

Brookhaven National Laboratory

Natural Resource Management Plan

Annual Report

Calendar Years 2010 & 2011

Introduction

This document summarizes activities carried out under Brookhaven National Laboratory's (BNL) Natural Resource Management Plan (NRMP) during calendar years 2010 and 2011. Previous year's reports may be obtained from BNL's Cultural and Natural Resource Manager. All activities carried out under the NRMP during CY2010 and CY2011 will be discussed and the report will facilitate development of summary information for the Site Environmental Report for 2011.

Comprehensive Natural Resource Management Plan

An update to the comprehensive Natural Resource Management Plan originally issued in 2003 was completed in 2011. The update continues to build on successes and efforts to better understand the ecosystems and natural resources found on the BNL site.

This report discusses work related to actions established within the NRMP and through subsequent annual reviews. Incremental changes from annual reviews will be incorporated annually with the completion of the required Annual Report. All incremental changes will be addressed during the 5-year re-write of the Plan.

Progress

1. Annual Report.

An annual summary report of activities under the NRMP was written for CY2009. This report covers CY2010 and CY2011. No report was written in CY2010 due to other higher priority work assignments.

2. NRMP Update.

An update to the 2003 Plan was completed in 2011. The NRMP is typically reviewed and updated every five years. This review and update was delayed to develop documents associated with a new third party facility, the Long Island Solar Farm (LISF). This two hundred-acre facility resulted in significant changes to the plan warranting the delay.

3. Adapt management based on new information.

This report acts as a summary of actions taken in 2010 just prior to the update of the NRMP and the first review in the Adaptive Management cycle for the 2011 update and is unlikely to result in the need for significant changes. The adaptive management approach was used in updating the NRMP.

4. Maintain & improve relationships with stakeholders.

The NYSDEC is routinely consulted on wildlife issues and they participated in tiger salamander egg mass surveys in 2011. BNL personnel facilitated setting waterfowl hunting seasons on Long Island; and natural resource staff continue to participate with local agencies on issues involving the Pine Barrens Region including the Advisory Council, Protected Lands Council, Pine Barrens Research Forum, International Twinings (Migliarino-San Rosore- Massaciucolli Park in Pisa, Italy), the Wildfire Task Force, the New York State Wildfire and Incident Management Academy, and assist the State and the US Fish & Wildlife Service with prescribed fire operations. Natural resource management is often a topic for presentation and discussion with BNL's Community Advisory Council and the Department of Energy's Brookhaven Executive Roundtable.

5. Improve decision-making through use of innovative tools/ Develop & maintain natural resource and cultural resource data layers in GIS/ Use GIS to assist in mapping and planning/Maintain meta-data for GIS data.

The use of global positioning systems (GPS) and geographic information systems (GIS) are routinely utilized in the Natural Resource and Cultural Resource Management program. The only significant new addition in 2010 and 2011 was the spatial data for the LISF. GPS and GIS continue to be used for planning and evaluation of environmental factors associated with construction and other major projects occurring at BNL.

6. Determine functionality of BNL central wetlands/ Maintain or improve wetland functions/Explore implementation of wetland monitoring protocols at BNL.

Due to funding and other resource constraints, this has not yet been started.

7. Monitor for flow and water quality.

Peconic River flow is measured at several locations including above the outfall (HE), down river at the East Firebreak (HMn), and near the boundary of the Laboratory (HQ). In addition, flows from the central wetlands are monitored before they enter the Peconic River station at the East Firebreak (HMs), and flows from the STP are measured prior to discharge into the Peconic River. Flow data for 2010 is presented in Figure 1 and flow data for 2011 is presented in Figure 2. In 2010 flow data indicated a typical wet spring followed by drying conditions when the river began recharging to groundwater. Flows at HM-N indicate combined flows of the STP discharge as well as river flows from upstream of the discharge pipe. By July 2010 all onsite flows consisted primarily of the STP Discharge.

Figure 1. Peconic River Flow Data for 2010.

