

# Historical Analysis and Map of Vegetation Communities, Land Covers, and Habitats of Trap Pond State Park Sussex County, Delaware

Broad Creek Watershed

**Submitted to:**

Chris Bennett  
Delaware Division of State Parks  
89 Kings Highway  
Dover, DE 19901

**Completed by:**

Robert Coxe, Ecologist

Delaware Natural Heritage and Endangered Species Program  
Wildlife Section, Delaware Division of Fish and Wildlife  
Department of Natural Resources and Environmental Control  
4876 Hay Point Landing Road  
Smyrna, DE 19977

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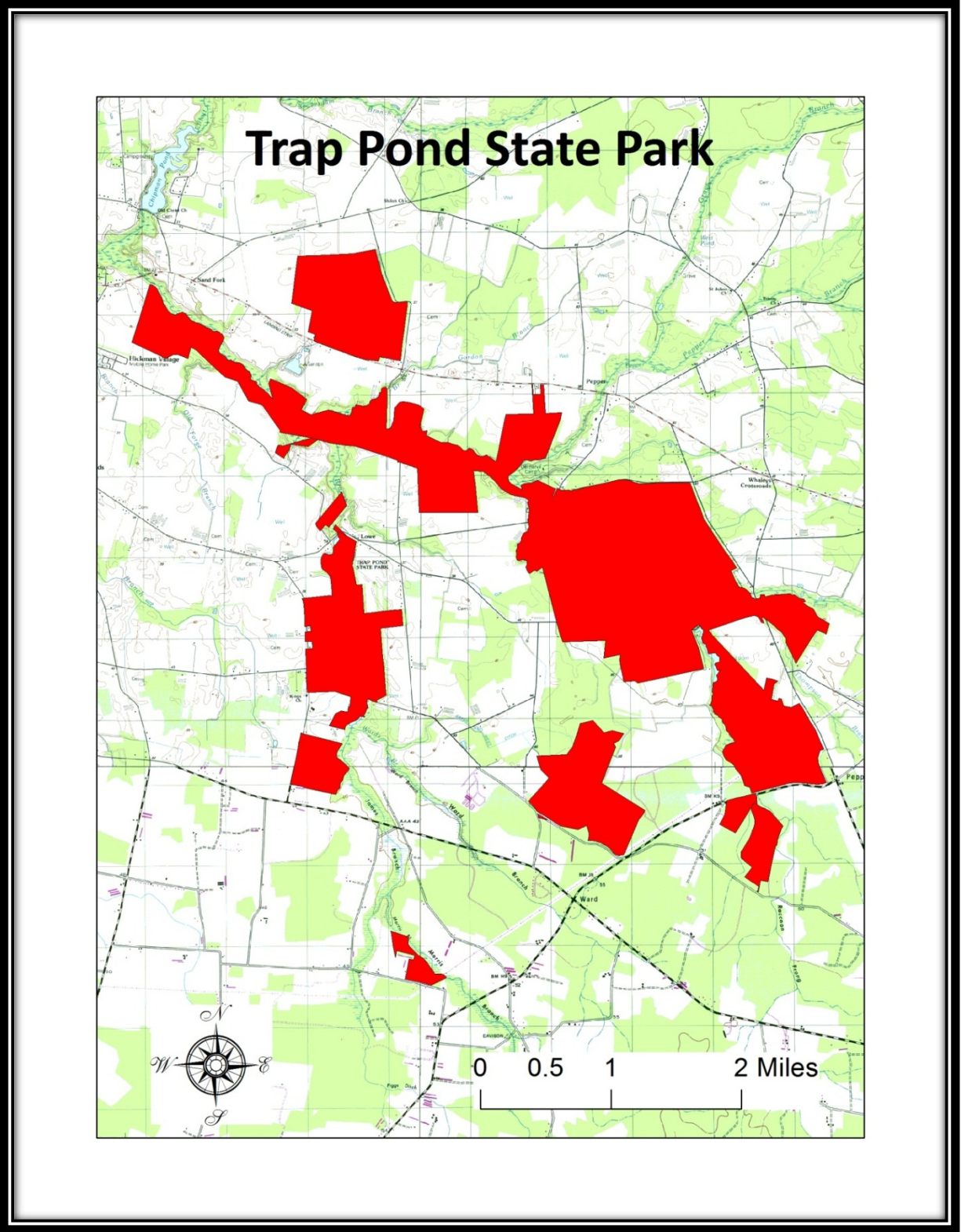
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## CHAPTER 1: INTRODUCTION AND METHODS

### Setting of Trap Pond State Park

Trap Pond State Park is located in southwestern Sussex County, Delaware (Figure 1.1) east of Laurel and totals 3,653 acres over 8 sections. All of the sections are located in the Broad Creek watershed of the greater Nanticoke River system. The sections are the Arvey Road Section (297 acres), James Branch Section (754 acres), Main Section (1,178 acres), Morris Branch Section (38 acres), Raccoon Prong Section (467 acres), Sand Fork Section (346 acres), Thompson Branch Section (90 acres), and the Trussum Pond Section (481 acres).





**Figure 1.1.** Location of Trap Pond State Park

## Soils and Geology of Trap Pond State Park

### Underlying Geology

Trap Pond State Park is mostly underlain by the Beaverdam Formation, except for the James Branch Floodplain downstream of Trap Pond, which is underlain by Holocene Deposits. The Beaverdam Formation is described as “Pale white to buff to greenish-gray medium sand with scattered beds of coarse sand, gravelly sand and light gray to greenish gray silty clay.”<sup>1</sup> Holocene deposits are described as “gray to black organic rich silty clay to medium sand associated with marsh and swamp environments.”<sup>2</sup>

### Soils

Three soils, Pepperbox-Rosedale Complex (675 acres), Runclint Loamy Sand (439 acres), and Puckum Muck (387 acres) are prominent in Trap Pond State Park. Other minor soils include Klej Loamy Sand (272 acres), Pepperbox Loamy Sand (243 acres), Hurlock Loamy Sand (191 acres), and Rosedale Loamy Sand (173 acres). Elevations of Trap Pond State Park range from 24 feet where James Branch flows out of the park to about 50 feet at the upper end of Raccoon Prong.

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<sup>1</sup> Ramsey, Kelvin W. and William S. Schenck. 1990. Geologic Map of Southern Delaware. Delaware Geological Survey, Open File Report No.32.

<sup>2</sup> Ramsey, Kelvin W. and William S. Schenck. 1990. Geologic Map of Southern Delaware. Delaware Geological Survey, Open File Report No.32.

## Arvey Road Section Soils

Hurlock Loamy Sand (135 acres) is the primary soil in the Arvey Road Section. Other minor soils include Klej Loamy Sand (61 acres) and Pepperbox Loamy Sand (49 acres).

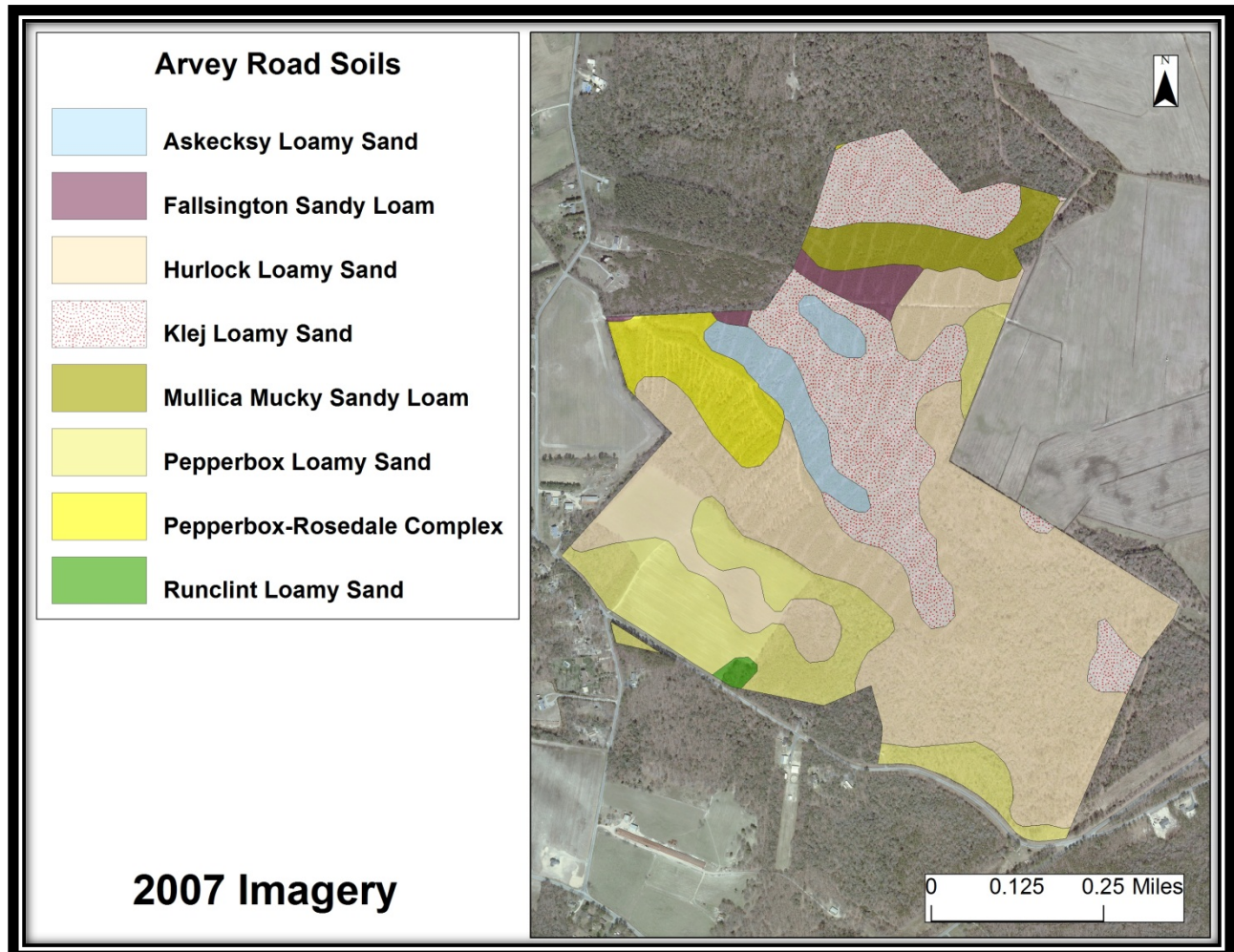


Figure 1.2. Arvey Road Section Soil Map



## James Branch Section Soils

Puckum Muck (304 acres) is the primary soil in the James Branch Section. Other minor soils include Evesboro Sandy Loam (122 acres), Pepperbox-Rosedale Complex (92 acres), and Rosedale Loamy Sand (81 acres).

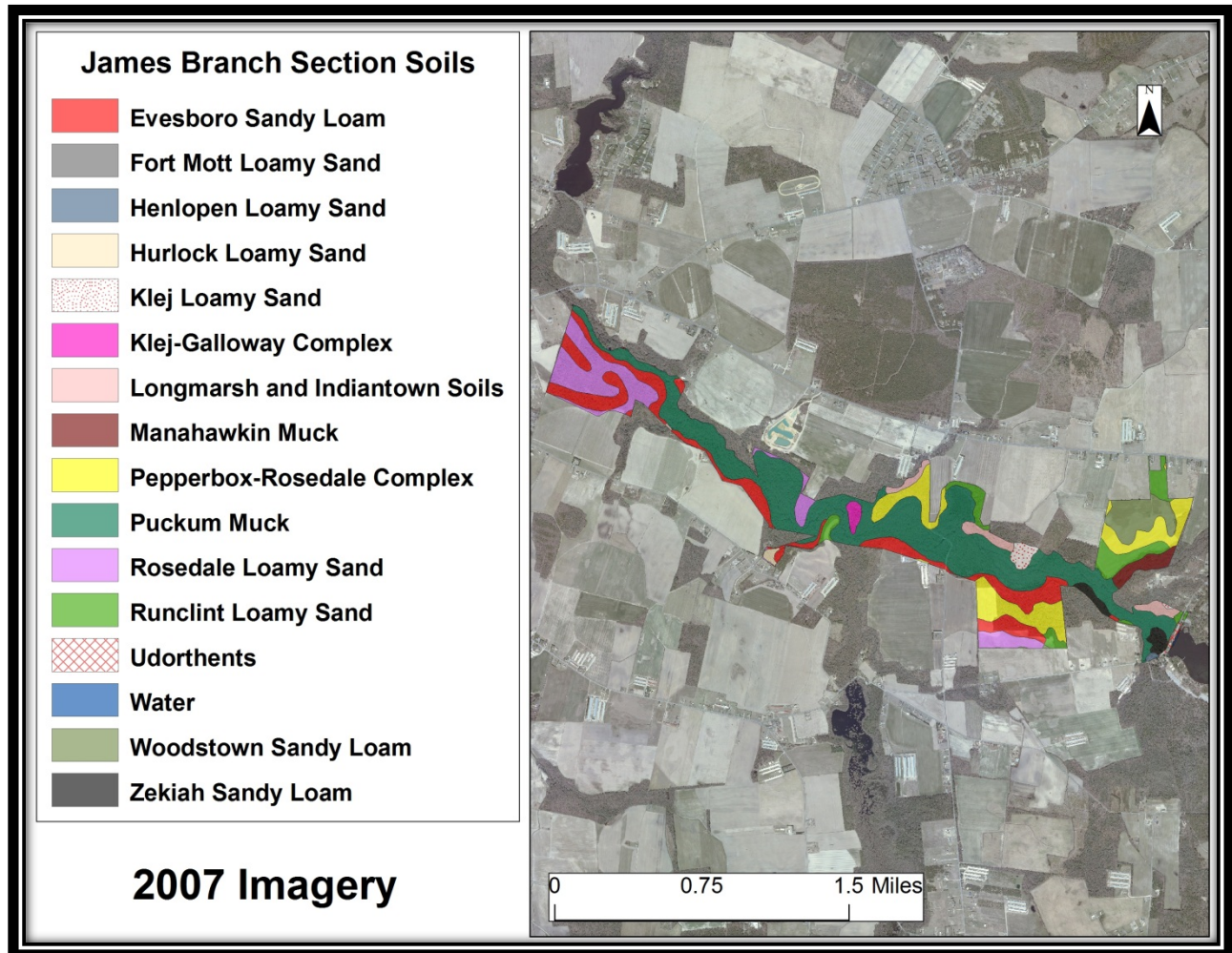


Figure 1.3. James Branch Section Soil Map

## Main Section Soils

Runclint Loamy Sand (305 acres) and Pepperbox-Rosedale Complex (188 acres) are primary soils in the main section. Other minor soils include Pepperbox Loamy Sand (121 acres), and Klej Loamy Sand (109 acres).

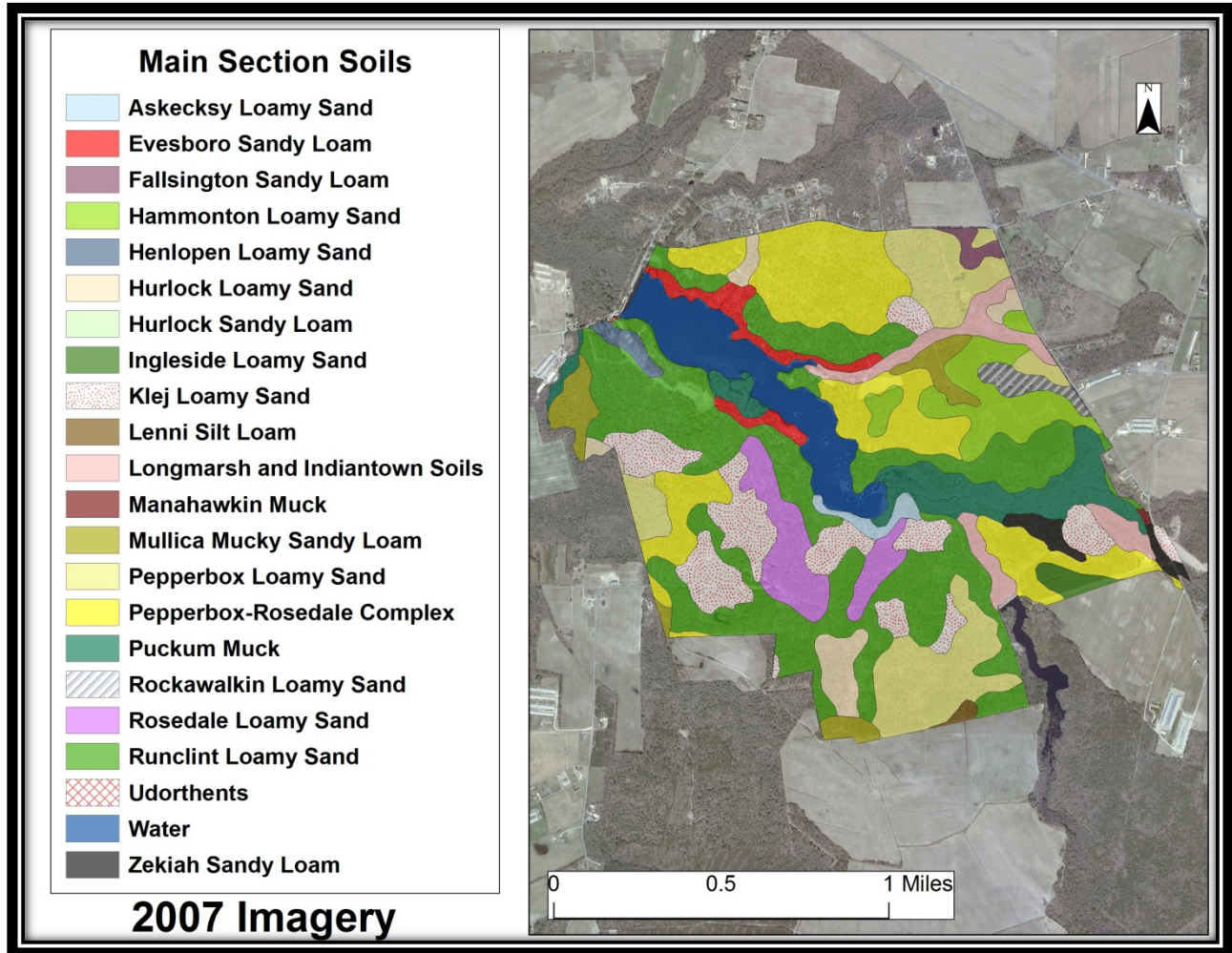
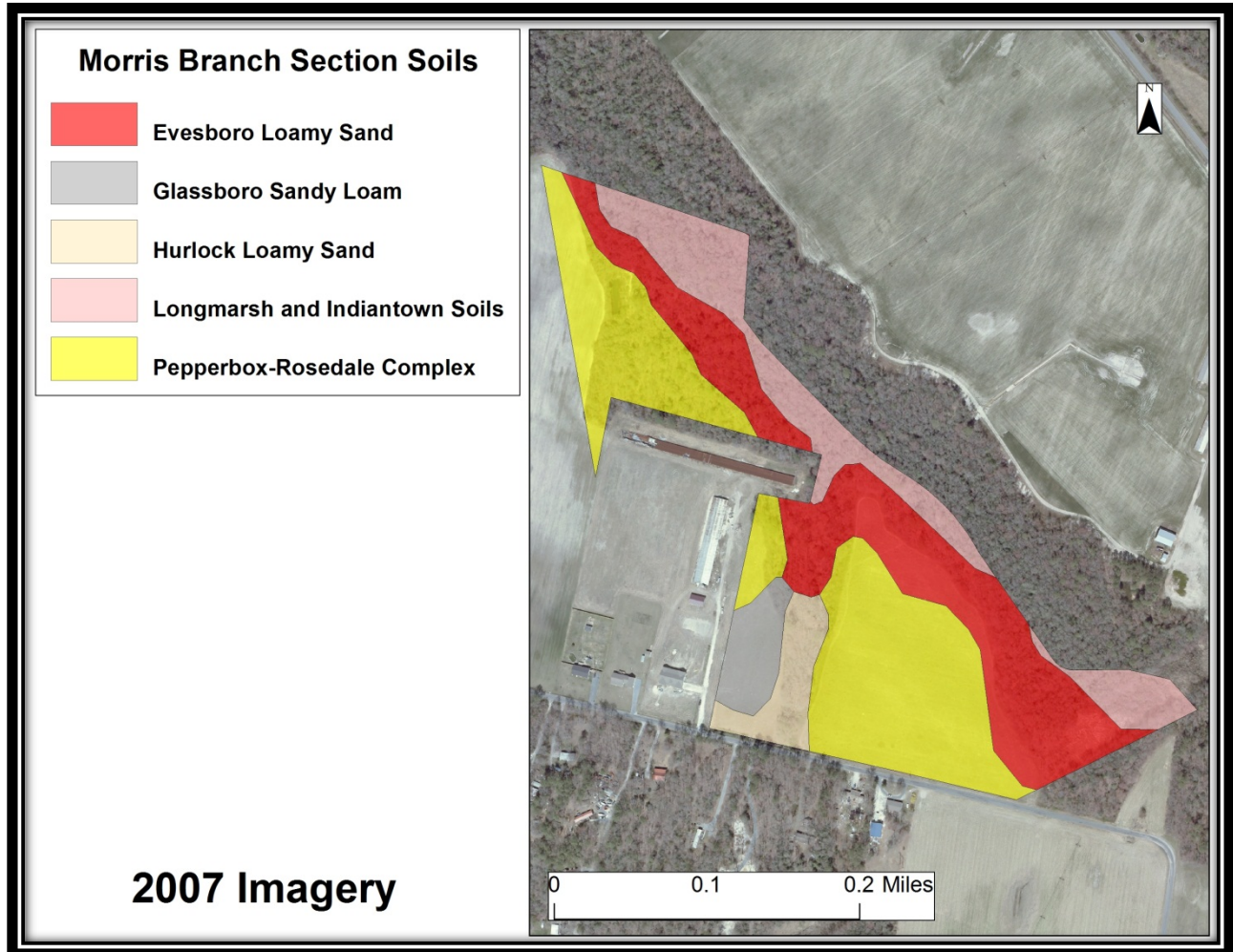


Figure 1.4. Main Section Soil Map



### *Morris Branch Section Soils*

Pepperbox-Rosedale Complex (16 acres) and Evesboro Loamy Sand (12 acres) are the main soils in the Morris Branch Section. Longmarsh and Indiantown Soils (7 acres) is a minor soil and are found in wetlands.



**Figure 1.5.** Morris Branch Section Soil Map

## Raccoon Prong Section Soils

Lenni Sandy Loam (115 acres) and Rockawalkin Loamy Sand (111 acres) are the main soils in the Raccoon Prong Section. Other minor soils include Runclint Loamy Sand (78 acres), Peppberbox-Rosedale Complex (49 acres), and Klej-Galloway Complex (38 acres).

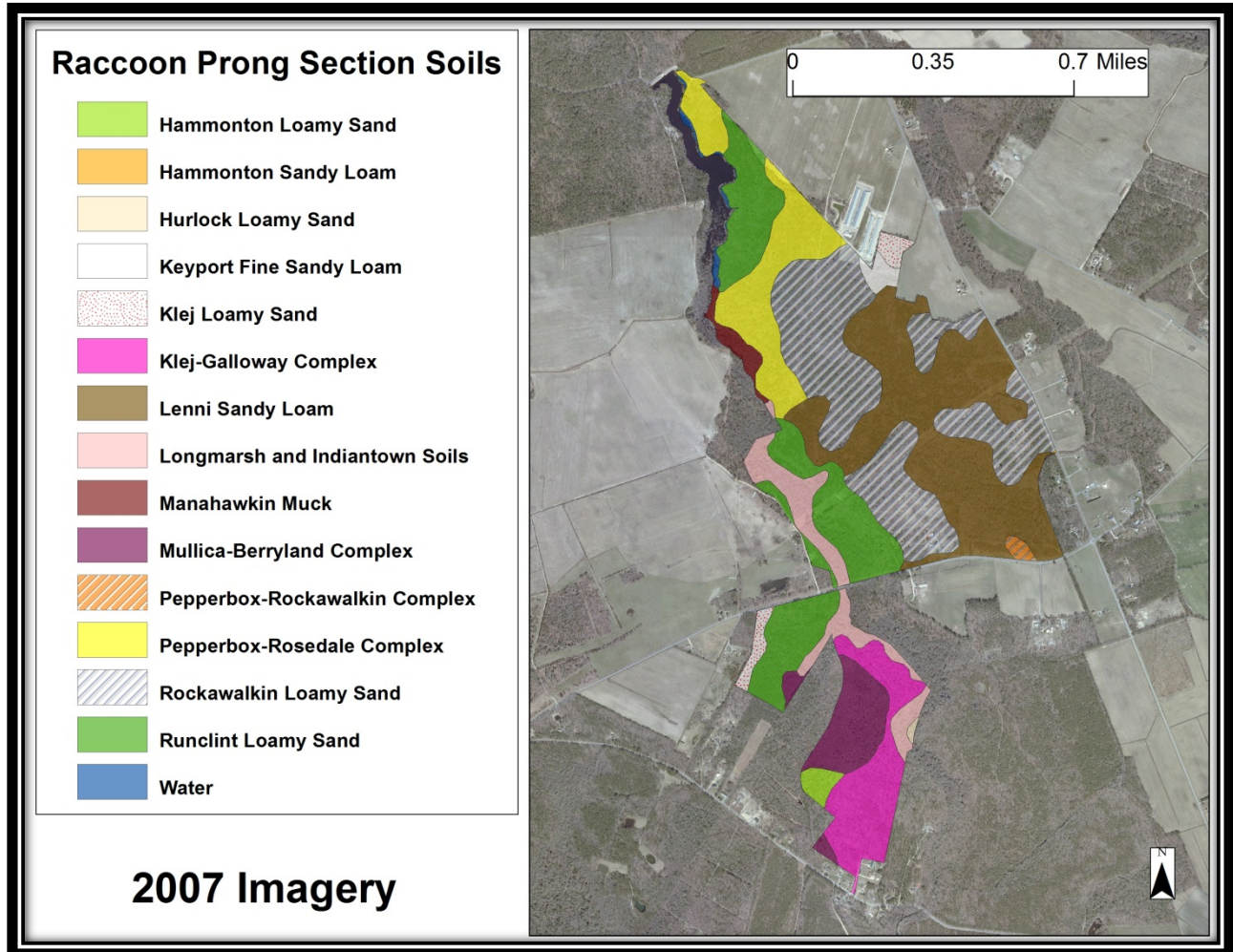
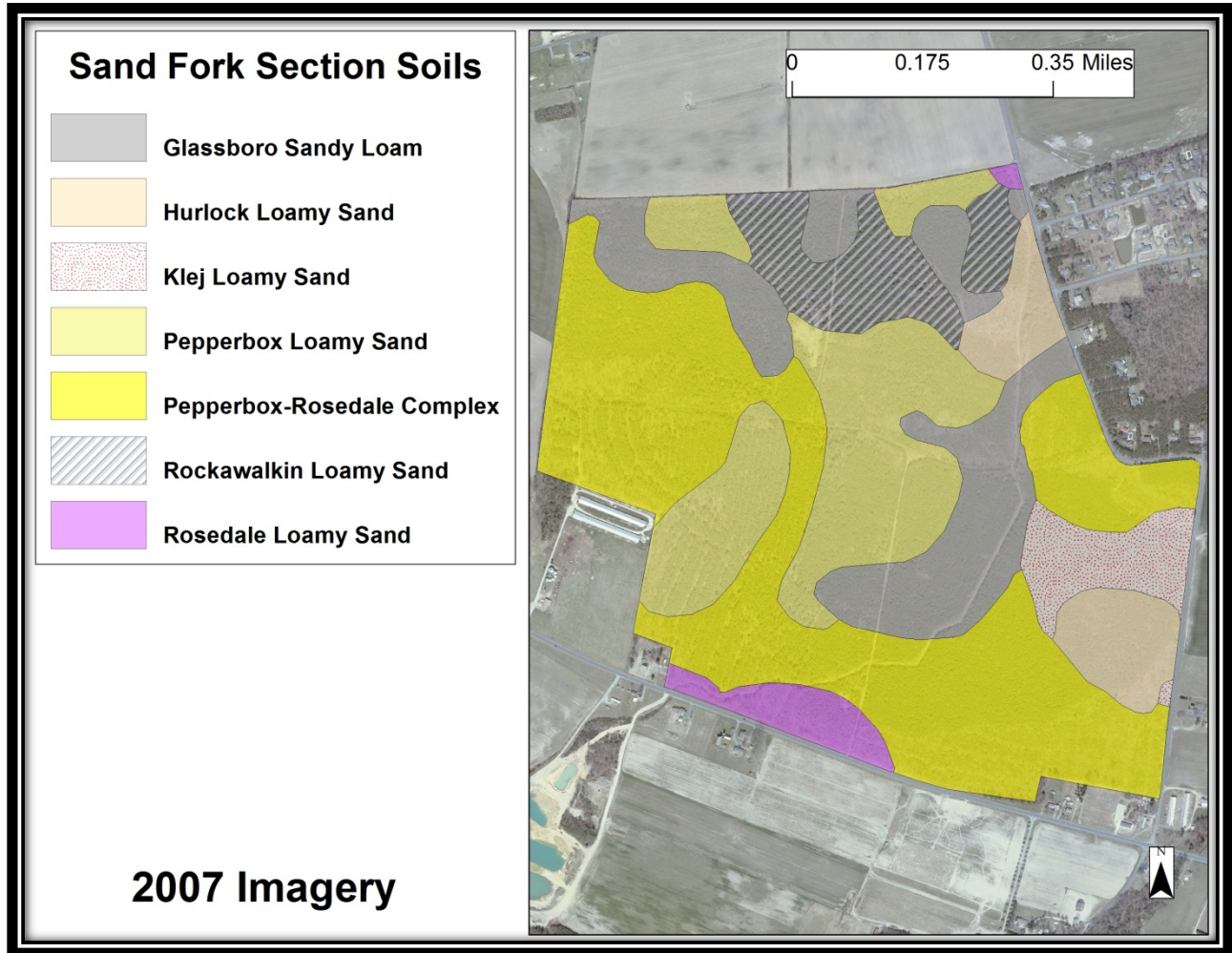


Figure 1.6. Raccoon Prong Section Soil Map

### *Sand Fork Section Soils*

Pepperbox-Rosedale Complex (141 acres) is the main soil in the Sand Fork Section. Other minor soils include Pepperbox Loamy Sand (72 acres) and Glassboro Sandy Loam (57 acres).



**Figure 1.7.** Sand Fork Section Soil Map



## Thompson Branch Section Soils

Klej Loamy Sand (71 acres) is the main soil in the Thompson Branch Section. Other very minor soils include Manahawkin Muck (8 acres) and Runclint Loamy Sand (6 acres).

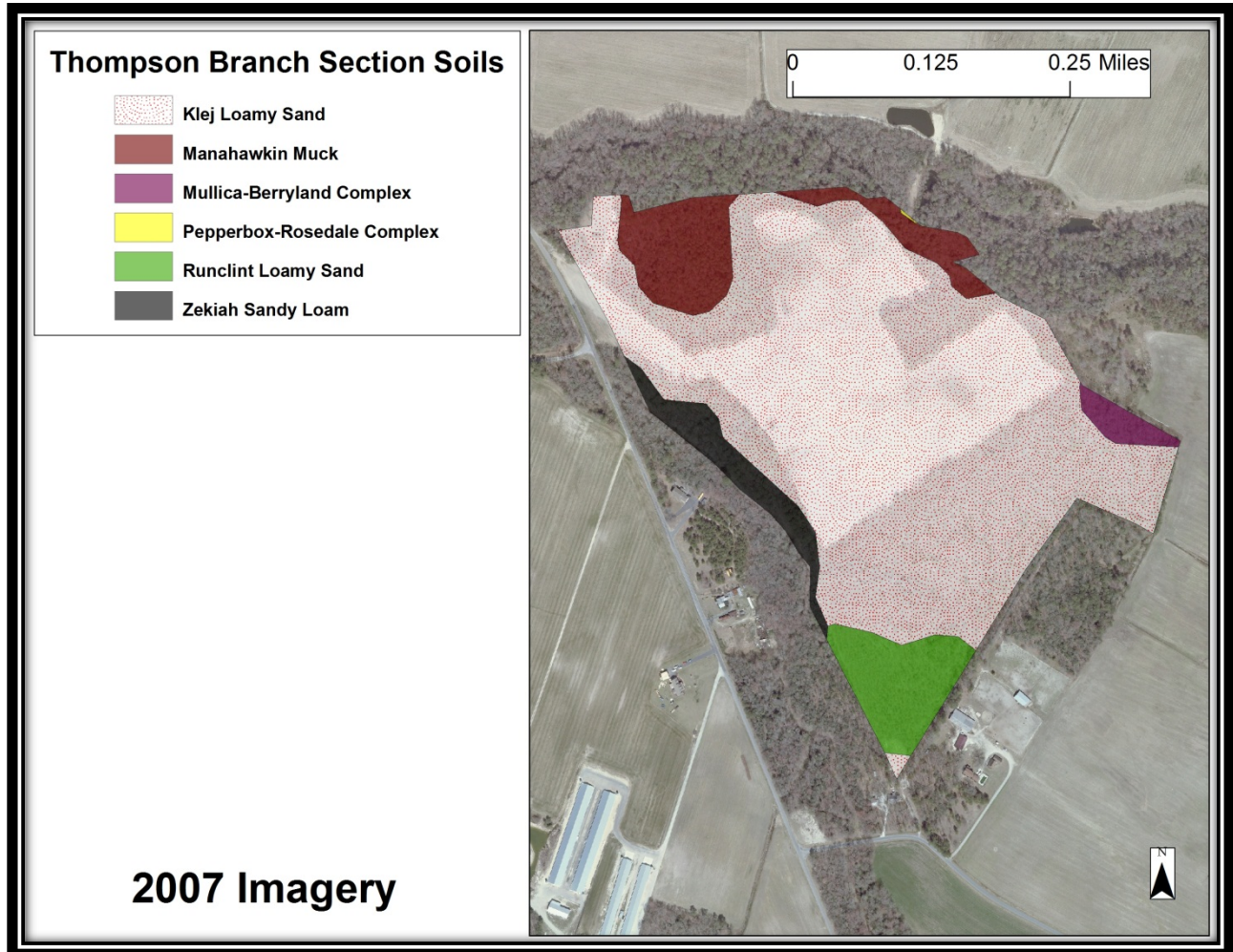


Figure 1.8. Thompson Branch Section Soil Map

## Trussum Pond Section Soils

Pepperbox-Rosedale Complex (173 acres) is the main soil in the Trussum Pond Section. Other minor soils include Evesboro Loamy Sand (80 acres) and Manahawkin Muck (74 acres).

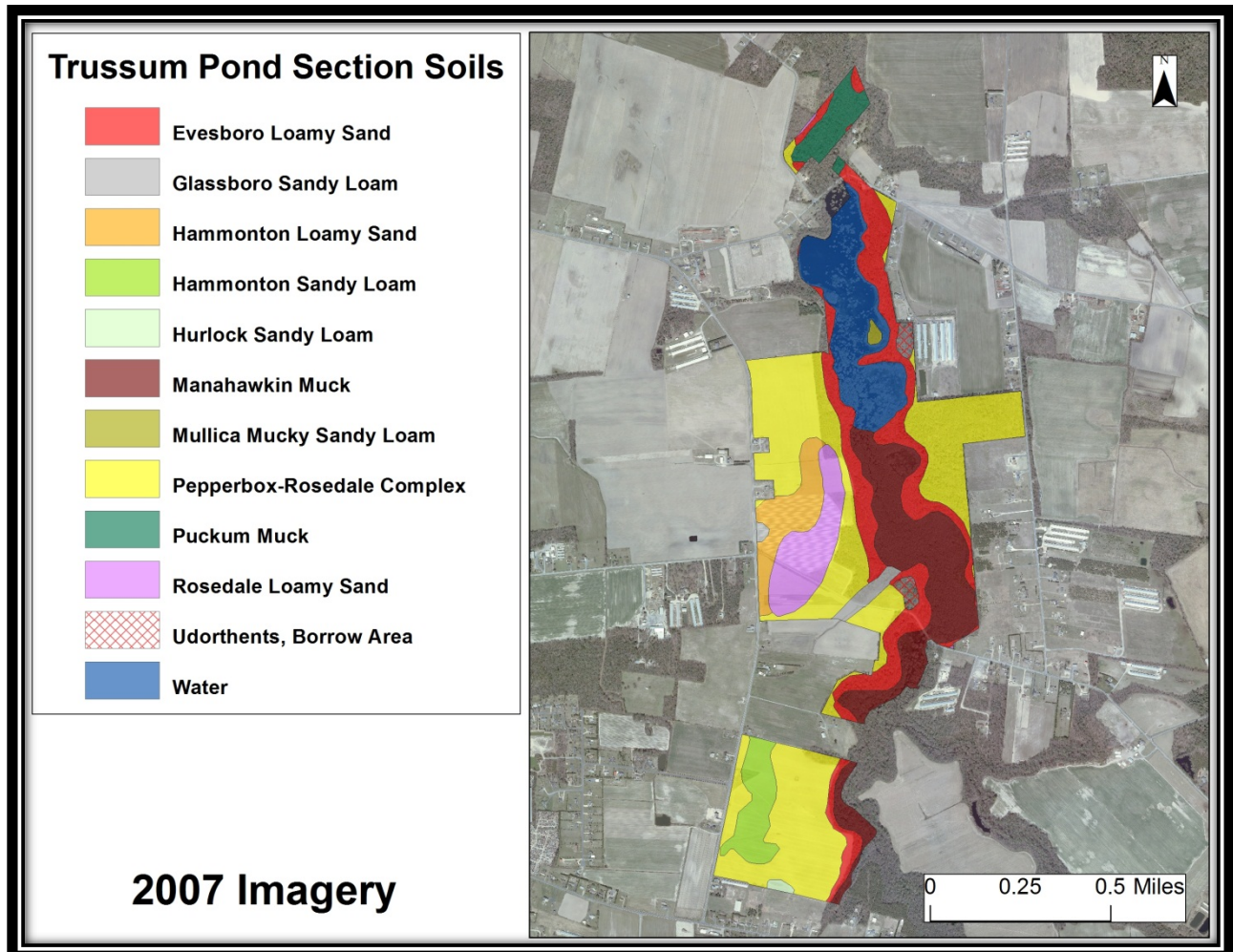


Figure 1.9. Trussum Pond Section Soil Map

## Discussion of vegetation communities in general and why they are important in management

While Natural Communities provide the optimal habitats and structure that are needed for animals to exist, vegetation communities provide an approximation of natural communities. The differences in the vegetation communities are governed by non-biotic factors and biotic factors. Non-biotic factors include things such as geology (soil type, availability of moisture, and exposure), climate, and fire regime. Biotic factors include: number and amount of predators and prey, biodiversity of the community and presence and absence of contributors to ecosystem health such as ants, fungi and bacteria and size of forest blocks. Historically these factors have not changed much other than changes brought about by larger climate shifts. Since the time of modern European settlement of Eastern North America (i.e. from about 1600 A.D.), physical factors such as fire regime and moisture availability have changed and nearly all of the biotic factors have changed resulting in a markedly different landscape today than what the original settlers saw. Today, instead of having Natural Communities, we have Vegetation Communities, which only approximate Natural Communities and are essentially artificial shells of what they could be.

## Purpose of the Study

This study was conducted with the following goals in mind:

1. Classify and map vegetation communities, land covers, and assess habitat conditions for Species of Greatest Conservation Need (SGCN)[ as defined in the Delaware Wildlife Action Plan (DEWAP)] for Trap Pond State Park based on 1961, 2002, and 2007 aerial imagery and field observations.
2. Use the maps above to determine changes in the vegetation communities over time.
3. Determine the forest blocks located within or partially within the state park.
4. Produce Ecological Integrity Assessments (EIAs) for vegetation communities that are ranked S2 or higher.

Surveys were conducted during 2012 by Robert Coxe, an Environmental Scientist with the Delaware Natural Heritage and Endangered Species Program (DNHESP) within the Delaware Division of Fish and Wildlife, Department of Natural Resources and Environmental Control (DNREC).

## Vegetation Community and Land Cover Surveys

Vegetation communities and land covers were determined by qualitative analysis using observations made in the field and aerial photo-interpretation using 1961, 2002, and 2007 imagery. Vegetation communities are named according to the *Guide to Delaware Vegetation Communities*<sup>3</sup> which follows the National Vegetation Classification System (NVCS). The NVCS classifies vegetation on a national scale for the United States and is linked to international vegetation classification. The NVCS helps provide a uniform name and description of vegetation communities found throughout the country and helps determine relative rarity. Descriptions of the vegetation communities are provided in Chapter 5 and of the land covers in Chapter 6. A crosswalk is provided to the Delaware Wildlife Action Plan (DEWAP) and to the Northeast Habitat Classification (NHC) at the top of each individual description.

## Analysis of Historical Imagery

Historical imagery of Trap Pond State Park from 1961, 2002 and current imagery from 2007 were examined. A vegetation community map was produced for each year in order to compare vegetation and land cover change over a 5, 41, and 46 year time frame. Changes in the respective vegetation communities and land covers are discussed in the descriptions while broader changes are discussed in the nature preserve discussion. There is more imagery available (1937, 1954, 1968, 1992, and 1997) but these sets were not used due to geo-registration problems in the image tiles.

## Ecological Integrity Assessment (EIA)

An EIA was conducted for those communities in the state park that are ranked S2 or higher in Delaware. EIAs are an analysis being developed by Natureserve to determine the relative quality of vegetation communities across North America. Using Natural Heritage methodology, communities are ranked according to rarity (Appendix I). The vegetation communities at Trap Pond State Park included in the EIA analysis are listed in Table 2.3 and depicted in Figure 2.1.

## Forest Block Analysis

Current forest blocks within or partially within the state park that are greater than 100 acres were mapped. Each current block is described for current total acres and current forest interior habitat, potential acres, potential forest interior habitat, vegetation communities currently present, and major drainage (Table 2.4 and Figure 2.2). A block is defined as contiguous forest habitat that is contained within 30 feet of non-forested and is the method used by the Maryland's Strategic Forest Lands Assessment.<sup>4</sup> Forest interior is forested area that is 100m from a forest edge. Potential blocks were extended out to areas of noncontiguous habitat (such as roads, power line right-of-ways, and developed areas) that were considered to be immovable. Most of the area that could be reverted to forest is

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<sup>3</sup> Cox, Robert. 2010. Guide to Delaware Vegetation Communities-Summer 2010 Edition. Unpublished report.

<sup>4</sup> Maryland Department of Natural Resources. 2003. Strategic Forest Lands Assessment. Co-op Project between Maryland Department of Natural Resources, Watershed Services, and Maryland Forest Service. 40 p.

currently old field habitat or in agricultural use. These blocks were determined for future planning in regards to improving and increasing forest interior habitat.



## CHAPTER 2: RESULTS OF EIAs, FOREST BLOCK ANALYSIS AND GENERAL OBSERVATIONS

### Summary of Findings from this study

1. **Vegetation Communities:** Twenty-four vegetation communities and nine land covers were found at Trap Pond State Park. Early to Mid-Successional Loblolly Pine Forest (1,010 acres) is the largest vegetation community, followed by the related Loblolly Pine Plantation with 626 acres. Agricultural field (211 acres) is the largest land cover, followed by Powerline R-O-W with 23 acres.
2. **Rare Plants:** Sixteen rare plants are known to exist in Trap Pond State Park (Table 2.1).

Scientific Name	Common Name	Rank	Last Observed
<i>Alnus maritima</i> ssp. <i>maritima</i>	Delmarva Alder	S3	1989
<i>Carex venusta</i>	Dark Green Sedge	S2	1993
<i>Dichantherium oligosanthes</i> var. <i>oligosanthes</i>	Heller's Witch Grass	S1	1991
<i>Drosera rotundifolia</i>	Roundleaf Sundew	S2	1994
<i>Eleocharis equisetoides</i>	Horse-tail Spike-rush	S2	2003
<i>Eriocaulon aquaticum</i>	Seven-angled Pipewort	S2	2003
<i>Juncus militaris</i>	Bayonet Rush	S2	1988
<i>Nymphoides aquatica</i>	Big-floating Heart	S1	1988
<i>Panicum hemitomum</i>	Maidencane	S2	1989
<i>Polygala incarnata</i>	Pink Milkwort	S1	1994
<i>Ranunculus pensylvanicus</i>	Bristly Crowfoot	S1.1	1992
<i>Rhynchospora glomerata</i>	Clustered Beak-rush	S2	1993
<i>Rhynchospora scirpoides</i>	Long-beaked Bald-rush	S2	2003
<i>Schoenoplectus etuberculatus</i>	Canby's Bulrush	S1	2003
<i>Schoenoplectus subterminalis</i>	Water Bulrush	S2	1989
<i>Scleria pauciflora</i>	Few-flowered Nutrush	S1	1994

**Table 2.1.** Rare Plants at Trap Pond State Park

3. **Rare Animals:** Twenty-three rare animals are known to exist in Trap Pond State Park (Table 2.2).

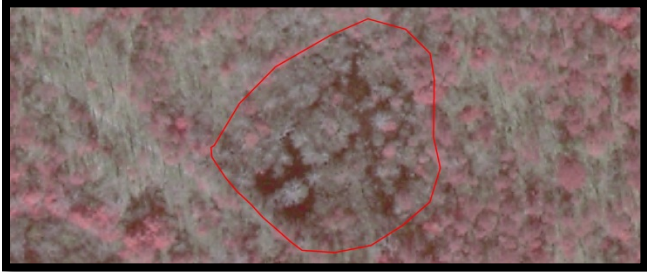
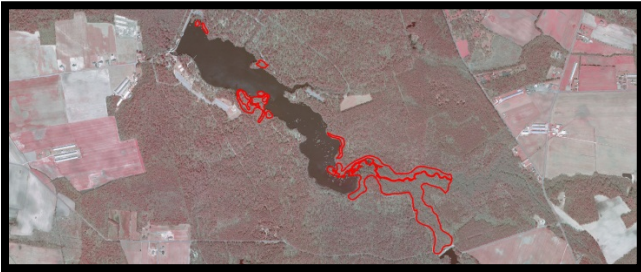

Scientific Name	Common Name	Rank	Last Observed
<i>Acantharchus pomotis</i>	Mud Sunfish	S2	1989
<i>Anodonta implicata</i>	Alewife Floater	S1	1996
<i>Buteo lineatus</i>	Red-Shouldered Hawk	S2B, S3N	1994
<i>Celithemis monomelaena</i>	Black Spotted Skimmer	S2	1979
<i>Cemophora coccinea</i>	Scarlet Snake	SH	1963
<i>Dendroica dominica</i>	Yellow-throated Warbler	S2B	1989
<i>Elliptio fisheriana</i>	Northern Lance	S2	1997
<i>Enallagma dubium</i>	Burgundy Bluet	S1	1991
<i>Enallagma durum</i>	Big Bluet	S2	1979
<i>Enallagma pallidum</i>	Pale Bluet	S1	1979
<i>Enallagma vesperum</i>	Vesper Bluet	S2	1979
<i>Enallagma weewa</i>	Blackwater Bluet	S2	1976
<i>Enneacanthus chaeton</i>	Blackbanded Sunfish	S2	1989
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S2B, S3N	2005
<i>Hyla chrysoscelis</i>	Cope's Gray Treefrog	S2	1990
<i>Lampetra aepyptera</i>	Least Brook Lamprey	S2	1993
<i>Lampropeltis getula</i>	Common Kingsnake	S2S3	1993
<i>Libellula deplanata</i>	Blue Corporal	S2	1981
<i>Scincella lateralis</i>	Ground Skink	S1	1989
<i>Somatochlora provocans</i>	Treetop Emerald	S1	1979
<i>Storeria occipitomaculata</i>	Redbelly Snake	S1	2002
<i>Strix varia</i>	Barred Owl	S2	1994
<i>Tetragoneuria spinosa</i>	Robust Baskettail	S1	1989

**Table 2.2.** Rare Animals at Trap Pond State Park



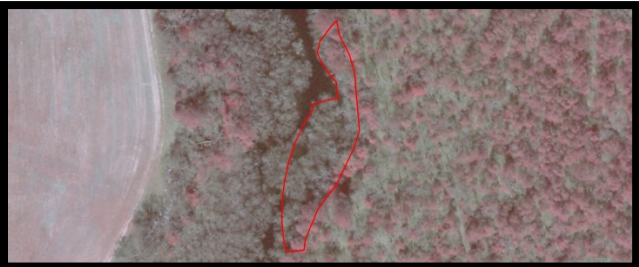
## Ecological Integrity Assessment (EIA)

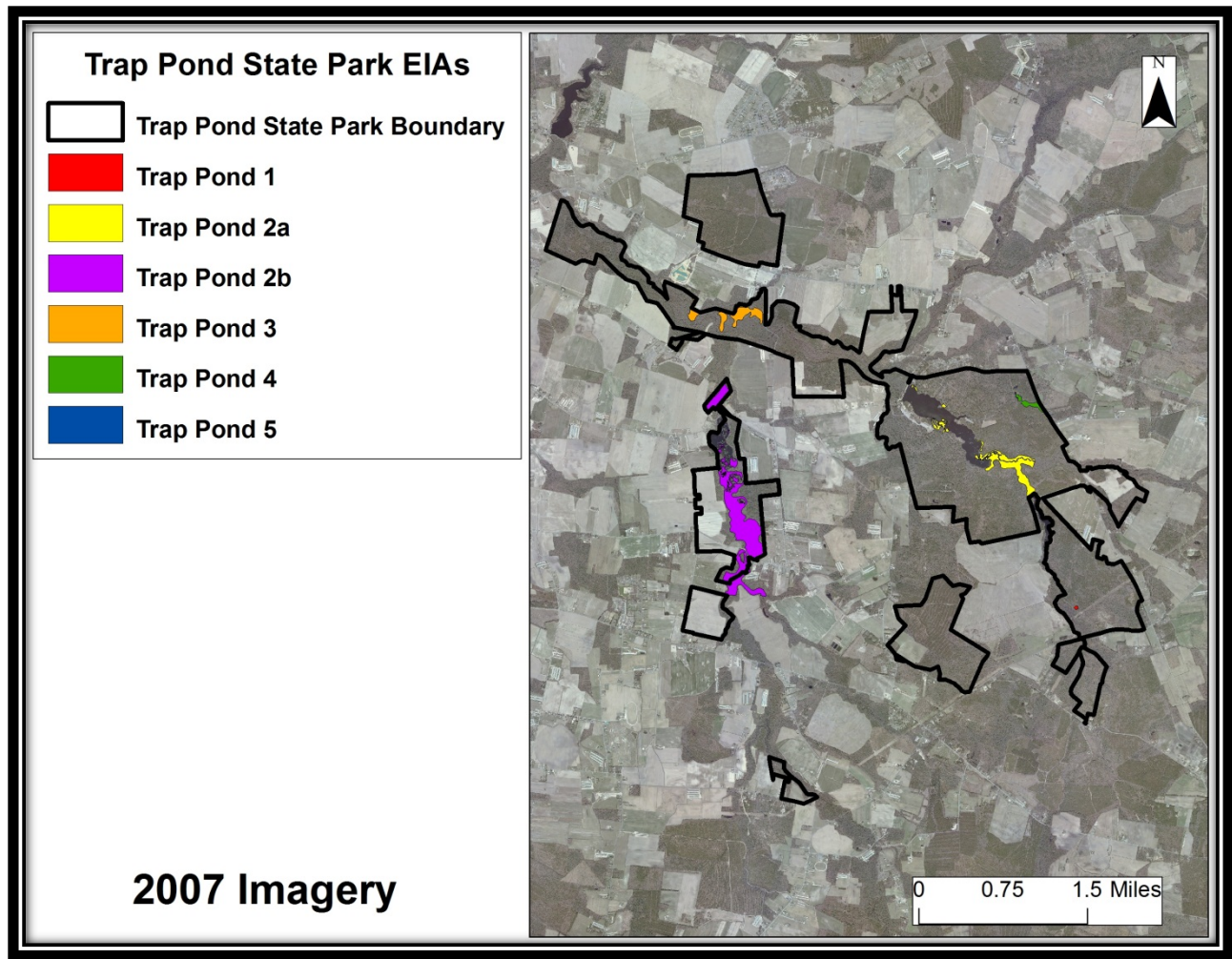
Five vegetation communities, are ranked S2 or higher at Trap Pond State Park. These areas are described in Table 2.3 and mapped in Figure 2.1.

**Table 2.3.** EIA Vegetation Communities located in Trap Pond State Park

Community Map	Community Name/EIA Score	Description
	<p><b>Trap Pond 1</b></p> <p><b>Blueberry Wetland Thicket (0.5 acres)</b></p> <p><b>EIA = 4.04 (B rank)</b></p>	<p>This shrubland is located in the Raccoon Prong Section.</p>
	<p><b>Trap Pond 2a</b></p> <p><b>Chesapeake Bay Cypress-Gum Swamp (41.7 acres)</b></p> <p><b>EIA = 4.30 (B rank)</b></p>	<p>This forest community is located on the edges and upper end of Trap Pond.</p>
	<p><b>Trap Pond 2b</b></p> <p><b>Chesapeake Bay Cypress-Gum Swamp (240 acres)</b></p> <p><b>EIA = 3.34 (C rank)</b></p>	<p>This forest community is located around Trussum Pond.</p>



Community Map	Community Name/EIA Score	Description
	<p><b>Trap Pond 3</b></p> <p><b>Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest (30.2 acres)</b></p> <p><b>EIA = 3.83 (C rank)</b></p>	<p>This forest community is located in the James Branch Section.</p>
	<p><b>Trap Pond 4</b></p> <p><b>Red Maple-Sweetgum Swamp (6.4 acres)</b></p> <p><b>EIA = 3.46 (C rank)</b></p>	<p>This forest community is located in the Main Section, west of Trap Pond.</p>
	<p><b>Trap Pond 5</b></p> <p><b>Smooth Alder Swamp (0.4 acres)</b></p> <p><b>EIA = 3.36 (C rank)</b></p>	<p>This shrub community is located at the upper end of Trussum Pond.</p>



**Figure 2.1.** Trap Pond State Park EIAs

## Forest Block Analysis

### *Importance of Forest Blocks*

Forest blocks are important for a number of animals such as bobcat and neo-tropical migratory birds which nest in forest interiors (those places that are 100 meters from the edge of a forest). Many Neotropical migratory birds are considered to be breeders in forest interior areas. Due to development, road building, which causes fragmentation, agricultural fields and other non-forest land uses, habitats for these birds are increasingly being eliminated leading to reductions in populations. Predators are better able to get the birds in small woodlands and edge habitats. In Ontario it was found that 80% of the neo-tropical bird nests in small woodlands (<100 ha) were lost to predators<sup>5</sup>. Nests in interior forests are less susceptible to predation and are not taken over by cowbirds, which is another hazard on

<sup>5</sup> Ontario Landowner Resource Centre. 2000. Conserving the Forest Interior: A threatened wildlife habitat. Ontario Ministry of Natural Resources.

edge habitats. Examples of birds that may be affected by a lack of large forest tracts include Barred Owl, Black and White Warbler, Worm-Eating Warbler, Acadian Flycatcher, Ovenbird, Kentucky Warbler, Red-Shouldered Hawk and many others.

Management of state parks has traditionally favored recreational uses, which require cultivated lawns and edges running counter to the habitat needed for forest interior birds. Protecting forest interior bird fauna runs contrary to the idea that artificially created edges creates more diversity. While this technique creates more diversity of some aggressive species it diminishes the populations of other species.


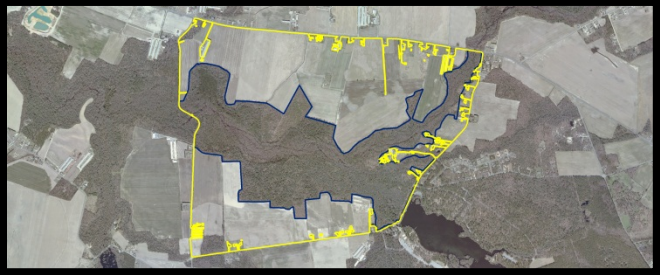
In protecting forest blocks, those blocks which are circular contain the most interior area per unit area. The next best shape is a square and linear configurations produce the least forest interior due to shape.

A study by Robbins et al. (1989) showed that most forest interior species require a forest of at least 150 ha (370 acres) in size. Very few forest tracts in Delaware are at least this size, one of the more notable being the Great Cypress Swamp and some of the ones located in Trap Pond State Park.

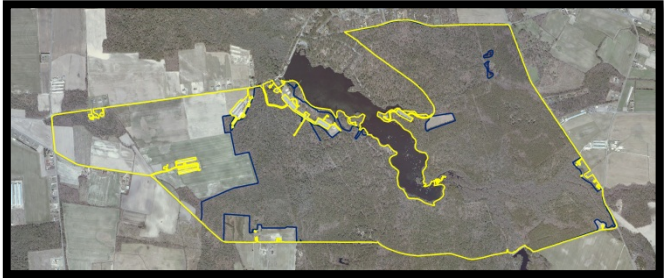


### **Analysis of Forest Blocks at Trap Pond State Park**



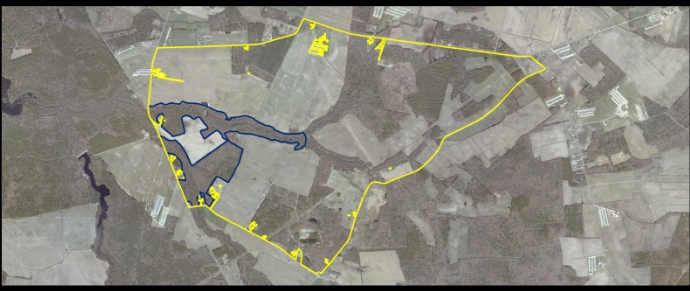
Thirteen forest blocks are present that are more than 100 acres in size and are located in whole or part in the state park (Table 2.4 and Figure 2.2). All forest blocks are bounded by a road, agricultural field, or other non-forested habitat. These areas are considered to be barriers to the passage of forest dwelling wildlife. A description is provided for each forest block.

**Table 2.4.** Forest Blocks located in whole or part in Trap Pond State Park

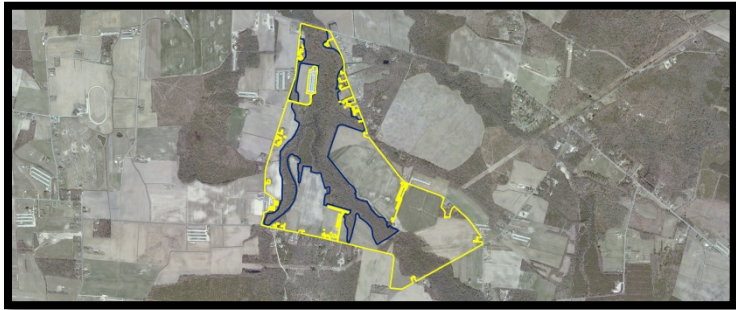
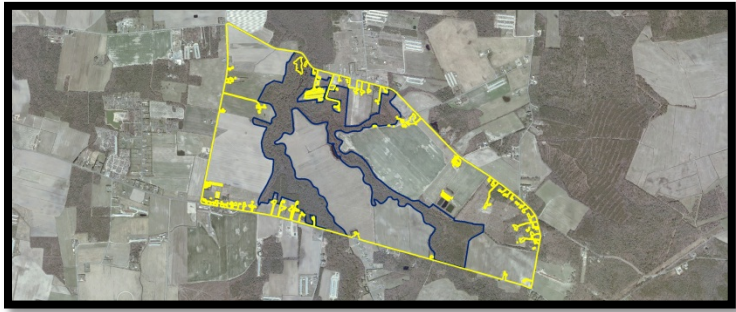
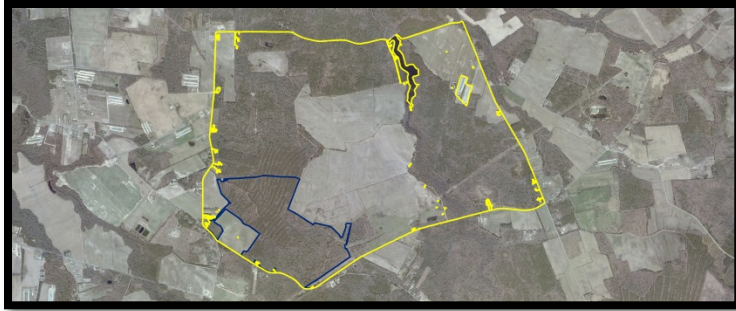
Forest Block Map	Block Name/Acreage	Description
	<p><b>Trap Pond A</b></p> <p><b>Current Block = 611 acres (241 acres interior)</b></p> <p><b>Potential Block = 1,492 acres (904 acres interior)</b></p>	<p>Trap Pond A encompasses the wooded area downstream of Hitch Pond Road along James Branch. It is bounded by Laurel Road (DE 24) on the north, Hitch Pond Road on the east, agricultural field on the south, and cultivated lawn on the west. Ten vegetation communities are located within this block and include Chesapeake/Piedmont Red Maple/Lizard’s Tail Swamp, Early to Mid-Successional Loblolly Pine Forest, Loblolly Pine Plantation, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Mid-Atlantic Mesic Mixed Hardwood Forest, Northeastern Coastal Plain/Piedmont Basic Mesic Hardwood Forest, Northeastern Modified Successional Forest, Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest, Southern Red Maple-Blackgum Forest, and Southern Red Oak/Heath Forest. Hitch Pond Branch, a tributary to James Branch, drains this block. Currently this block contains 241 acres of interior habitat. Potentially this block could be 1,492 acres in size, and contain 904 acres of interior habitat.</p>
	<p><b>Trap Pond B</b></p> <p><b>Current Block = 398 acres (167 acres interior)</b></p> <p><b>Potential Block = 998 acres (657 acres interior)</b></p>	<p>Trap Pond B encompasses all of the wooded area upstream of Hitch Pond Road to the dam at Trap Pond. It is bounded by agricultural field on the north, Road 449 on the east, agricultural field on the south, and Hitch Pond Road on the west. Five vegetation communities are located within this block and include Coastal Plain Atlantic White Cedar-Red Maple Forest, Early to Mid-Successional Loblolly Pine Forest, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Southern Red Maple-Blackgum Swamp, and Southern Red Oak/Heath Forest. Hitch Pond Branch, a tributary to James Branch, drains this block. Currently this block contains 167 acres of interior habitat. Potentially this block could be 998 acres in size and contain 657 acres of interior habitat.</p>


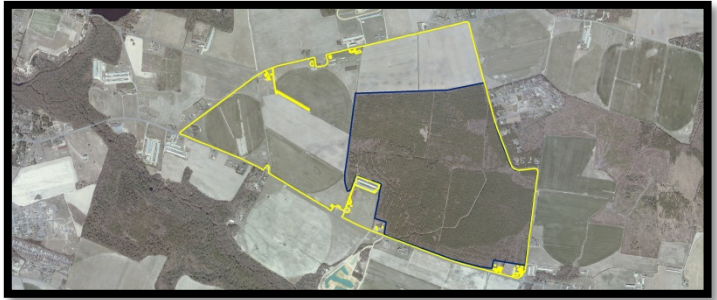


Forest Block Map	Block Name/Acreage	Description
	<p><b>Trap Pond C</b></p> <p><b>Current Block = 848 acres (493 acres interior)</b></p> <p><b>Potential Block = 1,132 acres (710 acres interior)</b></p>	<p>Trap Pond C encompasses all of the wooded area around Trap Pond. It is bounded by Goose Nest Road on the north, Road 422A on the east, Road 72 on the south, and agricultural field on the west. Seven vegetation communities are located within this block and include Early to Mid-Successional Loblolly Pine Forest, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Mid-Atlantic Mesic Mixed Hardwood Forest, Non-tidal Bald Cypress-Gum Swamp, Red Maple-Sweetgum Swamp, and Southern Red Maple-Blackgum Swamp. Hitch Pond Branch, a tributary to James Branch, drains this block. Currently this block contains 493 acres of interior habitat. Potentially this block could be 1,132 acres in size and contain 710 acres of interior habitat.</p>
	<p><b>Trap Pond D</b></p> <p><b>Current Block = 469 acres (251 acres interior)</b></p> <p><b>Potential Block = 1,937 acres (1,483 acres interior)</b></p>	<p>Trap Pond D encompasses part of the wooded area south of Road 72 on the northwest side. It is bounded by Road 72 on the north, agricultural field, Lagowski Lane and agricultural field on the east, an unnamed road on the south, and Road 458 on the west. Five vegetation communities are located within this block and include Early to Mid-Successional Loblolly Pine Forest, Loblolly Pine Plantation, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Northeastern Modified Successional Forest, and Southern Red Oak/Heath Forest. An unnamed tributary of Hitch Pond Branch drains this block. Currently this block contains 251 acres of interior habitat. Potentially this block could be 1,937 acres in size and contain 1,483 acres of interior habitat. Trap Pond D shares a potential block with Trap Pond E, F, and K.</p>
	<p><b>Trap Pond E</b></p> <p><b>Current Block = 253 acres (128 acres interior)</b></p> <p><b>Potential Block = 1,937 acres (1,483 acres)</b></p>	<p>Trap Pond E encompasses part of the wooded area south of Road 72 just east and south of Raccoon Pond. It is bounded by Road 72 on the north, agricultural field on the east, powerline R-O-W on the south, and agricultural field on the west. Six vegetation communities are located within this block and include Blueberry Wetland Thicket, Early to Mid-Successional Loblolly Pine Forest, Mid-Atlantic Mesic Mixed Hardwood Forest, Southern Red Oak/Heath Forest, Successional Sweetgum Forest. Raccoon Prong, a tributary to Hitch Pond Branch, drains this block. Currently this block contains 128 acres of interior habitat. Potentially it could be 1,937 acres in size and contain 1,483 acres of interior habitat. Trap Pond E shares a potential block with Trap Pond D, F, and K.</p>

Forest Block Map	Block Name/Acreage	Description
	<p><b>Trap Pond F</b></p> <p><b>Current Block = 117 acres (44 acres interior)</b></p> <p><b>Potential Block = 1,937 acres (1,483 acres)</b></p>	<p>Trap Pond F encompasses a wooded area wedged between a powerline R-O-W and Road 66. It is bounded by powerline R-O-W on the north, Whaley’s Road on the east, Road 66 on the south, and agricultural field on the west. Five vegetation communities are located within this block and include Chesapeake Bay Non-riverine Wet Hardwood Forest, Early to Mid-Successional Loblolly Pine Forest, Southern Red Maple-Blackgum Swamp, Successional Sweetgum Forest, and Successional Tuliptree Forest. Raccoon Prong, a tributary to Hitch Pond Branch, drains this block. Currently this block contains 44 acres of interior habitat. Potentially it could be 1,937 acres in size and contain 1,483 acres of interior habitat. Trap Pond F shares a potential block with Trap Pond D, E, and K.</p>
	<p><b>Trap Pond G</b></p> <p><b>Current Block = 447 acres (284 acres interior)</b></p> <p><b>Potential Block = 716 acres (423 acres)</b></p>	<p>Trap Pond G encompasses a wooded area wedged between a powerline R-O-W and Road 66. It is bounded by powerline R-O-W on the north, Whaley’s Road on the east, Road 66 on the south, and agricultural field on the west. Five vegetation communities are located within this block and include Chesapeake Bay Non-riverine Wet Hardwood Forest, Early to Mid-Successional Loblolly Pine Forest, Loblolly Pine Plantation, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Southern Red Oak/Heath Forest, and Southern Red Maple-Blackgum Swamp. Raccoon Prong, a tributary to Hitch Pond Branch, drains this block. Currently this block contains 284 acres of interior habitat. Potentially it could be 716 acres in size and contain 423 acres of interior habitat.</p>
	<p><b>Trap Pond H</b></p> <p><b>Current Block = 132 acres (8 acres interior)</b></p> <p><b>Potential Block = 1,407 acres (1,046 acres)</b></p>	<p>Trap Pond H encompasses a wooded area to the east of Whaleys Road along to forks of Hitch Pond Branch. It is bounded by agricultural field on the north, east, and south and Whaleys Road on the west. Five vegetation communities are located within this block and include Early to Mid-Successional Loblolly Pine Forest, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Southern Red Maple-Blackgum Swamp, Southern Red Oak/Heath Forest, Successional Tuliptree Forest. Hitch Pond Branch drains this block. Currently this block contains 8 acres of interior habitat. Potentially it could be 1,407 acres in size and contain 1,046 acres of interior habitat.</p>



Forest Block Map	Block Name/Acreage	Description
	<p><b>Trap Pond I</b></p> <p><b>Current Block = 158 acres (16 acres interior)</b></p> <p><b>Potential Block = 474 acres (221 acres)</b></p>	<p>Trap Pond I encompasses a wooded area north of Oak Branch Road in the Morris Branch Section. It is bounded by agricultural field on the north and east, Oak Branch Road on the south, and agricultural field on the west. Two vegetation communities are located within this block and include Northeastern Modified Successional Forest and Southern Red Maple-Blackgum Swamp. An unnamed fork to James Branch drains this block. Currently this block contains 16 acres of interior habitat. Potentially it could be 474 acres in size and contain 221 acres of interior habitat.</p>
	<p><b>Trap Pond J</b></p> <p><b>Current Block = 158 acres (10 acres interior)</b></p> <p><b>Potential Block = 921 acres (533 acres)</b></p>	<p>Trap Pond J encompasses a wooded upstream of Trussum Pond at the headwaters of James Branch. It is bounded by Arvey Road on the north, and agricultural field on the east, south and west. Four vegetation communities are located within this block and include Early to Mid-Successional Loblolly Pine Forest, Mid to Late Successional Loblolly Pine-Sweetgum Forest, Mid-Atlantic Mesic Mixed Hardwood Forest, and Southern Red Maple-Blackgum Swamp. James Branch drains this block. Currently this block contains 128 acres of interior habitat. Potentially it could be 921 acres in size and contain 533 acres of interior habitat.</p>
	<p><b>Trap Pond K</b></p> <p><b>Current Block = 251 acres (131 acres interior)</b></p> <p><b>Potential Block = 1,937 acres (1,483 acres)</b></p>	<p>Trap Pond K encompasses a wooded area north of Arvey Road. It is bounded by an unnamed road on the north, agricultural field on the east, Arvey Road on the south, and Road 458 on the west. Three vegetation communities are located within this block and include Chesapeake Bay Non-riverine Wet Hardwood Forest, Loblolly Pine Plantation, and Mid to Late Successional Loblolly Pine-Sweetgum Forest. An unnamed tributary to Hitch Pond Branch drains this block. Currently this block contains 131 acres of interior habitat. Potentially it could be 1,937 acres in size and contain 1,483 acres of interior habitat. Trap Pond K shares a potential block with Trap Pond D, E, and F.</p>

