

State Wildlife Grants
T-11-T-1
F13AF01046

Landscape Conservation Tools and Technical Guidance

Interim Report for Project Year
September 1, 2015 – August 31, 2016

NJ Department of Environmental Protection

DIVISION OF FISH AND WILDLIFE
ENDANGERED AND NONGAME SPECIES PROGRAM
P.O. BOX 420
TRENTON, NJ 08625



PERFORMANCE REPORT

STATE: New Jersey

PROJECT NUMBER: T-11-T-1

PROJECT TYPE: Research and/or Management

PROJECT TITLE: Landscape Conservation Tools and Technical Guidance

STUDY NUMBER AND TITLE: 1. The Landscape Project

PERIOD COVERED: September 1, 2015 to August 31, 2016

JOB NUMBER AND TITLE: 1A. Landscape Project Mapping

Prepared by: Patrick Woerner

Objective: Design, refine and make available wildlife habitat designations using the most current data on rare species populations and land cover types.

Key Findings:

- All Landscape Project GIS data continued to be made available in both shapefile and file geodatabase format and are fully documented with Federal Geographic Data Committee (FGDC) compliant metadata. The data is served on the NJDEP Bureau of GIS website for download (<http://www.nj.gov/dep/gis/landscape.html>) as well as on the NJDEP interactive mapping application ([NJ-GeoWeb](#)).
- Lack of staff resources, errors found in the SOA file, and additional GIS work required for the Wildlife Action Plan update (Conservation Focal Area mapping), significantly delayed update work on the Landscape Project and have pushed the release date into 2017.
- ENSP was able to hire one new full-time GIS staff member as of June 2016 that is to be 80% dedicated to the Landscape Project.
- One part-time seasonal and part-time temp agency staff members were also hired to work on the Landscape Project
- ENSP GIS staff began and continued to work on an update of the Landscape Project (Version 3.3) based on 2012 Land Use/Land Cover (LULC) and updated species occurrence area data SOA 11 data (3/9/16).
- Staff completed updates to the Landscape Project Habitat Preference database incorporating new LULC codes (5412, Tidal Mud Flat and 7440, Disturbed Tidal Wetlands) and citation information needed to produce Appendix V of the Landscape Project report.
- GIS staff completed the design of a geodatabase structure and geoprocessing models for generating potential and valued habitat for each species (BIOPID) mapped in Landscape.
- Two Federal-listed species not previously represented in the mapping will be included: Atlantic Sturgeon and Northern Myotis.
- Using Python scripting and ArcGIS geoprocessing models, GIS staff continues to work on automating aspects of Landscape Project Mapping. Incorporating all aspects of Landscape creation within the ArcGIS platform will enable a more automated, standardized and efficient process.

Conclusions:

- Dedicated full-time staff resources rather than part-time and temporary staff will be necessary to continue development and maintenance of the project.
- The creation of Version 3.3 is near 70% complete and release is scheduled for early 2017.

- Utilizing a geodatabase structure and geoprocessing models is an effective means of generating species-specific habitat patches.
- Creating a statewide version of the Landscape Project that incorporates Version 3 methodologies continues to be time consuming. If more detailed and species-specific mapping is going to be developed in future version then more staff time and resources must be devoted to Landscape Project mapping.

Recommendations:

- Dedicate additional full-time staff resources and funding to support the update and maintenance of the project.
- Continue work on developing a plan for releasing the Landscape Project products and, to the extent possible, minimize delays in product updates.
- Continue work on Version 3.3 of the Landscape Project with a target release in early 2017.
- Continue to develop modeling within the ArcGIS platform that will speed up the update process.
- Continue the peer review process on new methodologies as they are developed.

JOB NUMBER AND TITLE: 1B. Training, Information and Technical Guidance Program

Prepared by: Patrick Woerner and Brian Henderson

Objective: Build knowledge of critical habitat locations and disseminate Landscape Project data and training to guide land management, habitat conservation and acquisition, and land planning at all levels of government and non-government organizations.

Key Findings:

