

Weymouth Township Master Plan Recreational and Open Space Element



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Environmental Commission
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Table of Contents

	Page
Executive Summary	1
Goals and Policies	2
Inventory	3
Needs Analysis	6
Resource Assessment	9
Action Plan	11
South River Report	13

Maps

- Open Space Acquisition and State Open Space
- Wetlands and Forest Area Map
- Township Open Space Parcels and Zoning/Smart Growth

Part One. Executive Summary:

Weymouth Township is a rural community in western Atlantic County. Most of the Township is located in the New Jersey Pinelands Preservation Area which is regulated by the New Jersey Pinelands Protection Act. Along the Great Egg Harbor River and Route 50 the Township is regulated by the New Jersey Department of Environmental Protection, Coastal Area Facilities Review Act. These acts regulate what land uses are allowable, including recreational uses.

Weymouth Township is located in the environmentally important Elwood Corridor between Route 50 and Route 54. This area connects the northern and southern parts of the Pinelands and contains a wealth of natural resources. Of the 12 square miles or approximately 8,000 acres that make up Weymouth Township, 1,352 acres are wetlands, rivers, and lakes and 5,554 are forest. Included are the Great Egg Harbor River, South River, Tuckahoe River and many small tributaries that contain sensitive headwaters, Atlantic White cedar swamps, and habitat of endangered and threatened species.

The Federal Wild and Scenic River designation is granted for rivers that possess outstanding natural resources. In Weymouth Township, 3.31 miles of the Great Egg Harbor River and 5.7 miles of the South River have Federal Scenic and Recreational River designation. With funding from the National Park Service the Weymouth Township Environmental Commission produced the attached natural resources report of the South River Watershed in Weymouth Township.

Weymouth Township contains a wealth of important habitat for State designated threatened and endangered fauna, including the Cooper's hawk, Pine Barrens tree frog, barred owl and red headed woodpecker; and flora, including the yellow fringed orchid, lily leaf twayblade orchid, chickasaw plum, pine barrens smoke grass, and the federally protected swamp pink lily. The bald eagle and peregrine falcon include portions of the Great Egg Harbor, Tuckahoe and South River in their hunting territory. The alewife spawns in the upper part of the South River.

Most of Weymouth Township residents rely on the Cohansey aquifer for private wells. Only the Belcoville area north of Route 50 has public water. The Cohansey aquifer is an unconfined aquifer that is susceptible to contamination. Preserving open space to protect the critical recharge areas, such as uplands forest and watershed divides, will ensure the township's future water resources and is an important priority.

The purpose of the Weymouth Township Open Space and Recreation Plan is to establish a planning document that will serve as a guide for providing the open space and recreational needs of its citizens. As Weymouth Township is located the New Jersey Pinelands preservation area, any recommendations in the open space plan must comply with preservation area zoning regulations.

The plan will propose specific goals and policies and will identify recreational and open space areas that should be acquired or preserved over the next 5 years. The plan will propose specific areas for the New Jersey Pinelands comprehensive management designated “recreational facility, low intensive” and “recreational facility, intensive” uses. The plan will also designate historic farm properties for possible acquisition.

It is anticipated that with additional funding sources, including the Weymouth Township municipal open space fund which was approved in November 2003, the Atlantic County Open Space Program, and non-profit groups such as the New Jersey Conservation Foundation, an efficient and responsive program will be established to take advantage of open space preservation when opportunities arise.

This document was prepared with participation of the Weymouth Township Planning and Zoning Boards and the Weymouth Township Environmental Commission. The plan was also reviewed by the National Park Service, the Great Egg Harbor Watershed Association and the Great Egg Harbor River Council.

Part 2. Goals and Policies:

The Weymouth Township Open Space and Recreational Plan recommends the following actions be taken by the Weymouth Township Committee:

1. Set priorities based on availability and competition for lands for:
 - A. Recreational uses “intensive” such as ball fields and play grounds.
 - B. Recreational uses “low intensity” such as walking, biking and bridle trails.
 - C. Historic and cultural resources
 - D. Preservation of environmentally sensitive lands including endangered and threatened species habitat.
 - E. Continuity to lands presently owned and protected by state agencies and non-profit preservation organizations.
2. Purchase lands that are experiencing development pressures.
3. Purchase lands to develop a living history farm.
4. Purchase lands that allow additional public access to the South and Great Egg Harbor Rivers.
5. Purchase lands that provide a link between existing parks and lands owned by State and non-profit agencies.
6. Work with the Atlantic County open space program and non-profit groups to develop a long range funding strategy.
7. Seek funding to conduct a Township-wide natural resource inventory.

Part 3. Inventory:

	<u>Acres</u>
State Natural Lands Trust	110
State Fish and Wildlife Management Areas	<u>704</u>
Total State owned Land	814
Weymouth Township Owned Land Including MUA Property	364
<hr/>	
Total Open space	1178

The New Jersey Department of Transportation owns 185 acres along the railroad tracks and Route 557.

The 110 acre New Jersey Natural Lands Trust property is located on the tidal portion of the Great Egg Harbor River, is mostly wetlands, and contains threatened and endangered species habitat. It is mostly inaccessible and is not available for public use.

The State owns the 596 acre Great Egg Harbor Wildlife Management Area located on the peninsula between the Great Egg Harbor and South Rivers. This Wildlife Management Area is used for fishing, hunting, and hiking, and provides access to the South River for canoeing and kayaking. The State also owns 108 acres along the Tuckahoe River that abut the Peaslee Wildlife Management Area.

In addition to the listed recreational facilities Weymouth Township owns various undeveloped, scattered parcels throughout the Township, most of which are in the Pinelands forest area zoned locations.

