

The Landscape Project

New Jersey Department of Environmental Protection

Division of Fish and Wildlife

Endangered and Nongame Species Program



New Jersey is...

2 One of the smallest states in the country



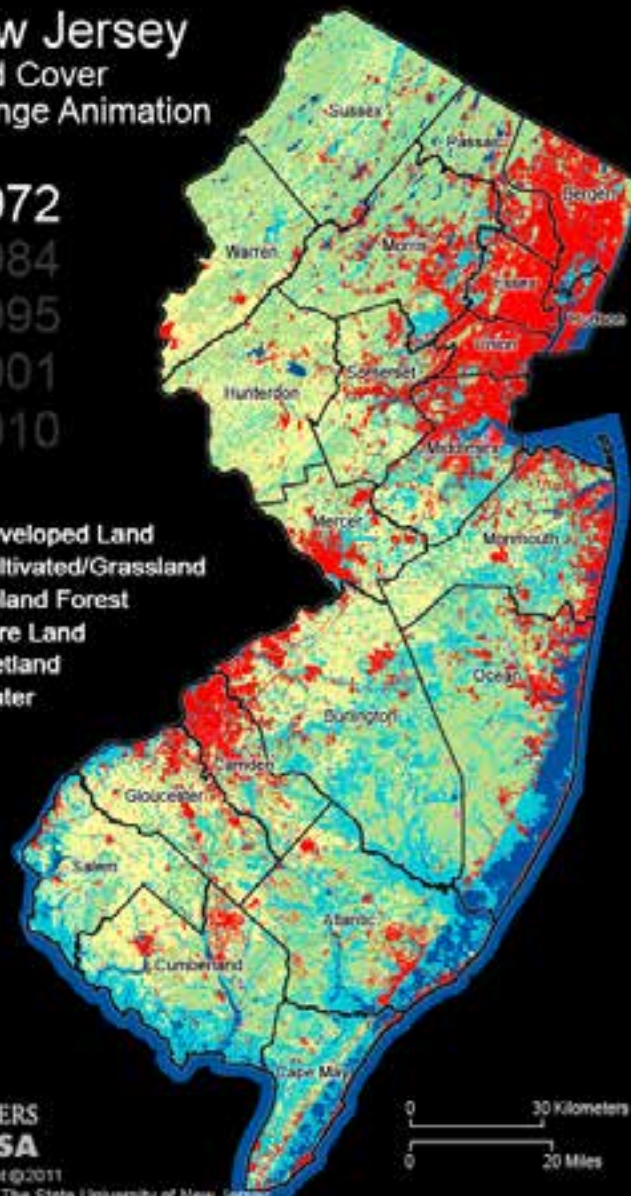
2 Yet it boasts a surprisingly wide diversity of habitat. It is the northern limit of many southern species, and the southern limit of many northern species.



New Jersey Land Cover Change Animation

>1972
>1984
>1995
>2001
>2010

- Developed Land
- Cultivated/Grassland
- Upland Forest
- Bare Land
- Wetland
- Water



RUTGERS
CRSSA

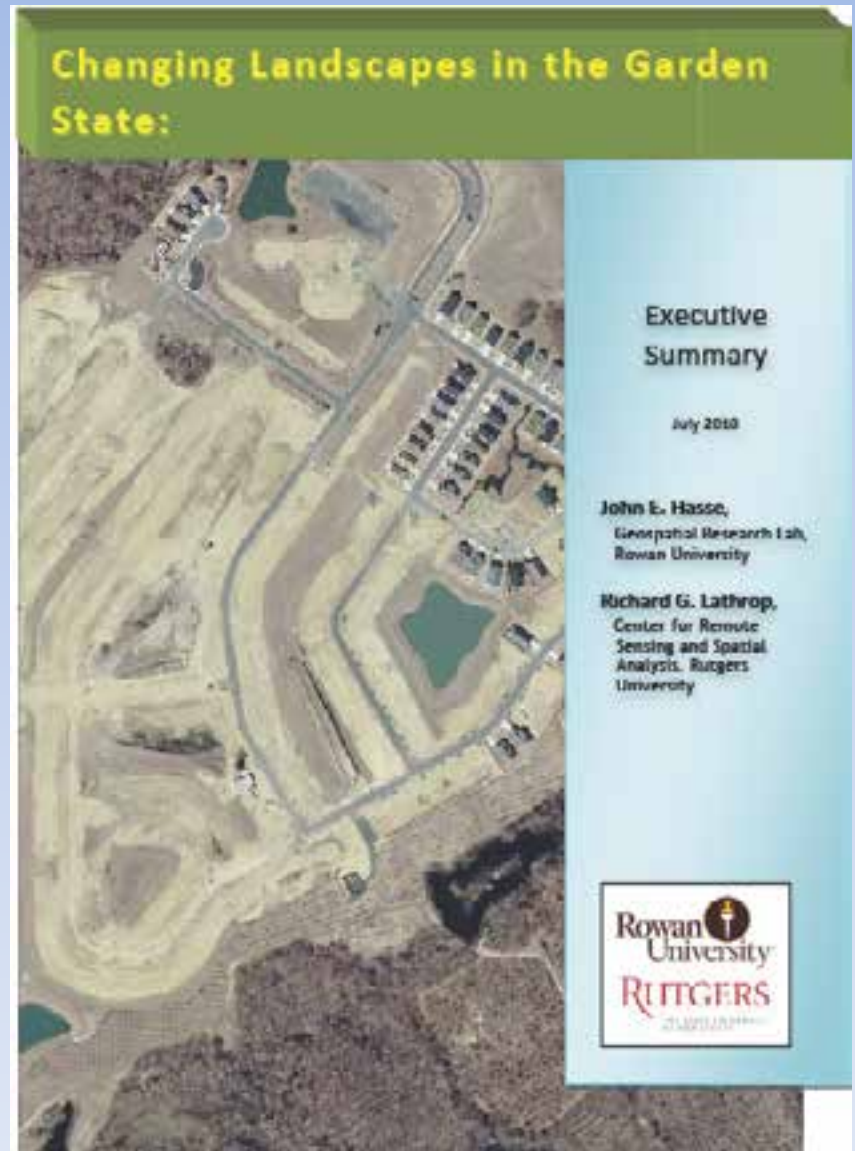
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<http://crssa.rutgers.edu>

New Jersey's Changing Landscape

Hasse and Lathrop (2010).

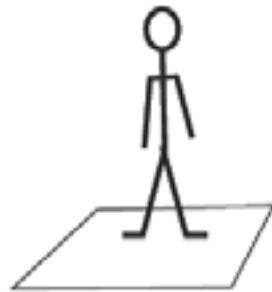
Changing Landscapes in the Garden State: Urban Growth and Open Space Loss in NJ 1986 thru 2007.

- 2 7% increase in development rate to 16,061 acres per year by 2007
- 2 NJ increased impervious surface by nearly 9 football fields per day during 2002 – 2007.
- 2 Deforestation largely due to sprawling residential development. In 2007, urban developed land surpassed upland forest in total acres.

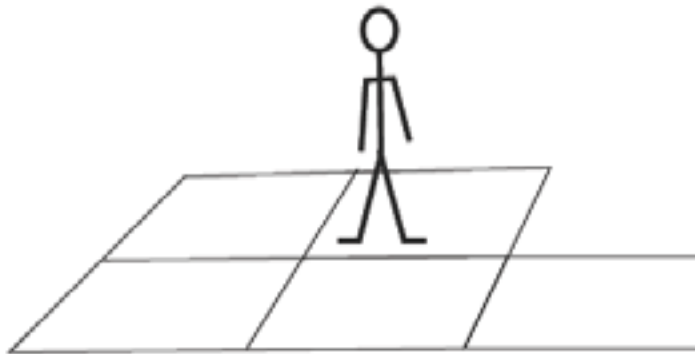


Changing Landscapes in the Garden State:

Urban Growth and Open Space Loss in NJ 1986 thru 2007



1986 land urbanized per capita (0.14 acres)



2002 - 2007 urban growth per capita population growth (0.76 acres)

John E. Hasse,

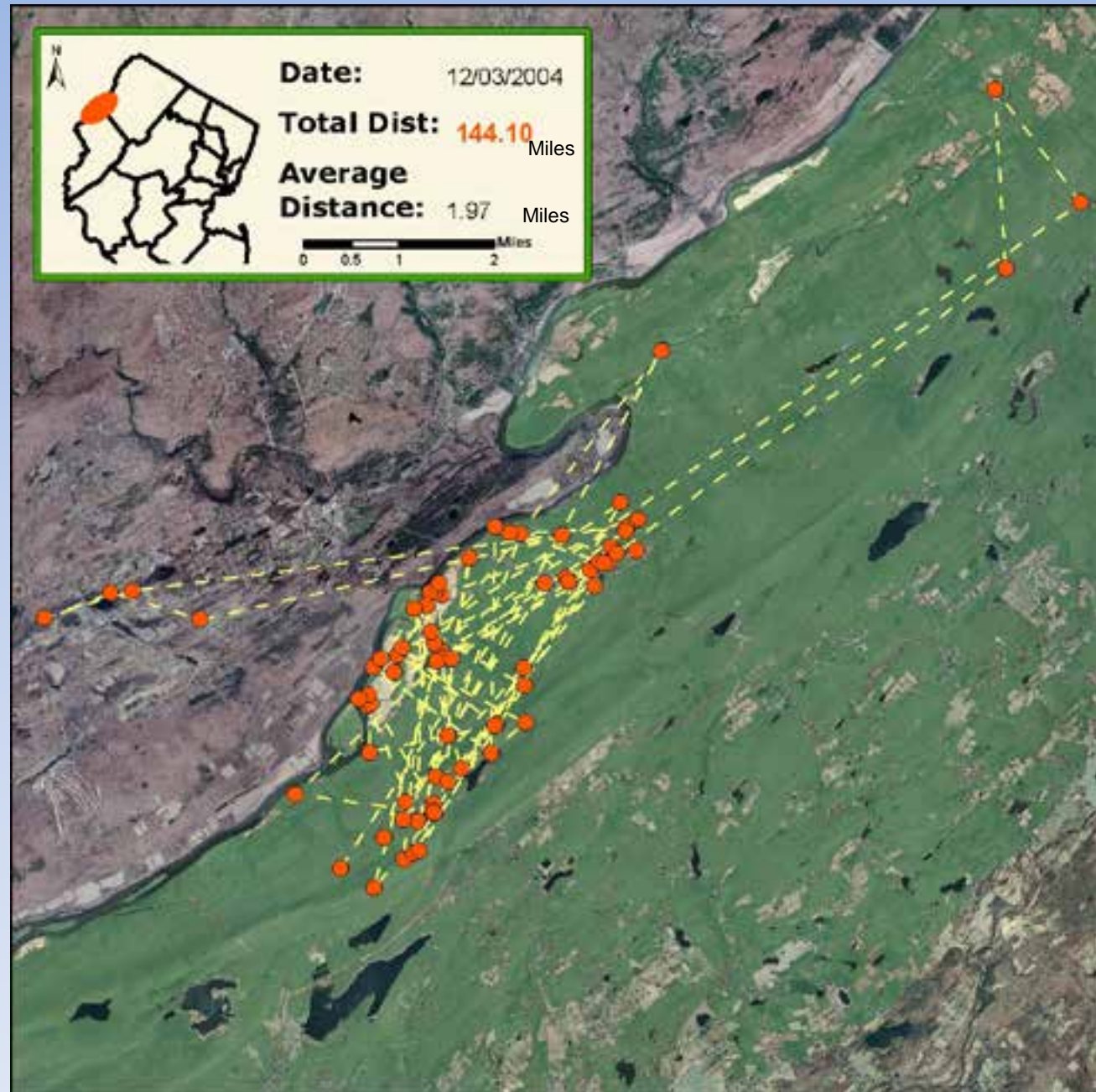
Geospatial Research Lab,
Rowan University