Forest Block Map	Block Name/Acreage	Description
	<p><b>Trap Pond L</b></p> <p><b>Current Block = 194 acres (41 acres interior)</b></p> <p><b>Potential Block = 484 acres (169 acres)</b></p>	<p>Trap Pond L encompasses the wooded area around and upstream of Trussum Pond. It is bounded by Road 72 on the north, agricultural field on the east, Arvey Road on the south, and agricultural field on the west. Four vegetation communities are located within this block and include Coastal Plain Atlantic White Cedar-Red Maple Swamp, Early to Mid-Successional Loblolly Pine Forest, Mid to Late Successional Loblolly Pine-Sweetgum Forest, and Non-tidal Bald Cypress-Gum Swamp. James Branch drains this block. Currently this block contains 41 acres of interior habitat. Potentially it could be 484 acres in size and contain 169 acres of interior habitat.</p>
	<p><b>Trap Pond M</b></p> <p><b>Current Block = 345 acres (230 acres interior)</b></p> <p><b>Potential Block = 679 acres (457 acres)</b></p>	<p>Trap Pond M encompasses the wooded area around the Sand Fork Section north of Laurel Road (DE 24). It is bounded by agricultural field on the north, Jestice Farm Road on the east, Laurel Road (DE 24) on the south, and agricultural field on the west. Three vegetation communities are located within this block and include Early to Mid-Successional Loblolly Pine Forest, Loblolly Pine Plantation, and Successional Sweetgum Forest. An unnamed tributary to Hitch Pond Branch drains this block. Currently this block contains 230 acres of interior habitat. Potentially it could be 679 acres in size and contain 457 acres of interior habitat.</p>



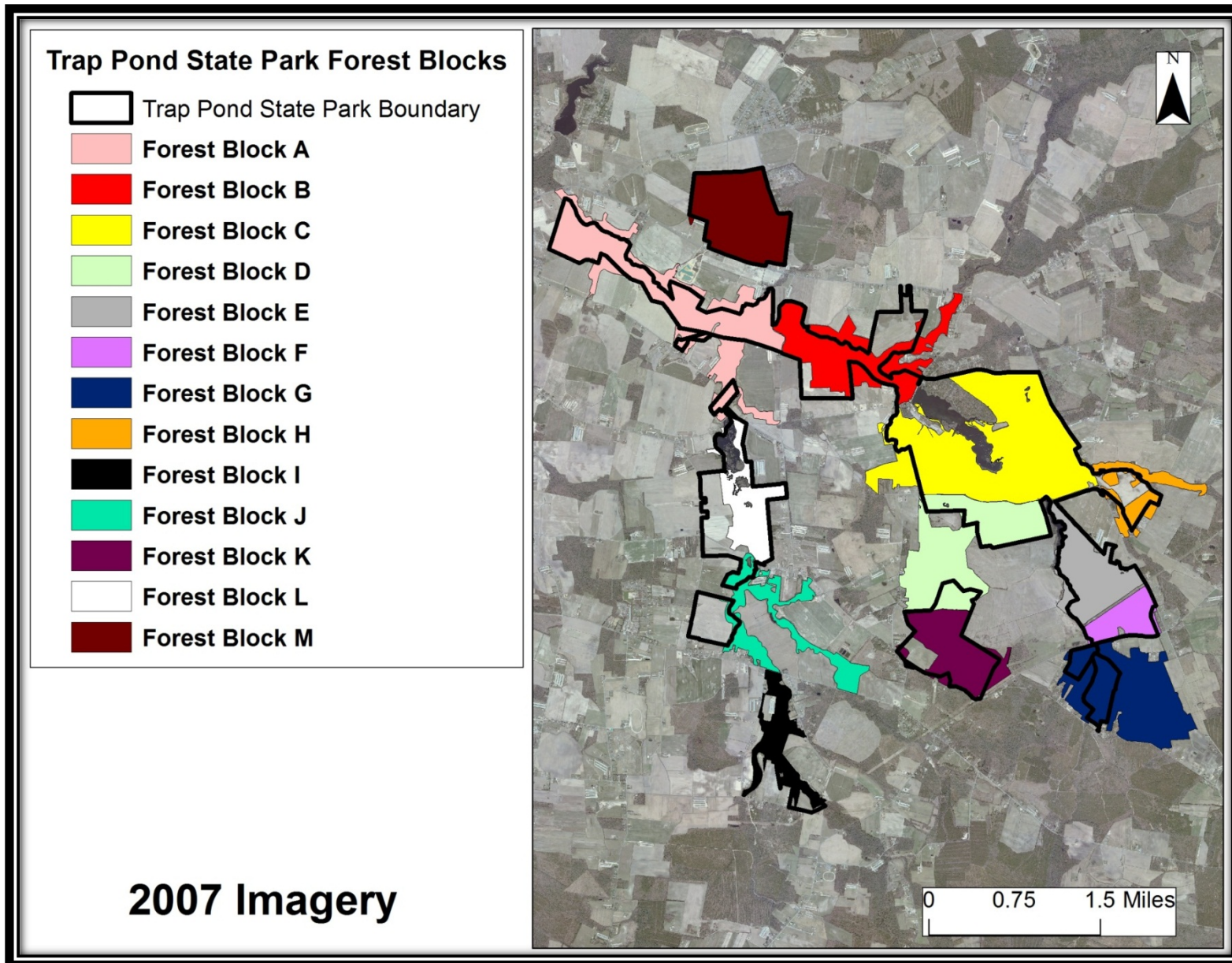
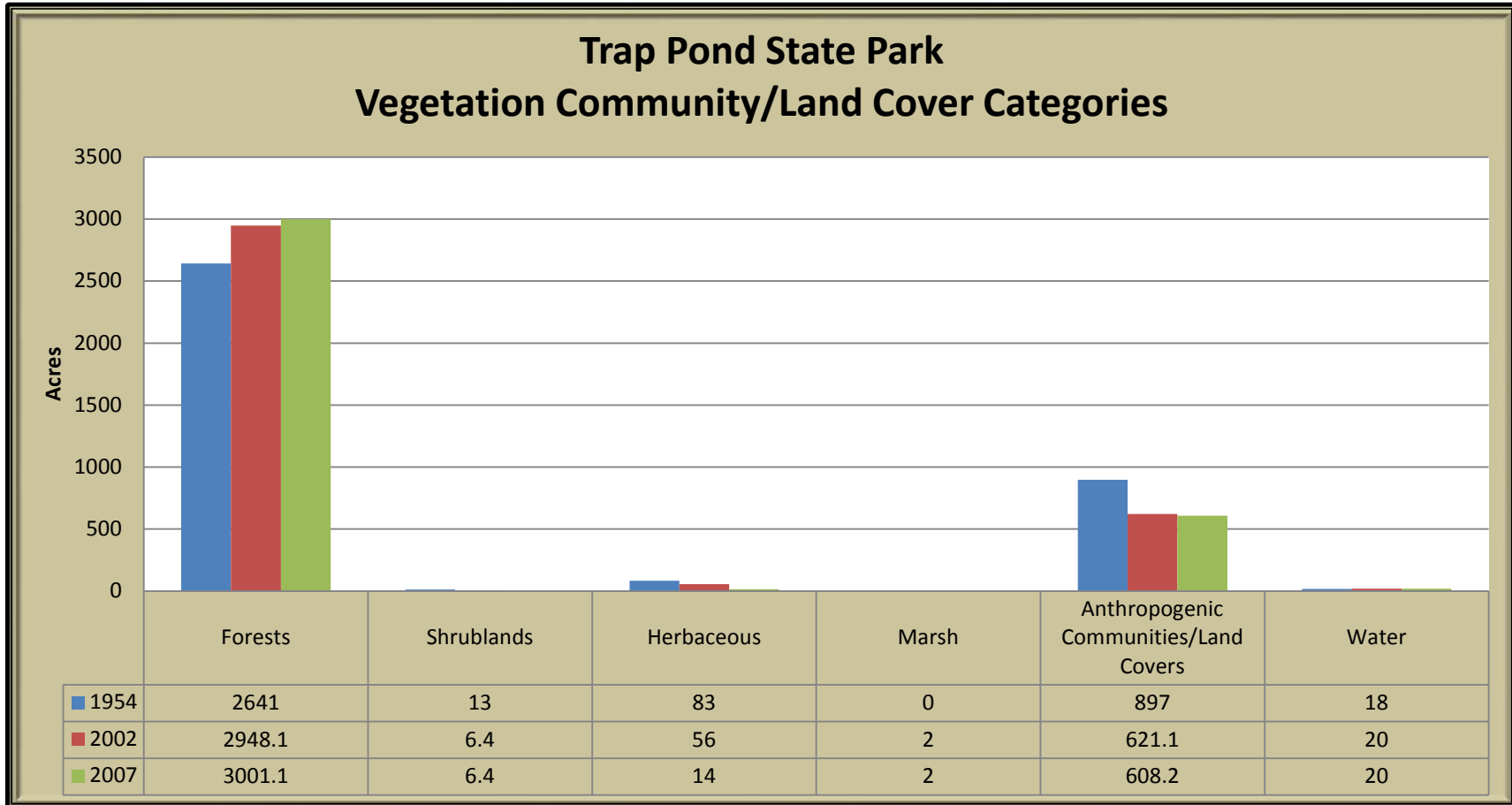


Figure 2.2. Trap Pond State Park Forest Blocks

CHAPTER 3: BROAD TRENDS AT TRAP POND STATE PARK



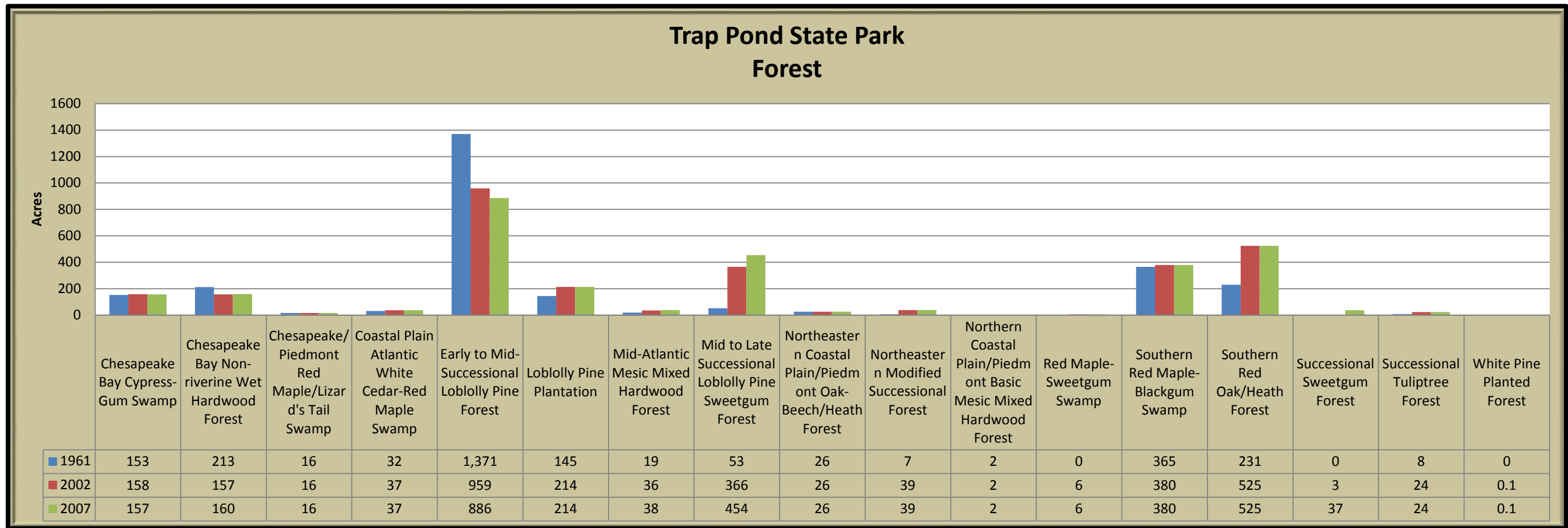
**Figure 3.1.** Trap Pond State Park Vegetation Categories/Land Covers (1961, 2002, and 2007)

**Trap Pond State Park Broad Trends (Figure 3.1):** Forest is the main vegetation community category in Trap Pond State Park. Anthropogenic Communities/land covers follow a distant second.

*Natural Capital* (Table 3.1)

Natural capital has decreased overall for Trap Pond State Park owing to development in the park and losses in wetland communities. A recent increase, however, was noted and appears to be based on maturation of the some of the field acreage.

<b>Table 3.1 Natural Capital of Trap Pond State Park</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$10,908,062/year
2002	\$10,522,448/year
2007	\$10,604,275/year



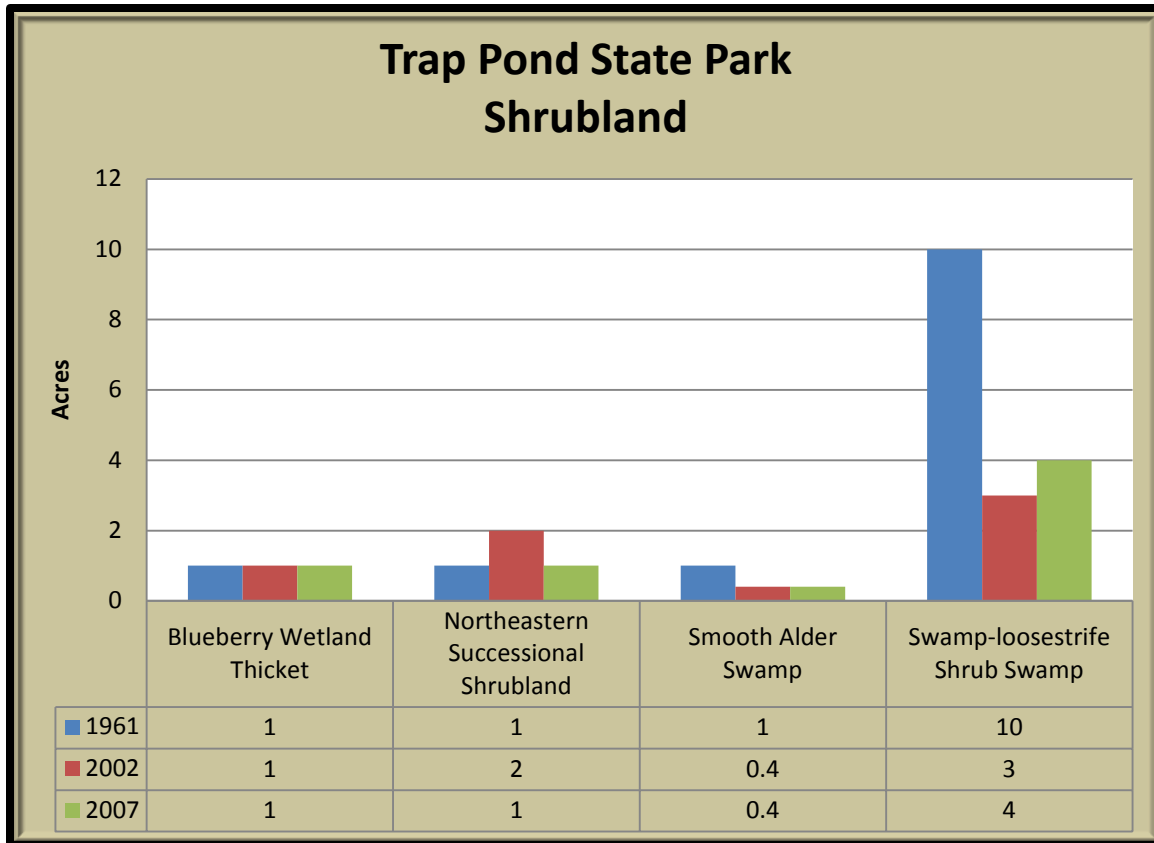
**Figure 3.2.** Forest at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Forest (Figure 3.2):** Early to Mid-Successional Loblolly Pine Forest is the largest forest community in the park, followed by Southern Red Oak/Heath Forest.

*Natural Capital* (Table 3.2)

Capital of forest has decreased overall since 1961, but has increased in the recent period (2002-2007).

<b>Table 3.2. Natural Capital of Trap Pond State Park Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$9,915,307/year
2002	\$9,583,796/year
2007	\$9,667,378/year



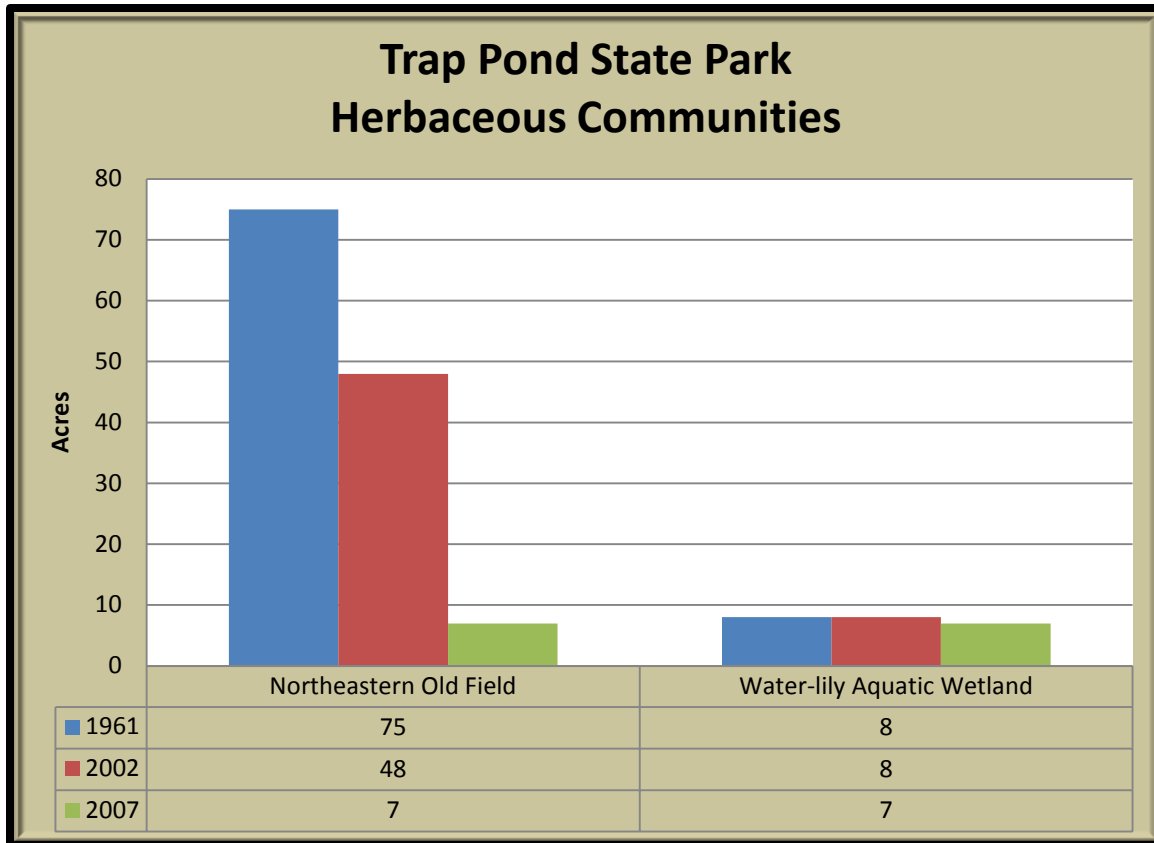
**Figure 3.3.** Shrubland at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Shrubland (Figure 3.3):** Swamp-loosestrife Shrub Swamp, which lines the shores of Trap Pond and Trussum Pond, is the largest shrubland in the park. Blueberry Wetland Thicket and Northeastern Successional Shrubland are tied for second place.

*Natural Capital (Table 3.3)*

Natural capital of shrubland has gone down with decreases in Swamp-loosestrife Shrub Swamp and Northeastern Successional Shrubland. The losses in Swamp-loosestrife Shrub Swamp have resulted in an overall capital reduction for the park.

<b>Table 3.3. Natural Capital of Trap Pond State Park Shrubland</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$111,521/year
2002	\$41,202/year
2007	\$50,440/year



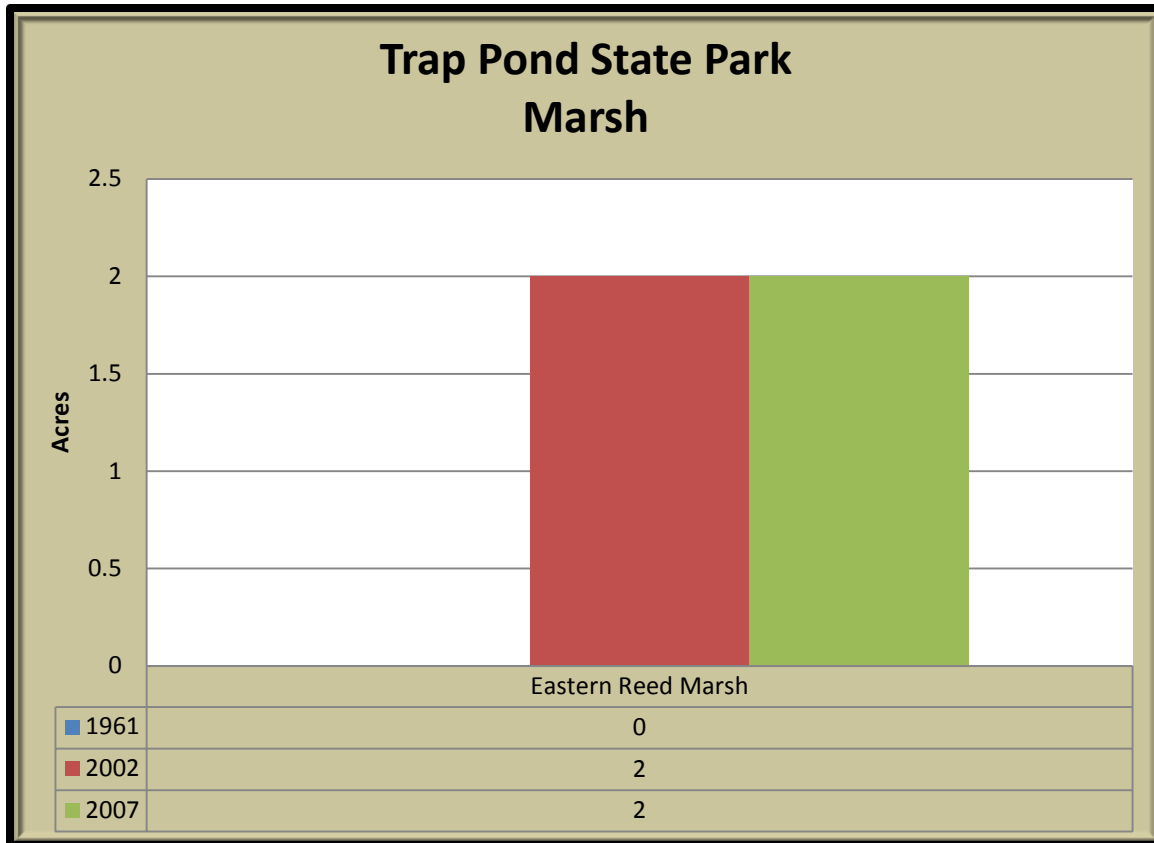
**Figure 3.4.** Herbaceous Communities at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Herbaceous Communities (Figure 3.4):** Northeastern Old Field and Water-lily Aquatic Wetland are the only two herbaceous communities and both have the same acreage. Northeastern Old Field has reduced since 1961 with maturation of the fields into shrublands and forest.

*Natural Capital (Table 3.4)*

Natural capital of herbaceous communities has decreased since 1961 with losses in Northeastern Old Field and Water-lily Aquatic Wetland. The capital of Northeastern Old Field was transferred to shrubland and forest, while the Water-lily Aquatic Wetland transferred to Impoundment, but for an overall loss to the park capital.

Table 3.4. Natural Capital of Trap Pond State Park Herbaceous Communities	
Year	Natural Capital (in 2012 dollars)
1961	\$94,460/year
2002	\$81,449/year
2007	\$66,106/year



**Figure 3.5.** Marsh at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Marsh (Figure 3.5):** Eastern Reed Marsh is the only marsh located in Trap Pond State Park.

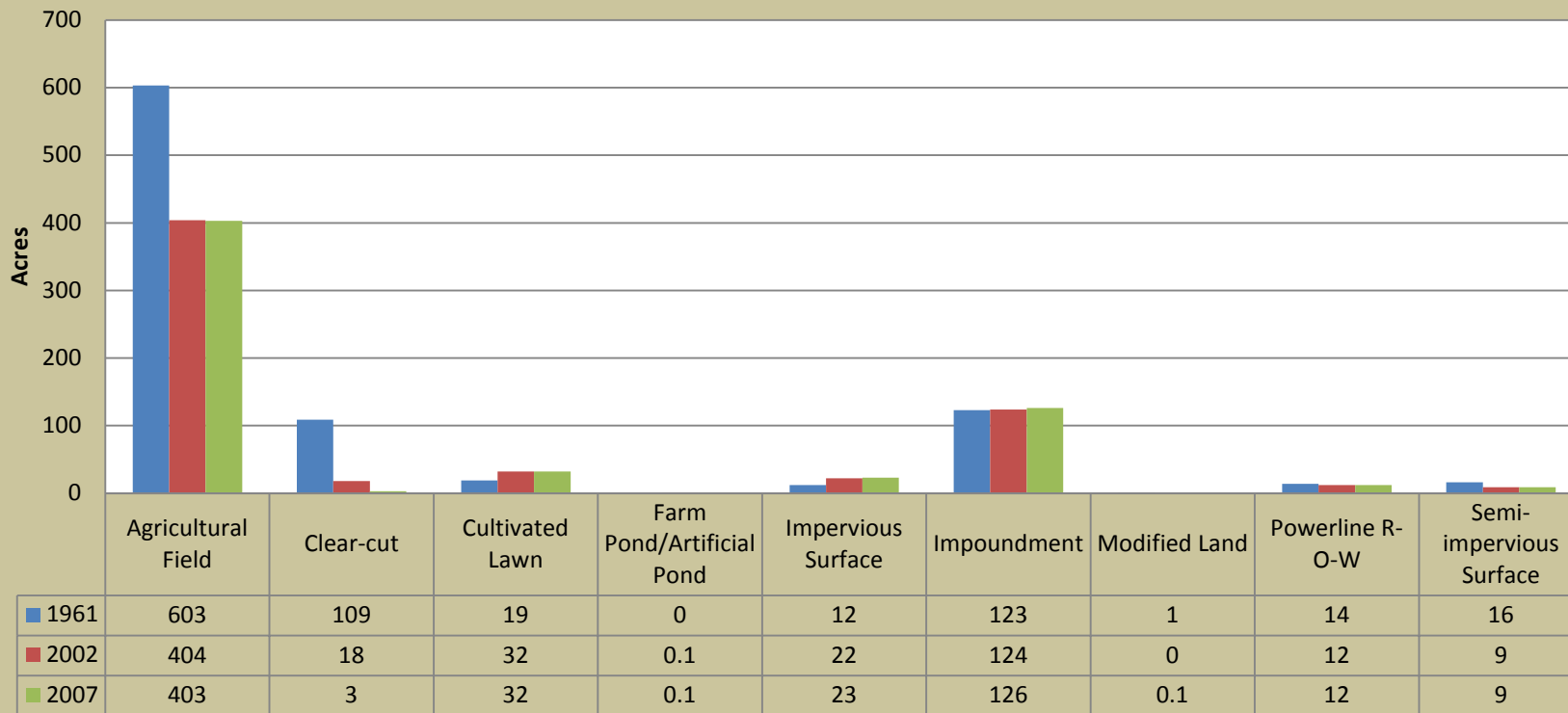
*Natural Capital (Table 3.5)*

Marsh was not present in 1961 and has since acquired \$20,419 in capital in 2007. It had a high of \$21,347 in 2002.

<b>Table 3.5. Natural Capital of Trap Pond State Park Marsh</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$21,347/year
2007	\$20,419/year



## Trap Pond State Park Anthropogenic Communities/Land Covers



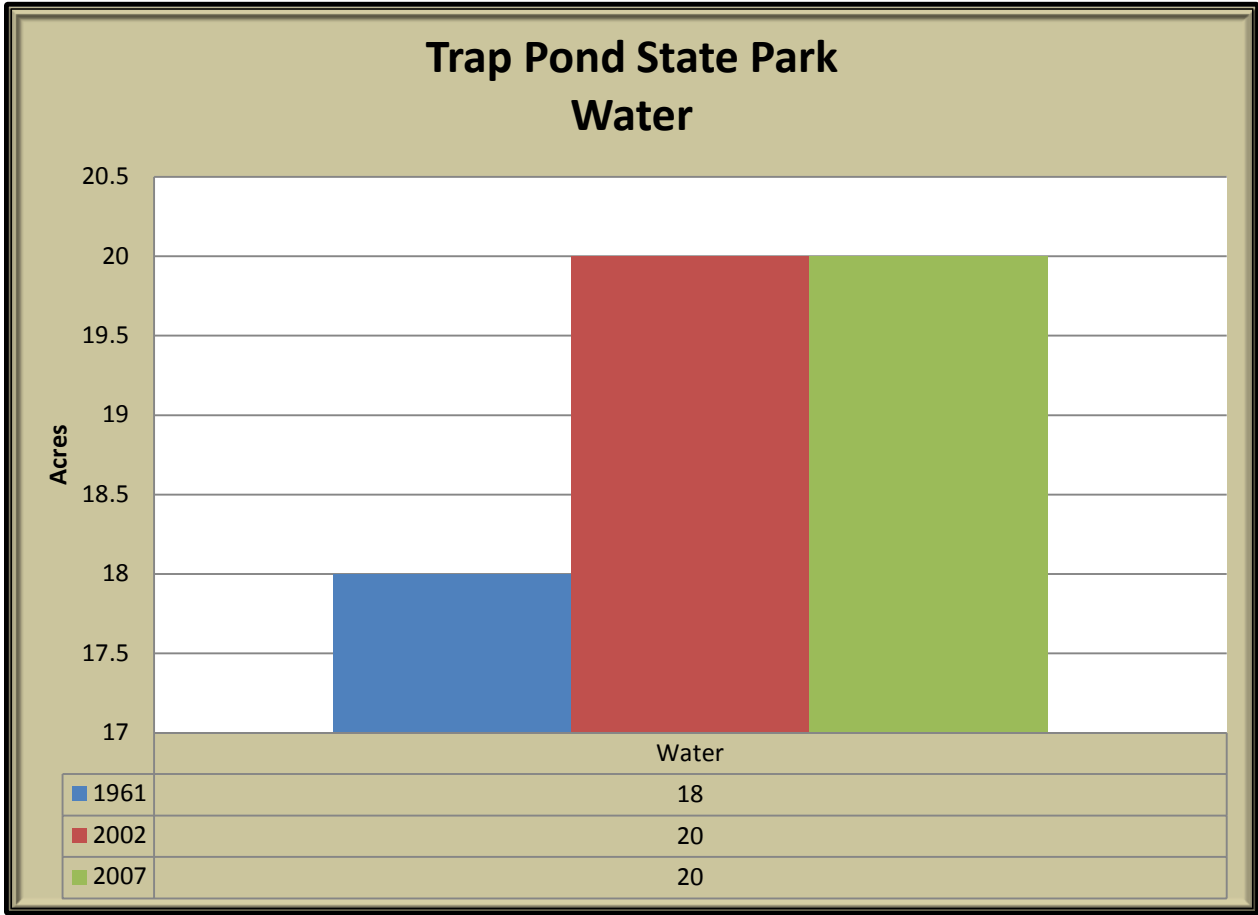
**Figure 3.5.** Anthropogenic Communities at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Anthropogenic Communities/Land Covers (Figure 3.5):** Agricultural field is the largest anthropogenic community/land cover in the park, followed by impoundments.

*Natural Capital* (Table 3.6)

Agricultural field and impoundments (Farm Pond/Artificial Pond and Impoundment) are the only anthropogenic communities/land covers with any natural capital in the park. The amount of these has been roughly stable despite the decreases in agricultural field. The impoundments are worth quite a bit more than the agricultural fields and pick the slack from these losses.

<b>Table 3.6. Natural Capital of Trap Pond State Park Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$690,742/year
2002	\$685,284/year
2007	\$690,562/year



**Figure 3.7.** Water coverage at Trap Pond State Park (1961, 2002, and 2007)

**Trap Pond State Park Water (Figure 3.7):** Water capital has increased slightly in acreage since 1961.

*Natural Capital (Table 3.7)*

Water capital has increased since 1961 with its acreage.

<b>Table 3.7. Natural Capital of Trap Pond State Park Water</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$96,032/year
2002	\$109,370/year
2007	\$109,370/year

## CHAPTER 4: VEGETATION COMMUNITIES BY SECTION

### 1. Arvey Road Section



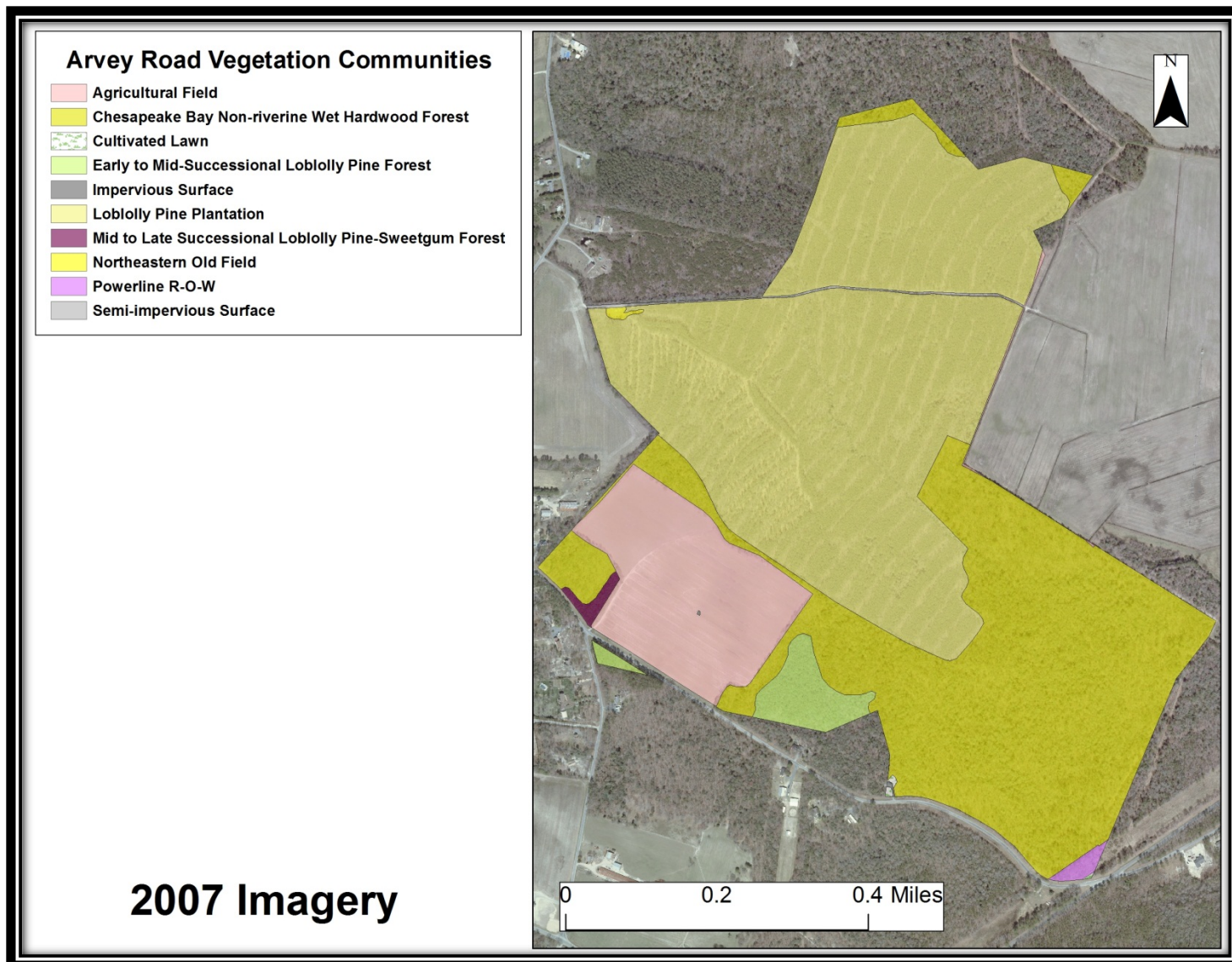


Figure 4-1.1. 2007 Vegetation Community Map of the Arvey Road Section

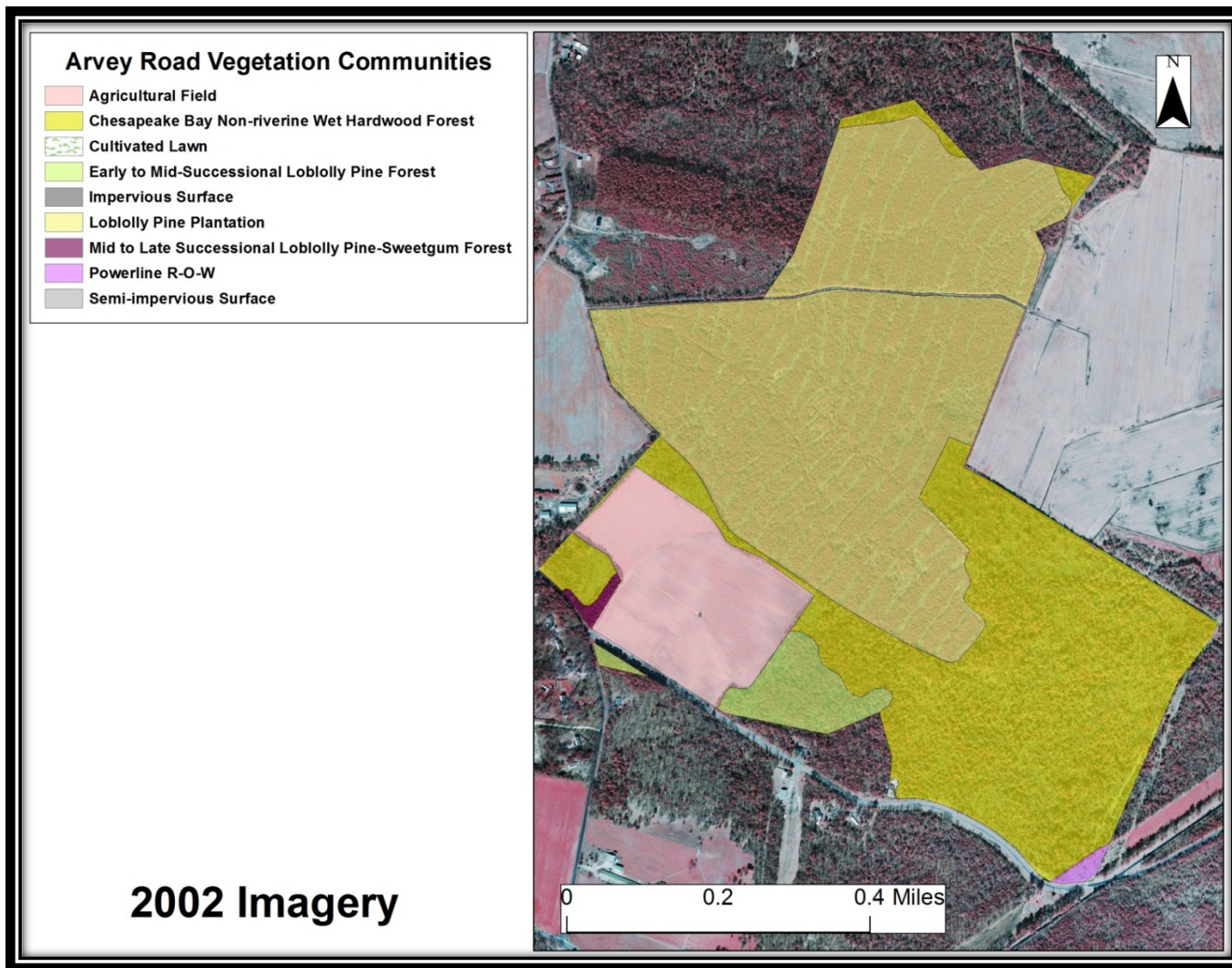


Figure 4-1.2. 2002 Vegetation Community Map of the Arvey Road Section



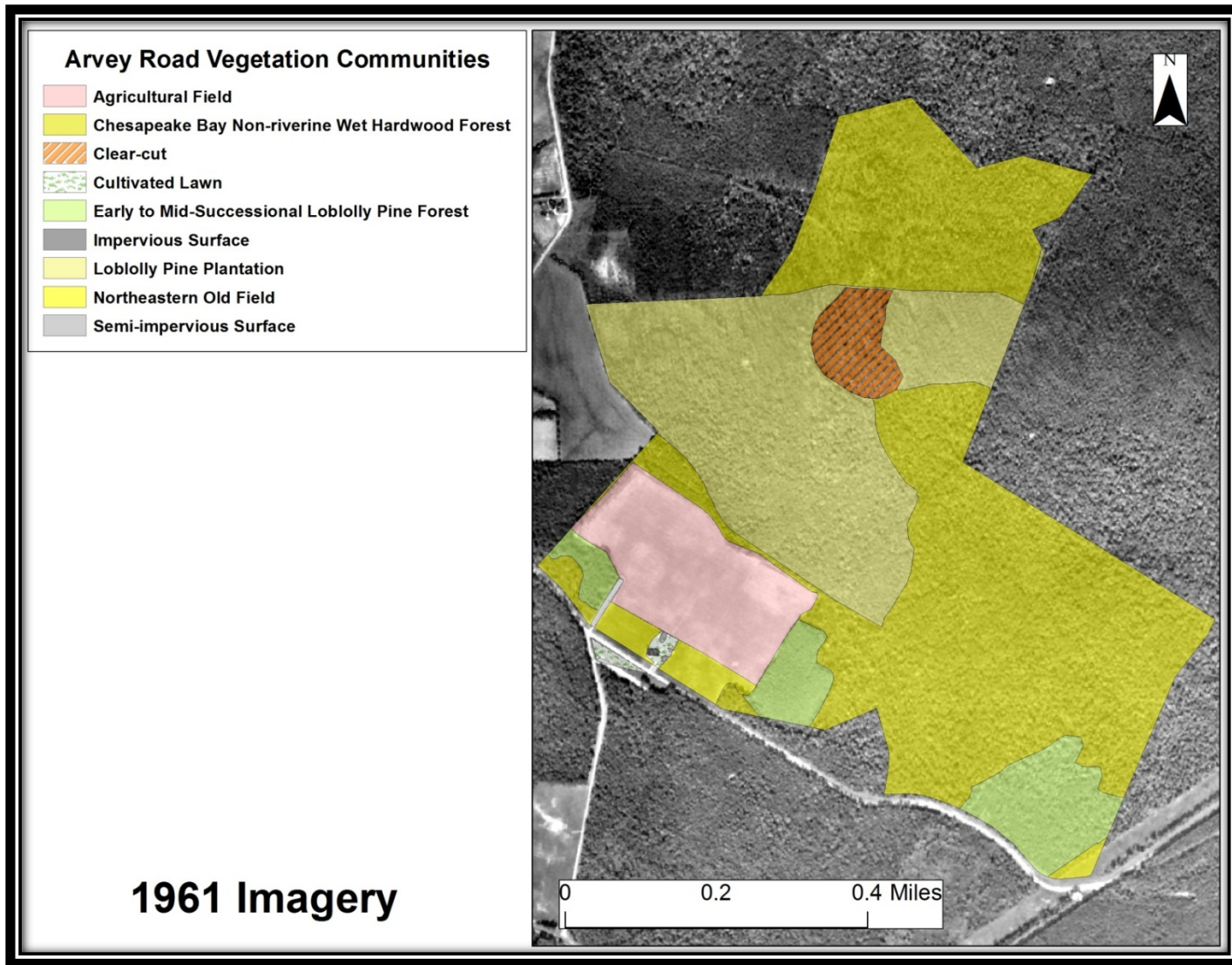
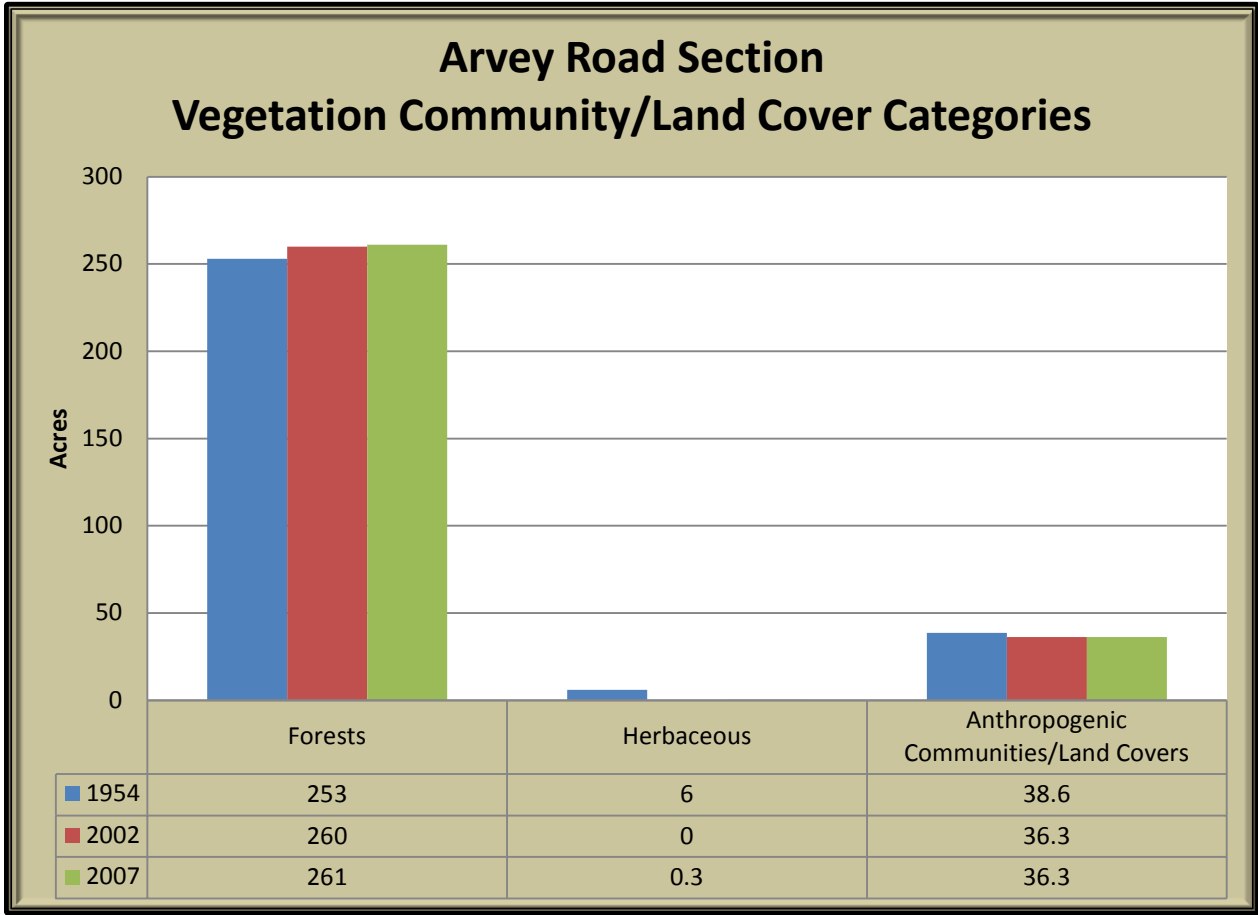


Figure 4-1.3. 1961 Vegetation Community of the Arvey Road Section



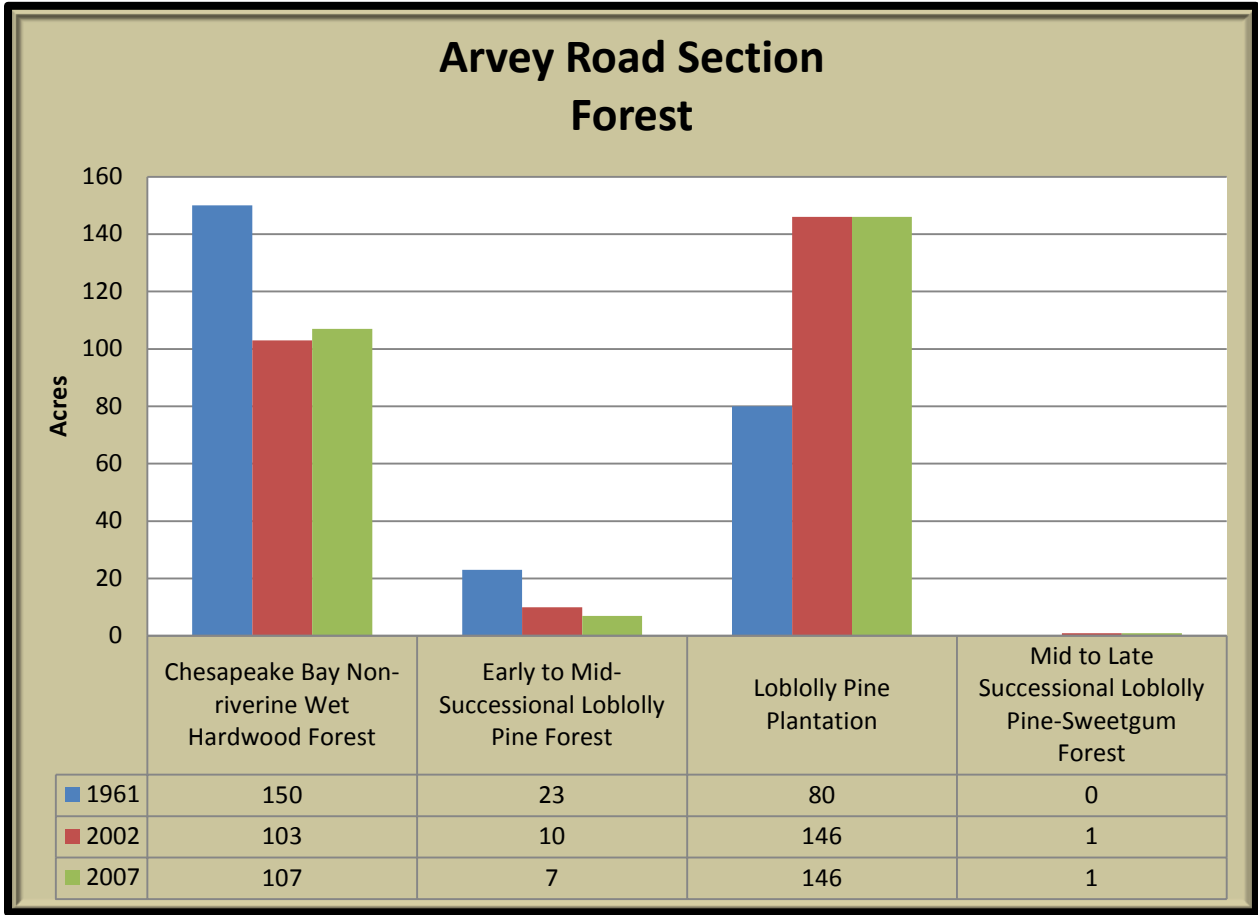
**Figure 4-1.4.** Arvey Road Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Arvey Road Section Vegetation Categories/Land Covers (Figure 4-1.4):** Forestland is the largest vegetation community type, like the rest of the state park, in the Arvey Road Section.

*Natural Capital* (Table 4-1.1)

Natural capital of the Arvey Road Section has been going down with losses in wetland forest.

Table 4-1.1. Natural Capital of the Arvey Road Section	
Year	Natural Capital (in 2012 dollars)
1961	\$1,865,740/year
2002	\$1,297,663/year
2007	\$1,297,140/year



**Figure 4-1.5.** Arvey Road Section Forest (1961, 2002, and 2007)

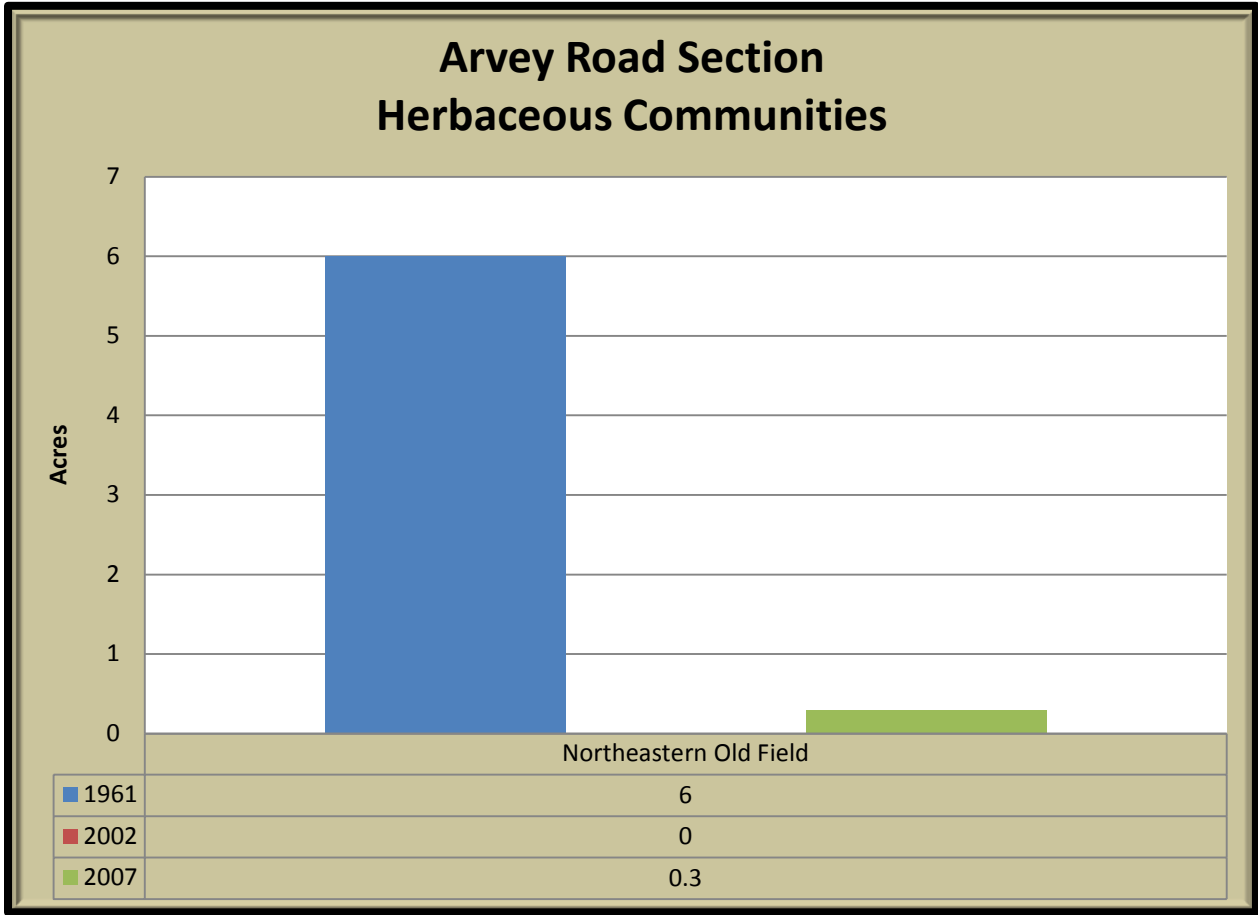
**Arvey Road Section Forest (Figure 4-1.5):** Loblolly Pine Plantation is the largest forest type in the Arvey Road Section.

*Natural Capital* (Table 4-1.2)

Capital of forestland in the Arvey Road Section has decreased with a decrease in the acreage of swamp forest (Chesapeake Bay Non-riverine Wet Hardwood Forest). This is in spite of the Loblolly Pine Plantation acreage nearly doubling.

Table 4-1.2. Natural Capital of Arvey Road Section Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$1,863,202/year
2002	\$1,295,713/year
2007	\$1,295,146/year





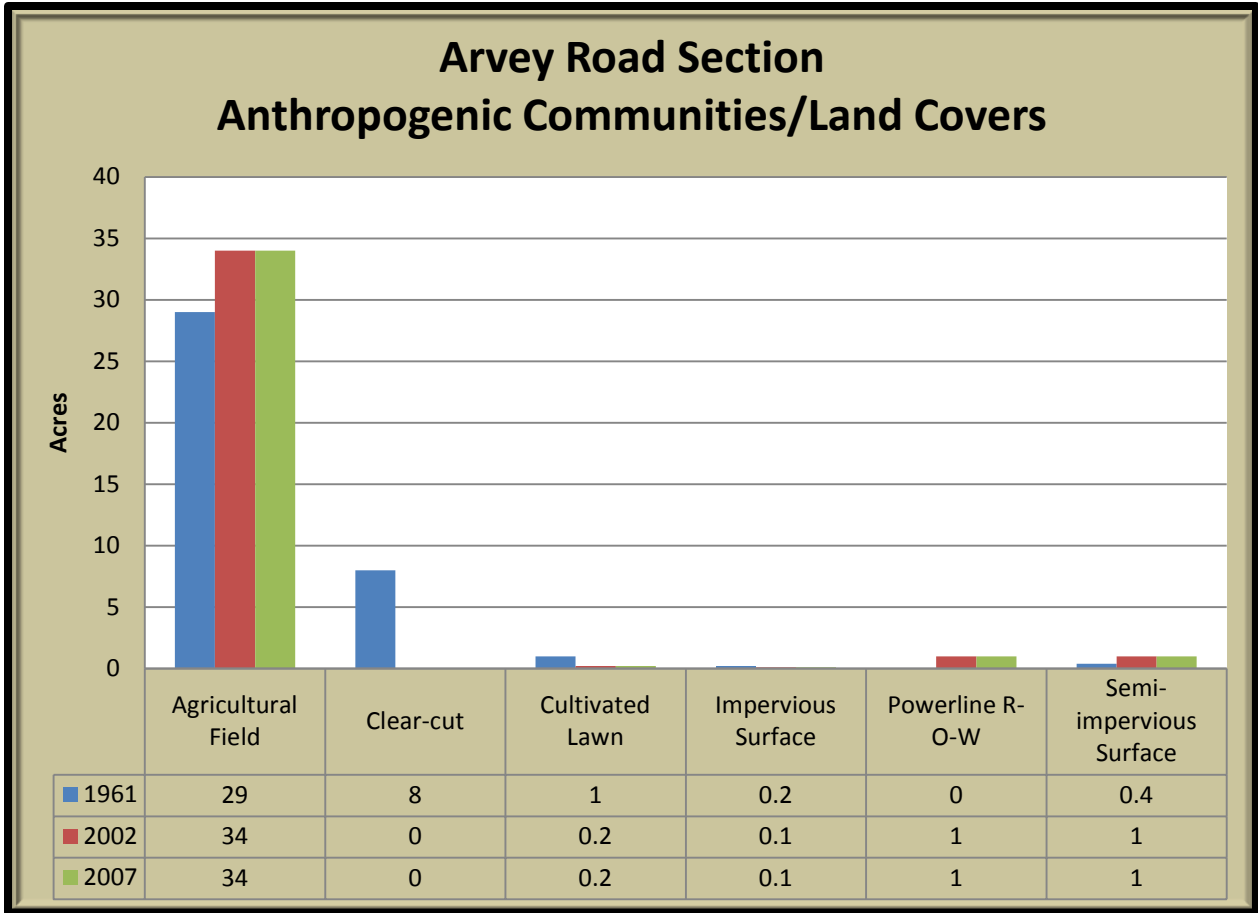
**Figure 4-1.6.** Arvey Road Section Herbaceous Communities (1961, 2002, and 2007)

**Arvey Road Section Herbaceous Communities (Figure 4-1.6):** Northeastern Old Field is the only herbaceous community present in the Arvey Road Section.

*Natural Capital* (Table 4-1.3)

Natural capital of herbaceous communities has been going down as these fields mature into shrubland and forest.

Table 4-1.3. Natural Capital of Arvey Road Section Herbaceous Communities	
Year	Natural Capital (in 2012 dollars)
1961	\$874/year
2002	\$0/year
2007	\$44/year



**Figure 4-1.7.** Arvey Road Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Arvey Road Section Anthropogenic Communities/Land Covers (Figure 4-1.7):** Agricultural field is the most common anthropogenic community/land cover in the Arvey Road Section.

*Natural Capital* (Table 4-1.4)

Agricultural field is the only anthropogenic community/land cover with any natural capital value in the Arvey Road Section. Its value has increased with an increase in acreage.

