NATURAL RESOURCE INVENTORY
for
WEYMOUTH TOWNSHIP

Prepared by the
WEYMOUTH TOWNSHIP ENVIRONMENTAL COMMISSION
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(Weymouth history section by Douglas Yearsley, Township Historian)

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WEYMOUTH TOWNSHIP ENVIRONMENTAL COMMISSION 2009

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OVERVIEW

As ANJEC indicates in their treatise on the subject, an Environmental Resource Inventory (ERI) is a "dynamic document, not cast in concrete. The commission should add to, revise and refine it as members gain knowledge and more data become available. The ERI is a notebook of accumulated information about an area". It is in that spirit that the Weymouth Environmental Commission presents this document. As will be seen, most of the data therein comes from State and County sources, usually from geographic information system coverages. These data like most, if not all environmental data, come from samples, not a 100% survey of the population. Hence, there is a level at which the data can be believed and a level where extreme caution in interpolation is in order. We therefore in the first section of the Appendix include one of the most important features of this ERI: links to the voluminous metadata on data we used. Metadata are data about the data, the reader is therefore cautioned to read and understand the dates in which data were collected, the resolution of the data and what was the sampling regime (and hence a clue at the error rates) among other important aspects of the metadata.

WEYMOUTH TOWNSHIP: THE BASICS

Weymouth Township, Atlantic County, New Jersey is composed of two towns, Dorothy and Belcoville. It is mostly in the Pinelands Reserve (see Figure 1, Appendix 1) and is about 8064 acres or 12.4 square miles (0.4 square miles of which is water). Belcoville is in the CAFRA zone (east of Route 50).

POPULATION and DEMOGRAPHICS

The following breakdown of the human population of Weymouth Township can be seen from the 2000 Census (from U.S. Census FactFinder page):

Table 1: United States 2000 Census data for Weymouth Township

General Characteristics -	Number	Percent	U.S.
Total population	2,257		
Male	1,085	48.1	49.1%
Female	1,172	51.9	50.9%
Median age (years)	39.4	(X)	35.3
Under 5 years	141	6.2	6.8%
18 years and over	1,694	75.1	74.3%
65 years and over	387	17.1	12.4%
One race	2,234	99.0	97.6%
White	2,076	92.0	75.1%
Black or African American	108	4.8	12.3%
American Indian and Alaska Native	9	0.4	0.9%
Asian	18	0.8	3.6%
Native Hawaiian and Other Pacific Islander	0	0.0	0.1%
Some other race	23	1.0	5.5%
Two or more races	23	1.0	2.4%
Hispanic or Latino (of any race)	86	3.8	12.5%
Household population	2,251	99.7	97.2%
Group quarters population	6	0.3	2.8%
Average household size	2.65	(X)	2.59
Average family size	3.06	(X)	3.14
Total housing units	909		
Occupied housing units	851	93.6	91.0%

Owner-occupied housing units	729	85.7	66.2%
Renter-occupied housing units	122	14.3	33.8%
Vacant housing units	58	6.4	9.0%

Social Characteristics -	**Number**	**Percent**	**U.S.**
Population 25 years and over	1,530		
High school graduate or higher	1,217	79.5	80.4%
Bachelor's degree or higher	217	14.2	24.4%
Civilian veterans (civilian population 18 years and over)	281	16.8	12.7%
Disability status (population 5 years and over)	446	21.5	19.3%
Foreign born	59	2.6	11.1%
Male, Now married, except separated (population 15 years and over)	497	60.2	56.7%
Female, Now married, except separated (population 15 years and over)	493	51.5	52.1%
Speak a language other than English at home (population 5 years and over)	125	6.0	17.9%

Economic Characteristics -	**Number**	**Percent**	**U.S.**
In labor force (population 16 years and over)	1,098	62.7	63.9%
Mean travel time to work in minutes (workers 16 years and over)	29.3	(X)	25.5
Median household income in 1999 (dollars)	45,882	(X)	41,994
Median family income in 1999 (dollars)	49,800	(X)	50,046
Per capita income in 1999 (dollars)	18,987	(X)	21,587
Families below poverty level	29	4.7	9.2%
Individuals below poverty level	115	5.1	12.4%

Housing Characteristics -	**Number**	**Percent**	**U.S.**
Single-family owner-occupied homes	470		
Median value (dollars)	119,000	(X)	119,600
Median of selected monthly owner costs	(X)	(X)	
With a mortgage (dollars)	1,214	(X)	1,088
Not mortgaged (dollars)	407	(X)	295

(X) Not applicable.

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3)

The 1990 Census had calculated a population of 1957 which means a growth rate of the human population of 15.3% in ten years. Weymouth Township is mostly in the Pinelands

Reserve where growth is limited, however there are still rather substantial areas open to development. The remaining development may hold one of the greatest challenges to Weymouth Township and its natural resources if not carefully planned and wise use of options chosen given the Pinelands Commission's 2009 adoption of new clustering rules/options.

WEYMOUTH TOWNSHIP (THE PINELANDS): THE PAST

ENVIRONMENT/HISTORY

One cannot successfully do an ERI in the present without a look into the past. The past has very often influenced the current conditions, trajectories, and sometimes attitudes regarding our natural resources. The Pinelands of New Jersey has a past similar to many areas of the U.S. where waves of settlers occupied and used (often abused) the resources they had.

The Pinelands National Reserve was formed in 1979 with the adoption of the Pinelands Preservation Act. The Pinelands Comprehensive Management Plan was a visionary document that allowed the human as well as the 'natural side' of the Pinelands to live side by side with the requirements that cultural/human activity would not be irreversible and sustainability of Pinelands natural resources would be protected. The Pinelands comprises about 1.1 million acres and covers in whole or part six counties and about 56 municipalities of South Jersey. As can be seen, all of Weymouth Township does not lie in the Pinelands jurisdiction (Figure 1 Appendix 1), but also in the jurisdiction of the Coastal Area Facility Review Act (CAFRA) to the east.

Marine deposition and erosion about 1 million years ago left deposits of clays, silts, sand and gravel. Erosion by wind and water shaped these deposits which range from 1300 to 6000 feet thick (Pinelands CMP 1980). The last marine deposit of this era is the Cohansey which overlays older deposit like the Kirkland. Five million years ago an uplifting of this landscape and these deposits began. This exposed some of these deposits in various areas of the Pinelands and gives us the sand we now see and the unique properties of soils and hydrology that dominate the region.

While the last glaciers of the Wisconsin ice age stopped north of the Pinelands; this era had a profound effect on climate and communities in the Pinelands and Weymouth Township. Biota now associated with boreal forests and tundra were here. Only after the retreat of the last ice sheets 10,000 years ago did the current biota migrate in. To this day because of the dynamic nature of our climate, immigration trends continue and changes in biota are still on-going. Thus our natural communities are dynamic even without the additional problems of invasive species and increased rates of global warming due to anthropogenic influence.

Fire and the disturbance regime it imposes greatly influences the Pinelands biota. Unfortunately, the need for suppression of fires to protect human assets has caused a change in the fire frequency and intensity regime. This has probably caused many ecological communities to be out of synch with the disturbance regimes under which they evolved. While the Pinelands pygmy pine plains have adapted to catastrophic fires, it is probably not the regime that other pine/oak communities adapted to. These other regimes, probably like those systems in the Southern and certain areas of the Western United States, evolved under frequent low intensity fires that did not destroy stands but

maintained a low density, multi-aged forest community. Consequently, today the fuel buildup in many forests in the Pinelands is dangerous and unnatural, and increases the probability of catastrophic stand replacement fires that threaten humans as well as all biota. The present use and extent of prescribed burns is not enough to correct the situation given the scale of the problem and exacting conditions needed to successfully prescribe burn and the resources needed to do so. New techniques employing low thins and prescribed burns are a possible answer to allow defensible spaces and biota more 'natural' to the region. This will be discussed later in this ERI.