Richard G. Lathrop,

Center for Remote
Sensing and Spatial
Analysis, Rutgers
University

Many Animals Move Across Large Areas

2 Bobcat movements derived from GPS collar data (March – December '04)



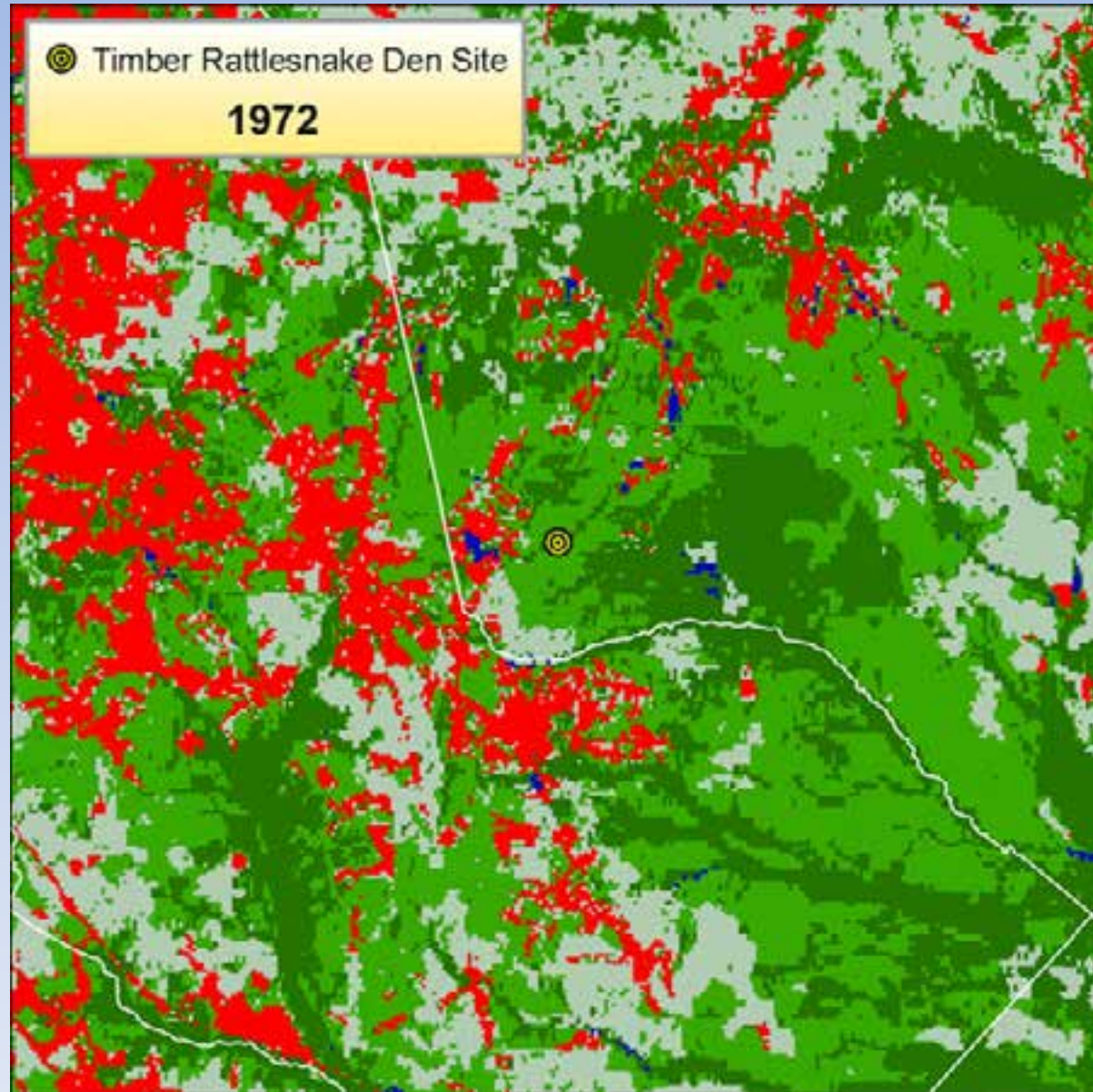
Development Reduces Habitat Connectivity

- 2 Increases barriers to movement
- 2 Decreases population viability
- 2 Bog turtles rely on early successional, interconnected wetlands. If connectivity between populations is not maintained and the habitat surrounding the wetland protected, subpopulations of turtles are vulnerable to extirpation



Development Increases Mortality

² by increasing human-wildlife
conflicts and road mortality



What is the Landscape Project?

Landscape Project Maps: -- a set of GIS layers that...

- 2 depict habitat for endangered, threatened and special concern wildlife species based on *documented occurrences* from the Biotics database
- 2 Biotics is the Department's database for tracking rare species occurrences. Expert biologists *review all species sighting reports* according to a specific protocol for acceptability/reliability and subsequently accept or reject species records
- 2 combine species location information with NJDEP land-use/land-cover data
- 2 provides users with science-based, peer-reviewed maps of species habitat areas in the state
- 2 supply data without compromising sensitive species locations



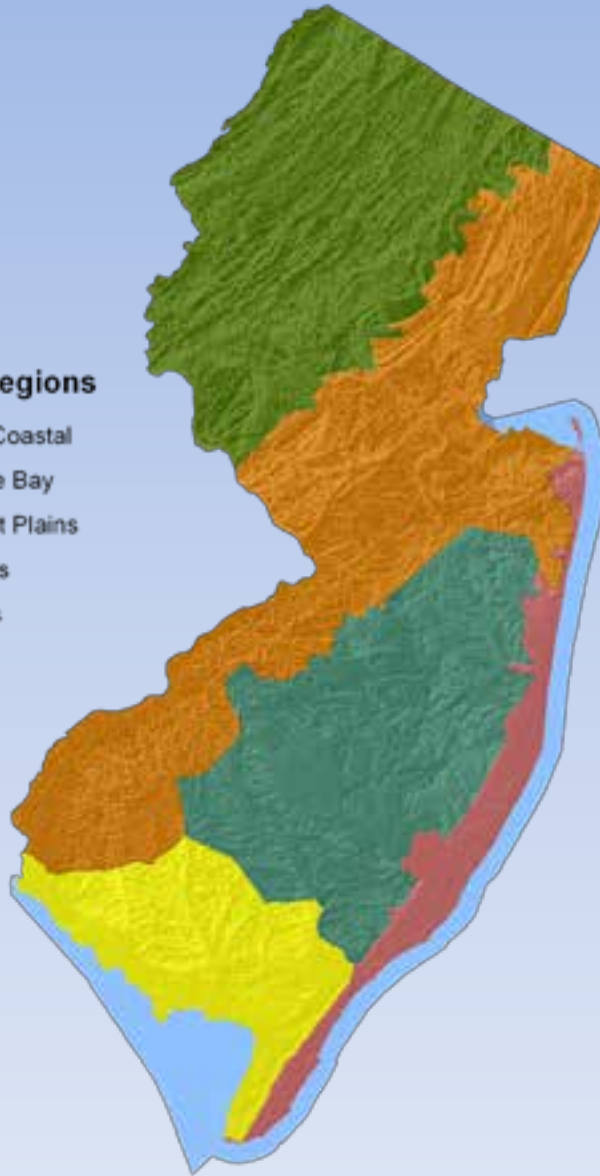
Landscape Project Maps Habitat Patch Ranking:

- 1) Suitable Habitat - Meets suitability requirement defined for each habitat type. No documented occurrences.
- 2) State Special Concern – At least one documented occurrence of a state special concern species.
- 3) State Threatened - At least one occurrence of a state threatened species.
- 4) State Endangered - At least one documented occurrence of a state endangered species.
- 5) Federally Listed - At least one documented occurrence of a federally listed.

Landscape Regions

Landscape Regions

- Atlantic Coastal
- Delaware Bay
- Piedmont Plains
- Pinelands
- Skylands
- Marine



Version 3.1

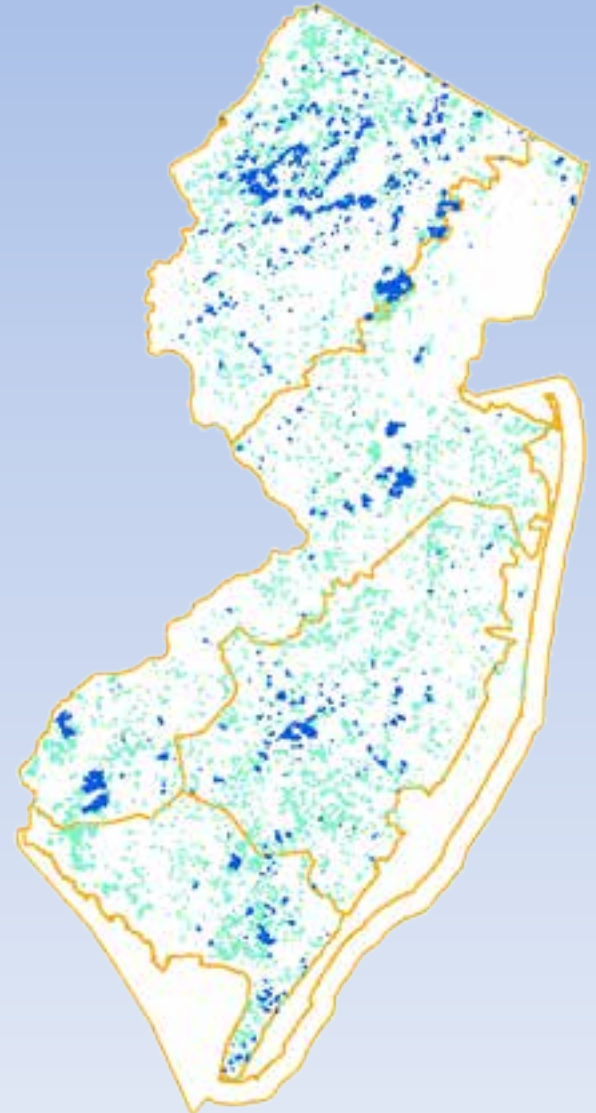
Species-Based Habitat



Freshwater Mussel Habitat



Vernal Habitat



Creating the Landscape Project Maps:

