



Bobcat Project | 2025

Gretchen Fowles, ENSP

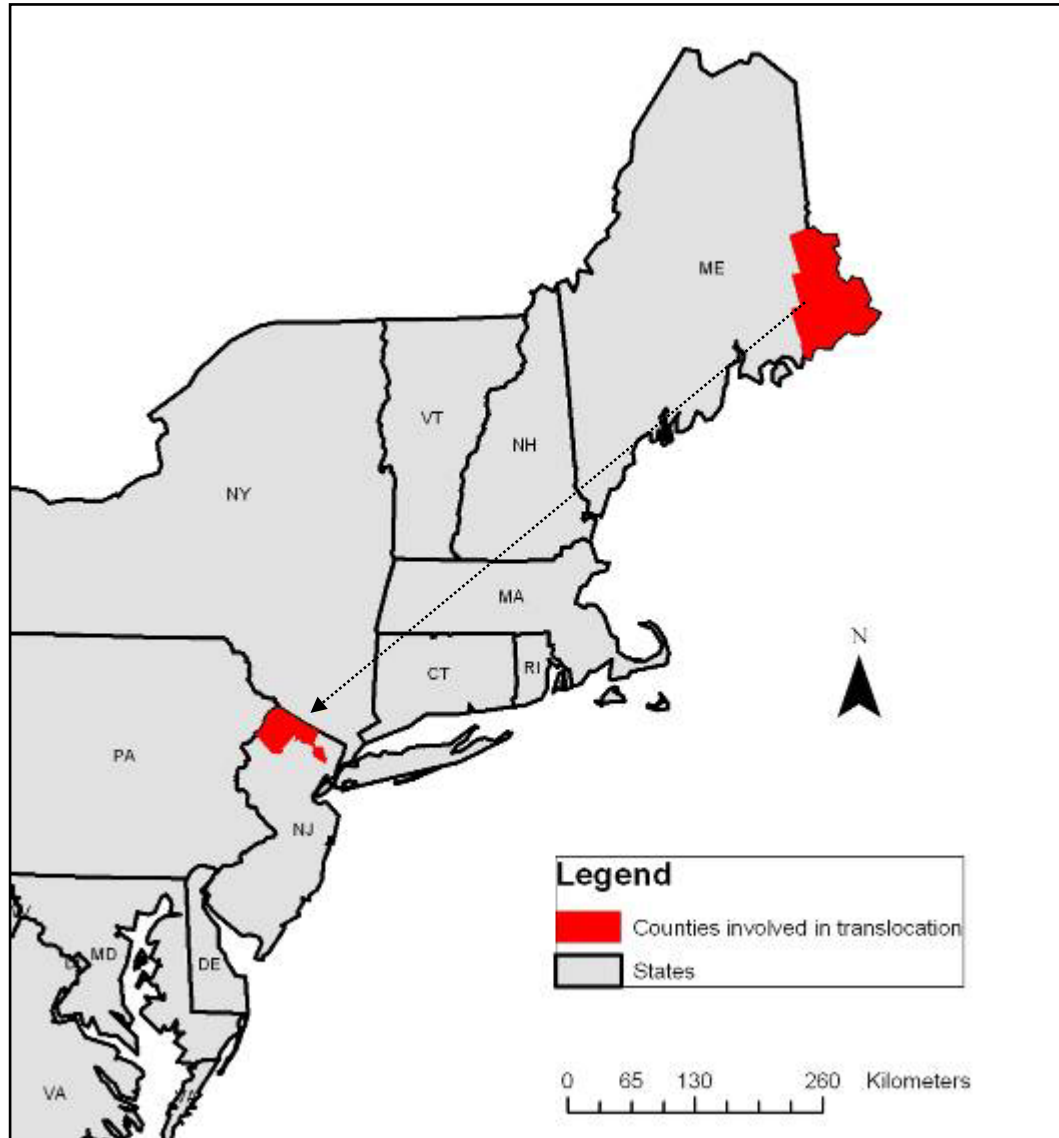


History



- **Colonial times to 1800s** – Records indicate abundant statewide; bounties paid on bobcats
- **Early 1900s** - Declining statewide due to clearing of forests / conversion to agriculture
- **1950s - 1970s** - Persisted in the northern part of the state, but just scattered reports
- **1972** - Gained full legal protection in NJ - classified as a game species with a closed season
- **Mid 1970s** – Believed to be extirpated from the state

History



1978 – 1982 – ‘Bobcat Relocation Project’; 24 bobcats from ME released into northern NJ

1975 – 1988 – Reports, including some from central and southern NJ, trended down over time

1991 – Listed as Endangered “little change in bobcat numbers and distribution since the restoration efforts”

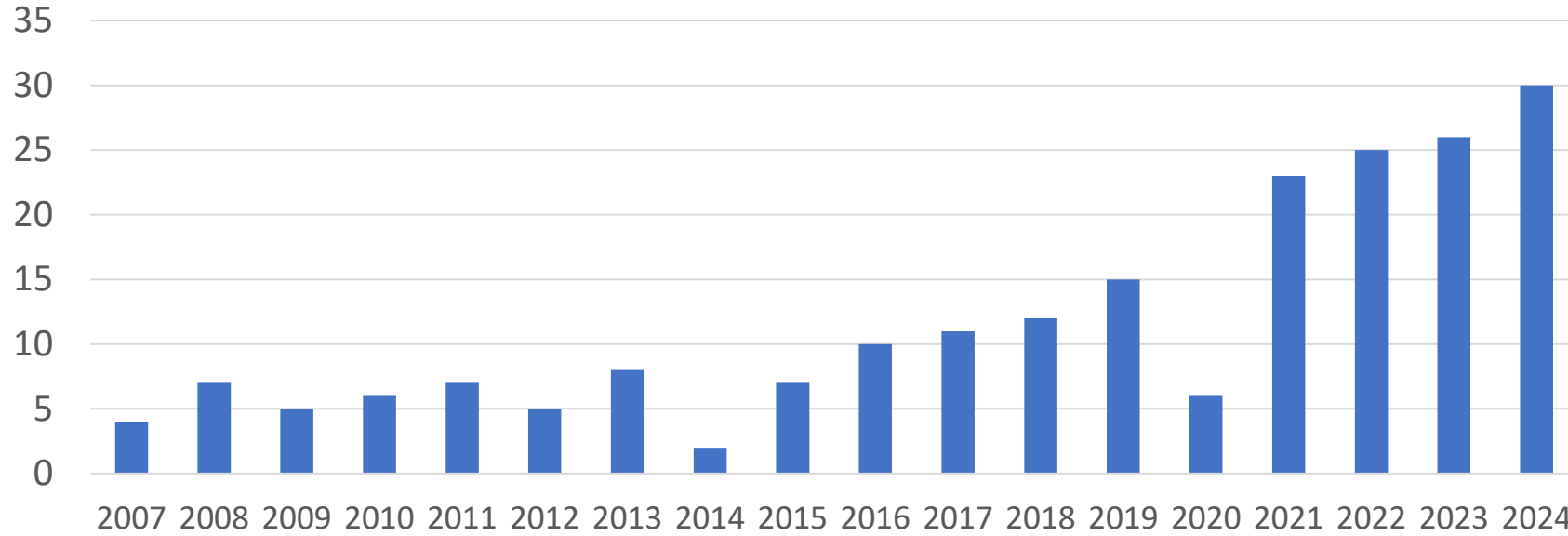
2015 – present – Increase in sighting reports, roadkills, accidentally trapped bobcats in Northern NJ.

2025 – Downlisted to Threatened

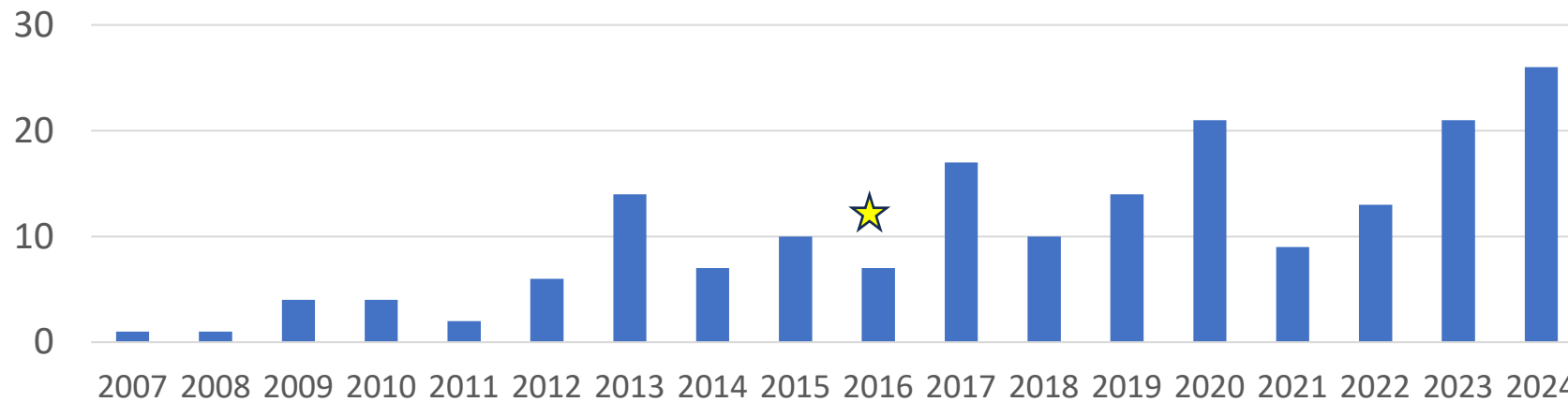


Population Abundance Indices

Roadkilled Bobcats



Trapped Bobcats

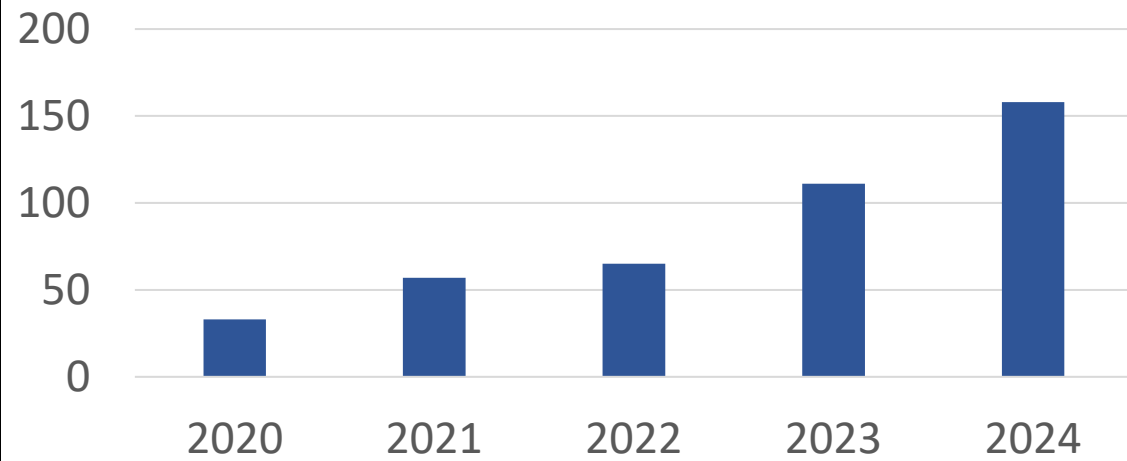


★ Reporting required

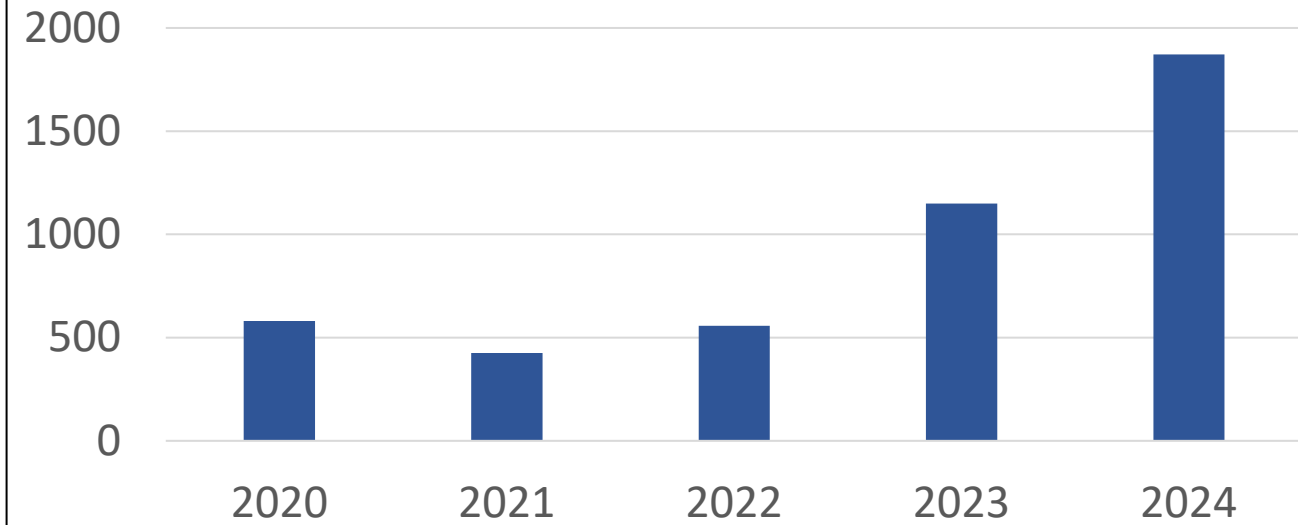


Population Abundance Indices

Number of **Bobcat** Observations
Received in NJ Wildlife Tracker and
Confirmed



Number of Observations Across **all Wildlife Species** Received in NJ Wildlife Tracker



Caveats

- TNC's Bobcat Alley campaign began end of 2016
- CHANJ project released early 2019
- NJ Wildlife Tracker released early 2023



Population Abundance and Density Estimates

ENSP:

- Field: Individual ID of bobcats using DNA extracted from scat found by detection dog
- Analytical: Bayesian Spatial Capture-Recapture
- Study area: 3,000 km² (N 78, W 46, W 287)
- **Bold** estimates resulted from more unique individuals and more recaps

