristics that signify very little disturbance.

Ecotype #3: Shrub swamp

Acreage: 1.0 acre

Flora: Inland from the tidal marsh at the head of the main ravine feeding Ray's Pond is a transitional shrub swamp. Vegetation comprising this shrub swamp includes swamp rose, blueberry, winterberry, fox grape, hollow stem joe-pye-weed, and spice bush. Red maple and black willow are the most common shrub trees, increasing in size in an upstream direction as soils become less saturated.

Ecotype #4: Ravine bottom

Acreage: 11.2 acres

Flora: There are four ravines in the Ray's Pond natural area; three smaller side ravines, and a larger, main ravine feeding Ray's Pond. The first ravine is 1.9 ac. in size and is located on the south side of Ray's Pond and extends back toward the houses on the north side of Joyce peninsula. The second ravine is 2.3 ac. in size, is also located on the south side of Ray's Pond, and extends into the heart of the undeveloped portion of the Mylander property. The third ravine is located on the north side of Ray's Pond, extends back to Kinloch circle in Glen Oban, and is 1.0 ac. in area. The fourth, main ravine, is 6.0 ac. in area, and extends back into the heart of the Iliff property near Joyce Lane. These ravines are characterized by very moist, rich soils which support numerous species of ferns, wildflowers, and other vegetation rare on the Coastal Plain. Plants identified in these ravines include upright smilax, yellow passion flower, maidenhair fern, wild sarsaparilla, rue amemone, cranefly orchid, and moonseed. Extremely large (DBH 18-30 in.), old growth hardwood trees provide almost perpetual shade for these cool ravine bottoms. Trees include tulip poplar (some examples 120-140 ft. tall), northern red oak, bitternut hickory, and beech. Understory plants commonly observed include ironwood and paw paw. The herbaceous layer is typified by christmas fern, mayapple, grape fern, wild yam, black snake root, richweed, blood root, woody redbud, raspberry, lizard's tail, and toothwort. The aforementioned plants and trees are tolerant of only the most moist, cool, and shady climates and very rich soils. The ravines of Ray's Pond are the deepest on the Severn and provide micro climatic conditions that produce a piedmont-like ecology rarely found on the Coastal Plain.

Ecotype #5: Freshwater pond

Acreage: 0.5 acre

Flora: The intact slopes adjacent to the pond located in the main ravine maintain an excellent quality of water and provide a stable habitat for bass and sunfish.

Ecotype #6: Steep slopes

Acreage: 83.2 acres

Flora: The very steep (15-100%) slopes are intact and covered with mature (old growth) hardwood trees which are among the largest examples in the Severn River watershed. The canopy layer is characterized by large chestnut oak, beech, tulip poplar and northern red oak trees (average DBH 18-24 in., with some examples exceed 30 in.). The understory consists of chestnut oak, ironwood, and flowering dogwood. The shrub layer consists of mountain laurel and wild azalea. Trailing arbutus is common in the herbaceous layer. In many cases, there is a very heavy oak leaf litter on the ground. Despite the extreme steepness of the slopes, they are very stable and suffer from almost no disturbance. The shade provided by these steep slopes results in a cool, moist, micro-climatic condition in the ravine bottoms, allowing a very unique assemblage of plants to prosper.

Ecotype #7: Uplands

Acreage: 26.2 acres

Flora: The relatively flat (5-15%) slopes of much of the upland area in the subwatershed are covered with a mature hardwood forest. The old growth trees include tulip poplar, red maple, sour gum, northern red oak, and beech. Wildflowers include pink ladyslipper, puttyroot, rattlesnake plantain, bluets, rue anemone and crane-fly orchid. Other plants include maidenhair fern, shining clubmoss and wild hydrangea. Trees of this upland are quite large (average DBH 12-24 in.). The assemblage of tree species is untypical for upland Severn sites, and more typical of moist, rich floodplain environments. The soils of this area provide uniquely rich edaphic conditions compared to most other subwatersheds in the Severn.

Ecotype #8: Pastures

Acreage: 37.0 acres (not included in the total acreage)

Flora: Two separate pasture areas (one on Joyce Lane and one adjacent to the old Baltimore-Annapolis Railroad line) provide a valuable transitional area and wildlife habitat for the natural area. The "edge effect" produced by the interfacing of the pasture and mature forest increases the ecological productivity of this area.

Natural Heritage Elements: 1) Upright smilax - B2U - highly State rare, in danger of extinction in Maryland, status unknown, uncertain Maryland record or questionable taxonomic entity. 2) Yellow passionflower - C, State declining.

Noteworthy Plant Species: 1) Round-lobed hepatica - "rare on the Coastal Plain" (Brown and Brown, 1984); 2) Maidenhair fern - "only occasional on the Coastal Plain" (Reed, 1953); 3) Silvery spleenwort - "uncommon on the Coastal Plain" (Reed, 1953); 4) Wild sarsaparilla - "rare on the Coastal Plain" (Brown and Brown, 1984); 5) Rue anemone - "common in midland and mountains" (Brown and Brown, 1984); 6) Cranefly orchid - "infrequently occurring" (Brown and Brown, 1984).

Exceptional Trees: Although no trees were measured during the site visit to Ray's Pond, several oaks and tulip trees appeared to be in excess of 9 ft. CBH and 120 ft. in height. Another site visit to this subwatershed should be made and these trees measured and registered on the "Big Tree Inventory".

Historic Features: 1) County Historic Site Survey AA 953 - Joyce Lane Baltimore & Annapolis Railroad Trestle - the trestle overpass (circa 1886) for Joyce Lane is actually in the Magothy Watershed, but because the structure could be destroyed by the pending development of "Harbor Glen" it is listed. 2) The history of early land grants after Edward Lloyd is particularly interesting, involving the more prominent families of Colonial days. This area appears to have been part of "Hyde's and Ray's Resurvey". 3) In the early 1900s the Mylander property was owned by the Sherwood Forest Company, which operated a ferry crossing the river during the summer months.

Archeological Features: Three MHT sites: 1) AN 450 - Heise Site - points and flakes found. 2) AN 100 - Joyce Site - a 1000 ft. long shell midden where sherds and chips were found. 3) AN 402 - Joyce II -a completely undisturbed Middle Woodland shell heap where three mockley net impressed sherds were found.

Wildlife: The forested watershed of Ray's Pond is of sufficient size, solitude, and pristine natural condition to comprise a complete functioning ecological system, supporting an intact complement of animal species. The value of this area as breeding habitat for neotropical forest interior birds is particularly significant. These species include: Ovenbird, American redstart, Kentucky warbler, black and white warbler, Louisiana waterthrush, blue-gray gnatcatcher, yellow-throated vireo, worm-eating warbler, northern parula warbler, and hooded warbler. All of these would be extirpated from the area should the critical size of this preserve be reduced. Ray's Pond (Ecotype #1) has been identified by the U.S. Fish and Wildlife Service as "an excellent nursery area for white perch, yellow perch, and striped bass.

Scenic Qualities: The solitude provided by the extremely steep slopes, combined with the overhead protection of a dense canopy, makes the ravines of Ray's Pond subwatershed a peaceful place for which to observe unique Piedmont-like ecology. The visual experience provided by the venerable hardwood forest and a host of different ferns, wildflowers, and other plants not usually found in the Coastal Plain is something that cannot be described adequately by words. The scenic qualities can only be fully appreciated first-hand.

Geology: The Aquia Fm. underlies the pastures (Ecotype #8), forested uplands (Ecotype #7), and steep slopes (Ecotype #6). The ravine bottom (Ecotype #4) is formed of Aquia sediments reworked from the uplands and steep slopes. The tidal marshes (Ecotype #1) and shrub swamps (Ecotype #2) are underlain with alluvium composed mostly of reworked Aquia sediments and decomposed organic material. The richness and fertility of the sediments may indicate a locally high concentration of glauconite. Although not mapped, the ridge crests on Joyce

Lane at elevations of 140-155 ft. (msl) may be composed of sediments from the Calvert Fm. The very fine texture of the silts that cap the knolls of Joyce Lane and their fertility are very similar in character to Calvert Fm. sediments located directly across the Severn River in Sherwood Forest at equal elevations. A very distinct set of flat terraces occur on the slopes at an elevation of 60-75 ft. These terraces appear to be erosional in origin (wave cut benches), formed when sea level was higher than present and correlative with deposition of the Talbot Fm. on Broadneck. Two cliffs facing the Severn River, one on the north side of Ray's Pond and one on the south side, provide scenic exposures of Aquia Fm. sediments. Both cliffs are ca. 125 ft. (msl) in elevation.

Soils: Tidal marsh and mixed alluvial soils are mapped at the head of Ray's Pond and upstream along the bottom of the main ravine, respectively. Monmouth fine sandy loam soils cover the steep slopes and forested uplands. Butlertown silt loams cover the flat and gently rolling pastures on Joyce Lane. The soils of the Ray's Pond subwatershed are finer grained and more fertile than similar Aquia sediments found in most other locales in the watershed. The overall richness of these soils provides an edaphic condition that allows plants tolerable only to fertile, moist conditions to prosper. These soils also allow plant species typical of moist floodplain soils to thrive on the highest upland areas. In sum, the rich soils help explain the unique Piedmont-like ecology of the subwatershed.

Topography: The uplands (Ecotype #7) and pastures (Ecotype #8) are relatively flat (2-10% slopes) and range in elevation from a maximum of 154 ft. (msl) to ca. 120 ft. (msl). The steep (15-100%) slopes range in elevation from ca. 120 ft. (msl) to sea level. These are some of the steepest slopes in the Severn River watershed. The elevation of the pond (Ecotype #6) in the bottom of the main ravine is 40.7 ft. (msl). From the pond, the ravine drops to sea level over a distance of 1500 ft.

Contiguity: The Ray's Pond natural area is fully contiguous with the natural areas of the Chase Creek subwatershed to the south. Together they form a natural area of ca. 400 acres, the largest on the north shore of the Severn River.

Other: Field review - 6/30/86

Previous Listings: 1) Scenic Rivers in Maryland (1970) - recommended as a "natural use area" with an activity center. 2) DNR Tidal Wetland Boundaries (1970) - a total of 2.1 acres is mapped as "marshelder, grounselbush, cattail, and smooth cordgrass." 3) The Upland Natural Areas Study (1977). 4) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory - mapped two separate areas at the mouth of ravines as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular"; their acreage was ca. 2.2. 5) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 12 lot (< 1 ac.) owners, 1 minor (1-5 ac.) landowners, and 2 major (> 5 ac.) landowners.

Land Use: Rural - Residential (1/2 or less units per ac.). The wetland areas are mapped under the Natural Features (Open Space) classification.

Residential Communities: Glen Oban, residents of Jovce Lane, Ashby

Problems: There are no major projects planned. Ray's Pond subwatershed is in an almost undisturbed state and there are few ongoing impacts of which to speak. However, excessive stormwater runoff into Ray's Pond from a Glen Oban storm drain is gradually causing aggradation of the pond. The 85 acre tract is slated for residential development of 18 homes known as "Harbour Glen" (Final 85-086).

Preservation Options: The final outcome of the Harbor Glen development will largely affect future preservation options for the Ray's Pond natural area. A signficant portion of the natural area may remain depending on the magnitude and extent of the final approved development. There are approximately 25 significant property owners in the Chase Creek/Ray's Pond natural area. Beginning with the largest properties first, these owners should be consulted (on a very personalized basis). Based on a general knowledge of the attitudes of many of these owners, a program based on donated and/or purchased conservation easements appears to have a high potential for success. Other innovative techniques such as conservation cooperatives and tax incentives may also be options where easements are not feasible. This program could be used as a model for future preservation efforts on other natural areas in the Severn River watershed. In a 1986 letter to the County and State, the SRC urgently recommended Rays Pond - North Branch Chase Creek as one of five areas of environmental importance to be preserved through appropriate county and State action. In the letter, the SRC stated, "If the proposed subdivision of the Mylander property is delayed or not completed, or if any other opportunity occurs, we recommend that this key and irreplaceable property be acquired by Anne Arundel County. Every effort must also be given to obtaining preservation agreements with the owners of contiguous properties to strengthen preservation of as much as possible of the complete Rays Pond watershed and approximately 200 acres of woodlands in the watershed of the North Branch of Chase Creek which are essential to protection of the Chase - Rays Arnold Forest."

Future Use: Based on the amount of habitat destruction associated with Habour Glen, the future use of the Ray's Pond natural area may vary. In its present state it is ideally suited for a forest wildlife reservation, a sanctuary, and scientific monitoring.

SUBWATERSHED #39

Name: Chase Creek (Chase's Timberneck Creek, 1856; Chase's Creek, 1846; Timberneck Creek, 1667).

Location: Bounded by the Ray's Pond subwatershed on the north and by the Coolspring Creek subwatershed on the south.

Natural Areas: This subwatershed includes five natural areas: 1) North Branch of Chase Creek; 2) Briar Cliff Ravine; 3) Rucker's Ravine; 4) Hidden Hills Ravine; 5) Bancroft Promontory.

NATURAL AREA #1

Name: North Branch of Chase Creek

Geographical Limits: Bounded on the northwest by developed lots in the Briar Cliff subdivision; on the north by the pasture at Joyce Lane; on the east by the right-of-way for the old Baltimore-Annapolis Railroad; on the south and southeast by developed lots in Pines on the Severn; and on the west by the tidewater of the north branch of Chase Creek.

Total Acreage: 172.5 acres

Ecological Classification: Environmental complex; this includes six ecotypes: 1) Tidal (cove) marsh; 2) Shrub swamp; 3) Ravine bottom; 4) Uplands and steep slopes; 5) Freshwater pond; 6) Pasture.

Ecotype #1: Tidal (cove) marsh

Acreage: 1.4 acres

Flora: At the mouths of Rowles Branch and a stream flowing from Pines on the Severn (the head of tidewater on the North Branch of Chase Creek) are two cove marshes, 1.0 and 0.4 ac. in size, respectively. These marshes are composed of smooth cordgrass, groundselbush, marshelder, meadow cordgrass, spikegrass, cattail, mallow, arrow arum, saltmarsh waterhemp, and common reed. A small sailboat mooring located between these cove marshes detracts somewhat from the scenic and habitat qualities.

Ecotype #2: Shrub swamp

Acreage: 0.4 acre

Flora: Inland from both cove marshes (Ecotype #1) are small transitional shrub swamps. These intact shrub swamps are characterized by black willow, swamp rose, small red maples, smooth winterberry, lady fern, fox grape, hollow stem joe-pye-weed, and poison sumac. Royal fern and sphagnum moss, plants not commonly found in the southern portion of the Severn watershed, were also identified. Both of the stream valleys are wide enough at this

point so that canopy trees on the adjacent slopes do not offer much shade. With distance upstream, the size of the red maples increases as soil conditions become drier.

Ecotype #3: Ravine bottom

Acreage: 22.0 acres

Flora: The ravine bottoms of Rowles Branch and the other unnamed branch, and their small offshoot side ravines, are characterized by rich, fine-grained, moist soils. The extremely steep slopes (Ecotype #4) and dense canopy offer almost constant shade and produce cool, micro-climatic conditions which allow a diverse assemblage of ferns, fern allies, and wild flowers to prosper in the herbaceous layer. These include whorled wild yam, New York fern, silvery spleenwort, glade fern, Christmas fern, Smilax pseudochina, mayapple, grape fern, maidenhair fern, black snakeroot, richweed, bloodroot, lizard's tail, toothwort, hepatica, rue anemone, yellow passion flower, and showy orchis. The herbaceous layer is one of the richest and most diverse in all of the Severn watershed. Rare and noteworthy herbaceous plants that require a strict regimen of shade, water, cool temperatures, and little disturbance flourish in the ravine bottoms of this natural area. Spicebush, wild hydrangea and pawpaw are common shrubs in an otherwise sparse shrub layer. The understory layer is well developed and markedly distinct due to the exceptional height of the trees in the canopy layer. Typical understory components include pawpaw, ironwood, and flowering dogwood. The canopy trees are extremely large, and almost without exception are old growth timber. In fact, northern red oak and beech groves are of virgin quality, and some exceed 200 years in age. Examples exceeding State Champion dimensions have also been recorded. The dominant trees include tuliptree, northern red oak, and beech. Tuliptree and northern red oak reach heights of 140 ft. with trunks up to 7.0 ft. in diameter. Collectively, the trees of the ravines, steep slopes, and uplands of this natural area may form the most significant and least disturbed hardwood forest in the entire watershed (see Exceptional Trees).

cotype #4: Uplands and steep slopes

Acreage: 14/./ acres

Flora: The very steep (15-100%) slopes and flat uplands support a variety of mature and extremely large hardwood trees and a very diverse and rich herbaceous layer. Dominant canopy trees include tulip poplar, red maple, sour gum, northern red oak, chestnut oak, black walnut, beech, white ash, black oak, white oak, mockernut hickory, and on the steepest slopes and 60 ft. terraces, chestnut oak, scarlet oak, and sassafras. These trees on average have DBHs of 24-36 in. and some reach heights of 120-140 ft. (see category on Exceptional Trees for specific examples of these extremely significant hardwood forest). Many of these tree species (e.g., red maple, ash, sour gum) are normally found on the rich, moist soils of floodplains elsewhere in the watershed. But to testify to the exceptional edaphic conditions, these trees grow on uplands and steep slopes in this natural area. The understory layer of ironwood, pawpaw and flowering dogwood is quite distinct due to the elevation of the canopy layer. A shrub layer of wild azalea, mountain laurel, spicebush, American holly (somewhat stunted because of the cooler ravine conditions), pawpaw, and American evonymus is

rather sparse. The herbaceous layer of the uplands and steep slopes is unique because plants normally only found on the bottoms of cool moist ravines and floodplains prosper. Due to the thick, rich, moist, and relatively undisturbed soils covering the uplands and slopes, the following herbaceous plants are found: showy orchis, hepatica, whorled wild yam, New York fern, richweed, mayapple, Christmas fern, and Smilax pseudochina. The occurrence of these light, water, and temperature sensitive plants on upland and slope areas in the Coastal Plain is quite remarkable.

Ecotype #5: Freshwater pond (located on the unnamed stream draining Pines on the Severn)

Acreage: 1.0 acre

Flora: The freshwater pond is surrounded by old woods and provides additional diversity to the habitat of the natural area. It supports a healthy population of large mouth bass and bluegills.

Ecotype #6: Pasture

Acreage: ca. 20 acres (not included in the total acreage)

Flora: The pasture on Joyce Lane acts as a valuable transition area for the Chase Creek ecosystem, and in essence, makes it fully contiguous to the Ray's Pond natural area to the north. The "edge effect" produced by the interfacing of the pasture and mature forest increases the ecological productivity of this area.

Natural Heritage Elements: 1) Glade fern - B3, State rare, in danger of extinction in Maryland (only one of three known stations on the Coastal Plain); 2) Yellow passionflower - C, State declining.

Noteworthy Plant Species: 1) Wild sarsaparilla - "rare on the Coastal Plain" (Brown and Brown, 1984); 2) Rue anemone - "common in midlands and mountains" (Brown and Brown, 1984); 3) Whorled pogonia orchid - "infrequent on the Coastal Plain" (Brown and Brown, 1984); 4) Maidenhair fern - "only occasionally found on the Coastal Plain" (Reed, 1953); 5) Silvery spleenwort - "uncommon on the Coastal Plain" (Reed, 1953); 6) Round-lobed hepatica - "rare on the Coastal Plain" (Brown and Brown, 1984); 7) Wild hydrangea - "common in the midlands and mountains, rare in the Coastal Plain" (Brown and Brown, 1972); 8) Showy orchis - "usually infrequent" (Brown and Brown, 1984).

