State Wildlife Grants
T-11-T-3
F18AF00967

Landscape Conservation Tools and Technical Guidance

Final Report for Project Year
January 1, 2019 – December 31, 2021

NJ Department of Environmental Protection

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

NEW JERSEY DIVISION OF
Fish and Wildlife

SPORT FISH & WILDLIFE RESTORATION

PERFORMANCE REPORT

STATE: New Jersey **PROJECT NUMBER:** T-11-T-3

PROJECT TYPE: Research and/or Management

PROJECT TITLE: Landscape Conservation Tools and Technical Guidance

PERIOD COVERED: January 1, 2019 to December 31, 2021

JOB NUMBER AND TITLE: 1A. Landscape Project Mapping
This job was transferred to NJ FW-64-T in 2020.

JOB NUMBER AND TITLE: 1B. Landscape Project Training, Information and Technical Guidance
This job was transferred to NJ FW-64-T in 2020.

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:

- Staffing of Biotics data managers has been an ongoing problem. Having lost one full time and one part time Biotics data manager FTE, due to them being shifted to another DFW program in 2019, ENSP has had to use full and part-time temporary employees to fill the roles, with months long periods of no data managers at different points in time due to 3 employee resignations. In May 2021 two full-time temporary employees with no prior Biotics experience, were hired and an FTE working for another program in DEP, who had worked on Biotics previously, started working 1day/week on Biotics work.
- In May 2021 the computer order initiated in February 2020 was finally ready, providing the remote access and GIS software needed for data managers to perform some of the job duties.
- Lack of staffing combined with COVID restricting access to our Trenton campus where hardcopy sighting report forms describing rare species observations are mailed and stored, has also made keeping up with data processing and inquiries very challenging. As a result, ENSP put an automatic reply message on our Biotics email saying that data was received, but we are unable to send personal replies and tracking information. That auto reply was active starting in March 2020 and removed in August 2021 once we had some data management temporary staff starting to be trained and increased access to the Trenton campus.
- Prior to March 2020, the Biotics data management record processing system was set up to handle paper records in Trenton with very limited data stored electronically on a shared drive. Even emailed records would be first printed, then tracked, mapped, and reviewed. Staff continued to implement a major reconfiguration of how wildlife observation data are processed during this reporting period.
    - The majority of data previously kept on a shared drive have been moved to Microsoft Teams for easier remote access.
    - Staff continued to work with DEP's Bureau of GIS to develop NJ Wildlife Tracker, which has several components now complete (Fig. 1) that enable the flow of observation data electronically from observer to a comprehensive geodatabase (GDB) that will store wildlife observation data, including roadkill data, in a standardized format that can be easily queried for use by ENSP and other DFW bureaus, and is compatible with Biotics for streamlined entry into the rare species database. Highlights include photos, videos, PDFs associated with the record can all be submitted and stored in the Feature Service and ultimately the GDB. Observers receive a copy of their submission for their records. Biologists are able to

review records online rather than hardcopy records housed in our Trenton office. The schema is consistent with the customized batch upload tool (developed collaboratively with NatureServe) to streamline entry into the Biotics database.

- ENSP staff are now exclusively using the NJ Wildlife Tracker system for entering new observation records, reviewing and QCing records, and for extracting data for input into Biotics.
- Older, hardcopy records not yet fully processed (reviewed by biologist and entered into Biotics), aare being scanned and reviewed based on highest priority.
- The testing of the final components – extraction of data and input into Biotics from the GDB and updating of the GDB with identifiers from Biotics – is still underway.
- As of the end of 2021, ENSP has not released information about the public nor AGO/Hub versions of the NJ Wildlife Tracker submission form, pending in-house testing. A soft release is planned to partners and then a broad public release later in the Spring.
- Observers who submit records now are receiving an email confirmation of their submission, including a copy of the record (including any attachments included such as photos), and notifying them of the NJ Wildlife Tracker application coming soon.

- Updates continue to be made to the comprehensive data management protocol to explicitly describe how observation data from various sources is processed and managed from receipt to entry into the Biotics database (as well as subsequent QC and filing) to serve as a user guide for new data managers. As the final components of data flow are tested and scripted, those elements will be included in the protocol as well.