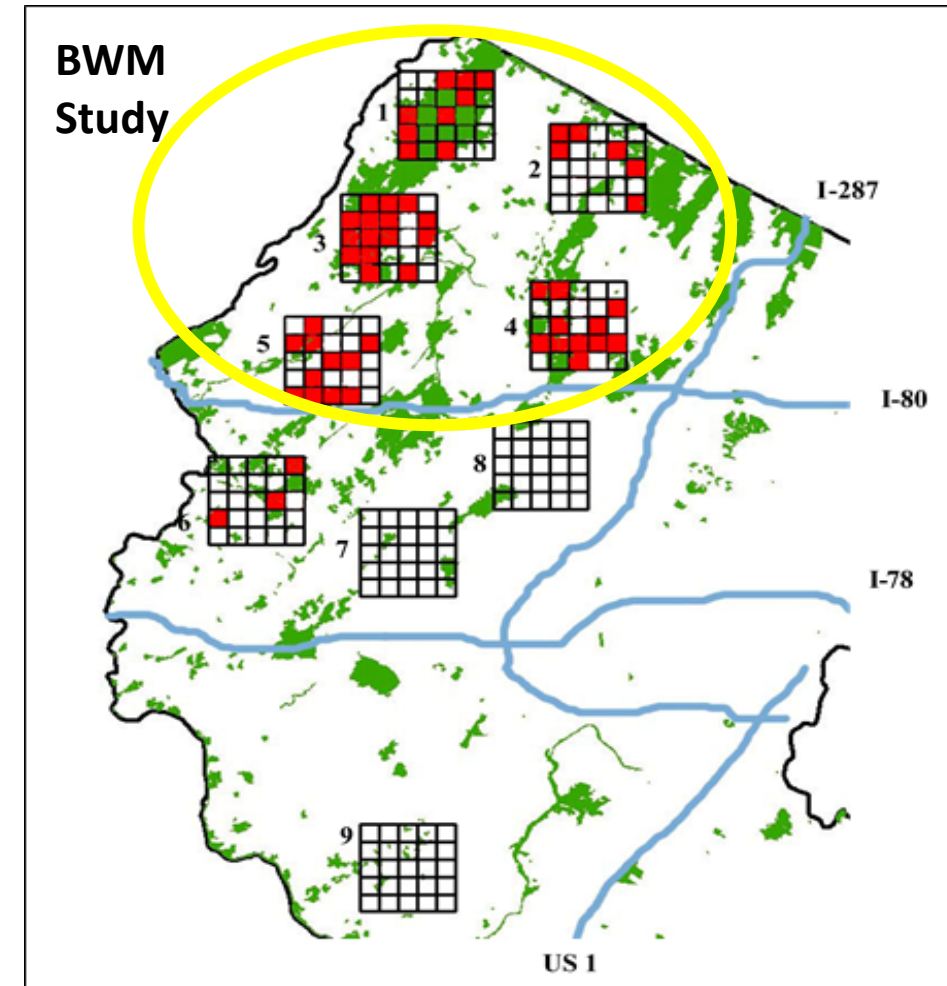
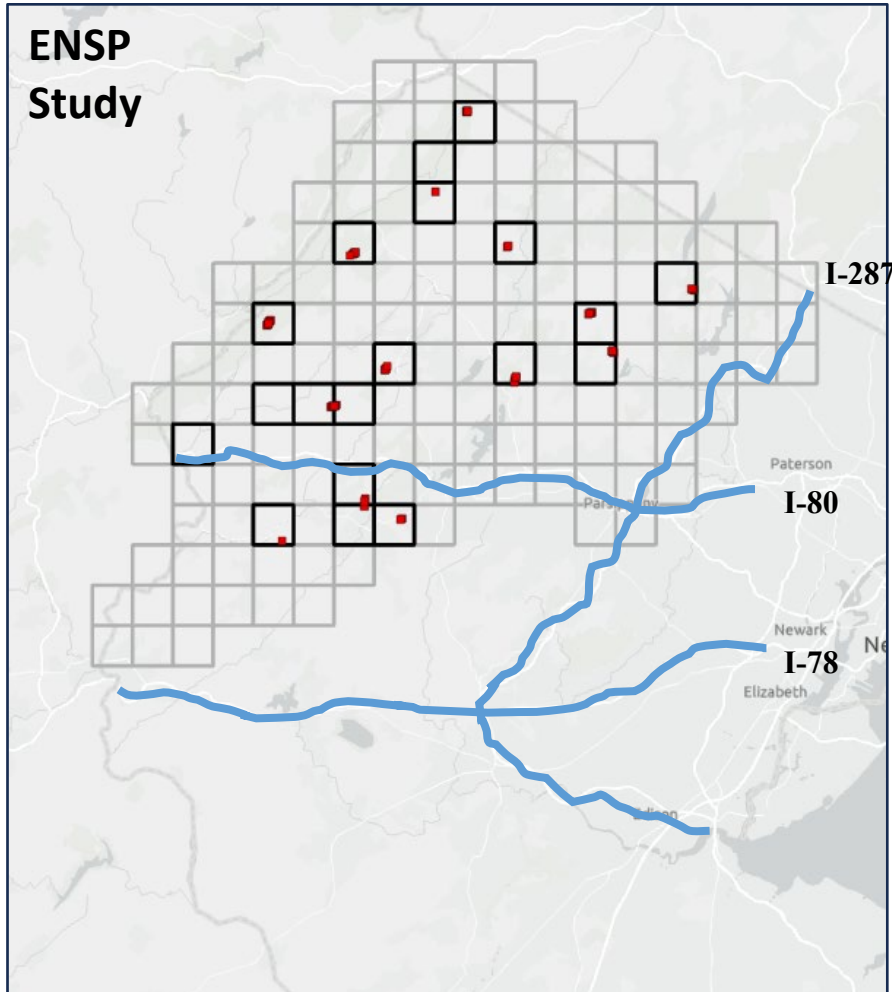
BWM:

- Field: Presence/absence at sites using baited hair snares along with a camera
- Analytical: Occupancy Model
- Study area: 2,500 km² (N 80, W 287)

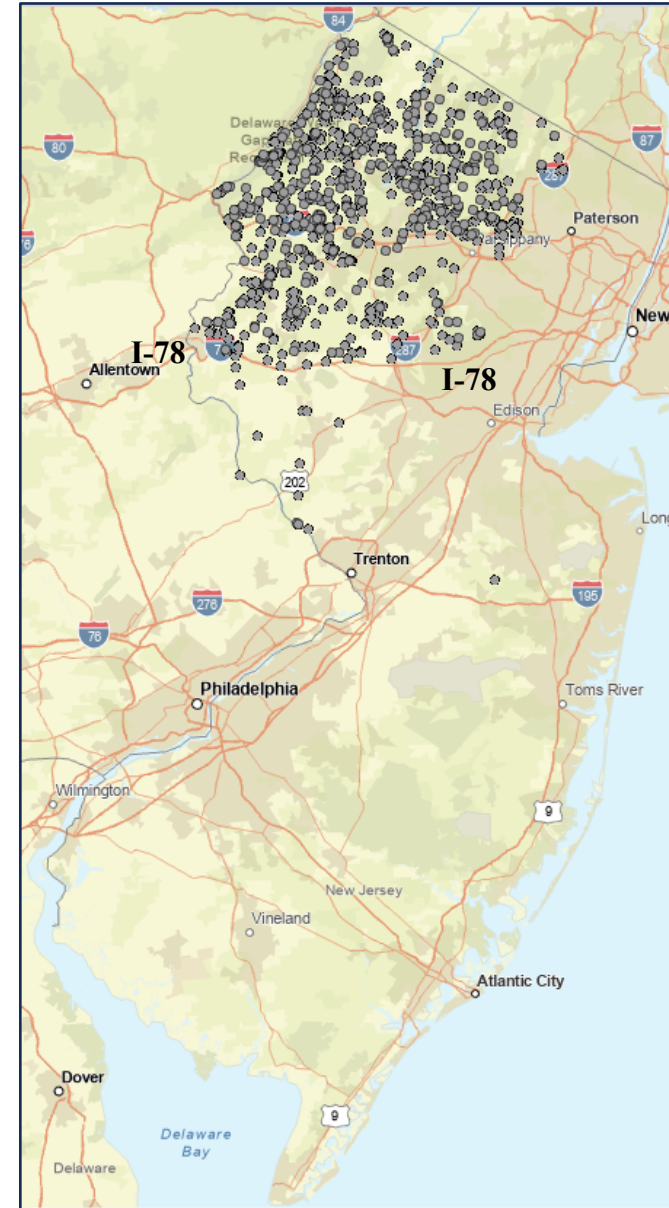
Year	Population Estimate (CI)	Density Estimate per 100km ² (CI)
2007	197 (51-447)	5 (1-12)
2008	179 (102-315)	5 (3-8)
2011	308 (145-462)	8 (4-12)
2012	355 (197-466)	9 (5-12)
2013	334 (183-463)	9 (5-12)
2015	180 (55-430)	5 (1-11)
2016	276 (85-459)	7 (2-12)
2021/2022	269 (167-330)	7 (4-9)

Year	Population Estimate (CI)	Density Estimate per 100km ² (CI)
2019	665 (335-1323)	26 (13-53)

Survey Areas / Distribution



Distribution



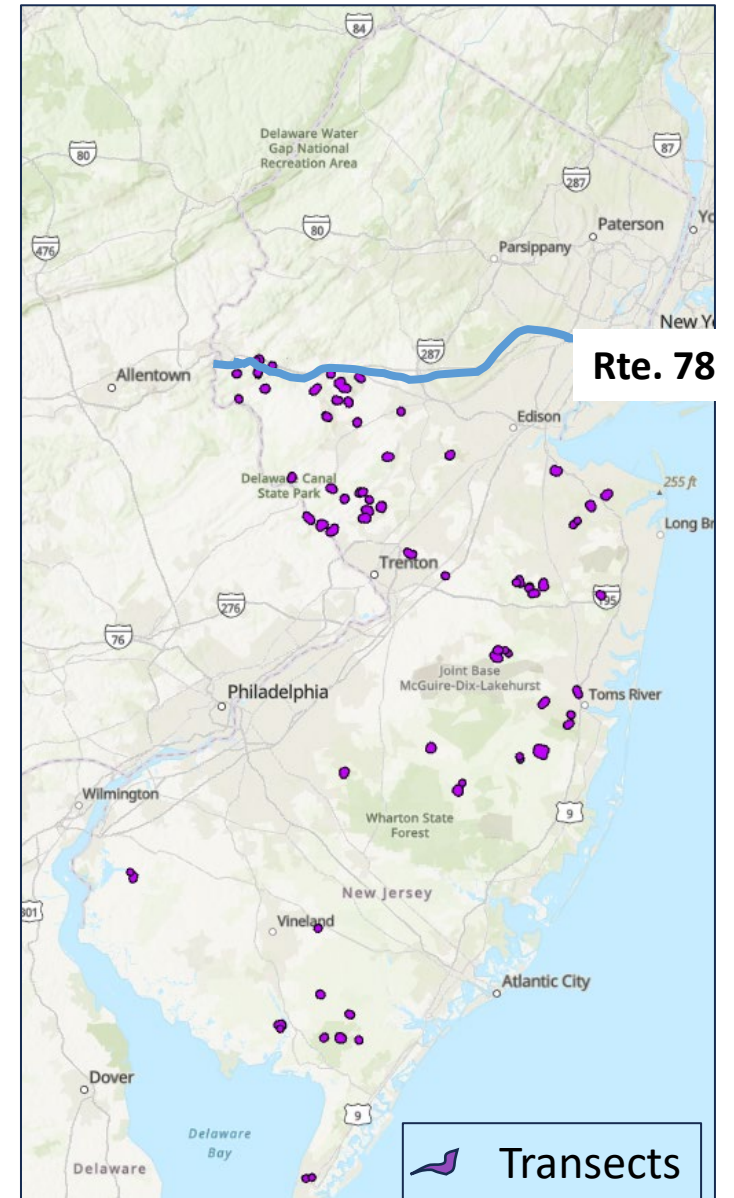
- Confirmed Bobcat Observation
- 2014 - 2024



South of Rte. 78

- 76 Transects
- 284km

3 Bobcat Scats



Distribution

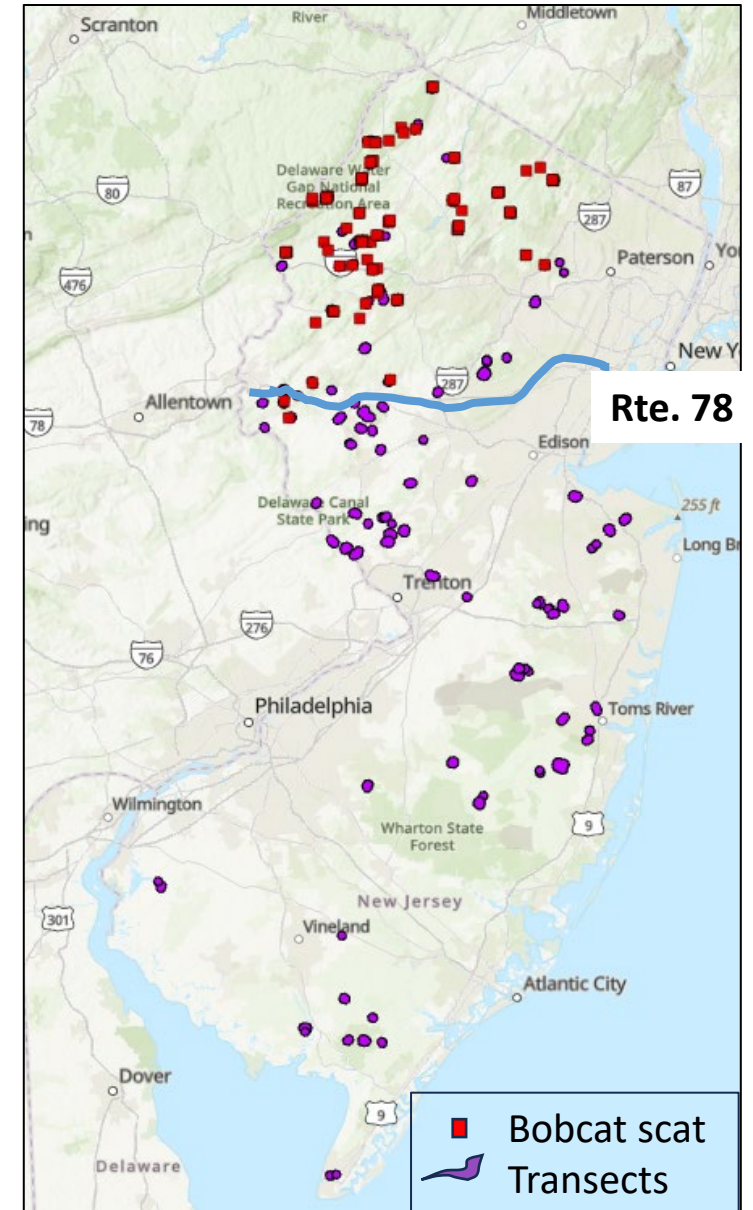
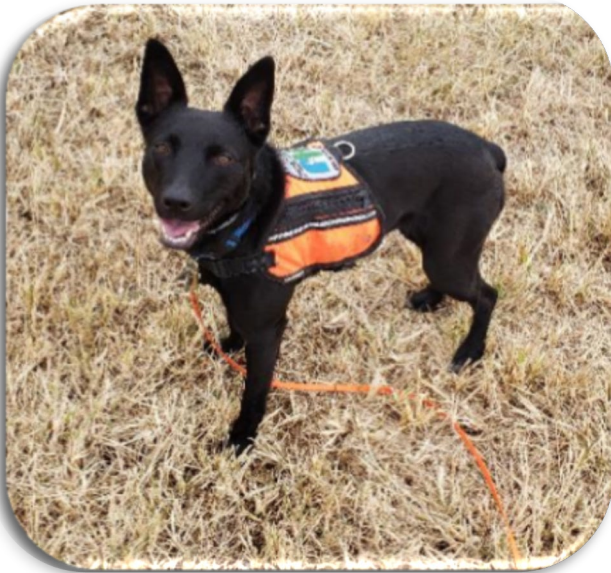
2020 – 2024

