Conservation Focus Areas of the Upper Susquehanna Watershed within the Finger Lakes Land Trust's Service Area

Prepared by the Finger Lakes Land Trust

2012

Cover photo near Finger Lakes Land Trust's Steege Hill Preserve and the Chemung River ©Chuck Feil

Executive Summary

In response to increasing development pressure in the southern portion of its service area, the Finger Lakes Land Trust assessed the organization's portion of the Upper Susquehanna watershed for conservation priority areas. During its 23-year history, the Land Trust has focused much of its land protection efforts in the Great Lakes watershed where threats to natural resources have been greater. However, nearly 50% of the organization's service area lies within the Upper Susquehanna watershed and threats to the region from sprawling development patterns, alterations of creeks and wetlands and natural gas development are growing.

By engaging partners throughout this assessment, the Land Trust developed consensus and support among conservation professionals for the priority areas identified herein. The Land Trust conducted interviews with 30 veterans of conservation and planning to develop our selection criteria and to inform our selection process. We then gathered existing information produced by The Nature Conservancy, the United States Fish and Wildlife Service, New York Audubon, Trout Unlimited, New York State and county planning agencies to develop a list of 11 conservation focus areas. Drafts of this report were reviewed by several key partners in The Nature Conservancy, The US Fish and Wildlife Service, New York State Department of Environmental Conservation and the Upper Susquehanna Coalition.

The final list of conservation focus areas support the region's best remaining natural resources including large forest blocks, wetlands, trout streams, rare species populations, bird concentration areas, unique natural areas and wildlife corridors.

Partnerships in planning, natural resource inventory, education, restoration and land protection will be critical to securing the long term viability of these focus areas. No single entity will be able to meet these challenges alone. However, by working together, we can benefit future generations by protecting public drinking water supplies, reducing flooding hazards, enhancing recreational opportunities, protecting the region's scenic resources, maintaining healthy and diverse wildlife populations and maintaining healthy ecosystems that support the well-being of people. The Land Trust is confident that this report will aid such endeavors.

Funding for this project was provided by the US Forest Service through the Chesapeake Bay Program, in cooperation with the New York State Department of Environmental Conservation.

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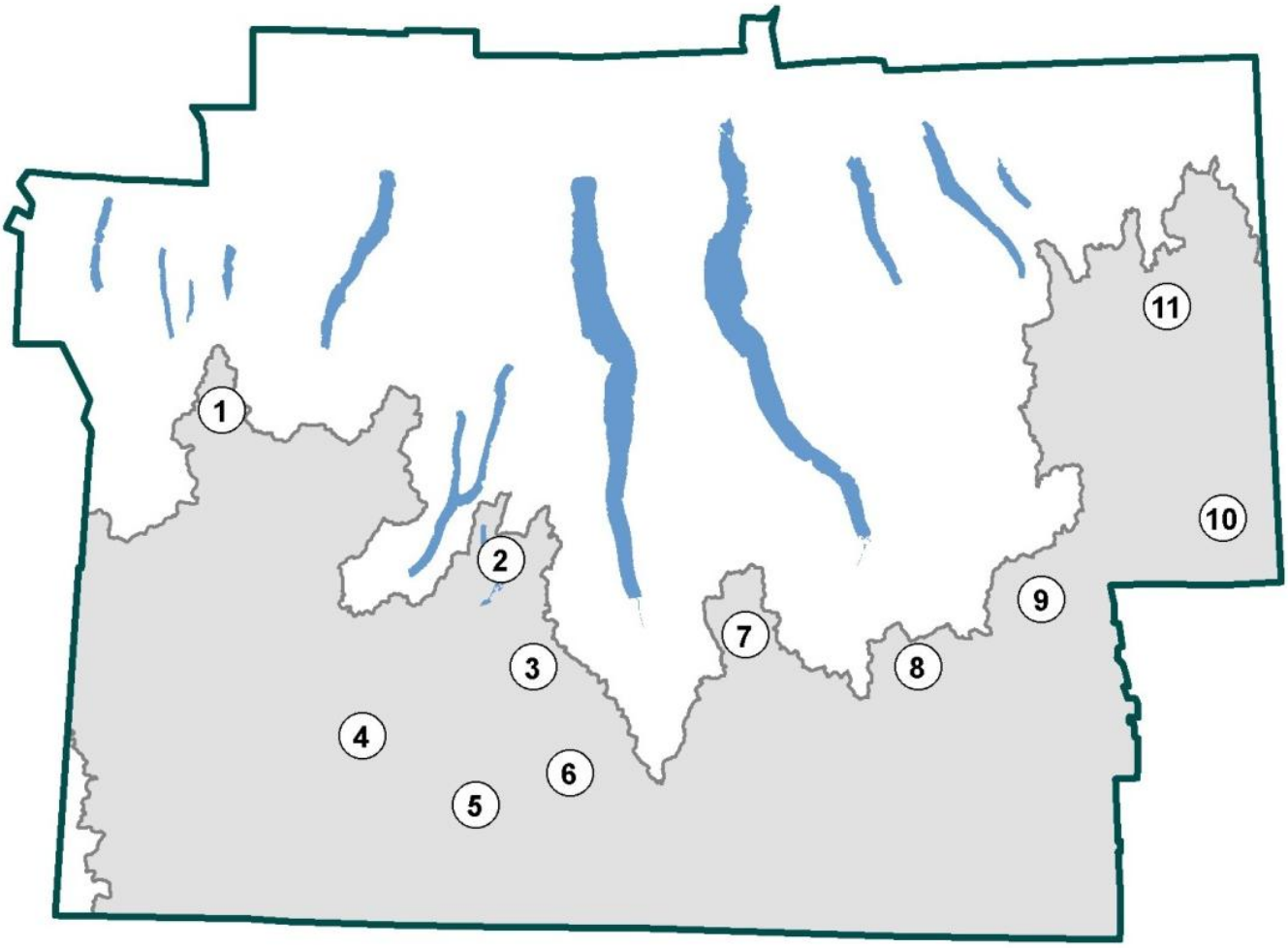
in the Finger Lakes Land Trust Service Area



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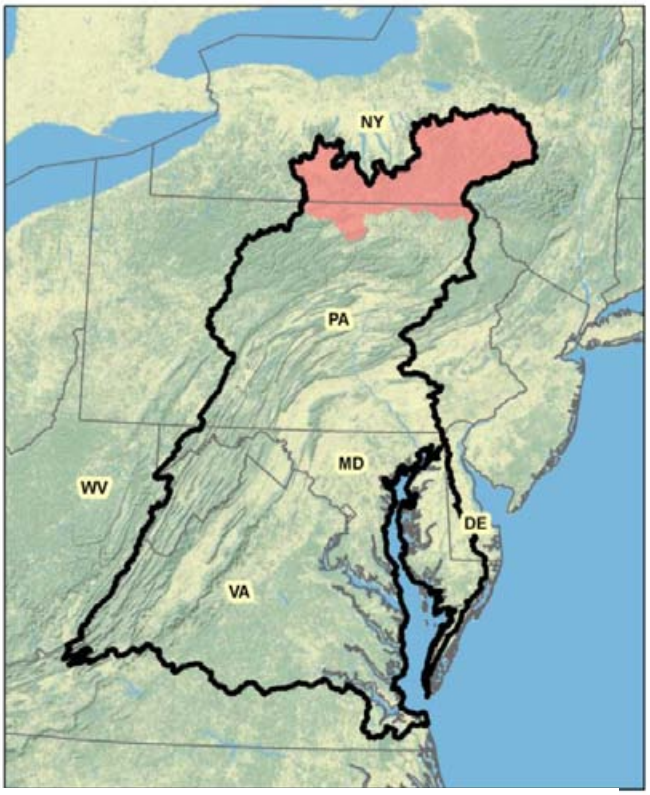
Contents

Introduction

The Chesapeake Bay is the nation's largest estuary, and nearly half of its water is supplied by the Susquehanna River, the longest river system on the east coast. Two major tributaries to the Susquehanna River, the Chemung River and the Upper Susquehanna River, arise in Central New York. Despite the fact that the Finger Lakes, themselves, are not within the Chesapeake Bay watershed, fully 46% of the Finger Lakes Land Trust's service area is within the Upper Susquehanna watershed, making resources there a priority for protection by this organization.



Map 1. Location of the Upper Susquehanna Watershed within the Chesapeake Bay Watershed

Until recently, the loss of open space has not been a commonly voiced concern among residents of New York's Southern Tier. However, because of increased development pressure associated with upgrades to local infrastructure, proposed Environmental Protection Agency (EPA) regulations of water quality in the region's rivers, and potential Marcellus and Utica Shale natural gas development, the Land Trust is increasing its capacity to conserve important resources in the Upper Susquehanna watershed. To best use its limited assets, the organization conducted a review of existing information to assess and identify those areas of highest conservation value and need. This document is a product of that review process.

Large forest blocks, wetlands, trout streams, habitat for rare species, bird concentration areas, unique natural areas, wildlife corridors, river resources, and recreational resources have all been identified as conservation priorities in New York's Southern Tier. In addition to protecting the natural heritage of the region, conservation of strategic areas within the Upper Susquehanna area will protect public drinking water supplies, reduce flooding potential, enhance recreational opportunities, protect the scenic character of the area, conserve habitat for a multitude of wildlife, and conserve ecosystems that support human health and wellbeing.

Threats to the region are increasing, so a coordinated effort is needed to conserve significant land and water resources. The Upper Susquehanna Coalition, made up of 19 Soil and Water Conservation Districts in New York and Pennsylvania, formed in 1996 to protect and improve

water quality and natural resources in the Upper Susquehanna River Basin specifically as they relate to agriculture, road-stream crossings and wetlands. More recently, in response to ongoing concerns about water quality in the Chesapeake Bay and a presidential directive to address them, the US Fish and Wildlife Service has taken on a coordinating role with the Upper Susquehanna Conservation Alliance. This broad based group of approximately 85 participants representing 32 organizations or stakeholders meets to discuss watershed issues, species at risk and potential areas for habitat preservation and restoration. The Alliance provides an opportunity to share ideas and coordinate efforts to conserve the Upper Susquehanna watershed. Members of the Alliance and many others provided input to this assessment.

Threats

Sprawl and Transportation Upgrades

Like much of upstate New York, the Southern Tier is threatened by sprawling land use patterns in spite of sluggish population growth. Most residential, commercial, and industrial development in the Southern Tier is constrained by steep slopes to the more accessible valley floors. Many hilltops with panoramic views attract residential development near Corning, Elmira, Ithaca, and Cortland.

In the mid to late 1990s, both New York State Route 17 and New York State Route 15 between the Pennsylvania border and Painted Post were designated as interstate highways (I-86 and I-99 respectively). Construction continues to make this designation a reality. Some municipalities have been able to take advantage of the upgraded transit system and have attracted large-scale commercial and retail development along the highway corridor. However, continued development of the river valleys can lead to increased impervious surfaces, increased runoff, sedimentation, less groundwater infiltration and increased volatility of flood events in downstream communities.

Shale Gas Development

Development of natural gas reserves through horizontal hydrofracturing of the Marcellus and Utica Shale deposits is likely to have widespread impacts on the region's natural resources. The Southern Tier is already seeing the economic effects of Pennsylvania gas field development as it spills over into communities along the I-86 and I-99 corridors. Oil and gas industry-related revenues flowing into the local economy have lead to support for drilling

Marcellus Shale Drill Rig, Lycoming County, Pennsylvania
Ruhrfisch

in New York among many Southern Tier landowners and local leaders.

However, if and when horizontal hydrofracturing moves into New York, cumulative negative effects on the region's natural resources are likely to be significant. Tens of thousands of wells are projected to be drilled across the Southern Tier. This development will involve clearing land not only for well pads but also for construction of additional roads and pipelines. Development of well pads and related roads will increase demand on the region's gravel resources, which are located along river valleys. The impacts of natural gas development on land resources in the Southern Tier will likely include significant loss and fragmentation of forest communities, loss of habitat to gravel mining, loss of small wetlands and vernal pools that fall below regulatory thresholds, and alterations of water flow, especially in smaller stream systems.