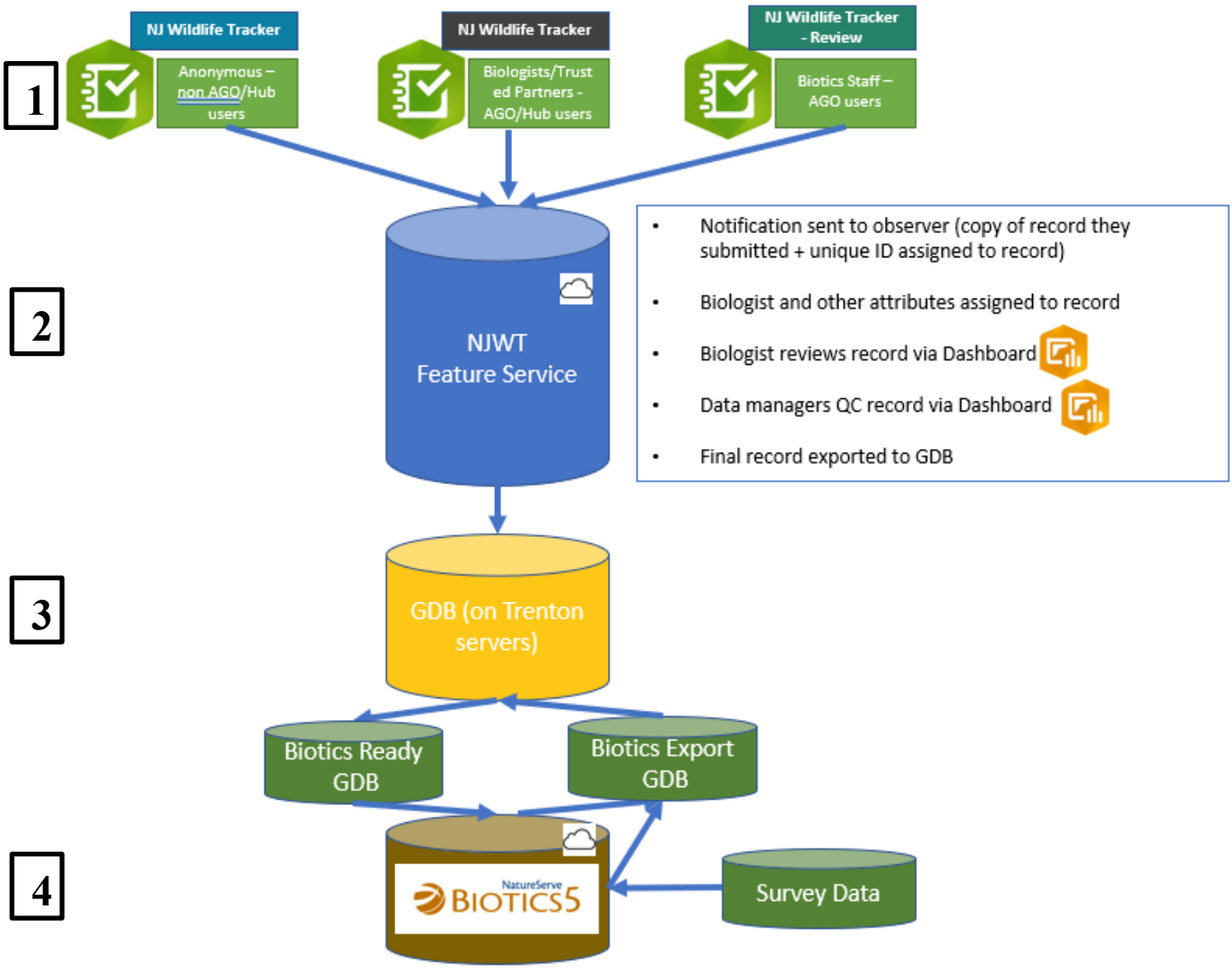

Figure 1. The NJ Wildlife Tracker Data Management System. 1) The data are submitted via a mobile friendly Survey 123 website. There is a public version which does not require a login, a version for partners with ArcGIS Online (AGO) accounts or we are able to offer individuals a free AGO "Hub" account wherein they log in and the application can look up their contact information, which would otherwise need to be entered, and lastly a version whereby Biotics data managers can transcribe data submitted via our Sighting Report Form. 2) Data entered populate a cloud-based feature service. Scripting on the back end populates several attributes and 2 Dashboard applications have been built to allow ENSP species experts to review records assigned to them and for Biotics data managers to quality control fully populated records. 3) Completed and quality-controlled records are exported to a geodatabase (GDB) housed on a backed up server in Trenton. 4) Appropriate data are exported and uploaded into Biotics and then Biotics identifiers for each record is updated in the GDB for easier tracking. Survey data submitted via standardized templates are uploaded into Biotics and then those datasets with Biotics identifiers are appended to the GDB, again, for better tracking of data.

- Staff finalized and released an updated Species Occurrence Area (SOA) and Source Features (SOA 13) in December. The final dataset was pulled from Biotics in October 2021 and included approximately 290 new source feature records currently ranked 3-5, although over 1,000 source feature records were consolidated into fewer records (many points converted to a few line records) so the number above isn't an accurate reflection of true increase. Records for two additional candidate species are now represented in the dataset, for a total of 40 candidate species. There are 58 candidate species that are proposed to be newly listed sometime in 2023; we have no data in Biotics for 18 of those species (including 10 freshwater fishes). Given staffing issues, only priority records were entered into Biotics, including records for candidate species, not previously listed, and records of currently listed species in new locations. We partnered with a student from Rutgers University to update the bald eagle foraging model included in the SOA. The datasets were partly released to parties with whom we have data sharing agreements, with additional releases not yet complete. This version of the SOA will be used to develop the revised Landscape Project mapping.
- One data exchange of element and element occurrence records from our local NJ Biotics database to the NatureServe central database was completed in August. Quality control issues were addressed. ENSP and the Natural Heritage Program are participating in central to local data exchanges of element taxonomic information and associated references with NatureServe.
- A large update of many common and scientific names was implemented in Biotics, NJ Wildlife Tracker, and our ENSP database where we maintain that information per updates that NatureServe has made over the past year.
- The two temporary employees who began in May 2021 completed NatureServe's Core Methodology Training, held virtually this fall.
- Biotics staff received approximately 7,813 additional rare animal records, 379 from the public, and 7,434 from ENSP staff and partners. Approximately 5,357 rare animal records were entered into Biotics. There remains a backlog of approximately 6,244 endangered, threatened, and special concern species records that have been reviewed and accepted by biologists and await entry into Biotics. There are >1,000 records in NJ Wildlife Tracker that still need to be reviewed by biologists and more hardcopies in Trenton that need to be scanned and added to NJ Wildlife Tracker. There are expected to be an additional >1,000 freshwater fish records from the Bureau of Freshwater Fisheries that will need to be entered. It remains challenging tallying this information because there remains a backlog of hardcopy data from the public that needs to be entered into NJ Wildlife Tracker to properly track it, but the new system should make keeping track of the status of records much easier once the backlog has been entered.
- Fifty-five percent of records entered into Biotics need to be quality controlled.
- 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:

- ENSP's Biotics program has struggled with lack of staff resources over the course of this segment. Being reliant on temporary staff as virtually our sole data managers is precarious; over the segment, three temporary employees resigned. We have invested in the two current temporary employees by having them attend the NatureServe Core Methodology Training.
- ENSP's Biotics program also struggled with the repercussions from COVID, including lack of access to paper files, computer connectivity, and computer equipment during this reporting period.
- An entire reconfiguration of how data are processed was the focus of the Biotics staff to update the system from handling most data in paper form to a more streamlined, purely electronic data system. The new system includes a mobile-friendly online submittal system called NJ Wildlife Tracker is designed to work seamlessly with new customized NJ batch-upload tools that enable more efficient data entry into Biotics. During this segment, the NJ batch-upload tool, and most of the NJ Wildlife Tracker system were completed; some final testing and scripting is needed for the last components thanks to a collaborative effort with the Bureau of GIS. ENSP staff are now utilizing all of the components of the system. Concurrently, a comprehensive data

management protocol is being developed to explicitly describe the new data management system being implemented. The new system is making all aspects of the data flow more efficient and accessible.