South of Rte. 78

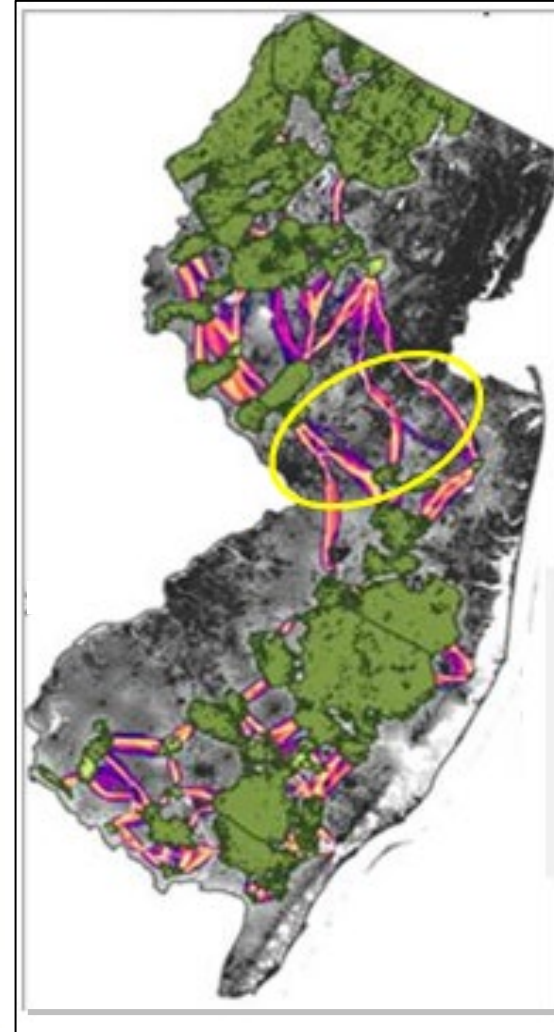
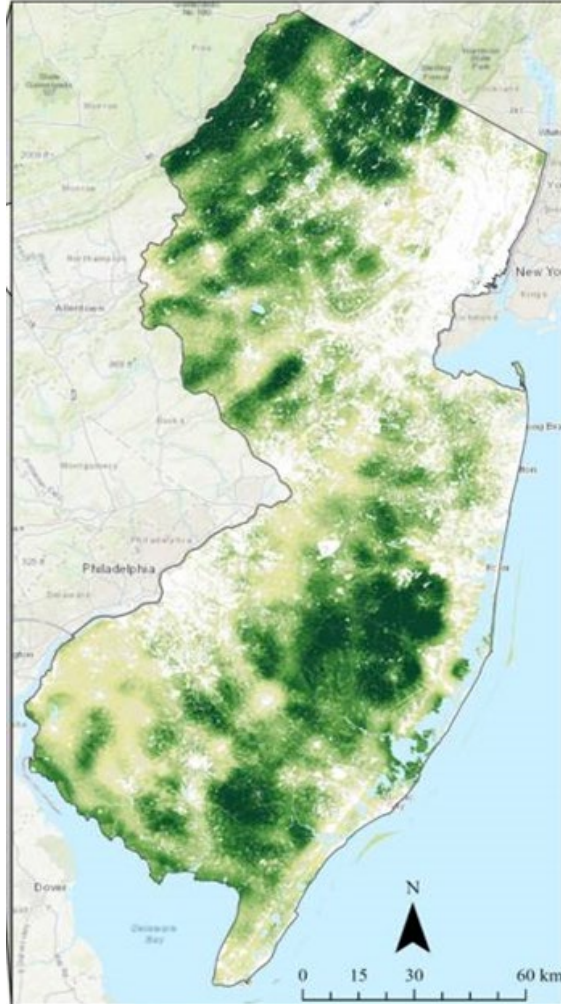
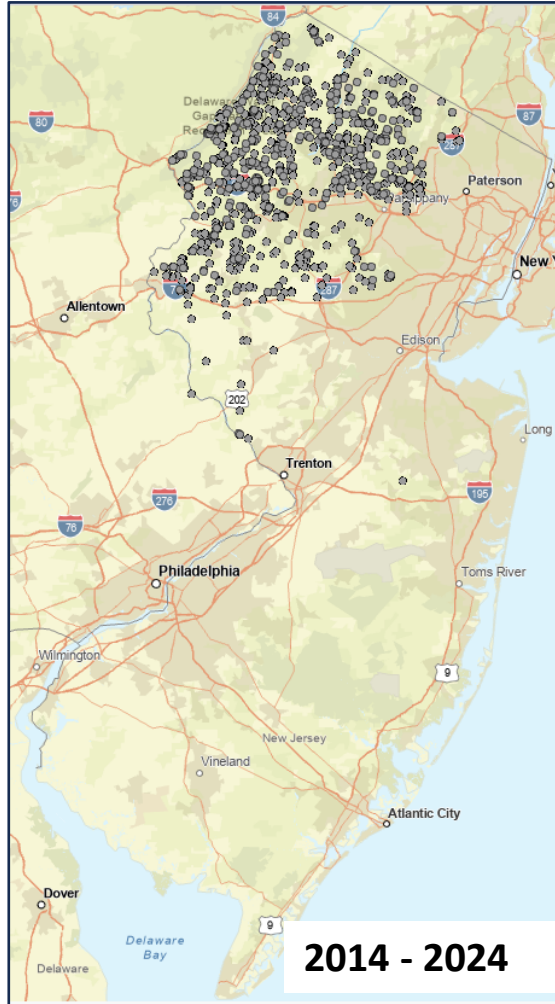
- 76 Transects
- 284km
- 3 Bobcat Scats

North of Rte. 78

- 99 Transects
- 354km
- 194 Bobcat Scats



Distribution

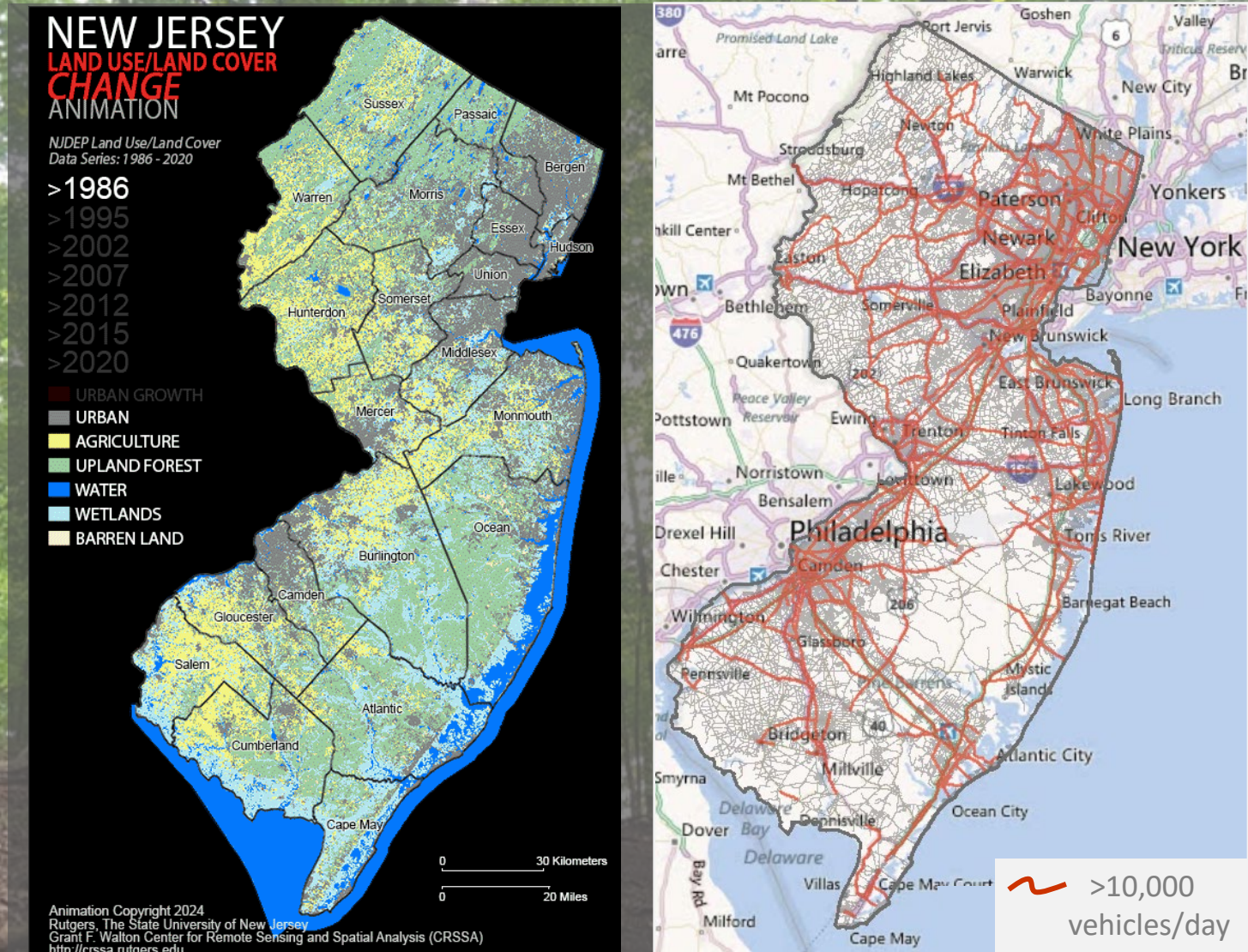


Cerreta. A.L. et al. 2023. Habitat suitability and landscape connectivity for an expanding population of bobcats. *Landscape Ecology*. 1-19.

Stressors

- Habitat Fragmentation
- Road Mortality
- Trapping, Incidental Captures
- Disease & Rodenticides

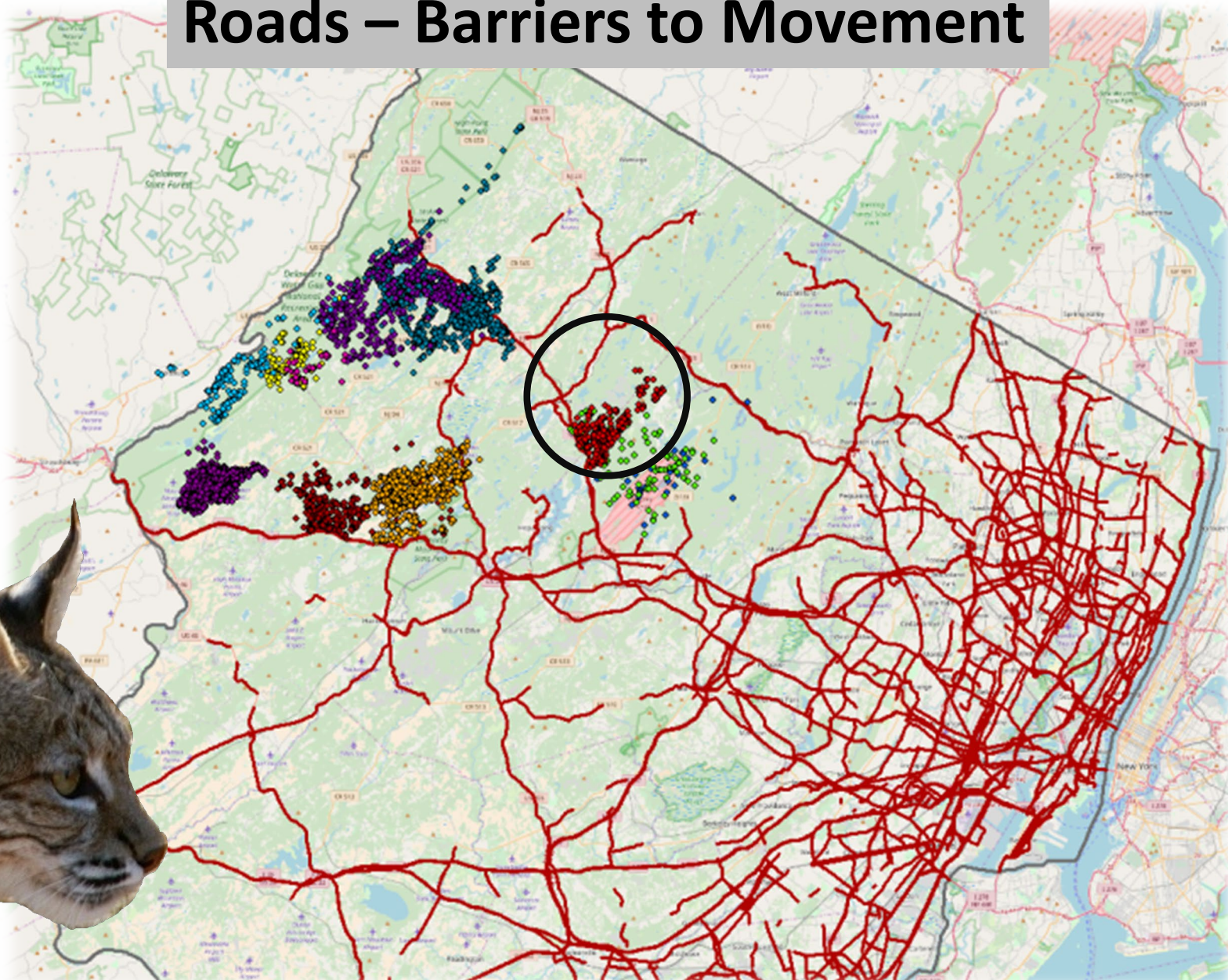
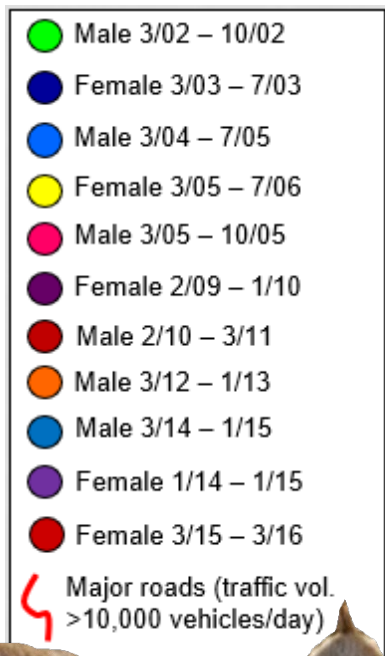
Stressor – Habitat Fragmentation



