

Marsh Migration in the New Jersey Tidal Delaware Bayshore Region: A Land Protection Plan



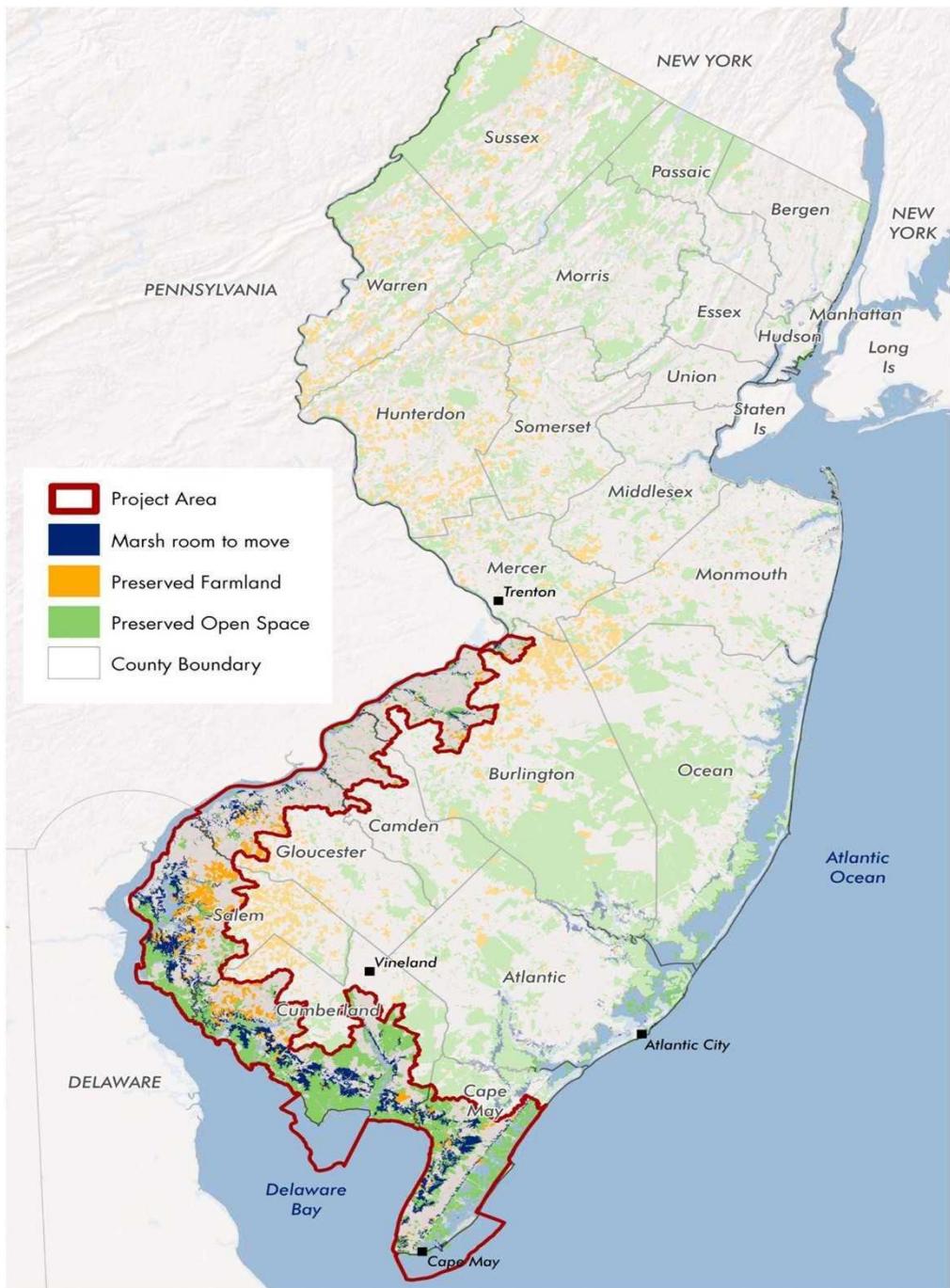
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Introduction and Context

With the support of a grant from the Land Trust Alliance and administered by the Open Space Institute of New York, this plan was prepared as a resource for conservation professionals seeking to protect the future of tidal marsh ecosystems in southern New Jersey. The geographic focus of this plan encompasses the tidal region along New Jersey's Delaware Bayshore, from the Blacks Creek watershed near Trenton south to Cape May Point.



Over the last 100 years, New Jersey's sea level has risen 0.45 m; this is 250% higher than the average global sea level rise of 0.18 m (NJDEP 2020). Today, sea level rise is occurring at a rate of 5-6 mm per year in New Jersey, with levels expected to accelerate over the next decade due to climate change pressures (NJDEP 2020). Sea level rise results in water moving further inland, turning existing tidal salt marsh into permanently inundated surface water. The focus of our project area, the tidal Delaware Bay watershed, is experiencing marsh loss at a rate of 1.1-1.9% per decade, and net elevation increases between 1.16-6.89 mm per year (NJDEP 2020). Due to the accelerating rates of sea level rise and the New Jersey tidal Delaware Bayshore's low and level topography, all current marshland will eventually be lost to open water except where interventions such as marsh plain elevation are implemented.

Marshlands are a critical natural resource in the fight against climate change. They are renowned for their ability to sequester and store carbon. They also serve as buffers, protecting coastal areas – including human development and infrastructure – from storms and natural disasters. Marshland provides critical habitat for threatened and endangered species, particularly migratory shorebirds that have nested and fed in these areas for millennia. Species such as piping plover, least tern, black skimmer, and salt marsh sparrow face the threat of extinction due to declining marsh habitat and accelerated sea level rise, which results in higher rates of nests flooding, causing populations to drop.

Providing and protecting pathways for marsh migration is vital to improve the resiliency of this coastal wetland habitat against sea level rise and marsh loss resulting from climate change. Preserving prioritized lands adjacent to current marshlands will provide space for these habitats to "migrate" upwards and inwards as sea levels rise. As described below, NJ Conservation Foundation used existing publicly available data to identify where topography, land use and hydrology would allow marshlands "room to move" as sea levels continue to rise. We then developed criteria to help focus conservation resources on parcels that are most likely to provide meaningful impacts. This plan will serve as a resource to guide the efforts of NJ Conservation Foundation, our land trust partners, and other government agencies and conservation organizations working to preserve the future of marsh habitats in this region.

Data Sources and Analyses

We began by reviewing various datasets including land use, high tide, sea level rise, and marsh migration from the National Oceanic and Atmospheric Administration (NOAA), the New Jersey Department of Environmental Protection (NJDEP), The Nature Conservancy (TNC), and Rutgers Center for Remote Sensing and Spatial Analysis (CRSSA). Since developing our own modeling for marsh migration was outside the scope of this project, we focused on existing datasets from the CRSSA and TNC.

We found TNC's data and modelling to be the most suitable for our needs. This is because their methodology identifies both space and conditions necessary for tidal complexes to migrate inland and adapt to new conditions, indicating where opportunities exist allowing marsh "room to move". Their model is also based on a 6-foot sea level rise, which provides a more robust projection compared to other datasets using 1-3 feet. Furthermore, using TNC data ensures consistency with other available mapping resources, such as the New Jersey Conservation Blueprint's Eco Priority Model, which also incorporates TNC's marsh migration data. We also noted a high level of consistency between the lands identified by TNC and CRSSA, which further validated our choice.

Utilizing the TNC data, we then completed our own secondary analysis which involved several steps. First, we identified marsh "room to move" areas within our project area. Then, we removed lands that had been developed subsequent to the creation of the source datasets used within the TNC model. We did this by eliminating any marsh "room to move" areas identified as 'Urban' in NJDEP's Land Use/Land Cover of New Jersey 2020. We then added identifiers to the remaining marsh "room to move" areas for elevation (in two ranges: 0-9.99' and >10'), preservation status and type (preserved or unpreserved; if preserved, open space or farmland), and 2020 land use type.

We then overlaid parcels to identify all parcels that contain marsh "room to move". Where available, tax information including tax class and owner names were added to parcel information. We calculated the percentage of land that qualifies as marsh "room to move" for each parcel as well as the percentages of total land area of preserved versus unpreserved marsh "room to move".

Lands adjacent to marsh "room to move" opportunities are important as they will subsequently become the adjacent habitats to buffer future marsh. Marshlands that have developed lands encroaching right up to their edges lose key ecological interactions amongst species that require a functional ecotone across the marsh-forest gradient. Developed areas adjacent to the future marshlands will also be more flood-prone. Therefore, we also identified unpreserved lands adjacent to marsh "room to move" areas and performed a land use/land cover analysis of those lands to determine development status.

For the sake of planning and organizing further analysis, we determined that HUC 6-8 subwatershed boundaries would serve as boundaries for the project's regional planning divisions.

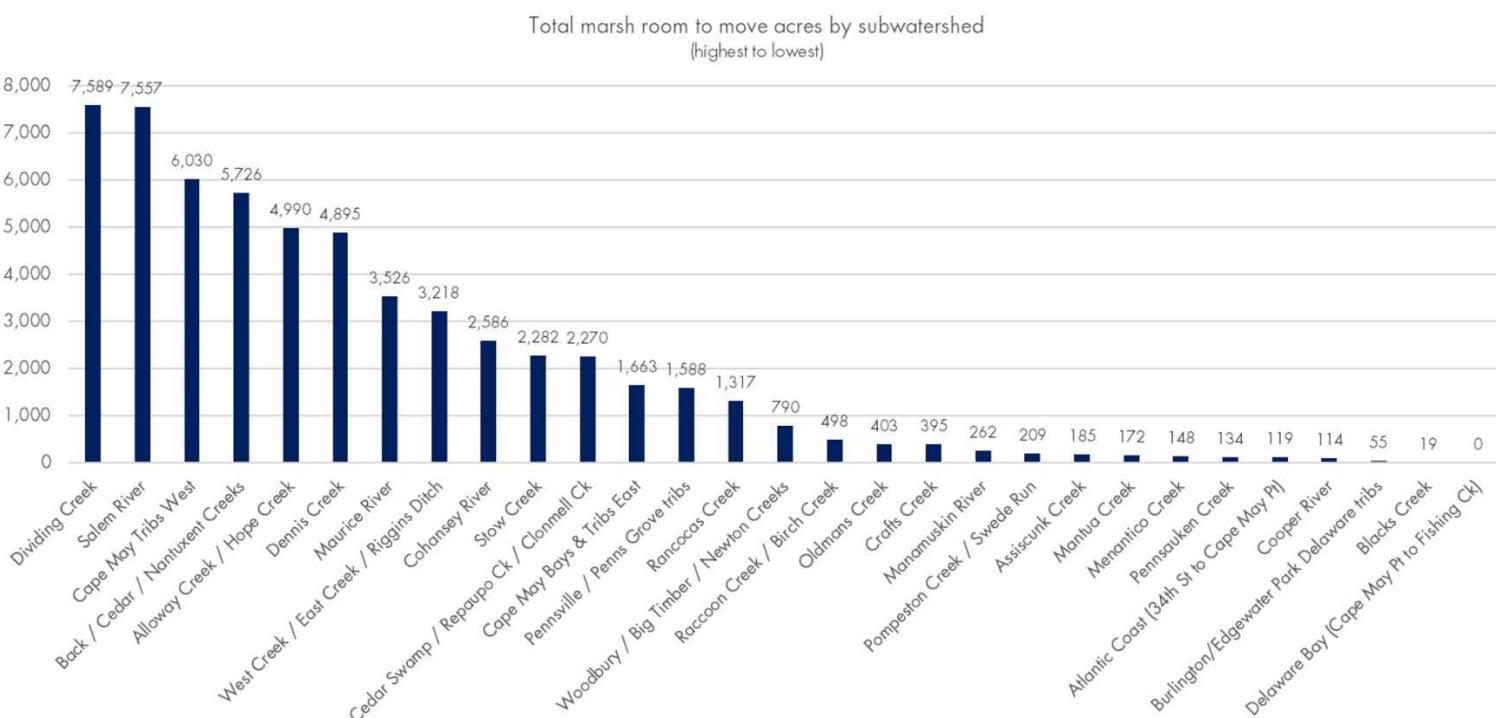
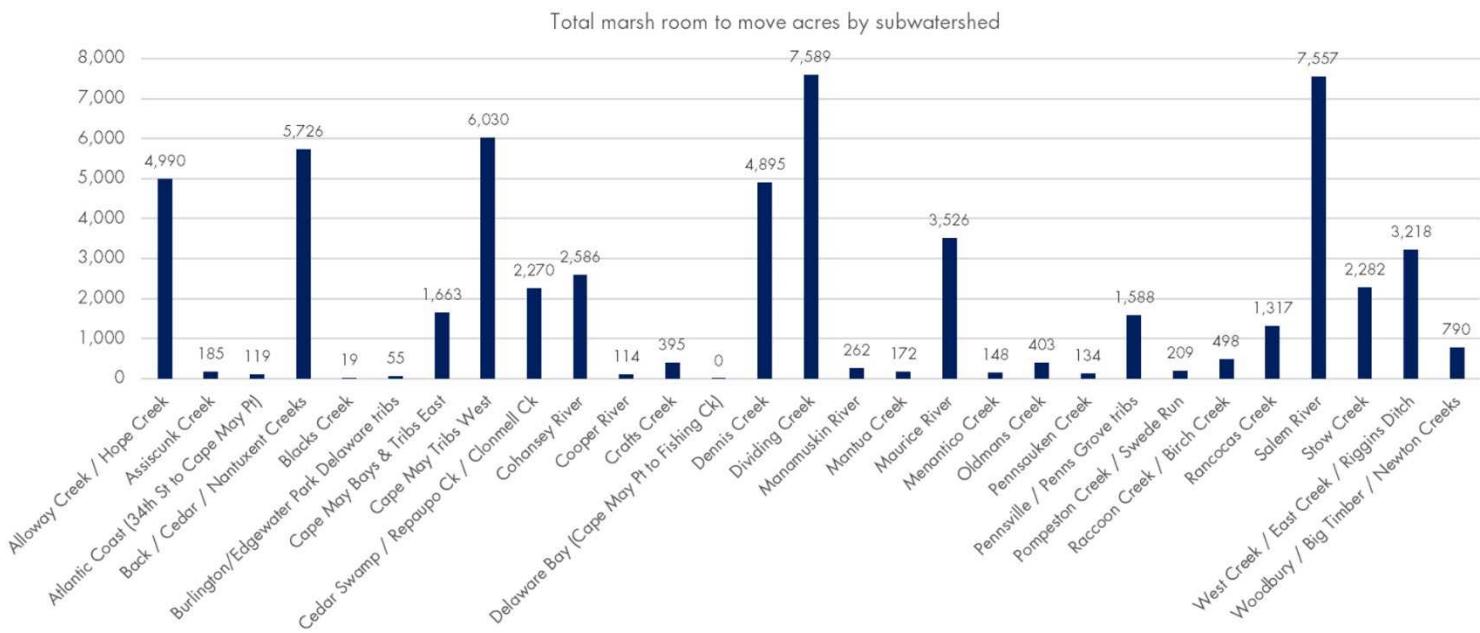
Marsh “Room to Move” Acres in New Jersey’s Tidal Delaware Bayshore Region

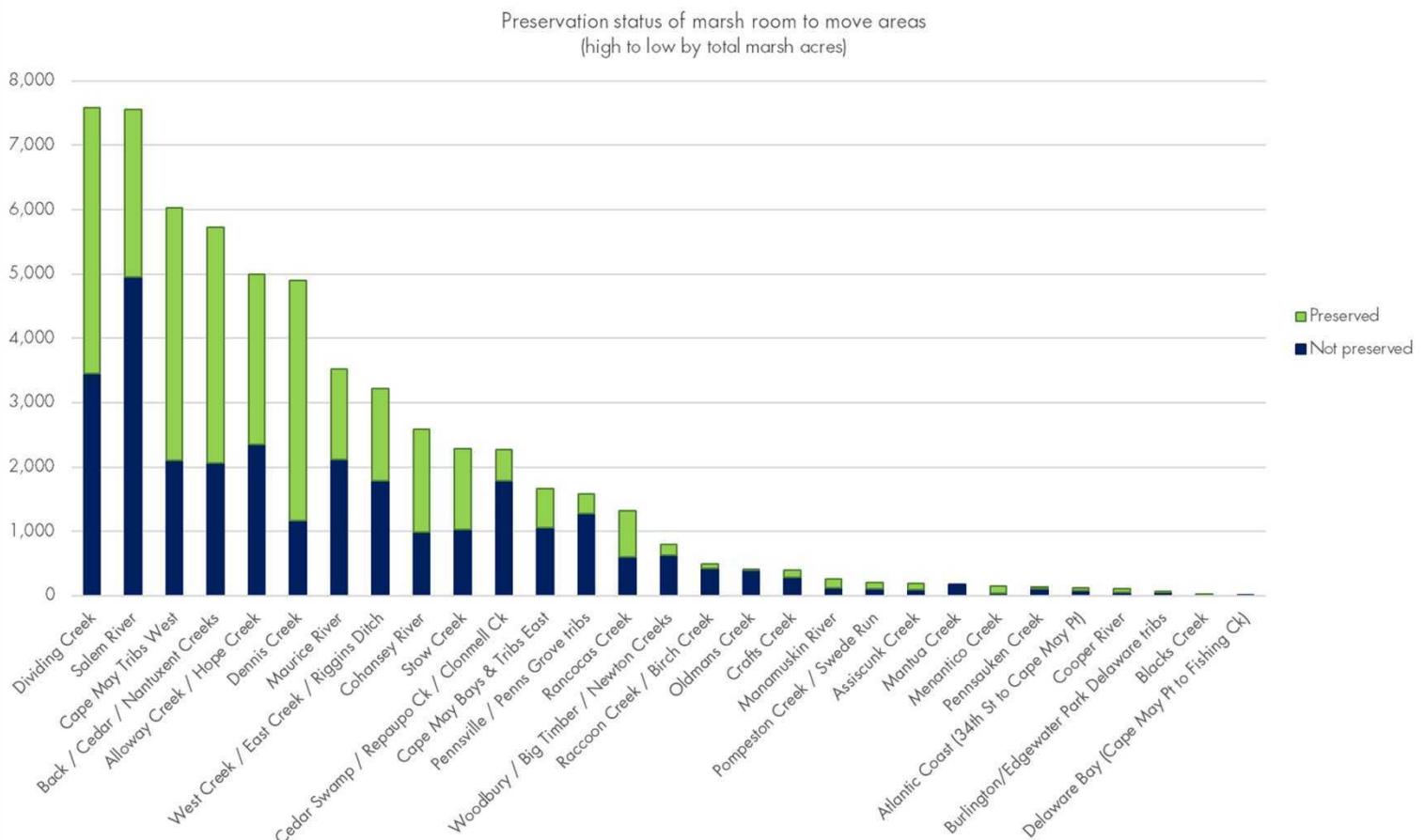
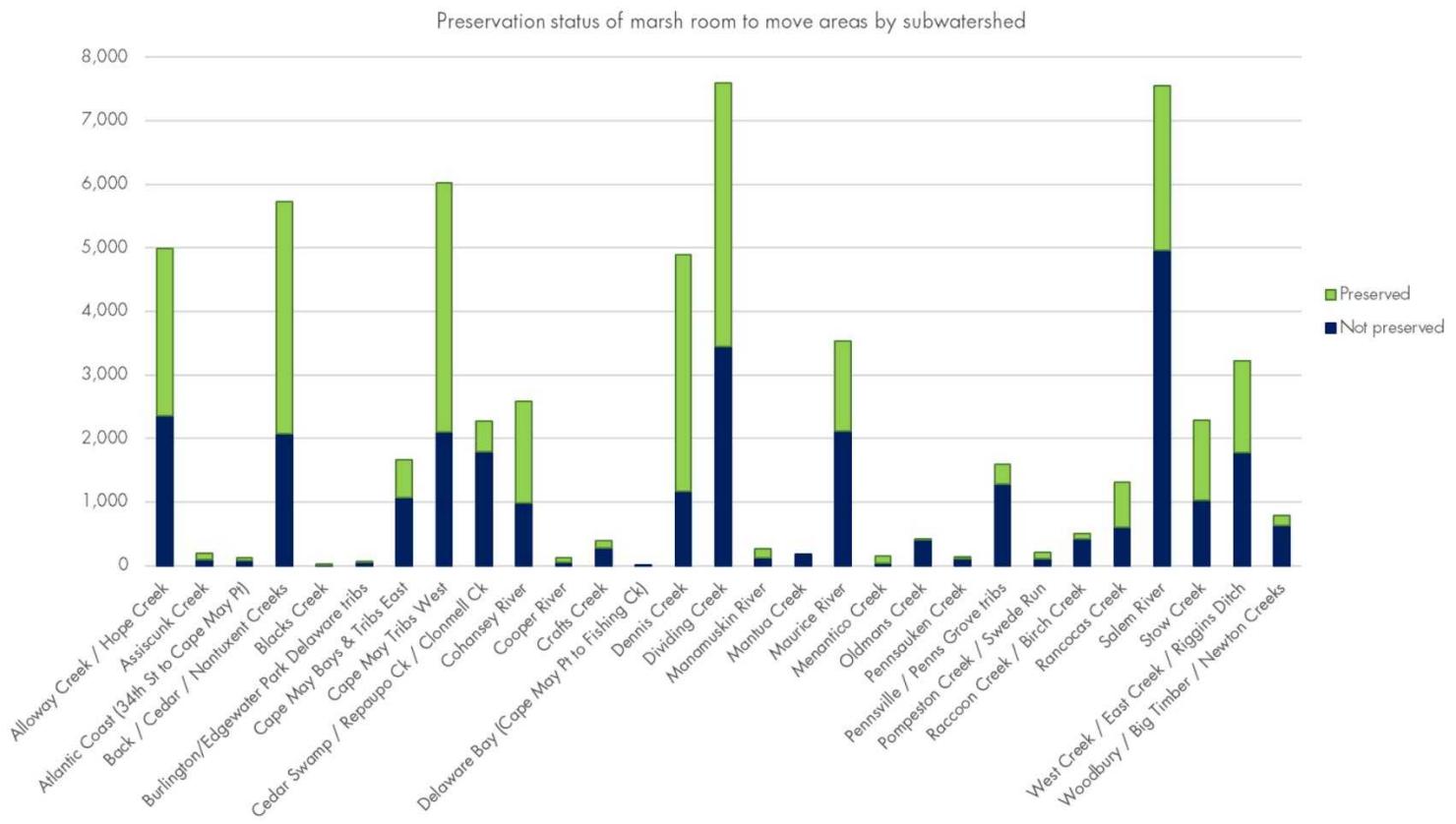
Within the geographic focus area, there are 29 subwatersheds with a total of \pm 58,740 acres identified as marsh “room to move”. Approximately 65% of total marsh “room to move” areas are wetlands, and 50% of the total marsh “room to move” acreage is preserved.

Marsh “Room to Move” Land Use Type	Acres
Agriculture	\pm 11,164 acres
Barren land	\pm 297 acres
Forest (upland)	\pm 8,903 acres
Water	\pm 428 acres
Wetlands	\pm 37,948 acres

Marsh “Room to Move” Preservation Status	Acres
Preserved	\pm 29,398 acres
Unpreserved	\pm 29,342 acres

The following graphs provide a comparison of marsh “room to move” acres across the subwatersheds within the project area. Total acres and preservation status are sorted by both watershed name and by acres highest to lowest.





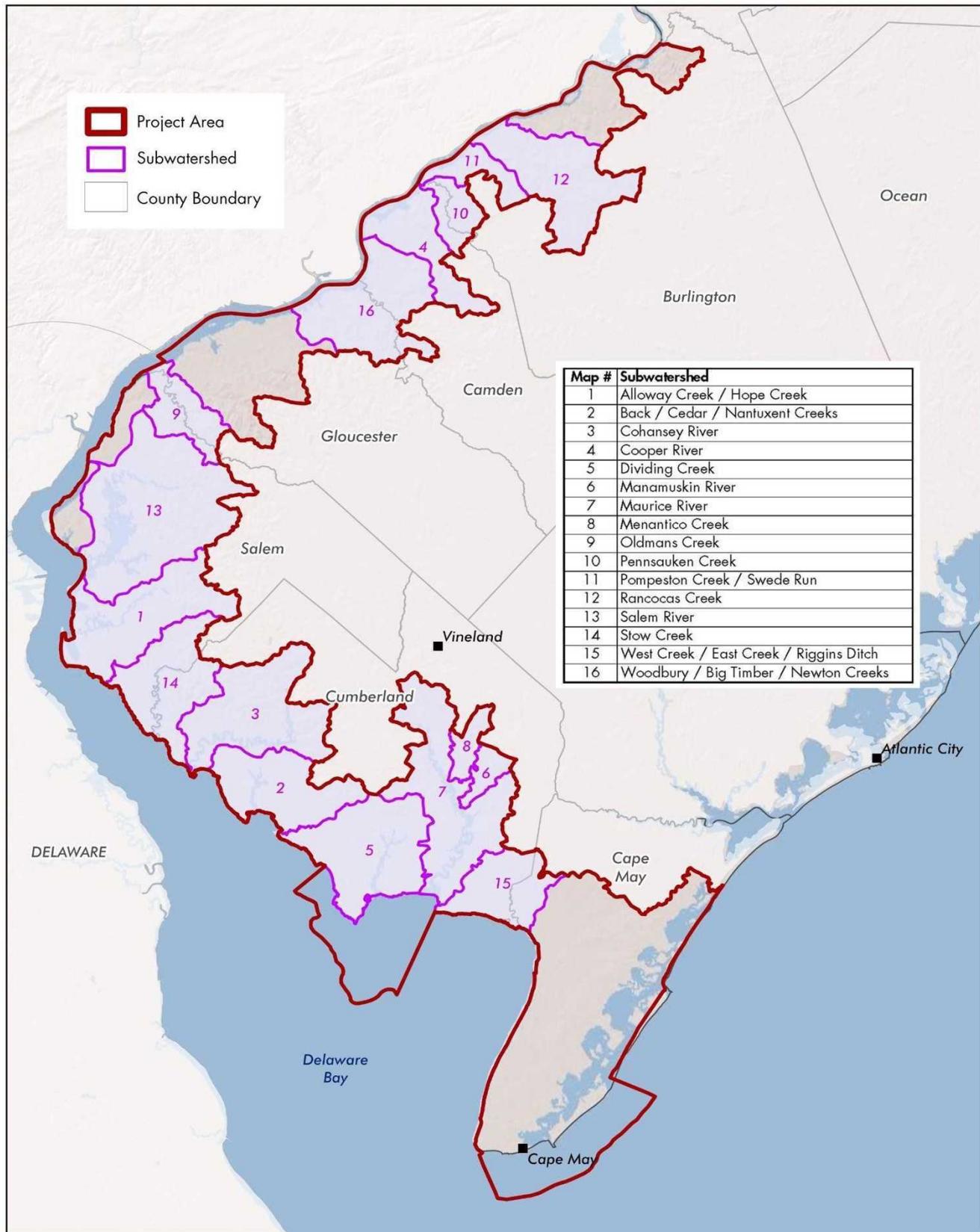
Prioritization Criteria

NJ Conservation Foundation prepared two sets of prioritization criteria to guide marsh migration pathway land protection efforts. First, we considered which of the subwatersheds in the region we plan to focus our resources on. Second, we developed criteria to help identify which parcels in any subwatershed would have the greatest impact on marsh migration goals.

NJ Conservation Foundation has a decades-long history of working in the expansive Delaware Bayshore region, which spreads across our organization's internal Delaware Bay Watershed and South Jersey Metro geographic focus areas. Within these focus areas, we have previously identified "project areas" in which our efforts have been continuously targeted. After considering our existing project areas and the results of the "room to move" mapping analysis, NJ Conservation Foundation intends to focus our land protection resources in the following subwatersheds (listed in alphabetical order, not order of priority):

1. Alloway Creek/Hope Creek
2. Back/Cedar/Nantuxent Creeks
3. Cohansey River
4. Cooper River
5. Dividing Creek
6. Manumuskin River
7. Maurice River
8. Menantico Creek
9. Oldmans Creek
10. Pennsauken Creek
11. Pompeston Creek/Swedes Run
12. Rancocas Creek
13. Salem River
14. Stow Creek
15. West Creek/East Creek/Riggins Ditch
16. Woodbury/Big Timber/Newton Creeks.

NJ Conservation Foundation will continue to collaborate with conservation partners in these subwatersheds on land protection efforts, to include targeted preservation of parcels that are identified as priority marsh migration pathways.



Throughout the tidal Delaware Bayshore region, NJ Conservation Foundation has identified unprotected lands that will provide opportunities for marsh migration as sea level rises. To make most efficient use of limited resources, an important step was to develop prioritization criteria for selection of parcels most critical to protect. These criteria differ somewhat depending on the land use context of the subwatershed. In less developed areas, larger contiguous areas of protected lands are critical for achieving ecological and habitat functionality. Prioritization of parcels that are adjacent to other protected open spaces, especially upland areas that are likely to remain upland in the future, will help to retain the full suite of wildlife species' ecological needs. However, in more urbanized areas and within overburdened communities, preservation of smaller parcels may contribute significantly to climate mitigation and adaptation goals. In all contexts, the availability of funding and strong partnerships - including organizations willing to acquire and manage protected lands or conservation easements - will help to further focus limited resources and maximize results.

The detailed maps and statistics on size and land use of each marsh "room to move" parcel and their surrounding parcels will help steer the choices of key properties for conservation acquisition in as objective a manner as possible. In addition to this data, another particularly important consideration in choosing priorities will be the ongoing development and implementation of marsh plain elevation projects. As the success of these projects is evaluated and the site choice of existing marshes appropriate for this strategy becomes clear, this may strongly influence the prioritization of acquisition targets.

Outreach and Collaboration

NJ Conservation Foundation works regularly with local, regional, state and federal partners in the Delaware Bayshore region, and has had several conversations to understand our partners' priorities and perspectives on work in this region. NJ Conservation Foundation participates in the NJ Conservation Blueprint Steering Committee with staff from The Nature Conservancy, whose data was key to this project.

Other opportunities for collaboration have included meetings of the South Jersey Bayshore Coalition, attended regularly by representatives from Citizens United to Protect the Maurice River and Its Tributaries, South Jersey Land and Water Trust, Partnership for the Delaware Estuary, and American Littoral Society, as well as meetings coordinated by Ducks Unlimited to strategize a large-scale wetland restoration and land protection effort around Mannington Meadows in Salem County, attended by participants from Ducks Unlimited, Partnership for the Delaware Estuary, the Conserve Wildlife Foundation of New Jersey, New Jersey Audubon, Natural Resource Conservation Service, Salem County, and the New Jersey State Agricultural Development Committee. NJ Conservation Foundation also had preliminary conversations with staff from the

U.S. Fish and Wildlife Service and NJ Division of Fish and Wildlife to discuss organizational priorities and goals relating to tidal marsh protection.

NJ Conservation Foundation plans to share the results of this project broadly, so that all conservation organizations working in this region can use the existing data to pursue protection of marsh migration pathways in alignment with their own respective goals. We have produced profiles of each subwatershed where NJ Conservation Foundation will prioritize its work. These profiles identify marsh migration opportunities in the context of geopolitical boundaries, existing preserved land, adjacent land uses, and proximity to overburdened communities. These profiles will be distributed to partners known to work in those subwatersheds, including municipalities and counties. We will also share this report so that other organizations interested in protecting marsh migration pathways in this region will have access to our rationale, data analysis, and prioritization criteria for use in all subwatersheds. Upon request, NJ Conservation Foundation will prepare profiles for subwatersheds outside of our priority areas to assist partners active in those geographies. Please refer to the Appendix for individual profiles of the subwatersheds in the Delaware Bayshore region where NJ Conservation Foundation plans to focus its efforts.

Within the subwatersheds where NJ Conservation Foundation intends to actively pursue land protection projects, we will conduct targeted outreach to landowners, municipalities, counties, and partners based on the prioritization criteria described earlier. This may include mailings, meetings with municipal and county open space and farmland preservation staff, and regular contact with partners to ensure clear communication of priorities and each organization's active work.

For those subwatersheds in which NJ Conservation Foundation has not historically worked and does not have active relationships or partners, we will share this plan and offer to prepare subwatershed profiles upon request, as noted above. If enough organizations indicate interest, NJ Conservation Foundation will convene annual or semi-annual meetings for partners to discuss successes, challenges, works in progress and lessons learned. In addition, although parcel-specific information is generally available via New Jersey Conservation Blueprint (<https://nj-map.com/blueprint/>), NJ Conservation Foundation will provide assistance to smaller local organizations in identifying priority parcels within their subwatersheds.

Regulatory and Statutory Considerations

Future monitoring and continued evaluation of preserved land and easements that may be submerged due to sea level rise as time progresses will be important. The New Jersey Department of Environmental Protection (NJDEP) should update Tidelands mapping using aerial photo review and field verification; the current data is decades old. A complex process always arises between choosing priority parcels for conservation acquisition versus the willingness and ability of private landowners to engage in a discussion regarding potential conservation transactions. Negotiations

can be difficult, particularly in the tidal regions of Delaware Bay, in part because using Green Acres Program acquisition funds requires a consideration of Tidelands acreage that has fallen into the category of “land below mean high tide”. These are tidal marshes that by state statute are already owned by the public. If a private landowner has no riparian grant or other established rights of ownership and is relying on outdated Tidelands mapping, they may actually own significantly less acreage than they realize, resulting in an unrealistic expectation of value and jeopardizing conservation acquisition negotiations. Updated NJDEP Tidelands mapping across the entire Delaware Bayshore would be more efficient than parcel-by-parcel determination during every land transaction and would improve landowners’ general understanding of how Tidelands impact their properties.

Preserved farmland adjacent to existing marshes whose elevations are low with respect to sea level pose special problems. Although preservation using state and county farmland preservation funds secures and requires a property’s availability for agricultural use in perpetuity, over time these lands may be claimed by rising marshes and no longer be feasible for agricultural use. NJ Conservation Foundation supports the State Agricultural Development Committee’s and County Agricultural Development Boards’ exploration of how to address the perpetual obligation to continue agricultural uses on preserved farms that experience permanent inundation. Going forward, purchasing new farmland preservation easements on at-risk farms with funds that allow for eventual marsh migration will be more sustainable as these acres in time are forced to be abandoned. Such conservation purchases may require policy changes that govern existing funding sources.

In overburdened communities, the innovative use of Blue Acres funding could be used to remove at-risk neighborhoods from harm’s way. Considering the forecasted increase in “sunny day flooding” or “high tide flooding,” an effective and proactive approach may be to use public funds to relocate homeowners to areas not subject to increased flooding and storm events, and to allow the current at-risk neighborhoods to be restored to open space allowing for marsh migration to occur. Certain policy changes might be needed to create long-term solutions in these situations.

Another tool that can be used to support protection of lands in marsh migratory pathways is New Jersey’s Payment-in-Lieu-of-Taxes (PILOT) Program in support of municipalities’ permanent protection of open space. The PILOT Program was formalized by the New Jersey State Legislature in the 1999 Garden State Preservation Trust Act and is funded by appropriations from the New Jersey General Fund; however, no new properties have been acquired under the PILOT Program since 2011. PILOT Program funds should be at least restored to former levels to encourage land protection efforts by municipalities, and perhaps could be increased specifically when marsh “room to move” lands are protected from development that could otherwise take place under current regulations. Municipalities that embrace the concept of avoiding development of lands that will become at-risk as sea level rises should be rewarded for their proactive efforts.

Resources

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Appendix

Map series for New Jersey Conservation Foundation's 16 subwatersheds of focus, including:

- Profile map with rivers, county & municipal boundaries, overburdened communities
- Location and preservation status of marsh "room to move" areas
- Location of unpreserved marsh "room to move" areas, identified by landuse type
- Location of unpreserved lands adjacent to marsh "room to move" areas that support the marsh ecosystem

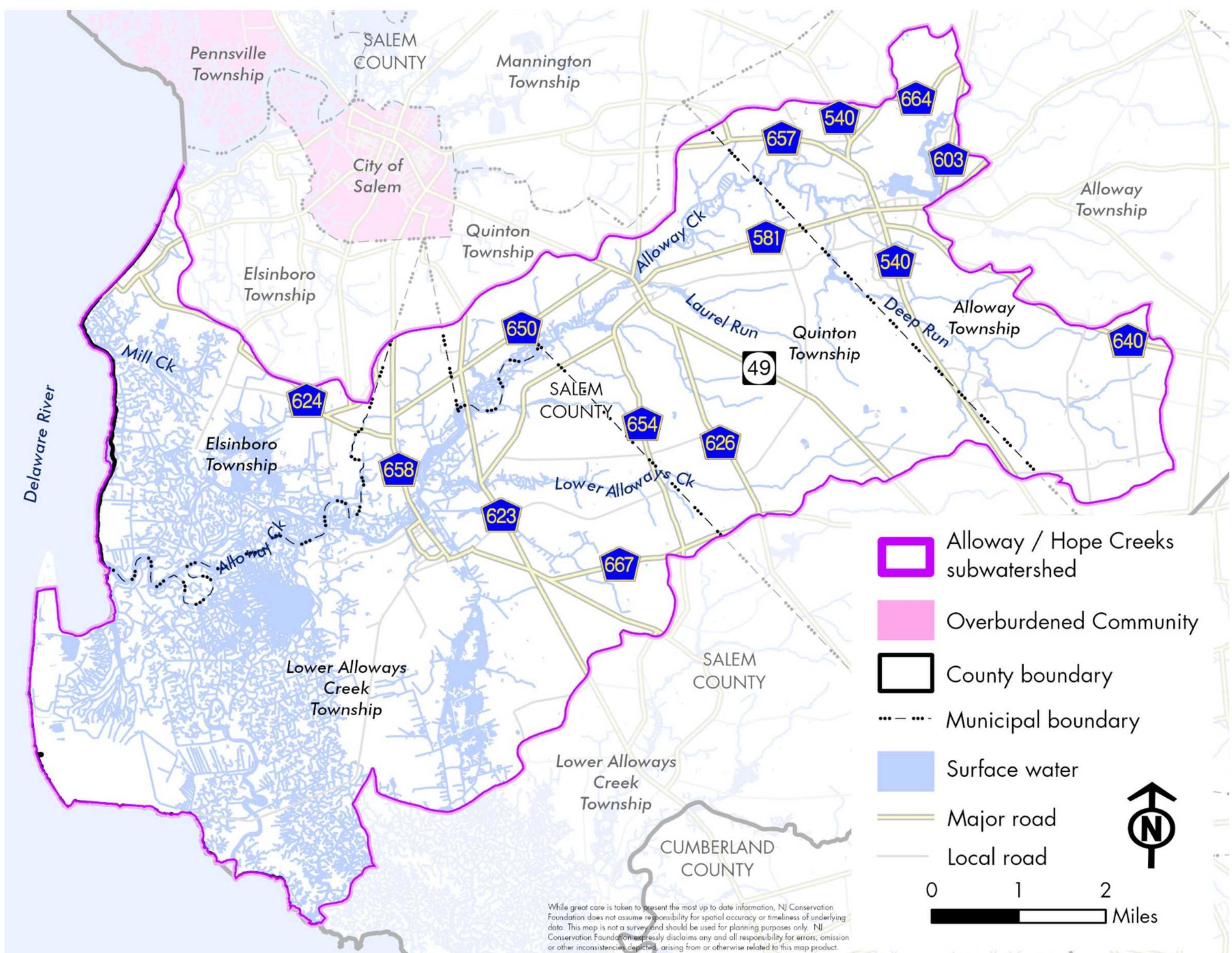
ALLOWAY / HOPE CREEKS Profile

Total area: 37, 637 acres

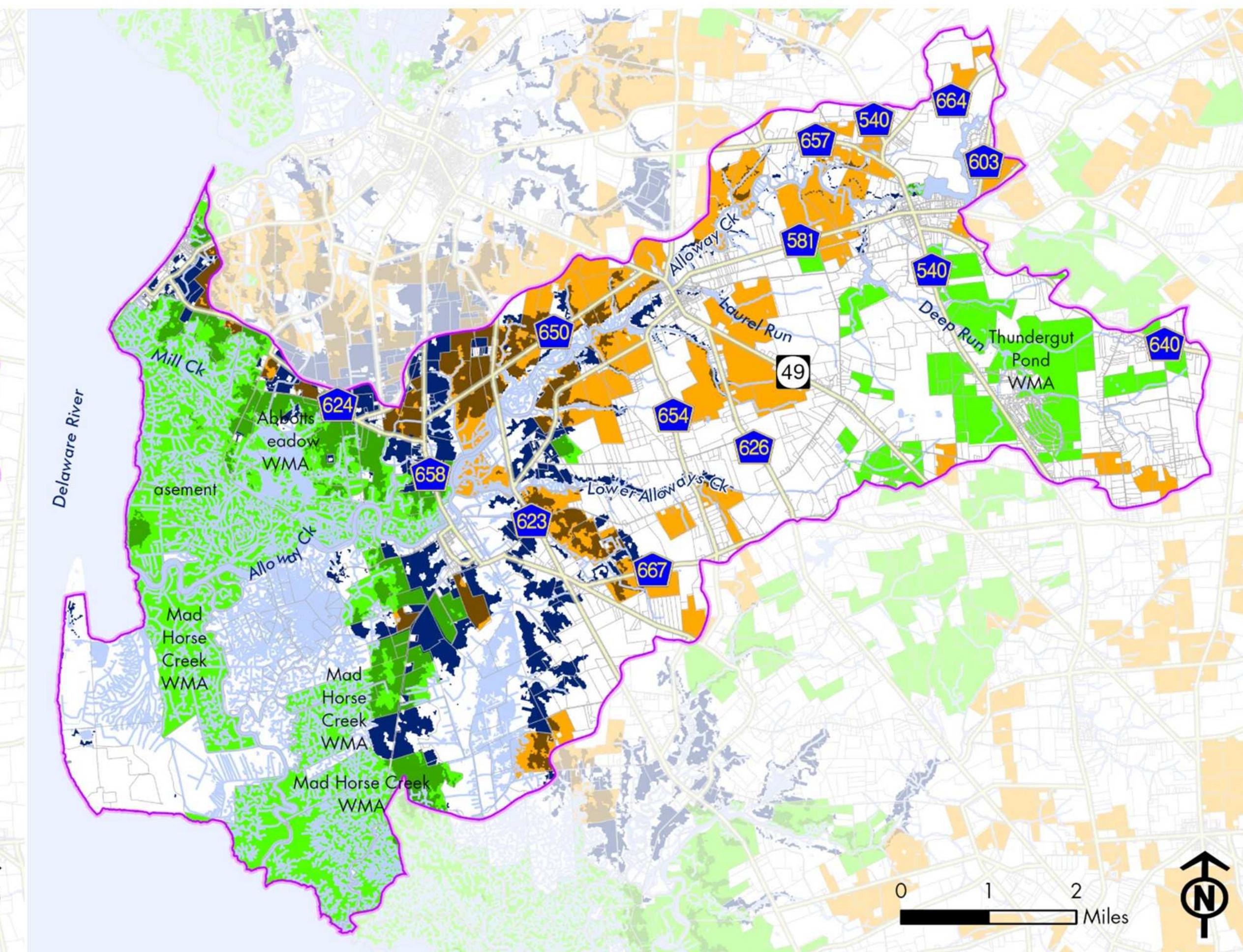
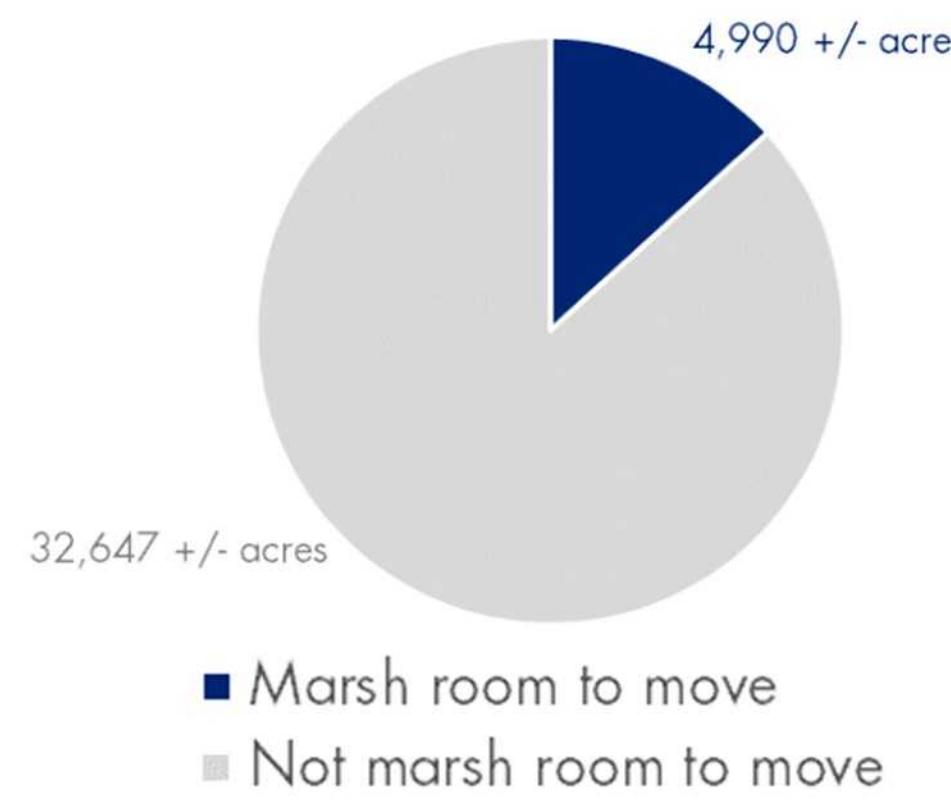
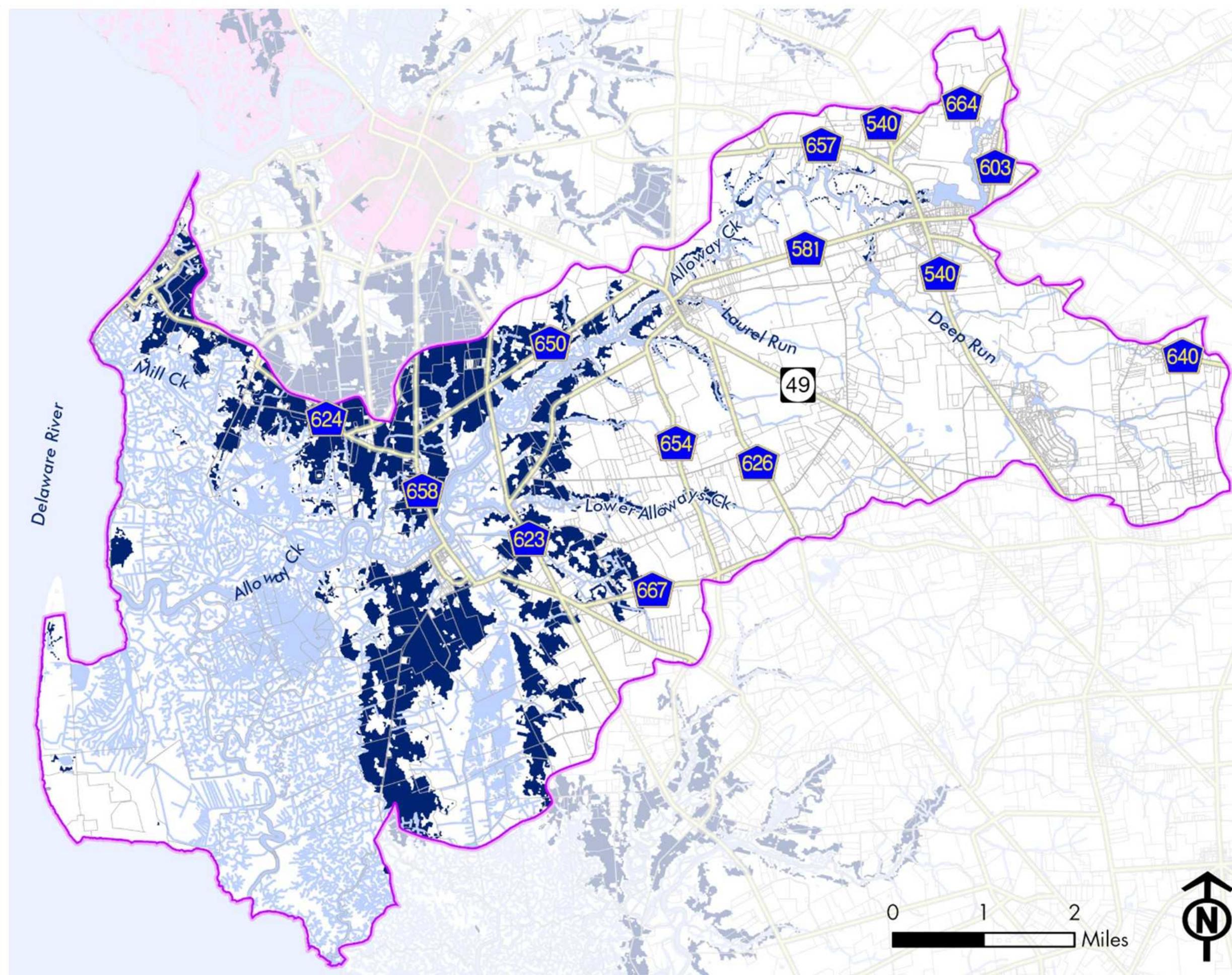
Counties: Salem

Municipalities:

- ◆ Alloway Township
- ◆ Elsinboro Township
- ◆ Lower Alloways Creek Township
- ◆ Quinton Township

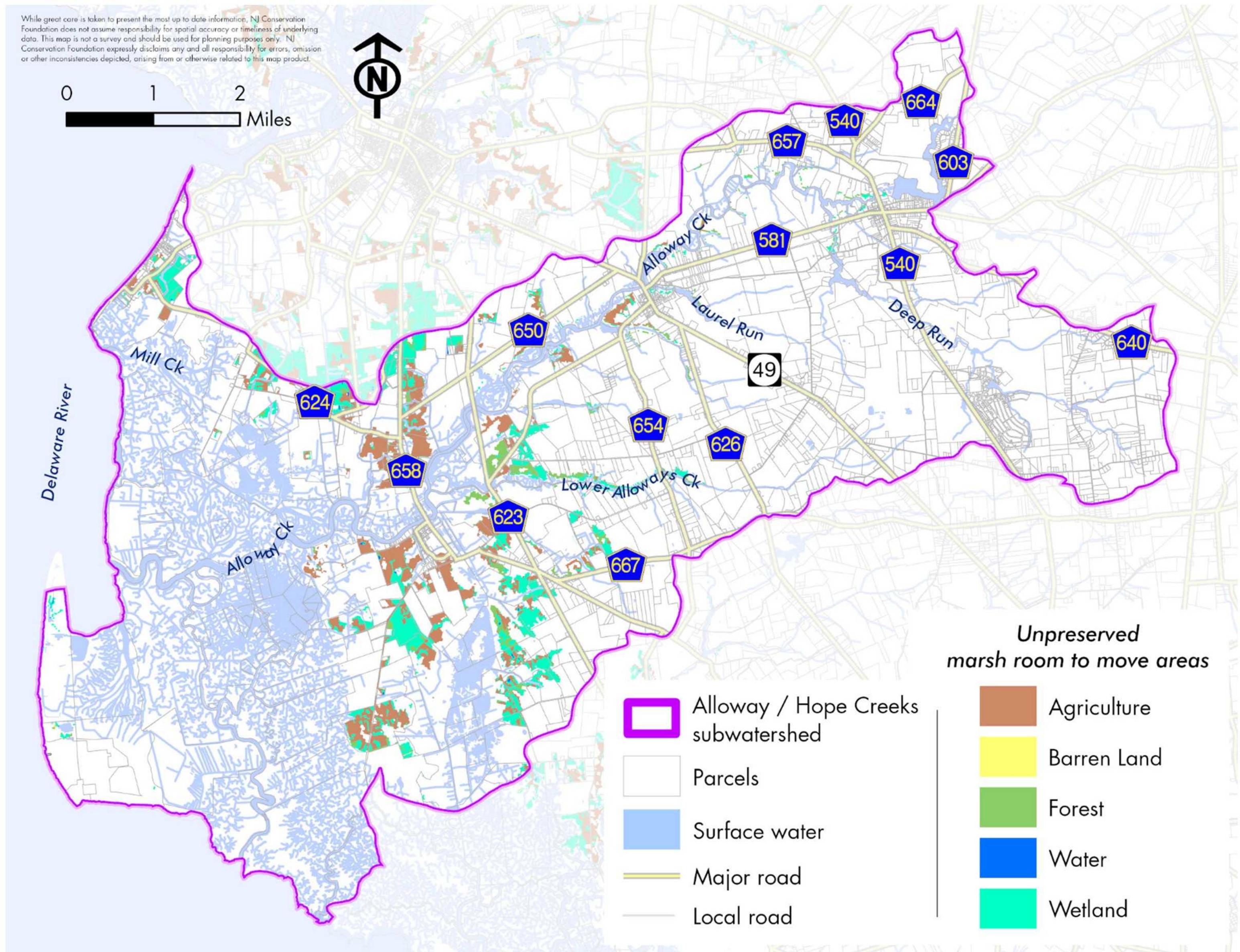
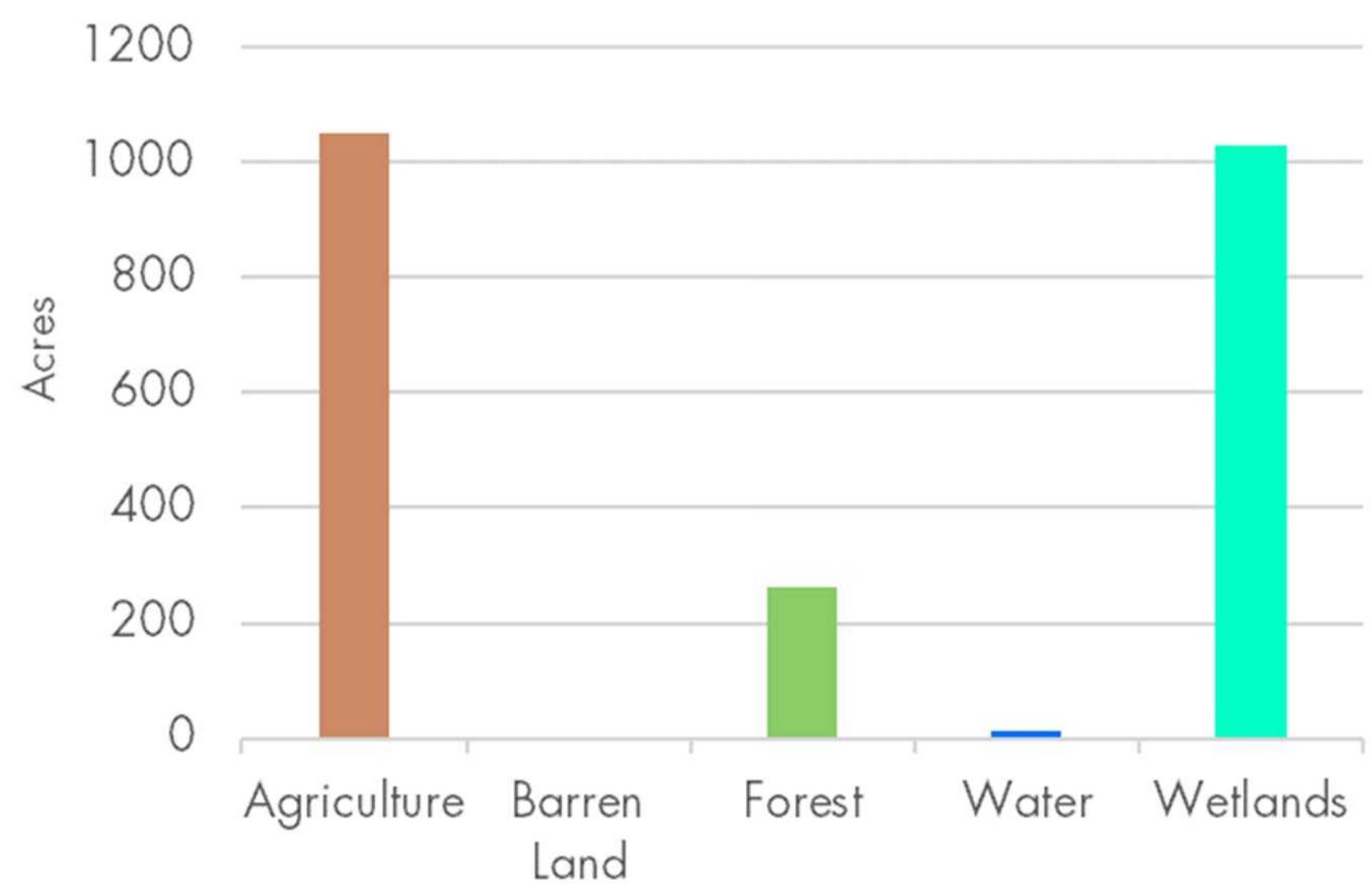


ALLOWAY RIVER Marsh room to move



ALLOWAY / HOPE CREEKS

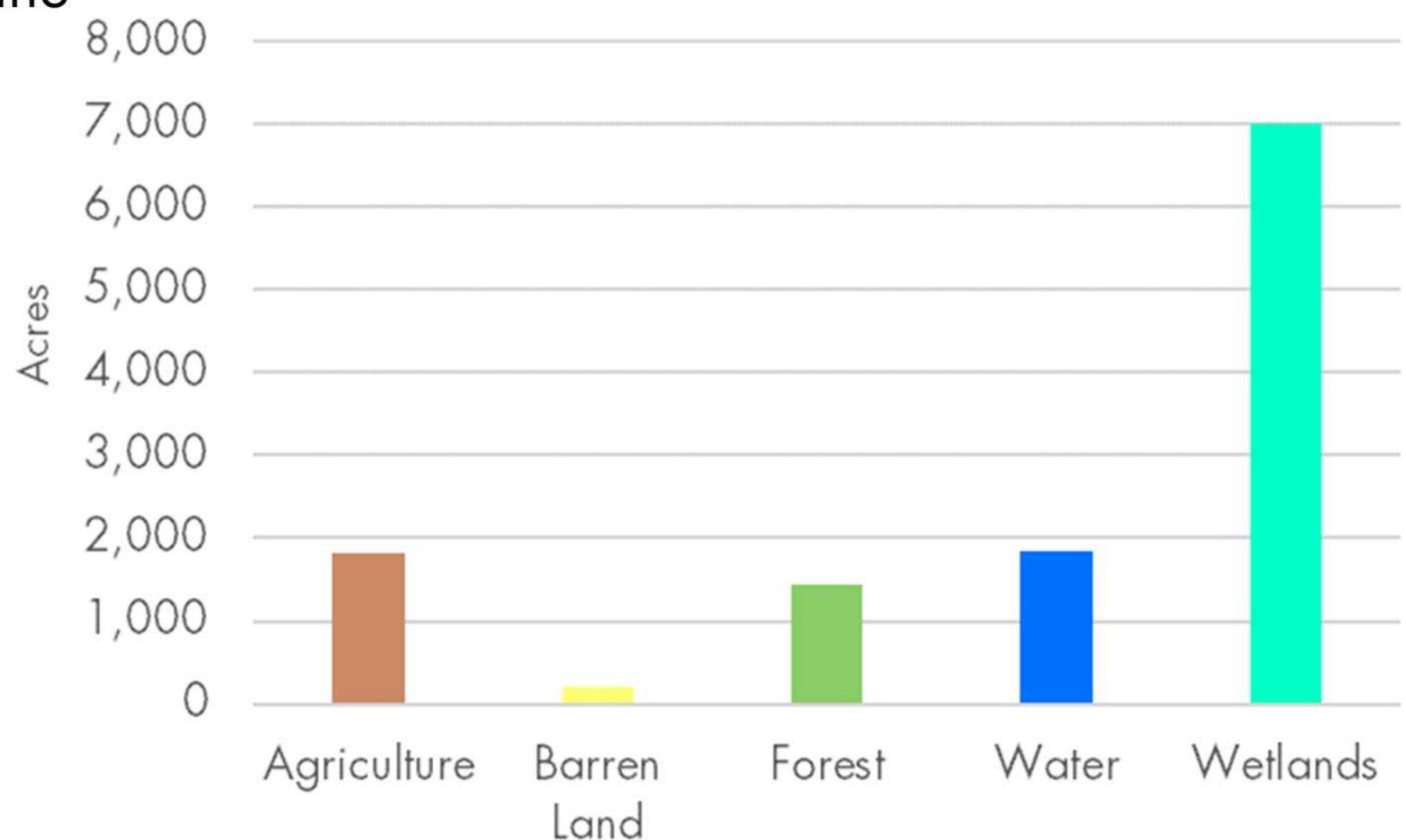
Unpreserved marsh room to move areas by landuse