Exceptional Trees

Historical Trees: 1) A beech tree with a CBH of 9 ft. 7 in. displays engravings that are over 100 years old. Although many of the carvings were distorted due to the stretching of the bark, a large and artful engraving of the letter "A" was clearly legible. This "A" stands for the Arnold Family tract; the Arnolds were the owners of this land in the 1800s. 2) A decadent, hollow beech tree displaying several sets of engraved initials and dates is likely over 200 years old. Clearly legible are the dates 1878, 1885 and the initials "R.H.A." for Robert Henry Arnold, whose family owned the land in the 1800s. Other initials include "A.R. Arnold" and stand

for Alton R. Arnold, the County Treasurer for Anne Arundel in 1920. The tree also served as a bench mark for a property line of the Arnold tract and was probably quite sizable when surveyed in the 1800s.

Old Trees: 1) The shell of an ancient fossil beech tree (which is still alive) located in Berry's Ravine is probably in excess of 250 years old. The bark thickness and pattern, the morphology of the tree, the root development, and local historical data offer evidence for this age interpretation. 2) A very large chestnut oak tree, based on the extreme development of the bark, is probably in excess of 150 years, and quite possibly as much as 200 years in age. 3) A beech tree with a very well developed root system - probably in excess of 150 years old.

Big Trees: 1) Beech tree - CBH 9 ft. 8 in.; 2) Chestnut oak - CBH 12 ft. 3 in.; 3) Sour gum - CBH 8 ft. 9 in. - sour gum trees such as this located near the base of moist ravine slopes reach noteworthy sizes for this tree species. This tree is also a fine example of how overmature trees sometime lose their rough bark and develop smooth surfaces; 4) Short leaf pine - CBH 5 ft. 8 in. CBH and ca. 110 ft. in height. This tree will rival the present State Champion in total points and should be officially measured by the Urban Forestry Division of the DNR; 5) Northern Red Oak - CBH 13 ft. 0 in.; 6) Tulip poplar CBH 13 ft. 8 in. and ca. 145 ft. in height (this is thought to be the tallest tree on the Severn Watershed; 7) Tulip poplar - DBH 3 ft. 5 in.; 8) Red maple - CBH 10 ft. 5 in.; 9) White ash - CBH 10 ft. 5 in. - this is the largest white ash known to occur in the Severn watershed (white ash is a species not commonly observed in the watershed); 10) Northern red oak - CBH 21 ft. 9 in. and a height of ca. 120 ft. - this tree may very well be higher in total points than the current State Champion and should be measured by the Urban Forestry Division of the DNR; 11) Black oak - CBH 10 ft. 5 in.; 12) Scarlet oak - CBH 6 ft. 9 in.; 13) Northern red oak - CBH 9 ft. 2 in., 90 ft. in height, 45 ft. spread; 14) Black oak - CBH 11 ft. 8 in. 15) White oak - CBH 12 ft. 8 in.; 16) Black oak - CBH 14 ft. 4 in., 85 ft. in height, 50 ft. spread.

Historic Features: 1) An original colonial land grant survey stone is located near the head of Rowles Branch. The marker is ca. 12 in. x 12 in. x 30 in. and was carved of sandstone. Still legible on the stone are the words "Loyd Lnd", for the colonial grant (circa late 1600s) of Edward Lloyd called "Swan Neck". 2) A path of stones was observed on the ground in a distinct pattern that suggests the foundation of a small house: possibly the home of a black tenant farmer or slave during the 1800s.

Archeological Features: 1) MHT site AN 99 - "Chase Point" - chips, and a herringbone incised rim were found at this site.

Wildlife: The forest of this natural area, together with the Ray's Pond natural area, has been rated very important for neotropical forest interior nesting birds by Dr. Eugene S. Morton of the Smithsonian Institution. Species indigenous to this natural area include ovenbird, American redstart, Kentucky warbler, blue-gray gnatcatcher, yellow-throated vireo, worm-eating warbler, northern parula warbler, hooded warbler, pileated woodpecker, and red shouldered hawk (a pair were observed during field work). Other noteworthy species known to occur include deer, otter, and star-nosed mole. A significant salamander habitat exists in this natural area. Red salamanders have been observed, and an eastern tiger salamander was collected here in 1961. This species is considered

endangered throughout the State of Maryland. Numerous other species of amphibians and reptiles have been recorded, including corn snake, queen snake, Valeria's snake, copperhead and ring-necked snake. In general, the combined acreage of Ray's Pond/Chase Creek subwatersheds form a large, intact natural area which supports many significant amphibian, reptile, bird, and mammal species. This natural area should be regarded as a significant wildlife habitat.

Scenic Qualities: In one aspect, the extremely large and venerable trees provide a sense of openness. But in another aspect they provide a sense of total enclosure due to their dense canopy. The extreme topographic relief is dramatized due to the open nature of the understory. The diverse assemblage of ferns, fern-allies, and native wildflowers, including six orchid species, offers tremendous aesthetic appeal on a much smaller scale. Collectively, the antiquity, size, and historical nature of the many handsome hardwood trees in this natural area make it unique unto the Severn for observing exceptional trees. At no other location in the watershed can so many significant trees be observed in an area this compact.

Geology: The Aquia Fm. underlies the uplands and steep slopes (Ecotype #4). The ravine bottom (Ecotype #3) is formed with reworked sediments from the Aquia Fm., and in essense have the same edaphic properties as the uplands and steep slopes, but are moister. Alluvium forms the shrub swamp (Ecotype #2) and tidal marsh (Ecotype #1). Based on the exceptionally high fertility of the thick soils in this natural area, there may be a locally high concentration of glauconite in the Aquia Fm. in this subwatershed. Terraces at an elevation of ca. 60 ft. occur in several locations in the natural area. These terraces may be erosional (wave-cut benches), formed when sea level was higher, and correlative with the Talbot Fm. on Broadneck.

Soils: Butlertown silt loam soils cover the pastures of Joyce Lane (Ecotype #6). Monmouth fine sandy loams and Collington fine sandy loams cover the steep slopes and uplands (Ecotype #4). Mixed alluvial land forms the ravien bottoms (Ecotype #3). The soils of this subwatershed are some of the most fertile and least disturbed in the entire Severn River watershed.

Topography: The uplands and pastures are relatively flat (2-10% slopes) and range in elevation from a maximum of 154 ft. (msl) to ca. 120 ft. (msl). The steep slopes range in elevation from ca. 120 ft. (msl) to sea level. These are some of the steepest slopes in the Severn River watershed. The elevation of the freshwater pond (Ecotype #5) is 14.4 ft. (msl). Rowles branch drops from ca. /5 ft. (msl) to sea level over a distance of ca. 2000 ft.

Contiguity: The North Branch of Chase Creek natural area is fully contiguous with the Ray's Pond natural area to the north. Only a few developed lots on Severn Way in Pines on the Severn separate this natural area from the natural areas on the South Fork of Chase Creek. Together, these natural areas total ca. 400 acres and form the largest natural area on the north shore of the Severn River.

Other: This natural area should be recognized for its outstanding hardwood forest. It should also be recognized for its special micro-climatic conditions which allow an exceptionally diverse assemblage of noteworthy ferns, fern-allies, and wildflowers to prosper. Field review - 6/30/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970) - "smooth cordgrass, meadow cordgrass, spikegrass, marshelder, groundselbush" = 0.8 acre. 2) Upland Natural Area Study (1977). 3) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory - "estuarine intertidal, emergent, narrow-leaved persistent, irregular" = 0.8 acre; "palustrine, forested, broad-leaved deciduous, temporary" = 18.0 acres; "palustrine, open water, intermittently exposed/permanent, diked/impounded" = 0.5 acre. 4) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 28 lot (< 1.0 ac.) owners, 3 major (> 5 ac.) landowners: corporate (1.98 ac.); community (2 lots).

Land Use: Rural-Residential (1/2 units or less/ac.); the wetland at the mouth of Rowles Branch is classified as Natural Features (Open Space).

Residential Communities: Briar Cliff, Pines on the Severn

Problems: There are no pending projects or proposed developments. Although several ongoing impacts were observed during field work, these were relatively minor and they are not adversely affecting the natural area to a significant degree. Some of these ongoing problems include stormwater runoff into a small side ravine of the stream draining Pines on the Severn; the growth of kudzu in the ravine bottom just below the freshwater pond (Ecotype #5); a small boat mooring at the head of the Chase Creek detracts somewhat from the scenic quality; and old horse riding trail used until ca. 10 years ago has been colonized by non-native plants; English ivy is flourishing in one area near the head of Rowles Branch.

Preservation Options: Conservation easements with the critical landowners hold much promise. Conservation cooperatives with the remaining lot owners should be pursued. In all cases, landowners should be approached on a very personalized basis. In a 1986 letter to the County and State, the SRC urgently recommended this as one of five environmentally important areas to be preserved through appropriate County and State action. In the letter, the SRC stated, "Every effort must be given to obtaining preservation agreements with owners of contiguous properties to strengthen preservation of approximately 200 acres of woodlands in the watershed of the North Branch of Chase Creek which are essential to protection of the Chase-Rays Arnold Forest.

Future Use: Because of the fragility of this ecosystem, a recognized species preserve, scientific monitoring, and a forest wildlife reservation appear to be suitable future uses.

ISOLATED FEATURES

Wetlands: The DNR Tidal Wetlands Boundaries (1970) recognize a fringe marsh on the north shore of Chase Creek at Gowan's Point. Smooth cordgrass, marshelder, and groundselbush are mapped over an area of ca. 0.3 acre.

NATURAL AREA #2

Name: Briar Cliff Ravine

Geographical Limits: Bounded on the south by Chase Creek, on the east by the Briar Cliff subdivision, on the north by Joyce Lane, and on the west by large developed lots at the end of Joyce Lane.

Total Acreage: 23.7 acres

Ecological Classification: Altered green area; this includes two ecotypes: 1) Ravine bottom; 2) Steep slopes.

Ecotype #1: Ravine bottom

Acreage: 5.8 acres

Flora: This ravine runs from its headwaters near Joyce Lane to the north shore of Chase Creek. Detailed field work was not done on this natural area and few specific comments on natural features can be made. However, it is known that this ravine has been heavily disturbed by the extensive growth of the non-native kudzu vine. Significant natural features such as noteworthy ferns and wildflowers may still exist. This ravine requires further field investigation.

Ecotype #2: Steep slopes

Acreage: 17.9 acres

Flora: The steep slopes extending from the ravine bottom to Briar Cliff on the east and house of Joyce Lane to the west have also been impacted by the rampant growth of kudzu. However, exceptional hardwood trees (such as those in the North Branch of Chase Creek woods; Natural Area #1) and other natural features may still exist and this area likewise requires further field investigation.

NATURAL AREA #3

Name: Rucker's Ravine

Geographical Limits: From its headwaters at Severnway Rucker's Ravine runs in a southeasterly direction for ca. 700 ft. and thence in a southwesterly direction for ca. 1100 ft. to its mouth at the South Branch of Chase Creek. It is encircled by developed lots of Severnway on the north, Grandview Road and Cascade Road on the east, North Riverdale Road on the south, and Old River Road and Spring Path on the west.

Total Acreage: 27.4 acres

Ecological Classification: Complete ecotype; this includes four ecotypes: 1) Ravine bottom; 2) Steep slopes; 3) Freshwater pond; 4) Freshwater pond. This complete ecotype functions as part of the larger Chase Creek environmental complex.

Ecotype #1: Ravine bottom

Acreage: 4.8 acres

Flora: The flat bottom of this very moist, shaded, and cool ravine is characterized by fragile herbaceous plants that require a strict regiem of temperature, water, and light for survival. Herbaceous plant species found there include glade fern, early saxifrage, wild sarsaparilla, maidenhair fern, silvery spleenwort, moonseed, wild hydrangea, crested wood fern, Clintons fern, whorled wild yam, New York fern, Christmas fern, mayapple, bloodroot and skunk cabbage. The shrub layer is very open with occasional occurrences of spicebush and pawpaw. The understory is relatively open and includes ironwood and flowering dogwood. Although heavily cutover during the earlier part of this century, the canopy layer is relatively mature and is dominated by tulip poplar. Density exceeds 18,500 board feet per acre, according to the Maryland Forest Service. Bitternut hickory, beech, and northern red oak trees are less freqent. The adjacent steep slopes and dense canopy offer almost constant shade and, in combination with waters from a free flowing spring, produce cool and moist micro-climatic conditions typical of Piedmont ecosystems.

Ecotype #2: Steep slopes

Acreage: 21.0 acres

Flora: The very steep (15-40%) slopes of Rucker's ravine support a mature hardwood forest characterized by tulip poplar and beech near the base of the slopes and by chestnut oak and mountain laurel on the steep mid-slope areas. Mature (DBH 12-24 in.) scarlet oak trees have colonized the flat 60 ft. terraces found midway up the slopes. Density exceeds 11,500 board feet per acre according to the Maryland Forest Service. Trailing arbutus, huckleberry, spotted wintergreen, Indian pipe, cranefly orchid and pink lady's slipper are plants found over much of the slope area.

Ecotype #3: Freshwater pond

Acreage: 0.5 acre

Flora: Rucker's freshwater pond is bordered by old woods on one side and a small grass meadow on the other. The pond which supports floating marsh pennywort provides added diversity to the habitat of the natural area. Typical fish and wildlife includes black bass, bluegill, muskrats, herons, and woodducks.

Ecotype #4: Freshwater pond (Winchester skating pond)

Acreage: 1.1 acres

Flora: Just downstream of Rucker's pond is a second freshwater pond impounded behind the embankment of Knollwood Road. The pond has slowly been infilled with sediment over the last few decades and is coverting into a freshwater marsh dominated by water willow. In addition to water willow, burreed and floating marsh pennywort are slowly colonizing the last remaining open water area (ca. 2000 $ft.^2$) near the embankment of Knollwood Road. Black willow and red maple have established along the perimeter of

the pond. Outward from the pond edge and beyond the red maple/black willow perimeter are transitional zones. These bands of upland hardwood trees protect the ecological and scenic integrity of the pond and act as buffers on either side of the pond. The continued ecological prosperity of the pond is dependent on these transitional ("life") zones.

Natural Heritage Elements: 1) Glade Fern - B3, State rare, in danger of extinction in Maryland (this is a very large station, and only one of three stations known on the Coastal Plain); 2) Floating marsh pennywort - C, State declining; 3) Yellow passionflower - C, State declining; 4) Clinton's fern - C, State declining (this is the only station known to exist in Anne Arundel County). 5) Two-flowered bladderwort - B2, highly State rare, in danger of extinction in Maryland.

Noteworthy Plant Species: 1) Silvery spleenwort - "rare on Coastal Plain" (Reed, 1953); 2) Wild sarsaparilla - "rare on Coastal Plain" (Brown and Brown, 1984); 3) Cutleaf dwarf sumac - "unique, absent from literature, unknown to occur elsewhere" (Rucker, 1986); 4) Maidenhair fern - "only occasionally occurs on the Coastal Plain" (Reed, 1953); 5) Moonseed - "common in the Piedmont and mountain zones" (Brown and Brown, 1972); 6) Wild hydrangea - "common in the midlands and mountains, rare in the Coastal Plain" (Brown and Brown, 1972); 7) Cranefly orchid -"infrequent on the Coastal Plain" (Brown and Brown, 1984).

Exceptional Trees

Big Trees: 1) Scarlet oak - DBH 33 in. and 103 ft. tall (exceeds the 1973 Maryland Champion).

Old Trees: 1) An extremely old tulip poplar tree occurs in Rucker's ravine. The tree is a mere shell of its former giant size. The base of this ancient tree is hollow, and has a CBH of 19 ft. 10 in. Based on the morphology and thickness of the bark, this tree is estimated to be well in excess of 200 years. This tree may have an interesting historical past as well.

Historical Features: 1) Freshwater pond at Knollwood Road (Ecotype #4) was formerly a skating pond for the Pines on the Severn community. The pond dates from construction of the road, circa 1952. Ernest William Mueller was killed (12/13/52) by a large beech tree while bulldozing the road. 2) The largest free flowing spring in the Severn watershed feeds Rucker's ravine. Based on local history and stone settings around the spring head, the spring has probably been a soruce of water for residents since Colonial times, and supplied the community water system until 1934. The occurrence of springs such as this may have had a significant impact on settlement patterns during the early history of the Severn. 3) Chase Creek in general is rich in local history and the accounts are too numerous for inclusion here (contact Colby B. Rucker for details).

Archeological Features: None registered

Wildlife: Numerous species of reptiles, insects, amphibians, and mammals are known to inhabit this Ravine (see pp. 62-64 in Maryland Scenic Rivers: The Severn for a complete listing of the wide diversity of fauna found in this natural area).

Scenic Qualities: Although almost surrounded by developed lots, the steep slopes and depth of Rucker's ravine, and the thick forests on the slopes, provide significant audio and visual protection from these developments. The solitude and serenity of this ravine, considering the surrounding develoment, is remarkable. The openness of the understory and shrub layers allows long, unrestricted views of the many diverse habitats along the ravine corridor. The openess underneath the thick canopy layer also allows one to fully appreciate the extreme relief and rugged topography of the ravine.

Geology: The Aquia Fm. underlies the steep slopes (Ecotype #2); Aquia sediments eroded from the steep slopes cover the floor of the ravine. Terraces at an elevation of ca. 60 ft. (msl) occur in several locations about half way up the slopes. These terraces may be erosional (wave-cut benches), formed when sea level was higher, and correlative with the Talbot Fm. on Broadneck. The infilling of the old skating pond is an ideal example of "alluvial drowning" and ecotype succession.

Soils: Collington sandy loams and silt loams cover the entire natural area except for the reworked alluvial soils on the ravine bottom which probably have edaphic properties very similar to Collington soils.

Topography: The crests of the steep (15-40%) slopes (Ecotype #2) are at an elevation of 110-120 ft. (msl). The head of Rucker's ravine is at 50 ft. (msl) and descends to 10 ft. (msl) at Rucker's pond, a distance of ca. 900 ft. (msl).

Contiguity: Rucker's Ravine, save a few developed lots on Severn Way, is contiguous to the Iliff/Berry Woods (Natural Area #1). Although migration of wildlife between these natural areas may be slightly impacted, many species are known to commute freely back and forth. Rucker's Ravine is a key link in a chain of properties that form a natural area of ca. 400 acres between Ray's Pond and Chase Creek; the largest remaining natural area on the north shore of the Severn.

Other: The free flowing spring which feeds Rucker's Ravine is the largest known on the Severn. The constant flow from this spring contributes to the ravine's exceptionally moist soil conditions and provides unique edaphic conditions which allow many noteworthy, rare, and unique plants to prosper. The spring is also one of the few known habitats for uncommon isopods and amphipods (groundwater invertebrates) on the Severn. Field review - 6/30/86.

Previous Listings: 1) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; Rucker's pond - "palustrine, open water, intermittently exposed/ permanent, diked/impounded = 1.0 acre; old skating pond - "palustrine, emergent, narrow-leaved persistent, seasonal = 1.0 acre; 2) Natural Heritage Program (1983 and 1985); Rucker's Ravine is recognized as an ecologically sensitive area. 3) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 32 lot (< 1.0 ac.) owners, 3 minor (1-5 ac.) landowners, 1 major (> 5 ac.) landowner: community; county government.