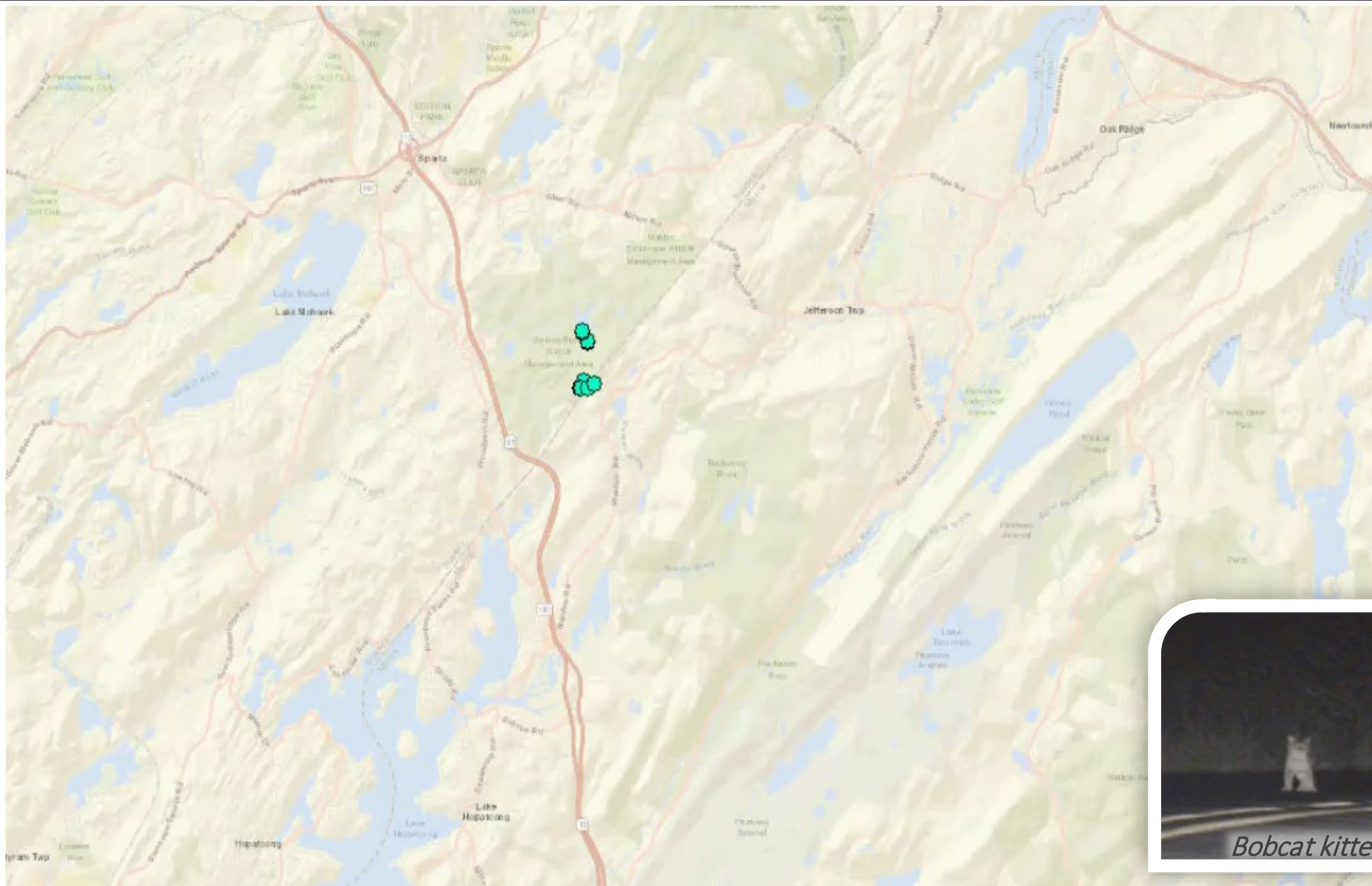
“Habitat loss or modification is the greatest threat to New Jersey’s wildlife” -NJ Wildlife Action Plan (2017)

Stressor – Habitat Fragmentation

Roads – Barriers to Movement



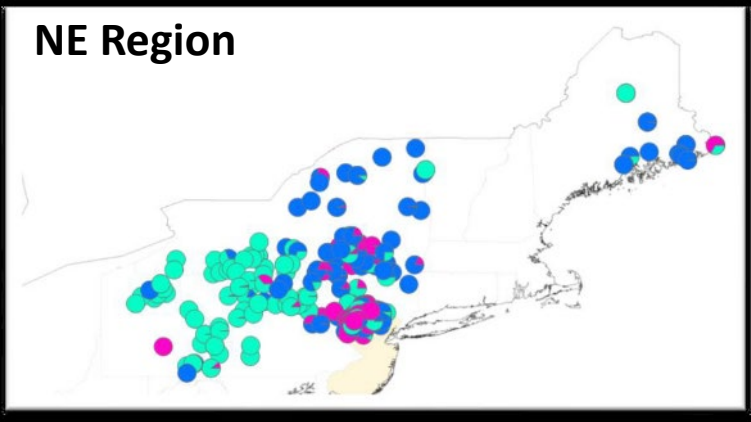
Bobcat Movements: 1 Year



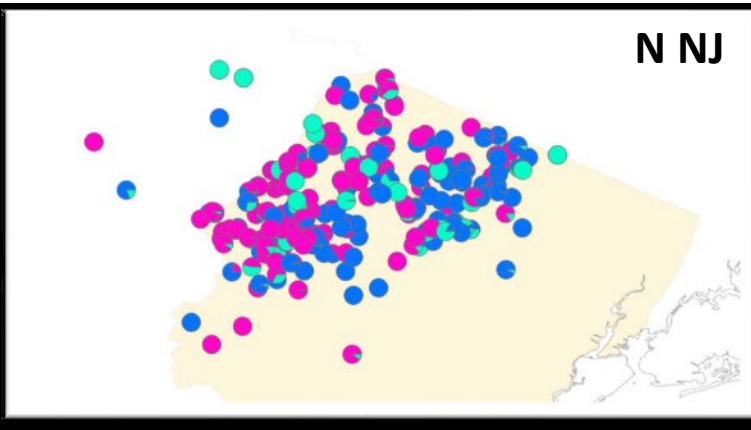
Stressor – Habitat Fragmentation

Gene Flow Evidence

NE Region



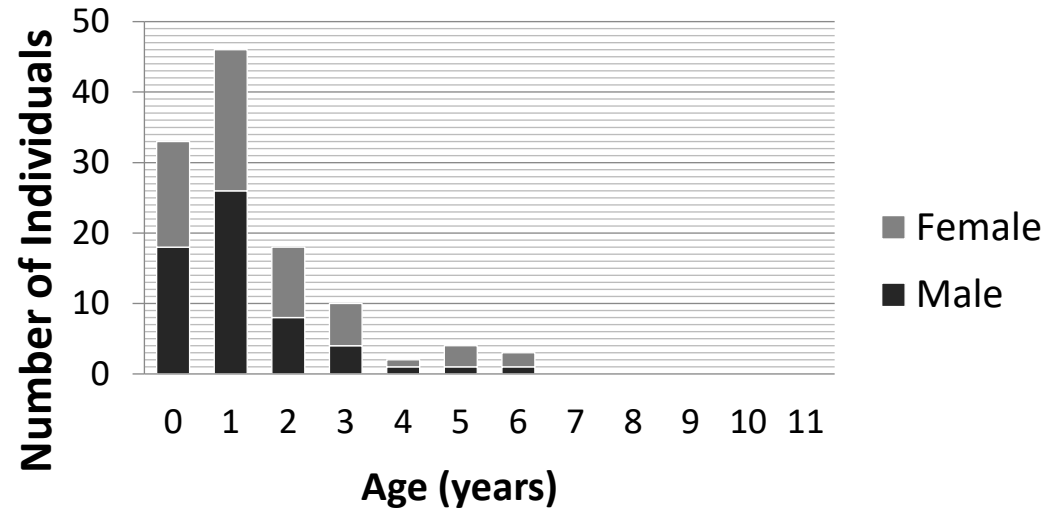
N NJ



- Likely remnant population prior to restoration - unique NJ signature (pink)
- Some connectivity with neighboring populations - NY more similar to NJ than PA
- 3 clusters: PA, Northern NY/ME, and NJ/Southern NY
- More recent analyses within NJ – human infrastructure/roads are impeding genetic connectivity in 7/10 mammalian species, including bobcats

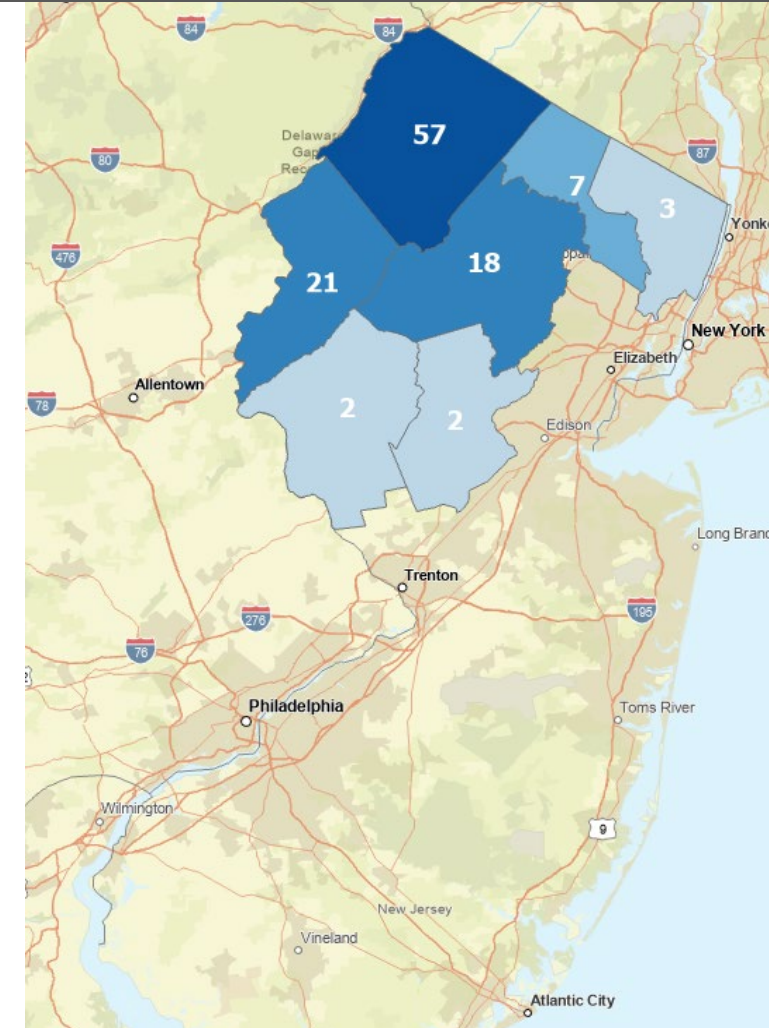
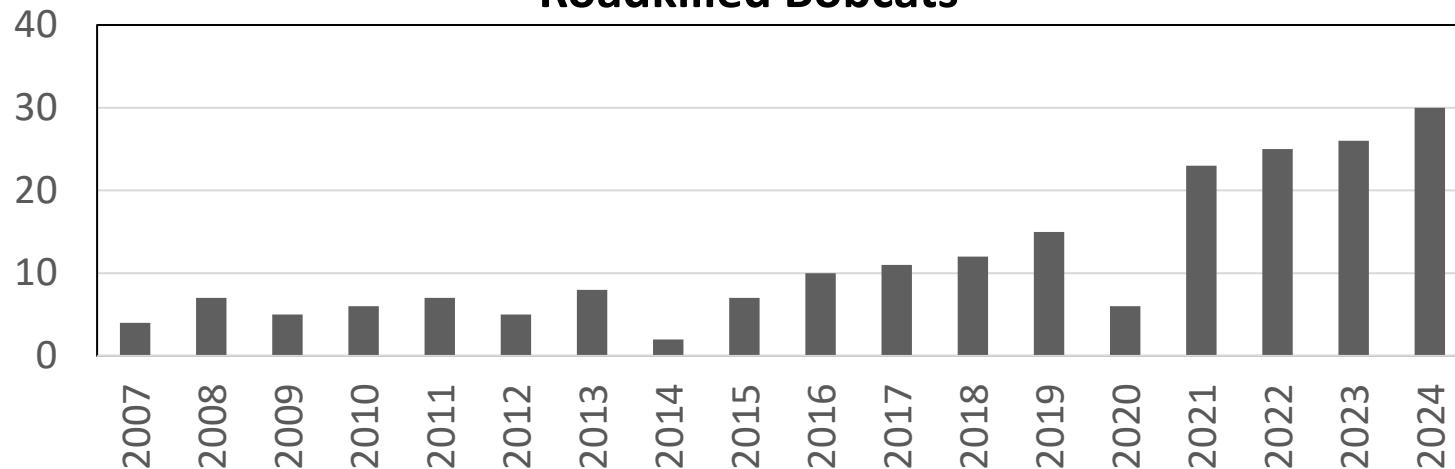
Stressor – Road Mortality

Age and Number of Bobcats Hit by Cars by Sex



2007-2022
~70% <2 years old

Roadkilled Bobcats

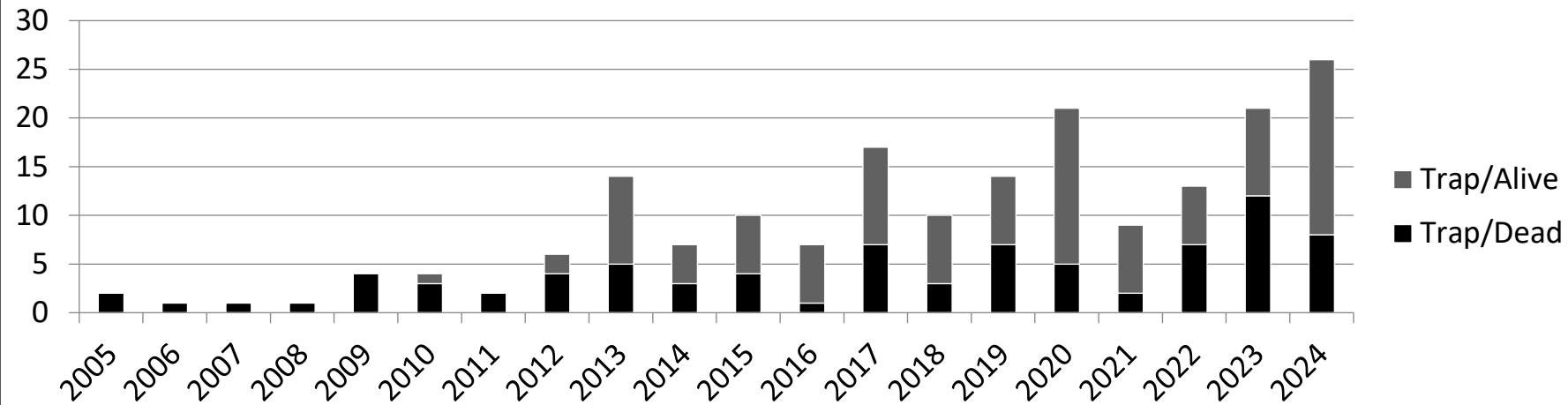


**Occurrences of Roadkills by
County
2020-2024**

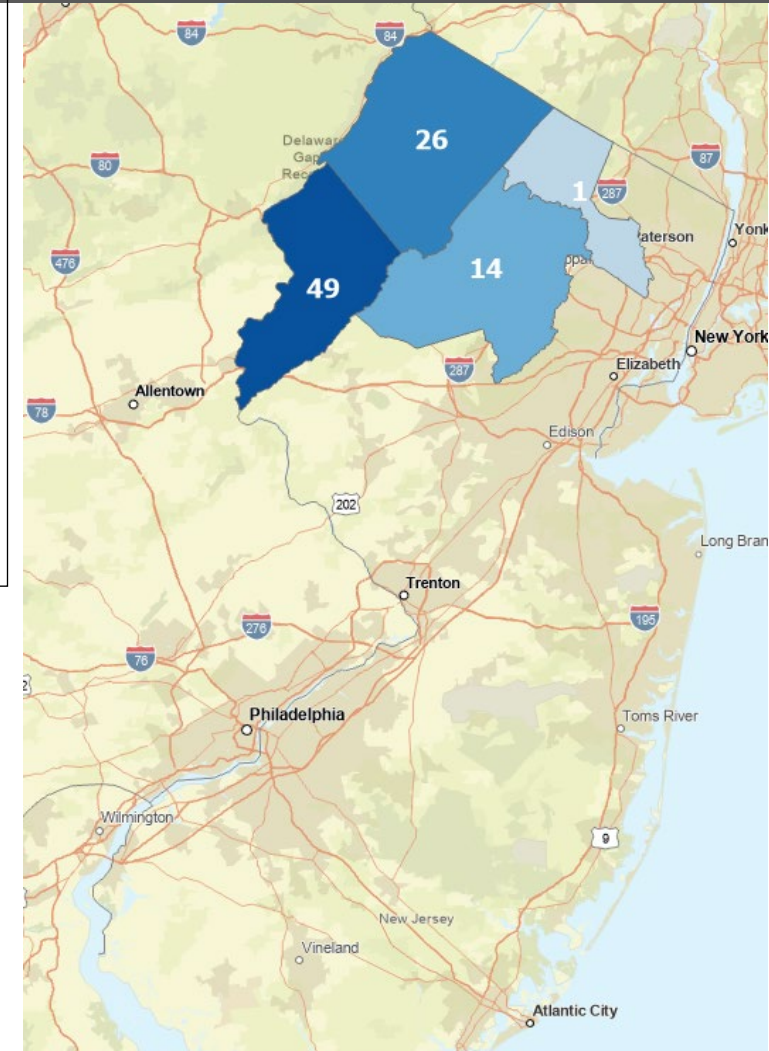
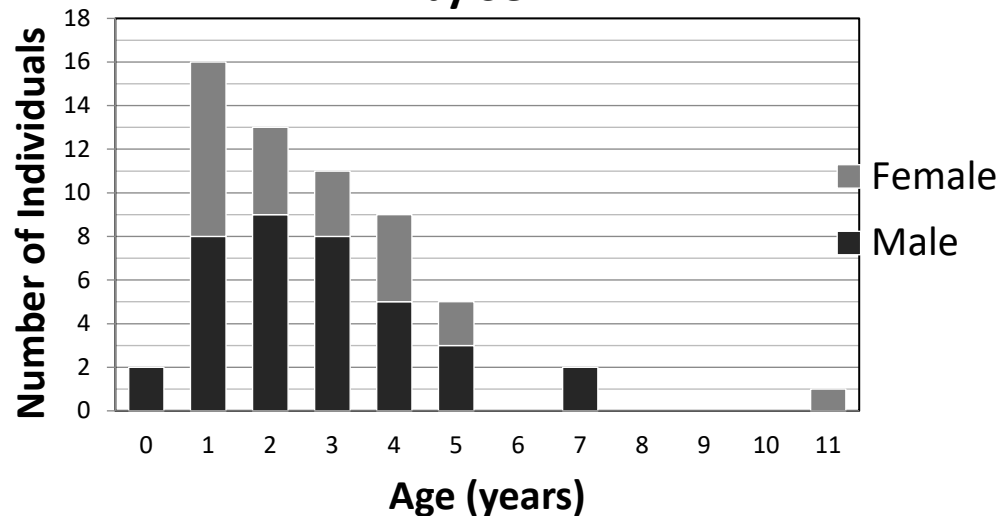