Flooding and Flood Control

The Upper Susquehanna is one of the nation's most flood prone watersheds. Since 1889, the Chemung River has reached flood stage 24 times in the Corning area. Even more dramatically, the Susquehanna River at Binghamton has exceeded flood stage 38 times in the last 80 years. The Binghamton area suffered devastating floods in 1996, 2006 and 2011. Development and natural processes most often intersect and collide in the river valleys because the region's topography constrains transportation corridors and large development to these flat and easily developed areas.

To protect public infrastructure and private property, federal, state, and local agencies have engineered solutions to minimize local flooding hazards. The larger rivers have extensive floodwalls, levees, and mown floodways where they pass through population centers. Smaller streams, particularly near roads, have traditionally been straightened and excavated in order to contain and move water through culverts and away from roads as quickly as possible. Unfortunately, these approaches to floodway and stream management can result in fish and wildlife habitat degradation, separation of river and stream channels from their natural floodplains, and increased erosion and flooding in downstream areas. The net effect of some flood hazard mitigation strategies may, in fact, set the stage for more intense flooding in the future.

Planning Process

This document incorporates information from existing data, reports and expert interviews to identify the region's most important natural assets. Data that drove our site selection process included locations of existing conserved lands; mapped locations of wetlands; forest block and eco-regional analysis conducted by The Nature Conservancy; watershed analysis by Eastern Brook Trout Joint Venture and Trout Unlimited; Important Bird Areas identified by New York

Audubon; information from New York State's Strategic Forest Management Plan; the New York State Open Space Plan; data available from the New York Natural Heritage Program and from the US Fish and Wildlife Service; and information available from the Schuyler County and Tompkins County Unique Natural Area Inventories.

This assessment is not intended to be an exhaustive or definitive conservation plan. Exclusion from this report does not mean that a site does not merit protection. Rather, it more likely reflects the limited natural resource data available, as none of the four counties that make up the bulk of in the study area have conducted field-based natural resource inventories. No new biological inventory was conducted as part of this project.

Given the relative lack of biological inventories, especially on private land in the study area, we augmented available data sets with expert interviews. We sought input from natural resource professionals employed by the US Fish and Wildlife Service, New York State's Department of Environmental Conservation, Soil and Water Conservation Districts, Natural Resources Conservation Service, as well as several non-governmental organizations, including The Nature Conservancy, National Audubon, and the Upper Susquehanna Coalition. Further, we interviewed planning professionals in Steuben and Chemung counties and at the Southern Tier Regional Planning and Development Board. We are in debt to those who shared their time and knowledge.

Regionally Important Natural Resources

Forests

Forests are the dominant land cover type in the study area. 2001 satellite imagery shows that more than 50% of the study area is covered by forests with greater than 70% canopy closure. GIS modeling by The Nature Conservancy finds 64 forest patches that are larger than 2,000 acres and 1,449 forest patches between 200 and 1,999 acres in size in the study area. Our assessment concentrates on the largest, most intact forest blocks. We designed our forest conservation focus areas around blocks larger than 2,000 acres that are also anchored by blocks of public land. Table 1 provides a brief overview of the landscape functions of forest patches of varying size and the rationale we used in determining the most important forest blocks within this largely forested landscape. In addition to direct economic benefits from timber and wildlife production, the forests of the Southern Tier provide important ecosystem services including carbon storage, water filtration, and storm water run-off reduction.

While the study area is defined by a watershed boundary and county boundaries, many of the forest blocks identified as conservation priorities in this report extend beyond those

boundaries. Forest blocks that cross the watershed divide between the Upper Susquehanna and the Great Lakes systems may be particularly important as species distributions change in response to climate change and other environmental alterations.

Table 1. Functional characteristics of different forest patch sizes.

Size (acres)	Species supported	Landscape Functions	Importance
200 – 1,999	Edge species dominate but some less sensitive forest interior species occur.	Broad corridors provide connections to larger landscape blocks; edge habitats and species can dominate.	Stepping stone
2000-5,999	Minimum area needed for sensitive forest interior dependent birds.	Provide important corridors and connections among larger forests.	Local
6,000-14,999	Supports some larger, area sensitive mammal species.	Can accommodate some large scale disturbance but may not be able to maintain entire range of habitats after large scale disturbance.	Regional
15,000 +	Supports a broad complement of wide-ranging and area-sensitive species including broad-winged hawk, barred owl, neotropical migrants, bear and bobcat.	Supports forest ecosystem dynamics including a wide range of forest successional stages and can accommodate large-scale disturbances like insect outbreaks, blowdowns and fire.	Global

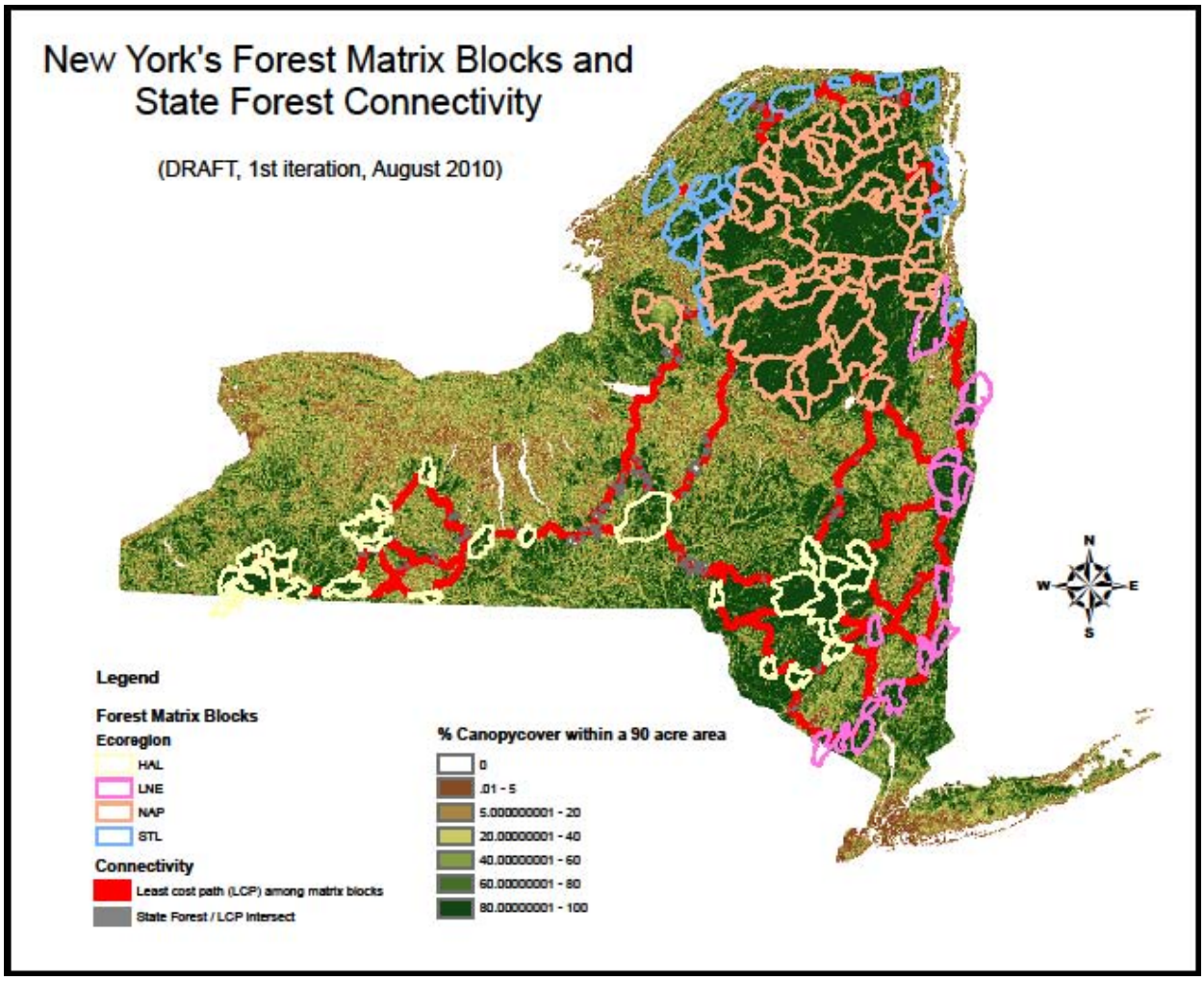
Adapted from Conserving Natural Areas and Wildlife in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York's Hudson River Valley. NYS DEC publication available at http://www.dec.ny.gov/lands/50083.html

Wildlife Habitat Corridors

In its Strategic Plan for State Forest Management, New York State recognizes that "securing connections between major forested landscapes and their imbedded matrix forest blocks is important for the maintenance of viable populations of species, especially wide-ranging and highly mobile species, and ecological processes such as dispersal and pollination over the long term." Identifying, maintaining, and enhancing these landscape connections is a critical conservation strategy that will allow species to shift their ranges in response to climate change and other environmental processes. This assessment recognizes the need to maintain connections between larger forest blocks. Many of the focus areas we propose are either large forest blocks or lie along habitat corridor connections modeled and predicted by the state. (See Map 2)

Several public land units lie along the state's designated forest habitat corridor but do not fall within one of our designated focus areas. Nonetheless, these forest units are important features on the landscape. They include Pigtail Hollow and Urbana Forest in Steuben County; Potato Hill State Forest in Tompkins County; Fairfield State Forest, Jenksville State Forest and

Anderson Hill State Forest in Tioga County; and Tuller Hill State Forest, Hoxie Gorge State Forest, and Baker School House State Forest in Cortland County.



Map 2: This map, published in the New York Sate Strategic Plan for State Forest Management, shows conceptual routes between large blocks of forest as red lines. Establishment of these routes could be accomplished on private land through voluntary conservation measures.

Wetlands

Given the region's hilly landscape, wetlands are uncommon in the Upper Susquehanna Watershed. High quality wetlands (those dominated by native species, have unaltered hydrologic regimes and support a diverse assemblage of plant and animal life) are particularly rare because historic and current land use practices have destroyed them outright or have introduced non-native invasive species. Where wetlands do exist they provide vital wildlife habitat and critical ecosystem services including flood attenuation, water filtration, and

groundwater recharge. Perhaps the most important service wetlands perform for people in this flood prone watershed is storm water retention — these are the places where storm water can spread out, slow down, and soak in.

Goetchius Wetland Preserve, Town of Caroline, Tompkins County
Andrew Zepp

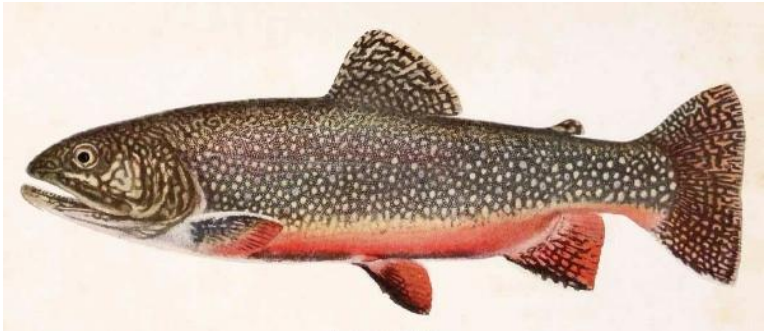
Over the last several hundred years, wetlands in the study area have been altered dramatically. Many small wetlands have been filled, drained or converted to bass ponds, while the larger wetlands have been reduced in size by agriculture, road construction, or other development. High-quality wetlands do persist higher up in the watershed and along headwater streams. In particular, good examples exist in the towns of Cohocton and Caton in Steuben County; Catherine in Schuyler County; Spencer in Tioga County; Caroline in Tompkins County; Truxton in Cortland County; and Fabius in Onondaga County. Because wetlands in the area are uncommon, have suffered high loss, and serve vital landscape functions, any remaining intact, high-quality wetland should be protected. Further, wetland restoration and incorporation of wetland buffers and wildlife corridors should be a priority throughout the watershed.

Rivers and streams

The study area is defined by rivers and streams which continue to shape the landscape. Many of the larger rivers have been impacted by current and past land use; nonetheless, they remain vital components to the landscape and are critical thoroughfares for aquatic species. Maintaining the health of the region's larger rivers will maintain the character of the region, support the quality of life of its residents, and sustain the biological integrity of smaller headwater streams and rivers. Conservation of these rivers will involve multiple partners, because the rivers themselves pass through multiple jurisdictions and the land around them is managed by both private individuals and public agencies.