Land Use: Residential - Rural (1/2 or less units/ac.); the old skating pond (Ecotype #4) is classified as Natural Features (Open Space).

Residential Communities: Pines on the Severn, Hidden Hills, Winchester on the Severn.

Problems: No proposed projects or residential developments are recorded. However, unsubstantiated proposals for filling in the old skating pond (Ecotype #4) for a parking area have periodically surfaced in the past. Ongoing problems include sediment runoff from Severn Way at the head of Rucker's ravine and slow but steady infilling of the old skating pond (Ecotype #4). Raising the water elevation of the pond by slightly increasing the level of the wood planked (drop box) spillway should help control the growth of water willow. This would allow a portion of the pond to remain as open water and improve amphibian habitat.

Preservation Options: The major critical landowner has expressed a very positive attitude about maintaining the property in a natural state. Conservation easements are possible viable options. Conservation cooperatives with the many lot owners whose properties encircle the ravine should be promoted. The continued viability of this natural area is dependent on the back portions of these lots remaining as green transitional zones. Environmentally sensitive management plans for the old skating pond (Ecotype #4) should be developed by the County. The Chase Creek Swim Club Inc. should also be contacted about their strategically important properties. In a 1986 letter to the County and State, the SRC urgently recommended this natural area (especially Ecotype #4) and Natural Area #4 (Hidden Hills Ravine) as one of five environmentally important areas to be preserved through appropriate County and State action. In the letter, the SRC stated, "To achieve full preservation of natural areas in the watershed, we recommend full environmental protection of the present County property" (Ecotype #4) "and preservation by either easements, protective agreements, or acquisition of the additional approximately 70 acres of most ravine bottoms and adjacent intact upland woods in the watershed."

Future Use: Because of the fragile ecology of the ravine, scientific monitoring and a recognized species preserve appear to be suitable future uses for this natural area.

NATURAL AREA #4

Name: Hidden Hills Ravine

Geographical Limits: This natural area is bounded by developed lots of Hidden Hills to the east and north, Winchester Road to the south, and Winchester on the Severn to the west. This natural area is fully contiguous to Rucker's Ravine (Natural Area #3).

Total Acreage: 57.9 acres

Ecological Classification: Complete ecotype; this includes three ecotypes: 1) Ravine bottom; 2) Steep slopes; 3) Uplands. This complete ecotype functions as part of the Chase Creek environmental complex.

Ecotype #1: Ravine bottom

Acreage: 4.3 acres

Flora: No on site field work was done on this natural area and few specific comments on natural features can be made. However, it is known to be completely wooded with red maple, sour gum and tuliptree.

Ecotype #2: Steep slopes

Acreage: 16.8 acres

Flora: The slopes are dominated by large chestnut oaks.

Ecotype #3: Uplands

Acreage: 36.8 acres

Flora: This is an intact mature hardwood forest dominated by tuliptree.

NATURAL AREA #5

Name: Bancroft Promontory

Geographical Limits: This natural area is the southern promontory at the mouth of Chase Creek.

Total Acreage: 27.8 acres

Ecological Classification: This promontory is known to be fully wooded. However, it is scheduled to be developed as the "Bancroft" subdivision, 12 single family lots on 27.8 acres. The development is registered as no. 5014-86 with the County.

ISOLATED FEATURES

Historic Features: 1) In the early 1900s, a cannery operated by Charles L. Tate (1868-1937) was located near the headwaters of Chase Creek at the Baltimore-Annapolis Railroad. Canneries such as this were of commercial significance in the 1800s and early 1900s in the Severn watershed.

SUBWATERSHED #40

Name: Coolspring Creek (Cool Springs Cove, 1983: Cool Spring Creek, 1979; Cool Spring Cove, 1935; Cool Spring, 1846; Hopkins Cove, 1667)

Location: Bounded on the north by the Chase Creek subwatershed and on the south by the Winchester Pond subwatershed. This is the subwatershed immediately upriver of the Route 50 bridge on the north shore of the Severn.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be given. Although no large natural areas are known to exist, wooded ravines in the vicinity of the Grabus property are mostly intact. A significant grove of chestnut oaks is found on dry soil at the top of the cliff at the A. Paul Evans property and another at the Friary. Perhaps 10-15 acres of uplands and slopes leading down from Winchester Road are intact woodland. The uplands are mostly tuliptree while the slopes support bitternut, black walnut, and redbud.

ISOLATED FEATURES

Wetlands: The DNR Tidal Wetlands Boundaries (1970) recognizes a large "bowl-shaped" marsh at the point adjacent to the Route 50 bridge; "meadow cordgrass, spikegrass, marshelder, grounselbush, cattail = 2.8 acres. The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also recognizes this marsh; "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 2.8 acres.

Historic Features: The County Historic Sites Survey lists one structure; 1) AA 951 - "St. Conrad's Friary" - has been described as a quality site and one worthy of submission as a candidate for the National Register of Historic Places. A description of the Bartlett-Hayward mansion (or St. Conrad's Friary) was written about 1984 by a developer seeking conversion of the building to an executive conference center. 2) The Sherwood House, for reference see a description of the Sherwood-Pine Lane Property in The Capital. 3) The Davis-Fraley - Hiltabidle House is also a commonly noted historic structure; more information is needed.

Archeological Features: 1) MHT site AN 96 - Larkington Cove I - a two ft. thick shell heap where bones and sherds were collected.

Geology: Two excellent cliff exposures are located on the Severn immediately upriver and downriver of the mouth of Coolspring Creek. The cliff nearest the Route 50 Bridge is ca. 60 ft. (msl) in elevation; the other, near St. Conrad's Friary, is ca. 90 ft. (msl) above the river. Both cliffs provide outstanding outcrops of weathered Aquia sediments.

Problems: One major highway project is planned. The SHA project, entitled "U.S. 50/301, Blue Star Memorial Highway", calls for removal of the at grade intersection of Route 50 and Winchester Road. This project includes construction of service roads connecting Ritchie Highway and Route 50. One of

these service roads is located in the headwaters of the Coolspring Creek subwatershed. As with any major construction activity there is potential for sediment runoff associated with this project. The final engineering is currently underway and construction is slated for completion by 1990.

SUBWATERSHED #41

Name: Winchester Pond (Crouchs Pond, 1979; Crouch's Pond, 1961; Catlyn's Cove, 1667)

Location: Bounded on the north by the Coolspring Creek subwatershed and on the south by the Browns Cove subwatershed. This is the subwatershed immediately downriver of the Route 50 Bridge on the north shore of the Severn.

Natural Areas: This subwatershed includes one natural area: 1) Severnside.

NATURAL AREA

Name: Severnside

Geographical Limits: Bounded on the west by the Severn River, on the north by Winchester Pond, on the south by the drainage divide separating the Browns Cove subwatershed, and on the east by the old Baltimore and Annapolis Railroad embankment.

Total Acreage: An 58.2 acre wooded historic property associated with Severnside.

Ecological Classification: Complete ecotype; this includes five ecotypes: 1) Pasture; 2) Steep slopes; 3) Uplands; 4) Ravine bottom, 5) Tidal marsh.

Ecotype #1: Pastures

Acreage: 26.0 acres (not included as part of the total acreage)

Flora: Open field grasses occur on the highest elevations in the natural area (100-126 ft. msl) near the Severnside house.

Ecotype #2: Steep slopes

Acreage: 43.0 acres

Flora: Mature woods of tuliptree occur, with some Virginia pine on the slopes down to the old Baltimore and Annapolis Railroad. Some English ivy has established in this area, and may spread. The woods on the slopes down to the pond are composed of stunted Virginia pine, chestnut oak, white oak, scarlet oak, and on the southern exposures, redbud, slippery elm, black walnut, black locust, and small hackberry.

Ecotype #3: Uplands (old field forest)

Acreage: 9.0 acres

Flora: On the higher uplands, a heavy growth of tulip poplars dominates the abandoned (old) field areas. Tulip poplars graduate into chestnut, scarlet, and white oaks near the steep slopes.

Ecotype #4: Ravine bottom

Acreage: 6.0 acres

Flora: A broad ravine bottom at the east end of Winchester Pond is characterized by large sycamores.

Ecotype #5: Tidal marsh

Acreage: 0.2 acre

Flora: A narrow sand spit protects the entrance of Winchester Pond. The spit is ca. 200 ft. long and reduces the entrance of the pond to ca. 50 ft. The spit is colonized with wetland vegetation, including common reed cattail, marshelder, groundselbush, and arrow arum.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) The County Historic Site Survey lists one structure, AA 312 - Severnside. The house has been described as being in "excellent, altered condition and on its original site." The house, which was built in 1849 by Jacob Winchester, was greatly enlarged in 1920 by the president of St. John's College. This addition included a large portico with massive columns, an imposing example of Greek Revival architecture. 2) An old railroad depot named Severnside was located on the north side of the old Baltimore and Annapolis line (circa 1887).

Archeological Features: Two MHT sites: 1) AN 95 - Severnside - is a shell midden where projectile points and sherds were found; 2) AN 98 - Winchester Pond - is a large (1 acre) site 1+ft. deep where chips, bones, turtle backs, and grit tempered fabric impressed sherds were collected.

Wildlife: No details known.

Scenic Qualities: The Severnside house and the 60 ft. cliff fronting the Severn are highly significant scenic features because of their enormous exposure to the thousands who can view them everyday as they travel east over the Route 50 Bridge. It is imposing bluffs and stately houses such as these that give the Severn an intangible quality and distinquish it from other rivers in the County.

Geology: The Aquia Fm. underlies the entire subwatershed. Alluvial sands form the spit (Ecotype #5) which protects the pond. The Severnside bluff is a 60 ft., near vertical exposure of weathered Aquia sediments. The cliff is rapidly eroding and, in part, this material is deposited on the sand spit immediately upriver. The buff, orange, and red sediments of the large cliff are a dramatic sight when viewed from the Route 50 Bridge.

Soils: Collington fine sandy loams cover the slopes leading to the pond. Monmouth fine sandy loams and clay loams cover the uplands and pastures near Severnside. Shrewsbury fine sandy loam soils cover the steep slopes and the cliff facing the Severn River.

Topography: The uplands (Ecotype #3) and pastures (Ecotype #1) are relatively flat (2-10% slopes) and range in elevation from 60 to 87 ft. (msl). The steep (15-40%) slopes ringing the pond range in elevation from sea level to 60 ft. (msl). The cliff fronting the Severn is ca. 60 ft. (msl) in elevation and is nearly vertical. The sand spit (Ecotype #5) has a maximum elevation of 3.0 ft. (msl).

Contiguity: The Severnside natural area is, for the most part, completely isolated by highways from other large natural areas.

Other: Field review - 6/25/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970) mapped the sand spit (Ecotype #5) as a 0.2 acre wetland.

LAND CONSERVATION

Ownership Type: Private (multiple), 1 lot (< 1 ac.) owner, 7 minor (1-5 ac.) landowners, 1 major (> 5 ac.) landowner.

Land Use: The eastern shoreline of the pond is mapped as Natural Features (Open Space). The remainder of the natural area is classified as Residential -Rural (1/2 or less units/ac.).

Residential Communities: Winchester Road East

Problems: One major highway project is planned. The SHA project, entitled "US 50/301, Blue Star Memorial Highway," calls for removal of the at grade intersection of Route 50 and Winchester Road. This project includes construction of service roads connecting Ritchie Highway and Route 50. One of these service roads will be located in the headwaters of the Winchester Pond subwatershed and will roughly be along the same line as that of the old Baltimore-Annapolis Railroad embankment. As with any major construction activity, there is potential for sediment runoff associated with this project. The final engineering is currently underway and construction is slated for completion by 1990. Although no developments have been proposed, the owner of the major property died in August, 1985. It is unknown if the succeeding heirs will put any part of the two properties up for sale. Development would certainly damage the scenic appeal of this part of the river. The succeeding nephew of the deceased landowner has expressed interest in woodland management. The County Department of Public Works has plans to dredge Winchester Pond for the purpose of boat access for the small marina on the east side of the pond. Ongoing impacts include some growth of non-native species, especially English ivy which has established near the railroad embankment.

Preservation Options: Conservation easements, mutual covenants, and conservation cooperatives are definite options and should be explored with the family which owns the majority of the natural area.

Future Use: Passive recreation, outdoor education, and restricted sightseeing are all viable future uses considering the present condition of the natural area. Severnside should also be considered a scenic buffer important to the integrity of the Severn River (especially considering its high visual exposure from Route 50 bridge traffic).

SUBWATERSHED #42

Name: Browns Cove (Browns Pond, 1961)

Location: Bounded on the north by the Winchester Pond subwatershed and on the south by the Jonas Green Pond subwatershed. This is the first subwatershed downriver of the old Baltimore and Annapolis Railroad bridge on the north shore of the Severn.

Natural Areas: This subwatershed includes one natural area: 1) Browns Cove Ravines.

NATURAL AREA #1

Name: Browns Cove Ravines

Geographical Limits: Three heavily wooded ravines feed Browns Cove, two from the north, one from the south. The first ravine flows along a southerly course, between the old Baltimore and Annapolis Railroad embankment on the west and Ritchie Highway on the east. The second ravine flows along a southwesterly course, underneath Ritchie Highway and has its headwaters near Old Annapolis Blvd. (Rt. 648). The third ravine flows along a northwesterly course into the south tidal fork of Browns Cove; it also flows under Ritchie Highway with its headwaters near Old Annapolis Blvd.

Total Acreage: 93.9 acres of woodland highly fragmented by railroad and highway transportation lines.

Ecological Classification: Altered green area; this includes five ecotypes: 1) Tidal (cove) marsh; 2) Ravine bottom and steep slopes; 3) Ravine bottom and steep slopes; 4) Tidal (cove) marsh; 5) Ravine bottom and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 1.0 acre

Flora: At the head of tidewater on the north fork of Browns Cove is an intact tidal marsh composed of smooth cordgrass, cattail, hibiscus, and arrow arum. This shoreline of this marsh is undisturbed and the vegetation is highly interspersed.

Ecotype #2: Ravine bottom and steep slopes

Acreage: 22.0 acres

Flora: The ravine running between the railroad and the highway is completed wooded. By far the most dominant tree of this heavily forested ravine is tulip poplar. Oaks, including southern red, white, and chestnut are common on the steep slopes of the ravine. Small side ravines which drain from the west, under the railroad embankment, to the main ravine are

covered with second growth tulip poplar. Mayapples thrive in these NE facing hollows, and showy orchis are found in limited number. Small pockets of shrub swamp may occur in these side ravines, immediately upstream of the railroad embankment ("alluvial drowning"). Further field investigation is required.

Ecotype #3: Ravine bottom and steep slopes

Acreage: 31.0 acres (this includes both upstream and downstream segments which are fragmented by Ritchie Highway)

Flora: Upstream of Ecotype #1 is a second heavily wooded ravine which passes under Ritchie Highway and terminates near Route 648. The dominant tree in this ecotype is second growth (old field) tulip poplar (9-18 in. DBH). Despite highway construction, this area appears to be in relatively good condition.

Ecotype #4: Tidal (cove) marsh

Acreage: 0.9 acre

Flora: At the head of tidewater on the south fork of Browns Cove is a cove marsh composed of mostly cattail, but with minor components of arrow arum, hibiscus, and smooth cordgrass. This marsh is protectively tucked away and appears totally undisturbed. Its shoreline is completely intact.

Ecotype #5: Ravine bottom and steep slopes

Acreage: 39.0 acres (12.0 acres below Ritchie Highway, 27.0 above)

Flora: The third ravine flows northwestward under Ritchie Highway and into the south cove marsh (Ecotype #4). This ravine and associated steep slopes are heavily wooded. Tulip poplar, some reaching mature size (12-24 in. DBH), is the major component of this hardwood forest.

Natural Heritage Elements: 1) Purple chokeberry - C, State declining.

Noteworthy Plant Species: 1) Showy orchis - "usually infrequent" (Brown and Brown, 1984).

Exceptional Trees:

Big Trees: 1) White Oak - CBH, 17.5 ft.; spread, 90 ft.; height, 90 ft. (considering that there are very few large trees left on the southern tip of Broadneck, this handsome specimen should be considered a significant natural feature). This fine white oak is located on the west side of Rt. 648, 0.6 mi. south of Rt. 50. 2) White oak - CBH, 7 ft. 6 in.; height, 78 ft.; spread, 35 ft. 3) White oak - CBH, 8.9 ft.; height, 89 ft.; spread, 45 ft. (white oaks 2 and 3 are registered on the Maryland "Big Tree Inventory").

Historic Features: The County Historic Sites Inventory lists two structures in this subwatershed: 1) AA 313 - Manresa - was built as a retreat house in 1926 by the Society of Jesus Colonial Revival, and is presently owned by the Roman Catholic Clergymen of Baltimore. From Manresa, the view of the Naval Academy

and Colonial Annapolis across the Severn River is spectular, making the building's location its most significant feature. 2) The old Baltimore and Annapolis Railroad trestle over the Severn River (circa 1887) is in itself an historically significant engineering structure. Its impact on transportation and commerce significantly impacted the infrastructure of Annapolis and the linkage to Baltimore. This trestle is registered on the County Historic Sites Survey as AA 928, but most of the north end has been removed to facilitate boat traffic. The southern end of the trestle is presently owned by the community of Wardour and it is currently being demolished. 3) Although not listed on the County Historic Sites Survey, the Old Annapolis Highway (Rt. 648), which was upgraded in 1912, is very old, and one of the most significant transportation routes for Annapolis during Colonial and early post-Colonial times. The terminus for this historic route was Ferry Point, from which ferry boats launched for Annapolis Neck.

Archeological Features: 1) MHT site AN 17 - Brice Farm - a 1000 x 300 ft. midden to a depth of 1-2 ft. Potsherds, points, bones, chips, shell tempered pottery with cordmaking fabric (100's of pieces), and chickaboming vessels were collected at this very large deposit. Two groundwater springs are also located at this site.

Wildlife: No significant wildlife observations were made, however, further detailed investigation could prove this natural area to be a significant bird habitat.

Scenic Qualities: A cliff at the end of Brices Lane offers an excellent 40 ft. exposure of weathered Aquia sediments; an outstanding sight from both the water and the Route 450 bridge. The old Manresa drive winds through thick woods and across a steep ravine to Route 648; a scenic and secluded trail. The windshield views from Old Annapolis Highway (Route 648) which meanders through a thick tulip poplar forest has been diminished greatly with recent development, but it still offers a nice drive through the wooded "countryside". The view across the Severn River to Colonial Annapolis from atop the Manresa hill (35 ft. msl) is spectacularly beautiful, probably the best view of the old town on the Severn. In addition, the view of the very majestic Manresa house from both the Route 450 bridge and the river is outstanding. Manresa is just one of the many prominent historic houses high atop the bluffs of the Severn which make the river uniquely scenic.

Geology: The Aquia Fm. underlies the entire natural area except for the tidal coves (Ecotypes #s 1 and 4) which are formed of alluvium. The small side ravines which run from the Rich property and drain under the Baltimore and Annapolis Railroad embankment may offer examples of "alluvial drowning". Small pockets of shrub swamp may have formed due to sedimentation upstream of the railroad embankment (further investigation is needed). The cliff at the end of Brices Lane offers and excellent 40 ft. exposure of weathered Aquia sediments.

Soils: Collington fine sandy loams cover the ravines and steep slopes (Ecotypes #s 2,3, and 5). Monmouth fine sandy loams cover the very steep slopes adjacent to Browns Cove. Tidal marsh soils cover Ecotypes #s 1 and 4.