- Biotics staff finalized and released the next version of the SOA dataset (version 13) in 2021. Two new versions of the SOA dataset were released during the segment, which is short of the 6 month target but more realistic given constraints. The production of SOA 13 took a great deal of effort with newly trained staff and was an achievement to complete and enable the Landscape Project mapping update to continue.
- During 2021, ENSP entered 10 times as many records as last year, though we also received 7 times as many records as last year, both due to a push to get data submitted for the SOA version that will support an update the Landscape Project mapping. Staff also entered fewer records than received, and continue to work on backlog of records to enter. With the anticipated listing of 58 additional species and de-listing of just 13, the abundance of data received is expected to continue to increase.
- The percentage of quality-controlled records in Biotics (45%) has remained about the same since the last reporting period. It will not be possible to increase this percentage unless staffing resources are increased.

Recommendations:

- Hire at least 2 full-time employees as Biotics data managers rather than relying on temporary employment positions given the importance of the Biotics database and the amount of training needed for data managers.
- Continue to work to streamline the data management system. Continue to collaborate with BGIS to complete the automation of the final components of NJ Wildlife Tracker system and continue to make improvements.
- Continue to update the data management protocol describing the new system.
- As testing of the new systems is completed, begin a soft release to trusted partners later this winter and if all is functioning well and staffing resources are sufficient, a full release to the public later this spring.
- Though a new streamlined, electronic system should increase efficiency and decrease errors, any new system requires close scrutiny to make sure it is working properly so Biotics staff will need to be vigilant with quality control as the new system continues implemented to ensure it is functioning as expected.

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:

- Having rolled out the two main CHANJ products, CHANJ Mapping and Guidance Document (both accessible from the CHANJ website), to the public in April, 2019, the CHANJ Team has focused on updating layers, developing additional tools and resources, and reaching out to potential implementers to demonstrate the CHANJ tools and discuss how their groups might use and apply these tools to help preserve and reconnect habitats for wildlife.
- Our CHANJ website, the 'one stop shop' for CHANJ information and all available CHANJ products, was accessed about 24,700 times in 2021 (Fig. 1); on par with the 25,000 visits in 2020. We are not entirely certain what caused the surge in March!

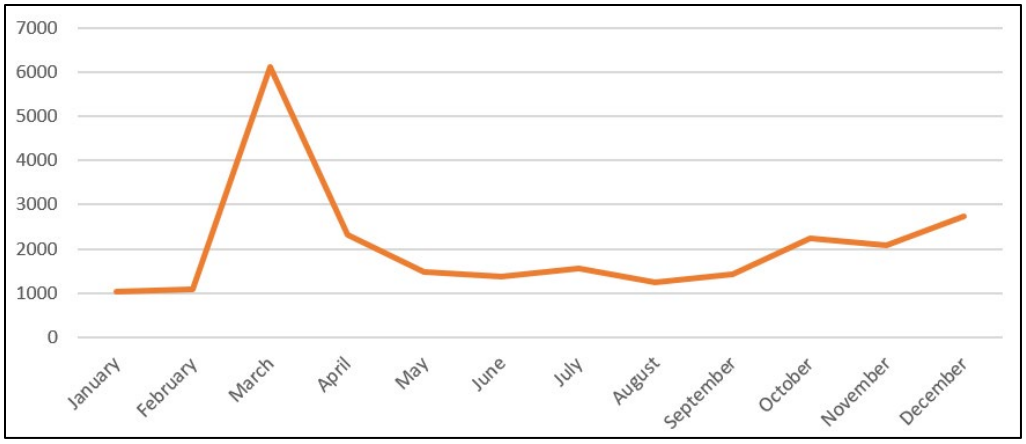

Figure 1. The number of times the CHANJ website was accessed in 2021, on a monthly basis.

- The CHANJ Web Viewer, an online interactive map containing all of the CHANJ Mapping layers, was accessed approximately 5,000 times each year in the last 3 years (Fig. 2). Each of the spikes in usage in Figure 2 were associated with a CHANJ listserve post that mentioned and linked to the CHANJ Web Viewer. Several of the mapping layers have also been incorporated into other mapping applications such as NJ Geoweb and NJ Conservation Blueprint, such that CHANJ layer views are likely being accessed in other platforms which we are unable to track.