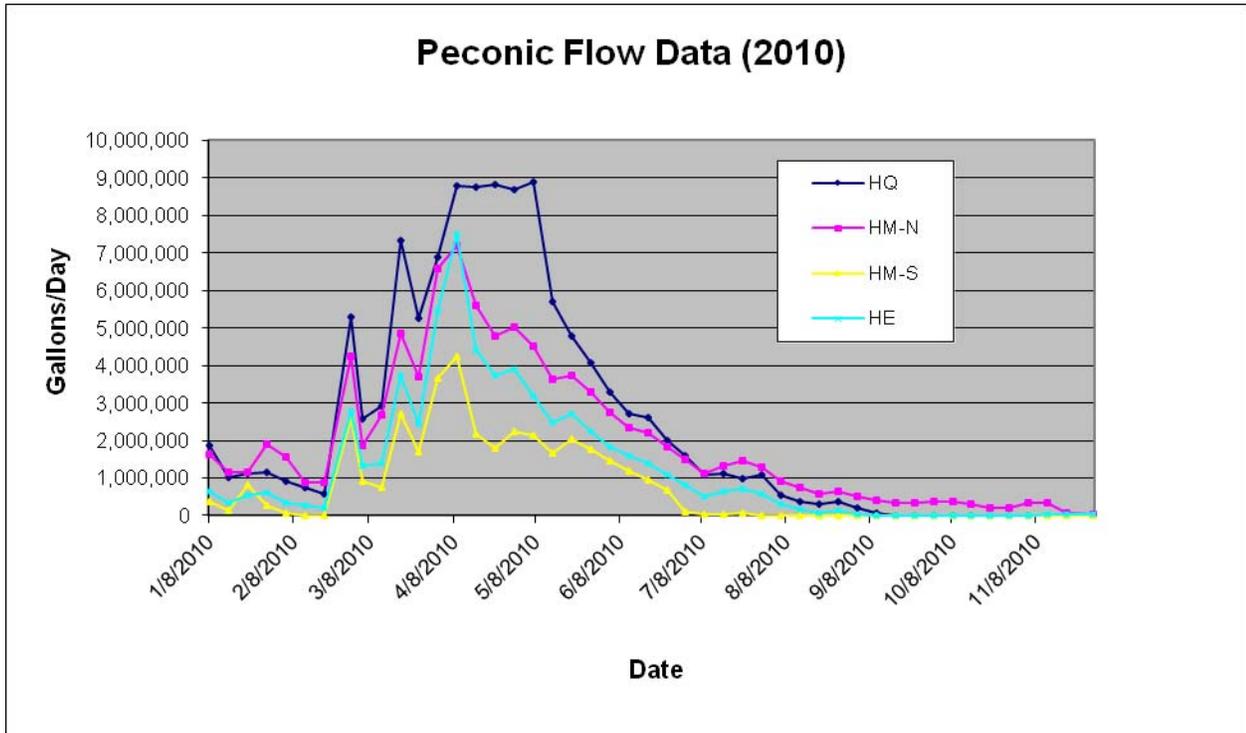
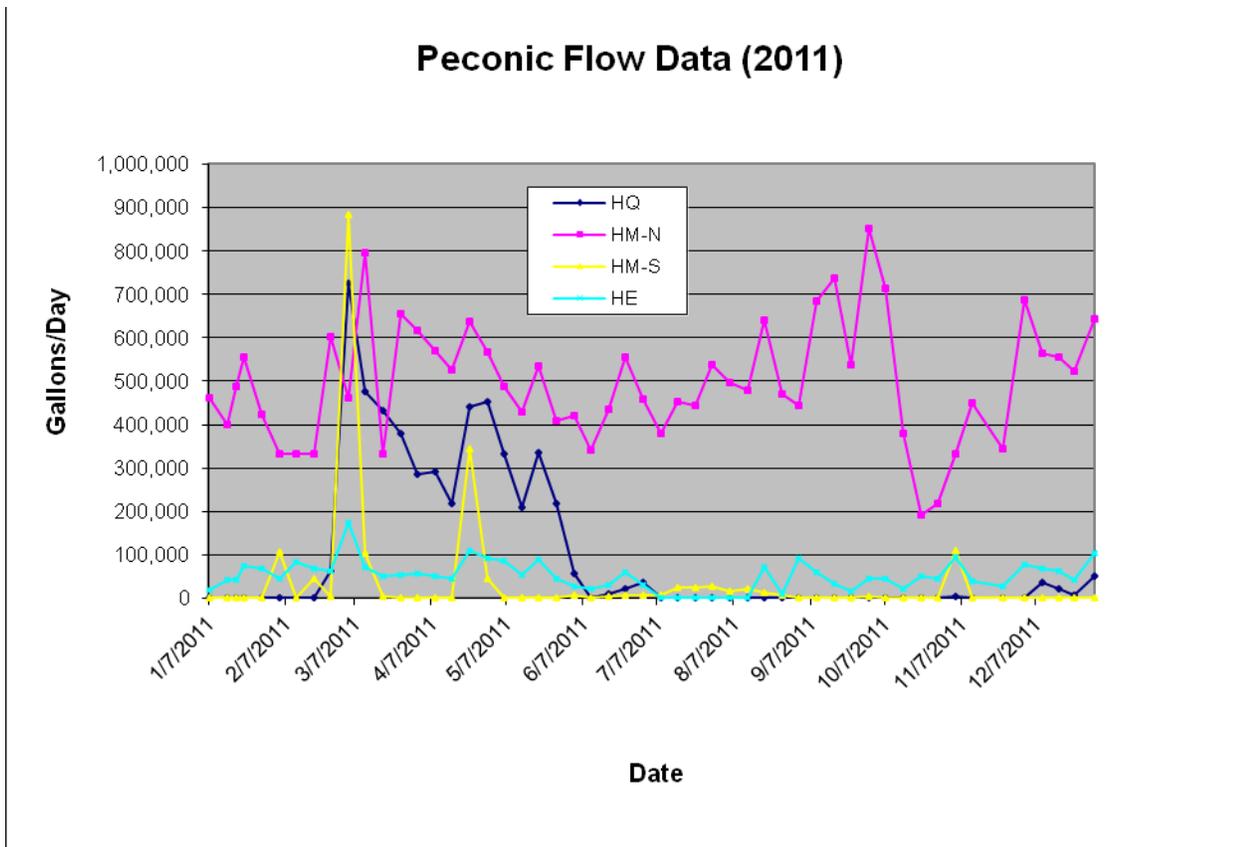


Figure 2. Peconic River Flow Data for 2011.



Overall, 2011 was a very dry year. Some corrections had to be made for HM-N because the totalizer data seemed flawed and upon reviewing the associated flow charts, it was clear that there was some issue with the monitoring system. Weir measurements that are collected by the Field Sampling Team each week were then used to calculate the average flows for the week.