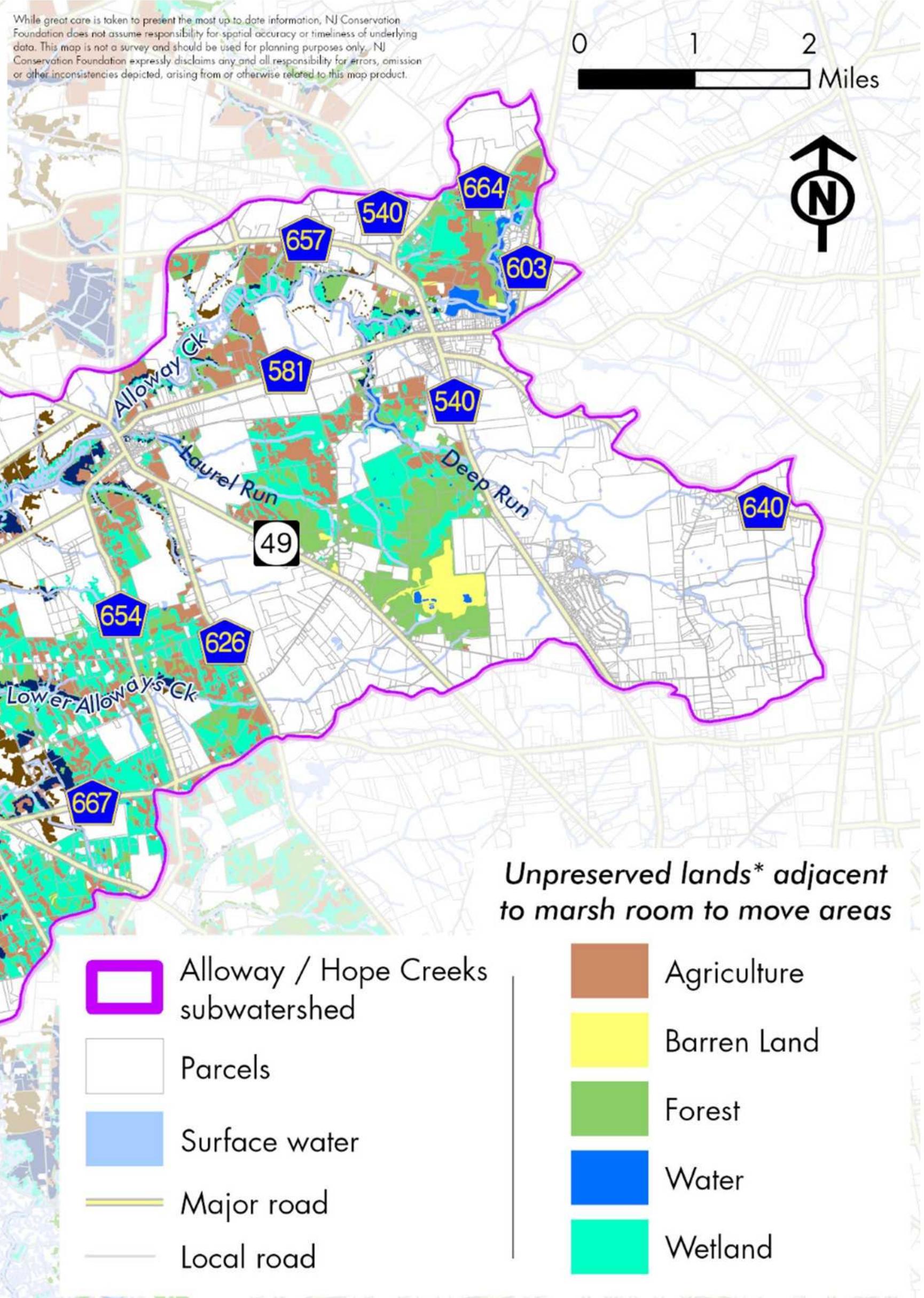
ALLOWAY / HOPE CREEKS

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



- Marsh room to move - not preserved
- Marsh room to move - preserved open space
- Marsh room to move - preserved farmland



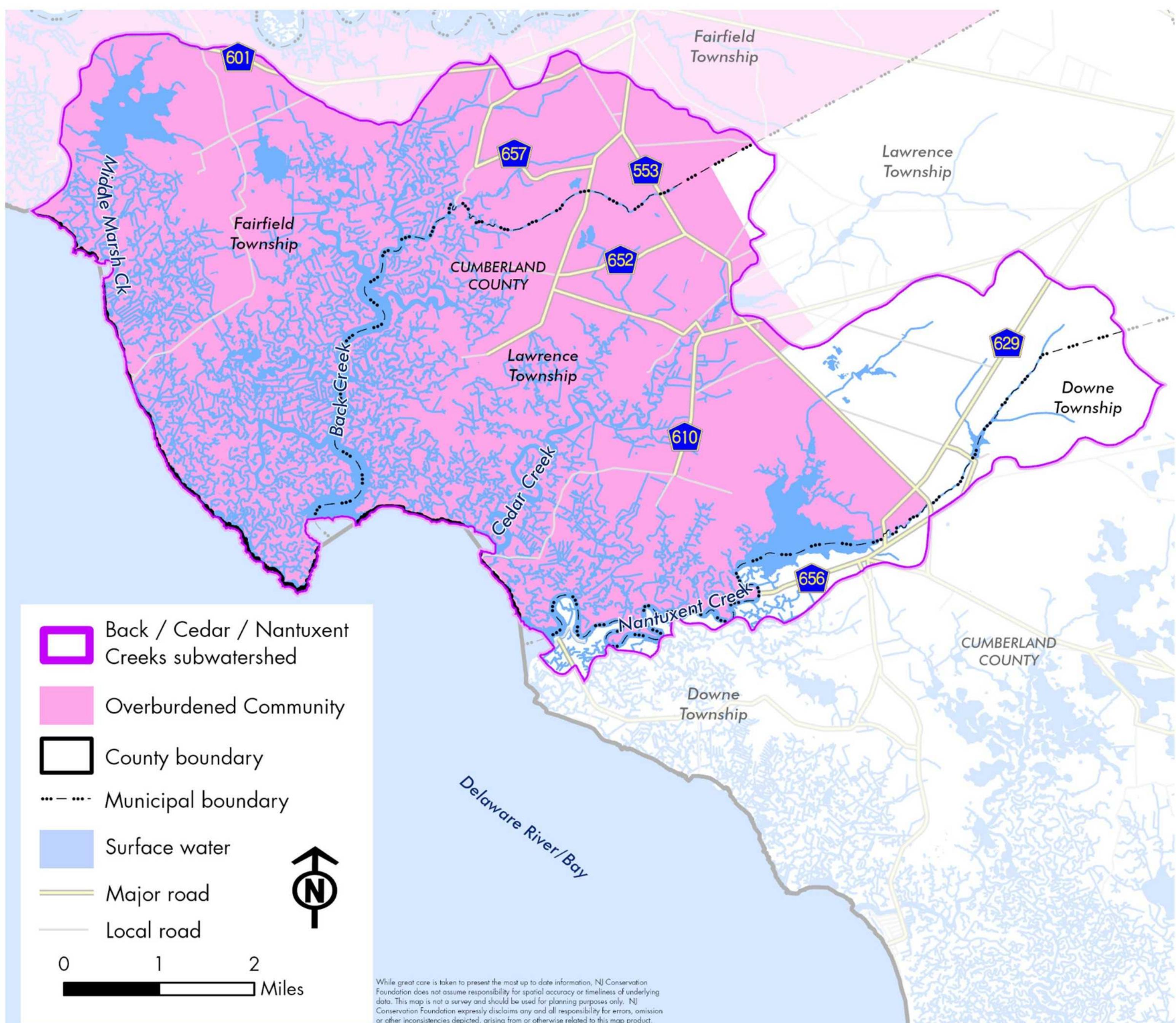
BACK / CEDAR / NANTUXENT CREEKS Profile

Total area: 28,719 +/- acres

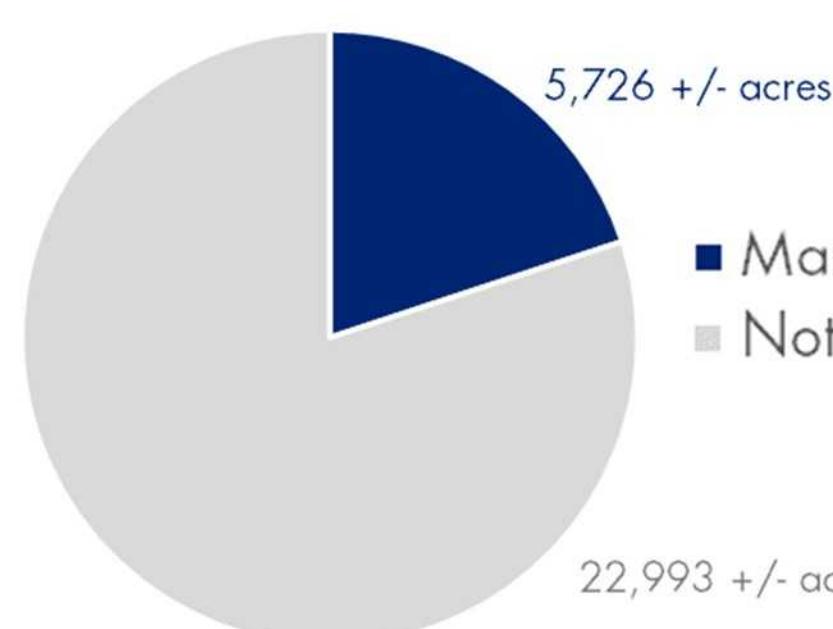
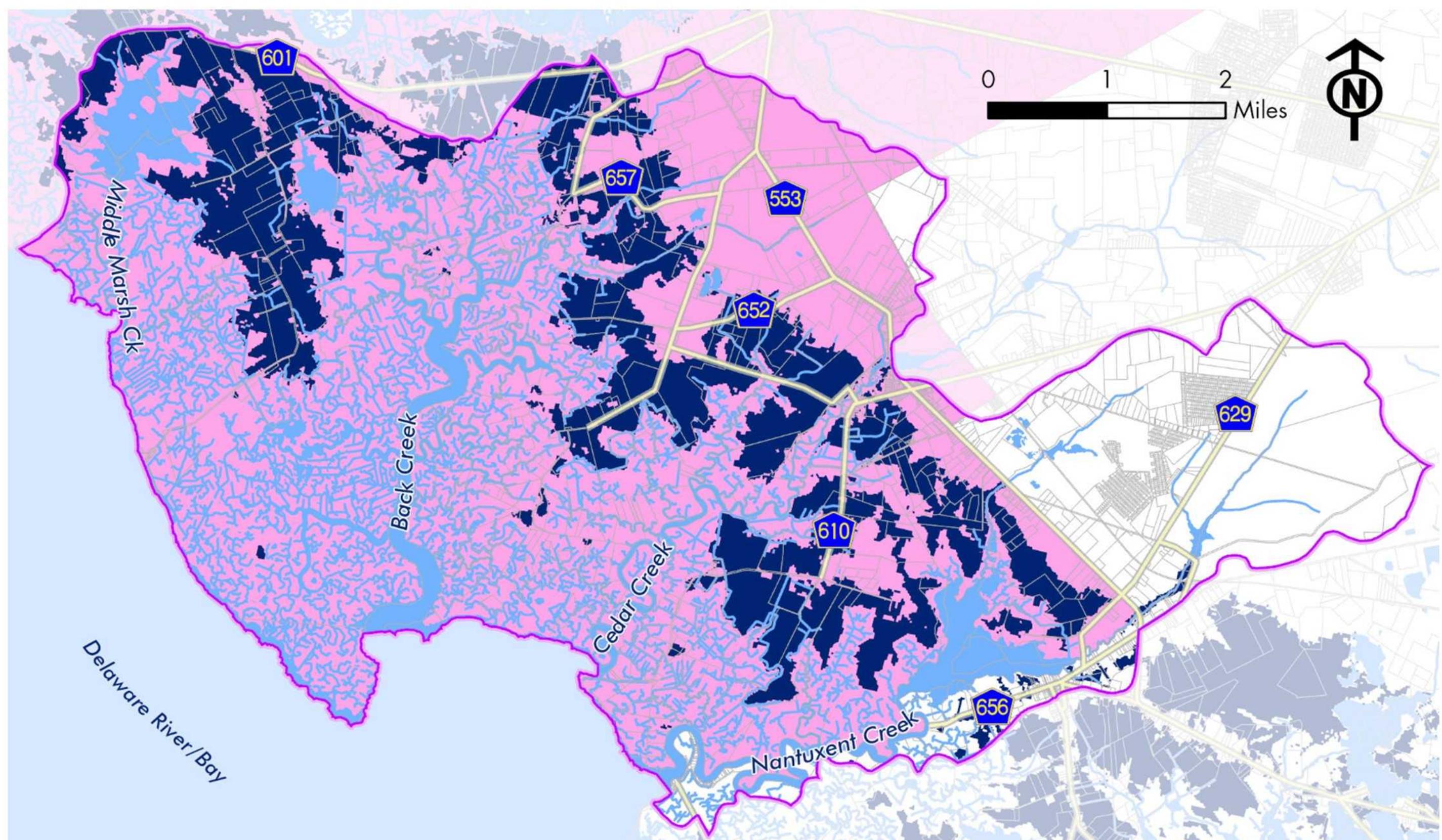
Counties: Cumberland

Municipalities:

- ◆ Downe Township
- ◆ Fairfield Township
- ◆ Lawrence Township



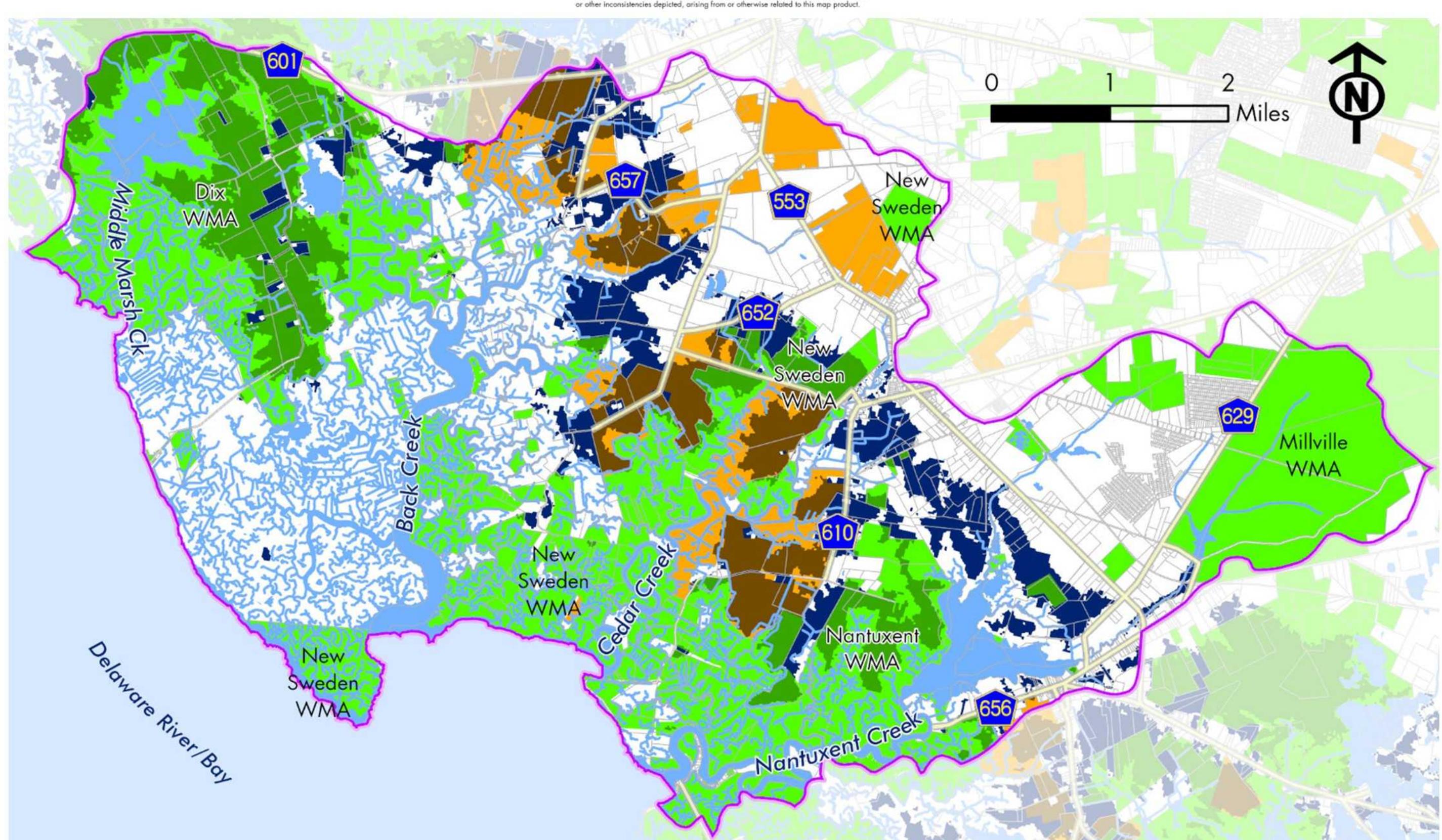
BACK / CEDAR / NANTUXENT CREEKS Marsh room to move



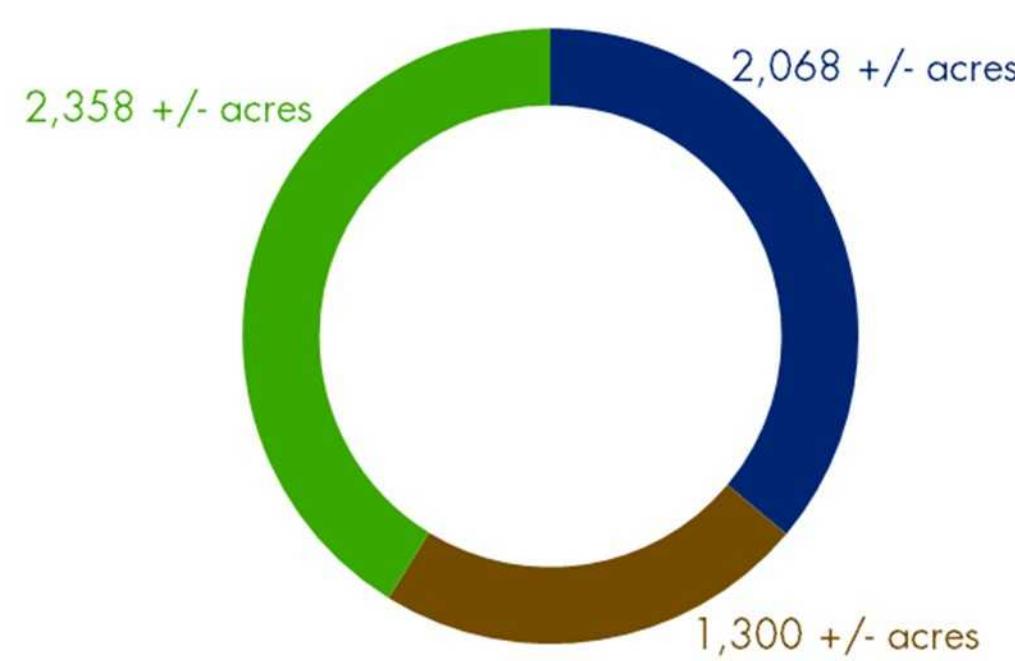
Marsh room to move

- Back / Cedar / Nantuxent Creeks subwatershed
- Marsh room to move
- Surface water
- Overburdened Community
- Parcels
- Major road
- Local road

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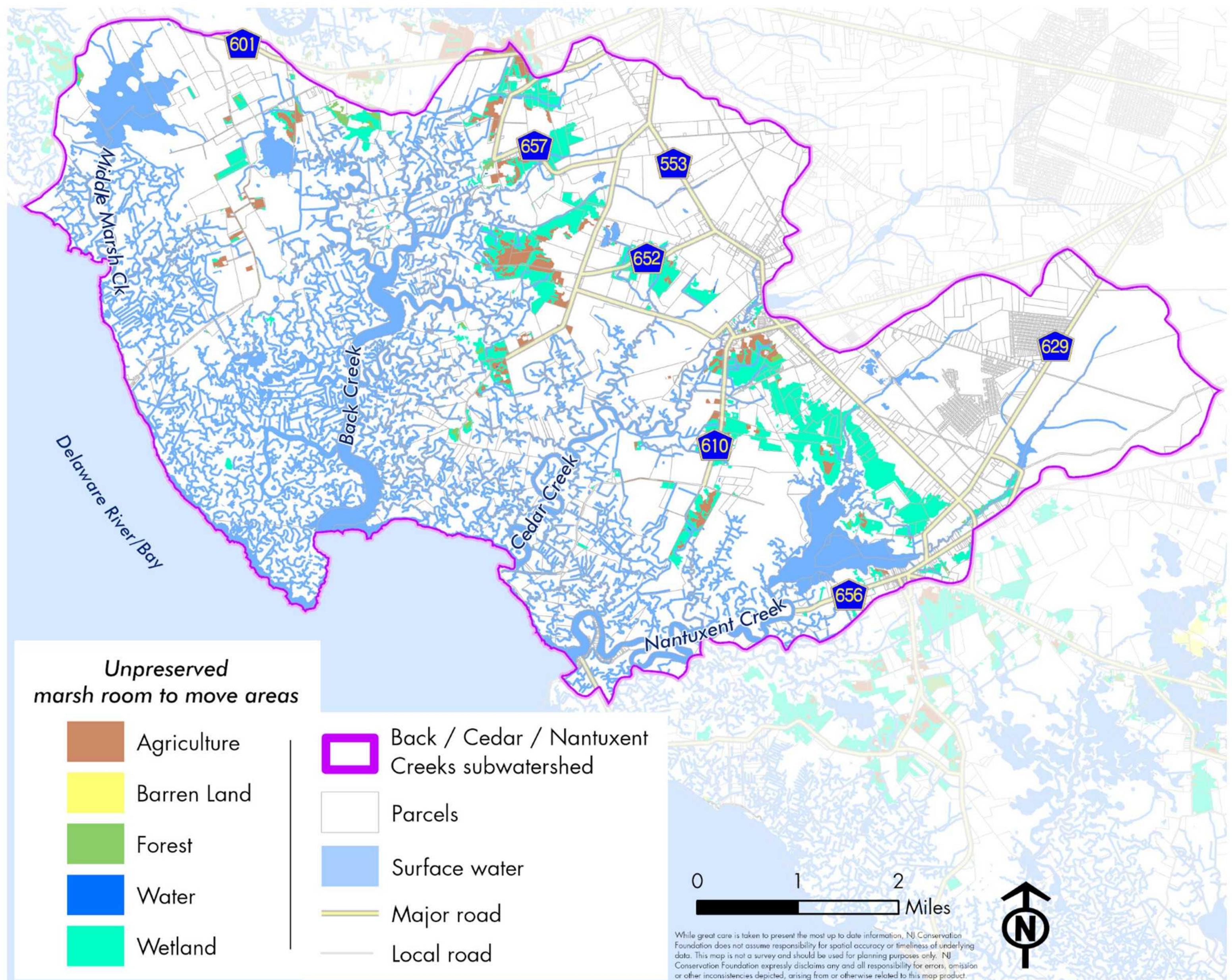
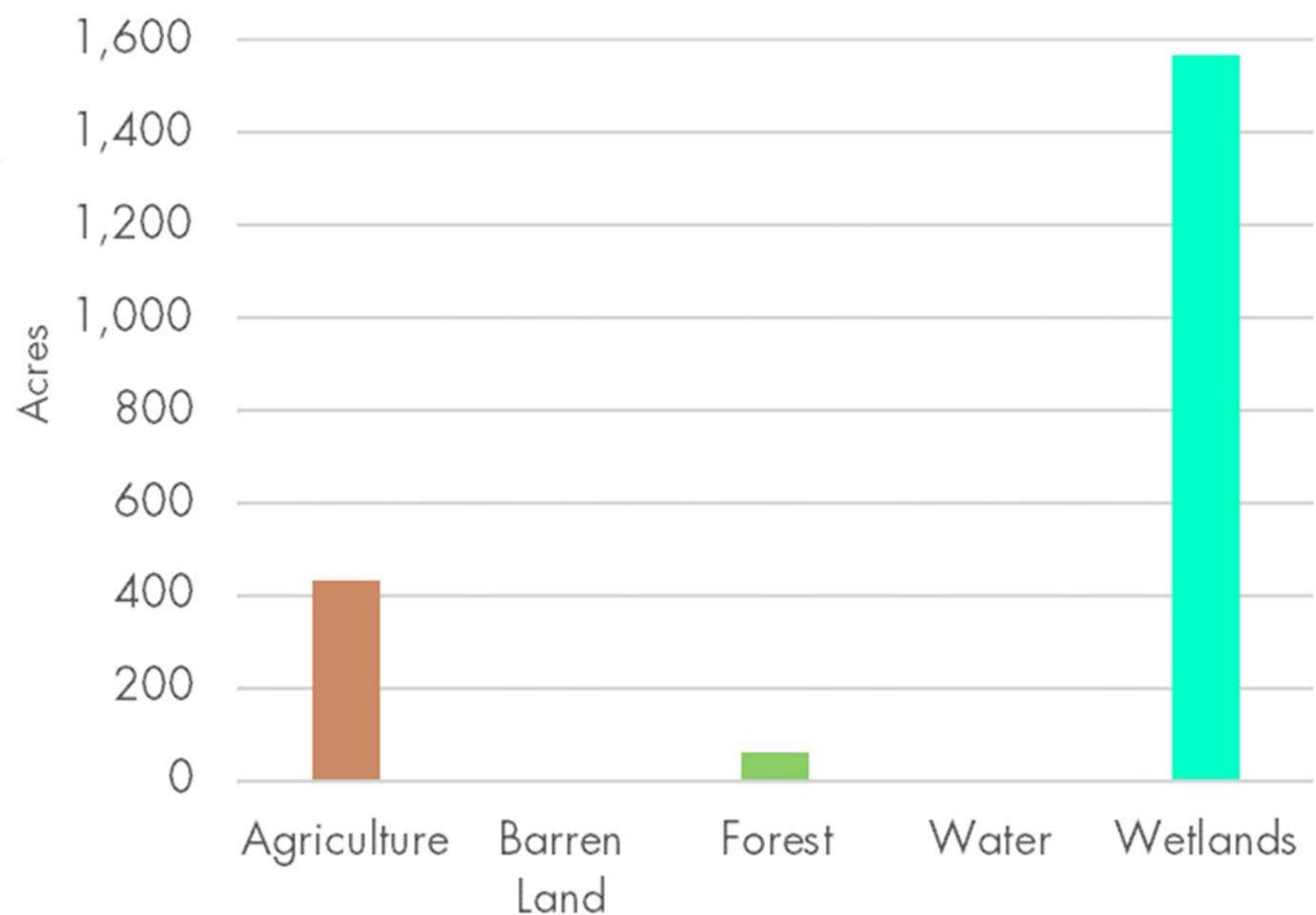
Marsh room to move – preservation status



- Back / Cedar / Nantuxent Creeks subwatershed
- Marsh room to move - not preserved
- Marsh room to move - preserved open space
- Marsh room to move - preserved farmland
- Other Preserved Farmland
- Other Preserved Open Space
- Surface water
- Parcels
- Major road
- Local road

BACK / CEDAR / NANTUXENT CREEKS

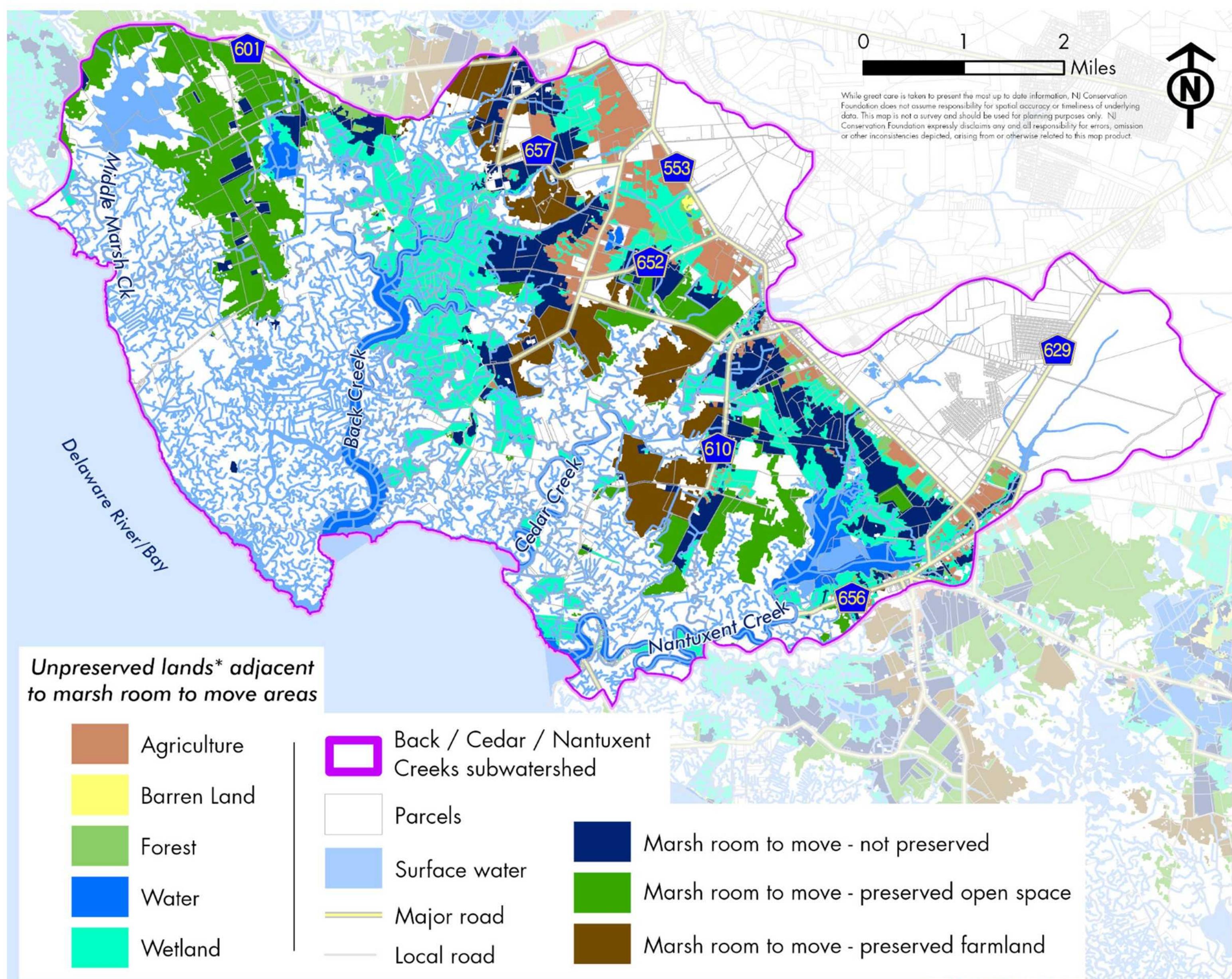
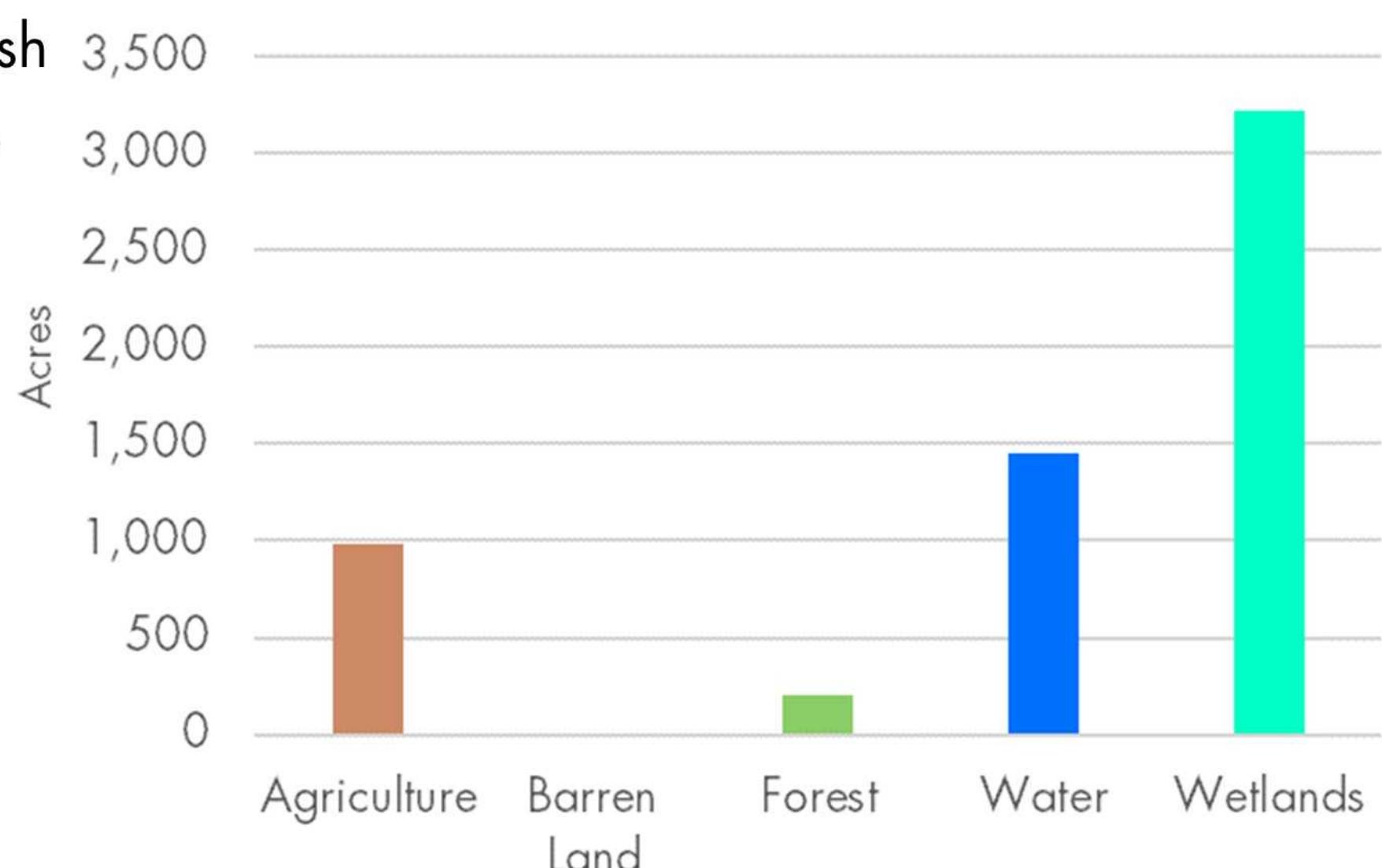
Unpreserved marsh room to move
areas by landuse



BACK / CEDAR / NANTUXENT CREEKS

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



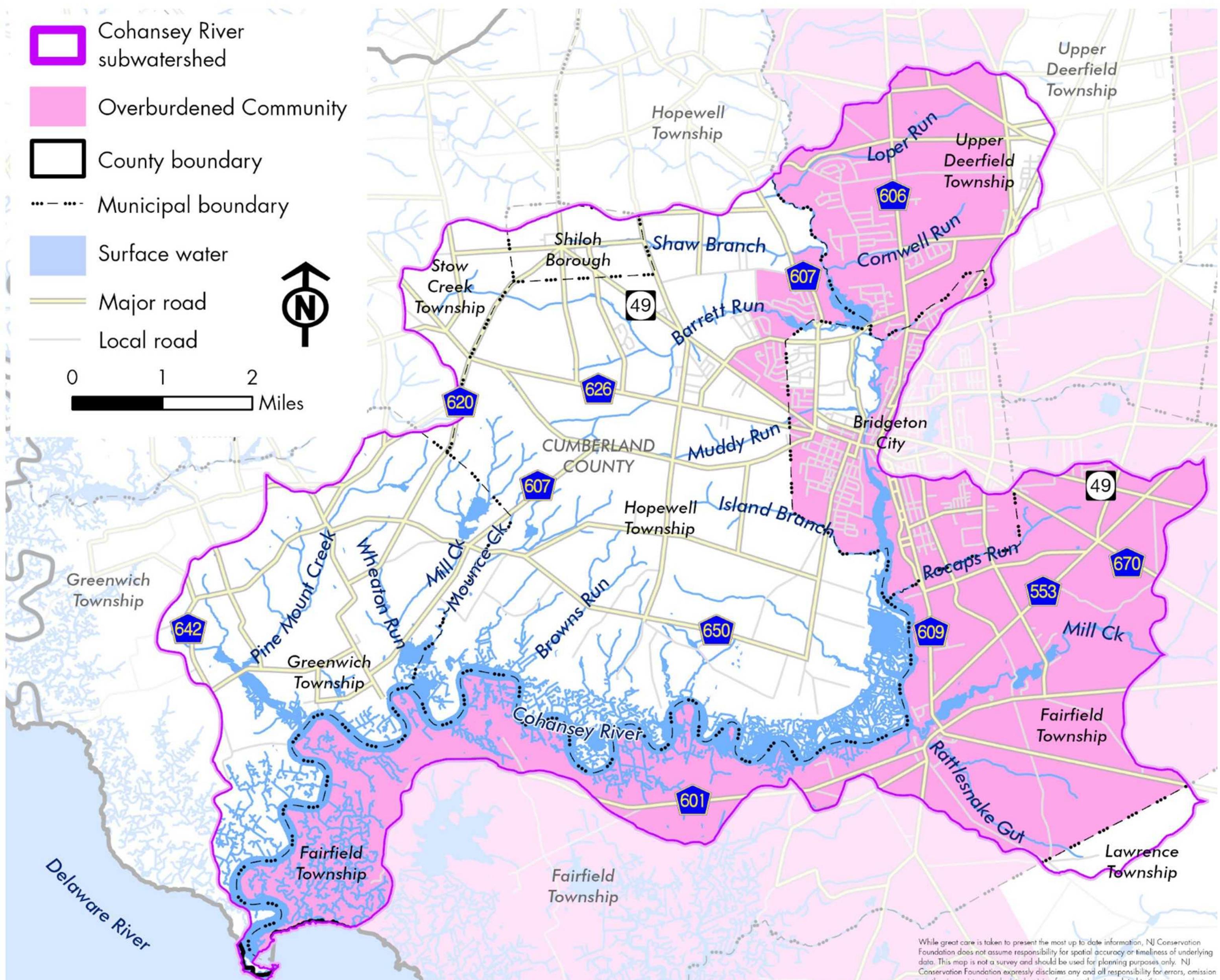
COHANSEY RIVER Profile

Total area: 40,340 +/- acres

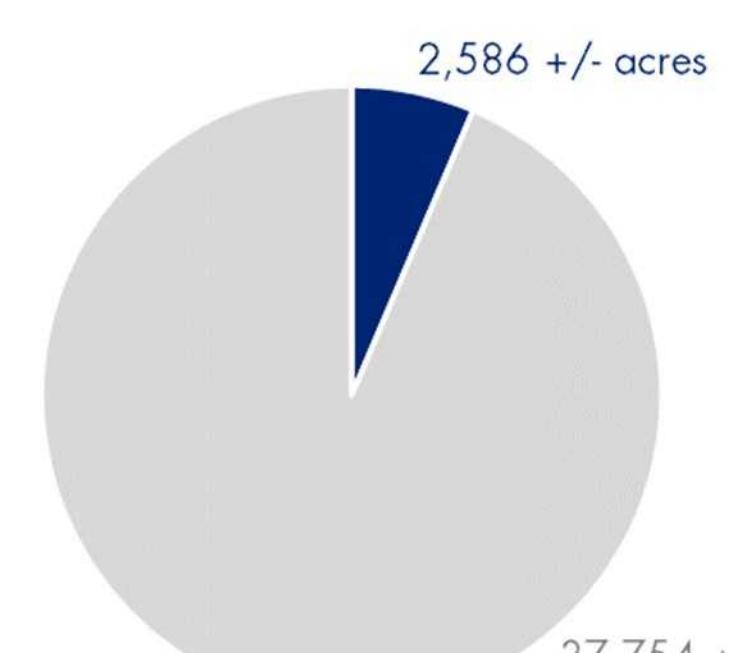
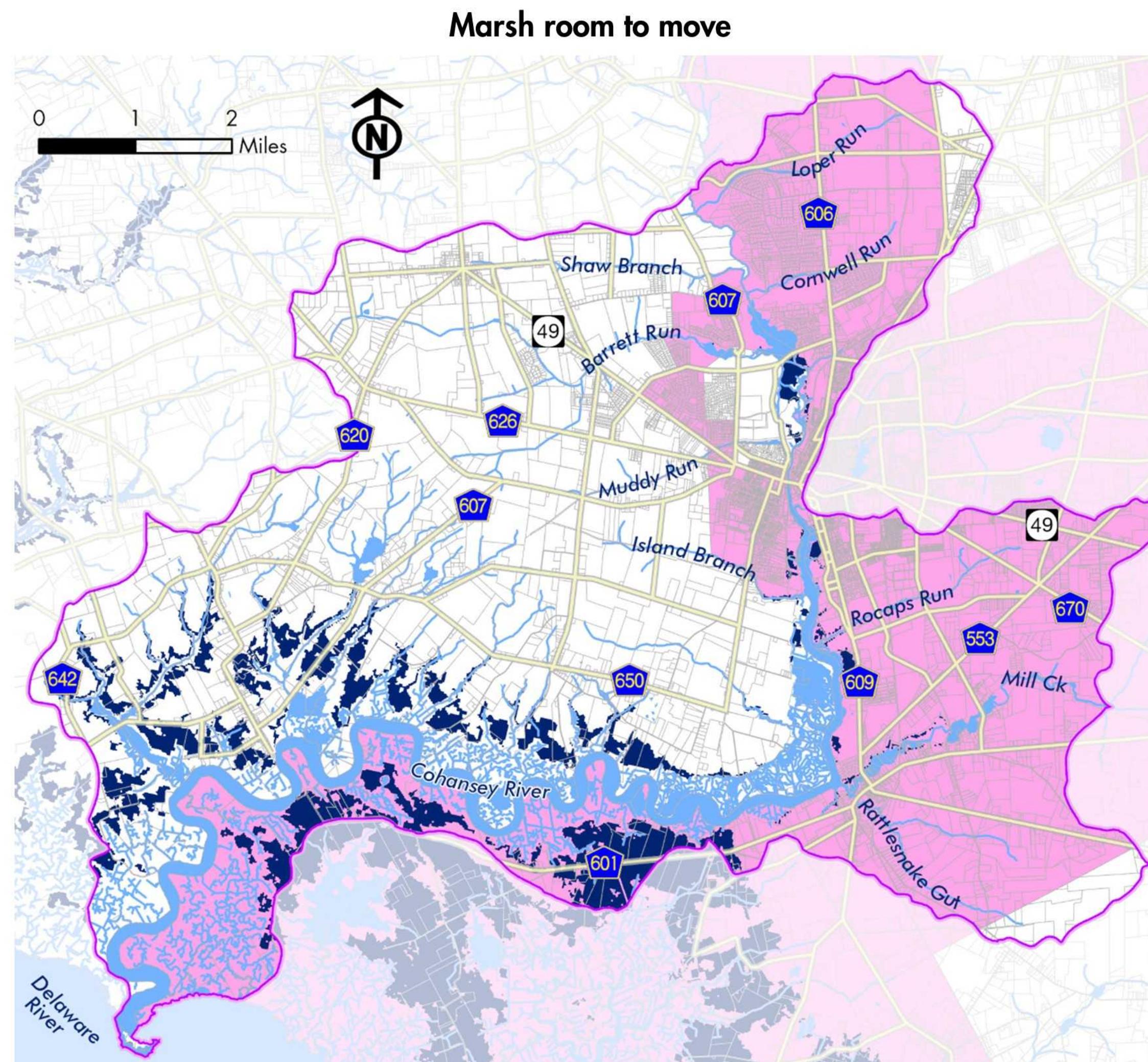
Counties: Cumberland

Municipalities:

- ◆ Bridgeton City
- ◆ Fairfield Township
- ◆ Greenwich Township
- ◆ Hopewell Township
- ◆ Lawrence Township
- ◆ Shiloh Borough
- ◆ Stow Creek Township
- ◆ Upper Deerfield Township



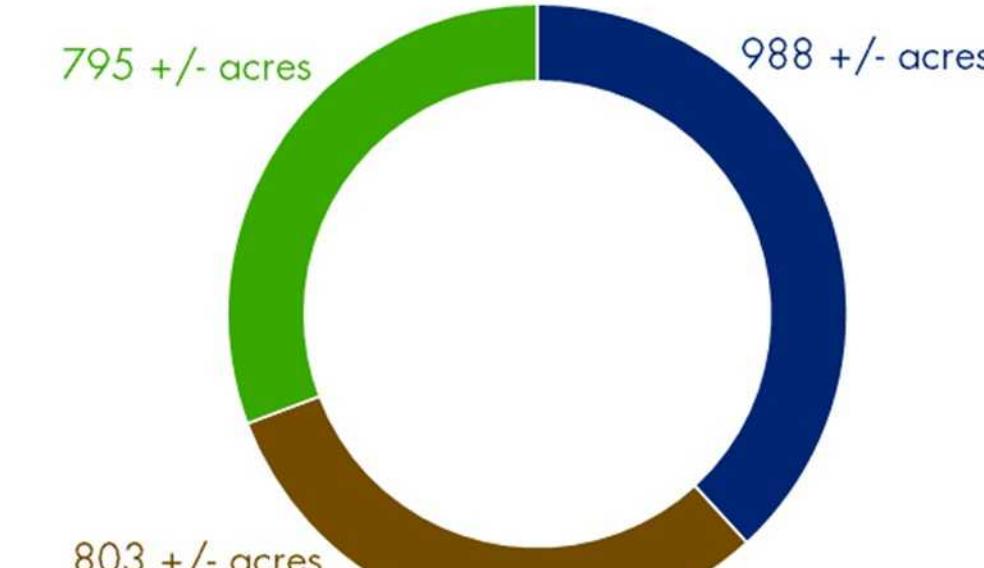
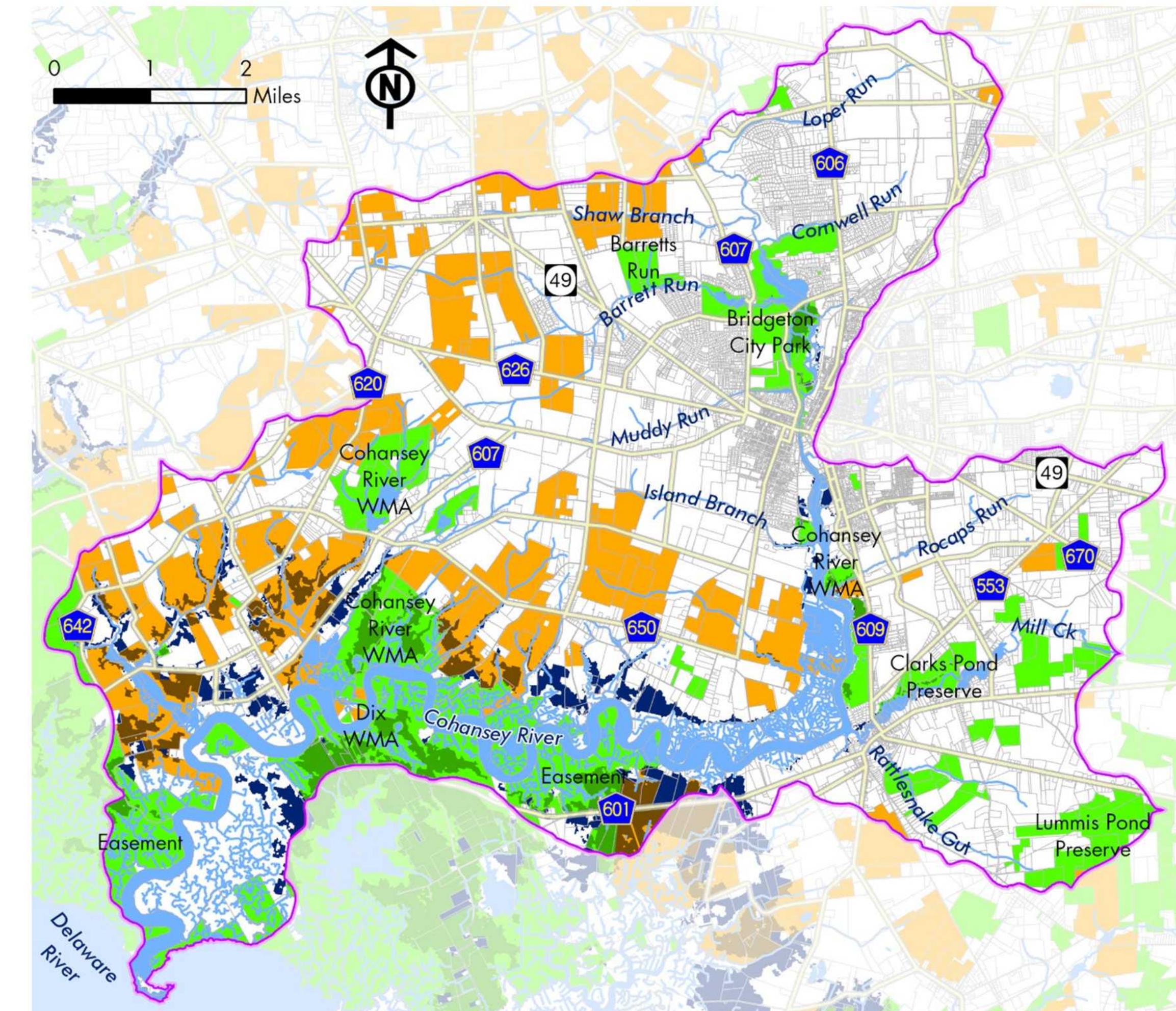
COHANSEY RIVER Marsh room to move



■ Marsh room to move ■ Not marsh room to move



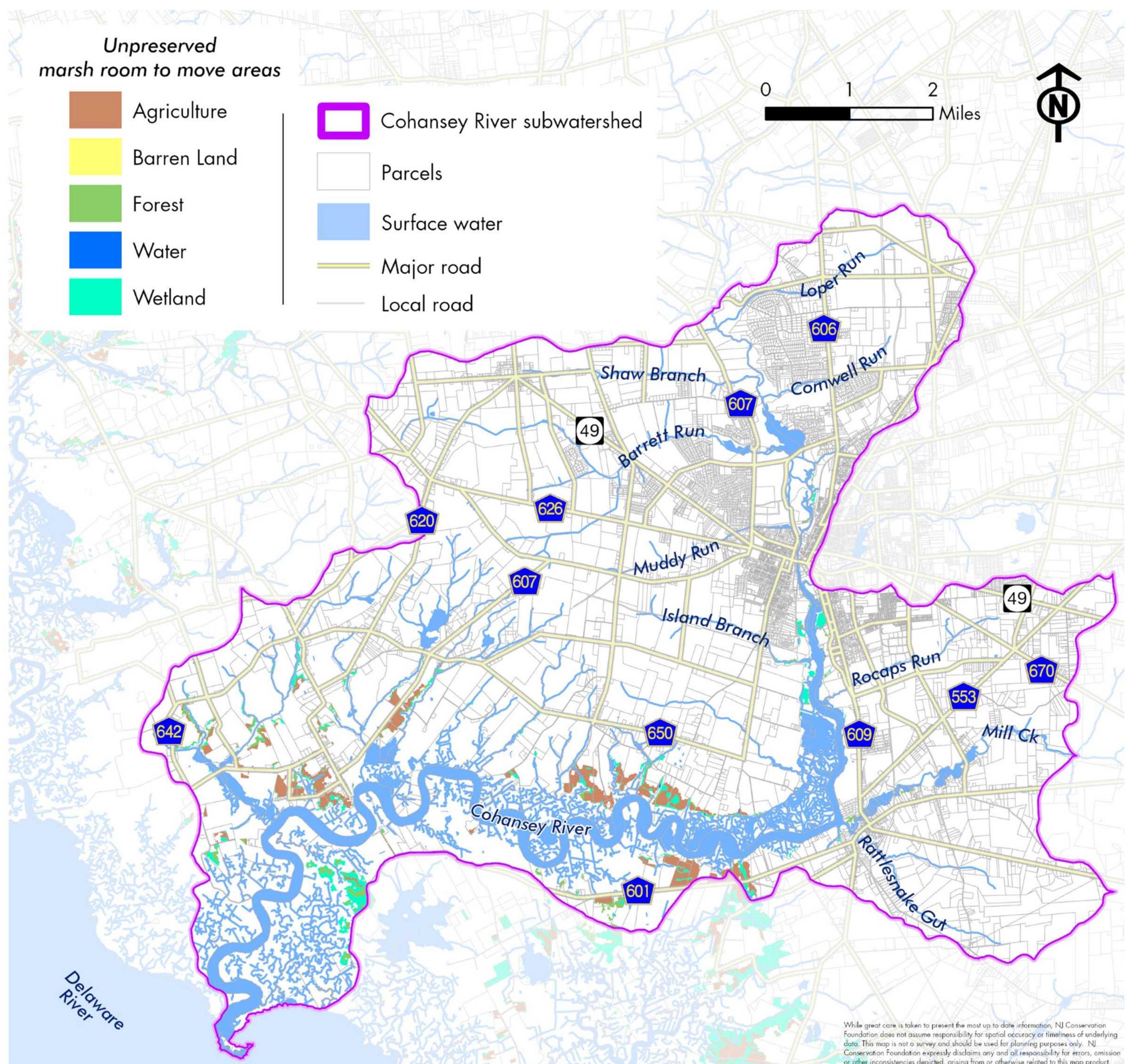
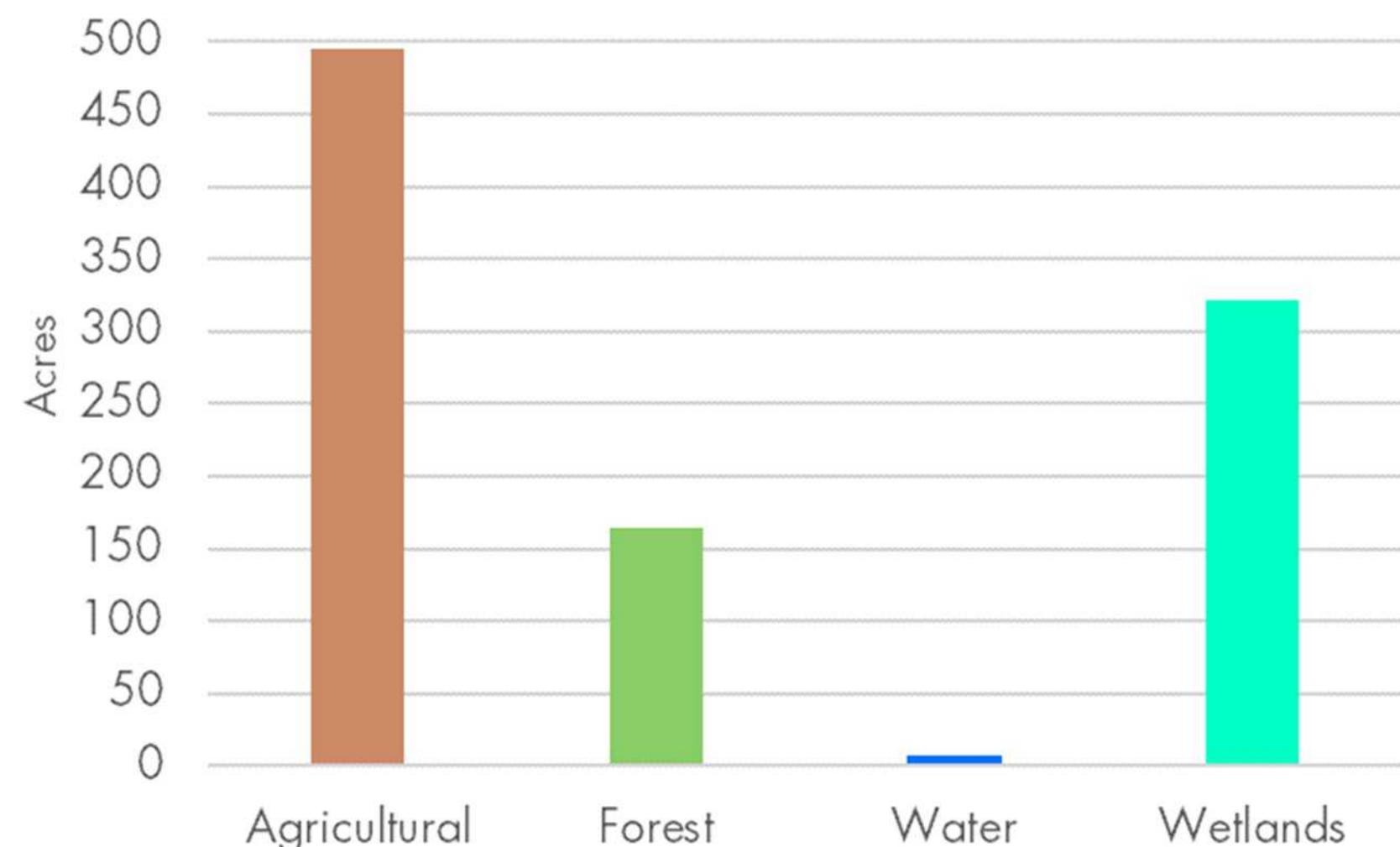
Marsh room to move—preservation status