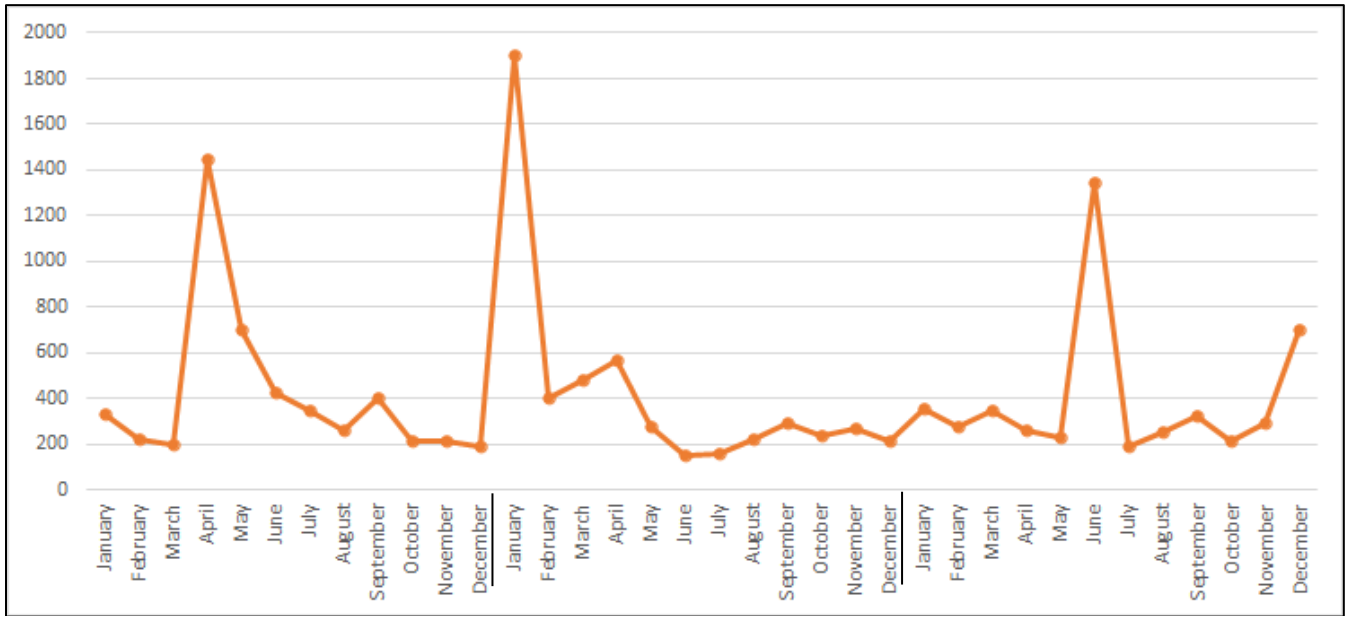

Figure 2. The number of times the CHANJ Web Viewer was accessed between 2019 and 2021, on a monthly basis. Each of the spikes in usage was associated with a CHANJ listserve post that mentioned and linked to the CHANJ Web Viewer.

- The CHANJ Team has worked on some additional tools and resources to enhance the CHANJ project during this period in addition to those reported in the interim reports from the previous 2 years. Those during this reporting period include:
- A new Vernal Pool Query tool was added to the CHANJ Web Viewer per request by the Sourland Conservancy to help with their habitat management planning efforts.

- An Action Team Web Viewer and Action Team Project Survey – These tools were created specifically for CHANJ implementers such as land trusts, land managers and transportation planners. They are invite-only and require an ArcGIS Online login, which we are able to provide to partners without one through the Bureau of GIS's Esri Hub. During this reporting period, one partner, the Sourlands Conservancy worked with the CHANJ team to document a couple of riparian restoration projects they have worked on.
- NJ Wildlife Tracker - This is a mobile-friendly web application that individuals, including the public, can use to report roadkill observations to ENSP. The platform can be used to help increase awareness of the issue of habitat fragmentation, while the data can help identify roadkill 'hot spots' where road mitigation efforts may be warranted. Development of the platform continued during this reporting period and a first version wherein appropriate data flow from submittal to review, to entry into the Biotics rare species database was almost complete by the end of the reporting period. The data submittal website and how we are seeking roadkill data has not yet been advertised or released outside of ENSP staff, but will be in 2022 now that development is nearing completion.
- Roads & Wildlife Reviewer Web Viewer and Pre-app Mitigation Survey – The web viewer is intended for internal use by the CHANJ team and inter-agency partners working together on road/wildlife mitigation efforts, specifically ENSP, DOT, the Division of Land Resource Protection (DLRP), and USFWS. The application was utilized by the Roads and Wildlife Working Group to review proposed projects during their bi-monthly meetings. The Pre-app Mitigation Survey was finalized and populated with these proposed projects, links to which were sent to working group members prior to the meetings for review in advance. The Fish Barriers Survey that captures locations where existing barriers may be beneficial for separating native and non-native fish populations has not yet been utilized by biologists from the Bureau of Freshwater Fisheries.

- CHANJ mapping layers have now been incorporated in mapping applications maintained outside of ENSP during the full grant period:
  - NJ GeoWeb – An interactive mapping application maintained by the BGIS that offers users access to NJDEP GIS data. The CHANJ Team worked with BGIS this reporting period to incorporate several CHANJ layers in a 'CHANJ' group in the NJ GeoWeb application in late April, as well as incorporate appropriate queries for the layers.
  - New Jersey Conservation Blueprint – An interactive mapping application developed by the Nature Conservancy, Rowan University, and the New Jersey Conservation Foundation aimed at guiding land preservation and land use decisions. The CHANJ Team worked with NJ Conservation Blueprint staff to incorporate CHANJ layers in the Ecological Integrity mapping of the NJ Conservation Blueprint.
  - North Jersey Transportation Authority – The CHANJ Team collaborated with NJTPA to incorporate CHANJ layers into their internal PRIME mapping system to help transportation and land use planners identify where wildlife movement needs should be considered.
  - NJ Bureau of Wildlife Management – The CHANJ Team collaborated with the BLM to incorporate CHANJ mapping and considerations into their internal WMA Acquisition Boundary mapping to guide the Division's acquisition of new lands that will enhance habitat connectivity.
  - Regional Interactive Environmental Resource Inventory Tool – A beta version of this tool developed by the Highlands Council was reviewed by the CHANJ team during this reporting period. CHANJ layers are among other environmental resource data in the tool, available at various geographic levels within the Highlands Region to be considered when making planning decisions.

- CHANJ communications reached a wide audience in 2021 and during the full grant period, following our April 2019 public release of the major CHANJ products.
  - In 2021 the CHANJ Team gave virtual presentations to 45 members of a local Sierra Club chapter, to the Rutgers University Student Chapter of the Wildlife Society, to the Viriginia Safe Wildlife

Corridors Collaborative, to the NRCS State Technical Committee, and participated in a NJDEP webinar series viewed live by 110 people from across the Department.

- Additionally, the team made five posts to the NJDFW CHANJ email listserv in 2021 to share project-related information and stories with partners and the public. We shared a yearly review of accomplishments, Road Wildlife Mitigation Project updates, a fun post about LEGO wildlife crossings designed by NJ kids (Fig. 3), an Amphibian Week-CHANJ story, and news about the federal Infrastructure Act funding for pro-wildlife transportation programs. The listserve has grown to more than 30,600 subscribers.
- We continued adding and updating content on our CHANJ public website (www.CHANJ.nj.gov), highlighting current projects and the available tools.

Figure 3. Snippet of a CHANJ listserv post encouraging creative child's play about wildlife crossings.