Stressor – Trapping, Incidental Captures

Trapped Bobcats



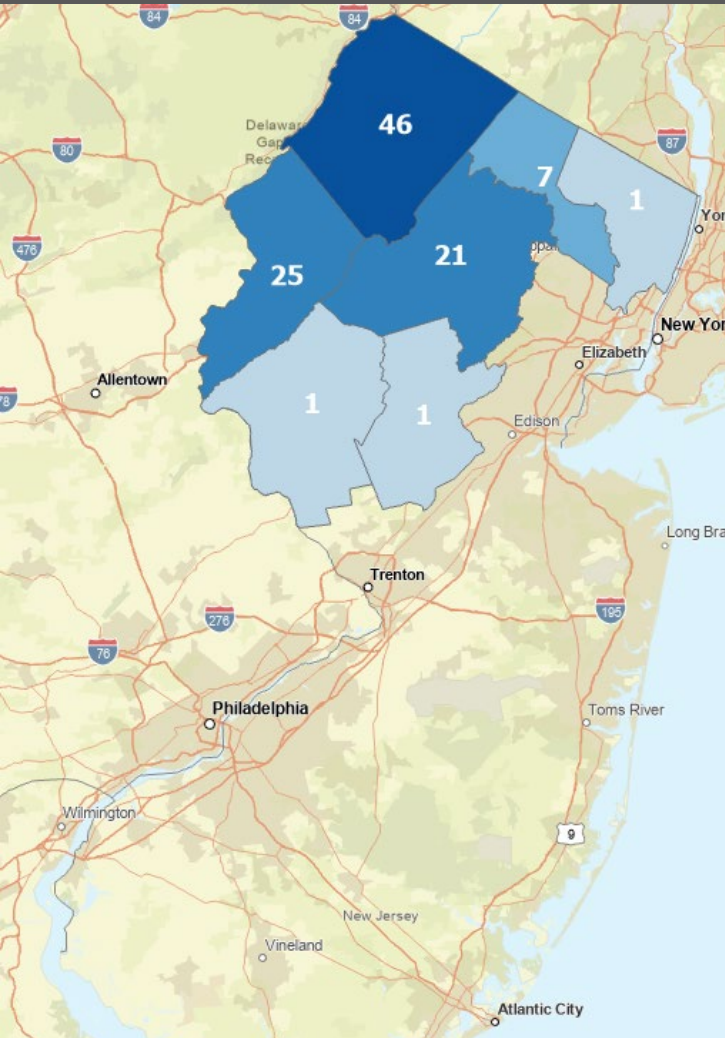
Age and Number of Bobcats Dead in Traps by Sex



Occurrences of Incidentally Trapped by County 2020-2024

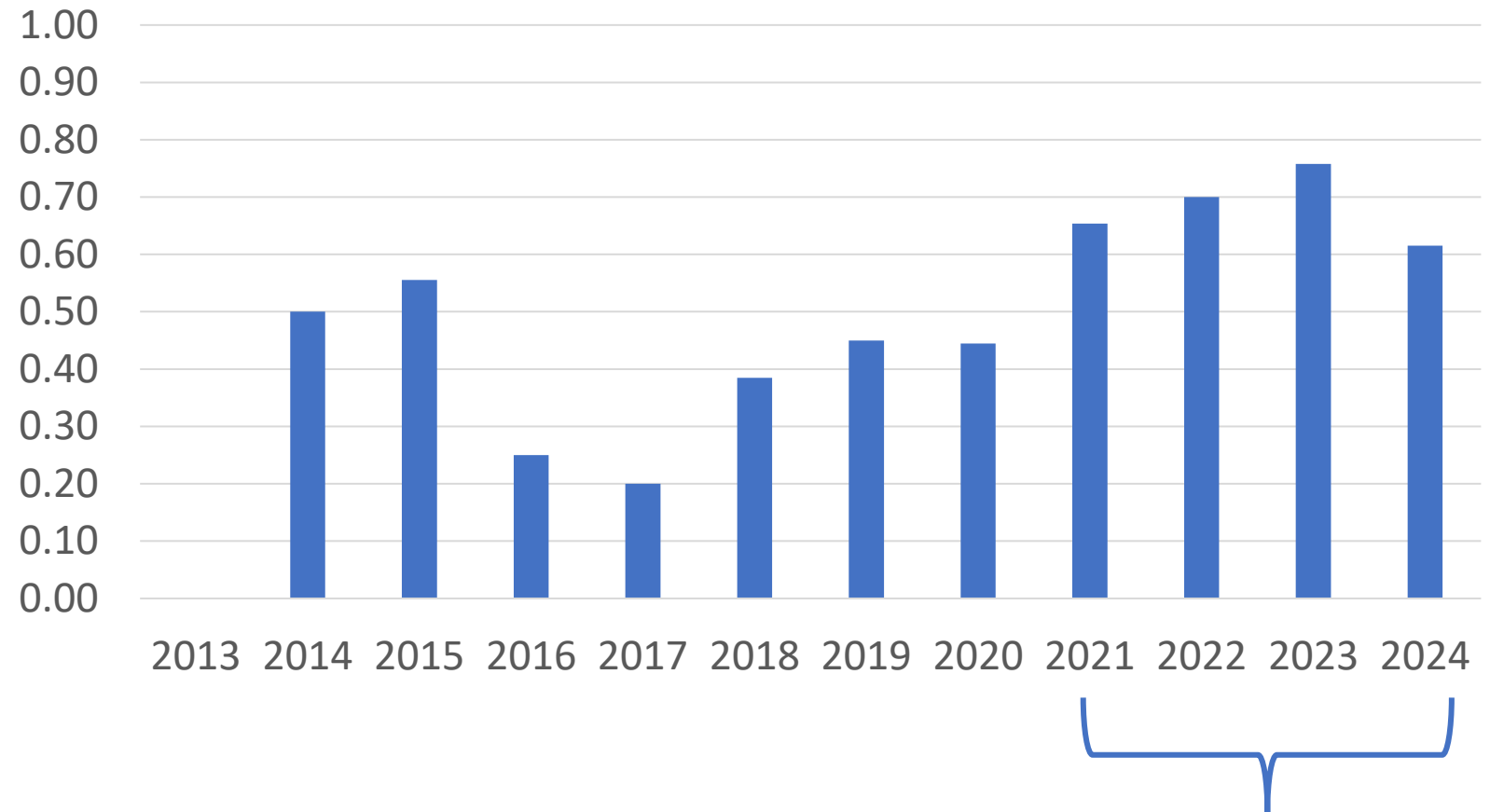


Stressor – Rodenticide Exposure



**Occurrences of Bobcats with
Rodenticide Exposure
2013-2024**

Frequency of Rodenticide Exposure in NJ Bobcats



Ave. Frequency of Exposure in last 4 year = 0.68

Stressor – Disease

- Feline parvovirus
- Feline leukomyelopathy
- Lungworm
- H5N1 Bird Flu



Pennsylvania
Department of Health



Pennsylvania Wild Animals at Higher Risk of Getting Bird Flu



Geese
(including
snow geese
and Canada
geese),
ducks, and
other
waterfowl



**Wild
poultry**
including
wild turkey
and grouse



**Scavenger
birds**
including
crows, gulls,
ravens, and
vultures



**Predatory
birds**
including
eagles, and
hawks



**Medium-
sized
mammals**
including
foxes,
raccoons,
and skunks



**Large
predators**
including
bobcats,
and
bears

H5N1 BIRD FLU: INTERACTING WITH WILDLIFE

H5N1 bird flu is caused by a virus that can lead to serious illness and death in birds and mammals. While human infection from bird flu viruses is rare, it is possible and can lead to severe illness and even death.

Symptoms of H5N1 Bird Flu in Humans

- Coughing
- Headaches
- Sore throat
- Shortness of breath or difficulty breathing
- Eye tearing, redness or irritation
- Runny or stuffy nose
- Diarrhea
- Muscle aches
- Pneumonia
- Seizures
- Fever



Management to Reduce Stressors

- Rodenticides & Disease
- Trapping, Incidental Captures
- Habitat Fragmentation
- Road Mortality

Management to Reduce Stressors

Rodenticides & Disease

Demographics / Health

- Necropsies of all dead
 - Health surveillance
 - Body condition score
 - Liver sample for rodenticide exposure testing
 - Histology on any unusual findings (e.g. lungworm)
 - Analysis of reproductive tracts (fecundity)
 - DNA sample
 - Lagomorph DNA from stomach
 - Teeth for aging
 - Feces
 - Ticks / blood

Patient Medical Record		Page 1 of 11	
		CASE#: 23-6	SPECIES: BOBCAT
Date Admitted Feb 4, 2023 9:44 am			
Band			
Name			
Reference Number NJ337			
Microchip Number Bo			
Rescuer Contact			
Rescuer:		Phone:	
Email:		Alt Phone:	
Address: NJ United States			
Notes About Rescuer:			
Intake			
Admitted By: MCW			
Address Found: Ri			
Reasons for Admis			
Care by Rescuer:			
Notes About Resc			



Management to Reduce Stressors

Trapping – Incidental Captures

Trapper response

- Immediate FW response
- Chemical immobilization to release from trap
- Assess condition
- Insert ear tags, take ear punch (DNA)
- Transport to nearest wildlife rehabilitator
- Generally release 24-48 hours later

Ensure trapper education includes national BMPs





Management to Reduce Stressors

Habitat Fragmentation & Road Mortality





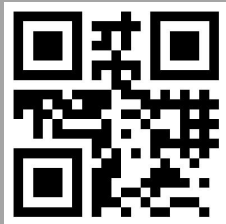
Connecting Habitat Across New Jersey



Tools and Resources to Guide:

- Land protection
- Habitat management and restoration
- Mitigation of road barriers

www.CHANJ.nj.gov



Connecting Habitat Across New Jersey (CHANJ)

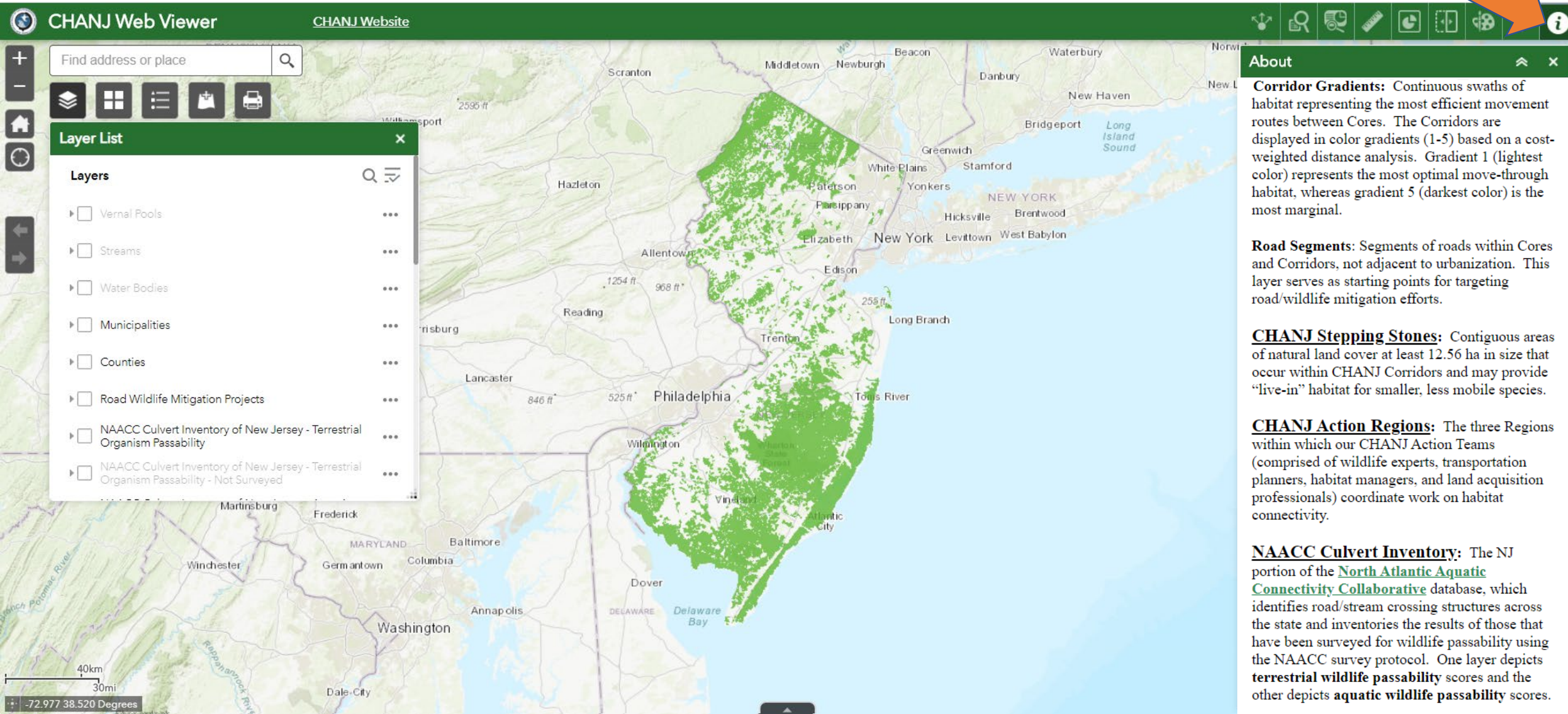
Whether they're small like a salamander or big and wide-roaming like a bear, animals need to be able to move through the landscape to find food, shelter, mates, and other resources. Without that ability to move, healthy populations simply will not persist over the long term. Here in New Jersey, wildlife are up against steady urbanization, a dense network of roads, and now a changing climate, all of which put the connectedness of our habitats and wildlife populations in jeopardy.