Topography: The steep (15-40%) slopes bordering the ravine bottoms range in elevation from 60 to 0-35 ft. (msl). The ravine bottoms generally descend in elevation from 35 ft. (msl) at their headwaters to sea level at the tidal coves; a distance of ca. 1500 ft.

Contiguity: Ecotype #2, the ravine running between the railroad embankment and Ritchie Highway, is almost fully contiguous to the Severnside natural area of the Winchester Pond subwatershed (i.e., the Rich property).

Other: The Browns Cove tidal tributary is relatively undisturbed and its steep shorelines are (save two or so small piers) almost completely intact. Except for the fields of Manresa on the north shore and a few large estates off Severn Ridge Road on the eastern shore, the steep slopes leading to the water are completely wooded. The entrance to the cove is extremely narrow (ca. 35 ft.) and offers protection from wave energies on the Severn. The restricted width and depth of the inlet only allows small draft boats to enter Browns Cove. This narrow entrance is vitally important to the water quality and scenic and ecological integrity of Browns Cove. Relatively undisturbed tidal coves such as this are becoming increasingly rare natural features on the Severn. Field review - 6/25/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); Ecotype #1 -"smooth cordgrass, cattail" = 1.0 acre; Ecotype #4 - "cattail" = 0.9 acre. 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; Ecotypes #1 and #4 - "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 1.0 and 0.9 acre, respectively; the narrow entrance to Browns Cove is mapped as "estuarine, intertidal, flat, regular."

LAND CONSERVATION

Ownership Type: Private (multiple), 14 lot (< 1 ac.) owners, 7 minor (1-5 ac.) landowners, 3 major (> 5 ac.) landowners; county government; institutional.

Land Use: The cove marshes at the north and south forks of Browns Cove (Ecotypes #1 and #4) are mapped as Natural Features (Open Space); the remainder of the natural area is mapped as Residential - Rural (1/2 or less units/ac.).

Residential Communities: Homes along Severn Ridge Road

Problems: A major highway project is planned. The SHA project, entitled "US 50/301, Blue Star Memorial Highway," calls for removal of the at grade intersection of Route 50 and Winchester Road. This project includes construction of service roads connecting Ritchie Highway and Route 50. One of these service roads will be located in the headwaters of the Browns Cove subwatershed (Ecotype #2). As with any major construction activity, there is potential for sediment runoff associated with this project. The ravine running between the Baltimore and Annapolis Railroad and Ritchie Highway (Ecotype #2) presently suffers from large volumes of stormwater runoff and aggrevation of this could potentially harm the wetlands at the mouth of the ravine. The County Department of Public Works has plans to dredge Browns Cove for the purpose of boat access. Considering the intact nature of this cove (see "Other" category above), dredging has the potential to cause significant environmental impacts. One minor subdivision is planned for this natural area; it is registered with the County as minor subdivision no. 121-85.

Preservation Options: Considering the major landowners making up the majority of this natural area, conservation easements and mutual covenants may have tremendous potential and should be relatively easy to pursue. Conservation

cooperatives with the minor landowners and lot owners may be viable options. The Roman Catholic Clergy which owns Manresa has expressed financial stresses, and like other local institutions, could sell for development. Representatives from Manresa should be contacted concerning their future plans and attitudes.

Future Use: The recreational tie-ins of the County's bike path should be incorporated into an overall management plan for the subwatershed. Because of the railroad recreational aspect, this natural area offers real benefits for careful planning. Passive recreation and outdoor education associated with the bike trail are potential future uses.

SUBWATERSHED #43

Name: Jonas Green Pond (Brice Point, 1963; Brice's Point, 1846)

Location: Bounded by the Browns Cove subwatershed on the north and the Pendennis Mount Pond subwatershed on the south. This is the subwatershed located immediately upriver of the Route 450 bridge on the north shore of the Severn.

Natural Areas: This subwatershed includes one natural area: 1) Jonas Green Pond.

NATURAL AREA #1

Name: Jonas Green Pond

Geographical Limits: Bounded on the west by the Severn River, on the north by three large developed lots on Carrollton Road in Pendennis Mount, and on the east and south by Route 450 (the Severn River bridge approach and the Ritchie Memorial Overlook). A large portion of this natural area is on the grounds of Jonas Green State Park.

Total Acreage: 6.0 acres

Ecological Classification: Complete ecotype; this includes four ecotypes: 1) Freshwater pond; 2) Old field; 3) Freshwater pond; 4) Steep slopes.

Ecotype #1: Freshwater pond

Acreage: 0.2 acre

Flora: Just north of the parking area for Jonas Green State Park (in the northeast corner of the park) is a small freshwater pond. Older aerial photography shows this pond to be a tidal draw marsh. However, because of sand spit accretion and colonization by strand vegetation, the wetland has been cut off from tidal influx and is now an intermittent freshwater pond. Since being disconnected from the Severn, the pond has gradually aggraded with sediment and no longer retains enough water during dry periods to be called perennial. The pond supports aquatic vegetation such as duckweed and pennywort. Scattered around the edges of the pond is a freshwater fringe marsh composed of rumex, mallow, cattail and arrow arum. Apparently, water levels in this pond fluctuate with seasonal changes in local precipitation. During the site visit to the pond, evidence of significant draw down was observed. Photographs reproduced in U.S. Naval Institute Proceedings, May 1932, p. 665 reveal that there were once rather extensive shallow tidal ponds at Brice Point, of which these (Ecotypes #s 1 and 3) are tiny remnants.

Ecotype #2: Old field

Acreage: 0.6 acre

Flora: Surrounding the pond is a band of both lowland vegetation and species typical of an old field association. Small trees and saplings (DBH < 6 in.) include black willow, persimmon, red maple, sweet gum, alder, pin oak, willow oak, black locust, white ash, swamp-chestnut oak, box elder, wild cherry, and apple trees. In the not too distant past, the areas between this pond and the Severn River must have been largely cleared.

Ecotype #3: Freshwater pond

Acreage: 0.2 acre

Flora: Just north (upriver) of the first freshwater pond (Ecotype #1) is a second pond which appears to be almost identical in size, shape, origin, and vegetational composition. Further field investigation is required.

Ecotype #4: Steep slopes

Acreage: 5.0 acres

Flora: Toward Pendennis Mount to the north and Route 450 to the east are heavily wooded steep slopes which drain into the ponds. The steepest slopes are forested with large (DBH 18-24 in.) black and chestnut oaks. The more gradual slopes were once cleared for agriculture and existing woodlands are dominated by tuliptree, black locust, and wild black cherry.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: 1) The County Historic Sites Survey recognizes the Route 450 bridge (circa 1924) over the Severn River (AA 764). The bridge is noted for its engineering and transportation significance. It is the only opening bridge in the County to be designed with steep arched spans. These spans give the bridge its graceful impression. 2) Brice Point was also the crossing site for the original Severn River Bridge, a wooded structure built immediately downriver of the existing bridge in 1886. 3) Brice Point, prior to the first bridge, was the location of the Tilghman Brice House and wharf.

Archeological Features: 1) MHT site AN 94 - Brice Point, Pendennis Mount is a very large site simply described as a shell midden.

Wildlife: Although this is a very small natural area, it is still healthy enough to support wildlife. A pair of muskrats were observed in the pond (Ecotype #1) during field work. The pond is probably a habitat for many other fauna as well.

Scenic Qualities: The Route 450 bridge is one of the most noteworthy scenic landmarks on the Severn. The arched spans and fine detailing are widely appreciated as a perfect complement of graceful elegance and masterful engineering. The Ritchie Memorial Overlook provides one of the best views of the Naval Academy and Colonial Annapolis to be had on the river.

Geology: The Aquia Fm. underlies Ecotype #4. A large deposit of alluvium forms the remainder of the natural area. Just upstream of Ecotype #3 is a 90 ft. cliff fronting the Severn River. The cliff offers a near-vertical exposure of weathered Aquia sediments.

Soils: The entire natural area is mapped as cut and fill land. Augering by the Maryland Geological Survey, for the proposed high span bridge, revealed a sandy clay loam (very compact in open areas adjacent to Rt. 450 and less compact in the woods). The soil was reported to have been disturbed in at least the top foot of soil throughout the area. Evidently, the use of the Brice Point area for a bridge approach has brought many changes to the area over the last 100 years.

Topography: The slopes (ecotype #4) range in elevation from 20 to 60 ft. (msl) and vary in steepness from 5 to 15%. The area at Brice Point (Jonas Green State Park) ranges from sea level to 20 ft. and is relatively flat (2-5% slopes).

Contiguity: Because of the residential development to the north and the busy highway to the south and east, this natural area is completely isolated from others.

Other: Field review - 7/2/86.

Previous Listings: 1) DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, marshelder, groundselbush" = 0.4 acre. This information is probably no longer accurate. 2) U.S. Fish and Wildlife Service (1979), National Wetlands Inventory; "palustrine, forested, broad-leaved deciduous, temporary" = 0.6 acre.

LAND CONSERVATION

Ownership Type: Private (multiple), 3 lot (< 1 ac.) owners; State government.

Land Use: The Jonas Green State Park is classified as Natural Features (Open Space). The remainder of the natural area is classified as Residential-Rural (1/2 or less units/ac.).

Residential Communities: Pendennis Mount

Problems: Brice Point has been embroiled in controversy between the Severn Inn, scenic interests, high-clearance bridge, and the environment for many years. At the heart of this controversy is the proposed construction of a 65 ft. (vertical navigational clearance) bridge to replace the existing Rt. 450 bridge over the Severn River. This project should have only minimal direct impacts on this natural area, however, secondary impacts such as increased noise and reduced scenic qualities may be significant. No proposed development is registered for this natural area. Ongoing impacts include scattered littering from picnickers at the State Park and persistent noise from Route 450 traffic.

Preservation Options: Conservation cooperatives with the three lot owners may be a viable option. The SHA should be contacted concerning their future plans for the ca. 4 acres in the natural area. Cooperative management plans between DNR and SHA should be pursued. The DNR has recommended that the portion of the existing bridge adjacent to Jonas Green Park remain as a fishing and crabbing pier. The SHA has been receptive to this request; details will be worked out during the final design of the project. Retaining a portion of the 1924 bridge as part of the State Park will serve both historic preservation and recreational interests.

Future Use: Because of the existing State Park, passive recreation and outdoor education will probably be the most appropriate future uses for this natural area.

SUBWATERSHED #44

Name: Pendennis Mount Pond

Location: Bounded on the north by the Jonas Green Pond subwatershed and on the south by the Woolchurch Cove subwatershed. This is the subwatershed located immediately downriver from Route 450 on the north shore of the Severn.

Natural Areas: This subwatershed includes one natural area: 1) Pendennis Mount Pond.

NATURAL AREA #1

Name: Pendennis Mount Pond

Geographical Limits: Bounded by Route 450 (near the Ritchie Memorial Overlook) to the northwest, by Old Annapolis Blvd. (Route 648) and the Severn Inn to the southwest, by three large developed lots off Route 648 to the south, by three large developed lots off Arlie Drive (Pendennis Mount) to the southeast, and by one developed lot off Route 450 to the north.

Total Acreage: 9.0 acres

Ecological Classification: Complete ecotype; this includes two ecotypes: 1) Shurb swamp; 2) Steep slopes.

Ecotype #1: Shrub swamp

Acreage: 5.0 acres

Flora: Immediately east of Route 648 (at the Severn Inn) is an intact shrub swamp which appears to be a remarkably productive habitat. The shrub swamp was probably a tidal cove dammed by the construction of the Old Annapolis Road a hundred years ago. The succession from tidal cove to shrub swamp was probably fully complete some time ago, for the swamp appears to be quite stable. The shrub swamp is characterized by diverse vegetation in very defined zonational patterns. The west perimeter of the swamp is a solid band of cattails 6 ft. in height. The lowest interior portion, just to the east of the cattails, is a very diverse freshwater wetland characterized by arrow head, mallow, marsh milkweed, rumex, boehemeria, arrow arum, marshfern, multiflora rose, swamp rose, and decodon. Further east, the swamp increases slightly (1-2 ft.) in elevation and the vegetation changes to that of a true shrub swamp. Shrub size plants include red maple, black willow, alder, buttonbush, and corkscrew willow (an ornamental). Around the perimeter of this shrub swamp, trees increase in size to form a true wooded swamp as the elevation increases by 1-2 ft. Most trees are ca. 20-25 ft. in height and have DBHs of 6-9 in. The most common of these are sour gum, black walnut, red maple, and wild cherry. Some of the wild cherry trees were almost completely smothered with grapevines.

Ecotype #2: Steep slopes

Acreage: 4.0 acres

Flora: To the north and especially the east and southeast, the shrub swamp is surrounded by an intact transitional zone of mature hardwood trees on steep slopes. These heavily wooded slopes are madeup of the undisturbed portion of large lots in Pendennis Mount and off Route 648. The linear band of trees ranges in width from 150 to 200 ft. Typical species include large (DBH 12-24 in.) tulip poplar, white oak, sweet gum, and on the steepest slopes, chestnut oak. The importance of this hardwood forest as a transitional "life" zone for the shrub swamp cannot be over emphasized.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historical Features: 1) The historical significance of the Old Annapolis Road (now Route 648) as the major (non-rail) transportation linkage for Annapolis over the past hundred years should be recognized. The construction of the old road is responsible for the formation of the shrub swamp (Ecotype #1) through damming of what was once a tidal cove. The exact date for this damming is unknown. 2) Prior to the construction of the first bridge (1886), three separate ferry lines worked between Ferry Point and Annapolis.

Archeological Features: 1) Conversation with the State Archeologists from the Maryland Geological Survey revealed that there is a high potential for the occurrence of historic arheological remains near the Severn shore. Such remains include submerged piling stubs from ferry landings, ferry tender's trash pits, derelict vessels, and other submerged resources.

Wildlife: Numerous species of birds (including green heron and red-winged blackbird) were observed during field work, and based on the relatively undisturbed nature of the shrub swamp, this area may be a significant bird habitat. The water quality of several patches of open water interspersed with the wetland plants appeared to be quite good. Large green frogs were observed, and this area may be a significant habitat for amphibians and reptiles also.

Scenic Qualities: The interspersed and finely zonated patches of wetland and shrub vegetation display a beautiful contrast of color and texture. For the residents of homes that back up to the shrub swamp, it is certainly considered important for its scenic qualities.

Geology: The Aquia Fm. underlies the steep slopes (Ecotype #2) and alluvium forms the shrub swamp (Ecotype #1). The shrub swamp is a classic example of "alluvial drowning" due to the blocking of a tidal cove by road construction. Since the initial blocking, the "bowl-like" ravine has gradually infilled with sediment and allowed freshwater shrub and swamp vegetation to colonize. In regard to "alluvial drowning", this shrub swamp is similar to the large shrub swamp (Ecotype #5) of Subwatershed #20 (Gumbottom Branch).

Soils: The shrub swamp is mistakenly mapped as tidal marsh, but should be mapped as mixed alluvial land. The steep slopes are covered with Collington fine sandy loams.

Topography: The lowest area of the shrub swamp (the freshwater wetland)is at an elevation of 2.8 ft. (msl). The main body of the shrub swamp is at an elevation of 4.0 to 5.0 ft. (msl). The wooded swamp area covers the slightly higher (5.0 - 8.0 ft. msl) elevations. The wooded slopes (Ecotype #2) range in steepness from 10 to 15% and in elevation from 10 to 40 ft. (msl).

Contiguity: This natural area is completely isolated from others by Routes 450 and 648 and developed lots.

Other: The quality of the water in this natural area was remarkably good considering the development in the watershed feeding the swamp. Field review - 7/2/86.

Previous Listings: 1) U.S. Fish and Wildlife Service (1979); National Wetlands Inventory (1979); "palustrine, forested, broad-leaved deciduous, temporary" = 4.6 acres.

LAND CONSERVATION

Ownership Type: State government; private (multiple), 5 lot (< 1 ac.) owners.

Land Use: The entire natural area is classified as Residential-Rural (1/2 or less units/ac.).

Residential Communities: Pendennis Mount

Problems: The construction of the interchange connecting Route 648 to the proposed Severn River high (65 ft.) span bridge for Route 450 will significantly impact this natural area. According to preliminary construction plans, the approach routes to the bridge (including right-of-way) will destroy ca. 2.0 acres of this natural area. The potential impacts of sediment runoff into this shrub swamp is an area of concern. The noise and aesthetic impacts will be hard to measure, but will significantly alter the natural area. No proposed developments have been recorded. Ongoing impacts include scattered littering on the periphery of the natural area from cars traveling Route 648. Noise from both Routes 450 and 648 reduces the scenic appeal of the natural area.

Preservation Options: The SHA should be contacted concerning the minimization of impacts due to the design of the interchange and construction activities. Conservation cooperatives with the lot owners may be a viable option.

Future Use: Because of the fragile character of the shrub swamp, it is most suited for scientific monitoring and as a wetland wildlife reservation.

ISOLATED FEATURES

Geology: A cliff off Homewood Road in the Ferry Farms subdivision offers a near-vertical, 50 ft. exposure of weathered Aquia sediments.

SUBWATERSHED #45

Name: Woolchurch Cove

The majority of the information listed for this subwatershed was taken from the Wildlife Management Plan, U.S. Naval Station, Annapolis, Maryland prepared by John W. Gill, Wildlife Biologist, Division of Ecological Services, Annapolis Field Office, U.S. Fish and Wildlife Service, February, 1985.

Location: Bounded on the north by the Pendennis Mount Pond subwatershed and on the south by the Carr Creek subwatershed. This subwatershed is directly across the Severn River from the U.S. Naval Academy.

Natural Areas: This subwatershed includes one natural area: 1) Woolchurch Cove Ponds.

NATURAL AREA #1

Name: Woolchurch Cove Ponds

Geographical Limits: The undisturbed area draining into the Woolchurch Cove Ponds is bounded by the Severn River to the west; developed lots off Homewood Road, Ferry Farms Road, Elmwood Road, and Kenwood Road (Ferry Farms subdivision) to the north; Kinkaid Road and the Navy Commissary and community facilities parking lot to the east; and Beach Road (totally within the Naval Station) to the south. Except for a small area of wooded slopes bordering Ferry Farms, the entire natural area is completely within the boundaries of the U.S. Naval Station, in its northwest corner.

Total Acreage: 69.3 acres

Ecological Classification: Environmental complex; this includes seven ecotypes: 1) Tidal (fringe) marsh and beach; 2) Freshwater marsh; 3) Wooded swamp; 4) Freshwater pond; 5) Wooded swamp; 6) Old field; 7) Uplands and steep slopes.

Ecotype #1: Tidal (fringe) marsh and beach

Acreage: 0.3 acre

Flora: The southern portion of the natural area directly fronting the Severn River is a 700 ft. long estuarine shoreline with associated beach and fringe marsh. The dominant marsh vegetation is common reed (an invasion species of disturbed areas) with a sparse strip of American threesquare occurring closer to the river. Tidemarsh water hemp (a good waterfowl food) can be found scattered throughout beech areas not taken over by common reed. Other species include willow, indigo bush, and smooth cordgrass.