The Pineland's ecosystems evolved without humans for thousands of years. Use of the Pinelands by the aboriginal people significantly changed fire frequencies and natural communities. In the 17th century with European settlement came further disruptions of natural ecosystems. The first furnaces in 1765 would herald the arrival of glass and iron industries which used the bog iron, sand, and forest (charcoal) resources of the Pinelands. No forest in the Pinelands was exempt and most if not all forests seen today are the aftermath of numerous cutting and re-cutting cycles that may number six or more in an area. Atlantic white-cedar (*Chamaecyparis thyoides*), a very light and resilient wood prized for shingles, fences, boats, etc. was decimated and is one of the few forest cover types that exists at a fraction of it's pre-European settlement area. It is important to note that the landscape we see today is very heavily influenced by a history of largely unregulated use. Streams, hydrology, and forest covers, have been altered and re-altered over the centuries.

WEYMOUTH TOWNSHIP: RECENT HISTORY

This italicized section is from the Weymouth Township History section of our township web pages and was written by Township Historian, Douglas Yearsley.

In 1694 Egg Harbor was given to Gloucester County by the West Jersey Legislature and the same year Gloucester County appointed Arthur Powell as constable for Weymouth, making here a "constablewick". The following year Weymouth and other townships were defined, but a clerk turned" the new Weymouth Township" into "New Waymouth Township" as it would stay for 16 years. The people did not accept the new name and the minutes of the Grand Jury ruled Gloucester County used the terms Egg Harbor and New Waymouth interchangeably. All historians agree Weymouth or New Waymouth was a Quaker name for the area now comprising Atlantic County. Between 1715 and 1774 the whole area was lumped under the term Egg Harbor or Great Egg Harbor.

All local business was put on hold because of the Revolutionary War in which here played a pivotal role in the American victory. The privateers sailed from our rivers brought all British commerce to a halt and made the war so expensive that it lost support in England. More battles were fought in New Jersey than any other state, ten battles in Gloucester County alone. King George called Egg Harbor "A nest of rebels". After independence Gloucester County began to fix the boundaries between its townships that it had put off during the war. In 1798 Weymouth Township was apportioned a third of the territory we now call Atlantic County. Weymouth Township helped found the Federal

government of the new nation. Around 1800 three partners began an extensive iron producing operation in Weymouth Township and named it for us. The ironworks flourished and in an attempt to consolidate their power the owners formed a new township encompassing all the ore beds, water power, forests, and river ports they could grab. In 1813 their Hamilton Township separated from Weymouth Township. The other iron operations in Weymouth Township were Etna Furnace founded in 1816 near Head of the River. It closed in 1832. There was also a smaller operation at Ingersoll Town, but it vanished without a trace. Monroe Forge, now called Walkers Forge after Lewis M. Walker, in 1816 and has now also vanished. In the 1820s John Estell founded John Estell and Company in the Stephens Creek area. Estells had worked for all the great iron works

whose ledgers list Thomas Estell, Richard Estell, Daniel Estell, and John. While the other Estells spent their time working drinking and training with the militia at Mays Landing, John seemed to learn something from his masters and founded his own baronial manor. He meant to do iron, but the ore quality must have been low. Also there was nearby competition at Monroe and Etna. In 1826 he took on a partner in the glass business named John Scott and they built a glass factory that produced until 1877. The Estells also built a sawmill and dabbled in boat building as well as farming. They built a village of Estellville on their millpond called Lake Rebecca and a mansion that rivaled Batsto or Weymouth.

Weymouth Township was a shipbuilding center with its many waterways and close timber and iron supply. Boats were built at High Banks Landing, Steelmans Landing, Gibsons Landing, Champions Landing, and Etna. The Estell family ruled a manor like anything out of Norman England full of tenants who owed them everything. Near the end of the 1800's Anderson Estell Bourgeois began selling off the vast land holdings as farmsteads. Many immigrants from the teeming cities came into Weymouth Township looking for cheap land and elbowroom. Anderson sent his daughter, Rebecca, to college in Chambersburg, Pennsylvania and to hear tell this was a mistake for our township.

About this time D.L. Risley of Philadelphia, New York, and London, a real estate speculator and railroad investor came upon the scene. He knew the railroad was coming between Richland and Tuckahoe through vast tracts of virgin land. The railroad came in 1893 and two Risley colonies, Milmay and Estelle sprang up in 1896. A year later Dorothy was christened and the Estells were faced with a population not beholden to them. Risley also sold to immigrants and city dwellers by making the most outlandish claims for local lots. He claimed that we had a year round growing season and a sea view.

In 1917 the government and the Bethlehem Company bought up huge areas in Weymouth Township and moved in the Bethlehem Loading Company to load shells for the allied

war effort in World War 1. This also changed us forever. We lost many old farms and gained a city, Belcoville with a population of over 9,000 soon dominated Weymouth township politics. Just as fast as the industrial giant was born, it died. The war ended soon after the loading plant was in operation.

By now the population of Weymouth Township had shifted from Corbin City, Estellville and Risley to Dorothy and Belcoville. It was more than the old timers could take and in 1922 Corbin City left, Rebecca Estell (Bourgeois) Winston was on the Weymouth Township Committee and followed the Corbin City cession carefully. Two years later she led all the people beholden to her family and incorporated most of old Weymouth into Estell Manor City. The people in Belcoville and Dorothy didn't seem to care since they were not from Weymouth Township. Mrs. Winston sat in the front room of the Estell mansion and with a red pencil included as much of the old township as she dared, even following the streams to their sources and choosing who to let into the new city and who to leave out. Neighbors on the same street were separated. The legislature of New Jersey went along with this madness because they simply did not care who suffered in a place they had forgotten existed. The rest, as they say, is history.

As can be seen in the above short history, Weymouth Township has had dramatic shifts in populations and land usage. The echo of these and other historical events reverberate in our natural resources and must be brought into focus to understand the forces that have shaped our current environmental situation. The earliest aerial

photography of Weymouth Township available to this Commission is from the 1930s (Figure 2, Appendix 1). It is apparent from Figure 2 and a comparison to the 2007 NJDEP aerial photography (Figure 3, Appendix 1) that the forces at work in recent times have changed our landscape.

GEOGRAPHY/TOPOGRAPHY

Weymouth Township is in Atlantic County, located in the outer coastal plain of New Jersey. The elevations in the township range from 5 to 95 feet above sea level (see Figure 4, Appendix 1).

GEOLOGY

Weymouth Township‘s geology is more complex than the GIS layer the NJDEP has with its underlying Cohansey Formation. (Figure 5, Appendix 1). Figure 6 (Appendix) shows a more complete picture of underlying geology using a section of a U.S. Geological Survey map of the nearest borings to Weymouth Township. The boring (11-0132) is about 5 miles north- northwest of Weymouth Township (a few miles southeast of Mitzpah). The map is called: “Bedrock Geologic Map of Central and Southern New Jersey” by James Owens, Peter Sugarman, Norman Sohl, Ronald Parker, Hugh Houghton, Richard Volkert, Avery Drake, and Randall Orndorff (edited by Randall Orndorff and contributions by Laurel Bybell, George Andrews, David Bukry, Otto Zapecza, Gary Paulachok, and Lloyd Mullikin, 1998). The closest boring (11-0132)

consists, in order from sea level down to about 200 feet below sea level, of the following layers/deposits seen in Table 2 below.