HABITAT DATA DEVELOPMENT

- Flood Prone
- +
- Hydic Soils
- +
- Wetlands
- +
- Water Buffer (50m)



Riparian



Clipped by

Water Buffer (100m)



Combined with

Landscape Base Layer



LULC



Erased by

Major Roads



SPECIES DATA DEVELOPMENT

Sighting Report or Professional Survey



Reliability Evaluation



Feature Label Assignment

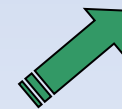


Biotics Database



SOA Production

Species-Based Habitat



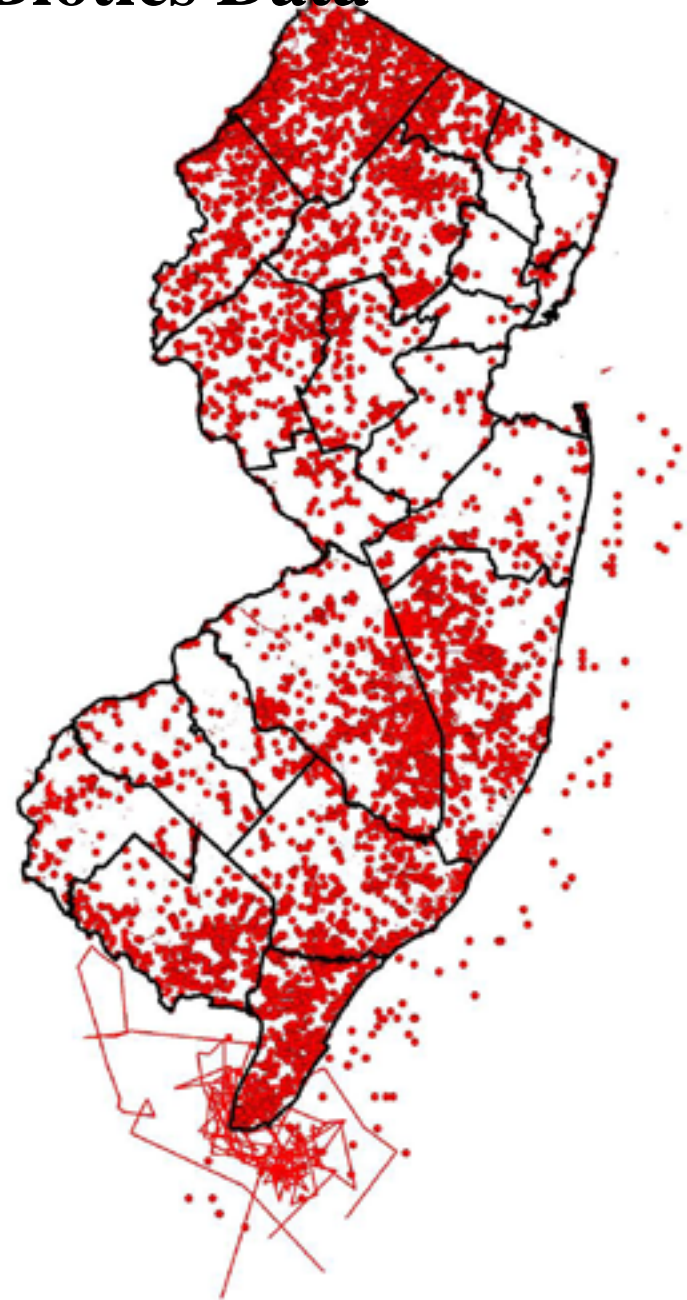
Biotics Database



² The ONLY statewide database of all rare animal species in NJ.

² Same database used throughout the NatureServe network, which extends across all 50 states, Canada, Latin America and the Caribbean, for tracking imperiled and rare species occurrences.

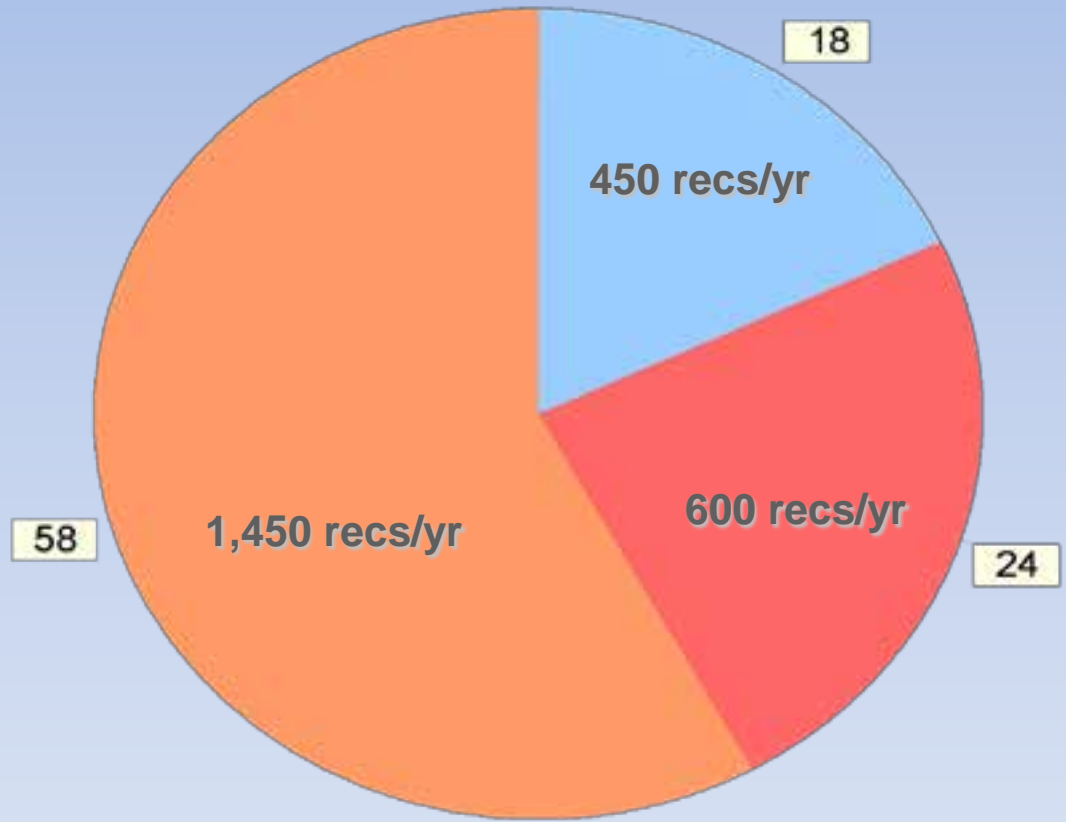
Biotics Data



Overview of data in Biotics

2 Sources of Data (5yr average all data)

Percent of Occurrence Information



- Information Source**
- ENSP Surveys
 - Other Professional Surveys
 - Sighting Report Forms

Protocol for Accepting or Rejecting Species Sighting Reports

- 2 Did the sighting occur within the known range of the species?
- 2 Did the sighting occur in the known/recognized habitat for the species?
- 2 Is the species easily identified, or is it often confused with another?
- 2 Did anyone else confirm the sighting, or can someone else vouch for the observer's identification skills?
- 2 Do we have first-hand knowledge of the observer's identification skills?
- 2 Did the observer include a photograph?
- 2 Is the species listed as endangered, threatened or special concern for the season in which it was reported? (Some species can have a separate status for breeding season and non breeding season.)
- 2 If uncertainty remains about the validity of the sighting, the observer is interviewed by the ENSP biologist.

Species Occurrence Data Development

Feature Label

2 A feature label describes the type of occurrence, e.g. nest, den, non-breeding sighting, dead-on-road, etc.

Species Occurrence Area (SOA)

2 Species-specific polygon used to value habitat in the Landscape Project.

2 Based on the average home range/territory size, or other appropriate life-history parameter as reported in peer-reviewed scientific literature or from information obtained through ENSP research.

2 Can represent one or many individuals

2 Often indicates the presence of a local population beyond the occurrence



Feature Label	SOA
Hibernaculum	4 kilometer buffer
Non-breeding Sighting	2 kilometer buffer
Maternity Colony	2 kilometer buffer
Breeding Sighting	2 kilometer buffer

Indiana Bat Feature Labels and SOAs

Species Occurrence Area Justifications – Appendix II

Indiana Bat

Myotis sodalis

SpcF LID	LUC	Feature Label	Buffer Size	Point Rule	Line Rule	Poly Rule	LP
4781	N/A	Hibernaculum	4.0 Kilometer Buffer	Apply a buffer	Apply a buffer	Apply a buffer	Yes
4782	N/A	Non-breeding Sighting	2.0 Kilometer Buffer	Apply a buffer	Convert to a point and buffer	Convert to a point and buffer	Yes
4783	N/A	Maternity Colony	2.0 Kilometer Buffer	Apply a buffer	Convert to a point and buffer	Convert to a point and buffer	Yes
4786	N/A	Breeding Sighting	2.0 Kilometer Buffer	Apply a buffer	Convert to a point and buffer	Convert to a point and buffer	Yes

Justification:

Fall roosting and foraging distance from hibernacula ranged from 2.4km-6.8km with an average distance of 4.33km. A 4km radius buffer was therefore selected to protect foraging and roosting habitat surrounding hibernacula. Summer roosting and foraging distances ranged from 0.679km-5km to create an average radius buffer of 2km.

Literature:

Callahan, E.V., R.D. Drobney, and R.L. Clawson. 1997. Selection of summer roosting sites by Indiana bats (*Myotis sodalis*) in Missouri. *J. Mamm.* 78:818-825.

The furthest distance documented between roosts occupied by bats within a single maternity colony was 5km.