Ecotype #2: Freshwater marsh (Woolchurch Cove Pond)

Acreage: 0./ acre

Flora: Landward of Ecotype #1 are two freshwater ponds with associated freshwater marshes. These ponds are separated from each other by a 30-40 ft. wide berm, and are separated from the Severn River by a dense stand of common reed. The smaller of the two ponds is named Woolchurch Cove Pond and is subject to irregular flooding. It is shallow, open water (mean depth 1-2.5 ft.) with a few small snag trees bordering the bank. The predominant submerged aquatic vegetation is Eurasian water milfoil. Emergent marsh, and scrub and woody vegetation surrounding the open water includes arrow arum, marsh mallow, water willow, swamp rose, and willow. Wetlands on Woolchurch Cove Pond are most extensive at the north end. It is in this area that a natural drainage swale from the upland and steep slope hardwood forest (Ecotype #7) dips down to the pond. Dominant marsh vegetation is water willow. Toward the upland end of the marsh, cattails, wool grass, arrow arum, and sensitive fern occur.

Ecotype #3: Wooded swamp

Acreage: 1.5 acres

Flora: Inland, the drainage swale feeding Woolchurch Cove Pond transforms from a marsh to a full wooded swamp. A dense carpet of water hemlock and jewelweed makes up the herb layer. Woody shrub species include elderberry, willow, buttonbush, common spicebush and, closer to the drier soils on the slopes, flowering dogwood. The canopy layer consists of red maple, sycamore, willow oak, and tulip poplar.

Ecotype #4: Freshwater pond

Acreage: 8.0 acres

Flora: The second, larger pond is a man-made body of fresh water created by an earthen dam. The embankment crosses the inlet of what was once a tidal cove near its confluence with the Severn River. The water surface elevation of the pond is ca. 10 ft. higher than that of the Severn River. The depth of the pond averages ca. 3 ft. Scattered fringe wetlands include jewelweed, smartweed, and pepperbush. A cove in the southeast corner of the pond has 15% open water with the remainder supporting a heavy growth of duckweed, cattail, willow, water willow, and arrow arum.

Ecotype #5: Wooded swamp

Acreage: 0.5 acre

Flora: Upstream (inland) from the southeast cove of the large pond (Ecotype #4) is a wooded swamp in the bottom of the drainage course feeding the cove. This swamp includes red maple, willow oak, and river birch in the canopy layer and buttonbush, spicebush and willow in the shrub layer.

Ecotype #6: Old field

Acreage: 3.0 acres

Flora: Extending inland from a second, smaller cove in the large freshwater pond (Ecotype #4) is a broad valley (a drainage swale) feeding the pond. This valley was cutover in the past, during the construction of the community facilities and parking lot (presumably it was a wooded area of the same composition as the surrounding hardwood forest prior to a clearing). The major field component is lespedez which was planted after construction of the community facility to combat erosion. Other species include clover, sumac, Japanese honeysuckle, and various grass and vine species. Scattered in small clumps throughout the field are black locust, box elder, and eastern red cedar. Near the pond, the vegetation changes to small tree species such as cottonwood, sycamore, and willow as soil moisture increases. A small (30 ft. dia.) patch of common reed, surrounded by black locust and wild rose, occurs adjacent to the pond.

Ecotype #7: Upland and steep slopes

Acreage: 55.3 acres

Flora: The remainder of the natural area is heavily wooded steep slopes (some up to 70%), flat uplands, and rolling topography surrounding the two ponds. The hardwood forest on the eastern and northern side of the large pond (up to Kinkaid and Beach Roads) is dominated by oaks (particularly chestnut oak) and tulip poplar with lesser amounts of beach, red maple, black cherry, black walnut, sassafras, and Virginia pine. Most of these hardwood canopy species are classified as mature to over mature. Typical understory species include flowering dogwood, red maple, sassafras, American holly, mountain laurel, and spicebush. The understory is moderately dense. Ground cover varies from thick ferns to Virginia creeper, poison ivy and other vine species on drier areas. The hardwood forest on the west (Ferry Farms) side of the large pond (Ecotype #4) is very similar to the forest just described, except for more sycamore trees and less American holly in the understory.

Natural Heritage Elements: None registered. (It should be noted that the peregrine falcon is an endangered species which has been observed attempting to nest not far away on the supporting structure of the Chesapeake Bay Bridge. It is possible that these magnificent birds of prey fly over Woolchurch Cove in search of food).

Noteworthy Plant Species: None reported

Exceptional Trees: None reported

Historic Features: 1) County Historic Sites Survey structure AA 948 - Ferry Point Farm - is located on a 45 ft. (msl) promontory (Ferry Point) overlooking Woolchurch Cove Pond and the Severn River. 2) Although the Naval Station was not formally established as a military command under a commanding officer until 1947, its mission and functions, and consequently history, can be traced back to 1851 when the first training ship was assigned to the U.S. Naval Academy. Since that time, a staff of personnel has existed to assist in the instruction of seamanship and midshipmen, and to maintain training vessels.

3) The name "Woolchurch" for this cove originates from the 1660s when the property in this area was patented to one Henry Woolchurch. 4) The site of Old Fort Biemen is located on Beamen's Hill (1776), a promontory overlooking Woolchurch Cove and the Severn River.

Archeological Features: Three MHT sites: 1) AN 93 - Ferry Point -is a shell heap first uncovered in 1959. 2) Quad file site no. 9 is located in the heart of this natural area and is thought to have been associated with Fort Nonsense. 3) Quad File site no. 8 is Old Fort Bieman, located on a promontory (Biemans Point) overlooking Woolchurch Cove and the Severn River.

Wildlife: The natural area was described as having "much promise" in terms of wildlife habitat because of 1) its large undisturbed area, 2) its wide variety and interspersion of vegetational types, 3) the occurrence of two secluded open water areas, and 4) the high amount of "edge" created by the old field (Ecotype #6) bordering the mature hardwood forest. Considerable suitable bird habitat presently exists in this natural area. Species occurring include suburban birds (e.g., cardinals, song sparrows, mockingbirds) and wetland-associated birds (e.g. herons, wading birds, osprey, and waterfowl). Mammals observed in this natural area include eastern gray squirrel, eastern chipmunk, raccoon, opossum, muskrat, white-tailed deer, red fox, eastern cottontail, and an unidentified rodent. This list is in no way complete because many of the mammals are extremely wary, and/or nocturnal, making observation difficult. The list does, however, indicate that Woolchurch Cove is a very healthy habitat for mammal life. A fish survey of the large pond (Ecotype #4) revealed that bluegill, black crapple, white catfish, carp, and American eel are inhabitants. Reptiles and amphibians are wary animals and, although none were observed, the natural area is thought to be an excellent habitat for both.

Scenic Qualities: The wide diversity of ecotypes in such a compact area as Woolchurch Cove makes for an enlightening and educational nature walk.

Geology: The Aquia Fm. underlies the uplands, steep slopes, and old field areas (Ecotypes #s 6 and 7). Alluvium forms the remainder of the natural area. Beamen's Hill (1776), located at the end of Beach Rd., offers a near vertical, 50 ft. exposure of weathered Aquia sediments.

Soils: Tidal marsh soils are incorrectly mapped for Woolchurch Cove Pond (Ecotype #2); the marsh is actually freshwater and not connected to the Severn River. Monmouth fine sandy loam and sassafras fine sandy loam soils cover the uplands, steep slopes, and old field areas (Ecotypes #s 6 and /).

Topography: The uplands are relatively flat (5-10% slopes) and range in elevation from 40 to 60 ft. (msl) The steep (15-70%) slopes range in elevation from sea level to 40 ft. (msl). The elevation of the large pond (Ecotype #4) is maintained at ca. 10 ft. (msl).

Contiguity: Although this natural area is separated from the Pendennis Mount pond to the north, it does back up to the open areas of the Naval Academy Golf Course to the east (across Kinkaid Road). Migration of some wildlife probably occurs between these areas.

Other: None

Previous Listings: 1) The DNR Tidal Wetlands Boundaries (1970); "smooth cordgrass, cattail, marshelder, groundselbush" = 2.1 acres. (This is an incorrect designation; the marsh is actually nontidal, freshwater). 2) U.S. Fish and Wildlife Service (1979) , National Wetlands Inventory recognizes the large pond (Ecotype #4) as "palustrine, open water, intermittently exposed/ permanent, temporary" = 8.0 acres; Woolchurch Cove pond (Ecotype #2) is recognized as "palustrine, open water, intermittently exposed/permanent, diked/impounded" = 0.7 acre.

LAND CONSERVATION

Ownership Type: Federal government

Land Use: The entire area is classified as Government/Institutional.

Residential Communities: Ferry Farms

Problems: No projects or developments have been planned for this natural area by the U.S. Naval Station. Ongoing impacts include sedimentation from hillside erosion and runoff in the large pond (Ecotype #4) and the growth of non-native species in the old field (Ecotype #6).

Preservation Options: The Commanding Officer of the U.S. Naval Station should be contacted about the future of this natural area. The U.S. Naval Station and the U.S. Fish and Wildlife Service have recently (February, 1985) entered into a cooperative agreement to implement a progressive wildlife management plan on the Station. If the Wildlife Management Plan for the Naval Station is implemented in full, the Woolchurch Cove natural area will remain in a relatively undisturbed condition. In fact, many of the proposals in the plan, if adopted, would actually enhance the ecological productivity of this natural area.

Future Use: The Wildlife Management Plan for the U.S. Naval Station proposes that the Woolchurch Cove natural area be mainly used as a forest and wetland wildlife reservation. The ponds (Ecotypes #s 2 and 4) are currently functioning as stormwater management areas. Passive recreation and outdoor education are also incorporated into the plan for certain portions of the natural area.

ISOLATED FEATURES

Historic Features: One site is recognized on the County Historic Sites Survey; AA 80 - "Old Fort Nonsense" - is an earthen fortification (circa 1844) consisting of two acres of embankments and trenches; it is 64.9 meters in circumference. The U.S. Naval Station has left the site undisturbed. This strategic site was used in the Revolutionary War, the War of 1812, and the Civil War, and is the last vestige of the Annapolis Harbor Facility. The pattern of this fortification does not conform to the patterns of normal military fortifications. Fort Nonsense is listed on the National Register of Historic Places.

Archeological Features: 1) MHT site AN 550 - Fort Nonsense - a 1824 dime, one shell casing, bottleglass, nails and wire were found during a survey of the fort site.

SUBWATERSHED #46

Name: Carr Creek (Car Creek, 1781; Big Cause, 1878, undoubtedly a rendering of the phonetic usage of the period: Carr's Creek, 1846).

Location: Bounded on the north by the Woolchurch Cove subwatershed and on the east by the Mill Creek subwatershed. This is the southernmost subwatershed (farthest downriver) on the north shore of the Severn River proper.

Natural Areas: This subwatershed includes one natural area: 1) Carr Creek.

NATURAL AREA #1

Name: Carr Creek (this is Area 3 as designated in the Wildlife Management Plan U.S. Naval Station, Annapolis, Maryland prepared by John W. Gill, Wildlife Biologist, Division of Ecological Services, Annapolis Field Office, U.S. Fish and Wildlife Service, February, 1985; most of the information listed for this natural area was taken from that document).

Geographical Limits: This natural area is totally confined to the U.S. Naval Station grounds. It consists of the wooded shoreline bordering the east side of Carr Creek between the Severn River and the USNA Golf Course. Basically, this is a linear shaped natural area sandwiched between the rifle and pistol ranges of the Naval Station to the west and Carr Creek to the east.

Total Acreage: 30.0 acres

Ecological Classification: Altered green area; this includes seven ecotypes: 1) Tidal (fringe) marsh; 2) Uplands; 3) Uplands; 4) Uplands; 5) Uplands; 6) Tidal (draw) marsh; 7) Old field.

Ecotype #1: Tidal (fringe) marsh

Acreage: 3700 linear ft. of shoreline

Flora: An intact (non-bulkhead) estuarine shoreline exists along the western side of Carr Creek from the sewage treatment plant on the north to the boat repair and docking facilities (at the confluence with the Severn River) to the south. The creek banks are fairly steep, with hardwood trees occurring down to the water's edge. Trees on the bank are shading shallow water habitat, which minimizes marsh vegetation. What little emergent vegetation is present occurs as small pockets of fringe marsh. Species noted include smooth cordgrass and saltmarsh water hemp.

Ecotype #2: Uplands

Acreage: 7.0 acres

Flora: North of rifle range B and west of the pistol range is a loblolly pine plantation. Trees average about 25 years in age. A thick, low understory consisting of Japanese honeysuckle, trumpet vine, and poison ivy is present. A few white and chestnut oaks and tulip poplars observed in the understory foretell this ecotype's probable evolution into a mixed coniferous/deciduous forest.

Ecotype #3: Uplands

Acreage: 3.0 acres

Flora: Due east of the loblolly pine plantation (Ecotype #2) and due south of the pistol range is a grove of loblolly pine mixed with black cherry, black locust, tulip poplar, white oak, and chestnut oak trees. The understory is dense and consists of vine and young canopy species.

Ecotype #4: Uplands

Acreage: 2.0 acres

Flora: Further east, toward Carr Creek, the mixed pine/hardwood grove (Ecotype #3) changes into a shrub community and the habitat becomes more disturbed. The canopy is very open and the understory is very brushy and dense due to the sunlight penetration. The sparse canopy includes loblolly pine, tulip poplar, black cherry and white oak. The understory consists of young canopy trees and sumac. Vine species include wild grape, trumpet vine, Japanese honeysuckle, deer's tongue, and poison ivy.

Ecotype #5: Uplands

Acreage: 12.0 acres

Flora: East of the shrub community (Ecotype #4) and the rifle and pistol ranges is a mature hardwood forest consisting of black cherry, black locust, tulip poplar, and southern red oak. The area is intermixed with brush and the understory is moderately dense and consists of flowering dogwood, sassafras, vine, and young canopy species. The wooded area, which borders most of the Carr Creek estuarine shoreline (Ecotype #1), plays an important role in stabilizing the unprotected creek bank. The woods also act as a buffer for both the pistol and rifle ranges.

Ecotype #6: Tidal (draw) marsh

Acreage: 1.5 acres

Flora: Within the mature hardwood forest (Ecotype #5) is a shallow depression colonized almost exclusively with common reed. This shallow depression is probably the remnant of Little Carr Creek (last shown on a 1935 map). A map in 1948 shows the depression only as a marshy area; apparently it was filled by the U.S. Naval Station for additional acreage between 1935 and 1948. In this immediate area, a small tributary is clearly shown on the 1667 map (Sears Creek), the 1878 map (Little Cause), and the 1844 map (Little Carr's Creek).

Ecotype #7: Old Field

Acreage: 4.5 acres

Flora: Extending northward (upstream) along Carr Creek from the mature hardwood forest (Ecotype #5) is an old field community containing a variety of vine, shrub, grass, and pine tree species. The plant diversity presently existing provides excellent habitat for many upland wildlife species such as red fox, rabbit, bobwhite quail, small mammals, reptiles (and their predators, e.g., hawks, owls, etc.), and songbirds.

Natural Heritage Elements: None reported

Noteworthy Plant Species: None reported

Exceptional Trees: None reported

Historical Features: None registered

Archeological Features: None registered

Wildlife: No significant observations were made.

Scenic Qualities: The heavily wooded shoreline of Carr Creek greatly increases the scenic integrity of the natural area.

Geology: The entire natural area is underlain by the Talbot Fm., although the common reed draw marsh (Ecotype #6) should probably be mapped as artificial fill.

Soils: The draw marsh (ecotype #6) is mapped as a swamp. The remainder of the natural area is covered with Keport silt loams and Monmouth fine sandy loams (the latter on the steep slopes which drop to the water's edge of Carr Creek).

Topography: The flat (0-5% slopes) uplands range in elevation from 15 to 25 ft. (msl). The flatness of the land in this area makes it conducive to small weapons training (i.e., rifle, pistol, and skeet practice ranges). The steep (15-40%) slopes immediately fronting Carr Creek range in elevation from sea level to 15 ft. (msl).

Contiguity: For the most part, this natural area is isolated from the Woolchurch Cove natural area to the north by intense development of the Naval Station. Immediately across Carr Creek is a large tidal wetland as mapped by the U.S. Fish and Wildlife Service. The interaction of wildlife between these areas is probable.

Other: This natural area acts as both a buffer and safety zone, providing physical, visual, and acoustical protection between the weapons training grounds and Carr Creek.

Previous Listings: The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory recognizes the common reed draw marsh (Ecotype #6) as "estuarine, intertidal, emergent, narrow-leaved persisten, irregular" = 1.5 acres.

LAND CONSERVATION

Ownership Type: Federal government

Land Use: The entire natural area is classified as Government/Institutional.

Residential Communities: None (except for on-base housing)

Problems: No projects or developments have been planned for this natural area by the U.S. Naval Station. Ongoing impacts include the growth of non-native species such as Japanese honeysuckle in many ecotypes. A productive wildlife area (Ecotype #7; the old field) is designated as a tree plantation site in the Naval Station Forestry Management Plan. A monoculture (all of one species) tree compartment would eliminate much of the wildlife diversity now present. Wildlife resources should be considered before any clearing or tree planting is undertaken.

Preservation Options: The Commanding Officer of the U.S. Naval Station should be contacted about the future of this natural area. The U.S. Naval Station and the U.S. Fish and Wildlife Service have recently (February, 1985) entered into a cooperative agreement to implement a progressive wildlife management plan on the station. If the Wildlife Management Plan for the Naval Station is implemented in full, this natural area will remain in a relatively undisturbed condition. In fact, many of the proposals in the plan, if adopted, would actually enhance the ecological productivity of this natural area.

Future Use: The Wildlife Management Plan for the U.S. Naval Station proposes that most of this natural area be used mainly as a forest wildlife reservation. This area also functions as a very important scenic, sound, and safety buffer for the small arms ranges at the Naval Station. Because of the dangerous activities (small weapons training) adjacent to this natural area, future uses involving the presence of humans, such as outdoor education and passive recreation, are obviously not feasible.

ISOLATED FEATURES

Wetlands: Ten separate draw and cove marshes and other non-tidal wetlands are scattered over the remainder of the Carr Creek subwatershed. These wetlands areas, as listed below, require further field investigation. 1) Immediately across Carr Creek from the natural area on the U.S. Naval Station grounds is a large (22-acre) tidal marsh. It appears to be quite diverse, with many varieties of marsh species interspersed in well zonated patterns. The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory (1979) recognizes four small patches of "estuarine, subtidal, unconsolidated bottom, organic, subtidal" scattered among the larger body of "estuarine, intertidal, emergent, persistent, irregular." The DNR Tidal Wetlands Boundaries (1970) recognizes this marsh as "smooth cordgrass, spikegrass, marshelder, groundselbush, cattail, and rose-mallow." 2-5) Four separate cove marshes, ranging in size from 0.3 to 1.0 acre, are located at the head of Carr Creek. Two are mapped by DNR Tidal Wetlands Boundaries (1970); one as "smooth cordgrass", the other "marshelder, groundsel-bush, and smooth cordgrass." The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory maps these two wetlands as "estuarine, intertidal, narrow-leaved persistent, irregular." They identified two additional cove

marshes, each of ca. 0.5 acre. They are classified as "palustrine, scrub shrub, broad-leaved deciduous/emergent, narrow-leaved persistent, seasonal tidal" and "palustrine, forested, broad-leaved deciduous, seasonal tidal." 6) Just upstream from one of the cove marshes is a freshwater pond formed by the embankment of Bryant By Road on the USNA Golf Course. The pond is classified as "palustrine, open water, intermittently exposed/permanent, diked/impounded." 7-10) Near the terminus of Greenbury Point are four stands of freshwater wetlands ranging from 0.5 to 2.0 acres in size. These are mapped as "palustrine, emergent, narrow-leaved persistent, seasonal saturated."