- Landscape Project GIS training/information sessions were put on hold due to lack of staff resources, work required for the Wildlife Action Plan update (Conservation Focal Area mapping), and work on the mapping update.
- Continued to provide the Landscape Project Training and Information Webinar program over Citrix GoToWebinar software to allow users to participate remotely, upon request.
- ENSP GIS staff met with Highlands Council staff in order to update the Highlands Critical Wildlife Habitat designations based on Landscape Project Version 3.1.
- GIS Staff met with the New Jersey Chapter of TNC and NJCF regarding the incorporation of Landscape Project and other GIS conservation datasets into the NJ Conservation Blueprint Project (<http://www.njmap2.com/blueprint/>) with a goal of determining the most important places remaining in NJ to protect from an ecological perspective.
- A presentation on the Landscape Project and other major ENSP GIS projects was given at the NJDEP's quarterly GIS Users Group Meeting on 6/2/16.
- GIS staff worked with DEP Bureau of GIS and Bureau of Emergency Response on updating their Area Contingency Plan (ACP)/Geographic Response Plan (GRP) in partnership with EPA. The effort includes developing a sensitive areas map for species at high risk of contamination from hazardous materials, such as oils spills.
- ENSP GIS staff attended a meeting, and responded to inquiries, on Landscape Project Version 3.1 to NJDEP upper management and the New Jersey Builder's Association (NJBA).
- Staff provided guidance and support on Landscape Version 3.1 to the Green Acres Program for incorporation of data in the prioritization of acquisition projects.
- ENSP GIS staff supported the Division of Land Use Regulation (DLUR) by providing applicable analysis and GIS data derived from the Landscape Project for regulatory reviews.
- Staff continued to provide Landscape Project support to the Division of Natural and Historic Resources' (NHR) Land Management Review Policy *Standard Operating Procedure* for screening management and other actions to determine if they will have an adverse impact on threatened and endangered species habitat.
- ENSP GIS staff continues work on the creation of a Landscape Project Story Map to be released in conjunction with the Landscape Project; it will provide a list of the changes made since the last release as well as a broad introduction of the data and methods used to a general audience.

Conclusions:

- Landscape Project data serves as a vital basis for analysis such as the Highlands Critical Wildlife Habitat designations in the Highlands Regional Master Plan, the NJ Conservation Blueprint Project (<http://www.njmap2.com/blueprint/>) and other habitat prioritization projects and environmental review.
- Providing Landscape Project GIS training and information sessions is an essential means of disseminating guidance information and proactively addressing potential misinterpretation and misuse of Landscape Project products.
- Maintaining a viable statewide training, information and technical guidance program on the Landscape Project is time consuming. While the level of staff resources has been reduced, the level of demand for such training and guidance has not. For it to be maintained and developed further, more staff time and resources must be devoted to the program.

- Communication and information on the Landscape maps and their limitations are vital as the Department references the mapping in various rules and regulations and continues to incorporate the mapping into policy decisions.

Recommendations:

- Dedicate additional staff resources and/or funding and refill lost position to support the update and maintenance of the project.
- Continue to provide guidance to state, federal, and municipal agencies and conservation groups.
- Continue to support state and regional planning efforts such as the NJ Conservation Blueprint Project and the Highlands Regional Master Plan by providing applicable Landscape Project data and guidance.
- Continue to promote the appropriate application of Landscape Project maps to land-use regulation and conservation planning. In doing so, the Department will continue to afford transparency and predictability to the land-use permitting and development process.
- Continue development and use of the GoToWebinar tool to support outreach and dissemination efforts.
- Continue to promote the integration and use of Landscape Project GIS data among and municipal and county planners.
- Continue to meet with public land managers and others as opportunities arise to promote integration of wildlife habitat management into existing or developing management plans
- Produce materials upon the next update to the Landscape Project to support the training and information program including printing of reports, presentations, tutorials, and other supplemental products in order to facilitate use of the Landscape Project's wildlife habitat mapping.

JOB NUMBER AND TITLE: 2. Biotics Database

Prepared by: Gretchen Fowles

Objective: Update and maintain the most current data on rare species populations in New Jersey.

Key Findings:

- ENSP continued the contract with the Conserve Wildlife Foundation of NJ (CWF) until April 30, 2016 for professional assistance with entering and maintaining records in the Biotics database. The contract then ended and was not permitted (by DEP management) to be renewed. One of the data managers from CWF, who has been working on Biotics data management for 11 years, was eventually hired into an ENSP position, but has spent limited time on Biotics work. Two other GIS staff were hired to help with data management, one as a permanent employee, but working only part-time on Biotics, and another that is a temporary employee and neither of whom have experience with the Biotics database or our data management protocol. All activities described below have been completed with staff assistance from the ENSP and the CWF.
- A comprehensive, written data management protocol was developed by ENSP to explicitly describe how observation data from various sources is processed and managed from receipt to entry into the Biotics database to serve as a user guide to train new data managers. Attempts were made to streamline the process as much as possible given the current limited staff resources, while maintaining data standards needed by ENSP and NatureServe.
- A Biotics-specific email address is now in place to serve as the central repository for species observations that ENSP receives electronically.
- A data exchange from the Biotics central database to the NJ local Biotics database was completed during the reporting period, which updated the element records at the global level. The local to central data exchange of element occurrences is planned to occur in the next reporting period.
- Biotics staff received approximately 908 additional rare animal records during the 2015-16 segment, 563 from the public and 345 from ENSP staff. Approximately 920 rare animal records were entered into Biotics. There remains a backlog of approximately 1,037 endangered and threatened species records that have been reviewed and accepted by biologists and are awaiting entry into Biotics. The backlog of special concern species records that have been reviewed and accepted by biologists and are awaiting entry into Biotics is approximately 2,390.
- Staff finalized Version 11 of the Species Occurrence Area (SOA), Sensitive Area, and Source Features files and released the files in October. SOA_11 will be used to update the Landscape Project mapping. There were approximately 1,472 new source feature records with rank 3, 4 or 5 (state or federally endangered or threatened species) included in SOA_11.
- Staff is no longer actively participating in the pilot roll-out of NatureServe's Kestrel, a mobile observation system that is a component of Biotics 5, and which will allow for online data entry of observation data as well as integrate with the Biotics database. NatureServe has not yet switched their focus to further development of Kestrel and is no longer providing support for it until they have the resources available. ENSP has investigated other alternatives and is actively exploring an in-house ArcGIS Online option for use by staff, consultants and the general public to report rare species observations to ENSP.
- There were no outreach efforts this reporting period related to the rare species database, procedure for submitting data, and how the data is used.