<b>Table 4-1.4. Natural Capital of Arvey Road Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,663/year
2002	\$1,950/year
2007	\$1,950/year

## 2. James Branch Section

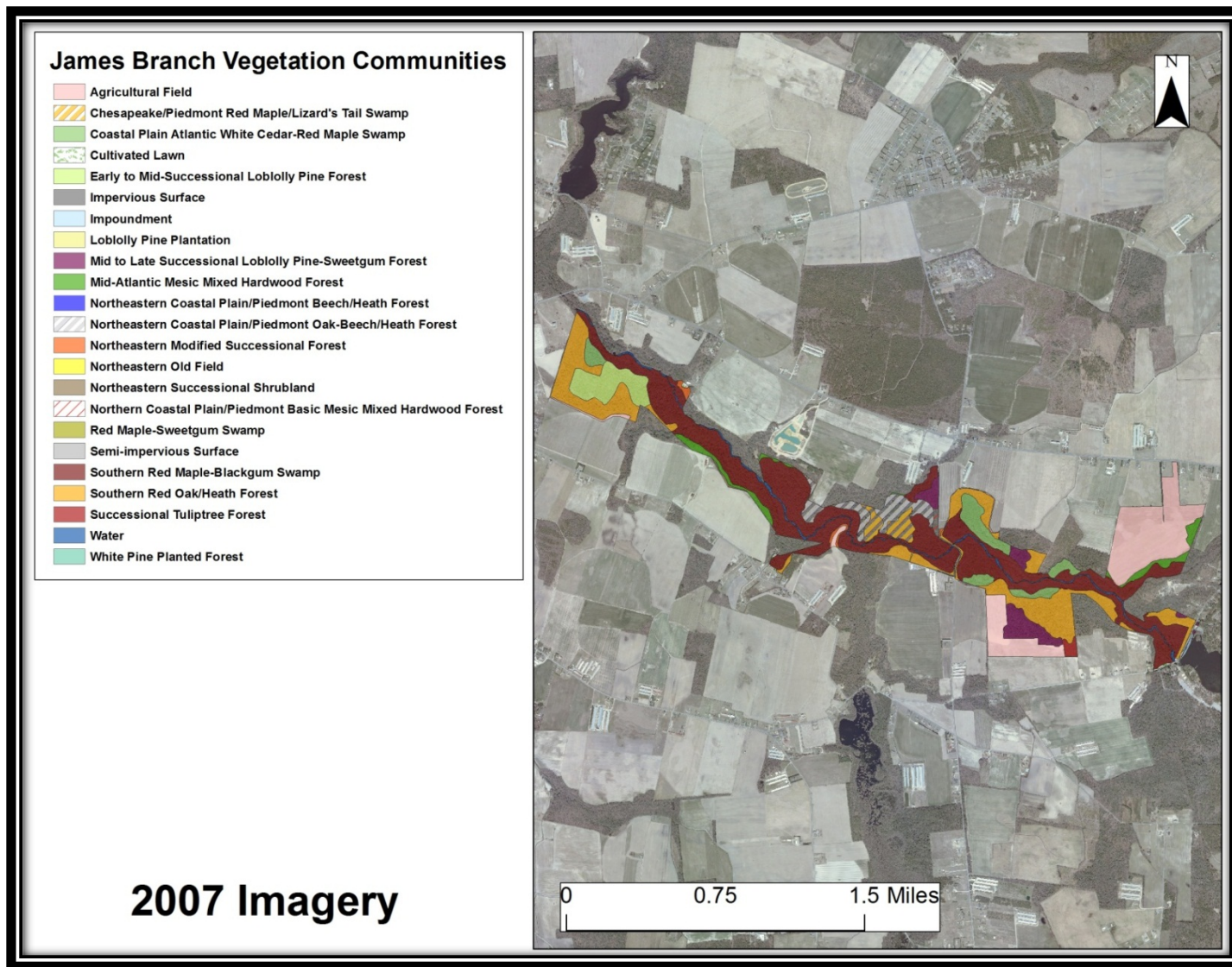


Figure 4-2.1. 2007 Vegetation Community Map of the James Branch Section

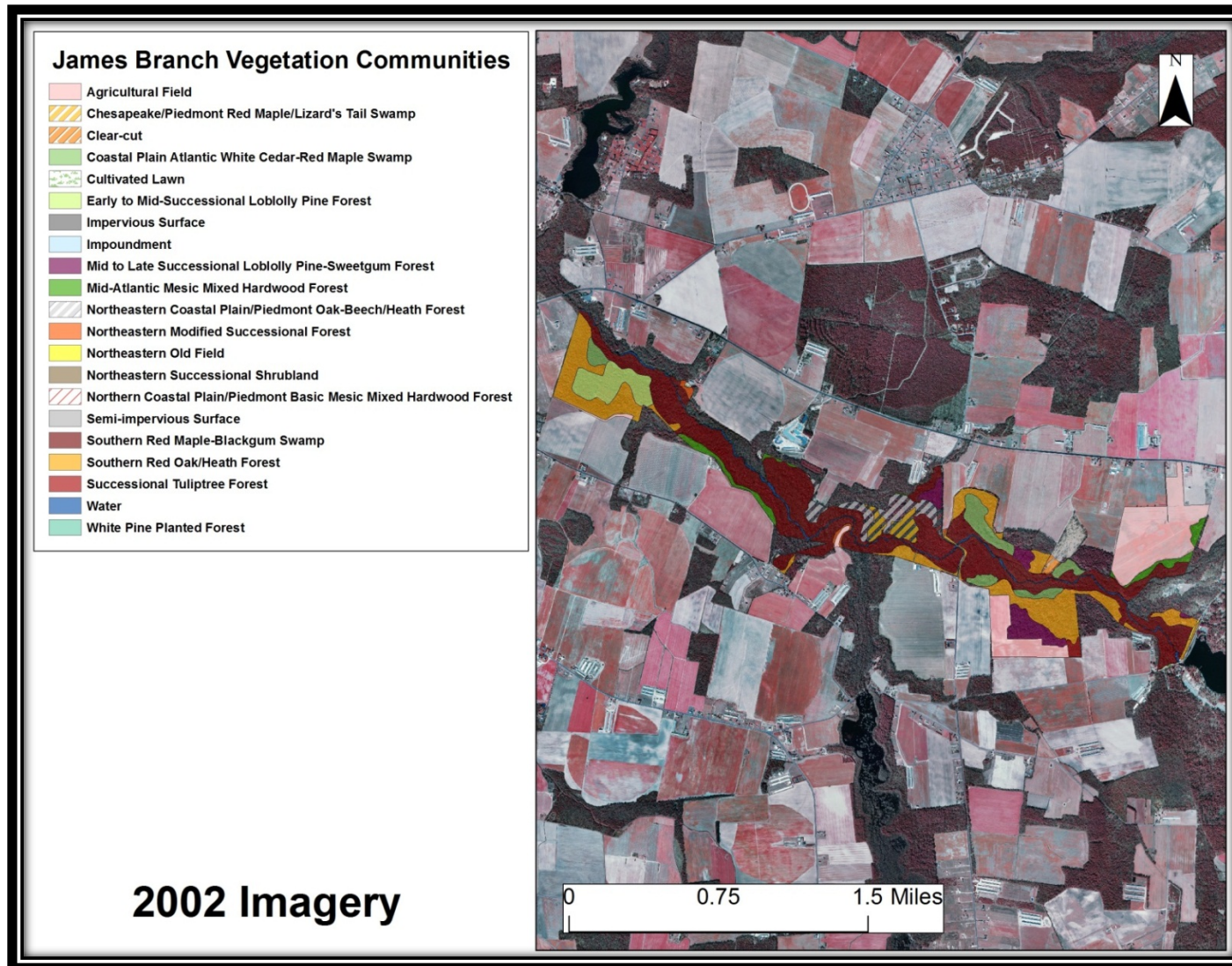


Figure 4-2.2. 2002 Vegetation Community Map of the James Branch Section



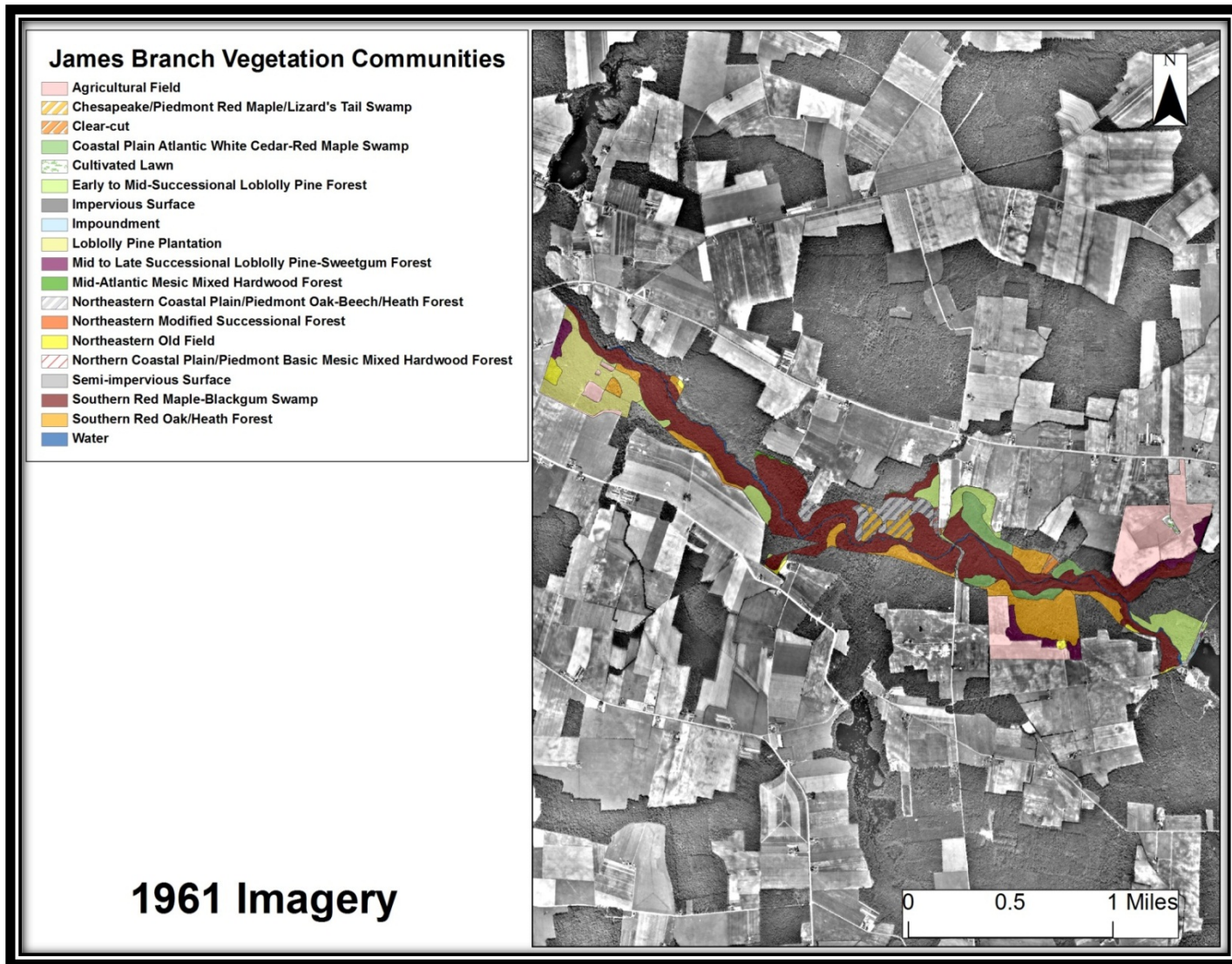
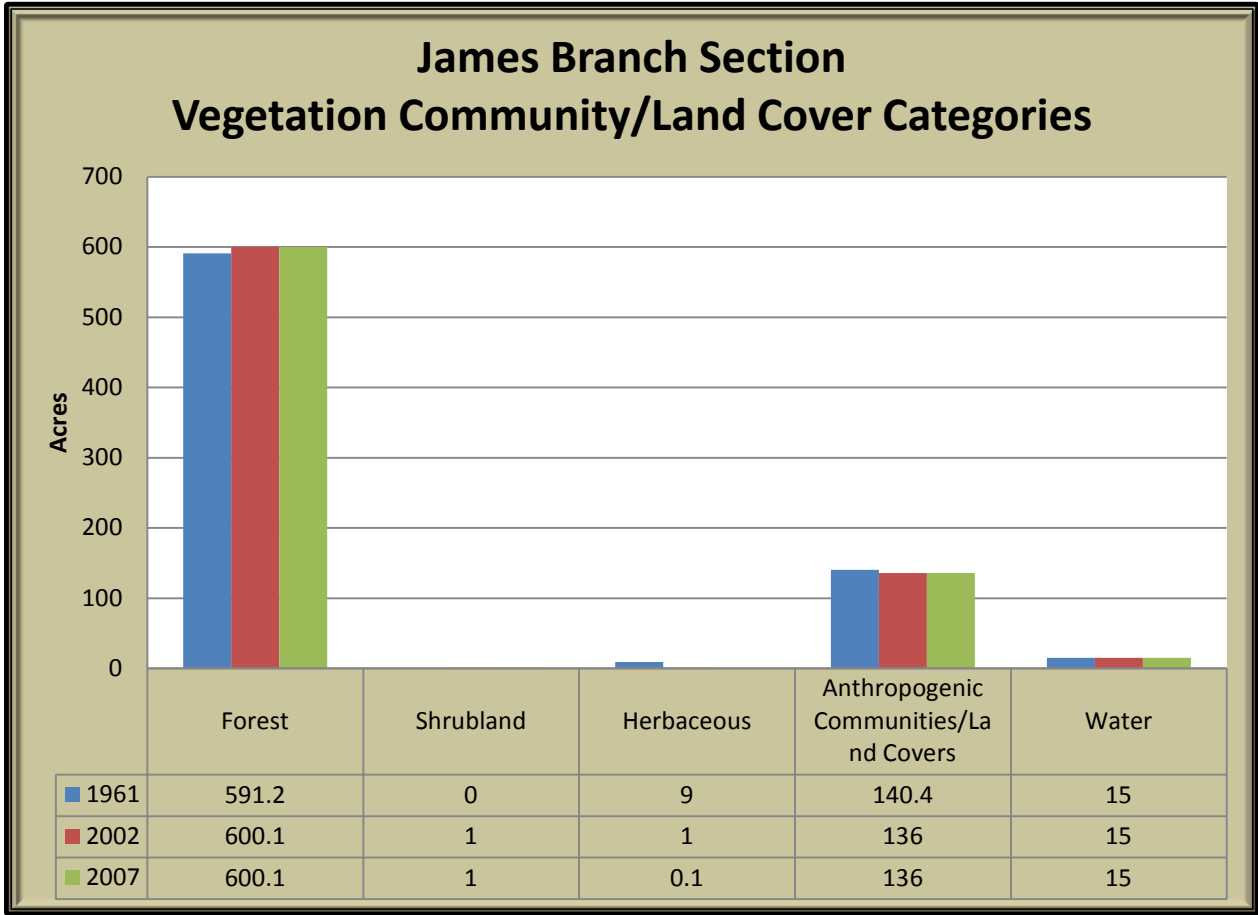


Figure 4-2.3. 1961 Vegetation Community Map of the James Branch Section



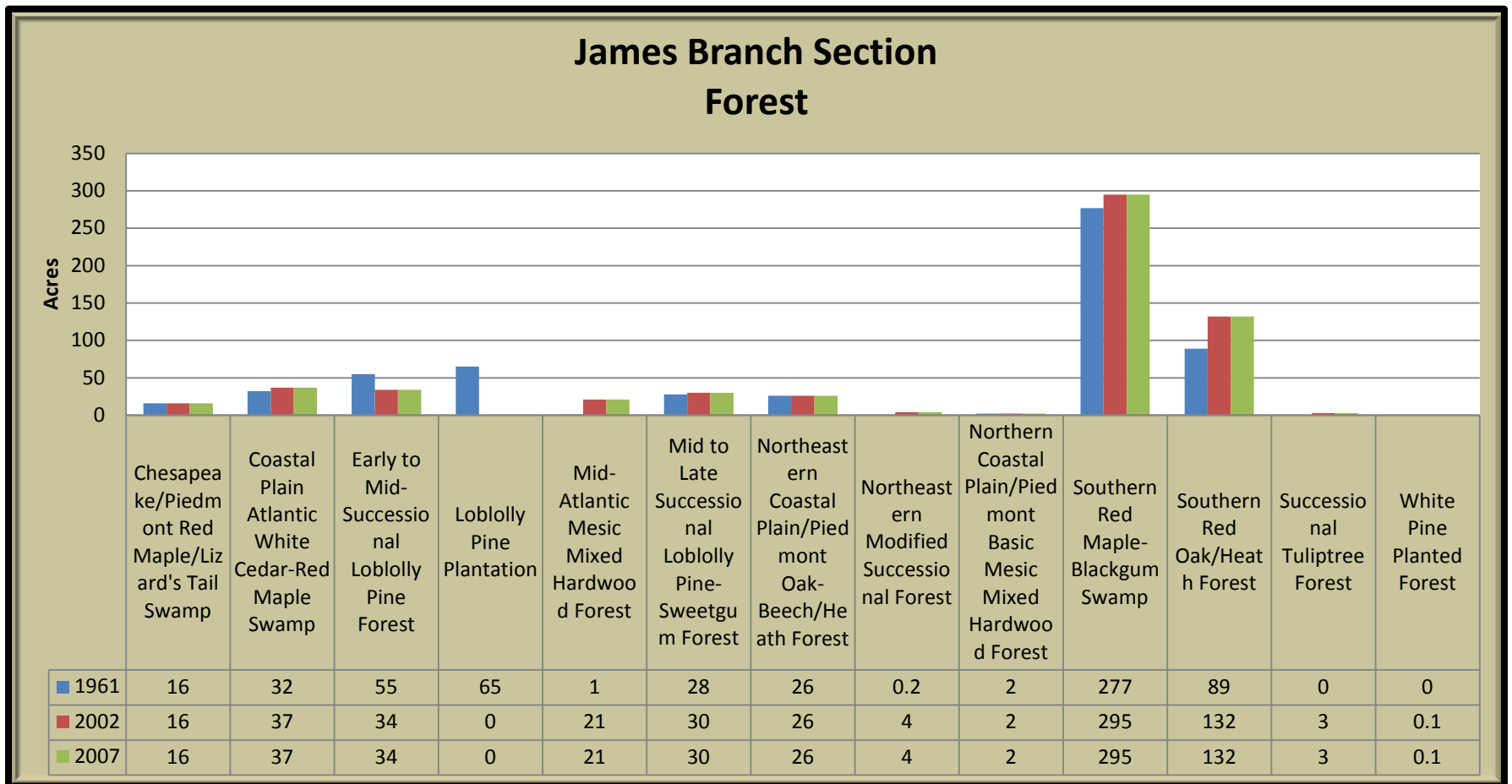
**Figure 4-2.4.** James Branch Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**James Branch Section Vegetation Community/Land Covers (Figure 4-2.4):** Forestland is the largest community type in the James Branch Section followed distantly by anthropogenic communities/land covers (136 acres).

*Natural Capital* (Table 4-2.1)

Capital for the James Branch Section has increased since 1961. However it has been near stable in capital in the recent period with just a very small decrease (2002-2007).

<b>Table 4-2.1. Natural Capital of the James Branch Section</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$4,139,147/year
2002	\$4,417,993/year
2007	\$4,417,862/year



**Figure 4-2.5.** James Branch Section Forest (1961, 2002, and 2007)

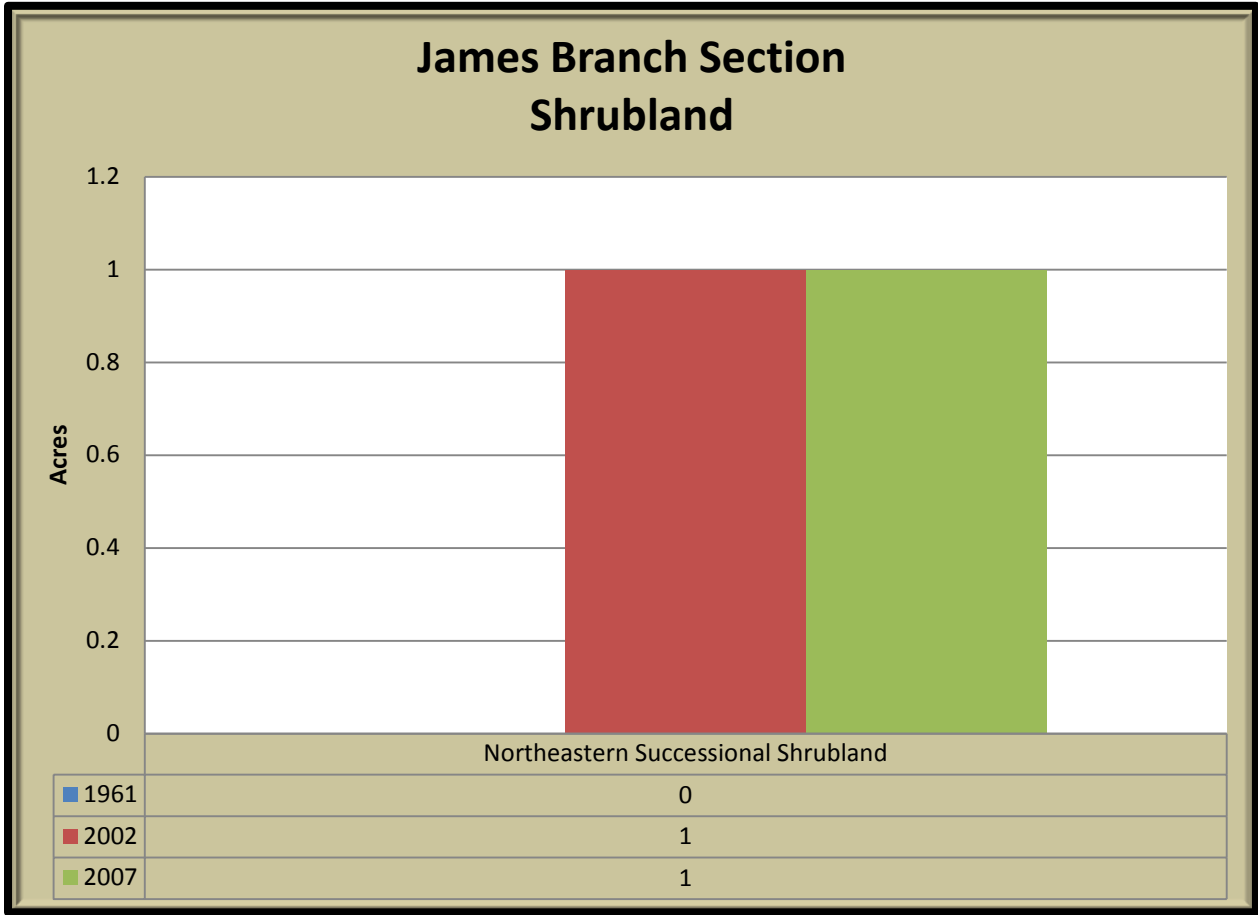
**James Branch Section Forest (Figure 4-2.5):** Southern Red Maple-Blackgum Swamp, which is found in the floodplain of James Branch, is the most common forest type in this section. Southern Red Oak/Heath Forest lying in the uplands is the next most common forest type.

*Natural Capital* (Table 4-2.2)

Capital of the forestland of the James Branch Section has increased overall since 1961. It has been stable in the recent period (2002-2007).

<b>Table 4-2.2. Natural Capital of James Branch Section Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$4,045,076/year
2002	\$4,325,114/year
2007	\$4,325,114/year





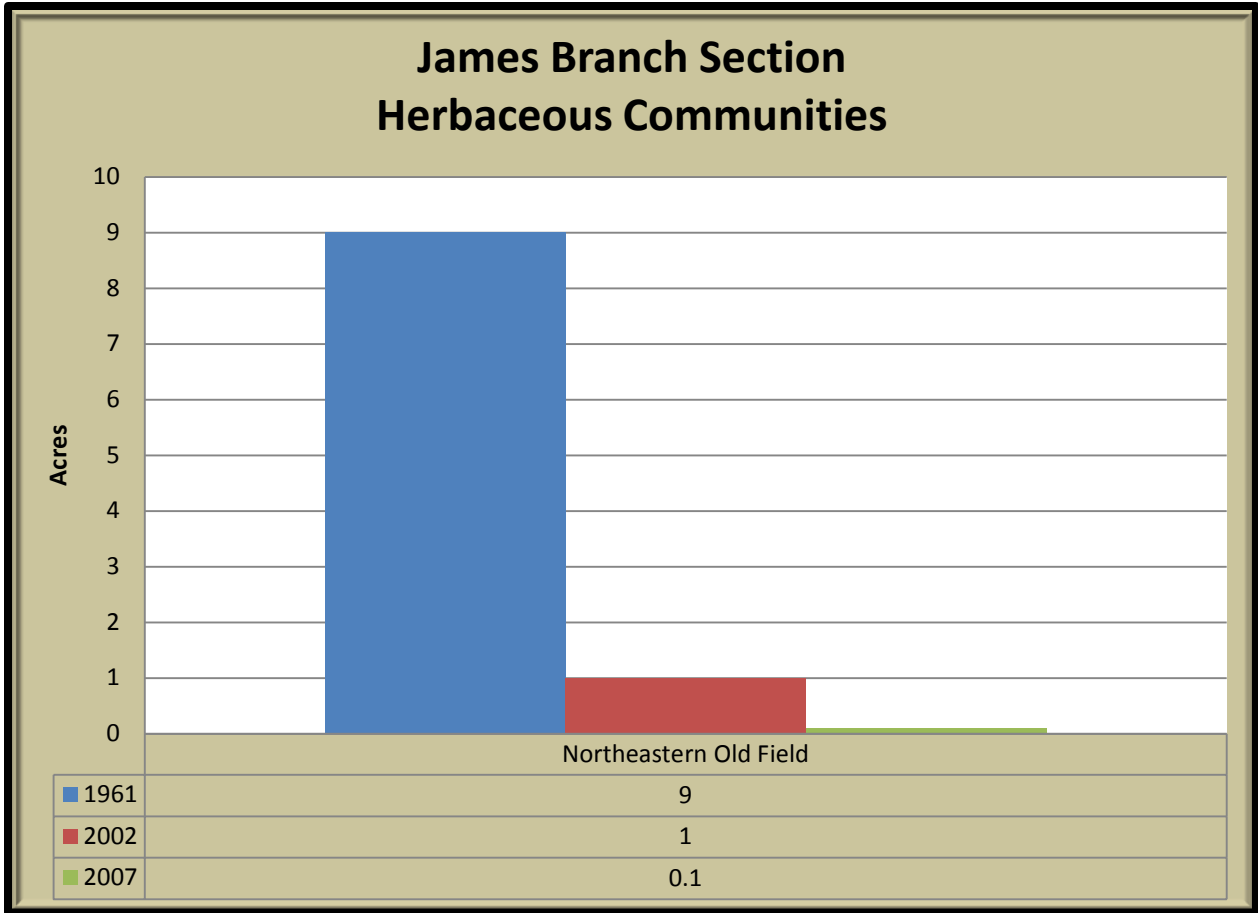
**Figure 4-2.6.** James Branch Section Shrubland (1961, 2002, and 2007)

**James Branch Section Shrubland (Figure 4-2.6):** Northeastern Successional Shrubland is the only shrubland community present in the Main Section.

*Natural Capital* (Table 4-2.3)

Shrubland was not present in 1961 and has since gained \$146 in capital for the James Branch Section. It has been stable in the recent period (2002-2007).

<b>Table 4-2.3. Natural Capital of James Branch Section Shrubland</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$146/year
2007	\$146/year



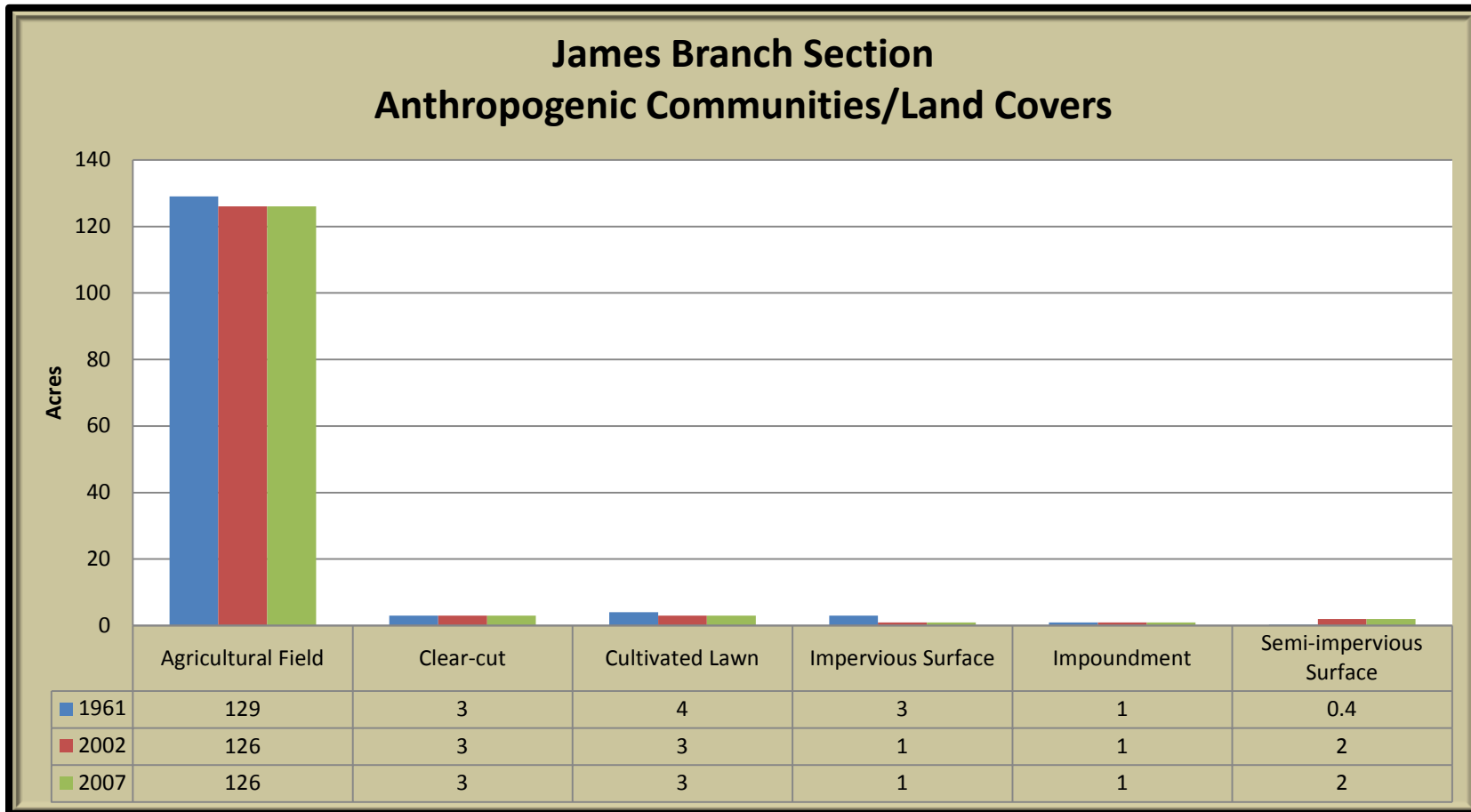
**Figure 4-2.7.** James Branch Section Herbaceous Communities (1961, 2002, and 2007)

**James Branch Section Herbaceous Communities (Figure 4-2.7):** Northeastern Successional Shrubland is the only shrubland community present in the Main Section.

*Natural Capital* (Table 4-2.3)

Herbaceous communities have declined to near zero in capital value with maturation of Northeastern Old Field to more mature communities such as shrubland and forest.

Table 4-2.3. Natural Capital of James Branch Section Herbaceous Communities	
Year	Natural Capital (in 2012 dollars)
1961	\$1,311/year
2002	\$146/year
2007	\$15/year



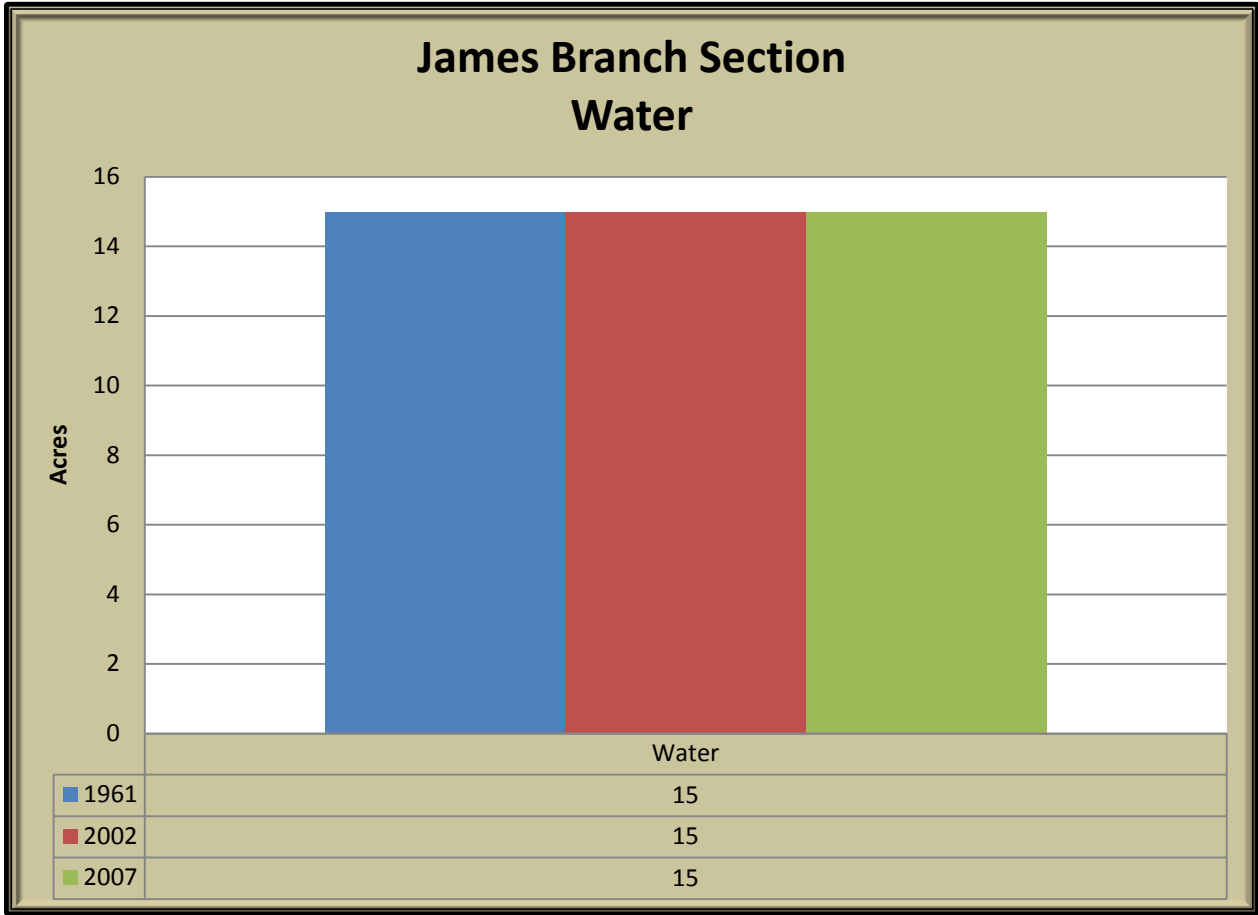
**Figure 4-2.8.** James Branch Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**James Branch Section Anthropogenic Communities/Land Covers (Figure 4-2.8):** Agricultural Field is the most common anthropogenic community/land cover, followed distantly by Powerline R-O-W.

*Natural Capital* (Table 4-2.4)

Agricultural field and impoundment are the only anthropogenic communities/land covers with any capital value. These communities have had a slight decrease in the recent period due to a decrease in agricultural field acreage.

<b>Table 4-2.4. Natural Capital of James Branch Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$12,733/year
2002	\$12,561/year
2007	\$12,561/year



**Figure 4-2.8.** James Branch Section Water (1961, 2002, and 2007)

**James Branch Section Water (Figure 4-2.8):** The main stem of Deep Creek makes up most of the water coverage in the main section.

*Natural Capital (Table 4-2.4)*

Capital of water has been stable through the study period.

Table 4-2.4. Natural Capital of James Branch Section Water	
Year	Natural Capital (in 2012 dollars)
1961	\$80,027/year
2002	\$80,027/year
2007	\$80,027/year



### 3. Main Section

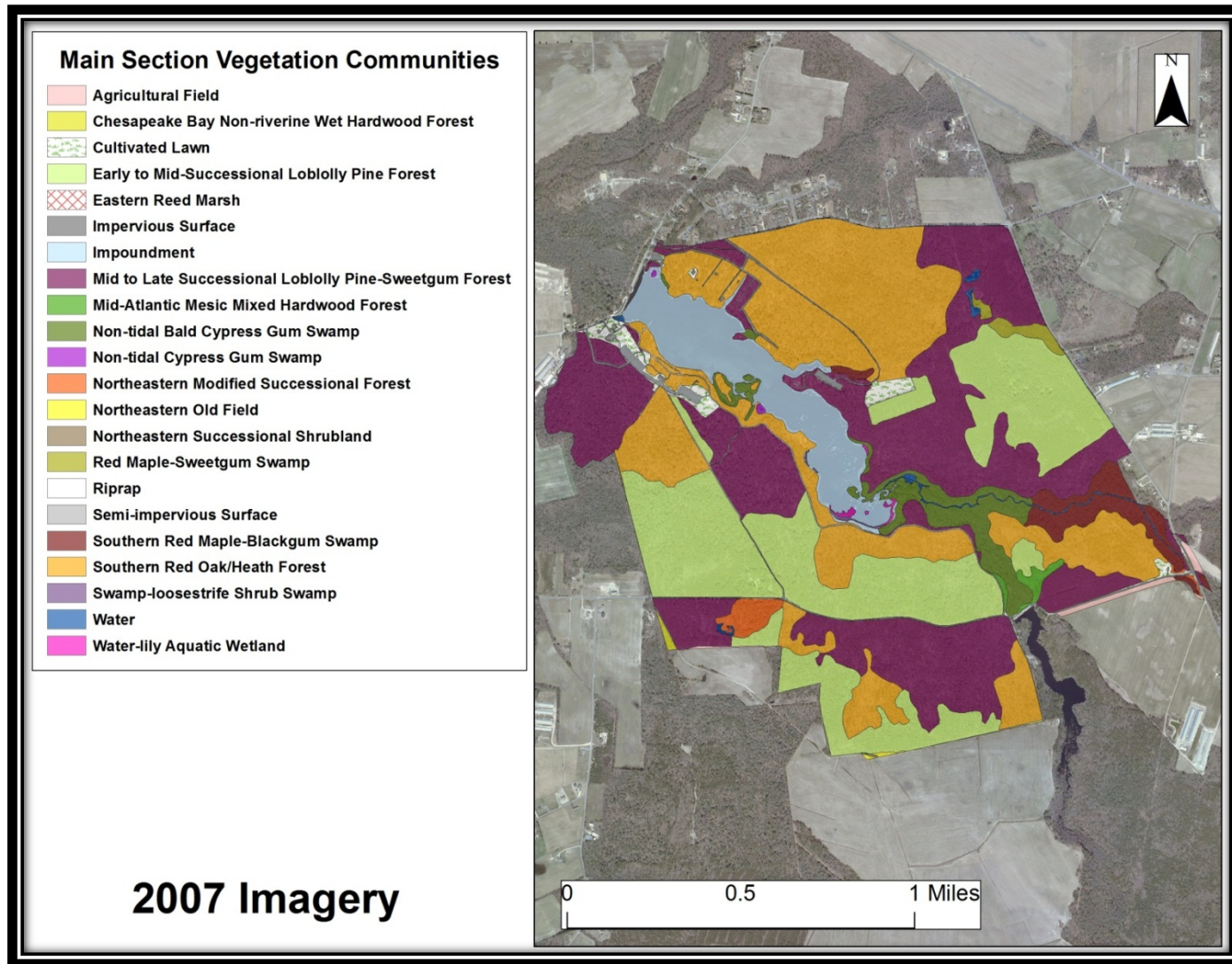
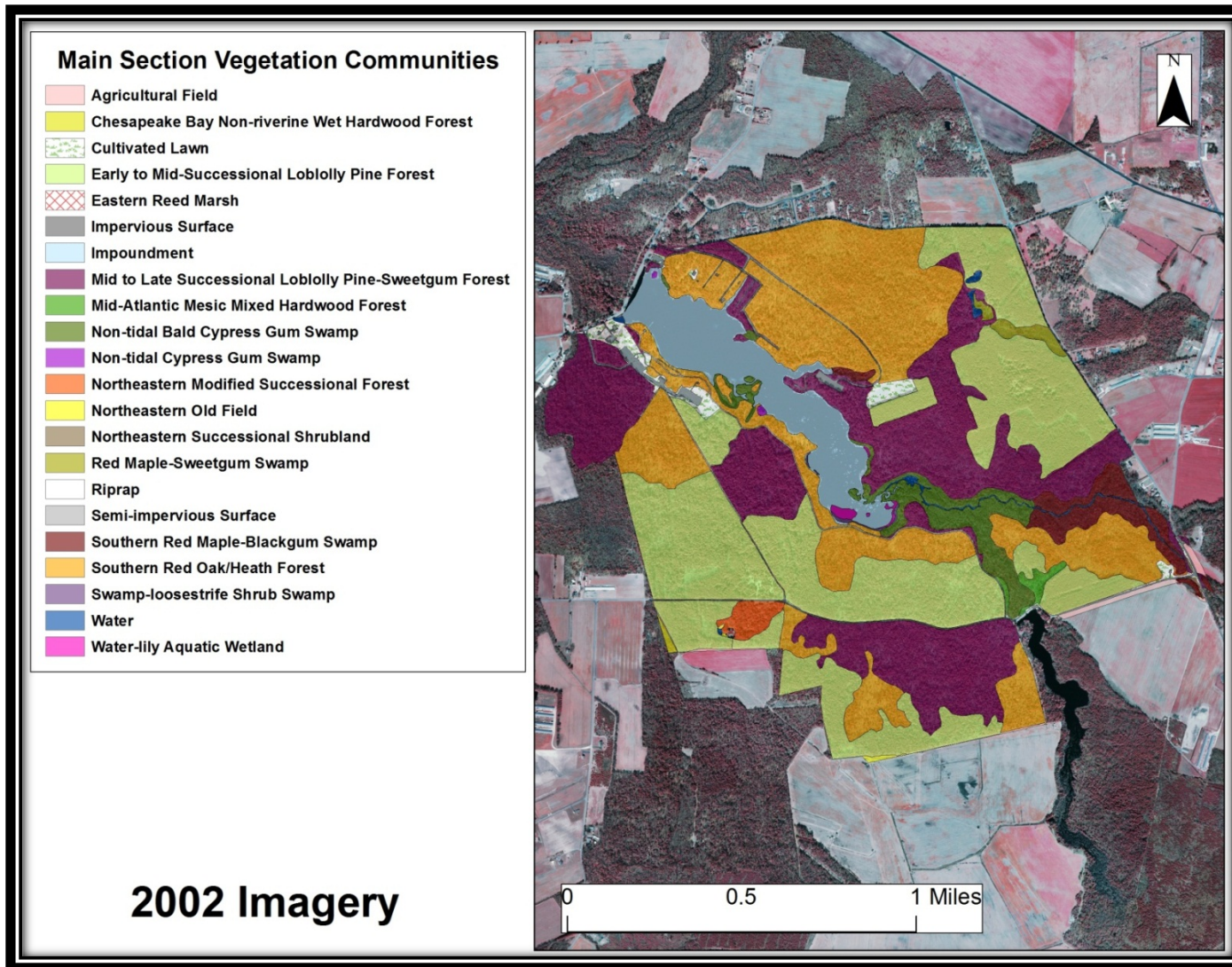


Figure 4-3.1. 2007 Vegetation Community Map of the Main Section



**Figure 4-3.2.** 2002 Vegetation Community Map of the Main Section



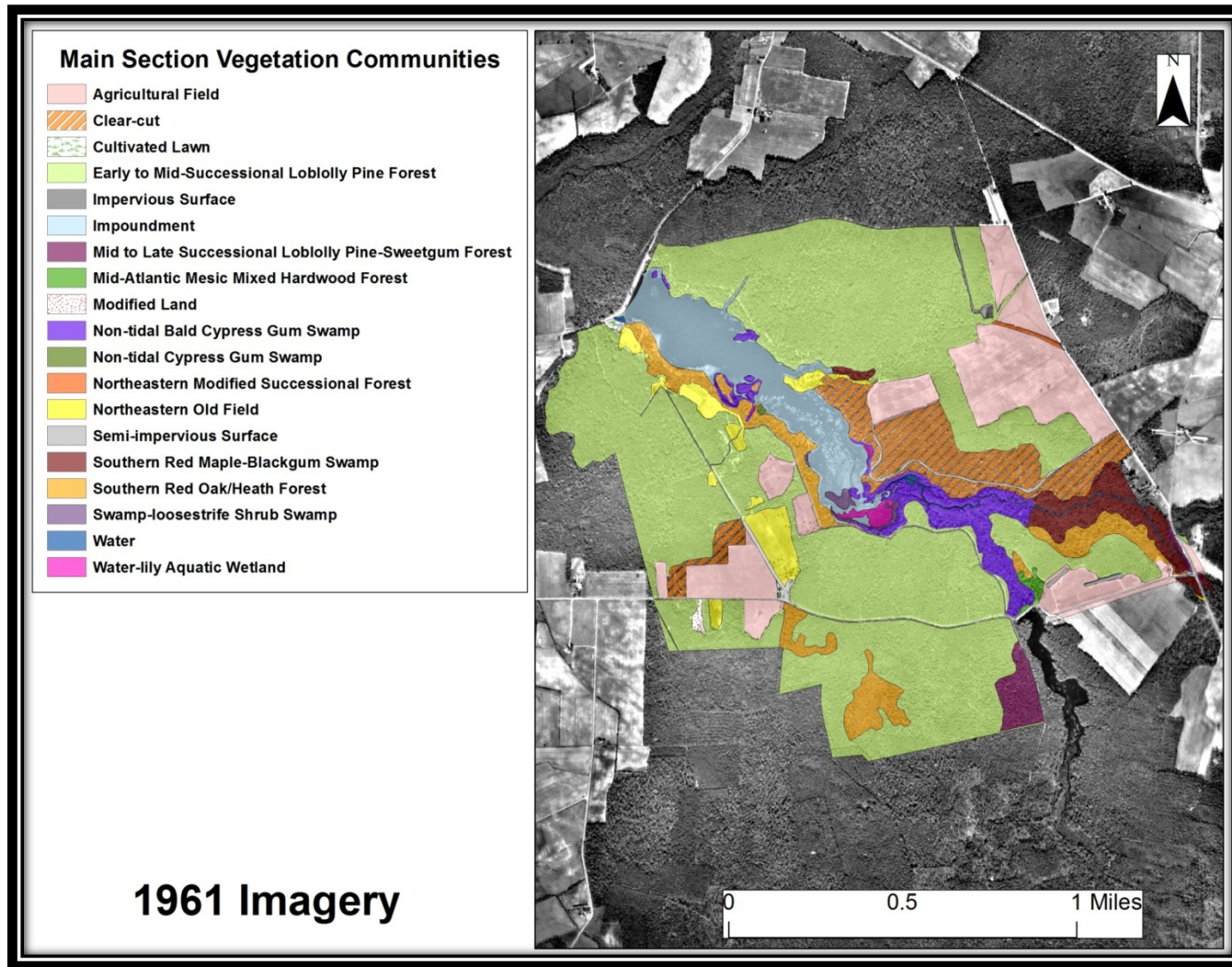
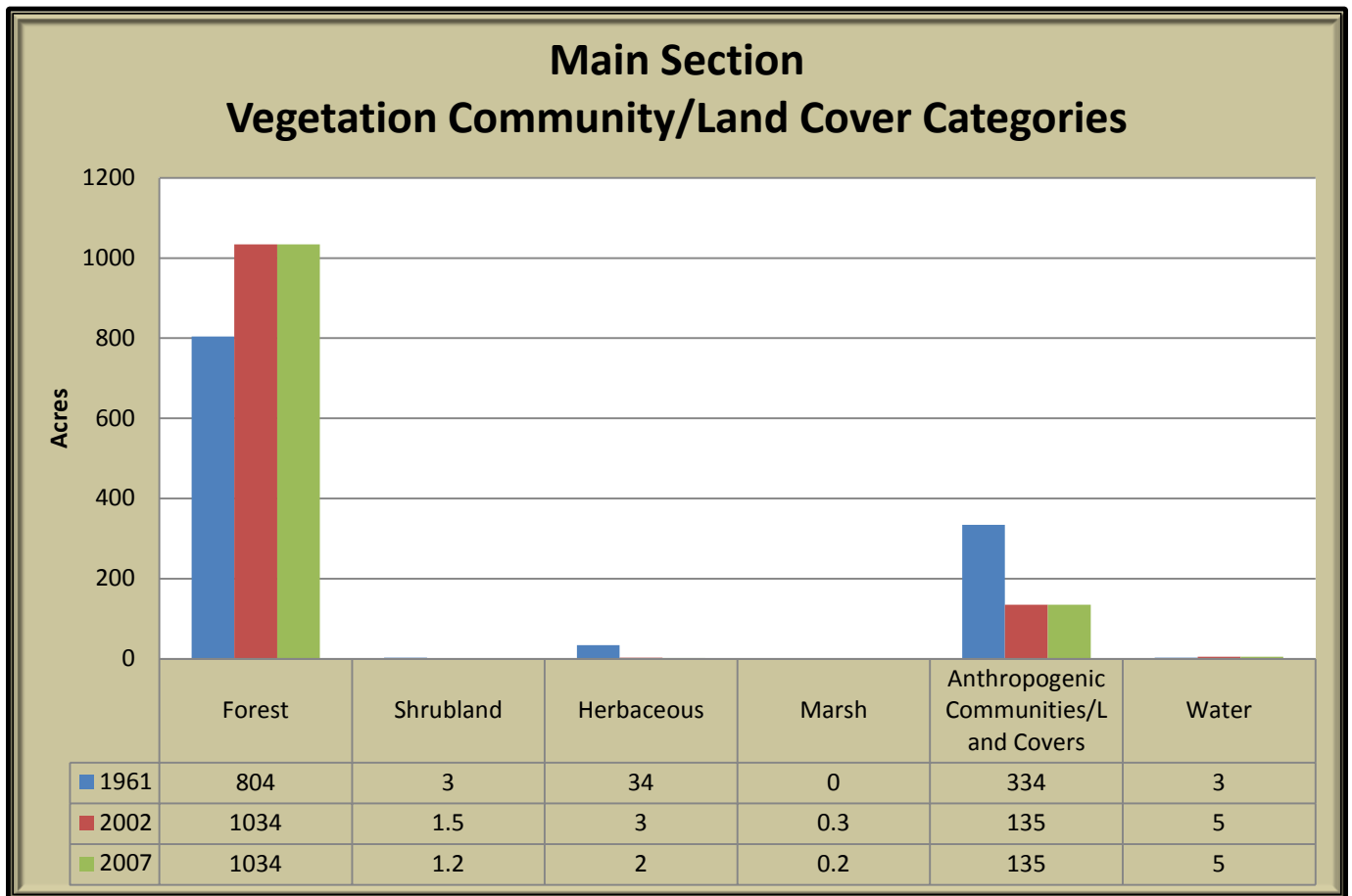


Figure 4-3.3. 1961 Vegetation Community Map of the Main Section



**Figure 4-3.4.** Main Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

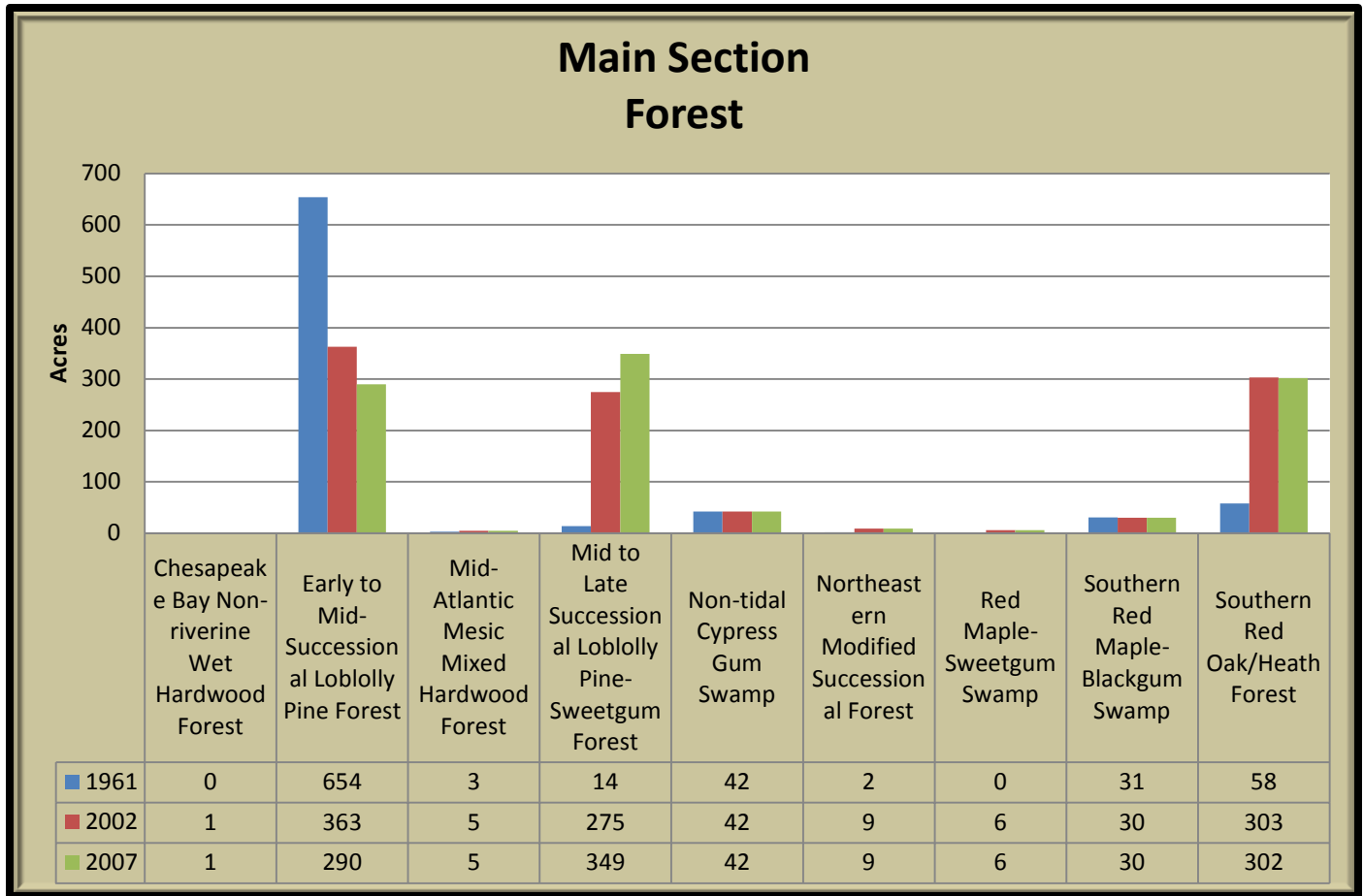
**Main Section Vegetation Community/Land Covers (Figure 4-3.4):** Forest is the most common vegetation community type in the Main Section, followed by Anthropogenic Communities/Land Covers.



*Natural Capital* (Table 4-3.1)

Capital in the Main Section has increased overall since 1961, with a slight decline in the recent period (2002-2007). Most of the decrease is due to declines in shrubland and herbaceous communities.

<b>Table 4-3.1. Natural Capital of the Main Section</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,582,713/year
2002	\$1,684,309/year
2007	\$1,679,334/year



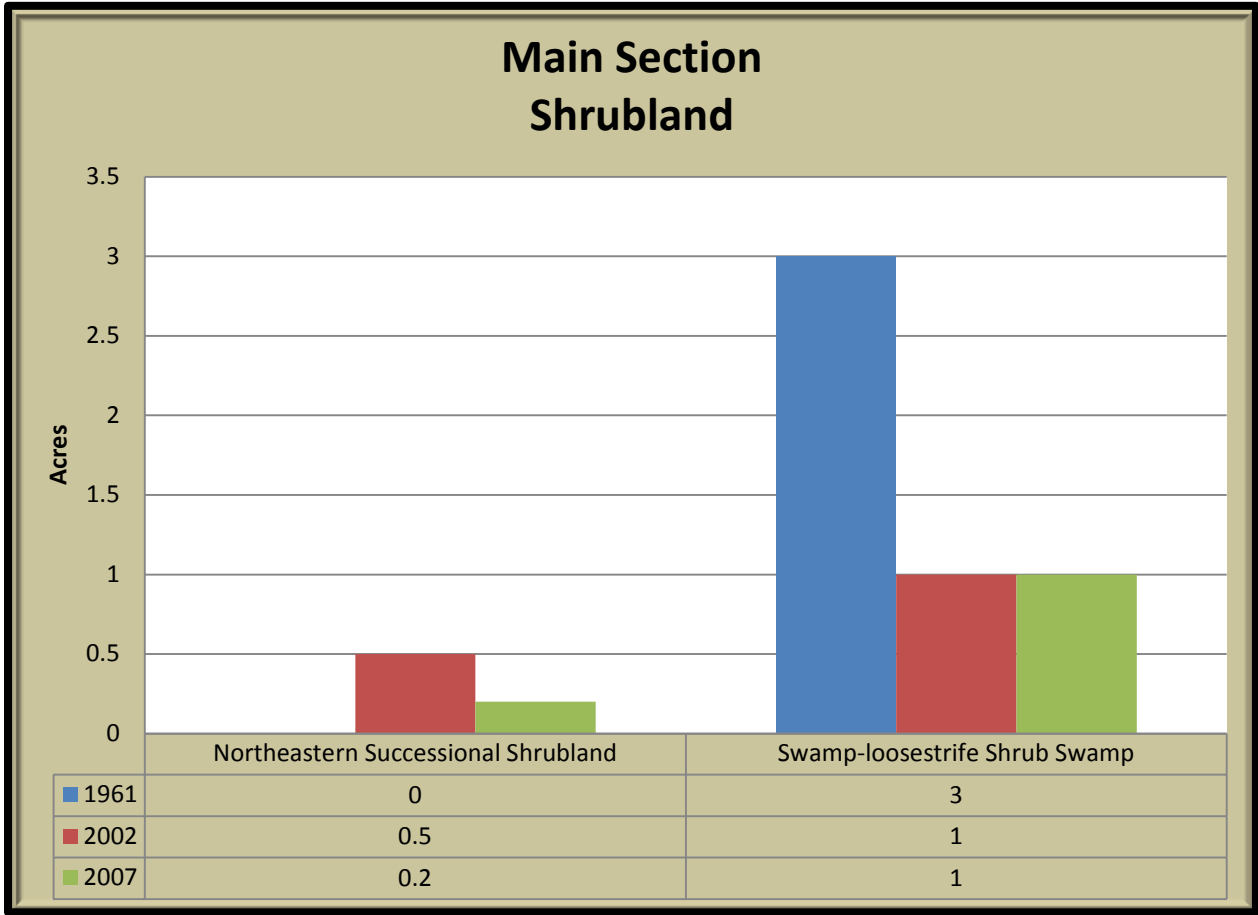
**Figure 4-3.5.** Main Section Forest (1961, 2002, and 2007)

**Main Section Forest (Figure 4-3.5):** Mid to Late Successional Loblolly Pine-Sweetgum Forest is the most common forest type in the Main Section, followed closely by Southern Red Oak/Heath Forest.

*Natural Capital* (Table 4-3.2)

Forestland capital has increased since 1961 and has been stable in the recent period (2002-2007).

<b>Table 4-3.2. Natural Capital of Main Section Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,035,512/year
2002	\$1,151,619/year
2007	\$1,151,619/year



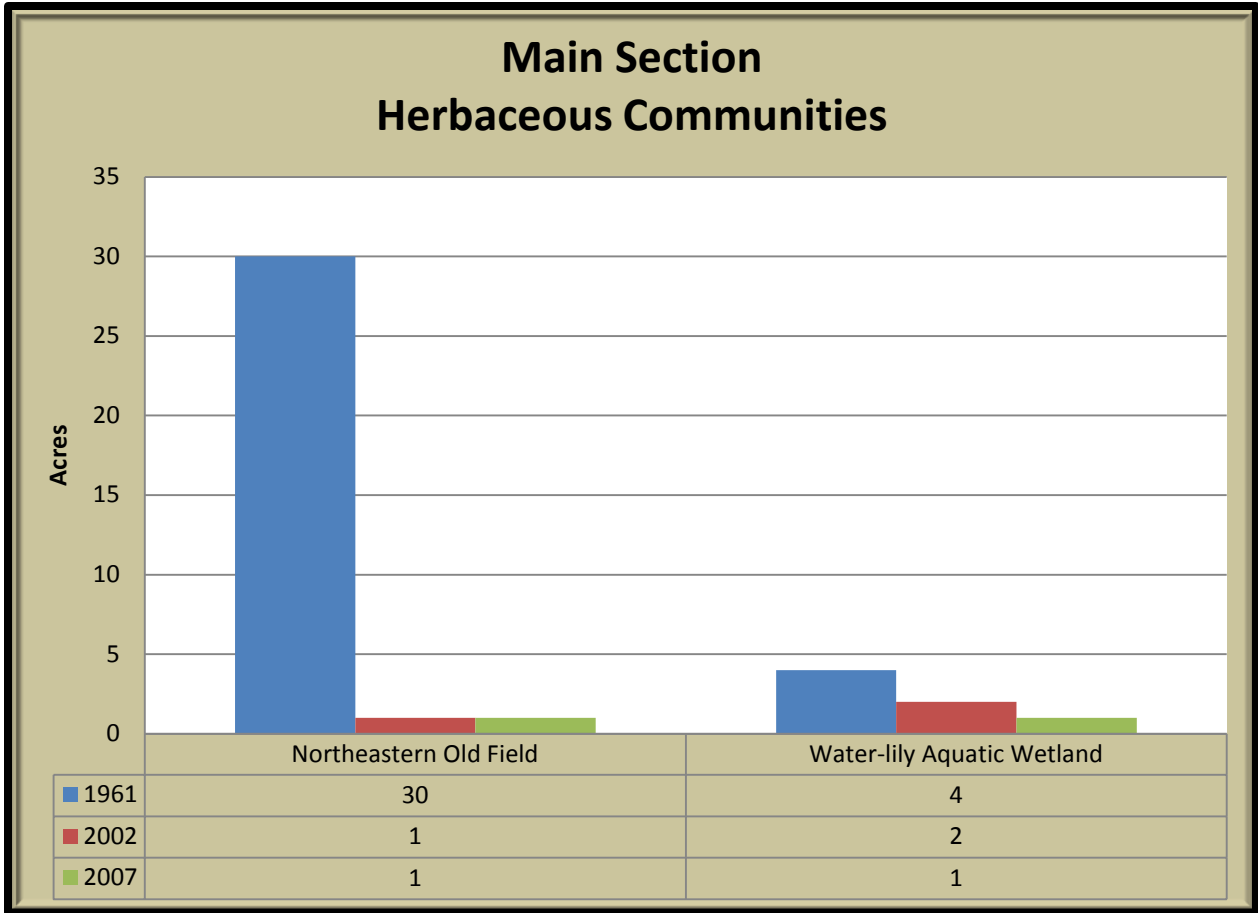
**Figure 4-3.6.** Main Section Shrubland (1961, 2002, and 2007)

**Main Section Shrubland (Figure 4-3.6):** Swamp-loosestrife Shrub Swamp is the most common shrubland in the main section and is found on the edges of Trap Pond.

*Natural Capital* (Table 4-3.3)

Like the herbaceous communities, shrubland has decreased over time. Swamp-loosestrife Shrub Swamp has declined in the pond leading to an overall decrease in capital.

Table 4-3.3. Natural Capital of Main Section Shrubland	
Year	Natural Capital (in 2012 dollars)
1961	\$27,843/year
2002	\$9,354/year
2007	\$9,310/year



**Figure 4-3.7.** Main Section Herbaceous Communities (1961, 2002, and 2007)

**Main Section Herbaceous Communities (Figure 4-3.7):** Northeastern Old Field and Water-lily Aquatic Wetland are tied for the most common herbaceous community in the Main Section. Northeastern Old Field has declined markedly since 1961.

*Natural Capital* (Table 4-3.4)

Herbaceous communities have decreased since 1961 with maturation of Northeastern Old Fields to shrubland and forest communities.

<b>Table 4-3.4. Natural Capital of Main Section Herbaceous Communities</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$41,497/year
2002	\$18,709/year
2007	\$9,427/year

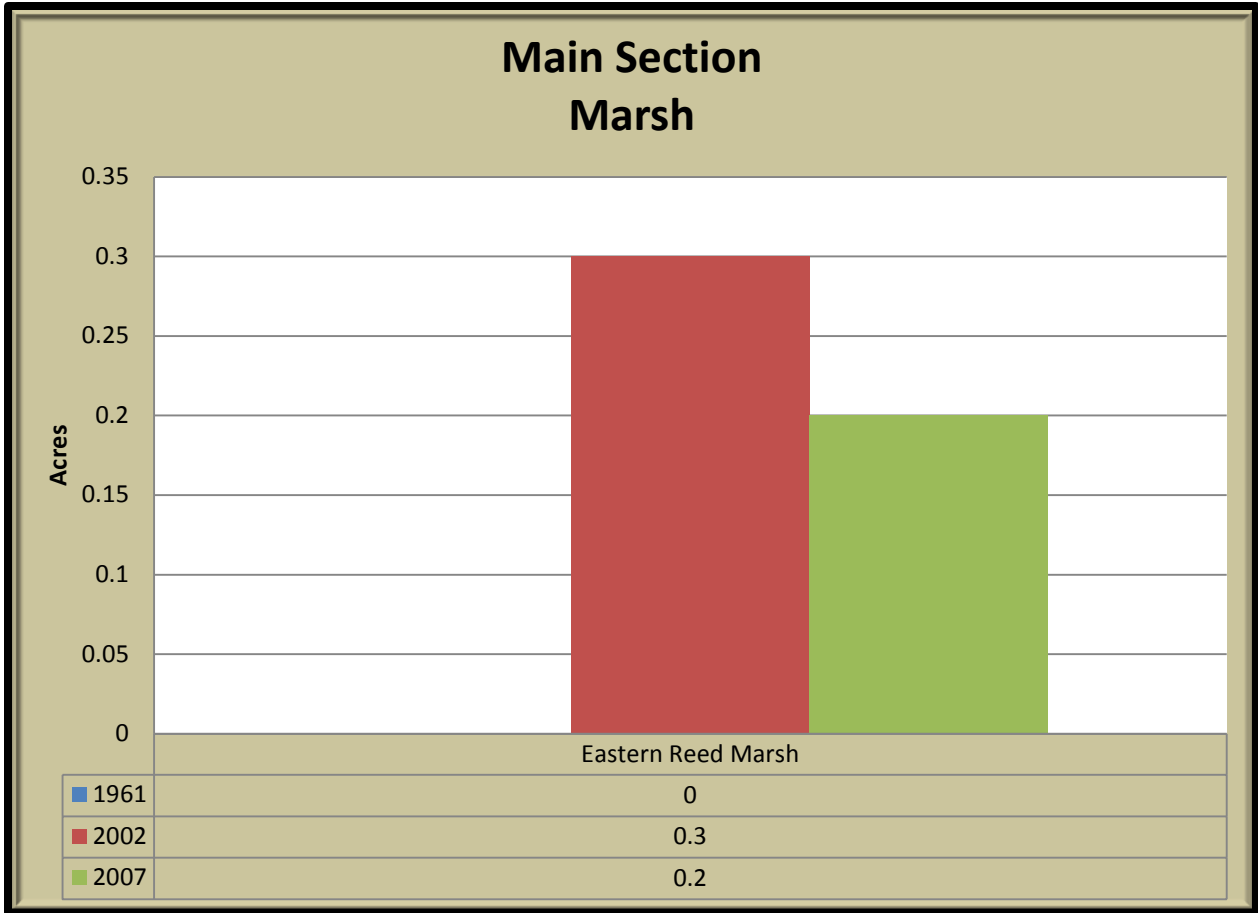


Figure 4-3.7. Main Section Marsh (1961, 2002, and 2007)

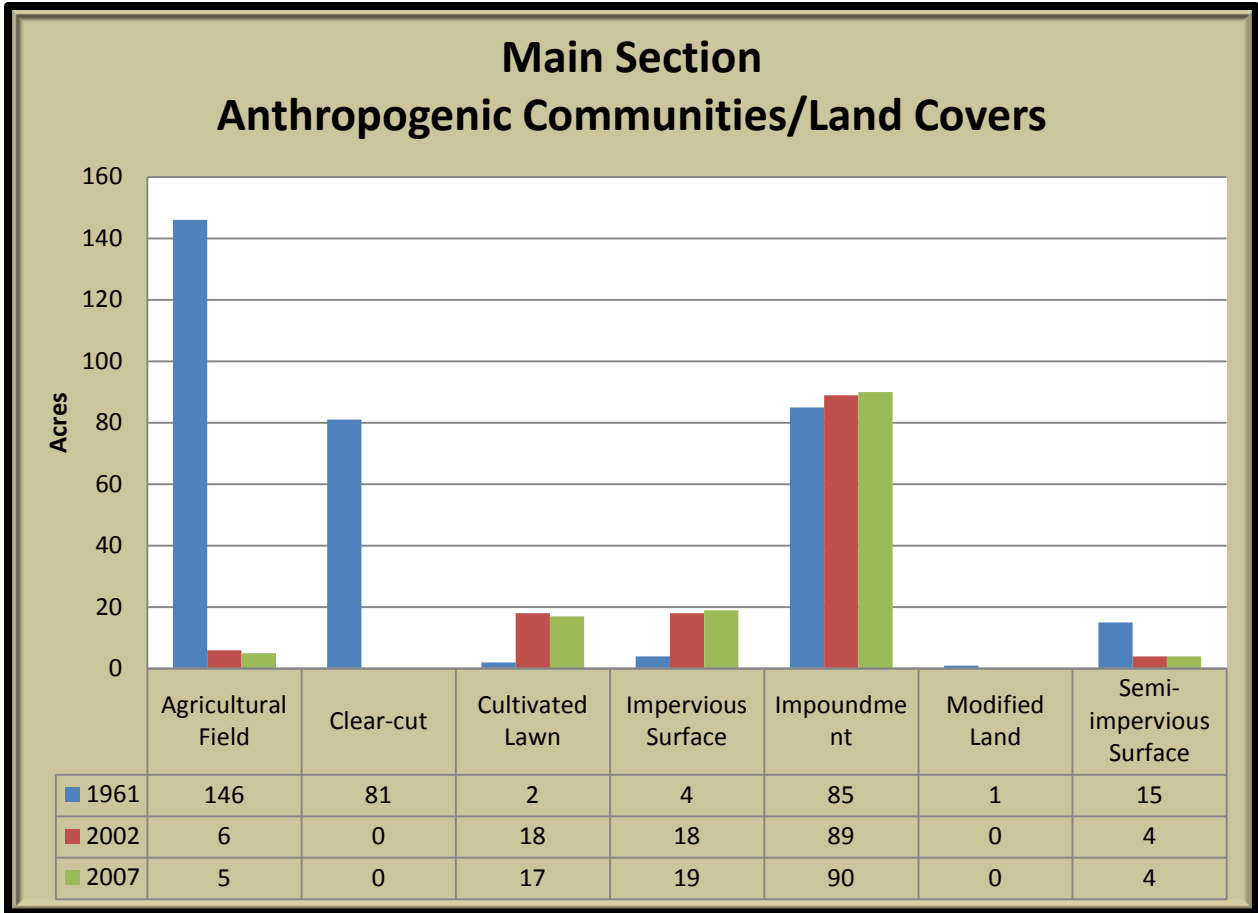
Main Section Marsh (Figure 4-3.7): Eastern Reed Marsh is the only marsh community in the Main Section.

Natural Capital (Table 4-3.4)

Marsh does not have much capital value in the Main Section. It was not present in 1961 and reached its highest amount in 2002 with a slight decrease to 2007.

Table 4-3.4. Natural Capital of Main Section Marsh	
Year	Natural Capital (in 2012 dollars)
1961	\$0/year (not present)
2002	\$2,784/year
2007	\$1,856/year





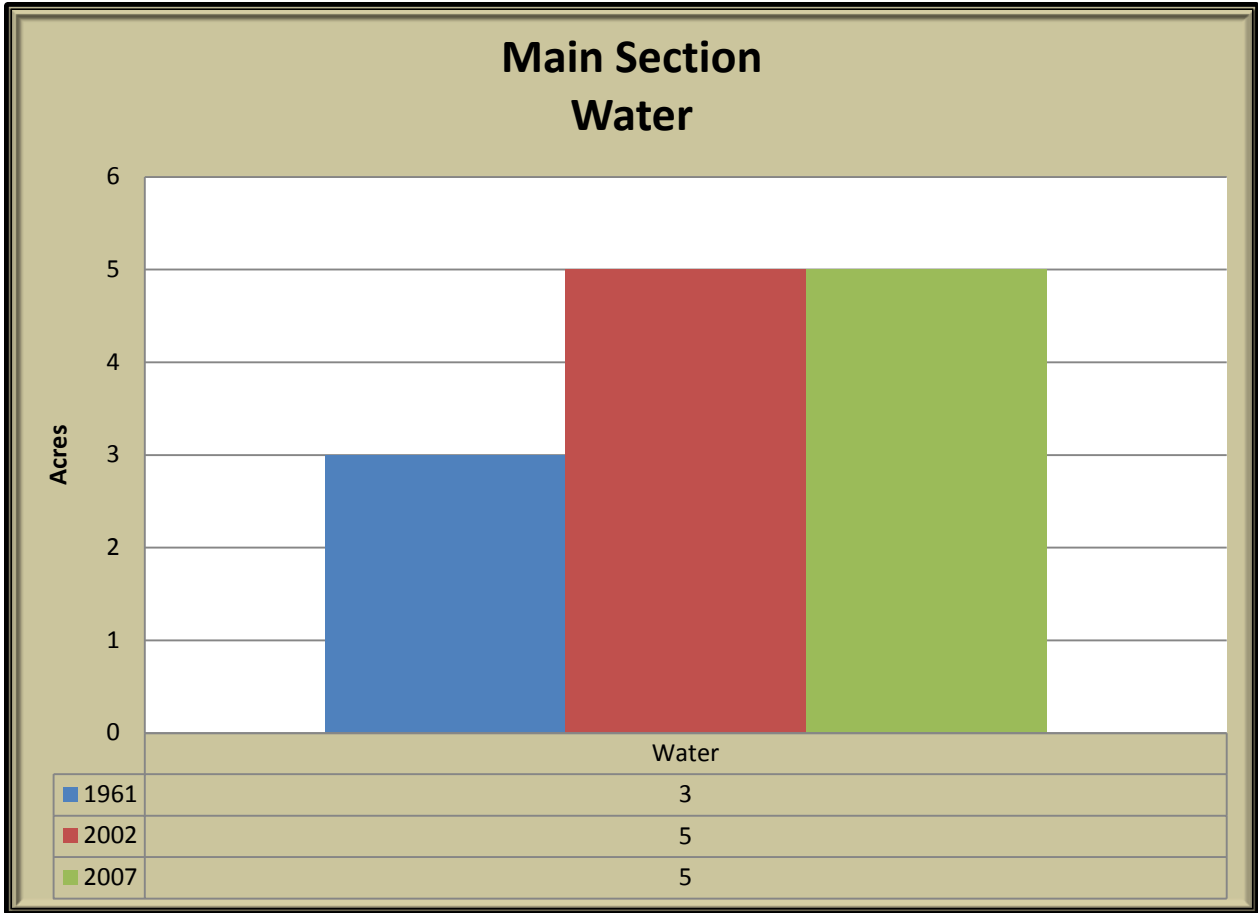
**Figure 4-3.8.** Main Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Main Section Anthropogenic Communities/Land Covers (Figure 4-3.8):** Impoundment (Trap Pond) is the largest anthropogenic community/land cover in the main section, followed by Impervious Surface.

*Natural Capital* (Table 4-3.5)

Agricultural field and impoundment are the only anthropogenic communities and land covers with capital value in the Main Section. While agricultural field is nearly gone from the section, impoundment has increased leading to an increase in the total capital value since 1961.