- Our CHANJ team met with agencies and organizations that can implement habitat connectivity enhancing actions. Due to the ongoing pandemic, these efforts were virtual again in 2021.
  - G. Fowles continued to organize bi-monthly web meetings of the Roads and Wildlife Working Group throughout the work period, made up of partners from DOT, USFWS, and DEP (Division of Land Resource Protection and ENSP). The group discussed proactive road mitigation strategies and project opportunities, issues like reducing the use of plastics and netting in soil erosion control, implementing the Flood Hazard Regulation Rule requiring dry passage through culverts and

bridges that intersect habitat for rare terrestrial wildlife species, and most recently the new Infrastructure Act; particularly its $350 million Wildlife Crossing Pilot Program. The group also reviewed projects that have gone in the ground to identify improvements in the process or design.
    - The CHANJ Team conducted analyses and helped plan a joint effort with the Sourland Conservancy, Friends of Hopewell Valley Open Space and the Natural Resources Conservation Service that targeted landowner outreach for habitat restoration supporting connectivity within key CHANJ areas of the Sourland Mountains region in central NJ.
    - CHANJ co-leaders G. Fowles and B. Zarate were invited to participate in a new AFWA Transportation working group, specifically a community of practice on transportation ecology that began meeting quarterly starting in 2021. They were also invited to give a presentation on NJ's transportation and wildlife efforts at the kickoff meeting.
    - The New Jersey Land Conservation Rally, which we intended to be the annual venue for our Action Team meetings as well as a major place to reach new implementer groups, was cancelled again in 2021. This set back our plans for certain training and adaptive planning goals; we expect to resume in the next grant period.
    - G. Fowles attended the International Conference on Ecology & Transportation, virtually, and shared content with relevant NJ professionals.
    - G. Fowles participated in meetings with the planning committee for the Northeastern Transportation and Wildlife Conference (NETWC) to be held in NJ in September 2022.

- The CHANJ team continued work under another federal grant to collaborate with partners to collect road assessment and culvert inventory data to be applied ultimately as a product of CHANJ to help further inform implementation actions.
- ENSP staff continued providing technical guidance to DEP's Division of Land Resource Protection and the NJ Department of Transportation on the CHANJ tools and effective design of wildlife crossing structures, specific to DEP Flood Hazard Area Control Act Rules requiring dry passage to be incorporated where new (or replacement) bridge or culvert projects are planned along roadways that fragment threatened, endangered, or special concern species habitat.
- An evaluation of all CHANJ-related regional and statewide metrics has not been completed because several are dependent on an updated version of the CHANJ mapping, which we will complete once the newest 2020 Land Use/Land Cover dataset (its main base layer) is available. A few metrics we could evaluate include:
    - Culvert inventories – There have been over 600 road/stream culverts evaluated for terrestrial passability (Fig. 4) over the full reporting period.
    - Terrestrial Wildlife Habitat Preserved land – Between 1/1/19 and 6/30/21 (the latest date for which there is updated data), 3,836 ha of land have been preserved (Fig. 5) that fit our definition of Terrestrial Wildlife Habitat (CHANJ Guidance Document, Page 24) and 95% of that land falls with CHANJ Cores (3365.3 ha, 87.7%) and Corridors (290.6 ha, 7.6%).

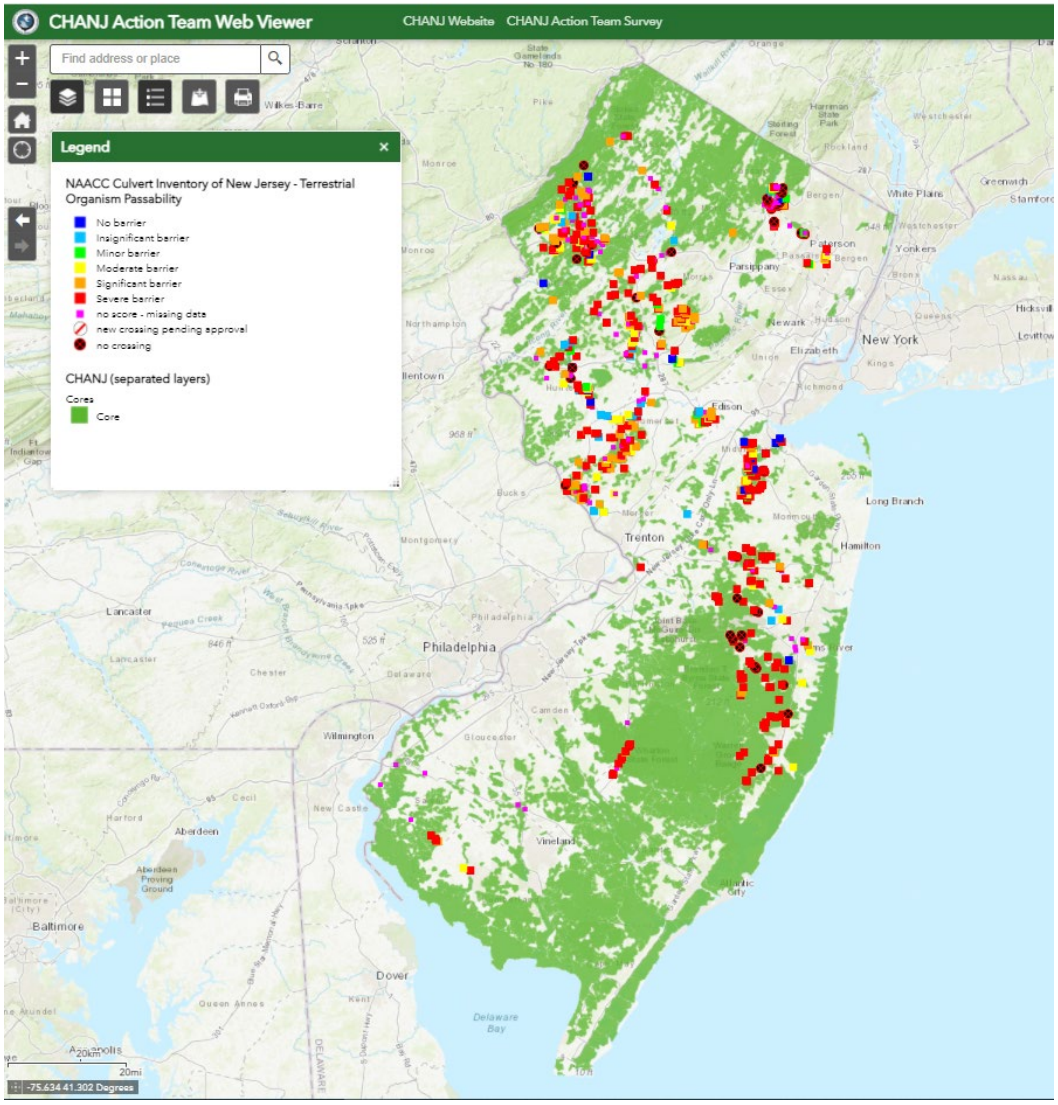

Figure 4. Culvert inventories completed using the NAACC methodology in New Jersey, assessed based on the predicted passability of the structure for terrestrial wildlife.