Conclusions:

- The number of rare animals records received (908) was less than half the records received during the last few reporting periods (2,542, 2,241, and 2,032 respectively). The difference in number is related to the number of ENSP staff records received. During the last reporting period 2,077 observations were received from ENSP staff and just 345 were received during this reporting period. It is possible that because of the disruption of data manager staffing as a result of not being permitted to continue to contract with CWF,

whose two data managers have been managing the Biotics data for 11 years for ENSP, ENSP staff have held off submitting their data.

- Less than half the number of records were entered into Biotics this reporting period (920) compared to last reporting period (2042) as a result of staffing disruptions. New data management staff are being trained using the new data management protocol, but it is a complex protocol and there are records of many different types and from different sources, and differences in how different types of species records are handled in and outside Biotics, all of which creates a steep learning curve and many months before data managers are up to speed.
- The number of records in the backlog has increased by close to 100 to 1,037 threatened and endangered species observations, though likely would have been substantially more, had the usual amount of ENSP staff data been received this reporting period. The number of special concern species records in the backlog has almost doubled during the reporting period to 2,390 compared to 1,228 last reporting period.
- Over 40% of animal records in Biotics still need to be quality-controlled.
- A schedule of releasing an updated SOA file every six months was not achieved during this segment due to staff changes.
- Staff began exploring and developing a pilot ArcGIS Online option for reporting rare species data to ENSP within the DEP rather than continuing to pilot NatureServe's Kestrel product. NatureServe has continued to focus their efforts on developing and enhancing Biotics 5 first, rather than Kestrel, and thanks to our DEP's access to technological enhancements that can serve our needs, as well as an opportunity that arose to work with ESRI to pilot a crowd-sourcing application for use by the public, an in-house reporting option has good potential.

Recommendations:

- Continue to work to train new data management staff and find additional staffing resources to limit the amount of backlog of records to be entered into Biotics that has been developing this reporting period.
- Continue to work to streamline the data management protocol as much as possible, while adhering to the data standards required by ENSP and NatureServe.
- Work to get back on track following the deadlines and work procedures put in place to ensure an update of the SOA and Source Feature files are ready for release every six months.
- Continue to work with NatureServe to complete the next phase of data exchange – the local to central exchange of element occurrence records so that NatureServe's central database is more up-to-date and could be used for data sharing when appropriate rather than ENSP having to fulfill requests because of out-of-date data in the central database.
- Continue to communicate with NatureServe and encourage upgrades to Kestrel, but continue to explore and develop an online data submittal application in-house to serve our needs.

JOB NUMBER AND TITLE: 3. Habitat Connectivity Project

Prepared by: Gretchen Fowles, Brian Zarate, and MacKenzie Hall

Objective: To develop a strategic plan for wildlife conservation that will identify key areas and the actions needed for preserving and restoring habitat connectivity for terrestrial wildlife in New Jersey.