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COHANSEY RIVER

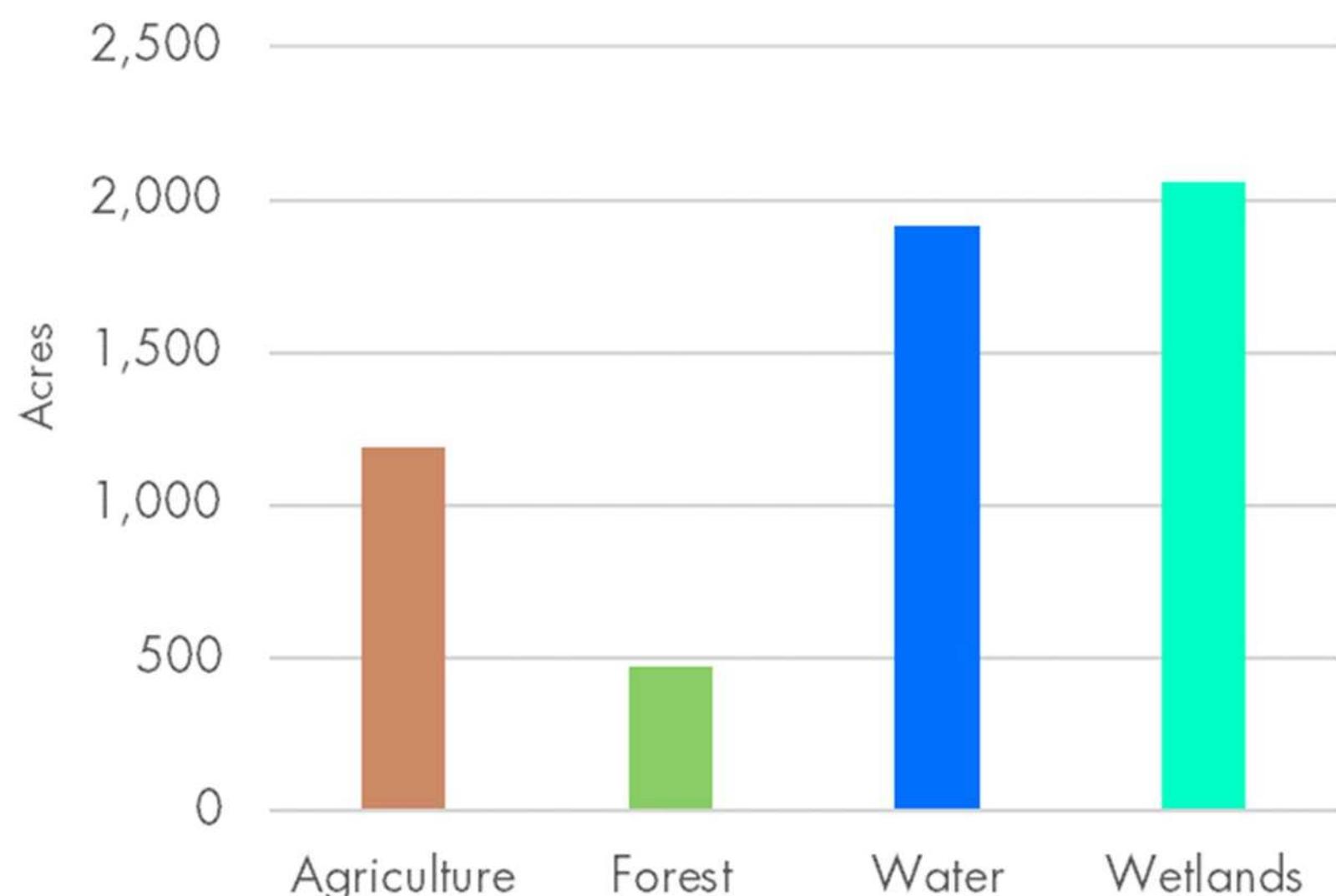
Unpreserved marsh room to move
areas by landuse



COHANSEY RIVER

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



Unpreserved lands* adjacent to marsh room to move areas

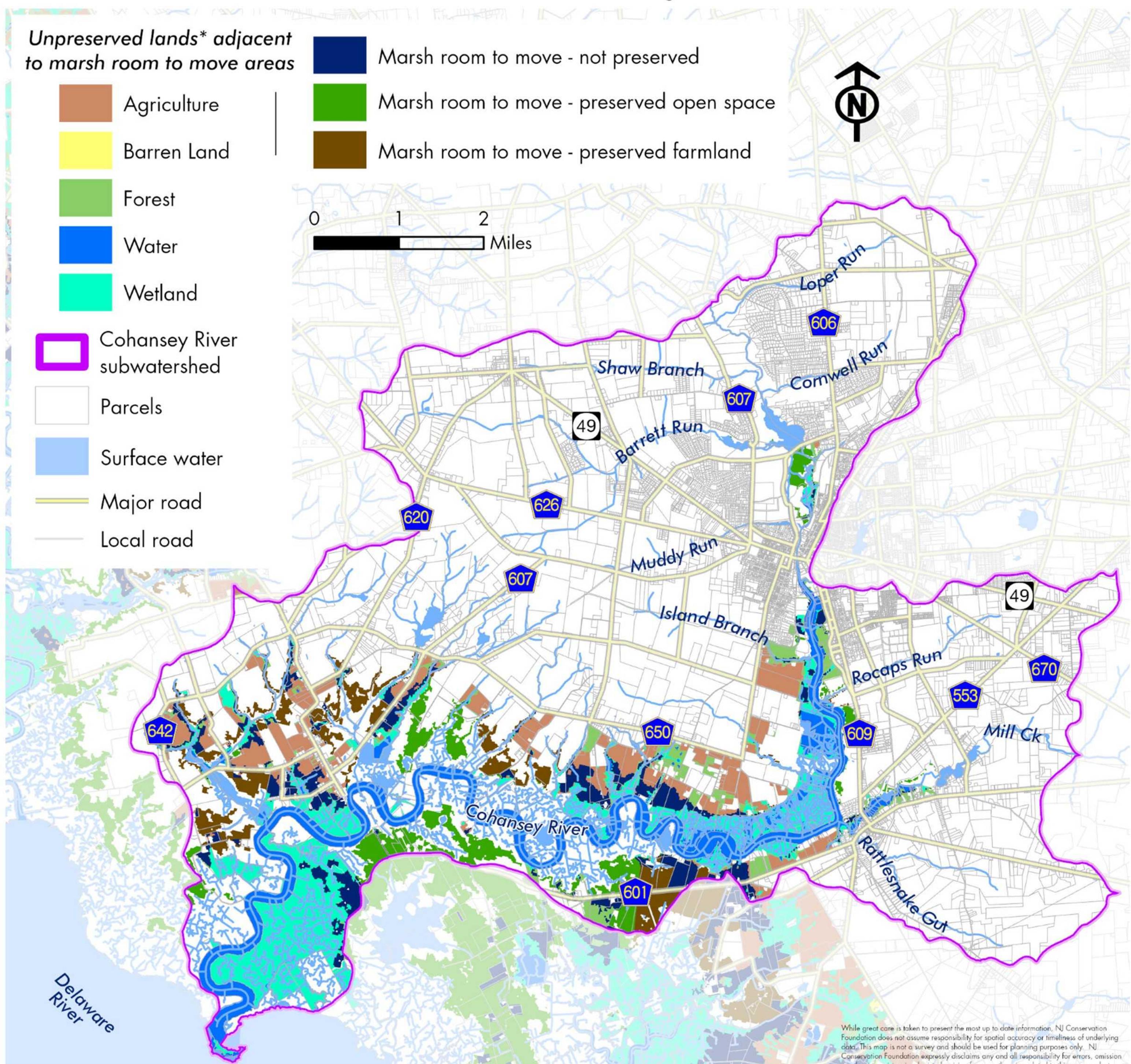
- Agriculture
- Barren Land
- Forest
- Water
- Wetland

Cohansey River subwatershed

- Parcels
- Surface water
- Major road
- Local road

- Marsh room to move - not preserved
- Marsh room to move - preserved open space
- Marsh room to move - preserved farmland

0 1 2 Miles



COOPER RIVER Profile

Total area: 20,824 acres +/- acres

Counties: Burlington, Camden

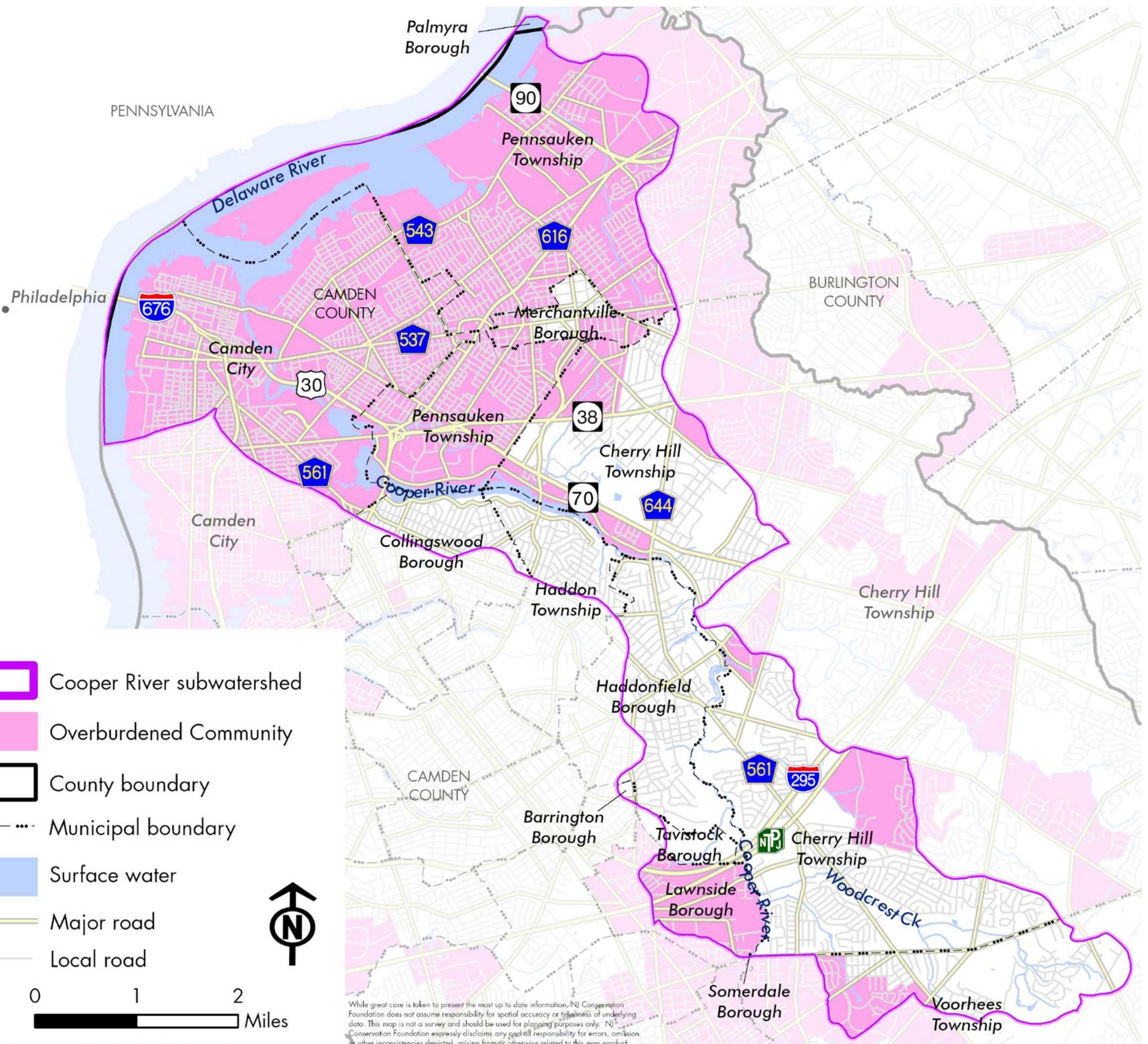
Municipalities:

Burlington county:

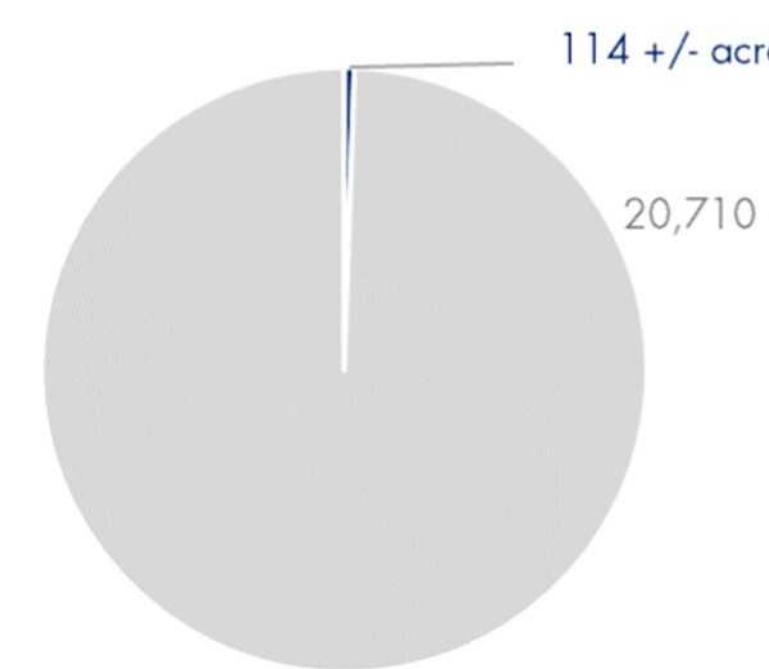
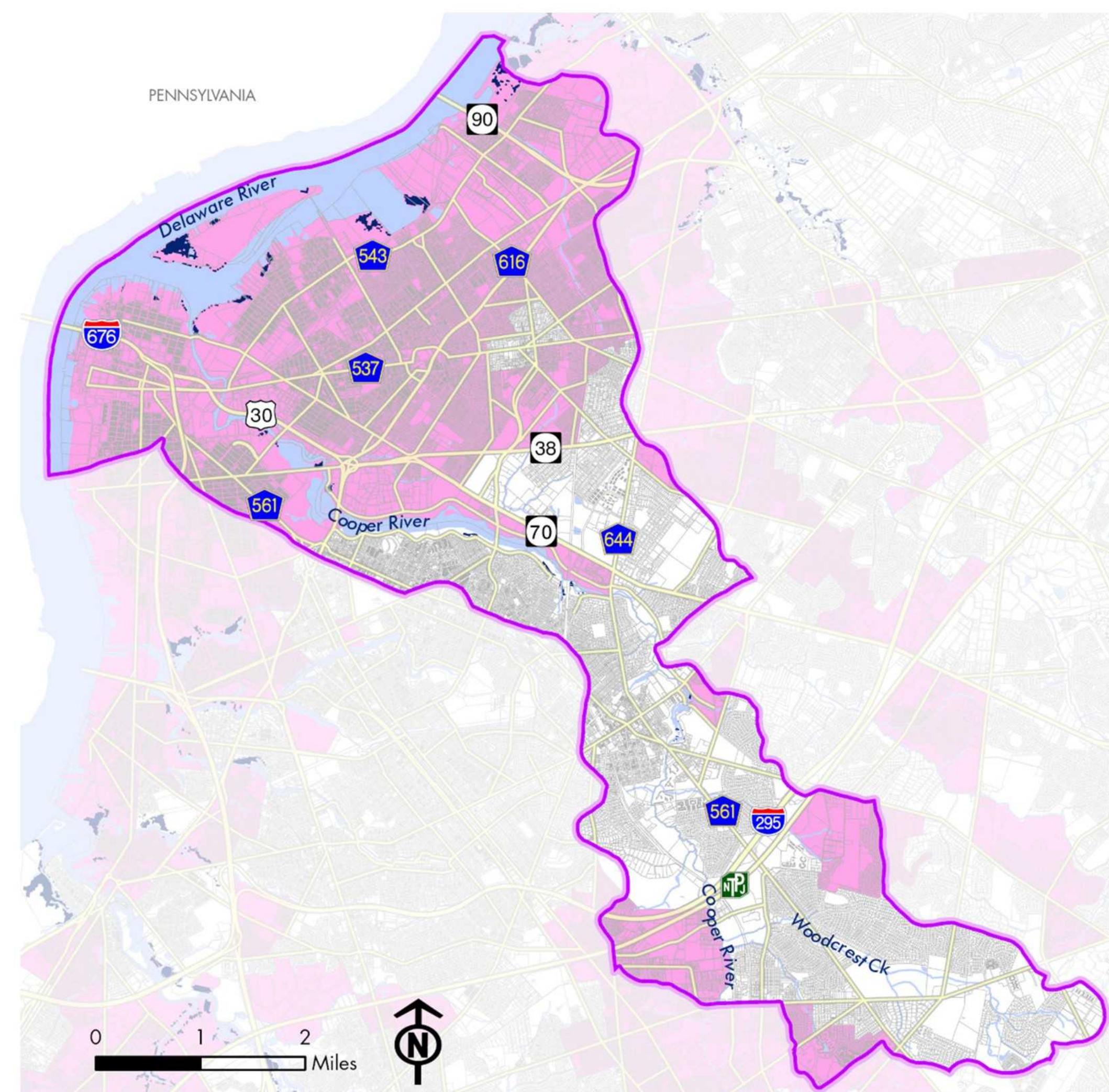
- ◆ Palmyra Borough

Camden county:

- ◆ Barrington Borough
- ◆ Camden City
- ◆ Cherry Hill Township
- ◆ Collingswood Borough
- ◆ Haddon Township
- ◆ Haddonfield Borough
- ◆ Lawnside Borough
- ◆ Merchantville Borough
- ◆ Pennsauken Township
- ◆ Somerdale Borough
- ◆ Tavistock Borough
- ◆ Voorhees Township



COOPER RIVER Marsh room to move

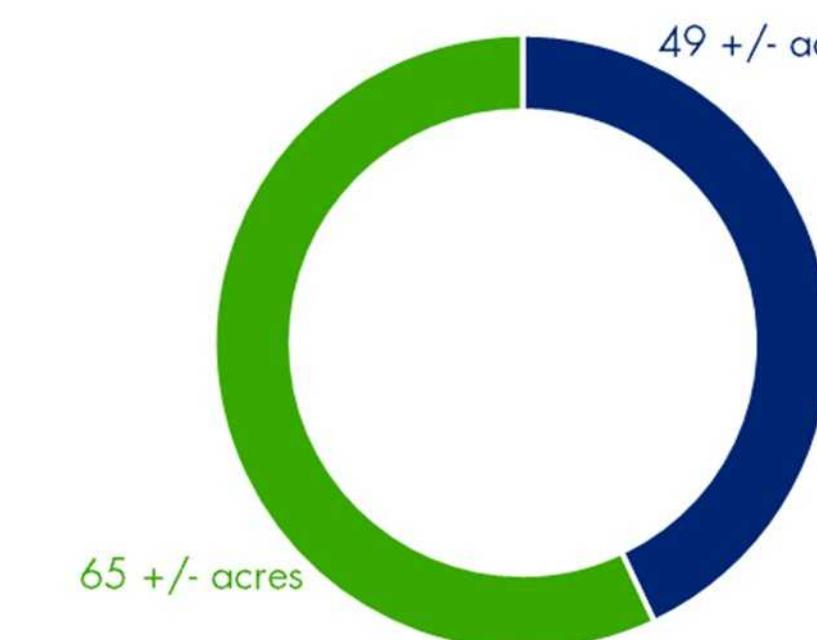
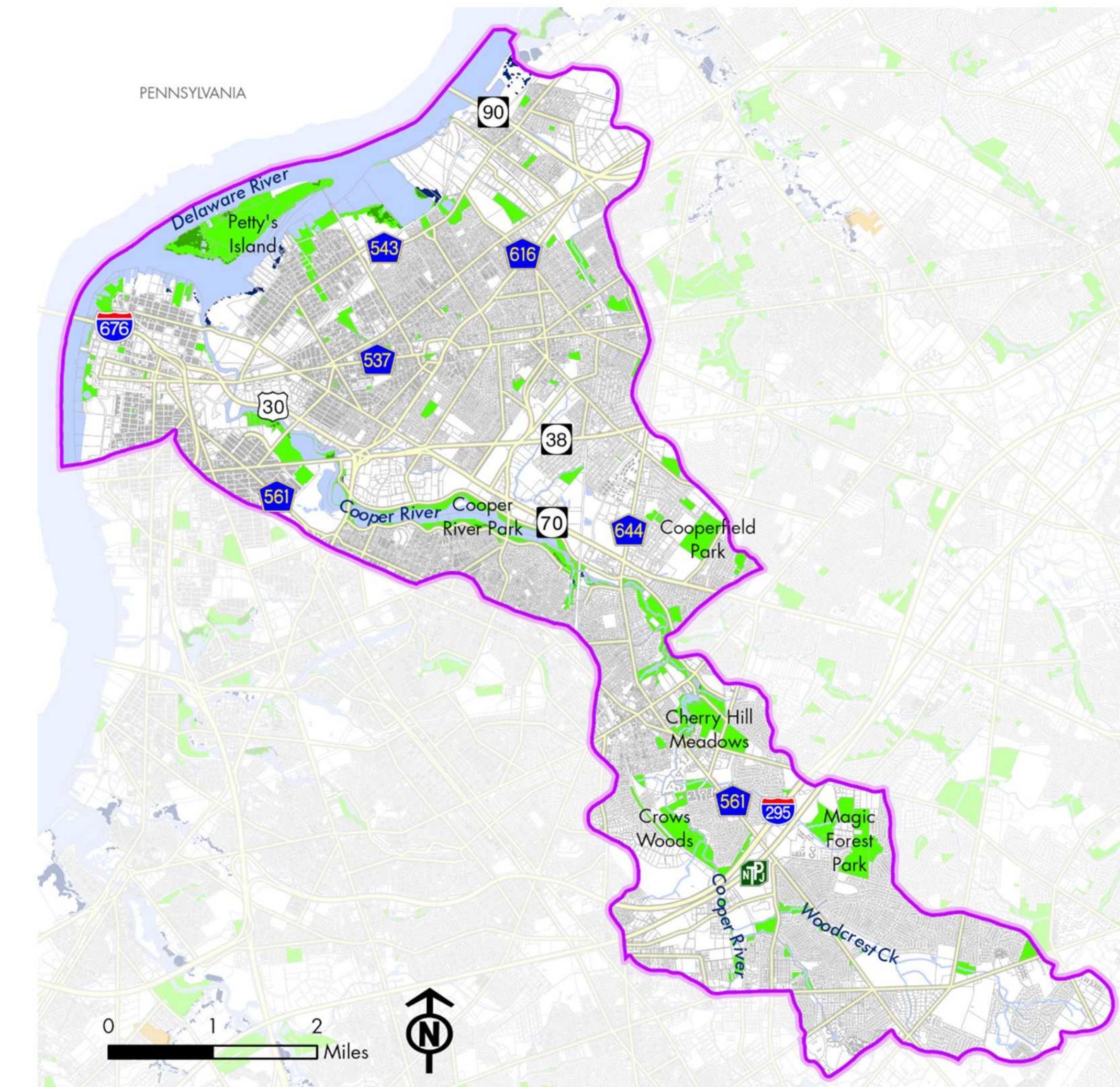


■ Marsh room to move ■ Not marsh room to move

- Cooper River subwatershed
- Marsh room to move
- Surface water
- Overburdened Community
- Major road
- Local road
- Parcels

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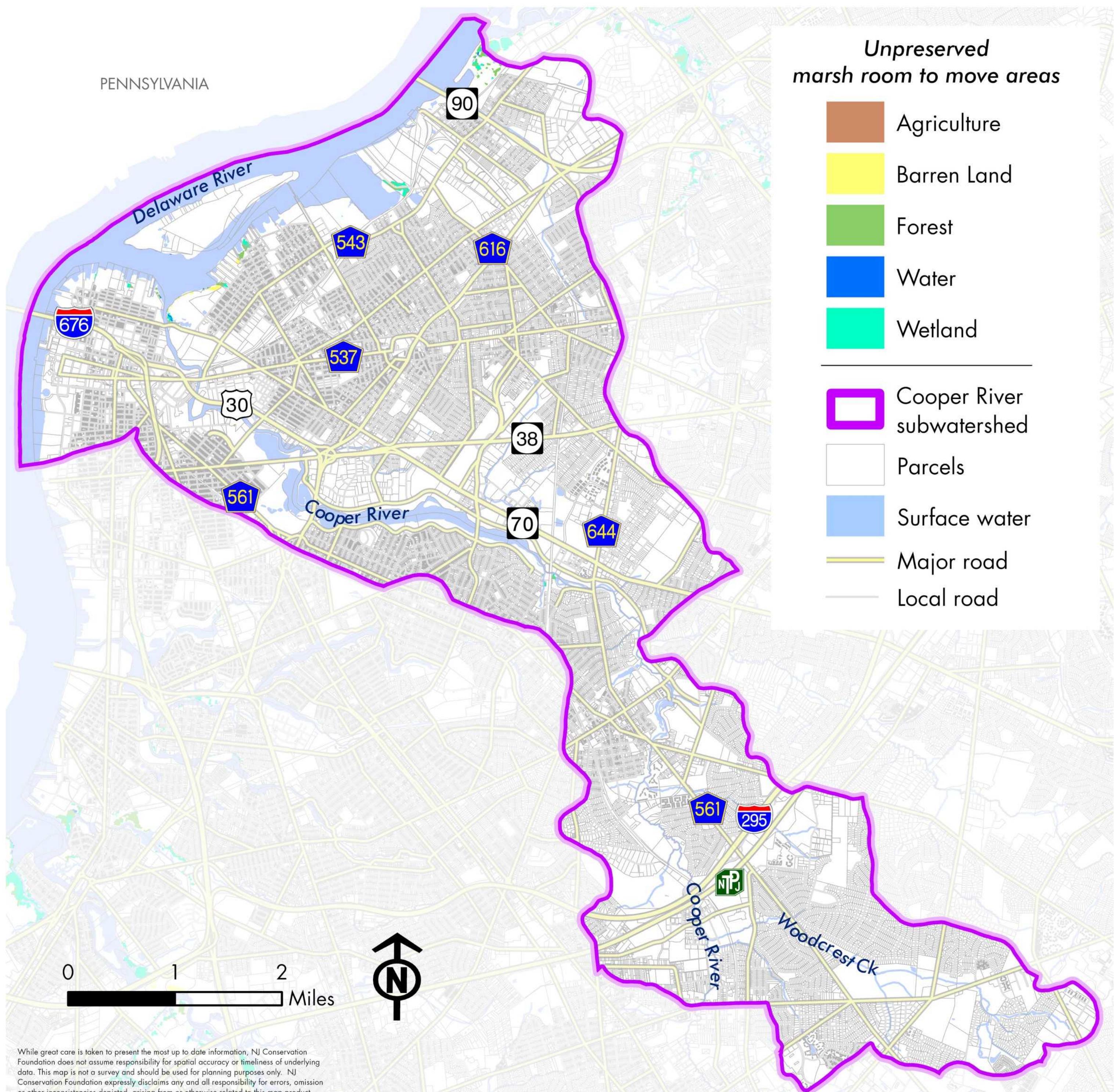
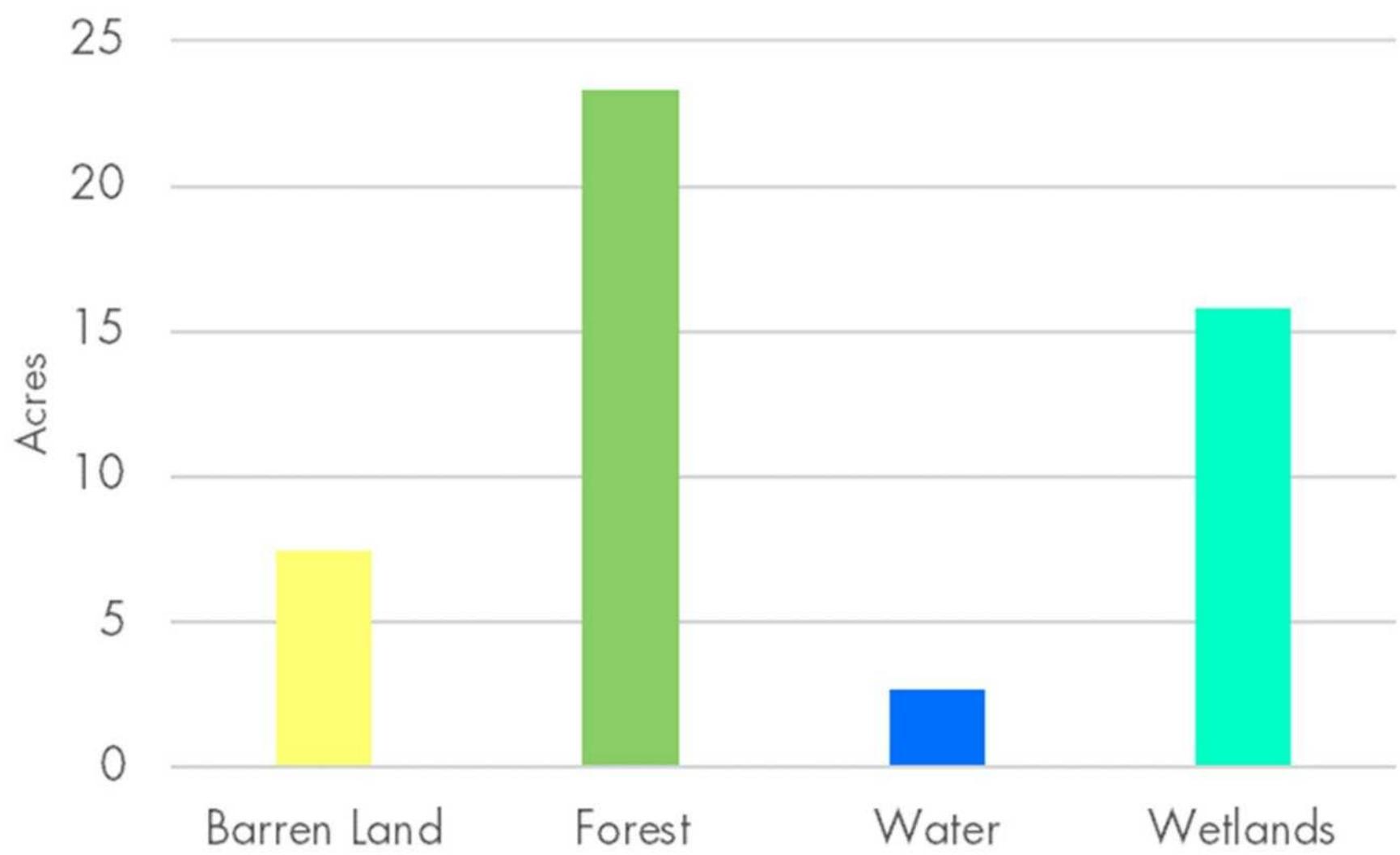
Marsh room to move—preservation status



- Cooper River subwatershed
- Marsh room to move - not preserved
- Marsh room to move - preserved open space
- Marsh room to move - preserved farmland
- Other Preserved Farmland
- Other Preserved Open Space
- Surface water
- Parcels
- Major road
- Local road

COOPER RIVER

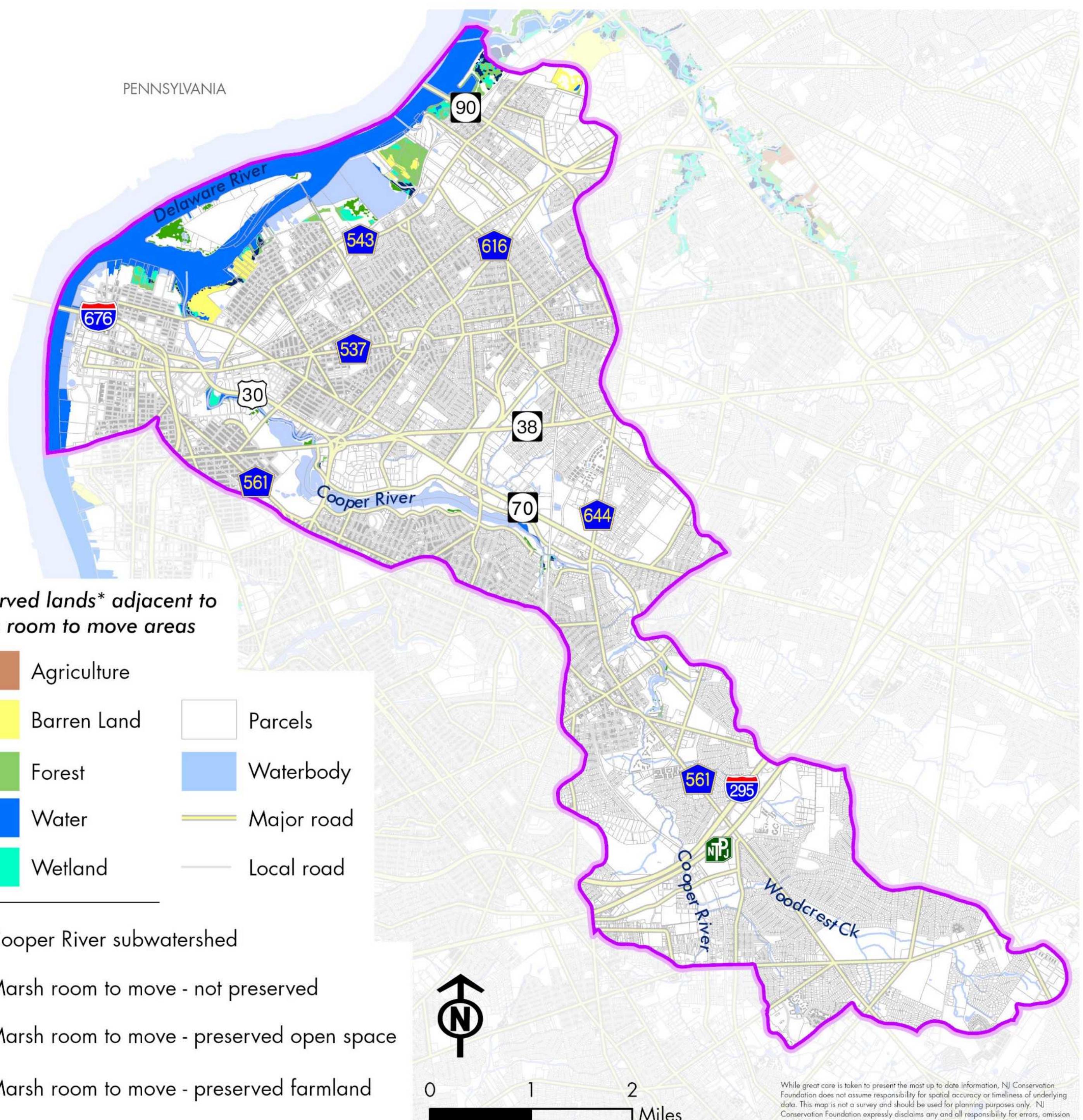
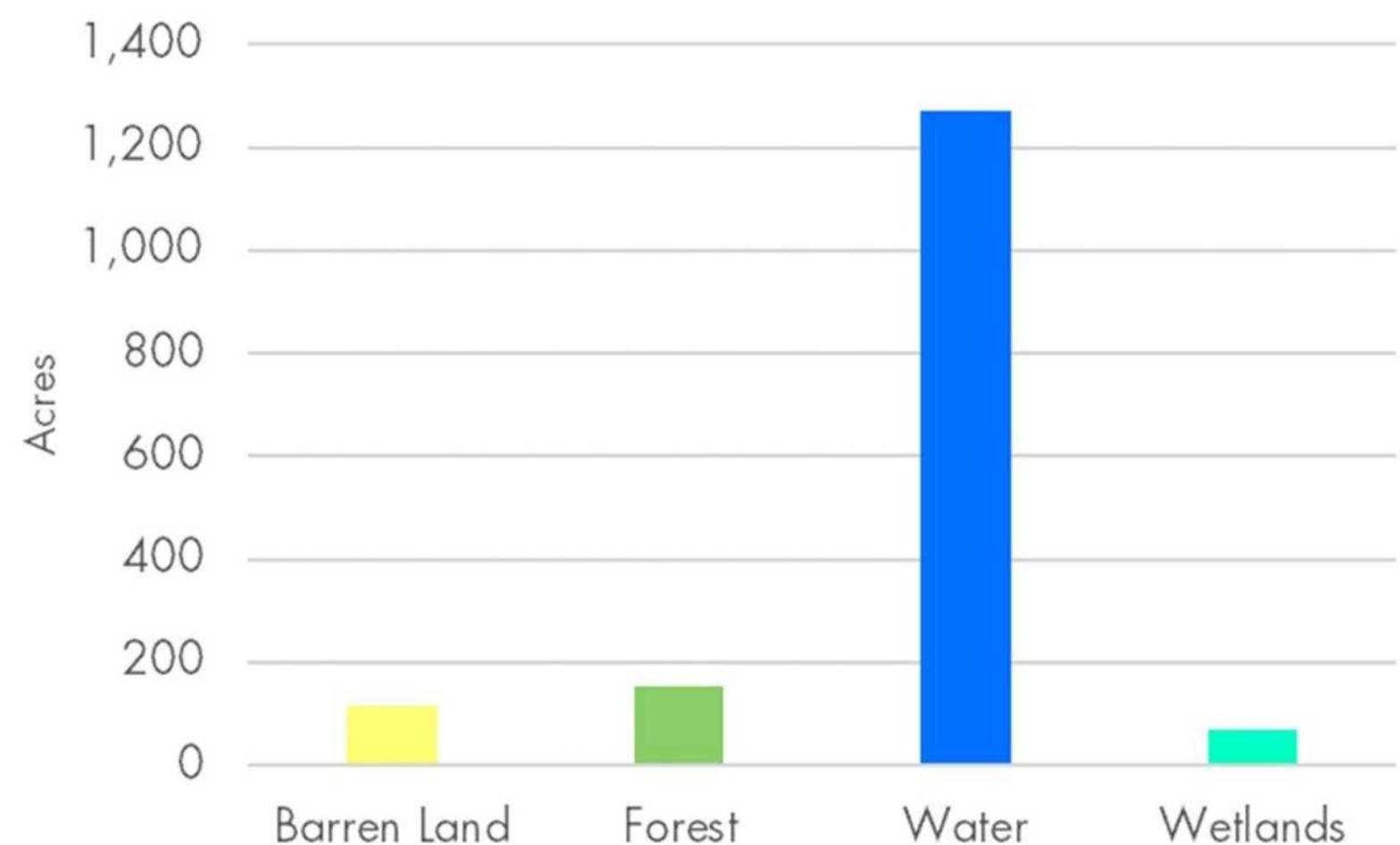
Unpreserved marsh room to move areas by landuse



COOPER RIVER

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



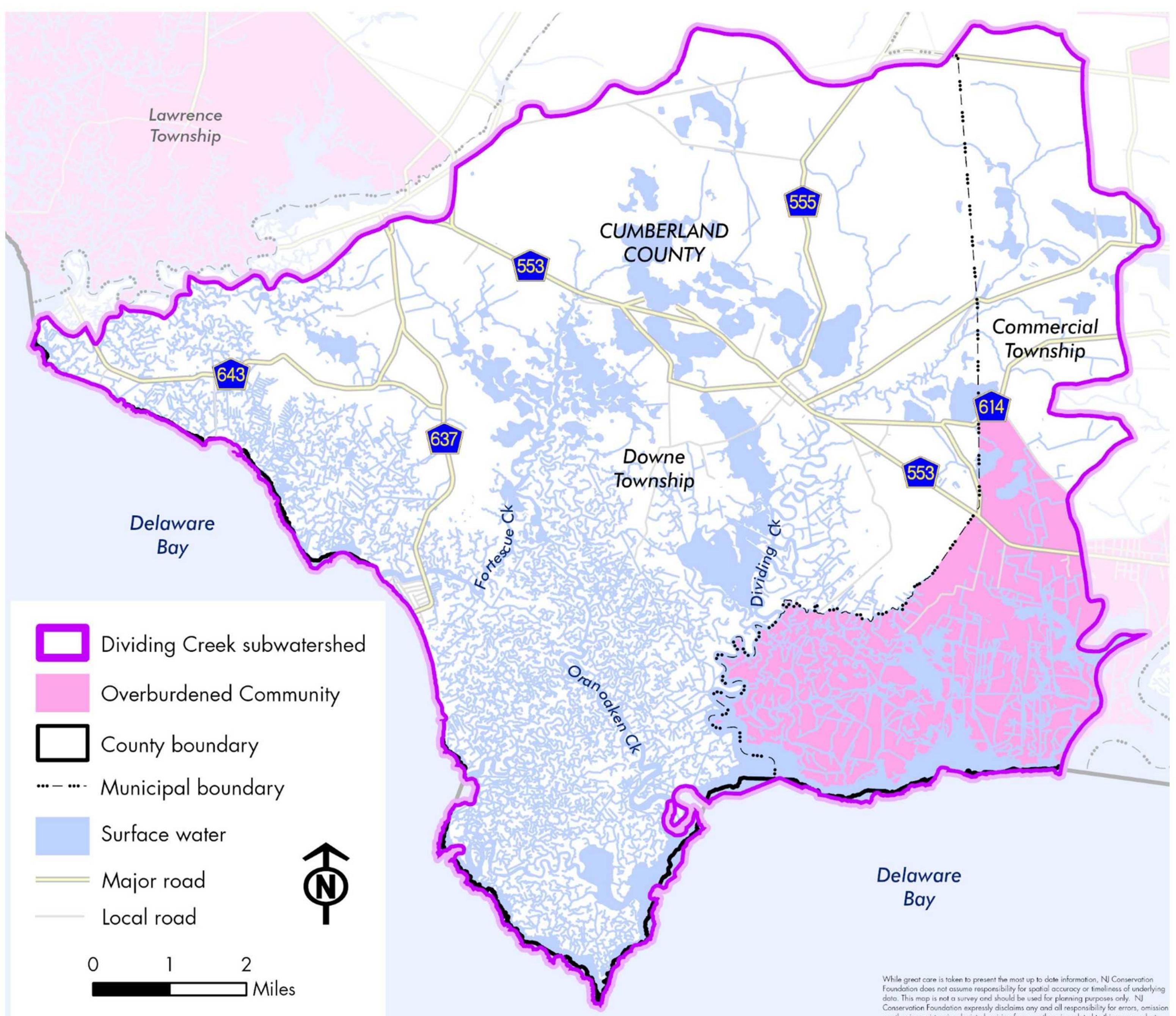
DIVIDING CREEK Profile

Total area: 38,338 acres +/- acres

Counties: Cumberland

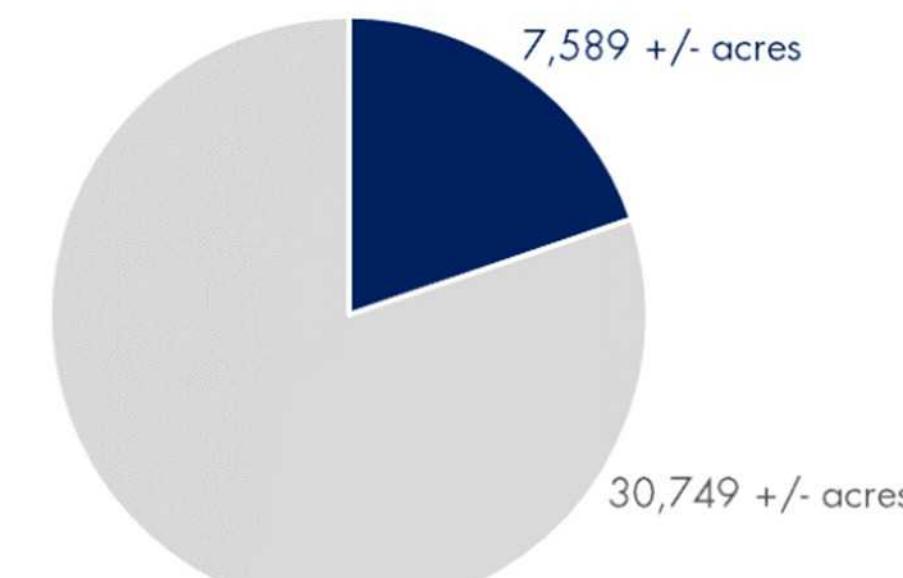
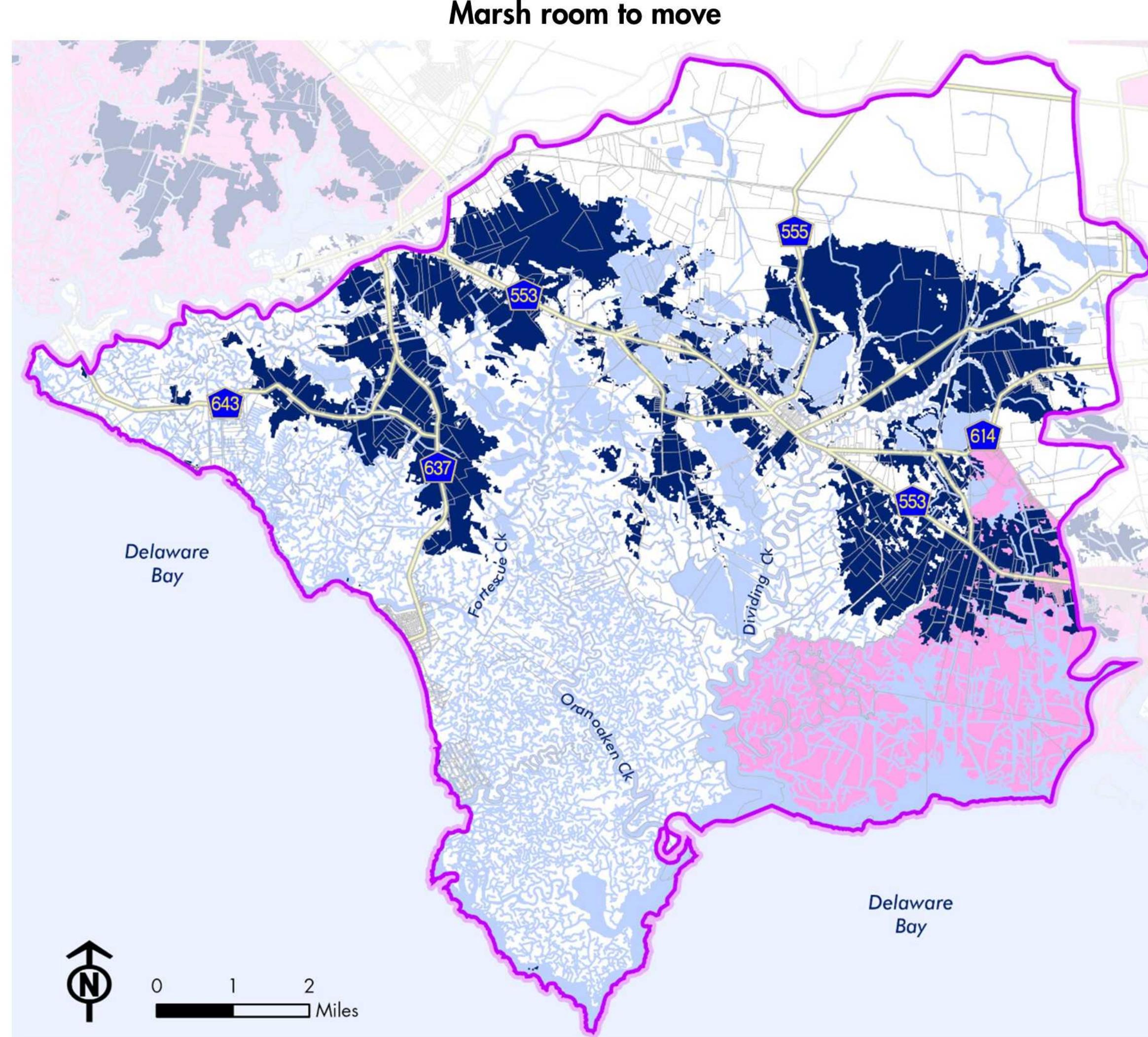
Municipalities:

- ◆ Commercial Township
- ◆ Downe Township



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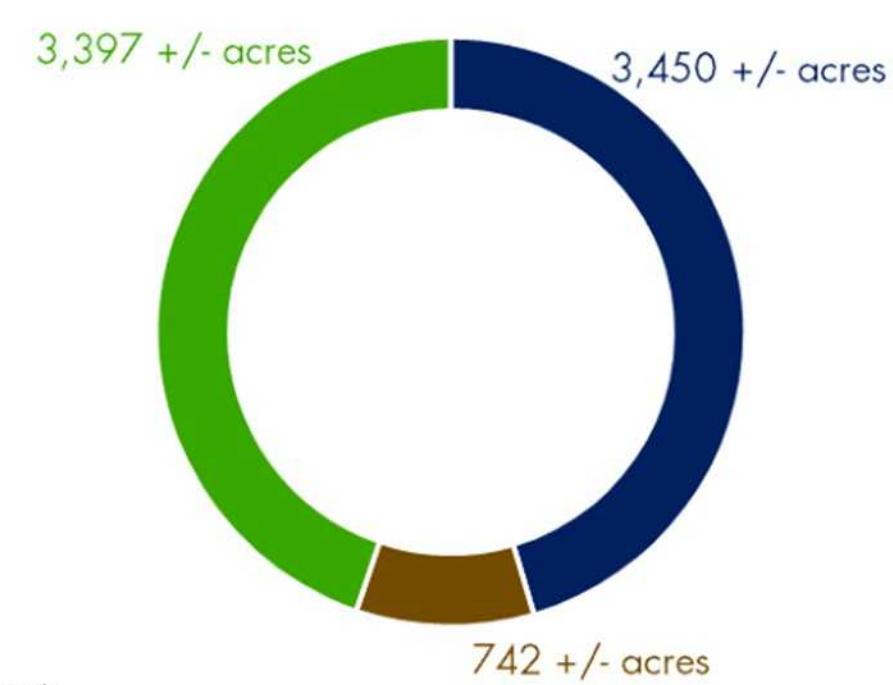
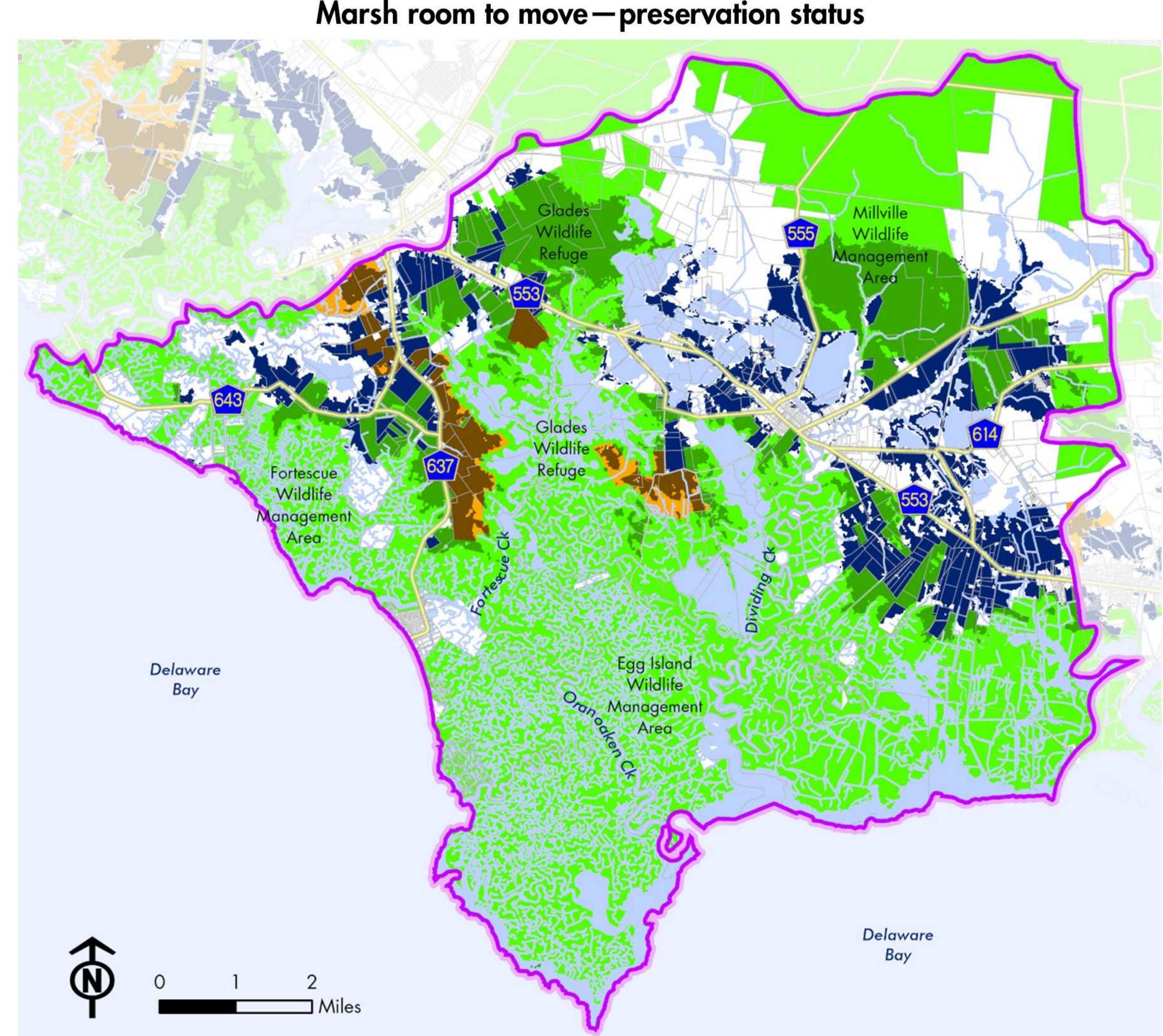
DIVIDING CREEK Marsh room to move



■ Marsh room to move ■ Not marsh room to move

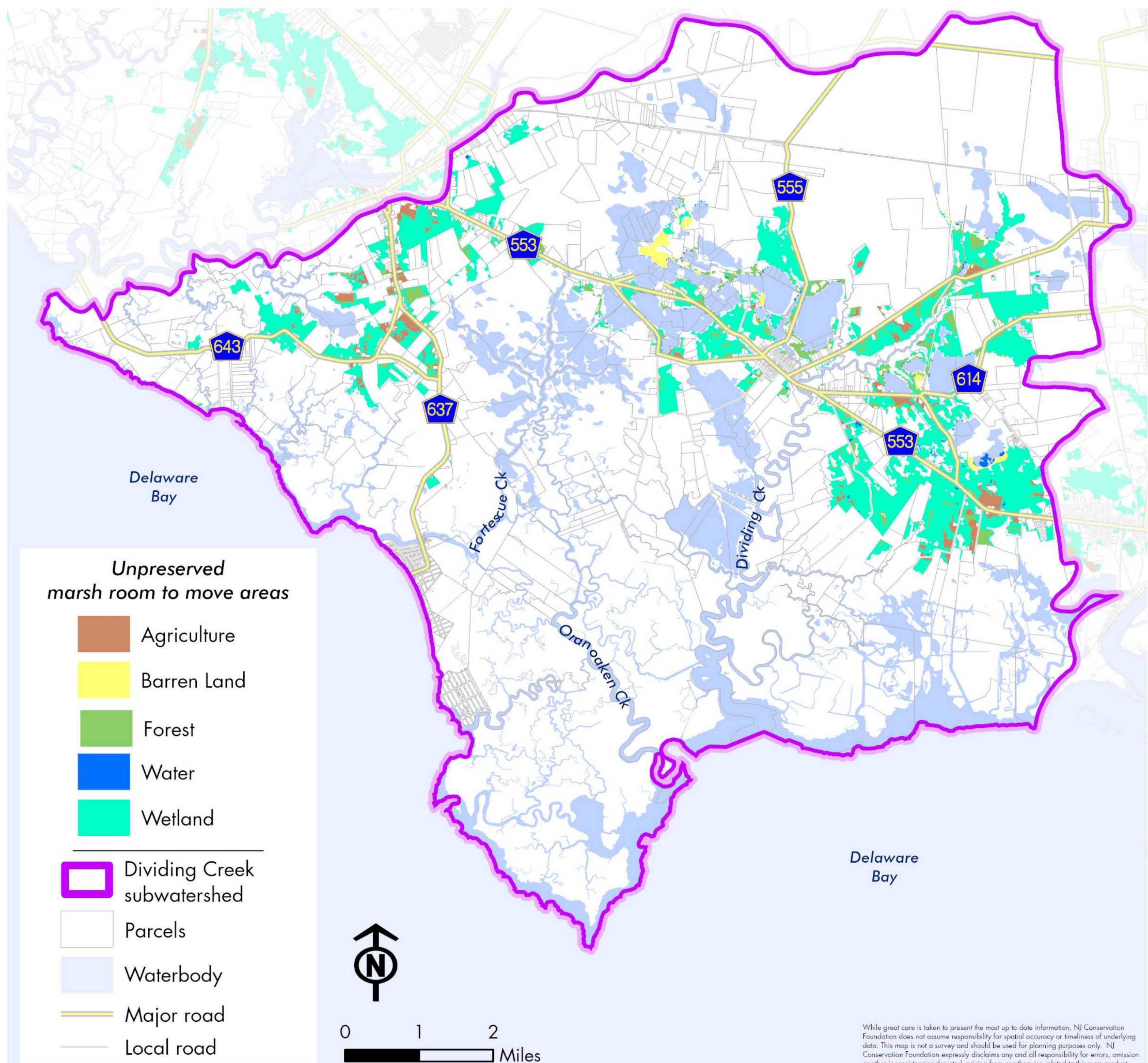
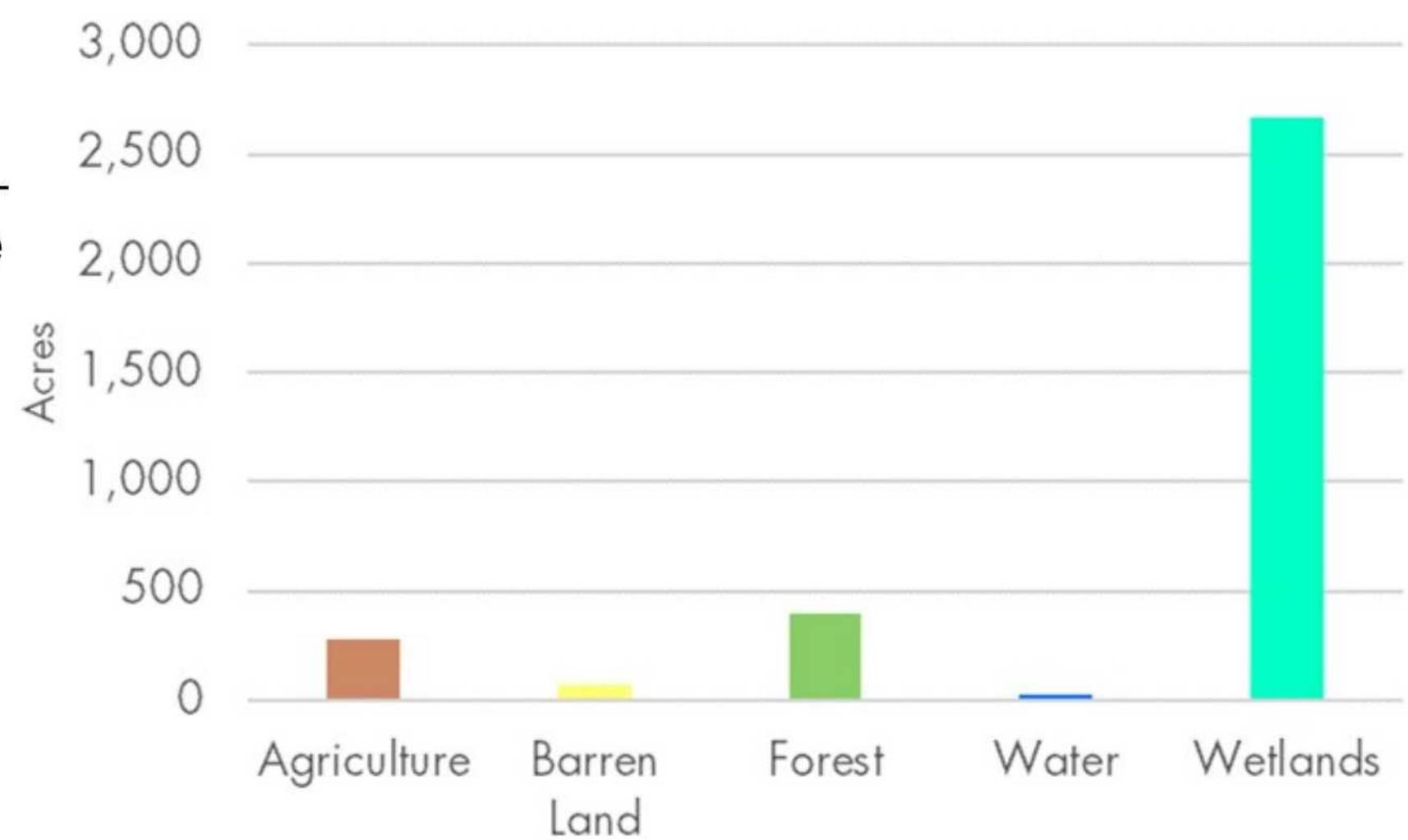


