

# Natural Resource Management Update

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NATIONAL LABORATORY  
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# Tonight's Talk

- 2007 Site Environmental Report Chapter 6
  - Environmental Monitoring of Biota
- Fire management update
  - Accomplishments
  - Plan updates
- Natural resource management update
  - Accomplishments
  - Plan updates

# Chapter 6 - Natural and Cultural Resources

## Natural Resource Management

- Chapter 6 Contents
  - Natural Resource Management
  - Environmental Monitoring of Biota
    - Deer, fish, aquatic sediments and vegetation, terrestrial vegetation and soil
  - Post clean-up monitoring of the Peconic River (summary covered in an earlier talk by Skip)
  - Internship programs
  - Cultural Resource Management (topic for a future talk?)

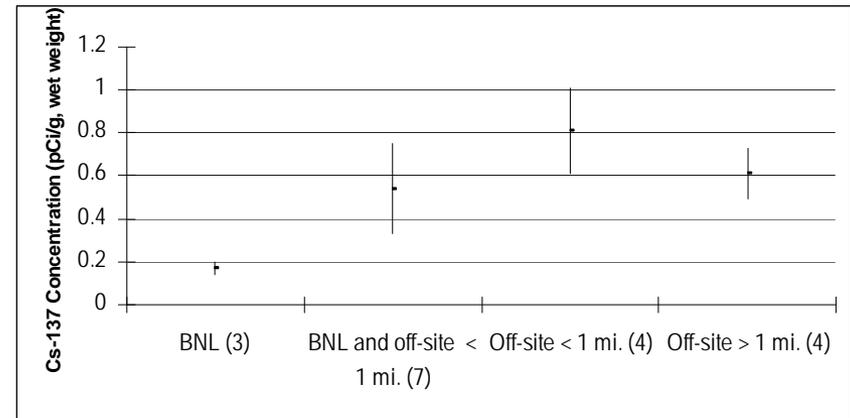


# Chapter 6 – Flora and Fauna Monitoring

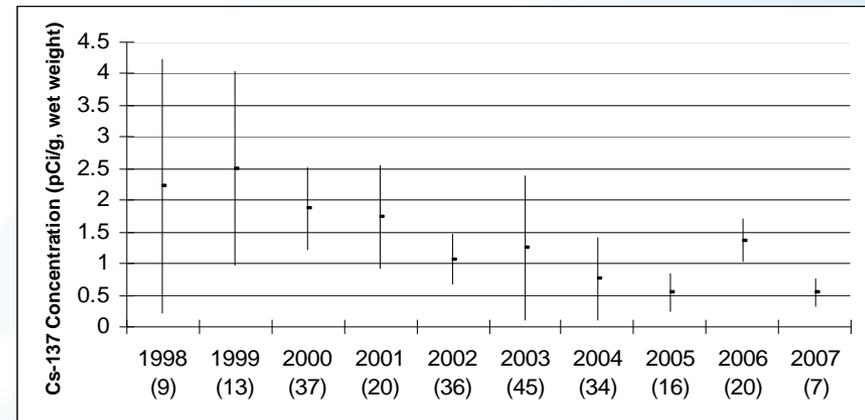
## ■ Deer Sampling

- 3 on site, 8 off-site samples
- Bone samples analyzed for Sr-90, values indicate background levels
- Cs-137 average for on site (0.17 pCi/g, wet weight) is much lower than average within 1 mile of the Laboratory (0.81 pCi/g, wet weight)
- Cs-137 average for all samples was 0.56 pCi/g, wet weight
- Ten-year trend indicating stabilizing trend with average values less than 1.5 pCi/g, wet weight since 2002

Average by Sampling Group



Long-term Trend in Cs-137 Average On and Near Off-site Sampling



# Chapter 6 – Flora and Fauna Monitoring (continued)

## ▪ Terrestrial Sampling

- Grassy vegetation: no detection of Cs-137
- Soils: 0.04 to 4.47 pCi/g dry weight Cs-137
  - High value at Bldg. 515
- Garden vegetables: Grown in garden near the Apartments
  - Non- detect of Cs-137
  - Soils 0.26 pCi/g dry weight
- Basin sediment monitoring: verification sampling every 5 years
  - PCBs – no change
  - Metals - Calcium & Magnesium increased in basin HW
  - Semi-volatile organic compounds - several values above action levels - re-sampling indicated no issues.