Key Findings:

- ENSP continued to engage the Full Working Group as well as core teams: Mapping, Guidance Document, and Communication, to develop the habitat connectivity project, now called Connecting Habitat Across New Jersey, or CHANJ. There are over 100 individuals in the Full Working Group, over 40 on the Mapping and Guidance Document core teams, and over 20 on the Communication core team made up of partners from both government and non-government agencies. ENSP maintains a working group website with meeting notes and resources and holds one to two webinars annually to engage the full working group.
- The Communication team, led by ENSP, met approximately bi-monthly to work on both within working group communications efforts, as well as public outreach products in anticipation of the release of the CHANJ products.
 - The team continued to develop CHANJ Bulletins that previously have been sent out quarterly to the Full Working Group that describes progress being made on the project as well as other habitat connectivity work taking place in New Jersey, a species profile, connectivity issues in the news, and interesting facts and photos relating to the topic. During this reporting period, the team prepared a CHANJ Bulletin for public distribution for the first time, met with the Assistant Commissioner and his communication team to brief them on CHANJ progress and discuss releasing the CHANJ Bulletin to the public. The release is currently pending DEP Communications Office approval. The team also developed a public website for CHANJ that is live and will be populated with many of the same items as the Bulletin once the team receives approval from the Communications Office to do so. The team developed a list of talking points for the project to convey a unified message, and also developed a PowerPoint presentation that would be appropriate for a general public audience. Work began on a promotional video for CHANJ, with the team developing a draft script and a list of photos and graphics to include and work for the video production was contracted out during the reporting period. ENSP gave a presentation on CHANJ at the 20th Annual Land Conservation Rally as well as at the annual Association of Fish and Wildlife Agencies (AFWA) meeting during the reporting period and received the 2015 Ernest Thompson Seton Award for work developing the innovative project.
- ENSP staff organized and led three joint meetings with the Mapping and Guidance Document core teams during the reporting period to work on development of the GIS-based map and the Guidance Document.
 - The team continues to use GIS tools made available by the Washington Wildlife Habitat Connectivity Working Group to map the habitat cores and corridors in New Jersey: Core Mapper and Linkage Mapper. A landscape integrity approach, or areas least modified by humans, were used to identify the base input habitat layers. The team had previously grouped the species that the mapping is targeting into three broad guilds representing different habitat associations and movement capabilities. Habitat core areas were developed for each of the three guilds in the Skylands Region of New Jersey, and corridors were between the core habitat areas for two of the species guilds: high mobility and moderate mobility in the same Skylands Region. Corridors were not developed for the low mobility guild because there was extensive overlap between the moderate and low mobility guild habitat cores and thus there would have been for the corridors for the two guilds as well. The draft mapping of habitat cores and corridors in the Skylands region served as a pilot project for the working group to review the draft products and provide feedback on how to make them more useable and effective for implementers. Once the review was complete, the team then began development of the statewide mapping that incorporates that

- input and also uses newly available 2012 land use land cover data. Statewide core habitat areas were developed and finalized and a draft of the corridors was being modeled by the end of the reporting period.
- Documentation of the GIS methods used is occurring as the mapping is being developed, and review of the draft Skylands Region products was completed by the Bureau of GIS and they offered guidance on how to prepare the final mapping products and mechanisms available for release of the products.
 - The teams also drafted the introductory chapters to the Guidance Document as well as key material to provide guidance and resources for habitat protection, management, and road mitigation.
- ENSP staff also organized and led three meetings for a Roads and Wildlife Working Group made up of CHANJ partners from DOT, USFWS, and DEP (Division of Land Use Regulation and ENSP) to develop roads and wildlife specific guidance document content.
 - The Working Group focused specifically on developing components of a Roads/Wildlife Toolkit that will be a component of CHANJ. The toolkit will consist of the a) CHANJ mapping, which incorporates road segments that intersect habitat cores and corridors, b) road segment assessments, c) culvert inventory data, d) Road/Wildlife Best Management Practices (BMPs), and e) Road/Wildlife Mitigation Projects database that together will offer a package of tools that are transparent, proactive, user-friendly, and informative for helping to strategically provide more safe passages for terrestrial wildlife through our road network. The toolkit was presented to two of the Metropolitan Planning Organizations (MPOs) to inform them of the development of these products, seek their input, and better understand how they might be able to make use of the tools in their work. In the long term the tools can be used by counties and municipalities to help plan and implement road/wildlife work as part of CHANJ.
 - ENSP staff have begun providing technical guidance on CHANJ even though the project is not yet complete, specific to new DEP Flood Hazard Area Control Act Rules that went into effect during the reporting period that require dry passage to be incorporated where a new (or existing) bridge or culvert is planned where the roadway fragments threatened, endangered, or special concern species habitat.
 - A draft of the statewide CHANJ products are not yet complete, but projects that enhance habitat connectivity are occurring in New Jersey, through land protection, management and restoration, and road mitigation.
 - ENSP staff continued to use and develop tools and protocols for project monitoring, such as remotely triggered cameras as well as collaborate with partners to collect data that will inform the project, such as wildlife on-road data and a culvert inventory.
 - ENSP staff continued to regularly meet with land managers and planners and transportation planners, through the Roads and Wildlife Working Group, to provide critical review and develop project that will enhance habitat connectivity where appropriate.
 - ENSP began developing an online database to track wildlife/road crossing projects in collaboration with the Bureau of GIS, a database that can be accessible by DOT, Division of Land Use Regulation, MPOs, and ultimately hopefully county and municipal road planners, and is researching mechanisms for tracking implementation of other CHANJ related projects in anticipation of the release of the products.