Table 2: Map codes for geological deposits (layers) found in Figure 6 (Appendix 1) of the closest boring to Weymouth Township

MAP CODE	DESCRIPTION
Surficial deposits	Surficial deposits
Tch	Cohansey formation (middle Miocene, Senavallian)
Tkw	Wildwood member (middle & lower Miocene, Langhanian & Burdigalian)
Tks	Shiloh Marl (lower Miocene, Burdigalian)
Tkl	Lower member (lower Miocene, Aquitanian)
Tac	Atlantic City Formation (upper Oligocene, Chattian)
Tai	Absecon Inlet Formation (upper Eocene, Priabonian)
Tsr	Shark river Formation (upper & lower Eocene, Priabonian through Lutetian)
Tmq	Manasquan Formation (lower Eocene, Ypresian)
Tvt	Vincentown Formation (upper Paleocene, Selandian)
Tht	Hornerstown Formation (lower Paleocene, Danian)
Kc4	Kc4 cycle (upper Cretaceous, Maastrichtian)
Kc3	Kc3 cycle (upper Cretaceous, upper Campanian)
Kc2	Kc2 cycle (upper Cretaceous, middle Campanian)
Kc1	Kc1 cycle (upper Cretaceous, lower Campanian)
Kcq	Cheesequake formation (upper Cretaceous, upper Campanian & lower Santan
Kmg	Magothy formation (upper Cretaceous, middle & lower Santanian)

Kr	Raritan formation (upper Cretaceous, upper Cenomanian)
Kp3	Unit 3 (upper Cretaceous, lower Cenomanian)

In Appendix 2 are three test boring reports done recently as precursor to building the new cell tower behind the Dorothy Volunteer Fire Department building. While only going down about 32 feet they give more immediate information about the upper strata geology here than the nearest deep borings presented.

HYDROLOGY

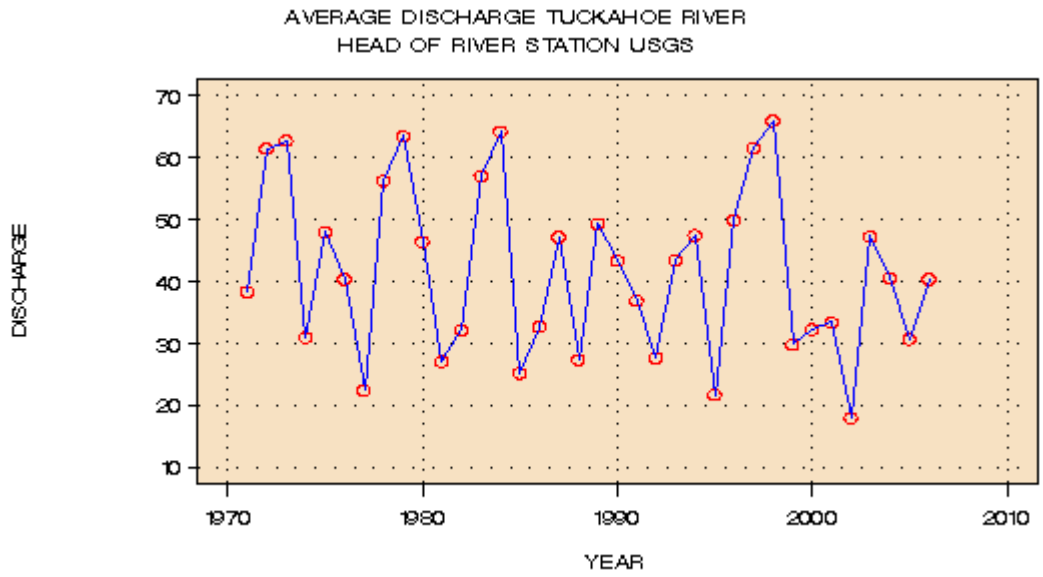
The obvious hydrologic features of Weymouth township are the over 35 miles of streams and rivers that either border and/or traverse the township (see Figure 7, Appendix 1).

Table 3: Stream lengths (in miles) for Weymouth Township (NJDEP data)

Town	Stream (Miles)
Belcoville	20.82
Dorothy	14.47
Weymouth Total	35.29

The rivers, streams, and their usually unnamed tributaries include the Tuckahoe River, Stephens Creek, Cedar Brook, South River, and the Great Egg Harbor River. We are in the NJDEP's Watershed Management Area 15 (Great Egg Harbor River).

The USGS maintains a monitoring station near Head of River on the Tuckahoe River that gives us in Weymouth some idea of general trends in stream discharge (cubic feet per second). Below is a graph of the data from that station for the years 1971 to 2006:



Despite fluctuations there have been no evident trends in the Tuckahoe River's discharge since 1970.

Stream assessment done in 2008 for a number of Weymouth' Township's waterways can be found in Appendix 2. Michael Hogan, who conducted these assessments using the United States Department of Agriculture's Stream Visual Assessment Protocol, found all stream segments assessed rated in the excellent category with a numerical rating higher than 9.

SOILS

The soils of Weymouth are varied but within the context of the Pinelands physiography. The acreage breakdown of soils within the Township can be seen in the

table below that is based on an analysis of the soils GIS coverage seen in Figure 8 (Appendix 1). Special care should be paid to lowlands soils such as Manahawkin mucks (377.9 acres) and other soils that might not respond well to disturbance.

Table 4: Breakdown of soil types in Weymouth Township (NJDEP data)

Soil	Description	Belcoville	Dorothy	Weymouth
Ats	Atsion sand	297.97	168.57	466.54
AucB	Aura loamy sand, 0 to 5 percent slopes	0	986.02	986.02
AugA	Aura sandy loam, 0 to 2 percent slopes	0	19.42	19.42
AugB	Aura sandy loam, 2 to 5 percent slopes	0	58.47	58.47
Ber	Berryland sand	74.13	0	74.13
Bert	Berryland sand, frequently flooded	0	110.11	110.11
DocB	Downer loamy sand, 0 to 5 percent slopes	0	1940.34	1940.34
EveB	Evesboro sand, 0 to 5 percent slopes	25.33	1237.13	1262.46
FobB	Fort Mott sand, 0 to 5 percent slopes	0	53.77	53.77
GamB	Galloway loamy sand, clayey substratum, 0 to 5 p	0	344.05	344.05
HbmB	Hammonton loamy sand, 0 to 5 percent slopes	0	483.23	483.23
HboA	Hammonton sandy loam, 0 to 2 percent slopes	0	94.88	94.88
LakB	Lakehurst sand, 0 to 5 percent slopes	509	36.05	545.05
LasB	Lakewood sand, 0 to 5 percent slopes	74.48	42.14	116.62
LasC	Lakewood sand, 5 to 10 percent slopes	0	13.54	13.54
Makt	Manahawkin muck, frequently flooded	229.5	147.79	377.29
MbtB	Matawan sandy loam, 2 to 5 percent slopes	0	115.58	115.58
Mum	Mulica sandy loam	0	321.28	321.28
PHG	Pits, sand and gravel	0	20.62	20.62
Ps	Psamments, nearly level	4.18	0	4.18
SUCT	Sulfihemists and Sulfaquents, frequently flooded	188.13	0	188.13
SacA	Sassafras sandy loam, 0 to 2 percent slopes	0	145.9	145.9
SacB	Sassafras sandy loam, 2 to 5 percent slopes	0	20.91	20.91
Udz	Udz	0	8.85	8.85
WATER	Water	145.73	0	145.73
WoeA	Woodstown sandy loam, 0 to 2 percent slopes	0	55.71	55.71

VEGETATION

As the Township's forestry consultant, Bob Williams, told the Weymouth Environmental Commission, "You (Weymouth) live in a forest," which is an apt

summary of our township's predominant vegetative cover and its scale relative to human habitation and density. Subsetting only NJDEP 2002 vegetation landuse codes, the table below and Figure 9 (Appendix 1) show the breakdown and spatial relationships of our vegetation types.