Creating the Landscape Project Maps:

HABITAT DATA DEVELOPMENT

- Flood Prone
- +
- Hydic Soils
- +
- Wetlands
- +
- Water Buffer (50m)



Riparian



Clipped by

Water Buffer (100m)



Combined with

Landscape Base Layer



LULC



Erased by

Major Roads



SPECIES DATA DEVELOPMENT

Sighting Report or Professional Survey



Reliability Evaluation



Feature Label Assignment

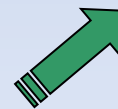


Biotics Database



SOA Production

Species-Based Habitat



NJDEP '07 Land Use/Land Cover Classes – Appendix III

LU07	TYPE07	LABEL07	LU07	TYPE07	LABEL07
1110	URBAN	RESIDENTIAL, HIGH DENSITY, MULTIPLE DWELLING	4311	FOREST	MIXED FOREST (>50% CONIFEROUS WITH 10%-50% CROWN CLOSURE)
1120	URBAN	RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY	4312	FOREST	MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE)
1130	URBAN	RESIDENTIAL, SINGLE UNIT, LOW DENSITY	4321	FOREST	MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE)
1140	URBAN	RESIDENTIAL, RURAL, SINGLE UNIT	4322	FOREST	MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE)
1150	URBAN	MIXED RESIDENTIAL	4410	FOREST	OLD FIELD (< 25% BRUSH COVERED)
1200	URBAN	COMMERCIAL/SERVICES	4411	FOREST	PHRAGMITES DOMINATE OLD FIELD
1211	URBAN	MILITARY RESERVATIONS	4420	FOREST	DECIDUOUS BRUSH/SHRUBLAND
1214	URBAN	NO LONGER MILITARY, USE TO BE DETERMINED	4430	FOREST	CONIFEROUS BRUSH/SHRUBLAND
1300	URBAN	INDUSTRIAL	4440	FOREST	MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND
1400	URBAN	TRANSPORTATION/COMMUNICATIONS/UTILITIES	4500	FOREST	SEVERE BURNED UPLAND VEGETATION
1410	URBAN	MAJOR ROADWAY	5100	WATER	STREAMS AND CANALS
1411	URBAN	MIXED TRANSPORTATION CORRIDOR OVERFLAP AREA	5190	WATER	EXPOSED FLATS
1419	WATER	BRIDGE OVER WATER	5200	WATER	NATURAL LAKES
1420	URBAN	RAILROADS	5300	WATER	ARTIFICIAL LAKES
1440	URBAN	AIRPORT FACILITIES	5410	WATER	TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS
1461	WETLANDS	WETLAND RIGHTS-OF-WAY (MODIFIED)	5411	WATER	OPEN TIDAL BAYS
1462	URBAN	UPLAND RIGHTS-OF-WAY (DEVELOPED)	5420	WATER	DREDGED LAGOON
1463	URBAN	UPLAND RIGHTS-OF-WAY (UNDEVELOPED)	5430	WATER	ATLANTIC OCEAN
1499	URBAN	STORMWATER BASIN	6111	WETLANDS	SALINE MARSHES (LOW MARSH)
1500	URBAN	INDUSTRIAL/COMMERCIAL COMPLEXES	6112	WETLANDS	SALINE MARSHES (HIGH MARSH)
1600	URBAN	MIXED URBAN OR BUILT-UP LAND	6120	WETLANDS	FRESHWATER TIDAL MARSHES
1700	URBAN	OTHER URBAN OR BUILT-UP LAND	6130	WETLANDS	VEGETATED DUNE COMMUNITIES
1710	URBAN	CEMETERY	6141	WETLANDS	PHRAGMITES DOMINATE COASTAL WETLANDS
1711	WETLANDS	CEMETERY ON WETLAND	6210	WETLANDS	DECIDUOUS WOODED WETLANDS
1741	URBAN	PHRAGMITES DOMINATE URBAN AREAS	6220	WETLANDS	CONIFEROUS WOODED WETLANDS
1750	WETLANDS	MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	6221	WETLANDS	ATLANTIC WHITE CEDAR SWAMP
1800	URBAN	RECREATIONAL LAND	6231	WETLANDS	DECIDUOUS SCRUB/SHRUB WETLANDS
1804	URBAN	ATHLETIC FIELDS (SCHOOLS)	6232	WETLANDS	CONIFEROUS SCRUB/SHRUB WETLANDS
1810	URBAN	STADIUM THEATERS CULTURAL CENTERS AND ZOOS	6233	WETLANDS	MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)
1850	WETLANDS	MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA	6234	WETLANDS	MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)
2100	AGRICULTURE	CROPLAND AND PASTURELAND	6240	WETLANDS	HERBACEOUS WETLANDS
2140	WETLANDS	AGRICULTURAL WETLANDS (MODIFIED)	6241	WETLANDS	PHRAGMITES DOMINATE INTERIOR WETLANDS
2150	WETLANDS	FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	6251	WETLANDS	MIXED FORESTED WETLANDS (DECIDUOUS DOM.)
2200	AGRICULTURE	ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS	6252	WETLANDS	MIXED FORESTED WETLANDS (CONIFEROUS DOM.)
2300	AGRICULTURE	CONFINED FEEDING OPERATIONS	6290	WETLANDS	UNVEGETATED FLATS
2400	AGRICULTURE	OTHER AGRICULTURE	6500	WETLANDS	SEVERE BURNED WETLANDS
4110	FOREST	DECIDUOUS FOREST (10-50% CROWN CLOSURE)	7100	BARREN LAND	BEACHES
4120	FOREST	DECIDUOUS FOREST (>50% CROWN CLOSURE)	7200	BARREN LAND	BARE EXPOSED ROCK, ROCK SLIDES, ETC.
4210	FOREST	CONIFEROUS FOREST (10-50% CROWN CLOSURE)	7300	BARREN LAND	EXTRACTIVE MINING
4220	FOREST	CONIFEROUS FOREST (>50% CROWN CLOSURE)	7400	BARREN LAND	ALTERED LANDS
4230	FOREST	PLANTATION	7430	WETLANDS	DISTURBED WETLANDS (MODIFIED)
			7500	BARREN LAND	TRANSITIONAL AREAS
			7600	BARREN LAND	UNDIFFERENTIATED BARREN LANDS

Version 3.1

The Species-Based Habitat approach:

² In Version 3.1, each species has a specific set of LULC classes that are designated as appropriate habitat relating to that species needs *that can be valued by a SOA*.



Creating the Landscape Project Maps (v3.1)

Riparian Corridor:

≥ Based on a modified CRSSA methodology the following are combined and dissolved into one layer:

≥ NJDEP 2007 Land-use/Land-cover (LULC) Waterbodies and 2002 stream centerlines buffered by 50 meters

≥ NJDEP 2007 LULC – all Type07 coded as “wetlands”

≥ NJDEP USGS Flood-Prone Areas – all areas coded as “USGS Documented Flood-prone Area”

≥ SSURGO – all soils defined as “hydric”

≥ Dissolved layer clipped by 100 meter buffer on streams centerlines and waterbodies

≥ Resulting areas are kept if they intersect stream centerlines.



Delineating Species-Based Habitat (Version 3.1)

Land Use/Land Cover Selections and Patch Type Justifications – Appendix V.

Land Use Land Cover Selections and Patch Type Justifications

Blue-spotted Salamander

BIOPID 207

REGION Statewide

PATCH TYPE Cardinal-Proximate *

<i>LU07</i>	<i>LABEL 07</i>	<i>LULC TREATMENT</i>	<i>CITATIONS</i>
1461	WETLAND RIGHTS-OF-WAY (MODIFIED)	Undissolved and Adjacent Undissolved	2-5
1463	UPLAND RIGHTS-OF-WAY (UNDEVELOPED)	Undissolved	2-5
1711	CEMETERY ON WETLAND	Undissolved and Adjacent Undissolved	2-5
1750	MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	Undissolved and Adjacent Undissolved	2-5
1850	MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA	Undissolved and Adjacent Undissolved	2-5
2140	AGRICULTURAL WETLANDS (MODIFIED)	Undissolved and Adjacent Undissolved	2-5
2150	FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	Undissolved and Adjacent Undissolved	2-5
4110	DECIDUOUS FOREST (10-50% CROWN CLOSURE)	Undissolved	2-5
4120	DECIDUOUS FOREST (>50% CROWN CLOSURE)	Undissolved	2-5
4210	CONIFEROUS FOREST (10-50% CROWN CLOSURE)	Undissolved	2-5
4220	CONIFEROUS FOREST (>50% CROWN CLOSURE)	Undissolved	2-5
4230	PLANTATION	Undissolved	2-5
4311	MIXED FOREST (>50% CONIFEROUS WITH 10%-50% CROWN CLOSURE)	Undissolved	2-5

Land Use/Land Cover Selections and Patch Type Justifications – Appendix V.

Land Use - Land Cover Selection and Patch Type Rationale

Blue-spotted salamanders (*Ambystoma laterale*) breed in fish-free ponds, often defined as vernal pools, in New Jersey (Anderson and Giacosis 1967). Much of each species' distribution is within 300-meters of a breeding habitat, although individuals will disperse outside of this range (Regosin et al. 2005). Vernal pools, a type of ephemeral wetland, are identified in the LULC as various wetland and forest classes and are a critical component to the persistence of this salamander. Many types of non-urban land use classes, primarily deciduous forest and deciduous wooded wetlands, surrounding a vernal pool will serve as the non-breeding habitat (Faccio 2003, Regosin et al. 2005).

Because of their limited dispersal ability and fidelity to vernal pools and other fish-free wetlands as breeding habitats, patch type Cardinal-Proximate is the best model to capture the species' critical habitat requirements. This patch type limits the amount of habitat valued beyond the normal dispersal distances of the salamanders from their breeding habitats. To better identify important breeding locations near to the species observation (along with the associated upland, non-breeding habitat that may not have been captured by the patch type Cardinal-Proximate method alone), a separate GIS layer of potential vernal and vernal habitat areas was used in the mapping for marbled salamander. This vernal GIS layer was used to value the selected LULC classes, following the same patch type approach, given they intersected the SOA. This process results in most important breeding and upland habitats associated with the SOA to be selected.

In a final step, after polygons from the initial set of LULC classes are valued based on intersection with the SOA or an associated potential vernal or vernal habitat area, polygons from a second set of wetland LULC classes are valued, provided they are immediately adjacent to the valued area made up of the initial set of LULC classes. This was done to best represent the important habitat needs for this species near the breeding sites and in the surrounding uplands or wetlands.

Literature Citations

1. Anderson, J.D. and R.V. Giacosis. 1967. *Ambystoma laterale* in New Jersey. *Herpetologica* 23 (2): 108-111
2. Faccio, S.D. 2003. Postbreeding emigration and habitat use by Jefferson and spotted salamanders in Vermont. *Journal of Herpetology* 37:479-489.
3. Madison, D. M. 1997. The emigration of radio-implanted spotted salamanders, *Ambystoma maculatum*. *Journal of Herpetology* 31:542-551.
4. Petranka, J.W. 1998. *Salamanders of the United States and Canada*. Smithsonian Institution Press, Washington D.C., USA.
5. Regosin, J.V., B.S. Windmiller, R.N. Homan, and J.M. Reed. 2005. Variation in Terrestrial Habitat Use By Four Pool-Breeding Amphibian Species. *Journal of Wildlife Management* 69 (4): 1481-1493.

Version 3.1 method

Patch Type – a category that describes the method employed to form the valued habitat area from the Landscape base layer for each species-feature label combination. Each species-feature label combination is grouped into one of the following patch type categories.

- **Limited Extent** – polygons from a select set of LULC classes are valued upon intersection with a SOA. Once the valued habitat area is identified, any internal holes or gaps containing polygons of selected LULC classes are also valued if they are completely enclosed by, and contiguous with, the valued area.
- **Contiguous Area** – polygons from a select set of LULC classes are dissolved/combined into contiguous areas and valued upon intersection with a SOA.
- **Cardinal-Proximate** – polygons from an initial, or cardinal, set of LULC classes are valued upon intersection with a SOA and then polygons from a second, proximate set of LULC classes are valued based on a spatial relationship (e.g., adjacency) with polygons from the cardinal set of LULC classes and/or a SOA. Once the valued habitat area is identified, any internal holes or gaps containing polygons of selected LULC classes are also valued if they are completely enclosed by, and contiguous with, the valued area.
- **Stream Centerline** – stream centerlines are valued upon intersection with a SOA.