Year	Natural Capital (in 2012 dollars)
1961	\$461,857/year
2002	\$475,168/year
2007	\$480,446/year



**Figure 4-3.8.** Main Section Water (1961, 2002, and 2007)

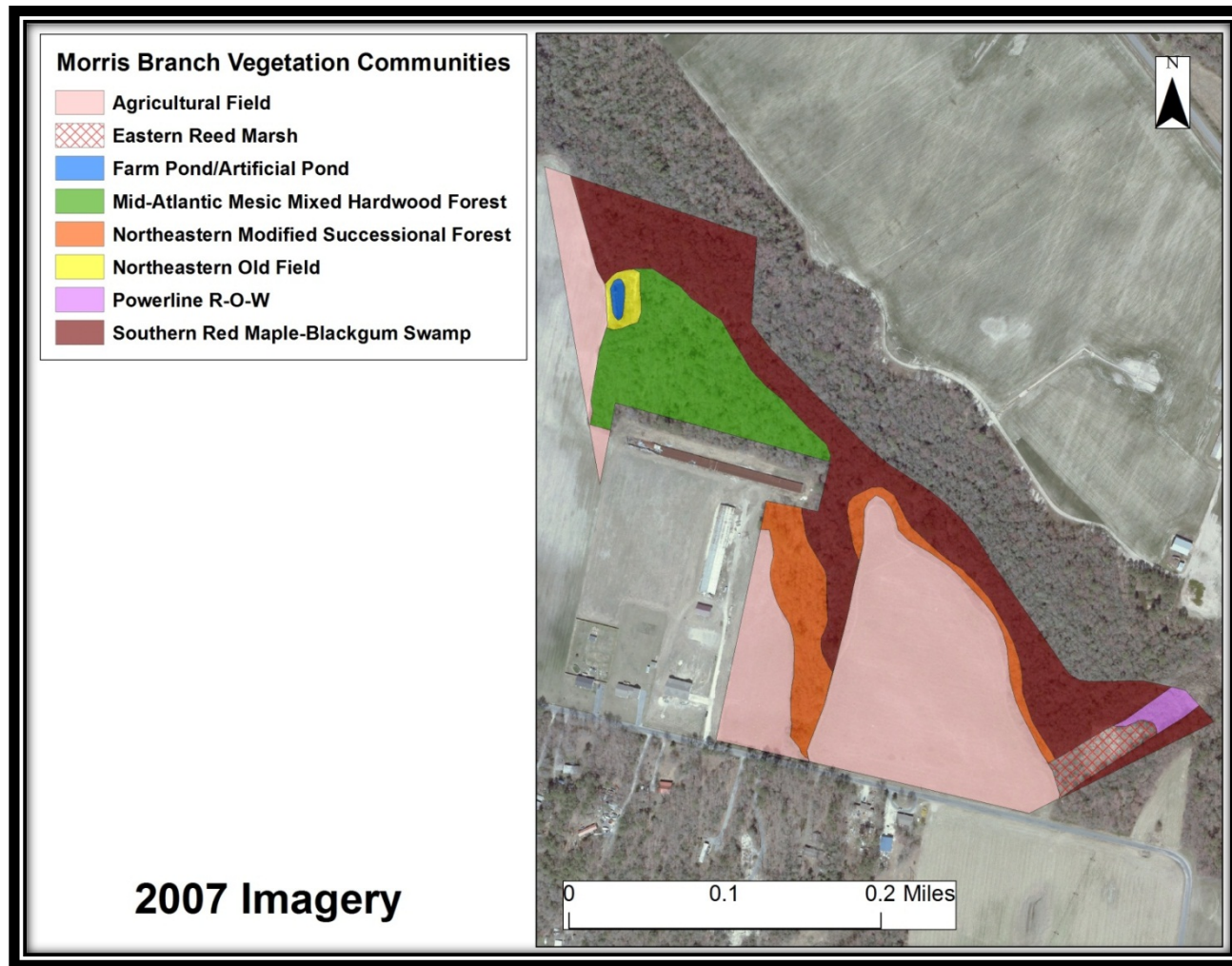
**Main Section Water (Figure 4-3.8):** The coverage of water has increased in the Main Section since 1961. It has been stable in the recent period (2002-2007).

*Natural Capital* (Table 4-3.5)

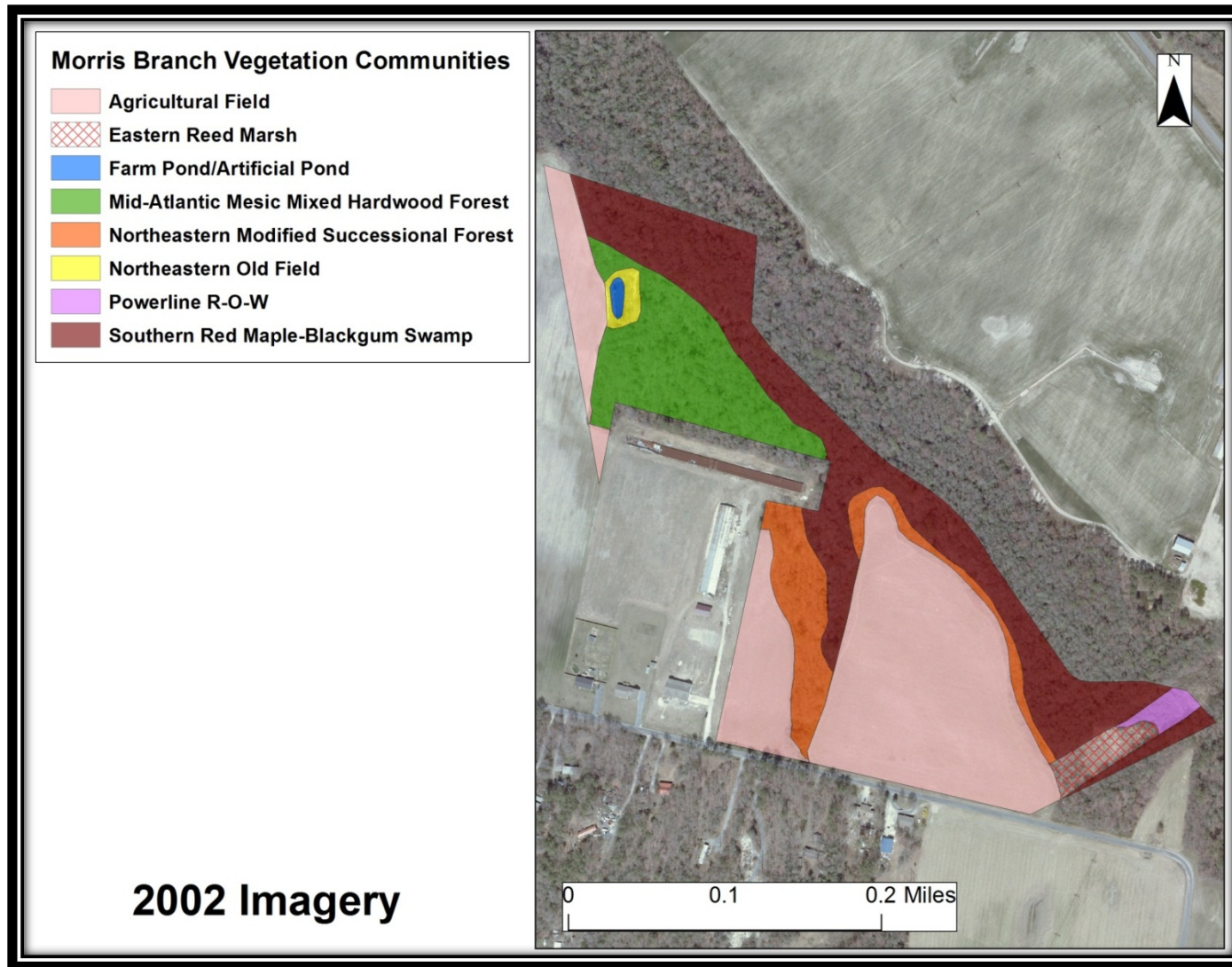
The capital of water has increased since 1961 along with its acreage.

<b>Table 4-3.5. Natural Capital of Main Section Water</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$16,005/year
2002	\$26,676/year
2007	\$26,676/year

#### 4. Morris Branch Section

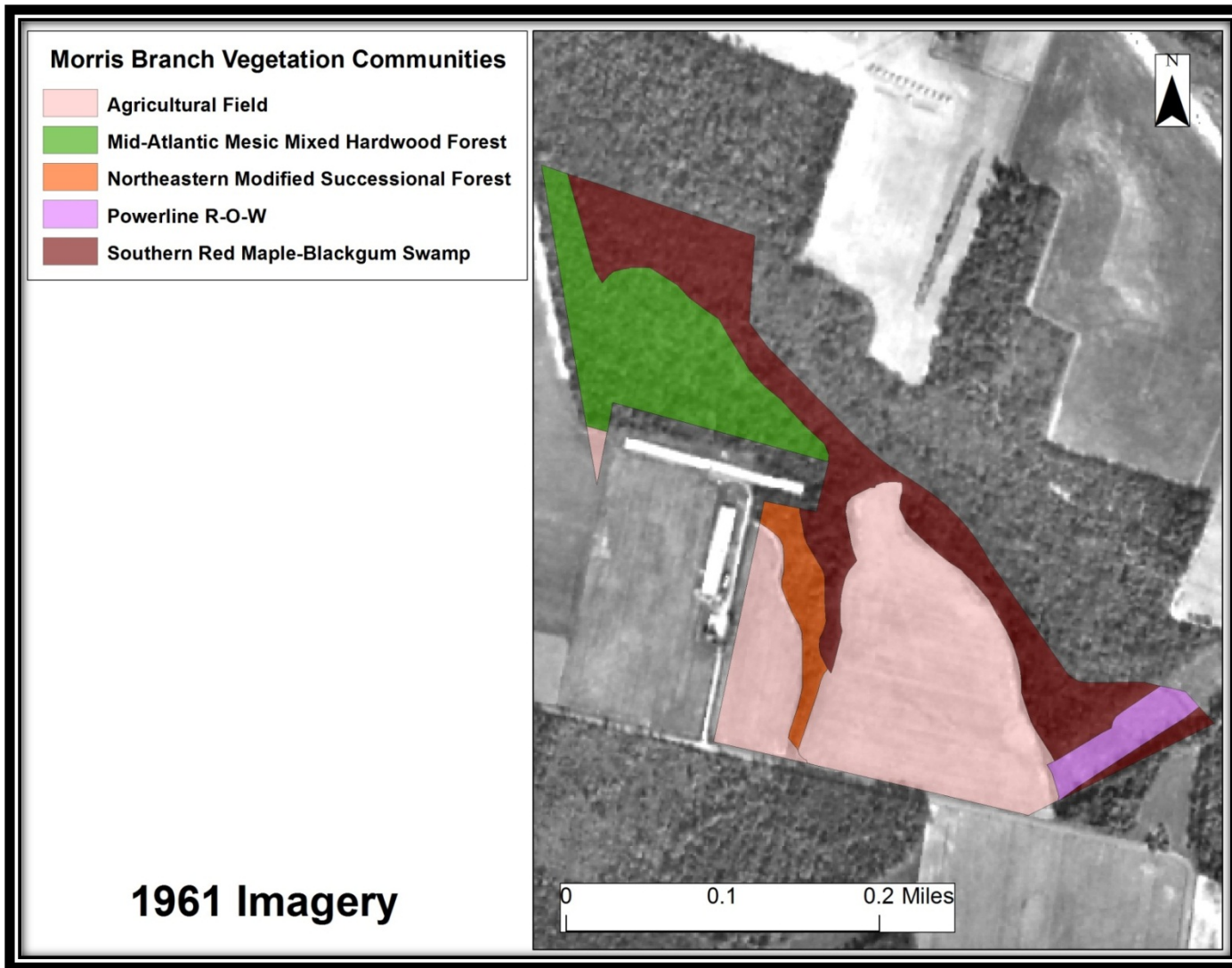


**Figure 4-4.1.** 2007 Vegetation Community Map of the Morris Branch Section

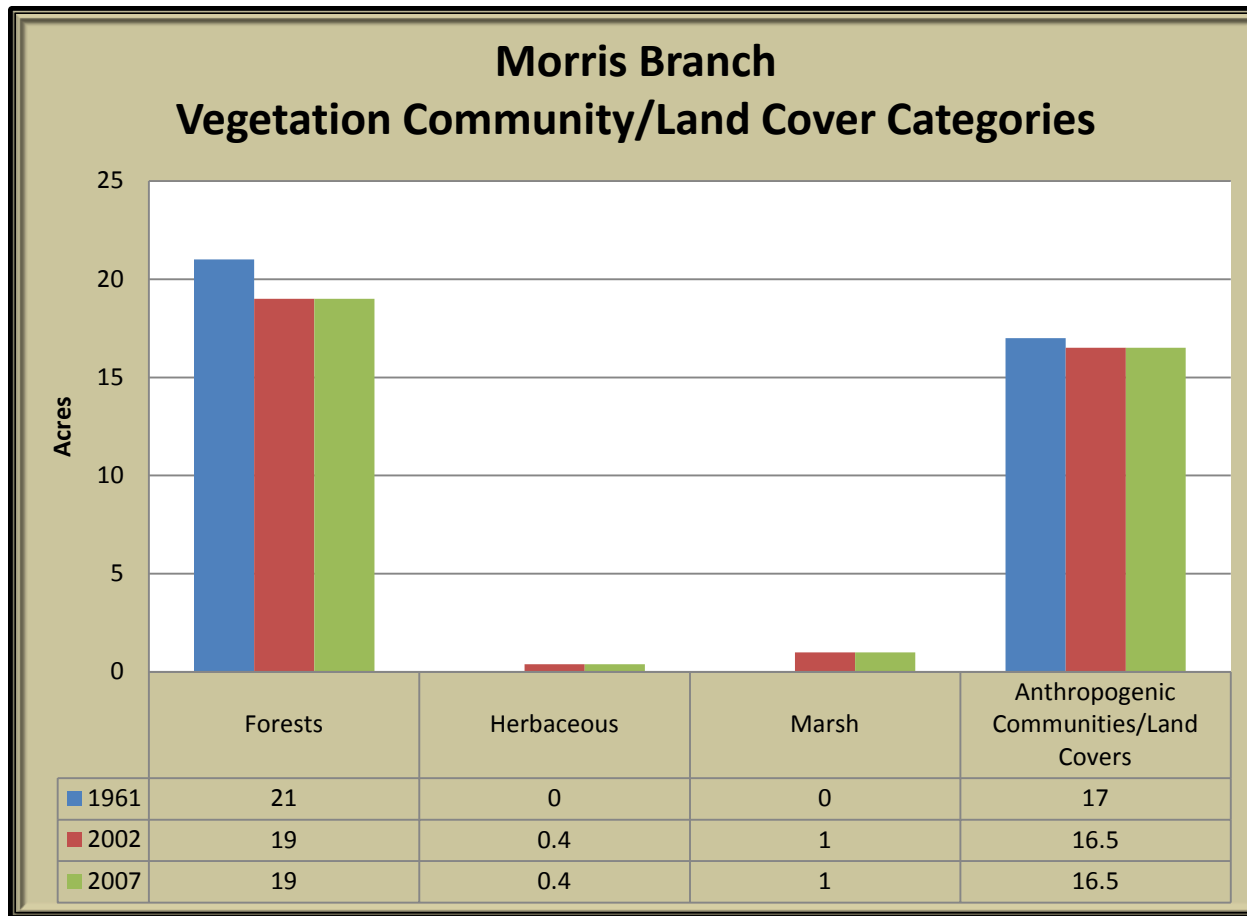


**Figure 4-4.2.** 2002 Vegetation Community Map of the Morris Branch Section





**Figure 4-4.3.** 1961 Vegetation Community Map of the Morris Branch Section



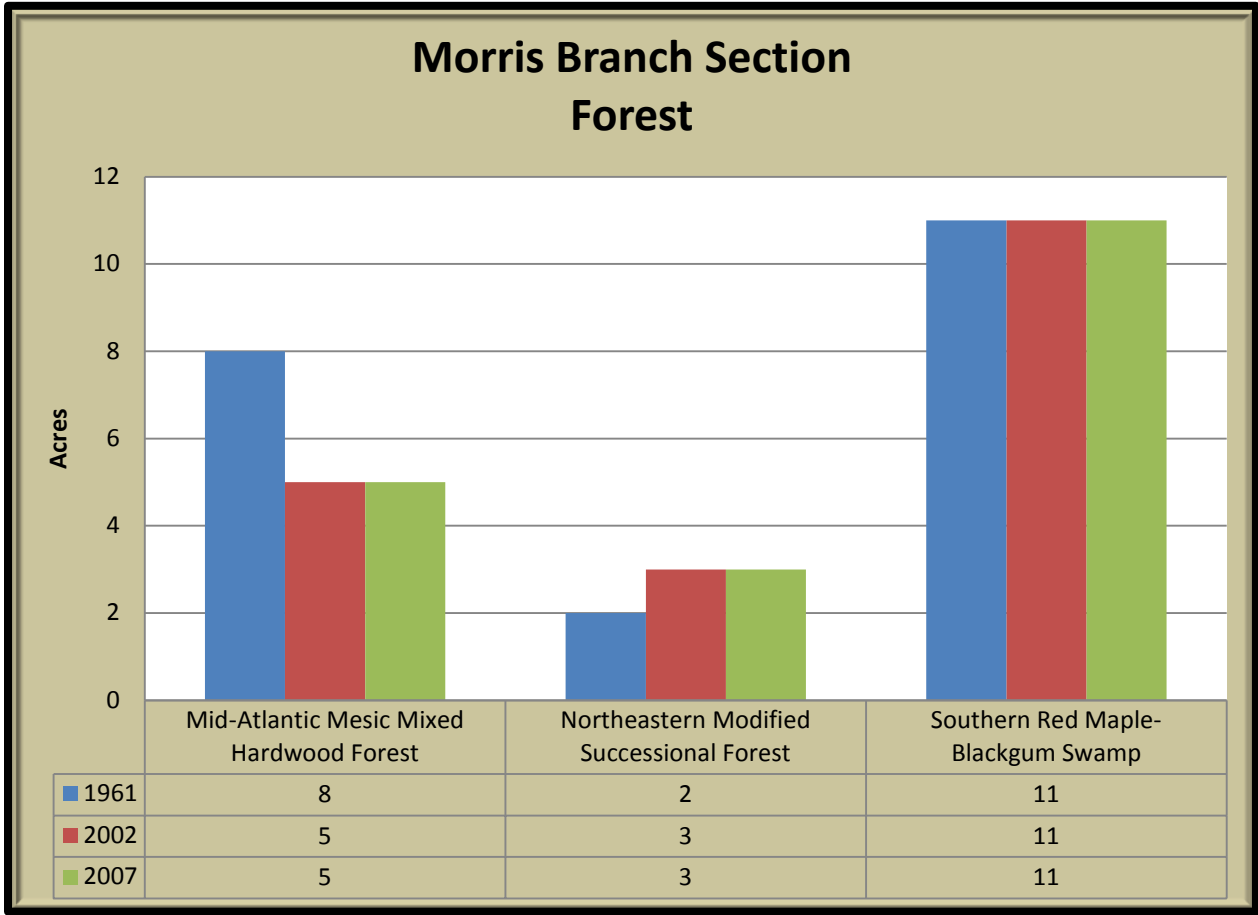
**Figure 4-4.4.** Morris Branch Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Morris Branch Section Vegetation Community/Land Covers (Figure 4-4.4):** Forestland is the most common vegetation community type in the Morris Branch Section, followed closely by anthropogenic communities/land covers.

*Natural Capital* (Table 4-4.1)

Capital in the Morris Branch Section has increased since 1961, with the appearance of marsh and herbaceous communities.

<b>Table 4-4.1. Natural Capital of the Morris Branch Section</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$138,015/year
2002	\$147,510/year
2007	\$147,510/year



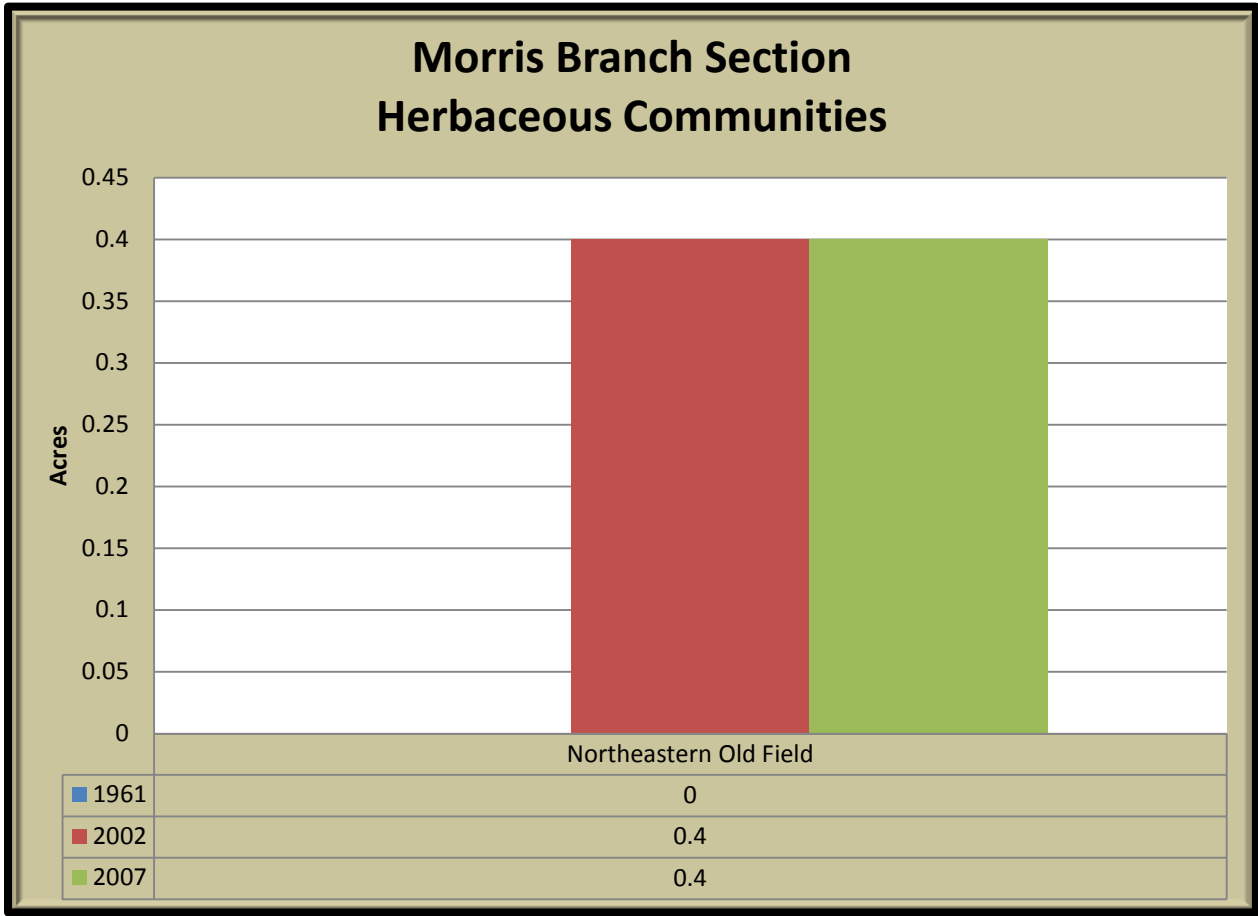
**Figure 4-4.5.** Morris Branch Section Forest (1961, 2002, and 2007)

**Morris Branch Section Forest (Figure 4-4.5):** Southern Red Maple-Blackgum Swamp is the most common forest community in the Morris Branch section.

*Natural Capital* (Table 4-4.2)

Forestland capital has decreases slightly with a decrease in the acreage of Mid-Atlantic Mesic Mixed Hardwood Forest.

Table 4-4.2. Natural Capital of Morris Branch Section Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$137,098/year
2002	\$136,719/year
2007	\$136,719/year



**Figure 4-4.6.** Morris Branch Section Herbaceous Communities (1961, 2002, and 2007)

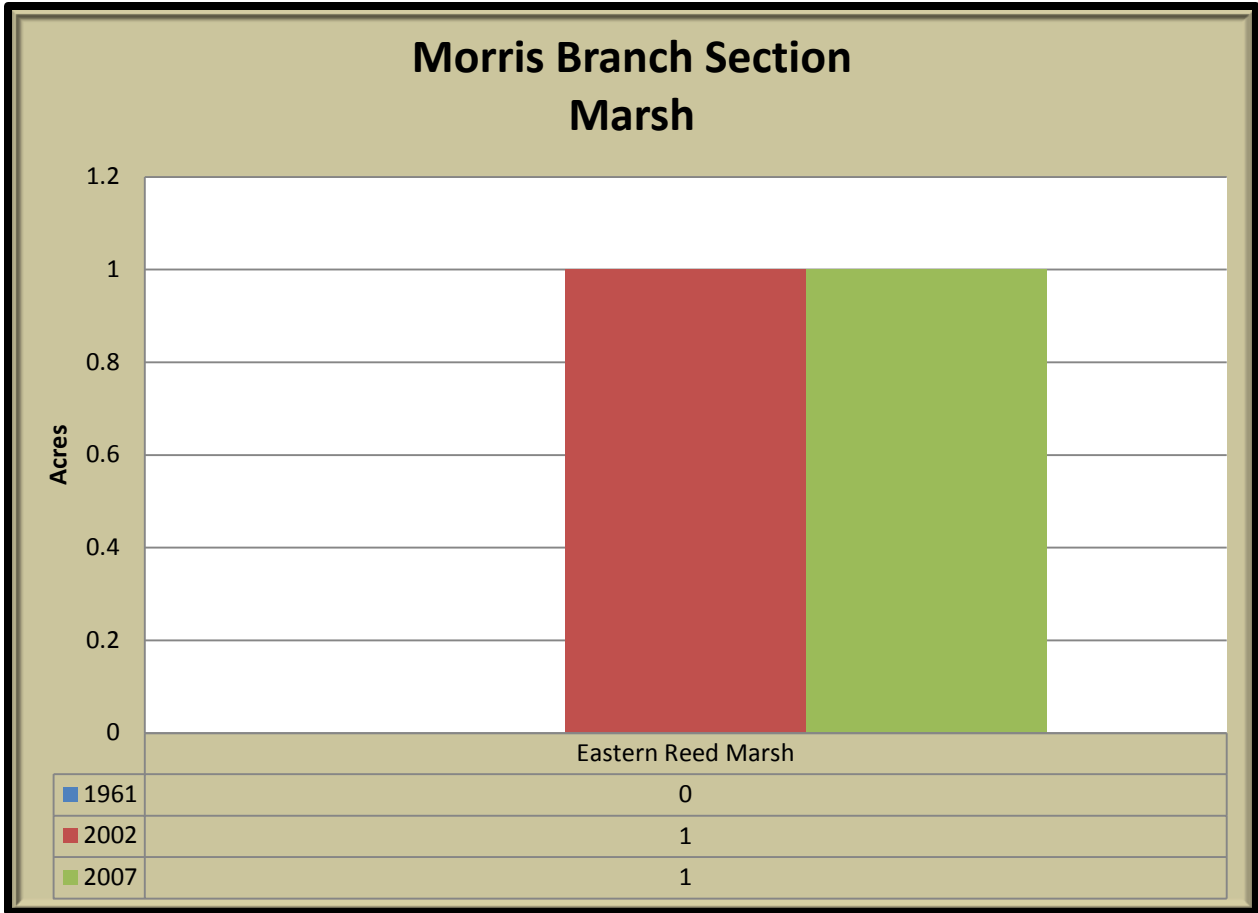
**Morris Branch Section Herbaceous Communities (Figure 4-4.6):** Northeastern Old Field is the only herbaceous community present in the Morris Branch section.

*Natural Capital (Table 4-4.3)*

Northeastern Old Field has appeared since 1961 and has contributed to an increase in overall capital for the section.

<b>Table 4-4.3. Natural Capital of Morris Branch Section</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$58/year
2007	\$58/year





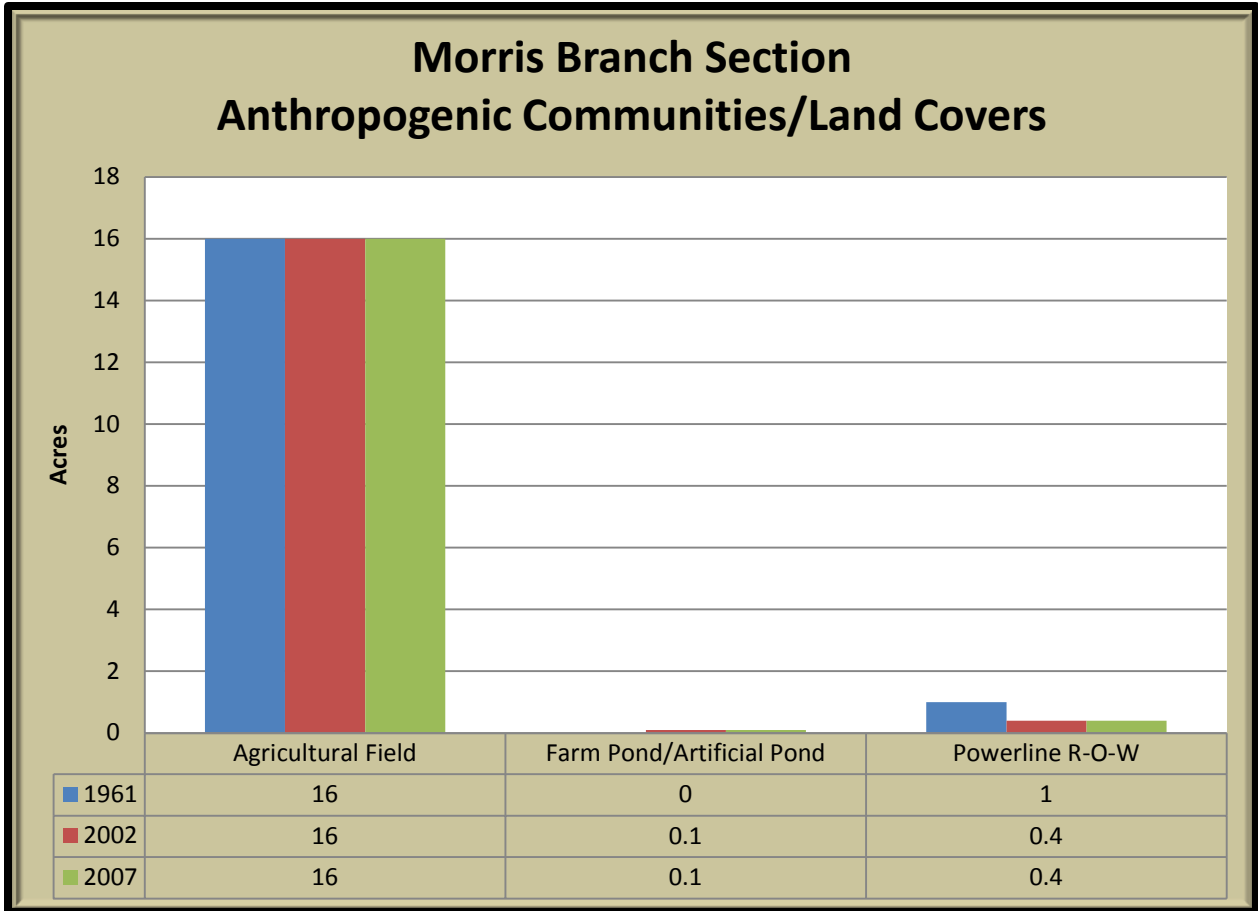
**Figure 4-4.7.** Morris Branch Section Marsh (1961, 2002, and 2007)

**Morris Branch Section Marsh (Figure 4-4.7):** Eastern Reed Marsh is the only marsh community in the Morris Branch section.

*Natural Capital* (Table 4-4.4)

Marsh was not present in 1961 and has since gained \$9,281 in capital for the section.

<b>Table 4-4.4. Natural Capital of Morris Branch Section Marsh</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$9,281/year
2007	\$9,281/year



**Figure 4-4.8.** Morris Branch Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Morris Branch Section Herbaceous Communities (Figure 4-4.8):** Agricultural Field is the most common anthropogenic community/land cover.

*Natural Capital*

Capital of anthropogenic communities/land covers has increased with the development of a pond in the Morris Branch Section.

<b>Table 4-4.4. Natural Capital of Morris Branch Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$918/year
2002	\$1,451/year
2007	\$1,451/year

## 5. Raccoon Prong Section

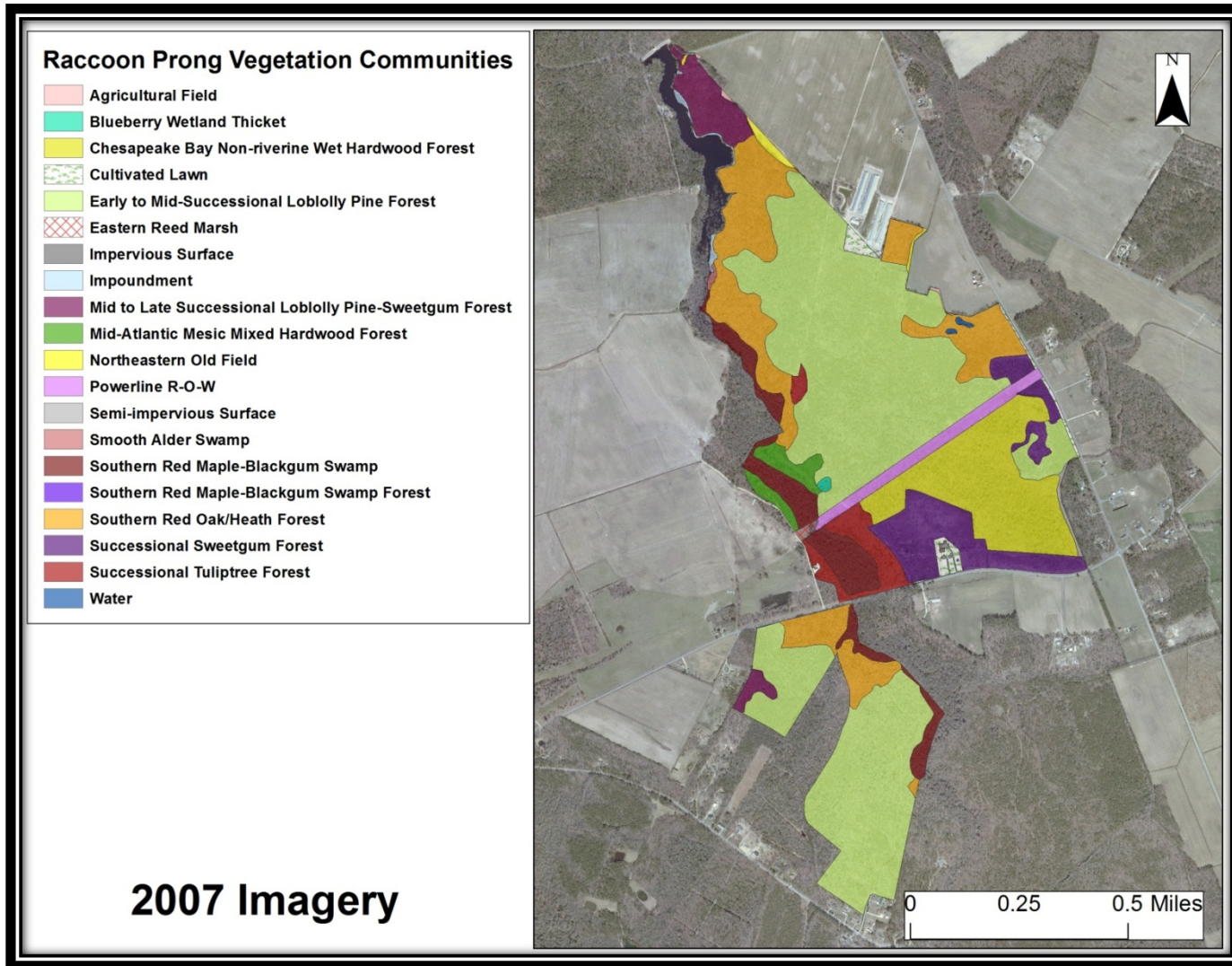


Figure 4-5.1. 2007 Vegetation Community Map of the Raccoon Prong Section

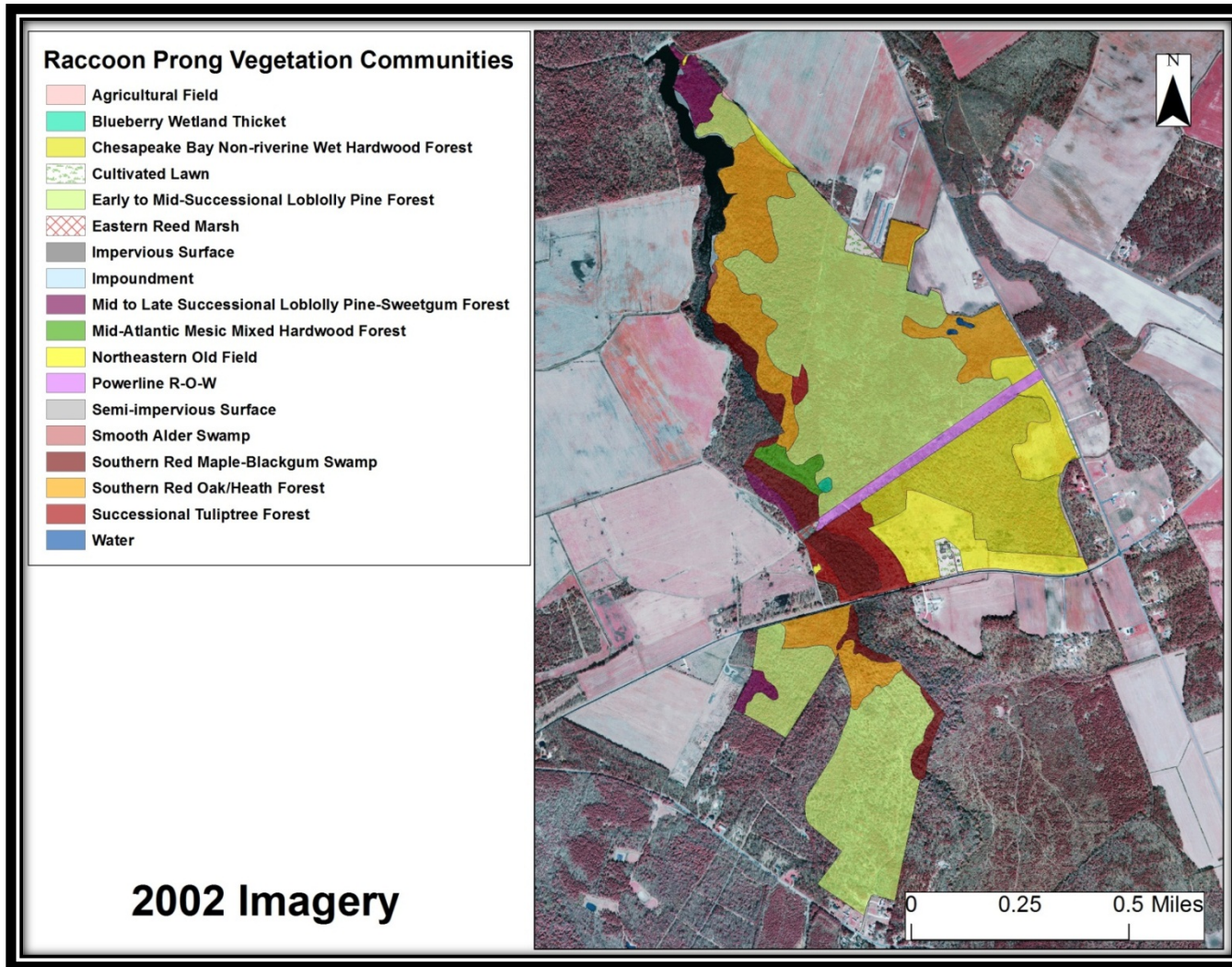


Figure 4-5.2. 2002 Vegetation Community Map of the Raccoon Prong Section



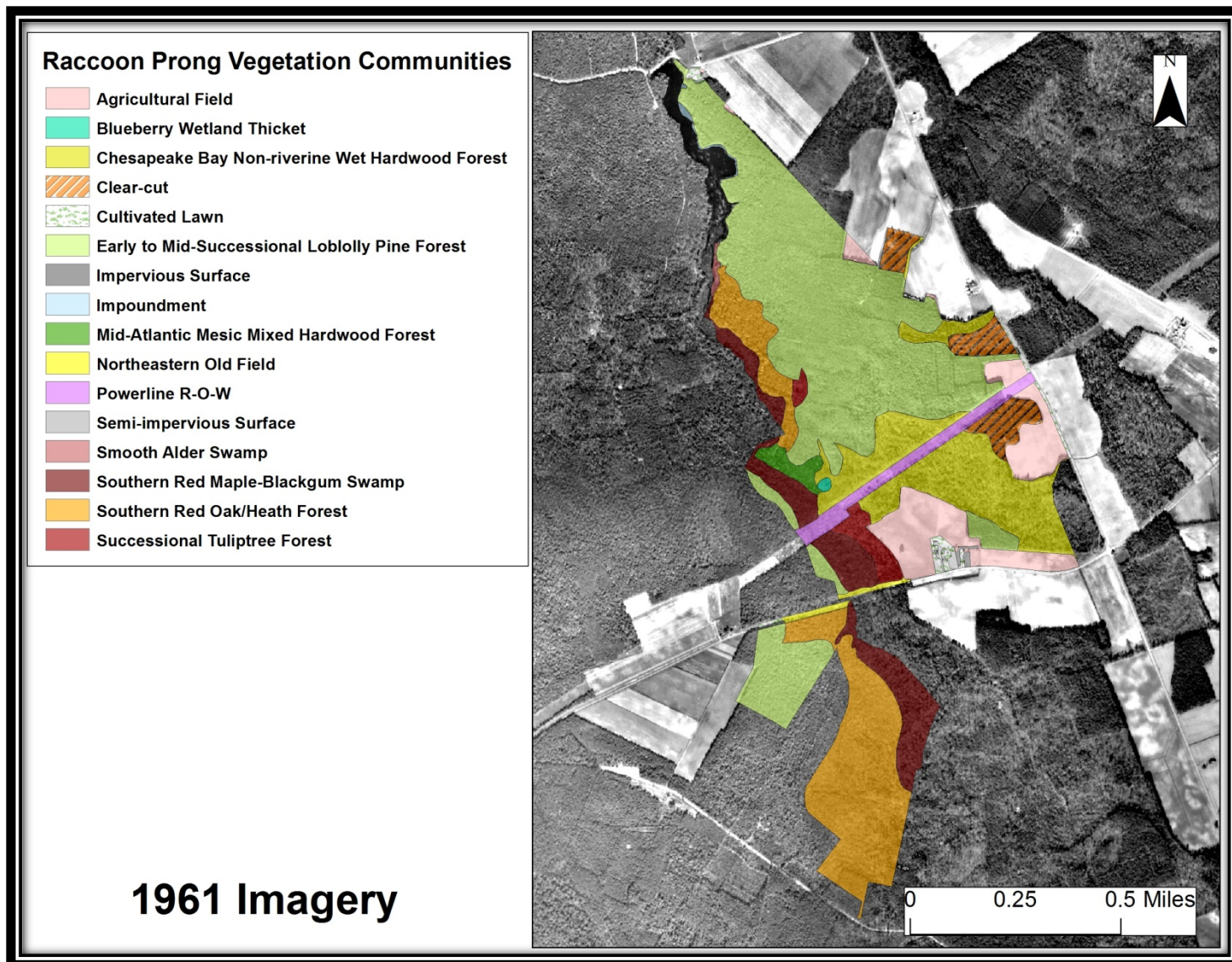
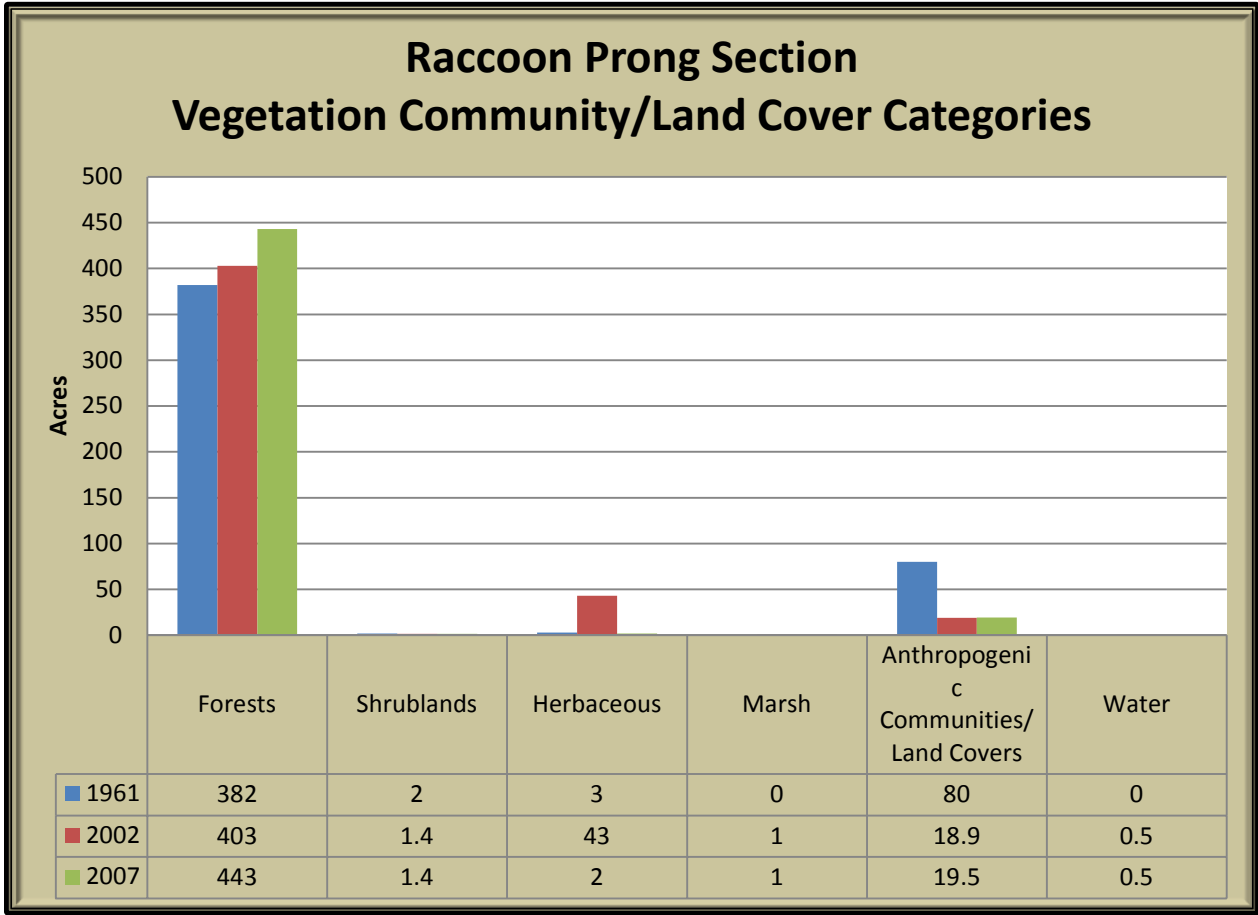


Figure 4-5.3. 1961 Vegetation Community Map of the Raccoon Prong Section





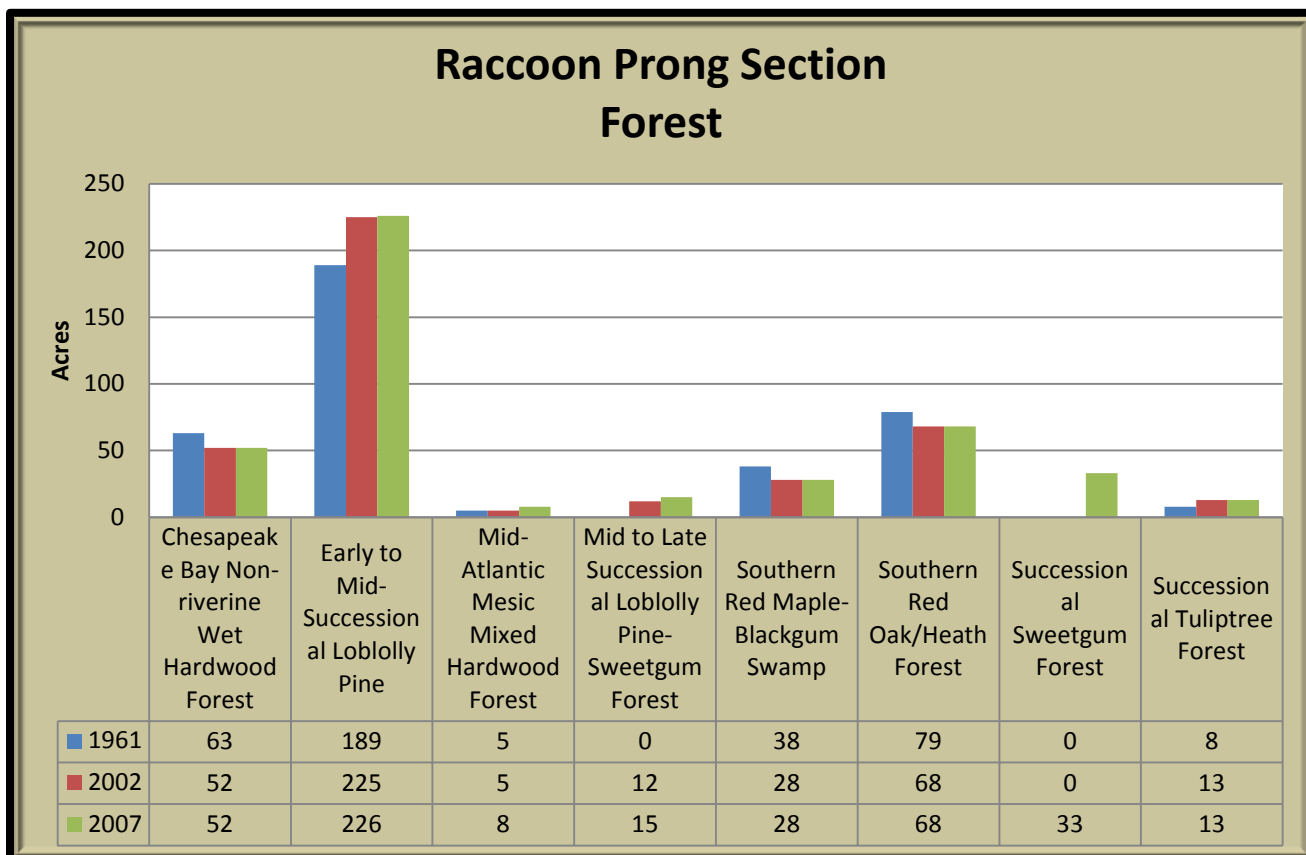
**Figure 4-5.4.** Raccoon Prong Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Raccoon Prong Section Vegetation Community/Land Covers (Figure 4-5.4):** Forest is the most vegetation community type in the Raccoon Prong Section, followed very distantly by Anthropogenic Communities/Land Covers.

*Natural Capital* (Table 4-5.1)

Capital of the Raccoon Prong Section has declined overall since 1961, but has posted an increase in capital for the recent period (2002-2007). Most of the decrease has been due to a loss in wetland forest.

<b>Table 4-5.1. Natural Capital of the Raccoon Prong Section</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,321,322/year
2002	\$1,080,971/year
2007	\$1,082,561/year



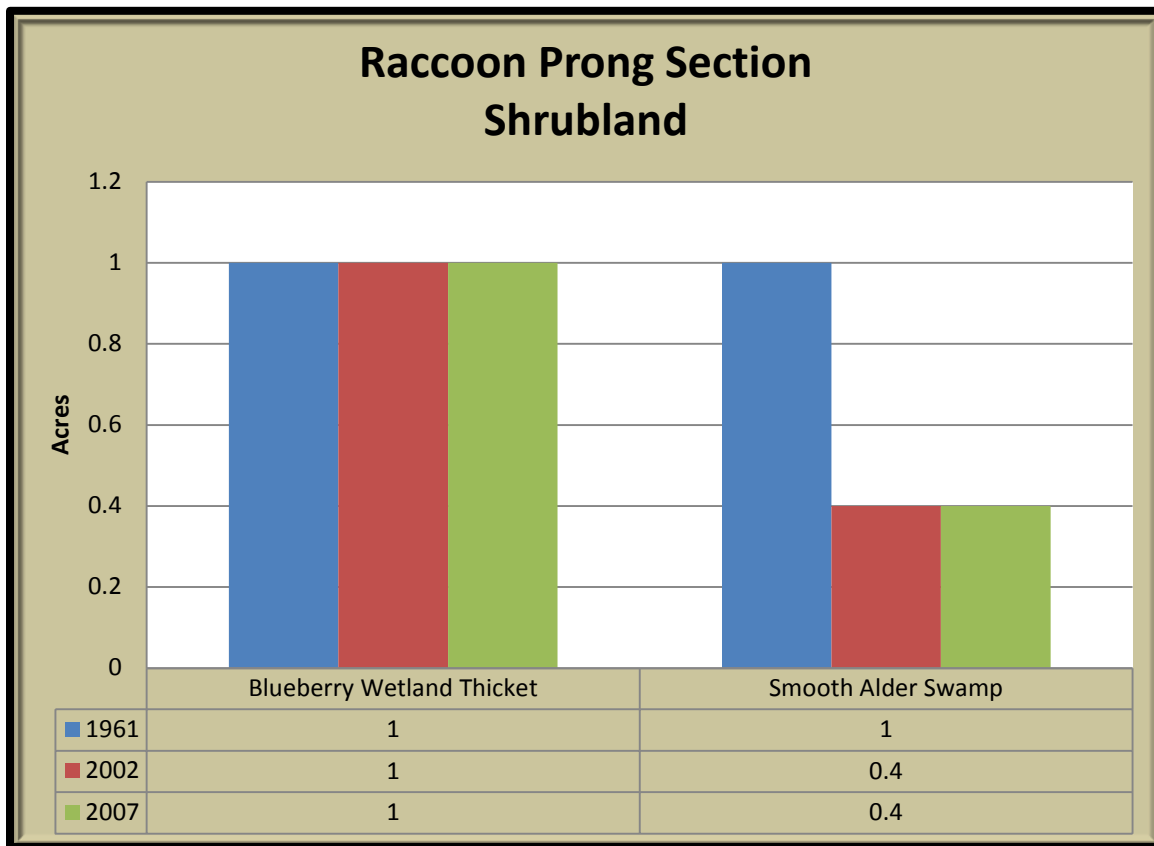
**Figure 4-5.5.** Raccoon Prong Section Forest (1961, 2002, and 2007)

**Raccoon Prong Section Forest (Figure 4-5.5):** Early to Mid-Successional Loblolly Pine Forest is the most common forest community, followed distantly by Southern Red Oak/Heath Forest. This site conditions in this area, with a lot of sand, appear to cause a slow successional process, making the successional pine forests older than average.

*Natural Capital* (Table 4-5.2)

Capital of forest has decreased overall with declines in wetland forest due to cutting. In the recent period, however, the capital appears to be coming back with the re-maturation of forests.

Table 4-5.2. Natural Capital of Raccoon Prong Section Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$1,294,579/year
2002	\$1,044,399/year
2007	\$1,051,963/year



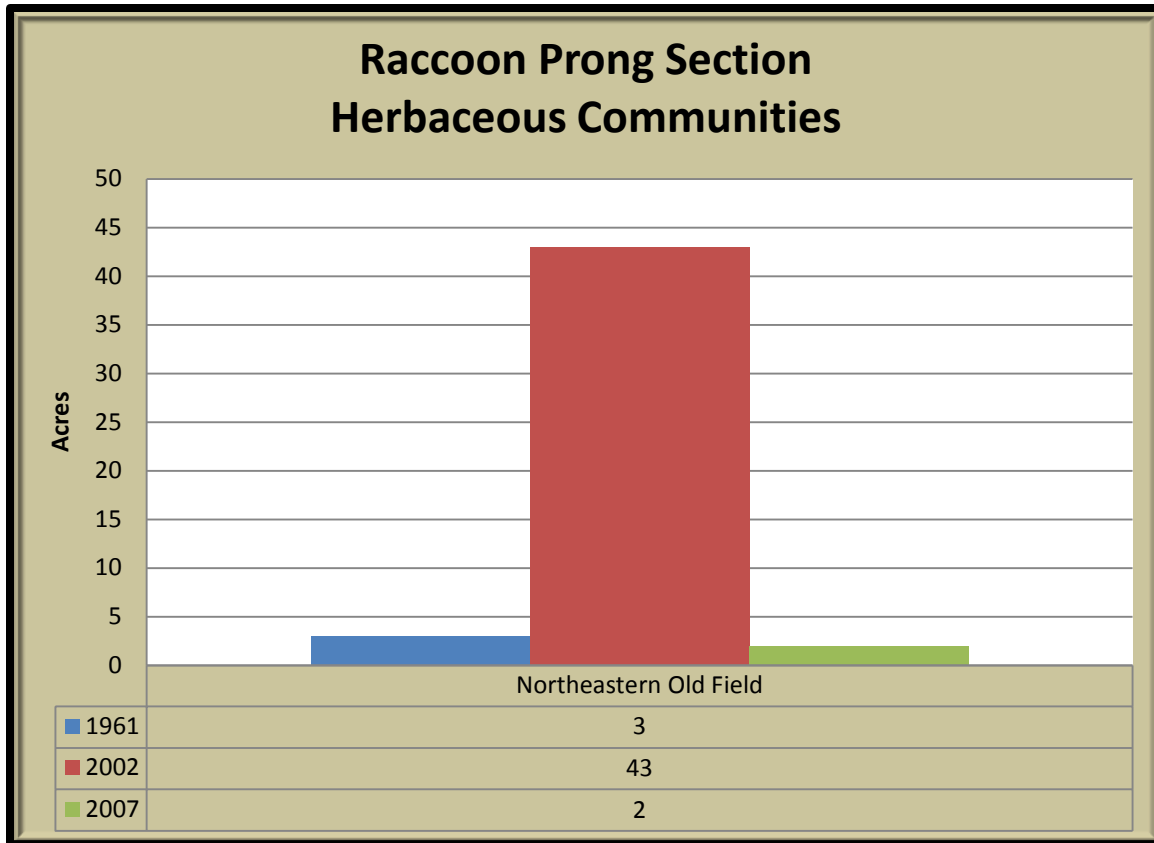
**Figure 4-5.5.** Raccoon Prong Section Shrubland (1961, 2002, and 2007)

**Raccoon Prong Section Shrubland (Figure 4-5.5):** Blueberry Wetland Thicket is the largest shrubland of two shrublands present in the section.

*Natural Capital (Table 4-5.3)*

Shrubland capital has decreased with a loss in acreage of Smooth Alder Swamp. It has been stable in the recent period.

Table 4-5.3. Natural Capital of Raccoon Prong Section Shrubland	
Year	Natural Capital (in 2012 dollars)
1961	\$18,563/year
2002	\$12,994/year
2007	\$12,994/year



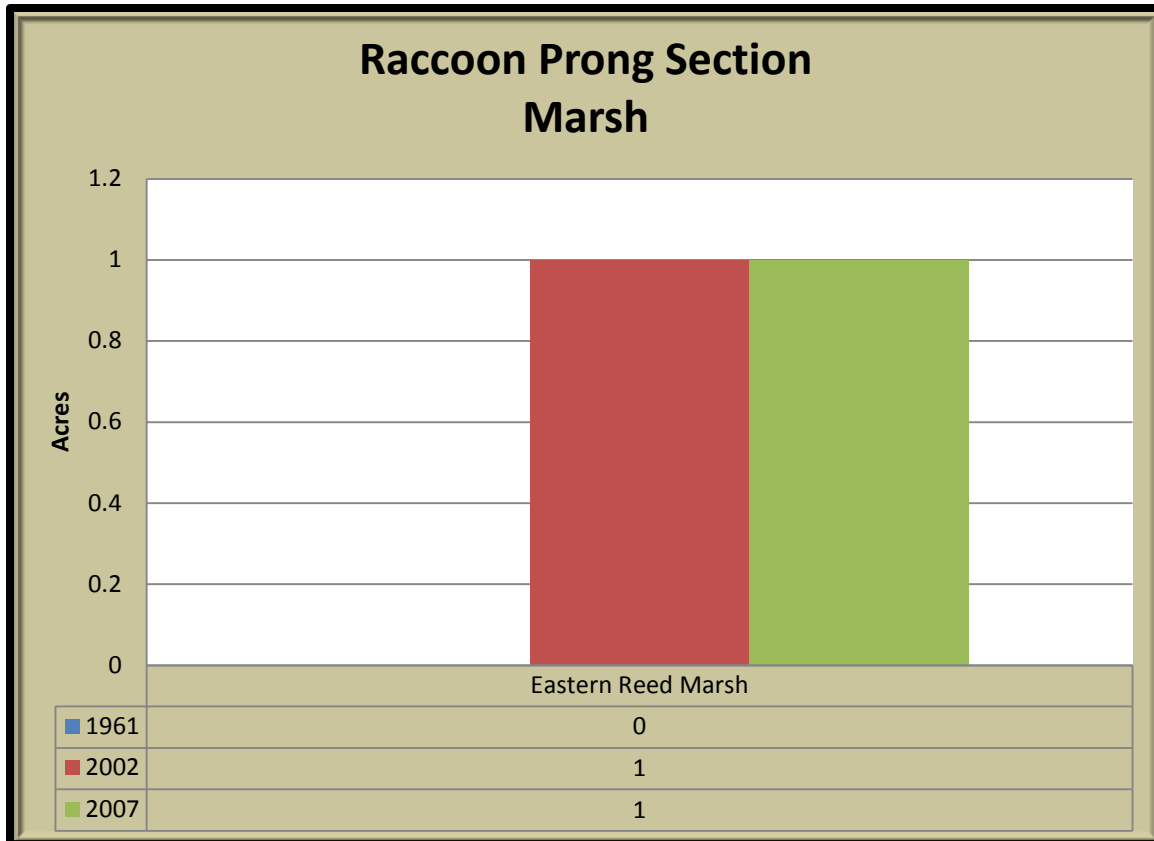
**Figure 4-5.5.** Raccoon Prong Section Herbaceous Communities (1961, 2002, and 2007)

**Raccoon Prong Section Herbaceous Communities (Figure 4-5.5):** Northeastern Old Field is the only herbaceous community in the Raccoon Prong Section and its acreage has fluctuated with agricultural fields being abandoned and the fields maturing to shrubland and successional forest communities.

*Natural Capital (Table 4-5.4)*

The capital of herbaceous communities has fluctuated wildly along with its acreage as these communities appear from abandoned agricultural fields and then mature into shrubland or forest.

Table 4-5.4. Natural Capital of Raccoon Prong Section Herbaceous Communities	
Year	Natural Capital (in 2012 dollars)
1961	\$437/year
2002	\$6,265/year
2007	\$291/year



**Figure 4-5.5.** Raccoon Prong Section Marsh (1961, 2002, and 2007)

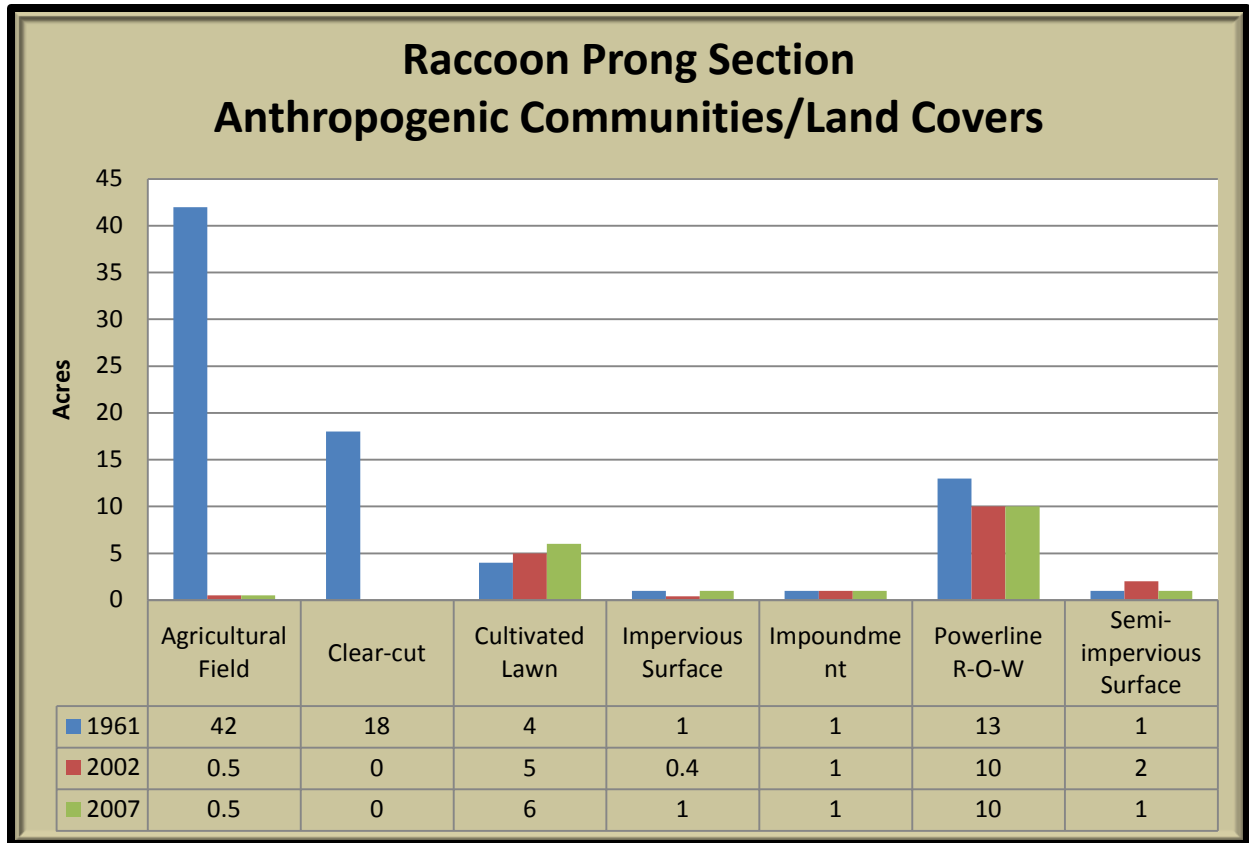
**Raccoon Prong Section Marsh (Figure 4-5.5):** Eastern Reed Marsh is the only marsh community present in the Raccoon Prong Section. It was not present in 1961.

*Natural Capital (Table 4-5.5)*

Marsh was not present in 1961 and has since gained \$9,281 in capital for the section.

<b>Table 4-5.5. Natural Capital of Raccoon Prong Section Marsh</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$9,281/year
2007	\$9,281/year





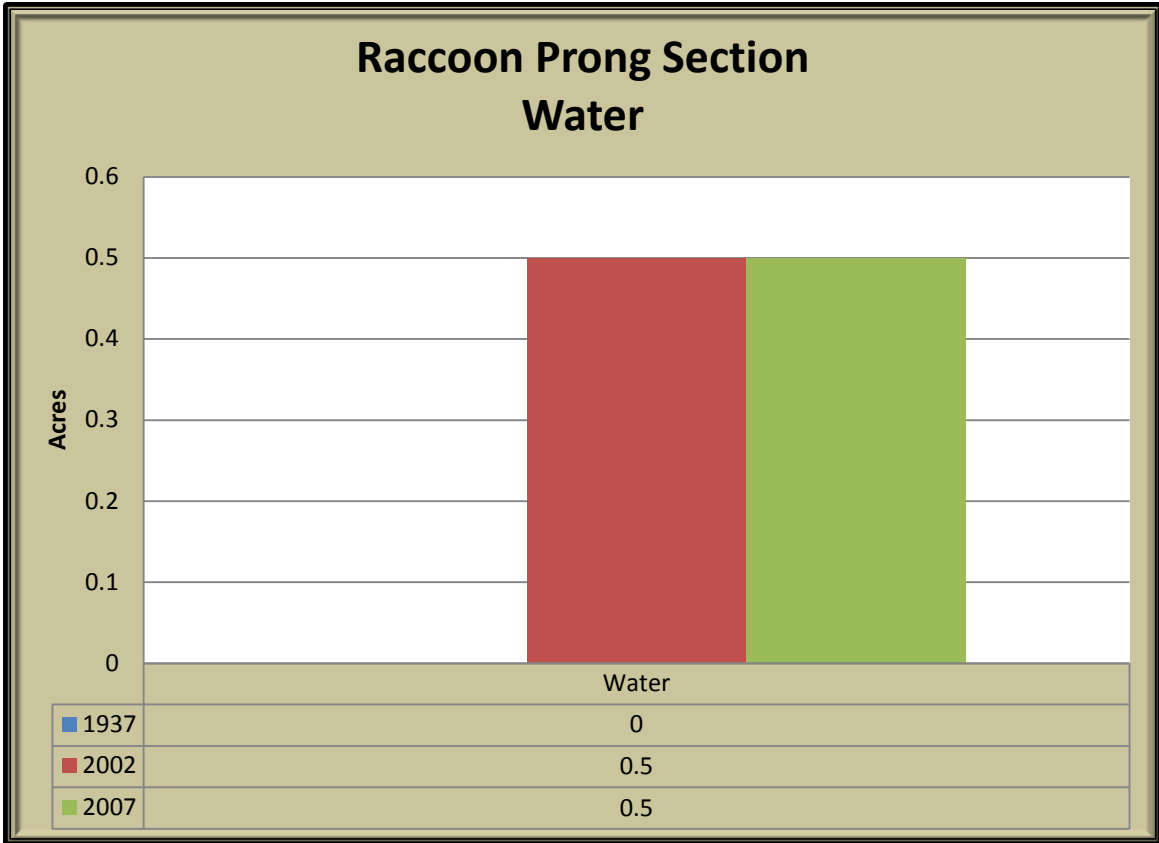
**Figure 4-5.6.** Raccoon Prong Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Raccoon Prong Section Anthropogenic Communities/Land Covers (Figure 4-5.6):** Powerline R-O-W is the most prominent anthropogenic community/land cover in the Raccoon Prong Section, followed by cultivated lawn. Clear-cut was present in 1961 and has since re-established as a forested area.

*Natural Capital* (Table 4-5.6)

Agricultural field and impoundment are the only anthropogenic communities/land covers with any natural capital value. They have declined since 1961 with losses in agricultural field acreage and have been stable in the recent period (2002-2007).

<b>Table 4-5.6. Natural Capital of Raccoon Prong Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$7,744/year
2002	\$5,364/year
2007	\$5,364/year



**Figure 4-5.6.** Raccoon Prong Section Water (1961, 2002, and 2007)

**Raccoon Prong Section Water (Figure 4-5.6):** Water includes non-impounded water surface. It was not present or discernible in 1961, but has since appeared in the section. It has been stable in acreage in the recent period (2002-2007).