Block and Lot Breakdown of Weymouth Township Open Space

New Jersey Department of Environmental Protection Owned

<u>Block</u>	<u>Lot</u>	<u>Location</u>	<u>Acres</u>
1	1	15 th Ave	55.00
15	18	10 th Ave	19.24
15	18.01	1516 10 th Ave	34.10
120	1	1900 River Front	429.00
120	10.2	1800 River Front	22.00
120	1.03	1700 South River	11.00
120	1.04	2000 River Front	60.00
120	2	2100 River Front	110.00
121	1	1700 River Front	74.55

New Jersey Department of Transportation Owned

Block	Lot	Location	Acres
200	1	Rail Road Row	185.00

Weymouth Township Owned

Block	Lot	Location	Acres
1	1.01	1420 15th Ave	7.00
1	10	1406 15th Ave	6.38
1	11	1404 15th Ave	.28
2	3.01	5-7 Cape May Ave	2.25
6	9	1504 13th Ave	5.00
7	32	1401 14th Ave	1.14
10	34.02	1402A 12th Ave	1.70
13	10	1411 12th Ave	5.00
17	22.01	80A Tuckahoe Rd	1.00
20	1	1 Maple Ave	26.20
20	1.01	3 Maple Ave	5.14
20	2	5 Maple Ave	14.87
27	35	45 S. Jersey Ave	6.15
32	3	1004 11th Ave	8.50
31	101	31 Estelle Ave	1.00
34	34	1102 10th Ave	5.00
35	4.01	1003A 11th Ave	1.25
35	4.02	1003B 11th Ave	1.25
35	7.01	40 Maple Ave	0.43
35	8	1018 10th Ave	4.86
35	15	42-44 Maple Ave	11.70
35	17	46 Maple Ave	5.27
35	17.01	1004 10th Ave	0.25
35	17.02	1004A 10th Ave	0.65
39	18	1101 14th Ave	4.97
50	2	611 16th Ave	4.84
50	5.01	603 16th Ave	0.29
52	9	608 12th Ave	5.00
58	9	508A S. Jersey Ave	0.30
62	3	407 12th Ave	5.00
67	5	303 13th Ave	5.00
67	6	301 13th Ave	5.00
67	9	308 12th Ave	5.00

68	7	312 11 th Ave	5.00
69	8	310 10 th Ave	5.00
71	5	303 9 th Ave	5.00
73	1	211 13 th Ave	5.00
73	3	207 13 th Ave	5.00
73	6	201 13 th Ave	5.00
73	8	210 12 th Ave	5.00
73	9	201 12 th Ave	5.00
73	10	206 12 th Ave	5.00
73	12	209 12 th Ave	5.00
74	2	209 12 th Ave	5.00
74	3	207 12 th Ave	5.00
74	5	203 12 th Ave	5.00
75	8	210 10 th Ave	5.00
75	12	202 10 th Ave	5.00
80	5	110 12 th Ave	5.00
81	1	112 12 th Ave	5.00
81	5	103 12 th Ave	5.00
81	12	106 11 th Ave	5.00
81	13	104 11 th Ave	5.00
86	1	1004 Blvd. Rt.50	64.50
86.01	2	912-914 11 th Ave	33.10
91	1	1001 Blvd. Rt. 50	0.25
101	1	1201 Madden Ave	2.02
112	2	1503 Blvd. Rt. 50	0.13
121	2	1300 Grace Ave	2.35

Part 4. Needs Analysis:

The Weymouth Township Environmental Commission conducted a recreational needs survey to determine the interests and needs of township residents. A survey form was mailed to every Household in the township newspaper and provided at Weymouth Township events including the annual Wienie Roast, Forth of July Fireworks, and Christmas party.

Open Space /Recreation Questionnaire

(43 responses as of 4/20/04)

Current Facilities adequate	Yes	No
	14	27

Type of Recreation Requested

	Preference			Total # Requests
	#1	#2	#3	
Trails				
Walking Trails	12	8	7	27
Bike Trail	8	9	2	19
Horse Trails	4	1	1	<u>6</u>
				52
Passive Recreation				
Park (open space)	4	3	3	10
Picnic Area	1			1
Swings, slides, etc.	1	1	3	<u>5</u>
				16
Sports Facilities				
Sports Fields	4	3	2	9
Golf course, par 3 etc.	2			2
Tennis court	2	1		<u>3</u>
				14

Other suggestions:

- Need something for seniors/adults 5
- Ice Skating 2
- Horseshoe pits
- Different sports-basket ball, football, hockey
- Fishing access to Rivers
- Skateboarding
- ATV or dirt bike area
- Concerts
- History Museum
- Camping

Existing Township Recreation Facilities

Municipal Building Grounds

1 Youth ball/soccer field

1 Advanced Playground

The Municipal Building grounds contain a 60 foot youth ball field and side line bleachers. The field is used by the West Atlantic County Youth League for baseball, softball, and soccer. The field is maintained by the township and is in good condition. The advanced playground contains two large modern multi-use pieces each with 8 different units and was installed in 2002. There is also a large tree shaded picnic area with 10+ picnic tables. The field and nearby open areas have also been used for a traveling circus, outdoor concerts, annual 4th of July fireworks, and annual wienie roast. However parking is sometimes a problem at this location. Many times during the sports season the limited parking spaces for the sports field and town hall are filled and excess cars must park along New Jersey Ave.

Weymouth Elementary School

1 Youth ball/soccer field

1 Advanced Playground

1 Full Size Basketball Court

Weymouth Elementary School contains a 60 foot youth ball field which is also used for soccer. The advanced playground contains 7 pieces and 1 large modern multi use piece with 6 units. All equipment is in good condition. There is one regulation size basketball court which is in good condition. The area is used primarily by students during the school year. It is only open during school hours and is not widely used by residents.

Belcoville Area

1 Youth ball/soccer field

The Belcoville Area contains an undersized youth ball field. This site is occasionally used by the West Atlantic County Youth League but has inadequate parking. There are 8 paved parking spaces around the Marsh Center, with additional parking along the dirt road abutting the ball field. To meet future recreations needs this site needs additional parking spaces, the ball field must be enlarged to regulation size and new play ground equipment should be installed in playground area.