Water quality is monitored as a requirement of BNL's State Pollutant Discharge and Elimination System (SPDES) permit. Water quality is measured at various outfalls including the STP discharge to the Peconic River and at several recharge basins that receive stormwater and/or once through cooling water. Results are reported to the NYSDEC on a monthly basis and summarized in the Site Environmental Report each year. The Site Environmental Report for the previous year is made available in October and may be viewed via the Internet at <http://www.bnl.gov/esd/SER.asp>. Sampling in 2010 and 2011 did not indicate any concerns for threatened or endangered species within basins or the Peconic River.

8. Explore creating wildlife viewing areas.

Due to time and resource constraints this has not yet been started.

9. Evaluate removal of barriers to fish migration on site.

This action is planned for 2014 in association with the diversion of Sewage Treatment Plant discharges to groundwater.

10. Fish sampling with NYSDEC/Cold Spring Harbor due to remediation.

Fish sampling in cooperation with the NYSDEC is ongoing. Sampling occurred in both 2010 and 2011, but in 2012 it will be limited to environmental monitoring samples. Post-remediation fish monitoring will be an every-other-year event. The next onsite sampling of fish will occur in 2013.

11. Evaluate continued need for environmental monitoring of fish.

Evaluation of the need for fish monitoring will occur once the STP begins discharging to groundwater in 2014.

12. Monitor ATV use and damage.

BNL works with the Pine Barrens Law Enforcement Task Force and on-site security in an effort to deter ATV riders, but more needs to be done to prevent further destruction of important habitat. ATVs continue to utilize the Laboratory illegally and have been seen as far as the central portions of the lab.

13. Establish deer exclosures associated with 4 forest health monitoring plots.

In 2011 student interns implemented the forest health monitoring protocols in three existing forest health monitoring plots and created 3 new plots adjacent to the existing ones for the establishment of deer exclosures. The fourth plot could not be monitored and the final deer exclosure plot could not be established because of access restrictions due to the construction of the LISF. The deer exclosures themselves will be constructed in 2012 and monitoring data will be collected at the final forest health plot and new deer exclosure site in 2012 as well.

14. Develop cooperative agreement with NYSDEC to implement prescribed fire.

Following discussions with the NYSDEC and DOE, BNL is currently exploring the insertion of language directly into the Fire Management Plan stating that resources will be shared among both parties to

engage in prescribed fire operations on both State and DOE lands. Due to liability issues, it will be virtually impossible for someone from the NYSDEC to act as a burn boss on DOE lands so we are pursuing an agreement with the US Fish & Wildlife Service to provide this support under the direction of the BNL Natural Resource Manager and NYSDEC Forest Rangers.

15. Implement Fire Management Plan/Implement use of prescribed fire and mechanical fuel reduction.

A prescribed fire was performed on site as part of the 2011 Wildfire and Incident Management Academy. Ideally, however, these burns would occur during the growing season and natural resource staff are working to expand prescribed burning operations beyond the Academy. See action item #14.

16. Investigate having timber companies come in to thin white pine stands.

This has not yet been started.

17. Investigate use of NY Wildfire & Incident Management Academy for management of white pines.

The S-212 Wildland Fire Chain Saws class given at the Fire Academy requires field sites for students to practice tree felling. BNL may be able to take advantage of this manpower to manage the white pines on-site. Many of the white pine stands on-site require selective thinning to promote new growth, however, the advice of a forester is needed to determine precisely how this should be done. In addition, each stand must be evaluated individually as they may be too dense to be safely used for practice by inexperienced sawyers. If the sites would not present a meaningful learning experience for the students they will not be used and other alternatives will be explored.

18. Use native vegetation on restorations and new construction landscaping.

Planting lists containing native and non-native non-invasive species have been distributed to BNL's Facilities & Operations Division as a tool to aid in planning for new construction landscaping. Only native species and, if possible, local genotypes are being recommended for use in restoration projects. The LISF has been utilizing native grasses for replanting and will continue to do so.

19. Re-survey the current Invasive Species Prevention Zone (ISPZ), explore addition of new areas to ISPZ and rewrite ISPZ plan/ Monitor distribution of invasive species.

Due to resource/personnel constraints this has not yet been started. This action is a priority, however, as invasive species are being actively managed on site.

20. Manage invasive plants where possible.

In 2011 EEA, Inc. was contracted to treat invasive plants on-site. Approximately 3 acres of black swallow-wort were treated with a foliar application of the herbicide triclopyr along First Path south of East Fifth Avenue.

Japanese barberry was treated using a "cut-stump" application of the herbicide glyphosate in 3 locations. This occurred along Weaver Road adjacent to Weaver Pond, along Upton Road between Brookhaven Avenue and West Fifth Avenue, and along East Princeton Avenue adjacent to the pond TS-10. In total, approximately 15 acres of Japanese barberry was treated in 2011. These areas will be spot treated in 2012 to kill re-sprouts and seedlings. Additional areas will be treated as budget allows.

21. *Maintain and monitor bird nests/boxes for bluebirds, kestrels & wood duck.*

Nest boxes are important for many species of birds because of the lack of suitable habitat. This is particularly true of birds that utilize cavities for nesting. The eastern bluebird is one of the better known birds for which nest boxes are important. Because a volunteer was no longer available to collect data and monitor nest boxes, there is no data for 2011. Additionally, many a significant number of boxes were removed in 2010 ahead of the LISF construction. New nest boxes will be installed in 2012 and 2013 in areas around the LISF and monitoring and data collection will resume.