Historic Features: 1) The County Historic Sites Survey lists one site on the U.S. Naval Station Grounds; AA 311 - Site of Providence - the first Colonial settlement in Anne Arundel County (circa 1649). Providence, at the time referred to as "Towne Neck", was settled by the Puritans from Virginia 15 years after St. Mary's City was established by followers of Lord Baltimore. The settlers built a fort at the end of Greenbury Point for protection against the warlike Susquehannock Indians. The settlement was abandoned in 1670. Erosion of the point has probably eliminated most traces. 2) The County Historic Sites Survey also lists AA 947 - Greenbury Point Light - a 19th century lighthouse on Greenbury Point Shoal. 3) Fort Madison (circa 1808), a Fort which saw duty in the War of 1812 and the Civil War, was active until the early 1900s. Although Fort Madison was quite substantial, it has apparently been completely razed.

Archeological Features: Four MHT sites: 1) AN 92 - Carr Creek Brick Kiln -bricks from a late 17th century brick kiln were uncovered in 1969. 2) AN 160 - Providence - a 17th century settlement preceeding Annapolis (see Historical Features above) where quartz chips, flint chips, brick chips, and hammers were uncovered. 3) AN 529 - KWW 6 - a subsurface foundation where brick fragments, mortar, glass, and iron spikes were found. This site is also related to the Providence settlement. 4) Quad File site no. 2 - a subaqueous site where three grooved axes were dredged up in 1-2 ft. of water. These axes may be associated with the construction of Fort Providence (circa 1649) located at the apex of Greenbury Point. The artifacts, found ca. 50-100 ft. offshore, may mark the actual site of the fort before the erosional retreat (at least 450 ft.) of Greenbury Point.

SUBWATERSHED #47

Name: Mill Creek (Ferry Creek, 1667)

Location: This is the westernmost of three large subwatersheds draining the southern half of the Broadneck Peninsula and flowing directly into the Chesapeake Bay. For the purposes of this study, Mill Creek is considered a part of the Severn River watershed. It is bounded by the Carr Creek subwatershed on the west and the Whitehall Creek subwatershed on the east. The Mill Creek subwatershed, at approximately 3700 acres, is the largest of the Severn's 50 subwatersheds.

Natural Areas: This subwatershed includes three natural areas: 1) Martins Cove Pond; 2) Mill Creek Head; and 3) Mill Creek Valley.

NATURAL AREA #1

Name: Martins Cove Pond

Geographical Limits: Martins Cove is one of several large tidewater coves which drain into Mill Creek. Martins Cove is located on the west side of the Mill Creek subwatershed and flows almost due east into the creek. The headwaters for the freshwater branch feeding Martins Cove originate at the intersection of Old Annapolis Blvd. (Route 648) and St. Margarets Road (Route 179), or Dulls Corner. This branch actually flows first into a freshwater pond located just upstream from the head of tidewater on Martins Cove, and is separated from the cove by an earthen embankment. The natural area surrounding the pond is bounded on the north by developed lots on Martins Cove Road and Martins Cove Court (Martins Cove Farm subdivision); on the west by Routes 648 and 179; on the south by cleared areas for the Naval Station radio towers and developed lots off Mulberry Hill Road; and on the east by Martins Cove and the developed lots which front its shoreline.

Total Acreage: 104.4 acres

Ecological Classification: Environmental complex: this includes six ecotypes: 1) Tidal (cove) marsh; 2) Uplands; 3) Freshwater pond; 4) Shrub swamp; 5) Floodplain forest; and 6) Uplands and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 0.3 acre

Flora: At the head of tidewater on Martins Cove is a marsh which is dominated by cattails. Near the water, small bands of smooth cordgrass, arrow arum, and marshelder occur. A transitional shrub swamp which usually occupies the ecological niche immediately upstream of cove marshes such as this is strangely absent. The shrub swamp may have been displaced by the

construction of the earthen embankment (Ecotype #2) which forms the dam for the freshwater pond (Ecotype #3); this dam abuts the cove marsh, and separates it from the pond.

Ecotype #2: Uplands

Acreage: 0.8 acre

Flora: The earthen embankment forming the dam of Martins Cove Pond averages about 5 ft. (msl) in elevation and is ca. 450 ft. in length (cross section) and 80 ft. in width. The dam is colonized by red maple, tulip poplar, sweet gum and, near the pond's edge, sour gum trees. These trees range in size from 9 to 18 in. DBH. A small free flowing creek drains the pond through a narrow breech in the embankment. The exact age, origin, and historical significance of this interesting feature were not acertainable from field observation. Evidence of old logging roads nearby suggests it may have been used as a "land bridge" for transportation of felled trees and equipment across the stream valley (a land bridge similar to this occurs near the mouth of Sewell Spring Branch, Subwatershed #25). The dam may also be an extension of a natural geomorpic feature; a side ravine which flows into the main branch at the south side of the dam may have deposited a portion of this embankment as an alluvial fan. Loggers, taking great advantage of natural landscape features (as they usually did), may have extended and built up the natural deposits to meet their purposes. There is always the possibility that the embankment is completely artificial and was built solely for the purpose of forming a pond (perhaps for fishing). The maturity of the trees growing on the dam suggest that it was constructed at least as far back as the early 1900s. Whatever the age or origin, this dam is an extremely interesting feature and its historical significance should be further investigated.

Ecotype #3: Freshwater pond (Martins Cove Pond)

Acreage: 3.5 acres

Flora: Martins Cove Pond is ca. 50% open water and 50% marsh. An intact fringe marsh occurs where open water borders the steep slopes. The main bodies of marsh are located at the upstream and downstream ends of the pond and consist of burrweed, water willow, cattail, and rose mallow. The pond and marsh show few signs of disturbance.

Ecotype #4: Shrub swamp

Acreage: 1.7 acre

Flora: Three separate small pockets of shrub swamp occur inland from the edges of the pond. One is located at the upstream end of the pond (the mouth of the branch feeding the pond), one at the mouth of a large side ravine on the pond's north side (near the dam), and one at the southeast corner of the pond. Plant species constituting the shrub swamp include red maple, alder, fox grape, tearthumb, and hollow stem joe-pye-weed.

Ecotype #5: Floodplain forest

Acreage: 13.1 acres

Flora: The floodplain of the freshwater branch feeding the pond (Ecotype #3) supports an intact hardwood forest. A significant portion of this ecotype is on the grounds of the U.S. Naval Station and could not be accessed. Mature red maple trees could be observed near the mouth of the floodplain and further investigation is warranted.

Ecotype #6: Uplands and steep slopes

Acreage: 85.0 acres

Flora: The gently rolling uplands and slopes surrounding the pond support a wide variety of mature hardwood trees and a rich herbaceous layer. The area appears never to have been heavily disturbed. The flora follows a consistent pattern as determined by topography, soil moisture, and soil texture. The low, natural drainage areas (swales) are covered with rich, moist soils and support mature beech and tulip poplar trees in the canopy layer and blood root, mayapple, black snakeroot , wild licorice, Smilax pseudochina, New York fern, jewel weed, Christmas fern, and horsetails in the herbaceous layer. The native herbaceous plants are species that are tolerant of only fertile, moist, and undisturbed conditions. The better drained, sandier soils of the slopes support chestnut oak and mockernut hickory trees in the canopy layer and mountain laurel in the shrub layer. The herbaceous layer is sparse with trailing arbutus being the most common species present. The soils on the flatter ridge crests are more fertile than those on the slopes, but less than the swales, and consist of white oak, short leaf pine (only occasional), and black oak trees. Many of these trees were robust examples (6-8 ft. CBH) and, as evidenced by the limited number of multiple trunks, have probably experienced only limited disturbance from logging operations. The steep slopes which descend to the water's edge of the pond support large (DBH, 12-18 in.) beech trees. Where the slopes meet the pond (the land/water interface), sour gum and American holly trees prosper.

Natural Heritage Elements: None observed

Noteworthy Plant Species: None observed

Exceptional Trees: None observed (NOTE: The entire natural area was not traversed during the field work and, based on the handsome oak and beech trees observed and the limited disturbance, it is quite possible that exceptional trees occur in the areas not covered).

Historic Features: The earthen embankment (Ecotype #2) may have an interesting historical genesis and warrants further investigation.

Archeological Features: None registered

Wildlife: The high quality and openness of its water, the interspersion of its freshwater marsh grasses, and the intactness of its completely wooded, stable shoreline makes Martins Cove Pond an exceptional habitat for waterfowl.

Scenic Qualities: The tranquil nature of the pond, the sweeping expanse of freshwater marsh grasses, and the large hardwood trees draping over the entire perimeter of the pond, make for a bucolic setting.

Geology: The uplands and steep slopes (Ecotype #6) are underlain by the Aquia Fm. Alluvium forms the tidal cove (Ecotype #1), the shrub swamps (Ecotype #4), and the floodplain forest (Ecotype #5).

Soils: The uplands and steep slopes (Ecotype #6) are covered with Collington fine sandy loams. Mixed alluvial soils cover the floodplain (Ecotype #5). Sassafras loams and fine sandy loams are a minor component of the ridge crests of the upland areas. Based on the presence of herbaceous plants that can only tolerate a specific range of edaphic conditions, the soils in this natural area are uncommonly rich for Aquia Fm. soils on the southern portion of the Broadneck Peninsula.

Topography: The water level of the pond fluctuates between 4.0 and 5.0 ft. (msl). The grade of the earthen embankment (Ecotype #2) is at ca. 6.0 ft. (msl). The steep (15-40%) slopes which surround the pond range in elevation from 5.0 to 50 ft. (msl). The relatively flat (5-15% slopes) uplands range in elevation from 78.0 to 50 ft. (msl). The floodplain (Ecotype #5) descends from 40.0 ft. (msl) at Dulls Corner to 6.0 ft. (msl) at the pond (at distance of 2200 ft).

Contiguity: This natural area is separated from others by residential development. However, thick woods on the U.S. Naval Station grounds which are in this natural area front open pastures of the radio tower right-of-way and the Golf Course. Migration of certain wildlife species likely occurs between the pastures and the natural area.

Other: An aerial photograph in 1970 shows the pond area to be ca. 90% open water. During field work in the summer of 1986 the open water area was only ca. 50%. The reduction in open water at the expense of marsh grasses may be due to natural sedimentation processes. However, the extremely dry spring prior to field work may also have been a factor (i.e., natural drawdown). Field review - 7/2/86.

Previous Listings: 1) The DNR Tidal Wetlands Boundaries (1970) incorrectly mapped the pond (Ecotype #3) and embankment (Ecotype #2) as tidal; the pond is non-tidal and the embankment is upland. The cove marsh (Ecotype #1) was mapped as "smooth cordgrass, cattails" = 0.3 acre. 2) The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory recognized 23.4 total acres of wetlands in this natural area: the tidal cove (Ecotype #1) as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 0.3 acre; the embankment (Ecotype #2) as "palustrine, forested, broad-leaved deciduous, seasonal tidal" = 3.7 acres; the pond (Ecotype #3) as "palustrine, open water, intermittently exposed/permanent, diked/impounded" = 1.8 acres; the marsh areas of the pond as "palustrine, emergent, narrow-leaved persistent, seasonal saturated, diked/impounded" = 1.5 acres; the shrub swamp (Ecotype #4) as "palustrine, forested, scrub shrub, broad-leaved deciduous, seasonal saturated" = 2.1 acres; the floodplain (Ecotype #5) and a small side ravine as "palustrine, forested, broad-leaved deciduous, temporary" = 14.0 acres.

LAND CONSERVATION

Ownership Type: Private (multiple), 11 lot (< 1 ac.) owners, 4 minor (1-5 ac.) landowners, 3 major (> 5 ac.) landowners; county government; Federal government; corporate.

Land Use: The tidal cove, embankment, pond, and shrub swamps (Ecotype #s 1-4) are classified as Natural Features (Open Space); the uplands, steep slopes and floodplain forest as Residential-Rural (1/2 or less units/ac.), except for that portion on the U.S. Naval Station Grounds which is Government/ Institutional.

Residential Communities: Martins Cove Farm, Mulberry Hills

Problems: Lots 26, 27, and 28 in Martins Cove Farm were undeveloped at the time of fieldwork (June, 1986). These lots back up to the pond and form an important portion of the natural area. In all likelihood they will be developed in the near future (during field work, surveyor's flagging on one of these lots was observed). Another large holding (14.6 acres) is owned by an incorporated group and may be slated for development in the future. In 1985, a community marina for Martins Cove Farm was proposed. The status of this project is unknown. A minor development is registered as no. 048-85 with the County. This is a "flag" lot which will front the south side of the pond. The majority of the natural area was in a remarkably undisturbed condition. The only ongoing impact is a recent stormwater project at the head of a side ravine off Martins Cove Farm Road. The placement of rip rap in the bottom of this ravine destroyed ca. 0.4 acres of the sensitive natural area.

Preservation Options: Contact with the Commander of the U.S. Naval Station concerning the future use of their holdings should be made. A wildlife management plan, similar to the one done for Woolchurch Cove and Carr Creek may be a logical initial step. Contact with the incorporated landowner should also be made concerning future use. Conservation cooperatives with the lot owners and minor landowners may have potential.

Future Use: The pond (Ecotype #3) is ideally suited for a wetland wildlife reservation as are the uplands and steep slopes for forest wildlife. The designation of the pond as a stormwater management area would be consistent with its current function.

NATURAL AREA #2

Name: Mill Creek Head (downstream of Route 50)

Geographical Limits: This natural area is bounded by Route 50 on the north; St. Margarets Road (Route 179) on the south; developed lots off View Top Court, Meadow Hill Drive, Mill Ridge Road (The Meadows subdivision), and Nap Lane East (Captains Choice subdivision) to the west; and developed lots, farms, and pastures off Old Mill Bottom Road to the east. The Anne Arundel County Rod and Gun Club is located in the heart of the natural area.

Total Acreage: 134.8 acres

Ecological Classification: Environmental complex; this includes four ecotypes: 1) Tidal (cove) marsh; 2) Shrub swamp; 3) Wooded swamp; 4) Uplands and steep slopes.

Ecotype #1: Tidal (cove) marsh

Acreage: 10.6 acres

Flora: At the head of tidewater on Mill Creek, beginning just upstream of St. Margarets Road (Route 179), is an extensive tidal wetland. Many species of grasses are segregated into distinctly zonated patterns and interspered with patches of open water. The quality and diversity of this large marsh are rarely seen in the Severn River watershed. Dominant marsh species include cattail, smooth cordgrass, rosemallow, meadow cordgrass, and spikegrass.

Ecotype #2: Shrub swamp

Acreage: 3./ acres

Flora: Continuing upstream on Mill Creek the cove marsh (Ecotype #1) grades into a dense shrub swamp. The dominant vegetative species include alder, sweet gum, red maple, blackberry, smartweed, winterberry, willow, buttonbush, and jewelweed.

Ecotype #3: Wooded swamp

Acreage: 14.4 acres

Flora: Continuing still further upstream on Mill Creek (to Route 50) the shrub swamp (Ecotype #2) grades into a full wooded swamp. The canopy layer in the swamp is comprised of red maple, black willow, and river birch. Winterberry and swamp rose are dominant in the shrub layer. Several acres of this wooded swamp were destroyed in the 1950s when a 300 ft. long by 800 ft. wide area was filled in for an unsuccessful business venture on Route 50.

Ecotype #4: Uplands and steep slopes

Acreage: 106.1 acres (47.1 acres on the west side of Mill Creek, 59.0 on the east side)

Flora: An intact, mature forest covers the rolling topography and steep slopes on either side of Mill Creek. Chestnut oak (12-15 in. DBH) is the most common canopy tree in the forest. White oak, mockernut hickory, southern red oak, and Virginia pine trees are other, less common canopy trees which also have DBHs of 12-15 in. Chestnut oak, black gum, flowering dogwood, and service berry characterize a well developed understory layer. Mountain laurel is the most dominant shrub species. Ferns and wild flowers include Christmas fern, ebony spleenwort, spotted wintergreen, indian cucumber root, ladies slipper, and trailing arbutus.

Natural Heritage Elements: None registered, but further detailed investigation is required.

Noteworthy Plant Species: None observed

Exceptional Trees: None observed

Historic Features: None registered

Archeological Features: None registered

Wildlife: The wetland area, with the almost completely intact wooded buffer, offers an exceptional waterfowl habitat. Kingfisher, red-shoulder hawk, green heron, and great blue heron are frequently observed in the area.

Scenic Qualities: The extensive, well zonated wetland is an impressive sight from the waters' edge.

Geology: The Aquia Fm. underlies the uplands and steep slopes (Ecotype #4) while alluvium forms the marsh, shrub swamp, and wooded swamp (Ecotype #s 1-3).

Soils: Tidal marsh soils cover the tidal marsh. Mixed alluvial lands cover the wooded and shrub swamps. Monmouth and Collington fine sandy loams cover the uplands and steep slopes. Cut and fill land is mapped on the disturbed area at Route 50 and the east side of Mill Creek.

Topography: The relatively flat (5-15% slopes) uplands range in elevation from 107.0 to 75.0 ft. (msl). The steep (15-40%) slopes range in elevation from 75.0 ft. to sea level (at the marsh). From Route 50 to St. Margarets Rd. the Mill Creek valley floor descends from 14.0 ft. to sea level.

Contiguity: This natural area is separated from Natural Area #3 by Route 50. Migration of wildlife species across this barrier is probably severely hampered.

Other: A small (ca. 0.5 acre) pond occurs on a side ravine to Mill Creek just south of Route 50. Further field investigation of this pond is required. Field review - 7/2/86.

Previous Listings: 1) The DNR Tidal Wetlands Boundaries (1970) mapped the tidal cove marsh (Ecotype #1) as "smooth cordgrass, cattail, spikegrass, rosemallow, and meadown cordgrass" = 10.6 acres. 2) The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also maps the cove marsh as "palustrine, scrub shrub, broad-leaved deciduous, seasonal tidal"; they also mapped the shrub swamp (Ecotype #2) as "palustrine, forested/scrub shrub, broad-leaved deciduous, seasonal saturated" and the wooded swamp (Ecotype #3) as "palustrine, forested, broad-leaved deciduous, seasonal saturated." The small (0.5 acre) pond near Route 50 is mapped as "palustrine, aquatic bed/open water, intermittently exposed/permanent, diked/impounded." Two large ravines located on the east side of Mill Creek (which require further field investigation) are mapped as "palustrine, forested, broad-leaved deciduous, temporary" and "seasonal saturated". 3) The Upland Natural Areas Study (1977) recognized 88.0 acres of this natural area. Since that study, however, a significant portion of the natural area on the west side of Mill Creek was replaced by the Meadows sub-division. 4) Natural Heritage Program (1983) - ca. 30 acres mapped as an ecologically sensitive area. 5) Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 11 major (> 5 ac.) landowners; county government.

Land Use: The marsh, shrub swamp, and wooded swamp (Ecotype #s 1-3) are mapped as Natural Features (Open Space). The uplands and slopes on the east side of Mill Creek are classified as Residential-Rural (1/2 or less units/ac.) while those on the west side are classified as Natural Features (Open Space).

Residential Communities: Captains Choice, The Meadows, St. Marqarets

Problems: No major projects have been proposed for this natural area. One minor development has been proposed for the uplands and steep slopes (Ecotype #4) on the west side of Mill Creek. This development is registered a no. 057-85 with the County. Ongoing impacts include scattered littering and selective cutting of hardwood trees. Noise impacts close to Route 50 and adjacent to the Rod and Gun Club are significant.