Habitat Patch Attributes:

LINKID - Unique ID used to link polygons with species look-up tables

LNDR (RANK) - patches are classified, or “valued,” based on the status of the species present

LU07 - Numeric 4 digit code representing land use/land cover category, (2007)

LABEL07 - Description of land use/land cover category, (2007)

TYPE07 - Generalized (Level I) land use/land cover category, (2007)

RIPARIAN - Designates if polygon is inside/outside riparian corridor

FOR_CORE (FOREST CORE) - Designates if a polygon is inside/outside a patch that meets the 10 hectare core requirement

GRASS_MIN (GRASSLAND MINIMUM SIZE) - Designates if a polygon is inside/outside a patch that meets the 18 hectare minimum size requirement

REGION - The Landscape Region where the geographic centrum of the polygon occurs

VERSION - Number used to track version

CONTACT - Contact info for US Fish and Wildlife Service

Species Occurrence Attributes:

LINKID - Unique ID used to link species information with habitat polygons

COMNAME (Common Name) - Common name of species present

SCINAME (Scientific Name) - Scientific name of species present

FEAT_LABEL (Feature Label) - A label assigned to each occurrence that describes the occurrence type (e.g., nest, den, dead on road, etc.).

CLASS - a taxonomic level

RANK - the conservation status of the species

FED_STATUS (Federal Status) - Federal status of species present

NJ_STATUS (New Jersey Status) - The New Jersey Status of species present

MAX_YEAR (LAST OBSERVATION YEAR) - Year species was last observed

CNT_SOA (SPECIES OCCURENCE AREA COUNT) - count of the number of species occurrence areas that intersect the patch of habitat

Creating the Landscape Project Maps (v3.1)

Freshwater Mussel Habitat

² In Version 3.1, stream and water-body centerlines are valued exclusively by freshwater mussel species.



Identify

Identify from: <Visible layers>

- Freshwater Mussel Habitat
 - Pompeston Creek
 - fw_mussels
 - Eastern Pondmussel

Location:

Field	Value
OBJECTID	637
Shape_Length	5244.64495007635
LINKID	44086
COMNAME	Eastern Pondmussel
SCINAME	Ligumia nasuta
FEAT_LABEL	Occupied Habitat
CLASS	Bivalvia
RANK	3
FED_STATUS	NA
NJ_STATUS	State Threatened
MX_YEAR	2008
CNT_SOA	1

Identified 1 feature



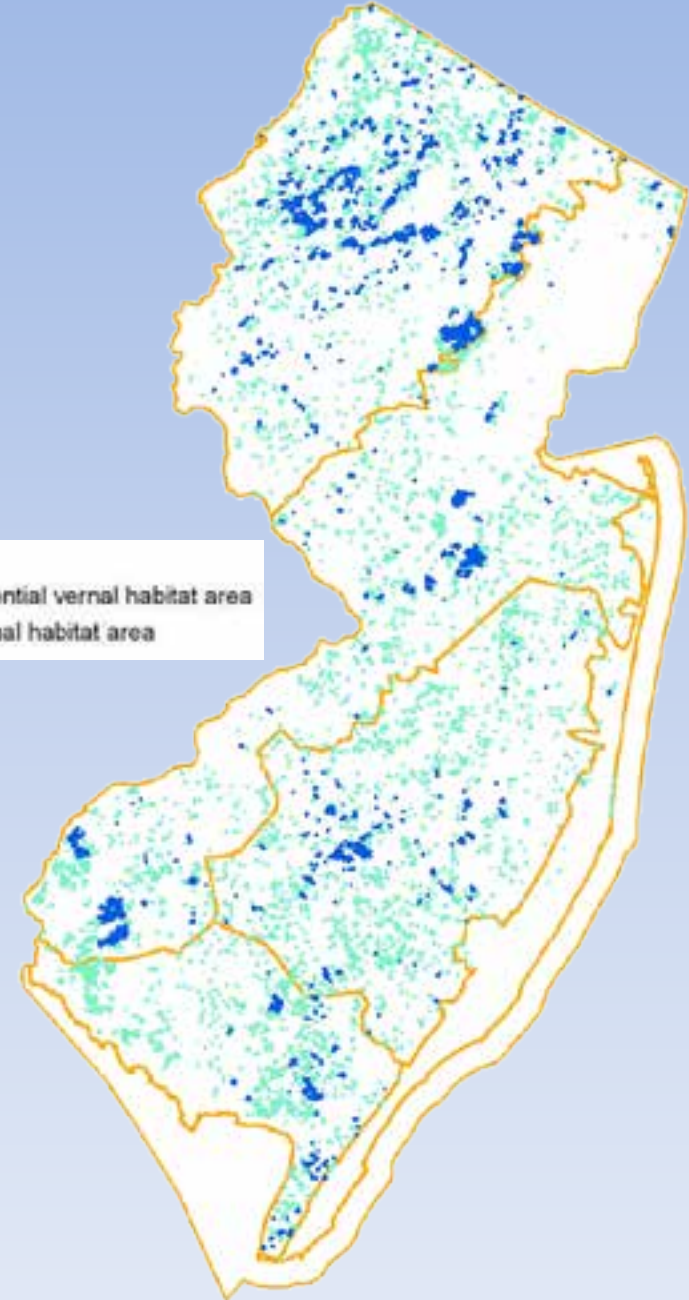
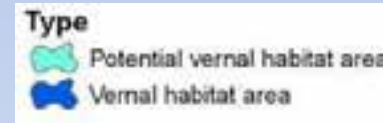
Creating the Landscape Project Maps (v3.1)

Vernal Habitat:

² All areas mapped as “potential vernal habitat areas” and “vernal habitat areas” include a point location estimated to be the center of an individual vernal pool, plus all areas within 300 meters of the point.

² Potential vernal habitat area - These are areas identified by CRSSA as possibly containing a vernal pool based on remote sensing

² Vernal habitat areas - These are areas that contain pools that have been field-verified



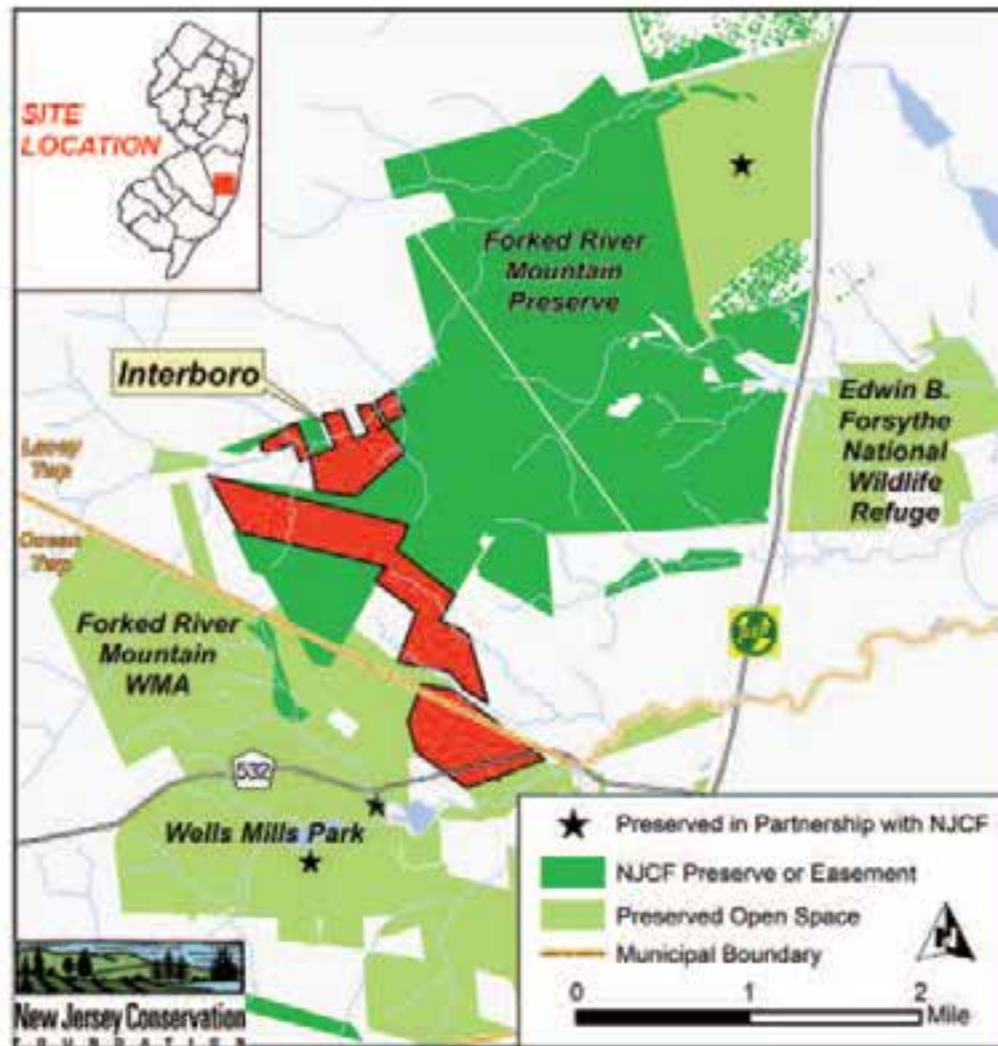
Landscape Project Applications

Landscape Project Maps are used...