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DIVIDING CREEK

Unpreserved marsh room to move areas by landuse

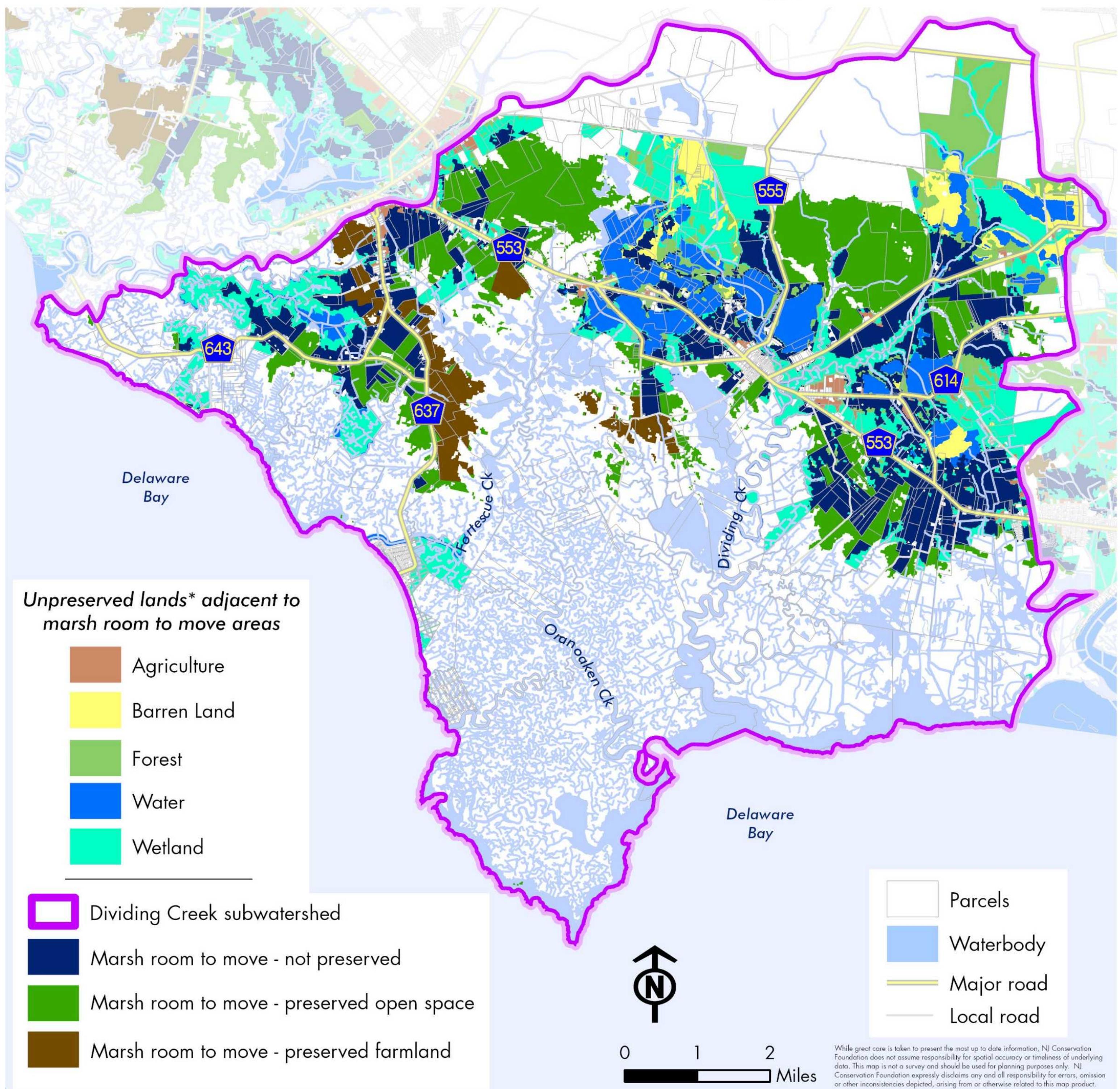
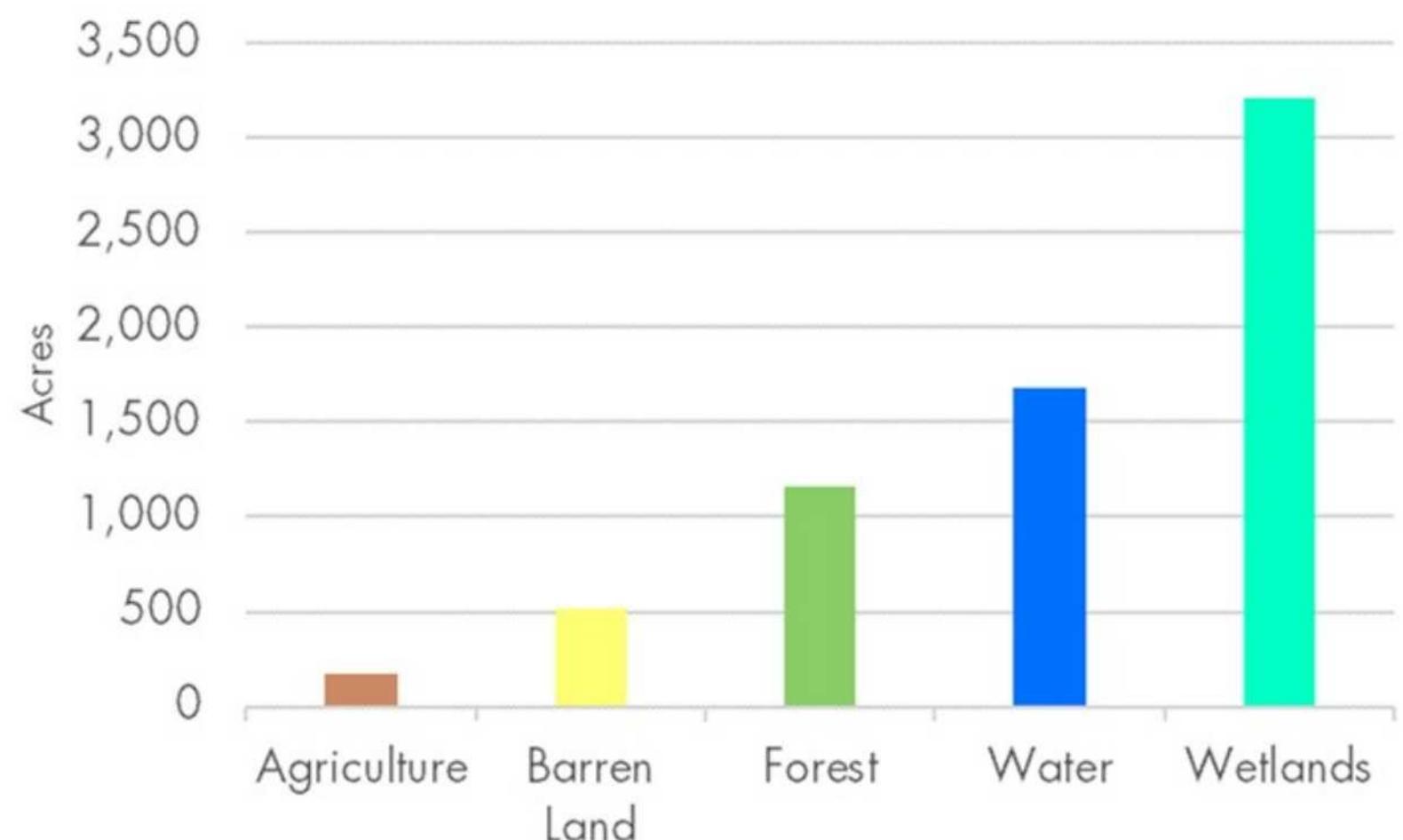


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DIVIDING CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



Profile

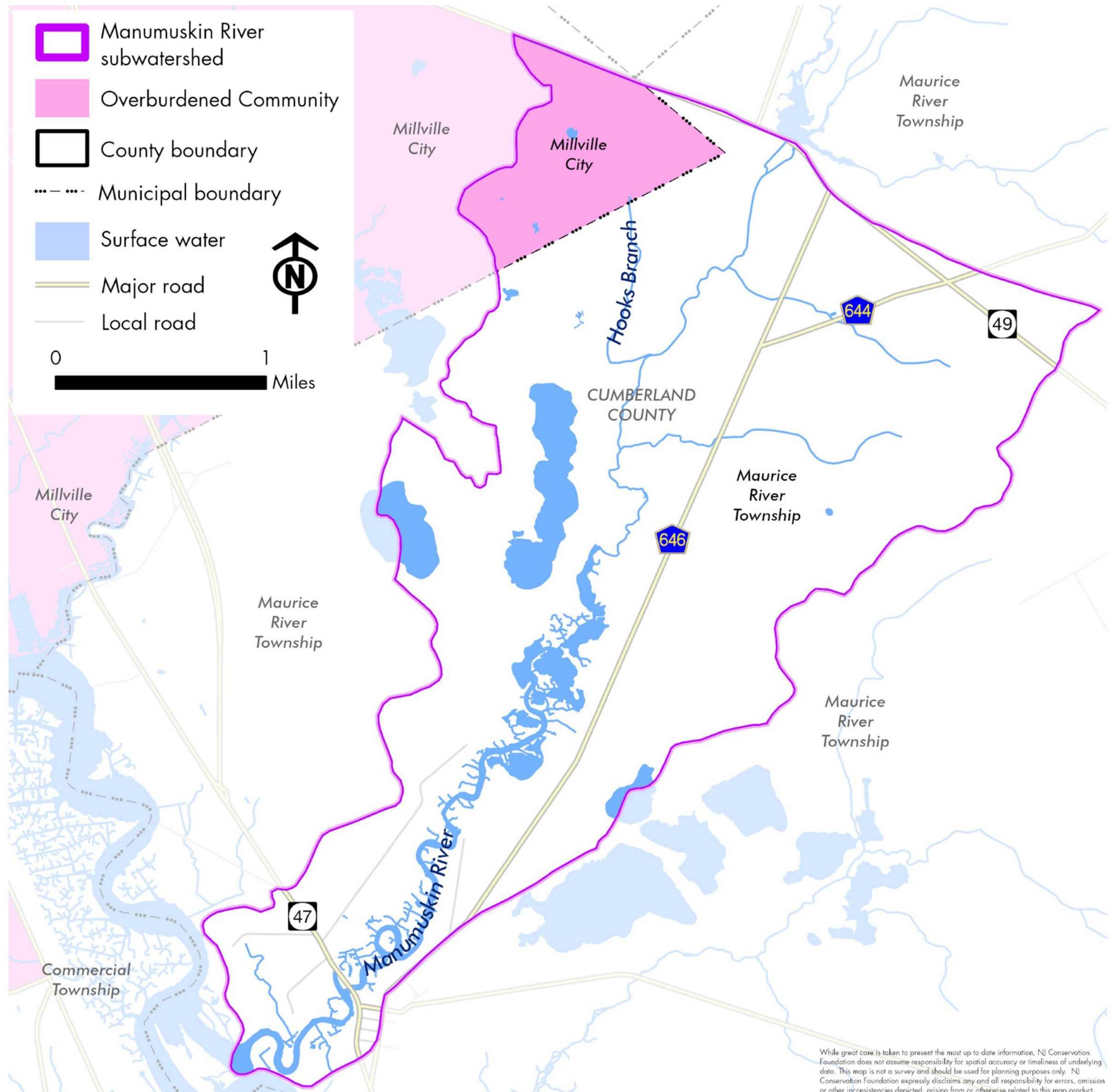
MANUMUSKIN RIVER

Total area: 5,368 +/- acres

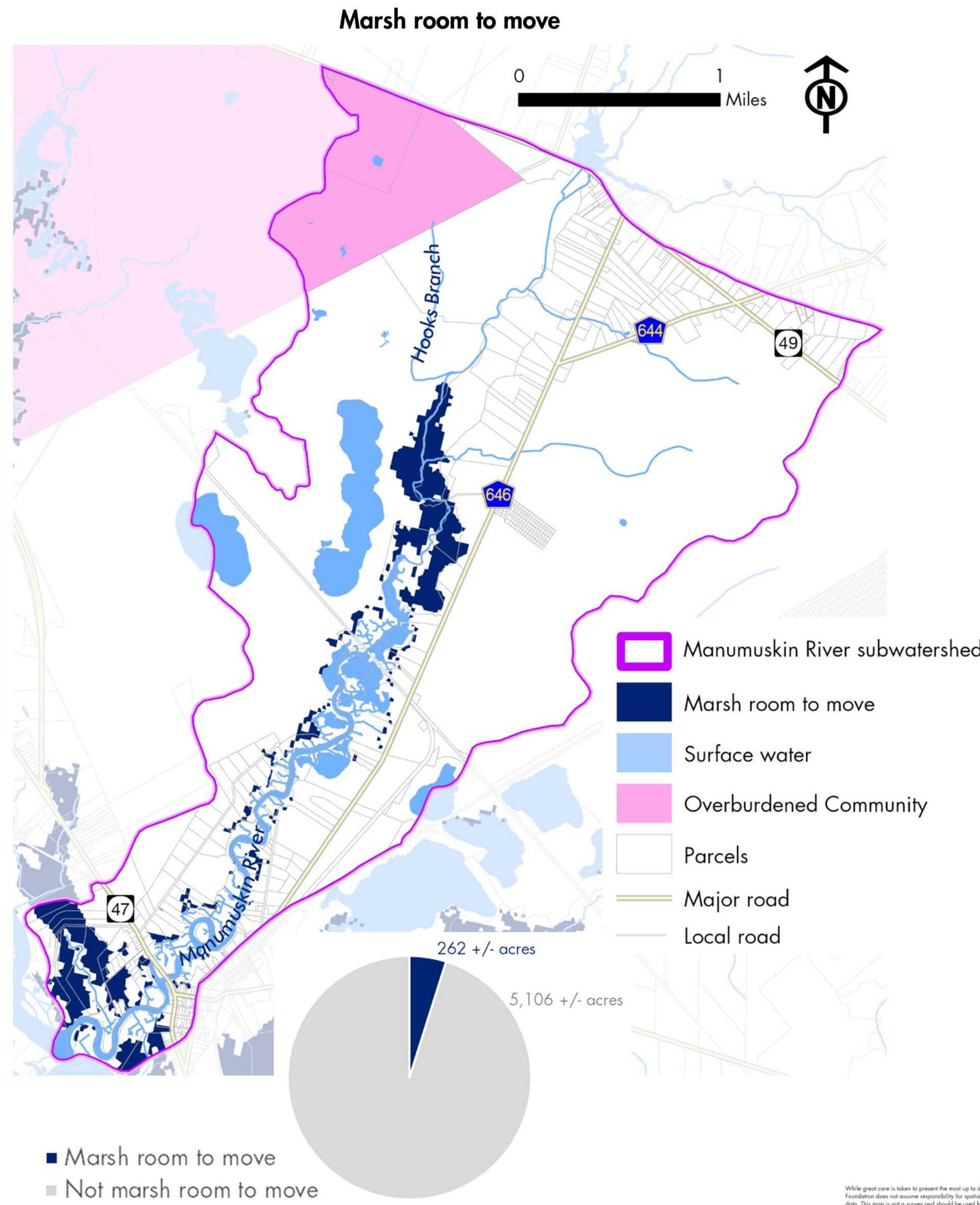
Counties: Cumberland

Municipalities:

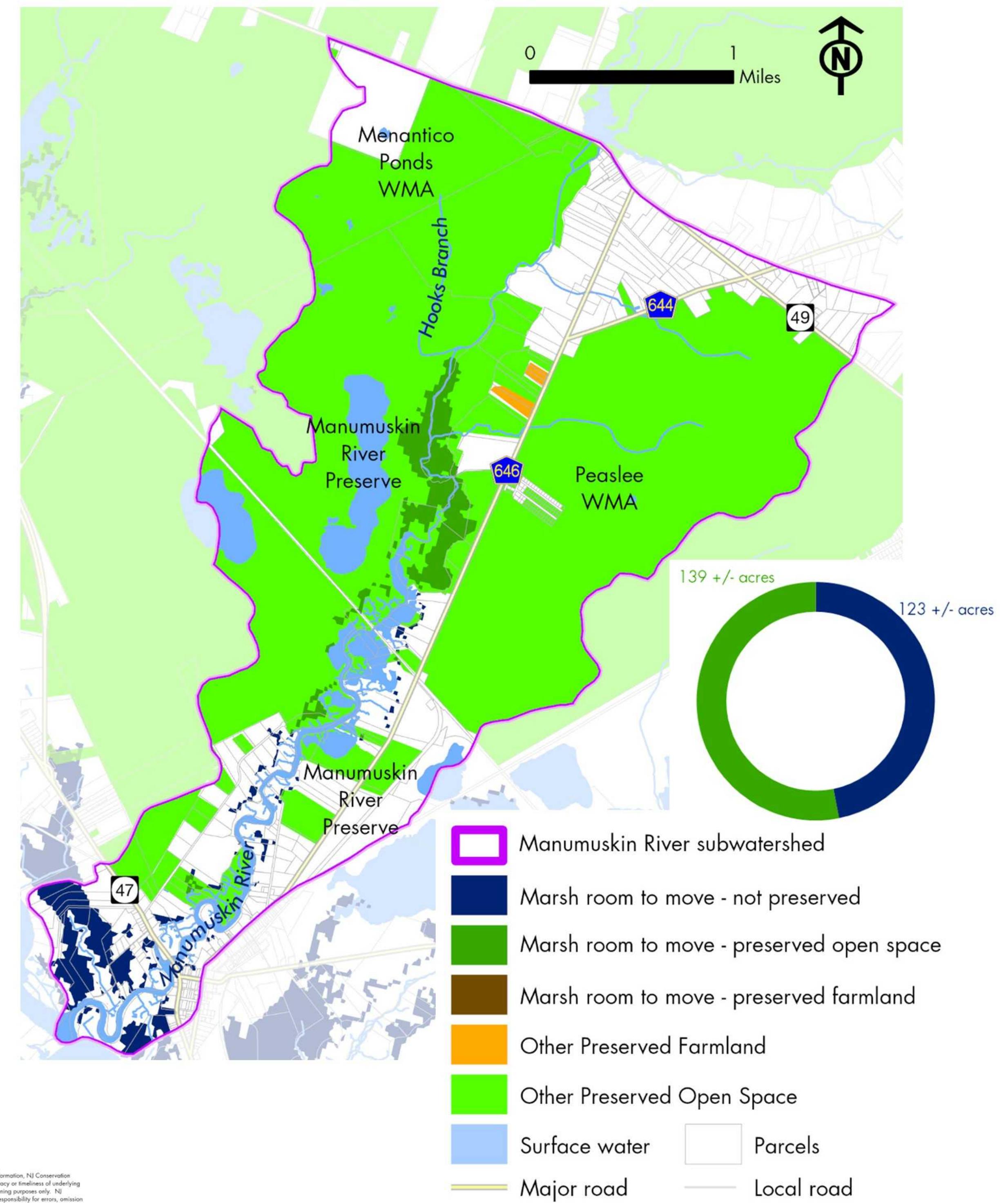
- ◆ Maurice River Township
- ◆ Millville City



MANUMUSKIN RIVER Marsh room to move

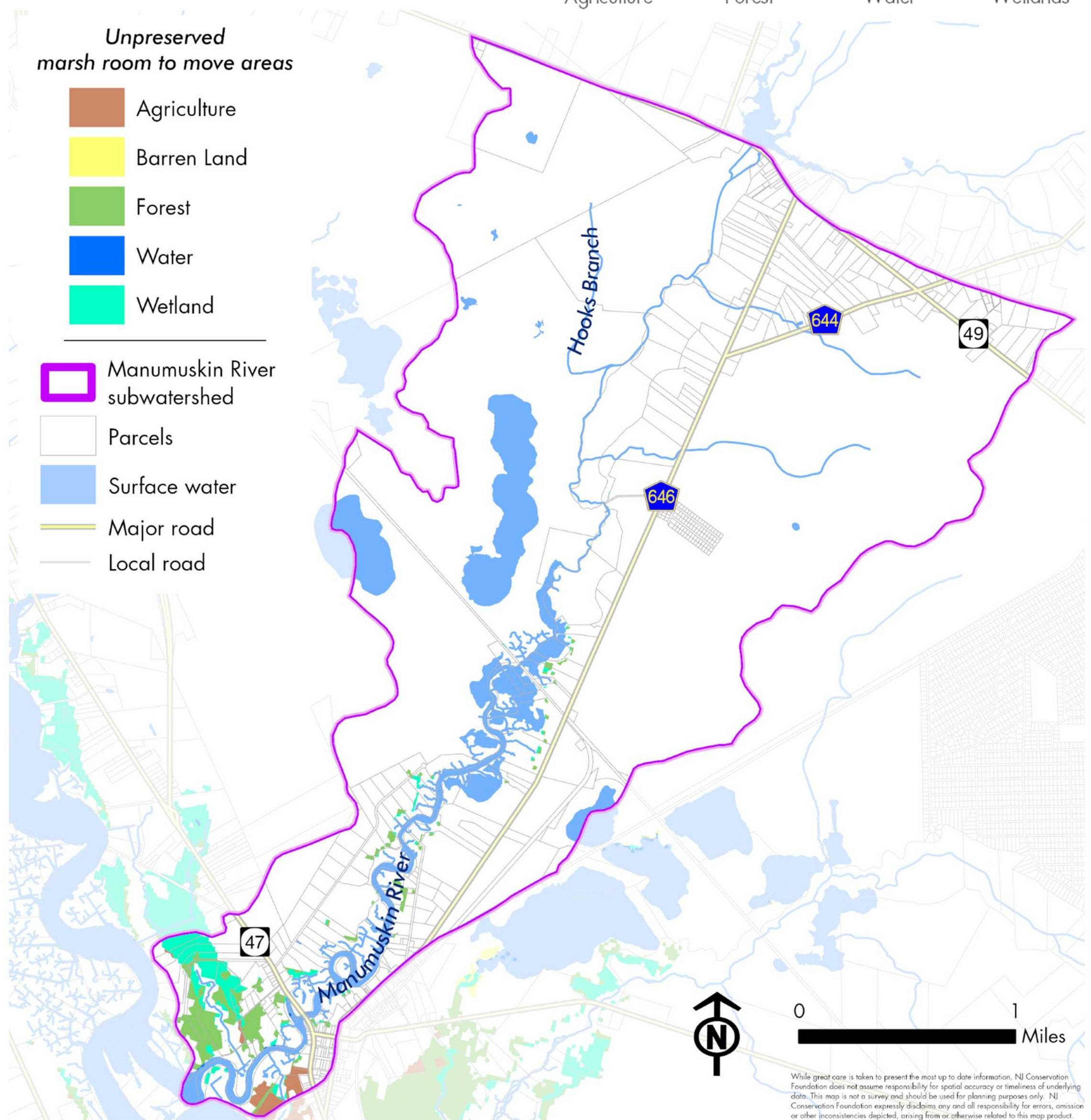
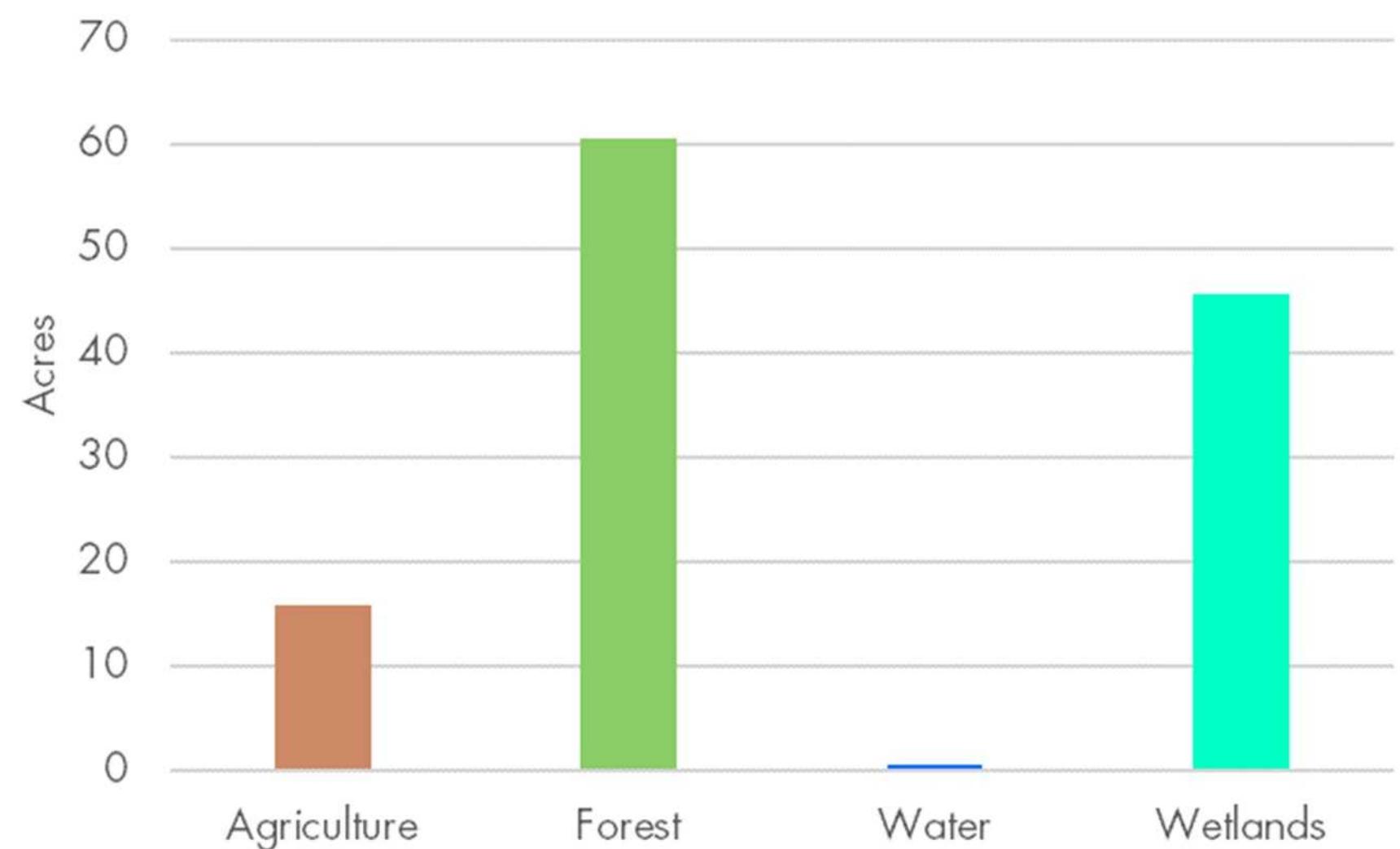


Marsh room to move—preservation status



MANUMUSKIN RIVER

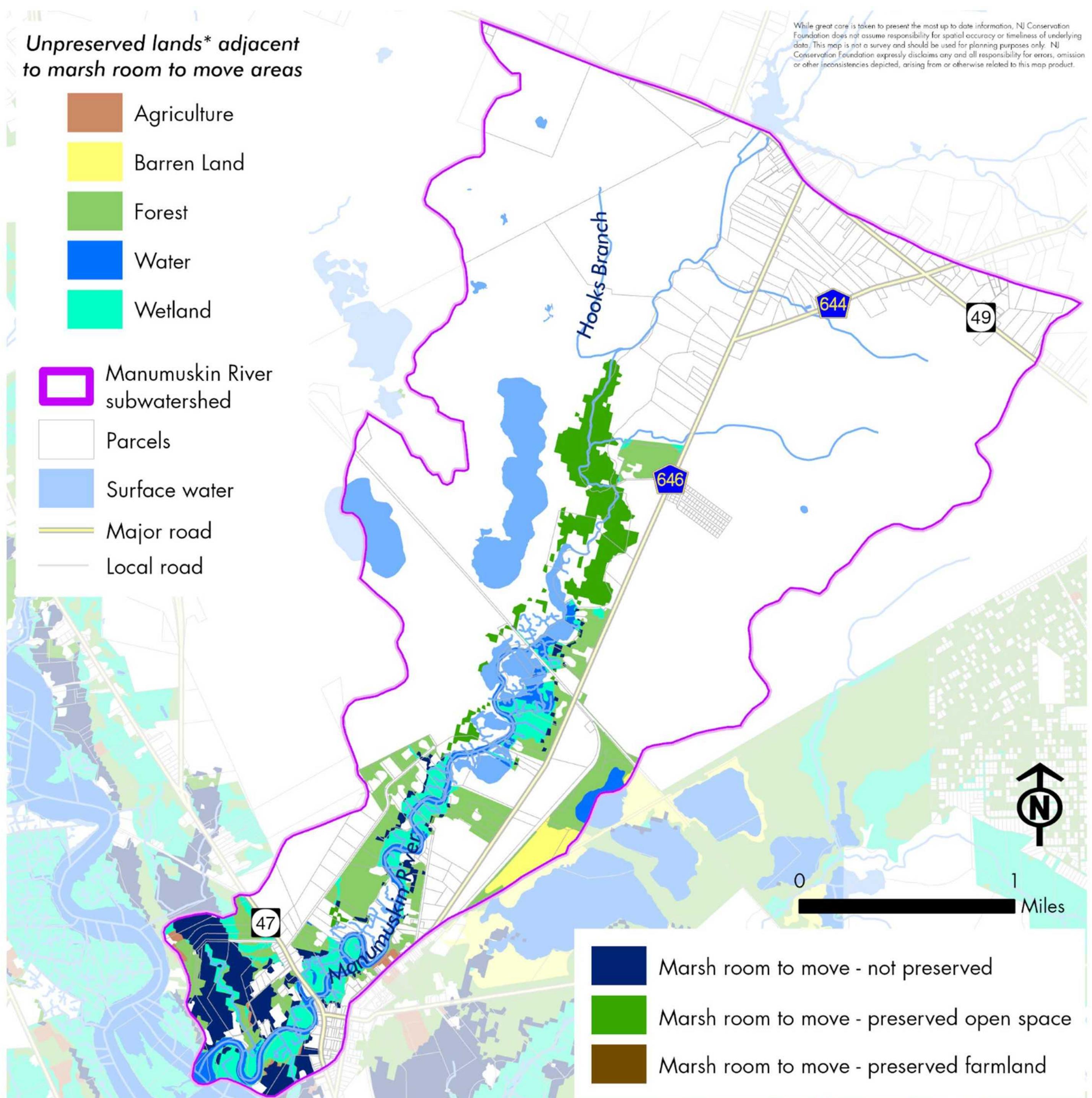
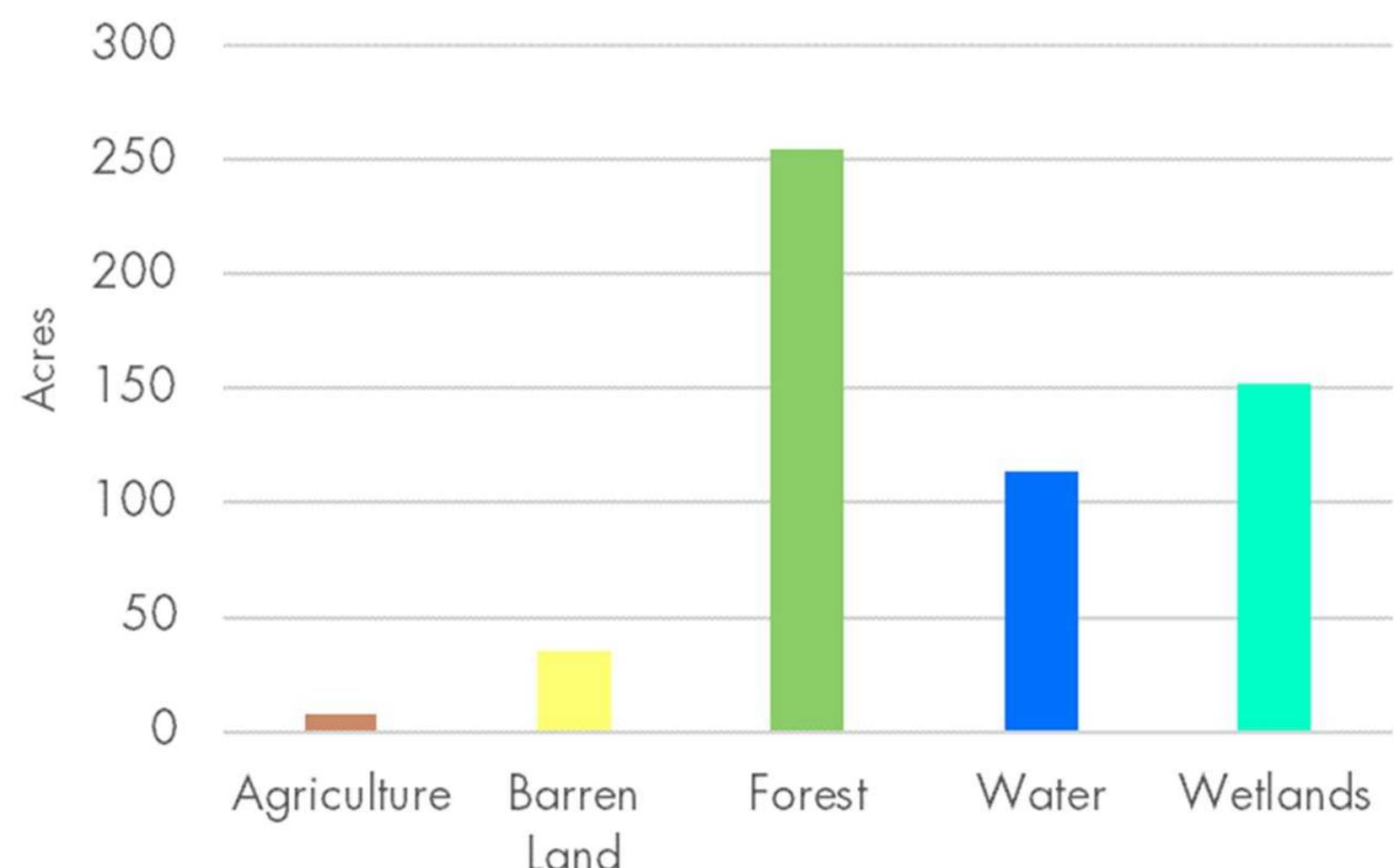
Unpreserved marsh room to move areas by landuse



MANUMUSKIN RIVER

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



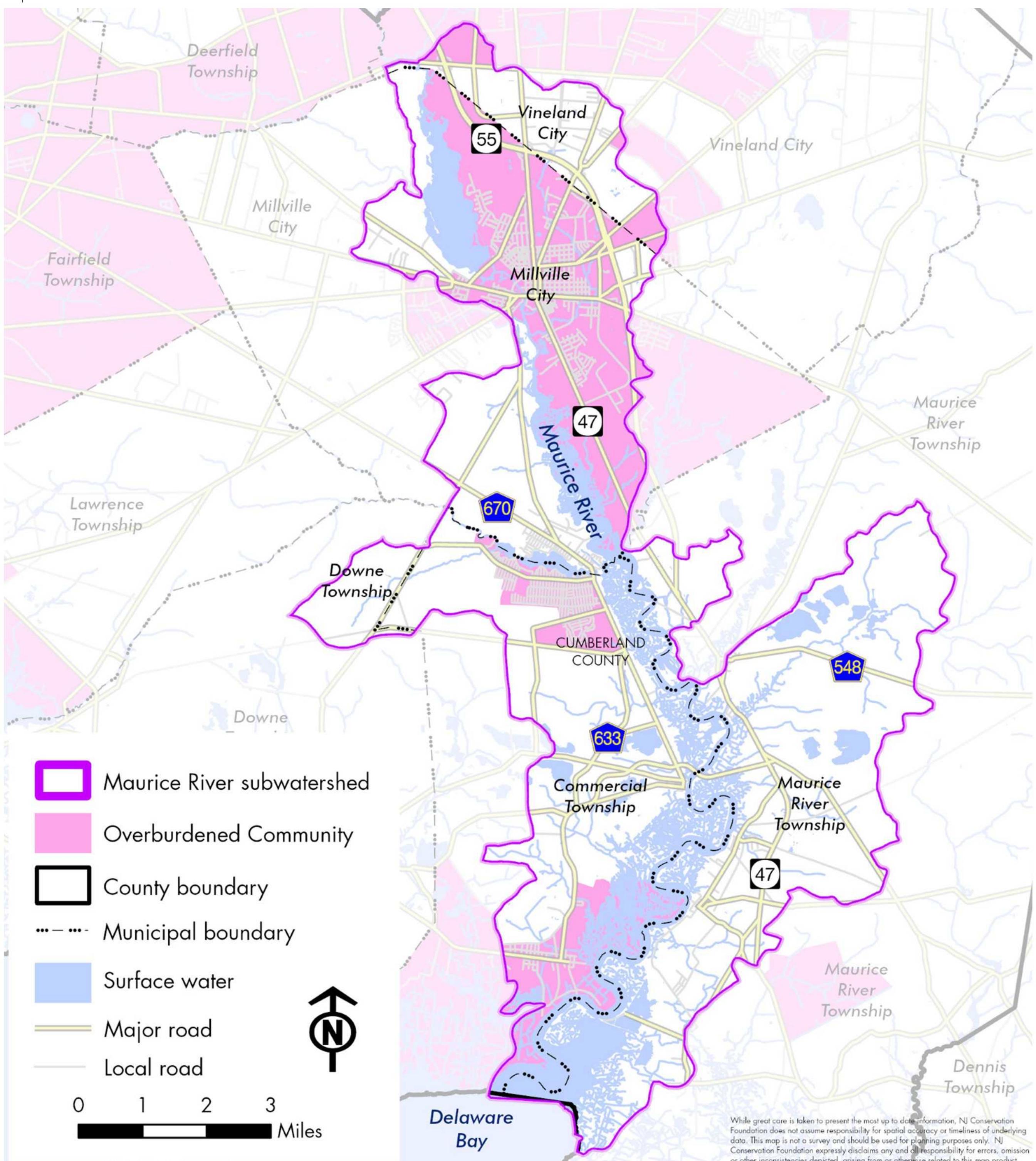
MAURICE RIVER Profile

Total area: 45,750 +/- acres

Counties: Cumberland

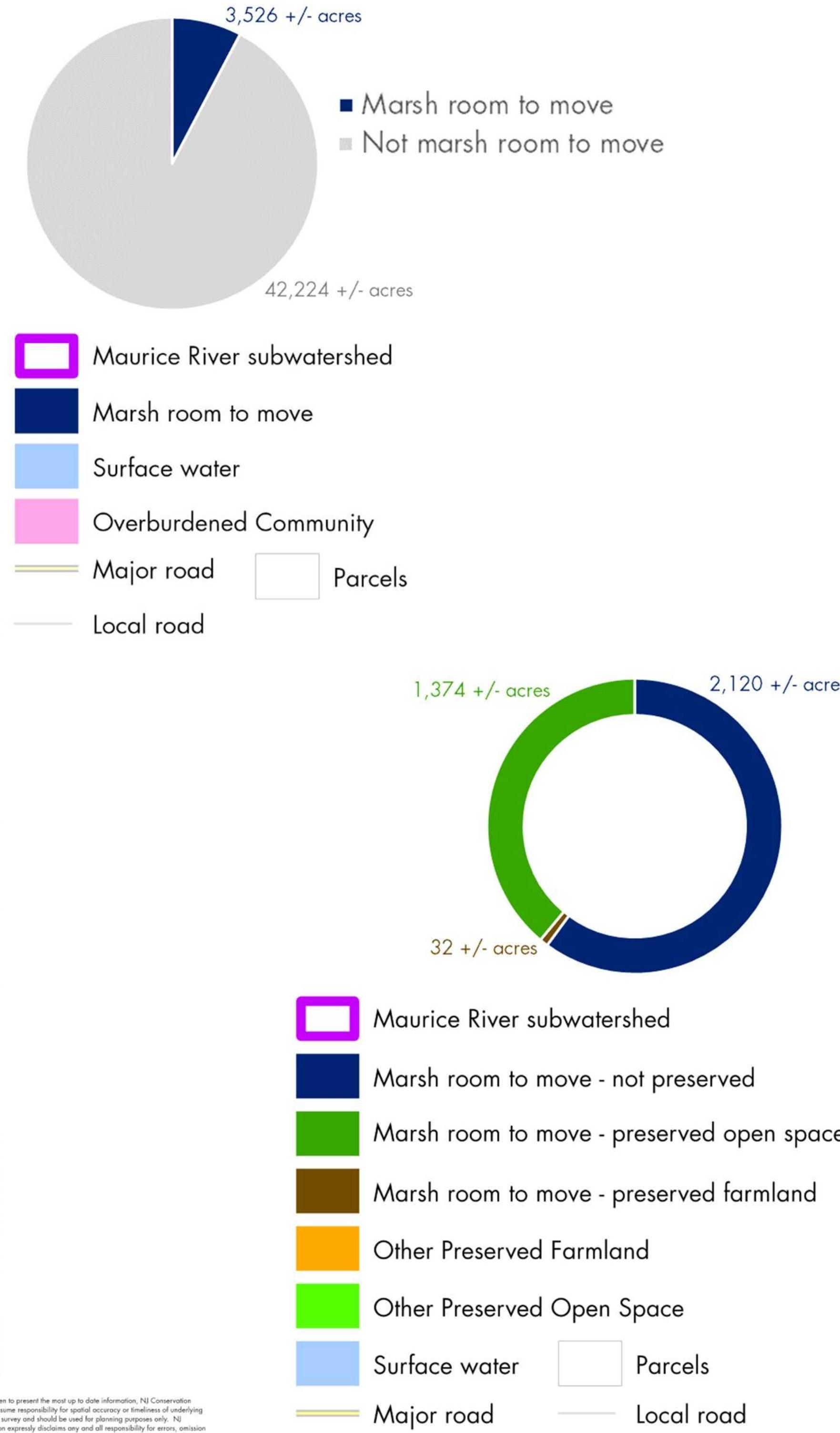
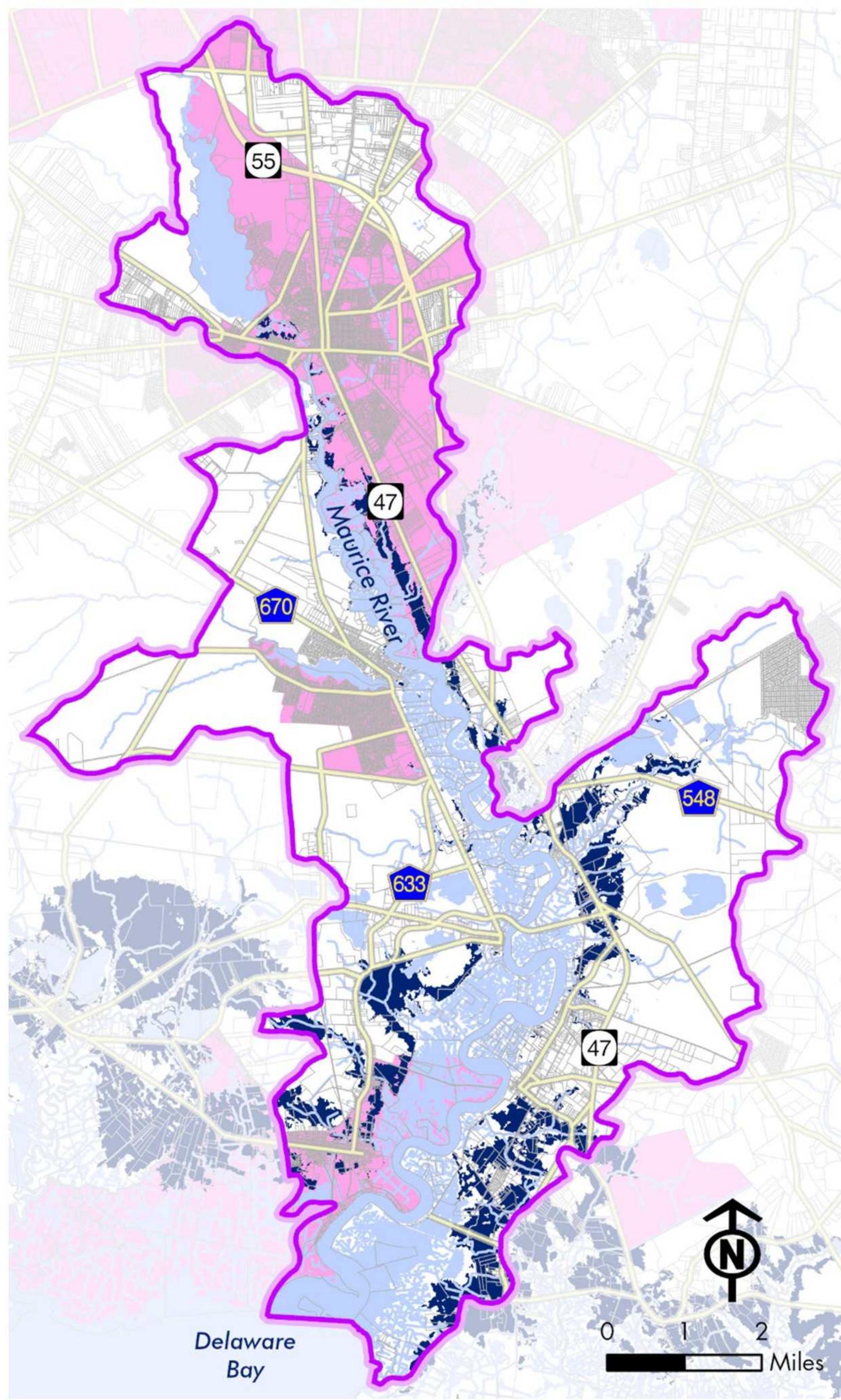
Municipalities:

- ◆ Commercial Township
- ◆ Downe Township
- ◆ Maurice River Township
- ◆ Millville City
- ◆ Vineland City

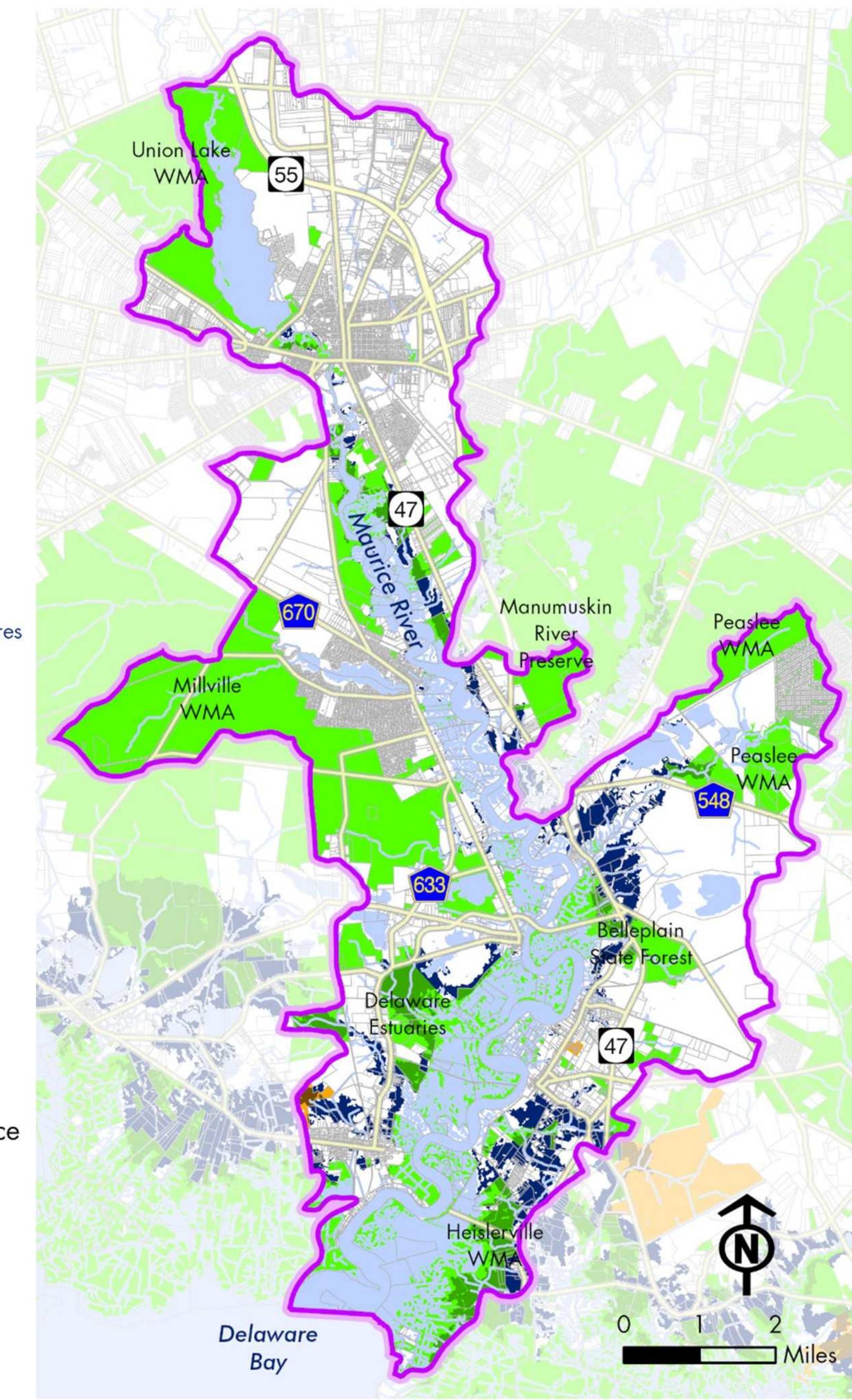


MAURICE RIVER Marsh room to move

Marsh room to move

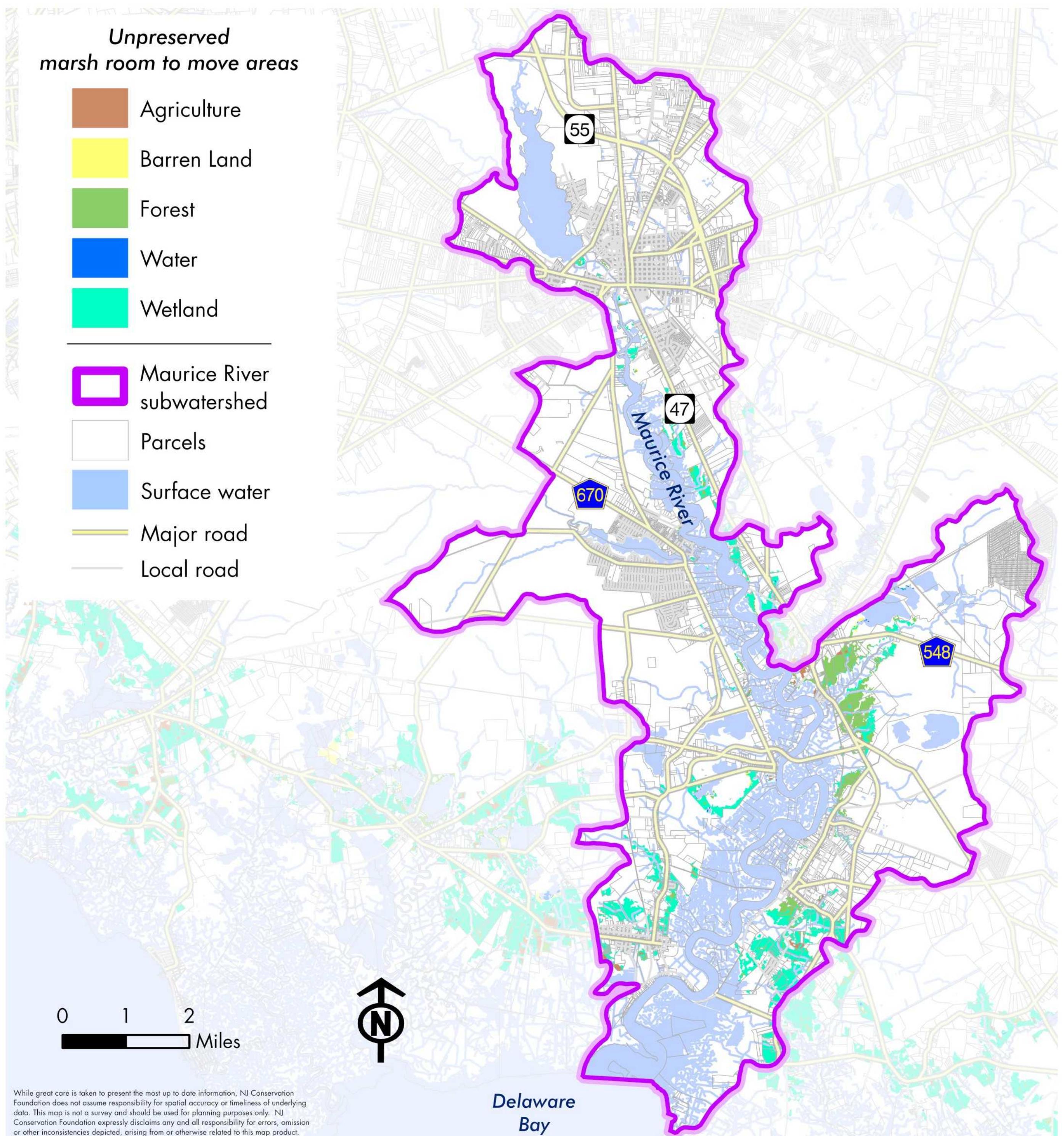
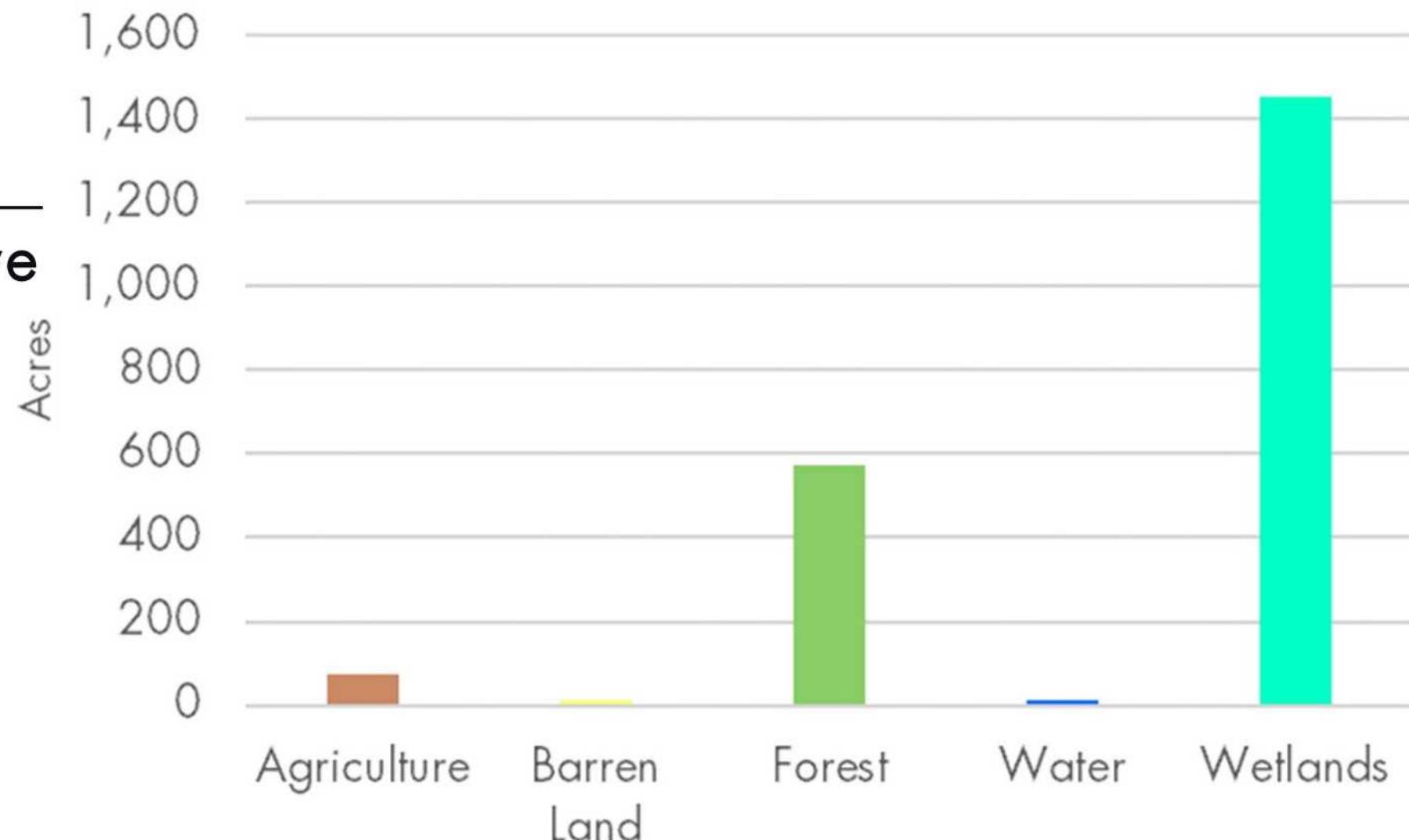