Table 5: Preliminary list of plants observed in Weymouth Township

The bulk of the Table below was prepared by Ted Gordon and Joseph Arsenault/Pine Barren Inventories, Southhampton NJ and the Weymouth Township Environmental Commission. Those species with a capital "M" at the end were identified by Michael Hogan

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
O. 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)
Lycopodium obscurum–Tree club moss
Lycopodium complanatum-ground cedar

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 chockeberry
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
Pyxidanthera barbulata - pyxie
Hypericum densiflorum - shrubby St.. John's-wort:
Leiophyllum buxifolium - sand myrtle
Elaeagnus umbellata - autumn olive
Amelanchier candensis - swamp shadbush
Rhus copallinum - dwarf sumac
Comptonia peregrina - sweetfern
Clethra ainifolia - sweet pepperbush
Crataegus uniflora - dwarf thorn
Epigaea repens - trailing arbutus
Campsis radicans - trumpet-creeper
Gaultheria procumbens - wintergreen or teaberry
Chimaphila maculata - spotted wintergreen

Mitchella repens – partridge-berry M
Baccharis halimifolia – groundsel tree M
Cuscuta spp – dodder M
Vitis aestivalis - summer grape M

TREES

Ailanthus altissima - tree of heaven
Betula populifolia - gray birch
Catalpa bignoniodes - 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 occidental is - 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
Q. 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

Liriodendron tulipifera - tulip poplar M
Populus grandidentata - large-toothed aspen M

HERBACBOUS PLANTS

Sagittaria latifolia - broad-leaved arrowhead
S. engelmanniana - Englemann ' s arrowhead
Peltandra virginica - arrow arum
Aster novibelgii - 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 milkwort
Habenaria (Platairthera) blepheriglottis- white fringed orchid
Pontederia cordat-a - pickerel weed
Petrohagia prolifer - childing pink
Lechea racemulosa - oblong fruited pinweed
Sarracenia purpurea - pitcher plant
Spergula morisonii - spurrey
Acorus calamus - sweet flag
Triadenuro virginicum - marsh St. John's-wort
Arenaria (Minuartia) caroliniana - pine barren sandwort
Ludwigia alternifolia - Seedbox
Scutelleria 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 - panicled 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
Helonias bullata - swamp pink M

Habenaria (Platairthera) ciliaris – yellow fringed orchid M
Habenaria (Platairthera) – bicolor yellow x white fringed orchid M
Liparis liliifolia – lily leaf twayblade M
Pagonia ophioglossoides – rose pagonia M
Helleborine orchid - epipactis helleborine M
Sparganium americanum – slender bur-reed M
Orontium aquaticum – golden club M
Decodon verticillatus – swamp loosestrife M
Nymphaea odorata – fragrant water lily M
Drosera rotundifolia - round-leaved sundew M
Aletris farinosa – colic root M
Iris versicolor - blue flag M
Sisyrinchiun atlanticum – eastern blue-eyed grass M
Polygala sanguinea - field milkwort M
Asclepias syriaca - common milkweed –M
Asclepias tuberose – butterfly-weed M
Hypericum stans - St Peter's wort M
Hypericum stragulum - St. Andrew's cross M
Hypericum denticulatum – coppery St John's wort M
Viola pedata – birdfoot violet M
Viola lanceolata – lance-leaved violet M
Viola primulifolia – primrose-leaved violet M
Viola papilionacea - common blue violet
Rhexia viginica – Virginia meadow beauty M
Rhexia mariana – Maryland meadow beauty M
Oenothers biennis - common evening-primrose M
Monotropa uniflora – Indian pipe M
Bartonia virginica – upright bartonia M
Apocynum androsaemifolium - spreading dogbane M
Trichostema setaceum - blue curls M
Aureolaria pedicularia - fern-leaved false foxglove M
Eupatorium hyssopifloium – hyssop-leaved thoroughwort M
Solidago puberula - downy goldenrod M
Solidago tenuifolia - slender goldenrod M
Baptisia tinctoria – wild indigo M
Antennaria parvifolia small-leaf pussytoes M
Aster dumosus - bushy aster M
Aster linariifolius - stiff leaved aster M
Aster solidagineus - white topped aster M
Aster divaricatus - woodland aster M

GRASSES

Spartina cynosuroides - big cord grass
Panicum clandestinum - deer's tongue
P. verrucosuro - warty panic grass
P. virgatuin - switch grass

P. dichotomum - forked panic grass
Phragmites australis - common reed
Andropogon glomeratus - bushy beardgrass
A. virginicus -broom-sedge or Virginia beardgrass
Chasmanthium laxurn - 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
Microstigium vimineus - stilt grass
Zizania aquatica - wild rice

SEDGES/RUSHES

Scirpus cyperinus - woolgrass
Eleocharis tenuis - slender spikerush
Scleria triglomerata - tall nut rush
Dulichium arundinaceuro - 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. pensylvanica - Pennsylvania sedge
C. nigromarginata - black-edged sedge
C. bullata - button sedge
C. umbellata - umbel-like sedge
Juncus canadensis - Canada rush
J. effusus - soft rush
J. tenuis - slender rush M

Approximately 84% of Weymouth Township is covered by some sort of vegetation. This attribute intimately affects the character of the Township. It is the unique responsibility of its citizens to understand and protect this large area of vegetated ecosystems. Below in Table 6 are the percent covers by vegetation landuse coding in Weymouth Township. The locations of the vegetation and its coverage can be seen in Figure 9 (Appendix 1).

To begin the task of managing Weymouth Township's forests, the Township hired Bob Williams, a NJDEP certified consulting forester and Vice President of Forestry Operations at Land Dimensions Engineering in Glassboro, New Jersey. Mr. Williams put together a preliminary community forest management plan (phase 1) that encompasses both community forest ry as well as traditional forest based activities within the precepts laid out by the Weymouth Township Environmental Commission. Those precepts include but are not limited to the following goals:

-to provide safety from catastrophic canopy forest fires,

-to reintroduce more 'natural' fire regimes

-to manage hazardous trees,

-to maintain and increase biodiversity,

-to promote education and awareness of forestry issues

-to protect and create habitats for state and federally threatened and endangered species

-to protect the health of our forests,

-to provide a revenue stream from forest products

Mr. William's draft plan (which still has to be edited to meet recent suggestions from the State) is found in Appendix 2.

Table 6: Vegetation landuse codes by percent of area. Prepared from the NJDEP GIS Landuse coverage.