# Chapter 6 – Flora and Fauna Monitoring (continued)

## ■ Aquatic Sampling

### – Fish

- Cs-137 (< 0.24 pCi/g, wet weight)
- Pesticides
  - DDT & break down products still being seen
  - Dieldrin and Endrine occasionally seen
- PCBs – sparsely detected in Peconic River
  - Mostly <MDL
  - Detections ranged from 0.01 mcg/kg of Aroclor 1248 in yellow perch (Forge Pond) to 252 mcg/kg of Aroclor 1254 in a brown bullhead (BNL)
- Mercury
  - 1.04 mg/kg in largemouth bass from Forge Pond
  - 1.35 mg/kg in pumpkinseed from BNL
  - 1.05 mg/kg in largemouth bass from BNL

# Chapter 6 – Flora and Fauna Monitoring (continued)

## ■ Aquatic Sampling

- Aquatic vegetation – low levels of Cs-137
  - Non-detect to 0.02 pCi/g wet weight
- Sediments – low levels of Cs-137
  - Non-detect to 1.04 pCi/g dry weight

## ■ Precipitation Monitoring

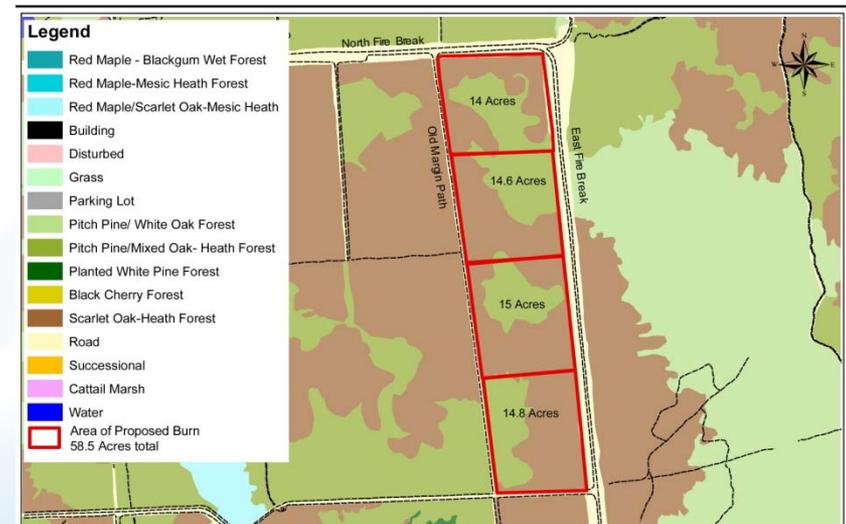
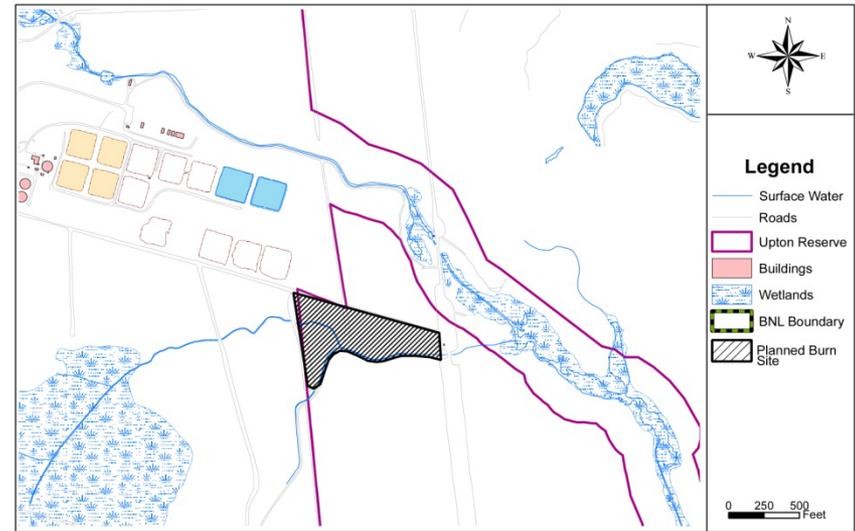
- Radiological - background
- Mercury - non-detectable to 13.5 ng/L

# Wildland Fire Management

- Wildland Fire Management Plan
  - Separate sub plan of Natural Resource Management Plan
    - Approved 09/2003
    - Describes BNL's response to wildland fire and use of prescribed treatments
    - 5 year review cycle