Oaks of Weymouth facilities (available to Oaks of Weymouth residents only)

1 Pool

1 Tennis Court

1 Bocce Ball Court

1 Shuffleboard

The Oaks of Weymouth is a 55+ retirement community with approximately 500 residents. Facilities include a large pool, tennis courts, shuffle board and bocce ball areas. The facilities are in good condition, are used only by its residents and maintained by the Oaks of Weymouth.

Population Statistics for Weymouth Township

	1930	1940	1950	1960	1970	1980	1990	2000
Population	685	675	750	788	998	1260	1957	2257
Population Density	56	55	61	65	82	103	160	185
Numbers Change	-10	75	38	210	262	697	300	
% Change	-1%	11%	5%	27%	26%	55%	15%	

Center for Regional & Business Research
Population Projects, 2010-2020

Weymouth Township	2010 Estimate	2020 Estimate
Population	2,451	2,652
Population Density	204	221
Numbers Change	+194	+101

Percent Growth From 2000-2010 8.6%

Percent Growth From 2010-2020 8.2%

Future Municipal and Recreational Needs

In the long term, Weymouth Township sees the need for the possible expansion or replacing of the existing 80+ year old municipal building and adding more parking spaces. The only property available for this future need is the abutting recreational ball fields. This entire area is the 6.1 acre, Block 27, Lot 35. Weymouth Township will not include the eastern 66% of this lot which abuts the municipal building, in the ROSI because of the possible municipal building need for expansion and parking. If this area is used for future expansion, the township anticipates the continuing use of the western 33% of this lot which contains a picnic grove, play ground, and the “Grammy Center” Community Center and Museum. This property is unfunded by the New Jersey Green Acres program.

The West Atlantic County Youth League is anticipating the long term need for more facilities, including more soccer fields and a 90 foot baseball diamond. Because of these needs and little possibility of expansion at the existing ball fields, Weymouth Township's long term plans include moving the township sports fields. Designated as the site for future sports fields complex is the Weymouth Township owned property at Block 20 Lots 1,1.01 and 2. This 45 acre uplands parcel at Maple Ave. and Sixteenth Ave. is located in the Pinelands Village zoned area which allows recreational facility, intensive use. This much larger area will provide Weymouth Township residents the room for future sport facility needs such as soccer and baseball fields and adequate parking.

The township anticipates the need for passive recreation including walking, bike, and horse trails and picnic area as indicated in the recreational survey. Such an area would be in a PFA zoned section of Weymouth.

Part 5. Resource Assessment:

Recreational facilities such as baseball and soccer fields are designated by the New Jersey Pinelands Comprehensive Management Plan as recreational facility, "intensive" use and are not permitted in Pinelands Forest zoned areas. They are only permitted in Pinelands Village zoned areas, therefore any future baseball/soccer fields or any other designated intensive use recreational facilities must be located in the Pinelands Village zoned areas.

Designated "intensive use" properties for possible acquisition, Pinelands Village zoned:

	Block	Lot
1. Petes Store 56 Tuckahoe Road	11	12.01
2. Both sides of 12 th Ave. between South Jersey and Estelle Avenues.	28 30	43-50 1-15
3. 13 th Avenue between Estelle and Maple.	29	1-7

There are large areas in Weymouth Township that are designated by the New Jersey Pinelands Comprehensive Management Plan as Pinelands Forest Area. These areas permits such low intensity uses as hiking, hunting, trapping, fishing, canoeing, nature study, orienteering, horseback riding, and bicycling.

Designated "low intensive use" properties for possible acquisition, Pinelands Forest zoned:

1. Appropriate Pinelands Forest zoned areas along the Tuckahoe River, South River and Stevens Creek corridors.
2. Appropriate Pinelands Forest zoned areas designated as flood prone by Weymouth Township Flood Management plan.

	Block	Lot
3. Robert Stewart Farm 1213-1215 10 th Ave.	33	8
4. Louis Klimek Farm 1412-1413 13 th Ave.	7	27

Appendix - Recreation Uses in the Pinelands

The Pinelands Comprehensive Management Plan (CMP) divides recreational uses (or facilities) into two types: "intensive" and "low intensive". The following are the CMP's definitions of those uses:

"Recreational facility, intensive" means any recreational facility which does not satisfy the definition of low intensive recreational facility including but not limited to golf courses, marinas, amusement parks, hotels, and motels.

"Recreational facility, low intensive" means a facility or area which complies with the standards in N.J.A.C. 7:50-5, Part HI, utilizes and depends on the natural environment of the Pinelands and requires no significant modifications of that environment other than to provide access, and which has an insignificant impact on surrounding uses or on the environmental integrity of the area. It permits such low intensity uses as hiking, hunting, trapping, fishing, canoeing, nature study, orienteering, horseback riding, and bicycling.

Although not explicitly listed, typical municipal recreational uses, such as ballfields, playgrounds, and indoor facilities are "intensive" uses. The CMP also requires municipal recreation management plans and implementing land use ordinances to meet certain criteria. These CMP criteria (see attached, N.J.A.C. 7:50-6.141 to 6.144) will be included in the plan, where appropriate.

Each management area also permits a degree of recreational uses. The following standards are also taken from the CMP:

Forest Area (FD Zones') - N.J.A.C. 7:50-5.23

1. Low intensity recreational uses, provided that:
 - i. The parcel proposed for low intensity recreational use has an area of at least 50 acres;
 - ii. The recreational use does not involve the use of motorized vehicles except for necessary transportation;
 - iii. Access to bodies of water is limited to no more than 15 linear feet of frontage per 1,000 feet of water body frontage;
 - iv. Clearing of vegetation, including ground cover and soil disturbance, does not exceed five percent of the parcel; and
 - v. No more than one percent of the parcel will be covered with impermeable surfaces.