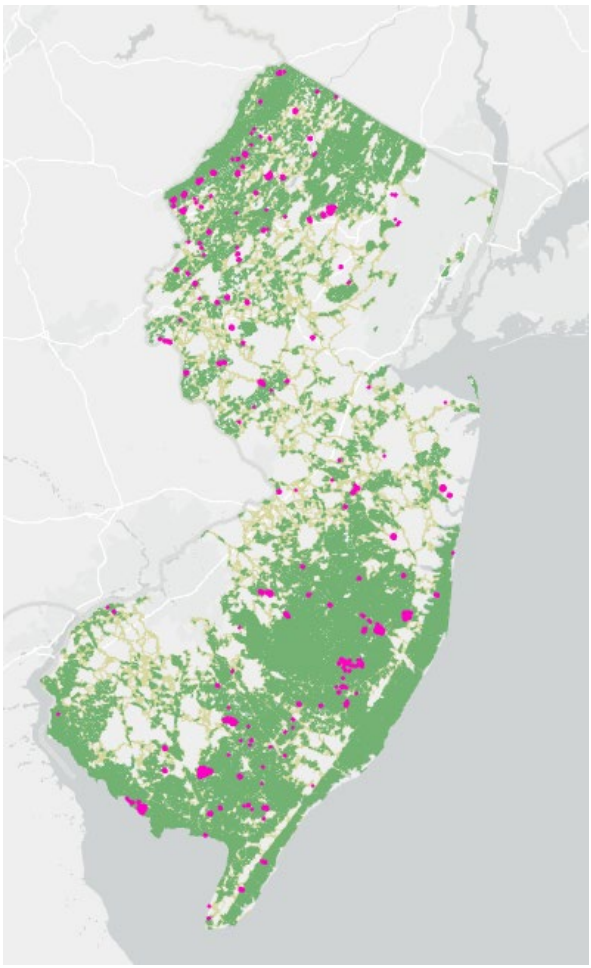

Figure 5. Terrestrial Wildlife Habitat (TWH) Preserved Land (pink with small buffer applied to increase visibility) that has been acquired between 1/1/19 and 6/30/21 overlaid on CHANJ mapped Cores (green) and Corridors (brown).

Conclusions:

- The CHANJ website continues to be accessed consistently over 1,500 times per month, and the CHANJ Web Viewer continues to be accessed approximately 5,000 times per year. The incorporation of the CHANJ layers into other interactive mapping applications may affect CHANJ Web Viewer "hit" numbers.
- The CHANJ Team continues to develop new tools and resources to enhance the project, include a video tutorial of the CHANJ mapping, an application for the public to report roadkill observations, an application for Action Team members to identify habitat connectivity work being conducted and to coordinate efforts, and an application for agencies working on transportation planning at the state level to better communicate and coordinate on opportunities to enhance habitat connectivity.
- The CHANJ layers have been incorporated into several other mapping applications outside of ENSP.
- Staff continued to successfully engage a multi-partner, multi-disciplinary Roads and Wildlife Working Group in bi-monthly meetings to facilitate progress on important state-scale wildlife mobility issues, including road mitigation implementation and monitoring.
- Despite the pandemic limiting in-person activities for two years, the CHANJ team were able to accomplish a great deal of communications during the grant period. We reached more than 1,700 people from 20 strategic organizations and professional audiences through meetings and presentations. We used listserv posts to engage a large audience of public and partner subscribers about habitat connectivity topics. Listserv posts have drawn measurable attention to the CHANJ website and Mapping tool.

- ENSP staff continue to implement, research and test project monitoring and tracking tools.

Recommendations:

- Continue to make updates to the mapping and guidance document and run the connectivity assessments to evaluate progress in implementing effective connectivity actions over time.
- Continue to develop tools that are in progress to enhance the existing CHANJ tools and resources.
- Continue outreach efforts to engage the public in the issue of habitat connectivity. Release listserv posts that introduce the readers step-by-step to the CHANJ Web Viewer.
- Continue to recruit and engage with key implementers across the state and identify ways to collaborate.
- Continue to stay abreast of research and ideas on habitat connectivity.

JOB NUMBER AND TITLE: 4. Habitat Change Analysis Project (HCAP)
This job was transferred to NJ FW-64-T in 2020.

JOB NUMBER AND TITLE: Job 5 - Technical Guidance on Behalf of SGCN
Prepared by: Kris Schantz

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:

- Over the course of the grant period, the ENSP provided input and guidance on projects and activities involving SGCN wildlife and habitats to more than 50 different state, federal, and local agencies or programs annually. This includes more than 432 reviews completed by ENSP staff in 2021 to approximately 38 agencies and programs with more than 1,300 reviews during this grant period. A listing of the reviews by category is found in Table 1.
- In many cases, the ENSP reviews were performed in association with local, state and/or federal regulatory reviews where the ENSP staff guidance ensured that relevant agencies could arrive at finding of compliance regarding threatened or endangered species regulations or that project proposals were altered or denied in order to avoid adverse impacts that might otherwise have occurred. Important examples of these reviews included routine coordination with the Department's Division of Watershed Protection and Restoration (formerly part of the Division of Land Resource Protection which was formerly the Division of Land Use Regulation), with whom more than 70 reviews were performed in 2021; more than 260 during the grant period.
- In other cases, the ENSP coordination and expertise was sought voluntarily by partners or non-profits who were engaged in project(s) specifically designed to benefit threatened or endangered species, or where

secondary project elements were sought that might add in beneficial habitat elements to an otherwise species-neutral proposal.