Preservation Options: The Rod and Gun Club should be contacted concerning plans for the remainder of their property which has not been developed. Especially important is a narrow band of hardwood trees which separates the intensely used area from the cove marsh (Ecotype #1). Maintenance of this tree line as a transitional "life" zone for the wetland is imporatnt. Conservation cooperatives, conservation easements, and mutual covenants may be viable options for the 11 major landowners.

Future Use: The tidal marsh (Ecotype #1), because of its size and diversity, is ideally suited as a wetland wildlife reservation. The remainder of the natural area may serve well as a forest wildlife reservation where passive recreation and outdoor education are allowed.

NATURAL AREA #3

Name: Mill Creek Valley (upstream of Route 50)

Geographical Limits: This natural area is bounded by Route 50 and Old Mill Bottom Road on the south, by Shot Town Road and intense development in Whispering Woods to the east, by developed lots in Indian Hills and off Old Frederick Road to the west, and by developed lots in Landhaven and Shirleyville to the north. Several inholdings (scattered homesteads off Shot Town Road) reduce the size of this natural area and detract somewhatfrom its scenic and ecological qualities.

Total Acreage: 250.5 acres

Ecological Classification: Environmental complex; this includes six ecotypes: 1) Freshwater marsh and shrub swamp; 2) Meadow; 3) Wooded swamp/floodplain forest; 4) Wooded swamp; 5) Shrub swamp and 6) Uplands and steep slopes.

Ecotype #1: Freshwater marsh and shrub swamp (former freshwater pond)

Acreage: 3.1 acres

Flora: Located between the Route 50 embankment on the south and the remnants of the earthen dam of Brice's (Winchester) Grist Mill on the north is a nontidal, freshwater marsh. During the 1960s, the culvert under Route 50 was partially blocked, impounding several feet of water upstream. This pond afforded excellent fishing for largemouth bass and chain pickerel. In 1973 a new crossing and culvert for Route 50 were constructed and the pond drained. Marsh and swamp vegetation has since colonized over most of the old pond bed, although several patches of open water still exist. Dominant vegetative species include cattail, mallow, alder, winterberry, horsetail, sensitive fern, and jewelweed. Bladderwort, duck potato, and floating marsh pennywort are found in the open water areas.

Ecotype #2: Meadow

Acreage: 2.4 acres

Flora: Upstream of the grist mill dam is an open meadow area on the former bed of the mill pond. The dominant vegetative species in the central, open area of the meadow is elderberry. Scatterings of jewelweed, meadow-rue, hollowstem joe-pye-weed, greenbriar, and unidentified reeds are also present. Toward the perimeter of the meadow shrub species become more frequent. These include alder, red maple, silky dogwood, and poison sumac.

Ecotype #3: Wooded swamp/floodplain forest

Acreage: 45.1 acres

Flora: The Mill Creek floodplain upstream of the meadow (Ecotype #2) is colonized by a very moist forest and, in places, a dense shrub swamp. Except possibly for the Severn Run, the floodplain of Mill Creek is the most extensive of any in the watershed. In places, the channel area proper is 3-5 ft. wide and ca. 2 ft. deep, and conveys a persistently large discharge. At a point approximately 1/4 mi. above the meadow (Ecotype #2), Mill Creek branches into east and west branches approximately equal in size. Red maple trees, the dominant canopy species, were some of the largest examples observed in the Severn watershed (18-24 in. DBH). Large (12-24 in. DBH) white ash trees (an infrequently seen species in the watershed) are also common. Other canopy species include river birch, sour gum, sycamore, and tulip poplar. Common species in a well developed understory layer include black willow, ironwood, and red maple. The shrub layer is extremely dense in selected locations and overrun with greenbriar. In areas absent of greenbriar, smooth alder and swamp rose are common in an otherwise sparse shrub layer. The herbaceous layer is rich and diverse. Typical species include arrowwood (abundant), crested wood fern (one of only two known sightings in the Severn watershed), ladies slipper, New York fern, clubmoss, cinnamon fern, dangleberry, running clubmoss, cut-leaf grape fern, wild yam, Solomons seal, skunk cabbage (in the wettest areas), jewelweed, and Christmas fern. Toward the edges of the floodplain, where the alluvium interfaces with the toe of the adjacent slopes, large American holly trees are present.

Ecotype #4: Wooded swamp

Acreage: 3.0 acres

Flora: On the eastern branch of Mill Creek, upstream of Shot Town Road, a wooded swamp has evolved due to "alluvial drowning". Since the construction of Shot Town Road water and sediment have been partially impounded behind the road. The elevation of the swamp above the road is 28.0 ft. (msl), 5.5 ft. higher than the elevation of the floodplain below the road (22.5 ft. msl). Recently, three pipes, each 6 ft. in diameter, were placed under Shot Town Road and ponding above the road was probably stopped. The upstream limit of this swamp is marked by an earthen embankment which supports a shell road. The swamp vegetation between these two embankments is characterized by red maple, persimmon, and smooth alder trees, each about 30 ft. in height. Three large (18 in. DBH) sycamore trees were also observed. Bayberry, New York fern and greenbriar are common herbaceous plants.

Ecotype #5: Shrub swamp

Acreage: 5.0 acres

Flora: Upstream of the shell-topped road which crosses the east branch of Mill Creek is a shrub swamp that has also evolved due to "alluvial drowning". In this case the alluviation has been even more pronounced (possibly due to a more complete blockage of flow) than that of the wooded swamp (Ecotype #4) blocked by Shot Town Road. The elevation of the shrub swamp is 36.0 ft. (msl), 8.0 ft. higher than the elevation of the wooded swamp (28.0 ft. msl) immediately downstream. Changes in the water and sediment regiem have greatly altered the vegetational composition of the Mill Creek floodplain over the last 40 or so years. What was once probably a floodplain forest is now a full shrub swamp with dead trees scattered intermittently about. Several portions of the swamp are open water; what is not open water is either standing water or completely saturated soils. The west side of the swamp is an intact hardwood forest; the east side fronts intense development of Whispering Woods, the lots of which have encroached completely to the edge of the swamp. This development has undoubtably detracted from the ecological and scenic integrity of the swamp. Nonetheless, the quality of the shrub swamp appears to be high and it is still probably an important habitat for less shy wildlife species. The dominant vegetative species include red maple, smooth alder, decodon, swamp rose, buttonbush and yellow waterlily (abundant).

Ecotype #6: Uplands and steep slopes

Acreage: 191.9 acres

Flora: Located on the east and west sides of Mill Creek, and in the area between the east and west branches of the creek (north of their confluence point), is a mature hardwood forest. Although there are several residential inholdings within this forest and some disturbance, it is, in general, a complete functioning ecotype. Much of this forest, especially the flatter uplands and gentle slopes, was cleared for agriculture in the past. The resulting successional forest that has evolved is, almost without exception, tulip poplar. Virginia pine is the secondary component

and occurs regularly within the tulip poplar stands. In areas that escaped agricultural clearing, white oak trees are common, especially on ridge crests and the upper portions of slopes. In general, more white oak trees were observed in this natural area than in any other in the Severn watershed. On the lower portions of the slopes, especially on the warmer south facing slopes, American holly flourishes in the understory. A few sizable American holly trees also occur in the canopy layer. Associated with tulip poplar and American holly are ironwood and witchhazel in the understory. The largest examples of ironwood found during field work occur in this natural area. Toward the bottom of the slopes, beech, sour gum, and northern red oak trees occur. The herbaceous layer, except under the beech trees where little else grows, is rich and diverse. Herbaceous plant species include rattlesnake fern, smilax, mayapple, tree club moss (on slightly higer hummocks), and bloodroot. In some areas a very heavy oak leaf litter replaces the herbaceous vegetation. On the very steepest slopes covered with dry, well-drained soils, chestnut oaks and scarlet oaks (some with DBHs up to 30 in.) occur in the canopy layer, and American chestnut sapplings and mountain laurel in the shrub layer. At the mouth of ravines (where they flow into the floodplain; Ecotype #3) are broad alluvial fans. These fans are ca. 6 in. to 1 ft. above the elevation of the floodplain. The soils of the alluvial fans are slightly coarser than those of the floodplain. Beech, sour gum, sweet gum, American holly, tulip poplar, and northern red oak trees are common in the canopy layer. Both the shrub and understory layers on these fans are almost non-existent, but the herbaceous layer is quite rich. Typical plants include New York fern, ladies slipper, rattlesnake fern, bloodroot, and tree club moss (abundant on slightly higher hummocks).

Natural Heritage Elements: 1) Floating marsh pennywort - C, State declining. 2) American chestnut - C, State declining.

Noteworthy Plant Species: None observed

Exceptional Trees

Historic Trees: 1) One beech tree (DBH 36 in.) bears engraved initials (unknown origin) and a date of 1930. This tree was probably quite large when the carvings were made and could be over 100-120 years old. Several other beech trees, larger and probably older than this example, were also observed.

Old Trees: 1) Several large (CBH 8-10 ft.) stumps of chestnut trees were also observed. At the time of their demise, these chestnut trees could have been quite old. Vestiges of this once important tree are becoming increasing less common observances in the Severn watershed.

Historic Features: 1) The Winchester (or Brice's) grist mill site is the most prominent historic feature in the subwatershed. It is also one of the more outstanding historic examples of engineering, transportation, and commerce in the Severn watershed. The earthen embankment is the largest remaining historic mill dam on the Severn. In plan view, the 4-5 ft. high dam is L-shaped, with the main portion of the embankment perpendicular to the Mill Creek valley. The leg of the dam, the sluiceway embankment, is located on the easternmost side of the valley and runs parallel to stream flow. The sluiceway, of which ca. 150 ft. remains, was apparently excavated from insitu Aquia Fm. sediments of the

side slope. Large scallop-shaped indentations in the side of the slope were probably borrow areas for material used to construct the main portion of the dam. An sunken road bed aligned with the dam can be observed on the upland slope on the eastern side of the valley. The dam, which is at least 8-10 ft. wide at it crest, performed the dual function of a road, bridging the large Mill Creek valley for horse drawn traffic. The road atop the dam was probably the major link between the southern portion of Broadneck and Old Annapolis Blvd., and thence the ferry to Annapolis. Apparently, a wooden bridge was used to span the sluiceway and connect the road on the dam to the road on the upland slope. The exact age of the present dam is unknown, but John Brice first used the site for a mill in the mid-1700s. There was a grist mill (Winchester's) here as late as 1880. The road was probably built a top the dam in the early and mid-1800s. The site is worthy of future historical and archeological study to determine the original layout and significance of the old grist mill and bridge. 2) From a perspective of engineering, transportation, and highway and bridge construction, the Mill Creek valley from the grist mill site to Route 50 is historically significant. Evidence of four generations of bridges occur at this site: the mid-1800s bridge on Winchesters Dam as described above; a turn of the century (circa 1890s - 1920s) low bridge located just upstream of Route 50; the modern day predecessor to the present Route 50 bridge (pre-1973); and the present Route 50 span. The turn of the century crossing is evidenced by an earthen embankment on the west side of the Mill Creek valley. The earthen embankment roughly parallels Route 50 and is ca. 5-6 ft. above the elevation of the floodplain. At 8-10 ft. wide, this embankment afforded a narrow road by present day standards. This road probably connected Old Mill Rd. on the east to Old Annapolis Blvd. on the west. At the time this bridge was actively used, Mill Creek occupied a channel ca. 100 ft. west of the present channel. Four iron I-beam girders still span the abandoned channel. The wood planks which once capped these iron supports no longer exist. The first Route 50 bridge which succeeded the 1900 bridge was replaced by the present Route 50 bridge in 1973. Mill Creek presently flows under Route 50 via a large concrete box culvert. 3) Old Mill Bottom Road, a 2-lane narrow route, was probably named for the Winchester Mill crossing.

Archeological Features: No sites are recorded by the MHT, however, the Winchester (Brice) Mill site and dam and the turn of the century bridge may both prove to be significant sites for historic archeology.

Wildlife: During the late 1940s the Mill Creek marsh (Ecotype #1) above Route 50 was a very active amphibian breeding area. The area may still be important habitat for reptiles and amphibians, as very large snapping turtles, toads, and frogs were observed during field work. A bobcat was shot in a wooded area (now Indian Hills) by James J. Mullens in the 1950s. Although the area has been progressively fragmented and reduced by development over the last 20 years, it is still large and intact enough to support a significant mammal population.

Scenic Qualities: The view from atop the historic grist mill dam is outstanding. Open meadows occupy the dry bed of the mill pond on the north, while a fresh marsh teeming with birds occupies the impounded area to the south. With the high clarity of the water in Mill Creek, many fish, amphibians, and reptiles can be observed.

Geology: The Aquia Fm. underlies the uplands and steep slopes. Alluvium forms the remaining ecotypes (#s 1-5) located in the Mill Creek valley. 2) The Mill Creek natural area offers several excellent examples of fluvial geomorphic

processes, including historic changes in channel course, "alluvial drowning," the effect of local changes in base level on sedimentation, and the formation of alluvial fan deposits.

Soils: Mixed alluvial soils are mapped in Ecotype #s 1-5. Monmouth, Collington, and Butlertown silt loams and fine sandy loams cover the uplands and steep slopes. In general, soils everywhere is this natural area are rich and moist and support a complement of flora which reflect this.

Topography: The rolling (5-15% slopes) uplands range in elevation from ca. 120 to 100 ft. (msl). The steep (15-40%) slopes range in elevation from ca. 100 ft. (msl) to the level of the Mill Creek floodplain. The floodplain descends from 36 ft. (msl) in the upstream portion of the natural area to 13.0 ft. (msl) at Route 50.

Contiguity: This natural area is separated from the Mill Creek natural area below Route 50 by the very busy 4-lane highway. Migration of wildlife across this barrier is disrupted to a large degree.

Other: Field review - 7/2/86

Previous Listings: 1) The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory maps a total of 36.7 acres of non-tidal wetlands in the floodplain of Mill Creek. Ecotype #s 1-2 (the marsh and meadow) are classified as "palustrine, emergent, narrow-leaved deciduous, seasonal saturated" = 5.5 acres; Ecotype #s 3-4, the wooded swamp/floodplain, are mapped as "palustrine, scrub shrub, broad-leaved deciduous, seasonal" = 14.0 acres; Ecotype #5, the shrub swamp, is mapped as "palustrine, emergent, nonpersistent/narrow-leaved persistent, semipermanent, diked/impounded" = 2.8 acres; the remainder of the Mill Creek floodplain is mapped as "palustrine, forested, broad-leaved deciduous, temporary, seasonal, and seasonal saturated/permanent" = 14.4 acres. 2) Natural Areas of Highest Priority for Preservation (1986).

LAND CONSERVATION

Ownership Type: Private (multiple), 8 lot (< 1 ac.) owners, 5 minor (1-5 ac.) landowners, 23 major (> 5 ac.) landowners; county government.

Land Use: A portion of the natural area bordering the east branch of Mill Creek (near Shot Town Road) is classified as Residential Low-Med (2-5 units/ac.); A very sensitive portion of the natural area (Ecotype #1, the fresh marsh/shrub swamp) is directly fronting a parcel classified as Commercial. The remainder of the natural area is classified as Residential - Rural (1/2 or less units/ac.).

Residential Communities: Indian Hills, Whispering Woods, Arnold Village, Shirleyville, Capetown, Hanekes Corner, Landhaven

Problems: No major projects are presently proposed for this natural area. One major development was at the presubmittal stage at the time of this writing; it is registered as "Sillaman Estates, PS 299-84" with the County. One cul-de-sac in this subdivision is a threat to the State Champion Red Maple. Several negative impacts are ongoing in this natural area: 1) Flagrant roadside dumping of trash and debris along the shoulder of Shot Town Road is a significant problem; 2) Adjacent to Ecotype #1, the marsh and shrub swamp, a commercial

venture has completely cleared the transitional buffer which once protected the marsh. The property is classified as commercial (see "Land Use" category above) and directly abuts the heart of the Mill Creek natural area. The commercial activity ongoing at this site severely impacts the scenic and ecological integrity of the natural area. The venture, at the time field work was conducted (July, 1986), was petitioning for rezoning of 0.77 acres, from R-1 to C-4. Any increase in the activity of this commercial establishment will worsen what is already an impactive situation. The addition of just a narrow strip of buffering vegetation between the natural area and the commercial venture would help reduce some of the impacts. 3) Bordering the east branch of Mill Creek is a dirt road connecting a homestead to Shot Town Road. Recently, this road was regraded and widened. Approximately 30 ft. of vegetation on either side of the road was bulldozed over a distance of ca. 1/4 mi. No sediment control measures were in use at the time field work was conducted. In addition to the impacts to the scenic and ecological integrity of the site, this situation may be having a significant effect on the water quality of Mill Creek. 4) Near Route 50, the passing of traffic at high speeds produces persistent noise which detracts somewhat from the character of this natural area.

Preservation Options: Because of the large number of major landowners, conservation easements and mutual convenants will be a complex pursuit. However, the major holdings, in aggregrate, make up one of the largest remaining "green areas" in the Severn River watershed. Conservation cooperatives with the minor landowners and lot owners, as a complement to easement and covenants, are also promising options. The owner of the largest holding in the natural area has demonstrated a willingness to keep the property in a natural state. Contact with this critical landowner should be made immediately, and would be a good start to a comprehensive voluntary land preservation program in the Mill Creek subwatershed.

Future Use: Both wetland and forest wildlife reservations are viable future uses for this large natural area. The old grist mill dam and the Route 50 embankment currently function as stormwater management areas. Because of the excellent reptile and amphibian habitat provided by Mill Creek, scientific monitoring may also have future application.

ISOLATED FEATURES

Wetlands: The DNR Tidal Wetlands Boundaries (1970) and the U.S. Fish and Wildlife Service (1979), National Wetlands Inventory both recognize ten isolated tidal draw marshes in this subwatershed, seven on the lower portion of Mill Creek and three on Burley Creek. Each is small (0.2 - 0.7 acre) and mapped as "smooth cordgrass" and/or "cattail" and as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular." Further upstream on Mill Creek, four small tributary ravines are mapped by the National Wetlands Inventory (1979). Their respective acreages of "palustrine, forested, broad-leaved deciduous, temporary" are 3.0, 3.3, 4.1, and 4.4. At the mouth of each ravine is a tidal cove marsh. DNR (1970) maps them as "cattail" and/or "smooth cordgrass" while the National Wetlands Inventory (1979) maps three as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" and another as "palustrine, scrub shrub, broad-leaved deciduous, seasonal tidal." Three of the cove marshes are ca. 0.5 acre or less. The fourth is 1.5 acres.

Natural Heritage Elements: 1) Two-flowered bladderwort has been identified in Davidsons Pond. This plant is ranked as B2 - highly State rare, in danger of extinction in Maryland.

Exceptional Trees

State Champion: 1) Presently there is no State Champion red maple tree. A red maple with dimensions exceeding those of the former champion exists in an area off Old Frederick Rd. This maple, which measures CBH ca. 14 ft. 10 in., 80 ft. in height, and 75 ft. in spread, has been officially measured by the DNR Urban Forestry Division and declared State Champion. This tree at the time of this writing, was in serious danger of being cut down for Silliman Estates subdivision.