2. Campgrounds, not to exceed one campsite per gross acre, provided that the campsites may be clustered at a net density not to exceed 10 campsites per acre.

Agricultural Production Area (AG zones') - N.J.A.C. 7:50-5.24

1. Low intensity recreational uses, provided that:
 - i. The parcel proposed for low intensity recreational use has an area of at least 50 acres;
 - ii. The recreational use does not involve the use of motorized vehicles except for necessary transportation;
 - iii. Access to bodies of water is limited to no more than 15 linear feet of frontage per 1,000 feet of water body frontage;
 - iv. Clearing of vegetation, including ground cover and soil disturbance, does not exceed five percent of the parcel.

Part 6. Action Plan:

The planning process has identified a list of potential properties to accomplish the Open Space and Recreational Plans goals and objectives.

Weymouth Township anticipated open space needs for the next 5 years include:

3 Years:

1. Upgrade ball field and expand parking facilities at Belcoville site, install new playground equipment in playground area..
2. Acquire property for passive recreational uses such as walking, biking and bridle trails and a picnic area.

5 years:

3. Acquire a township farm site for historic preservation and passive recreation.
4. Acquire additional property for ball fields to meet future WACYL growth needs.
5. Acquire properties for wellhead and endangered species protection.

Long Term:

In the long term future, Weymouth Township's ball field recreation area will be relocated to a 45 acre township owned parcel located at Block 20 Lots 1,1.01 and 2 This much larger site will easily meet Weymouth Townships future recreational needs.

To meet future recreational and open space needs Weymouth Township passed a 1 cent open space tax in 2003. Weymouth Township also anticipates additional support from the Atlantic County open space program and from non-profit groups including the New Jersey Conservation Foundation.

The Weymouth Township Environmental Commission has been promoting public education about the importance of open space and the recreational needs of its residents. It has completed a number of projects including:

1. With NJ DEP funding, completed a photographic Inventory of the Great Egg Harbor River Watershed in Weymouth Township.
2. With NJ DEP funding, produced a Watershed slide presentation on CD Rom that was distributed in Weymouth Township's school and to residents.
3. With National Park Service funding completed a Natural Resource Inventory of the South River in Weymouth Township.
4. Arranged public meetings and speakers for successful open space campaign.
5. With NJ DEP funding produced a Township Web site (www.weymouthnj.org) with a large amount of environmental and open space information and links.
6. With NJ DEP funding, purchased ARCVIEW 8 GIS software, a computer workstation, and GIS training.

Weymouth Township will continue to seek funding to educate residents of the importance of open space and preserving its environmental resources.

Part 8. Additional Parcel Data Requirements:

- A. Existing preserved open space documented in the plans ROSI delineated at the lot and block level

PFA 25 Acre Zone:

Block 1, Lot 1.01 = 7 Acs.

PFA 10 Acre Zone:

Block 35, Lots 7.01, 15, 16, 17, 17.01 & 17.02 = 12.95 Acs.

Block 58, Lot 9 = .30 Acs.

PFA 20 Acre Zone:

Block 39, Lot 18 = 4.97 Acs.

Block 52, Lot 9 = 5.0 Acs.

Block 62, Lot 3 = 5.0 Acs.

Block 67, Lots 5, 6 & 9 = 15 Acs.

Block 69, Lot 8 = 5.0 Acs.

Block 71 Lot 5 = 5.0 Acs.

Block 73, Lots 1, 3, 6, 8, 9, 10, & 12 = 35.0 Acs.

Block 74, Lots 2, 3 & 5 = 15.0

Block 75, Lots 8 &12 = 10.0 Acs.

Block 76, Lot 9 =5.0 Acs.

Block 80, Lot 5 = 5.0 Acs.

Total Acs. =130.22

Part 9. Public Participation:

The Open Space plan was developed with input from the Weymouth Township Planning and Zoning boards and Environmental Commission. Input was also obtained from the Weymouth Township Civic Association, the Western Atlantic County Youth League, the Great Egg Harbor Watershed Association, the Great Egg Harbor River Council, and the National Parks Service. Public hearings were held on August 31 and on November 2. A special Weymouth Township Committee meeting regarding Open Space was held on September 23 and was attended by representatives of the Atlantic County Open Space Program, New Jersey Green Acres Program and the New Jersey Conservation Foundation. Issues regarding the Open Space and the Recreational Master Plan Element and funding resources were discussed at length.

The plan was published on the Weymouth Township website, www.weymouthnj.org. A township survey was mailed to all Weymouth Township residents for their input for recreational needs.

Part 10. Planning Consistency:

The Weymouth Township Planning Board adopting the OSRP and certified consistency with the conservation and recreation elements of the local master plan at the 11.08.05 Planning Board meeting.

SOUTH RIVER RESOURCES REPORT
NATURAL RESOURCES OF WEYMOUTH TOWNSHIP

STUDY PURPOSE

Weymouth Township's political boundaries surround a large segment of the South River watershed. This includes open land north of Eleventh Avenue and east of Route 50. Weymouth Township recognizes the open area supports native forests, wildlife and water resources. Acting upon this recognition, the Township's Environmental Commission funded a biological investigation to define the resources. Ted Gordon and Joe Arsenault were selected to provide field investigation and produce a report from field study on the peninsula's vegetation, important flora and fauna as well as any other identified resource.

METHOD OF STUDY

The investigators made three site visits to the peninsula and adjoining South River corridor lands. Visits were made in the spring, summer and fall of 1999(April 29, July 7, September 30, 1999). The site was walked or driven where access existed to insure coverage of portions of the land identified by the Township Environmental Commission (Figure 1: Study Area). All existing vegetation types were noted and the important characters of the flora and fauna were recorded. The landscape and soils are characterized as well.