VEGETATION TYPE	Sum_ACRES
AGRICULTURAL WETLANDS (MODIFIED)	3.0855
ATLANTIC WHITE CEDAR WETLANDS	86.3854
CONIFEROUS BRUSH/SHRUBLAND	27.2454
CONIFEROUS FOREST (10-50% CROWN CLOSURE)	41.0541
CONIFEROUS FOREST (>50% CROWN CLOSURE)	740.8810
CONIFEROUS SCRUB/SHRUB WETLANDS	0.7924
CONIFEROUS WOODED WETLANDS	268.7407
CROPLAND AND PASTURELAND	130.9987
DECIDUOUS BRUSH/SHRUBLAND	20.2327
DECIDUOUS FOREST (10-50% CROWN CLOSURE)	53.3705
DECIDUOUS FOREST (>50% CROWN CLOSURE)	1287.3377
DECIDUOUS SCRUB/SHRUB WETLANDS	106.2952
DECIDUOUS WOODED WETLANDS	256.4470
DISTURBED WETLANDS (MODIFIED)	1.6903
FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	1.3284
FRESHWATER TIDAL MARSHES	16.4700
HERBACEOUS WETLANDS	8.2845
MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	2.2165
MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND	75.0685
MIXED FOREST (>50% CONIFEROUS WITH 10-50% CROWN CLOSURE)	22.2417
MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE)	1137.8828
MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE)	38.8385
MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE)	1524.6178
MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)	39.6976
MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)	80.9491
MIXED WOODED WETLANDS (CONIFEROUS DOM.)	288.3252
MIXED WOODED WETLANDS (DECIDUOUS DOM.)	128.5031
OLD FIELD (< 25% BRUSH COVERED)	28.7964
ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS	1.3411
OTHER AGRICULTURE	78.4382
PHRAGMITES DOMINATE COASTAL WETLANDS	24.3245
PHRAGMITES DOMINATE INTERIOR WETLANDS	0.8000
SALINE MARSH (HIGH MARSH)	14.9962
SALINE MARSH (LOW MARSH)	194.2754
TRANSITIONAL AREAS	38.1908
UPLAND RIGHTS-OF-WAY UNDEVELOPED	49.3333
WETLAND RIGHTS-OF-WAY	6.6164
TOTAL	**6826.0926**

WILDLIFE

There is a wide variety of wildlife in Weymouth Township due to the diversity and age classes of vegetation, the presence of water in various forms/and depths (saline, fresh in steams, lakes, marshes, etc) and disturbance regimes. However, due to

suppression of fire and lack of disturbance, there are losses of early successional species such as the ruffed grouse and quail which once was plentiful in the Pinelands, but are now largely extirpated. Below in Tables 7 and 8 are the fauna that is present through personal observation and recent surveys by governmental and non-governmental organizations. Figure 10 (Appendix 1) shows the habitats according to the New Jersey Fish and Wildlife Service's landscape project.

Table 7: Bird species observed in Weymouth Township including year-round, summer and winter residents and spring/fall migrants.

Fish Eating birds and Water Fowl
Belted Kingfisher-*Megaceryle alcyon*
Canada Goose- *Branta canadensis*
Great Blue Heron-*Ardea herodias*
Great Egret-*Egretta alba*
Green Heron-*Butorides virescens*
American Black Duck-*Anas rubripes*
Mallard-*Anas platyrhynchos*
Wood Duck-*Aix sponsa*

Birds of Prey
American Kestrel-*Falco sparverius*
Broad-winged Hawk-*Buteo platypterus*
Cooper's Hawk-*Accipiter cooperii*
Osprey-*Pandion haliaetus*
Peregrine Falcon-*Falco peregrinus*
Red-tailed Hawk-*Buteo jamaicensis*
Sharp Shin Hawk- *Accipiter striatus*
Turkey Vulture-*Cathartes aura*

Owls
Barred Owl-*Strix varia*
Eastern Screech Owl-*Otus asio*
Great Horned Owl-*Bubo virginianus*

Woodpecker Family
Hairy Woodpecker-*Dendrocopos villosus*
Downy Woodpecker-*Dendrocopus pubescens*
Northern Flicker- *Colaptes auratus*
Red–bellied Woodpecker- *Melanerpes carolinus*
Red–headed woodpecker- *Melanerpes erythrocephalus*

Sparrows
Chipping Sparrow-*Spizella passerina*
Fox Sparrow- *Passerella iliaca*
House Sparrow- *Passer domesticus*
Song Sparrow-*Melospiza melodia*
White-throated Sparrow- *Zonotrichia albicollis*

Warblers (continued)
Red Crossbill-*Loxia curvirostra*
Red-breasted Nuthatch-*Sitta canadensis*

Warblers
American Redstart-*Setophaga ruticilla*
Black-and-White Warbler-*Mniotilta varia*
Common Yellowthroat-*Geothlypis trichas*
Magnolia Warbler *Dendroica magnolia*
Ovenbird-*Seiurus aurocapillus*
Hooded Warbler *Wilsonia citrina*
Pine Warbler-*Dendroica pinus*
Palm Warbler- *Dendroica palmarum*
Prairie Warbler-*Dendroica discolor*
Prothonatary Warbler-*Proronotaria citrea*
Yellow Warbler-*Dendroica petechia*
American Crow-*Corvus brachyrhynchos*
American Goldfinch-*Carduelis tristis*
American Robin-*Turdus migratorius*
American Woodcock-*Scolopax minor*
Barn Swallow-*Hirundo rustica*
Blue-gray Gnatcatcher-*Polioptila caerulea*
Blue Jay-*Cyanocitta cristata*
Brown Creeper-*Certhia americana*
Brown-headed Cowbird-*Molothrus ater*
Brown Thrasher-*Toxostoma rufum*
Carolina Chickadee-*Parus carolinensis*
Cedar Waxwing-*Bombycilla cedrorum*
Common Grackle-*Quiscalus quiscula*
Dark-eyed Junco-*Junco hyemalis*
Eastern Bluebird-*Sialia sialis*
Eastern Kingbird-*Tyrannus tyrannus*
Eastern Phoebe-*Sayornis phoebe*
Eastern Wood Pewee-*Contopus virens*
European Starling- *Sturnus vulgaris*
Golden-crowned Kinglet-*Regulus satrapa*
Gray Catbird-*Dumetella carolinensis*
Great-crested Flycatcher-*Myiarchus crinitus*
House Finch-*Carpodacus mexicanus*
House Wren-*Troglodytes aedon*
Indigo Bunting-*Passerina cyanea*
Marsh Wren-*Cistothorus palustris*
Mourning Dove-*Zenaidura macroura*
Northern Cardinal-*Pyrrhuloxia cardinalis*
Northern Mockingbird-*Mimus polyglottos*
Northern Oriole-*Icterus galbula*

Redwing Blackbird-*Agelaius phoeniceus*
Ruby-crowned Kinglet-*Regulus calendula*
Ruby-throated Hummingbird-*Archilochus colubris*
Rufus-sided Towhee-*Pipilo erythrophthalmus*
Scarlet Tanager-*Piranga olivacea*
Summer Tanager-*Piranga rubra*
Tree Swallow-*Tachycineta bicolor*
Tufted Titmouse-*Baeolophus bicolor*
Whip-poor-will-*Caprimulgus vociferous*
White-breasted Nuthatch-*Sitta carolinensis*
White-eyed Vireo-*Vireo griseus*
Wild Turkey-*Meleagris gallopavo*
Wood Thrush- *Hylocichla mustelina*

Table 8: Reptile, amphibian, and mammal species observed in Weymouth Township.