In its ecoregional planning process, The Nature Conservancy (TNC) analyzed the aquatic systems within the study area using GIS modeling, existing field data, and expert opinions. Larger rivers that were recognized as important connections on the landscape include the

Chemung, Susquehanna, Cohocton, Canisteo, and Tioughnioga Rivers. Smaller rivers and creeks that TNC identified as important for sustaining the region's biological diversity include the Upper Cohocton River, Five Mile Creek, Mud Creek, and Bennett's Creek in Steuben County; Catatonk Creek and its headwater streams in Tioga County; Owego Creek and headwater streams in Tioga and Cortland counties; and the East Branch of the Tioughnioga River and Trout Brook in Cortland County. Nearly all of these smaller creeks are included in the conservation focus areas proposed herein.



Eastern Brook Trout

Eastern brook trout and pearly mussels are sentinels of the status of our waters. In addition to TNC's analysis, these species drove our selection of river and stream segments for inclusion in a focus area. The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits the study area. Brook trout prefer clear, clean waters with a narrow *p*H range in lakes, rivers, and streams. They are sensitive to poor oxygenation, pollution, and changes in *p*H caused by environmental effects such as acid rain.

Like brook trout, pearly mussels inhabit unpolluted rivers and streams rich in oxygen. As a group, pearly mussels have suffered dramatic declines due to water pollution, dams and dredging, loss of fish hosts, and introduction of exotic species. There are four pearly mussel species of greatest conservation need found in the study area: *Alasmidonta varicosa* (brook floater), *A. marginata* (elktoe), *Lasmigona subviridis* (green floater) and *Lampsilis cariosa* (yellow lampmussel). Two are considered by New York State to be threatened: the brook floater and the green floater.

Conservation Focus Areas

We designated 11 focus areas as those most important for conservation action due to the quality and diversity of the natural resources they contain (see Map 3). For ease of reference, we inserted symbols prior to the discussion of each focus area to indicate which resources are associated with that area. A key to the symbols used in the text is provided in Table 2.

Map 3. Conservation Focus Areas of the Upper Susquehanna Watershed in the Finger Lakes Land Trust Service Area.

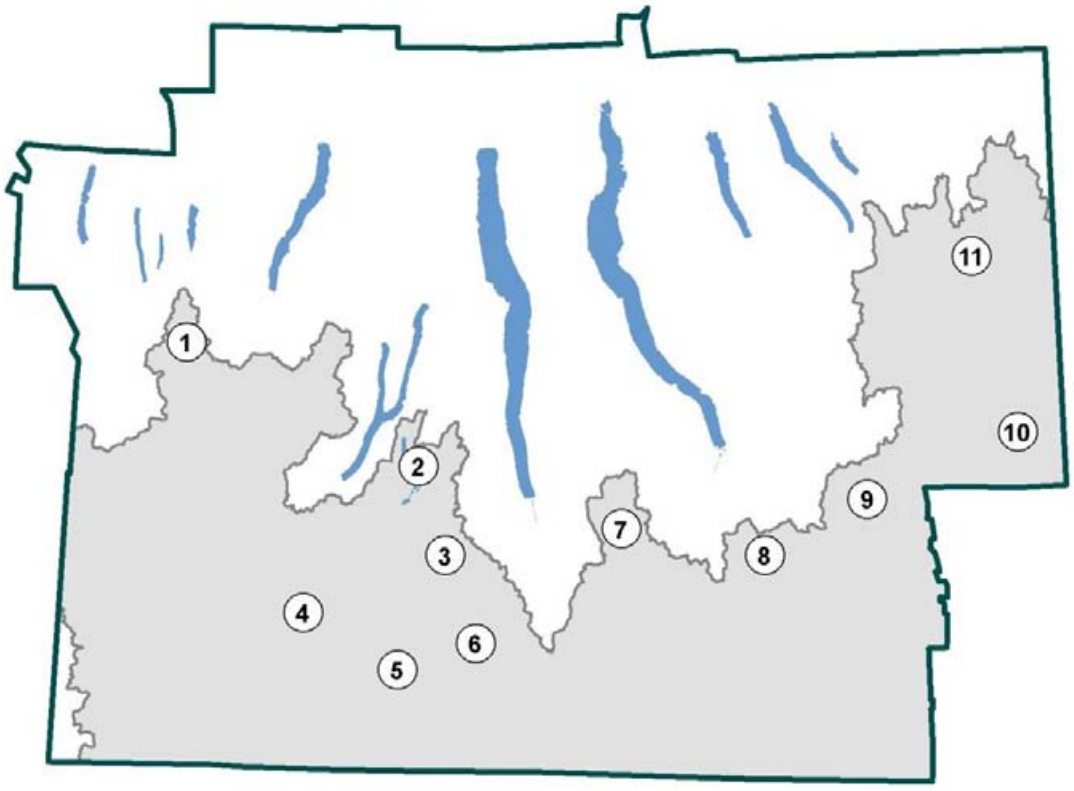


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Table 2. Key to symbols used with conservation focus area descriptions.

New York State Open Space Plan Priority Project	
New York Audubon Designated Important Bird Area	
Globally Significant Forest Matrix Block	
Regionally Significant Forest Block (larger than 6,000 acres)	
State Recognized Wildlife Habitat Corridor	
Wetlands	
Priority Aquatic Resources	
Species of Special Concern	
Hiking Trails	
Recreational boating	

Upper Cohocton River Wetlands

The Upper Cohocton River Wetlands focus area is a breeding site for bald eagles
©Marie Read

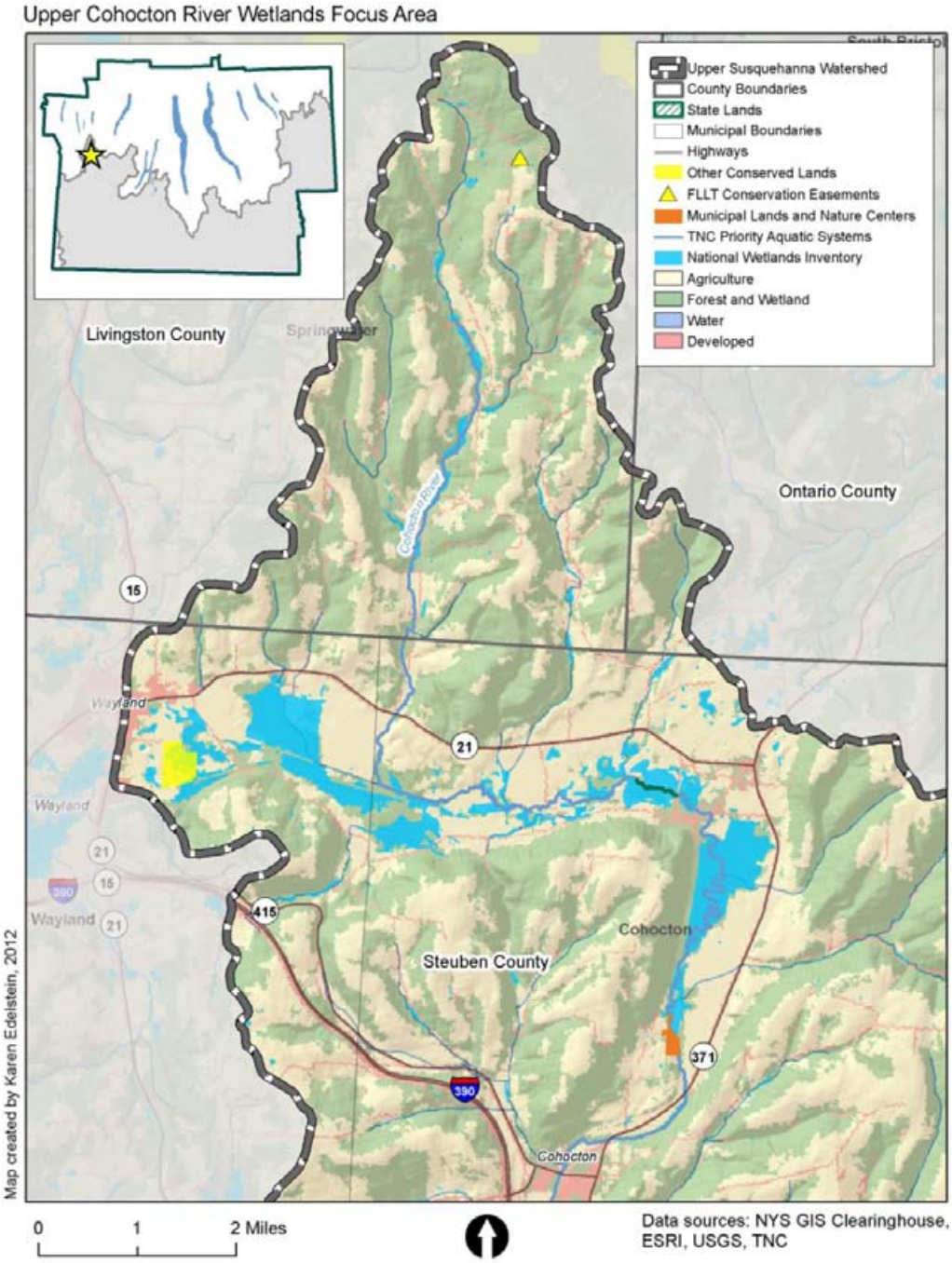
One of the largest complexes of existing and restorable wetlands in the Chemung River basin lies at the headwaters of the Cohocton River in the Steuben County towns of Wayland and Cohocton. The National Wetland Inventory documents more than 1,500 acres of wetland in this complex. Native brook trout populations are sustained in these waters. Bald eagles (NYS threatened and federally protected) and willow flycatcher (NY Audubon Watch List) have been documented breeding in the area. This area also lies within a state recognized wildlife corridor because it lies just south of the Bristol Hills Forest Matrix Block identified by The Nature Conservancy in the Great Lakes Watershed.

Most of the Cohocton headwaters remain in private ownership, and conservationists have been working with landowners here for years. The Natural Resources Conservation Service has enrolled more than 200 acres in the

Wetland Reserve Program. New York State DEC has established public fishing access sites and owns public fishing rights on significant stretches of the Cohocton River. The Finger Lakes Land Trust holds a conservation easement on about 450 acres in the hills north of this wetland complex at the Chesapeake-Great Lakes watershed divide. Recently, the Wetlands Trust purchased 85 acres of wetlands and surrounding upland buffer from a willing seller.

Table 3. Summary of Acres Conserved in the Upper Cohocton Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
2	26	453	86	567



Mud Creek Watershed

The Mud Creek watershed extends from the Steuben County towns of Wayne and Bradford into the Schuyler County towns of Tyrone and Orange and includes more than 1,200 acres of forested and shrub wetlands. New York State owns about 5,300 acres of land at Bird's Eye Hollow State Forest and Moss Hill State Forest and administers another 157 at the Waneta-Lamoka Wildlife Management Area. The Finger Lakes Land Trust has protected nearly 200 acres within this focus area through both conservation easements and fee ownership.

A number of birds of special conservation concern have been documented in the Mud Creek watershed including several raptors, early successional species, and wetland species. They include Cooper's hawk, sharp-shinned hawk, red-shouldered hawk, osprey, grasshopper sparrow, horned lark, vesper sparrow, common nighthawk, golden-winged warbler, and American bittern.

Bird's Eye Hollow State Forest is a 3,446-acre area containing small kettle lakes, riparian wetlands, and a forested stream corridor. New York State has protected nearly 90% of the wetlands in Bird's Eye Hollow. These wetlands include two examples of swamp white oak communities (rare in New York) and support two dragonflies uncommon in New York (*Cordulegaster oblique* and *Rhionaeschna mutate*). The lakes attract recreational use and the area is traversed by the Finger Lakes Trail.