*Natural Capital* (Table 4-5.7)

Water coverage not associated with an impoundment was not present in 1961. It has since appeared and has contributed \$2,668 to the capital value of the section.

<b>Table 4-5.7. Natural Capital of Raccoon Prong Section Water</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$2,668/year
2007	\$2,668/year

## 6. Sand Fork Section

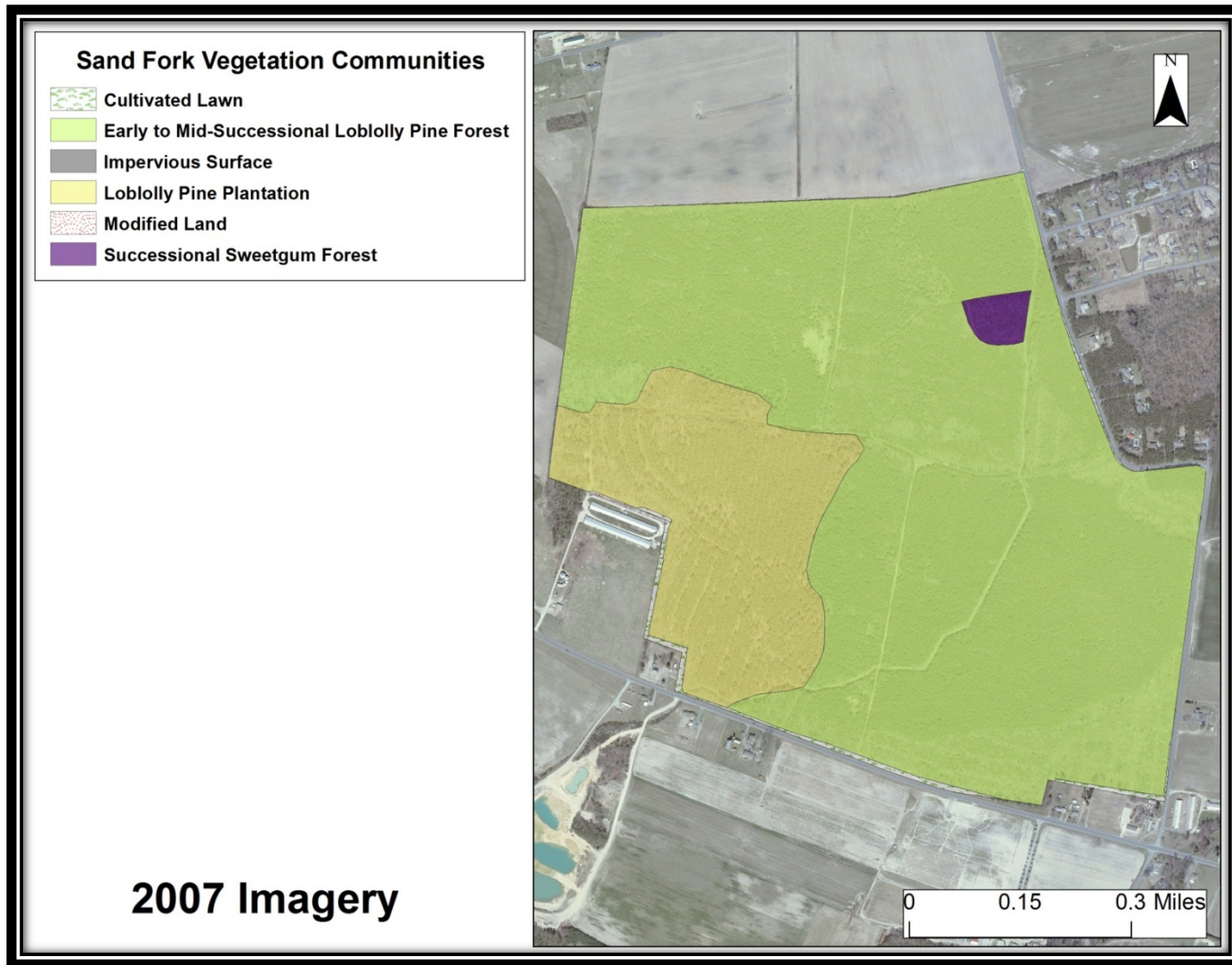


Figure 4-6.1. 2007 Vegetation Community Map of the Sand Fork Section

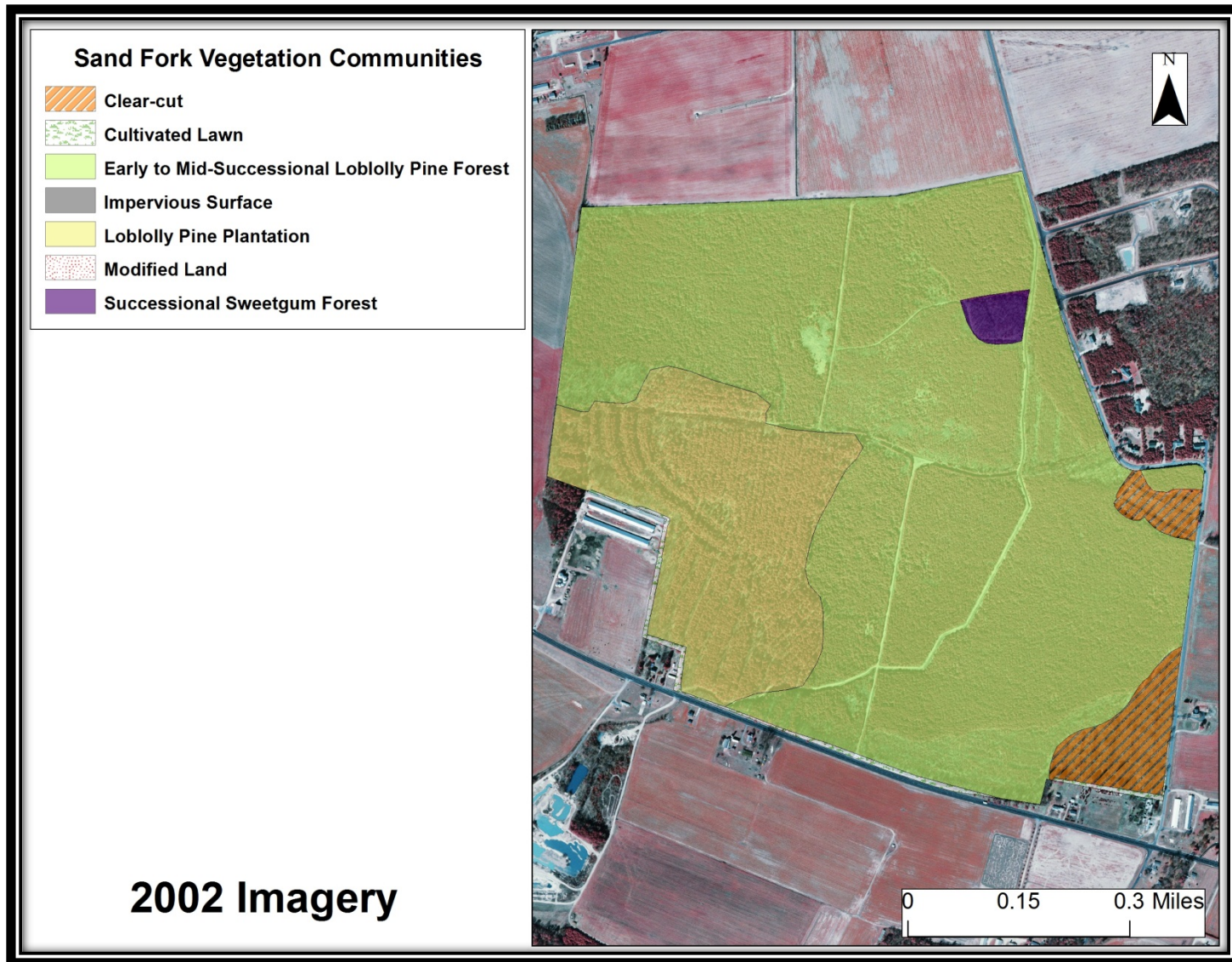
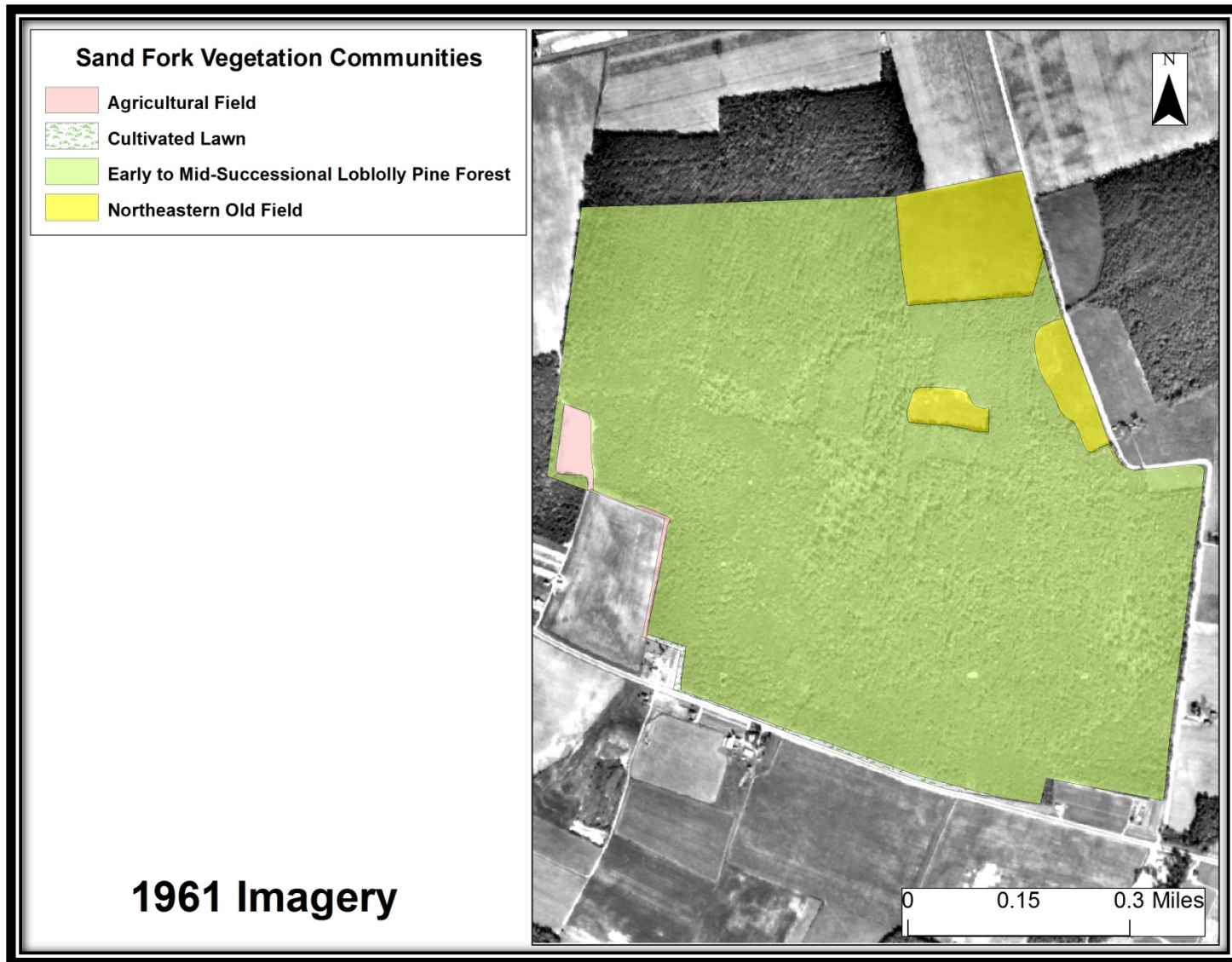


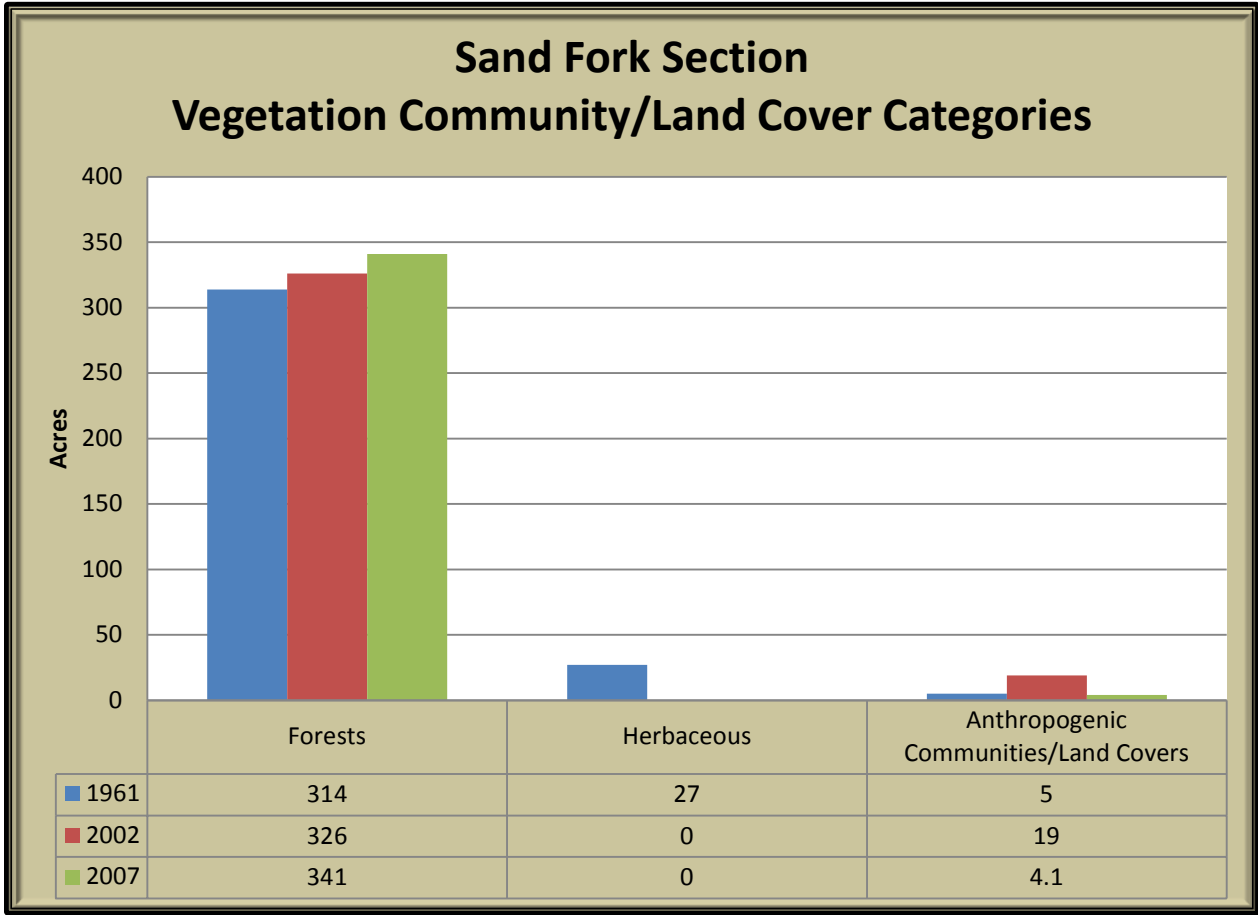
Figure 4-6.2. 2002 Vegetation Community Map of the Sand Fork Section





**Figure 4-6.3.** 1961 Vegetation Community Map of the Sand Fork Section





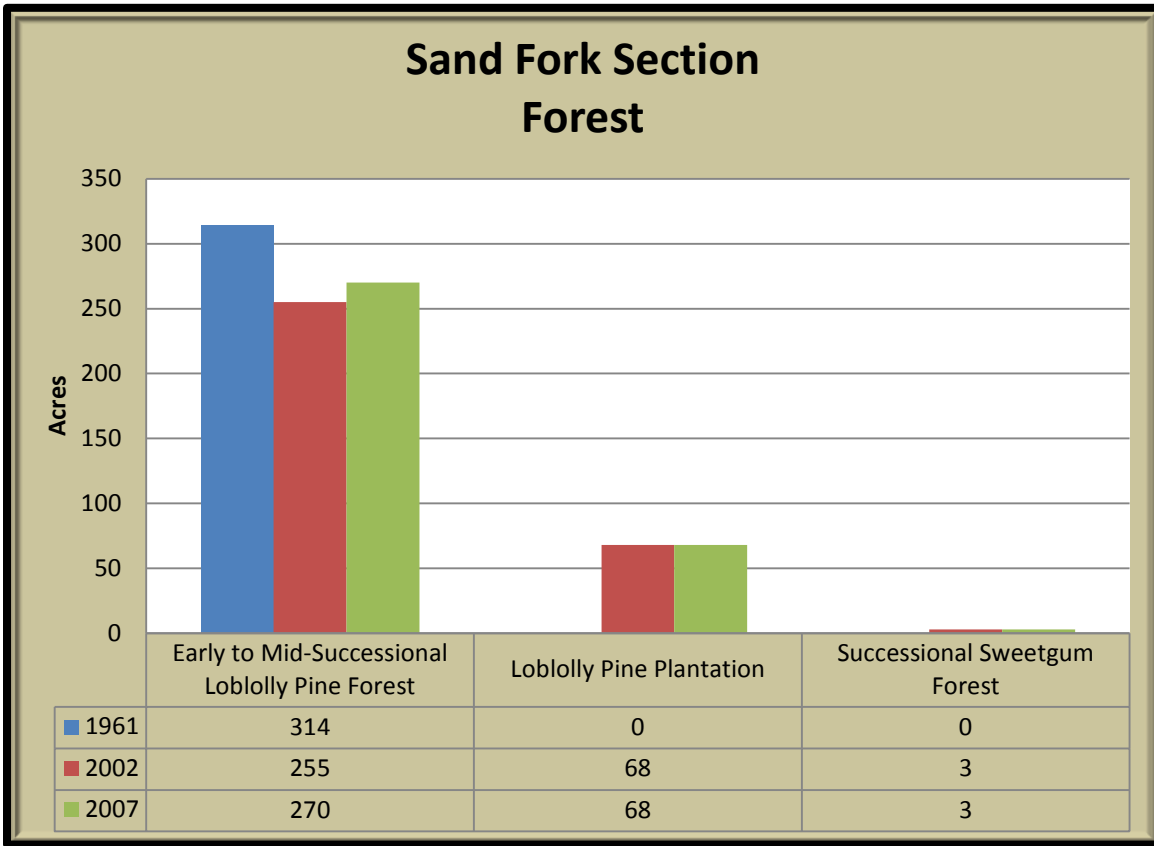
**Figure 4-6.4.** Sand Fork Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Sand Fork Section Vegetation Community/Land Covers (Figure 4-5.4):** Forest is the most vegetation community type in the Raccoon Prong Section, followed very distantly by Anthropogenic Communities/Land Covers.

*Natural Capital* (Table 4-6.1)

Capital of the Sand Fork Section has gained overall with a decrease in the middle with a clear-cut.

Table 4-6.1. Natural Capital of the Sand Fork Section	
Year	Natural Capital (in 2012 dollars)
1961	\$63,483/year
2002	\$61,647/year
2007	\$64,483/year



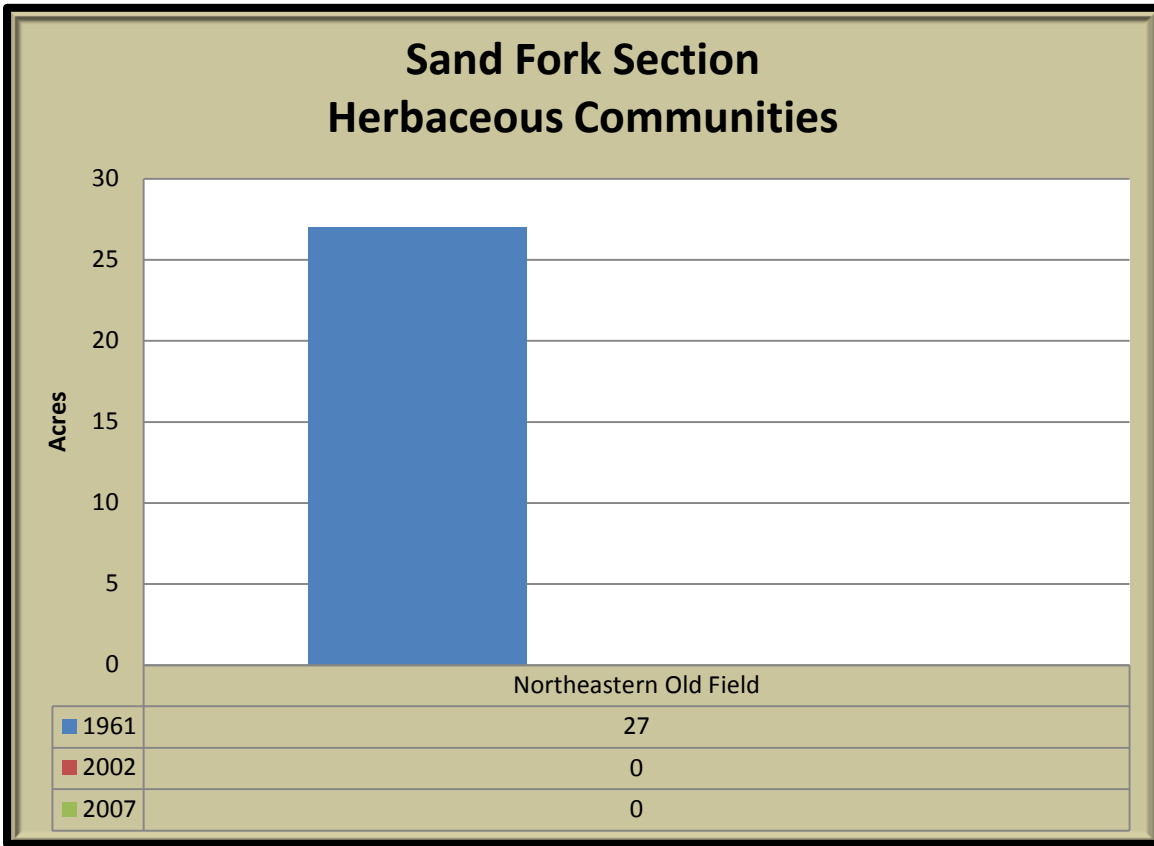
**Figure 4-6.5.** Sand Fork Section Forest (1961, 2002, and 2007)

**Sand Fork Section Forest (Figure 4-6.5):** Early to Mid-Successional Loblolly Pine Forest is the most common vegetation community in the Sand Fork Section, followed by the related Loblolly Pine Plantation.

*Natural Capital* (Table 4-6.2)

Forestland capital has shown a gradual increase during the study period.

Table 4-6.2. Natural Capital of Sand Fork Section Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$59,377/year
2002	\$61,647/year
2007	\$64,483/year



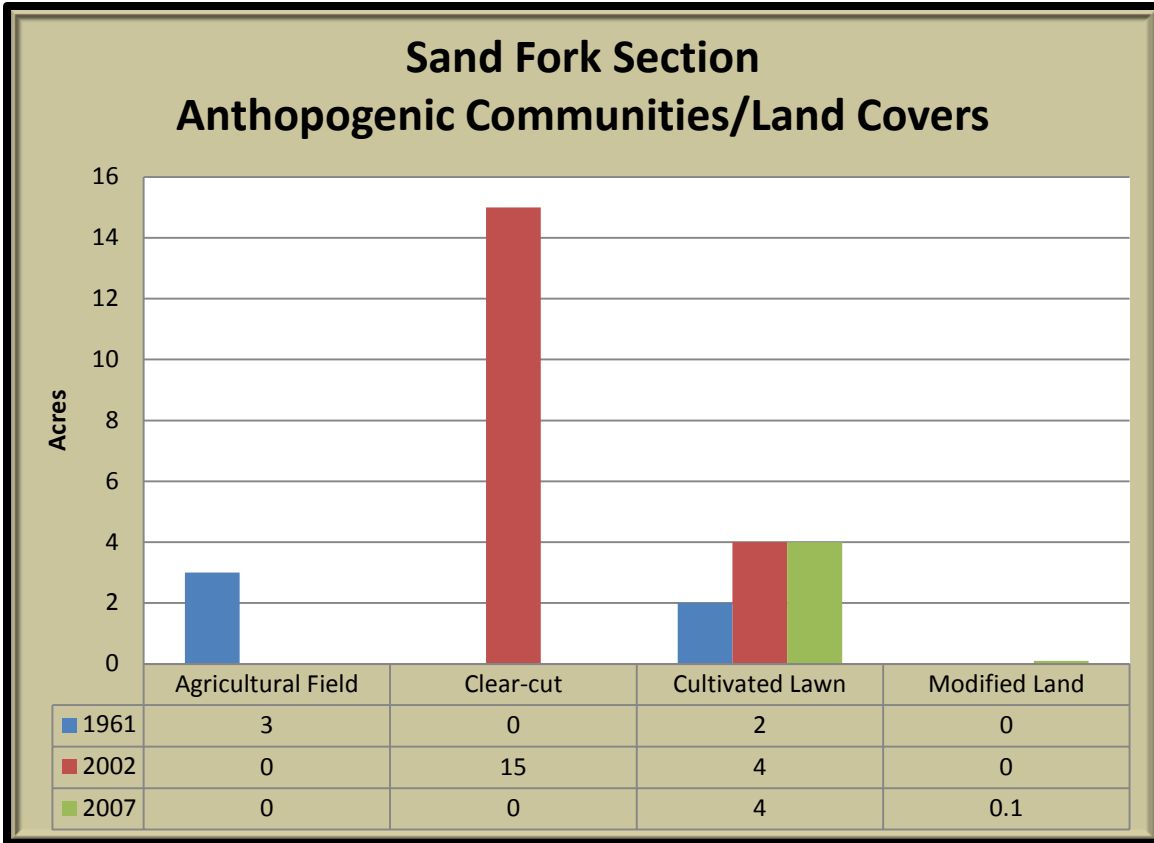
**Figure 4-6.6.** Sand Fork Section Herbaceous Communities (1961, 2002, and 2007)

**Sand Fork Section Herbaceous Communities (Figure 4-6.6):** Northeastern Old Field was the only herbaceous community present in the Sand Fork Section. It is no longer present in the section as it has matured into forest.

*Natural Capital* (Table 4-6.3)

Herbaceous communities no longer have any capital value in the Sand Fork Section, but contained almost \$4,000 in capital.

<b>Table 4-6.3. Natural Capital of Sand Fork Section Herbaceous Communities</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$3,934/year
2002	\$0/year (not present)
2007	\$0/year (not present)



**Figure 4-6.7.** Sand Fork Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Sand Fork Section Anthropogenic Communities/Land Covers (Figure 4-6.7):** Cultivated Lawn is the largest anthropogenic community/land cover in the Sand Fork Section. A lot of these communities that were once present are no longer around.

*Natural Capital* (Table 4-6.4)

Agricultural Field was the only anthropogenic community/land cover with any capital value. It is no longer present and as such does not have any capital value.

<b>Table 4-6.4. Natural Capital of Sand Fork Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$172/year
2002	\$0/year (not present)
2007	\$0/year (not present)

## 7. Thompson Branch Section

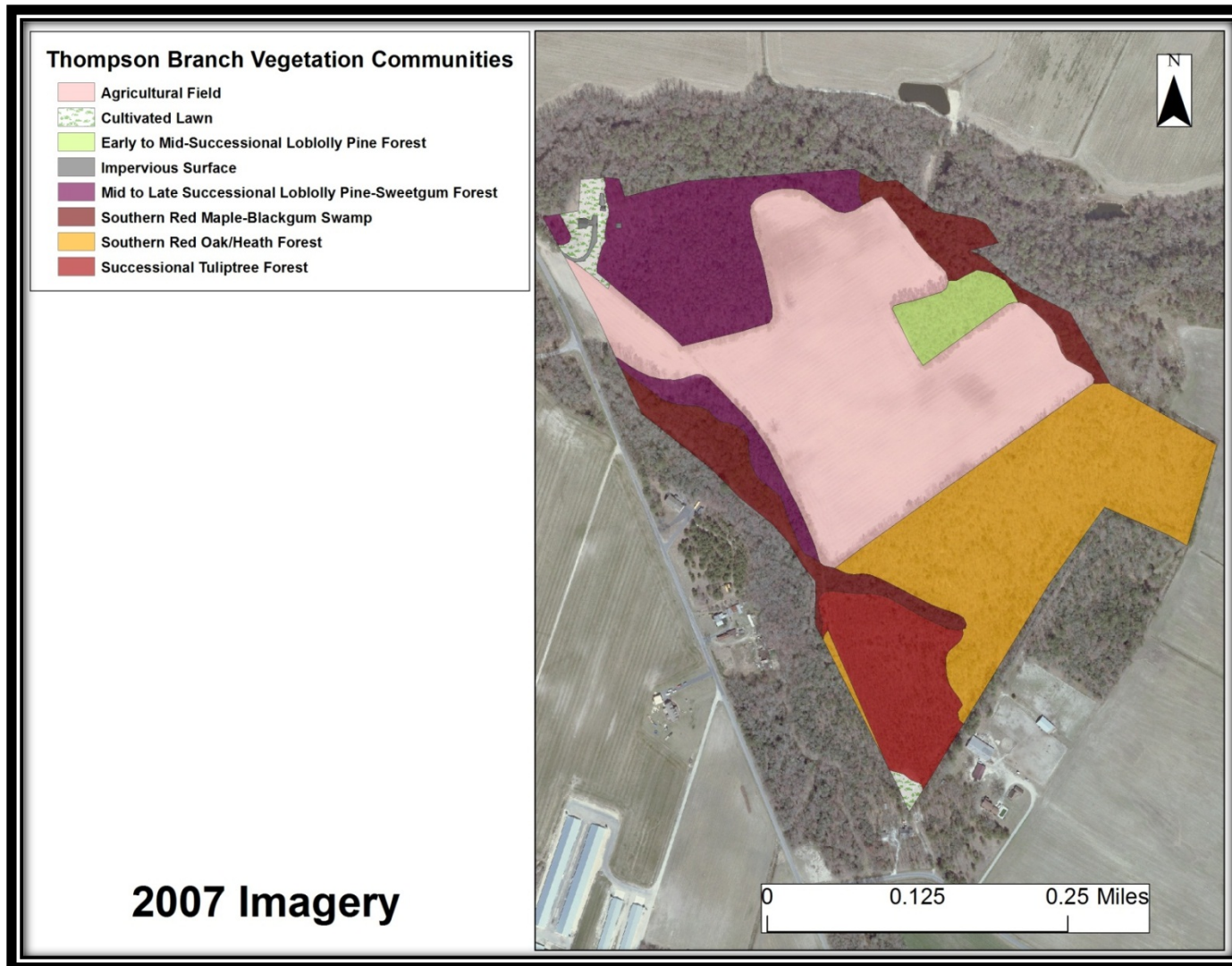
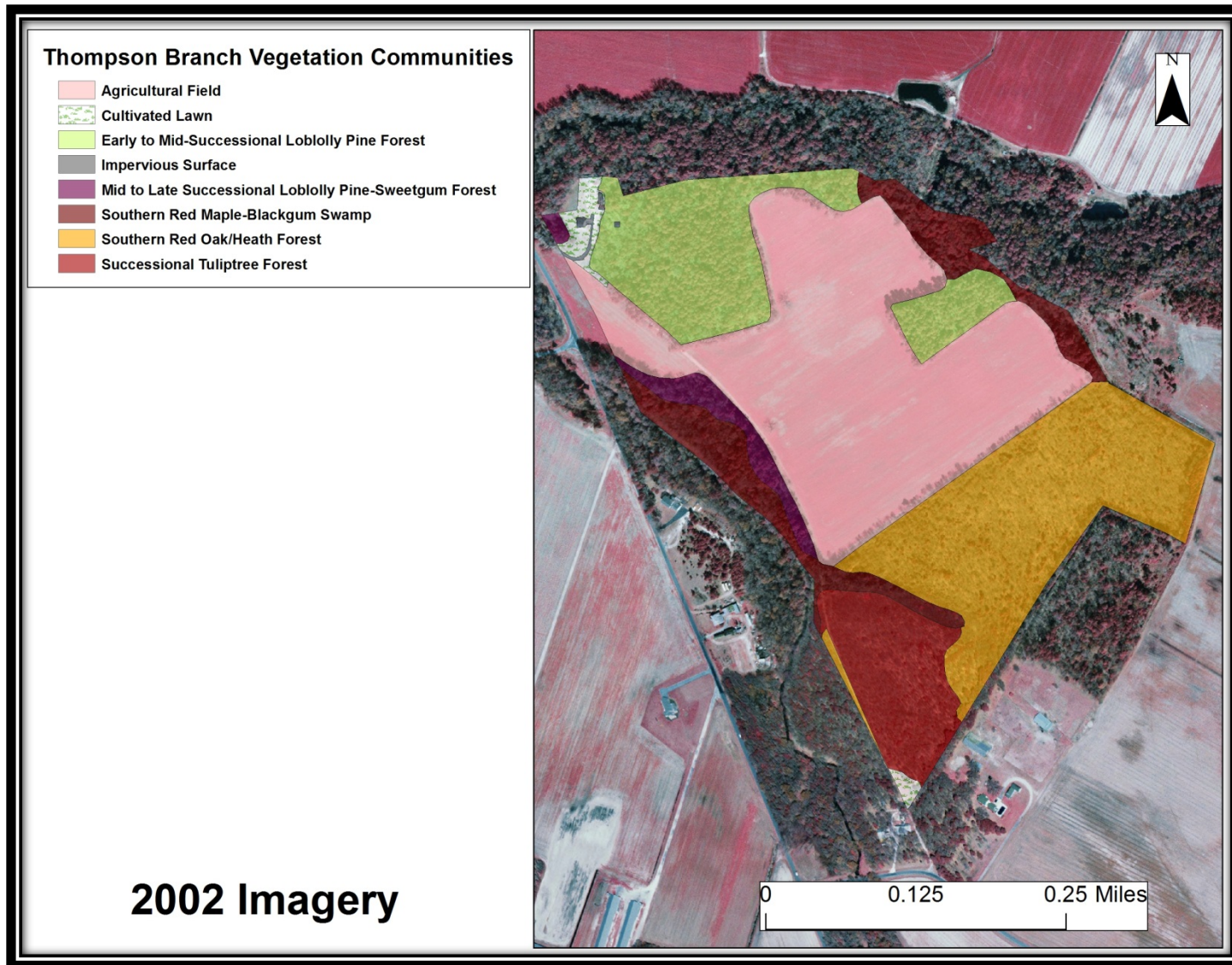
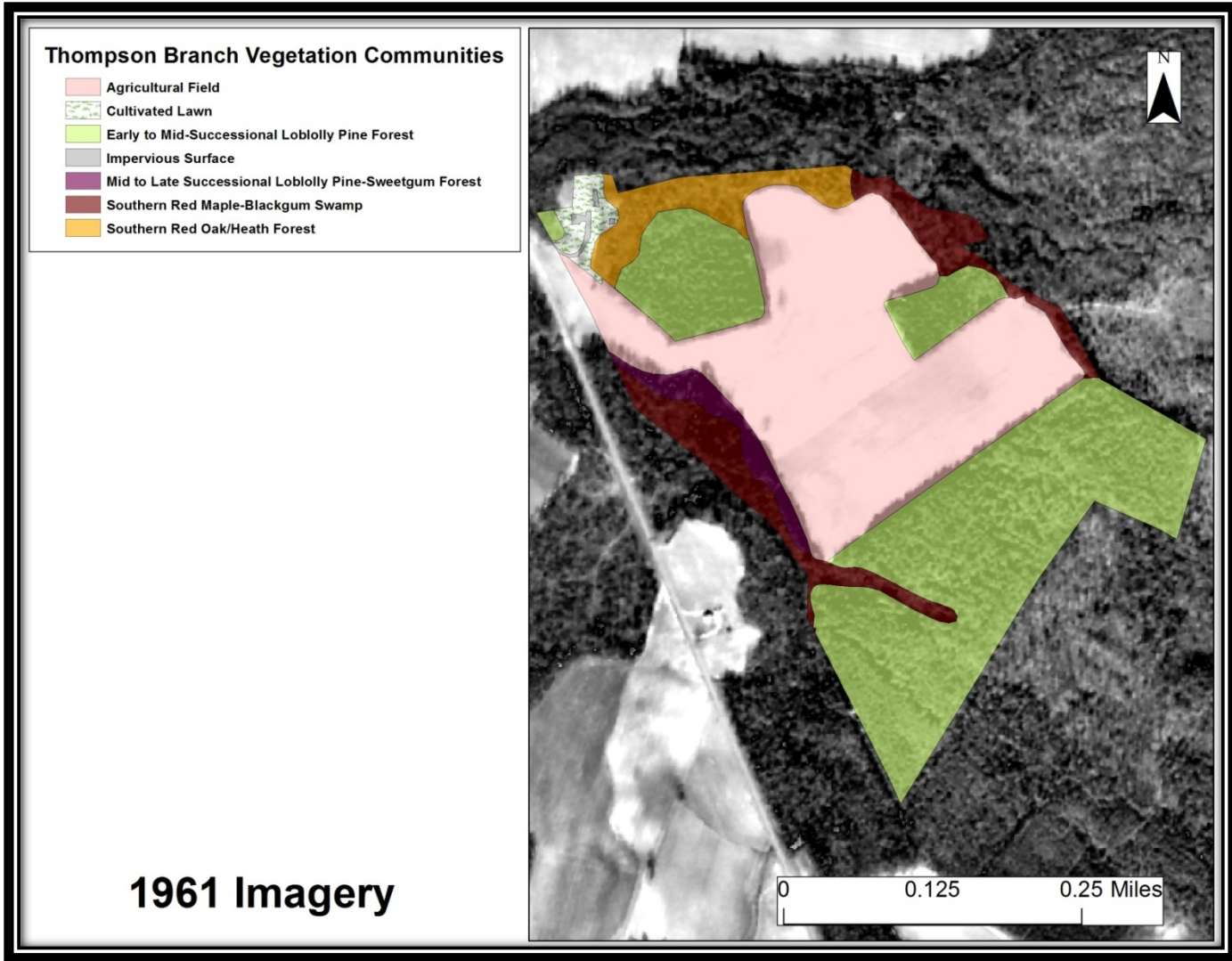


Figure 4-7.1. 2007 Vegetation Community Map of the Thompson Branch Section

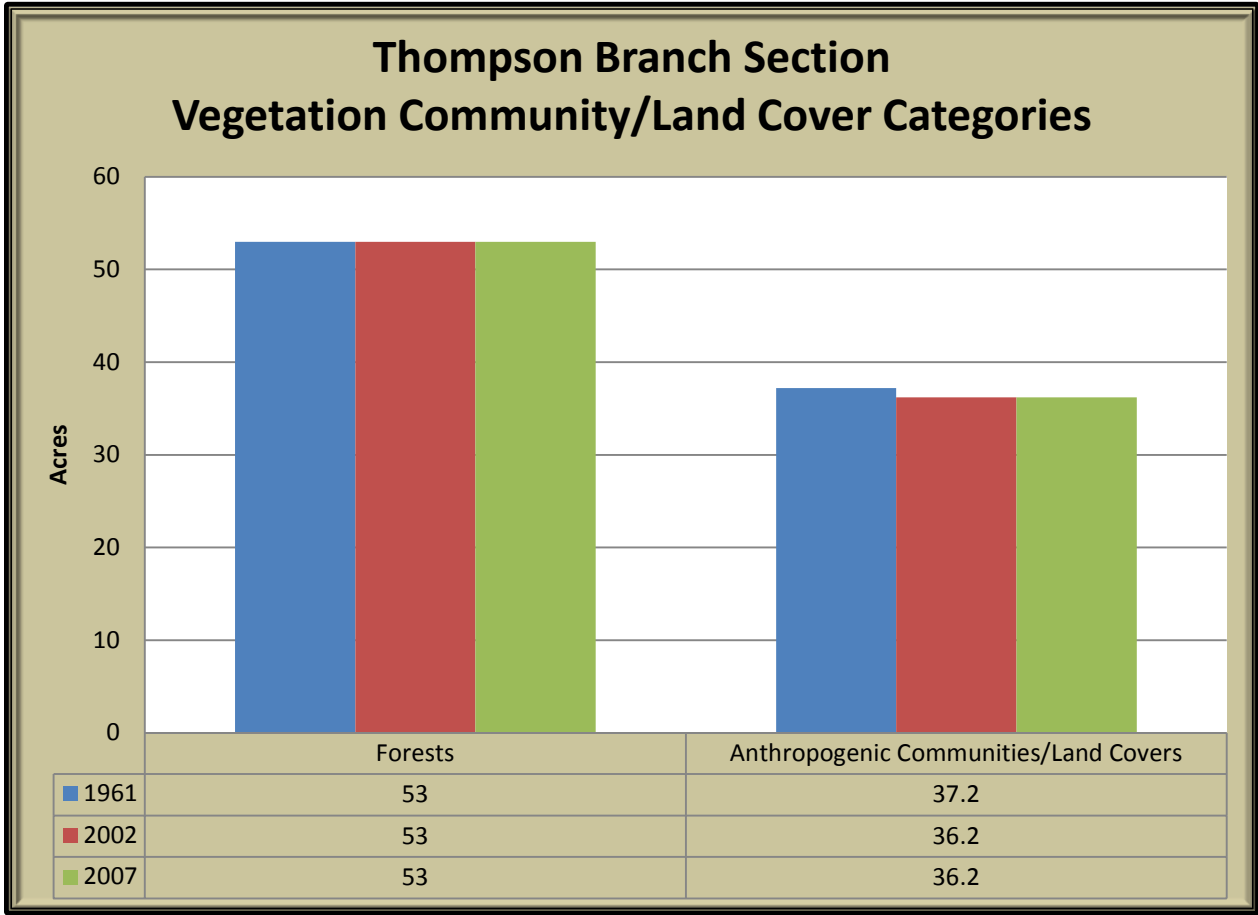




**Figure 4-7.2.** 2002 Vegetation Community Map of the Thompson Branch Section



**Figure 4-7.3.** 1961 Vegetation Community Map of the Thompson Branch Section



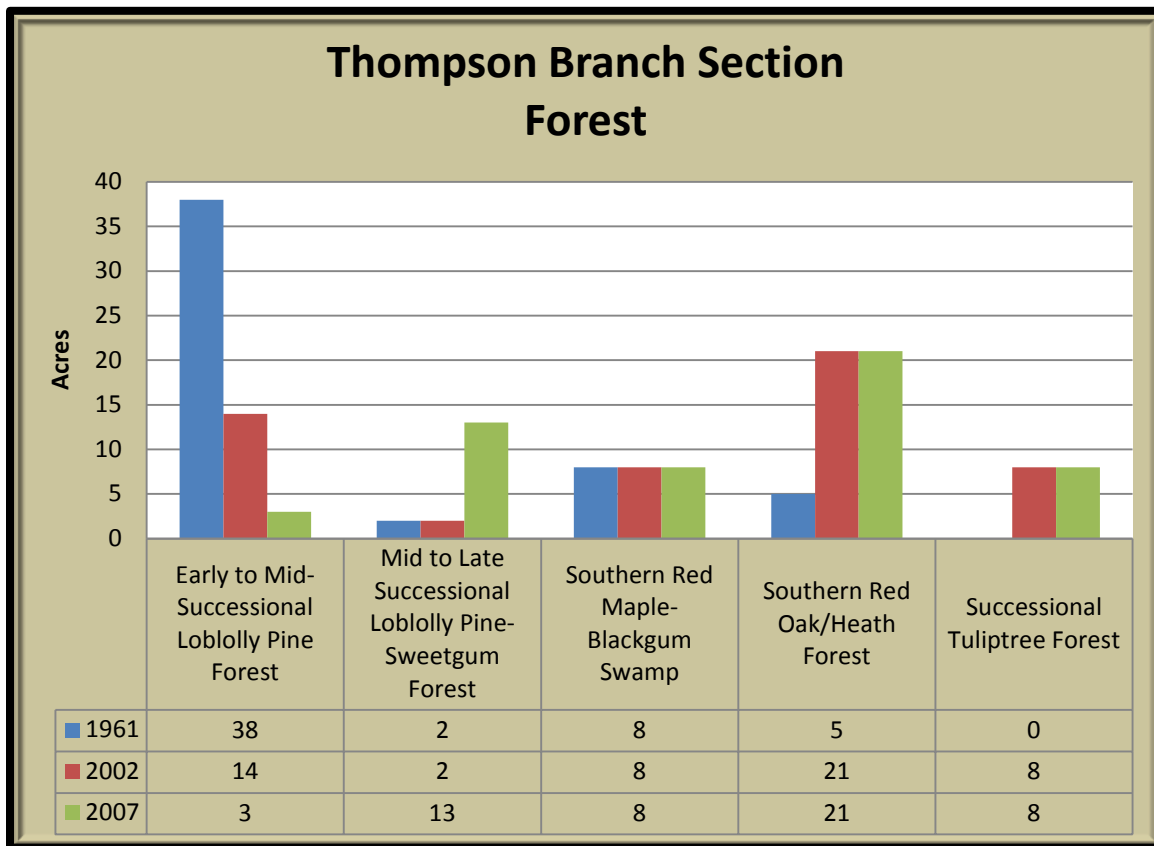
**Figure 4-7.4.** Thompson Branch Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Thompson Branch Section Vegetation Community/Land Covers (Figure 4-7.4):** Forest is the most vegetation community type in the Thompson Branch Section, followed by Anthropogenic Communities/Land Covers.

*Natural Capital* (Table 4-7.1)

Capital in the Thompson Branch Section has remained the same through the study period.

Table 4-7.1. Natural Capital of the Thompson Branch Section	
Year	Natural Capital (in 2012 dollars)
1961	\$108,906/year
2002	\$108,906/year
2007	\$108,906/year



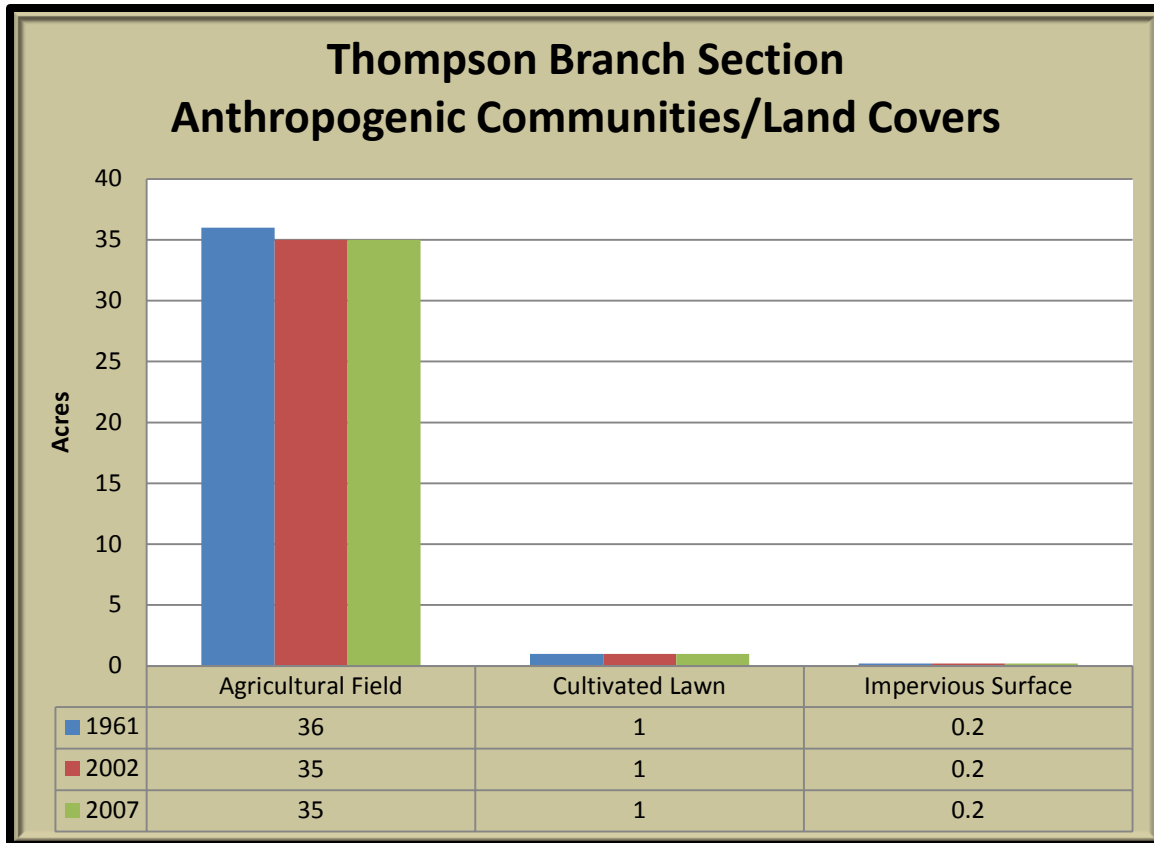
**Figure 4-7.5.** Thompson Branch Section Forest (1961, 2002, and 2007)

**Thompson Branch Section Forest (Figure 4-7.5):** Southern Red Oak/Heath Forest is the most common forest community in the Thompson Branch Section, followed by Mid to Late Successional Loblolly Pine-Sweetgum Forest.

*Natural Capital* (Table 4-7.2)

Forest capital has remained the same throughout the study period.

Table 4-7.2. Natural Capital of Thompson Branch Section Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$106,842/year
2002	\$106,842/year
2007	\$106,842/year



**Figure 4-7.6.** Thompson Branch Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Thompson Branch Section Anthropogenic Communities/Land Covers (Figure 4-7.6):**

Agricultural Field is the most common anthropogenic community/land cover in the Thompson Branch Section.

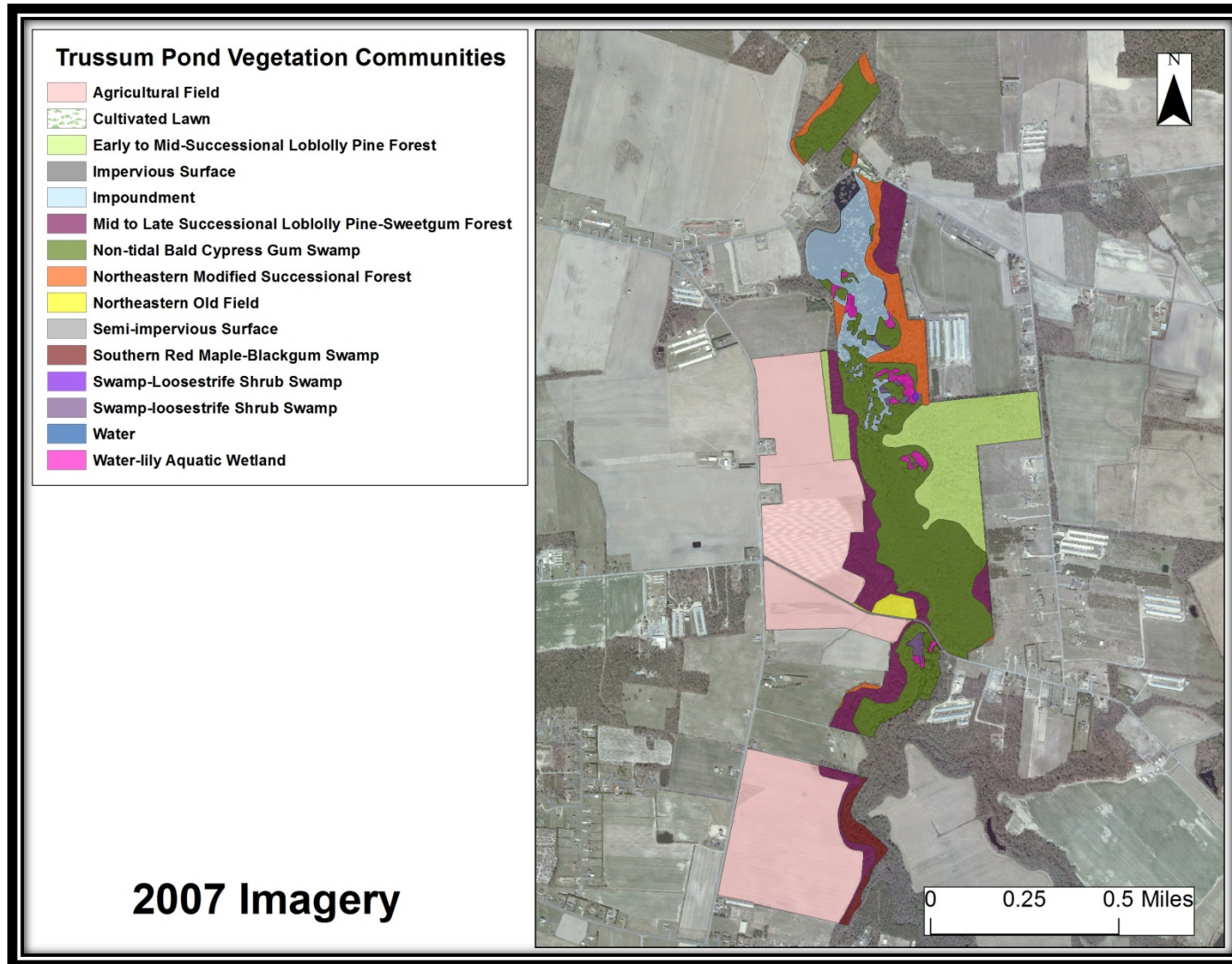
*Natural Capital (Table 4-7.3)*

Agricultural Field is the only anthropogenic community/land cover with any capital value in the Thompson Branch Section. It has remained the same throughout the study period.

<b>Table 4-7.3. Natural Capital of Thompson Branch Section Anthropogenic Communities/Land Covers</b>	
Year	Natural Capital (in 2012 dollars)
1961	\$2,065/year
2002	\$2,065/year
2007	\$2,065/year

## 8. Trussum Pond Section





**Figure 4-8.1.** 2007 Vegetation Community Map of the Trussum Pond Section

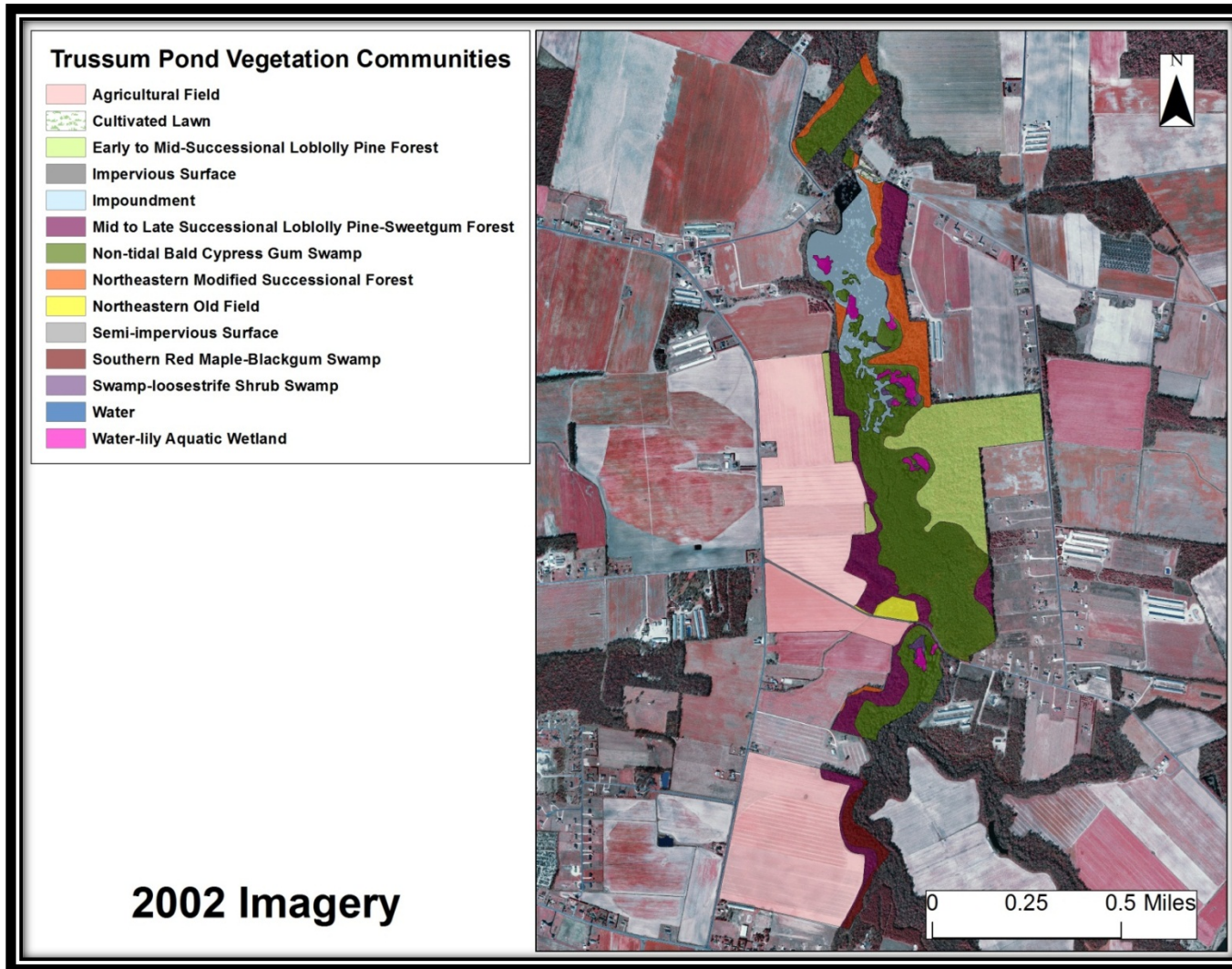
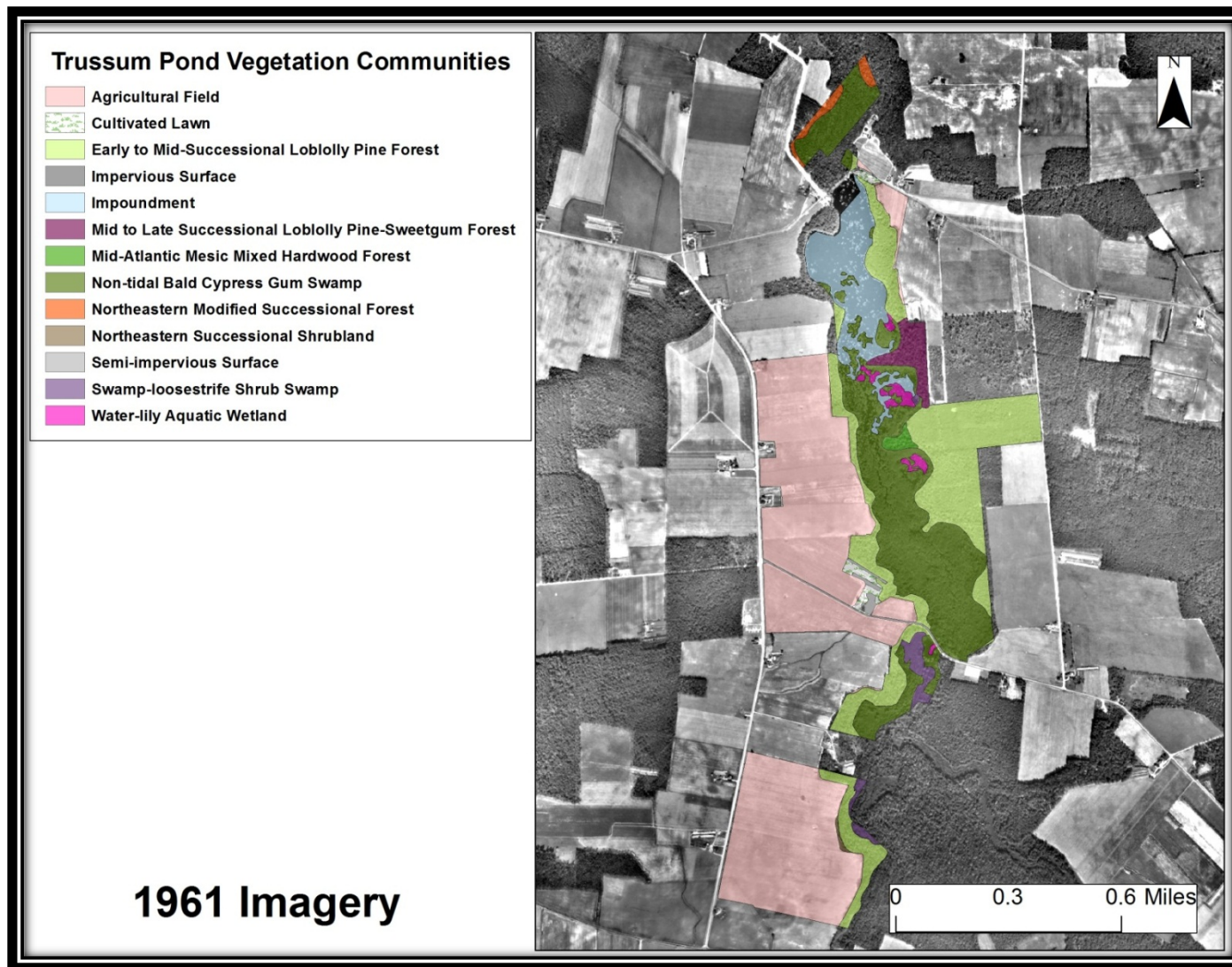
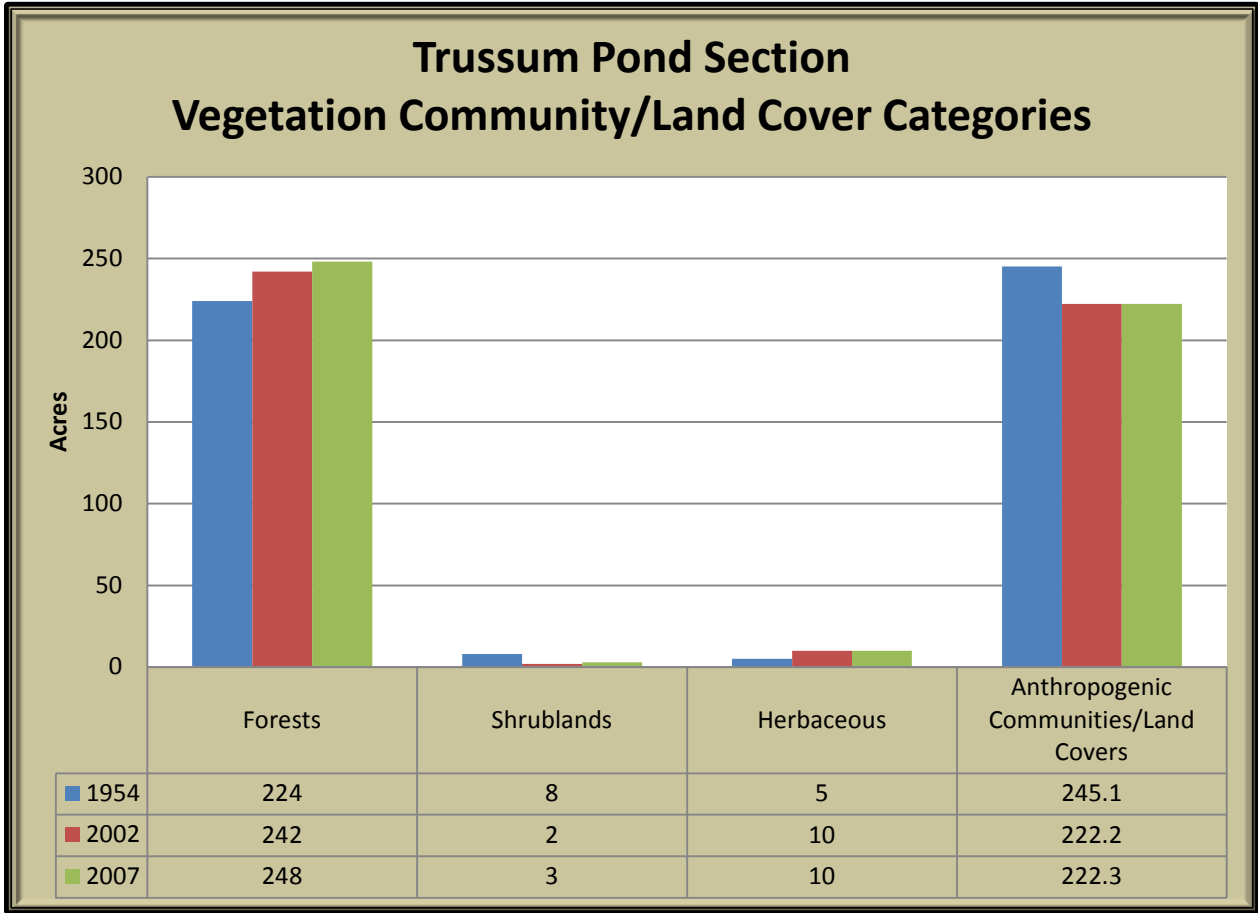


Figure 4-8.2. 2002 Vegetation Community Map of the Trussum Pond Section





**Figure 4-8.3.** 1961 Vegetation Community Map of the Trussum Pond Section



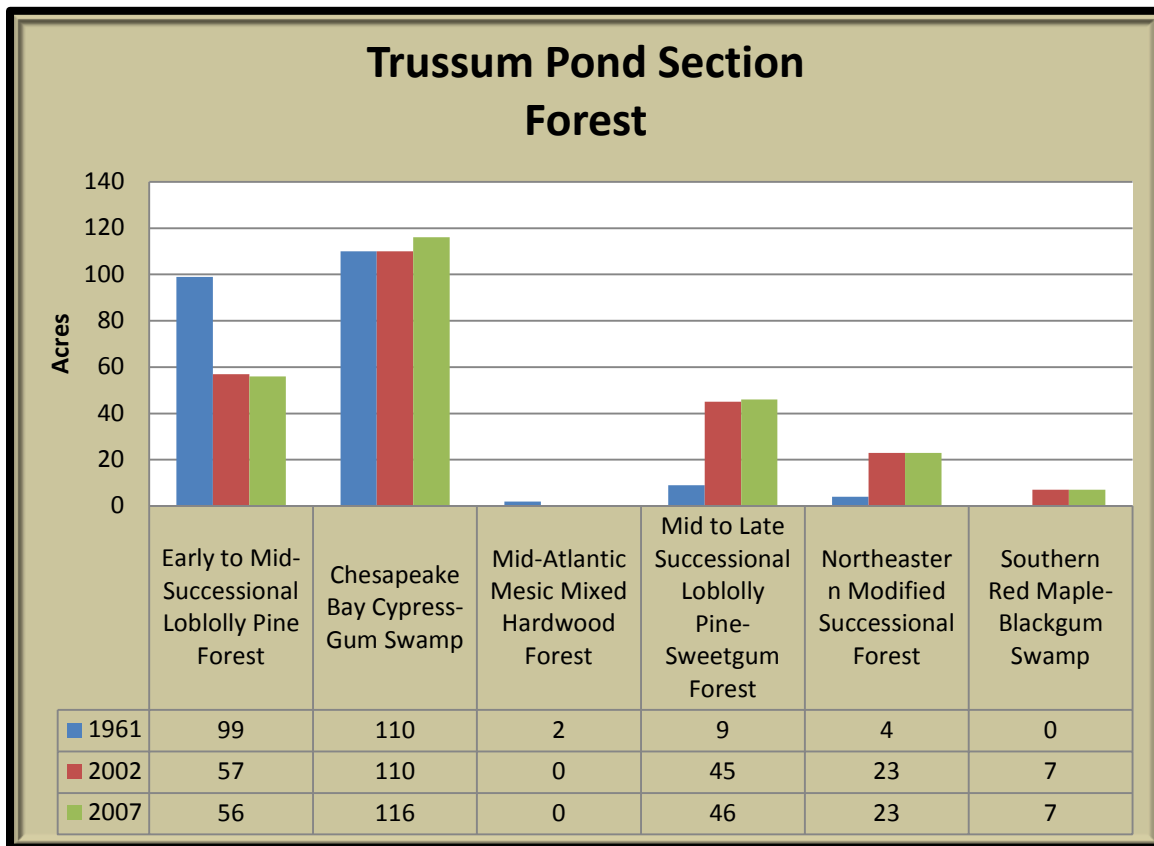
**Figure 4-8.4.** Trussum Pond Section Vegetation Community/Land Cover Categories (1961, 2002, and 2007)

**Trussum Pond Section Vegetation Community/Land Covers (Figure 4-8.4):** Forest is the most vegetation community type in the Raccoon Prong Section, followed very distantly by Anthropogenic Communities/Land Covers.

*Natural Capital (Table 4-8.1)*

Natural Capital of the Trussum Pond Section has increased throughout the study period. Most of the gains have come from increases in forestland.