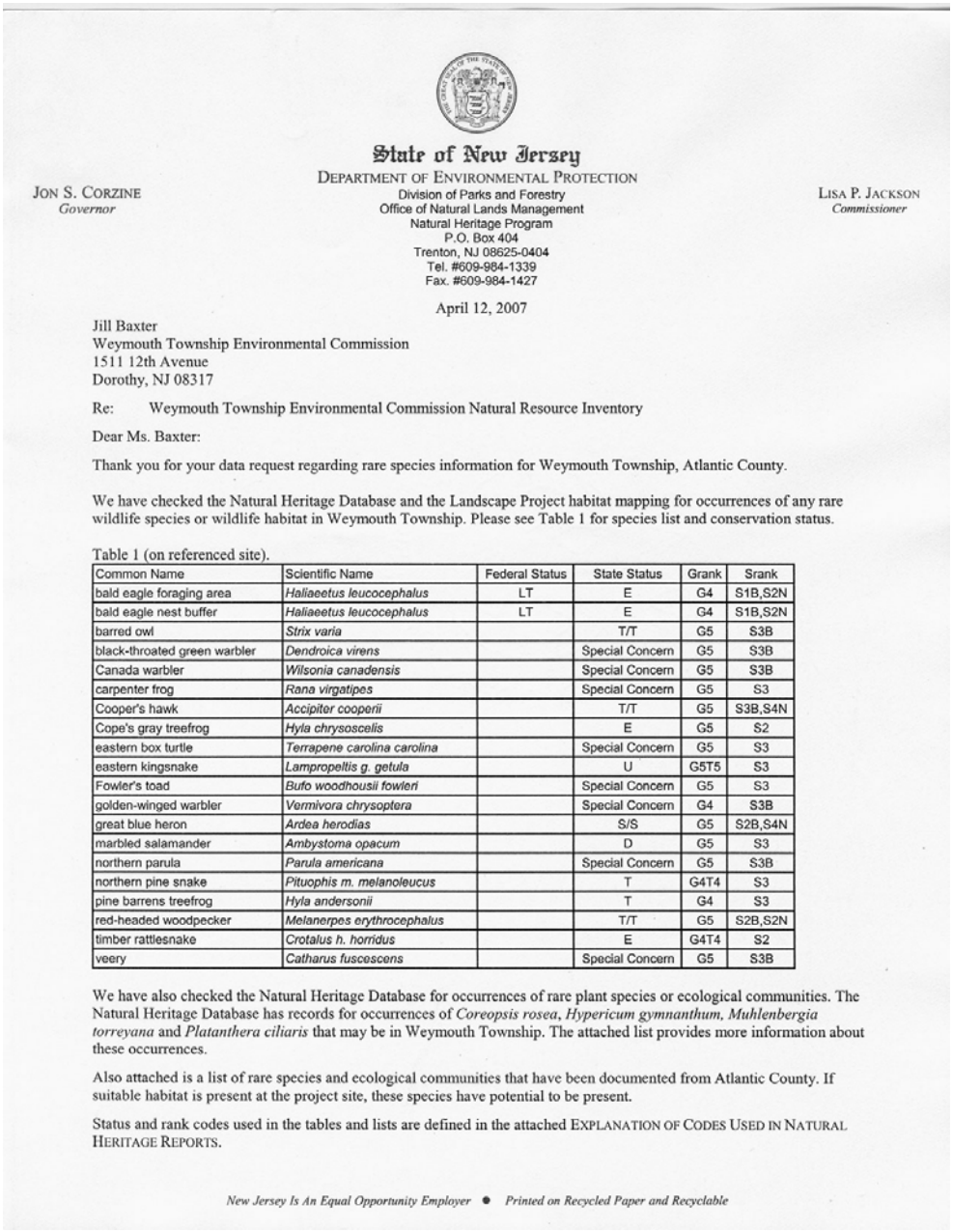
Amphibians
Marbled Salamander-*Ambystoma opacum*
Red-backed Salamander-*Plethodon cinereus*
Bullfrog-*Rana catesbeiana*
Carpenter Frog-*Rana virgatipes*
Eastern SpadefootToad-*Scaphiopus holbrooki*
Green Frog-*Rana clamitans*
Fowler's Toad-*Bufo woodhousei*
Northern Gray Treefrog-*Hyla versicolor*
New Jersey Chorus Frog-*Pseudacris triseriata kalmi*
Northern Cricket Frog-*Acris crepitans*
Gray Treefrog-*Hyla versicolor*
Southern Leopard Frog-*Rana sphenocephala*
Pine Barrens Treefrog-*Hyla andersoni*
Northern Spring Peeper-*Hyla crucifer*
Wood Frog-*Rana sylvatica*

Reptiles
Box Turtle-*Terrapene carolina*
Common Snapping Turtle-*Chelydra serpentina*
Common Mud Turtle-*Kinosternon subrubrum*
Painted Turtle-*Chrysemys picta*
Red-bellied Turtle-*Chrysemys rubriventris*
Spotted Turtle-*Clemmys guttata*
Eastern Fence Lizard-*Sceloporus undulatus*
Five-lined Skink-*Eumeces fasciatus*
Black Racer-*Coluber constrictor*
Black Rat Snake-*Elaphe obsoleta*
Eastern Garter Snake-*Thamnophis sirtalis*
Eastern Milk Snake-*Lampropeltis triangulum*
Eastern Ribbon Snake-*Thamnophis sauritus*
Northern Water Snake-*Natrix sipedon*
Ringneck Snake-*Diadophis punctatus*
Rough Green Snake-*Opheodrys aestivus*
Worm Snake-*Carphophis amoenus*

Mammals
Eastern Chipmunk-*Tamias striatus*
Eastern Cottontail-*Sylvilagus floridanus*
Eastern Mole-*Scalopus aquaticus*
Gray Fox- *Urocyon cinereoargenteus*
Gray Squirrel-*Sciurus carolinensis*
Little Brown Bat- *Myotis lucifugus*
Muskrat-*Ondatra zibethicus*
Raccoon-*Procyon lotor*
River Otter-*Lontra canadensis*
Short-tailed Shrew-*Blarina brevicauda*
Southern Flying Squirrel-*Glaucomys volans*
Striped Skunk-*Mepihitis mepihitis*
Virginia Opossum-*Didelphis virginiana*
White-footed Mouse-*Peromyscus leucopus*
White-tailed Deer-*Odocoileus virginianus*

THREATENED & ENDANGERED SPECIES

Below is a letter from NJDEP's Heritage Program's database about threatened and endangered species in our Township:



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

April 12, 2007

Jill Baxter
Weymouth Township Environmental Commission
1511 12th Avenue
Dorothy, NJ 08317

Re: Weymouth Township Environmental Commission Natural Resource Inventory

Dear Ms. Baxter:

Thank you for your data request regarding rare species information for Weymouth Township, Atlantic County.

We have checked the Natural Heritage Database and the Landscape Project habitat mapping for occurrences of any rare wildlife species or wildlife habitat in Weymouth Township. Please see Table 1 for species list and conservation status.

Table 1 (on referenced site).

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
bald eagle foraging area	*Haliaeetus leucocephalus*	LT	E	G4	S1B,S2N
bald eagle nest buffer	*Haliaeetus leucocephalus*	LT	E	G4	S1B,S2N
barred owl	*Strix varia*		T/T	G5	S3B
black-throated green warbler	*Dendroica virens*		Special Concern	G5	S3B
Canada warbler	*Wilsonia canadensis*		Special Concern	G5	S3B
carpenter frog	*Rana virgatipes*		Special Concern	G5	S3
Cooper's hawk	*Accipiter cooperii*		T/T	G5	S3B,S4N
Cope's gray treefrog	*Hyla chrysoscelis*		E	G5	S2
eastern box turtle	*Terrapene carolina carolina*		Special Concern	G5	S3
eastern kingsnake	*Lampropeltis g. getula*		U	G5T5	S3
Fowler's toad	*Bufo woodhousii fowleri*		Special Concern	G5	S3
golden-winged warbler	*Vermivora chrysoptera*		Special Concern	G4	S3B
great blue heron	*Ardea herodias*		S/S	G5	S2B,S4N
marbled salamander	*Ambystoma opacum*		D	G5	S3
northern parula	*Parula americana*		Special Concern	G5	S3B
northern pine snake	*Pituophis m. melanoleucus*		T	G4T4	S3
pine barrens treefrog	*Hyla andersonii*		T	G4	S3
red-headed woodpecker	*Melanerpes erythrocephalus*		T/T	G5	S2B,S2N
timber rattlesnake	*Crotalus h. horridus*		E	G4T4	S2
veery	*Catharus fuscescens*		Special Concern	G5	S3B

We have also checked the Natural Heritage Database for occurrences of rare plant species or ecological communities. The Natural Heritage Database has records for occurrences of *Coreopsis rosea*, *Hypericum gymnanthum*, *Muhlenbergia torreyana* and *Platanthera ciliaris* that may be in Weymouth Township. The attached list provides more information about these occurrences.