Conclusions:

- Successfully engaging a multi-partner, multi-disciplinary working group to develop Connecting Habitat Across New Jersey, including three core teams: Mapping, Guidance Document, and Communication.
- Several communications efforts are underway to keep the CHANJ working group engaged in the project as well as products that will be used to reach out to public audiences in anticipation of the release of the CHANJ products.

- Draft mapping methodology was developed and implemented in the Skylands region for the habitat core and corridor modeling of the state. The mapping was reviewed by the working group to provide feedback on how it could be improved to make the end products most useable by implementers of habitat protection, management, restoration, and road planning. The input is being incorporated into the development of the statewide habitat core and corridor mapping.
- The Guidance Document team drafted various chapters and appendices that were reviewed along with the Skylands Region draft mapping by the working group. Feedback received is being incorporated into the draft version of the Guidance Document that will be reviewed along with the statewide mapping.
- Development of a Roads/Wildlife Toolkit has begun, that will be a component of CHANJ, and specifically is a package of tools that are transparent, proactive, user-friendly, and informative for helping to strategically provide more safe passages for terrestrial wildlife through roadways.
- ENSP has provided technical guidance for CHANJ projects even though the project is not yet complete, in relation to new Flood Hazard Area Control Act Rules that went into effect and call for the inclusion of dry passage for terrestrial wildlife when a bridge or culvert is being built new or replaced. The Communication team and Guidance Document team are also working on mechanisms, tools, and materials for the provision of additional technical guidance as part of the CHANJ product release.
- ENSP staff are implementing, researching and testing the tools that will be needed for future phases of CHANJ including project monitoring and tracking.

Recommendations:

- Continue to engage and lead Full Working Group and Core Team members to develop and seek feedback on Connecting Habitat Across New Jersey.
- Continue to develop communications products in the form of a promotional video, engaging website, bulletins highlighting habitat connectivity work to reach out and inform the public about CHANJ and the importance of a connected landscape. Continue to work with the DEP Communications Office to try to expedite approval to release completed products
- Continue to implement the mapping methodology developed in the Skylands region for modeling habitat cores and corridors across the whole state using the most recent data layers available. Lead the Mapping team in the final review of the draft statewide CHANJ mapping products
- Continue to lead the Guidance Document team and Roads and Wildlife Working Group and finalize draft documents for release with draft statewide mapping for final review.
- Continue to lead the Communication and Guidance Document teams in efforts to develop mechanisms, tools, and materials that will help with providing technical guidance on CHANJ when it is released.
- Continue to research and tools related to project monitoring and tracking, including continuing to collaborate with partners to collect data that will inform the project.
- Continue to stay abreast of research and ideas on habitat connectivity.

JOB NUMBER AND TITLE: 4. Habitat Change Analysis Project (HCAP)

Prepared by: Patrick Woerner and Sharon Petzinger

Objective: Develop and conduct habitat change analysis that will allow for the ongoing examination of wildlife habitat transition and fragmentation trends over a time.

Key Findings:

- ENSP worked to continue the Habitat Change Analysis Project (HCAP) initialized by the Division of Fish and Wildlife in partnership with Rowan University. Building upon previous habitat change analysis work, Rowan worked with the Endangered and Nongame Species Program (ENSP) to incorporate the 2012 Land Use/Land Cover (LULC)-derived habitat base layer into the existing change analysis.
- ENSP staff continued to collaborate with Rowan University to develop and execute automated geo-processing and statistical routines to analyze habitat change taking a programmatic, reproducible approach for ongoing examination of wildlife habitat transition and fragmentation trends over time.
- ENSP received the deliverables from Rowan University's GeoLab covering three time periods 1986-1995 (T1), 1995-2002 (T2), 2002-2007 (T3) and 2007-2012 (T4).
- ENSP staff provided a new habitat base layer from the 2012 Land Use/Land Cover (LULC) to create a consistent basis for comparative analysis across all five available LULC datasets (1986, 1995, 2002, 2007, and 2012).
- ENSP collaborated with the Bureau of Lands Management (BLM) to develop analysis and reporting components for endangered and threatened species by each Wildlife Management Area (WMA). A composite file of all endangered and threatened species habitat was analyzed for each WMA.
- HCAP was expanded to look at habitat change specifically on state-owned lands (WMAs, Parks and Forestry, NLTs) and within different jurisdictions (Highlands, Pinelands, CAFRA) of protection. ENSP met with BLM and Rowan to review the analysis methodology and various output samples. A composite of all endangered and threatened species habitat was analyzed by Open Space categories versus lands held in private ownership.
- ENSP continues to maintain range extents for 59 species covering 66 unique species-occurrence type combinations. Range extents were typically developed by applying minimum bounding geometry in the form of a convex hull to available species occurrence data. Where occurrence data was spatially disparate, separate hulls were generated for a given species-occurrence type combination. Finally, range extent polygons were hand-edited to accurately represent the occupied range and to generally conform to habitat regions bounded by major roads.
- Habitat associations based on 1986, 1995, 2002, 2007, and 2012 LULC level III Anderson codes were maintained for each of the 66 unique species-occurrence type combinations.
- ENSP staff continues to coordinate with Rowan University to determine reporting components and habitat change summarization formats.
- ENSP and Rowan presented on the Habitat Change Analysis Project (HCAP) at the 30th Northeast Arc Users (NEARC) Conference in Burlington, VT.
- ENSP is scheduled to present on HCAP at the bi-annual Mid-Atlantic Chapter of Urban and Regional Information Systems Association (MAC URISA) Conference in Atlantic City on October 13 and 14, 2016.
- Habitat fragmentation summary report outputs for each BIOPID and for all BIOPIDS combined showing total habitat acres, number of patches, average, median, minimum, maximum patch size and average, median, minimum, maximum edge-to-area ratio are still outstanding.
- ENSP and Rowan University are completed draft pilot products of an interactive dashboard and draft deliverables continue to be reviewed internally to inform development of a new service agreement that will focus on final development of an interactive dashboard that enables non-technical staff to explore the analysis findings in a guided way and end-user documentation that explains how the dashboard and/or reports can be used to answer land-use/land-management related questions.

Conclusions:

- Implementing a programmatic approach to analysis has proved an effective and efficient way of obtaining nuanced multi-level estimates of habitat change for an extensive list of species.
- The development of species range extent data products can have ancillary benefits for other conservation planning projects (e.g., Wildlife Management Area WMA planning, Focal Species mapping for Wildlife Action Plan development, no-net-loss habitat conservation plans).
- Results can be used for secondary analysis of Wildlife Management Areas (WMA), preservation areas (Highlands, Pinelands, CAFRA) and regulated areas.
- ENSP review of preliminary outputs confirmed that analysis results will be a useful component to determine trends in habitat loss and conversion and for development of species status assessments/recovery plans.

Recommendations:

- Continue to collaborate with Rowan to research, develop and implement GIS and statistical routines to analyze wildlife habitat change and fragmentation utilizing a programmatic approach.
- Update species range extents and habitat associations as new data becomes available.
- As they are updated, incorporate the latest Land Use/Land Cover (LULC), range extents, species-habitat associations and road-bound blocks into the HCAP database, analysis routines and report outputs.
- Utilize analysis results in development of species status assessments and recovery plans.
- Explore leveraging analysis results to guide and monitor effectiveness of habitat conservation planning, land-use regulation and planning, land management, restoration and preservation efforts.
- Gain proficiency in leveraging PostgreSQL and PostGIS in order to manage habitat change database and run automated scripts to produce data outputs and reporting components.
- Coordinate with Rowan to develop an interactive dashboard that enables non-technical staff to explore the analysis findings.
- Develop guidance documents and interpretive products to package with analysis outputs to guide use and application of change analysis data.

JOB NUMBER AND TITLE: Job 5 - Technical Guidance on Behalf of SGCN

Prepared by: John H. Heilferty

Objectives:

To identify projects, proposals, policies or management plans which have the potential for adverse impacts to populations of SGCN and/or the habitat(s) essential for their long term viability.

To provide consultation on projects, proposals, policies and management plans proposed or conducted by federal, State, county, municipal, NGO, commercial and/or private residents in order to minimize adverse effects and maximize beneficial effects to endangered, threatened, special concern and rare wildlife. Consultation shall include: targeted environmental impact assessments of specific projects, activities or management plans; habitat and/or environmental assessments; development of planning tools such as habitat-, activity- or species-specific “best management practices;” or the generation of applicable GIS data or tools for constituent use in performing site assessments, species and/or critical habitat investigations or regional planning efforts.