DESCRIPTION OF THE STUDY AREA

GEOLOGY & PHYSIOGRAPHY

Weymouth Township's portion of South River is situated on an Outer Coastal Plain lowland terrace. This terrain formed on a Cohansey Formation outcrop capped with a veneer of Cape May Gravel that has been weathered and eroded by time, wind and water. The South River valley is a wide, gentle depression formed by thousands of years of run off and seeps. At the western end of the study area, near the headwaters, the stream is narrow (<7' wide) and shallow (<3' deep). Near the terminus, the South River joins an ancient oxbow of the Egg Harbor River and triples in size and volume.

SOILS

The soils formed from the Cohansey and Cape May formations are fine to medium sand and gravel. The Atlantic County Soil Survey, Sheets 30, 31 and 38, has classified the soils. The uplands east of Route 50 support Lakehurst Sand (LaA) and Lakewood Sand (LeA). West of Route 50, the landscape changes slightly. The terrain begins to rise in elevation toward the South River headwaters. On this landscape, Lakehurst and Lakewood give way to Evesboro, Aura and Matawan Sand on the higher topographies and slopes.

VEGETATION

Today's landscape resembles the regionally distinct Pine Barrens, with a slight coastal influence. Situated southwest of the county seat. Mays Landing, the South River peninsula is relatively undeveloped. Residential dwellings cluster around the little village of Belcoville, as well as along the township and State roads such as Route 50, Lowell Street and West Riverside Drive. The study area encompasses a portion of land abutting the Egg Harbor River as well as the headwaters of the South River. Each provides distinct environmental conditions, producing subtle changes to the natural vegetation. The western end of the study area surrounds the non-tidal watershed of the South River. The landscape's hydric soils support an oak-pine forest characteristic of Atlantic County's Bridgeton Cap uplands. Deciduous hardwoods, primarily oaks, with a small component of pitch pine and short leaf pine, dominate the forest. The forests do not show signs of repeated fire, but do show signs of repeated logging. The forest, for the most part, is composed of multi-aged stands of re-sprouting oak forest. Multiple stemmed trees predominate and provide a clear indication of timber harvesting. Scarlet, white, black, southern red, chestnut oaks provide a 40 to 60% canopy closure. The forest is stratified with few sub-canopy trees and shrubs. Black huckleberry, inkberry, lowbush blueberry, and teaberry dominate the forest floor. Dangleberry, scrub oak and staggerbush are less pronounced members of this dense understory. The wetland end of this non-tidal continuum is dominated by red maple. Hardwoods such as black gum, gray birch, and sweet-bay magnolia are the other dominant trees. Atlantic white cedar and pitch pine are also present to a lesser degree, but do form pure stands where disturbance removed the hardwoods, providing space for the evergreen trees. A dense, multi-layered thicket of shrubs and vines entangles most of the understory in the wetland corridor. This thicket includes many ericaceous and related species such as sweet pepperbush, fetterbush, high-bush blueberry, swamp azalea, and other plants like nannyberry, winterberry, and greenbrier.

A different set of habitats exists further down stream, close to the tidal water. A subtle yet gradual change is visible the closer one gets to the distinct open waters of the confluence of the two regional waterways. The dense canopy of the wetlands in the headwater corridor gives way to a leading edge of tidal inundation. Here trees die and remain standing as the gradual sea-level rise covers the non-tidal landscape. Further downstream, most tree snags have collapsed and the river edge opens up to a freshwater marsh. The marsh gradually dominates the landscape and eventually becomes the dominant vegetation at the confluence of the Great Egg and South rivers. The leading edge of the freshwater marsh is dominated by tussock sedge, golden club, spatterdock and arrowhead. Dodder and other vines are interlaced into the fabric of the mixed shrub and herbaceous dominated vegetation. Further down, near the confluence, the marsh vegetation become more complex. Species such as wild rice, tall cord grass, sweet flag and broad-leaf cattail become major components, nearly displacing the marsh species encountered upstream.

The soils and micro-topography of the uplands also changes, reflecting the lowland position within the corridor. The upland is a series of dunes comprised of

materials re-deposited from the Bridgeton Formation found in the headwaters. Coarse sand deposited in long narrow ridges show signs of water deposition and Aeolian reworking. Upon these dunes are typical pine barren forests. Pitch pine and short needle pine are dominating primarily due to the coarse xeric soil but also due to the intensive disturbances created by the historic Belcoville complex. Black jack, post, black, southern red and scrub oaks also exist on this droughty soil.

SPECIAL FEATURES OF THE STUDY AREA

The South River Study Area provides a large setting with many possible species groupings. The site inspection found numerous items of interest, which are described in the following category assessments.

NATURAL LANDSCAPES

The study area stretches between the Bridgeton Formation and the Cohansey Formation. Both are common southern New Jersey unconsolidated geologies. Their location, however, in close proximity, provides an interesting series of topographies.

2. The Upland Cape May Formation Cap: This is the origin for the South River. This upland landscape is dominant across southern New Jersey Upland Interior, and this forms an eastern leading edge. This upland landscape dominates the Pleistocene deposit from New Jersey's cuesta to the headwaters of the major regional rivers. This setting provides a relatively steep gradient between the finer Cape May sediments to the more coarse Cohansey deposits. A drop of approximately 50' occurs from the headwaters of the South River to the confluence with the Egg Harbor River. This area is important for its upland ecosystem continuity as well as its water recharging resources.

2. The Riverine Dune Complex: This landscape exists between the South River and the Great Egg Harbor River, south of Belcoville. Dunes are normally associated with oceanic beaches and dry arid landscapes. Here, in Weymouth Township, dunes are the relic evidence of a once active flooding regime. The parallel ridges and orientation indicate that the origin of the dune system is periodic, severe river flooding. Subsequent actions of the wind reshaped the sandy deposits into the features we see today. These are a very unusual landscape features in New Jersey. They have importance because they are visual remnants of an ancient landscape that has otherwise been muted and smoothed by the eastern North American climate and vegetation.