Also attached is a list of rare species and ecological communities that have been documented from Atlantic County. If suitable habitat is present at the project site, these species have potential to be present.

Status and rank codes used in the tables and lists are defined in the attached EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS.

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The Weymouth Township Environmental Commission believes the letter is incomplete in its listing and in Table 9 below is additional information by a variety of categories:

Table 9: Species not listed in NJDEP Heritage database observed by various trained individuals

CMP flora not listed by the State in Weymouth Township.
Swamp pink- *Helonias bullata*, Maple Ave. site is USF&WLS documented.
Lily Leaf twayblade- *Liparis liliifolia*, 12th Ave.
Loesel's twayblade- *Liparis loeselii*, Doc. by Joseph Arsenault on 10th Ave. in chicken coop ruins.

* Also white x yellow fringed orchid hybrid, *Platanthera bicolor*, NJ DEP does not track species, Joseph Arsenault and Ted Gordon state they are very rare, Ted G. identified the population on 12th Ave.

CMP fauna not listed by the State in Weymouth Township
Osprey- *Pandion haliaetus*, Michael Hogan has observed them in the South River area numerous times.

Non CMP but NJ DEP T&E Flora Species
Wild lupine, *Lupinus perennis*, S-3, 12th Ave., 11th Ave, Railroad right of way in South River Management Area.

NJDEP Species of Special Concern
Spotted turtle *Clemmys guttata*, S-5, Common in upper South River.
Broad-winged hawk *Buteo platypterus,* S-4, Michael Hogan has observed nesting pair in NJCF Dorothy Reserve area in the past.

Other Resources
The Weymouth Twp. River Management Plan (1999) lists Chickasaw Plum and Pink Tickseed from the NJ Natural Heritage database but they are not in the list we received from NH. I (M. Hogan) have not observed these species so I think it would be best to omit them.

The Weymouth Twp. River Management Plan also lists curly grass fern and crane fly orchid from records of the Atlantic County Parks naturalists. I will check with them and confirm if populations still exist. I have not observed the 2 species.

The Weymouth Twp. River Management Plan also lists:
Common Tern
Fosters Tern
Glossy Ibis
Black crowned night heron
Yellow crowned night heron

Black Rail
Peregrine falcon
Corn snake
Snowy egret
Little blue heron
Northern harrier
from records of the Atlantic County Parks naturalists.

WETLANDS

The proportion of uplands and wetlands in Weymouth Township and its components can be seen in the following table:

Table 10. Acreage of uplands and lowlands from analysis of NJDEP GIS data for Weymouth Township.

	(Acres)		
Land Cover	**Belcoville**	**Dorothy**	**Weymouth**
Uplands	320.76	4813.40	5134.16
Wetlands	907.49	627.09	1534.58
Total	**1228.25**	**5440.49**	**6668.74**

With 23% of Weymouth Township comprised of wetlands, it follows that the protection of those wetlands and their quality will be important to the Township in any future development or management of the landscape.

The breakdown of wetlands as defined by the NJDEP's GIS layer is as follows:

Table 11: Acreage breakdown of wetlands based on NJDEP GIS coverage for Weymouth Township

	(Acres)		
Wetlands	**Belcoville**	**Dorothy**	**Weymouth**
AGRICULTURAL WETLANDS (MODIFIED)	0.00	3.09	3.09
ATLANTIC WHITE CEDAR SWAMP	7.67	43.96	51.63
CONIFEROUS SCRUB/SHRUB WETLANDS	12.07	0.71	12.78
CONIFEROUS WOODED WETLANDS	96.04	143.78	239.82
DECIDUOUS SCRUB/SHRUB WETLANDS	130.54	35.96	166.50
DECIDUOUS WOODED WETLANDS	72.31	168.10	240.41
DISTURBED WETLANDS (MODIFIED)	0.00	2.32	2.32
FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	0.00	1.33	1.33
HERBACEOUS WETLANDS	5.15	8.28	13.43
MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	0.00	2.08	2.08
MIXED FORESTED WETLANDS (CONIFEROUS DOM.)	62.39	100.05	162.43
MIXED FORESTED WETLANDS (DECIDUOUS DOM.)	96.26	106.57	202.83
MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)	32.15	4.86	37.01
MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)	135.45	2.63	138.08
SALINE MARSHES	251.61	0.00	251.61
WETLAND RIGHTS-OF-WAY (MODIFIED)	5.86	3.39	9.25
Totals	**907.50**	**627.09**	**1534.58**

The distribution of these wetland types can be seen in Figure 11 (Appendix 1).

LAND USE

The land use acreage from analysis of NJDEP GIS coverage data for our township can be seen in Table 12 below.

Table 12: Acreage breakdown of general land use coverage based on NJDEP GIS coverage for Weymouth Township

GENERAL LAND USE	ACRES
AGRICULTURE	210.7779
BARREN LAND	42.9622
FOREST	4997.5671
URBAN	990.9026
WATER	200.3779
WETLANDS	1530.2233

A more detailed breakdown of land use cover by acreage for Weymouth Township using the 2002 NJDEP dataset is as follows:

Table 13: Detailed acreage breakdown of wetlands based on NJDEP GIS coverage for Weymouth Township

LAND USE CODES	ACRES
AGRICULTURAL WETLANDS (MODIFIED)	3.09
ALTERED LANDS	0.52
ARTIFICIAL LAKES	1.04
ATHLETIC FIELDS (SCHOOLS)	6.50
ATLANTIC WHITE CEDAR WETLANDS	86.39
CEMETERY	0.92
COMMERCIAL/SERVICES	33.19
CONIFEROUS BRUSH/SHRUBLAND	27.25
CONIFEROUS FOREST (10-50% CROWN CLOSURE)	41.05
CONIFEROUS FOREST (>50% CROWN CLOSURE)	740.88
CONIFEROUS SCRUB/SHRUB WETLANDS	0.79
CONIFEROUS WOODED WETLANDS	268.74
CROPLAND AND PASTURELAND	131.00
DECIDUOUS BRUSH/SHRUBLAND	20.23
DECIDUOUS FOREST (10-50% CROWN CLOSURE)	53.37
DECIDUOUS FOREST (>50% CROWN CLOSURE)	1287.34
DECIDUOUS SCRUB/SHRUB WETLANDS	106.30
DECIDUOUS WOODED WETLANDS	256.45
DISTURBED WETLANDS (MODIFIED)	1.69
EXTRACTIVE MINING	4.25
FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	1.33
FRESHWATER TIDAL MARSHES	16.47
HERBACEOUS WETLANDS	8.28
MAJOR ROADWAY	20.80
MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	2.22
MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND	75.07
MIXED FOREST (>50% CONIFEROUS WITH 10-50% CROWN CLOSURE)	22.24
MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE)	1137.88
MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE)	38.84
MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE)	1524.62
MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)	39.70
MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)	80.95
MIXED WOODED WETLANDS (CONIFEROUS DOM.)	288.33
MIXED WOODED WETLANDS (DECIDUOUS DOM.)	128.50
NATURAL LAKES	1.47
OLD FIELD (< 25% BRUSH COVERED)	28.80
ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS	1.34
OTHER AGRICULTURE	78.44
OTHER URBAN OR BUILT-UP LAND	43.06
PHRAGMITES DOMINATE COASTAL WETLANDS	24.32
PHRAGMITES DOMINATE INTERIOR WETLANDS	0.80
RECREATIONAL LAND	20.26

RESIDENTIAL, HIGH DENSITY OR MULTIPLE DWELLING	66.84
RESIDENTIAL, RURAL, SINGLE UNIT	589.92
RESIDENTIAL, SINGLE UNIT, LOW DENSITY	102.64
RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY	29.12
SALINE MARSH (HIGH MARSH)	15.00
SALINE MARSH (LOW MARSH)	194.28
STORMWATER BASIN	4.54
STREAMS AND CANALS	3.12
TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS	194.74
TRANSITIONAL AREAS	38.19
TRANSPORTATION/COMMUNICATION/UTILITIES	23.78
UPLAND RIGHTS-OF-WAY UNDEVELOPED	49.33
WETLAND RIGHTS-OF-WAY	6.62

Figure 12 (Appendix 1) shows the spatial arrangement of these specific land-use codes.