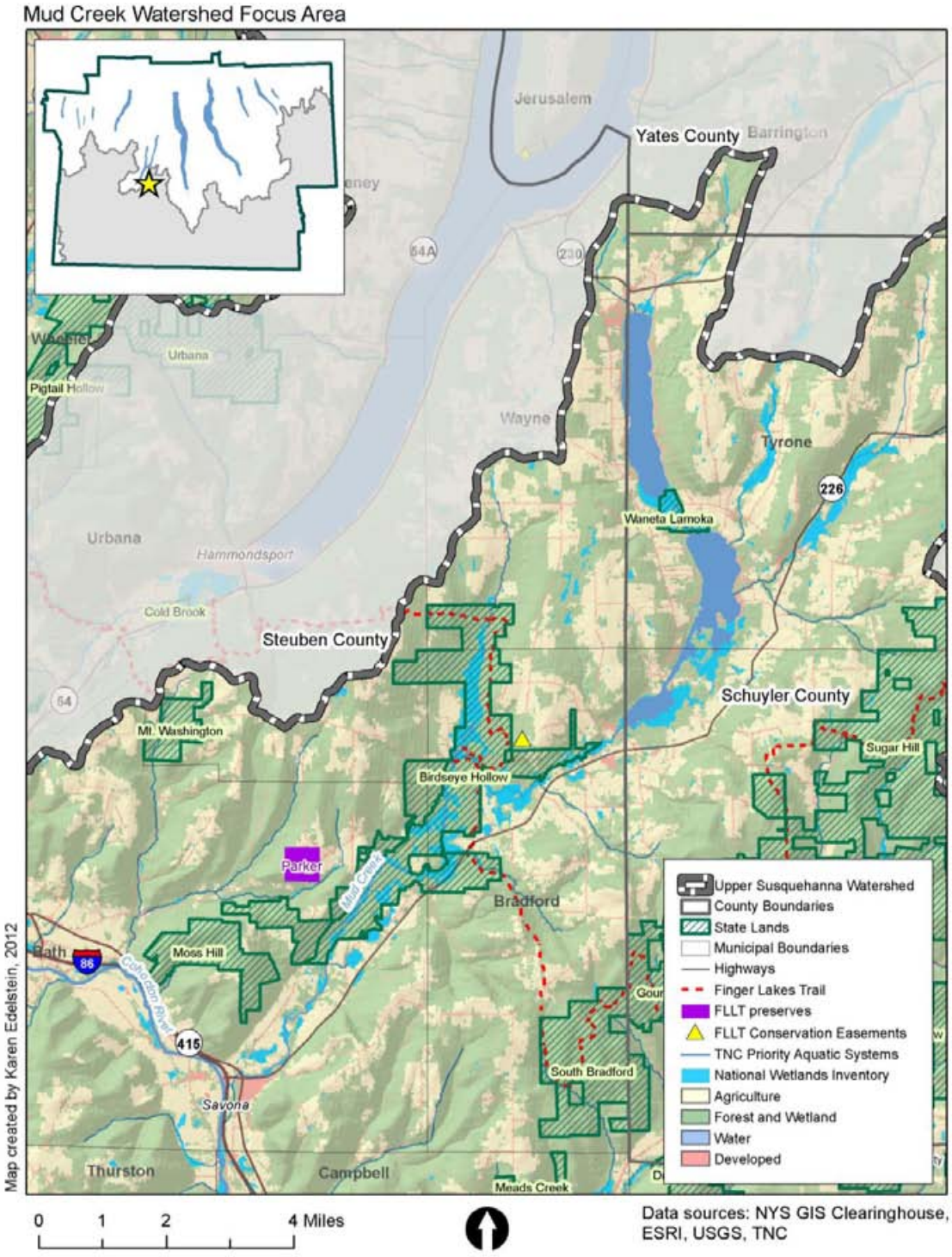
Lamoka Lake

Higher up in the watershed, Waneta-Lamoka Wildlife Management Area conserves much of a high-quality 164-acre wetland. This unit also provides primary public access to both Lamoka and Waneta lakes. According to the Susquehanna River Basin Commission, high-quality streams and associated wetlands lie upstream of Lamoka Lake. Privately owned wetlands along Little Tobehanna Creek and tributaries to Tobehanna Creek provide habitat for nesting waterfowl,

amphibians, fish, and aquatic reptiles. Otter and bobcat have been documented using this area as well.

Table 4. Summary of Acres Conserved in the Mud Creek Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
5,973	0	205	0	6,178



Six Nations Forest

The Six Nations Forest focus area includes a complex of nearly 22,000 acres of state forest managed by New York State Department of Environmental Conservation at Sugar Hill State Forest and nine other nearby state forest management units. The Finger Lakes Land Trust holds a single conservation easement within this forest landscape.

The extent, configuration and quality of forest in this area resulted in its identification as a globally significant forest block by The Nature Conservancy — one of only two in the study area. This designation, in turn, resulted in these forests being afforded special recognition and protection by New York State in the Marcellus Gas SGEIS.

The Six Nations Forest Focus Area contains ideal forest habitat for scarlet tanager and other interior forest breeding bird species. ©Lang Elliott

This forest complex comprises important natural resources that reflect the mixture of habitat types found across the landscape. Species of particular conservation interest include two state threatened animals (northern harrier and timber rattlesnake). A dragonfly uncommon in New York (*Rhionaeschna mutate*) has been documented here. Meads, Dry Run, Cutler and Post creeks flow from these forested hills and support Eastern brook trout populations. While Six Nations was not designated as an Important Bird Area by New York Audubon in a state-wide analysis, it is an important resource for interior forest breeding bird species at the regional scale of this assessment.

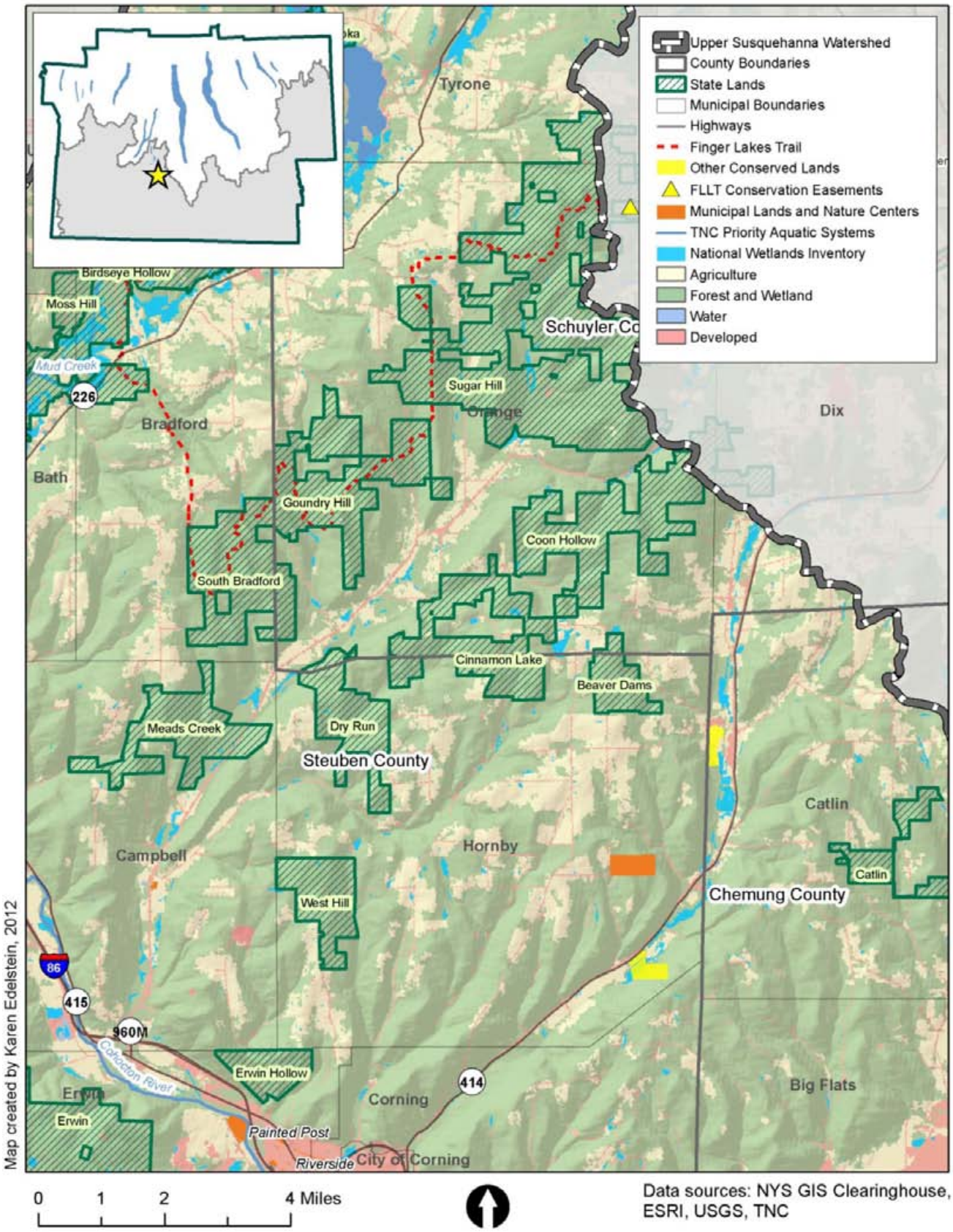
The area is traversed by a section of the Finger Lakes Trail, which is also designated as part of the 3,200-mile long North Country National Scenic Trail proposed to extend from New York to North Dakota. The Upper Susquehanna Coalition, in partnership with NYS DEC foresters is restoring wetlands on state lands within this focus area.

Table 5. Summary of Acres Conserved in the Six Nations Forest

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
21,014*	312	57*	196	21,579

*Includes acreage outside of Upper Susquehanna Watershed. See map.

Six Nations Forest Focus Area



Canisteo River Valley

The Canisteo River, another major tributary in the Chemung River basin, flows 61 miles from the hills northwest of Hornell, Steuben County, through a sparsely populated valley in the towns of Canisteo and Cameron. Lower sections of the river harbor populations of state threatened mussels, while the steeply forested hills above the river provide habitat for threatened timber rattlesnake populations as well as nesting bald eagles. Several populations of long-tailed salamander, an amphibian of special concern in New York State, have been documented in floodplains on this river.

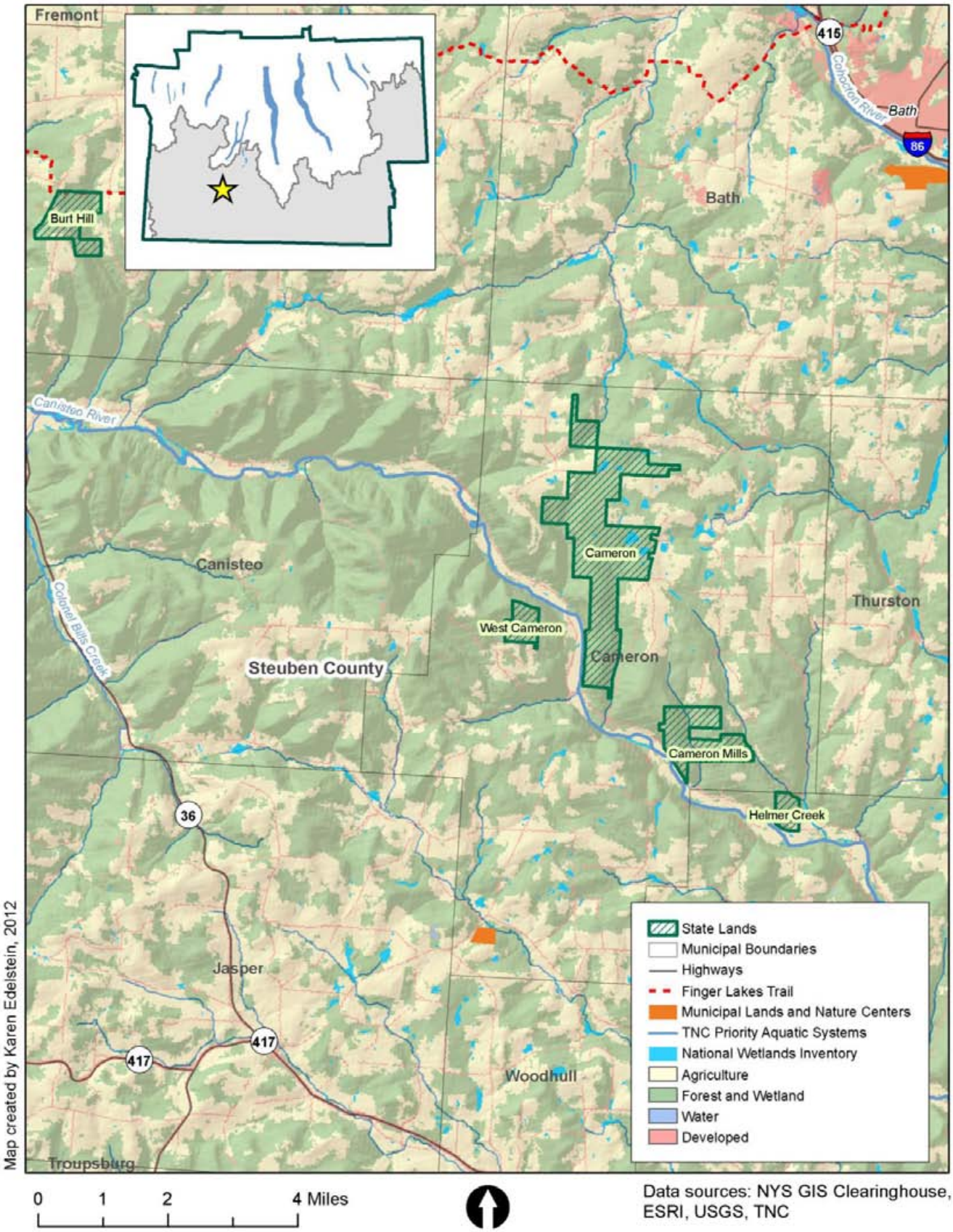
New York State owns about 3,400 acres in the Canisteo Valley at several state forests, including Cameron, Cameron Mills, Helmer Creek, and at West Cameron and Tracy Creek wildlife management areas. These disjunct state forests serve as important wildlife habitat, not only to the species of concern mentioned above, but also to bobcat and black bear, which are becoming more common in the area. Maintaining habitat connectivity between these state lands was noted as a priority within the Chemung Greenbelt project area of the New York State Open Space Plan.