22. *Work with LISF to install nest boxes on-site once construction is completed/ Add nest box locations and other data to GIS library.*

Construction on the LISF was completed in November 2011; therefore, nest box installation will begin in 2012. Locations will be added to the GIS library at that time.

23. *Maintain special status species list.*

The list was reviewed during completion of the 2011 NRMP update. Federal and State lists are monitored through the regulatory compliance software called CyberRegs and will continue to be updated as needed. **Error! Reference source not found.** contains a list of all special status species either confirmed to be present on site or likely to be present on site.

Table 1. New York State Special Status Species at BNL.

New York State Threatened & Endangered Species, Species of Special Concern, & Species of Greatest Conservation Need			
Common Name	Scientific Name	State Status	BNL Status
Insects			
Comet darner	<i>Anax longipes</i>	SGCN	Confirmed
Frosted elfin	<i>Callophrys iris</i>	T	Likely
New England bluet	<i>Enallagma laterale</i>	SGCN	Likely
Little bluet	<i>Enallagma minusculum</i>	T	Confirmed
Scarlet bluet	<i>Enallagma pictum</i>	T	Likely
Pine Barrens bluet	<i>Enallagma recurvatum</i>	T	Confirmed
Mottled duskywing	<i>Erynnis martialis</i>	SC	Likely
Persius duskywing	<i>Erynnis persius persius</i>	E	Likely
Fish			
Banded sunfish	<i>Enniacanthus obesus</i>	T	Confirmed
Swamp darter	<i>Etheostoma fusiforme</i>	T	Confirmed
Amphibians			
Marbled salamander	<i>Ambystoma opacum</i>	SC	Confirmed
Eastern tiger salamander	<i>Ambystoma tigrinum tigrinum</i>	E	Confirmed
Fowler's toad	<i>Bufo fowleri</i>	SGCN	Confirmed
Four-toed salamander	<i>Hemidactylium scutatum</i>	SGCN	Confirmed
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>	SC	Confirmed
Reptiles			
Worm snake	<i>Carphophis amoenus</i>	SC	Confirmed
Snapping turtle	<i>Chelydra serpentina</i>	SGCN	Confirmed
Spotted turtle	<i>Clemmys guttata</i>	SC	Confirmed
Northern black racer	<i>Coluber constrictor</i>	SGCN	Confirmed

Eastern hognose snake	<i>Heterodon platyrhinos</i>	SC	Confirmed
Stinkpot turtle	<i>Sternotherus odoratus</i>	SGCN	Confirmed
Eastern box turtle	<i>Terrapene carolina</i>	SC	Confirmed
Eastern ribbon snake	<i>Thamnophis sauritus</i>	SGCN	Confirmed
Birds (nesting, transient, or potentially present)			
Cooper's hawk	<i>Accipiter cooperii</i>	SC	Confirmed
Sharp-shinned hawk	<i>Accipiter striatus</i>	SC	Confirmed
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SC	Confirmed
Great egret	<i>Ardea alba</i>	SGCN	Confirmed
Whip-poor-will	<i>Caprimulgus vociferus</i>	SC	Likely
Northern harrier	<i>Circus cyaneus</i>	T	Confirmed
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	SGCN	Confirmed
Northern bobwhite	<i>Colinus virginianus</i>	SGCN	Confirmed
Prairie warbler	<i>Dendroica discolor</i>	SGCN	Confirmed
Horned lark	<i>Eremophila alpestris</i>	SC	Confirmed
Wood thrush	<i>Hylocichla mustelina</i>	SGCN	Confirmed
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	SC	Confirmed
Osprey	<i>Pandion haliaetus</i>	SC	Confirmed
Scarlet tanager	<i>Piranga olivacea</i>	SGCN	Confirmed
Glossy ibis	<i>Plegadis falcinellus</i>	SGCN	Confirmed
Brown thrasher	<i>Toxostoma rufum</i>	SGCN	Confirmed
Blue-winged warbler	<i>Vermivora pinus</i>	SGCN	Confirmed
Plants			
Stargrass	<i>Aletris farinosa</i>	T	Confirmed
Butterfly weed	<i>Asclepias tuberosa</i>	V	Confirmed
Spotted wintergreen	<i>Chimaphila maculata</i>	V	Confirmed
Flowering dogwood	<i>Cornus florida</i>	V	Confirmed
Pink lady's slipper	<i>Cypripedium acaule</i>	V	Confirmed
Winterberry	<i>Ilex verticillata</i>	V	Confirmed
Sheep laurel	<i>Kalmia angustifolia</i>	V	Confirmed
Narrow-leafed bush clover	<i>Lespedeza augustifolia</i>	R	Confirmed
Ground pine	<i>Lycopodium obscurum</i>	V	Confirmed
Bayberry	<i>Myrica pensylvanica</i>	V	Confirmed
Cinnamon fern	<i>Osmunda cinnamomera</i>	V	Confirmed
Clayton's fern	<i>Osmunda claytoniana</i>	V	Confirmed
Royal fern	<i>Osmunda regalis</i>	V	Confirmed
Crested fringed orchid	<i>Plantathera cristata</i>	E	Likely
Swamp azalea	<i>Rhododendron viscosum</i>	V	Confirmed
Long-beaked bald-rush	<i>Rhynchospora scirpoides</i>	R	Confirmed
Stiff goldenrod	<i>Solidago rigida</i>	T	Confirmed
New York fern	<i>Thelypteris novaboracensis</i>	V	Confirmed
Marsh fern	<i>Thelypteris palustris</i>	V	Confirmed
Virginia chain-fern	<i>Woodwardia virginica</i>	V	Confirmed
Notes: * information based on 6 NYCRR Part 182, 6 NYCRR Part 193, and BNL survey data.			
No federally listed threatened or endangered species are known to occur at BNL.			
E = endangered, T = threatened, SC = species of special concern, R = rare, V = exploitably vulnerable, SGCN = species of greatest conservation need			