- 2 to prioritize conservation acquisitions
- 2 for environmental review
- 2 in local environmental resource inventories and ordinances
- 2 for conservation planning at the regional, state, county and municipal level
- 2 to protect habitat through a number of state regulations

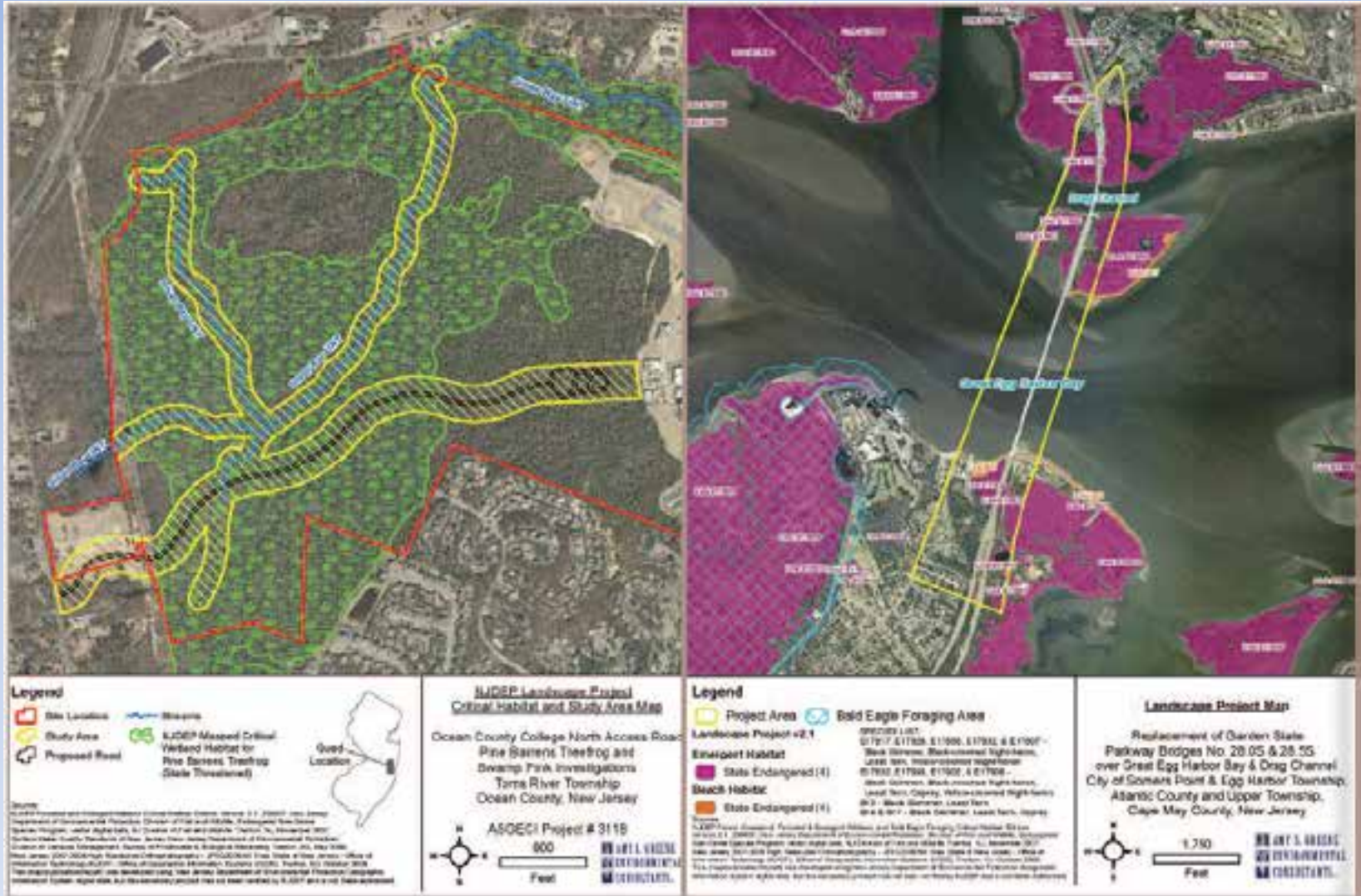


Prioritize Conservation Acquisitions



Green Acres provided grant funding to the New Jersey Conservation Foundation to help purchase the Interboro tract in the Forked River Mountains area that serves as habitat for a number of threatened and endangered wildlife species.

Project Review/Environmental Impact Assessment



Landscape Project data used for project review: Left) Landscape Project data used to show the extent of Pine Barrens Treefrog habitat in order to determine if a proposed new access road for the Ocean County College campus would impact this species. Right) Landscape Project data used to help conduct a habitat assessment for a proposed Garden State Parkway bridge replacement project over Great Egg Harbor Bay and Drag Channel in Atlantic and Cape May counties. The map shows areas of suitable habitat capable of supporting State and Federal listed threatened and endangered species within the project area, including Black Skimmer, Black-crowned night-heron, Yellow-crowned night-heron, Least Tern, and Osprey.

Environmental Resource Inventories

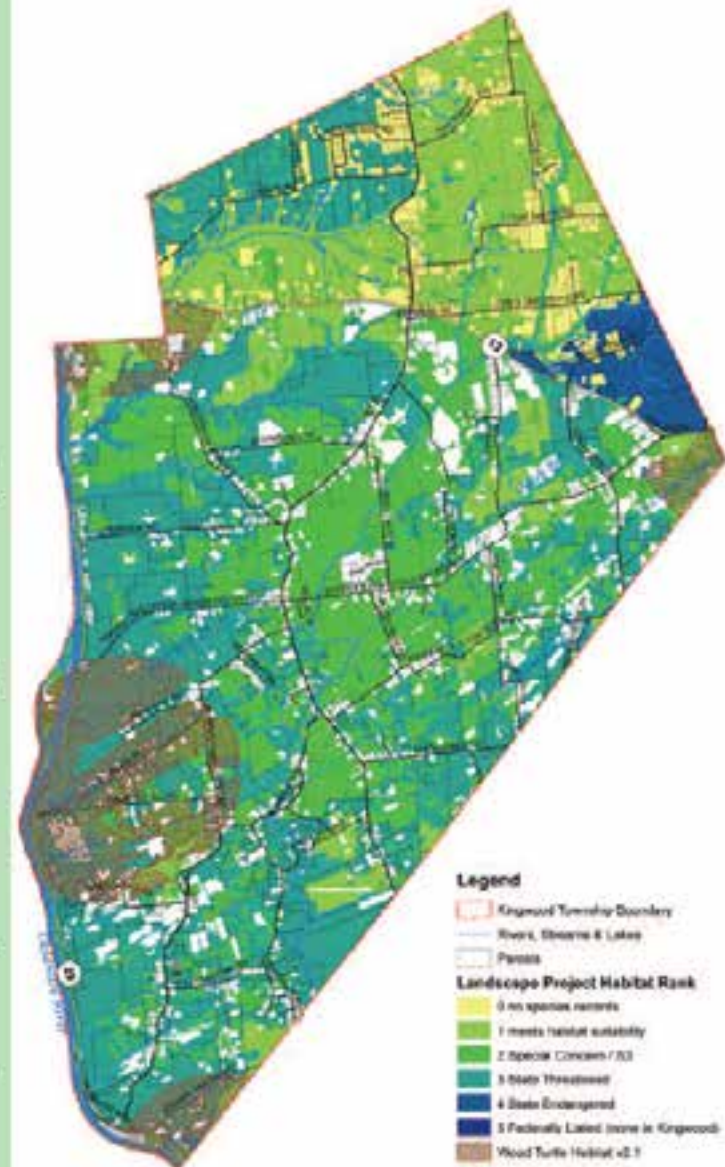
Landscape Project maps enable state, county, municipal and private agencies to identify important habitats and protect them in a variety of ways:

Prioritize conservation acquisitions: The Landscape Project is used to assist with prioritizing land parcels for purchase through acquisition programs such as Farmland Preservation and the USFWS's refuge system.

Guide regulators and planners: Landscape Project maps provide those who administer land use regulations and state, county and local planners with a crucial tool used to enhance protection and properly plan development through the regulatory and planning process.

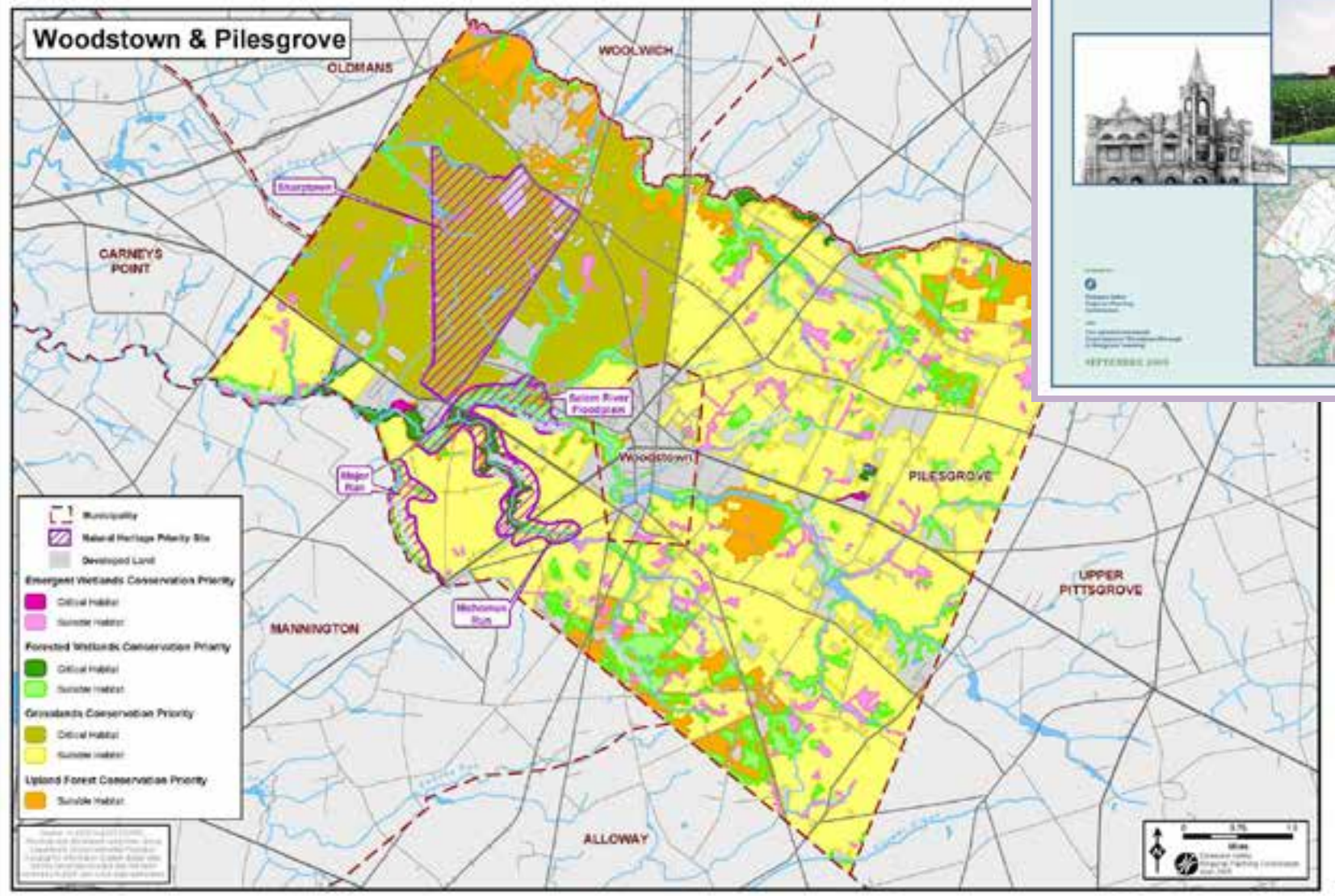
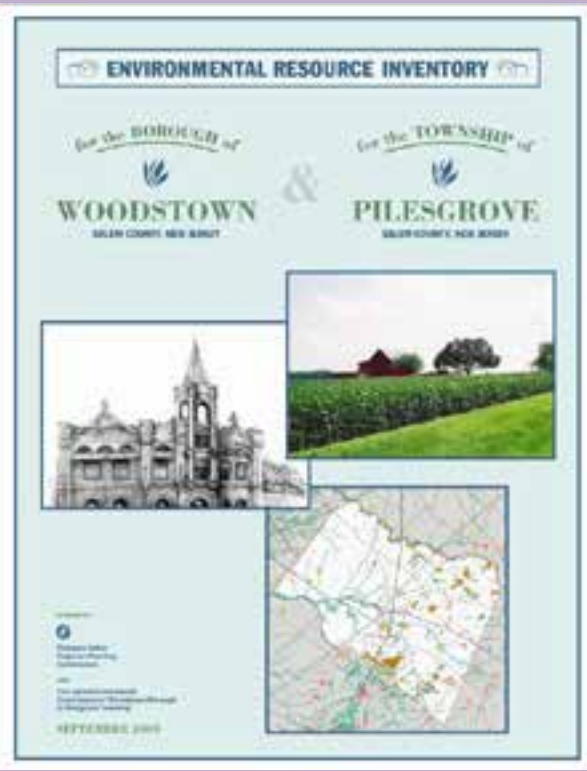
Provide citizens with conservation tools: The Landscape Project provides a transparent and readily accessible tool to help guide citizen actions to protect imperiled and special concern species habitat at the local level.