Bobcats require large blocks of forest habitat for their survival and are becoming more common in the Southern Tier.

Table 6. Summary of Acres Conserved in the Canisteo River Valley

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
3,795	53	0	0	3,848

Canisteo River Valley Focus Area



Map created by Karen Edelstein, 2012

Data sources: NYS GIS Clearinghouse, ESRI, USGS, TNC

Erwin Forests

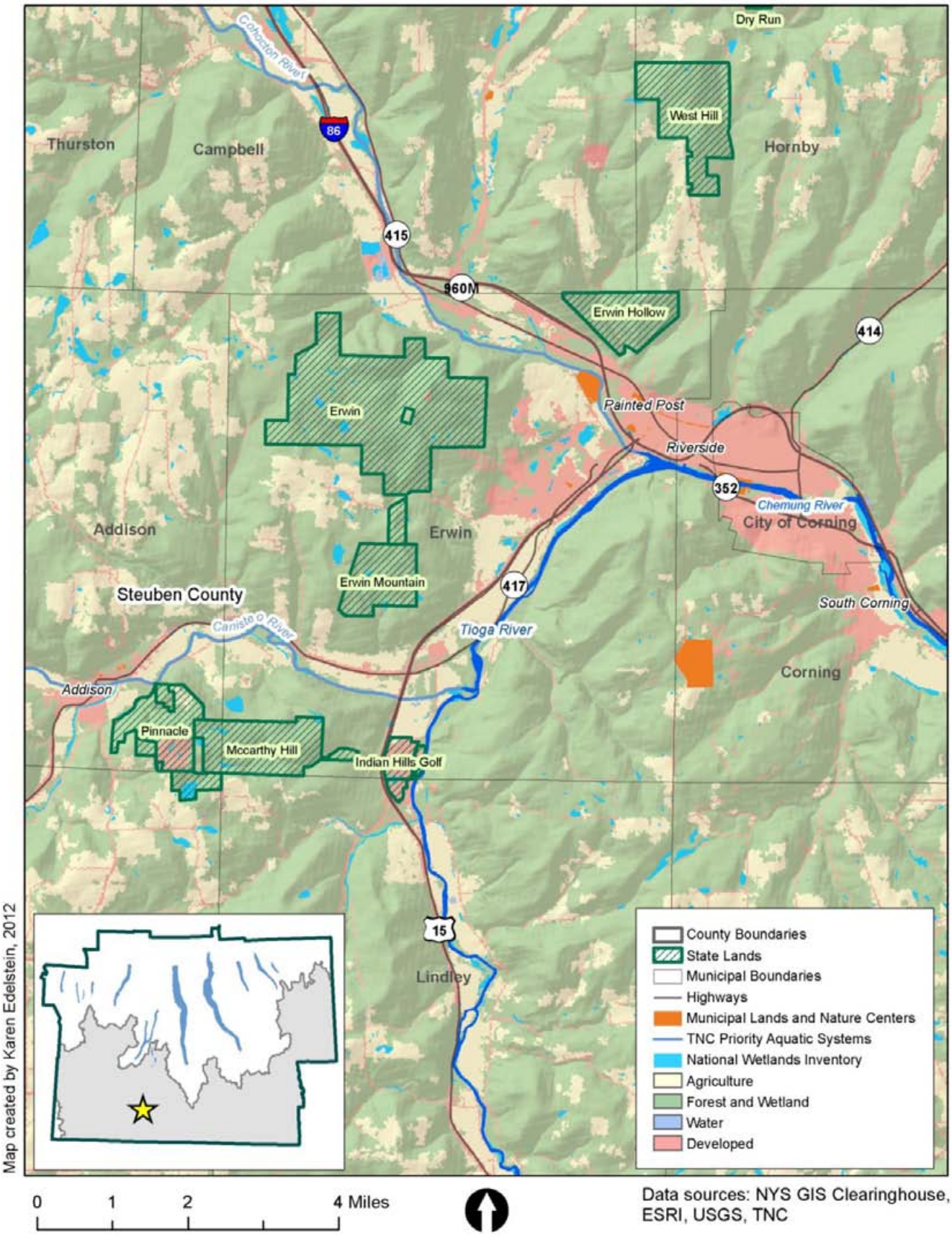
The Town of Erwin lies at the confluence of the Tioga and Cohocton rivers and hosts four forest blocks larger than 2,000 acres. Three of these blocks are centered on nearly 5,000 acres of public land at Erwin Wildlife Management Area, Erwin Mountain Reforestation Area, McCarthy Hill State Forest, and Pinnacle Hill State Park. This area was noted as a priority within the Chemung Greenbelt project area of the New York State Open Space Plan; moreover, it is within a wildlife corridor designated in the New York State Forest Strategic Management Plan. Although Erwin has a comprehensive plan that supports conservation of its steep forested slopes, growth in this town threatens long term forest connectivity.

These forest slopes are particularly important —– and not only because of their size. They harbor a federally-listed, endangered plant (northeastern bulrush *{Scirpus ancistrochaetus}*), two state-endangered plants (wild hydrangea *{Hydrangea arborescens}* and sweet coltsfoot *{Petasites frigidus var. palmatus}*), support federally protected nesting bald eagles, and protect native mussel beds within the Chemung, Cohocton and Canisteo rivers from the threat of erosion.

Table 7. Summary of Acres Conserved in the Erwin Forests

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
6,080	299	0	0	6,379

Erwin Forests Focus Area



Chemung River Valley

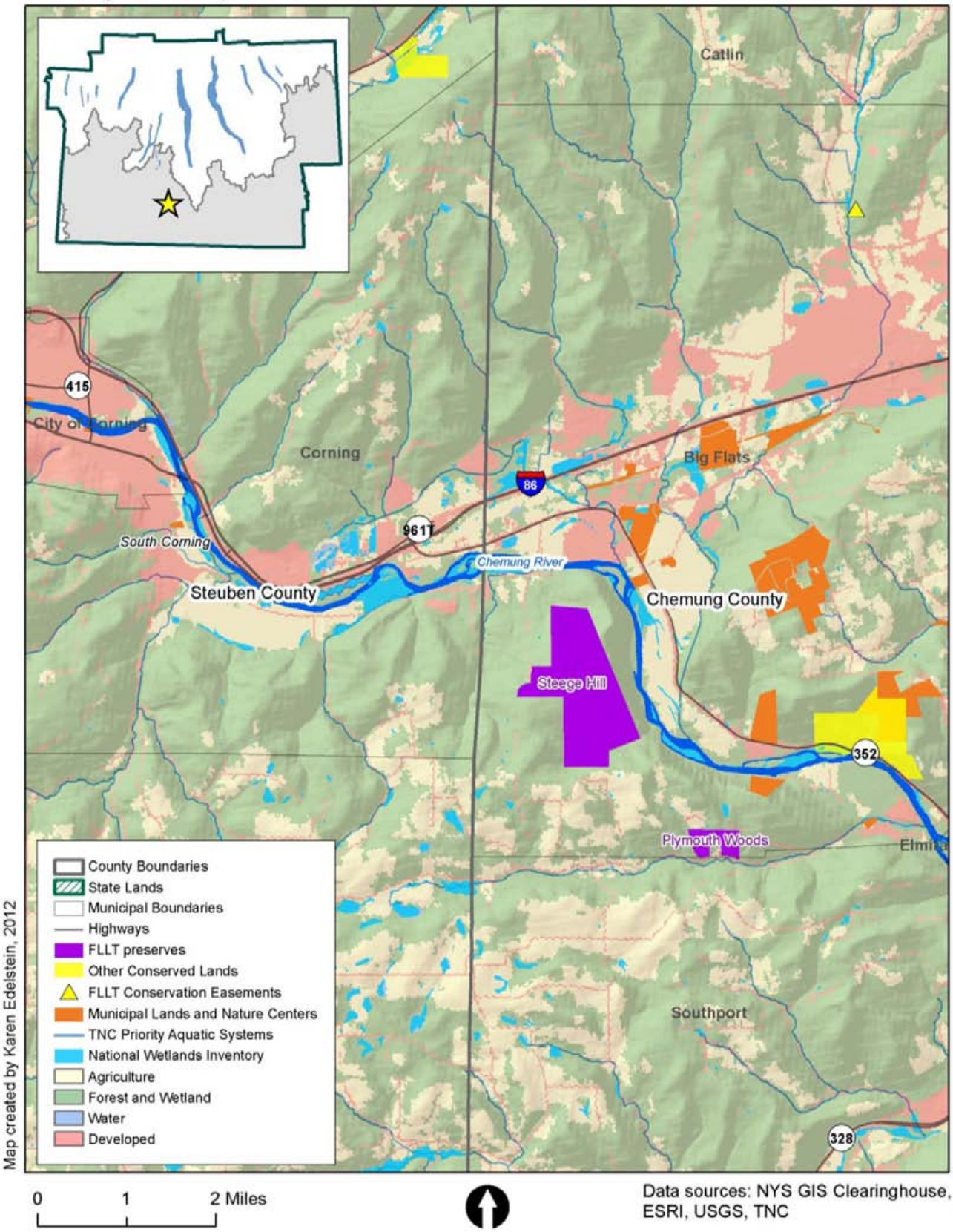
This focus area is centered on the six-mile stretch of the Chemung River west of Elmira in the town of Big Flats. For more than 20 years, The Nature Conservancy, Tanglewood Nature Center, Finger Lakes Land Trust, and the Town of Big Flats have worked to conserve the steep forested slopes and rare wildlife resources of this area. Collectively, these groups have protected nearly 1,500 acres, hosting threatened timber rattlesnakes, rare coal skinks, two state-listed plants (wild hydrangea *{Hydrangea arborescens}* and nodding wild onion *{Allium cernuum var. cernuum}*), nesting bald eagles, and prime examples of several natural plant communities. The Finger Lakes Land Trust's Steege Hill and Plymouth Woods nature preserves lie within a block of forest more than 2,000 acres in size. Steep cliffs, known locally as The Palisades, are noted as a priority within the Chemung Greenbelt project of the New York State Open Space Plan. The river corridor supports high quality examples of flood plain forest and at least one mussel bed. Chemung County, the Town of Big Flats, and the United States Department of Agriculture collectively own more than 500 acres in this project area, most of which serve the public as parks and recreational areas.