Time for CHANJ

Connecting Habitat Across New Jersey (CHANJ) is an effort to make our landscape and roadways more permeable for terrestrial wildlife by identifying key areas and actions needed to achieve habitat connectivity across the state. CHANJ offers two main products – an interactive Mapping tool and a Guidance Document – to help prioritize land protection, inform habitat restoration and management, and guide mitigation of road barrier effects on wildlife and their habitat.



CHANJ Web Viewer: Intro



CHANJ Web Viewer CHANJ Website

Find address or place

Layer List

Layers

- ☐ Vernal Pools
- ☐ Streams
- ☐ Water Bodies
- ☐ Municipalities
- ☐ Counties
- ☐ Road Wildlife Mitigation Projects
- ☐ NAACC Culvert Inventory of New Jersey - Terrestrial Organism Passability
- ☐ NAACC Culvert Inventory of New Jersey - Terrestrial Organism Passability - Not Surveyed

About

Corridor Gradients: Continuous swaths of habitat representing the most efficient movement routes between Cores. The Corridors are displayed in color gradients (1-5) based on a cost-weighted distance analysis. Gradient 1 (lightest color) represents the most optimal move-through habitat, whereas gradient 5 (darkest color) is the most marginal.

Road Segments: Segments of roads within Cores and Corridors, not adjacent to urbanization. This layer serves as starting points for targeting road/wildlife mitigation efforts.

CHANJ Stepping Stones: Contiguous areas of natural land cover at least 12.56 ha in size that occur within CHANJ Corridors and may provide "live-in" habitat for smaller, less mobile species.

CHANJ Action Regions: The three Regions within which our CHANJ Action Teams (comprised of wildlife experts, transportation planners, habitat managers, and land acquisition professionals) coordinate work on habitat connectivity.

NAACC Culvert Inventory: The NJ portion of the [North Atlantic Aquatic Connectivity Collaborative](#) database, which identifies road/stream crossing structures across the state and inventories the results of those that have been surveyed for wildlife passability using the NAACC survey protocol. One layer depicts **terrestrial wildlife passability** scores and the other depicts **aquatic wildlife passability** scores.

The screenshot shows the CHANJ Web Viewer interface. The main map area displays a geographic region with green 'Core' areas and orange/brown 'Corridor' areas. A legend on the left side of the map provides the following information:

- CHANJ Stepping Stones**
 - Core (Green)
- CHANJ (quick draw)**
 - Road, Moderate (Light Gray)
 - Road, Severe (Dark Gray)
 - Road, Severe_hv (Black)
 - Corridor, 1, Easier movement (Light Orange)
 - Corridor, 2 (Orange)
 - Corridor, 3 (Dark Orange)
 - Corridor, 4 (Brown)
 - Corridor, 5, More difficult movement (Dark Brown)

The map includes a search bar at the top left, navigation controls (zoom in, zoom out, home, etc.), and a scale bar at the bottom left. The map area shows various locations including Princeton, NJ, and surrounding areas. An inset map at the bottom right shows the location of the study area within the state of New Jersey.

Table 4.III. Wildlife passage system structure specifications recommended for different species mobility guilds.

Wildlife Passage System: Structure Specifications													
SPECIES GUILD	STRUCTURE TYPE*	SUBSTRATE	SPAN (if conveying water)	WIDTH (internal)		HEIGHT (internal)		LENGTH		SPACING of STRUCTURES		GRATED TOP (openings along road surface for climate)	
				recommended	min	recom'd	min	recom'd	max	recom'd	max	recom'd	min
Low mobility	Open bottom bridge / culvert	Leave natural	1.2x bankfull width at both ends, minimum	2'	18"	2'	1'	≤ 40'	125'	120'	200'	Entire length	At ends
	Box, circular, or elliptical culvert	Backfill with >6" natural substrate											
Moderate mobility	Open bottom bridge / culvert	Leave natural	1.2x bankfull width at both ends, minimum	4'	3'	4'	3'	≤ 40'	125'	500'	1,000'	Entire length	At ends
	Box, circular, or elliptical culvert	Backfill with >6" natural substrate											
High mobility	Open bottom bridge / culvert	Leave natural	1.2x bankfull width at both ends, minimum	8'	6'	8'	6'	≤ 40'	125'	500'	1 mile	-	-
	Box, circular, or elliptical culvert	Backfill with >6" natural substrate											
High Openness Fauna	Open bottom bridge / culvert	Leave natural	1.2x bankfull width at both ends, minimum	20'	10'	10'	8'	≤ 40'	125'	0.5 miles	1 mile	-	-
	Box, circular, or elliptical culvert	Backfill with >6" natural substrate											
NOTES:		<ul style="list-style-type: none">Tunnel should be perpendicular to road, situated at base of slope below road grade, completely level or minimum grading (3%)Design for the needs of all species utilizing the area; multiple structures of different types and sizes may be preferable, and in general, the bigger the better.Maximize continuity of native vegetation, natural material (e.g., rocks, logs), and soils adjacent to and within structure* Overpasses are effective across all species guilds, especially when designs include natural substrate, continuous vegetation cover, a diversity of microhabitats, and separation from human use areas.											

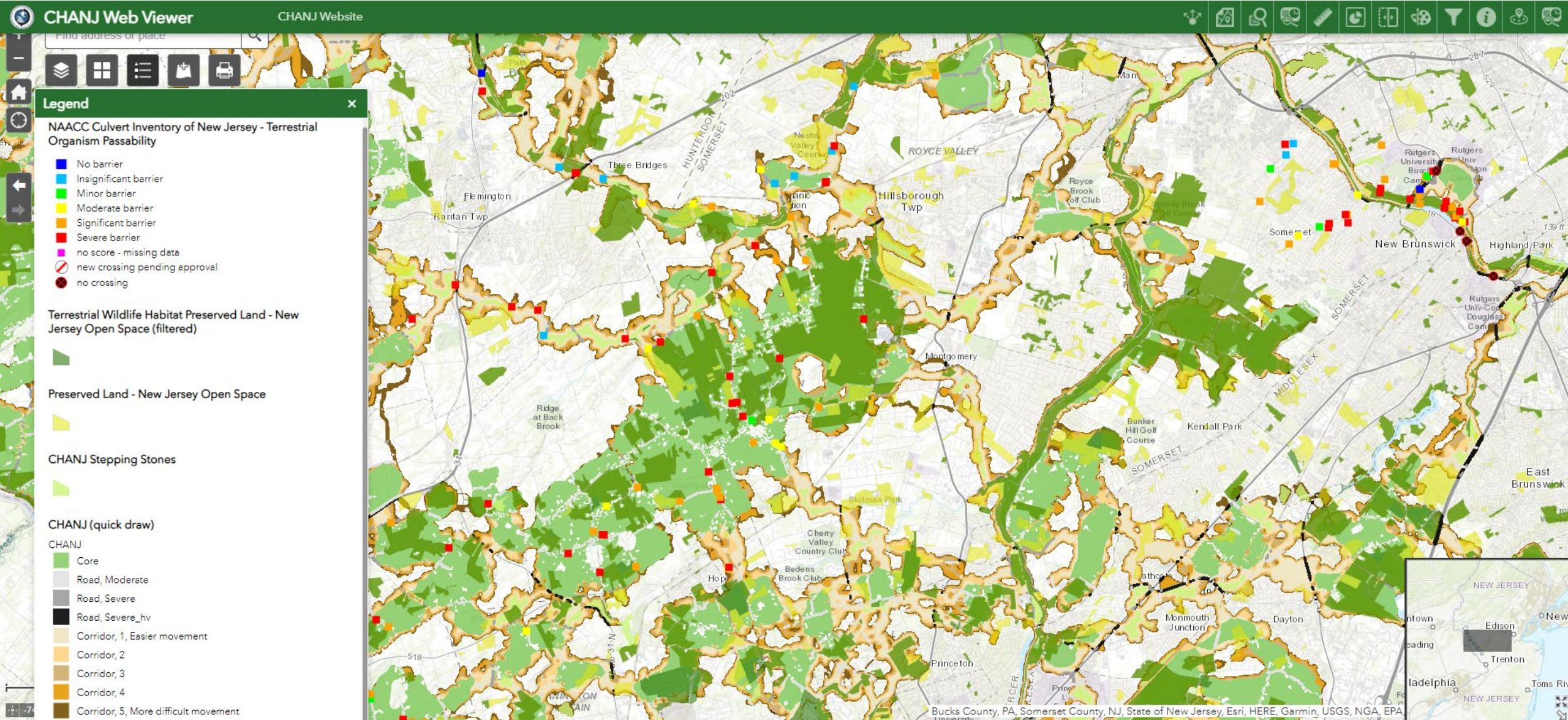
April 2019

ridors

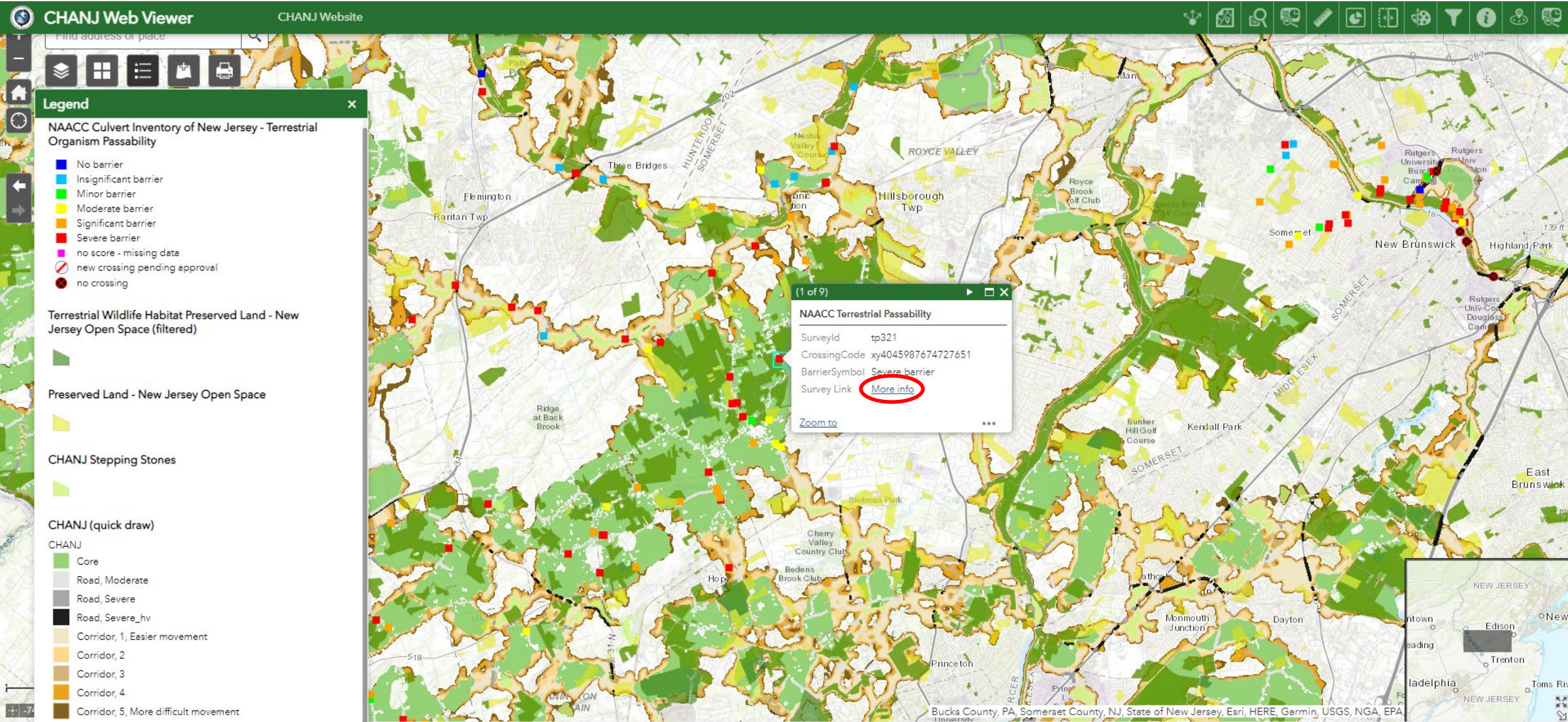
it the
represent
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prioritize

offers
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in criteria
layers,
Document

Preserved Land & NAACC Culvert Inventory



NAACC Culvert Inventory



NAACC Culvert Inventory



NAACC Data Center

[Search Crossings](#) [Login](#)

Data Set: **Terrestrial Passage Assessments - NAACC (after 2018)**

Survey Id: **tp321** Crossing Code: **xy4045987674727651**

NAACC Terrestrial Passability Scores for Crossing

Average: **0.11**

Small Mammals Snakes Lizards: **0.00**

Medium Mammals Turtles: **0.63**

Bobcat Lynx: **0.00**

Bear Wolf Coyote Cougar: **0.02**

Deer: **0.00**

Moose: **0.00**

Data checked and accurate by David Hsu on 11-21-2019



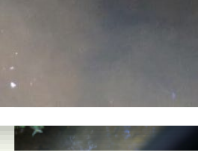
[xy4045987674727651\(inletTpApproach\)8-26-2019.jpg](#)



[xy4045987674727651\(inletTpContext\)8-26-2019.jpg](#)



[xy4045987674727651\(outletTpApproach\)8-26-2019.jpg](#)



[xy4045987674727651\(outletTpContext\)8-26-2019.jpg](#)