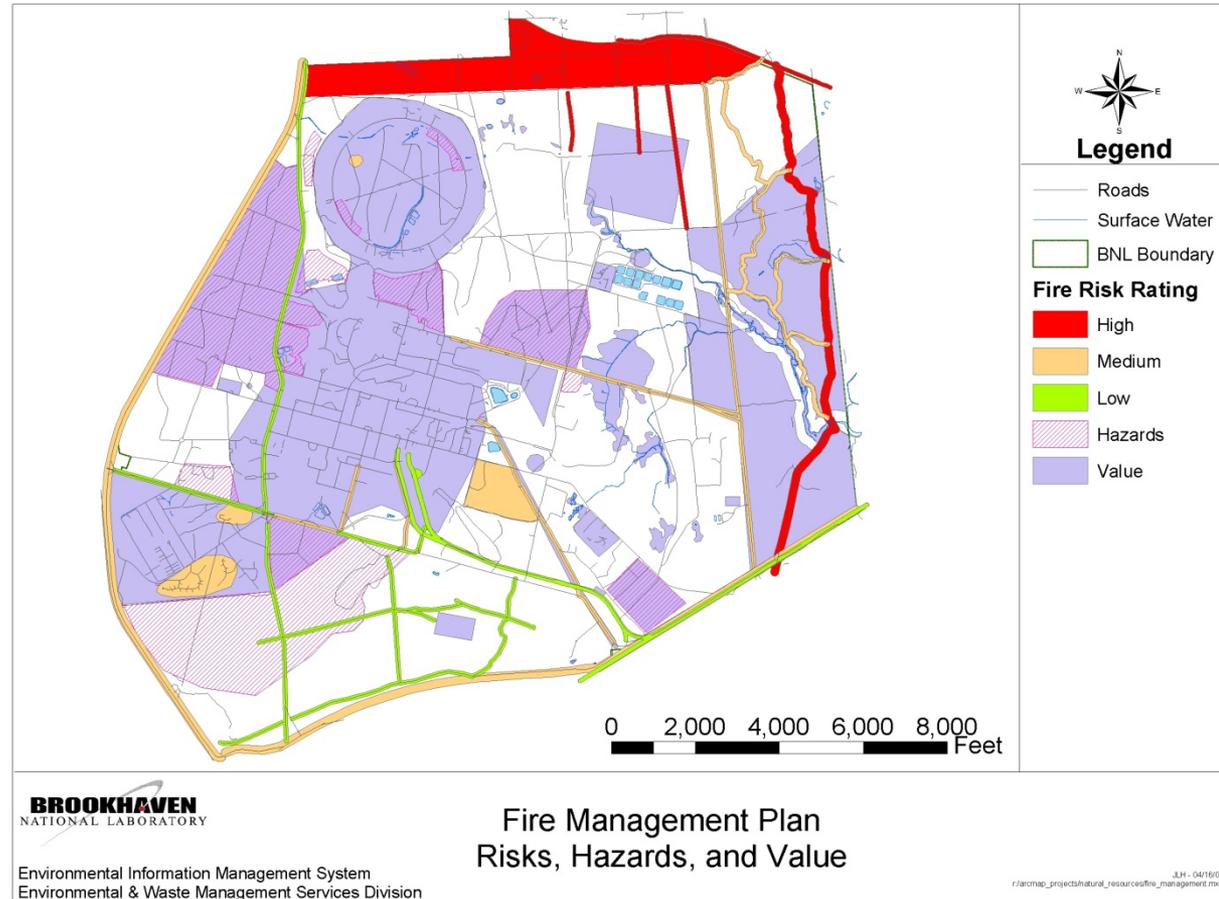
# Wildland Fire Management Plan

- Accomplishments
  - 2 Prescribed Fire Burn Plans developed
    - 1<sup>st</sup> by US Fish & Wildlife Service
    - 2<sup>nd</sup> by BNL staff w/assistance from The Nature Conservancy and NYSDEC
  - 2 Prescribed Fires in 5 years
  - Notifications
    - Originally door-to-door
    - Now – post cards



# Fire Management (Cont.)

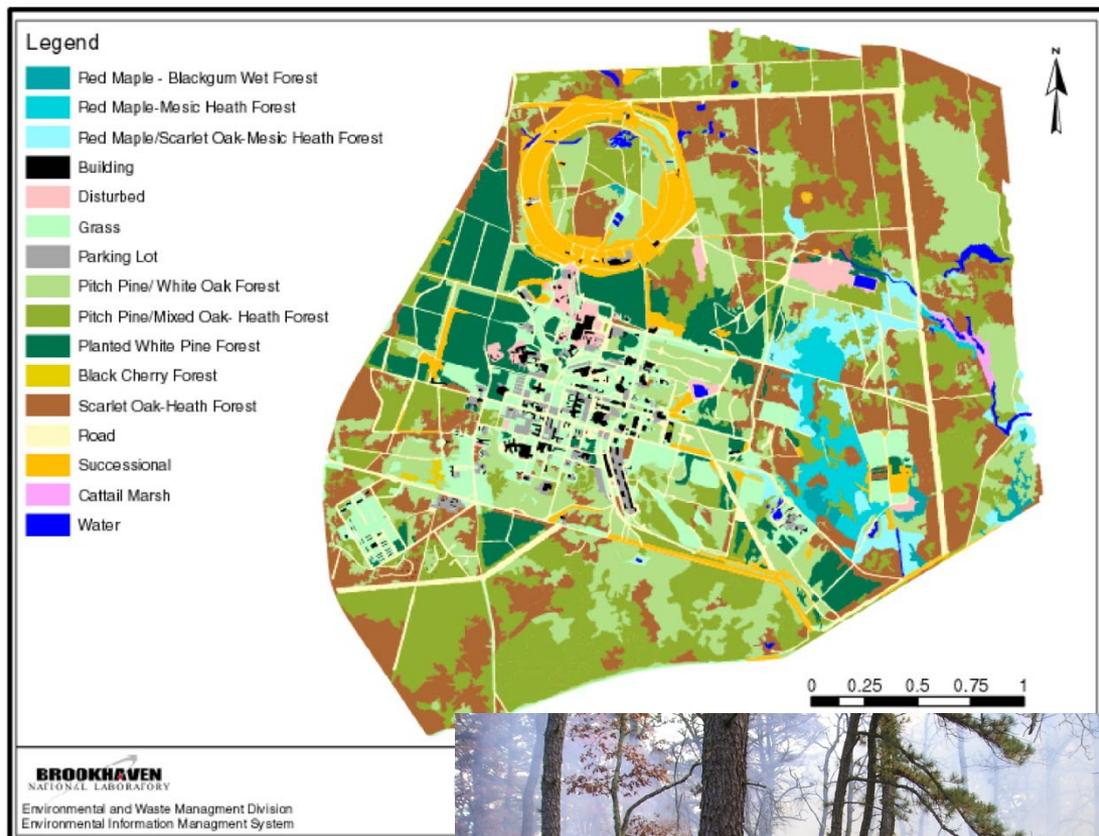
- Fire Protection Assessment
  - Risks
  - Hazards
  - Values