Marsh room to move—preservation status



MAURICE RIVER

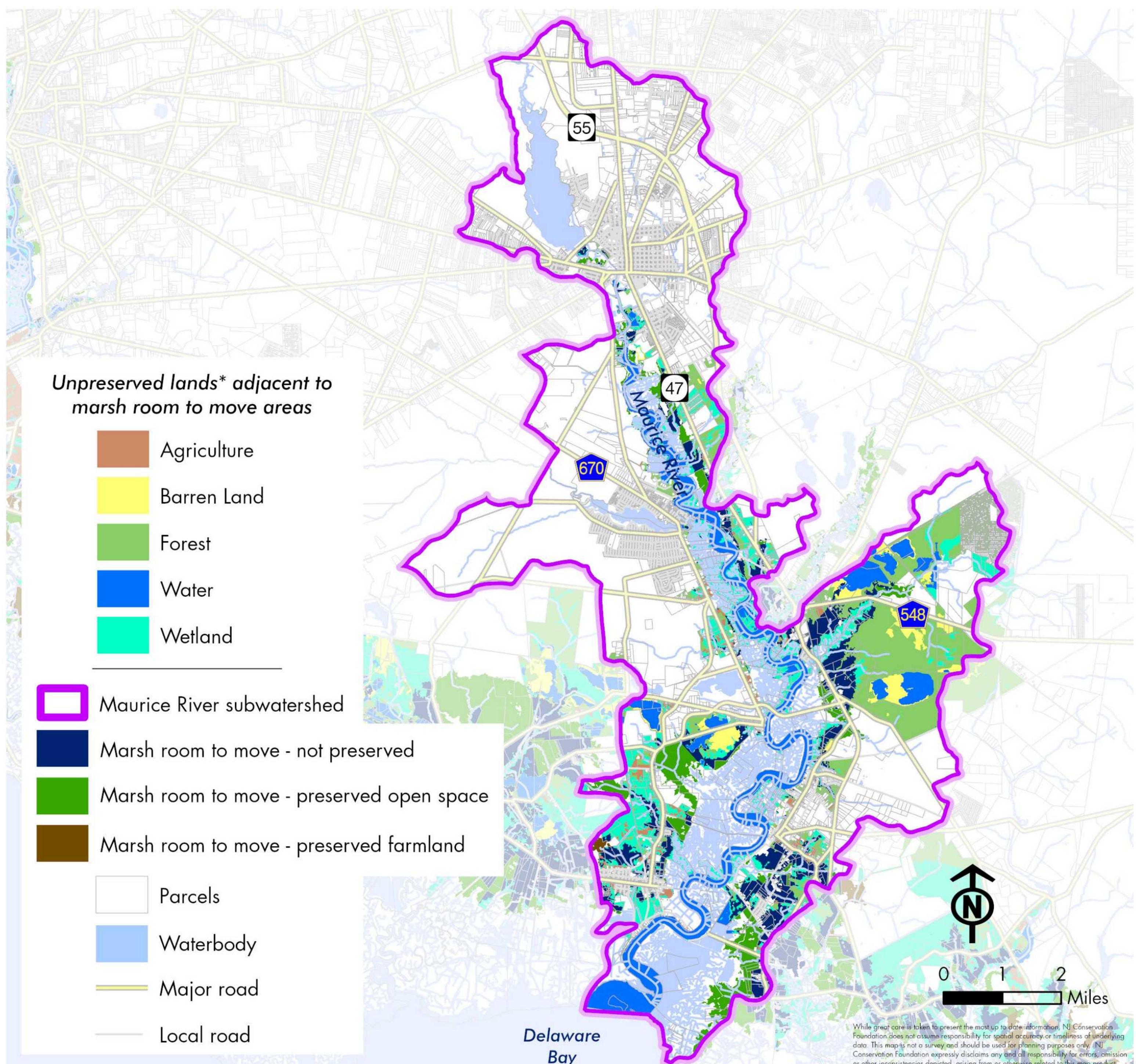
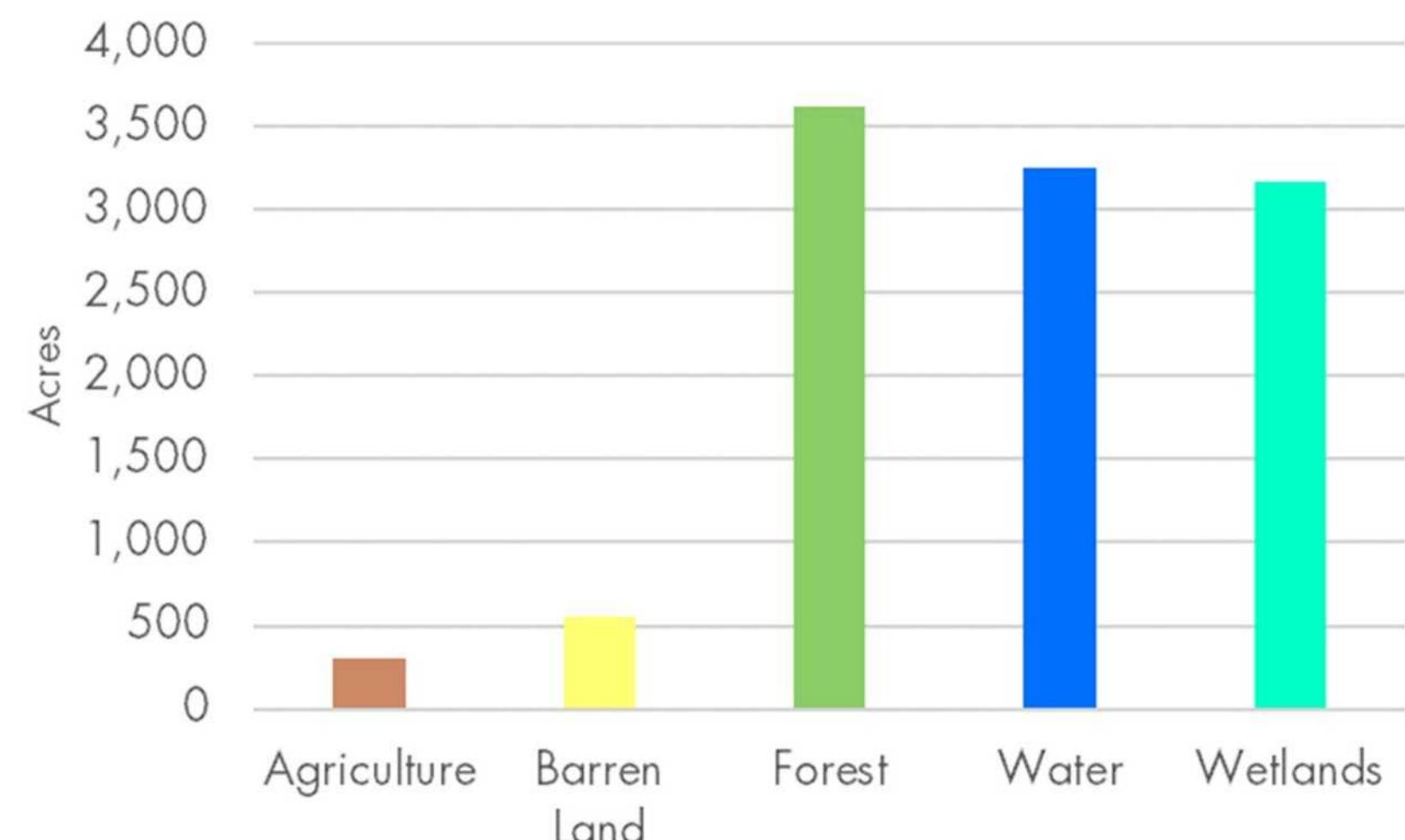
Unpreserved marsh room to move areas by landuse



MAURICE RIVER

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



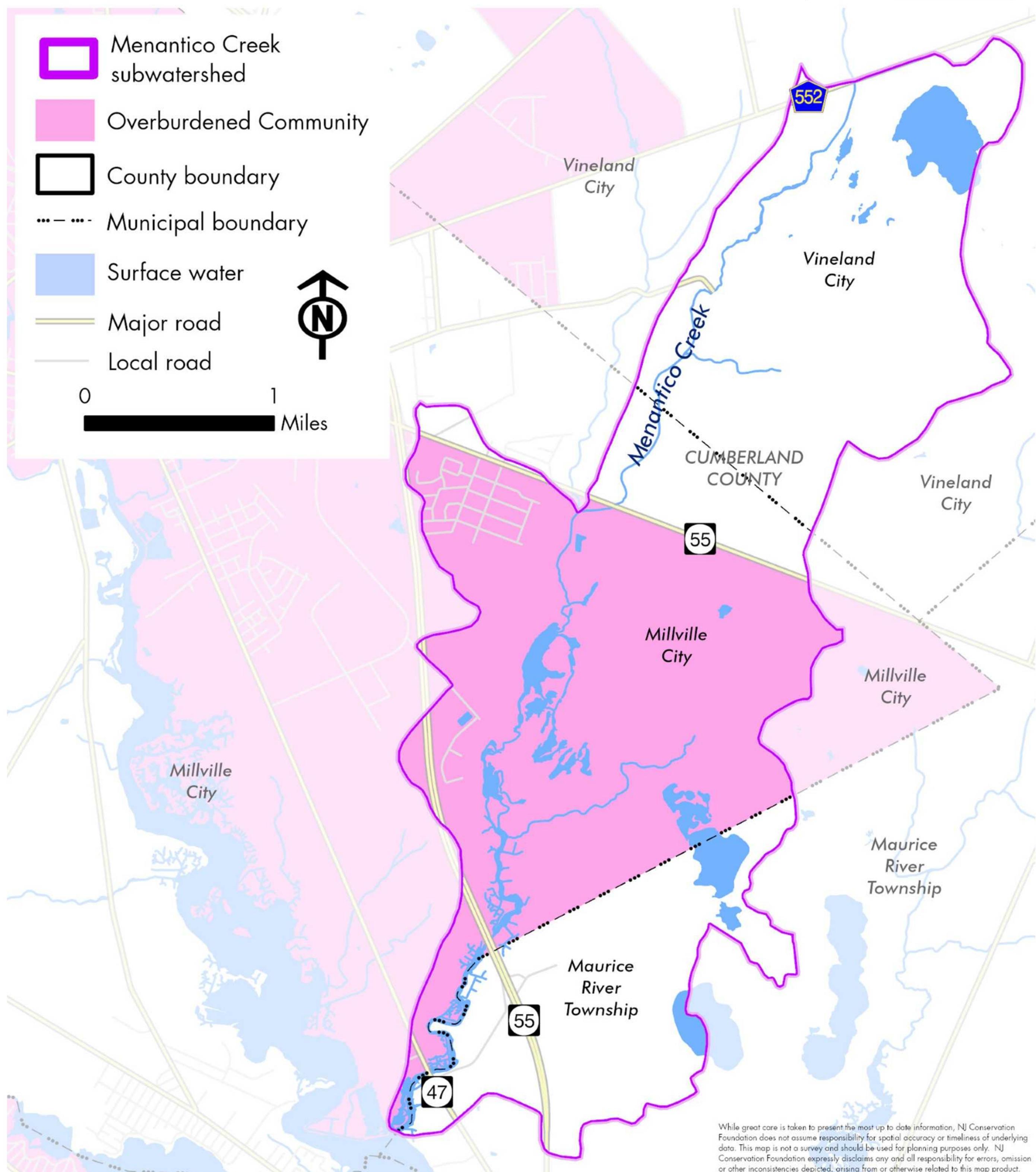
MENANTICO CREEK Profile

Total area: 6,085 +/- acres

Counties: Cumberland

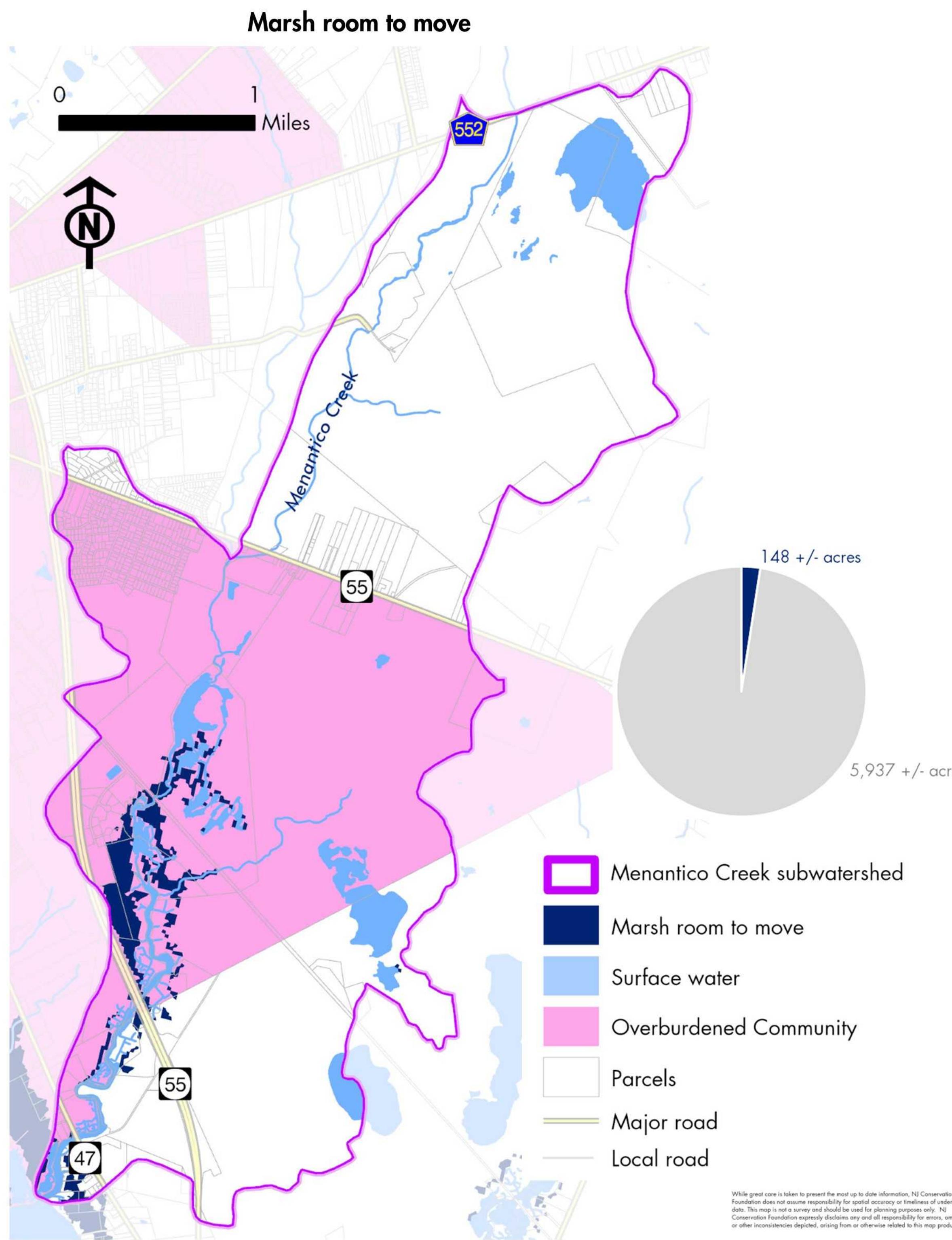
Municipalities:

- ◆ Maurice River Township
- ◆ Millville City
- ◆ Vineland City

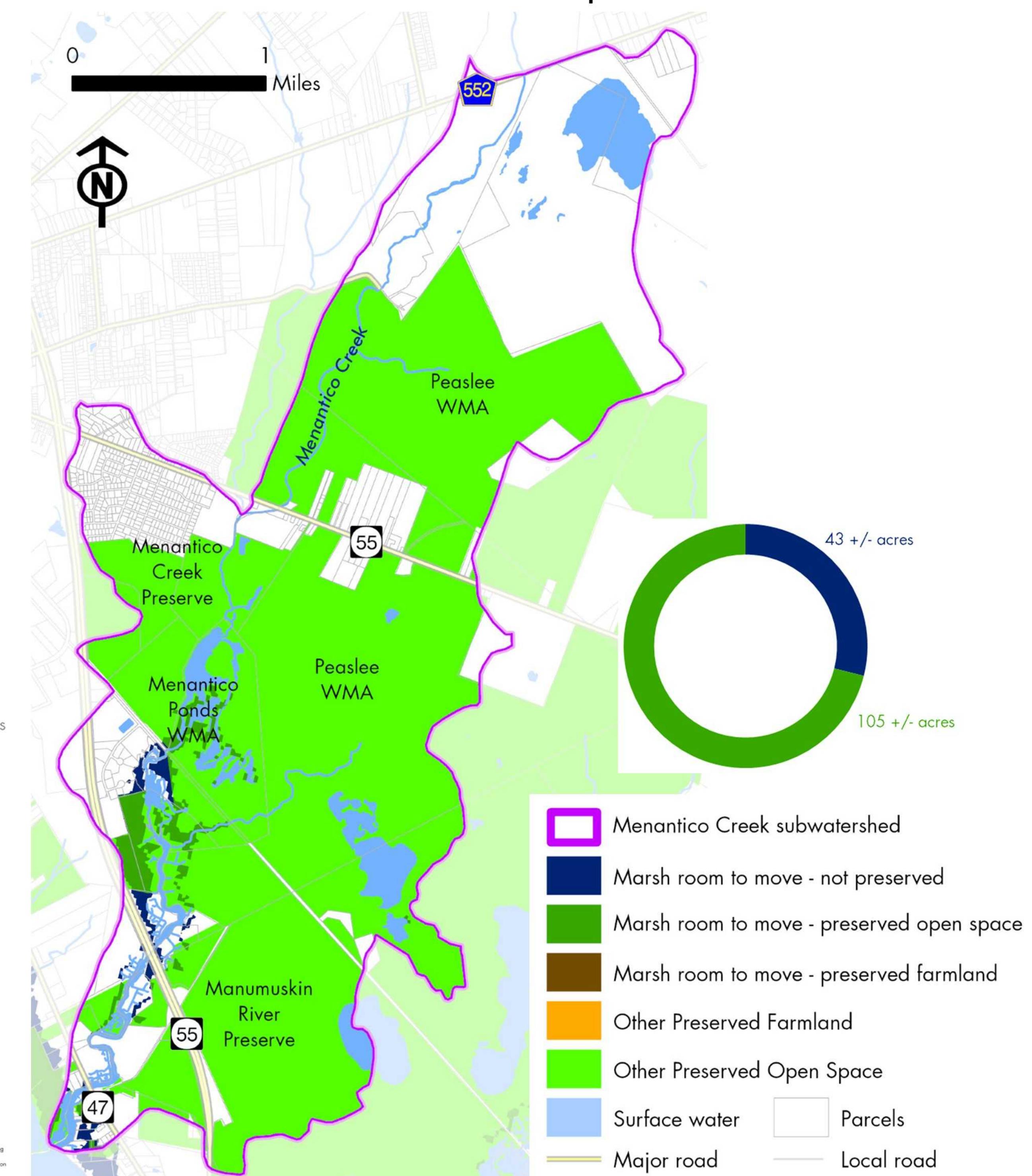


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MENANTICO RIVER Marsh room to move

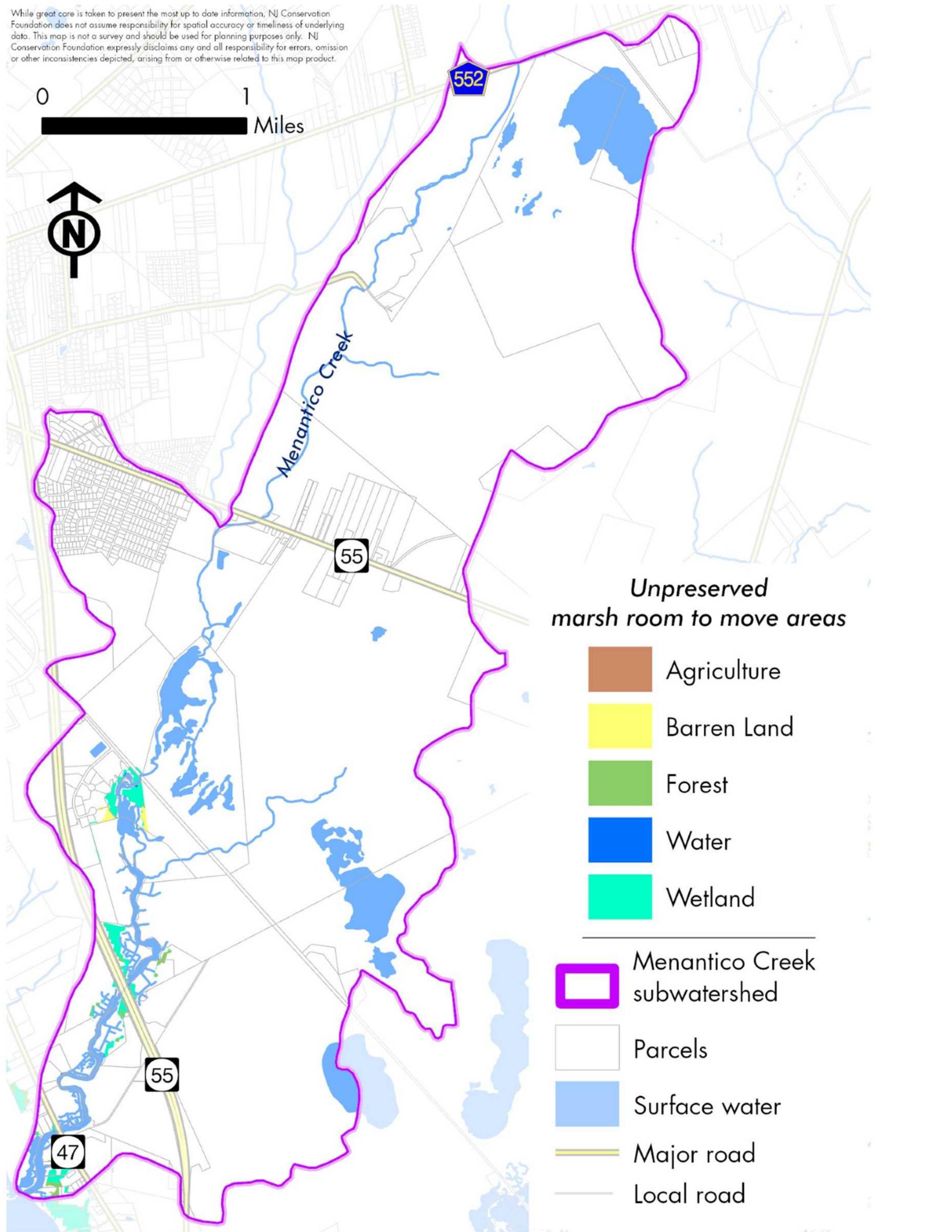


Marsh room to move—preservation status



MENANTICO CREEK

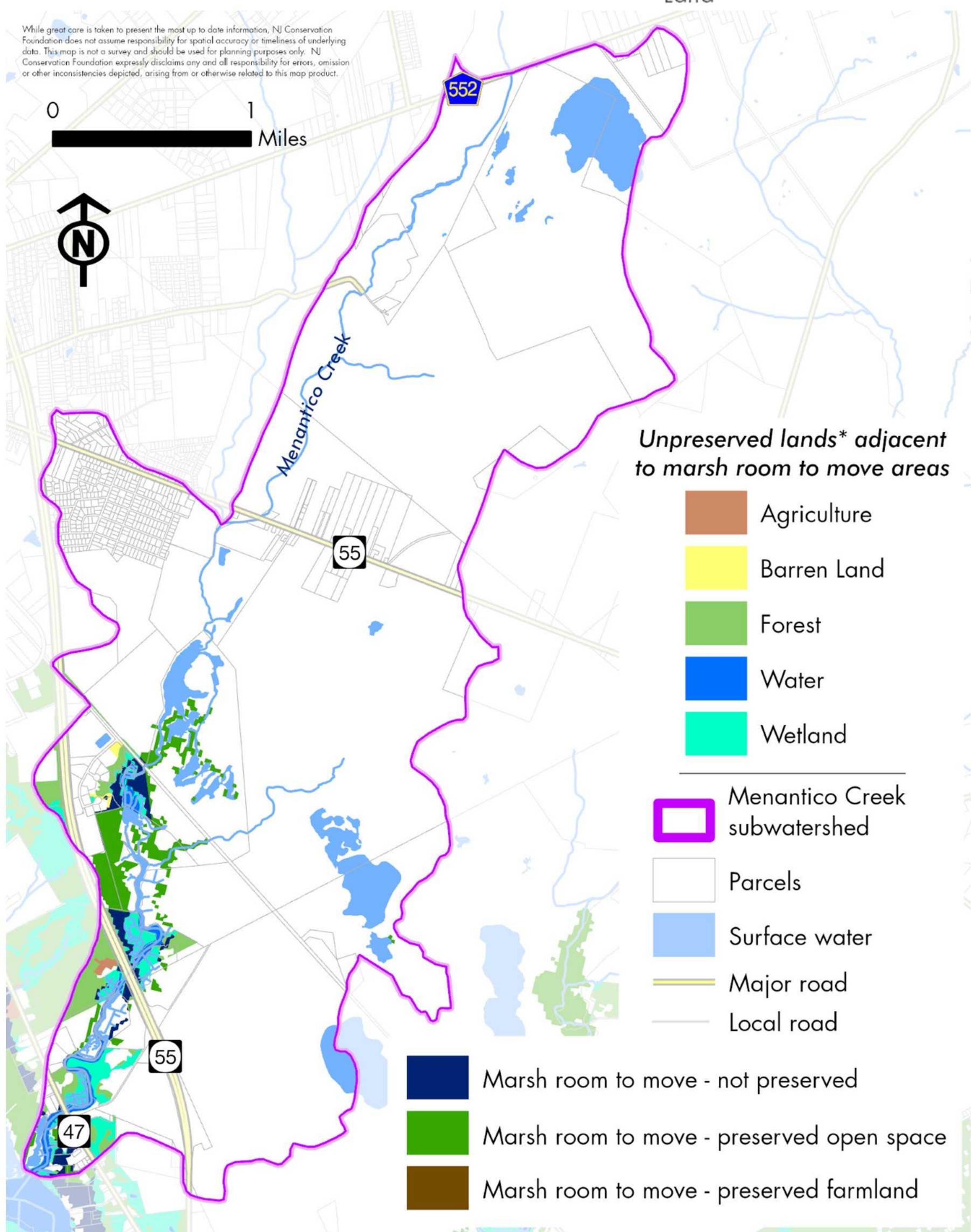
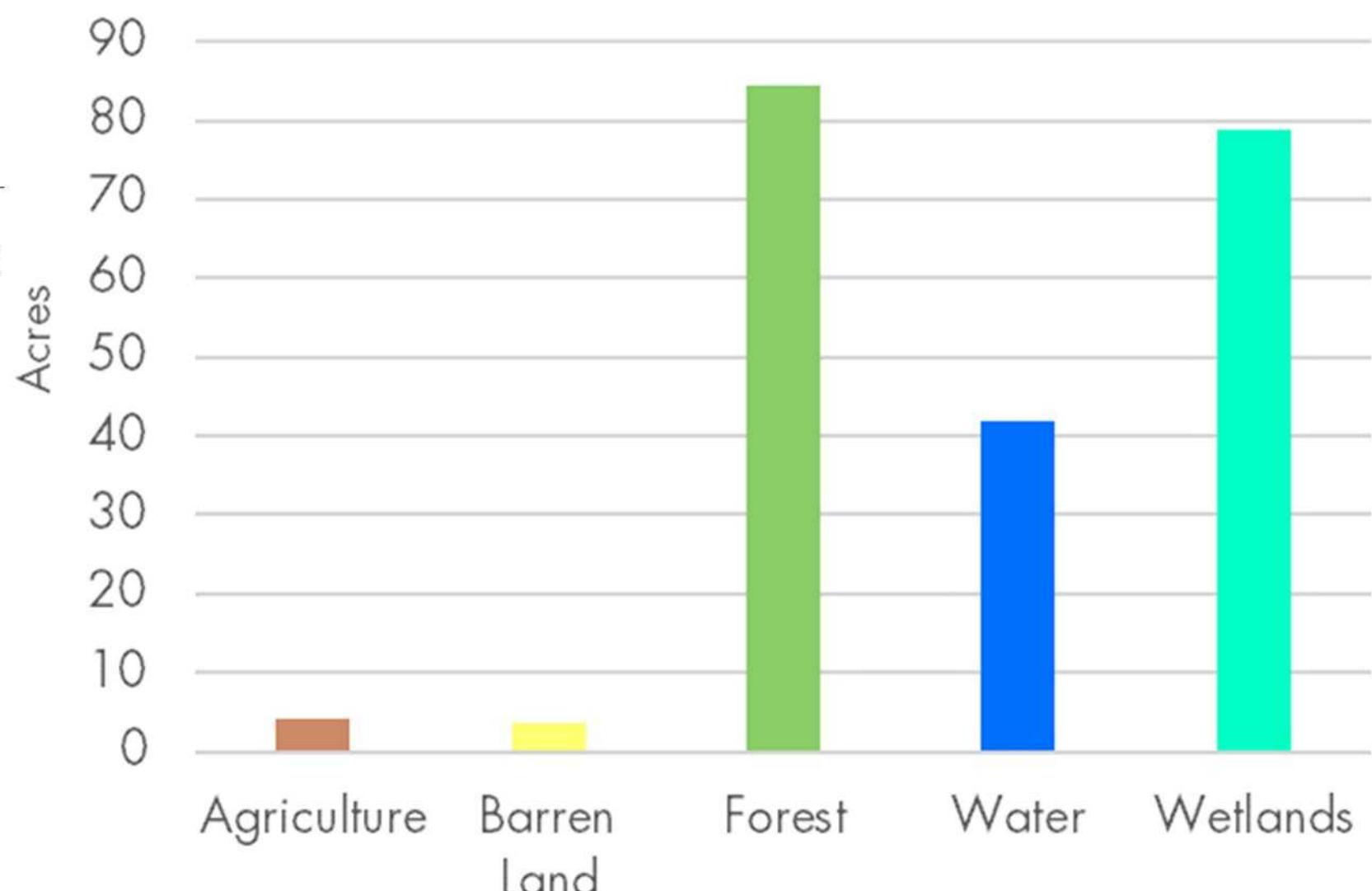
Unpreserved marsh room to move areas by landuse



MENANTICO CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



OLDMAN'S CREEK Profile

Total area: 14,743 +/- acres

Counties: Gloucester, Salem

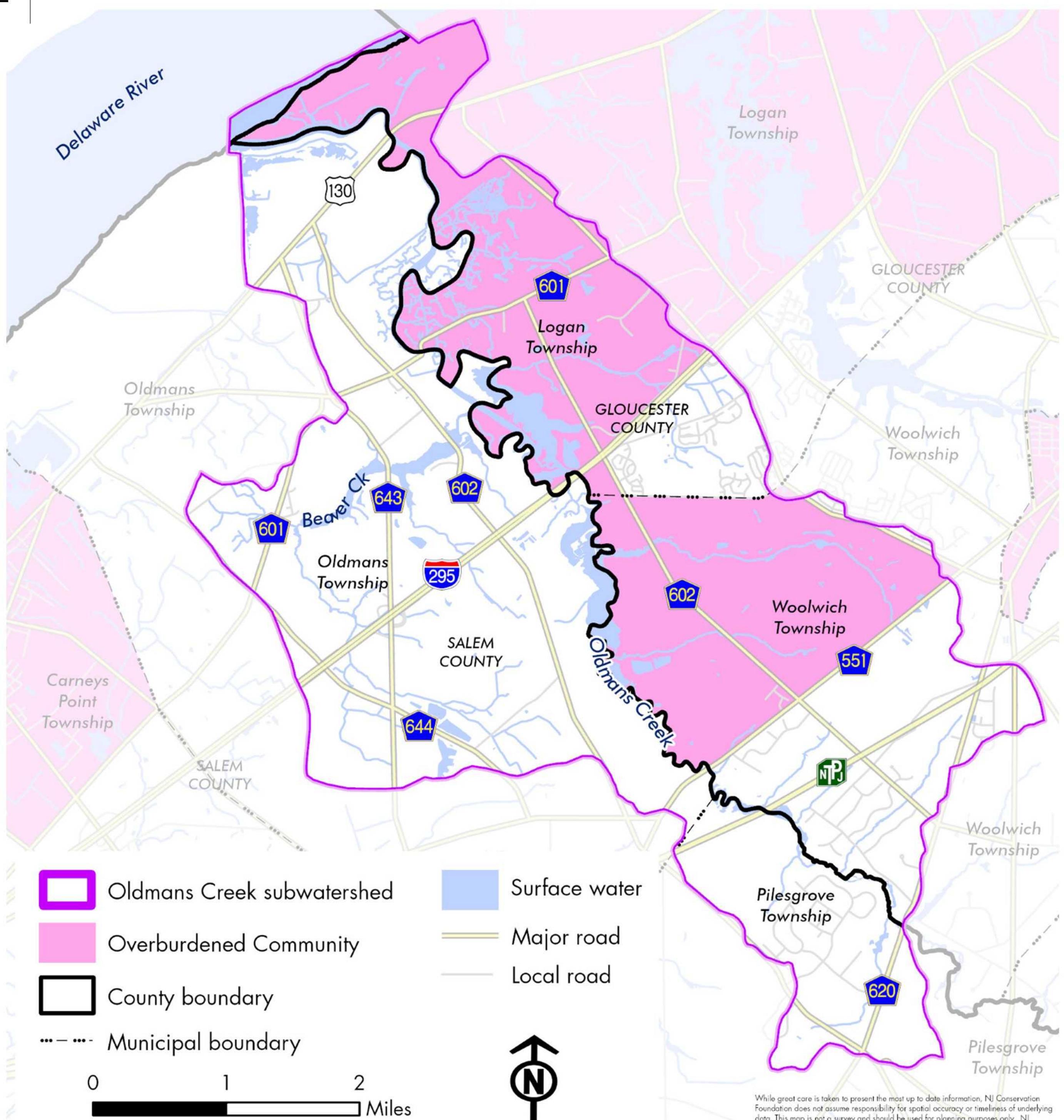
Municipalities:

Gloucester county:

- ◆ Logan Township
- ◆ Woolwich Township

Camden county:

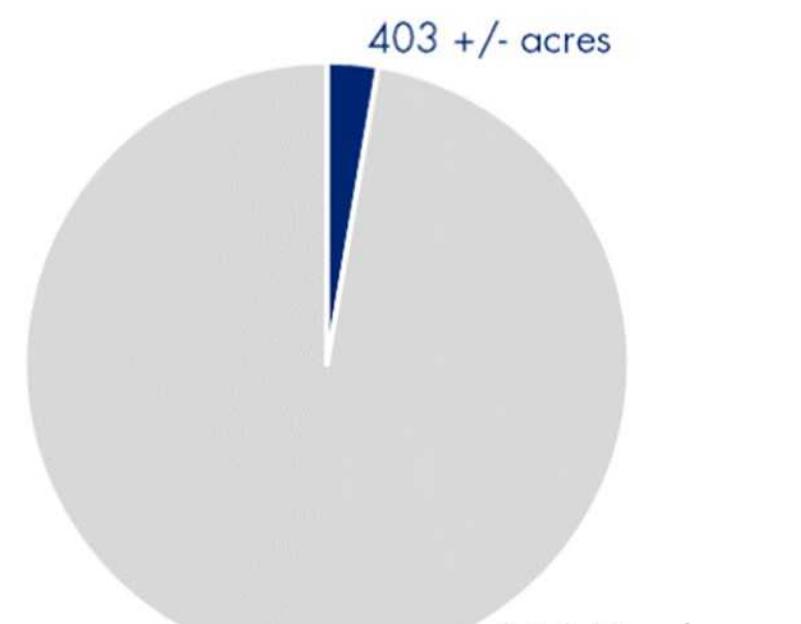
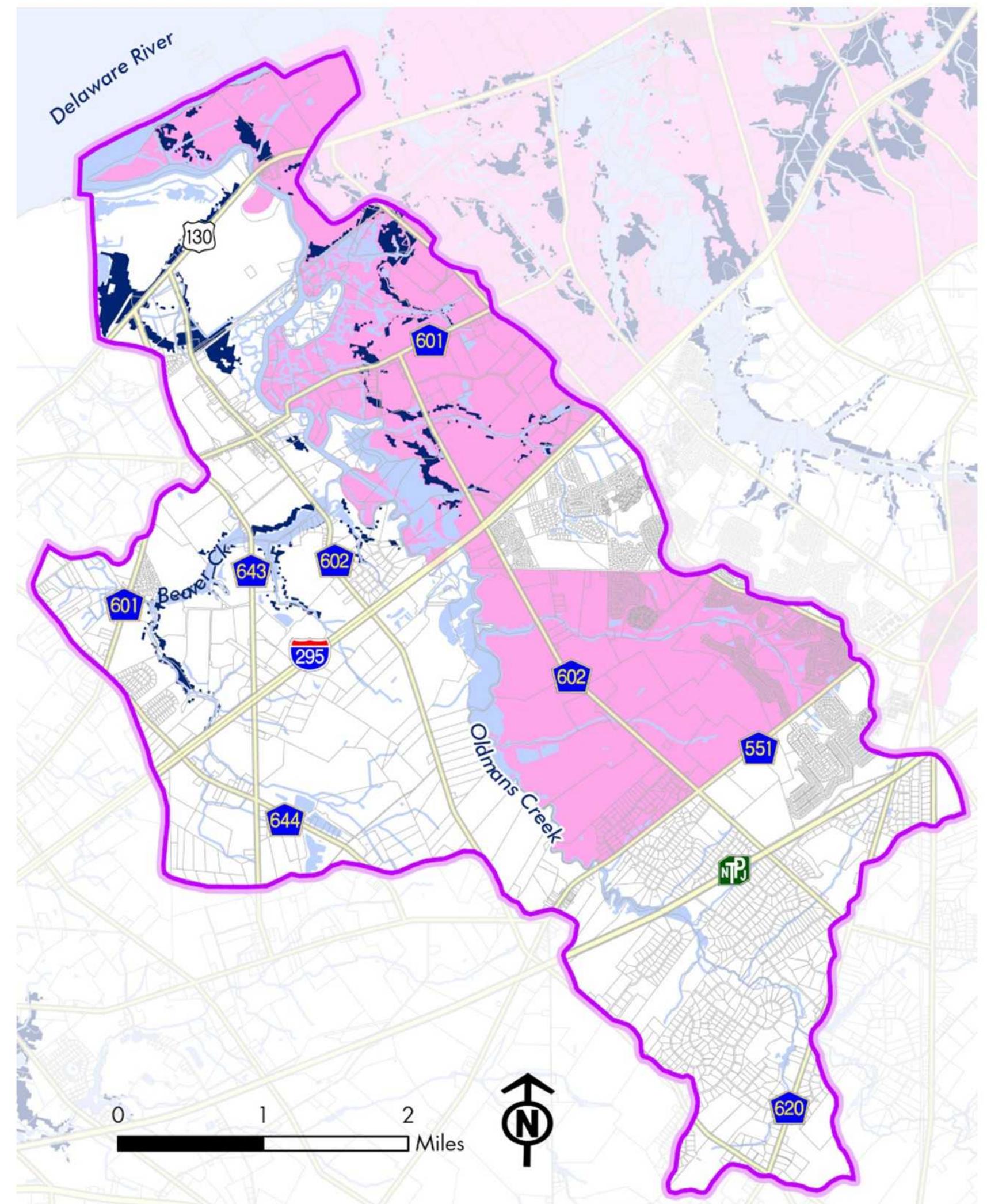
- ◆ Oldmans Township
- ◆ Pilesgrove Township



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OLDMANS CREEK Marsh room to move

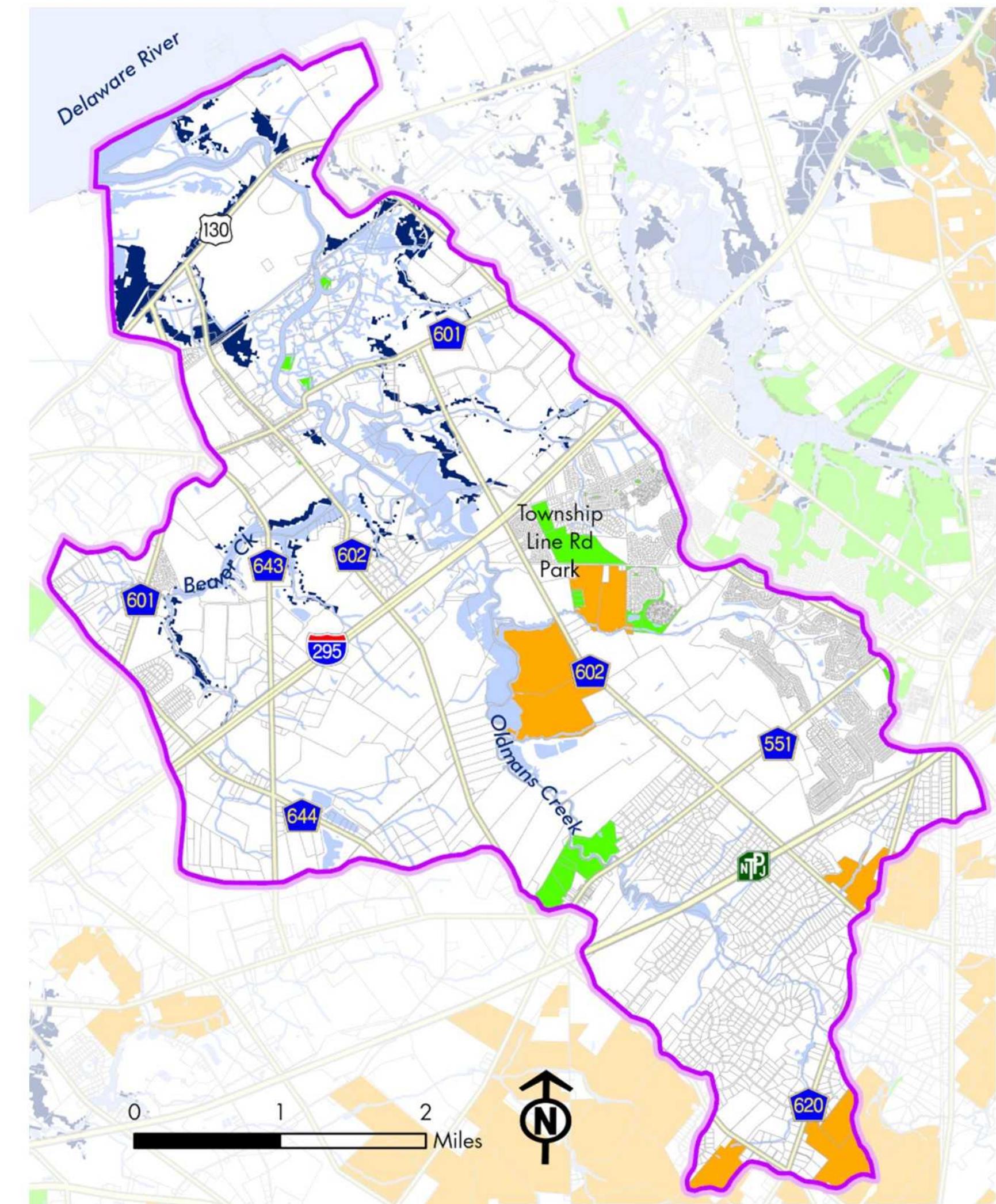
Marsh room to move



■ Marsh room to move ■ Not marsh room to move

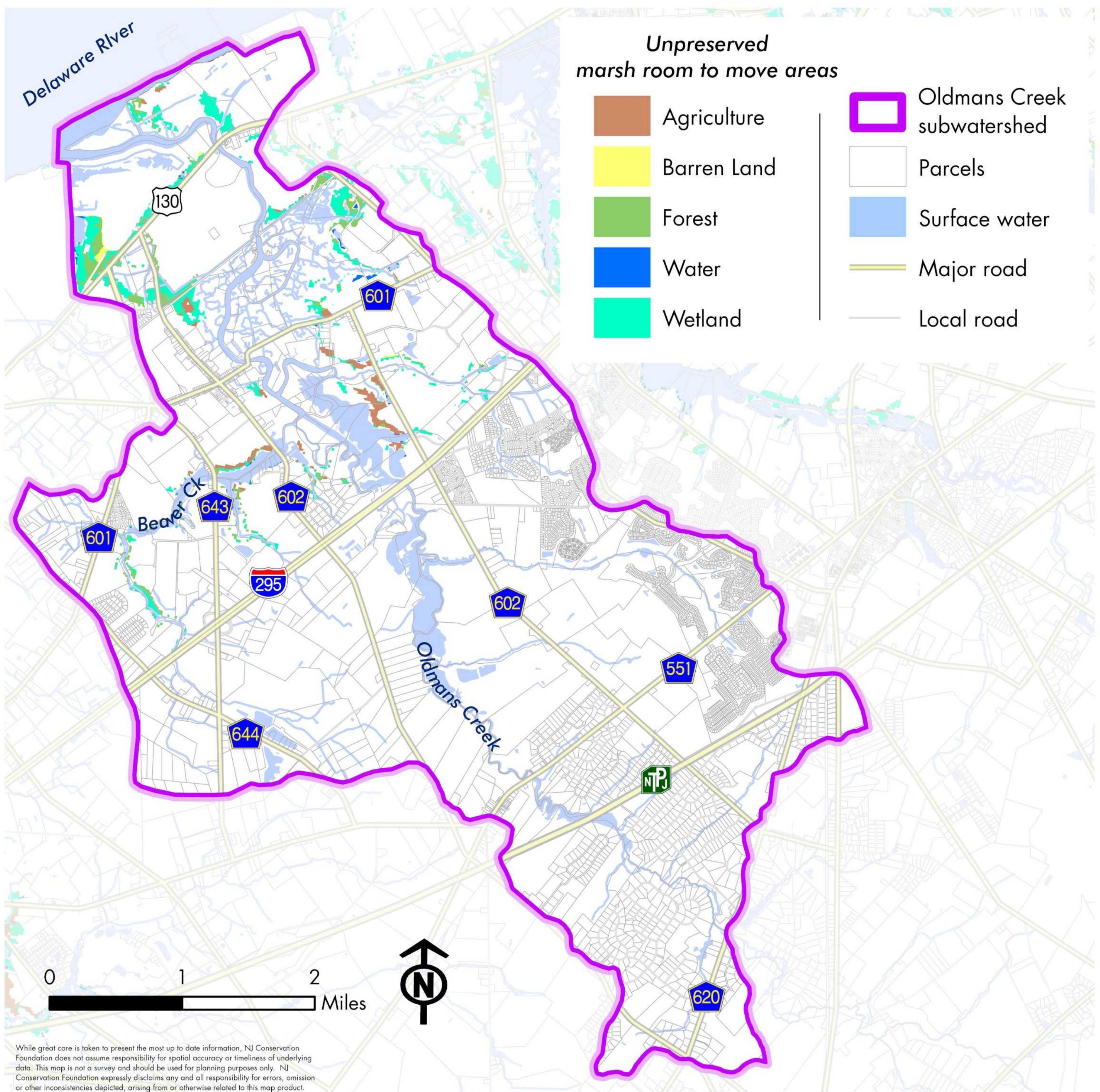
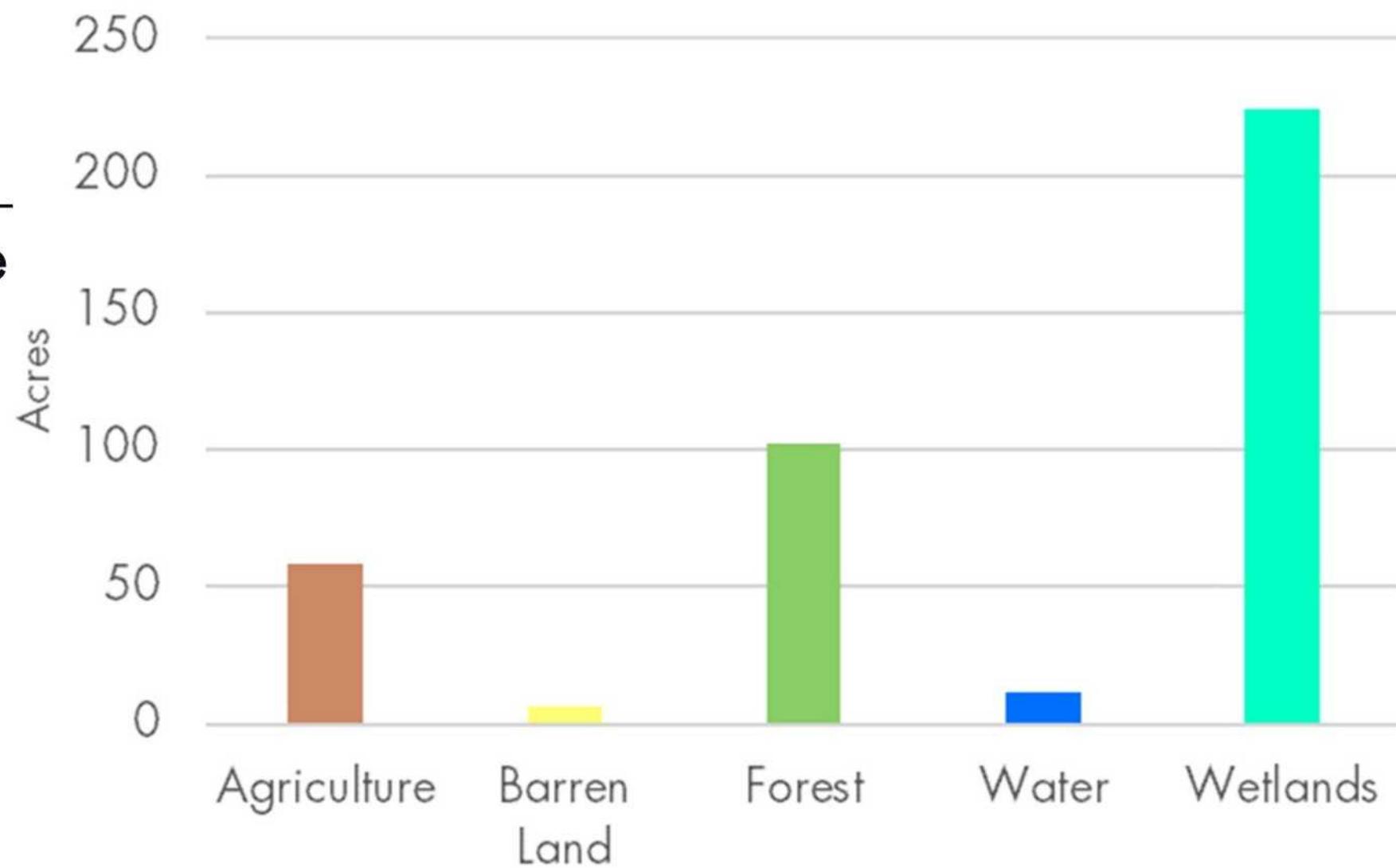
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Marsh room to move—preservation status



OLDMANS CREEK

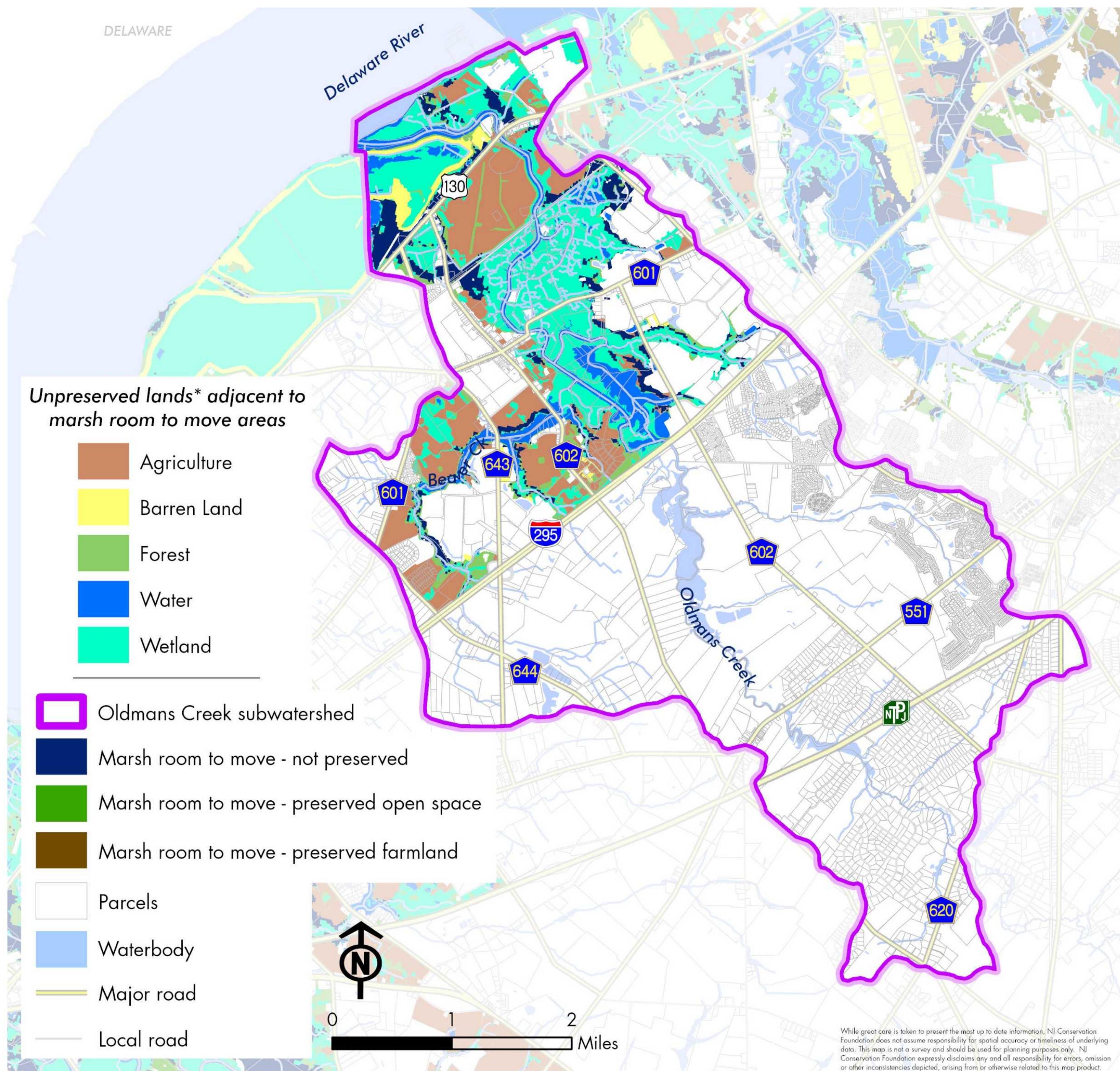
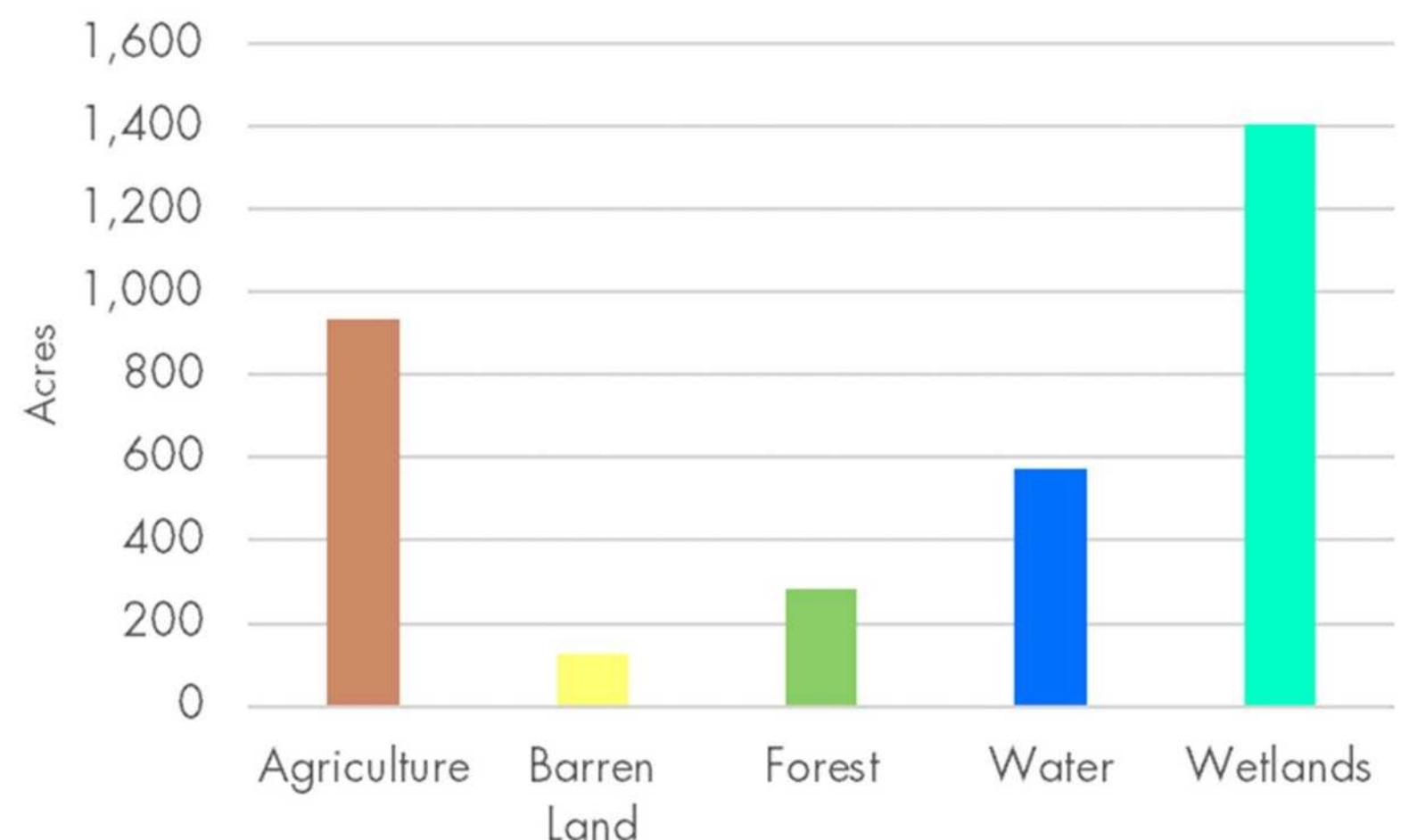
Unpreserved marsh room to move areas by landuse