Guide stewardship of conserved areas: New Jersey has more than 400,000 hectares of open space. These lands are managed by a variety of agencies and organizations, both public and private. Landscape Project maps identify important imperiled and special concern species habitats on these lands. ENSP staff work closely with land managers and landowners to develop appropriate best management practices for the long-term conservation of imperiled and special concern species.



Landscape Project maps are widely used in municipal and county Environmental Resource Inventories (ERI) to document threatened and endangered wildlife habitat. ERI for Kingwood Township, Hunterdon County, shown above.

Environmental Resource Inventories



Regional Conservation Planning

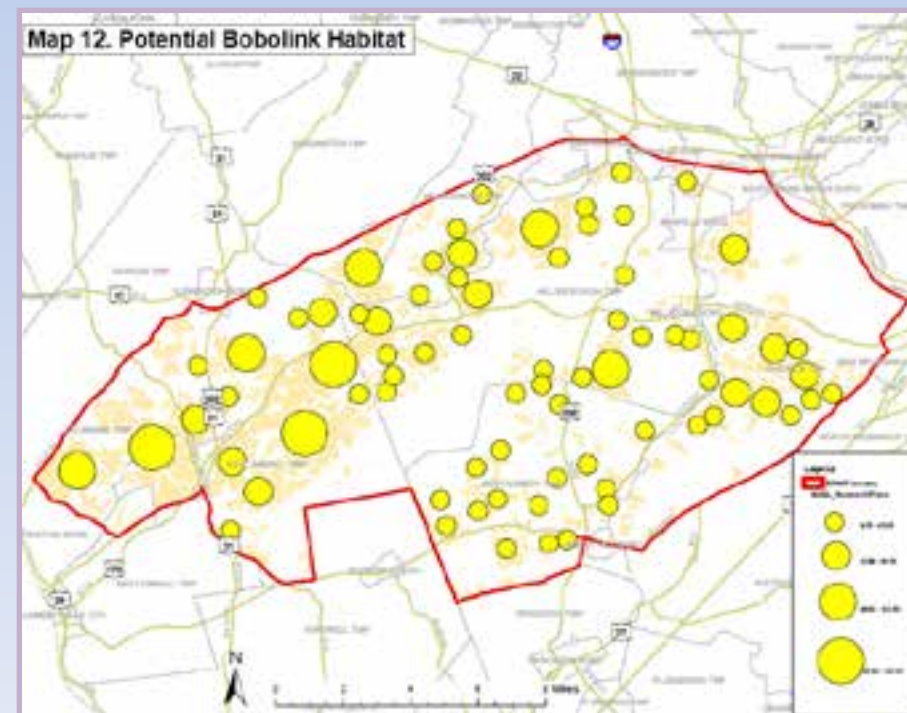
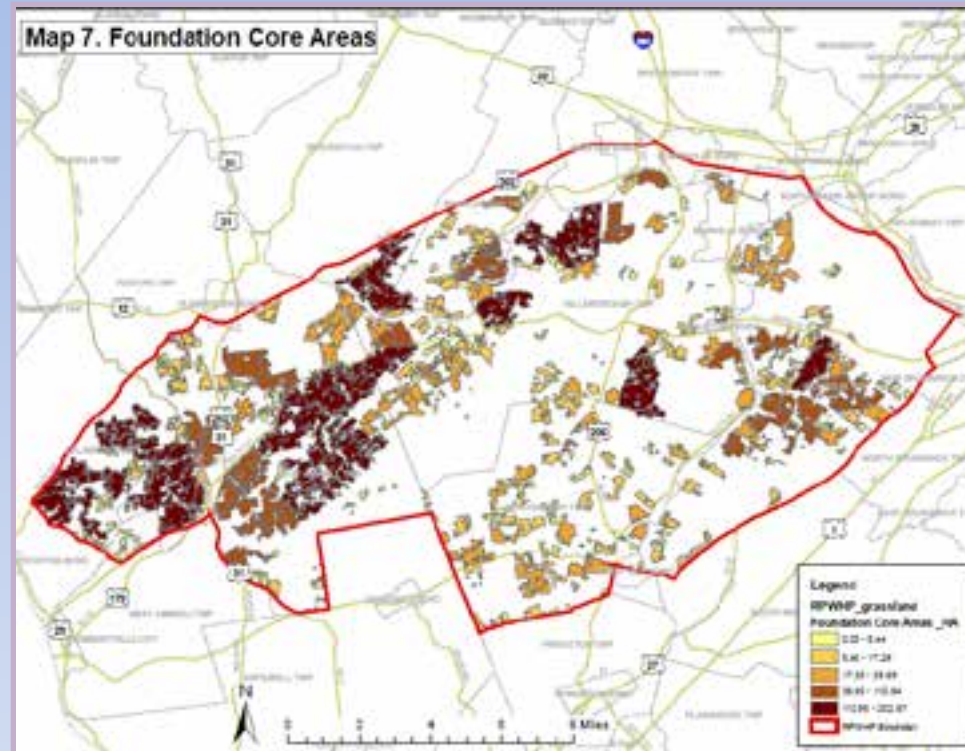
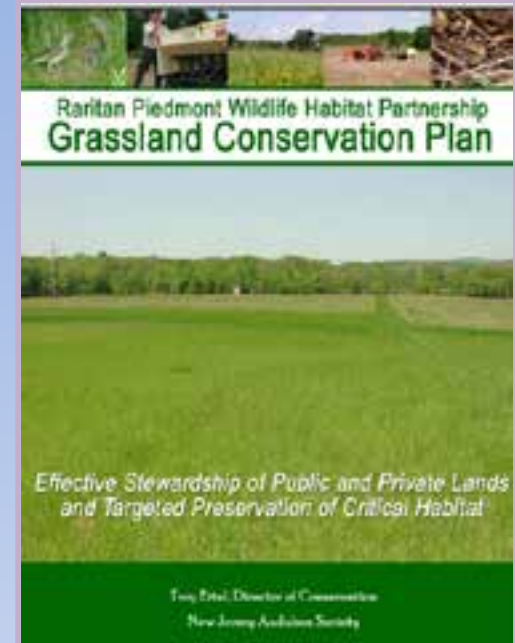
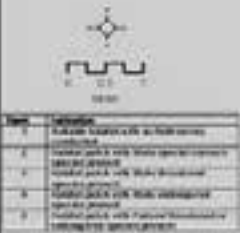


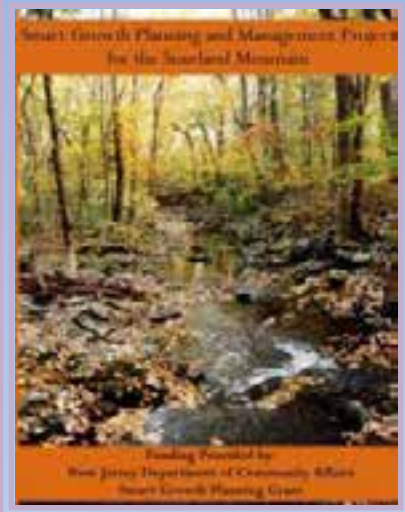
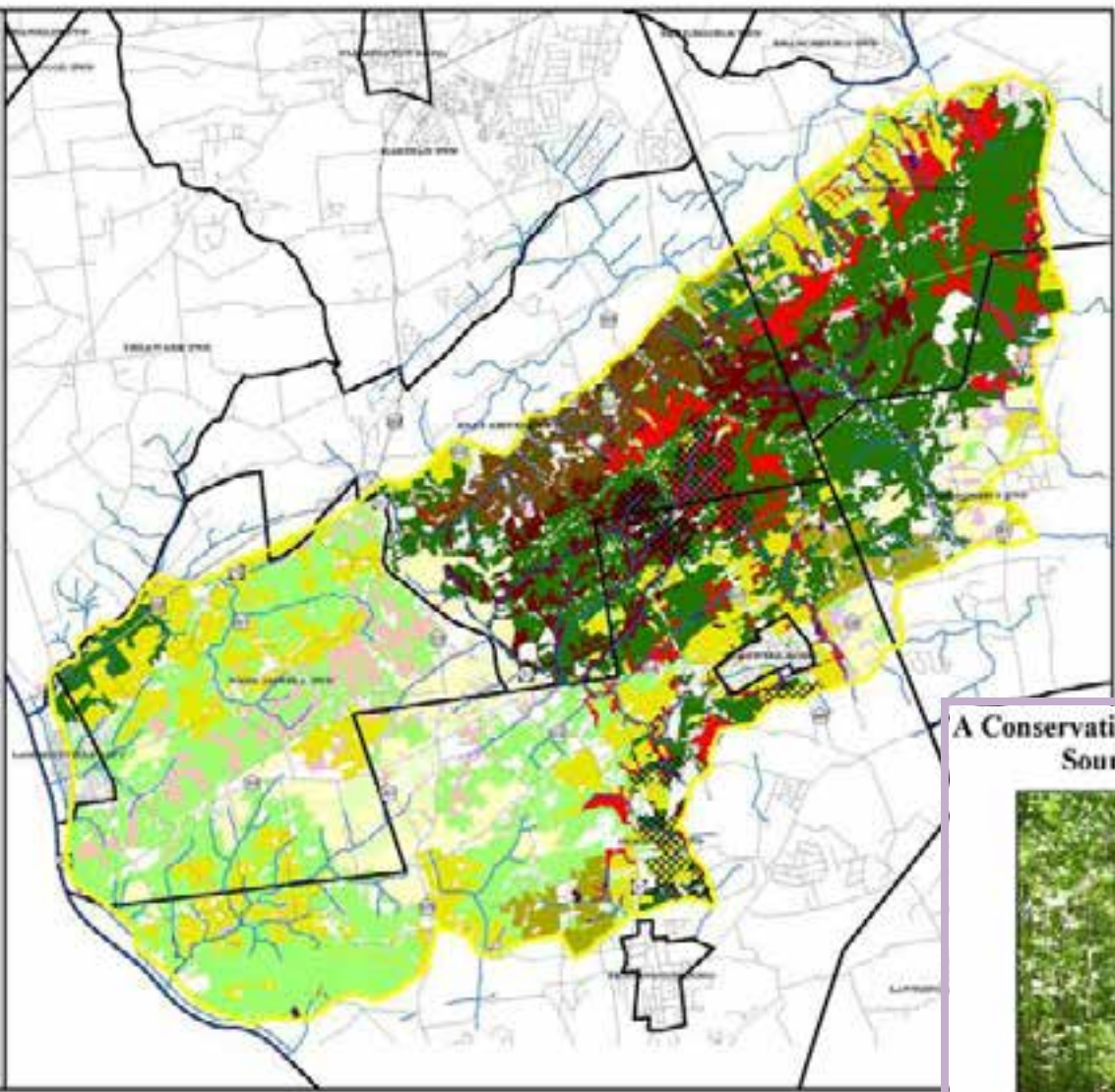
Figure 6
New Jersey Landscape
Project Habitat Data

The Sourland Mountain District
 A Portion of Central New Jersey

November 2005



This map was prepared using data from the Department of Environmental Protection, Division of Planning, Bureau of Planning and Policy, and the Division of Environmental Management, Bureau of Planning and Policy. © State of New Jersey, 2005.