# Fire Management – Future Efforts

## ■ Plan Update

- Bring plan into agreement with recent updates
- Increased use of prescribed fire
- Establish agreements
  - TNC
  - NYSDEC
- Target areas for prescribed treatments
  - High Risk
  - Ecological
- Update complete by end of FY09



# Natural Resource Management Update

- Natural Resource Management Plan – Approved 12/2003.
  - Describes BNL's approach to natural resource management.
  - 65 actions included in plan
  - Annual Reporting and a 5 year review cycle

# NRMP

- Technical Advisory Group – instrumental in developing NRMP
- Maintain good relationships with stakeholders – CAC, County, NYSDEC, Pine Barrens Commission, etc.
- Work within the larger Pine Barrens ecosystem

# Deer management

- Several CAC presentations
- Spring 2008 – employee meetings
  - Lab wide survey in early October
  - Reviewing results
  - Must meet with Lab management
    - Decide path forward
  - Report back to employees
  - Another CAC presentation?



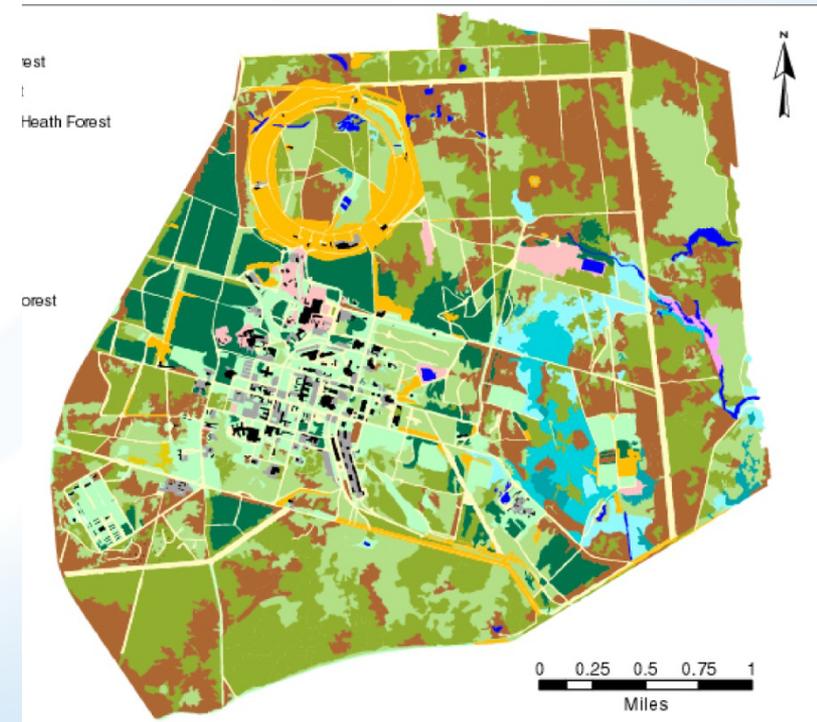
# Special Status Species

- 41 species that are NY State designated as endangered, threatened, special concern, or vulnerable
  - 29 species in 2002
  - Tiger salamander
  - Banded sunfish
  - Birds
  - Insects
  - Plants