OLDMANS CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



PENNSAUKEN CREEK Profile

Total area: 9,657 +/- acres

Counties: Burlington, Camden

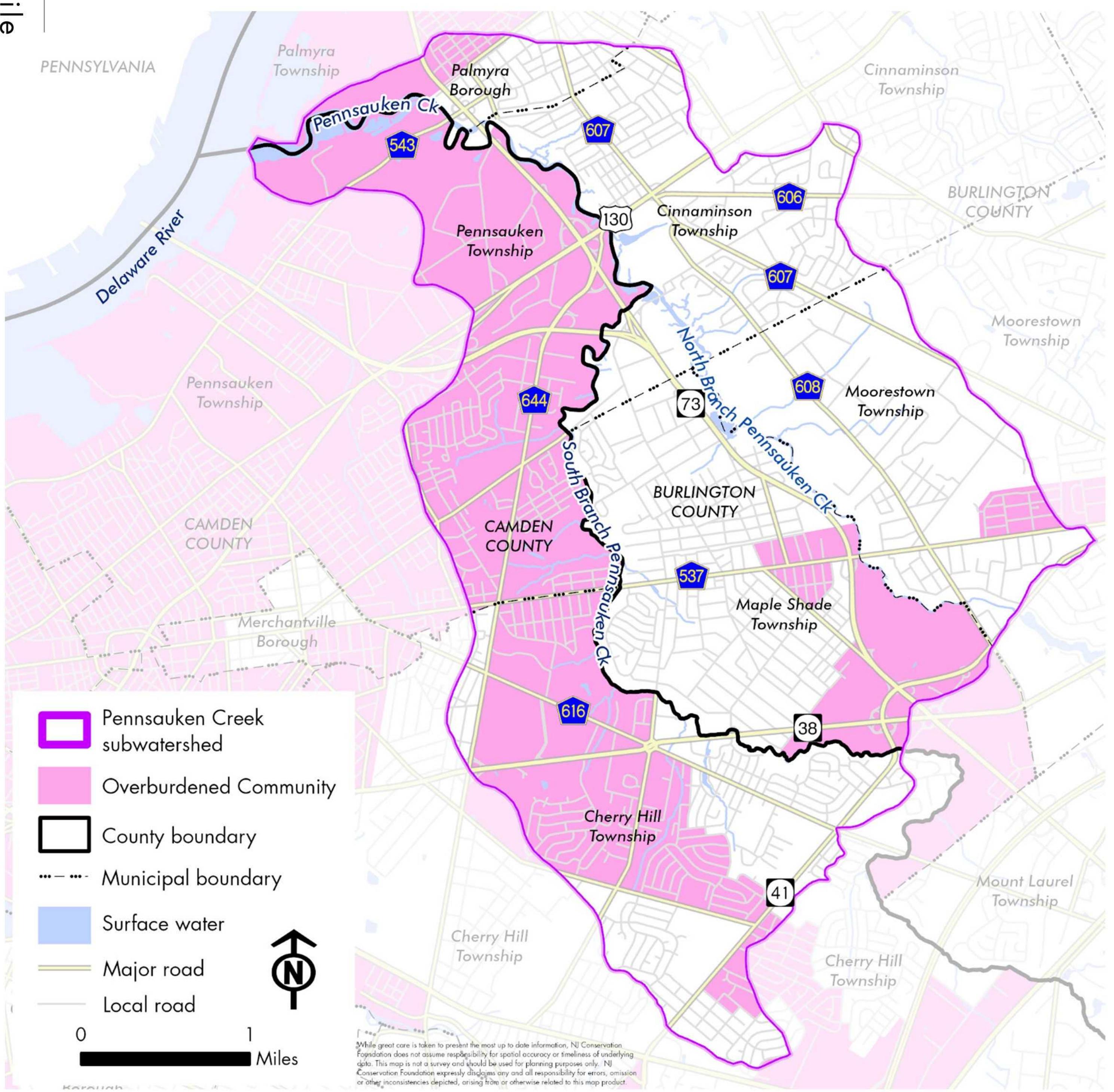
Municipalities:

Burlington county:

- ◆ Cinnaminson Township
- ◆ Maple Shade Township
- ◆ Moorestown Township
- ◆ Palmyra Borough

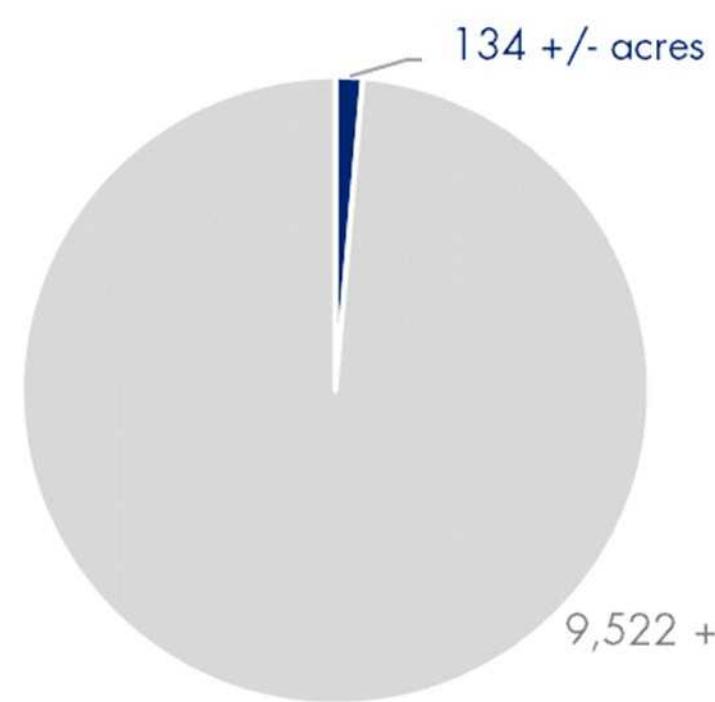
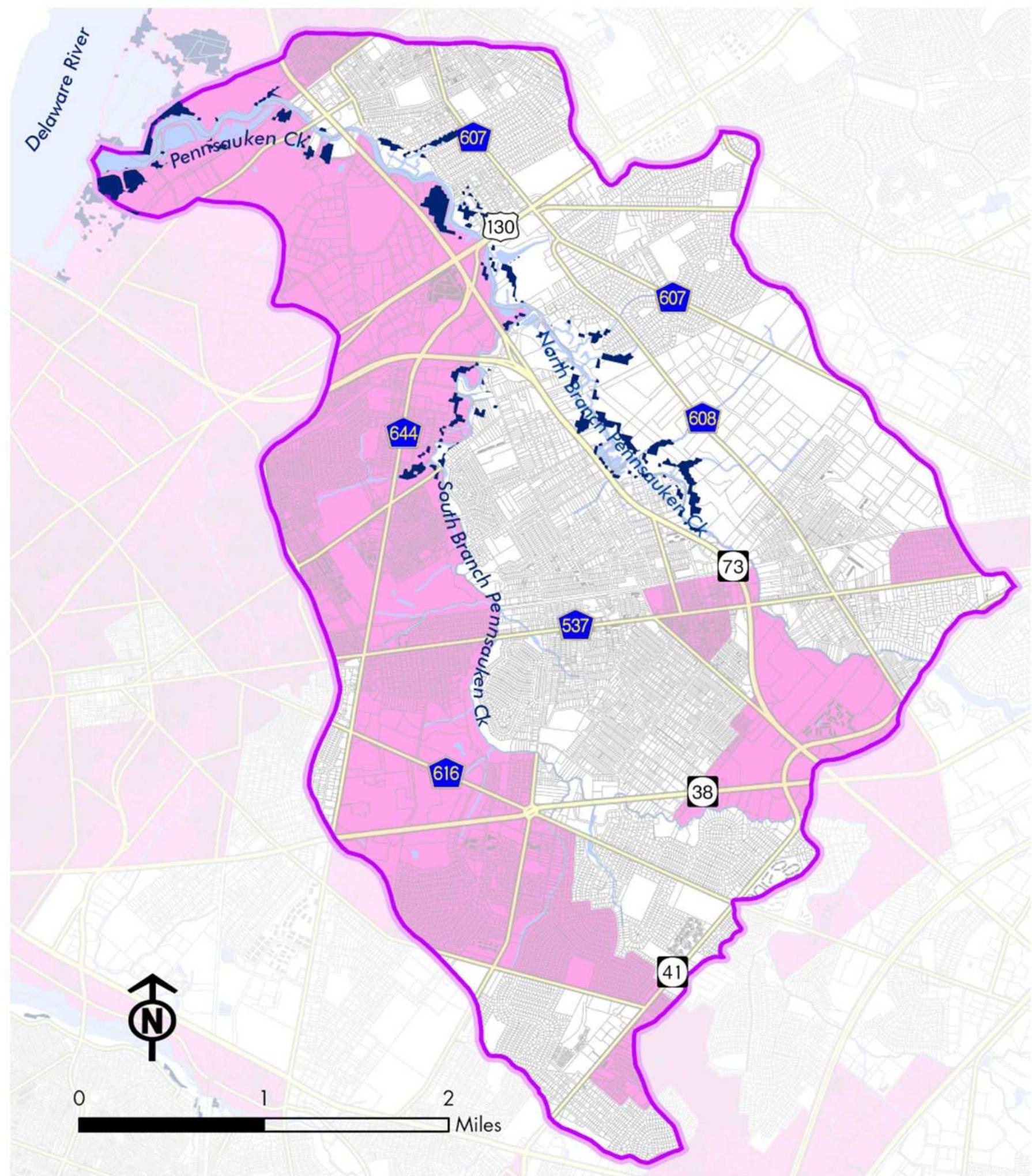
Camden county:

- ◆ Cherry Hill Township
- ◆ Pennsauken Township

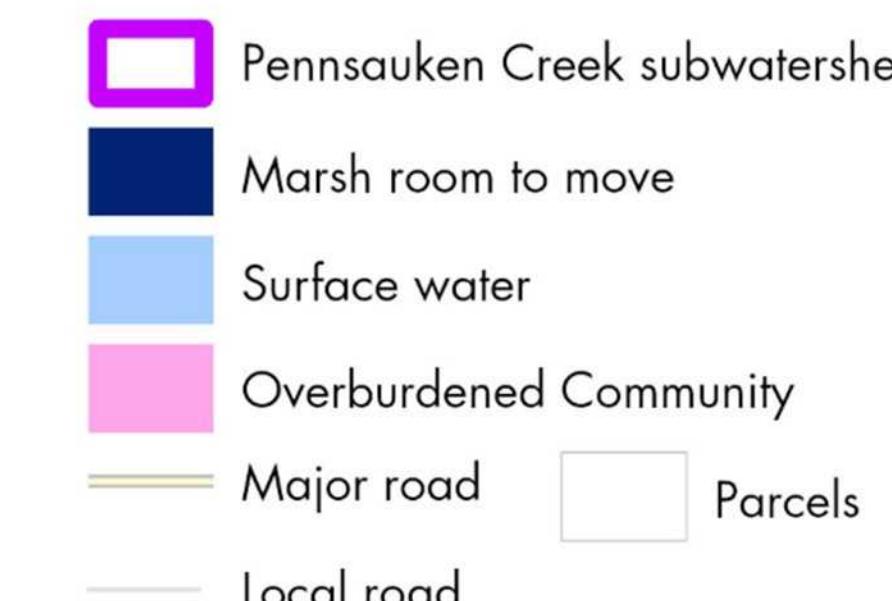


PENNSAUKEN CREEK Marsh room to move

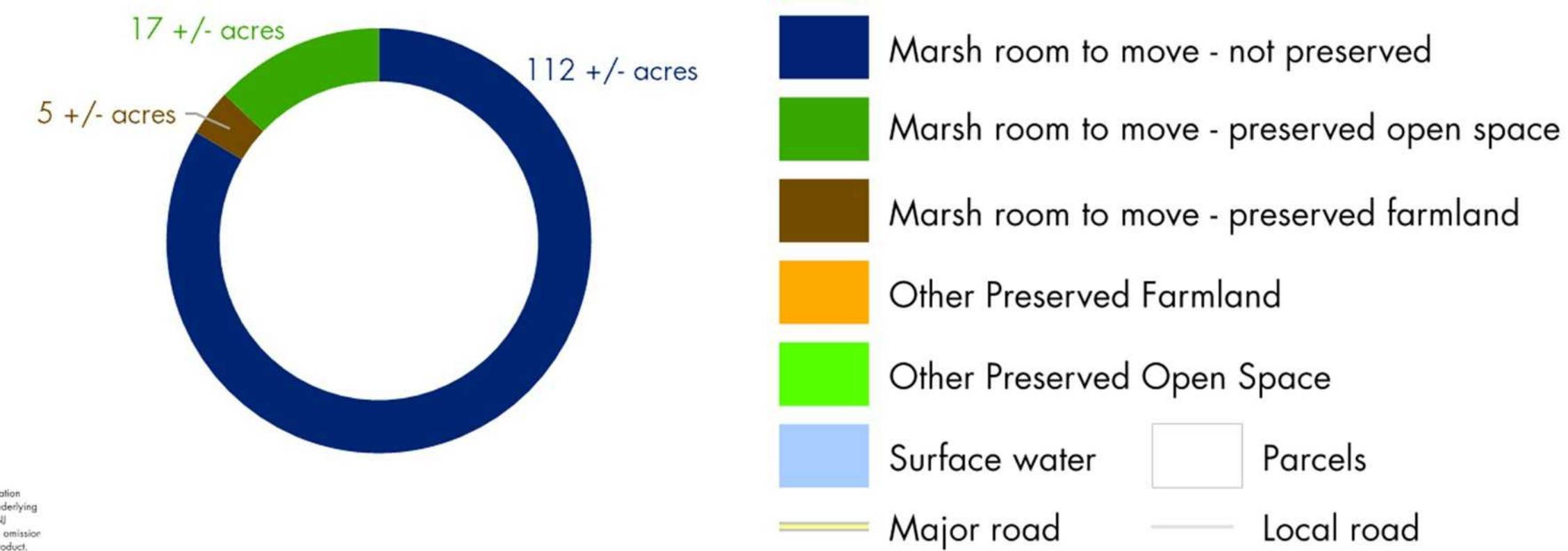
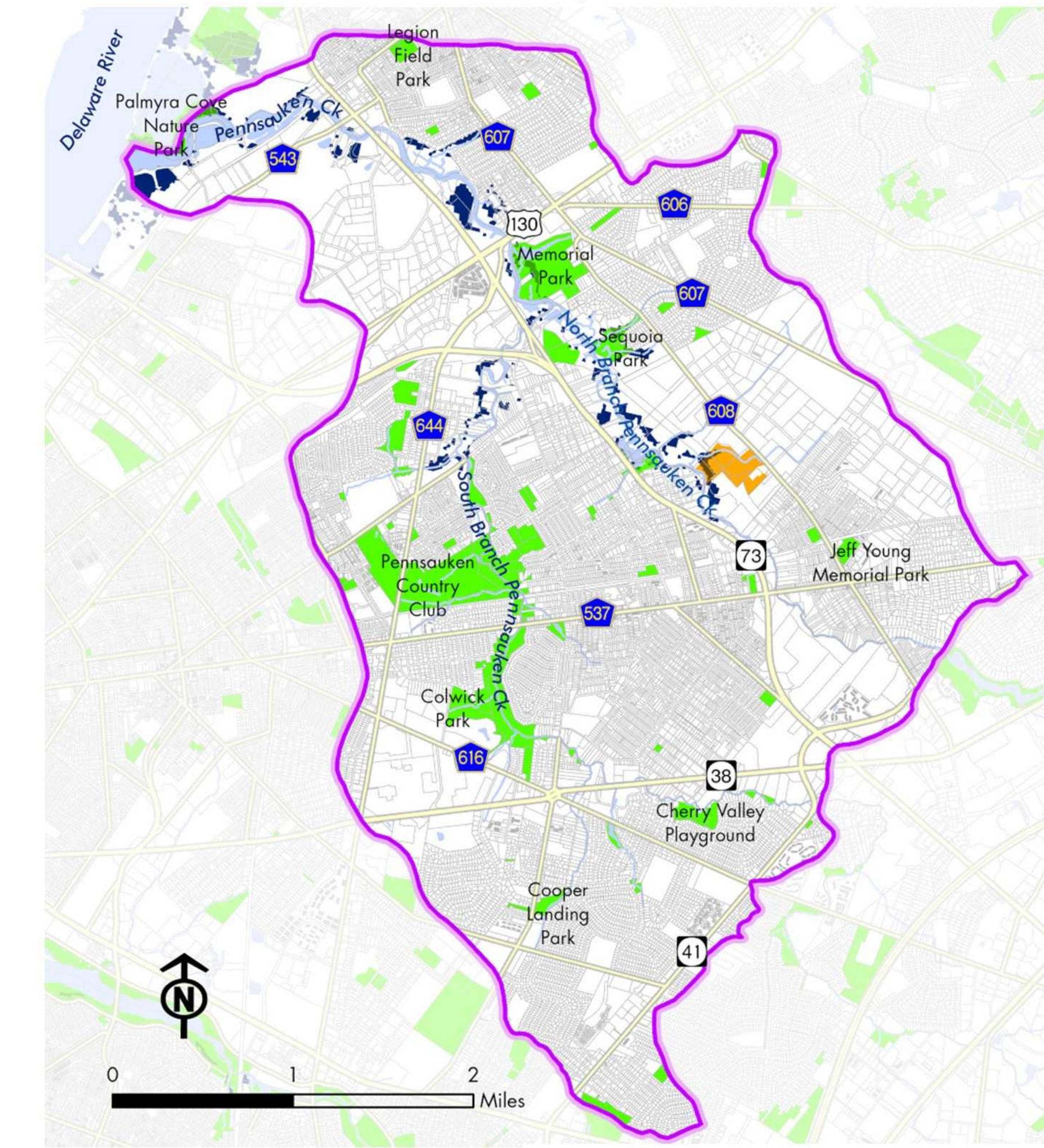
Marsh room to move



■ Marsh room to move ■ Not marsh room to move



Marsh room to move—preservation status

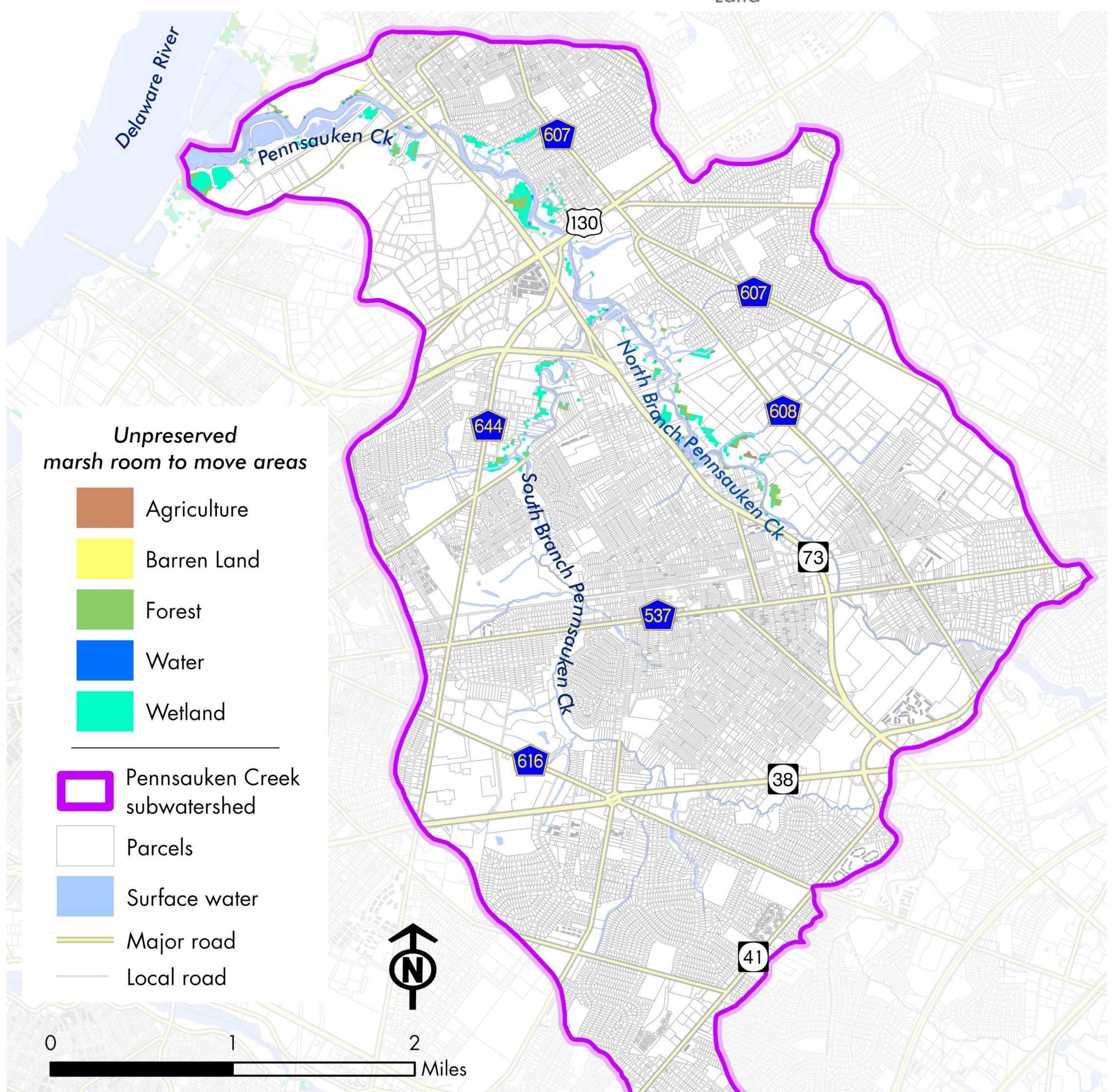
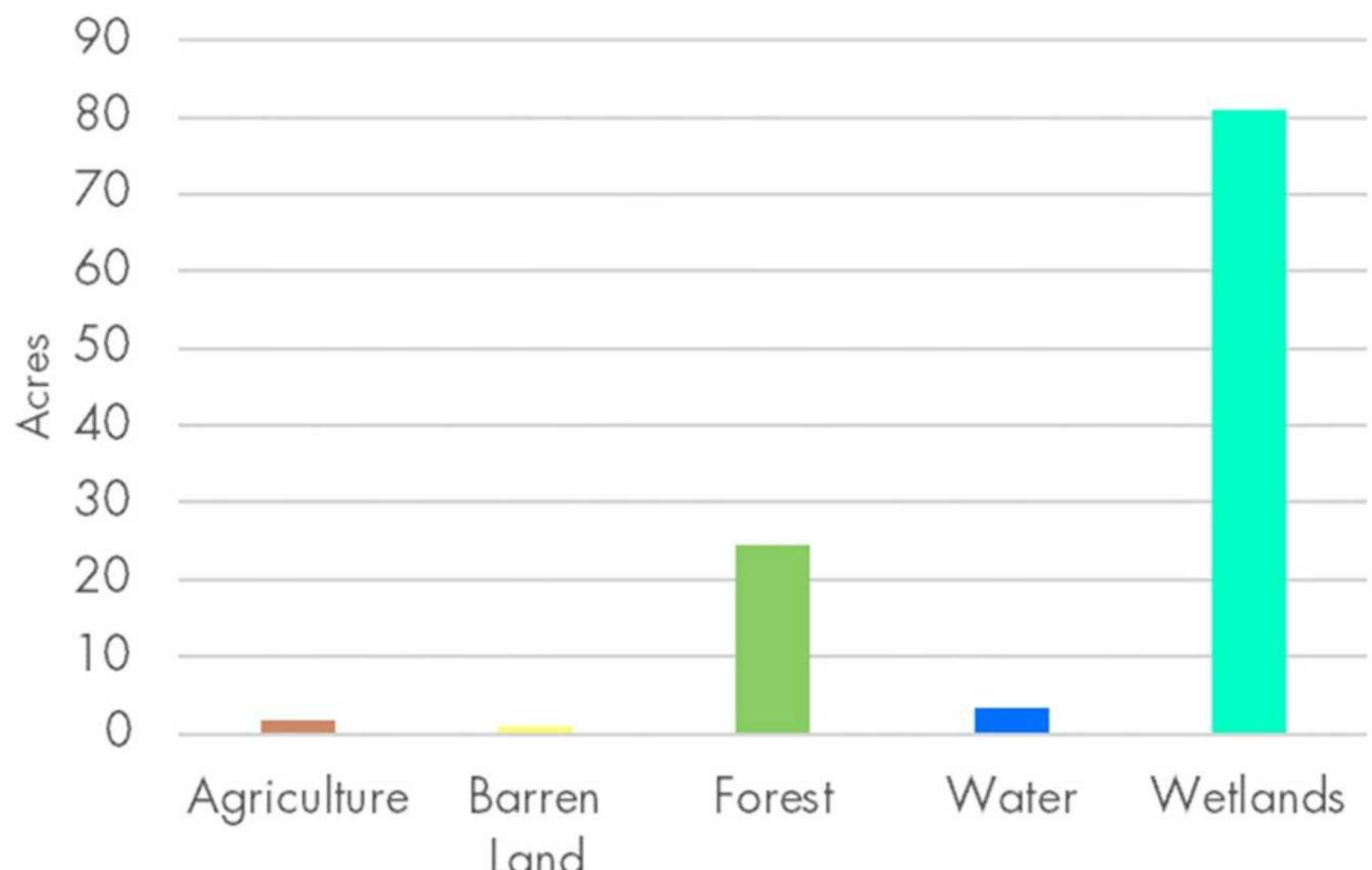


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■ Parcels
— Local road

PENNSAUKEN CREEK

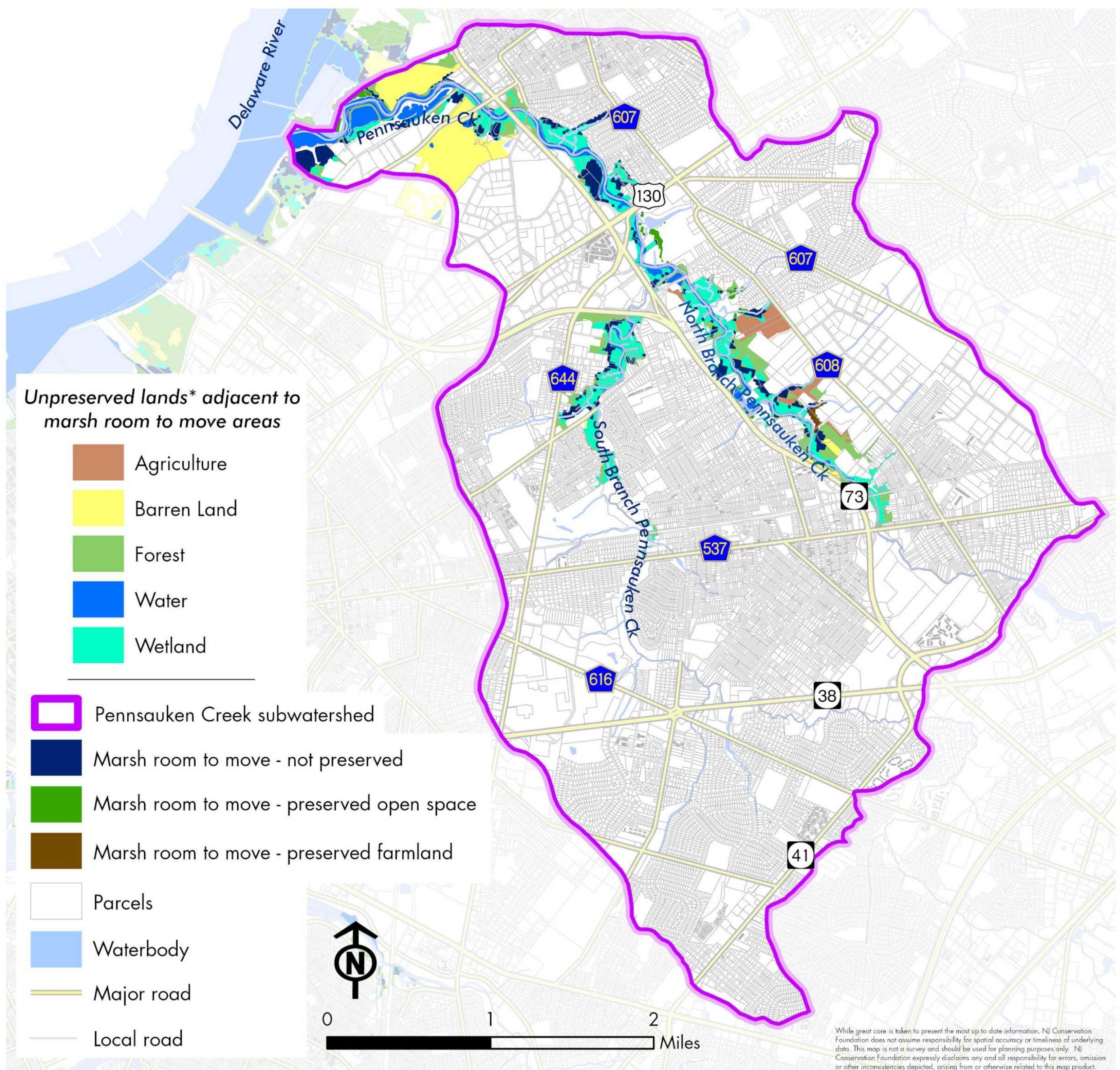
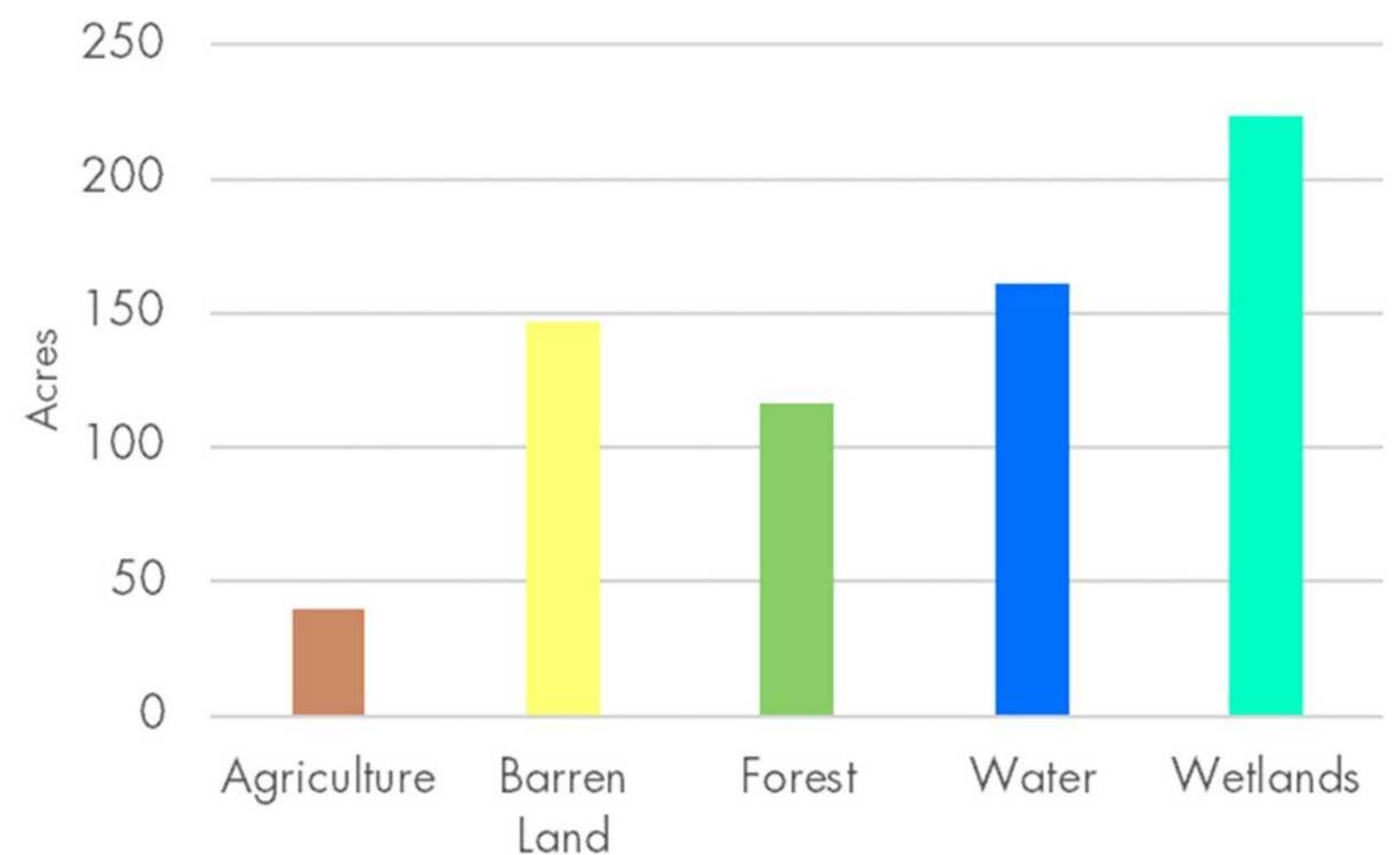
Unpreserved marsh room to move areas by landuse



PENNSAUKEN CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



POMPESTON CREEK / SWEDES RUN

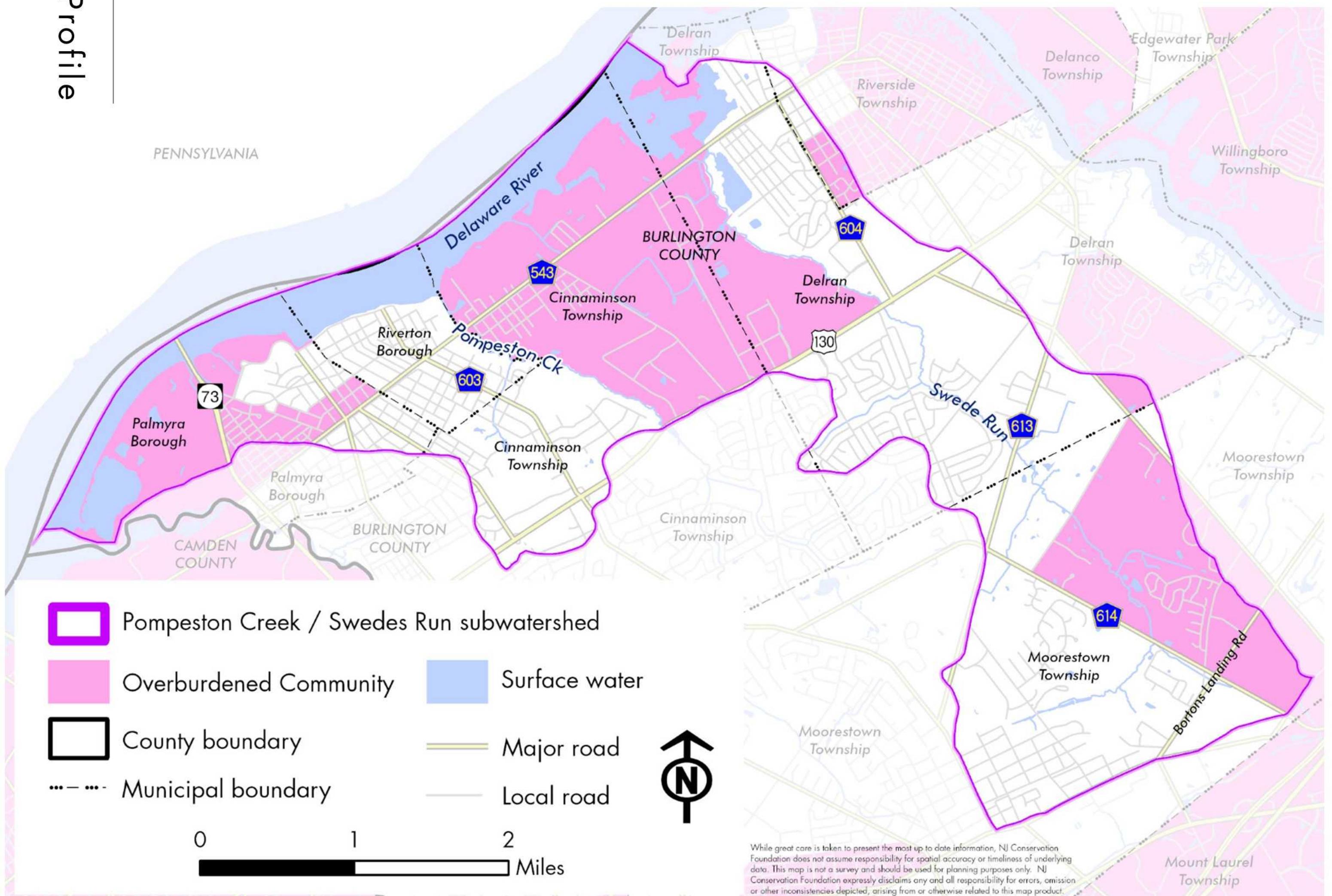
Profile

Total area: 9,271 +/- acres

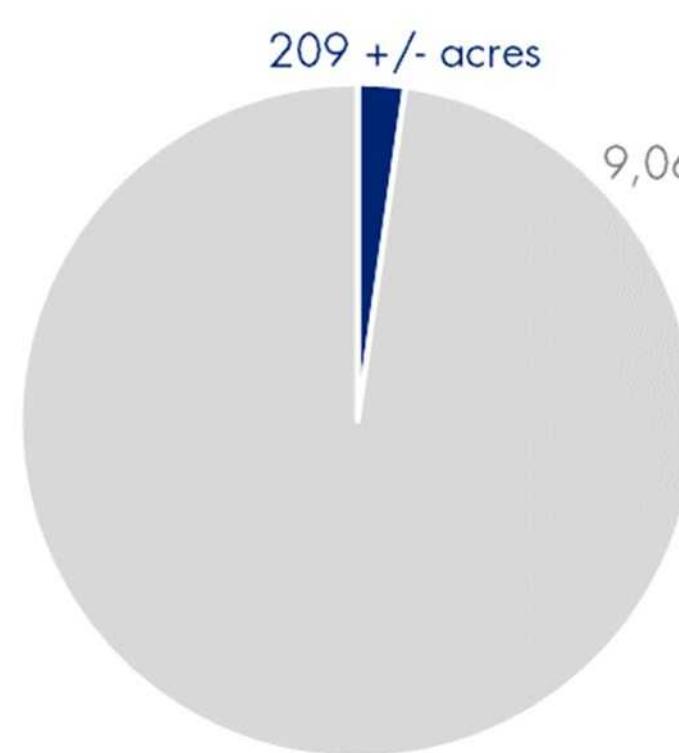
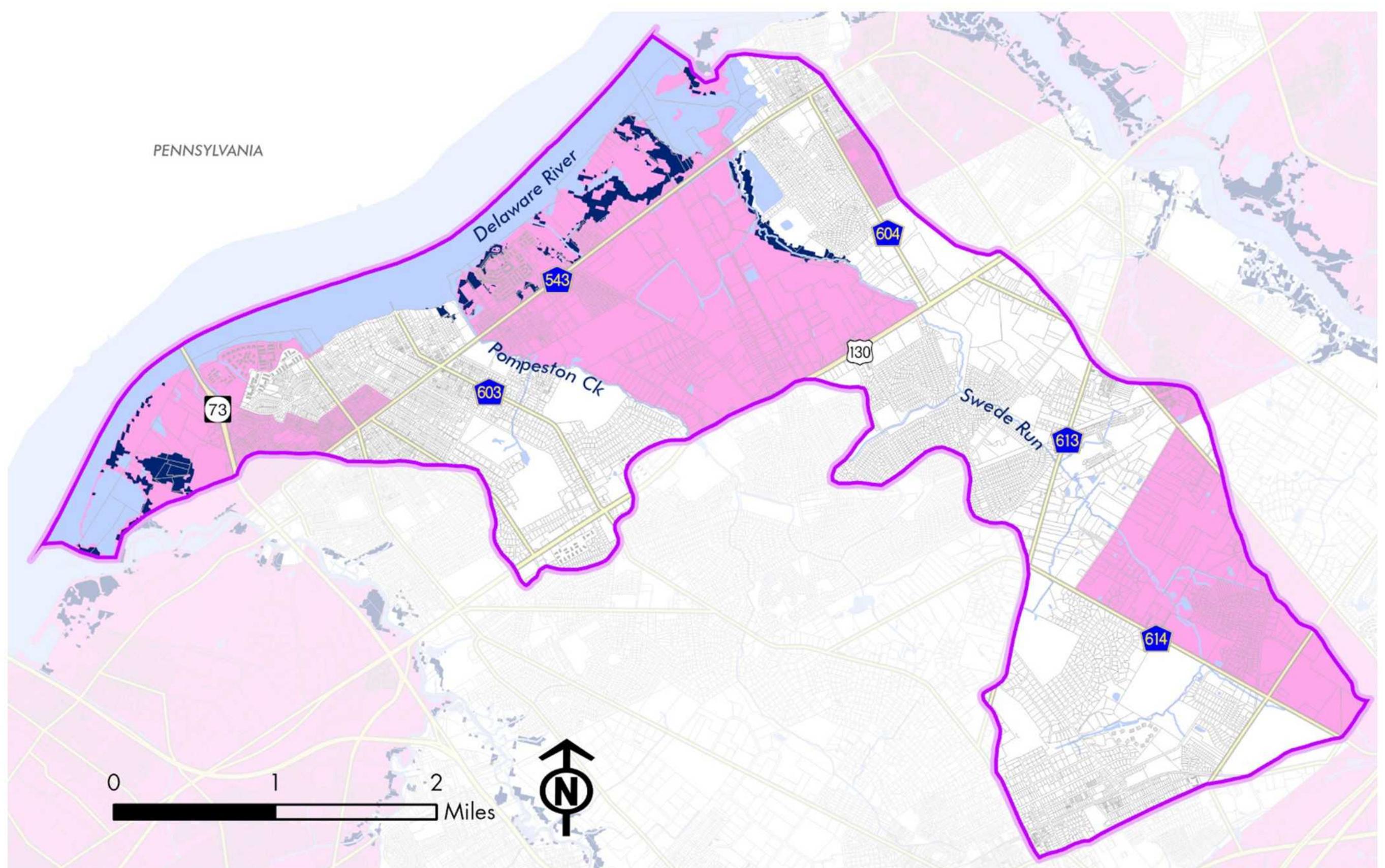
Counties: Burlington

Municipalities:

- ◆ Cinnaminson Township
- ◆ Delran Township
- ◆ Moorestown Township
- ◆ Palmyra Borough
- ◆ Riverside Township
- ◆ Riverton Borough



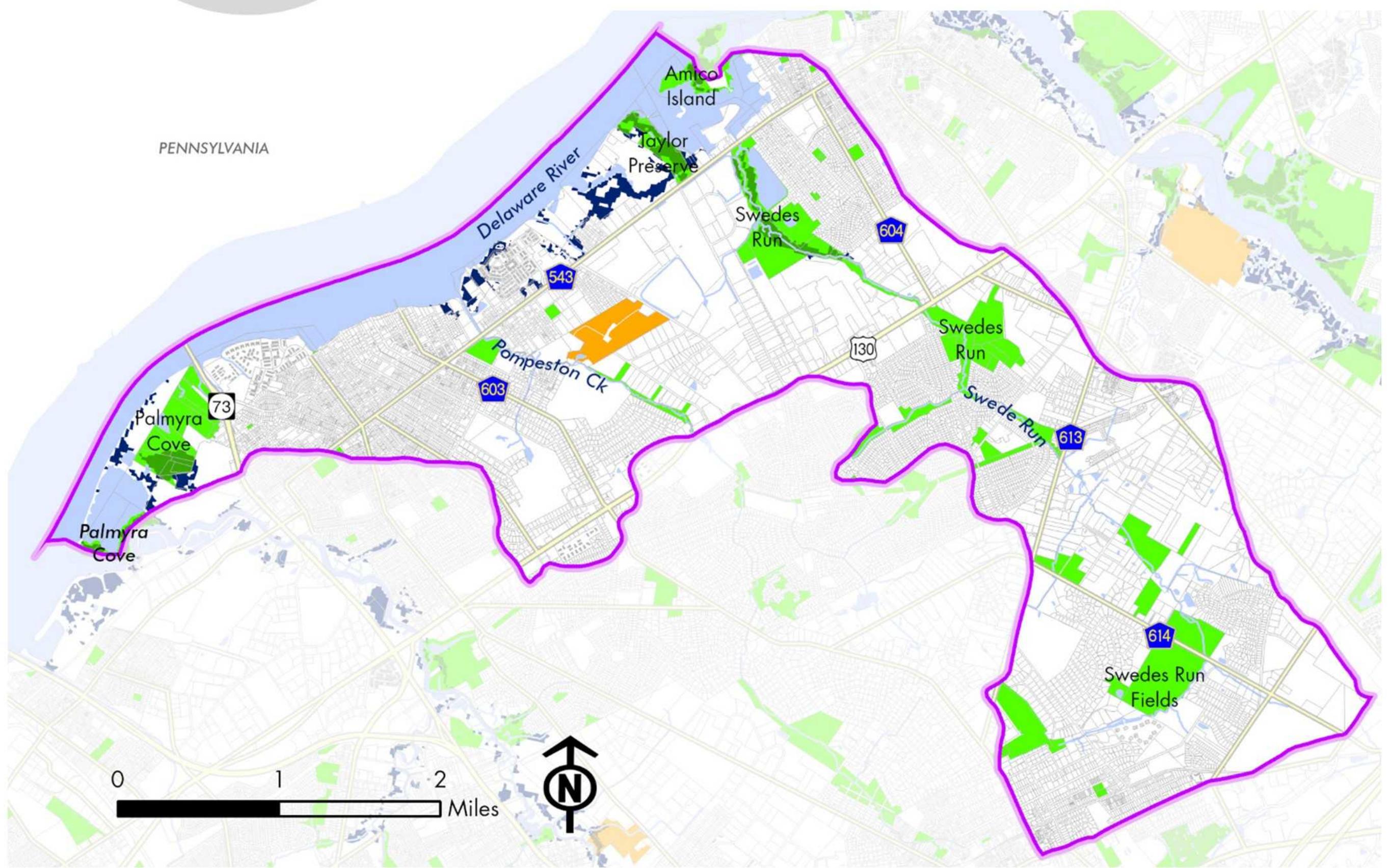
POMPESTON CREEK / SWEDES RUN Marsh room to move



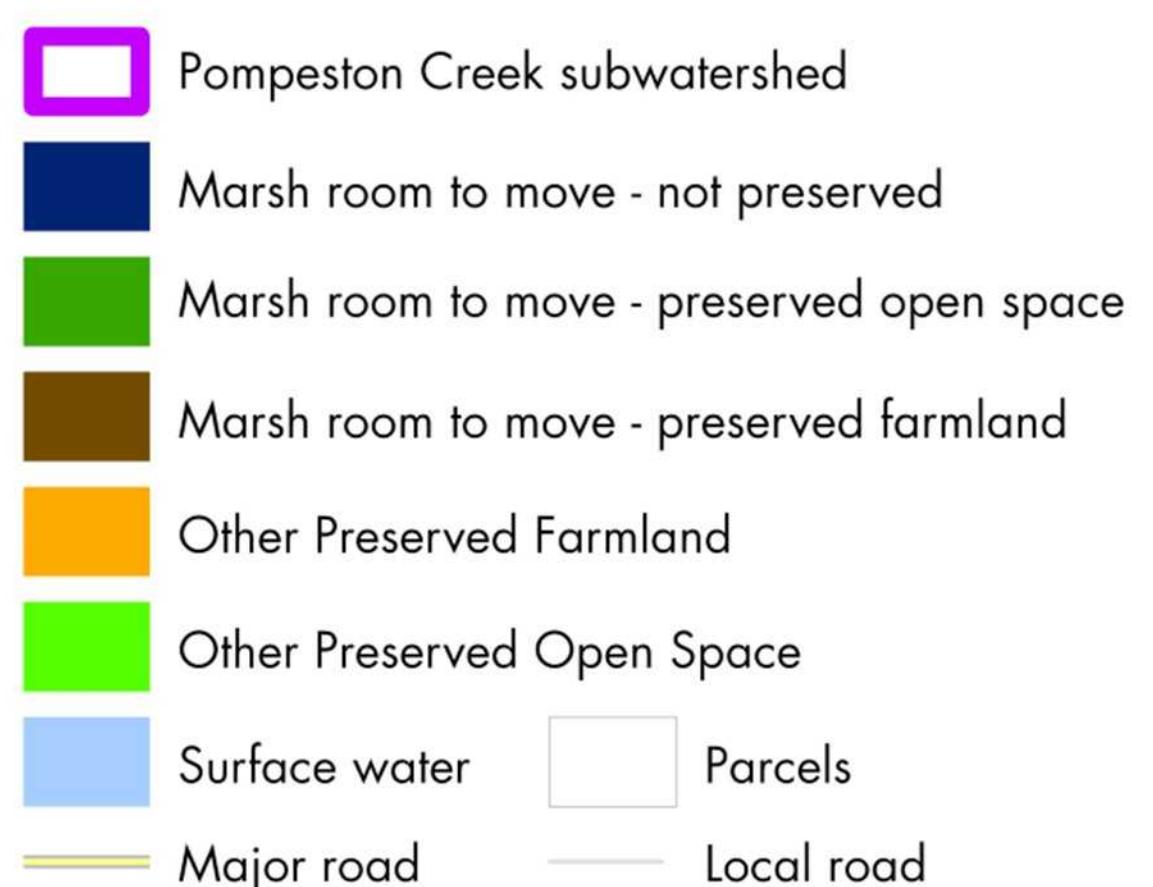
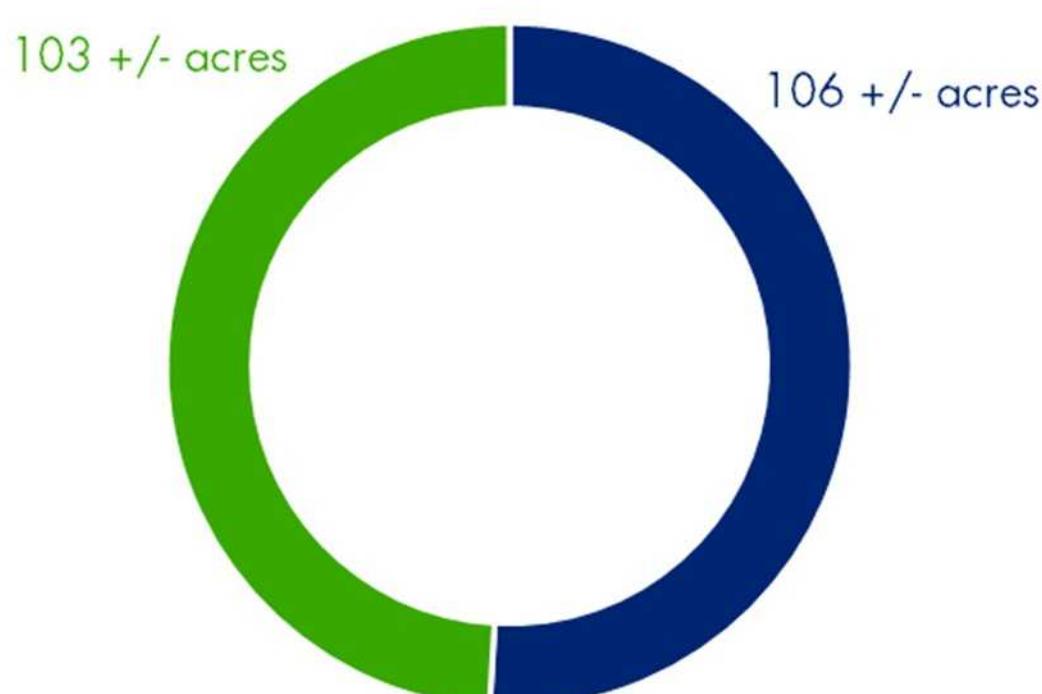
Marsh room to move



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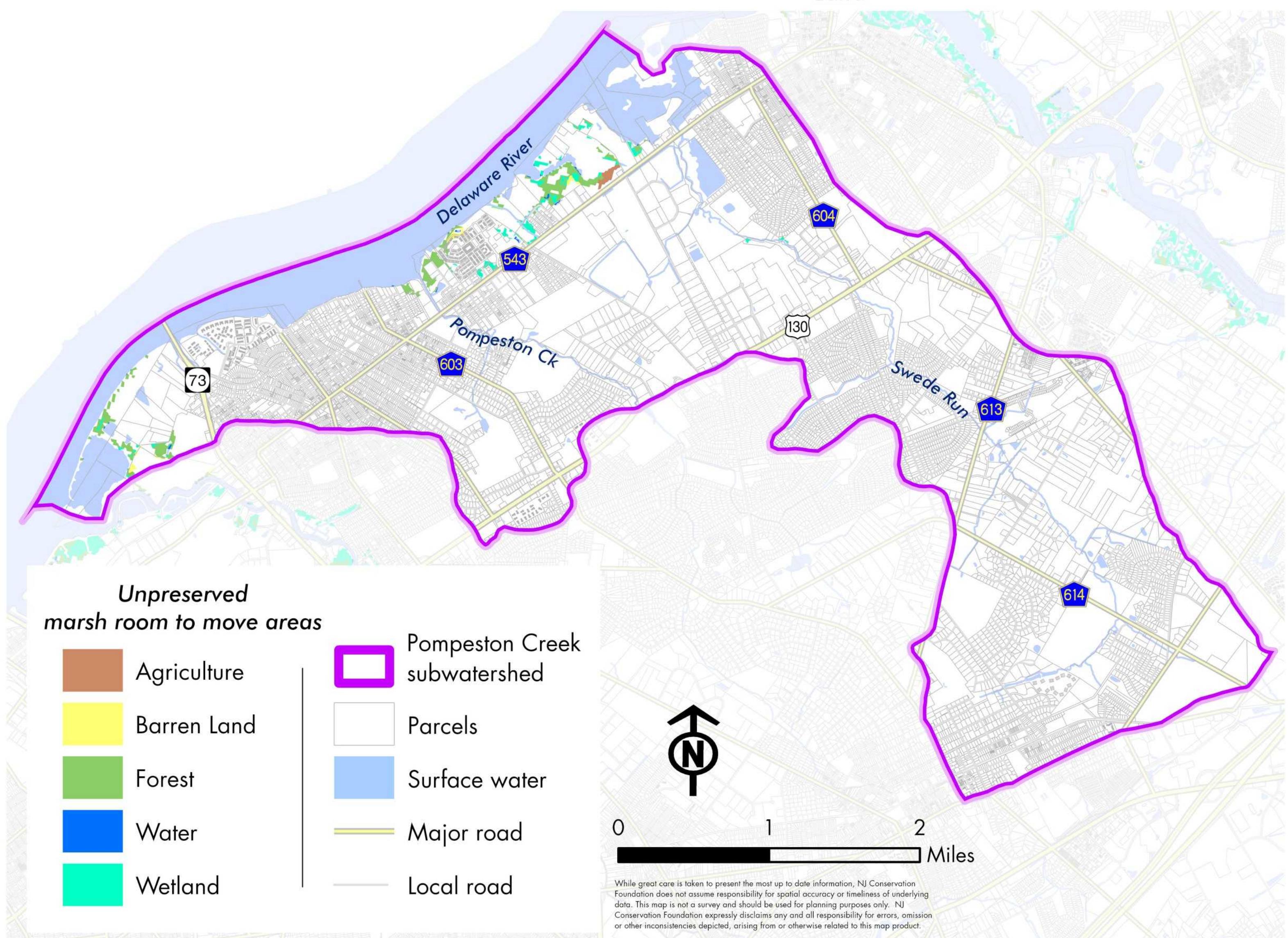
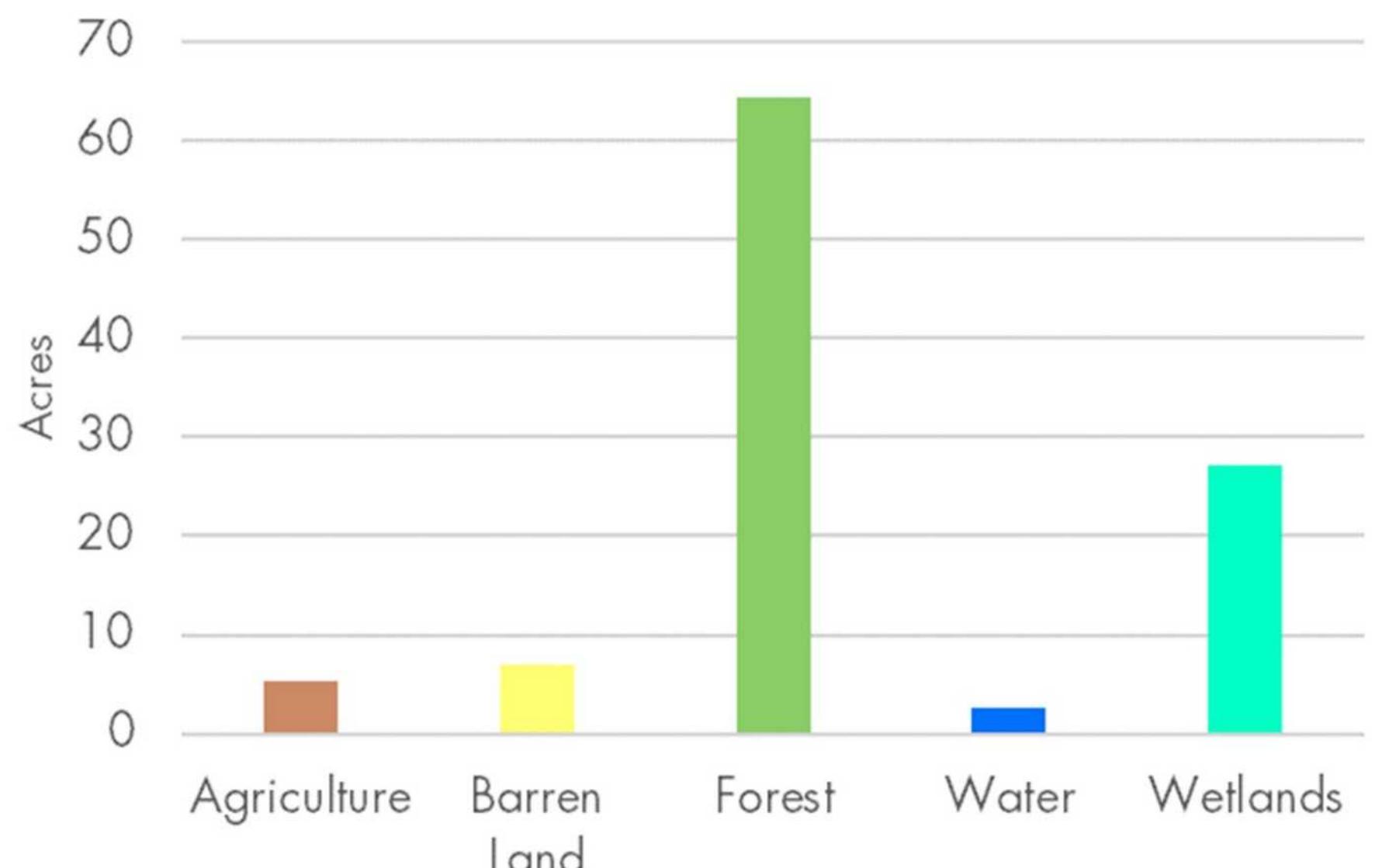