CLIMATE

The present world situation and greenhouse gas production will shift climate in ways that cannot accurately be predicted. The climate maps found in Figure 13 (Appendix 1) .are current averages, with the caveat that any warming trend and change in precipitation patterns will be monitored and taken into account. The ramifications of climate change include water availability, rainfall/snow patterns, disease movement (i.e. Southern pine bark beetle), and migrations of species, particularly those endangered or invasive.

AIR

There is no air monitoring station in Weymouth Township; the nearest one is in Millville (see Figure 14, Appendix 1). Also included are the two other nearest stations for which the NJDEP had historic data online (the Atlantic City or Somers Point data were

not displayed on the NJDEP site). The ozone and CO data for latest available years are in the following table:

Table 14: Ozone and carbon monoxide events at Millville station (nearest Weymouth Township) as well as Ancora and Nacote Creek stations

NJDEP AIR MONITORING STATION	2005 Exceedances of the 8-hour Ozone(>0.08ppm)	2004 Exceedances of the 8-hour Ozone(>0.08ppm)	1995-2005 Exceedances of the Carbon Monoxide Stan
Millville	4	2	0
Ancora St. Hospital	12	6	0
Nacote Creek	3	0	0

Certain air quality parameters such as fine particulates (< 2.5 micrometers) could be influenced in the future with a policy of more prescribed burns in the Township.

NJDEP has a web site dealing with air toxics. In this case the toxics modeled in 1999 for all New Jersey are:

- Acetaldehyde
- Acrolein
- Arsenic Compounds
- Benzene
- Bis(2-ethylhexyl)phthalate
- 1,3 Butadiene
- Cadmium Compounds
- Carbon Tetrachloride
- Chloroform
- Chromium VI
- 1,4-Dichlorobenzene
- 1,3-Dichloropropene
- Diesel Particulate Matter
- Ethylene Dibromide
- Ethylene Dichloride
- Ethylene Oxide
- Formaldehyde
- Methyl Chloride
- Naphthalene
- Nickel Compounds
- Perchloroethylene
- 1,1,2,2-Tetrachloroethane

Figure 15 (Appendix 1) shows the spatial variation of the above air toxics modeled in 1999 for New Jersey. Although Weymouth Township is in a relatively undeveloped area of New Jersey, there are some risks above benchmarks for residents. For example, benzene is modeled at 5 to 10 times the benchmark. Below is the NJDEP's benchmarks and risk ratios from their web site:

"Comparing a health benchmark to an air concentration gives a risk ratio. Risk ratios equal to or less than one (below the health benchmarks) are not expected to be harmful to human health. It is not always clear, however, how far above the health benchmark an air concentration has to be before it becomes harmful. Types of harmful health effects and

actual harmful levels will vary substantially from pollutant to pollutant. Still, comparison to a health benchmark is a useful tool for evaluating air concentrations like those predicted in NATA. If the modeled air concentration is below the health benchmark (the risk ratio is less than or equal to one), there is probably no need for further concern. If the risk ratio is greater than one (the air concentration is above the health benchmark), there may be some cause for concern, and further assessment is warranted. The risk ratio also indicates just how much higher the air concentration is than the health benchmarks."

HISTORIC/CULTURAL RESOURCES

The Belcoville Post Office, 1202 Madden Avenue, is the only listed State and National Historic Site in Weymouth (Figure 16, Appendix 1).

Weymouth Township also has areas on the State's historic site grid. The metadata for the historic grid areas are:

> "This dataset includes a vector grid of approximately 1/2 mile cells indicating the presence of archaeological sites that: 1. Are included in the New Jersey or National Registers of Historic Places, 2. Have been determined Eligible for inclusion through federal or state processes as administered by the New Jersey Historic Preservation Office (HPO), or 3. Have been identified through cultural resources survey conducted pursuant to federal or state processes as administered by the New Jersey Historic Preservation Office (HPO).
>
> Archaeological sites are particularly sensitive to destruction and vandalism, and this grid format protects specific site locations while alerting users of this data to the potential presence of archaeological resources in their area of interest. This format is consistent with National Register guidelines. Inclusion in this dataset does not preclude the existence of other sites as yet unidentified.
>
> THIS SHAPEFILE REPRESENTS ONLY A PORTION OF THE TOTAL NUMBER OF REGISTERED, ELIGIBLE OR IDENTIFIED ARCHAEOLOGICAL SITES IN NEW JERSEY. THE HPO IS STILL IN THE PROCESS COMPLETING THIS COVERAGE. (See Completeness Report) "

EXISTING/PLANNED INFRASTRUCTURE

Weymouth Township's current road system has about 62.4 miles of roads and railway, yet from the map (Figure 17, Appendix 1) it is obvious there are large areas in which the roads are undeveloped. This poses a challenge when it comes to providing access for fire fighting, fire suppression and general management. The need to evacuate residents in a reasonable amount of time in case of emergencies must also be considered.

CONTAMINATED SITES

The May 2008 Known Contaminated Site Report from the NJDEP lists contaminated sites in Weymouth Township.

Table 15: NJDEP known contaminated sites in Weymouth Township (remediated and active)

Active Sites with Confirmed Contamination:

Site ID (MasterFile)	PI Number	PI Name	Address
364502	450445	BELARUSAN AUTOCEPHALIC ORTHODOX CHURCH (BAOC)	55 S JERSEY AVE
65081	G000026257	WEYMOUTH TOWNSHIP SANITARY LANDFILL	11TH AVE

No Pending Sites with Confirmed Contamination

Closed Sites with Remediated Contamination:

223420	291743	1421 ROUTE 50	1421 RT 50
42813	003868	WEYMOUTH TWP CITY HALL	12TH AVE & S JERSEY AVE

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We do however have a landfill in our Township (Figure 18, Appendix 1) which to date has not leaked during any monitoring by NJDEP (see Appendix 2 for a sample of the well test data we have confirming this). We strongly urge NJDEP to continue monitoring since no cap can last forever.

CRITICAL ENVIRONMENTAL AREAS

Weymouth Township has 28 vernal ponds (Figure 19, Appendix 1).

We also have the following in open space:

Table 16: Total acreage of open space by ownership in Weymouth Township.

	Total Acres Open Space		
Open Space Type	**Belcoville**	**Dorothy**	**Weymouth**
Municipal Open Space	46.98	6.83	53.81
NJ Natural Lands Trust	103.89	0	103.89
NJDEP Div. of Fish, Game & Wildlife	797.48	133.48	930.95

See Figure 20 (Appendix 1) for the spatial distribution of these open spaces.