New York State Threatened, Endangered, and Species of Special Concern.							
Common Name	Scientific Name	State Status	BNL Status	Common Name	Scientific Name	State Status	BNL Status
<b>Insects</b>				<b>Plants</b>			
Frosted elfin	<i>Callophrys iris</i>	T	Potential	Stargrass	<i>Aletris farinosa</i>	T	Confirmed
Mottled duskywing	<i>Erynnis martialis</i>	SC	Potential	Butterfly weed	<i>Asclepias tuberosa</i>	V	Confirmed
Persius duskywing	<i>Erynnis persius persius</i>	E	Potential	Spotted wintergreen	<i>Chimaphila maculata</i>	V	Confirmed
Pine Barrens Bluet	<i>Enallagma recurvatum</i>	T	Confirmed	Flowering dogwood	<i>Comus florida</i>	V	Confirmed
				Pink lady's slipper	<i>Cypripedium acaule</i>	V	Confirmed
<b>Fish</b>				Winterberry			
Banded sunfish	<i>Enniacanthus obesus</i>	T	Confirmed	Sheep laurel	<i>Kalmia angustifolia</i>	V	Confirmed
Swamp darter	<i>Etheostoma fusiforme</i>	T	Confirmed	Narrow-leaved bush clover	<i>Lespedeza augustifolia</i>	R	Confirmed
				Ground pine	<i>Lycopodium obscurum</i>	V	Confirmed
<b>Amphibians</b>				Bayberry			
Eastern tiger salamander	<i>Ambystoma tigrinum tigrinum</i>	E	Confirmed	Cinnamon fern	<i>Osmunda cinnamomera</i>	V	Confirmed
Marbled salamander	<i>Ambystoma opacum</i>	SC	Confirmed	Clayton's fern	<i>Osmunda claytoniana</i>	V	Confirmed
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>	SC	Confirmed	Royal fern	<i>Osmunda regalis</i>	V	Confirmed
				Crested fringed orchid	<i>Plantathera cristata</i>	E	Potential
<b>Reptiles</b>				Swamp azalea			
Spotted turtle	<i>Clemmys guttata</i>	SC	Confirmed	Long-beaked bald-rush	<i>Rhynchospora scirpoides</i>	R	Confirmed
Eastern box turtle	<i>Terrapene carolina</i>	SC	Confirmed	Stiff goldenrod	<i>Solidago rigida</i>	T	Confirmed
Worm snake	<i>Carphophis amoenus</i>	SC	Confirmed	New York fern	<i>Thelypteris novaboracensis</i>	V	Confirmed
Eastern hognose snake	<i>Heterodon platyrhinos</i>	SC	Confirmed	Marsh fern	<i>Thelypteris palustris</i>	V	Confirmed
				Virginia chain-fern	<i>Woodwardia virginica</i>	V	Confirmed
<b>Birds</b>							
Horned lark	<i>Eremophila alpestris</i>	SC	Potential	Notes:			
Whip-poor-will	<i>Caprimulgus vociferus</i>	SC	Likely	* information based on 6 NYCRR Part 182, 6 NYCRR Part 193, and BNL survey data.			
Vesper sparrow	<i>Pooecetes gramineus</i>	SC	Potential	No federally listed threatened or endangered species are known to occur at BNL.			
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SC	Potential	E = endangered, T = threatened, SC = species of special concern, R = rare,			
Northern harrier	<i>Circus cyaneus</i>	T	Confirmed	V = exploitably vulnerable			
Osprey	<i>Pandalion haliaetus</i>	SC	Confirmed				
Cooper's hawk	<i>Accipiter cooperii</i>	SC	Confirmed				
Sharp-shinned hawk	<i>Accipiter striatus</i>	SC	Confirmed				

# Tiger Salamander

- Tiger salamanders – confirmed at 22 locations, 5 more than in 2003
  - Includes new pond in RHIC
  - Restored Meadow Marsh and Former Waste Management Area ponds
- 3.5 year study nearing completion.
- Salamanders use a much larger area around ponds than previously thought
  - Increase from 800 ft to ~1200 ft from ponds.
- Research important for development of a recovery plan



# Banded Sunfish and Swamp Darter

- Banded Sunfish
  - 195 recovered from Peconic River
    - **Thanks Bob Conklin!**
  - 250 returned to Peconic from Zeke's Pond
  - Several thousand maintained
  - Future releases expected
  - 3 summer projects
- Swamp Darter
  - Extirpated from BNL when Zeke's dried in 2003
- Working with NYSDEC toward recovery plan for both species in NY.



# Birds

- Geese
  - Nest management implemented in 2007
  - Population went from 120 to 157
  - More aggressive management in 2008
    - 12 goslings hatched
  - Current population estimate at 148
- Turkeys
  - Population doing well
  - Fluctuates between 300 and 500 birds
  - 2008 closer to 500 birds
  - Management coming?