3. Freshwater Tidal Flats: Open mud and freshwater marshes are dynamic. The conditions that surround the tidal river deposits are very fine silts, clays and organic fragments from the South River and Great Egg Harbor watersheds. This accumulation will eventually erode and be replaced with a more saline environment and quite possibly open water as regional sea level rises. Freshwater marshes are important for their varied vegetative covers, wildlife habitats and the positive impacts to regional water quality.

VEGETATION

The South River Study Area supports vegetation types common to southern New Jersey's Southern Pine Barrens. The following are among the more noteworthy vegetation habitats.

Atlantic white cedar swamps: This vegetation type is a limited forest type throughout New Jersey. The South River Study Area supports small concentrations of Atlantic white cedar throughout the corridor. Most exist as small stands within the larger red maple hardwood swamp complex. This tree is a critical and characteristic component of southern New Jersey's coastal plain wetlands. Atlantic white cedar forests support a wide array of typical pine barren species, some of which are protected by statute.

Non-tidal Freshwater Marshes: Marsh habitats are confined to the stream corridor in the headwaters of the South River, as well as the fringed edges of the river within the tidal portion of the river. This wetland type is non-tidal and maintained by persistent disturbance and inundation. One small marsh exists under the PSE&G power line. This is maintained by mowing within the right-of-way. A second open marsh is present upstream of Eleventh Avenue. A constriction in the stream flow caused by the Eleventh Avenue causeway dams water that allows for a small non-tidal marsh to exist. These habitats are limited in size and dependent on human intervention to persist.

Tidal Freshwater Marshes: This wetland cover type is an important yet limited habitat on New Jersey's Atlantic Ocean drainage systems. Most coastal freshwater marshes are small, found as a narrow fringe associated with a small segment of the tidal watercourse. The South River and the tidal edge of the Great Egg Harbor River, however, support extensive freshwater tidal marshes. These are some of the largest freshwater marshes associated with the Atlantic drainage in New Jersey. Nowhere else in Atlantic County are freshwater marshes so extensive and relatively free of modern disturbances. This vegetation type is also known to support very rare plants such as Parker's Pipewort and sensitive joint vetch. Important as a food source, wild rice and other large seed producing plants exist and provide seasonal calories to migrating ducks and perching birds.

Pitch Pine Lowlands: This characteristic pine barren habitat is found within the intra-dune swales on the peninsula between the South and Egg Harbor rivers. This habitat supports characteristic pine barren flora and is an archetype of pine barren vegetation.

Open Water-Aquatic Bed: The extent of this habitat is not known, but constitutes an important habitat for marine fisheries and migrating waterfowl. Wild celery, sago, clasping-leaf, small and ribbon-leaf pondweeds & swaying bulrush are species expected to occupy this limited habitat. The vegetation type is elevated to a stature of notoriety because the river has an exceptional inter-tidal habitat without extensive modern pollution or dredging impacts.

FLORA

The plant life in the South River corridor is composed of a flora reflecting pine barren affinities, yet with indications of different nutrient inputs. Many characteristic pine barren plants abound within the study area. The upland oak-pine and pine-oak woodlands support the typical array of species. The same is true for the wetland areas. A few, however, stand out because of their rarity or status within our local flora.

At the close of the field investigations, three characteristic pine barren plants were verified in their appropriate habitats. Sand myrtle, turkey beard and pyxie moss are found in pitch pine lowland conditions on the intra-dune landscape of the peninsula between the Egg Harbor and South rivers. These plants are found nowhere else in New Jersey but the Pine Barrens. Their presence within the study area provides an important link between the local South River plant community and the surrounding, greater Pine Barrens region.

Although suitable rare species habitat exists within the study area, only one State Natural Heritage Program tracked species was identified during the study. The plant, wild lupine, (*Lupinus pennnis*) is a S-3 (25-100 colonies) species with a declining population in New Jersey. Wild lupine is a member of the pea family. It produces a beautiful blue- purple flower in May. This species is found along the abandoned railroad bed, near its intersection with the high power line. Its characteristic leaf is visible in widely scattered clumps on the north and south side of the old railroad.

FAUNAL RESOURCES

No systematic faunal investigation was undertaken in this study. It is assumed all common mammals and avian faunal species characteristic of the various vegetation types exist. Common upland mammals such as gray and red squirrel, white-tailed deer, pine vole, white foot mouse raccoon, opossum, and cottontail rabbit are ubiquitous throughout the state, and are assumed to have the same population dynamics within the study area. Reptiles such as the black rat snake banded water snake, garter snake, box turtle, snapping turtle, mud turtle, red-bellied turtle and eastern fence swift

are common and assumed present throughout the study site. The study site's proximity to large open water of the South River and the Great Egg Harbor River provides habitat to unusual species such as river otter, mink and the wide variety of birds adapted to the inter-tidal flats. Herons, egrets and other wading birds have ample habitat at low tide to forage for freshwater invertebrates. Notable species observed include the osprey and bald eagle, both seen in the vicinity of the tidal rivers confluence.

CULTURAL RESOURCES

Man has always been a critical part of the South River-Great Egg Harbor River ecosystem. From the earliest periods of human existence in North America to the present day, man has been a part of this system. The work provided for this biological survey also discovered many sites distinguished by their cultural affinities. "The items found put the South River area in an important position as a focal point of regional cultural heritage.

1. Prehistoric Aboriginal Loci: Early man is known from numerous sites throughout southern New Jersey. Early collectors discovered tools and other evidence between the South and Egg Harbor rivers. While conducting the botanical phase of this investigation the survey team also found lithic evidence left on the landscape by these people. At least five separate encampments are currently exposed within the study area. (Refer to the Cultural Resource Map found in the Appendix of this report.) Stone tools, flakes and bits of ancient pottery abound where the camps once flourished. There are, no doubt, more prehistoric human sites within the study area. Many aboriginal sites were occupied as late as the time of the first arrival by Europeans, but many were long lost to even the native memory by that time. The sites span a period from the middle Archaic Period (5,000-1,500 B.C.) up to the most recent Late Woodland Period (1,000-1,500 A.D.), is well represented in the debris (see photocopy in appendix). The sites discovered during this survey are located in logical situations, along the river's upland terraces. These are areas where sandy soil conditions and close proximity to water exist. Lithic scatters have been identified throughout the watershed, from the South River headwaters to the last spit of accessible upland at the southern edge of the study area.