Terrestrial Connectivity Crossing Data

Database Entry By: Kenneth Hamel

Coordinator: David Hsu

GPS to Crossing Distance (meters): 4.9

Crossing Code: xy4045987674727651

Date Observed: 08-26-2019

Entry Date: 11-20-2019

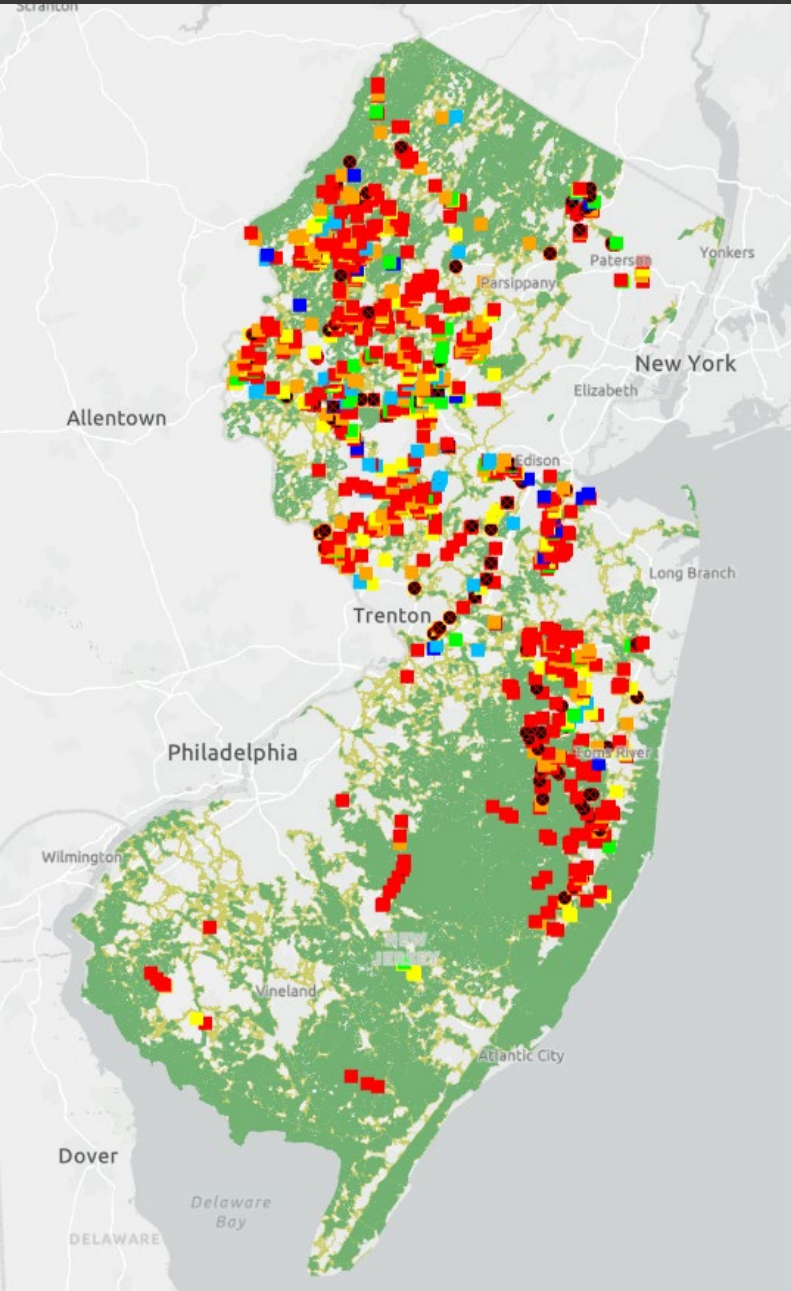
Last Updated: 11-20-2019

NHD-HUC8 Watershed: Raritan

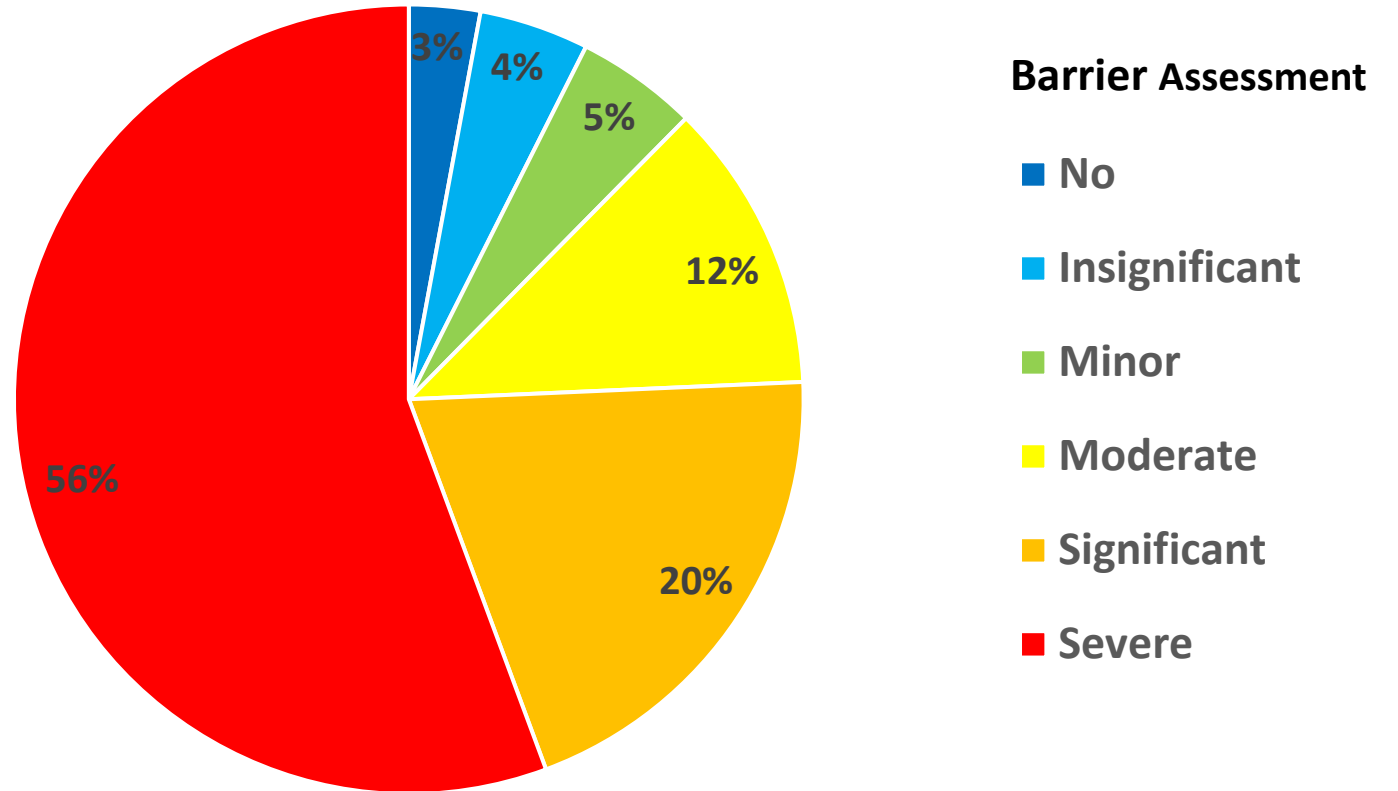
Local ID: No data

Lead Observer: Kenneth Hamel

Culvert Assessments in CHANJ Areas (N=823)



Terrestrial Passage Assessed in CHANJ Cores/Corridors



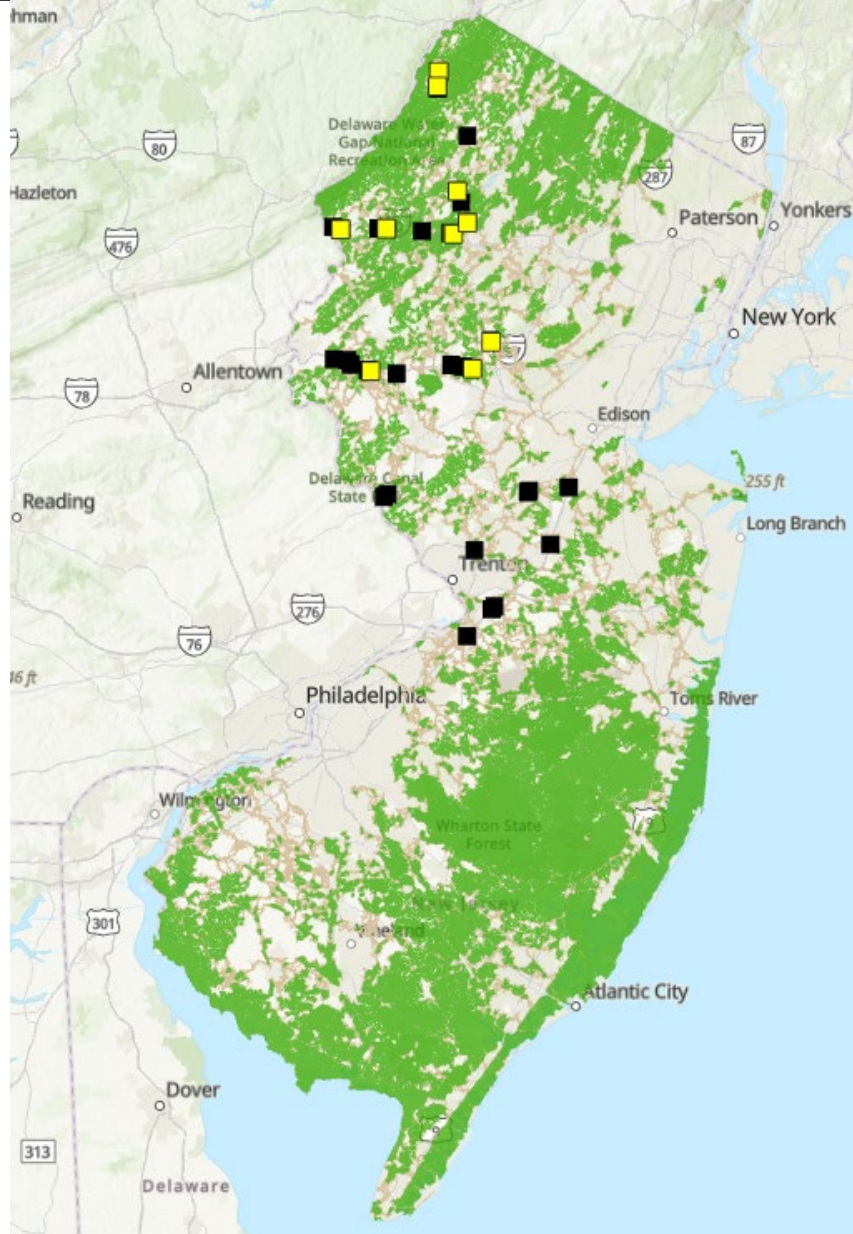


'No Barrier' Crossing

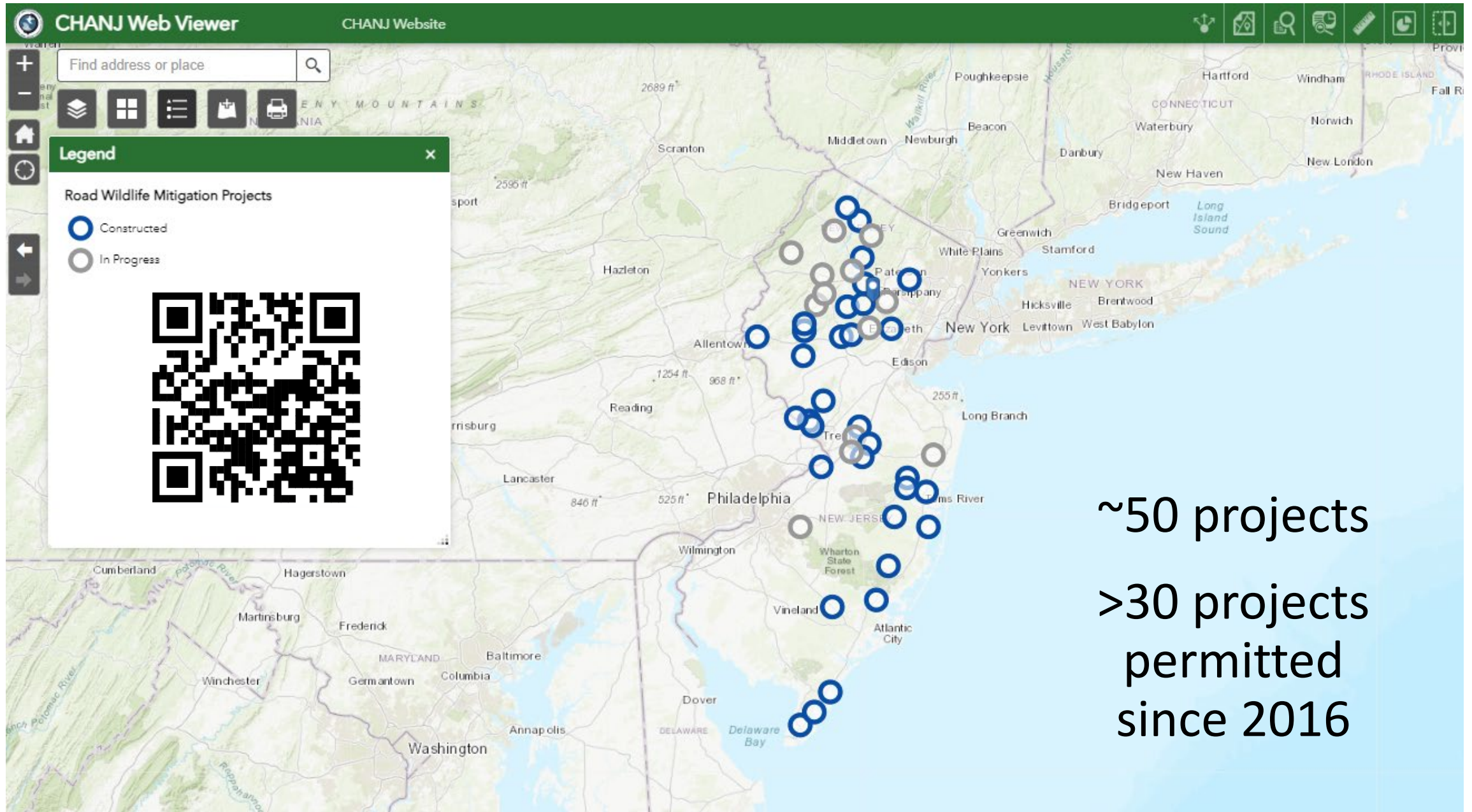


Collaboration with DOT and UDel

■ Bobcat on Camera



Road Wildlife Mitigation Projects



Wildlife Passage Requirement

N.J.A.C. 7:13 FLOOD HAZARD AREA CONTROL ACT RULES

Date amended: June 20, 2016

When is a wildlife passage required?