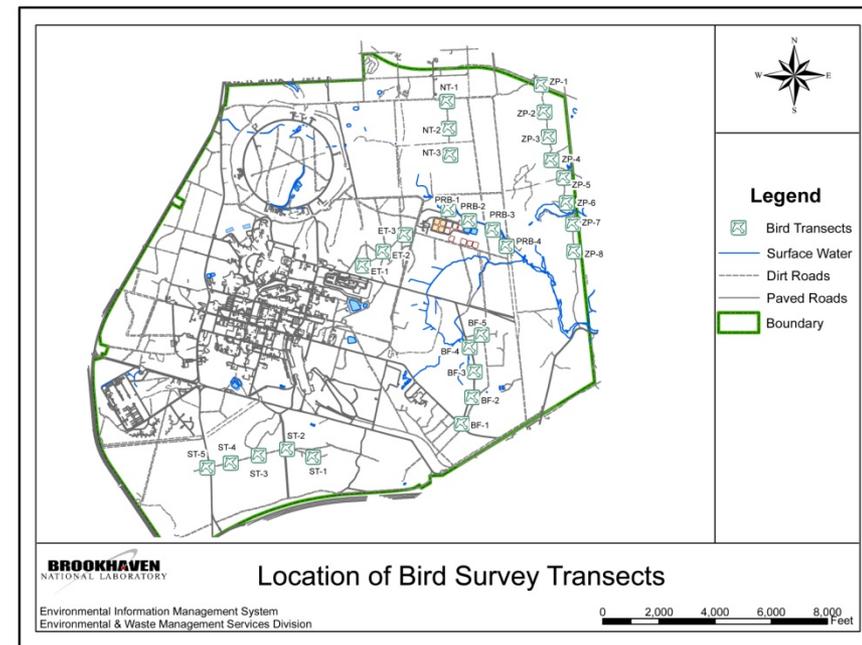
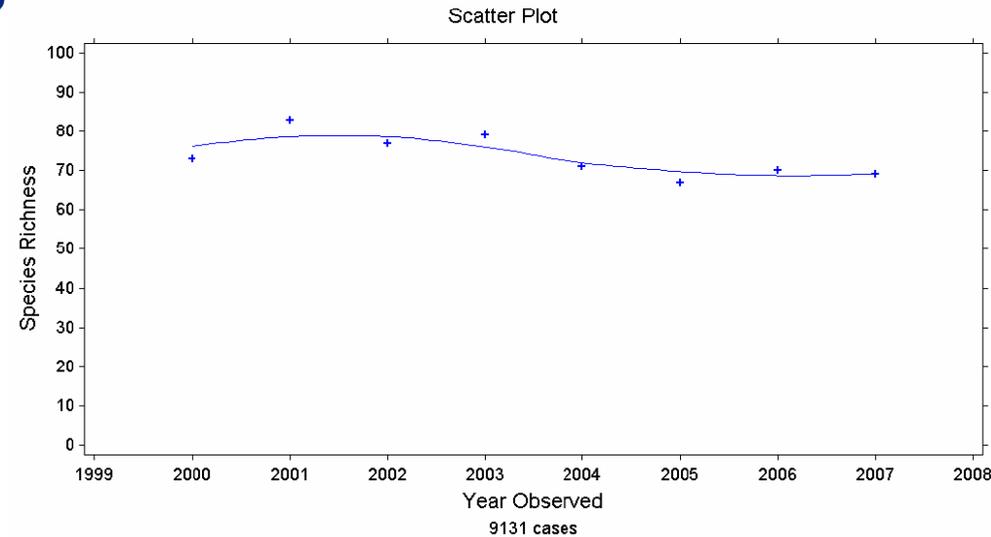
# Song bird surveys

- Nine years of monitoring
- Over 9,000 data points
- 113 species
- Areas near wetlands more diverse than away from wetlands.



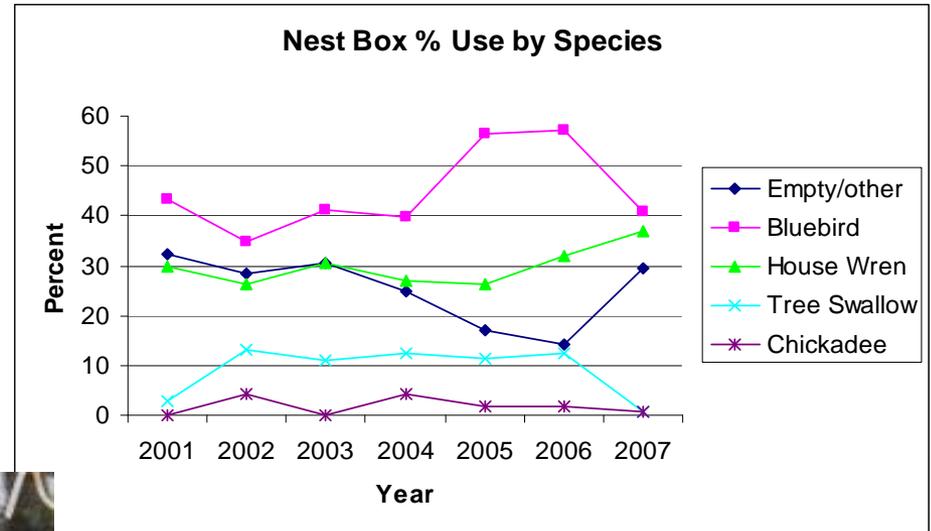
Photo taken by Toucan10000, Member of NYC Audubon PhotoSIG Forums.

## Change in Annual Bird Biodiversity Index



# Bluebirds

- 56 Nest boxes maintained and monitored by volunteer.
- 40-50% of boxes used by eastern bluebirds.