The Palisades provide nesting habitat for bald eagles and a scenic backdrop for paddling on the Chemung River.
Kris West

Table 8. Summary of Acres Conserved in the Chemung River Valley

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
0	1,501	946	516	2,963

Chemung River Valley Focus Area



Map created by Karen Edelstein, 2012

Data sources: NYS GIS Clearinghouse, ESRI, USGS, TNC

Upper Cayuta Creek Watershed

The Upper Cayuta Creek Watershed focus area lies within the Emerald Necklace — a New York State Open Space Plan priority project. Because it includes a large assemblage of forests, this area was identified by The Nature Conservancy as globally significant for its contributions to the conservation of high quality natural forest communities. It was also identified as an Important Bird Area by New York Audubon. This focus area includes undeveloped lake front on Cayuta Lake, riparian wetlands on Cayuta Creek, upland forests and private land within the greater Connecticut Hill Important Bird Area. Conserved lands in this focus area includes more than 19,000 acres at Connecticut Hill Wildlife Management Area (WMA), Newfield State Forest, Cliffside State Forest, two conservation easements held by the Finger Lakes Land Trust, Tompkins county reforestation land, Cornell University owned land at Cayuta Inlet, Carter Creek, and Arnot Forest.

Aerial view of the Cayuta Lake outlet
©Bill Hecht

Cayuta Lake, located in southeastern Schuyler County, is a 588-acre glacial lake connected to the Susquehanna River by Cayuta Creek. Pied-billed grebes (NYS threatened) have been documented breeding in the wetlands near the lake. The inlet feeding Cayuta Lake is a clear, calcareous stream that flows through more than 500 acres of wetlands and hosts a globally rare fresh water sponge of the genus *Spongilla* and a rare *spongilla* fly. Much of the wetland remains in private ownership.

As Cayuta Creek leaves the lake, it passes through a steep-sided 150-foot deep outlet gorge which is traversed by the Finger Lakes Trail. The Lost Gorge of Hendershot Gulf, which marks the preglacial outlet of the lake, is a unique feature in the area and supports seasonal wetlands and bottomland forest.

Located just east of Cayuta Lake and north of the outlet gorge is Connecticut Hill Wildlife Management Area. More than 10,000 acres of Connecticut Hill is owned and managed by New York State as its largest wildlife management area. Connecticut Hill contains some of the highest quality higher elevation forests in the region, is home to a diverse bird community including nesting Sharp-shinned hawk, northern goshawk, and Cooper's hawk (all species of special concern in New York State) and many warbler species as well as coal skinks. Cliffside State Forest, Newfield State Forest, and Arnot Forest are located southeast of Connecticut Hill WMA and north of Cayuta Creek between Routes 224 and 13. The Nature Conservancy's GIS model of forest patches indicates that there are eight forest blocks larger than 2,000 acres in the Upper Cayuta Creek watershed.

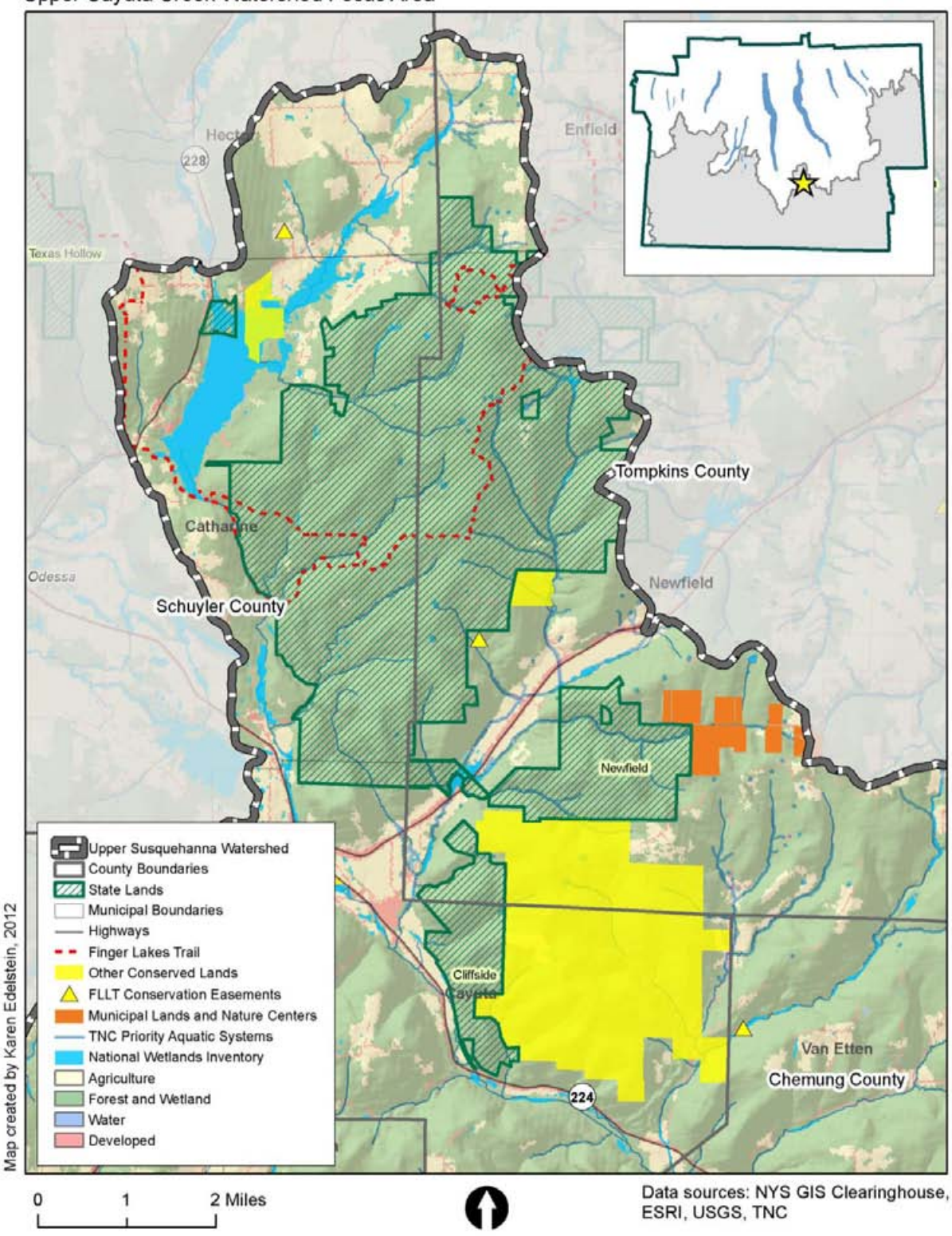
Finger Lakes Land Trust conservation easement property in the Upper Cayuta Creek Watershed Focus Area. Mark Whitmore

Table 9. Summary of Acres Conserved in the Upper Cayuta Creek Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
14,061*	458	302	4,957	19,778

*Includes acreage outside of Upper Susquehanna Watershed. See map.

Upper Cayuta Creek Watershed Focus Area



Upper Catatonk Creek Watershed

The Upper Catatonk Creek Watershed focus area includes North Spencer Marsh, Michigan Hollow, Danby State Forest, Danby Creek, Upper Willseyville Creek, and Shindagin Hollow State Forest. It is located in the Tompkins County towns of Danby and Caroline and the Tioga County towns of Spencer and Candor. The Tompkins County Unique Natural Area Inventory (UNA) identified no fewer than a dozen UNAs between Spencer Marsh and Shindagin Hollow State forest. One of these areas was described as being possibly "the most species rich forested wetland in the state." This focus area sustains populations of rare plants, such as lyre-leaved rockcress *(Arabidopsis lyrata*), cow-wheat *(Melampyrum lineare)*, and hairgrass *(Deschampsia flexuosa*) high on the hilltops, and orchids, including fragrant white bog orchid and hooded ladies' tresses (*Spiranthes romanzoffiana*) in the wetlands.

The western-most feature in this planning area is Spencer Marsh, a 100-acre wetland complex considered to be one of the highest quality wetlands in the study area. Spencer Marsh supports a diverse bird community, including breeding pied-billed grebe and bald eagle (both NYS threatened) as well as American bittern and northern harrier (both species of special concern in NY). Mussels, reptiles and a diverse assortment of amphibians can also be found here.

The Finger Lakes Trail traverses a significant portion of the Upper Susquehanna Watershed and is a popular recreational resource.

The hilltops in this focus area include nearly 13,000 acres of forest within Danby State Forest and Shindagin Hollow State Forest. Additional protected land within this area includes Cornell properties at Bald Hill and Caroline Pinnacles and several properties conserved by the Finger Lakes Land Trust. The Finger Lakes Trail traverses this focus area and descends to the valley from Danby State Forest onto the Ithaca and Owego Rail Trail that runs along the west side of the valley.

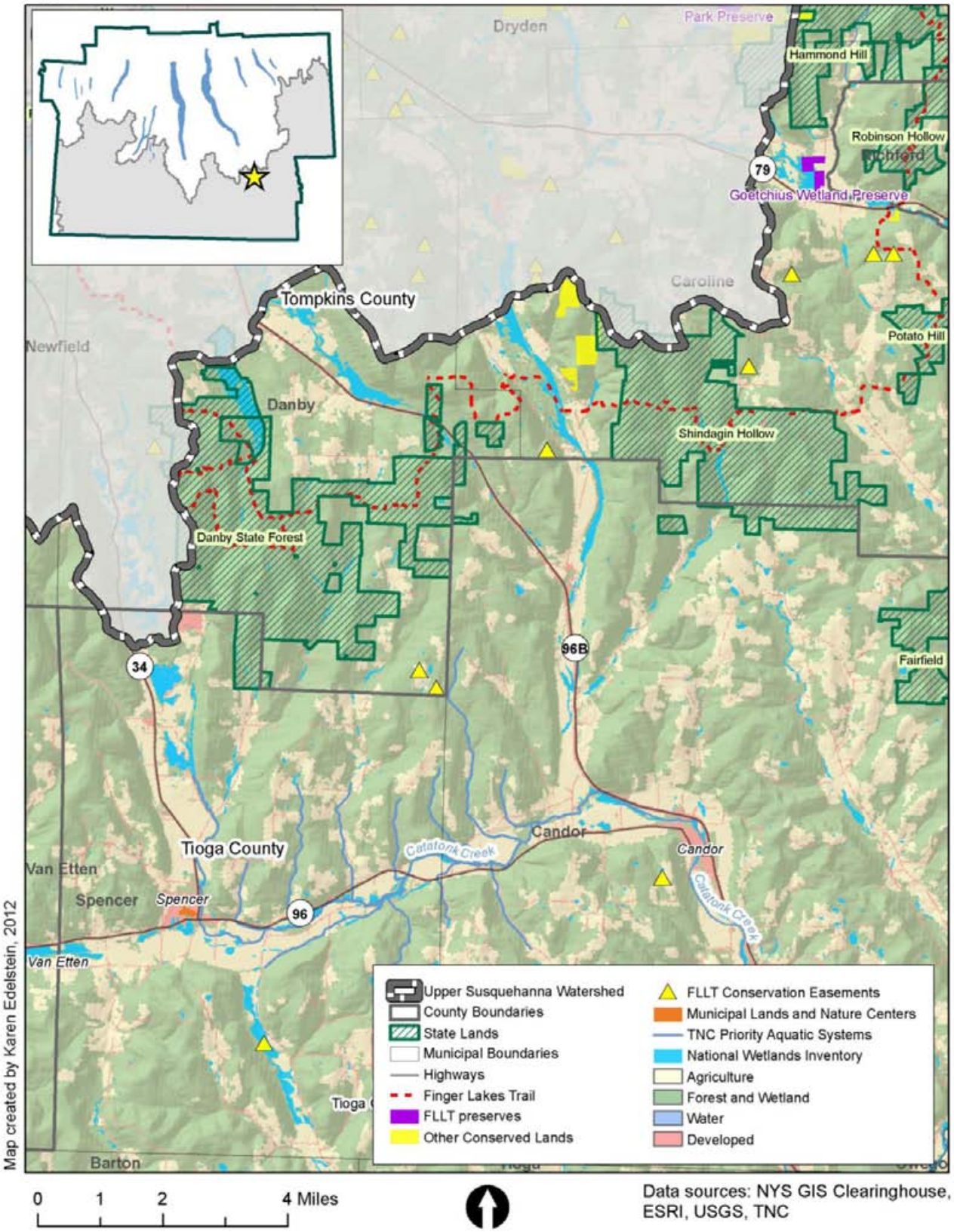
The Upper Catatonk Watershed focus area includes three particularly important aquatic resources. Nestled in the glacial through-valleys between Danby and Shindagin Hollow State forests are Upper Willseyville Creek and Danby Creek, both high quality trout streams buffered by more than 600 acres of DEC Regulated Class 1 wetlands. The South Branch of Catatonk Creek was designated by The Nature Conservancy as a priority aquatic system for conservation in its High Allegheny Plateau Ecoregional Plan. This designation indicates that the South Branch of Catatonk Creek is important to supporting the region's aquatic biological diversity.