JOB 5A. Project Review

Key Findings:

- Within this reporting period over 34 state, federal, and local agencies requested input and guidance from ENSP on projects and activities related to SGCN wildlife and habitats, resulting in 585 reviews completed by ENSP staff. A listing of the reviews by category is found in Table 1.
- ENSP biologists continued to conduct impact assessments and review resource reports for portions of the Penn East Pipeline, a pipeline that may potentially be submitted for formal review through the Land Use Permit application process.
- Staff continued working with NRCS biologists on Working Lands for Wildlife, which focuses on managing early successional habitat specifically to benefit golden-winged warblers. ENSP staff worked with NRCS biologists to assess and provide guidance for applicants interested in participating in this program.
- Staff continued to consult with other DEP agencies and the USFWS on bald eagle nest area protections in the face of proposed developments, including working with USFWS staff to develop conditions included in three Bald and Golden Eagle Protection Act permits.
- ENSP staff continued to review projects on behalf of the US Department of Housing and Urban Development (“HUD”), in their capacity as the action agency relating to the rebuilding of homes after Hurricane Sandy in the coastal zone, to assess whether the proposed plans had the potential to negatively impact federally listed species (including piping plover, red knot and northern long-eared bat) and to determine whether consultation with USFWS should be initiated. Staff also reviewed projects relating to state listed species to determine what, if any, impacts were expected and how to mitigate or prevent those impacts.
- Staff performed 20 project reviews related to Hurricane Sandy Housing and Urban Development (HUD) Community Development Block Grant (CDBG) environmental assessments.
- Staff also continued to review coastal development projects related to the elevation of existing structures to new state/FEMA standards, new coastal hardening projects (private landowners), extensive coastal beach-fill projects (USACE), and debris removal (NJDEP) to screen for potential impacts to state- or federally-listed species.
- Staff spent significant time working on two committees of the Atlantic States Marine Fisheries Commission. For the Delaware Bay Ecosystem Technical Committee, staff conducted data analysis, reviewed reports, stock assessments and harvest allocation recommendations. Staff participated in review of a decade of biological data submitted in connection with a NOAA permit application for 2016 horseshoe crab harvest in the Shuster Reserve, with the intention of minimizing negative impacts on migratory shorebirds dependent on horseshoe crabs for food. For the Adaptive Resource Management (ARM) Subcommittee, staff contributed red knot data (aerial survey, re-sightings of marked birds) and technical guidance for developing annual harvest allocation with ARM Model (implemented in 2013).
- Staff of the Endangered and Nongame Species Program and Bureau of Shellfisheries prepared a Programmatic Biological Assessment (PBA) for intertidal structural aquaculture for submission to the

USFWS. This PBA was required by the USFWS to allow the continued operation of the Division's Aquaculture Development Zone 4 and developed conservation measures governing the expansion of new aquaculture into critical red knot habitat.

Conclusions:

- Within this reporting period over 34 state, federal, and local agencies requested input and guidance from ENSP on projects/activities related to SGCNs and their habitat, with 585 reviews completed by ENSP staff. The ENSP clearly serves an instrumental role in representing the needs of rare wildlife on behalf of the NJDEP.
- ENSP staff has served a particularly critical role in performing efficient, knowledgeable technical guidance regarding impacts to federally-listed species for state and federally-implemented projects where rapid and accurate response or assessment was critical to delivery of project goals.
- Interstate and Flyway organizations, particularly when sanctioned by state agencies, have a high likelihood of producing near-term, population-scale benefit for SGCN via standardized methods, comparable trend and other data, prioritized conservation action and regional implementation.

Recommendations:

- This job should continue to be funded continuously since it allows ENSP staff to thoroughly consider impacts to State- and federally-protected endangered, threatened, special concern and nongame wildlife habitat in the course of permit and environmental review.

Table 1. Number of technical Guidance reviews and consultations conducted by ENSP by category, 9/1/15 through 8/31/16.	Totals:
1. State: reviews	
DEP Land Use Regulation Program (Freshwater Wetland Act, CAFRA, Waterfront Development, Stream Encroachment, Highlands Act, Pinelands Act)	111
Sandy Related: HUD/CDBG/Debris removal Reviews	20
Division of Watershed Management	3
Division of Water Quality	5
Office of Program Coordination and Environmental Review	26
Office of Dredging and Sediment Technology	4
Office of Permit Information and Assistance	
Division of Parks and Forestry	13
NJDEP Review of Activities Proposed for N&HR-Administered Lands and Waters (LMR)	179
Division of Solid and Hazardous Waste Management	
Site Remediation Program	
Bureau of Surface Water Permitting	
Bureau of Wastewater Management	
Bureau of Marine Water Monitoring	
Office of Water Policy	
Office of the Commissioner	
New Jersey Department of Transportation	3
New Jersey Pinelands Commission	
New Jersey Highlands Council	1
Office of Policy, Planning and Science	3
Office of Sustainability and Green Energy	
Bureau of Land Management	13
Bureau of Wildlife Management	1
Division of Fish and Wildlife, Exotic and Nongame Permits Office: Scientific Collecting Permits	92
2. U.S. Government: reviews and consultations	
U.S. Fish and Wildlife Service	39