24. Identify habitats of special status species.

As new species are added to the special status species list for New York State, habitats for these species are identified. No new species have been added recently so there has been no need to identify habitats.

25. Confirm presence/absence of Frosted Elfin/Habitat assessment for lupine/Increase lupine populations; maintain & enhance lupine habitats.

The Frosted Elfin is a small orange-brown butterfly that is dependent on wild lupine. Historically, the Frosted Elfin was found along the south boundary and LIRR right of way at the south east corner of the Lab. This area is typified by soil disturbance that enhances habitat for wild lupine that in turn provides habitat for the butterfly. Due to the lack of suitable habitat of sufficient size, the Frosted Elfin is unlikely to occur on site. Wild lupine likes disturbed soil areas as is found along the south firebreak at the southeast corner of the Lab. Disturbance of the primary area of lupine has not yet resulted in additional plants establishing. Areas favorable for the growth of lupine have been identified. Seeds were collected in 2011 from the small existing population located within the LISF and will be planted in 2012 to increase the existing population as well as to create new ones.

26. Monitor for banded sunfish and survey for swamp darter/ Explore re-introduction of both species to on-site portions of the river/ Remove predatory fish.

Monitoring of banded sunfish populations was done as part of summer student research projects in 2011. Swamp darter was not found at this time. The banded sunfish population in Zeke's Pond was estimated at approximately 6,430 individuals—an increase of over 62% from the 2007 estimate.

Re-introduction of these species will be explored in the future as natural restoration of the vegetation along the Peconic River continues. Once the STP begins discharging to groundwater it is possible that more suitable habitat will be created and re-introduction of banded sunfish and swamp darter can be further explored at that time.

Removal of predatory fish is done only as needed and since few predatory fish were found in 2011, there is currently no need for removal efforts.

27. Annual tiger salamander egg mass and larval surveys at breeding ponds.

No formal surveys of tiger salamander egg masses were conducted in 2010, however, larvae were noted in ponds TSW6a & b. Egg mass surveys were conducted 2011 with the help of the DEC and students.

28. Conduct songbird surveys.

Songbird surveys have been carried out since May 2000 and since that time 117 species have been documented. Monitoring involves recording ambient weather conditions at the beginning and end of each of the eight routes, and counting the number of individuals of each species heard or seen during a five minute period at each point on the route. The detailed information is tracked in a database that is updated annually. In 2010, 1 new transect was added in order to begin more targeted monitoring of bird species at the LISF. Points are spaced approximately 300 meters apart to prevent overlap of counts from point to point.

Monitoring is carried out monthly from April through September each year. The current summary of monitoring is provided in Table 2 below and Figure 3 shows the trends in species counts from year to year for each transect.

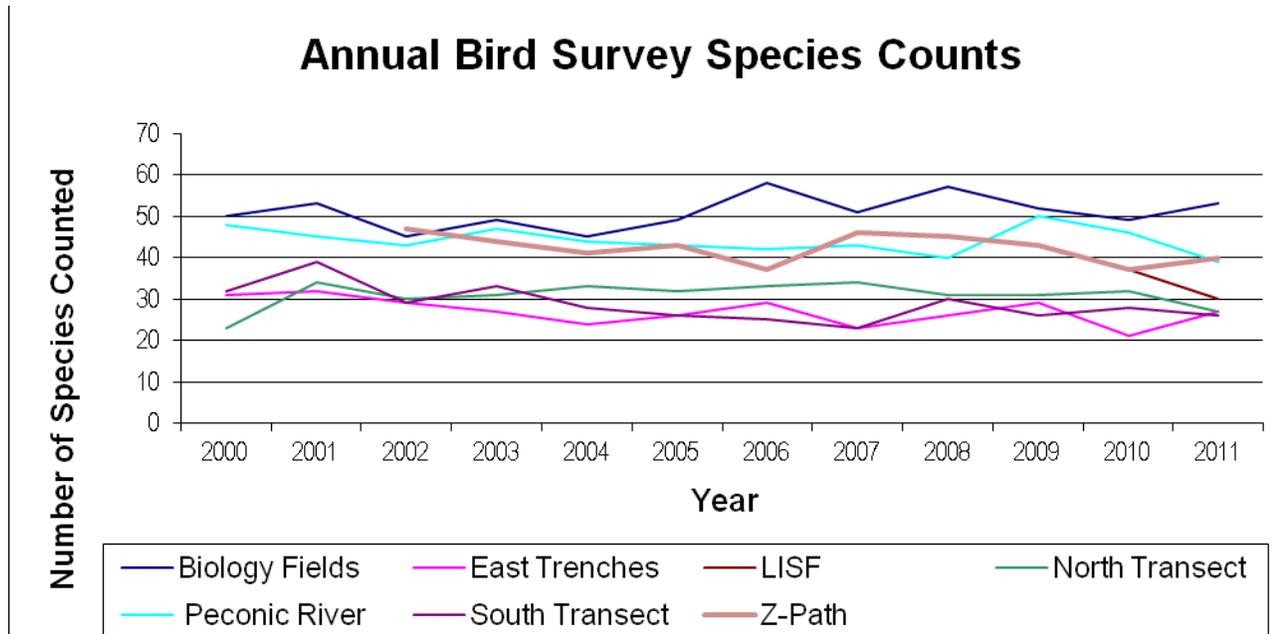
In 2010, 71 species of birds were detected and in 2011 62 species were detected. Routes next to wetlands (Peconic River, Biology Fields, and Z-path routes) continue to have the highest number of species detected. This is likely due to higher biodiversity in these habitats that support a greater variety of nesting sites and foraging opportunities. Results along the Z-Path route are also beginning to indicate high number of species, likely due to the variability of habitats along this route. The Z-Path route goes through the most diverse habitats, ranging from pine forest, to wetlands, to mixed forest.