2. Colonial Occupation: Mays Landing and the surrounding environments have been important to American history. The riverine corridors carried timber, grain, ore and finished products to Europe during the colonial occupation by Great Britain. The region was important during the revolutionary war and was part of the early industrial might of the young United States. Shipping, shipbuilding, iron manufacturing, glass and collection of raw materials were once the backbone of the regional economies. Sites such as Walkers Forge, today a place name on the upper South River, were an

important local source for employment and supplied materials throughout the region. Other activities, such as charcoal making and forest harvesting have left subtler, though ever present, ecological scars on the reforested landscape.

3. Belcoville and Related Industries:

Belcoville was a World War I munitions plant operated to produce explosives. Manufacturing occurred in isolated bunkers scattered throughout the land located east and south of the named village. A rail line passed through the plant and carried raw products to this and other destinations within Weymouth Township. Today, all that remains are eroded revetments, derelict concrete ruins, abandoned railroad beds and dirt roads. These are the remnants and the sole identifiers of this once bustling community. These ruins, as degraded as they are, provide a link to the earliest parts of the 20th century and together with the two or three other pine barren munitions plants attest to the importance of New Jersey's products to the health and wealth of the nation.

CONCLUSION

The South River study area is a unique and interesting natural site. The study area supports typical southeastern New Jersey biotic resources and as well as unusual landscapes. Our study found few living resources with limited distributions (protected species), but it did find a healthy, vibrant ecosystem that is unique by virtue of its location and type. Modern landscape interpretations focus on physical features that define a landform. Watersheds have become the current model or unit of landscape subdivision that is readily definable and self-contained.

The South River watershed supports a wetland corridor that is a small, confined coastal drainage. The compact nature of the system provides headwater, mid-channel and lower tidal habitats that exist in a relatively short distance. From headwaters on gravel outcrops to coastal marshes on muck and peat, this drainage corridor is a good representation of New Jersey's important coastal environments. Weymouth Township's natural and man-made resources are also well represented within the study site. Oak-pine and pine-oak uplands, old-fields, hardwood and evergreen wetland forests, shrub thickets and freshwater tidal marshes are all represented, each providing an important component to the sustenance and maintenance of the natural communities.

The presence of many habitats compressed into a short distance and their proximity to navigable waters has provided motivation for human use and occupation for many years. The evidence of a continued use from the early prehistoric time to the present indicates how important the area is to human needs. Our presence in the region, studying the natural communities, also attests to modern culture's interest in the resources it continues to support.

The information presented in this document should act as a starting point for future investigations into the watershed's natural resources. There will, no doubt, be new finds and discoveries that will add to this interpretation. With that in mind, the following recommendations are made:

V. Current GIS information for soils, wetland cover and land use is available as digital data. It is recommended the township obtain or produce annotated maps from the available digital data as supplements to this report.

2. Any new flora or fauna records should be kept in an easily accessible file, or on a list that is easily updated. Encourage regular inspections and updates by township residents and regional professionals.

V. As with every landscape, the South River study area will change. Incorporate long-term updates into a periodic summary that will provide information on the dynamic nature of the upper extreme of this coastal ecosystem.

PRELIMINARY LIST OF PLANTS OBSERVED

Taxonomy follows Gleason, H.A. & A. Cronquist. 1991. Manual of Vascular Plants of the Northeastern United States and Adjacent Canada, 2nd ed. New York Botanical Garden, Bronx, NY

Ferns/Mosses

Asplenium platyneuron – ebony spleenwort

Osmunda cinnamomea – cinnamon fern

V. *regalis* – royal fern

Thelypteris palustris – marsh fern

Pteridium aquilinum – bracken fern

Woodwardia areolata – netted chain fern

W. virginica – Virginia chain fern

Sphagnum tenerum – a peat moss

S. compactum – a peat moss

Sphagnum spp. – peat mosses (2)

Shrubs/Sub-Shrubs

Ainus serrulata – common alder

Viburnum dentatum – arrowwood

V. *cassionoides* – witherod

V. *nudum* – naked witherod

Rhododendron viscosum – swamp azalea

Myrica pensylvanica – common bayberry

M. cerifera – wax myrtle

Rubus allegheniensis – common blackberry

Vaccinium corymbosum – highbush blueberry

V. *pallidum* – lowbush blueberry

Cephalanthus occidentalis - buttonbush
Aronia arbutifolia - red chokeberry
Leucothoe racemosa - fetterbush
Smilax rotundifolia - common greenbrier
Corylus americana - American hazelnut
Gaylussacia baccata - black huckleberry
G. frondosa - dangleberry
G. dumosa - dwarf huckleberry
Hudsonia ericoides - heath-like hudsonia
Ilex glabra - inkberry
I. verticillata - common winterberry
Kalmia angustifolia - sheep laurel
K. latifolia - mountain laurel
Chamaedaphne calyculata - leatherleaf
Decodon verticillatus - swamp loosestrife
Lyonia ligustrina - maleberry
L. mariana - staggerbush
Toxicodendron radicans - poison ivy
T. vernix - poison sumac
Opuntia humifusa - prickly-pear
Pyxidantha barbata - pyxie
Hypericum densiflorum - shrubby St. John's-wort
Leiophyllum buxifolium - sand myrtle
Elaeagnus umbellata - autumn olive
Amelanchier canadensis - swamp shadbush
Rhus copallinum - dwarf sumac
Comptonia peregrina - sweetfern
Clethra alnifolia - sweet pepperbush
Crataegus uniflora - dwarf thorn
Epigaea repens - trailing arbutus
Campsis radicans - trumpet-creeper
Gaultheria procumbens - wintergreen or teaberry
Chimaphila maculata - spotted wintergreen