Table 10. Summary of Acres Conserved in the Upper Catatonk Creek Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
12,916*	26	282	273	13,497

*Includes acreage outside of Upper Susquehanna Watershed. See map.

Upper Catatonk Creek Watershed Focus Area



Map created by Karen Edelstein, 2012

Data sources: NYS GIS Clearinghouse, ESRI, USGS, TNC

Owego Creek

Owego Creek is the only watershed in the planning area designated by the Eastern Brook Trout Joint Venture as a "watershed best for protection." Within the planning area, Owego Creek received Trout Unlimited's highest Conservation Success Index score for brook trout conservation. These designations indicate that not only does the Owego Creek watershed remain intact enough to support viable wild brook trout populations, but also that brook trout populations persisting here are relatively strong. The importance of Owego Creek is further supported by designation of its headwater streams as ecoregional priority aquatic systems by The Nature Conservancy. Finally, the status of the Creek as a stronghold for wild brook trout production in the Southern Tier is confirmed by the regional state fisheries biologists.

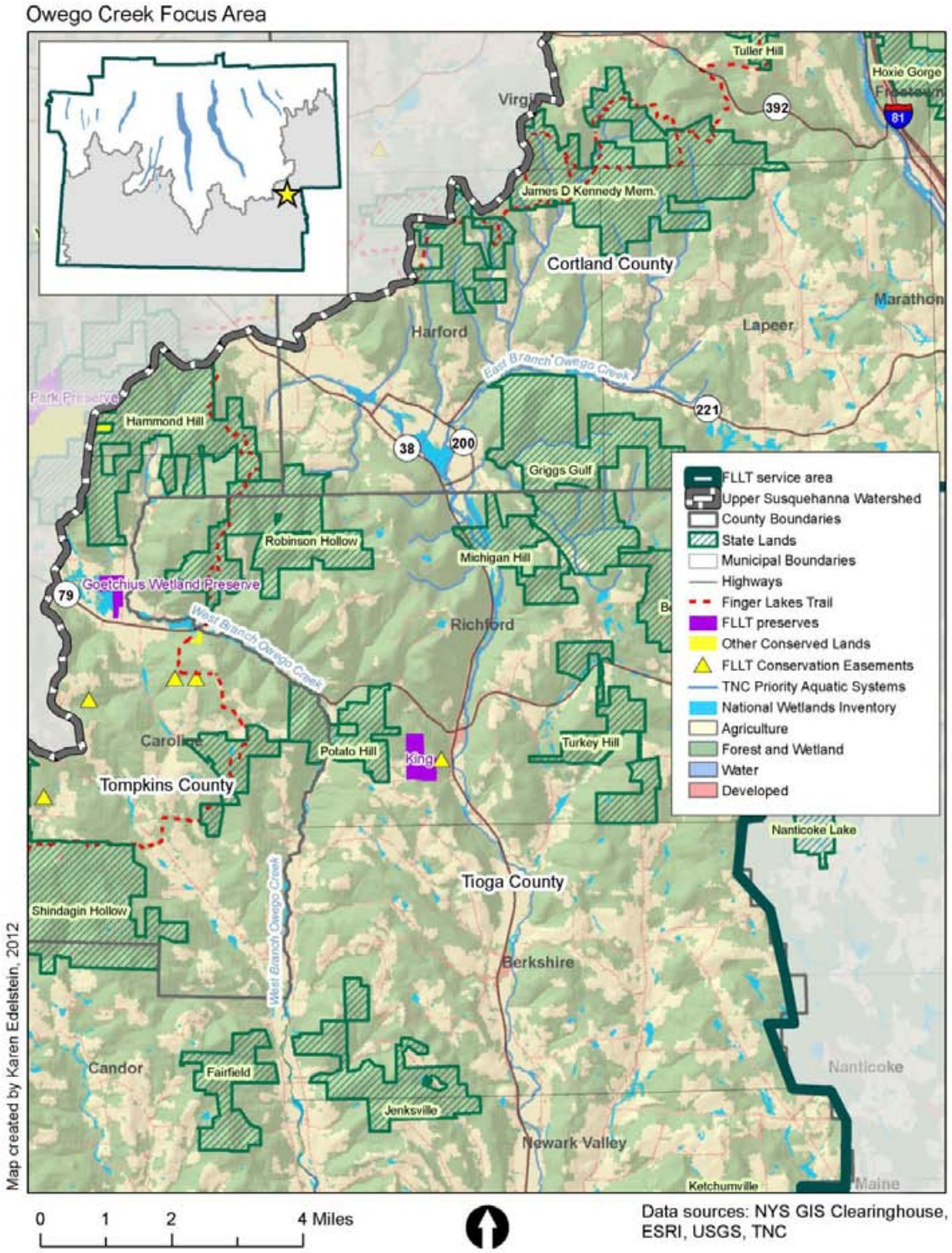
Conserved land in this area includes nearly 25,000 acres of forested hills in an archipelago of no less than nine state forests. Those of particular interest due to their size and landscape context include Robinson Hollow State Forest, Hammond Hill State Forest, James D. Kennedy Memorial State Forest, Griggs Gulf State Forest, and Michigan Hill State Forest. These forests lie along a state recognized wildlife habitat corridor. The Finger Lakes Trail winds its way through this landscape, enhancing the recreational value of these forests. The Finger Lakes Land Trust, in partnership with the Upper Susquehanna Coalition, has partially protected the 250-acre Caroline Swamp. In total, the Land Trust has protected 400 acres in the upper reaches of the Owego Creek watershed.

The Finger Lakes Land Trust's Goetchius Wetland Preserve at the headwaters of the West Branch of Owego Creek. ©Melissa Groo

Table 11. Summary of Acres Conserved in the Owego Creek Watershed

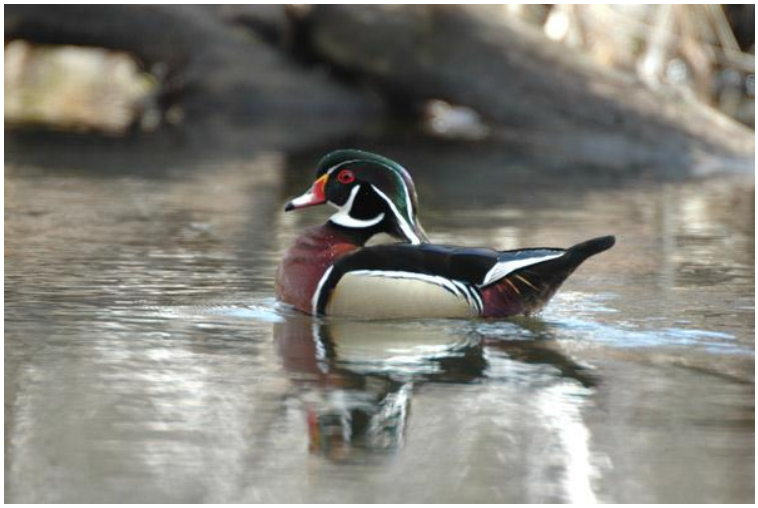
State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
24,832*	0	400	430	25,662

*Includes acreage outside of Upper Susquehanna Watershed. See map.



Otselic River Watershed

The Otselic River flows out of the Chenango Highlands of Madison and Chenango Counties through a small segment of Cortland County to its confluence with the Tioughnioga River just below the Whitney Point Reservoir in Broome County. While only a short stretch of the Otselic flows through the Finger Lakes Land Trust's service area, this river is included as a focus area in recognition of its inclusion in the Chenango Highlands Forest Matrix Block – a globally significant forest block identified by The Nature Conservancy. Furthermore, the Otselic River flows to the Whitney Point Reservoir in Broome and Cortland Counties. The Whitney Point Multiple Use Area encompasses nearly 5,000 acres along more than 12 miles of river corridor between Cincinnatus in Cortland County and the dam in the Village of Whitney Point. The Whitney Point Reservoir is an important migratory waterfowl stop-over and a New York Audubon-designated Important Bird Area. In Cortland County, the river flows through a rural landscape that includes more than 500 acres of riparian wetlands. The waters of the Otselic support both Eastern brook trout and stocked brown trout.

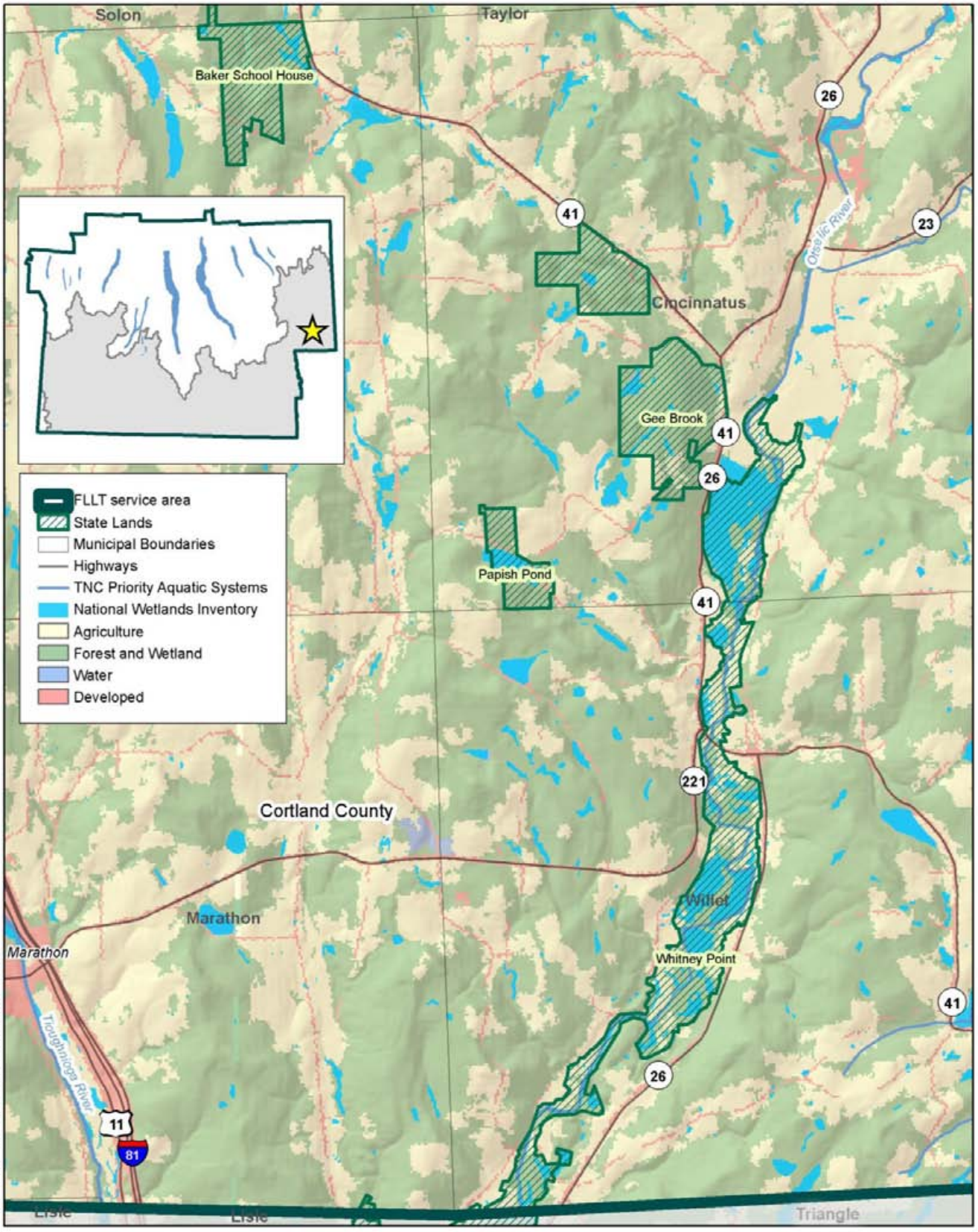


Wood ducks are among the migratory waterfowl that make use of the Atlantic Flyway and stop-over habitat at places like the Whitney Point Reservoir. Fred Bertram

Table 12. Summary of Acres Conserved in the Otselic River Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
6,081	0	0	0	6,081

Otselic River Watershed Focus Area



Map created by Karen Edelstein, 2012

0 1 2 Miles

Data sources: NYS GIS Clearinghouse, ESRI, USGS, TNC

East Branch of the Tioughnioga River Watershed

The landscape of the East Branch of the Tioughnioga River is defined by large forest blocks, high-quality streams, and agriculture. The East Branch of the Tioughnioga River was designated as an aquatic priority for conservation by The Nature Conservancy in its ecoregional planning process. Within the watershed of the East Branch of the Tioughnioga River lie two important forest blocks – the Hill and Hollow area north of Route 13 in the towns of Truxton, Cuyler, and Fabius and the Taylor Valley forests south of Route 13 in the towns of Cuyler, Taylor, and Salon. The North Country National Scenic Trail winds its way through this focus area.