Table 1. Number of Technical Guidance reviews and consultations conducted by ENSP by category, 01/01/21 through 12/31/21.	Number of Reviews:
1. State reviews	
New Jersey Department of Transportation	17
New Jersey Pinelands Commission	2
DEP Division of Land Resource Protection, *formerly Land Use Regulation Program* (Freshwater Wetland Act, CAFRA, Flood Hazard Area Control Act, Waterfront Development, Stream Encroachment, Highlands Act, Pinelands Act)	70
DEP Division of Watershed Protection and Restoration (*formerly the Division of Watershed Management*)	7
DEP Bureau of Coastal and Land Use Enforcement and Compliance	7
DEP Division of Water Quality	0
DEP Division of Coastal Engineering	3
DEP Office of Permit Coordination and Environmental Review	29
DEP Office of Dredging and Sediment Technology	1
DEP Office of Permit Information and Assistance	1
DEP Division of Parks and Forestry	5
DEP Review of Activities Proposed for N&HR-Administered Lands and Waters	95
DEP Division of Solid and Hazardous Waste Management	1
DEP Site Remediation Program	2
DEP Bureau of Surface Water Permitting	0
DEP Bureau of Wastewater Management	0
DEP Bureau of Marine Water Monitoring	0
DEP Office of Water Policy	0
DEP Office of the Commissioner	5
DEP Office of Policy, Planning and Science	2
DEP Office of Sustainability	0
DEP Office of Coastal and Land Use Planning	0
DEP Division of Fish & Wildlife, Bureau of Land Management	16
DEP Division of Fish & Wildlife, Bureau of Wildlife Management	4
DEP Division of Fish & Wildlife, Exotic & Nongame Permits Office: Scientific Collecting Permits	60
DEP Division of Science and Research	5
DEP Green Acres Program	2
DEP Bureau of Climate Resilience Planning	1
DEP Office of Policy	0
2. U.S. Government reviews	
U.S. Fish and Wildlife Service	38
Army Corps of Engineers	6
Federal Emergency Management Agency (FEMA)	0
Nuclear Regulatory Commission	0
National Marine Fisheries Service	0
National Park Service	6
Natural Resource Conservation Service	12
National Oceanic and Atmospheric Administration (NOAA)	0
Environmental Protection Agency	0
Federal Energy Regulatory Commission	0
U.S. Military: Army, Navy, Air Force, Coast Guard	0
U.S. Geologic Survey	2
Bureau of Ocean Energy Management	1

3. Interstate Commissions, etc. reviews	
Delaware River Basin Commission	0
NY/NJ Port Authority	1
Atlantic States Marine Fisheries Commission	0
Meadowlands Commission	5
Atlantic Flyway Council	2
US Fish & Wildlife Service, Atlantic Coast Joint Venture	1
Other officially recognized interstate committees and cooperatives	0
4. County and Local Entities: reviews and consultations	
County Mosquito Commissions	1
County and Local Park Commissions	6
Watershed Associations	1
Local Municipalities	7
Local and Regional Environmental Commissions	2
5. Private, Non-Profit Conservation Organization reviews	
National Fish and Wildlife Foundation	0
State and county Federations of Sportsmen's Clubs	0
The Nature Conservancy, Natural Lands Trusts, NJ Audubon, Land Conservancy of NJ, etc.	7
NJ Conservation Foundation	0
Environment and Climate Change Canada, Canadian Wildlife Service	0
Other (other direct-contact project reviews)	1
Total:	**432**

Conclusions:

- Throughout the grant period, state, federal, and local agencies or partners requested input and guidance from the ENSP on projects/activities related to SGCN and their habitats. The ENSP clearly serves an instrumental role in representing the needs of rare wildlife on behalf of the NJDEP.
- ENSP staff has served a 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.
- The ENSP is committed to maintaining a close working relationship with the USFWS, particularly as staff work to 1) implement regulatory protection of bald eagle nests and related supporting habitat; 2) enhance habitat for migratory shorebirds including red knot; 3) improve site management for piping plovers; 4) enhance long term viability of bog turtle habitats; 5) improve conditions for endangered and threatened freshwater mussels; 6) determine what steps are needed to protect and recover newly listed eastern black rail; 7) conserve remaining populations of imperiled bats.
- Similarly, the ENSP's work to coordinate with the NRCS continues to be an effective means of delivering early-successional habitat management on private land, and this will continue to be an ENSP priority.
- With the NJ DEP's commitment to renewable energy generation, we saw an increase in policy and project-related consultations during the grant period, and this is becoming a major component of technical guidance performed by the Program. In 2021, ENSP staff continued reviewing off-shore wind energy project proposals, attended meetings and training opportunities regarding wildlife impact minimization, research and monitoring, and began planning for specific research and monitoring initiatives related to wildlife migration and interaction with wind energy development off-short of NJ.
- Reviews associated with green or renewable energy projects continued at 2020 levels, but ENSP became more involved in the policies for offshore wind and solar installations.
- Reviews associated with instream projects (e.g., bridge replacements/repairs, dam removals, dredging) relative to listed freshwater mussel species continued. We coordinated with Division of Land Resource Protection to minimize project impacts on listed and rare mussels and provided guidance on survey, relocation and monitoring requirements.

- Reviews and inter-agency coordination between the ENSP, USFWS, and NJ Department of Transportation increased during the grant period and continued through 2021 to address the potential for federally-listed bats to occupy bridge structures.
- Habitat connectivity continues to be a major focus of the Program's technical guidance, particularly in association with the Program's "Connecting Habitat Across New Jersey" (CHANJ) initiative. The Department's flood hazard regulations incorporate CHANJ guidelines for design of terrestrial safe passage structures under roadways in application requirements, and the ENSP's expertise in this area of concern include coordination with the FHWA, state DOT, county and municipal transportation entities and regional planning associations.
- NJ DEP's leadership and commitment to executing, supporting, and guiding beneficial reuse projects has increased. The ENSP will continue to play a critical role in site identification, setting project goals, and ensuring natural resources are both protected and promoted on these projects.