Bird surveys will continue in 2012; however the decision was made to limit surveys to the May-August timeframe because only winter residents are typically being detected in April and September.

Table 2. Results of Bird Surveys by Transect 2000-2011.

Year	# of Species Identified	# New Species Identified	Total # of Species	# of Species Biology Fields	# of Species East Trenches	# of Species LISF	# of Species North Transect	# of Species Peconic River	# of Species South Transect	# of Species Z-Path
2000	70	-	70	50	31	-	23	48	32	-
2001	73	23	93	53	32	-	34	45	39	-
2002	73	6	99	45	29	-	30	43	29	47
2003	79	4	103	49	27	-	31	47	33	44
2004	68	2	105	45	24	-	33	44	28	41
2005	67	3	108	49	26	-	32	43	26	43
2006	70	2	110	58	29	-	33	42	25	37
2007	69	1	111	51	23	-	34	43	23	46
2008	70	2	113	57	26	-	31	40	30	45
2009	71	1	114	52	29	-	31	50	26	43
2010	71	1	115	49	21	37	32	46	28	37
2011	62	2	117	53	27	30	27	39	26	40

Figure 3. Trends in species counts by transect from 2000-2011.



29. Monitor turkey populations/Provide NYSDEC with sighting reports/Cooperate with NYSDEC management actions.

Turkey populations appear to have stabilized in recent years and consist of approximately 350-500 birds. No surveys were completed 2010 or 2011.

30. Monitor Canada goose populations/Manage goose populations by oiling eggs.

In 2010, approximately 105 geese were counted in the spring, but by 2011 it was down to about 85 individuals.

Oiling of goose eggs was continued in 2011, however, several nests were missed and the population increased to pre-management population of approximately 125.

No goose banding occurred in 2010. In June 2011, however, the NYSDEC was able to band approximately 30 birds.

31. Odonate surveys.

No Odonate surveys were conducted in 2010 or 2011. These will begin again once the necessary resources become available.

32. Reptile & amphibian surveys.

Some limited shell-notching of Eastern box turtles was conducted in 2010. In 2011 radio telemetry of box turtles was initiated in addition to shell-notching. Using the telemetry data collected, student interns explored factors influencing home ranges as well as the behavioral ecology of box turtles at the Lab. These surveys and collection of telemetry data will continue in 2012 with student interns. Reports of 2011 activities may be found at: <http://www.bnl.gov/esd/wildlife/research.asp>.

33. Environmental assessment under NEPA for deer management/Establish & implement deer management.

Initial planning for the Environmental Assessment was discussed with DOE in 2011. The EA will be completed and management planning will be initiated in 2012.

34. Continue deer population estimation.

Construction of the LISF in 2010 and 2011 impeded survey routes; therefore, no surveys were conducted during this time. Surveys were resumed late in 2011 with completion of winter surveys in January 2012.

35. Establish feral, free-ranging nuisance animal policy/Implement BNL policy on feral animals.

Under the current policy, all stray dogs and those cats living outside of approved colonies are brought to the Brookhaven Animal Shelter for disposition. BNL is currently investigating the humane euthanasia of nuisance animals that become trapped in buildings and cannot be released back into the environment without becoming a recurring problem.

36. Keep informed of LCC research findings and management recommendations/Explore possibility of performing research on local effects of climate change on-site.

Little has changed since the initial consultation with the Landscape Conservation Cooperative (LCC). They are aware of BNL's interest in keeping abreast of new developments in climate change research as well as the potential to conduct research on-site. Natural resource staff are exploring the possibility of joining the National Phenology Network and establishing routes to collect phenology data in the future.

37. Provide educational material or opportunities to BNL staff & public on environmental issues.

Natural Resource Management staff actively participated in Earth Week activities in 2010 and 2011, participated in the Green Institute, as well as the Open Space Stewardship Program, and provided hands on experience during Pine Barrens Discovery Day.

38. Continue to host interns to assist with and conduct research on-site.

Every year, interns are hosted to conduct ecological and wildlife research to assist in understanding how the natural environment works. The information gained from these projects is used to make management decisions at the Laboratory. Interns are high school or undergraduate students participating in BNL's Office of Education summer programs. During 10 weeks, the students conduct experiments, population surveys, ecological monitoring, and other natural resource investigations. Students are required to complete a paper and/or poster as part of their internship.