A Conservation and Open Space Plan for the
Sourland Mountain Region



Regional Conservation Planning

State Regulations with E&T Habitat Protection Provisions

- 2 New Jersey Freshwater Wetlands Protection Act Rules
- 2 New Jersey Flood Hazard Area Control Act Rules
- 2 Coastal Zone Management and Coastal Permit Program Rules
- 2 Highlands Water Protection Act Rules
- 2 Water Quality Management Planning Rule
 - 2 Sewer Service Area Mapping
- 2 Pinelands Comprehensive Management Plan (Pinelands Protection Act)

Data Accessibility:

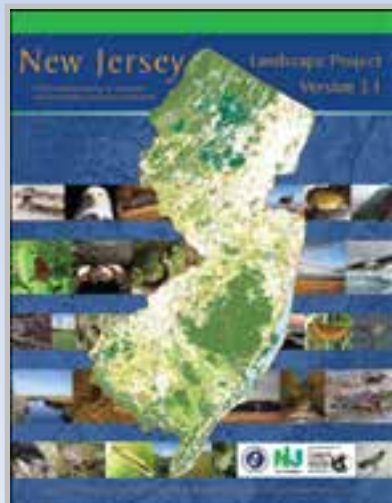
≈ Download from NJDEP's Bureau of GIS website: <http://www.nj.gov/dep/gis/>
(Also, internally on DEPView)



≈ Online via DEP's interactive mapping application: <http://www.nj.gov/dep/gis/>



≈ Report and supplemental documentation:



≈ GeoLab at Rowan University – NJ Municipal Asset Profiler (NJ MAP).



Education and Outreach Efforts:

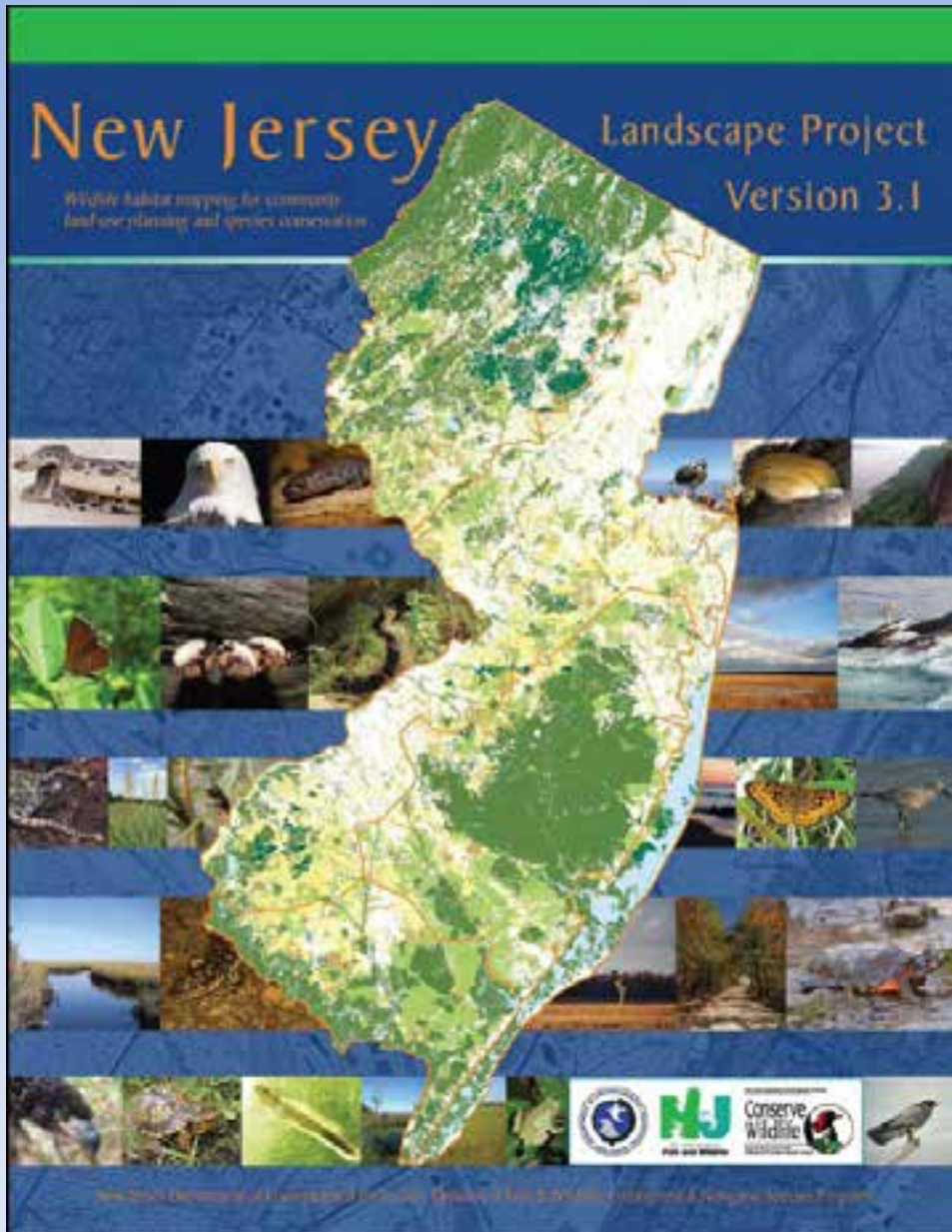
- 2 **Landscape Training and Information Program**
 - 2 Sessions held statewide (in person and remote) to guide interpretation, use and application of the mapping

- 2 **Stakeholder meetings (2010)**
 - 2 gather input from cross-section of users (federal agencies, county governments, environmental commissions and the consultant community)

- 2 **“Frequently Asked Questions” (FAQs) document**
 - 2 address issues of mischaracterization and misinformation

- 2 **NJMAP - Municipal Asset Profile (GeoLab at Rowan University)**
 - 2 make tool easily accessible on a municipal level

Documentation:



Appendices

2 [Appendix I. Protocol for Accepting or Rejecting Species Sighting Reports.](#)

2 [Appendix II. Species Occurrence Area Justifications.](#)

2 [Appendix III. NJDEP 2007 Land Use/Land Cover Categories.](#)

2 [Appendix IV. Land Use/Land Cover Analysis for Species and their Feature Label components.](#)

2 [Appendix V. Land Use/Land Cover Selections and Patch Type Justifications.](#)

Questions?

New Jersey Landscape Project Version 3.1

Wildlife habitat mapping for conservation
with land planning and transportation

SPECIES OCCURRENCE DATA DEVELOPMENT

- Improved wildlife occurrence data and cover and integrated in the New Jersey Database
- Occurrence data are based on field observations from a variety of sources including surveys carried out by the Endangered and Migratory Species Program (EMSP) and reports from the general public.
- All records are evaluated according to an established protocol to ensure reliability.
- Feature Labels are assigned to describe the type of occurrence (e.g., nest, den, etc.).
- A Species Occurrence Area (SOA) is a polygon applied to each species occurrence location and used to value habitat in the Landscape Project.
- The size of a SOA is based on the average territory/home range size of other (or target) species as reported in peer-reviewed scientific literature or through EMSP records.
- SOAs are overlaid onto species-specific habitat patches and patches are classified, or "ranked," based on the value of the species present at habitat.

LANDSCAPE BASE LAYER DEVELOPMENT

- NJDEP Land Use/Land Cover (LULC) is the foundation of the base layer from which wildlife habitat is derived.
- NJDOT Major Roads are used to break LULC as they can serve as barriers to movement for many species.
- Riparian Corridors (potential habitat) are used as critical travel corridors for wildlife.

SPECIES-BASED HABITAT

FRESHWATER MUSSEL HABITAT

- Using NJDEP Stream Network data, a subset of the 2002 1:24,000 high-resolution National Hydrography Dataset (NHD), water body commission and stream commission data are valued exclusively by freshwater mussel species occurrence areas.
- An index for each representative "patches" of habitat from the 2002 Stream 2002 team, commission area broken at the confluence of two or more streams or the inflow/outflow of a water body. Sections of stream represented by a mussel SOA are valued as habitat.

VERNAL HABITAT

- NJDEP partnered with Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA) to develop a method for measuring potential vernal pools throughout New Jersey.
- "Vernal habitat" includes a vernal pool, or the area of ponding, plus any freshwater wetland adjacent to the vernal pool.
- Wet areas classified as "potential vernal habitat areas" and "vernal habitat areas" are derived from a cover layer composed to be the center of an individual vernal pool and include all areas within 500 meters of the pool.

WHY WE NEED THE LANDSCAPE PROJECT

- Rising and falling USAs, Changing Landscapes in the Atlantic States urban growth and Open Space Loss in NJ 1984 thru 2007.
- 15,000 acres of habitat per year during 2002 - 2007.
- NJ increased impervious surface by more than 4 thousand acres per day during 2000 - 2007.
- In 2007 urban land increased urban areas in the most government land use in NJ.

- NJDEP Land Use/Land Cover: 1984 - 2007. New Jersey's landscape is rapidly changing. Since 1984, urbanization has resulted in the loss of more than 3,000 hectares of wildlife habitat per year. Moreover, much of the habitat that remains is less suitable for wildlife due to habitat fragmentation. This is especially detrimental to imperiled wildlife, as many of these species require large, contiguous tracts of habitat.

LANDSCAPE PROJECT APPLICATIONS

- Invasive Conservation Acquisition
- Environmental Review/Impact Assessment
- Environmental/Natural Resource Inventory
- Regional Conservation Planning
- Land Use Regulation and Management

DATA AVAILABILITY

- Request and download data from the NJDEP website.
- Download LULC data from the NJDEP website.
- NJDEP's Conservation Planning and Assessment website.

Questions?