Eastern Bluebird

# Dragonflies and damselflies

- 60 species identified on BNL
  - One NY threatened species – Pine Barrens Bluet
  - 1/2 of known species from Suffolk County
  - Sparked multiple studies for interns and OSSP



**DRAGONFLIES**

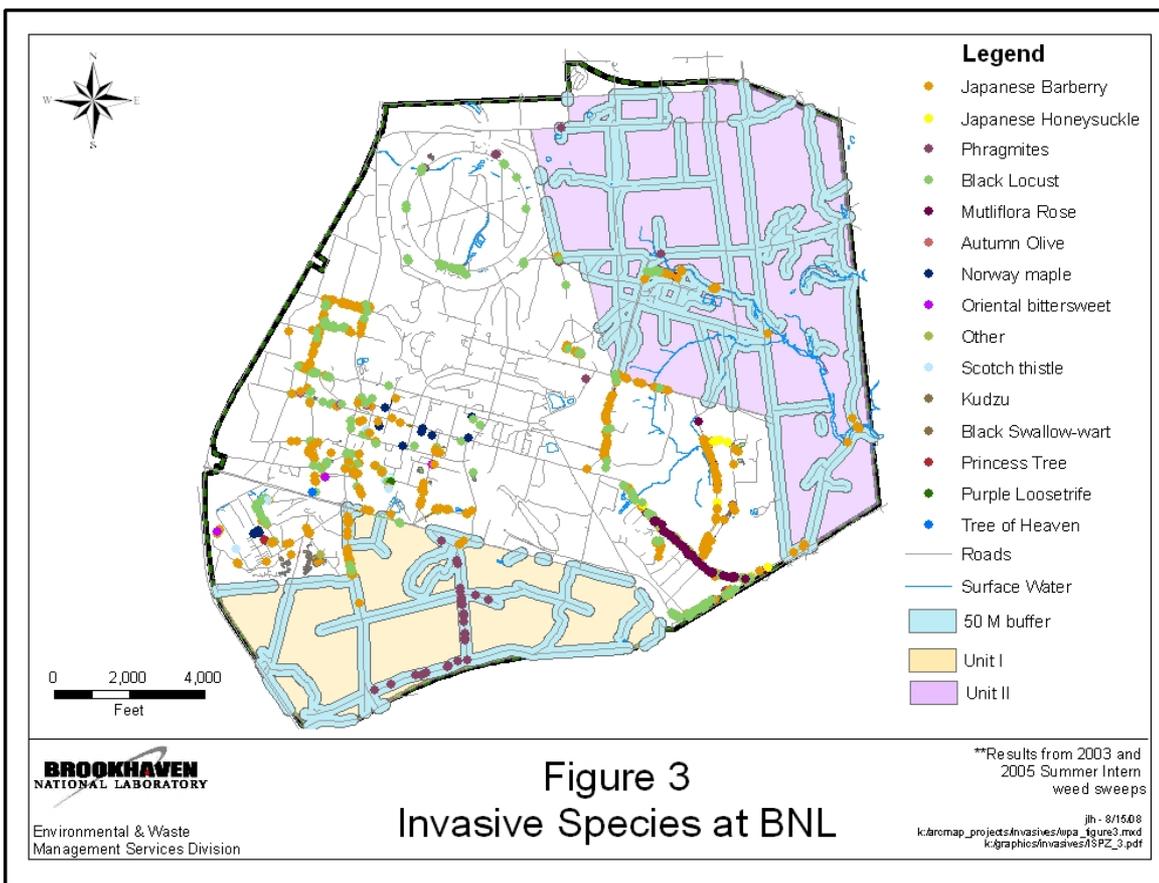
<b>Aeshnidae</b>	<b>Scientific Name</b>	<b>Libellulidae (cont.)</b>	<b>Scientific Name</b>
Shadow Darner	<i>Aeshna umbrosa</i>	Slaty Skimmer	<i>Libellula incesta</i>
Common Green Darner	<i>Anax junius</i>	Widow Skimmer	<i>Lebellula luctuosa</i>
Comet Darner	<i>Anax longipes</i>	Twelve-spotted Skimmer	<i>Libellula pulchella</i>
Swamp Darner	<i>Epeaeschna heros</i>	Painted Skimmer	<i>Libellula semifasciata</i>
Harlequin Darner	<i>Gophaeschna furcillata</i>	Band-winged Meadowhawk	<i>Sympetrum semicinctorum</i>
<b>Gomphidae</b>		Black Saddlebags	<i>Tramea lacerata</i>
Unicorn Clubtail	<i>Arigomphus villosipes</i>	Blue Dasher	<i>Pachydiplax longipennis</i>
Ashy Clubtail	<i>Gomphus lividus</i>	Carolina Saddlebags	<i>Tramea carolina</i>
<b>Corduliidae</b>		Cherry-faced Meadowhawk	<i>Sympetrum internum</i>
Common Baskettail	<i>Epithea cynosura</i>	Common Whitetail	<i>Libellula lydia</i>
Williamson's Emerald	<i>Somatochlora williamsoni</i>	Eastern Amberwing	<i>Perithemis tenera</i>
<b>Libellulidae</b>		Great Blue Skimmer	<i>Libellula vibrans</i>
Bar Winged Skimmer	<i>Libellula axilena</i>	Black Setwing	<i>Dythemis nigrescens</i>
Calico Pennant	<i>Celithemis elisa</i>	Spot-winged Glider	<i>Pantala hymenaea</i>
Halloween Pennant	<i>Celithemis eponina</i>	Wandering Glider	<i>Pantala flavescens</i>
Martha's Pennant	<i>Celithemis martha</i>	White-faced Meadowhawk	<i>Sympetrum obtrusum</i>
Eastern Pondhawk	<i>Erythemis simplicicollis</i>	Double-ringed Pennant****	<i>Celithemis verna</i>
Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>	Ruby Meadowhawk	<i>Sympetrum rubicundulum</i>
Spangled Skimmer	<i>Libellula cyanea</i>	Frosted Whiteface	<i>Leucorrhinia frigida</i>
Blue Corporal	<i>Libellula deplanata</i>	Elfin Skimmer	<i>Nannothemis bella</i>