In 2010, students worked on various projects including flying squirrel radio telemetry, tiger beetle surveys, heavy metals in air and soils, vegetation composition of Pine Barrens, and baseline surveys of biomass distribution among others. Much of the research conducted took place in the area where the LISF was to be located and will serve as baseline data for future studies.

In 2011, students collected radio telemetry data on flying squirrels and eastern box turtles to determine home ranges and movements; conducted surveys for bat species present both at the Lab and throughout parts of eastern Long Island; collected data on the distribution of banded sunfish in the

Pine Barrens region; and collected forest health data--specifically examining litter depths, understory composition, and tree regeneration.

Each intern was responsible for their own research as well as assisting each other in the collection of data. Results of the research were presented in a poster session sponsored by the Office of Education Programs, and the research was also presented at a poster session at the Pine Barrens Research Forum. Papers and posters resulting from these projects can be found online at <http://www.bnl.gov/esd/wildlife/research.asp>.

39. Support and conduct research as needed.

In addition to working with Dowling College on microbial research and providing funding, FERN also provided funds for leopard frog research in 2010. Both BNL and FERN were acknowledged in scientific papers.

40. Identify, attract, & support ecological research at BNL.

As mentioned previously we've been supporting Dowling College's microbial research and in 2011 BNL began talks with SUNY College of Environmental Science and Forestry (ESF) about conducting research at the Lab. More outreach needs to be done, however, and will be explored in 2012.

Appendix A - Natural Resource Management Plan – Completed Action Items

Action Item	Site ID	Action	Planned Date	Action Taken
1	Site-wide	Transition WMP Action into NRMP	December 2003	Complete
3	Site-wide	TAG Review of Annual Report	Annual by May	Discontinued
Deer Management				
10	Site-wide	Issue and Discussion Paper on deer management by Natural Resource Manager	Fall 2007	Completed, approved Feb. 2009
Tiger Salamander				
19	RHIC	New pond being added at RHIC	Summer 2004	Completed
20	Tiger salamander	Set up cover boards around one breeding site (as a test case)	Summer	Summer 2001 & 2002, completed, drift fences installed, completed
21	TS-A7	Lining of pool ER program	Aug 2003	Completed
22	TS-W6b	Pond Remediation ER program	2004-2005	Completed
	TS-10	Expansion of pond to lessen slopes	2006	Completed as part of NSLS-ii project 2008
Banded Sunfish				
23	OU V	Peconic River Remediation Program	Spring 2004	Completed, tracking success of restoration completed
Frosted Elfin				
25	Habitat Specific	Establish standard monitoring protocols for the Frosted Elfin		Likely no longer needed
Population Management				
36	Site-wide	Manage Wild Turkey population	As necessary	Not yet necessary
37	Site-wide	Establish BNL policy on feral animals	General policy implemented	Completed
38	Site-wide	Establish monitoring and management protocols for feral animals	Fall 2003	Completed , initiated, ad hoc group providing monitoring information
Vegetation Management				
39	Site-wide	Establish protocol for use of native vegetation		Routinely done w/out protocol, planting list provided
41	RHIC Revegetation	Implement Revegetation	Completed	Grasses planted 2002 and 2003, Completed 2005. No active revegetation needed as species are colonizing on their own.
42	Site-wide	Establish policy and procedure for cutting trees		Informal procedure appears adequate.
Ecosystem Monitoring and Management				
47	Site-wide	Develop criteria to monitor wetland health	2007	Completed
50	Site-wide	Develop criteria to monitor forest health	Fall 2004	Completed 2005
51	Site-wide	Establish forest health monitoring locations	Summer 2005	Initiated 2005, continued 2006, completed
Pesticide Use				

54	Site-wide	Determine need for a SBMS subject area on pesticides	As necessary	Not currently necessary
Action Item	Site ID	Action	Planned Date	Action Taken
55	Site-wide	Pesticide use for natural resource management	As identified	Completed
Wildland Fire Management				
56	Site-wide	Implement Fire Management Plan	Sept. 2003	Plan approved September 2003, re-written in 2009
57	Site-wide	Implement use of prescribed fire and mechanical fuel reduction	March 2003	1 st Fire November 2004 CY2006 Approved. CY2007 plan approved

Appendix B - Natural Resource Management Plan – Ongoing and New Action Items

Site ID	Action	Planned Date	Action Taken
Site-wide	Annual Summary Report	Annual by April 30	Ongoing
Site-wide	NRMP Plan Update	Every 5 years Next update 2016	In process
Site-wide	Adapt Management based on new information	As Required	Ongoing
Site-wide	Maintain and Improve relationships with stakeholders	Continual	Ongoing
Site-wide	Improve decision making through use of innovative tools	As Necessary	Implemented 2003, ongoing
GIS			
Site-wide	Develop & maintain natural resource data layers of GIS	Ongoing	Ongoing
Site-wide	Use GIS to assist in mapping and planning	Ongoing	Ongoing
Site-wide	Maintain meta-data on GIS data	Ongoing	Ongoing
Cultural Resource Management			
Site-wide	Continue to develop & maintain GIS layers documenting cultural resources.	As required	Ongoing
Freshwater Wetlands & the Peconic River			
Site-wide	Determine functionality of BNL Central wetlands	2007-2009	Not started
Site-wide	Maintain or improve wetland functions		
Wetlands	Explore implementation of monitoring protocols at BNL	As funds become available	Not yet started
Monitoring Station HMn	Monitor for flow & water quality	Monthly sampling SPDES Program	Ongoing
Peconic River Remediation	Explore creating wildlife viewing areas		
Peconic River	Evaluate removal of barriers to fish migration on site	2014	Not yet started
Peconic River	Fish sampling with NYSDEC/Cold Spring Harbor due to remediation	Annual Spring/Summer	Ongoing
Peconic River	Evaluate continued need for environmental monitoring of fish should BNL move to onsite recharge to groundwater system	2014	Not yet started
Law Enforcement			
Site-wide	Monitor ATV use and damage	Continual	Ongoing
Site-wide	Work to reduce ATV use; investigate deterrents	Continual	Ongoing
Site-wide	Work with security on other trespass issues	Continual	Ongoing
Vegetation Monitoring & Management			
Site-wide	Revisit forest health monitoring plots; collect and analyze data	Every 10 years.	Ongoing