Marsh room to move – preservation status



POMPESTON CREEK

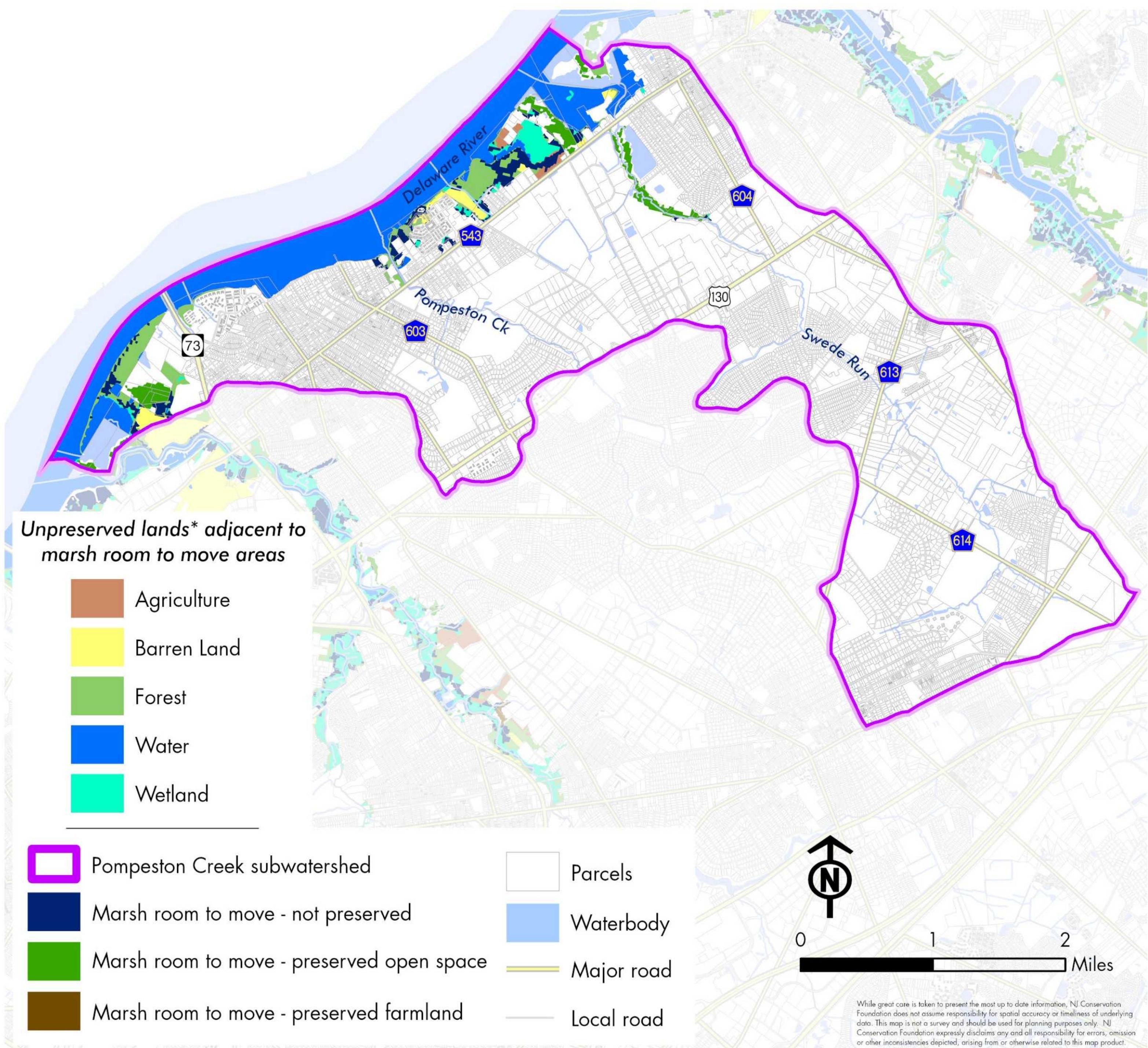
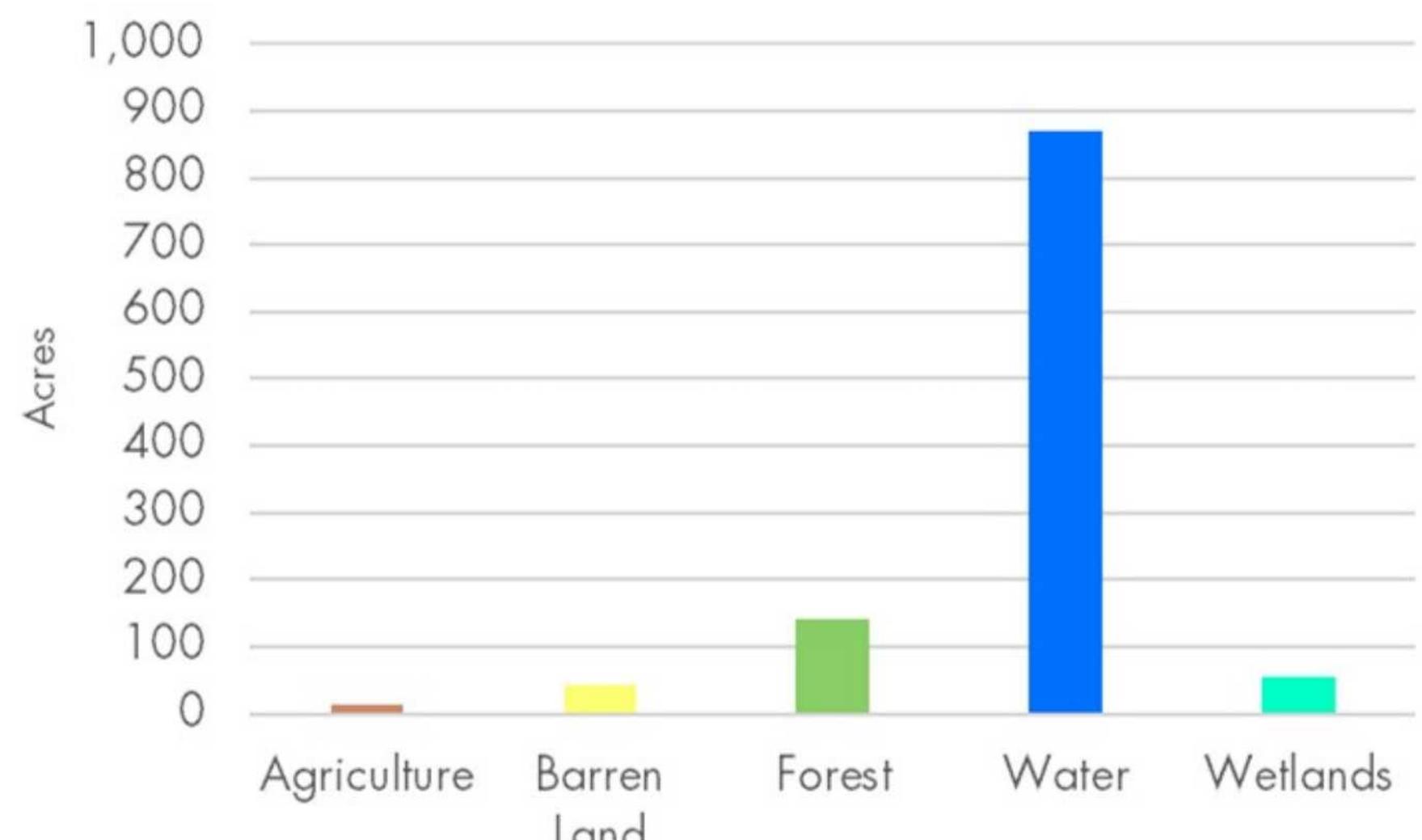
Unpreserved marsh room to move areas by landuse



POMPESTON CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



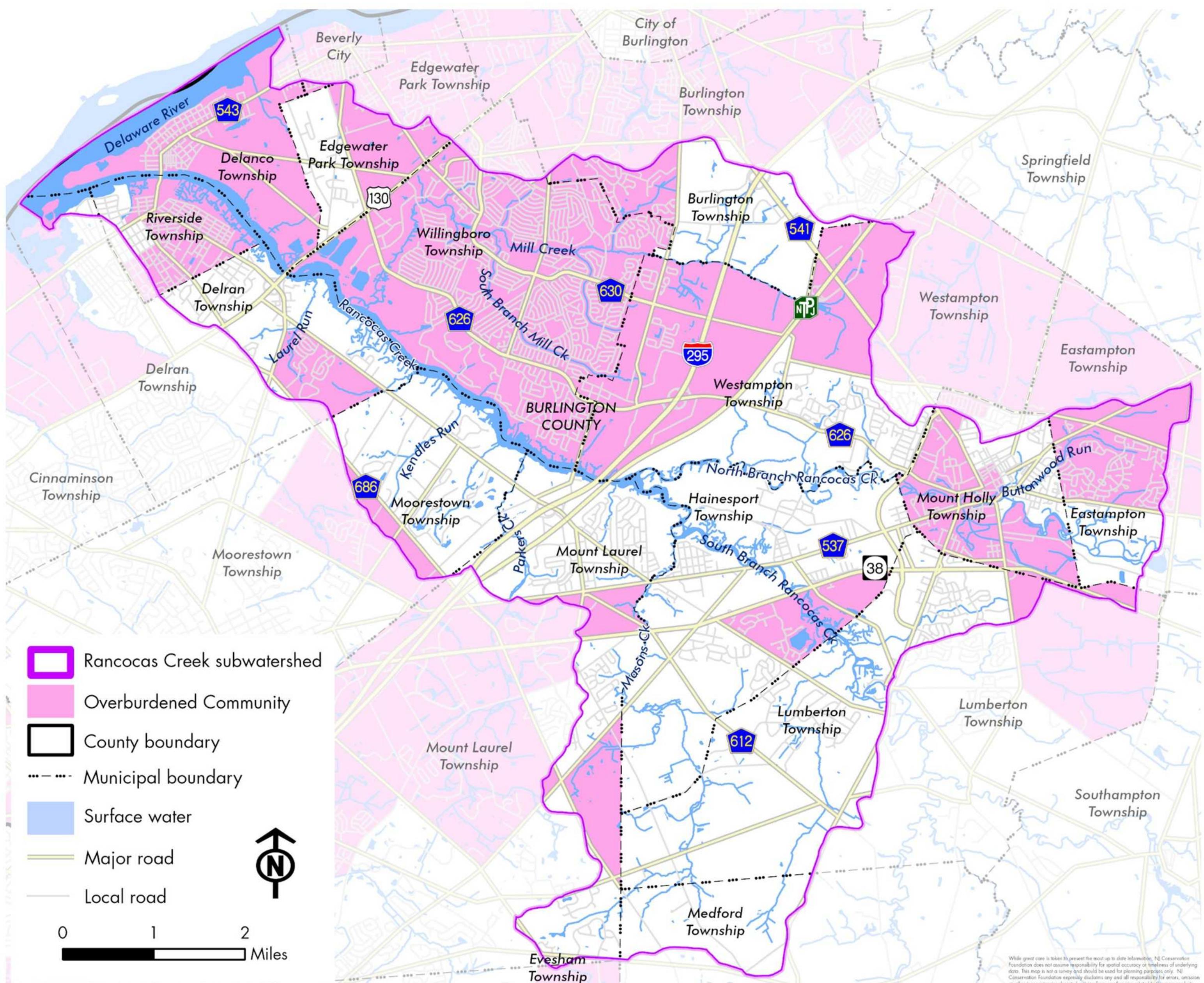
RANCOCAS CREEK Profile

Total area: 35,179 +/- acres

Counties: Burlington

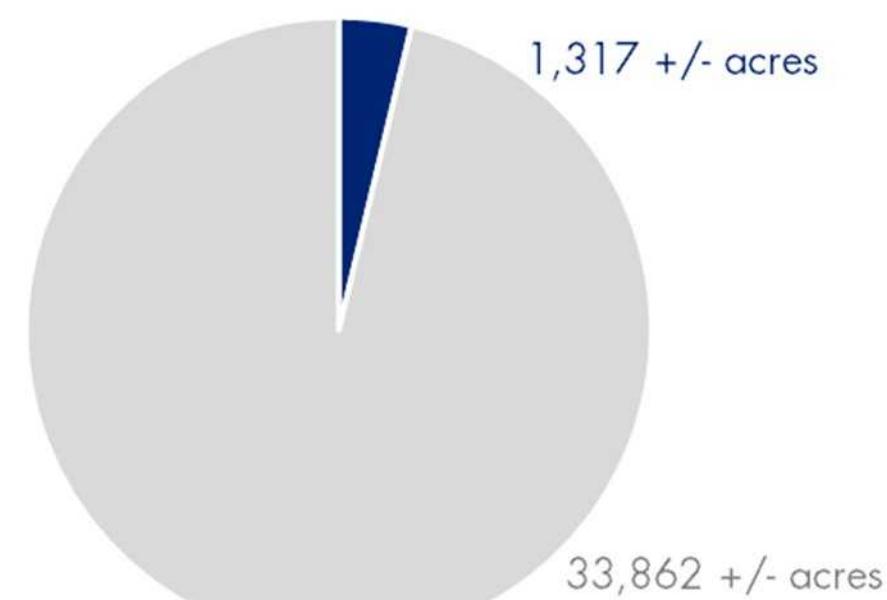
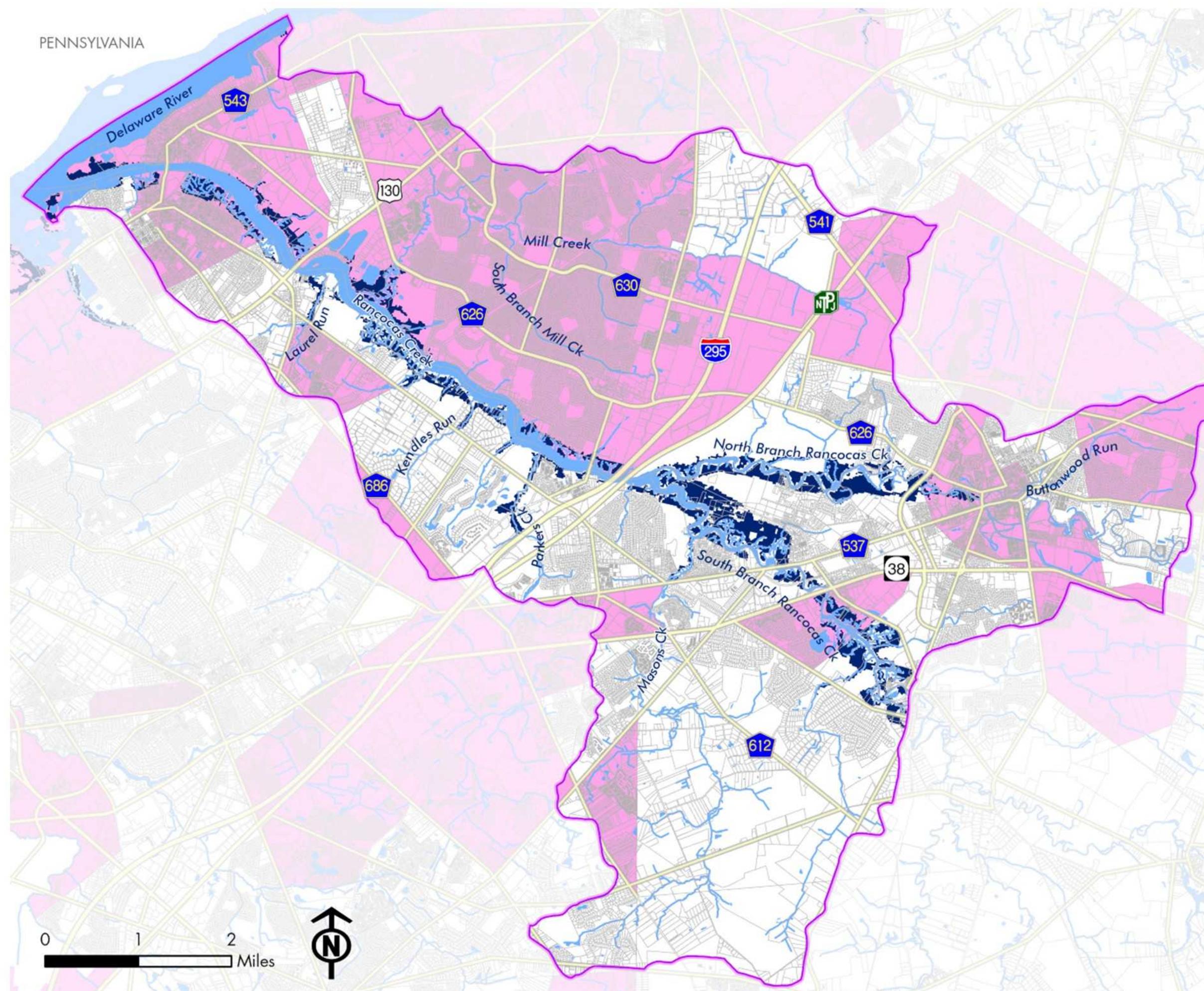
Municipalities:

- ◆ Beverly City
- ◆ Burlington Township
- ◆ Delanco Township
- ◆ Delran Township
- ◆ Eastampton Township
- ◆ Edgewater Park Township
- ◆ Evesham Township
- ◆ Hainesport Township
- ◆ Lumberton Township
- ◆ Medford Township
- ◆ Moorestown Township
- ◆ Mount Holly Township
- ◆ Mount Laurel Township
- ◆ Riverside Township
- ◆ Westampton Township
- ◆ Willingboro Township



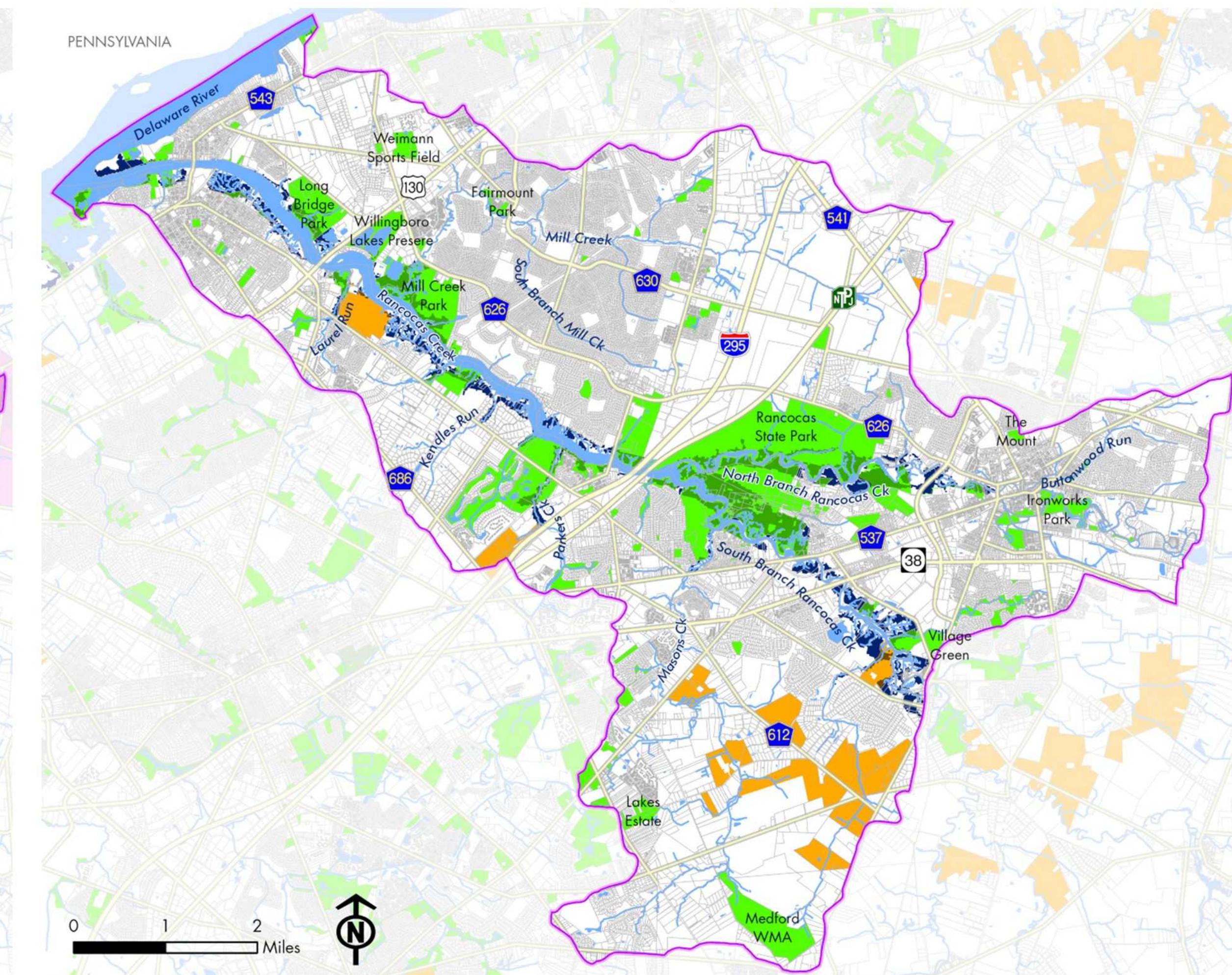
RANCOCAS CREEK Marsh room to move

Marsh room to move



■ Marsh room to move ■ Not marsh room to move

Marsh room to move—preservation status

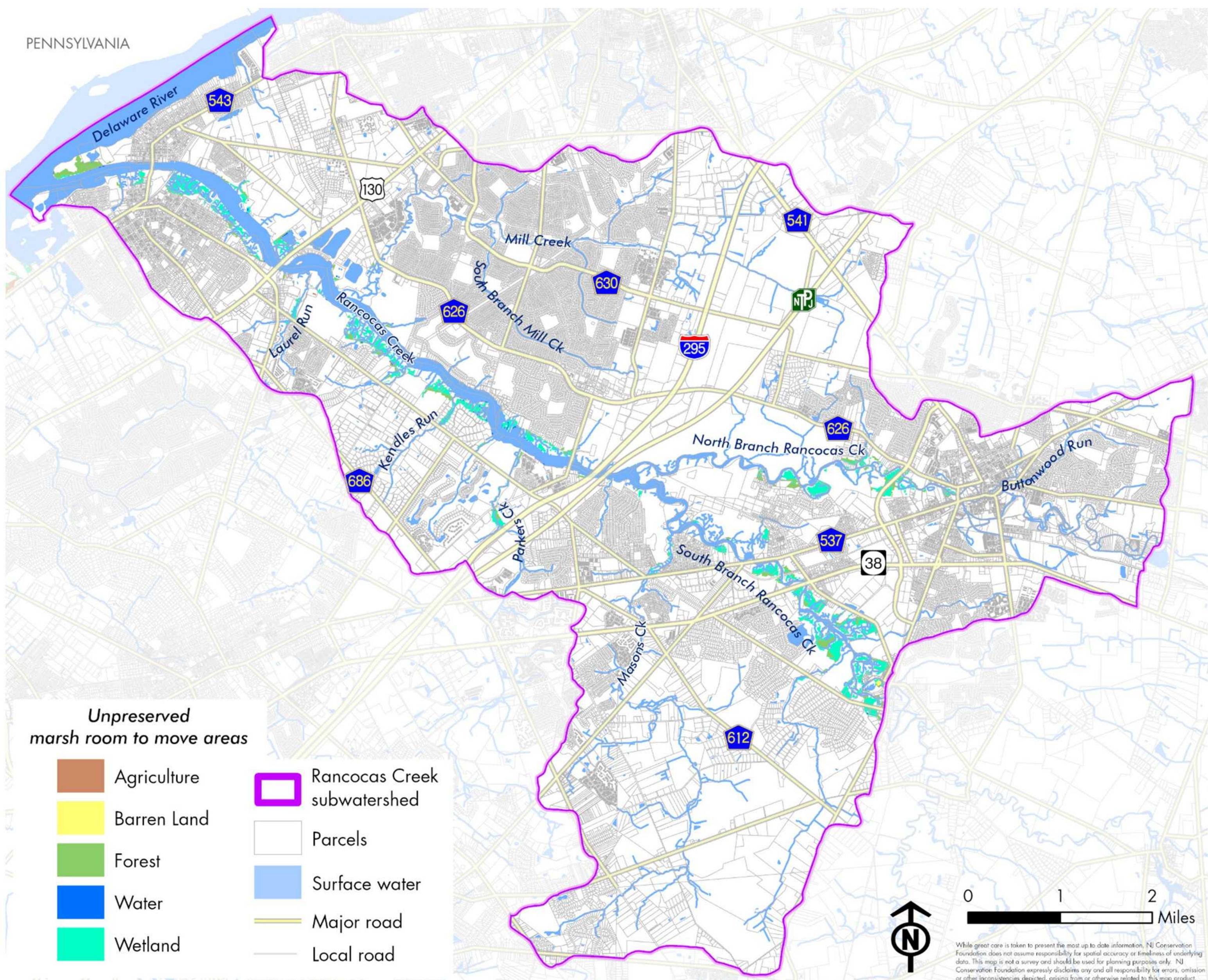
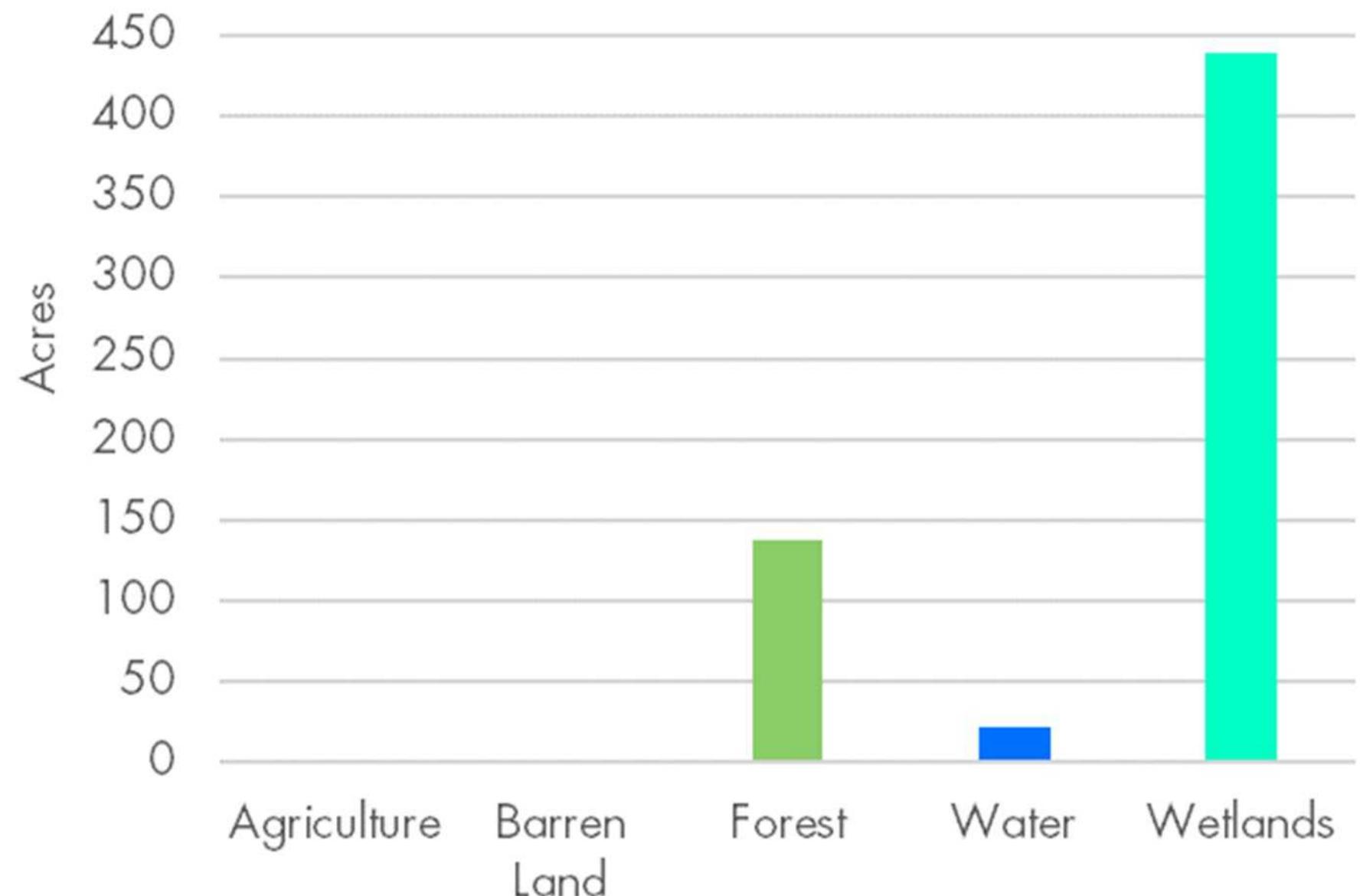


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RANCOCAS CREEK

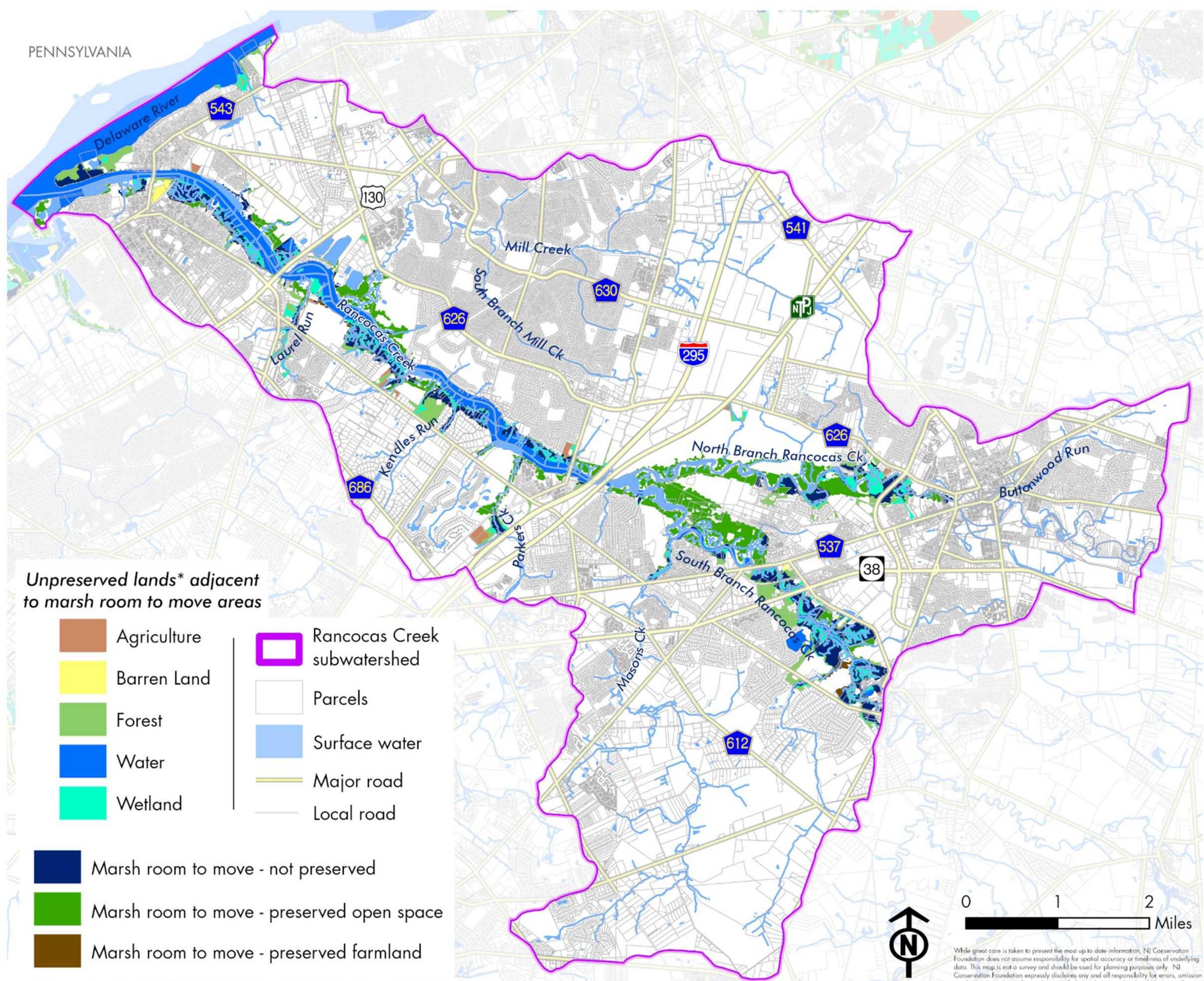
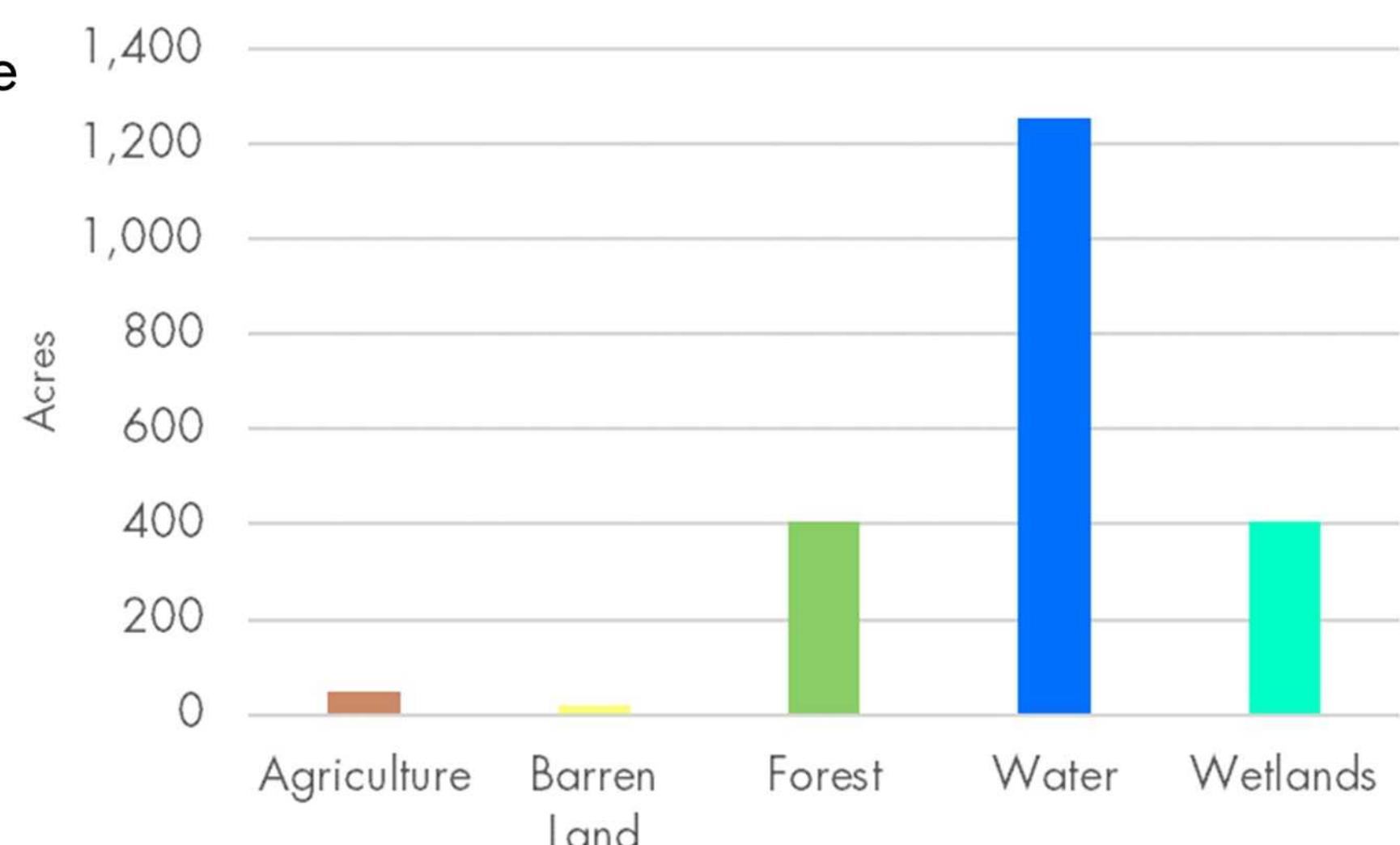
Unpreserved marsh room to move areas by landuse



RANOCAS CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas

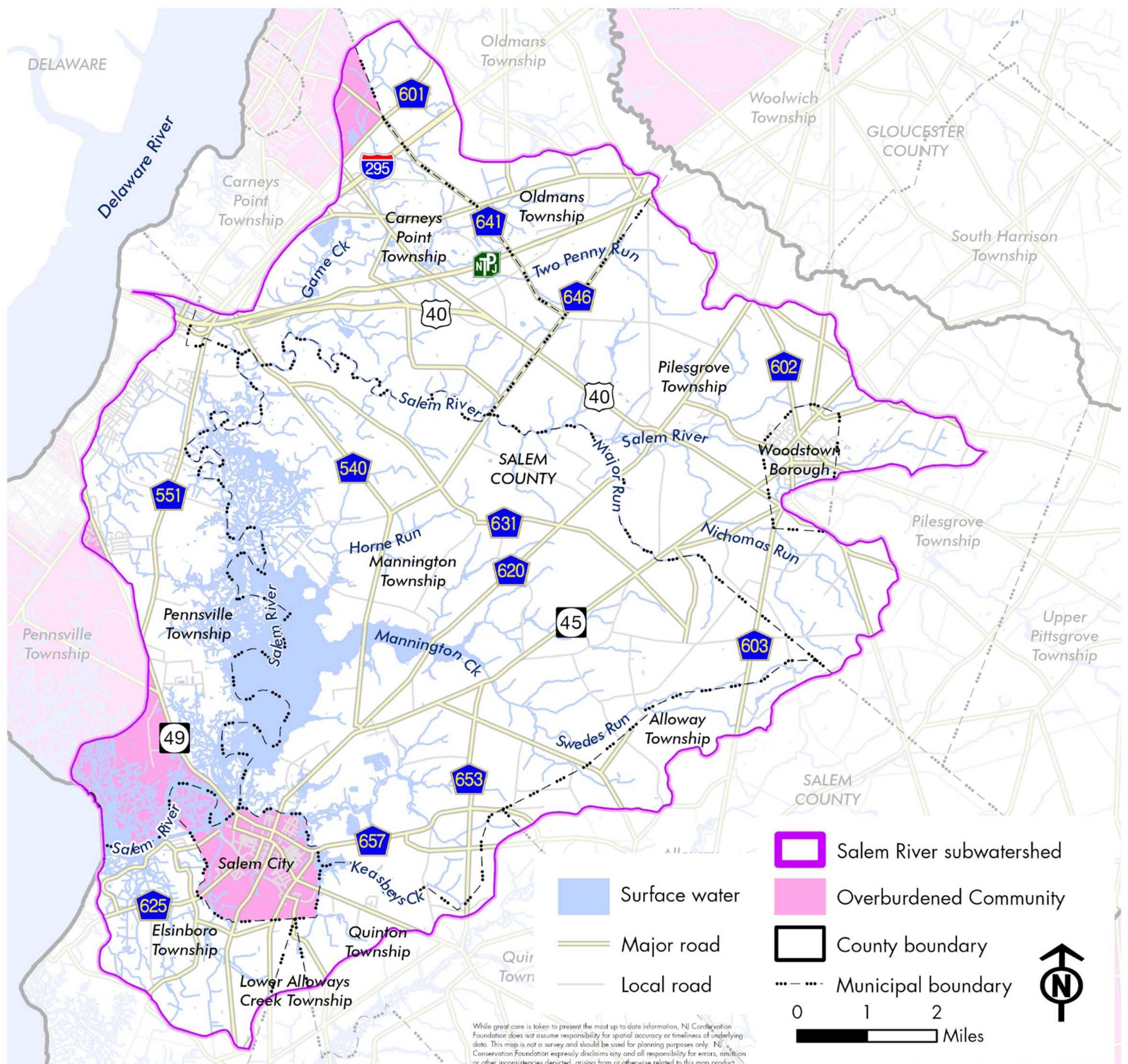
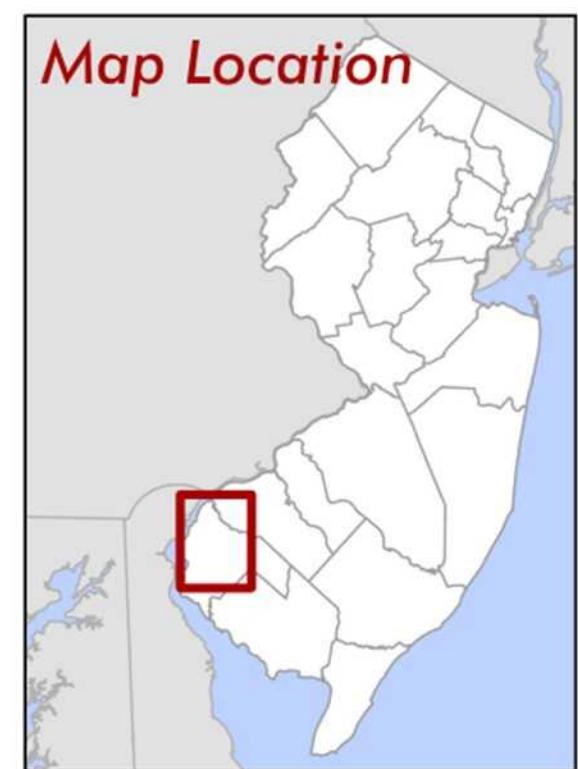


Total area: 65,527 +/- acres

Counties: Salem

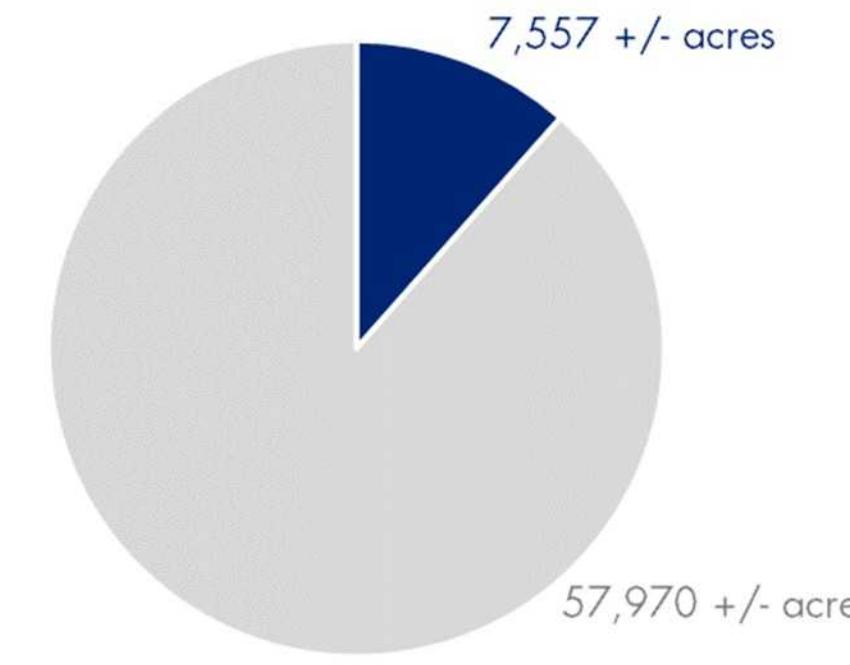
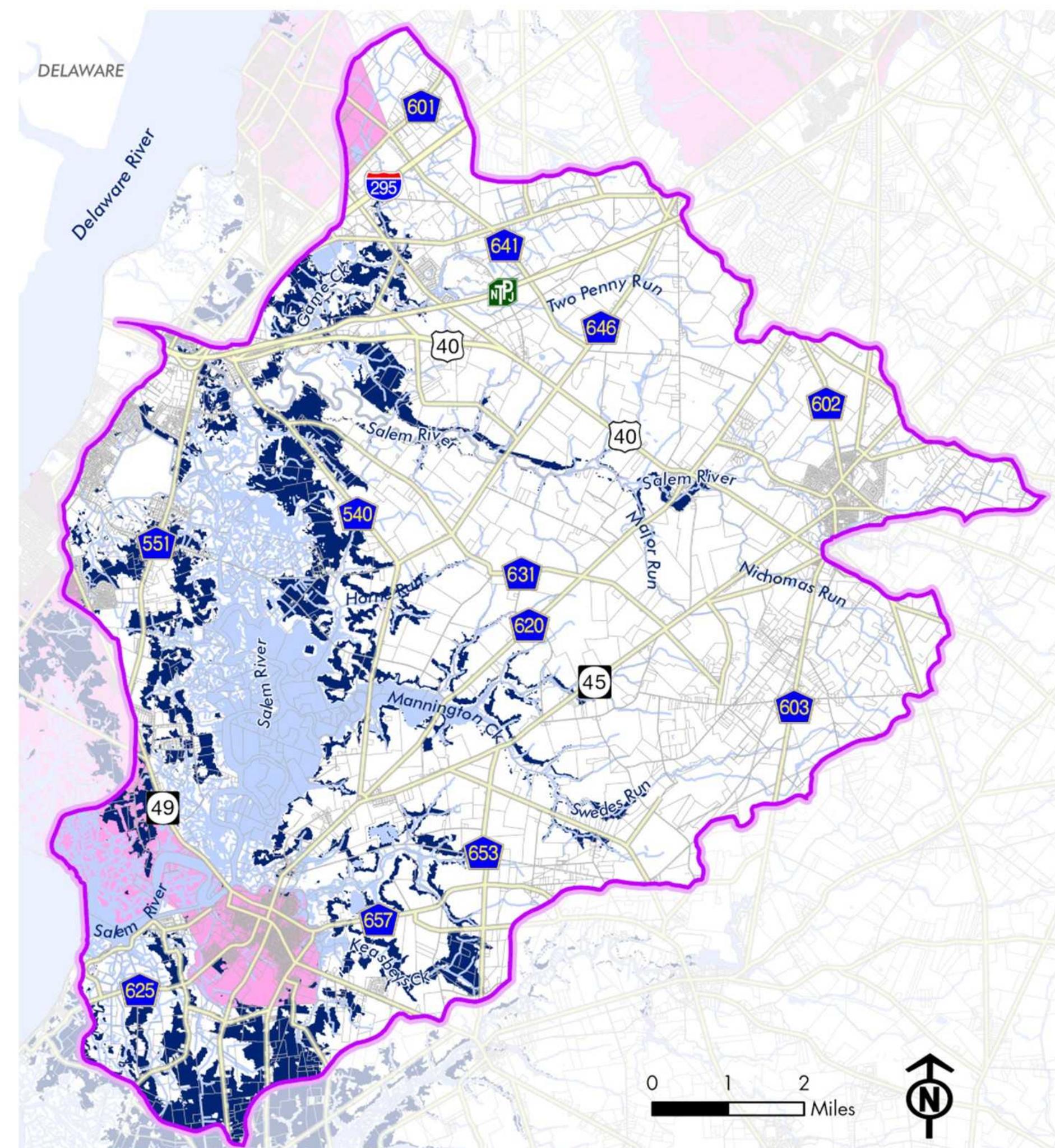
Municipalities:

- ◆ Alloway Township
- ◆ Carneys Point Township
- ◆ Elsinboro Township
- ◆ Lower Alloways Creek Township
- ◆ Mannington Township
- ◆ Oldmans Township
- ◆ Pennsville Township
- ◆ Pilesgrove Township
- ◆ Quinton Township
- ◆ Salem City
- ◆ Woodstown Borough



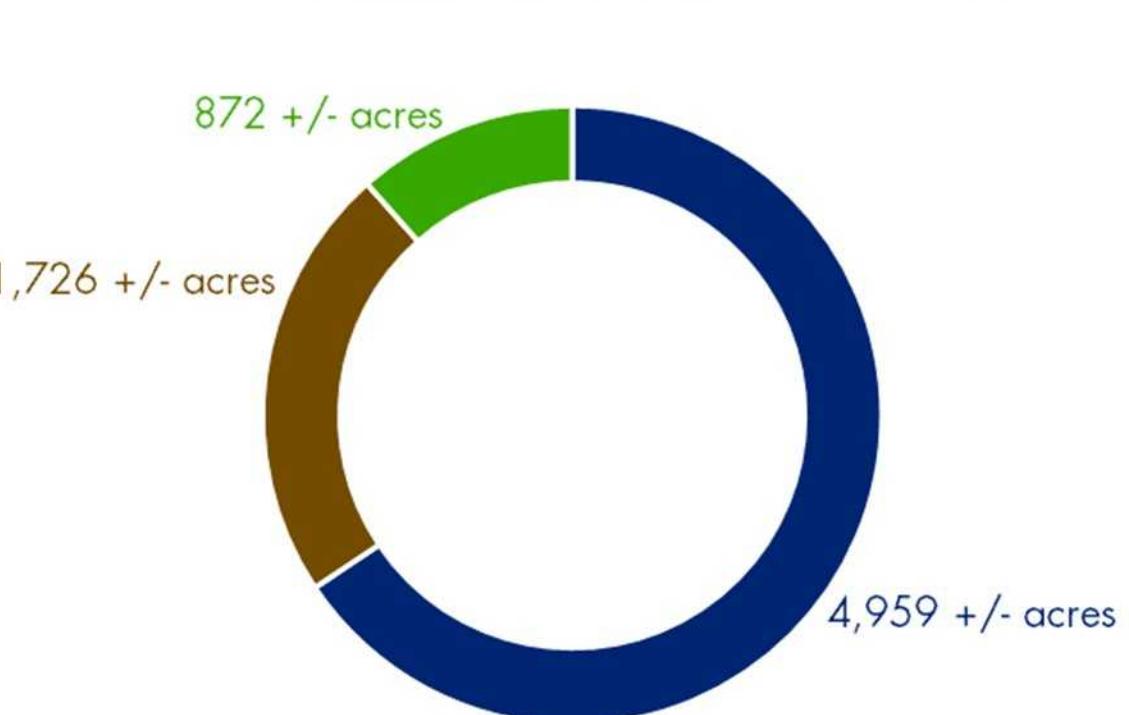
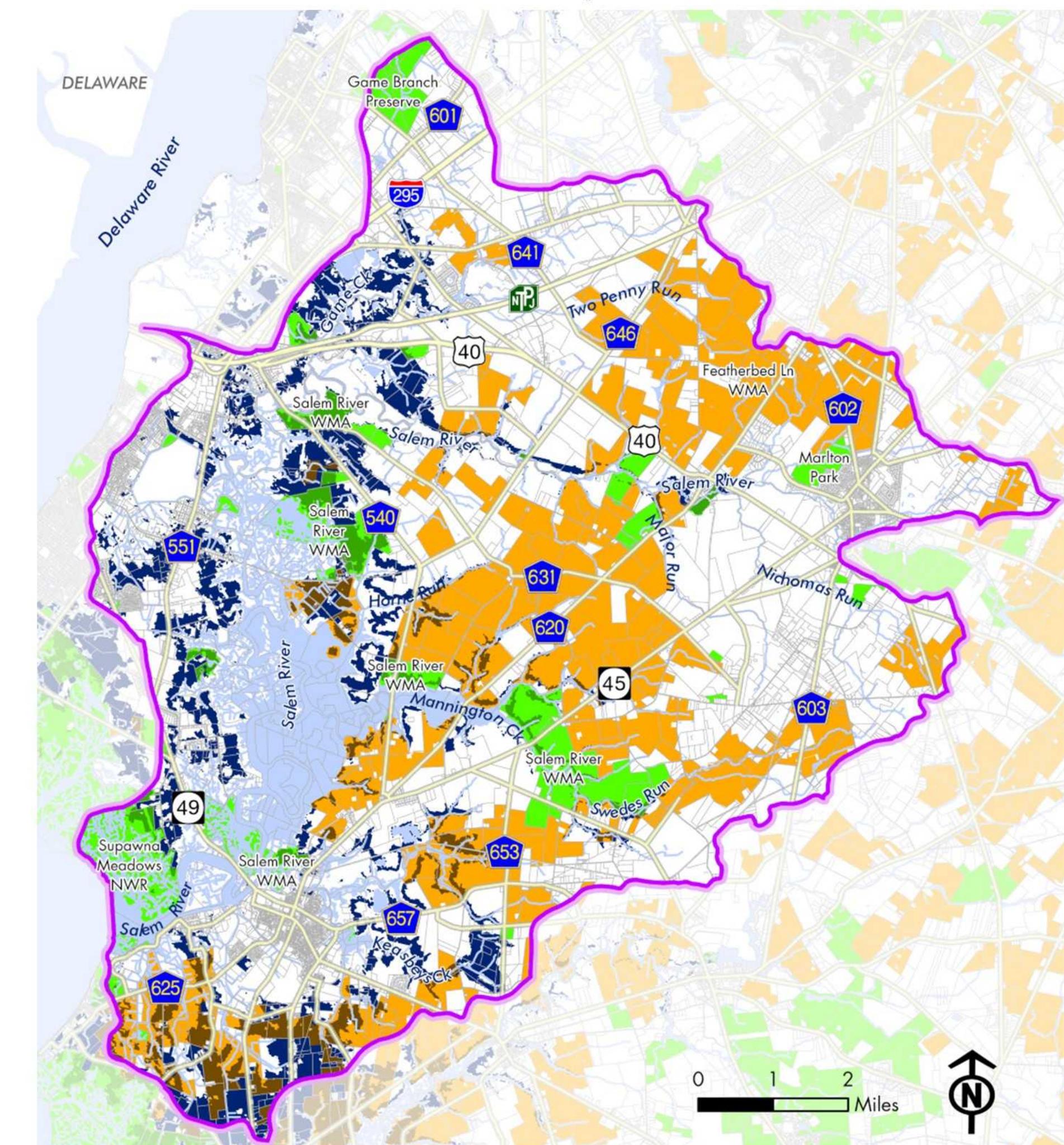
SALEM RIVER Marsh room to move

Marsh room to move



■ Marsh room to move ■ Not marsh room to move

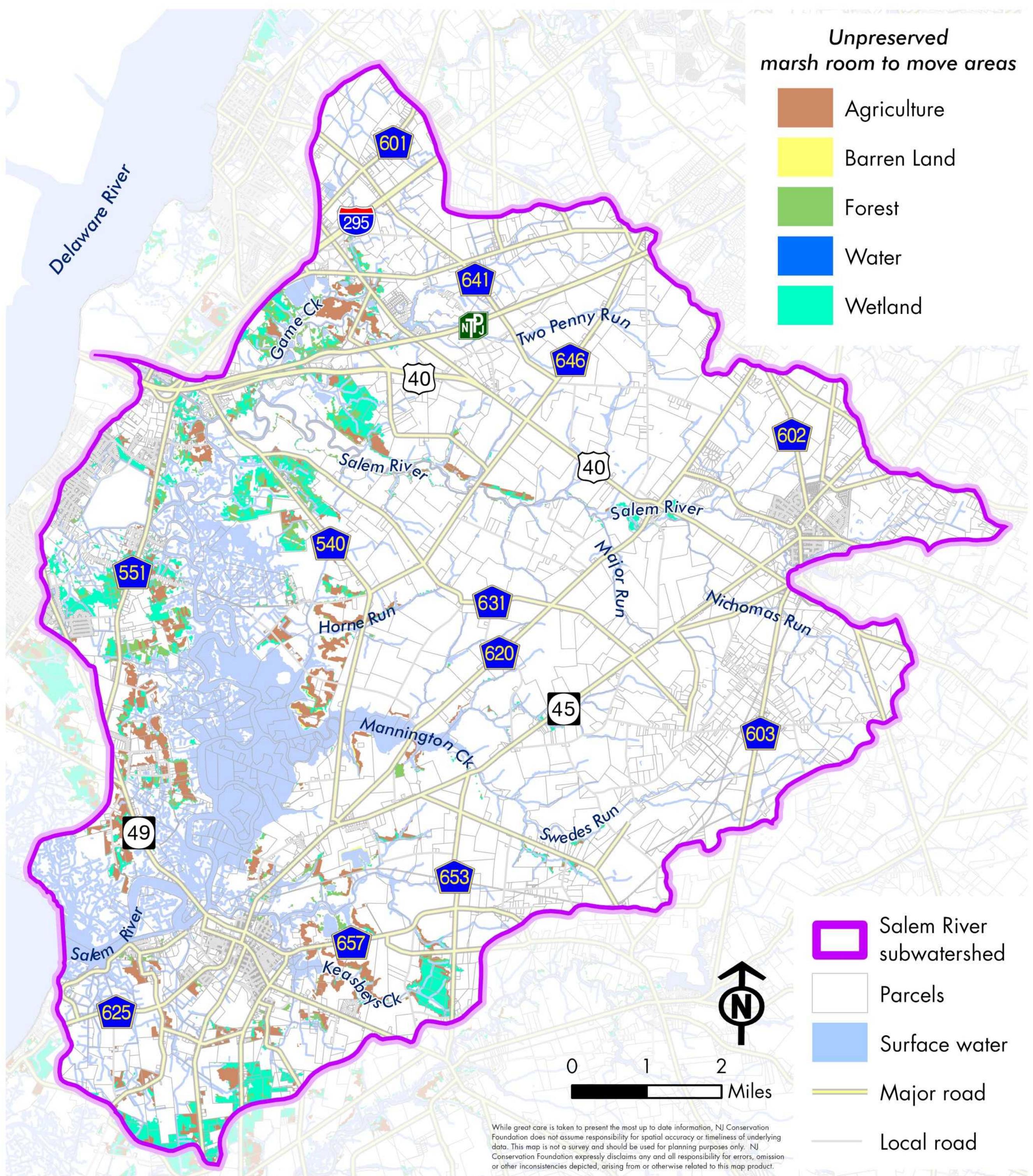
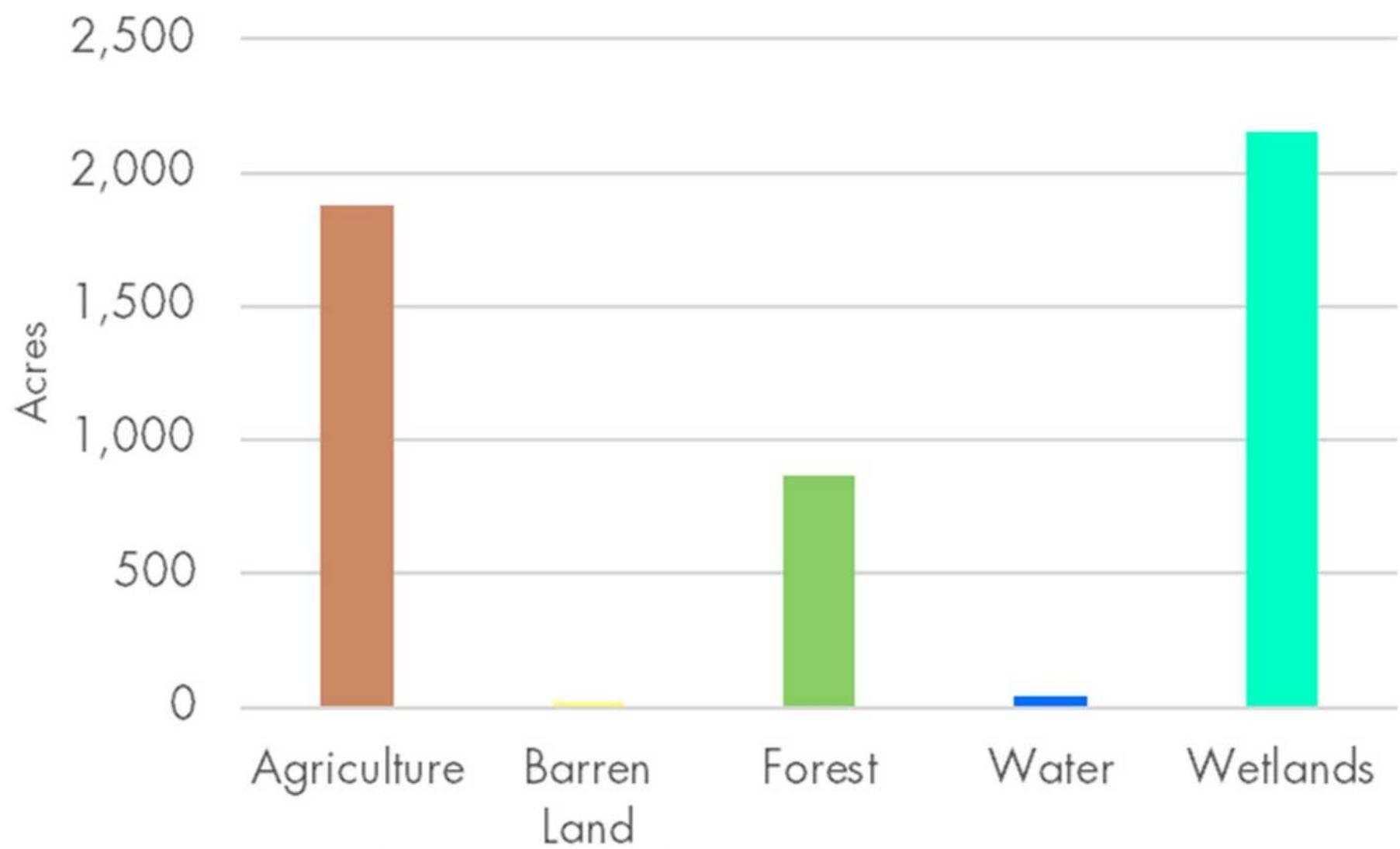
Marsh room to move—preservation status