Table 4-8.1. Natural Capital of the Trussum Pond Section	
Year	Natural Capital (in 2012 dollars)
1961	\$1,688,736/year
2002	\$1,723,302/year
2007	\$1,806,333/year



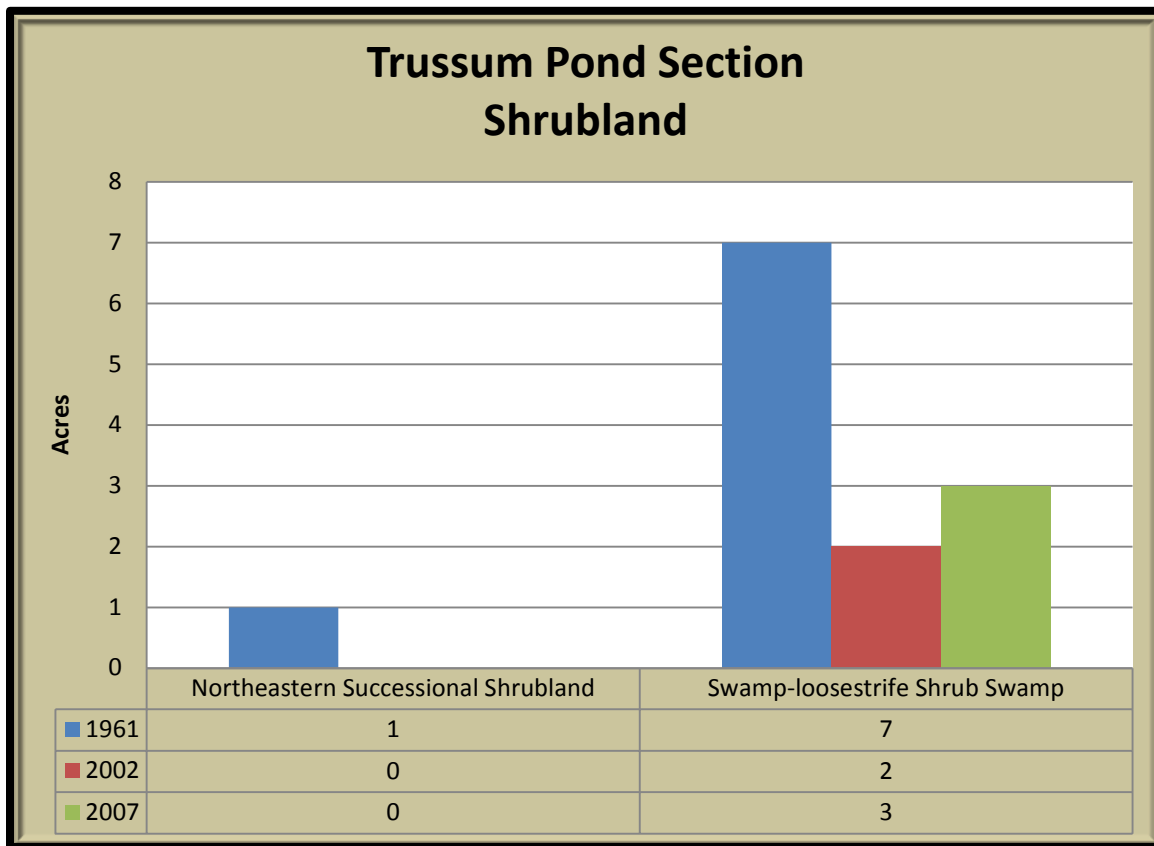
**Figure 4-8.5.** Trussum Pond Section Forest (1961, 2002, and 2007)

**Raccoon Prong Section Forest (Figure 4-8.5):** Chesapeake Bay Cypress-Gum Swamp is the most common forested community in the Trussum Pond Section, followed by Early to Mid-Successional Loblolly Pine Forest.

*Natural Capital (Table 4-8.2)*

Forestland capital has increased throughout the study period and is responsible for an overall capital increase in the section.

<b>Table 4-8.2. Natural Capital of Trussum Pond Section Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,373,622/year
2002	\$1,461,743/year
2007	\$1,535,492/year



**Figure 4-8.6.** Trussum Pond Section Shrubland (1961, 2002, and 2007)

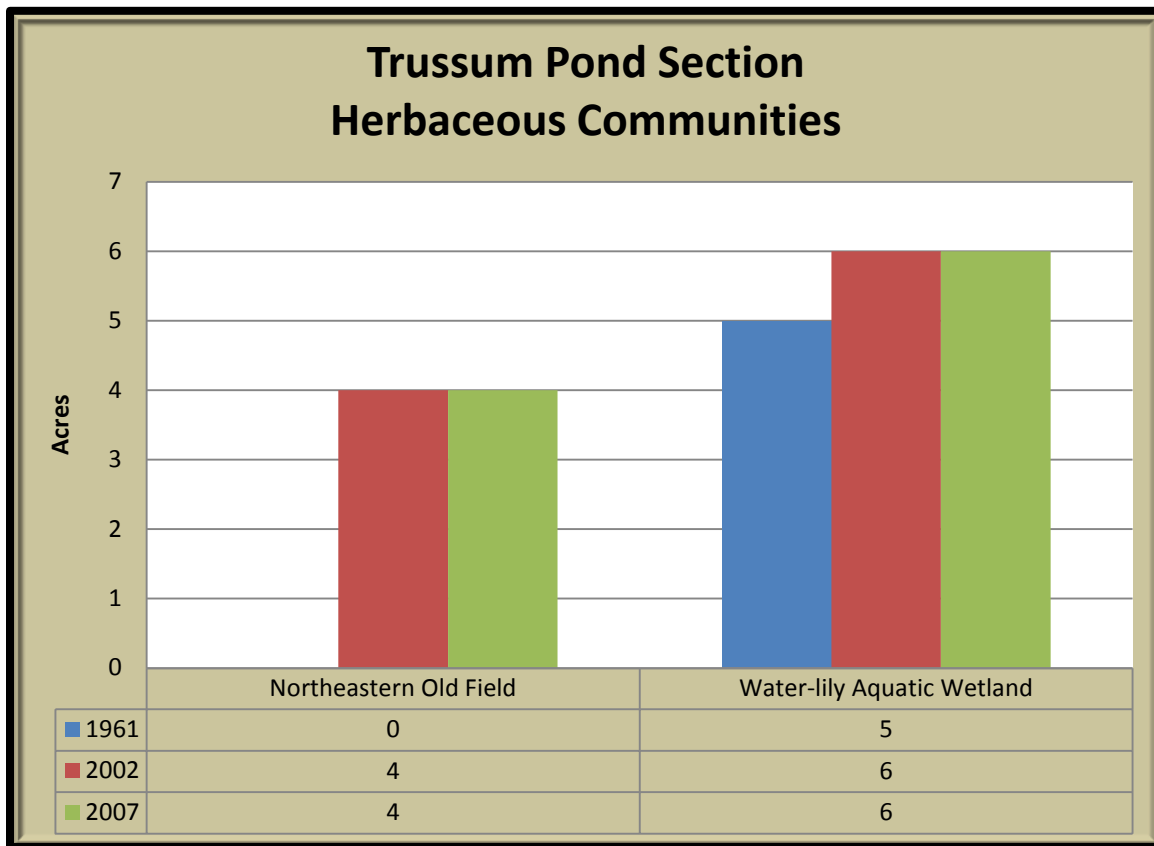
**Trussum Pond Section Shrubland (Figure 4-8.6):** Swamp-loosestrife Shrub Swamp is largest and only shrubland still present in the Trussum Pond Section.

*Natural Capital* (Table 4-8.3)

Shrubland capital has decreased overall in the Trussum Pond Section, but has increased slightly in the recent period.

<b>Table 4-8.3. Natural Capital of Trussum Pond Section Shrubland</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$65,116/year
2002	\$18,563/year
2007	\$27,844/year





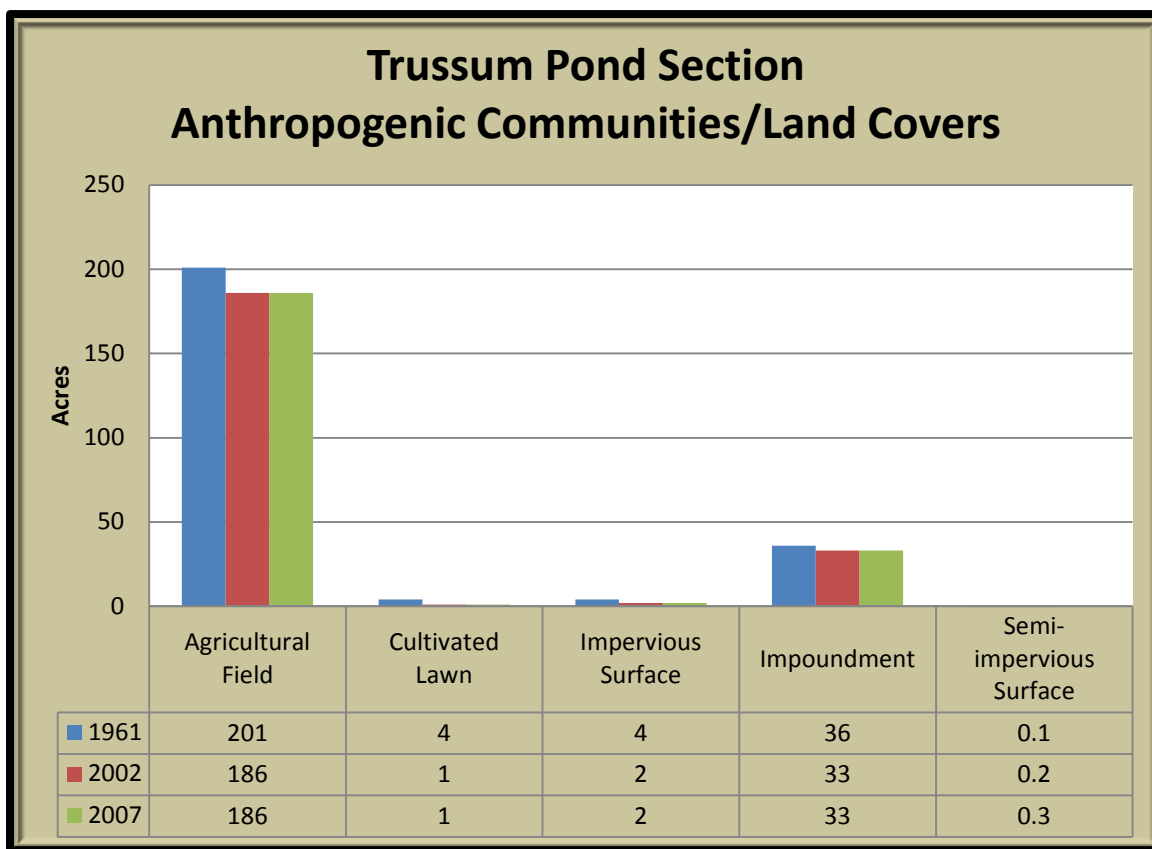
**Figure 4-8.7.** Trussum Pond Section Herbaceous Communities (1961, 2002, and 2007)

**Trussum Pond Section Herbaceous Communities (Figure 4-8.7):** Water-lily Aquatic Wetland is the most common herbaceous community, followed closely by Northeastern Old Field.

*Natural Capital* (Table 4-8.4)

Capital of herbaceous communities has increased with an increase in acreage of both of the herbaceous communities in the section.

<b>Table 4-8.4. Natural Capital of Trussum Pond Section Herbaceous Communities</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$46,407/year
2002	\$56,271/year
2007	\$56,271/year



**Figure 4-8.8.** Trussum Pond Section Anthropogenic Communities/Land Covers (1961, 2002, and 2007)

**Trussum Pond Section Anthropogenic Communities/Land Covers (Figure 4-8.8):** Agricultural field is the largest anthropogenic community/land cover in the Trussum Pond Section, followed by Impoundment.

*Natural Capital* (Table 4-8.5)

Agricultural field and impoundment are the only anthropogenic communities/land covers with any capital value. Both have decreased in acreage resulting in a decrease in capital.

<b>Table 4-8.5. Natural Capital of Trussum Pond Section Anthropogenic Communities/Land Covers</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$203,591/year
2002	\$186,725/year
2007	\$186,725/year

## CHAPTER 5: DESCRIPTIONS AND ANALYSIS OF THE VEGETATION COMMUNITIES

Twenty-four vegetation communities and nine land covers were noted in the survey. Below are the descriptions of the vegetation communities. The National Vegetation Classification (NVC) Association number is given with the vegetation community and their approximate acreage in the project area. Names of communities correspond with the common names as given in the NVC and the Guide to Delaware Vegetation Communities.

The vegetation communities include:

1. Blueberry Wetland Thicket (CEGL006371)—1 acre
2. Chesapeake Bay Cypress-Gum Swamp (CEGL006214)—157 acres
3. Chesapeake Bay Non-riverine Wet Hardwood Forest (CEGL004644)—160 acres
4. Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp (CEGL006606)—16 acres
5. Coastal Plain Atlantic White Cedar-Red Maple Swamp (CEGL006078)—37 acres
6. Cultivated Lawn (CEGL008462)—32 acres
7. Early to Mid-Successional Loblolly Pine Forest (CEGL006011)—886 acres
8. Eastern Reed Marsh (CEGL004141)—2 acres
9. Loblolly Pine Plantation (CEGL007179)—214 acres
10. Mid-Atlantic Mesic Mixed Hardwood Forest (CEGL006075)—38 acres
11. Mid to Late Successional Loblolly Pine-Sweetgum Forest (CEGL008462)—454 acres
12. Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest (CEGL006919)—26 acres
13. Northeastern Old Field (CEGL006107)—7 acres
14. Northeastern Successional Shrubland (CEGL006451)—1 acre
15. Northeastern Coastal Plain/Piedmont Basic Mesic Mixed Hardwood Forest (CEGL006011)—2 acres
16. Red Maple-Sweetgum Swamp (CEGL006110)—6 acres
17. Smooth Alder Swamp (CEGL005082)—0.4 acres
18. Southern Red Maple-Blackgum Swamp (CEGL006238)—380 acres
19. Southern Red Oak/Heath Forest (CEGL006269)—525 acres
20. Successional Sweetgum Forest (CEGL007216)—37 acres
21. Successional Tuliptree Forest (CEGL007220)—24 acres
22. Swamp-loosestrife Shrub Swamp (CEGL005089)—3 acres
23. Water-lily Aquatic Wetland (CEGL002386)—7 acres
24. White Pine Planted Forest (CEGL007178)—0.1 acres

The land covers include:

1. Agricultural Field—403 acres
2. Clear-cut—3 acres
3. Farm Pond/Artificial Pond—0.1 acres
4. Impervious Surface—23 acres
5. Impoundment—126 acres
6. Modified Land—0.1 acres
7. Powerline R-O-W—12 acres
8. Semi-impervious Surface—9 acres

9. Water—20 acres

**Blueberry Wetland Thicket [1 acre (Figures 5.1-5.2, Tables 5.1)] G2? S4**

**DEWAP: Shrub Swamps  
NHC: Northern Atlantic Coastal Plain Pond**

Description

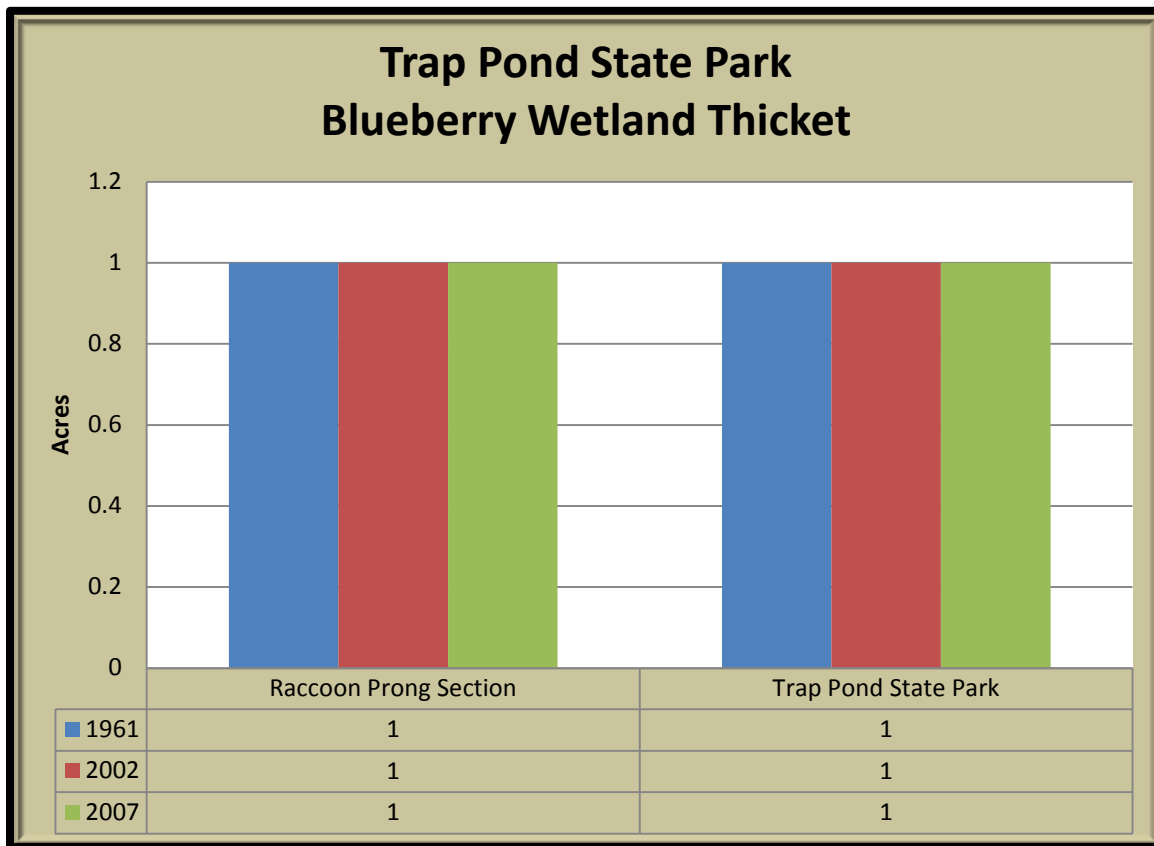


**Figure 5.1.** Blueberry Wetland Thicket  
(Raccoon Prong Section)

This community is located around a small impoundment and is densely dominated by highbush blueberry (*Vaccinium corymbosum*). A thin canopy of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and blackgum (*Nyssa sylvatica*) is present around the edge of the pond along with very scattered American holly (*Ilex opaca*) and sweetbay (*Magnolia virginiana*). A little bit of common greenbrier (*Smilax rotundifolia*) is also present. No herbs were noted in this community.

Analysis of Condition at Trap Pond State Park

Blueberry Wetland Thicket has not changed in extent or acreage since 1961.



**Figure 5.2.** Blueberry Wetland Thicket at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.1)

Capital of Blueberry Wetland Thicket has not changed since 1961.

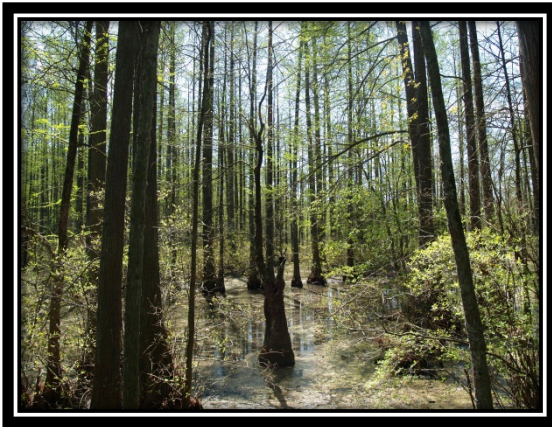
<b>Table 5.1. Natural Capital of Blueberry Wetland Thicket</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$9,281/year
2002	\$9,281/year
2007	\$9,281/year



DEWAP: Forested Floodplains and Riparian Swamps  
NHC: Northern Atlantic Coastal Plain Pond

Description

This community is located at the upper end of Trap Pond and in Trussum Pond. It is dominated by bald cypress (*Taxodium distichum*) in the canopy and associated by red maple (*Acer rubrum*). The understory is scattered and includes red maple and American holly (*Ilex opaca*). The shrub and vine layer includes highbush blueberry (*Vaccinium corymbosum*), red chokeberry (*Aronia arbutifolia*), poison ivy (*Toxicodendron radicans*), laurel-leaf greenbrier (*Smilax laurifolia*), and water-willow (*Decodon verticillata*). Herbs noted in this community



include netted chain fern (*Woodwardia areolata*), false nettle (*Boehmeria cylindrica*), Virginia creeper (*Parthenocissus quinquefolia*), arrow-arum (*Peltandra virginica*), grape fern (*Botrychium virginianum*), and partridgeberry (*Mitchella repens*).

All of the occurrences of this community appeared to be at least late successional and most were mature. Some larger trees reach 2.5 feet in diameter. Definition of layers is good and exotic invasive plants are few.

Figure 5.3. Chesapeake Bay Cypress-Gum Swamp (Trussum Pond Section)

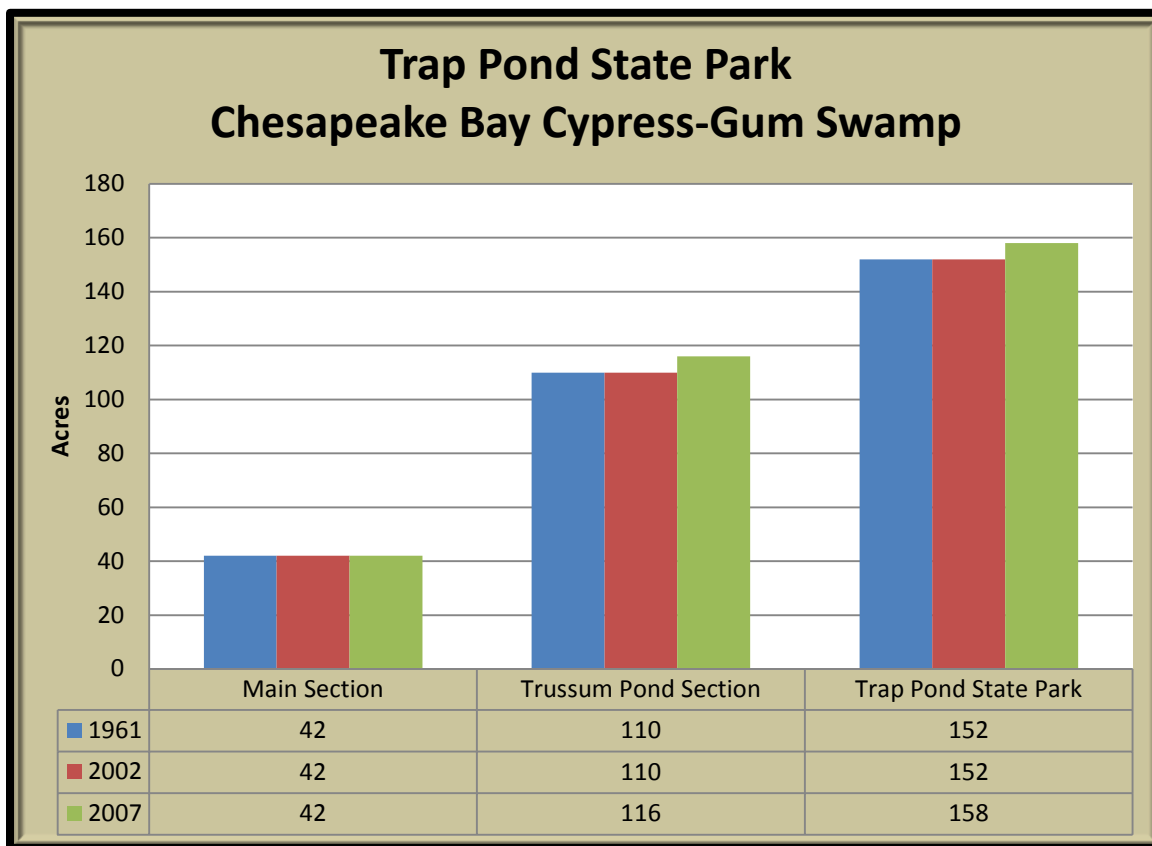
Analysis of Condition at Trap Pond State Park

Nearly all of the Chesapeake Bay Cypress-Gum Swamp present in 1961 was still present in 2007 (151 in 2007 vs. 152 in 1961). Some of the remaining acreage had become 1 acre of impoundment and 0.4 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest (Table 5.2).

Since 1961, this community has expanded in acreage and into 3 acres of Swamp-loosestrife Shrub Swamp, 2 acres of Water-lily Aquatic Wetland, and 1 acre of Early to Mid-Successional Loblolly Pine Forest, and 1 acre of impoundment (Table 5.3).

<b>Table 5.2. What was once Chesapeake Bay Cypress-Gum Swamp in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Chesapeake Bay Cypress-Gum Swamp	151 acres
Impoundment	1 acre
Mid to Late Successional Loblolly Pine-Sweetgum Forest	0.4 acres

<b>Table 5.3. Chesapeake Bay Cypress-Gum Swamp has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Chesapeake Bay Cypress-Gum Swamp	151 acres
Swamp-loosestrife Shrub Swamp	3 acres
Water-lily Aquatic Wetland	2 acres
Early to Mid-Successional Loblolly Pine Forest	1 acre
Impoundment	1 acre



**Figure 5.4.** Chesapeake Bay Cypress-Gum Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.4)

Capital of Chesapeake Bay Cypress-Gum Swamp has increased with its acreage since 1961.

<b>Table 5.4. Natural Capital of Chesapeake Bay Cypress-Gum Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,868,308/year
2002	\$1,868,308/year
2007	\$1,942,057/year

**Chesapeake Bay Non-riverine Wet Hardwood Forest [160 acres (Figures 5.5-5.6, Tables 5.5-5.7)] G2? S4**

**DEWAP: Isolated Wetlands**

**NHC: Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest**

Description

Chesapeake Bay Non-riverine Wet Hardwood Forest is mostly located in the Arvey Road Section with a smaller amount in the Raccoon Prong Section. Southern red oak (*Quercus falcata*), sweetgum (*Liquidambar styraciflua*), swamp chestnut oak (*Quercus michauxii*), red maple (*Acer rubrum*), loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), and a few American holly (*Ilex opaca*) compose the canopy. Understory species include flowering dogwood (*Cornus florida*), blackgum (*Nyssa sylvatica*), sweetbay (*Magnolia virginiana*), and sassafras (*Sassafras albidum*). The shrub and vine layer is



composed of common greenbrier (*Smilax rotundifolia*), white-leaf greenbrier (*Smilax glauca*), highbush blueberry (*Vaccinium corymbosum*), and lowbush blueberry (*Vaccinium pallidum*). Partridgeberry (*Mitchella repens*) was the only herb noted in this community.

Most of the examples of this community in the park were of young to mid-successional age, with short/thick understories and not much defined layering.

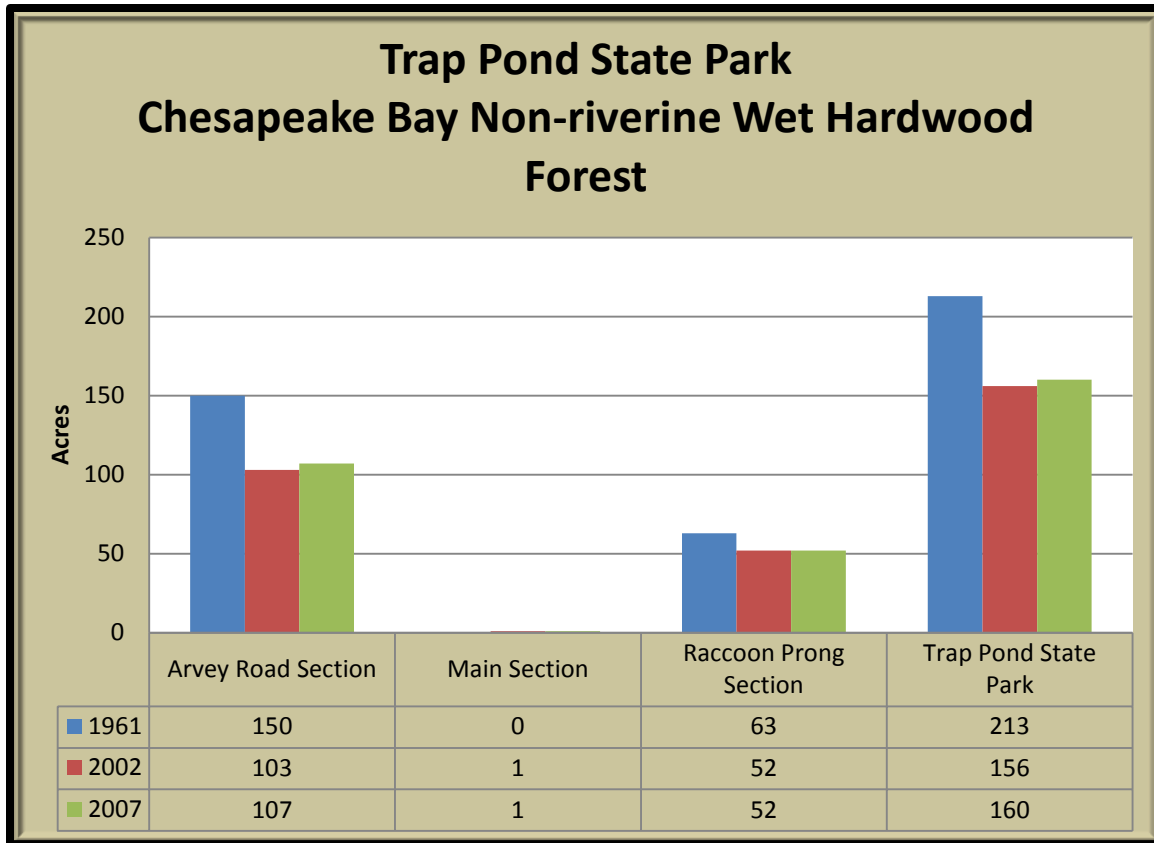
**Figure 5.5.** Chesapeake Bay Non-riverine Wet Hardwood Forest (Arvey Road Section)

Analysis of Condition at Trap Pond State Park

About 127 acres of Chesapeake Bay Non-riverine Wet Hardwood Forest remained in 2007 from 1961. The rest of the forest had become 59 acres of Loblolly Pine Plantation, 20 acres of Early to Mid-Successional Loblolly Pine Forest, 4 acres of Southern Red Oak/Heath Forest, and 1 acre of Semi-impervious Surface (Table 5.5). Since 1961, this forest has grown from 23 acres of Early to Mid-Successional Loblolly Pine Forest, 8 acres of clear-cut, 2 acres of agricultural field, and 0.2 acres of Northeastern Old Field (Table 5.6).

<b>Table 5.5. What was once Chesapeake Bay Non-riverine Wet Hardwood Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Chesapeake Bay Non-riverine Wet Hardwood Forest	127 acres
Loblolly Pine Plantation	59 acres
Early to Mid-Successional Loblolly Pine Forest	20 acres
Southern Red Oak/Heath Forest	4 acres
Semi-impervious Surface	1 acre
Other vegetation communities/land covers	1 acre

<b>Table 5.6. Chesapeake Bay Non-riverine Wet Hardwood Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Chesapeake Bay Non-riverine Wet Hardwood Forest	127 acres
Early to Mid-Successional Loblolly Pine Forest	23 acres
Clear-cut	8 acres
Agricultural Field	2 acres
Northeastern Old Field	0.2 acres



**Figure 5.6.** Chesapeake Bay Non-riverine Wet Hardwood Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.7)

Capital of Chesapeake Bay Non-riverine Wet Hardwood Forest has declined since 1961 with conversion to Loblolly Pine Plantation and clear-cutting. Its capital has increased in the recent period (2002-2007).

<b>Table 5.7. Natural Capital of Chesapeake Bay Non-riverine Wet Hardwood Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$2,618,090/year
2002	\$1,917,474/year
2007	\$1,966,640/year



**Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp [16 acres (Figures 5.7-5.8, Table 5.8)]**  
GNR S3

**DEWAP: Forested Floodplains and Riparian Swamps**  
**NHC: Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest**

Description

The only occurrences of this swamp community occur in sheltered coves of James Branch in the James Branch Section. Red maple (*Acer rubrum*) and green ash (*Fraxinus pensylvanica*) co-dominate the canopy and are associated by sweetgum (*Liquidambar styraciflua*) and blackgum (*Nyssa sylvatica*). The understory includes smaller members of the canopy plus spicebush (*Lindera benzoin*), sweetbay (*Magnolia virginiana*), and a few American holly (*Ilex opaca*). Blackberry (*Rubus* sp.), highbush blueberry (*Vaccinium corymbosum*), common greenbrier (*Smilax rotundifolia*), creeping raspberry (*Rubus hispidus*), strawberry-bush (*Euonymus americana*), and winterberry (*Ilex verticillata*) compose the shrub and vine layer. Common herbs include lizard's tail (*Saururus cernuus*), netted chain fern (*Woodwardia areolata*), false nettle (*Boehmeria cylindrica*), wetland blue violet (*Viola cucullata*), cinnamon



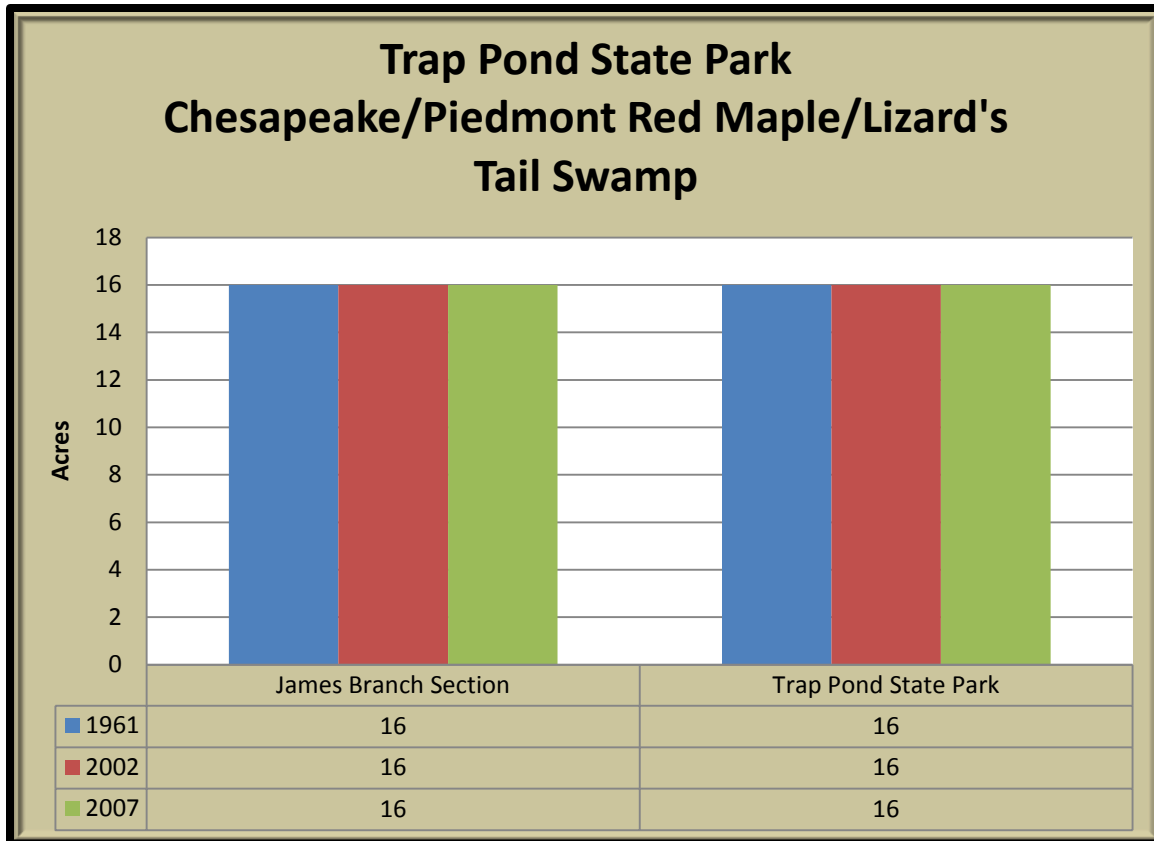
**Figure 5.7.** Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp (James Branch Section)

Analysis of Condition at Trap Pond State Park

Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp has not changed since in extent or location since 1961.

fern (*Osmunda cinnamomea*), common blue violet (*Viola sororia*), arrow-arum (*Peltandra virginica*), turtle-head (*Chelone glabra*), sensitive fern (*Onoclea sensibilis*), and royal fern (*Osmunda regalis*).

All of the examples of this community in the park along James Branch were in mature state with good layering and diameters of canopy trees ranging from 1 to 2 feet. Most of the hydrology was very saturated with some areas of standing water and muck.



**Figure 5.8.** Chesapeake/Piedmont Red Maple/Lizard’s Tail Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.8)

Capital of Chesapeake/Piedmont Red Maple/Lizard’s Tail Swamp has not changed in extent or acreage since 1961.

<b>Table 5.8. Natural Capital of Chesapeake/Piedmont Red Maple/Lizard’s Tail Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$196,664/year
2002	\$196,664/year
2007	\$196,664/year

**Coastal Plain Atlantic White Cedar-Red Maple Swamp [37 acre (Figures 5.7-5.8, Tables 5.9-5.10)]**                      GNR    S4

**DEWAP: Atlantic White Cedar Non-tidal Wetlands**  
**NHC: Northern Atlantic Coastal Plain Basin Peat Swamp**

Description

Atlantic white cedar swamps are located in curves of James Branch below Trap Pond. The canopy is dominated by Atlantic white cedar (*Chamaecyparis thyoides*), that are associated by a few loblolly pine (*Pinus taeda*). The understory includes red maple (*Acer rubrum*), sweetbay (*Magnolia virginiana*), American holly (*Ilex opaca*), spicebush (*Lindera benzoin*), and a few sweetgum (*Liquidambar styraciflua*). Shrubs and vines include creeping raspberry (*Rubus hispidus*), sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), arrowwood (*Viburnum dentatum*), Japanese honeysuckle (*Lonicera japonica*), and poison ivy (*Toxicodendron radicans*). Common herbs include Virginia creeper (*Parthenocissus*



*quinquefolia*), netted chain fern (*Woodwardia areolata*), partridgeberry (*Mitchella repens*), and royal fern (*Osmunda regalis*).

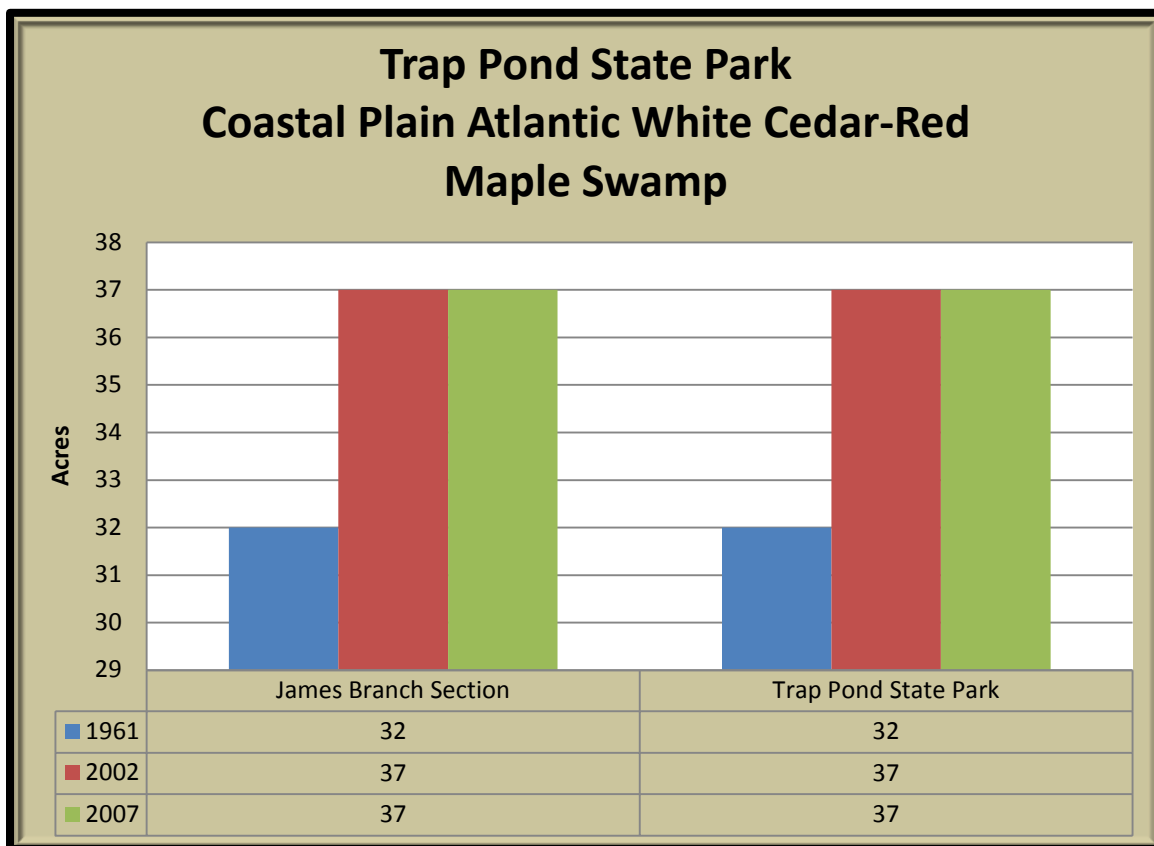
The stands located in Trap Pond State Park appear to be fairly mature or at least late successional. Atlantic white cedar has tendency to fall over in the wind once it gets large. No regeneration of the Atlantic white cedar was observed and could be a detriment to the long term survival of the species in this area.

**Figure 5.9.** Coastal Plain Atlantic White Cedar-Red Maple Swamp

Analysis of Condition at Trap Pond State Park

All 32 acres of Coastal Plain Atlantic White Cedar-Red Maple Swamp from 1961 was still present in 2007. Since 1961, this community has expanded into 5 acres of former Loblolly Pine Plantation (Table 5.9).

<b>Table 5.9. Coastal Plain Atlantic White Cedar-Red Maple Swamp has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Coastal Plain Atlantic White Cedar-Red Maple Swamp	32 acres
Loblolly Pine Plantation	5 acres



**Figure 5.10.** Coastal Plain Atlantic White Cedar-Red Maple Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.10)

Capital of Coastal Plain Atlantic White Cedar-Red Maple Swamp has increased with its acreage.

<b>Table 5.10. Natural Capital of Coastal Plain Atlantic White Cedar-Red Maple Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$393,328/year
2002	\$454,786/year
2007	\$454,786/year

**Cultivated Lawn [32 acres (Figure 5.11, Tables 5.11-5.12)]      GNA    SNA**

**DEWAP: No Equivalent Classification  
NHC: No Equivalent Classification**

Description

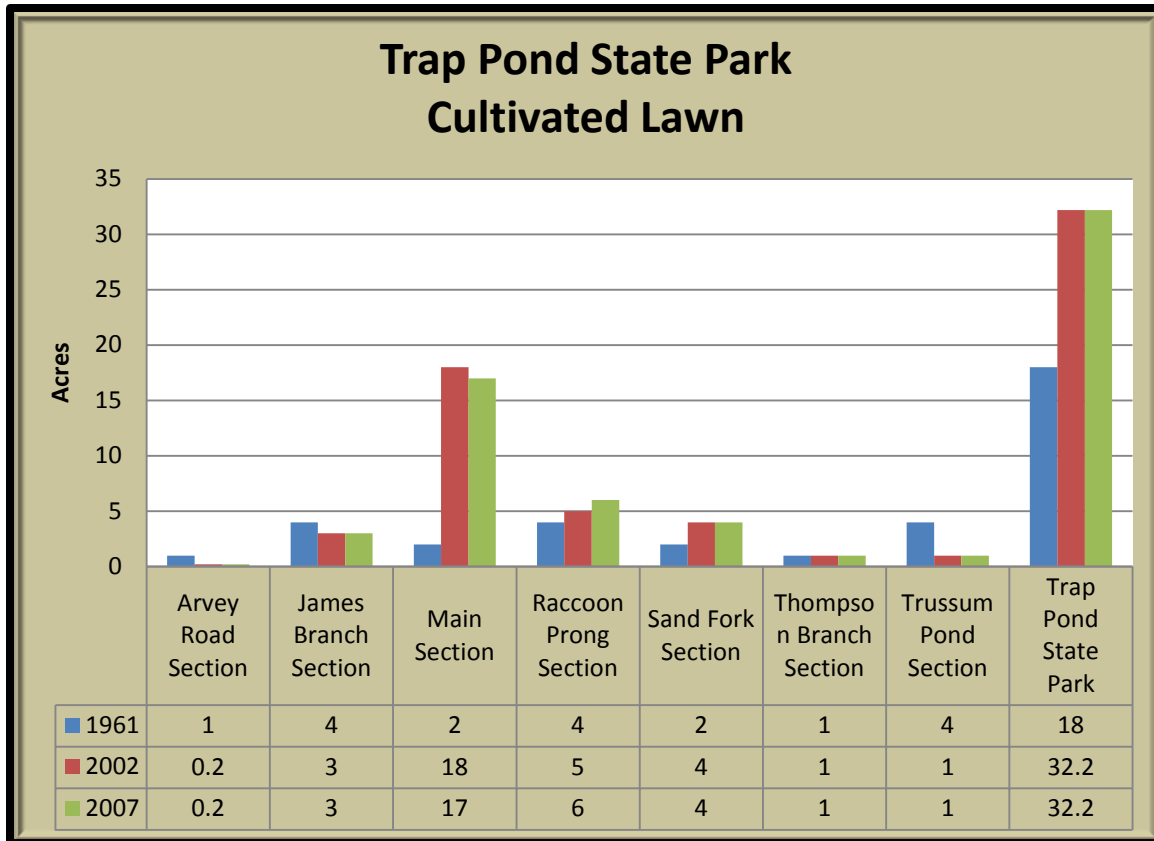
This anthropogenic community located around human built structures, roads, and parking lots. Tall fescue (*Festuca rubra*) and assorted ornamental plants are common in this community.

Analysis of Condition at Trap Pond State Park

In 2007 9 acres of the original 18 acres from 1961 still existed as cultivated lawn. The rest of the acreage had become 2 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 3 acres of agricultural field, 1 acre of Early to Mid-Successional Loblolly Pine Forest, and 1 acre of Southern Red Oak/Heath Forest (Table 5.11). Since 1961, cultivated lawn has been developed in 9 acres of agricultural field, 6 acres each of Early to Mid-Successional Loblolly Pine Forest and Northeastern Old Field, and 1 acre of Semi-impervious Surface (Table 5.12).

<b>Table 5.11. What was once Cultivated Lawn in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Cultivated Lawn	9 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	3 acres
Agricultural Field	3 acres
Early to Mid-Successional Loblolly Pine Forest	1 acre
Southern Red Oak/Heath Forest	1 acre
Other vegetation communities/land covers	1 acre

<b>Table 5.12. Cultivated Lawn has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Cultivated Lawn	9 acres
Agricultural Field	9 acres
Early to Mid-Successional Loblolly Pine Forest	6 acres
Northeastern Old Field	6 acres
Semi-impervious Surface	1 acre
Other vegetation communities/land covers	1 acre



**Figure 5.11.** Cultivated Lawn at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Cultivated lawn does not have any natural capital value.



**Early to Mid-Successional Loblolly Pine Forest [886 acres (Figures 5.12-5.13, Tables 5.13-5.14)]**  
GNA SNA

**DEWAP: Shrub/Brush Early Successional Upland Habitats**  
**NHC: Semi-natural/Altered vegetation and Conifer Plantations**

Description

Early to Mid-Successional Loblolly Pine Forest is the most common forested community in the park. Loblolly pine (*Pinus taeda*) solely dominates the canopy, which is the definition of the community. The understory is composed of red maple (*Acer rubrum*), American holly (*Ilex opaca*), hercule's club (*Aralia spinosa*), sweetgum (*Liquidambar styraciflua*), sassafras (*Sassafras albidum*), southern red oak (*Quercus falcata*), and a few American beech (*Fagus grandifolia*).

The shrub and vine layer is composed of summer grape (*Vitis aestivalis*), poison ivy (*Toxicodendron radicans*), highbush blueberry (*Vaccinium corymbosum*), Japanese honeysuckle (*Lonicera japonica*), common greenbrier (*Smilax rotundifolia*), and multiflora rose (*Rosa multiflora*). Few herbs are located in this forest and include pokeweed (*Phytolacca americana*), ground pine (*Lycopodium obscurum*), and partridgeberry (*Mitchella repens*).



**Figure 5.12.** Early to Mid-Successional Loblolly Pine Forest (Main Section)

Most of the occurrences of this community in the park are close to mid-successional and are making the transition to having other species in the canopy making them Mid to Late Successional Loblolly Pine-Sweetgum Forests. Very few are young (early) age.

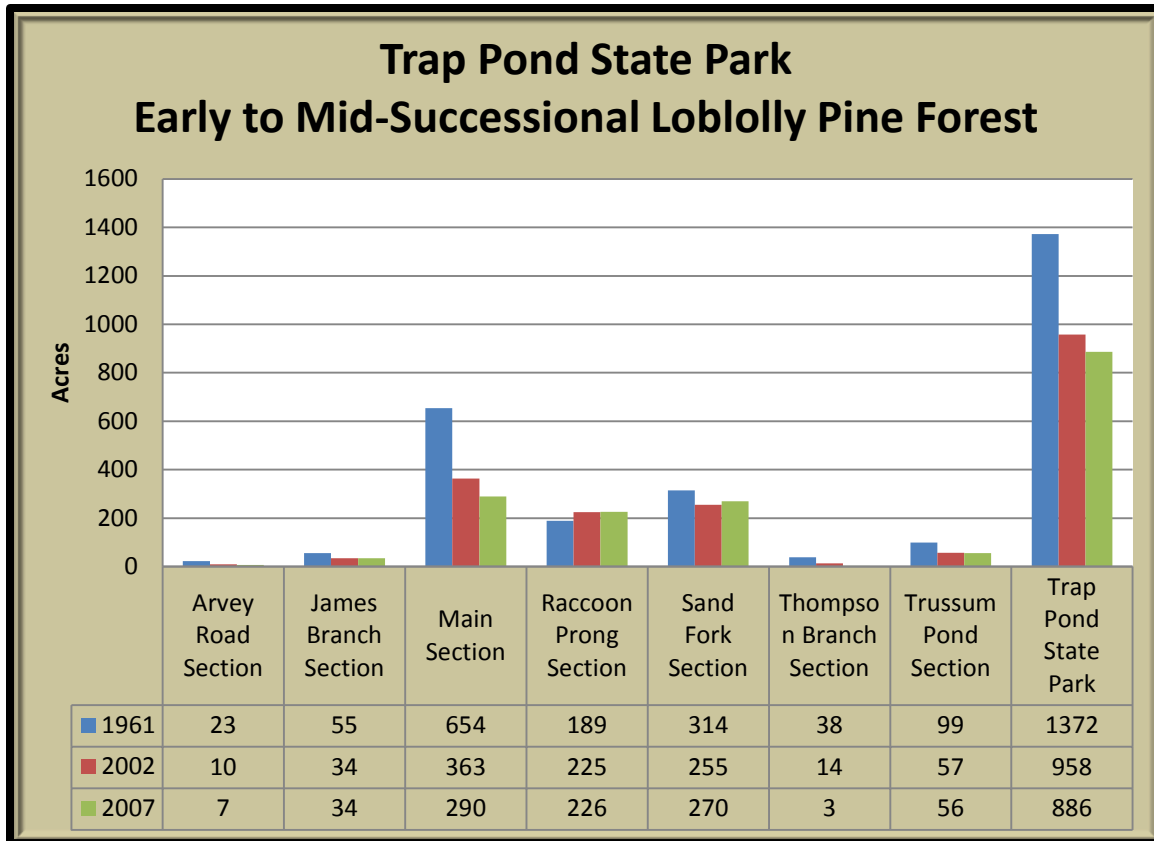
Analysis of Condition at Trap Pond State Park

In 2007, 618 acres of the original 1,372 acres from 1961 were still present. The rest of the acreage has become 303 acres of Southern Red Oak/Heath Forest, 284 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 66 acres of Loblolly Pine Plantation, and 24 acres of Southern Red Maple-Blackgum Swamp (Table 5.13).

Since 2007, Early to Mid-Successional Loblolly Pine Forest has grown into 103 acres of agricultural field, 57 acres of Southern Red Oak/Heath Forest, 38 acres of Northeastern Old Field, and 26 acres of Loblolly Pine Plantation (Table 5.14).

<b>Table 5.13. What was once Early to Mid-Successional Loblolly Pine Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	618 acres
Southern Red Oak/Heath Forest	303 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	284 acres
Loblolly Pine Plantation	66 acres
Southern Red Maple-Blackgum Swamp	24 acres
Other communities/land covers	78 acres

<b>Table 5.14. Early to Mid-Successional Loblolly Pine Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	618 acres
Agricultural Field	103 acres
Southern Red Oak/Heath Forest	57 acres
Northeastern Old Field	38 acres
Loblolly Pine Plantation	26 acres
Other vegetation communities/land covers	44 acres



**Figure 5.13.** Early to Mid-Successional Loblolly Pine Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.15)

Capital of Early to Mid-Successional Loblolly Pine Forest has been decreasing as these forests mature to other forests.

<b>Table 5.15. Natural Capital of Early to Mid-Successional Loblolly Pine Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$259,445/year
2002	\$181,158/year
2007	\$167,543/year

**Eastern Reed Marsh [2 acres (Figures 5.14-5.15, Tables 5.16-5.17)]      GNA    SNA**

**DEWAP: Streamside Herbaceous Wetlands  
NHC: Semi-natural/Altered vegetation and Conifer Plantations**

Description



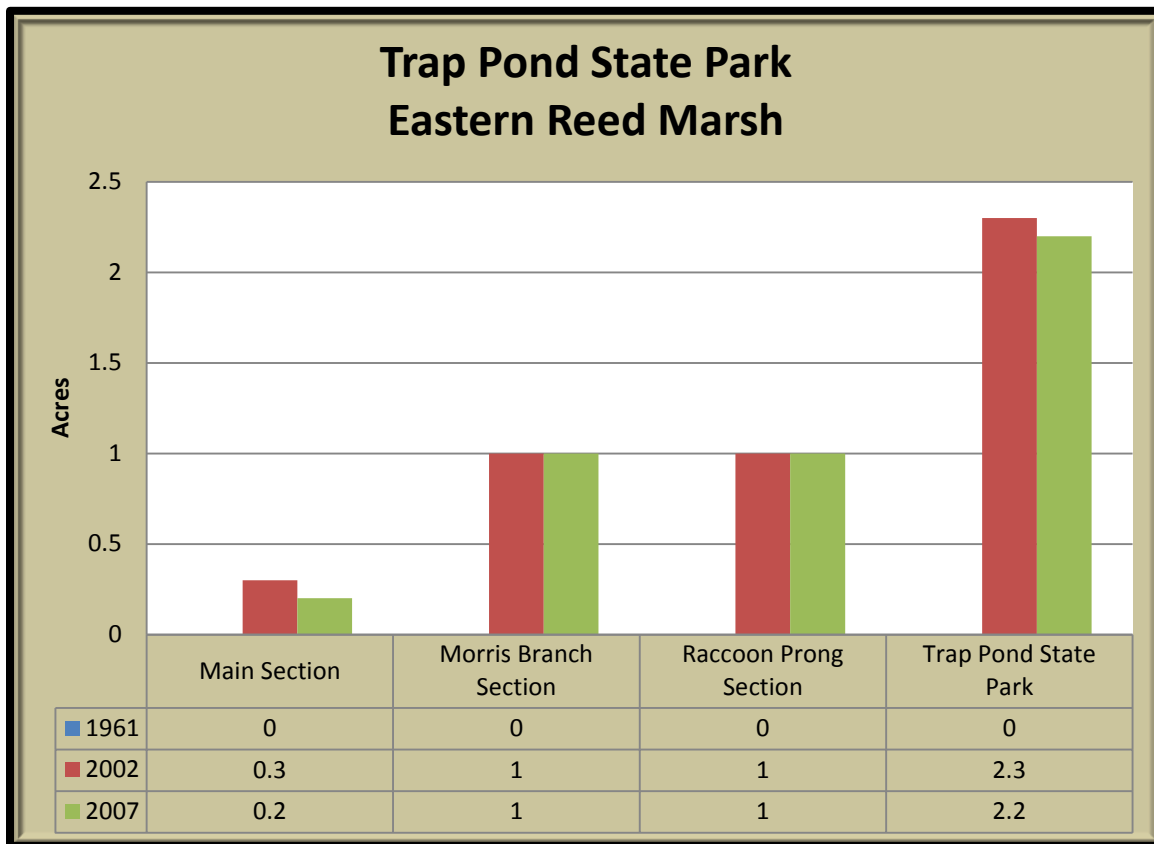
Eastern Reed Marsh is not all that common in the park. It is found in isolated wetlands and is composed nearly entirely of common reed (*Phragmites australis*).

**Figure 5.14.** Eastern Reed Marsh (Main Section)

Analysis of Condition at Trap Pond State Park

Eastern Reed Marsh was not present in 1961, or at least did not appear to be present in 1961. Since 1961, it has taken up residence in 2 acres of Powerline R-O-W and 0.2 acres of Early to Mid-Successional Loblolly Pine Forest (Table 5.16).

<b>Table 5.16. Eastern Reed Marsh has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Powerline R-O-W	2 acres
Early to Mid-Successional Loblolly Pine Forest	0.2 acres



**Figure 5.15.** Eastern Reed Marsh at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.17)

Eastern Reed Marsh was not present in 1961 and has since acquired around \$21,000 in capital. The capital has decreased recently with a loss in acreage in the Main Section.

<b>Table 5.17. Natural Capital of Eastern Reed Marsh</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$21,347/year
2007	\$20,419/year

**DEWAP: Coastal Plain Upland Forest**  
**NHC: Semi-natural/Altered vegetation and Conifer Plantations**

Description

Loblolly Pine Plantations are managed for the timbering of loblolly pine (*Pinus taeda*) and in this area mostly for pulpwood, meaning that the trees do not reach a large size in



diameter. Other trees in the canopy include red maple (*Acer rubrum*) and wild black cherry (*Prunus serotina*). Understory trees include American holly (*Ilex opaca*), sweetgum (*Liquidambar styraciflua*), and sweetbay (*Magnolia virginiana*). Shrubs and vines include common greenbrier (*Smilax rotundifolia*), lowbush blueberry (*Vaccinium pallidum*), and highbush blueberry (*Vaccinium corymbosum*). Herbs in this community include Pennsylvania sedge (*Carex pennsylvanica*), speargrass (*Chasmanthium laxum*), and broom-sedge (*Andropogon virginicus*).

**Figure 5.16.** Loblolly Pine Plantation (Arvey Road Section)

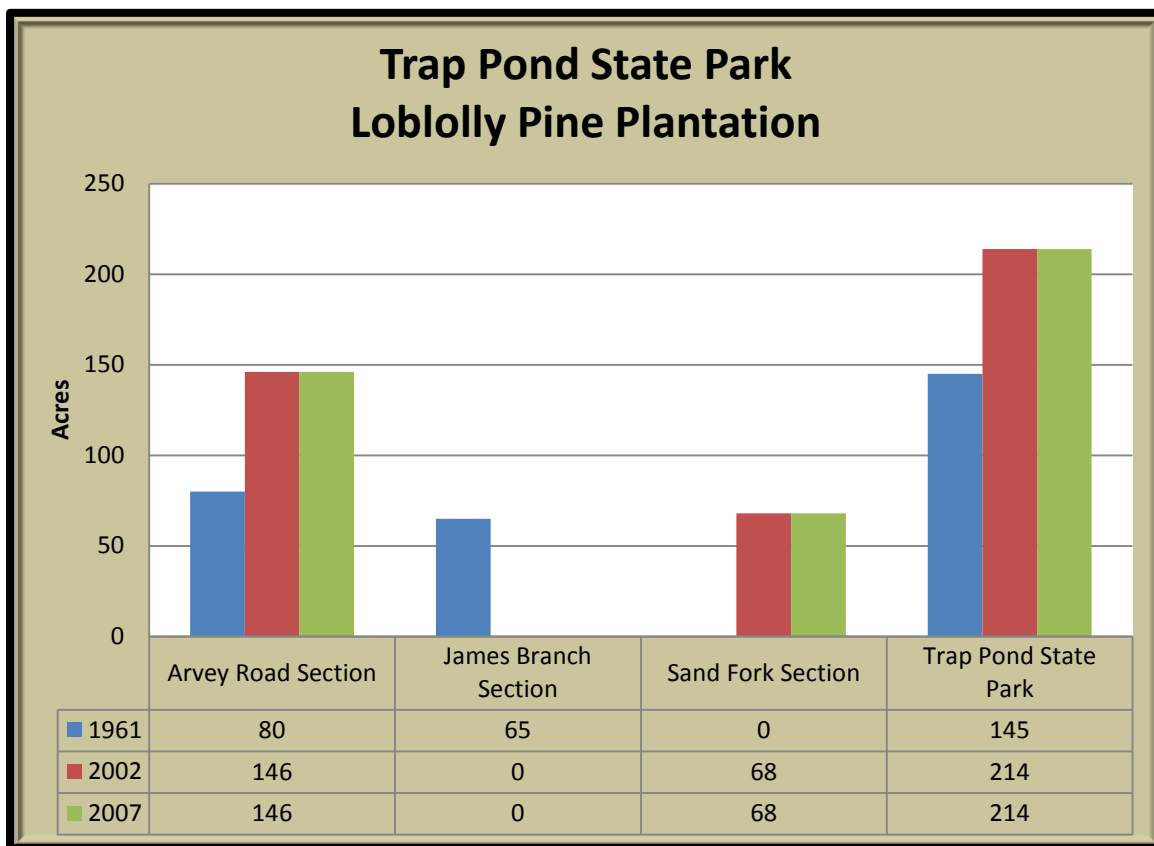
Analysis of Condition at Trap Pond State Park

About 79 of the original 145 acres from 1961 were still present in 2007. The rest of the acreage had become 33 acres of Southern Red Oak/Heath Forest, 26 acres of Early to Mid-Successional Loblolly Pine Forest, 6 acres of Coastal Plain Atlantic White Cedar-Red Maple Swamp, and 1 acre of Semi-impervious Surface (Table 5.18). Since 1961, Loblolly Pine Plantations have been developed in 66 acres of Early to Mid-Successional Loblolly Pine Forest, 59 acres of Chesapeake Bay Non-riverine Wet Hardwood Forest, 8 acres of clear-cut, and 3 acres of agricultural field (Table 5.19).

<b>Table 5.18. What was once Loblolly Pine Plantation in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Loblolly Pine Plantation	79 acres
Southern Red Oak/Heath Forest	33 acres
Early to Mid-Successional Loblolly Pine Forest	26 acres
Coastal Plain Atlantic White Cedar-Red Maple Swamp	6 acres
Semi-impervious Surface	1 acre
Other vegetation communities/land covers	1 acre



Table 5.19. Loblolly Pine Plantation has migrated into X or remained since 1961	
X	Acreage
Loblolly Pine Plantation	79 acres
Early to Mid-Successional Loblolly Pine Forest	66 acres
Chesapeake Bay Non-riverine Wet Hardwood Forest	59 acres
Clear-cut	8 acres
Agricultural Field	3 acres



**Figure 5.17.** Loblolly Pine Plantation at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.20)

Capital of Loblolly Pine Plantation has been increasing as more of these areas are grown in the park.

<b>Table 5.20. Natural Capital of Loblolly Pine Plantation</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$27,420/year
2002	\$40,467/year
2007	\$40,467/year

**Mid to Late Successional Loblolly Pine-Sweetgum Forest [454 acres (Figures 5.18-5.19, Tables 5.18-5.20)] G? S1**

**DEWAP: Coastal Plain Upland Forests  
NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description

Mid to Late Successional Loblolly Pine-Sweetgum Forest is the next stage in successional from an Early to Mid-Successional Loblolly Pine Forest. In this stage, loblolly pine (*Pinus taeda*) and joined in the canopy by hardwood species. The hardwood species in the canopy include southern red oak (*Quercus falcata*), American beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), and white oak (*Quercus alba*). Understory species include smaller members of the



canopy plus American holly (*Ilex opaca*), flowering dogwood (*Cornus florida*), eastern red cedar (*Juniperus virginiana*), mockernut hickory (*Carya alba*), and red maple (*Acer rubrum*). Shrubs and vines include lowbush blueberry (*Vaccinium pallidum*), highbush blueberry (*Vaccinium corymbosum*), muscadine grape (*Vitis rotundifolia*), arrowwood (*Viburnum dentatum*), and common greenbrier (*Smilax rotundifolia*). Herbs are few in this community and include partridgeberry (*Mitchella repens*) and large twayblade (*Liparis lilifolia*).

**Figure 5.18.** Mid to Late Successional Loblolly Pine-Sweetgum Forest (Main Section)

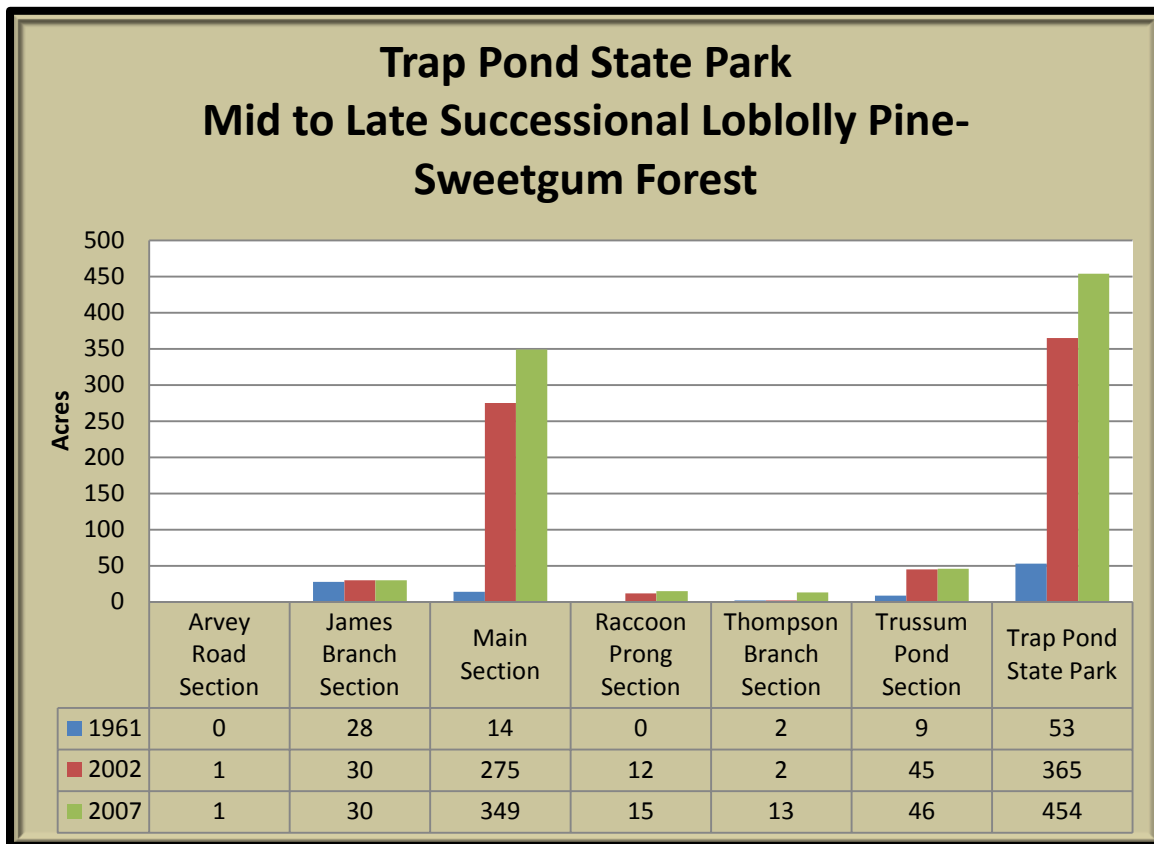
Analysis of Condition at Trap Pond State Park

Showing that a lot of these stands mature to climax communities, only 13 acres of the 53 acres present in 1961 were still present in 2007. The rest of the acreage had become 18 acres of Southern Red Oak/Heath Forest, 10 acres of Mid-Atlantic Mesic Mixed Hardwood Forest, 9 acres of Northeastern Modified Successional Forest, and 3 acres of Successional Tuliptree Forest (Table 5.18).

Since 1961 this community has expanded as Early to Mid-Successional Loblolly Pine Forest has matured into Mid to Late Successional Loblolly Pine-Sweetgum Forest. About 278 acres of Early to Mid-Successional Loblolly Pine Forest, 69 acres of clear-cut, 46 acres of agricultural field, and 18 acres of Southern Red Oak/Heath Forest, via clear-cut have grown into this forest (Table 5.19).

<b>Table 5.18. What was once Mid to Late Successional Loblolly Pine-Sweetgum Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Southern Red Oak/Heath Forest	18 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	13 acres
Mid-Atlantic Mesic Mixed Hardwood Forest	10 acres
Northeastern Modified Successional Forest	9 acres
Successional Tuliptree Forest	3 acres
Other vegetation communities/land covers	0.2 acres

<b>Table 5.19. Mid to Late Successional Loblolly Pine-Sweetgum Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	278 acres
Clear-cut	69 acres
Agricultural Field	46 acres
Southern Red Oak/Heath Forest	18 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	13 acres
Other vegetation communities/land covers	31 acres



**Figure 5.19.** Mid to Late Successional Loblolly Pine-Sweetgum Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital (Table 5.20)*

Capital of Mid to Late Successional Loblolly Pine-Sweetgum Forest has increased as early successional forests mature into it. Most of the gain has been through transfers; however there has been an overall increase in capital for the park from this community.

<b>Table 5.20. Natural Capital of Mid to Late Successional Loblolly Pine-Sweetgum Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$10,022/year
2002	\$69,022/year
2007	\$85,851/year

**Mid-Atlantic Mesic Mixed Hardwood Forest [39 acres (Figures 5.20-5.21, Tables 5.21.5.23)] G5  
S5**

**DEWAP: Coastal Plain Upland Forests  
NHC: Northern Atlantic Coastal Plain Hardwood Forest**

Description

This community is largely located in the James Branch Section and along Raccoon Prong. American beech (*Fagus grandifolia*) is a characteristic canopy dominant and is associated by loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). The understory includes sassafras (*Sassafras albidum*), American holly (*Ilex opaca*), sweetbay (*Magnolia virginiana*), and water oak (*Quercus nigra*). Lowbush blueberry (*Vaccinium pallidum*) and common greenbrier



(*Smilax rotundifolia*) compose the shrub and vine layer. Herbs noted in this community include speargrass (*Chasmanthium laxum*), partridgeberry (*Mitchella repens*), and bracken fern (*Pteridium aquilinum*).