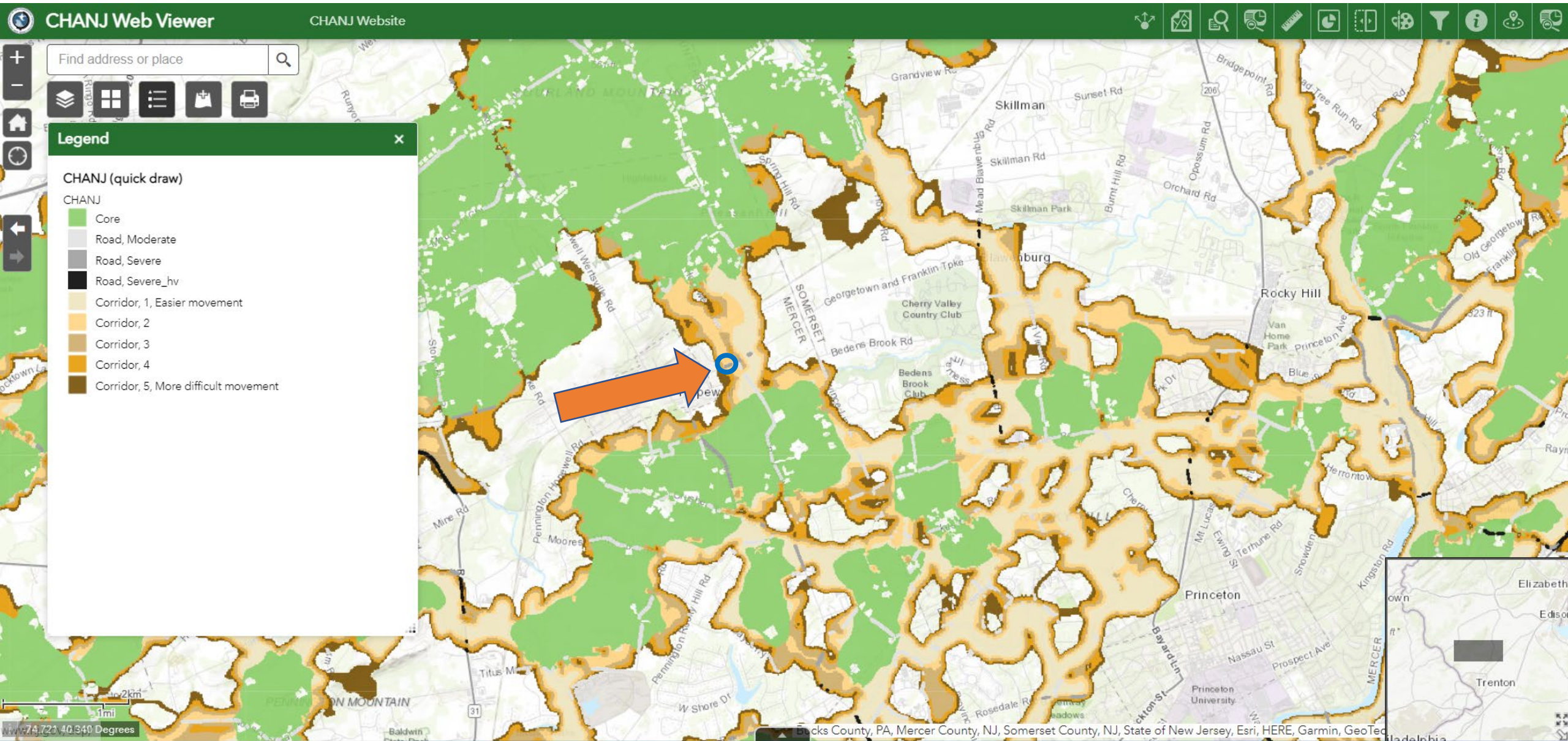
Where a new or existing bridge, culvert, and/or the railroad or roadway it serves would cause or currently causes **fragmentation** of habitat for **terrestrial threatened, endangered, and/or species of special concern**

Terrestrial Corridor Species

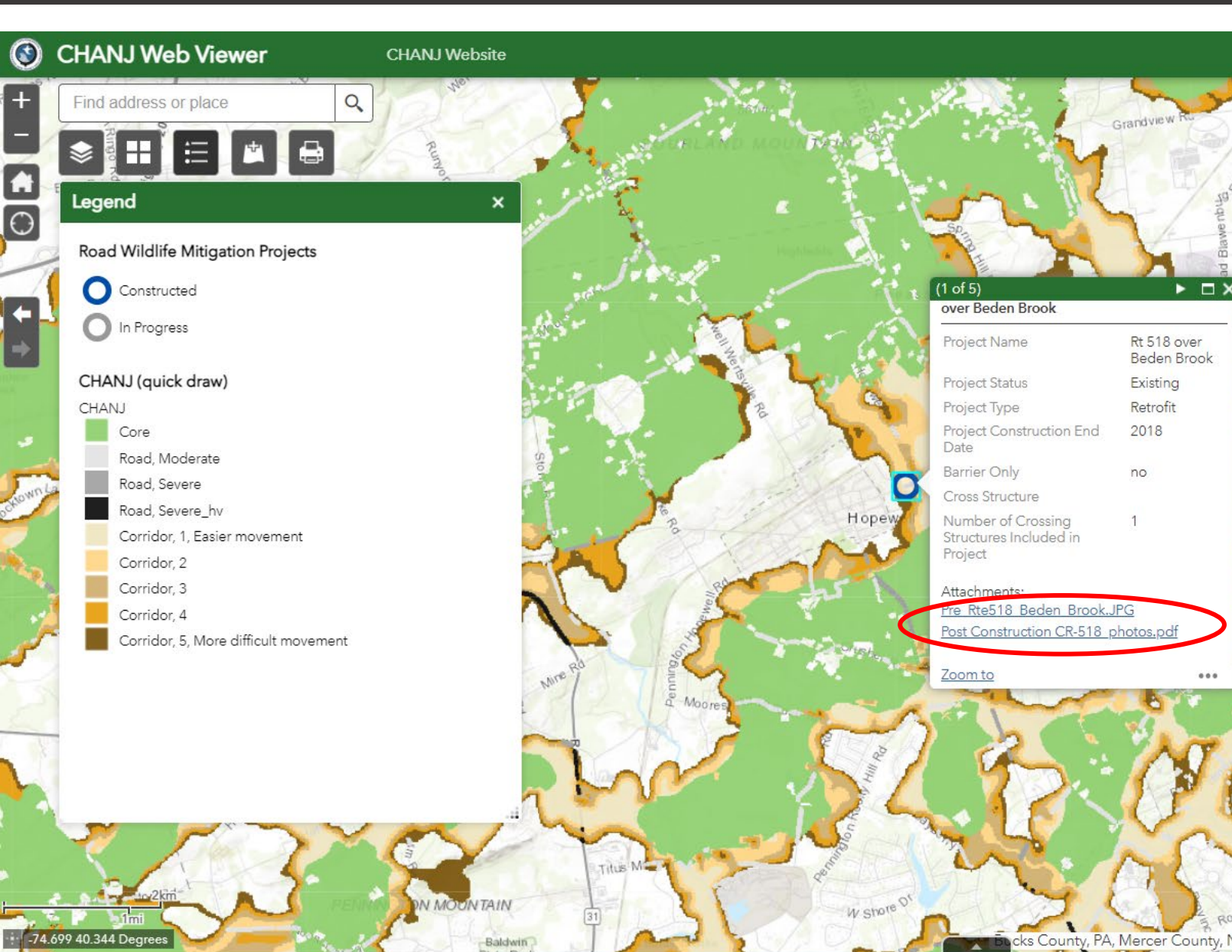
<u>Endangered</u>	<u>Threatened</u>	<u>Special concern</u>
Timber Rattlesnake	Wood Turtle	Northern Spring Salamander
Bog Turtle	Longtail Salamander	Carpenter Frog
Corn Snake	Northern Pine Snake	Fowler's Toad
Cope's Gray Treefrog	Eastern Mud Salamander	Jefferson Salamander
Queen snake	Pine Barrens Treefrog	Marbled Salamander
Allegheny Woodrat		Eastern Box Turtle
Eastern Tiger Salamander		Spotted Turtle
Blue spotted Salamander		Eastern Kingsnake
Bobcat		Northern Copperhead

The applicant shall additionally **adopt appropriate measures** where necessary to encourage the **species to pass through the structure.**

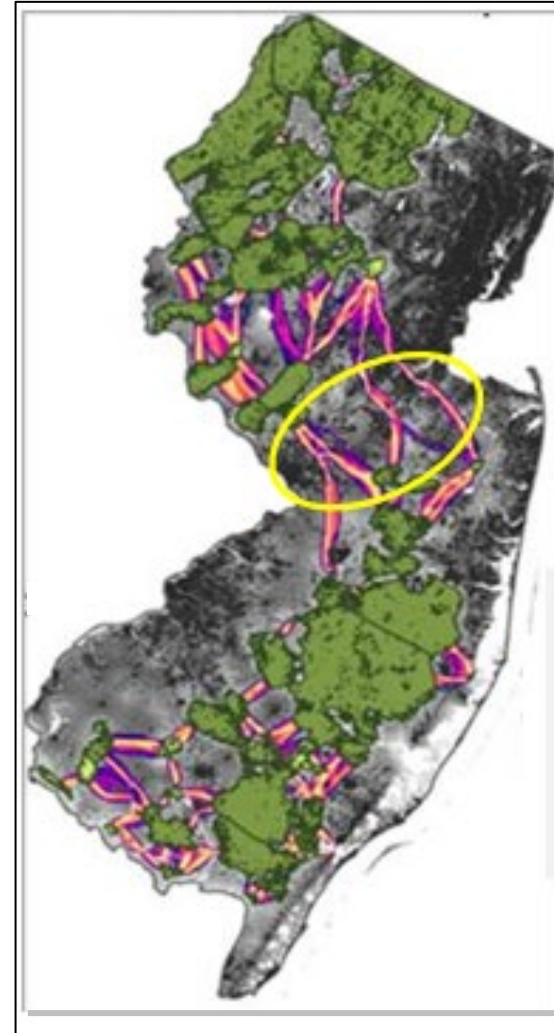
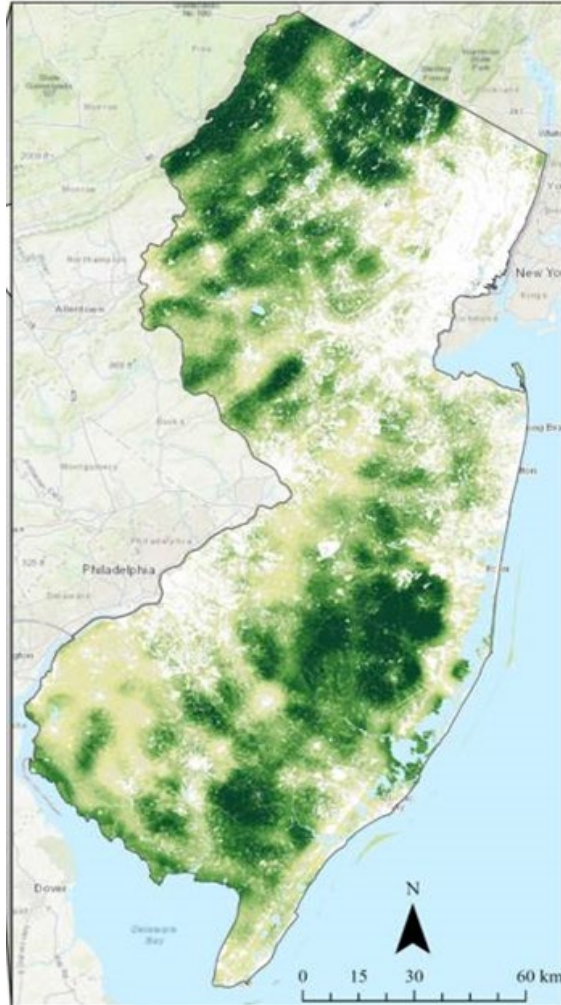
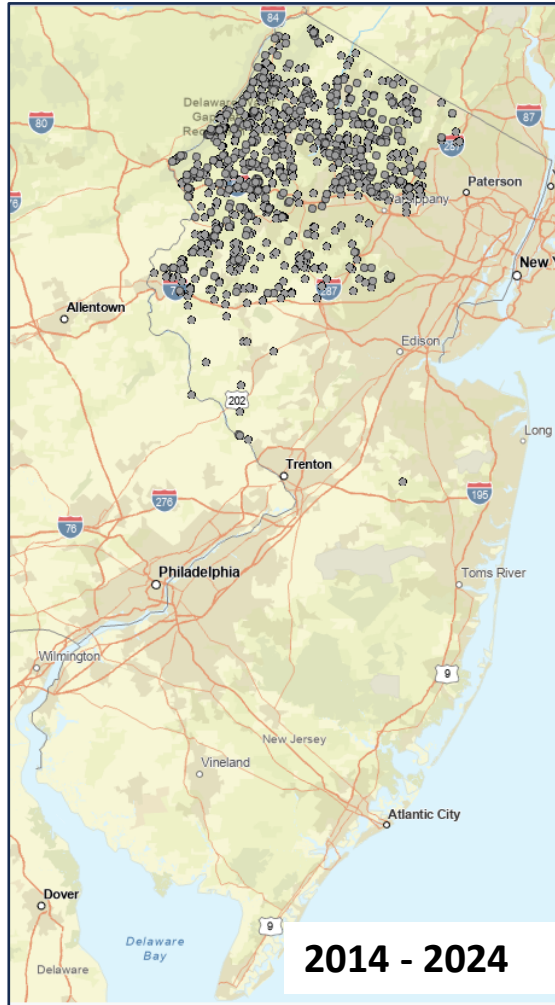
Example: Road Wildlife Mitigation Project



Example: Road Wildlife Mitigation Project



Stressor – Habitat Fragmentation & Roads



Tyler Christensen

Cerreta. A.L. et al. 2023. Habitat suitability and landscape connectivity for an expanding population of bobcats. *Landscape Ecology*. 1-19.

Urbanization vs. Protection in CHANJ Areas (2012 – 2020)

New **Urbanization** 2012 – 2020 within CHANJ Areas:

CHANJ Feature	Area (km ²)	% of CHANJ Feature
Cores	34	0.4
Corridors	36	1.7
Stepping Stones*	4	1.4

**>4x the rate
in Corridors vs. Cores**

New **Open Space** 2012-2020 within CHANJ Areas

CHANJ Feature	Area (km ²)	% of CHANJ Feature
Cores	184.7	2.17
Corridors	21.6	1.01
Stepping Stones*	3.9	1.4

**<1/2 the rate
in Corridors vs. Cores**

Corridors are at risk



Management to Reduce Stressors

Habitat Fragmentation & Road Mortality

- Collaborations/Efforts to Increase Landscape Permeability
 - DOT – Roads & Wildlife Working Group
 - Green Acres – ID priority parcels for protection + Action Teams
 - Garden State Preservation Trust – funding a central NJ road mitigation feasibility study
 - MPOs – increased engagement, CHANJ priorities on their radar
 - Regional States – Habitats & Highways Training video
- Data Collection – metrics to gauge progress
 - Culvert cameras, culvert assessments, detection dog surveys, roadkill surveys



Management to Reduce Stressors

UDeI Postdoc [2025-2026]

- Identify and prioritize locations for constructing/enhancing wildlife crossings in central NJ best suited to facilitate recolonization of bobcats
- Update and expand a spatially explicit scenario model of bobcat recolonization into southern NJ under various management actions including construction/enhancement of priority wildlife crossing structures
- Co-author a NJ bobcat status assessment and recovery plan, incorporating the above + recovery metrics

[Home](#) > [Conservation](#) > [Connecting Habitat Across New Jersey \(CHANJ\)](#)

Connecting Habitat Across New Jersey (CHANJ)

Whether they're small like a salamander or big and wide-roaming like a bear, animals need to be able to move through the landscape to find food, shelter, mates, and other resources. Without that ability to move, healthy populations simply will not persist over the long term. Here in New Jersey, wildlife are up against steady urbanization, a dense network of roads, and now a changing climate, all of which put the connectedness of our habitats and wildlife populations in jeopardy.



Time for CHANJ

Connecting Habitat Across New Jersey (CHANJ) is an effort to make our landscape and roadways more permeable for terrestrial wildlife by identifying key areas and actions needed to achieve habitat connectivity across the state. CHANJ offers two main products – an interactive Mapping tool and a Guidance Document – to help prioritize land protection, inform habitat restoration and management, and guide mitigation of road barrier effects on wildlife and their habitats:

[Subscribe to the CHANJ E-mail List](#)[CHANJ Listservs](#)[Report Wildlife Sightings](#)

Contact Us

Tools of CHANJ

Explore our statewide CHANJ Mapping and Guidance Document, as well as other resources to guide your habitat connectivity efforts.

Projects & Partners

A growing reel of accomplishments and ongoing projects related to CHANJ.

What's New

- [Road Wildlife Mitigation Projects layer](#): Updated with the latest information on Constructed and In Progress projects and photos.
- [NJ Wildlife Tracker](#): New web app helps identify problem spots for wildlife along NJ roadways.
- [Report: CHANJ connectivity assessment for mammals](#) shows it's tougher for animals to get around these days.
- [Habitat suitability and landscape connectivity for an expanding population of bobcats](#) – Landscape Ecology 38(6) 1-19.

Introducing: NJ Wildlife Tracker

Report Sightings of:

- NJ Rare or Endangered Species
- Wildlife on Roads / Roadkill



<https://dep.nj.gov/njfw/conservation/reporting-rare-wildlife-sightings/>



Bobcat

Courtesy of Tyler Christensen