Trees

Ailanthus altissima - tree of heaven
Betula populifolia - gray birch
Catalpa bignonioides - southern catalpa
Prunus serotina - wild black cherry
Chamaecyparis thyoides - Atlantic white cedar
Juniperus virginiana - red cedar
Cornus florida - dogwood
Nyssa sylvatica - sour or black gum
Liquidambar styraciflua - sweet gum
Celtis occidentalis - hackberry
Carya pallida - sand (pale) hickory
Ilex opaca - American holly
Magnolia virginiana - swamp magnolia
Acer rubrum - red maple
Morus rubra - red mulberry
Quercus velutina - black oak

Q. marilandica - blackjack oak
Q. ilicifolia - bear or scrub oak
Q. prinus - chestnut oak
O. stellata - post oak
Q. coccinea - scarlet oak
Q. falcata - southern red oak or Spanish oak
Q. alba - white oak
Diospyros virginiana - persimmon
Pinus - taeda - loblolly pine (planted)
P. rigida - pitch pine
P. sylvestris - scotch pine (planted)
P. echinata - shortleaf pine
P. virginiana - Virginia pine
Sassafras albidum - sassafras
Juglans nigra - black walnut

Herbaceous Plants

Sagittaria latifolia - broad-leaved arrowhead
S. engelmanniana - Englemann 's arrowhead
Peltandra virginica - arrow arum
Aster novi-belgii - New York aster
Galium palustre - marsh bedstraw
Bidens connata - purplestem beggar-ticks
B. laevis - showy bur-marigold
Uvularia sessilifolia - sessile-leaved bellwort
Rumex verticillatus - water-dock
Utricularia geminiscapa - hidden fruited bladderwort
Potentilla canadensis - Canada or running cinquefoil
Liatris graminifolia - hairy blazing star
Sparganium americanum - slender bur-reed
Lespedeza procumbens - downy trailing lespedeza
Lobelia cardinalis - cardinal flower
L. nuttallii - Nuttall's lobelia
Typha latifolia - broad-leaved cattail
Mikania scandens - climbing heropweed
Oxypolis rigideor - cowbane
Melampyrum lineare - cow-wheat
Cuscuta gronovii - common dodder
Erechtites hieracifolia - white fireweed
Helianthemum canadense - frostweed
Tephrosia virginiana - goat's-rue
Iris pseudacorus - yellow flag
Solidago canadensis var. scabra - common goldenrod
S. graminifolia - flat-topped or grass-leaved goldenrod
S. fistulosa - pine barren goldenrod
S. rugosa - wrinkled-leaved goldenrod
Vernonia noveboracensis - ironweed
Eupatorium dubiuro - Joe-pye-weed
E. rotundifolium var. ovatum - hairy thoroughwort
E. pilosum - rough thoroughwort or boneset
E. rugosum - white snakeroot

Polygonella articulata - coast jointweed
Spiranthes cernua - nodding ladies-tresses
Cypripedium acaule - lady's- slipper
Lupinus perennis - wild lupine
Polygala lutea - orange roilkwort
Habenaria (Platyrhiza) blephariglottis - white fringed orchid
Pontederia cordata - pickerel weed
Petrohagia prolifer - childing pink
Lechea racemulosa - oblong fruited pinweed
Sarracenia purpurea - pitcher plant
Spergula morisonii - spurrey
Acorus calamus - sweet flag
Triadenum virginicum - marsh St. John's-wort
Arenaria (Minuartia) caroliniana - pine barren sandwort
Ludwigia alternifolia - Seedbox
Scutellaria integrifolia - hyssop skullcap
Euphorbia epicacuanhae - ipecac spurge
Drosera intermedia - spatulate-leaved sundew
Polygonum sagittatum - arrow-leaved tearthumb
P. punctatum - dotted smartweed
P. arifolium - halberd-leaved tearthumb
Desmodium paniculatum - panicked tick-trefoil
Nuphar lutea spp. *advena* - spatterdock
Lilium superbum - turk's- cap lily
Linaria canadensis - blue toadflax
Xerophyllum asphodeloides - turkeybeard
Epilobium coloratum - purple-leaved willow-herb
Xyris difformis - yellow eyed grass
GRASSES
Spartina cynosuroides - big cord grass
Panicum clandestinum - deer's tongue
P. verrucosum - warty panic grass
P. virgatum - switch grass
P. dichotomum - forked panic grass
Phragmites australis - common reed
Andropogon glomeratus - bushy beardgrass
A. virginicus - broom-sedge or Virginia beardgrass
Chasmanthium laxum - slender spike grass
Glyceria obtusa - blunt mannagrass
G. striata - fowl mannagrass
Phalaris arundinacea - reed canary grass
Stipa avenacea - black oat grass
Elymus virginicus - Virginia rye grass
Microstegium vimineum - stilt grass
Zizania aquatica - wild rice
SEDGES/RUSHES
Scirpus cyperinus - woolgrass
Eleocharis tenuis - slender spikerush
Scleria triglomerata - tall nut rush
Dulichium arundinaceum - three-way sedge
Eriophorum virginicum - Virginia cotton grass

Rhynchospora alba - white beaked rush
R. capitellata - small-headed beaked rush
Carex foliculata - long sedge
C. striata - Walter's sedge
C. canescens v. disjuncta - silvery sedge
C. pennsylvanica - Pennsylvania sedge
C. nigromarginata - black-edged sedge
C. bullata - button sedge
C. umbellata - umbel-like sedge
Juncus canadensis - Canada rush
J. effusus - soft rush

This report was prepared by Ted Gordon and Joseph Arsenault/Pine Barren
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