The Hill and Hollow forest block contains over 13,000 acres of forest bisected by glacial through-valleys and watershed divide wetlands. It includes a state unique area, two state forests, a county forest, and a forest managed by SUNY College of Environmental Science and Forestry. Labrador Creek and the West Branch of Tioughnioga Creek, high-quality headwater streams to the East Branch of the Tioughnioga River, flow through this focus area.

Labrador Hollow State Unique Area is biologically diverse because the arrangement of steep slopes topography allows for the persistence of plant communities more typical of the Adirondacks growing alongside other plant communities typical of central New York. Labrador Hollow Unique Area also supports a100-acre kettle lake surrounded by wetlands, including a sphagnum bog and a northern hemlock-white pine swamp. The western side of Labrador Hollow supports a maple and basswood-rich mesic forest. Labrador Hollow, connected to both Kettlebail State Forest and Morgan Hill State Forest, is at the heart of more than 7,000 acres of contiguous public land.

The eastern edge of this forest block is anchored by Highland Forest County Park, which includes 2729 acres of land and 20 miles of recreational trails. This focus area extends north to include wetlands in a glacial through valley where the Central New York Land Trust has conserved portions of Old Fly Marsh and Carpenter's Pond. The western edge of this forest block is anchored by the Svend O. Heiberg Memorial Forest, which is owned and managed by SUNY College of Environmental Science and Forestry.

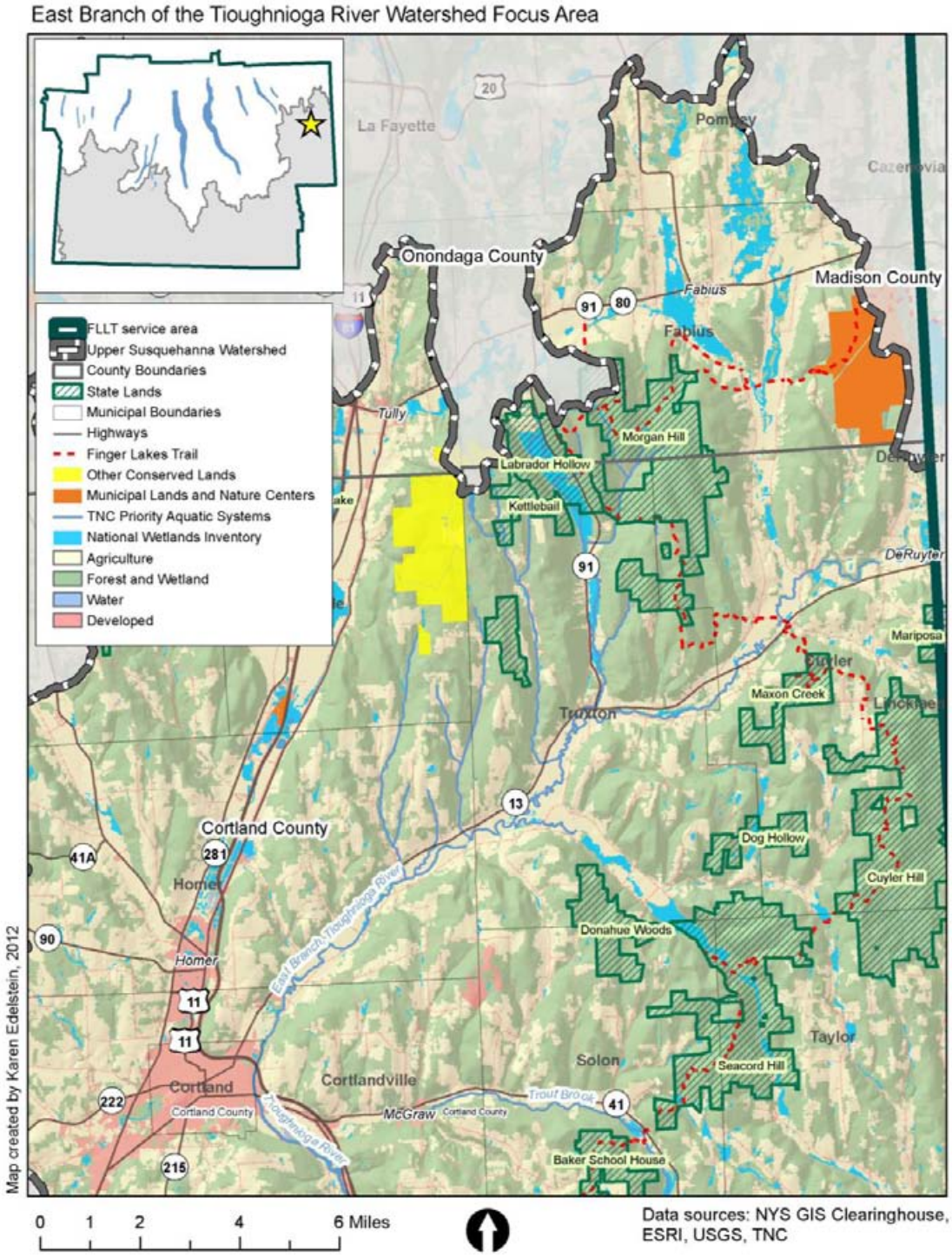
Taylor Valley, south of Route 13, supports one of the largest forest blocks in the study area. Over 12,000 acres are conserved at Donahue State Forest, Cuyler Hill State Forest, Taylor Valley State Forest, Dog Hollow State Forest, and Maxon Creek State Forest. The forests in this area support breeding sharp-shinned and Cooper's hawks along with a diversity of forest songbirds. Cheningo Swamp lies at the heart of Taylor Valley State Forest. This large, diverse wetland

system supports bottomland forest as well as breeding pied-billed grebe, a threatened bird in New York. Suitable brook trout habitat exists on Cheningo Creek, but a number of culverts along the creek prevent fish movement into high-quality habitat.

Table 13. Summary of Acres Conserved in the East Branch of the Tioughnioga Watershed

State Land	Municipal Lands and Nature Centers	FLLT Easements and Preserves	Other Conserved Land	Total Conserved Land
23,163*	2,821	0	2,673	28,657

*Includes acreage outside of Upper Susquehanna Watershed. See map.



Recommendations

With the threats of sprawl, natural gas development, and flooding expected to increase in the Upper Susquehanna watershed, deliberate and coordinated efforts are needed to conserve the natural resources that make up the fabric of the region's landscape. By identifying the most regionally significant natural resources in the Finger Lakes Land Trust's portion of the watershed, this assessment provides an ambitious starting point. There is much work to be done. Specifically we recommend:

Planning

County and regional planning boards can take an active role in facilitating natural resource conservation by towns through planning assistance and development of model regulations. However, the advisory roles of regional and county planners are often hindered by a perceived lack of urgency or need for resource conservation on the part of local residents and town leaders.

Education

Local leaders should be educated about the threats to the region's resources and the means to conserve them. The sluggish economy throughout much of the study area leads many local decision makers to encourage economic development projects with little consideration to environmental impacts. Integration of conservation into development plans promotes the long term sustainability and prosperity of communities.

Biological inventory

Much of the area lacks up-to-date biological inventory information, which is a key component for land use decision makers. For instance, Steuben County's last natural resource inventory was completed in the 1970's. We recommend that counties emulate the approach taken by Tompkins County to develop a locally-based natural resource inventory and conservation plan. In Tompkins County, the Environmental Management Council, County Planning Department and County Legislature worked with volunteers, university students, and conservation professionals to develop inventory methods and identify unique natural areas. Since the 1970's, the list has been revised more than four times and now includes more than 200 Unique Natural Areas. This work, funded through the county planning department and supported by landowners and volunteers, is used broadly by towns throughout Tompkins County.

Model regulations

Regional and county planning agencies should develop an integrated suite of model regulations for use by towns to conserve riparian corridors, wetlands, forest blocks, habitat corridors, and scenic areas.

Refined conservation planning

A more detailed analysis of each focus area identified in this report is needed to identify key landowners and local leaders for outreach and education efforts.

Restoration

Past and current land use has altered the landscape of the Upper Susquehanna watershed, requiring restoration of some resources. Wetlands should be restored and preserved wherever possible because they have been highly altered and degraded and because they provide vital services including flood water attenuation and wildlife habitat.

Connections between large forest blocks should be identified, conserved and restored. The corridors identified by New York State's "Least Cost Path" analysis need refining. In some areas, the current path, while taking the shortest route between two forest blocks, traverses lands developed beyond the point of forest restoration.

Where larger rivers are managed within floodways, the Army Corps of Engineers and New York State DEC should, wherever possible, incorporate natural habitat restoration and management. On smaller rivers and creeks, highway departments should implement measures to conserve natural creek functions, habitats, and passage for aquatic species especially near road crossings.

Land Protection

Permanent conservation of critical lands identified in this assessment will support the quality of life of the region's residents, enhance community sustainability and promote long term ecological health of the area. Conservation can be achieved through a number of means including the voluntary use of conservation easements and, where appropriate, fee acquisition. Well coordinated, cost effective conservation efforts will require funding, education, and collaboration among partner organizations.

Funding

While New York State has maintained a strong commitment to land conservation funding over the last decade, little money has been allocated to permanently conserve lands of the Upper Susquehanna watershed. Funding is needed to purchase development rights for critical resource areas, assist with transaction costs associated with donated conservation easements, and purchase land in fee title from willing sellers where appropriate.

Education

Local landowners and leaders should be educated about the full range of conservation options available to generate the political support needed to direct both private and public funding toward conservation initiatives.

Acknowledgements

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The work laid out in this assessment cannot, and should not, be done by any single organization. Partnerships exist and are developing among the many conservation and planning professionals who graciously gave of their time and expertise to help inform the preparation of this document. We are indebted to their commitment to conservation and we look forward to working in collaboration with them to see the vision they shared become reality for the landscape of New York's Southern Tier. Those who contributed to this project include:

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Jonathan Barter, Steuben County Soil and Water Conservation District Grazing Specialist
Tom Bell, Wildlife Biologist, DEC Region 7
Katie Borgella, Principal Planner, Tompkins County Planning Department
Marcia Brown, Director, Southern Tier Central Regional Planning
Darren Crabtree, Pennsylvania Director of Conservation Science, The Nature Conservancy
Jim Curatolo, Watershed Coordinator, Upper Susquehanna Coalition
Suzy Daubert, District Conservationist, Tioga and Chemung County Natural Resources Conservation Service
Henry Dedrick, Forester, DEC Region 7
Amy Dlugos, Steuben County Planner
Sandra Doran, Fish and Wildlife Biologist, United States Fish and Wildlife Service
Jennifer Fais, Planning Consultant, Southern Tier Central Regional Planning
John Gibbs, Regional Forester, DEC Region 8
Dave Lemon, Fisheries Biologist, DEC Region 7
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Jennifer Trimber, Director, Chemung County Environmental Management Council
Mark Watts, District Manager for Chemung County Soil and Water Conservation Service

Chris Yearick, GIS Specialist and Data Manager, Upper Susquehanna Watershed Coalition
Melissa Yearick, Wetlands Coordinator, Upper Susquehanna Watershed Coalition
Mark Zubal, Forester, DEC Region 7

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