Site ID	Action	Planned Date	Action Taken
Site-wide	Establish Deer Exlosures associated with 4 forest health plots	2011	Not yet started
Site-wide	Develop cooperative agreement with NYSDEC to implement prescribed fire at BNL	2012	
Site-wide	Implement Fire Management Plan	Sept. 2003	Plan approved September 2003, re-written in 2009
Site-wide	Implement use of prescribed fire and mechanical fuel reduction	March 2003	1 st Fire November 2004 CY2006 Approved. CY2007 plan approved
White pine stands	Investigate having timber companies come in to thin stands—possibly for cost of lumber		
White pine stands	Investigate use of NY Incident Command and Wildland Fire Academy for management of white pines		
Site-wide	Use native vegetation on restorations and new construction landscaping	As necessary and applicable	Initiated 2003, ongoing
ISPZ	Re-survey the current ISPZ, explore addition of new areas to ISPZ and rewrite the ISPZ plan.	2011-2012	Not yet started
Site-wide	Monitor distribution of invasive species	Continual	Ongoing; initiated Summer 2003
Site-wide	Manage invasive plants where possible	As necessary	Ongoing; initiated 2008
Habitat Enhancement – other species			
Site-wide	Maintain and monitor bird nests/boxes for bluebirds, kestrel & wood duck	Annually	Ongoing
LISF	Work with LISF to install nest boxes on-site once construction is completed.	2012	Not yet started
Site-wide	Add nest box locations and other data to GIS library.	As necessary	Not yet started
Special Status Species – General			
Site-wide	Maintain Special-status species list	Annual Review	Ongoing
Site-wide	Identify habitats of special-status species	Continual	Ongoing
Frosted Elfin			
Habitat specific	Confirm presence/absence of Frosted Elfin	May-June Annually	Ongoing
Site-wide	Habitat assessment for lupine	Spring 2004	Ongoing
Species specific	Increase lupine population; maintain and enhance lupine habitats	Continual	Ongoing
Banded Sunfish & Swamp Darter			
Site-wide	Monitor for banded sunfish and survey for presence of swamp darter	Biennially	Ongoing
Site-wide	Remove predatory fish	As necessary	Ongoing
Site-wide	Explore re-introduction of both species to on-site portions of the river	As necessary	Ongoing
Tiger Salamander			
Site-wide	TS annual egg mass & larval surveys at breeding ponds	Annual Feb-April, June-July	Ongoing
Population Monitoring & Management – other species			
Site-wide	Conduct songbird surveys	Annual April-September	Ongoing

Site ID	Action	Planned Date	Action Taken
Site-wide	Monitor turkey populations	Continual	Ongoing
Site-wide	Provide NYSDEC with sighting reports	As necessary	Ongoing
Site-wide	Cooperate with NYSDEC management actions	As necessary	Ongoing
Site-wide	Monitor goose populations	Continual	Ongoing
Site-wide	Manage goose populations by oiling eggs	As necessary	Ongoing
Site-wide	Odonate surveys	Summers, periodic	Initiated 2003, periodic
Site-wide	Reptile and amphibian surveys	Ongoing	Surveys are variable
Deer Management			
Site-wide	Environmental Assessment under NEPA for deer management	2011	In process
Site-wide	Establish & implement deer management		Decision to be made based on open meetings
Site-wide	Continue deer population estimation	Nov-Jan May-June	Ongoing. Routine estimates made twice a year, new protocol developed in 2004
Feral & Nuisance Animals			
Site-wide	Establish feral, free-ranging, nuisance animal policy		
Site-wide	Implement BNL policy on feral animals	Continual	Ongoing
Climate Change			
Site-wide	Keep informed of LCC research findings and management recommendations	Continual	Not yet started
Site-wide	Explore possibility of performing research on local effects of climate change on site	2012-2013	Not yet started
Education & Outreach			
Education	Provide educational material or opportunities to BNL staff and public on environmental issues	Continual	Ongoing. Utilize Office of Education Programs Interns, etc.
Site-wide	Continue to host interns to assist with and conduct research on-site as part of BNL's Office of Education summer programs.	Ongoing	Ongoing
Research			
Site-wide	Support and conduct research as needed	Ongoing	FERN periodically supports research with limited funds
Site-wide	Identify, attract, and support ecological research at BNL	Ongoing	Coordinating with FERN

ATTACHMENTS

STUDENT INTERN POSTERS 2010 & 2011

Posters and Papers Available at

<http://www.bnl.gov/esd/wildlife/research.asp>