Recommendations:

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

Job 5B. Policy and Planning

Key Findings:

- Staff met with a number of NJDEP partners to guide policy decisions and help with planning initiatives. Coordination with the Division of Watershed Protection and Restoration (formerly in Division of Land Use Regulation) included technical guidance on recommendations concerning wildlife associations with a variety of regulatory standards (e.g., species considered to be "critically dependent upon the watercourse" under the FHCA Rules, and justifying Exceptional Resource Value Wetland Classification guidelines for Northern Myotis). Staff coordinated with the Bureau of Shellfisheries to adaptively manage the state's aquaculture development zone on the Delaware Bay. Staff provided input on an Aquaculture Siting Tool that seeks to identify areas of potential conflicts. Staff participated in ongoing adaptive management for red knots and horseshoe crabs with the Atlantic States Marine Fisheries Commission. Additional consultation took place with NJDEP partners regarding wind and solar energy, and Category 1 Water designations.
- ENSP biologists coordinated with other DEP staff to identify research and monitoring needed on new offshore wind developments. The state has approved leases for offshore wind infrastructure that may be built in the next five years; the DEP is coordinating the research and monitoring requirements, and ENSP began developing project requirements to gather data on potentially vulnerable birds and bats that migrate in the offshore areas. This work, coordinating and directing projects, will continue into the next segment.
- Staff continued coordinating with USFWS and NJDOT on a formal bridge inspection program for bats, which took shape during the grant period following adoption of a Range-wide Programmatic Agreement between the USFWS and Federal Highway Administration requiring bat inspections prior to bridge repairs or modifications that may affect federally listed Indiana Bats or Northern Long-eared Bats. Where colonies of non-federally listed bats are documented, state protections against take apply as per New Jersey's Endangered and Nongame Species Conservation Act. NJDOT and their consultants are following the bat survey guidance, reporting methods, and conservation measures which ENSP and USFWS developed for bridge maintenance projects.
- In 2020 and 2021, the ENSP aimed to limit the use of soil erosion and sediment control products that incorporate netting made of plastics and other synthetic materials harmful to wildlife and the environment.
    - In 2021, the ENSP continued discussions with the NJ Dept. of Transportation (DOT) and presented our objective to the NJ National Resources Conservation Service (NRCS) State Office. Currently, the standards outlined in the Department of Agriculture, State Soil Conservation Committee's "*The*

Standards for Soil Erosion and Sediment Control in New Jersey" (Performance Standards) do not prohibit the use of such products. At this time the DOT has not moved forward with such changes.
    - Efforts to engage the NJ Dept. of Agriculture, State Soil Conservation Committee have been sidelined by the Governor's larger "green initiatives."
    - ENSP requested assistance from the NRCS with the State Soil Conservation Committee and encouraging a shift away from such products in the future.
    - ENSP drafted a potential NJDEP policy to minimize the use such products on lands owned, managed, leased, or regulated by NJDEP to reduce the use of plastics and wildlife entanglements. The document is currently being reviewed.
- Staff continued work on a programmatic consultation for the piping plover with US Army Corps of Engineers, NJ Division of Coastal Engineering, US Fish and Wildlife Service – New Jersey Field Office, and Division of Land Resource Protection staff.
- Staff worked with NJ Division of Parks and Forestry and U.S. Fish and Wildlife Service–NJ Field Office, to hone predator management strategies, while abating public concerns, for the benefit of endangered beach nesting birds.
- Staff worked with U.S. Fish and Wildlife Service, their contractors, and the NJ Division of Parks and Forestry to update or create beach management plans for the benefit of beach nesting birds in municipalities and state parks along the coast. These plans were then implemented by NJ DFW.
- Staff worked with Bureau of Lands Management, NJ Department of Transportation, U.S Army Corps of Engineers, U.S. Fish and Wildlife Service, and local NGOs to pilot projects to increase resilience of coastal marsh systems in the face of sea-level rise, subsidence, and the consequences of a stabilized shoreline. Especially notable is the collaborative effort of the Seven Mile Island Innovation Lab, and living shoreline projects being developed by American Littoral Society and the Nature Conservancy.
- Staff worked on two committees of the Atlantic States Marine Fisheries Commission:
    - The Delaware Bay Ecosystem Technical Committee: ENSP staff conducted data analysis, reviewed reports, stock assessments, recommendations, and other duties in preparation for bi-annual meetings.
    - The Adaptive Resource Management (ARM) Subcommittee: ENSP staff contributed red knot data (aerial survey, re-sightings of marked birds) and technical guidance for use with ARM Model.
- In 2019, staff reviewed the 2019 Benchmark Stock Assessment for Horseshoe Crab, and annually provided updated data to update the ARM Model (used to predict crab bait harvest given red knot population stability). That work was completed in 2021. In 2016, the USFWS issued a Programmatic Biological Opinion (PBO) for shellfish aquaculture in a portion of Delaware Bay. The PBO provides conservation measures for red knot (federal threatened) on aquaculture operations, and a ten-year framework for impacts assessment including stakeholder and agency working groups process for considering new science and/or changes to Conservation Measures; 2021 was year five of PBO implementation.
- ENSP staff continued to assess stakeholder concerns and finalize the Program's minimize harm guidance document (formerly a "best management practices" document) regarding maintenance and construction activities on rights-of-way (ROWs). The current document provides both optimal and minimally-acceptable minimize harm strategies for rare species pertaining to routine vegetation maintenance (e.g., mow, cut, herbicide), excavation and grading, and general activities conducted on ROWs.
- Staff provided comments on the Scope of Work for carbon sequestration calculations for the pending Natural and Working Lands Strategy.
- Staff continued to actively participate as a member of the USDA – Natural Resources Conservation Service's State Technical Committee.
- Staff continued to actively participate in the Appalachian Mountains Joint Venture technical committee meetings to create a priority list of bird species of conservation concern and address data and implementation gaps in reversing declines of those species.
- Staff actively participated in Road 2 Recovery Workshops to help stop declines and recover the 3 billion birds lost in North America since the 1970s.

- Staff continued to actively participate as a voting member of the Atlantic Flyway Council Nongame Bird Technical Section and chair of its Shorebird Committee.

Conclusions:

- ENSP staff contributed to a number of state and federally initiated planning efforts, delivering 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 and local policies or regulations to advocate for wildlife habitat needs.

Recommendations:

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