Army Corps of Engineers	4
FEMA	1
Nuclear Regulatory Commission	
National Marine Fisheries Service	1
National Park Service	2
Natural Resource Conservation Service	14
Environmental Protection Agency	
Federal Energy Regulatory Commission	
U.S. Military: Army, Navy, Air Force, Coast Guard	7
3. Interstate Commissions, etc.: reviews and consultations	
Delaware River Basin Commission	
NY/NJ Port Authority	
Atlantic States Marine Fisheries Commission	4
Meadowlands Commission	1
Atlantic Flyway Council	3
US Fish & Wildlife Service, Atlantic Coast Joint Venture	4
Other officially recognized interstate committees and cooperatives	2
4. County and Local Entities: reviews and consultations	
County Mosquito Commissions	1
County and Local Park Commissions	2
Watershed Associations	3
Local and Regional Environmental Commissions	7
5. Private, Non-Profit Conservation Organizations: reviews	
National Fish and Wildlife Foundation	
State and county Federations of Sportsmen's Clubs	1
The Nature Conservancy, Natural Lands Trusts, NJ Audubon, etc.	9
NJ Conservation Foundation	2
Other (other direct-contact project reviews)	4
Total:	585

Job 5B. Policy and Planning

Key Findings:

- Staff spent extensive time addressing questions and concerns about the Division's proposed Sparta Mountain WMA Forest Stewardship Plan and the need for young forest management in the northern part of the state to benefit golden-winged warblers and other species.
- Staff spent extensive time on the newly-revived Forest Stewardship Advisory Council reviewing the Forest Action Plan and advising on forestry policies.
- Staff spent extensive time working with Department of Defense and USFWS revising the INRMP for changes to grassland management changes at McGuire AFB.
- Staff spent significant time advising the Division of Land Use Regulation on the biological impacts of new Flood Hazard Area Control Act Rules that relate to habitat connectivity of Endangered, Threatened, and Special Concern terrestrial species.
- Staff served as members of the Natural Resources Technical Advisory Committee for the Highlands Regional Master Plan (RMP), offering input on the indicators used to evaluate the natural resource goals and policies of the RMP for the first 10 years of its existence, as well as make refinements to milestones and monitoring activities for the next 10 year period.
- ENSP staff coordinated with the Division of Land Use Regulation (DLUR) and the Bureau of GIS (BGIS) to carry out GIS data development work for the migration of information from the Department's wetland mitigation database (WETMIT) to its centralized NJEMS database and creation of GIS data layers of wetland mitigation site locations, bank locations and bank service areas for use by Department staff, federal agencies and the general public via the Department's interactive mapping website.

- Staff continued to provide annual and technical guidance to support U.S. Fish and Wildlife Service critical habitat designation and recovery planning for red knot.
- ENSP GIS staff continued to work with Division of Fish and Wildlife's Bureau of Law Enforcement (BLE) to assist conservation officers in preventing and deterring illegal collection of endangered and threatened wildlife species. ENSP provided spatial data that contain bog turtle, freshwater mussel, and snake sites potentially susceptible to illegal collection. Spatial data were incorporated into BLE's Environmental Police Conservation Enforcement and Management System (EPCEMS) so that conservation officers can access digital species maps in their vehicles while conducting patrols. This initial effort to programmatically share endangered and threatened species site data with BLE has served as a basis for increased coordination between ENSP and BLE.
- ENSP GIS staff continued to serve as NJDFW's State Representative on the Regional Conservation Opportunity Areas (RCOA) Project; a collaborative effort among 13 states, the North Atlantic Landscape Conservation Cooperative (LCC), U.S. Fish and Wildlife Service, and partners, to identify the best opportunities for conserving intact terrestrial, aquatic and coastal ecosystems, supporting habitat for imperiled species, and connecting natural areas across the Northeast region. The RCOA Team convened two workshops in March and July, 2016 and completed Version 1.0 of the GIS products in August followed by a series of webinars designed to introduce technically capable users and reviewers from Northeast states, U.S. Fish and Wildlife Service, and other partner organizations, to Regional Conservation Opportunity Areas Version 1.0 (<http://rcoa.cicapps.org/>). GIS Staff also presented on RCOA products and their applications to all NJ Division of Fish and Bureau Chiefs.

Conclusions:

- ENSP staff contributed to a number of state and federally initiated planning efforts, delivering important regional expertise on species abundance, trends and habitat needs, helping to assess regional threats and to identify the actions which might address them.
- ENSP staff has also helped steer State or local policies or regulations in a manner which advocate for wildlife needs.

Recommendations:

- This job should continue to be funded continuously since it allows ENSP staff to remain engaged in the development of State and local planning or policy initiatives, which will help advance the needs of State and federally protected wildlife.