The examples of this community in Trap Pond State Park are in the late successional state to barely mature with weak formation of layers and somewhat young age canopy trees. Overall they could be considered fair to good condition for the type.

**Figure 5.20.** Mid-Atlantic Mesic Mixed Hardwood Forest (Main Section)

Analysis of Condition at Trap Pond State Park

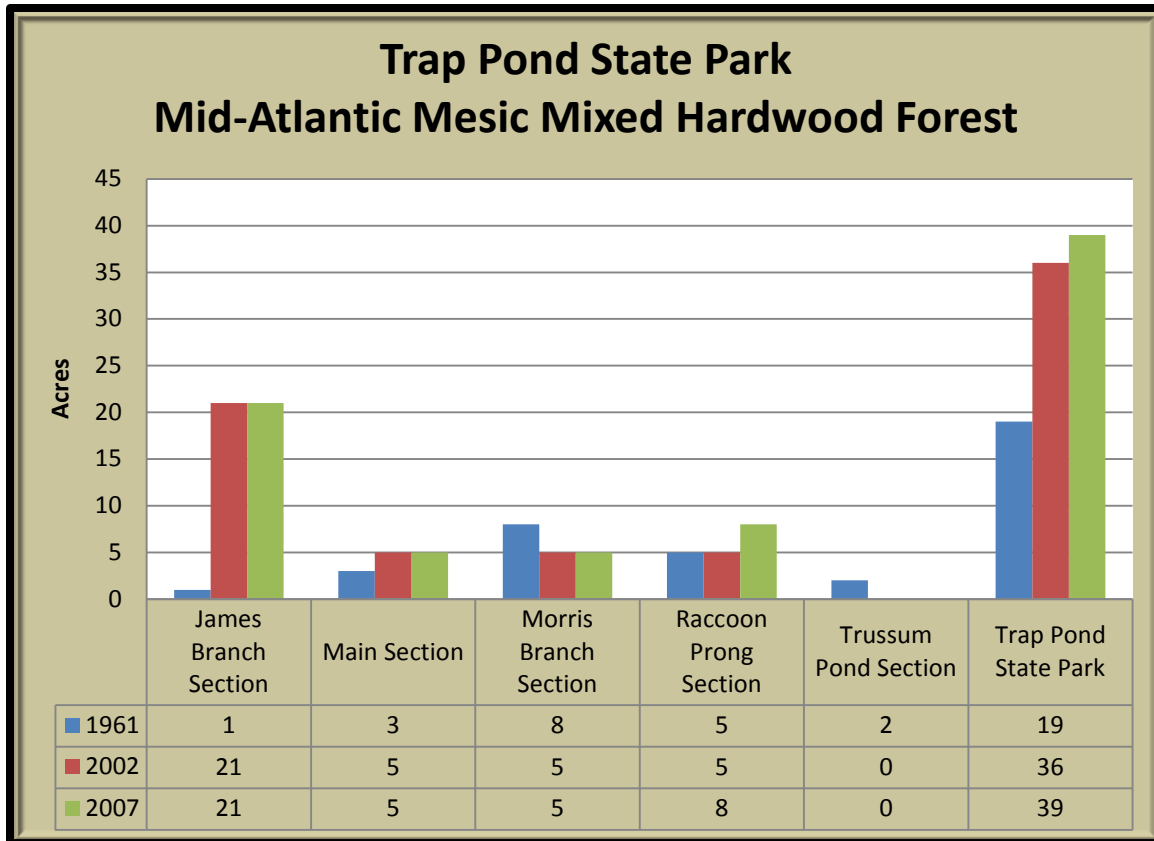
About 14 acres of the 19 acres present in 1961 was still present in 2007. The rest of the acreage had become 2 acres of Early to Mid-Successional Loblolly Pine Forest (likely through a clear-cut), 2 acres of agricultural field, 0.4 acres of Northeastern Old Field, and 0.1 acres of Farm Pond/Artificial Pond (Table 5.21).

Since 1961, the acreage of this community has increased to 39 acres by the maturation of 10 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 8 acres of Early to Mid-Successional Loblolly Pine Forest, and the conversion of 6 acres of Southern Red Oak/Heath Forest (Table 5.22). Most of the increase has come in the James Branch Section.



<b>Table 5.21. What was once Mid-Atlantic Mesic Mixed Hardwood Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Mid-Atlantic Mesic Mixed Hardwood Forest	14 acres
Early to Mid-Successional Loblolly Pine Forest	2 acres
Agricultural Field	2 acres
Northeastern Old Field	0.4 acres
Farm Pond/Artificial Pond	0.1 acres

<b>Table 5.22. Mid-Atlantic Mesic Mixed Hardwood Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Mid-Atlantic Mesic Mixed Hardwood Forest	14 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	10 acres
Early to Mid-Successional Loblolly Pine Forest	8 acres
Southern Red Oak/Heath Forest	6 acres



**Figure 5.21.** Mid-Atlantic Mesic Mixed Hardwood Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.23)

Capital in Mid-Atlantic Mesic Mixed Hardwood has been increasing as its acreage increases. Most of the increases have been by transfers from other forested communities.

<b>Table 5.23. Natural Capital of Mid-Atlantic Mesic Mixed Hardwood Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$3,593/year
2002	\$6,808/year
2007	\$7,375/year

**Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest [26 acres (Figures 5.22-5.23, Tables 5.24-5.26)] GNR S1**

**DEWAP: Coastal Plain Upland Forests  
NHC: Northern Atlantic Coastal Plain Hardwood Forest**

Description

This is the only occurrence of this generally Piedmont community known to be on the Coastal Plain of Delaware. Chestnut Oak (*Quercus prinus*) dominates the canopy and is associated by American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), tuliptree (*Liriodendron tulipifera*), and southern red oak (*Quercus falcata*). The understory is composed of smaller members of the canopy plus American holly (*Ilex opaca*), spicebush (*Lindera benzoin*), and mockernut hickory (*Carya alba*). The shrub and vine layer is co-dominated by common



greenbrier (*Smilax rotundifolia*) and muscadine grape (*Vitis rotundifolia*), and associated by white-leaf greenbrier (*Smilax glauca*). Partridgeberry (*Mitchella repens*) was the only herb documented for this community.

The examples of this community in the park are mature and in good condition. Excepting the lack of herbaceous plants, which are seen in the Piedmont examples, but are typical for a lot of Coastal Plain communities, this community is a good example of the type.

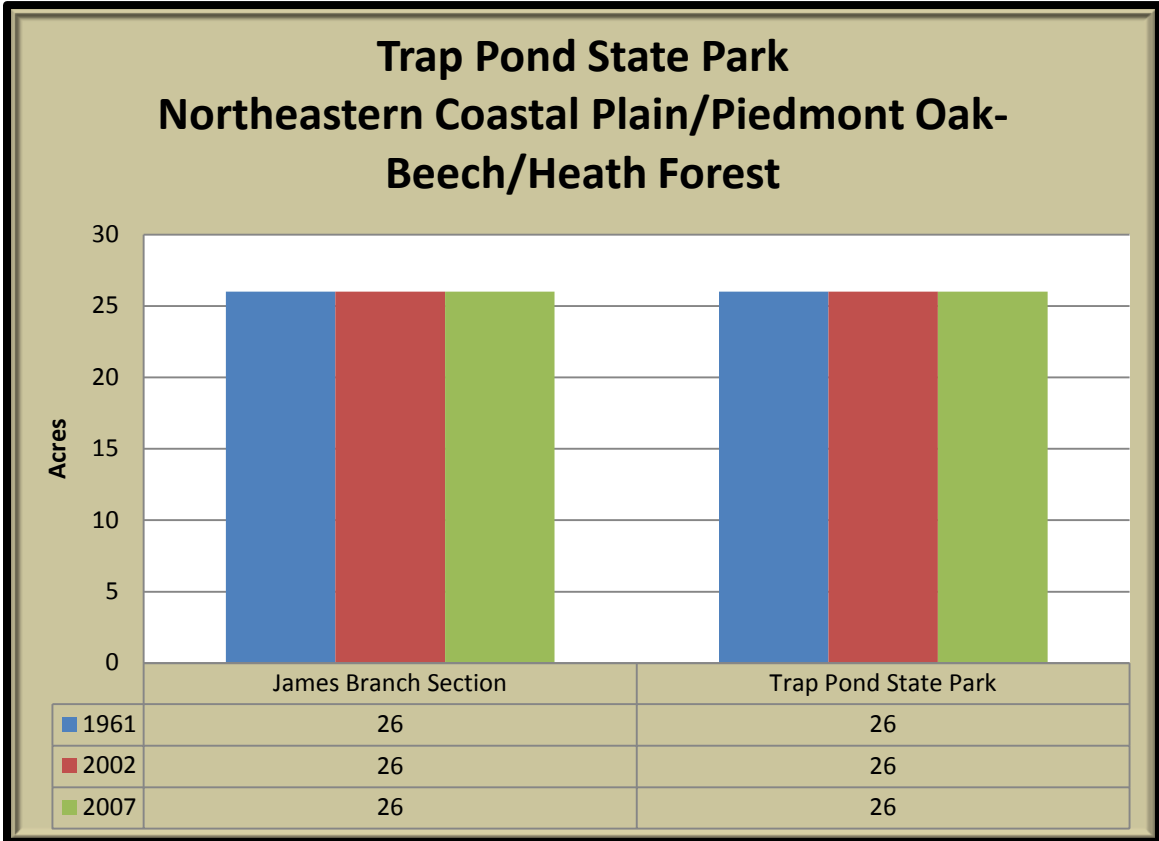
**Figure 5.22.** Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest (James Branch Section)

Analysis of Condition at Trap Pond State Park

Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest has not changed in acreage or extent since 1961 (Tables 5.24 and 5.25).

<b>Table 5.24. What was once Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest	26 acres

Table 5.25. Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest has migrated into X or remained since 1961	
X	Acreage
Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest	26 acres



**Figure 5.23.** Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.26)

Capital of Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest has not changed since its acreage has not changed.

<b>Table 5.26. Natural Capital of Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$4,917/year
2002	\$4,917/year
2007	\$4,917/year

**Northeastern Modified Successional Forest [39 acres (Figures 5.24-5.25, Tables 5.27-5.29)]**  
**GNA SNA**

**DEWAP: Coastal Plain Upland Forests**  
**NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description

This forested community is typified by a dense understory of exotic invasive plants. Tuliptree (*Liriodendron tulipifera*), southern red oak (*Quercus falcata*), red maple (*Acer rubrum*), and in younger stands, loblolly pine (*Pinus taeda*) are common in the canopy. The understory contains smaller members of the canopy plus American holly (*Ilex opaca*), wild black cherry (*Prunus serotina*), sassafras (*Sassafras albidum*), and eastern red cedar (*Juniperus virginiana*). The dense shrub and vine layer is composed of multiflora rose (*Rosa multiflora*), common greenbrier (*Smilax rotundifolia*), summer grape (*Vitis aestivalis*), English ivy (*Hedera helix*), Japanese honeysuckle (*Lonicera japonica*), and white-leaf greenbrier (*Smilax glauca*). No herbs were noted in these communities.



**Figure 5.24.** Northeastern Modified Successional Forest (James Branch Section)

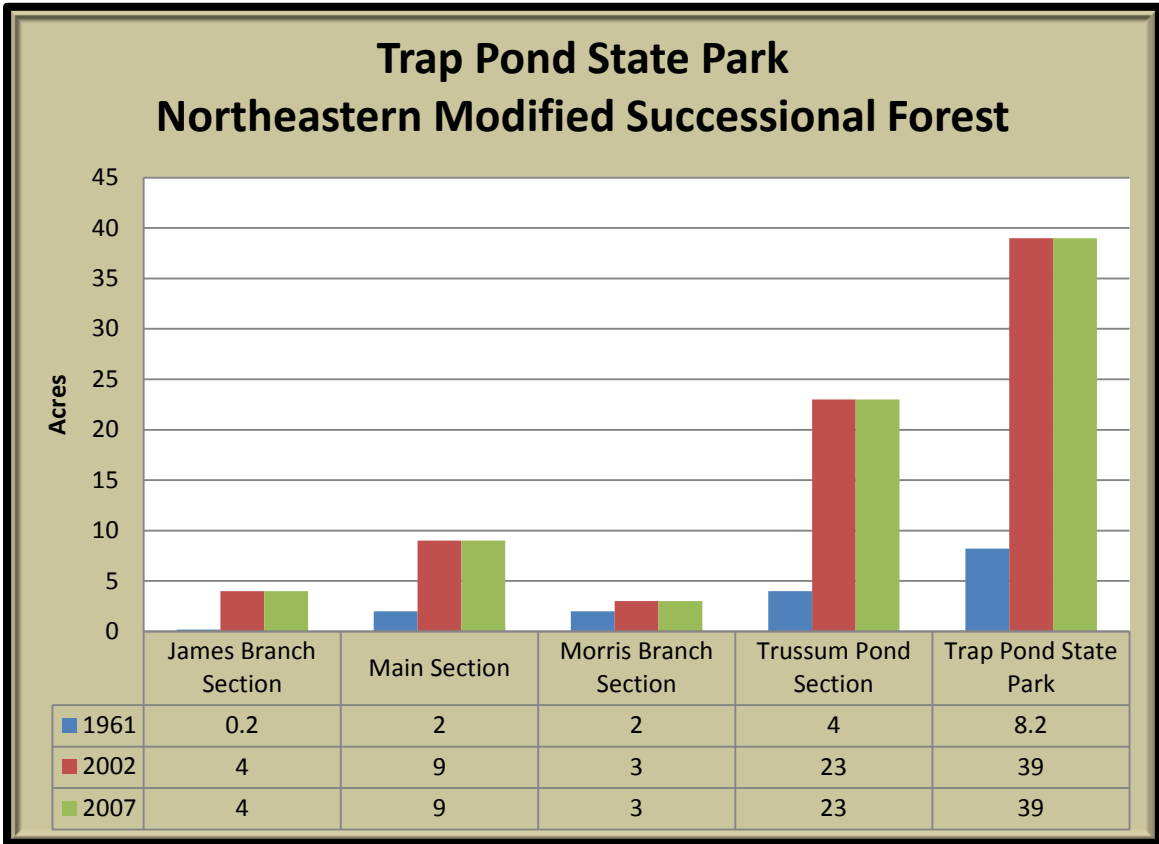
Analysis of Condition at Trap Pond State Park

All of the Northeastern Modified Successional Forest that was present in 1961 was still present in 2007 (Table 5.27). Since 1961, the acreage of this community has increased by converting 12 acres of Early to Mid-Successional Loblolly Pine Forest, 9 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 8 acres of agricultural field, and 3 acres of Southern Red Oak/Heath Forest (Table 5.28).

<b>Table 5.27. What was once Northeastern Modified Successional Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Northeastern Modified Successional Forest	7 acres



<b>Table 5.28. Northeastern Modified Successional Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	12 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	9 acres
Agricultural Field	8 acres
Northeastern Modified Successional Forest	6 acres
Southern Red Oak/Heath Forest	3 acres
Other vegetation communities/land covers	1 acre



**Figure 5.25.** Northeastern Modified Successional Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.29)

Capital of Northeastern Modified Successional Forest has increased greatly as it has invaded or other forests have grown into it.

<b>Table 5.29. Natural Capital of Northeastern Modified Successional Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,551/year
2002	\$7,375/year
2007	\$7,375/year

**Northeastern Old Field [39 acres (Figures 5.26-5.27, Tables 5.30-5.32)] GNA SNA**

**DEWAP: Herbaceous Early Successional Upland Habitats  
NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description



Northeastern Old Fields are mowed once or less per year, which distinguished them from cultivated lawns. These fields are filled with grasses such as tall fescue (*Festuca rubra*), orchard grass (*Dactylis glomerata*), broom-sedge (*Andropogon virginicus*), and timothy (*Phleum pratense*). Some woody species may be present include sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), and red maple (*Acer rubrum*).

**Figure 5.26.** Northeastern Old Field  
(Trussum Pond Section)

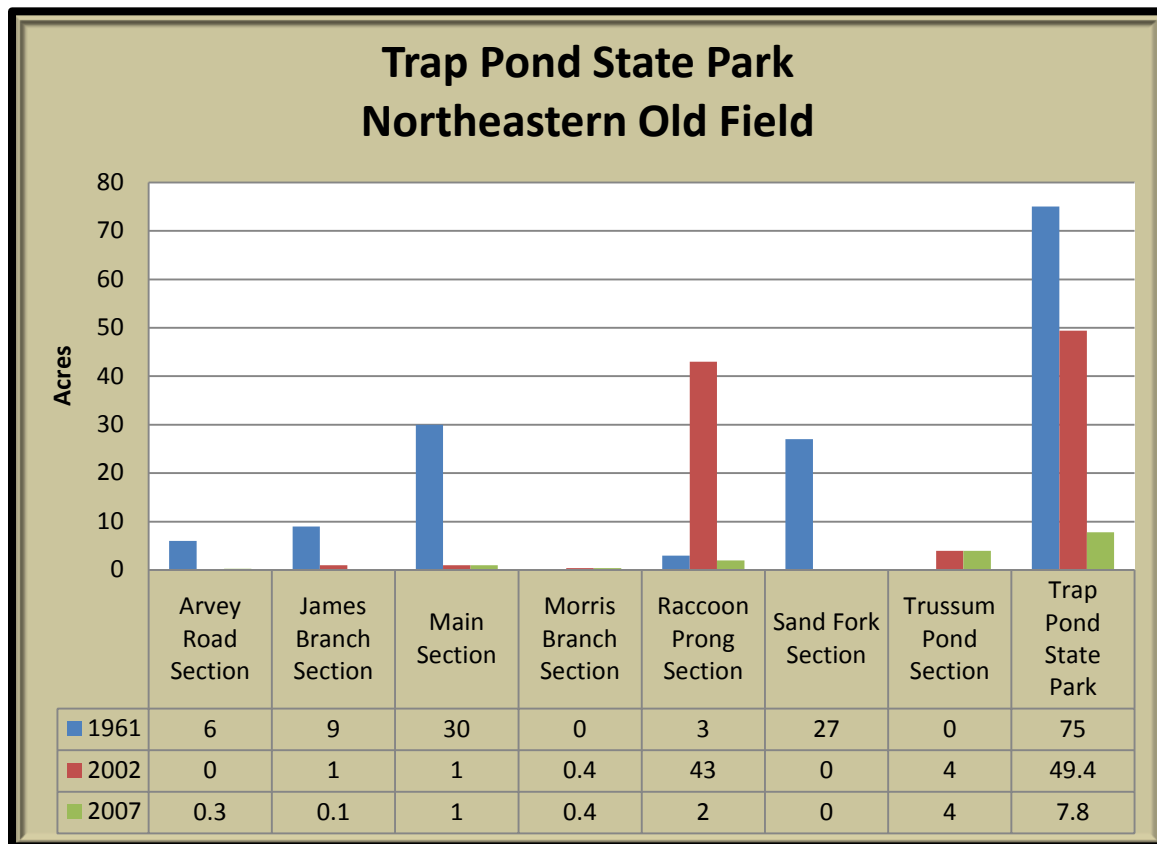
Analysis of Condition at Trap Pond State Park

Showing the ephemeral nature of these communities, only 0.5 acres of the 78 acres present in 1961 were still present in 2007. The rest of the fields had become 38 acres of Early to Mid-Successional Loblolly Pine Forest, 11 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 8 acres of Southern Red Oak/Heath Forest, 6 acres of cultivated lawn, and 5 acres of agricultural field (Table 5.30).

Since 1961, Northeastern Old Field has greatly decreased in the park as these areas have succeeded to shrubland and forest. However, these fields have appeared in 4 acres of agricultural field, 2 acres of Early to Mid-Successional Loblolly Pine Forest, and 0.4 acres of Mid-Atlantic Mesic Mixed Hardwood Forest (Table 5.31).

<b>Table 5.30. What was once Northeastern Old Field in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	38 acres
Mid to Late Successional Loblolly Pine Forest	11 acres
Southern Red Oak/Heath Forest	8 acres
Cultivated Lawn	6 acres
Agricultural Field	5 acres
Other vegetation communities/land covers	6 acres

Table 5.31. Northeastern Old Field has migrated into X or remained since 1961	
X	Acreage
Agricultural Field	4 acres
Early to Mid-Successional Loblolly Pine Forest	2 acres
Northeastern Old Field	0.5 acres
Mid-Atlantic Mesic Mixed Hardwood Forest	0.4 acres
Loblolly Pine Plantation	0.3 acres
Other vegetation communities/land covers	0.3 acres



**Figure 5.27.** Northeastern Old Field at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.32)

Capital of Northeastern Old Field has decreased as these fields succeed to other communities such as shrubland and forest.

<b>Table 5.32. Natural Capital of Northeastern Old Field</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$10,928/year
2002	\$7,274/year
2007	\$1,136/year

**DEWAP: Shrub/Brush Early Successional Upland Habitats  
 NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description

Northeastern Successional Shrubland is present in small amount around the park. Often these communities are a dense tangles of vines and shrubs and include Japanese honeysuckle (*Lonicera japonica*), blackberry (*Rubus* sp.), multiflora rose (*Rosa multiflora*), and red maple (*Acer rubrum*).

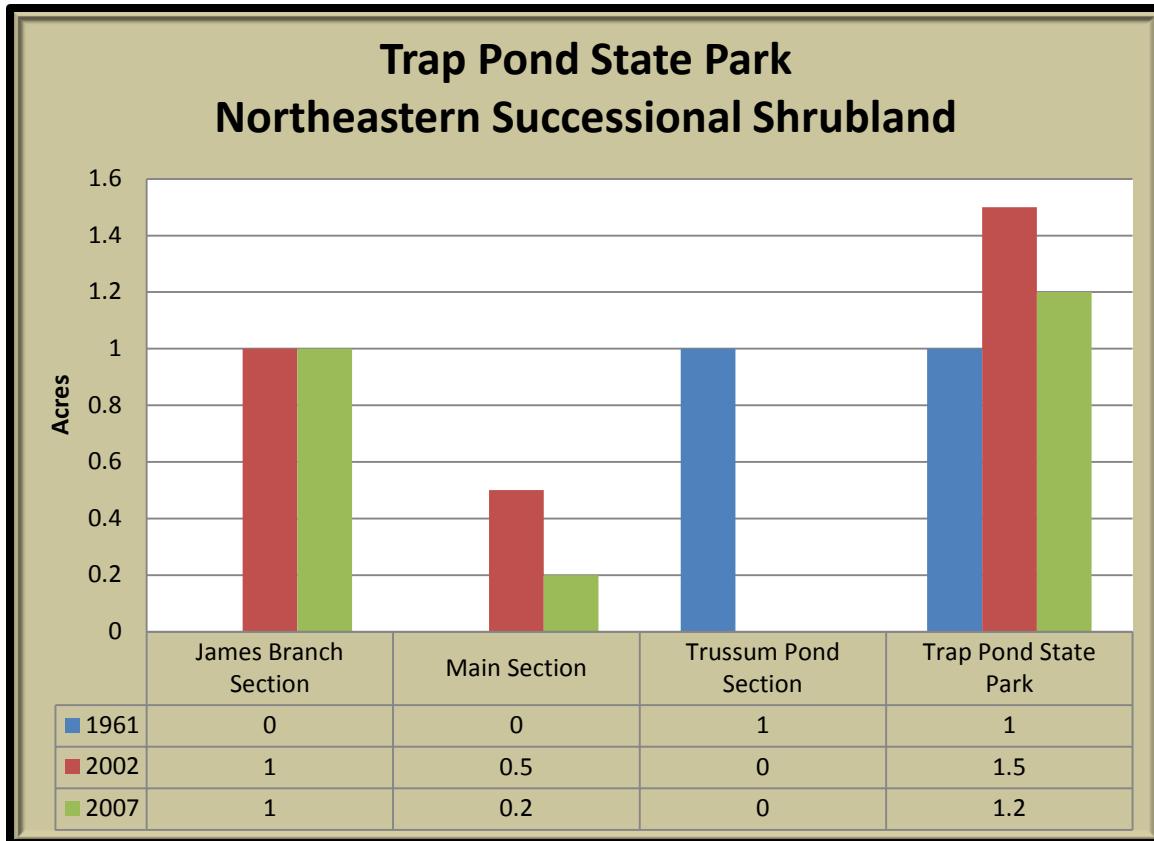
Analysis of Condition at Trap Pond State Park

None of the Northeastern Successional Shrubland from 1961 was still present in 1961. The shrubland then had become 1 acre of agricultural field and 0.1 acres of cultivated lawn (Table 5.33). Since 1961, Northeastern Successional Shrubland has occupied 1 acre of agricultural field, 0.2 acres of Southern Red Oak/Heath Forest, and 0.2 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest (Table 5.34).

<b>Table 5.33. What was once Northeastern Successional Shrubland in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	1 acre
Cultivated Lawn	0.1 acres

<b>Table 5.34. Northeastern Successional Shrubland has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	1 acre
Southern Red Oak/Heath Forest	0.2 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	0.2 acres





**Figure 5.28.** Northeastern Successional Shrubland at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.35)

Capital of Northeastern Successional Shrubland has never been all that much. Its amount has oscillated with its acreage as it matures into other communities.

Table 5.35. Natural Capital of Northeastern Successional Shrubland	
Year	Natural Capital (in 2012 dollars)
1961	\$146/year
2002	\$219/year
2007	\$175/year

**Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest [2 acres (Figures 5.29-5.30, Table 5.36)] G4? S2**

**DEWAP: Coastal Plain Upland Forests  
NHC: Northern Atlantic Coastal Plain Calcareous Ravine**

Description

Northern Coastal Plain/Piedmont Basic Mixed Hardwood Forest is located on the north side of Hitch Pond Branch near Hitch Pond Branch Road. Tuliptree (*Liriodendron tulipifera*) dominates the site and is associated by red maple (*Acer rubrum*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), and a few chestnut oak (*Quercus prinus*). Understory species include smaller members of the canopy plus flowering dogwood (*Cornus florida*), spicebush (*Lindera benzoin*), and wild black cherry (*Prunus serotina*). The shrub and vine layer is dominated by Japanese honeysuckle (*Lonicera japonica*), and associated by common greenbrier (*Smilax rotundifolia*), straw-berry bush (*Euonymus americana*), multiflora rose (*Rosa multiflora*), wineberry (*Rubus phoenocalasius*), and muscadine grape (*Vitis rotundifolia*). Common herbs in



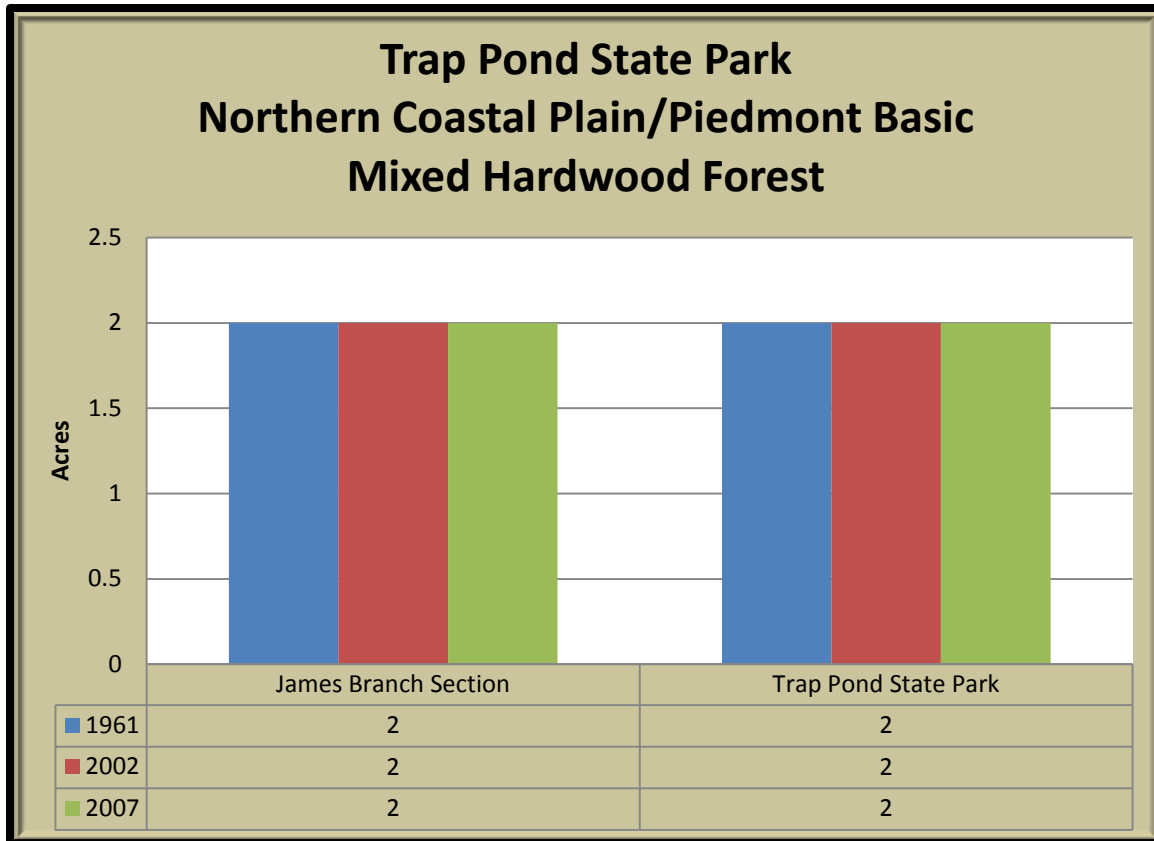
**Figure 5.29.** Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest (James Branch Section)

this community include hen-bit (*Lamium amplexicaule*), wild licorice (*Galium aparine*), Christmas fern (*Polystichum acrostichoides*), swan' sedge (*Carex swanii*), Virginia creeper (*Parthenocissus quinquefolia*), Pennsylvania sedge (*Carex pennsylvanica*), and New York Fern (*Thelypteris novaboracensis*).

The one example of this community in Trap Pond State Park is in fairly good condition with heterogeneous ages of trees and large diameter (1' to 2') canopy trees. The herbaceous is fairly rich but not as rich as some examples.

Analysis of Condition at Trap Pond State Park

This community has not changed in acreage or extent since 1961.



**Figure 5.30.** Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.36)

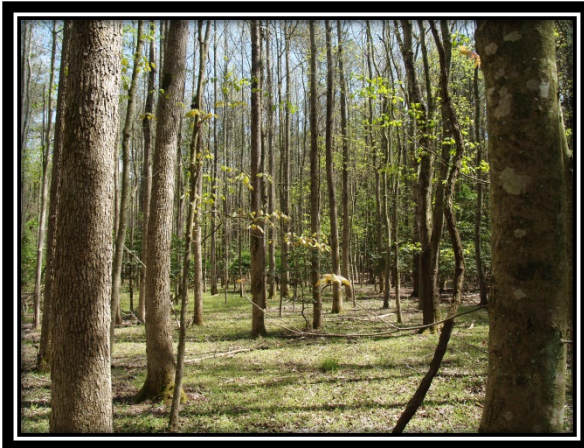
Capital of Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest has not changed since 1961.

<b>Table 5.36. Natural Capital of Northern Coastal Plain/Piedmont Basic Mesic Mixed Hardwood Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$378/year
2002	\$378/year
2007	\$378/year

**DEWAP: Isolated Wetlands**  
**NHC: Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest**

Description

This wetland community is located at the eastern end of the Main Section and is co-dominated by red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*) in the canopy. The understory contains the addition of American holly (*Ilex opaca*), while the shrub and vine



layer is composed of multiflora rose (*Rosa multiflora*), common greenbrier (*Smilax rotundifolia*), blackberry (*Rubus* sp.), and summer grape (*Vitis aestivalis*). Herbs noted from this community include wild onion (*Allium* sp.), Virginia cress (*Planodes virginicum*), and ebony spleenwort (*Asplenium platyneuron*).

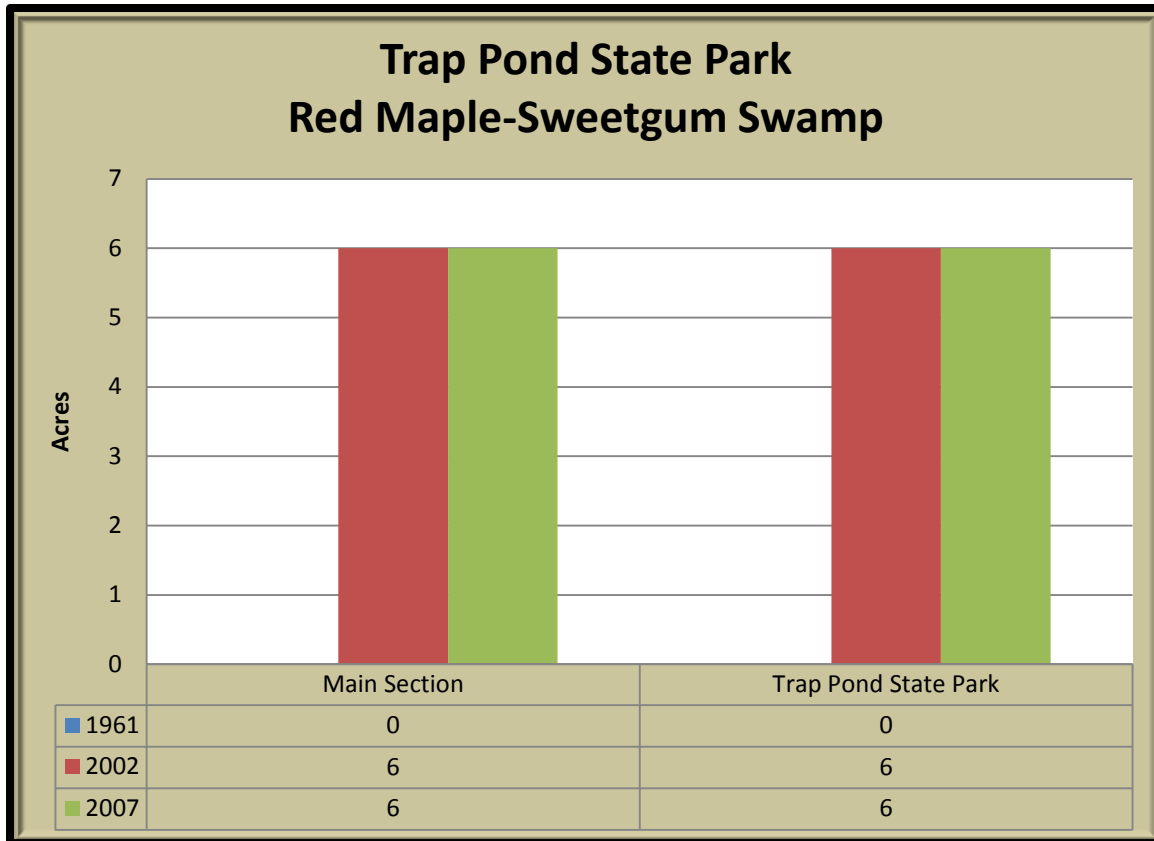
The example in Trap Pond State Park is in poor to fair condition and is disturbed. Trees in this community are fairly small and the understory contains a fair amount of exotic invasive plant species.

**Figure 5.31.** Red Maple-Sweetgum Swamp (Main Section)

Analysis of Condition at Trap Pond State Park

Red Maple-Sweetgum Swamp was not present in 1961 and has since grown into 4 acres of former agricultural field, 1 acre of Northeastern Modified Successional Forest, 1 acre of Impervious Surface, and 1 acre of Early to Mid-Successional Loblolly Pine Forest (Table 5.37).

<b>Table 5.37. Red Maple-Sweetgum Swamp has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	4 acres
Northeastern Modified Successional Forest	1 acre
Impervious Surface	1 acre
Early to Mid-Successional Loblolly Pine Forest	1 acre



**Figure 5.32.** Red Maple-Sweetgum Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.38)

Capital of Red Maple-Sweetgum Swamp has not changed since it appeared in 2002. Its appearance produced an overall capital gain for the park.

<b>Table 5.38. Natural Capital of Red Maple-Sweetgum Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$73,749/year
2007	\$73,749/year

DEWAP: Shrub Swamps  
 NHC: Laurentian-Acadian Wet Meadow Shrub Swamp

Description



**Figure 5.33.** Smooth Alder Swamp (Raccoon Prong Section)

This shrub swamp is located at the upper end of Raccoon Pond near where Raccoon Prong enters. Smooth alder (*Alnus serrulata*) dominates the shrubland and is associated by scattered red maple (*Acer rubrum*), highbush blueberry (*Vaccinium corymbosum*), wax-myrtle (*Morella cerifera*), and a few laurel-leaf greenbrier (*Smilax laurifolia*).

This example is a fair example of the type. Since it located in an impoundment there is more disturbance than otherwise associated with these communities.

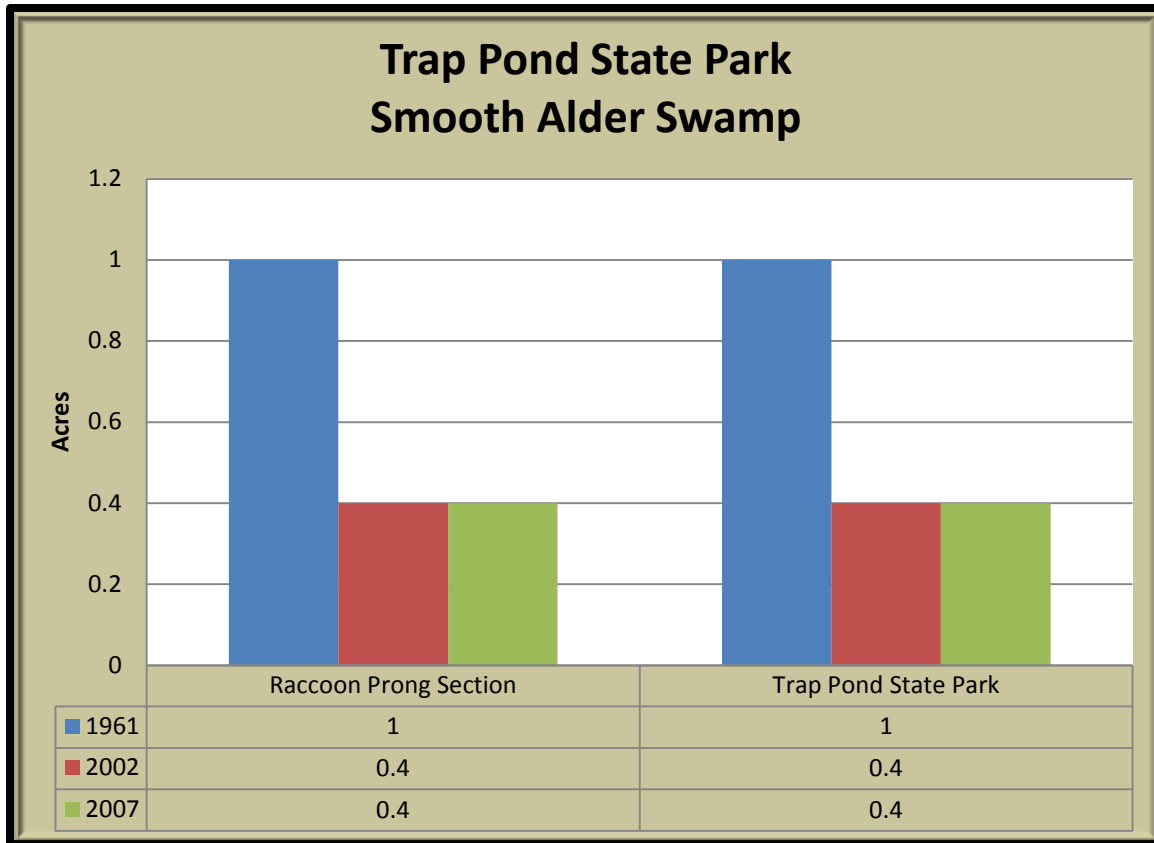
Analysis of Condition at Trap Pond State Park

About 0.4 acres of the 1 acre of Smooth Alder Swamp from 1961 was still present in 2007. Since 1961, this swamp has opened up with impoundment taking about 0.5 acres (Table 5.39) leaving 0.4 acres left (Table 5.40).

<b>Table 5.39. What was once Smooth Alder Swamp in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Impoundment	0.5 acres
Smooth Alder Swamp	0.4 acres

<b>Table 5.40. Smooth Alder Swamp has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Smooth Alder Swamp	0.4 acres





**Figure 5.32.** Smooth Alder Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.41)

Capital of Smooth Alder Swamp has decreased with its acreage since 1961.

Table 5.41. Natural Capital of Smooth Alder Swamp	
Year	Natural Capital (in 2012 dollars)
1961	\$9,281/year
2002	\$3,713/year
2007	\$3,713/year

**Southern Red Maple-Blackgum Swamp [379 acres (Figures 5.33-5.34, Tables 5.42-5.44)]**  
G3? S3

**DEWAP: Forested Floodplains and Riparian Swamps**  
**NHC: Northern Atlantic Coastal Plain Stream and River**

Description

This floodplain community contains a canopy of red maple (*Acer rubrum*) that is sometimes co-dominated by green ash (*Fraxinus pennsylvanica*). Other canopy associates include swamp white oak (*Quercus bicolor*), sweetgum (*Liquidambar styraciflua*), tuliptree (*Liriodendron tulipifera*), and blackgum (*Nyssa sylvatica*). The understory includes American holly (*Ilex opaca*), American hornbeam (*Carpinus caroliniana*), and sweetbay (*Magnolia virginiana*). Shrubs and vines include highbush blueberry (*Vaccinium corymbosum*), Sweet pepperbush (*Clethra alnifolia*), common greenbrier (*Smilax rotundifolia*), strawberry-bush (*Euonymus americana*), winterberry (*Ilex verticillata*), and creeping raspberry (*Rubus hispidus*). No herbs were noted in this community. Herbs include royal fern (*Osmunda regalis*), netted



**Figure 5.33.** Southern Red Maple-Blackgum Swamp (Main Section)

chain fern (*Woodwardia areolata*), New York fern (*Thelypteris novaboracensis*), arrow-arum (*Peltandra virginica*), Virginia creeper (*Parthenocissus quinquefolia*), cinnamon fern (*Osmunda cinnamomea*), thicket sedge (*Carex abscondita*), and jack-in-the-pulpit (*Arisaema triphyllum*).

Most of the occurrences of this community in the park are at least late successional if not mature. Layering is good and canopy trees are large in the 1' to 2' range. Most are rated as good.

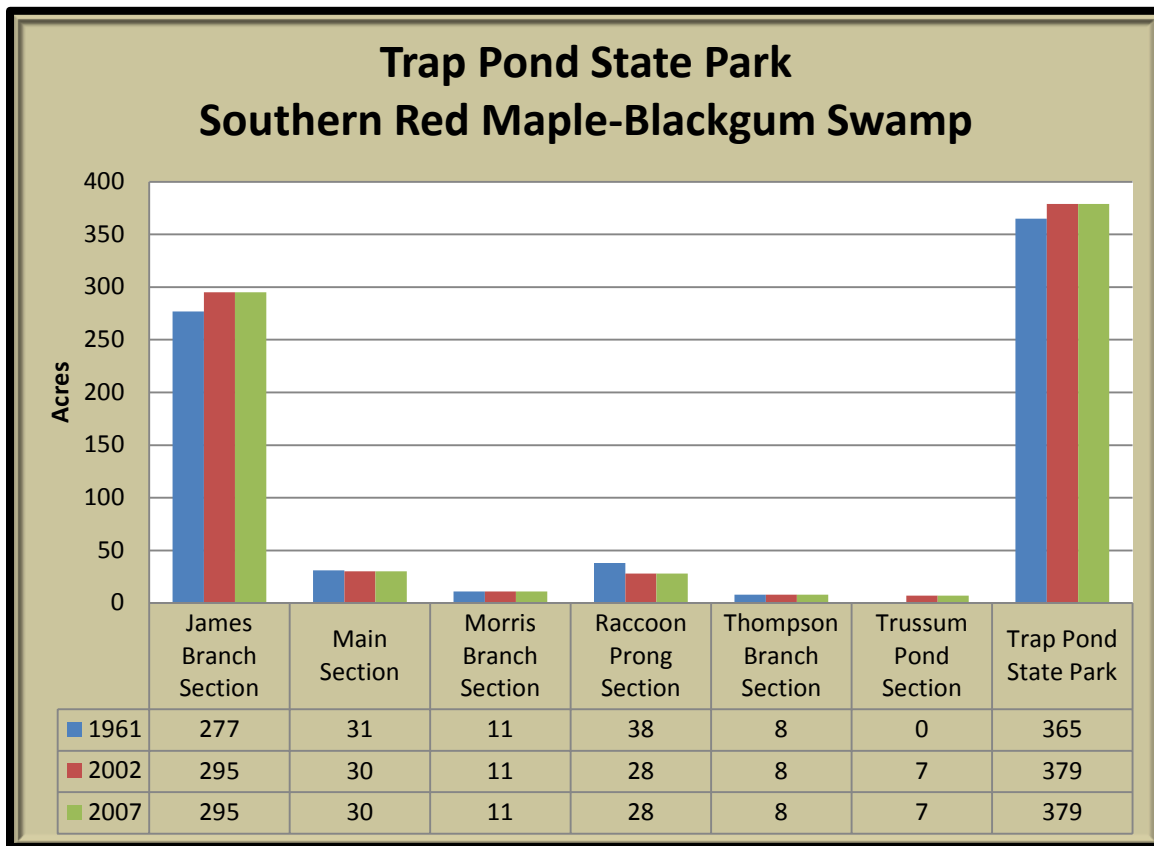
Analysis of Condition at Trap Pond State Park

Most of the acreage of this community that was present in 1961 was still present in 2007 (365 acres vs. 353 acres). The rest of the acreage had become 8 acres of Early to Mid-Successional Loblolly Pine Forest, 3 acres of Southern Red Oak/Heath Forest (this could be due to mapping error), and 0.3 acres of Northeastern Modified Successional Forest (Table 5.42).

Since 1961, this community has gained acreage by maturing from 24 acres of Early to Mid-Successional Loblolly Pine Forest, 2 acres of Swamp-loosestrife Shrub Swamp, 1 acre of Powerline R-O-W (powerline has narrowed), and 1 acre of agricultural field (Table 5.43).

<b>Table 5.42. What was once Southern Red Maple-Blackgum Swamp in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Southern Red Maple-Blackgum Swamp	353 acres
Early to Mid-Successional Loblolly Pine Forest	8 acres
Southern Red Oak/Heath Forest	3 acres
Northeastern Modified Successional Forest	0.3 acres

<b>Table 5.43. Southern Red Maple-Blackgum Swamp has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Southern Red Maple-Blackgum Swamp	353 acres
Early to Mid-Successional Loblolly Pine Forest	24 acres
Swamp-loosestrife Shrub Swamp	2 acres
Powerline R-O-W	1 acre
Agricultural Field	1 acre



**Figure 5.34.** Southern Red Maple-Blackgum Swamp at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.44)

Capital of Southern Red Maple-Blackgum Swamp has increased with its acreage since 1961.

<b>Table 5.44. Natural Capital of Southern Red Maple-Blackgum Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$4,486,398/year
2002	\$4,658,479/year
2007	\$4,658,479/year

**DEWAP: Coastal Plain Upland Forests**  
**NHC: Northern Atlantic Coastal Plain Hardwood Forest**

Description

Southern Red Oak/Heath Forest is the second largest forested community in the park and covers the upland areas. Southern red oak (*Quercus falcata*) that associated by loblolly pine (*Pinus taeda*), Virginia pine (*Pinus virginiana*), white oak (*Quercus alba*), tuliptree (*Liriodendron tulipifera*), and scarlet oak (*Quercus coccinea*). The understory is composed of sassafras (*Sassafras albidum*), water oak (*Quercus nigra*), American hornbeam (*Carpinus caroliniana*), and



**Figure 5.35.** Southern Red Oak/Heath Forest (Main Section)

American holly (*Ilex opaca*). The shrub layer is often defined by a strong layer of lowbush blueberry (*Vaccinium pallidum*) and huckleberry (*Gaylussacia* sp.). The only herbs noted in this community include speargrass (*Chasmanthium laxum*), partridgeberry (*Mitchella repens*), and bracken fern (*Pteridium aquilinum*).

Most of the occurrences of this community in the park are fairly young age and the lowbush blueberry layer has been browsed. I would rate the examples in the park as fair.

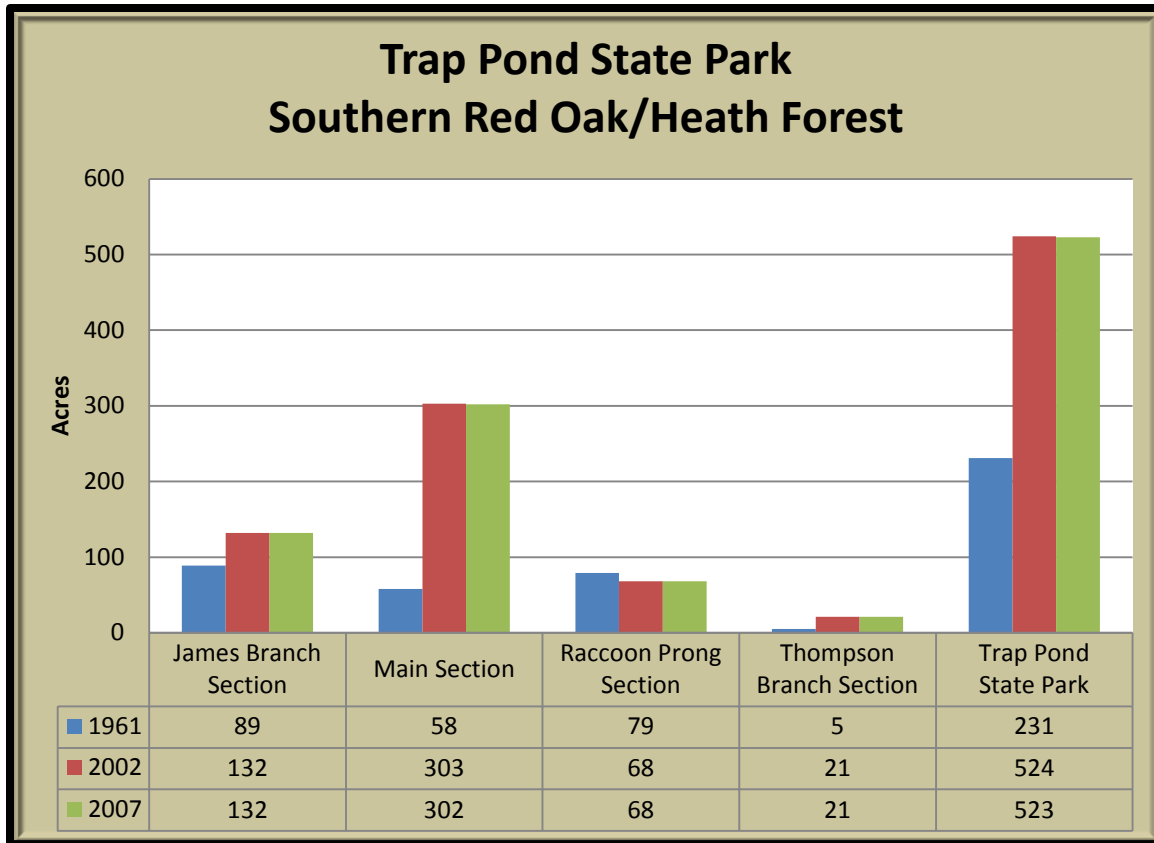
Analysis of Condition at Trap Pond State Park

About 143 acres of the 231 acres in 1961 were still present in 2007. The rest of the forest had converted to 57 acres of Early to Mid-Successional Loblolly Pine Forest (likely via a clear-cut), 18 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 6 acres of Mid-Atlantic Mesic Mixed Hardwood Forest, and 3 acres of Northeastern Modified Successional Forest (Table 5.45).

Since 1961, this community has almost doubled its acreage by the maturation of 303 acres of Early to Mid-Successional Loblolly Pine Forest, 33 acres of Loblolly Pine Plantation, 18 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, and 10 acres of clear-cut (Table 5.46).

<b>Table 5.45. What was once Southern Red Oak/Heath Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Southern Red Oak/Heath Forest	143 acres
Early to Mid-Successional Loblolly Pine Forest	57 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	18 acres
Mid-Atlantic Mesic Mixed Hardwood Forest	6 acres
Northeastern Modified Successional Forest	3 acres
Other vegetation communities/land covers	4 acres

<b>Table 5.46. Southern Red Oak/Heath Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	303 acres
Southern Red Oak/Heath Forest	143 acres
Loblolly Pine Plantation	33 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	18 acres
Clear-cut	10 acres
Other vegetation communities/land covers	18 acres



**Figure 5.36.** Southern Red Oak/Heath Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital (Table 5.47)*

Capital of Southern Red Oak/Heath Forest has increased since 1961 with a slight decrease from development in the 2002-2007 period.

Table 5.47. Natural Capital of Southern Red Oak/Heath Forest	
Year	Natural Capital (in 2012 dollars)
1961	\$43,682/year
2002	\$99,088/year
2007	\$98,899/year



**Successional Sweetgum Forest [37 acres (Figures 5.37-5.38, Tables 5.48-5.49)] GNA SNA**

**DEWAP: Coastal Plain Upland Forests  
NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description

Successional Sweetgum Forest is found mostly in the southern part of the Raccoon Prong Section. Sweetgum (*Liquidambar styraciflua*) dominates a low canopy and is associated by loblolly pine (*Pinus taeda*). The understory contains southern red oak (*Quercus falcata*), wild black cherry (*Prunus serotina*), and American holly (*Ilex opaca*). The shrub and vine layer contains multiflora rose (*Rosa multiflora*) and common greenbrier (*Smilax rotundifolia*).



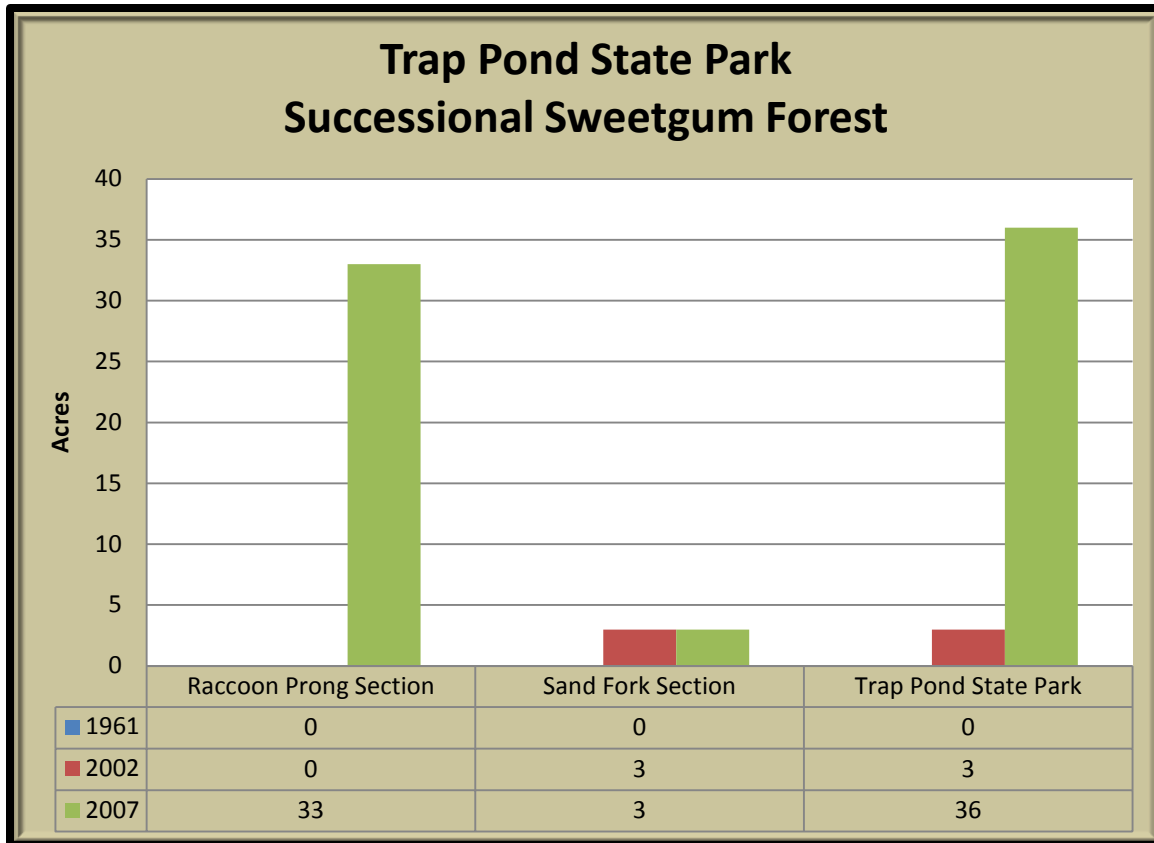
These stands contain a significant amount of multiflora rose, which if left unchecked, would help this stand become a Northeastern Modified Successional Forest.

**Figure 5.37.** Successional Sweetgum Forest (Raccoon Prong Section)

Analysis of Condition at Trap Pond State Park

Successional Sweetgum Forest was not present in 1961 and has since grown into 32 acres of agricultural field, and matured from 3 acres of Early to Mid-Successional Loblolly Pine Forest, 1 acre of Impervious Surface, 0.3 acres of Northeastern Old Field, and 0.3 acres of cultivated lawn (Table 5.48).

<b>Table 5.48. Successional Sweetgum Forest has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	32 acres
Early to Mid-Successional Loblolly Pine Forest	3 acres
Impervious Surface	1 acre
Northeastern Old Field	0.3 acres
Cultivated Lawn	0.3 acres



**Figure 5.38.** Successional Sweetgum Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.49)

Capital of Successional Sweetgum Forest has increased since 1961, when it was not present. The majority of the increase has been in the 2002 to 2007 period.

<b>Table 5.49. Natural Capital of Successional Sweetgum Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$567/year
2007	\$6,808/year

DEWAP: Coastal Plain Upland Forests  
 NHC: Semi-natural/Altered Vegetation and Conifer Plantations

Description

Successional Tuliptree Forest present primarily in the Raccoon Prong Section and the Thompson Branch Section. Tuliptree (*Liriodendron tulipifera*) is dominant and associated with a small amount of wild black cherry (*Prunus serotina*). The understory includes American holly (*Ilex opaca*) and sweetbay (*Magnolia virginiana*). Multiflora rose (*Rosa multiflora*) and Japanese



honeysuckle (*Lonicera japonica*) make up the shrub and vine layer. Herbs noted from this community include partridgeberry (*Mitchella repens*), shaved sedge (*Carex tonsa*), speargrass (*Chasmanthium laxum*), crane-fly orchid (*Tipularia discolor*), and ground pine (*Dendrolycopodium obscurum*).

Most of the examples of this community in the park are young age pole timber size, but they contain understories.

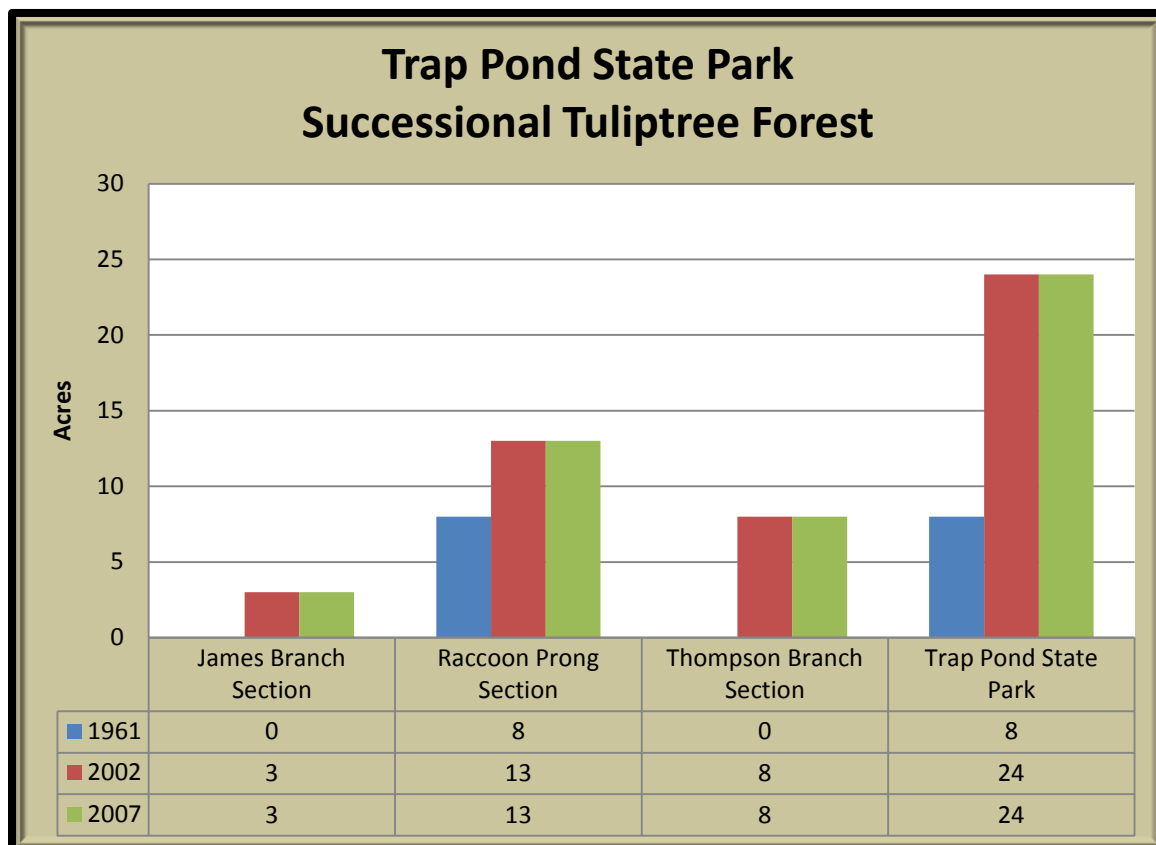
**Figure 5.39.** Successional Tuliptree Forest (Raccoon Prong Section)

Analysis of Condition at Trap Pond State Park

All of the acreage from 1961 still existed in 2007 (Table 5.50). Since 1961, Successional Sweetgum Forest has increased by maturation from 10 acres of Early to Mid-Successional Loblolly Pine Forest, 3 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest (likely via a clear-cut), 1 acre of Northeastern Old Field, and 1 acre of Powerline R-O-W (Table 5.51).

<b>Table 5.50. What was once Successional Tuliptree Forest in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Successional Tuliptree Forest	8 acres

Table 5.51. Successional Tuliptree Forest has migrated into X or remained since 1961	
X	Acreage
Early to Mid-Successional Loblolly Pine Forest	10 acres
Successional Tuliptree Forest	8 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	3 acres
Northeastern Old Field	1 acre
Powerline R-O-W	1 acre
Other vegetation communities/land covers	0.2 acres



**Figure 5.40.** Successional Tuliptree Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.52)

Capital of Successional Tuliptree Forest has increased since 1961 with an increase in its acreage.

<b>Table 5.52. Natural Capital of Successional Tuliptree Forest</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$1,513/year
2002	\$4,538/year
2007	\$4,538/year

**DEWAP: Shrub Swamps  
NHC: Northern Atlantic Coastal Plain Stream and River**

Description



This shrubland which is located on the edge of Trap Pond and at the upper end of Trussum Pond is dominated nearly entirely by swamp loosestrife (*Decodon verticillata*).

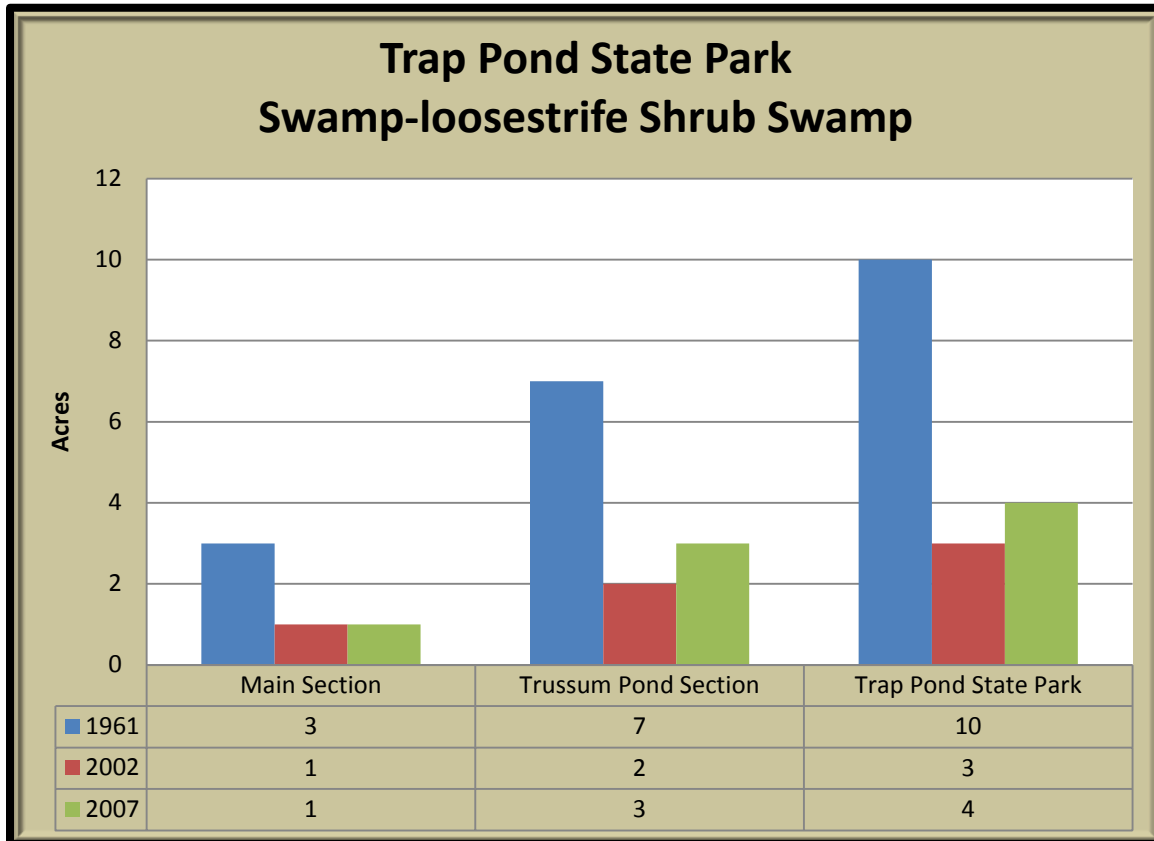
**Figure 5.41.** Swamp-loosestrife Shrub Swamp (Main Section)

Analysis of Condition at Trap Pond State Park

About 2 acres of the 10 acres that existed in 1961 were still present in 2007. The rest had become 3 acres of Chesapeake Bay Cypress-Gum Swamp, 2 acres of impoundment, 2 acres of Southern Red Maple-Blackgum Swamp, and 1 acre of water-lily Aquatic Wetland (Table 5.53). Since 1961, Swamp-loosestrife Shrub Swamp has moved into 1 acre of Water-lily Aquatic Wetland and 1 acre of impoundment (Table 5.54).

<b>X</b>	<b>Acreage</b>
Chesapeake Bay Cypress-Gum Swamp	3 acres
Impoundment	2 acres
Swamp-loosestrife Shrub Swamp	2 acres
Southern Red Maple-Blackgum Swamp	2 acres
Water-lily Aquatic Wetland	1 acre
Other vegetation communities/land covers	1 acre

Table 5.54. Swamp-loosestrife Shrub Swamp has migrated into X or remained since 1961	
X	Acreage
Swamp-loosestrife Shrub Swamp	2 acres
Water-lily Aquatic Wetland	1 acre
Impoundment	1 acre



**Figure 5.42.** Swamp-loosestrife Shrub Swamp at Trap Pond State Park (1961, 2002, and 2007)



*Natural Capital* (Table 5.55)

Capital of Swamp-loosestrife Shrub Swamp has decreased with its acreage since 1961. Recently, however, the amount has increased slightly.

<b>Table 5.55. Natural Capital of Swamp-loosestrife Shrub Swamp</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$92,814/year
2002	\$27,844/year
2007	\$37,126/year

**DEWAP: Riverine Aquatic and Submerged Vegetation  
NHC: Laurentian-Acadian Freshwater Marsh**

Description



This aquatic wetland is located in Trap Pond and Trussum Pond and is dominated by water-lily (*Nymphaea odorata*) and spatterdock (*Nuphar lutea*) and is associated by watershield (*Brasenia schreberi*), duckweed (*Lemna* sp.), and pondweed (*Potamogeton* sp.).