Big Trees: A tremendous white oak tree is located off Jones Station Rd. on the County's athletic property (Arnold Park), near the microwave tower. This great white oak measures 110 ft. in height, 115 ft. in spread, and 21 ft. 1 in. CBH. This tree has locally been named the "Wilmer Stone White Oak" after the former owner of the property. The tract was also once owned by John Arnold. This tree should be officially measured by the DNR Urban Forestry program and placed on Maryland's Big Tree Inventory.

Old Trees: In 1975 the DNR located three trees in excess of 200 years for inclusion in the "Bicentennial Trees" report. 1) A southern red oak 230 years in age (now 242 years) is located in St. Margarets. 2) A chestnut oak 225 years in age (now 237 years) is located on Forest Beach Road. 3) A cherrybark oak 205 years in age (now 217 years) is located on the same lot as the chestnut oak.

Historic Features: The County Historic Sites Survey recognizes two isolated sites. 1) AA 314 - Horace Winchester Farmhouse - is a deteriorated structure, which at the time of the historic survey was slated for destruction. The 19th century structure (present status unknown) is significant for its relationship with Winchester's Grist Mill. 2) AA 324 - Maiden Stone Farm - is also referred to as the Duvall House. It was constructed in 1875 and is described as being in "excellent condition, altered, and on its original site." There is also an 1850s graveyard located on the site.

Archeological Features: Four MHT sites: 1) AN 91 - Old Tavern - an isolated artifact finding thought to be a 1710 club house or tavern. 2) AN 528 - KWW 4 - a Woodland age site where quartz points and chert flakes were collected. 3) AN 340 - was an early 18th century pre-Annapolis Colonial settlement associated with Providence. 4) AN 412 - is a Late Archaic oyster shell midden.

SUBWATERSHED #48

Name: Whitehall Creek (Homewood Creek, 1667)

Location: Bounded on the west by the Mill Creek subwatershed and on the east by the Meredith Creek subwatershed. This is the second of three large subwatersheds draining the southern half of the Broadneck Peninsula and flowing directly into the Chesapeake Bay. For the purposes of this study, Whitehall Creek is considered a part of the Severn River watershed. At approximately 1600 acres, this is one of the Severn's largest subwatersheds.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be given. However, several lowland natural areas are known to exist and require further field investigation. These include: 1) A small stream and cove marsh at the head of Ridout Creek (Rydout's Creek, 1846), the largest tidal tributary of Whitehall Creek; 2) A large unnamed stream (ca. 8500 ft. in length) and associated linear swamps which form the headwaters of Whitehall Creek above Route 50; 3) A historic mill pond (Boones Mill) now silted in which is located at the junction of St. Margarets Road and Broadneck Road; 4) A small pond, also silted in, located in the Whitehall Creek valley immediately upstream of Route 50; 5) Numerous tidal and non-tidal wetlands located along Whitehall Creek and its tributaries (see Isolated Features below), especially a large wetland at the head of the tidal creek, below Boones Mill.

ISOLATED FEATURES

Wetlands: Three tidal wetlands are mapped on Ridout Creek by the DNR Tidal Wetlands Boundaries (1970). These cove marshes are 1.1, 1.3, and 2.2 acres, respectively, and are mapped as "smooth cordgrass, cattail, red maple, white ash, groundselbush and marshelder." The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also recognizes these three cove marshes as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular." They also recognize 2.0 and 5.2 acres of non-tidal wetlands upstream of two of the cove marshes. These wetlands are classified as "palustrine, forested (and scrub shrub), broad-leaved deciduous, temporary." In addition, the DNR (1970) maps 10 additional cove and draw marshes at the heads of small inlets and tributaries of Whitehall Creek. These cove and draw marshes range in size from 0.3 to 2.3 acres and contain "smooth cordgrass, cattail, and spikegrass." The U.S. Fish and Wildlife Service (1979) maps these 10 marshes as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular." In addition they recognize two forested wetlands upstream of cove marshes located near Route 50. These are each about 3.0 acres in area and are mapped as "palustrine, forested, broad-leaved deciduous, temporary tidal. The head of Whitehall Creek is an extensive wetland. The DNR (1970) maps the 3.5 acres as "cattail, smooth cordgrass, red maple/white ash, marshelder, groundselbush," while the U.S. Fish and Wildlife Service (1979) maps it as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" and "palustrine, scrub shrub (and forested), broad-leaved deciduous, temporary (and seasonal tidal)." Boone's Mill pond (ca. 3.0 acres) is mapped by the U.S. Fish and Wildlife Service (1970)

as "palustrine, scrub shrub (and emergent), broad-leaved deciduous (and narrow-leaved persistent), seasonal saturated." Above Route 50 they also map perhaps 40 acres of non-tidal wetlands in the floodplain of the freshwater branch feeding Whitehall Creek. These wetlands are classified as "palustrine, forested (and scrub shrub), broad-leaved deciduous, temporary (and seasonal saturated)." Unfortunately, Route 50 coincides with most of this stream valley and it is fragmented in three places. Near the headwaters of this unnamed freshwater stream, where it crosses Route 50 at the first of three places, a small (ca. 0.5 acre) pond and marsh have formed. This is probably due to the damming effect of the conduits under Route 50. The impoundment is mapped as "palustrine, open water, semipermanent" and "palustrine, emergent, narrow-leaved persistent, seasonal saturated."

Natural Heritage Elements: 1) Floating marsh pennywort - C, State declining is plentiful in the old Boone mill pond.

Exceptional Trees

Big Trees: A southern magnolia tree is on the Maryland "Big Tree Inventory." The tree, located off St. Margarets Road, measures CBH 10.1 ft., 46 ft. in height, and 45 ft. in spread.

Historic Features: Eleven isolated historic sites are listed by the County Historic Sites Survey. 1) AA 316 - Old St. Margarets Church Rectory - is described as being in "good condition, altered and on its original foundation." This structure was constructed in the 1800s. 2) AA 317 - John Small House -is an 1800s house described as being significant for its architecture and being in "good condition, altered, and on its original site." 3) AA 318 - St. Margarets Church - is an Episcopal church built in 1895 and described as being in "good condition, unaltered and on its original site." 4) AA 319 - Millers House - is the home of a man who operated the mill at the head of Whitehall Creek (Boone's Mill). The house was built prior to 1860 and is described as being in "good condition, altered, and on its original site." 5) AA 323 - Pleasant Plains - is a 1700s structure once owned by John Ridout. The structure, which has several interesting outbuildings is described as being in "fair condition, unaltered, and on its original site." 6) AA 325 - Whitehall - is described as being an outstanding example of a Georgian Country house. This five part structure with spacious, intact grounds was built by Maryland Governor Horatio Sharpe on a 1000 acre estate in 1764. It has the special distinction of being one of only two pre-Revolutionary houses in America to display a full temple portico. Whitehall is a major milestone in American architectural history; great sophistication of design. It is listed on the National Register of Historic Places. 7) AA 326 -Taylor Residence - was the Whitehall overseer's house built in the late 1700s. It is in excellent condition. The log quarter of the house represent an unusual form of construction in Anne Arundel County, though log buildings are common in Western MD. 8) AA 327 - Whitehall Brick Yard (site) - was the producer of the brick used in the construction of Whitehall as well as the Brice and Ridout houses. Bricks for houses in Annapolis may have been manufactured here. Numerous 10 in. bricks and some molded water table bricks have been found on this site. The site of this Colonial brickyard is significant to historical as well as industrial archeology. 9) AA 328 -Belfield site - was a Colonial farmstead probably built by Thomas Homewood (died 1737). The structure burned in 1939, but outbuildings and an old graveyard remain. The brick smokehouse is a typical example of the times except it has a shed roof brick addition. The graveyard contains the burial sites of Thomas Homewood, whose family were

original patentees of the land, and John Hesselius, the famous painter who died in 1778 (unmarked grave). Belfield still retains possible signficance as an archeological site. 10) AA 329 - Whitehall Stable - is described as being in "good condition, altered, and on its original site." The stable as part of Whitehall, is also on the National Register of Historic Places. 11) AA 956 -Bay Head Manor. In addition to these eleven sites, the site of Governor Sharpe's (Boone's) Grist Mill is an important archeological site. The gristmill was built about 1760 by Governor Horatio Sharpe. It was rebuilt by John Ridout about 1783. It was next owned by John B. Boone and his brother, T.C. Boone from at least 1860 to 1880, when the dam washed out.

Archeological Features: Four MHT sites: 1) AN 248 - Whitehall Creek site - is a small oystershell midden with sherds. 2) AN 556 - no information available. 3) AN 414 - no information available. 4) AN 415 - Fort Smallwood site - is an oystershell midden of the Church Creek Late Archaic Period.

Previous Listings: 1) Whitehall (AA 325) was listed by both the Catalog of Natural Areas (1968) and the survey of Ecologically Important Areas of the Chesapeake Bay Region (1974). 2) Bellefield (AA 328) was included in the Compendium of Natural Features (1975). 3) Whitehall Creek, Whitehall Creek Head, and Ridout Creek are listed on the Upland Natural Area List (1977).

Geology: This subwatershed is significant for having three geologic formations in vivid juxtaposition. In the area of St. Margarets, the very flat plains of the Talbot Fm. (elevation ca. 20 ft. msl) rise abruptly to the Pleistocene Terrace Deposits (elevation 60-80 ft. msl) and thence to the Aquia Fm. (100-120 ft. msl). Looking across the flat pastures of Pleasant Plains, the well defined linear terrace escarpment and the immediate increase in relief offers an encapsulated view across millions of years of geologic time. The height and ruggedness of the Aquia Fm. in the background is greatly accentuated by the almost perfectly level deposits of the Talbot Fm. in the foreground. The might and extensiveness of the geologic processes that helped form the Chesapeake Bay (and the Severn River) can be better comprehended by a trip from St. Margarets Rd. to Pleasant Plains and across 50 million years of geologic time.

SUBWATERSHED #49

Name: Meredith Creek (Merrideths Creek, 1878; Duvall's Creek, 1846; Merriken Creek, 1667)

Location: Bounded on the west by the Whitehall Creek subwatershed and on the east by the Chesapeake Bay (the Hacketts Point to Sandy Point subwatershed). This is the easternmost of three large subwatersheds draining the southern half of the Broadneck Peninsula and flowing directly into the Chesapeake Bay. For the purposes of this study, Meredith Creek is considered a part of the Severn River watershed. The subwatershed is approximately 700 acres in size.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be given. However, several natural areas are known to occur along parts of the Meredith Creek shoreline. The Corrin Strong property and the head of Meredith Creek especially should receie priority for future field investigation.

Noteworthy Plant Species: 1) Swamp chestnut oaks and 2) a large southern red oak x willow oak occur on the Strong property.

ISOLATED FEATURES

Wetlands: Eight tidal marsh areas are mapped by the DNR Tidal Wetlands Boundaries (1970), six smaller draw marshes along the shores of Meredith Creek and two larger cove marshes at the head of the creek. The six draw marshes are 0.2 to 0.5 acre and consists of "smooth cordgrass, cattail, marshelder, groundselbush, and spikegrass." The two cove marshes located at the mouths of the two freshwater branches feeding Meredith Creek are 4.5 and 2.0 acres respectively. These marshes are mapped as "smooth cordgrass, cattail, marshelder, groundselbush, spikegrass." The U.S. Fish and Wildlife Service (1979), National Wetlands Inventory also recognizes the eight tidal marshes as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular." In addition, they map two non-tidal wetland areas in the subwatershed. 1) A 20 acre tract of hardwoods near Woodland Road is mapped as "palustrine, forested, broad-leaved deciduous, temporary." 2) Along the unnamed western branch feeding Meredith Creek (upstream of Route 50) are ca. 10 acres of "palustrine, forested, broad-leaved deciduous, seasonal tidal (and temporary)."

Historic Features: Three sites are mapped by the County Historic Sites Survey. 1) AA 338 - Woodly Farmhouse - is a typical mid to late 19th century farmhouse built throughout Broadneck over the last half of the 19th century. The dwelling is described as being in "fair condition, unaltered, and on its original site." 2-3) AA 320-321 - Boundary Markers: Whitehall -Homewood's Lott - are two of the four existing boundary stones which separated the Homewood Lott of John Hesselius (now Belfied; AA 328) from Governor Haratio Sharpe's tract. One of these stones bears the insignia "Here stood Wm. Fuller's Red Oak." Capt. Wm. Fuller had been granted 150 acres in 1659 and served as governor of the province.

Archeological Features: One MHT site: 1) AN 249 - Meredith Creek - is a large shell midden.

Previous Listings: Compendium of Natural Features (1975); Upland Natural Areas Study.

Other: The shorelines of this creek are amazingly intact despite increasing development along Whitehall Road.

Wildlife: The DNR (1978) mapped osprey nest sites on the creek near Whitehall. The entire subwatershed, because of its relatively undisturbed condition, may be a significant bird habitat.

SUBWATERSHED #50

Name: Hacketts Point to Sandy Point

Location: Bounded on the west by the Meredith Creek subwatershed and on the east by the Chesapeake Bay. Technically because of the flat terrain, this is not easily perceived as a subwatershed in the usual sense, but an extensive shoreline spotted with small coves and large wetland areas. The northern portion of the shoreline (above the Chesapeake Bay Bridge) is located on the grounds of Sandy Point State Park.

Natural Areas: Little detailed field work was done on this subwatershed and few specific comments on natural areas can be given. However, extensive and ecologically valuable wetlands exist and require further field investigation. These wetlands include: 1) The Mezick Ponds, a NE pond dredged for a boat basin and a SW pond now called Westinghouse Bay; 2) Moss Pond; and 3) Goose Pond. Also warranting investigation is a 6 acre freshwater pond at the tip of Hacketts Point.

ISOLATED FEATURES

Wetlands: The freshwater pond is mapped by the U.S. Fish and Wildlife Service (1979), National Wetlands Inventory (1979) as "palustrine, open water, intermittently exposed/permanent." This study also recognized the following wetlands: 1) Goose Pond - "estuarine, intertidal, emergent, narrow-leaved persistent, irregular" = 11.0 acres; an adjacent 1.0 acre pond as "palustrine, scrub shrub, broad-leaved deciduous/emergent narrow-leaved persistent, seasonal"; and a 2.0 acre upland hardwood grove bordering Moss Pond as "palustrine, forested, broad-leaved deciduous, temporary." 2) SW Mezick Pond (Westinghouse Bay) as "lacustrine, limnetic, open water, permanent, diked/impounded" = 25.0 acres; a 2.0 acre draw marsh located on this pond is mapped as "palustrine, emergent, broad-leaved deciduous, temporary;" three additional 0.5 acre draw marshes on the pond are "palustrine, emergent, narrow-leaved persistent, seasonal saturated, diked/impounded." 3) NE Mezick Pond was mapped as 27.0 acres of "lacustrine, limnetic, open water, permanent, diked/impounded." A large (19.0 acre) marsh at the head of the pond was mapped as "estuarine, intertidal, emergent, narrow-leaved persistent, irregular." Adjacent to NE Mezick Pond is a secondary (5.0 acre) wetland mapped as "palustrine, emergent, narrow-leaved persistent, seasonal tidal, spoil." The DNR Tidal Wetlands Boundaries (1970) maps the aforementioned wetlands as "smooth cordgrass, cattail, grounselbush, marshelder, common reed, spikegrass, red maple, white ash, and open water."

Historic Features: Two sites are recognized on the County Historic Sites Survey. 1) AA 322 - Weedon Farmhouse - is an 1800s dwelling described as being in "good condition, altered, and on its original site." 2) AA 330 - Sandy Point Farmhouse - is an excellent example of the residence of a relatively affluent Maryland farmer in the first quarter of the 19th century. The house and outbuildings are a worthy preservation of Maryland Country architecture. The farmhouse is distinguished as being an 18th century building building in the

19th century (1810-1820); a holdover. Sandy Point Farmhouse is on the National Register of Historic Places. Other significant historic features include the Labrot Farm, and the Sandy Point Ferry landing.

Archeological Features: Five MHT sites: 1) AN 534 - Sandy Point Farmhouse -this federal style masson brick structure is described above. 2-3) AN 416 and AN 417 were not described. 4) Quad File site no. 3 is a subaqueous site where 19th century reed stem pipes were found on rocks offshore of Goose Pond. 5) Quad File site no. 4 - no information was provided.

Natural Heritage Elements: 1) Least tern - B2, highly State rare, in danger of extinction in Maryland; 2) Black rail - B1, regionally rare, in danger of extinction in Maryland; 3) Sora - B3, State rare, in danger of extincton in Maryland; 4) Yellow passionflower - C, State declining.

Wildlife: The DNR (1978) mapped several osprey nests sites in this subwatershed. The peregrine falcon, an endangered species, has been observed attempting to nest in the supporting structure of the Chesapeake Bay Bridge. It is probable that these magnificent birds of prey fly over this subwatershed in search of food. In general, this subwatershed is an important wildlife area for geese and other waterfowl.

Previous Listings: 1) The Corcoran Tract on Sandy Point State Park was listed in the Compendium of Natural Features (1975) as was Hacketts Point. 2) The Upland Natural Areas Study (1977) also identified these two areas.

Other: Many interesting variations on names and historical names denoting natural landmarks in this subwatershed have been used over the last 300 years. Some of these are: Sandy Point - Rattlesnake Point (1776) and Ralph Hawkins Point (1667); Mezick Pond - Mezick Cove (1878) and Hawkins Creek (1667); Westinghouse Bay - Shorts Creek (1667); Moss Pond - Moss' Pond (1667), Weedens Cove (1878), Weeden's Cove (1846); Goose Pond (1846); North Shoal (1846).

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MARYLAND DEPARTMENT OF NATURAL RESOURCES
CAPITAL PROGRAMS ADMINISTRATION
LAND PLANNING SERVICES -

Land Planning Services provides planning, evaluation, mapping, graphic, environmental review and capital budget services for the acquisition, development and management of public lands and scenic rivers administered or managed by the Department.

The activities of Land Planning Services are accomplished through five projects: Resource Planning; Scenic and Wild Rivers; Acquisition, Graphics and Research; and Capital Budget Planning and Environmental Review.

MARYLAND SCENIC AND WILD RIVERS PROGRAM -

The Maryland Scenic and Wild Rivers Program is the state program responsible for administering the policies and mandates of the State Scenic and Wild Rivers Act and for providing technical assistance to those communities interested in local river conservation management. Created in 1972 and placed within the Department of Natural Resources, it is one of the oldest state scenic river programs in the country. A total of nine rivers have been designated and included in the state river system as either "wild" or "scenic" with an additional fifteen under consideration for inclusion.

For rivers not included in the state river system, the Program offers a range of planning services to local jurisdictions and private (non-profit) river organizations interested in assistance with protecting a particular river stretch or watershed. This component to the Program is its newest and most important attribute and one that is increasing in demand every day.

Maryland is blessed with an abundance of riverine systems that span from fast moving white water of the western counties to slow meandering black water of the lower eastern shore. It also has one of the world's largest and most productive estuaries, the Chesapeake Bay. But its most precious treasure is its Scenic Rivers Program; for it is designed with the mechanisms for the protection, conservation, and potential management of all of Maryland's water resources.

SEVERN RIVER COMMISSION PUBLICATIONS

- Severn River Natural Areas of Highest Priority for Preservation, 1986.
- Abstracts from 1st Severn River Symposium, "The Waters of Marylands Capital River," 1986.
- 1985-86 Report to the Anne Arundel County Council and the Annapolis City Council from the Severn River Commission, 1987.
- Gems of the Severn, 1988.

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