**DAMSELFLIES**

<b>Calopterygidae</b>	<b>Scientific Name</b>	<b>Coenagrionidae (cont.)</b>	<b>Scientific Name</b>
Ebony Jewelwing	<i>Calopteryx maculata</i>	Azure Bluet	<i>Enallagma aspersum</i>
<b>Lestidae</b>		Familiar Bluet	<i>Enallagma civile</i>
Spotted Spreadwing	<i>Lestes congener</i>	Northern Bluet	<i>Enallagma cyathigerum</i>
Common Spreadwing	<i>Lestes disjunctus</i>	Atlantic Bluet	<i>Enallagma doubledayi</i>
Amber-winged Spreadwing	<i>Lestes eurinus</i>	Big Bluet	<i>Enallagma durum</i>
Sweetflag Spreadwing	<i>Lestes forcipatus</i>	Skimming Bluet	<i>Enallagma geminatum</i>
Elegant Spreadwing	<i>Lestes inaequalis</i>	Pine Barrens Bluet	<i>Enallagma recurvatum</i>
Slender Spreadwing	<i>Lestes rectangularis</i>	Orange Bluet	<i>Enallagma signatum</i>
Lyre-tipped Spreadwing	<i>Lestes unguiculatus</i>	Citrine Forktail	<i>Ischnura hastata</i>
Swamp Spreadwing	<i>Lestes vigilax</i>	Fragile Forktail	<i>Ischnura posita</i>
<b>Coenagrionidae</b>		Rambur's Forktail	<i>Ischnura ramburii</i>
Marsh Bluet	<i>Enallagma ebrium</i>	Eastern Forktail	<i>Ischnura verticalis</i>
Variable Dancer	<i>Argia fumipennis</i>	Sphagnum Sprite	<i>Nehalennia gracilis</i>

# Invasive Species

- Most invasive plants are mapped
- Established two invasive species management zones
- Working with Pine Barrens Commission for limited removals



# Upton Reserve/FERN

- Upton Ecological and Research Reserve
  - Developed as part of NRMP
  - 4 years of funding – many, many projects
  - U.S. Fish & Wildlife Service personnel had key role in NRMP and Wildland Fire Management Plan development
  - Transition to FERN began in 2003
- Foundation for Ecological Research in the Northeast
  - Established 11/25/2003
  - Conducts work throughout Pine Barrens

# Internships

- Highly successful program
  - 2001 – 1 intern, 1 mentor
  - 2008 – 1 professor, 2 teachers, 14 college interns, 3 high school interns, 5 mentors
    - Through 2008 - 71 college interns, 8 teachers, 9 high school interns, 2 graduate students, 3 college professors for a total of 105 experiences
  - 2009 will necessarily be smaller due to loss of two mentors

# Internships

- Dozens of projects completed on many topics including:
  - Southern Leopard frog, tiger salamanders, radio telemetry on multiple species (salamanders, fox, turtles, snakes), genetics, forest health, wetland health, microbial distributions in forest soil, odonate surveys, statistical analysis of data, water quality, linkages between soil and water chemistry, aquatic invertebrate distributions, deer, and banded sunfish.
  - Open Space Stewardship Program evolved out of Natural Resource Program internships

# Plan Update

- Maintain and build upon existing actions
  - Positive relations with stakeholders
  - T&E species management
  - Fire management and prescribed fire
  - Educational opportunities
- Added focus on unresolved actions and actions in progress
  - Deer management
  - Nuisance animals, Feral cats
  - Invasive species
  - Wetland enhancements
- Add in actions for emerging issues
  - Climate change and ecological effects
- Identify additional funding sources
  - NYS Invasives Management funds
  - Other Federal funds?

# Plan Update (cont.)

- Process
  - Technical Advisory Group – used to review final document only
    - Many representatives are over extended with work assignments
  - Document progress in past five years
  - Identify new priorities
  - Hold round tables on more sensitive issues
  - Write plan appropriately
- Time frame
  - Completion and approval by end of FY2009