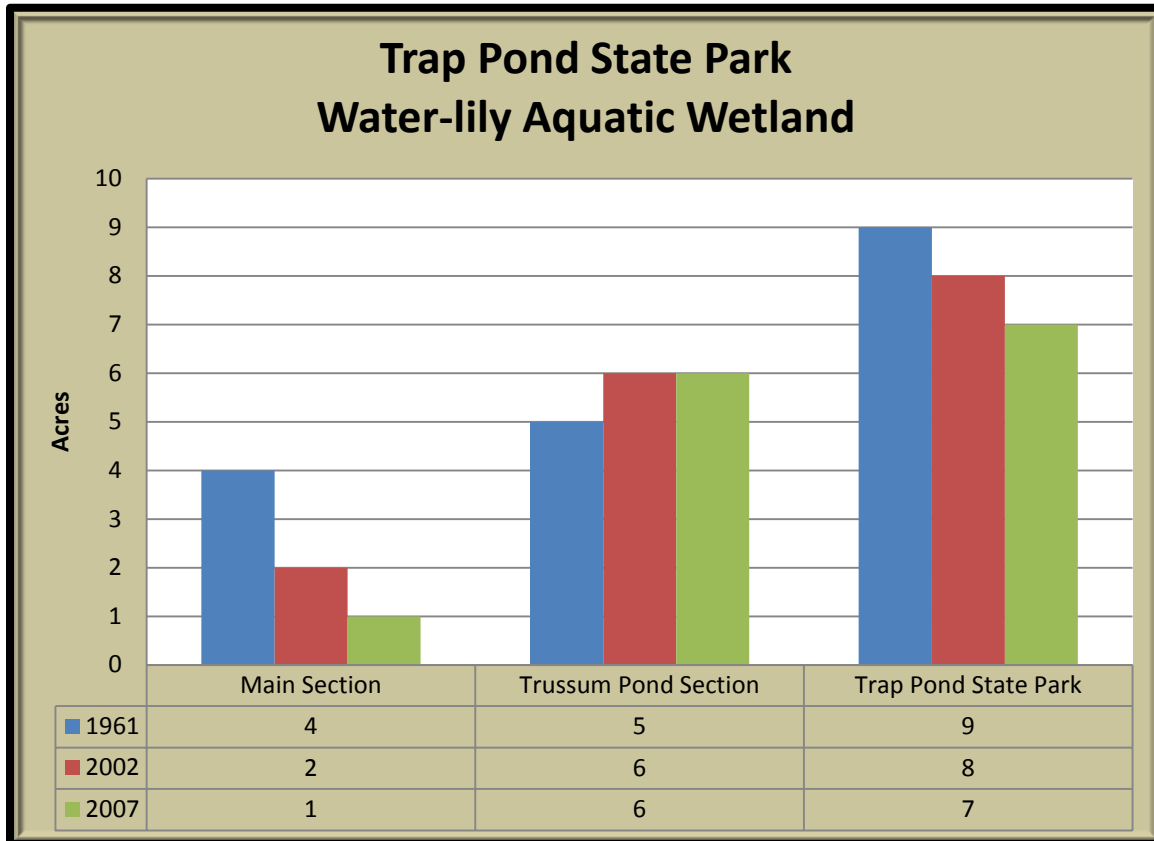
**Figure 5.43.** Water-lily Aquatic Wetland (Main Section, in background)

Analysis of Condition at Trap Pond State Park

About 1/3 of the acreage of Water-lily Aquatic Wetland from 1961 was still present in 2007 (9 acres vs. 3 acres). The rest of the area had become 3 acres of impoundment, 2 acres of Chesapeake Bay Cypress-Gum Swamp, and 1 acre of Swamp-loosestrife Shrub Swamp (Table 5.56). Since 1961, Water-lily Aquatic Wetland has occupied 3 acres of impoundment and a 1 acre of Swamp-loosestrife Shrub Swamp (Table 5.57).

<b>Table 5.56. What was once Water-lily Aquatic Wetland in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Water-lily Aquatic Wetland	3 acres
Impoundment	3 acres
Chesapeake Bay Cypress-Gum Swamp	2 acres
Swamp-loosestrife Shrub Swamp	1 acre

<b>Table 5.57. Water-lily Aquatic Wetland has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Water-lily Aquatic Wetland	3 acres
Impoundment	3 acres
Swamp-loosestrife Shrub Swamp	1 acre



**Figure 5.44.** Water-lily Aquatic Wetland at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.58)

Capital of Water-lily Aquatic Wetland has been decreasing along with its acreage. It is unknown whether this is a long-term trend.

<b>Table 5.58. Natural Capital of Water-lily Aquatic Wetland</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$83,533/year
2002	\$74,251/year
2007	\$64,970/year

**White Pine Planted Forest [0.1 acres (Figures 5.45, Table 5.59)] G4G5 S3?**

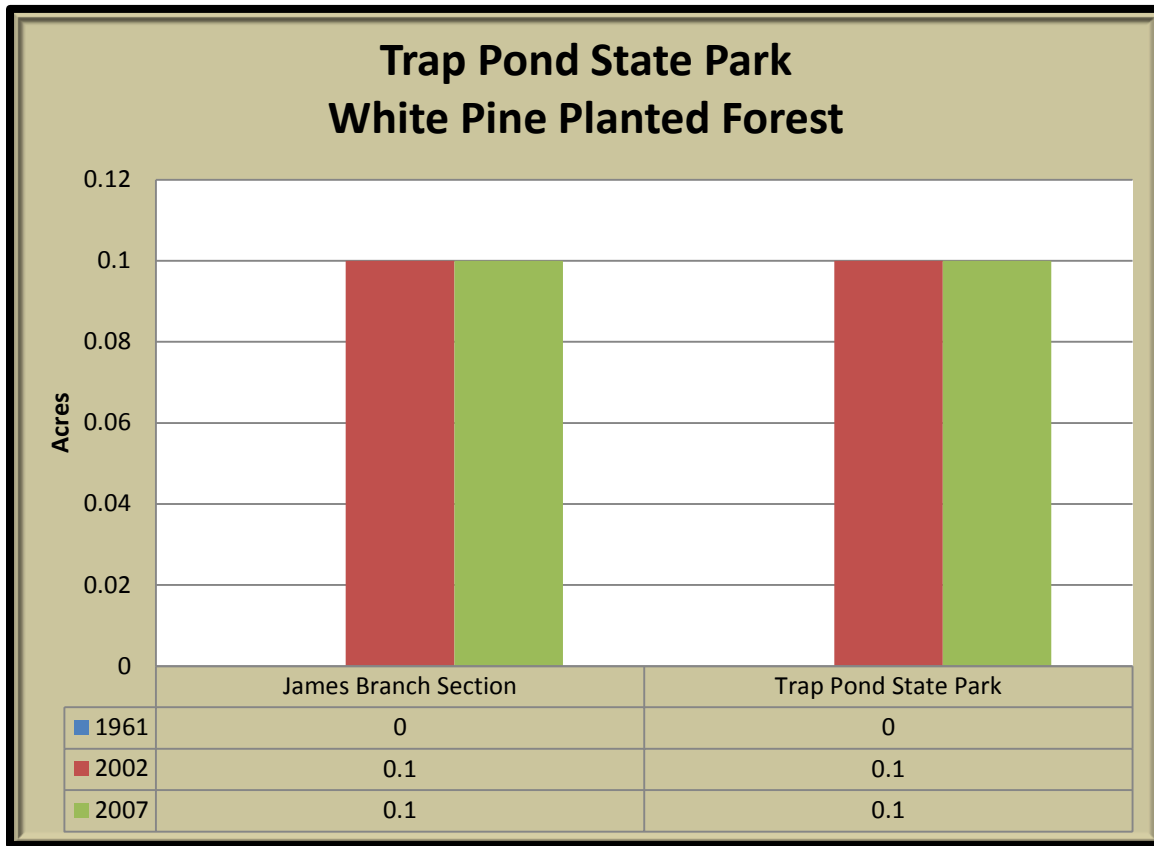
**DEWAP: No Equivalent Classification**  
**NHC: Semi-natural/Altered Vegetation and Conifer Plantations**

Description

This planted forest of white pine (*Pinus strobus*) is located at the edge of a farm in the James Branch Section.

Analysis of Condition at Trap Pond State Park

White Pine Planted Forest was not present in 1961 and has since come into the very edge of the park. All of the acreage now covered by it was a Southern Red Oak/Heath Forest in 1961.



**Figure 5.45.** White Pine Planted Forest at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 5.58)

White Pine Planted Forest was not present in 1961 and has since had \$19 in capital transferred to it.

<b>Table 5.58. Natural Capital of Water-lily Aquatic Wetland</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$19/year
2007	\$19/year

## CHAPTER 6: DESCRIPTIONS AND ANALYSIS OF THE LAND COVERS

Land covers are those areas such as agricultural fields or places that do not contain vegetation communities but still cover ground surface. In terms of sea-level rise, water is most important but its effects can also be seen in the impoundments.

The land covers include:

1. Agricultural Field—403 acres
2. Clear-cut—3 acres
3. Farm Pond/Artificial Pond—0.1 acres
4. Impervious Surface—23 acres
5. Impoundment—126 acres
6. Modified Land—0.1 acres
7. Powerline R-O-W—12 acres
8. Semi-impervious Surface—9 acres
9. Water—20 acres



**Agricultural Field [211 acres, (Figure 6.1, Tables 6.1-6.3)]**

**DEWAP: No Equivalent Classification  
NHC: Semi-natural/Altered vegetation and Conifer Plantations**

Description

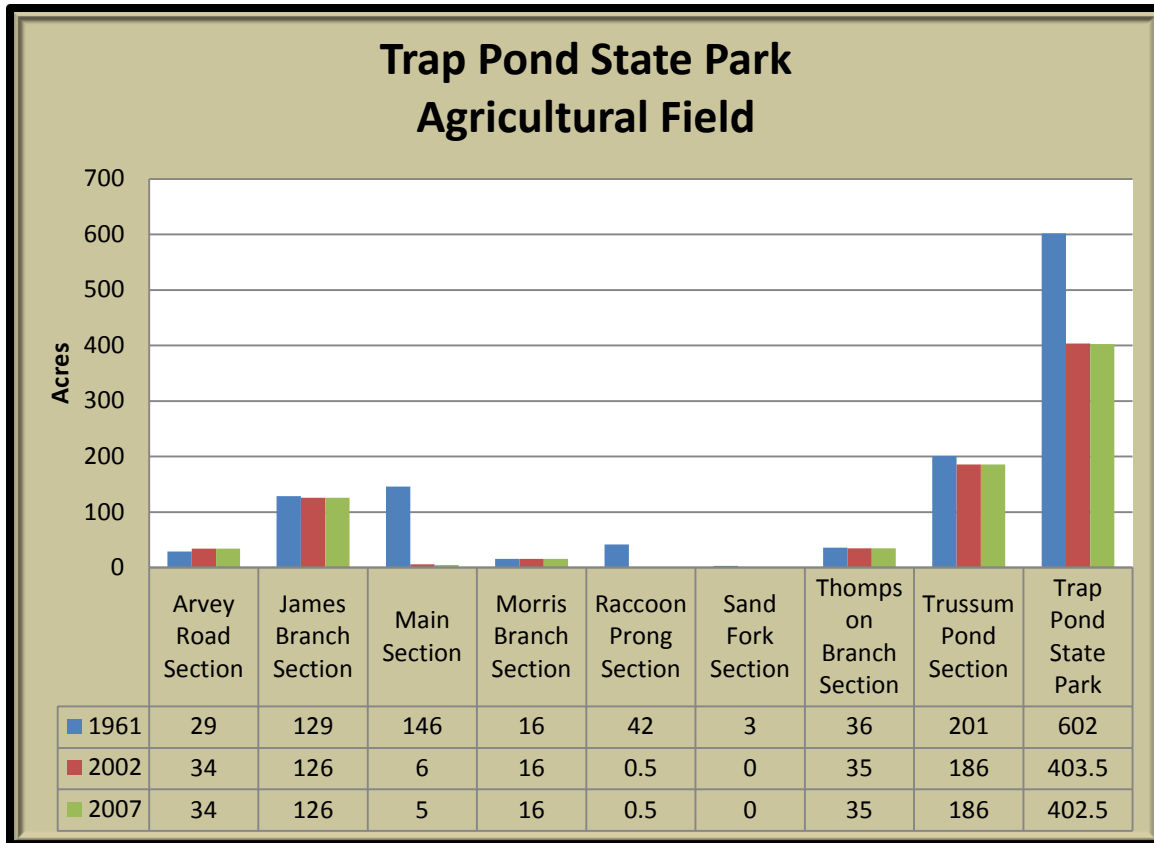
Agricultural field is one of the prominent non-forest cover types in the park but as the fields have been abandoned, they have matured into forestland.

Analysis of Condition at Trap Pond State Park

About 390 acres of the 602 acres present in 1961 still existed in 2007. The rest of the agricultural fields had become 103 acres of Early to Mid-Successional Loblolly Pine Forest, 46 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 32 acres of Successional Sweetgum Forest, and 9 acres of Cultivated Lawn (Table 6.1). Since 1961, Agricultural Fields have been developed in 5 acres of Northeastern Old Field, 3 acres of Cultivated Lawn, 2 acres of Mid-Atlantic Mesic Mixed Hardwood Forest, and 2 acres of Southern Red Oak/Heath Forest (Table 6.2).

<b>Table 6.1. What was once Agricultural Field in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	390 acres
Early to Mid-Successional Loblolly Pine Forest	103 acres
Mid to Late Successional Loblolly Pine-Sweetgum Forest	46 acres
Successional Sweetgum Forest	32 acres
Cultivated Lawn	9 acres
Other communities/land covers	23 acres

<b>Table 6.2. Agricultural Field has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Agricultural Field	390 acres
Northeastern Old Field	5 acres
Cultivated Lawn	3 acres
Mid-Atlantic Mesic Mixed Hardwood Forest	2 acres
Southern Red Oak/Heath Forest	2 acres
Other communities/land covers	3 acres



**Figure 6.1.** Agriculture Field at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 6.3)

Capital of agricultural fields has been decreasing as more fields are abandoned. The abandonment has generally resulted in a capital increase for the park.

Table 6.3. Natural Capital of Agricultural Field	
Year	Natural Capital (in 2012 dollars)
1961	\$34,525/year
2002	\$23,141/year
2007	\$23,083/year

**Clear-cut [3 acres, (Figure 6.2, Table 6.4)]**

**DEWAP: No Equivalent Classification**

**NHC: No Equivalent Classification**

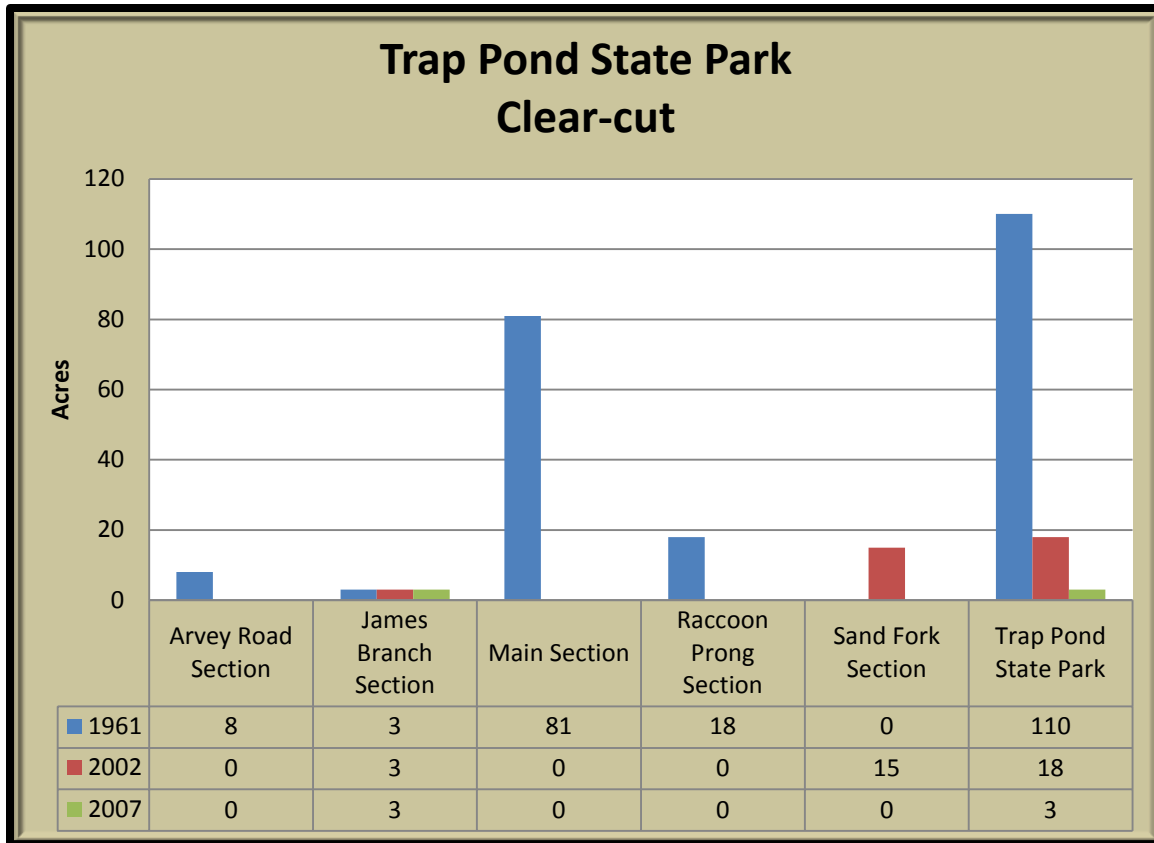
Description

Clear-cuts are mainly located in the James Branch and Sand Fork Sections of the park and are part of the Loblolly Pine Plantations.

Analysis of Condition at Trap Pond State Park

Only three acres of the clear-cut present in 1961 was still in this condition in 2007 and was likely the result of another clear-cut. The rest of the clear-cuts have matured to 69 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 10 acres of Early to Mid-Successional Loblolly Pine Forest, 10 acres of Southern Red Oak/Heath Forest, 8 acres of Loblolly Pine Plantation, and 8 acres of Chesapeake Bay Non-riverine Wet Hardwood Forest (Table 6.4). No additional clear-cuts have come about since 1961.

<b>Table 6.4. What was once Clear-cut in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Mid to Late Successional Loblolly Pine-Sweetgum Forest	69 acres
Early to Mid-Successional Loblolly Pine Forest	10 acres
Southern Red Oak/Heath Forest	10 acres
Loblolly Pine Plantation	8 acres
Chesapeake Bay Non-riverine Wet Hardwood Forest	8 acres
Other communities/land covers	4 acres



**Figure 6.2.** Clear-cut at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Clear-cuts do not have any natural capital value.

**Farm Pond/Artificial Pond [0.1 acres, (Figure 6.3, Table 6.5)]**

**DEWAP: No Equivalent Classification**

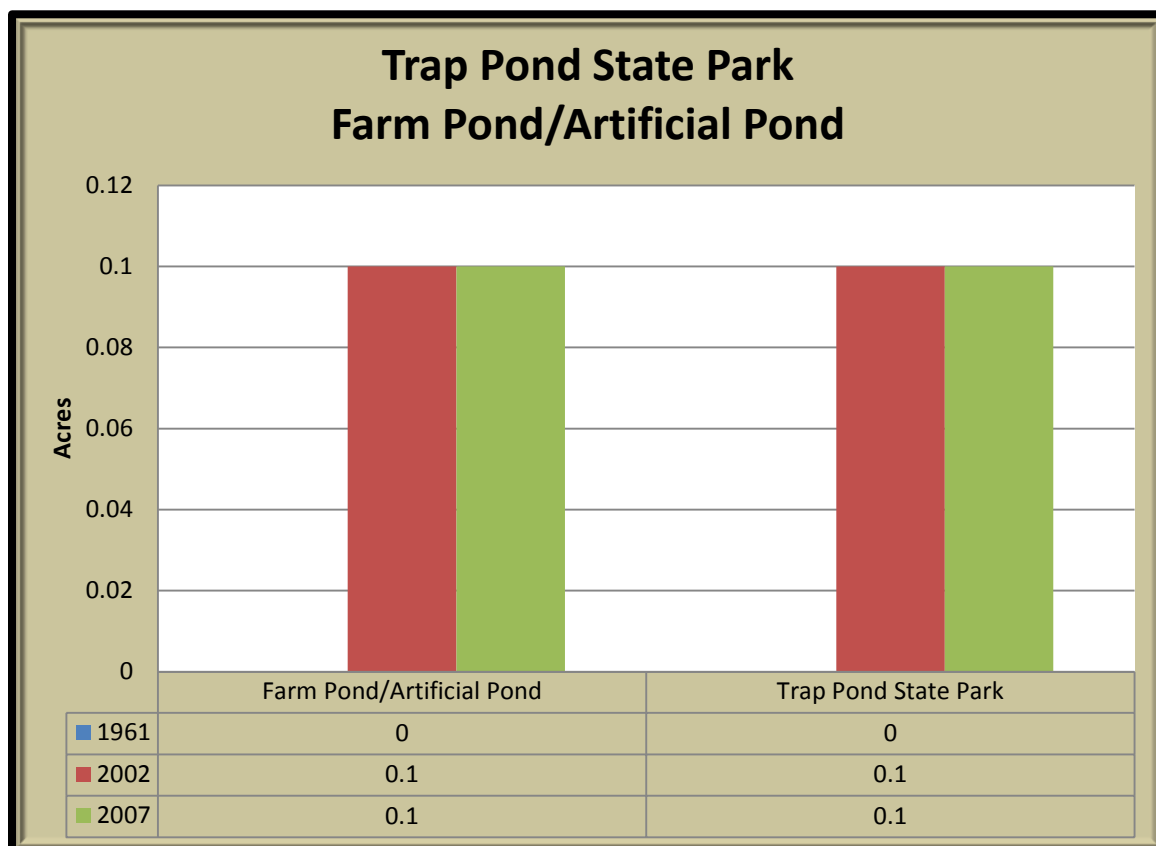
**NHC: No Equivalent Classification**

Description

Farm Pond/Artificial Pond includes water bodies that are 5 acres or less in size.

Analysis of Condition at Trap Pond State Park

Farm Pond/Artificial Pond was not present in 1961 and has since been developed in 0.1 acres of Mid-Atlantic Mesic Mixed Hardwood Forest.



**Figure 6.3.** Farm Pond/Artificial Pond at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Farm Pond/Artificial Pond was not present in 1961 and has since gained \$534 in capital resulting in a slight capital increase for the park.

<b>Table 6.5. Natural Capital of Farm Pond/Artificial Pond</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$0/year (not present)
2002	\$534/year
2007	\$534/year

**Impervious Surface [23 acres, (Figure 6.4, Tables 6.6-6.7)]**

**DEWAP: No Equivalent Classification**

**NHC: No Equivalent Classification**

Description

Impervious surface includes those places that are impervious to flow of water including roads, parking lots, and structures.

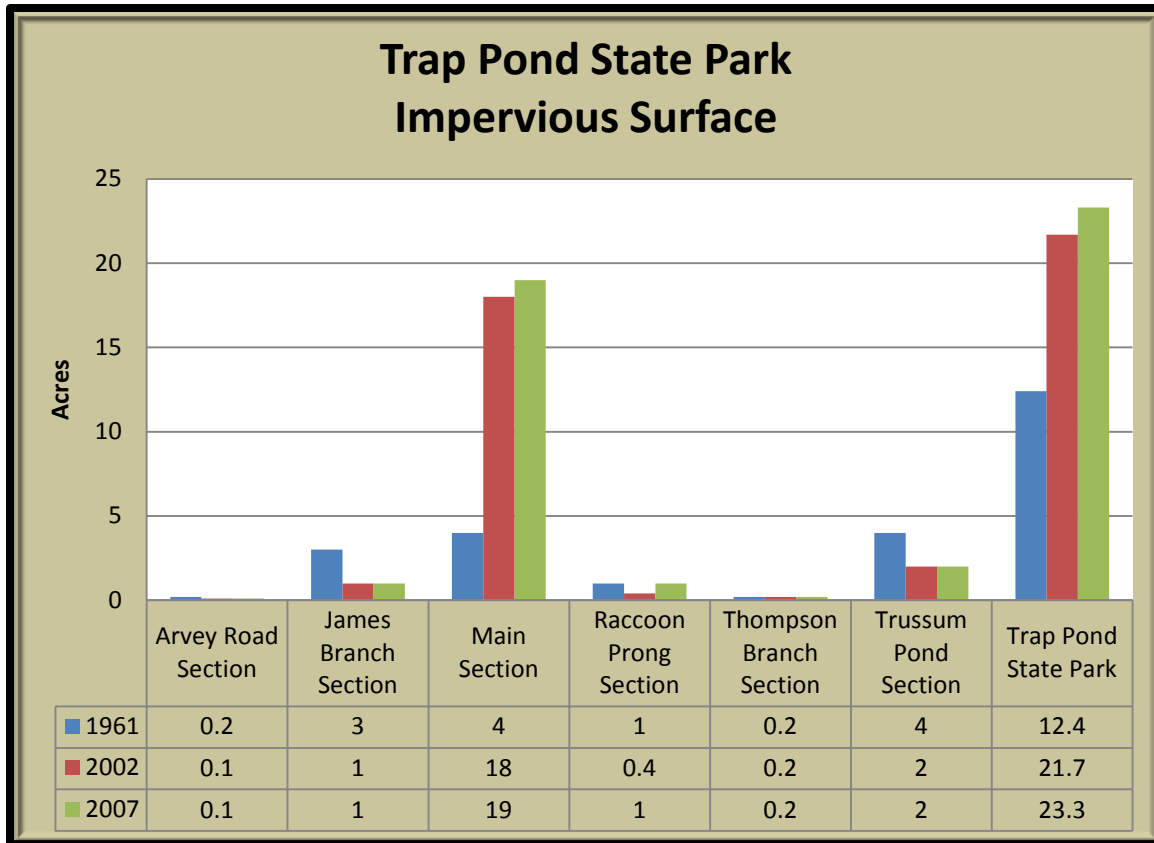
Analysis of Condition at Trap Pond State Park

About 4 acres of the 12 acres of impervious surface from 1961 was still present in 2007. The rest had become 4 acres of Mid to Late Successional Loblolly Pine-Sweetgum Forest, 1 acre of Semi-impervious surface, 1 acre of Successional Sweetgum Forest and 1 acre of Red Maple-Sweetgum Swamp (Table 6.6). Since 1961, impervious surface has increased in the park and has been developed in 9 acres of Early to Mid-Successional Loblolly Pine Forest, 6 acres of Semi-impervious Surface, 2 acres of cultivated lawn, and 1 acre each of Northeastern Old Field and clear-cut (Table 6.7).

<b>Table 6.6. What was once Impervious Surface in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Mid to Late Successional Loblolly Pine-Sweetgum Forest	4 acres
Impervious Surface	4 acres
Semi-impervious Surface	1 acre
Successional Sweetgum Forest	1 acre
Red Maple-Sweetgum Swamp	1 acre
Other communities/land covers	1 acre

<b>Table 6.7. Impervious Surface has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Early to Mid-Successional Loblolly Pine Forest	9 acres
Semi-impervious Surface	6 acres
Impervious Surface	4 acres
Northeastern Old Field	2 acres
Clear-cut	1 acre
Other communities/land covers	1 acre





**Figure 6.4.** Impervious Surface at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Impervious Surface does not have any natural capital value.

**Impoundment [126 acres, (Figure 6.5, Tables 6.8-6.10)]**

**DEWAP: Impoundment  
NHC: No Equivalent Classification**

Description

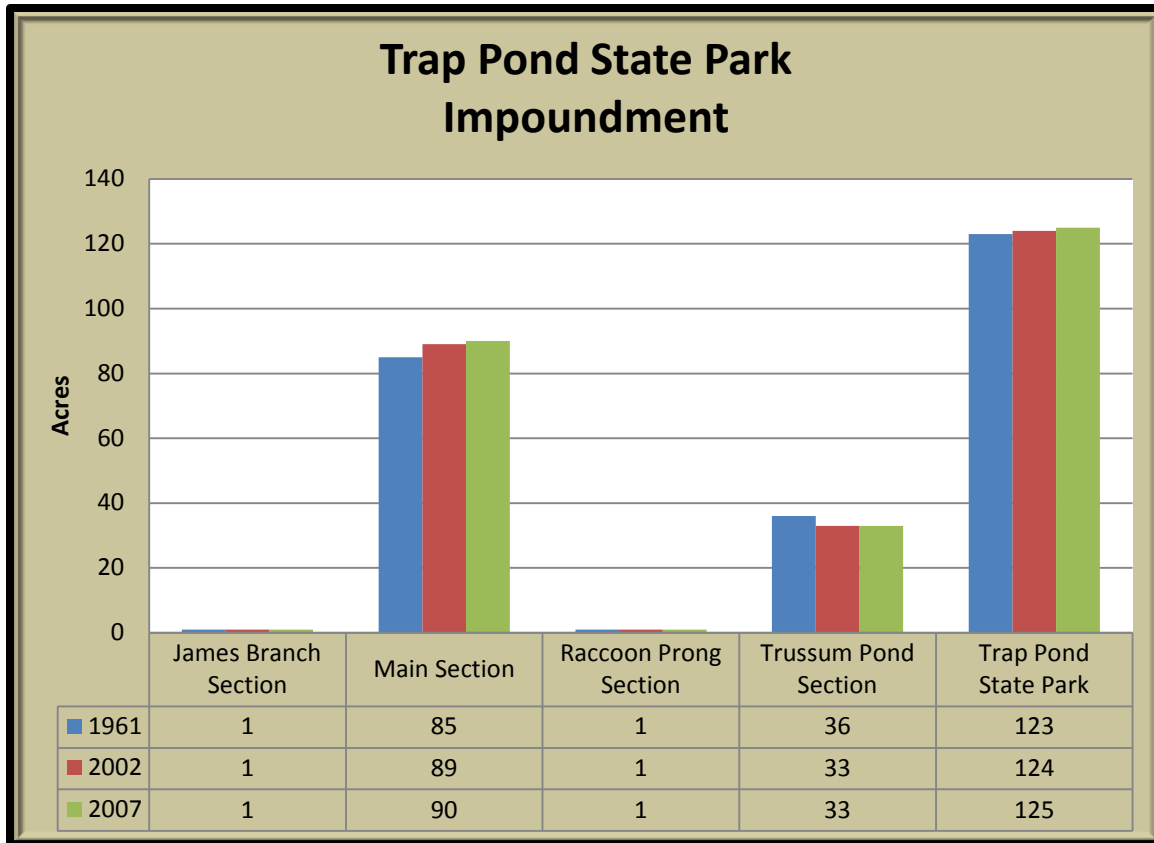
Impoundment includes those water bodies that are larger than 5 acres in size. This cover type includes Raccoon Pond, Trap Pond, and Trussum Ponds in Trap Pond State Park.

Analysis of Condition at Trap Pond State Park

Impoundment has not changed much since 1961, with 119 acres of the 123 acres present in 1961 still existing in 2007. The remaining 4 acres have become 3 acres of Water-lily Aquatic Wetland, 1 acre of Chesapeake Bay Cypress-Gum Swamp, and 1 acre of Swamp-loosestrife Shrub Swamp (Table 6.8). Since 1961, 3 acres of Water-lily Aquatic Wetland, 2 acres of Swamp-loosestrife Shrub Swamp, 1 acre of Chesapeake Bay Cypress-Gum Swamp, and 1 acre of Smooth Alder Swamp have grown into the impoundments (Table 6.9).

<b>Table 6.8. What was once Impoundment in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Impoundment	119 acres
Water-lily Aquatic Wetland	3 acres
Chesapeake Bay Cypress-Gum Swamp	1 acre
Swamp-loosestrife Shrub Swamp	1 acre

<b>Table 6.9. Impoundment has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Impoundment	119 acres
Water-lily Aquatic Wetland	3 acres
Swamp-loosestrife Shrub Swamp	2 acres
Chesapeake Bay Cypress-Gum Swamp	1 acre
Smooth Alder Swamp	1 acre



**Figure 6.5.** Impoundment at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital (Table 6.10)*

Impoundment capital has increased overall since 1961 with an increasing amount of acreage.

<b>Table 6.10. Natural Capital of Impoundment</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$656,217/year
2002	\$661,552/year
2007	\$666,888/year

**Modified Land [0.1 acres, (Figure 6.6, Tables 6.11-6.12)]**

**DEWAP: No Equivalent Classification**

**NHC: No Equivalent Classification**

Description

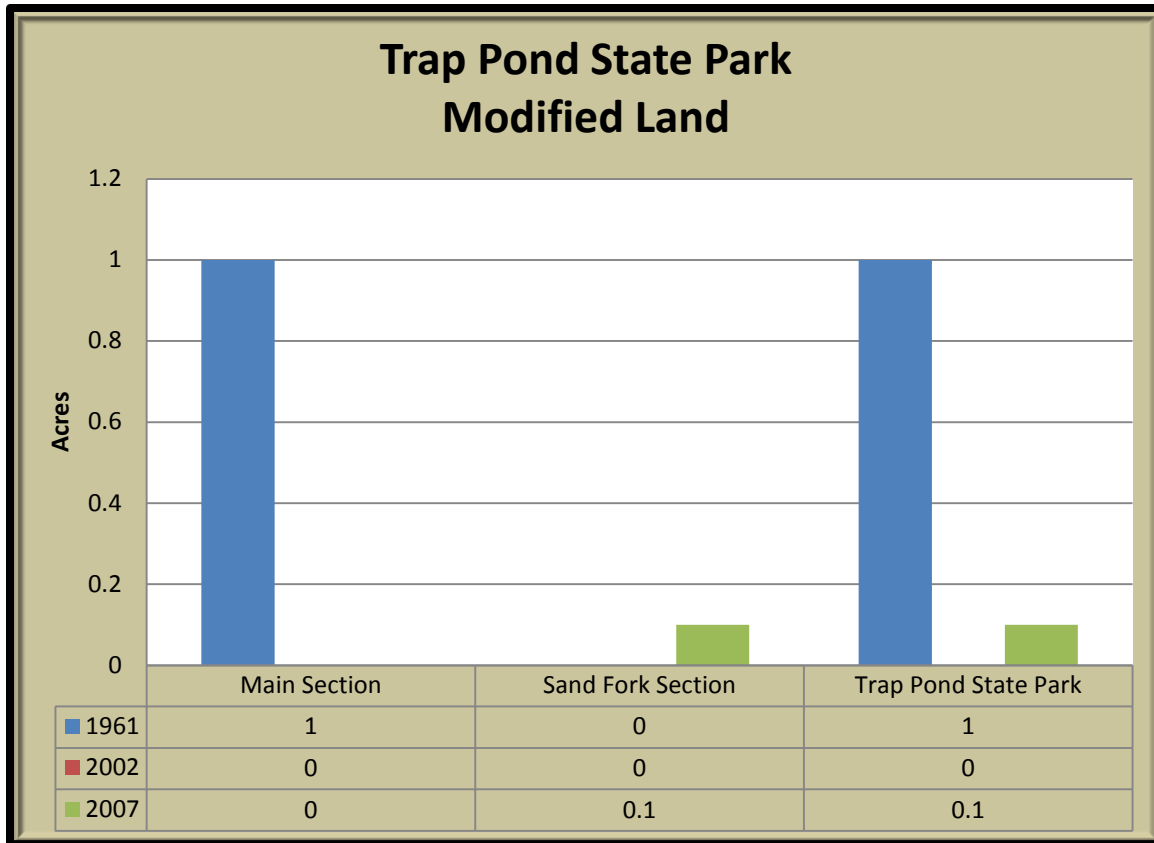
Modified Lands include those areas that contain bare soil or have been disturbed containing little vegetation if any.

Analysis of Condition at Trap Pond State Park

Most of the modified land in 1961 had become Mid to Late Successional Loblolly Pine-Sweetgum Forest by 2007 (Table 6.11). Modified land has not increased since 1961 (Table 6.12).

<b>Table 6.11. What was once Modified Land in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Mid to Late Successional Loblolly Pine-Sweetgum Forest	1 acre

<b>Table 6.12. Modified Land has migrated into X or remained since 1961</b>	
<b>X</b>	<b>Acreage</b>
Modified Land	0.1 acres



**Figure 6.5.** Modified Land at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Modified Land does not have any natural capital value.

**Powerline R-O-W [11 acres, (Figure 6.6, Table2 6.13-6.14)]**

**DEWAP: No Equivalent Classification**

**NHC: No Equivalent Classification**

Description

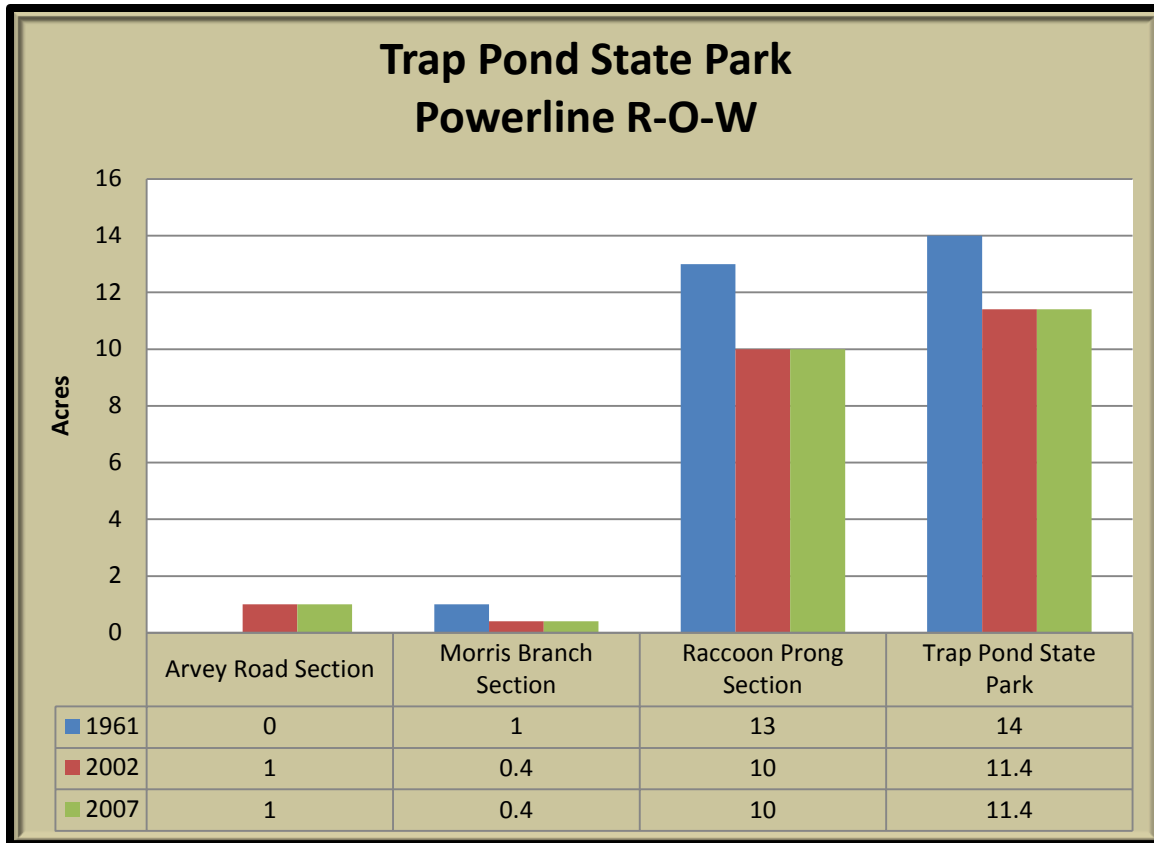
Powerline R-O-W includes the area underneath high tension powerlines. These areas are similar to Northeastern Old Fields in vegetation composition.

Analysis of Condition at Trap Pond State Park

About 11 acres of the 14 acres of Powerline R-O-W present in 1961 was still present in 2007. The rest had become 2 acres of Eastern Reed Marsh (developed underneath), 1 acre of Successional Tuliptree Forest, and 1 acre of Southern Red Maple-Blackgum Swamp (Table 6.13). Since 1961, Powerline has been developed in 1 acre of Northeastern Old Field (Table 6.14).

<b>Table 6.13. What was once Powerline R-O-W in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Powerline R-O-W	11 acres
Eastern Reed Marsh	2 acres
Successional Tuliptree Forest	1 acre
Southern Red Maple-Blackgum Swamp	1 acre

<b>Table 6.14. Powerline R-O-W has been developed in X</b>	
<b>X</b>	<b>Acreage</b>
Powerline R-O-W	11 acres
Northeastern Old Field	1 acre



**Figure 6.6.** Powerline R-O-W at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Powerline R-O-W does not have any natural capital value.



**Semi-impervious Surface [8 acres, (Figure 6.6, Table2 6.13-6.14)]**

**DEWAP: No Equivalent Classification**

**NHC: No Equivalent Classification**

Description

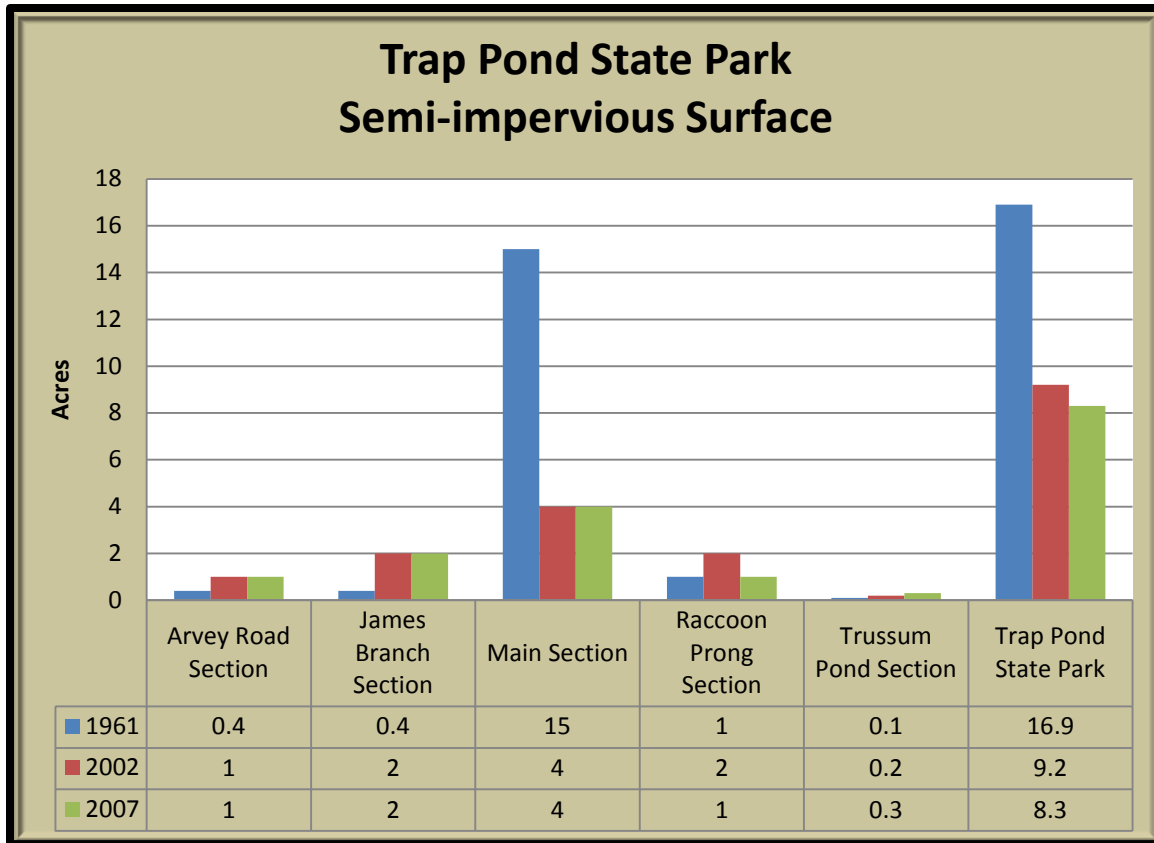
Powerline R-O-W includes the area underneath high tension powerlines. These areas are similar to Northeastern Old Fields in vegetation composition.

Analysis of Condition at Trap Pond State Park

About 11 acres of the 14 acres of Powerline R-O-W present in 1961 was still present in 2007. The rest had become 2 acres of Eastern Reed Marsh (developed underneath), 1 acre of Successional Tuliptree Forest, and 1 acre of Southern Red Maple-Blackgum Swamp (Table 6.13). Since 1961, Powerline has been developed in 1 acre of Northeastern Old Field (Table 6.14).

<b>Table 6.13. What was once Semi-impervious Surface in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Powerline R-O-W	11 acres
Eastern Reed Marsh	2 acres
Successional Tuliptree Forest	1 acre
Southern Red Maple-Blackgum Swamp	1 acre

<b>Table 6.14. Semi-impervious Surface has been developed in X</b>	
<b>X</b>	<b>Acreage</b>
Powerline R-O-W	11 acres
Northeastern Old Field	1 acre



**Figure 6.6.** Semi-impervious Surface at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital*

Semi-impervious Surface does not have any natural capital value.

**Water [2 acres, (Figure 6.7, Tables 6.15-6.17)]**

**DEWAP: Coastal Plain Non-tidal Streams  
NHC: No Equivalent Classification**

Description

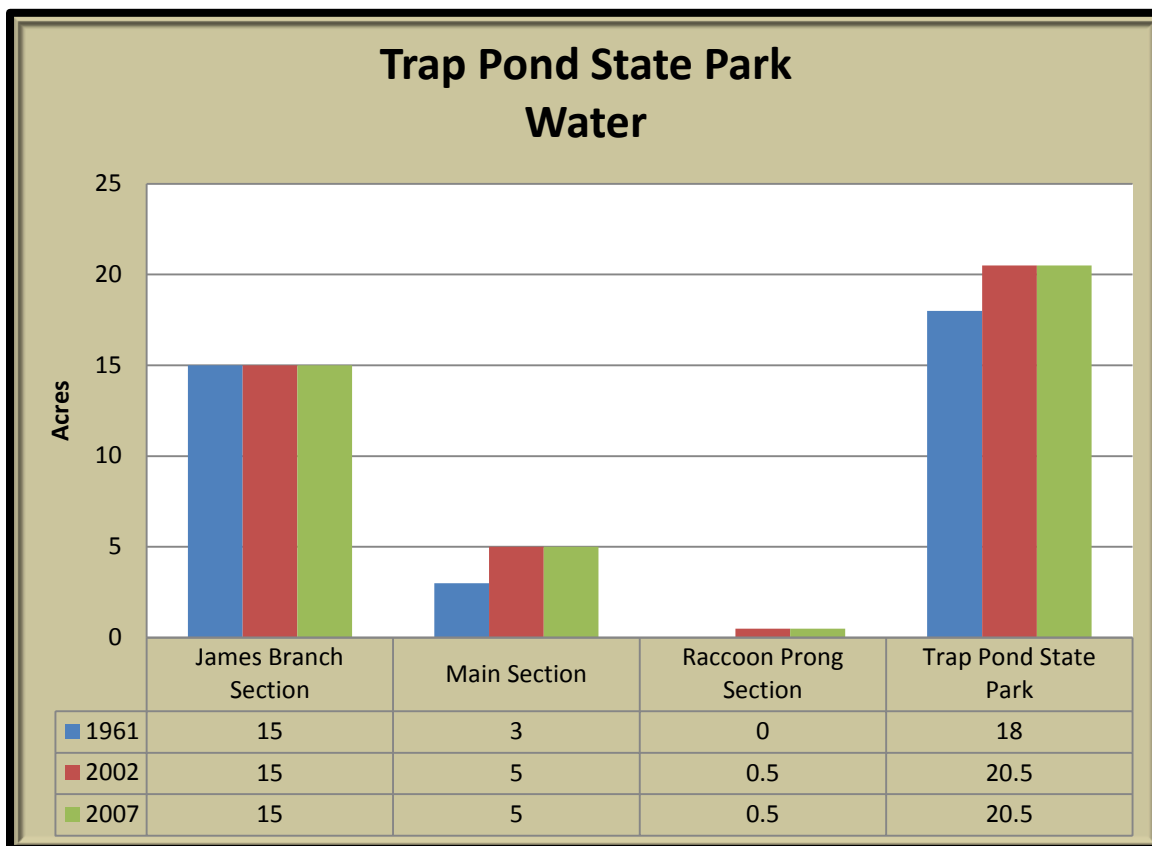
Water includes places that are not associated with a water body such as an impoundment or farm pond. In the case of Trap Pond State this includes Hitch Pond Branch, James Branch, and Raccoon Prong.

Analysis of Condition at Trap Pond State Park

All of the water present in 1961 in was still present in 2007 (Table 6.15). Since 1961 water has increased slightly by inundating 2 acres of Early to Mid-Successional Loblolly Pine Forest, 0.4 acres of Chesapeake Bay Non-riverine Wet Hardwood Forest, and 0.3 acres of Impervious Surface (Table 6.16).

<b>Table 6.15. What was once Water in 1961 has become X or remained in 2007</b>	
<b>X</b>	<b>Acreage</b>
Water	18 acres

<b>Table 6.16. Water has migrated to X since 1961</b>	
<b>X</b>	<b>Acreage</b>
Water	18 acres
Early to Mid-Successional Loblolly Pine Forest	2 acres
Chesapeake Bay Non-riverine Wet Hardwood Forest	0.4 acres
Impervious Surface	0.3 acres



**Figure 6.7.** Water at Trap Pond State Park (1961, 2002, and 2007)

*Natural Capital* (Table 6.17)

Capital of water has increased along with its acreage since 1961.

<b>Table 6.17. Natural Capital of Water</b>	
<b>Year</b>	<b>Natural Capital (in 2012 dollars)</b>
1961	\$96,032/year
2002	\$109,370/year
2007	\$109,370/year

## APPENDIX I: STATE RARE VEGETATION RANKING CRITERIA

Ranks are based on a system developed by The Nature Conservancy and Natureserve to measure the relative rarity of vegetation communities within a given state. State rarity ranks are used to prioritize conservation and protection efforts so that the rarest of vegetation communities receive immediate attention. The primary criteria for ranking vegetation communities are the total number of documented occurrences with consideration given to the total number of occurrences and total amount of acreage in the state. Ranks for vegetation communities are updated annually and are based on current knowledge and mapping being done for the Guide to Delaware Vegetation Communities.

### State Rank

- S1** Extremely rare (i.e., typically 5 or fewer occurrences statewide), or may be susceptible to extirpation because of other threats to its existence.
- S1.1** Only a single occurrence or population of the species is known to occur. (this rank is only applied to plants.)
- S2** Very rare, (i.e., typically 6 to 20 occurrences statewide), or may be susceptible to extirpation because other threats to its existence.
- S3** Rare to uncommon, not yet susceptible to extirpation but may be if additional populations are destroyed. Approximately 21 to 100 occurrences statewide.
- S4** Common, apparently secure in the state under present conditions.
- S5** Very common, secure in the state under present conditions.
- SH** Historically known, but not verified for an extended period (usually 15+ years); there are expectations that the species may be rediscovered.
- SX** Extirpated or presumed extirpated from the state. All historical locations and/or potential habitat have been surveyed.
- SU** Status uncertain within the state. Usually an uncommon species which is believed to be of conservation concern, but there is inadequate data to determine the degree of rarity.
- SNR** Unranked
- SNA** Not Applicable
- SW** Weedy vegetation or vegetation dominated by invasive alien species (this rank is only applied to natural communities).
- SM** Vegetation resulting from management or modification of natural vegetation. It is readily restorable by management or time and/or the restoration of original ecological processes (this rank is only applied to natural communities).

## APPENDIX II: SGCN SPECIES EXPECTED FOR KEY WILDLIFE HABITATS

SGCN Species expected in Atlantic White Cedar Non-tidal Wetlands			
Species	Common Name	Class	Tier
<i>Callophrys hesseli</i>	Hessel's Hairstreak	Insect	1
<i>Exyra fax</i>	Pitcher plant moth	Insect	1
<i>Papaipema appassioata</i>	Pitcher plant borer moth	Insect	1
<i>Manduca jasminearum</i>	Ash sphinx	Insect	1
<i>Dolba hyloeus</i>	Black alder or pawpaw sphinx	Insect	2
<i>Papaipema stenocelis</i>	Chain fern borer moth	Insect	2
<i>Xestia youngii</i>	Young Blueberry Dart	Insect	2
<i>Gomphaeschna furcillata</i>	Harlequin darner	Insect	2
<i>Argia bipunctulata</i>	Seepage dancer	Insect	2
<i>Enallagma weewa</i>	Blackwater bluet	Insect	2
<i>Nehalennia gracilis</i>	Sphagnum Sprite	Insect	2
<i>Hemidactylum scutatum</i>	Four-toed Salamander	Amphibian	2
<i>Pseudotriton montanus montanus</i>	Mud Salamander	Amphibian	2

SGCN Species expected in Coastal Plain Forested Floodplains and Riparian Swamps			
Species	Common Name	Class	Tier
<i>Satyrium kingi</i>	King's hairstreak	Insect	1
<i>Clemmys guttata</i>	Spotted turtle	Reptile	1
<i>Terrapene carolina</i>	Eastern box turtle	Reptile	1
<i>Nerodia erythrogaster</i>	Plainbelly water snake	Reptile	1
<i>Nycticorax nycticorax</i>	Black crowned night-heron	Bird	1
<i>Nyctanassa violacea</i>	yellow-crowned night-heron	Bird	1
<i>Buteo platypterus</i>	Broad-winged hawk	Bird	1
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	Bird	1
<i>Hylocichla mustelina</i>	Wood thrush	Bird	1
<i>Parula americana</i>	Northern parula	Bird	1
<i>Setophaga ruticella</i>	American redstart	Bird	1
<i>Limnothlypis swainsonii</i>	Swainson's warbler	Bird	1
<i>Amblyscirtes aesculapius</i>	Lace-winged roadside-skipper	Insect	2
<i>Libytheana carinenta</i>	American snout	Insect	2
<i>Anacamptodes pergracilis</i>	Cypress looper	Insect	2
<i>Chloropteryx tepperaria</i>	Angle winged emerald moth	Insect	2
<i>Manduca jasminearum</i>	Ash sphinx	Insect	2
<i>Dolba hyloeus</i>	Black alder or pawpaw sphinx	Insect	2
<i>Haploa colona</i>	A tiger moth	Insect	2
<i>Orgyia detrita</i>	A tussock moth	Insect	2
<i>Catocala unijuga</i>	Once-married underwing	Insect	2
<i>Catocala praeclara</i>	Praeclara underwing	Insect	2
<i>Parapamea buffaloensis</i>	A borer moth	Insect	2
<i>Papaipema stenocelis</i>	Chain fern borer moth	Insect	2
<i>Gomphaeschna antilope</i>	Taper-tailed darner	Insect	2
<i>Gomphaeschna furcillata</i>	Harlequin darner	Insect	2

<i>Sympetrum ambiguum</i>	Blue-faced meadowhawk	Insect	2
<i>Enallagma weewa</i>	Blackwater bluet	Insect	2
<i>Hemidactylum scutatum</i>	Four-toed salamander	Amphibian	2
<i>Pseudotriton montanus montanus</i>	Mud salamander	Amphibian	2
<i>Hyla chrysoscelis</i>	Cope's gray treefrog	Amphibian	2
<i>Rana virgatipes</i>	Carpenter frog	Amphibian	2
<i>Opheodrys aestivus</i>	Rough green snake	Reptile	2
<i>Thamnophis sauritus</i>	Eastern ribbon snake	Reptile	2
<i>Agkistrodon contortix</i>	copperhead	Reptile	2
<i>Ardea herodias</i>	Great blue heron	Bird	2
<i>Casmerodius albus</i>	Great egret	Bird	2
<i>Egretta thula</i>	Snowy egret	Bird	2
<i>Egretta caerulea</i>	Little blue heron	Bird	2
<i>Egretta tricolor</i>	Tricolored heron	Bird	2
<i>Bubulcus ibis</i>	Cattle egret	Bird	2
<i>Plegadis falcinellus</i>	Glossy ibis	Bird	2
<i>Buteo lineatus</i>	Red-shouldered hawk	Bird	2
<i>Strix varia</i>	Barred owl	Bird	2
<i>Vireo flavifrons</i>	Yellow-throated vireo	Bird	2
<i>Protonotaria citrea</i>	Prothonotary warbler	Bird	2
<i>Helmitheros vermivorus</i>	Worm-eating warbler	Bird	2
<i>Oporornis formosus</i>	Kentucky warbler	Bird	2
<i>Piranga olivacea</i>	Scarlet tanager	Bird	2
<i>Icterus galbula</i>	Baltimore oriole	Bird	2
<i>Lasionycteris noctivagans</i>	Silver-haired bat	Mammal	2
<i>Nycticeius humeralis</i>	Evening bat	Mammal	2

<b>SGCN Species expected in Coastal Plain Upland Forest</b>			
<b>Species</b>	<b>Common Name</b>	<b>Class</b>	<b>Tier</b>
<i>Cicindela patruela consentanea</i>	Northern barrens tiger beetle	Insect	1
<i>Callophrys irus</i>	frosted elfin	Insect	1
<i>Catocala antinympha</i>	sweetfern underwing	Insect	1
<i>Catocala lacrymosa</i>	tearful underwing	Insect	1
<i>Terrapene carolina</i>	Eastern box turtle	Reptile	1
<i>Eumeces laticeps</i>	broadhead skink	Reptile	1
<i>Cemophora coccinea</i>	scarlet snake	Reptile	1
<i>Elaphe guttata</i>	corn snake	Reptile	1
<i>Lampropeltis triangulum</i>	milk snake	Reptile	1
<i>Haliaeetus leucocephalus</i>	Bald eagle	Bird	1
<i>Accipiter cooperii</i>	Cooper's Hawk	Bird	1
<i>Buteo platypterus</i>	broad-winged hawk	Bird	1
<i>Asio otus</i>	long-eared owl	Bird	1
<i>Melanerpes erythrocephalus</i>	red-headed woodpecker	Bird	1
<i>Certhia americana</i>	brown creeper	Bird	1



<i>Hylocichla mustelina</i>	wood thrush	Bird	1
<i>Wilsonia citrina</i>	hooded warbler	Bird	1
<i>Sciurus niger cinereus</i>	Delmarva fox squirrel	Mammal	1
<i>Discus catskillensis</i>	angular disc	Gastropod	2
<i>Cicindela patruela</i>	Northern barrens tiger beetle	Insect	2
<i>Cicindela unipunctata</i>	one-spotted tiger beetle	Insect	2
<i>Photuris frontalis</i>	a firefly	Insect	2
<i>Erynnis martialis</i>	mottled duskywing	Insect	2
<i>Erynnis baptisiae</i>	wild indigo duskywing	Insect	2
<i>Battus philenor</i>	pipevine swallowtail	Insect	2
<i>Polygonia progone</i>	gray comma	Insect	2
<i>Caripeta aretaria</i>	a geometer moth	Insect	2
<i>Tolype notialis</i>	a lasiocampid moth	Insect	2
<i>Hemileuca maia maia</i>	the buckmoth	Insect	2
<i>Cisthene kentuckiensis</i>	Kentucky lichen moth	Insect	2
<i>Cisthene tenuifascia</i>	a lichen moth	Insect	2
<i>Grammia phyllira</i>	phyllira tiger moth	Insect	2
<i>Zale metata</i>	a noctuid moth	Insect	2
<i>Catocala flebilis</i>	mournful underwing	Insect	2
<i>Catocala residua</i>	residua underwing	Insect	2
<i>Catocala cerogama</i>	Yellow banded underwing	Insect	2
<i>Acronicta exilis</i>	Exiled dagger moth	Insect	2
<i>Acronicta lithospila</i>	Streaked dagger moth	Insect	2
<i>Papaipema araliae</i>	Aralia shoot borer moth	Insect	2
<i>Papaipema baptisiae</i>	Wild indigo borer moth	Insect	2
<i>Lepipolys perscripta</i>	A noctuid moth	Insect	2
<i>Scincella lateralis</i>	Ground skink	Reptile	2
<i>Heterodon platirhinos</i>	Eastern hognose snake	Reptile	2
<i>Lampropeltis getula</i>	Common kingsnake	Reptile	2
<i>Storeria occipitomaculata</i>	Redbelly snake	Reptile	2
<i>Virginia valeriae</i>	Smooth earth snake	Reptile	2
<i>Agkistrodon contortix</i>	Copperhead	Reptile	2
<i>Coragyps atratus</i>	Black vulture	Bird	2
<i>Strix varia</i>	Barred owl	Bird	2
<i>Caprimulgus vociferus</i>	whip-poor-will	Bird	2
<i>Colaptes auratus</i>	Northern flicker	Bird	2
<i>Myiarchus crinitus</i>	Great crested flycatcher	Bird	2
<i>Sitta pusilla</i>	Brown-headed nuthatch	Bird	2
<i>Vireo flavifrons</i>	Yellow-throated vireo	Bird	2
<i>Dendroica dominca</i>	Yellow-throated warbler	Bird	2
<i>Mniotilta varia</i>	Black-and-white warbler	Bird	2
<i>Seiurus motacilla</i>	Louisiana waterthrush	Bird	2
<i>Oporornis formosus</i>	Kentucky warbler	Bird	2
<i>Piranga olivacea</i>	Scarlet tanager	Bird	2
<i>Pipilo erythrophthalmus</i>	Eastern towhee	Bird	2
<i>Icterus galbula</i>	Baltimore oriole	Bird	2
<i>Lasionycteris noctivagans</i>	Silver-haired bat	Mammal	2
<i>Lasiurus borealis</i>	Eastern red bat	Mammal	2

<i>Lasiurus cinereus</i>	Hoary bat	Mammal	2
<i>Canis latrans</i>	coyote	Mammal	2

SGCN Species expected in Early Successional Upland Habitats			
Species	Common Name	Class	Tier
<i>Nicrophorus americanus</i>	American burying beetle	Insect	1
<i>Callophrys irus</i>	frosted elfin	Insect	1
<i>Papaipema maritima</i>	maritime sunflower borer moth	Insect	1
<i>Terrapene carolina</i>	Eastern box turtle	Reptile	1
<i>Lampropeltis triangulum</i>	milk snake	Reptile	1
<i>Branta canadensis</i>	Canada goose (migratory)	Bird	1
<i>Circus cyaneus</i>	Northern harrier	Bird	1
<i>Bartramia longicauda</i>	upland sandpiper	Bird	1
<i>Scolopax minor</i>	American woodcock	Bird	1
<i>Asio flammeus</i>	short-eared Owl	Bird	1
<i>Chordeiles minor</i>	common nighthawk	Bird	1
<i>Lanius ludovicianus</i>	loggerhead shrike	Bird	1
<i>Dendroica discolor</i>	prairie warbler	Bird	1
<i>Ammodramus henslowii</i>	Henslow's sparrow	Bird	1
<i>Cincindela scutellaris</i>	festive tiger beetle	Insect	2
<i>Atrytonopsis hianna</i>	dusted skipper	Insect	2
<i>Satyrium liparops</i>	striped hairstreak	Insect	2
<i>Satyrium liparops strigosum</i>	stiped hairstreak	Insect	2
<i>Callophrys gryneus</i>	juniper hairstreak	Insect	2
<i>Speyeria aphrodite</i>	aphrodite fritillary	Insect	2
<i>Speyeria idalia</i>	regal fritillary	Insect	2
<i>Boloria bellona</i>	meadow fritillary	Insect	2
<i>Paratrea plebeja</i>	trumpet vine sphinx	Insect	2
<i>Calyptra canadensis</i>	Canadian owlet	Insect	2
<i>Acronicta rubricoma</i>	a dagger moth	Insect	2
<i>Papaipema rigida</i>	rigid sunflower borer moth	Insect	2
<i>Cirrhophanus triangulifer</i>	a noctuid moth	Insect	2
<i>Schima septentrionalis</i>	a noctuid moth	Insect	2
<i>Plegadis falcinellus</i>	glossy ibis	Bird	2
<i>Cygnus columbianus</i>	tundra swan	Bird	2
<i>Coragyps atratus</i>	black vulture	Bird	2
<i>Colinus virginianus</i>	Northern bobwhite	Bird	2
<i>Pluvialis squatarola</i>	black-bellied plover	Bird	2
<i>Coccyzus erythrophthalmus</i>	black-billed cuckoo	Bird	2
<i>Chaetura pelagica</i>	chimney swift	Bird	2
<i>Colaptes auratus</i>	Northern flicker	Bird	2
<i>Empidonax minimus</i>	least flycatcher	Bird	2
<i>Tyrannus tyrannus</i>	Eastern kingbird	Bird	2
<i>Toxostoma rufum</i>	Brown thrasher	Bird	2
<i>Dendroica pensylvanica</i>	Chestnut-sided warbler	Bird	2
<i>Icteria virens</i>	Yellow-breasted chat	Bird	2
<i>Pipilo erythrophthalmus</i>	Eastern towhee	Bird	2

<i>Spizella pusilla</i>	field sparrow	Bird	2
<i>Poocetes gramineus</i>	vesper sparrow	Bird	2
<i>Passerculus sandwichensis</i>	savannah sparrow	Bird	2
<i>Ammodramus savannarum</i>	grasshopper sparrow	Bird	2
<i>Dolichonyx oryzivorus</i>	bobolink	Bird	2
<i>Cryptotis parva</i>	least shrew	Bird	2

<b>SGCN Species expected in Impoundments</b>			
<b>Species</b>	<b>Common Name</b>	<b>Class</b>	<b>Tier</b>
<i>Podilymbus podiceps</i>	Pied-billed grebe	Bird	1
<i>Branta canadensis</i>	Canada goose (migratory)	Bird	1
<i>Anas rubripes</i>	American black duck	Bird	1
<i>Pandion haliaetus</i>	osprey	Bird	1
<i>Actitis macularia</i>	Spotted sandpiper	Bird	1
<i>Cygnus columbianus</i>	Tundra swan	Bird	2
<i>Anas platyrhynchos</i>	mallard	Bird	2
<i>Anas clypeata</i>	Northern shoveler	Bird	2
<i>Aythya valisneria</i>	canvasback	Bird	2
<i>Aythya marila</i>	Greater scaup	Bird	2
<i>Aythya affinis</i>	Lesser scaup	Bird	2
<i>Bucephala albeola</i>	bufflehead	Bird	2
<i>Lophodytes cucullatus</i>	Hooded merganser	Bird	2
<i>Pluvialis squatarola</i>	Black-bellied plover	Bird	2
<i>Himantopus mexicanus</i>	Black-necked stilt	Bird	2
<i>Catoptrophorus semipalmatus</i>	willet	Bird	2
<i>Calidris pusilla</i>	Semipalmated sandpiper	Bird	2
<i>Calidris alpina</i>	dunlin	Bird	2

<b>SGCN Species expected in Non-tidal Coastal Plain Streams</b>			
<b>Species</b>	<b>Common Name</b>	<b>Class</b>	<b>Tier</b>
<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	Bivalves	1
<i>Alasmidonta undulata</i>	Triangle floater	Bivalves	1
<i>Lampsilis cariosa</i>	Yellow lampmussel	Bivalves	1
<i>Lampsilis radiata</i>	Eastern lampmussel	Bivalves	1
<i>Leptodea ochracea</i>	Tidewater mucket	Bivalves	1
<i>Ligumia nasuta</i>	Eastern pondmussel	Bivalves	1
<i>Gomphus fraternus</i>	Midland clubtail	Insects	1
<i>Cottus caeruleomentum</i>	Blueridge Sculpin	Fishes	1
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Fishes	1
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon	Fishes	1
<i>Notropis bifrenatus</i>	Bridle shiner	Fishes	1
<i>Notropis chalybaeus</i>	Ironcolor shiner	Fishes	1
<i>Moxostoma macrolepidotum</i>	Shorthead redhorse	Fishes	1
<i>Ictalurus natalis</i>	Yellow bullhead	Fishes	1
<i>Acantharchus pomotis</i>	Mud sunfish	Fishes	1
<i>Percina peltata</i>	Shield darter	Fishes	1

<i>Actitis macularia</i>	Spotted sandpiper	Birds	1
<i>Anodonta implicata</i>	Alewife floater	Bivalves	2
<i>Elliptio fisheriana</i>	Northern Lance	Bivalves	2
<i>Strophitus undulatus</i>	creeper	Bivalves	2
<i>Photuris pensylvanica</i>	A firefly	Insects	2
<i>Photuris hebes</i>	A firefly	Insects	2
<i>Cordulegaster bilineata</i>	Brown spiketail	Insects	2
<i>Domogomphus spinosus</i>	Black-shouldered spinyleg	Insects	2
<i>Gomphus rogersi</i>	Sable clubtail	Insects	2
<i>Gomphus apomyius</i>	Banner clubtail	Insects	2
<i>Macromia taeniolata</i>	Royal river cruiser	Insects	2
<i>Tetragoneuria costalis</i>	Stripe-winged baskettail	Insects	2
<i>Helocordulia selysii</i>	Sely's sundragon	Insects	2
<i>Somatochlora filosa</i>	Fine-lined emerald	Insects	2
<i>Somatochlora provocans</i>	Treetop emerald	Insects	2
<i>Celithemis ornata</i>	Faded pennant	Insects	2
<i>Enallagma dubium</i>	Burgundy bluet	Insects	2
<i>Enallagma durum</i>	Big bluet	Insects	2
<i>Enallagma pallidum</i>	Pale bluet	Insects	2
<i>Enallagma weewa</i>	Blackwater bluet	Insects	2
<i>Nehalennia integricollis</i>	Southern Sprite	Insects	2
<i>Archilestes grandis</i>	Great spreadwing	Insects	2
<i>Gomphus plagiatus</i>	Russet-tipped clubtail	Insects	2
<i>Gomphus villosipes</i>	Unicorn clubtail	Insects	2
<i>Lampetra aepyptera</i>	Least brook lamprey	Fishes	2
<i>Lampetra appendix</i>	American brook lamprey	Fishes	2
<i>Anguilla rostrata</i>	American eel	Fishes	2
<i>Alosa mediocris</i>	Hickory shad	Fishes	2
<i>Notropis amoenus</i>	Comely shiner	Fishes	2
<i>Noturus insignis</i>	Margined madtom	Fishes	2
<i>Apeltes quadracus</i>	Fourspine stickleback	Fishes	2
<i>Enneacanthus chaetodon</i>	Blackbanded sunfish	Fishes	2
<i>Enneacanthus obesus</i>	Banded sunfish	Fishes	2
<i>Etheostoma vitreum</i>	Glassy darter	Fishes	2
<i>Pseudemys rubriventus</i>	Redbelly turtle	Reptiles	2
<i>Regina septemvitta</i>	Queen snake	Reptiles	2
<i>Anas platyrhynchos</i>	Mallard	Birds	2
<i>Lophodytes cucullatus</i>	Hooded merganser	Birds	2

**SGCN Species expected in Riverine Aquatic and Submerged Vegetation**

<b>Species</b>	<b>Common Name</b>	<b>Class</b>	<b>Tier</b>
<i>Ischnura kellicotti</i>	Lilypad forktail	Insect	2