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SALEM RIVER

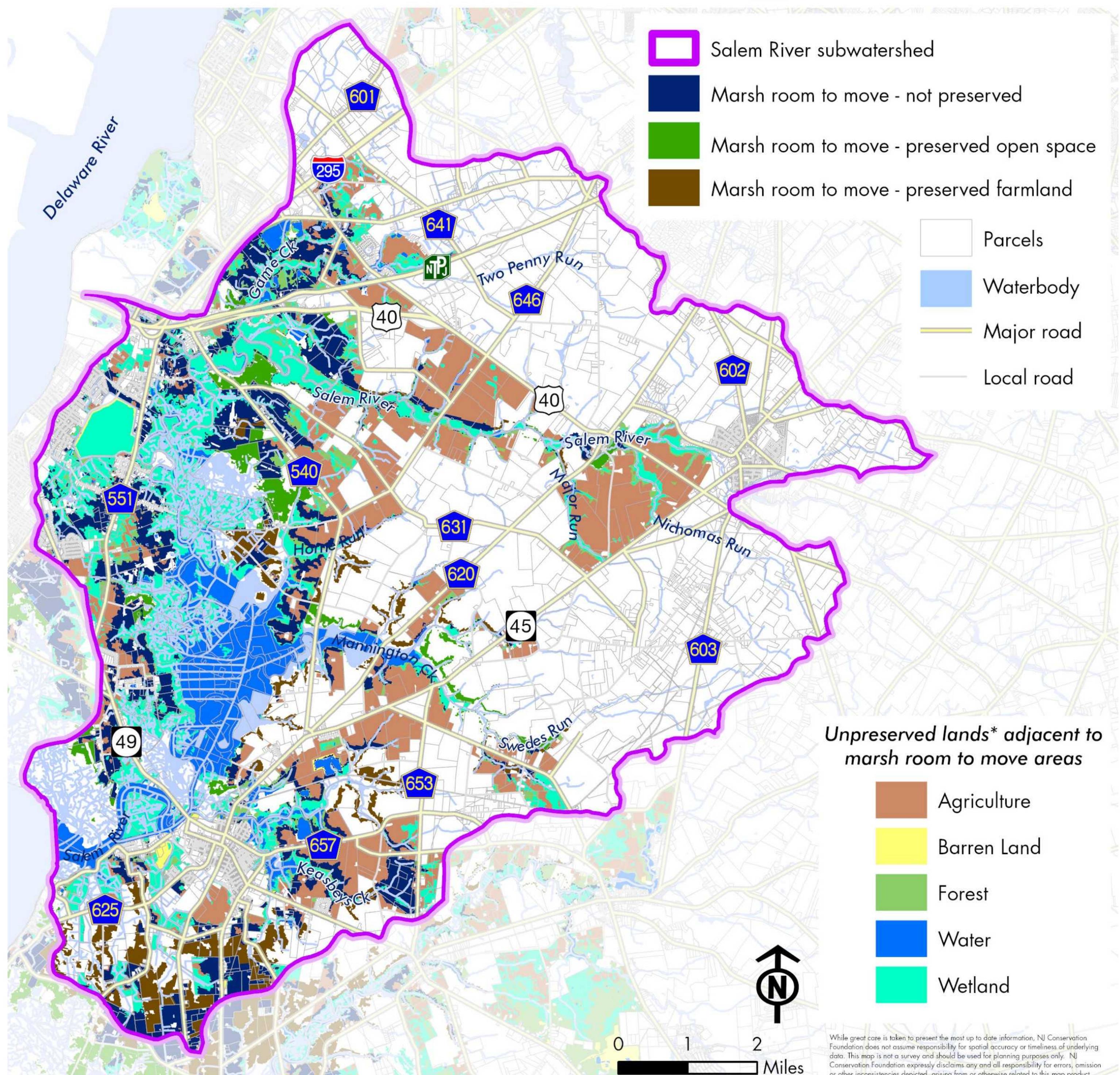
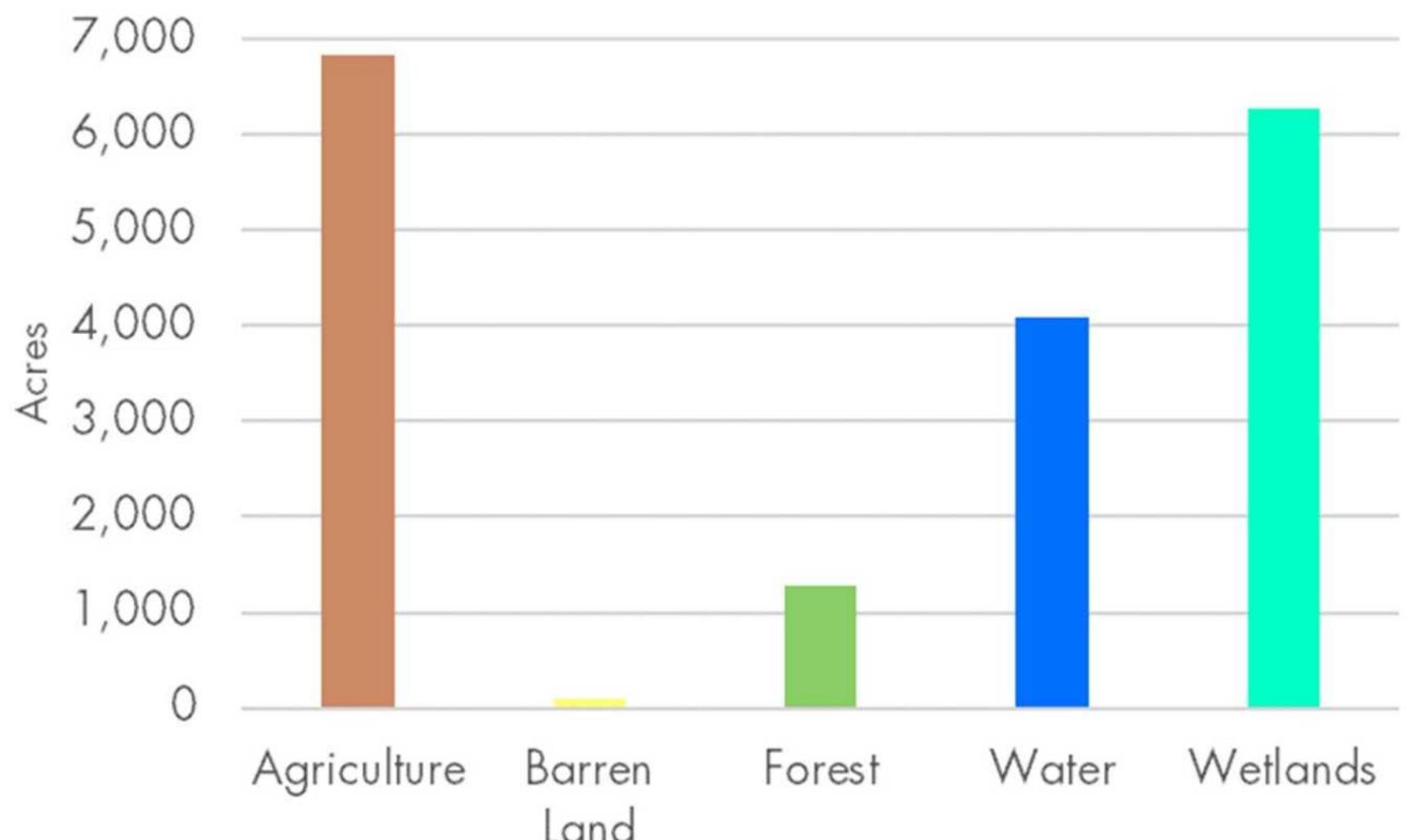
Unpreserved marsh room to move areas by landuse



SALEM RIVER

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



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STOW CREEK Profile

Total area: 30,162 +/- acres

Counties: Cumberland, Salem

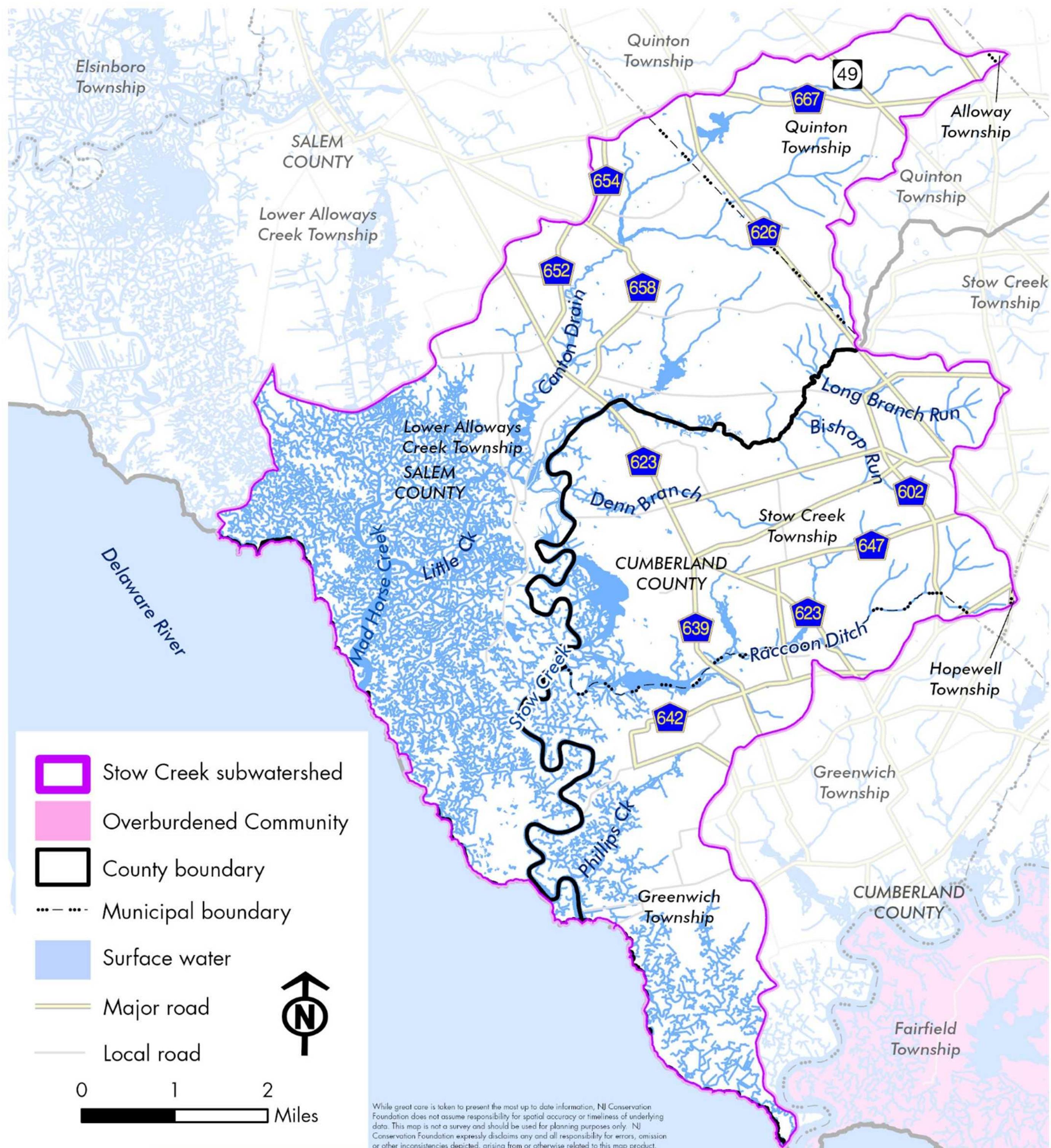
Municipalities:

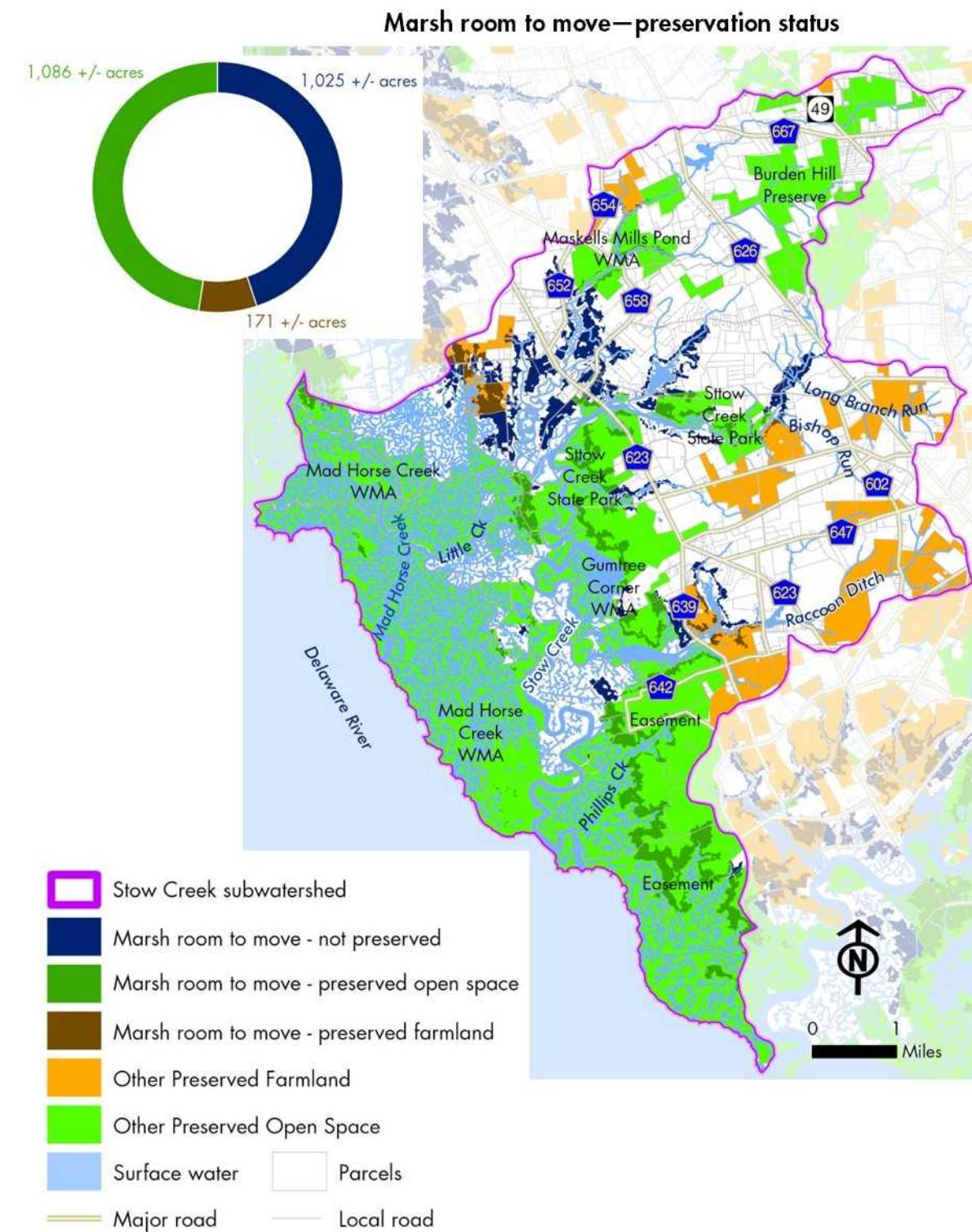
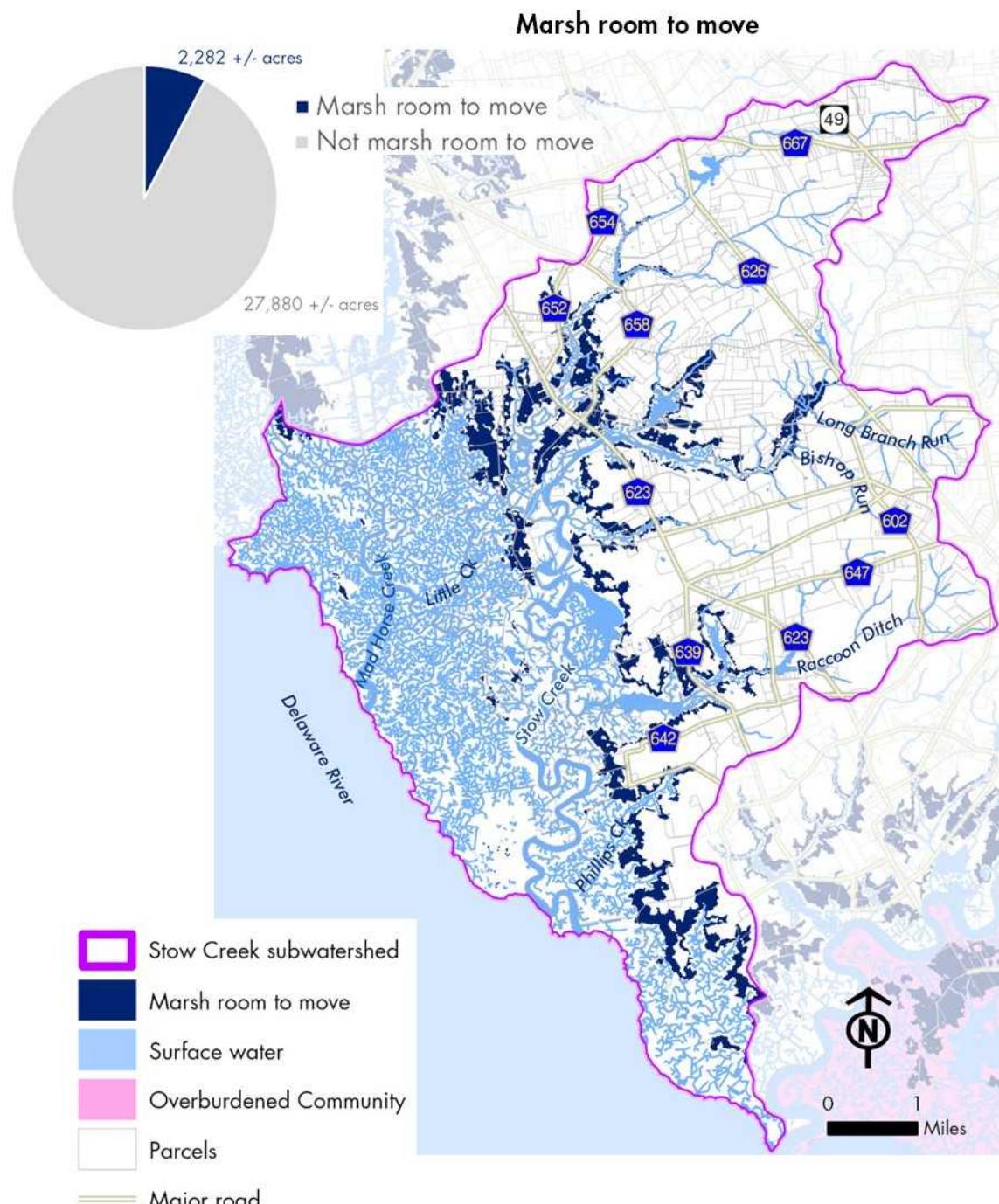
Cumberland county:

- ◆ Greenwich Township
- ◆ Hopewell Township
- ◆ Stow Creek Township

Salem county:

- ◆ Alloway Township
- ◆ Lower Alloways Creek Township
- ◆ Quinton Township

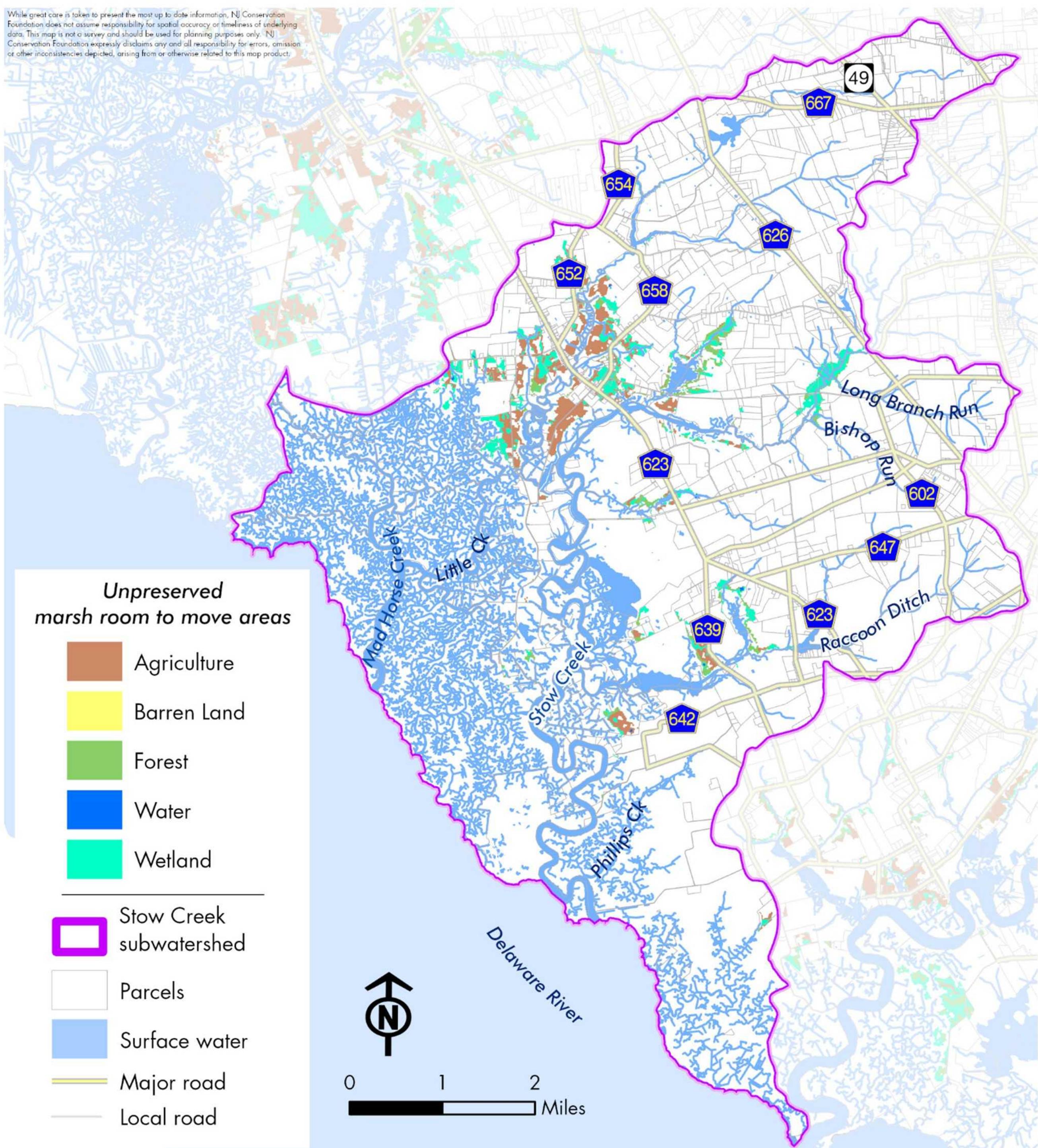
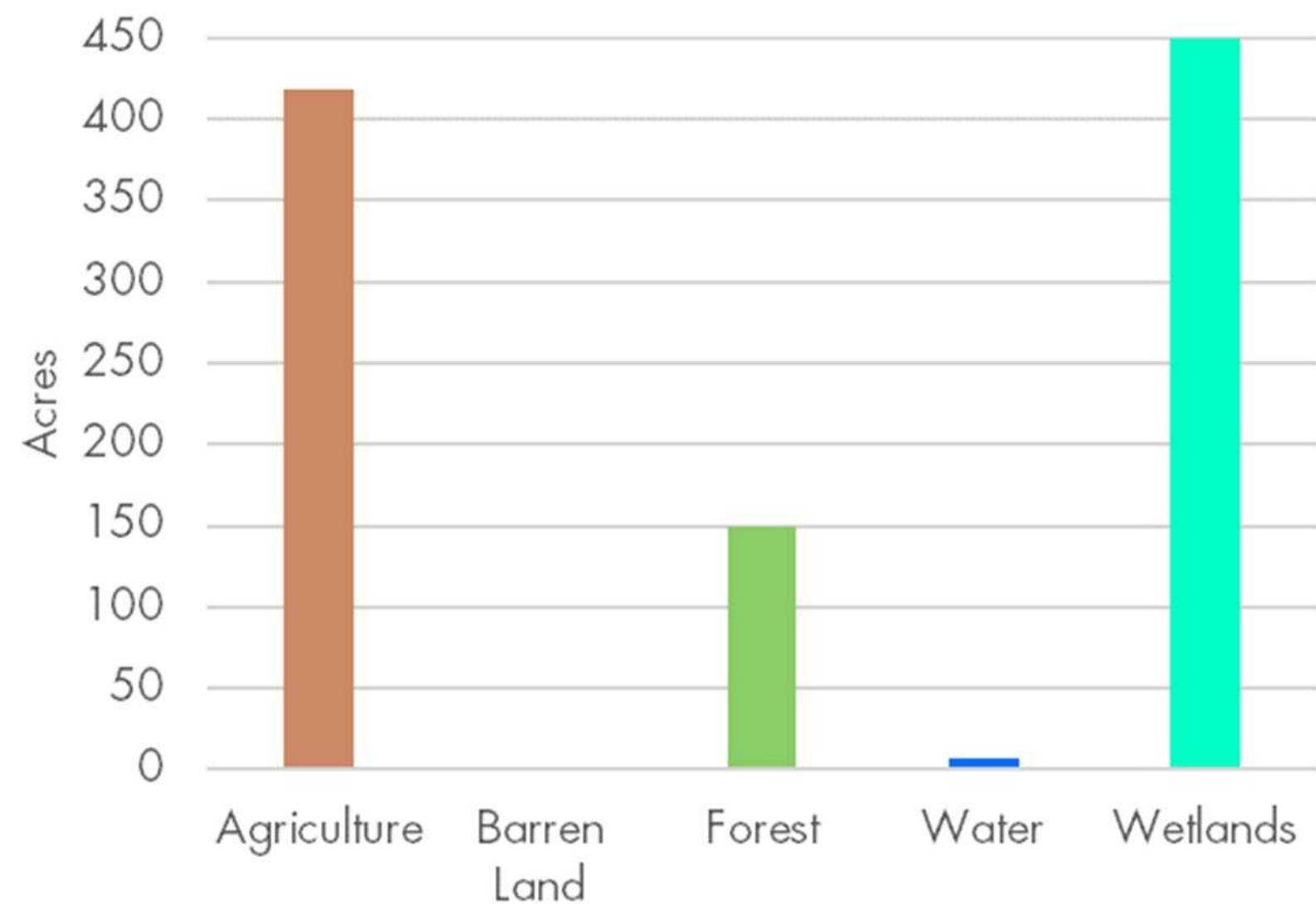




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STOW CREEK

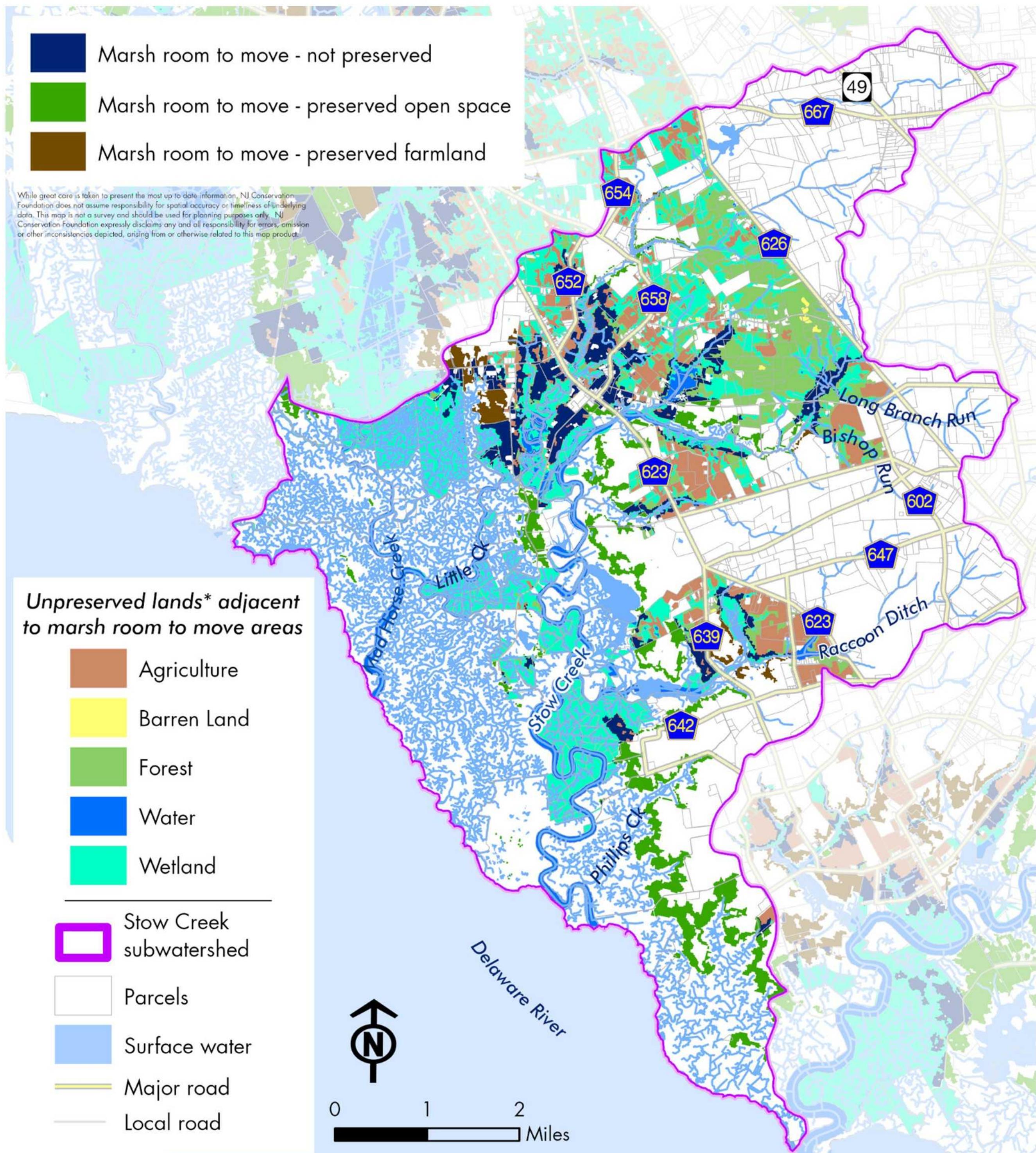
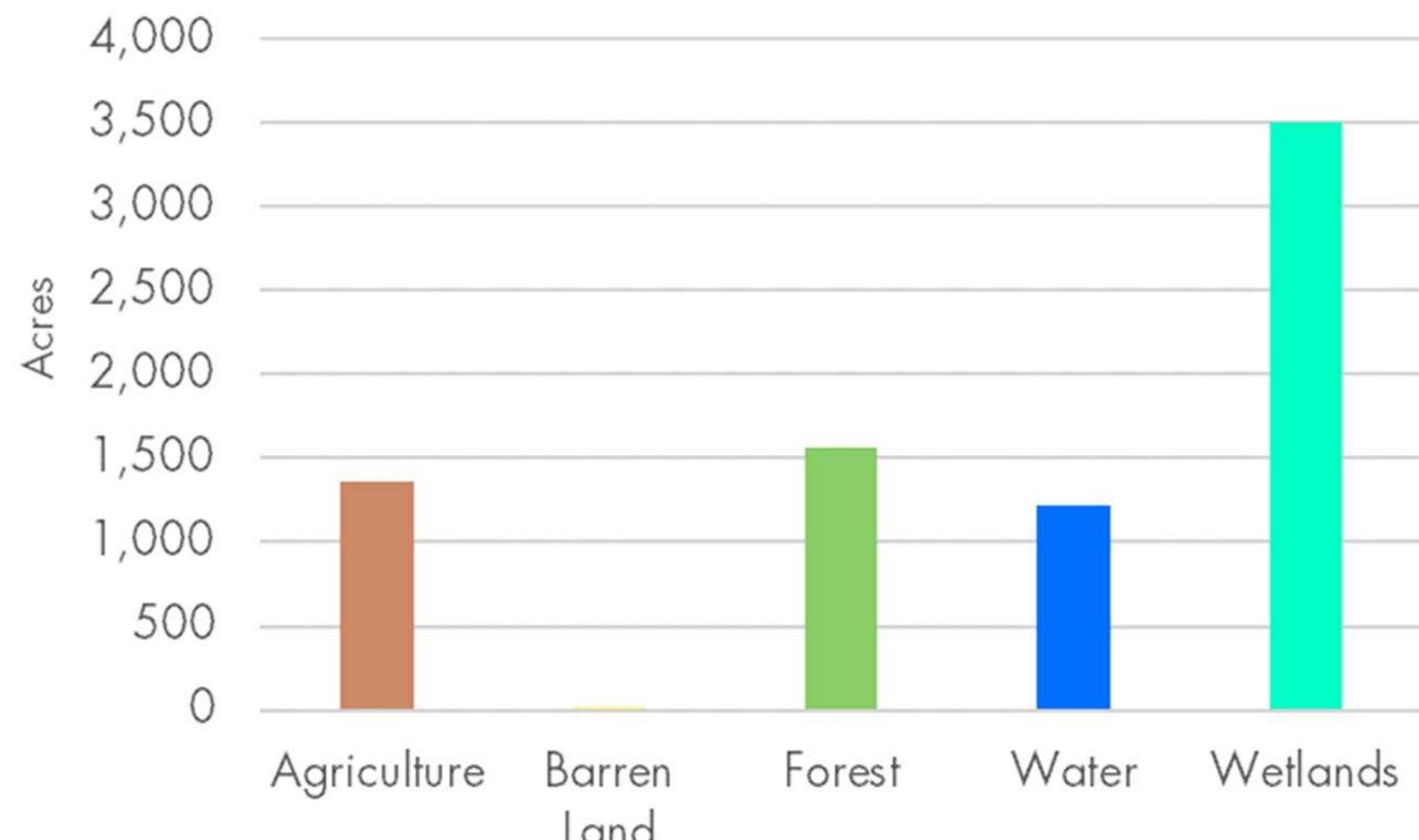
Unpreserved marsh room to move areas by landuse



STOW CREEK

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



WEST / EAST CREEKS / RIGGINS DITCH Profile

Total area: 20,689 +/- acres

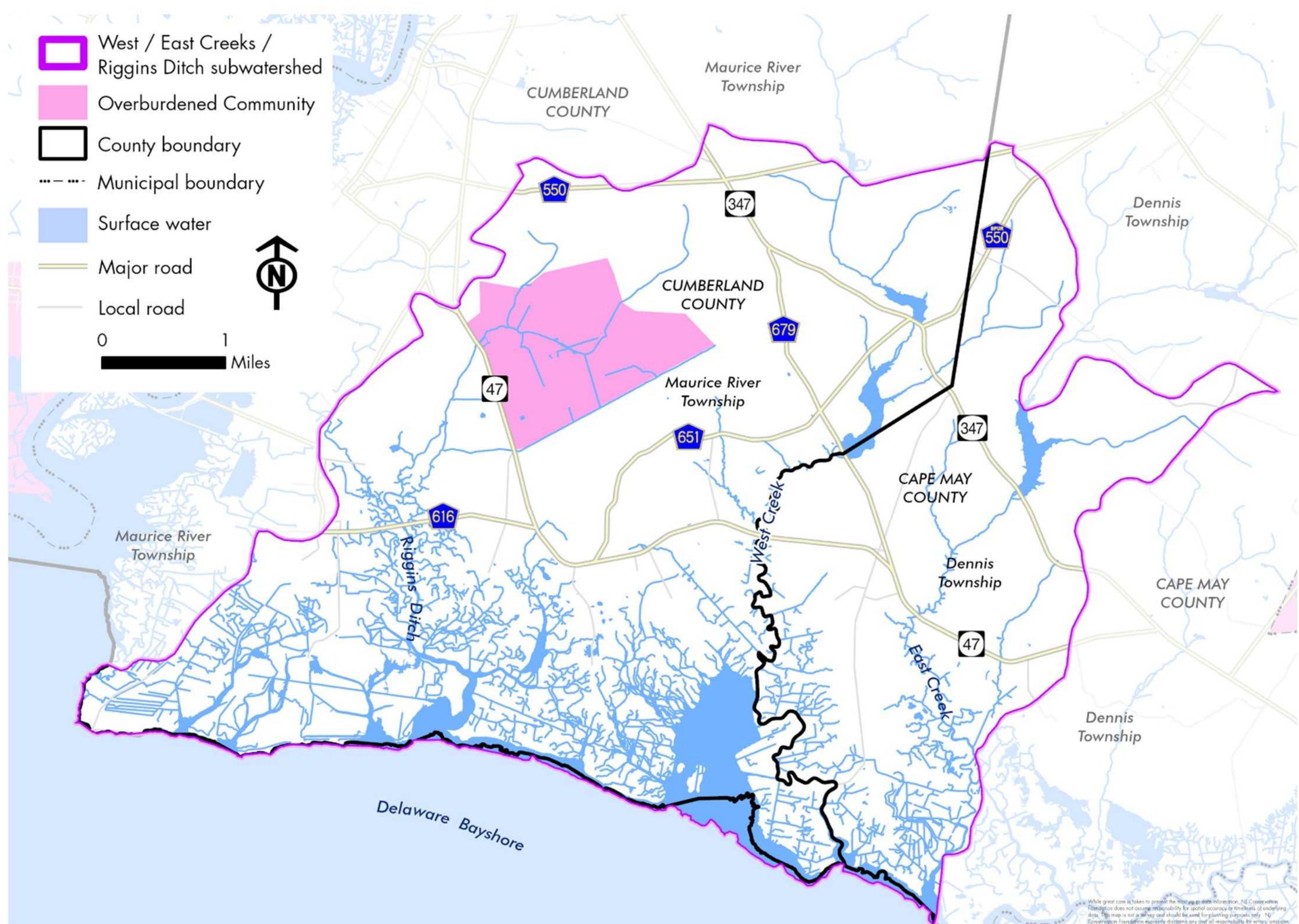
Counties: Cape May, Cumberland

Cape May county:

- ◆ Dennis Township

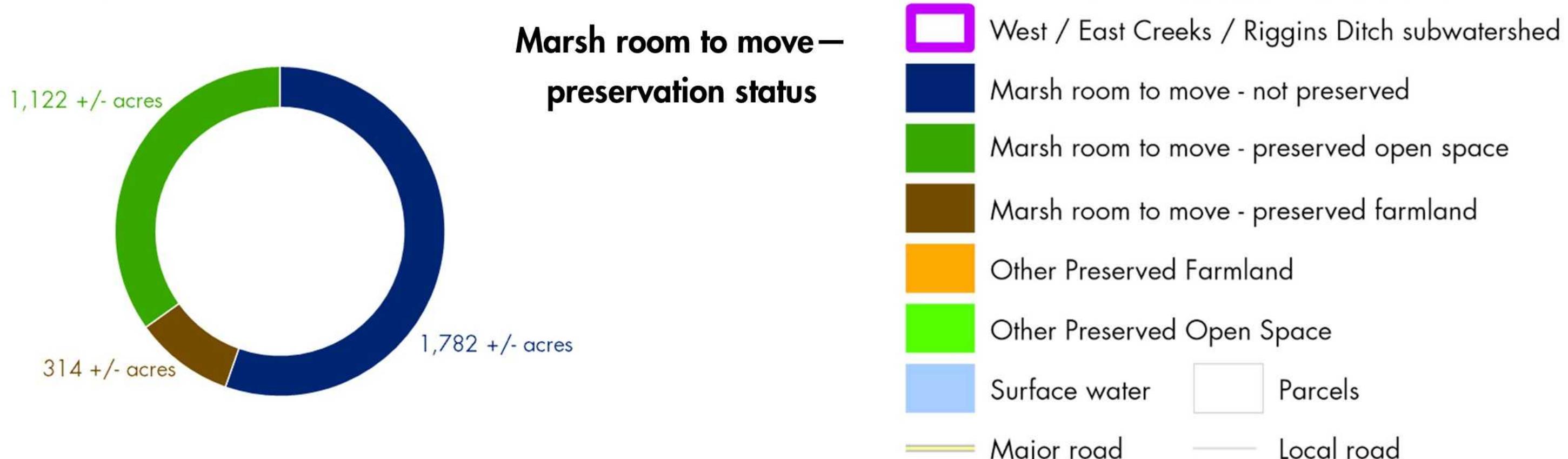
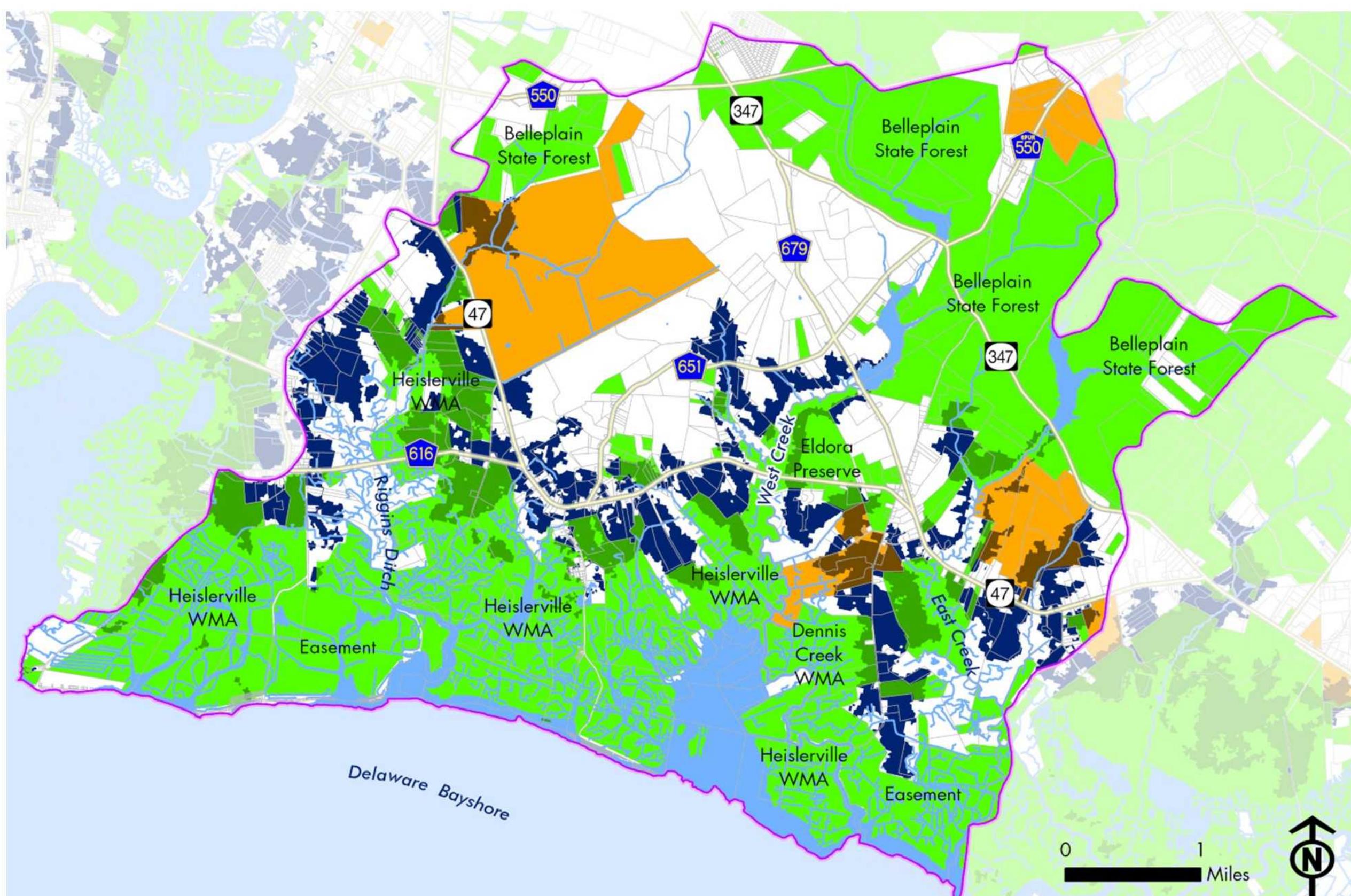
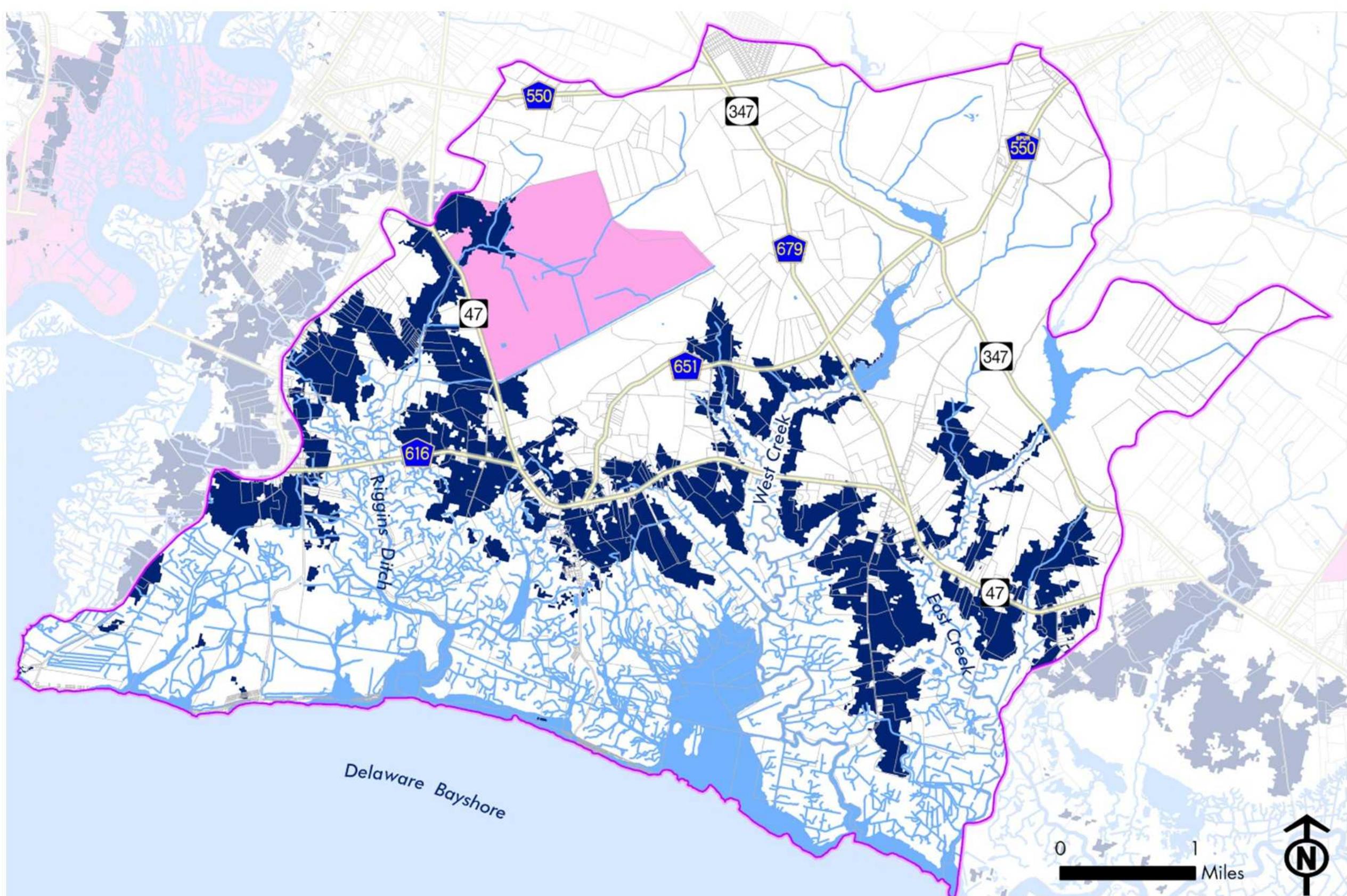
Cumberland county:

- ◆ Maurice River Township



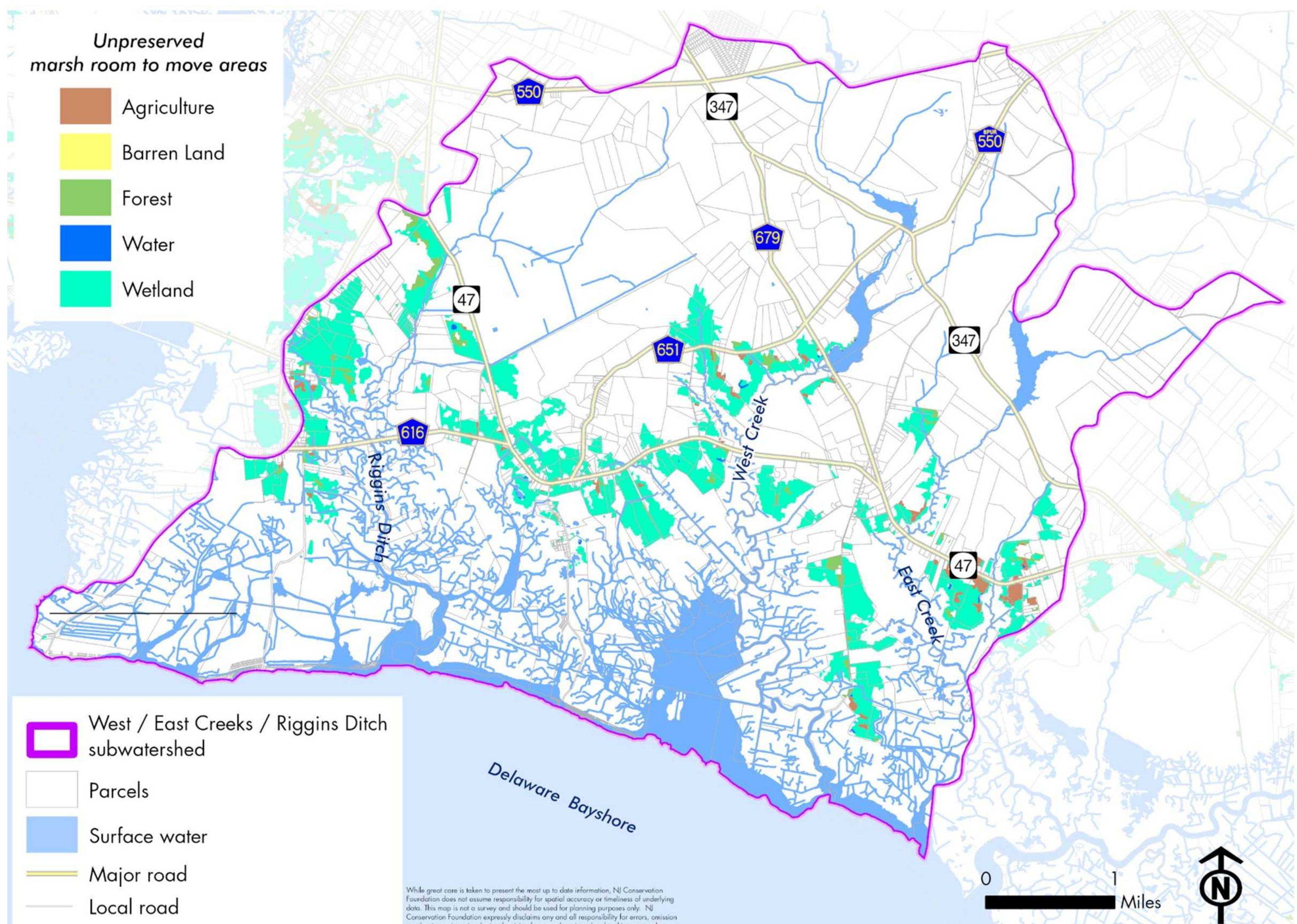
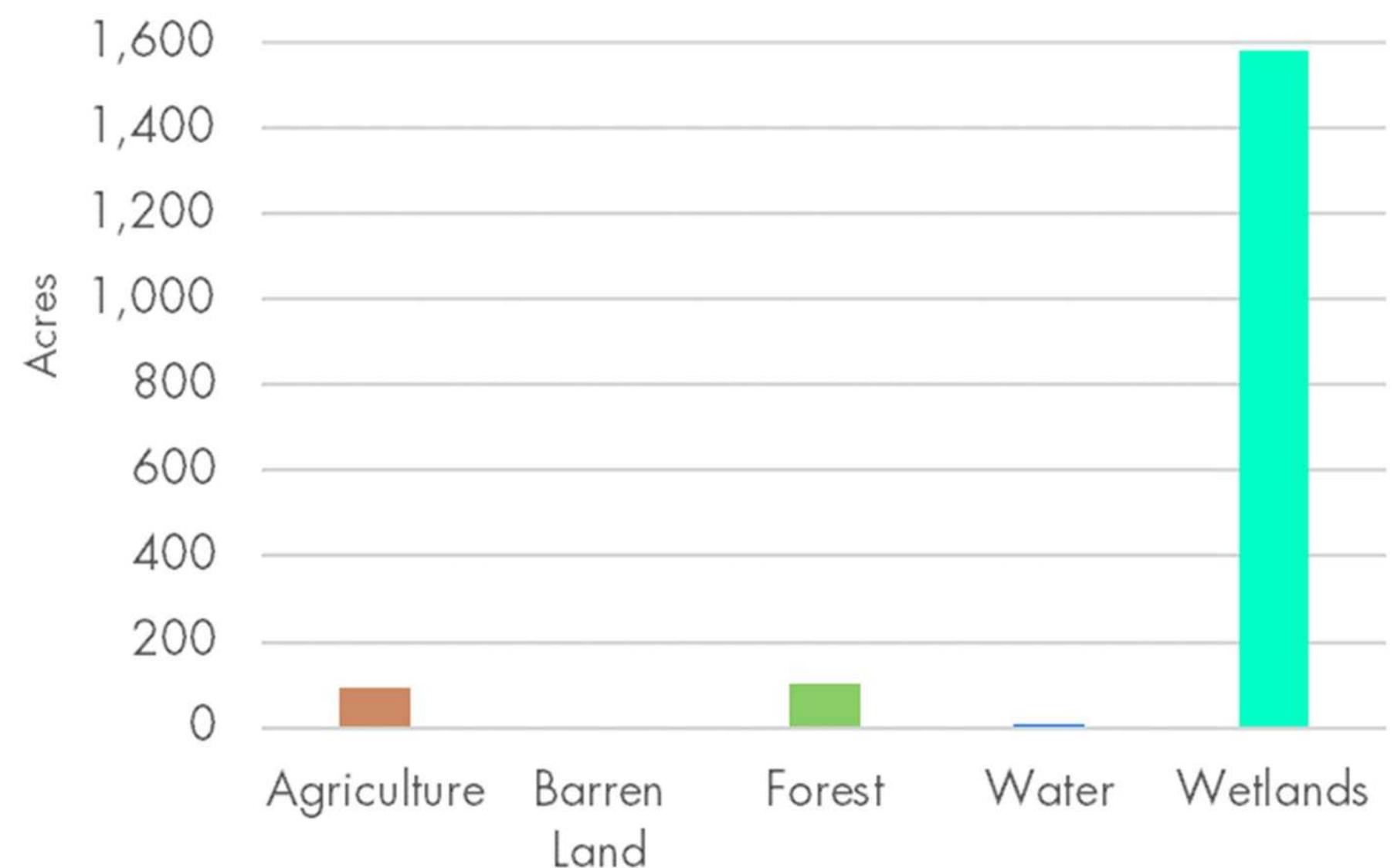
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WEST / EAST CREEKS / RIGGINS DITCH Marsh room to move



WEST / EAST CREEKS / RIGGINS DITCH

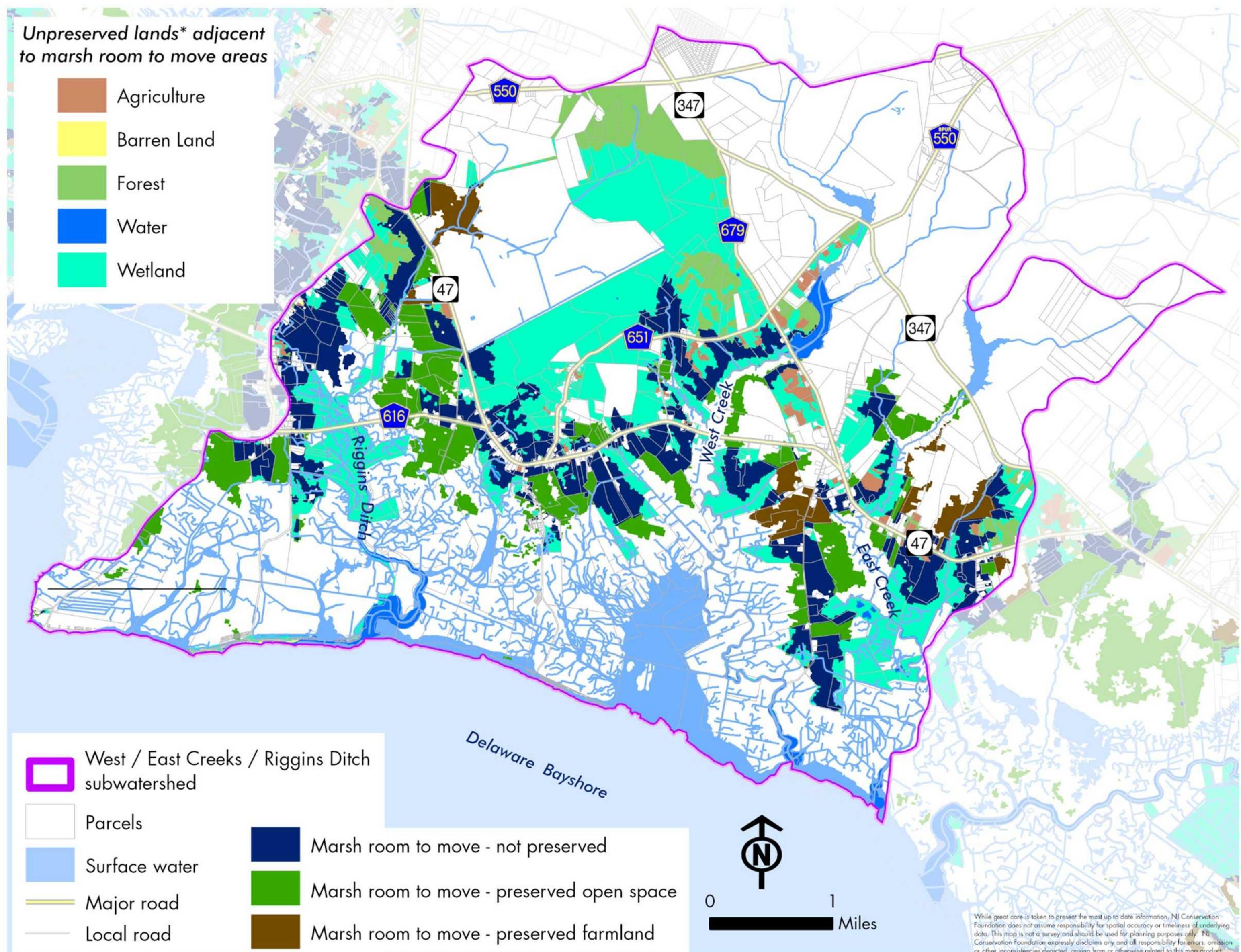
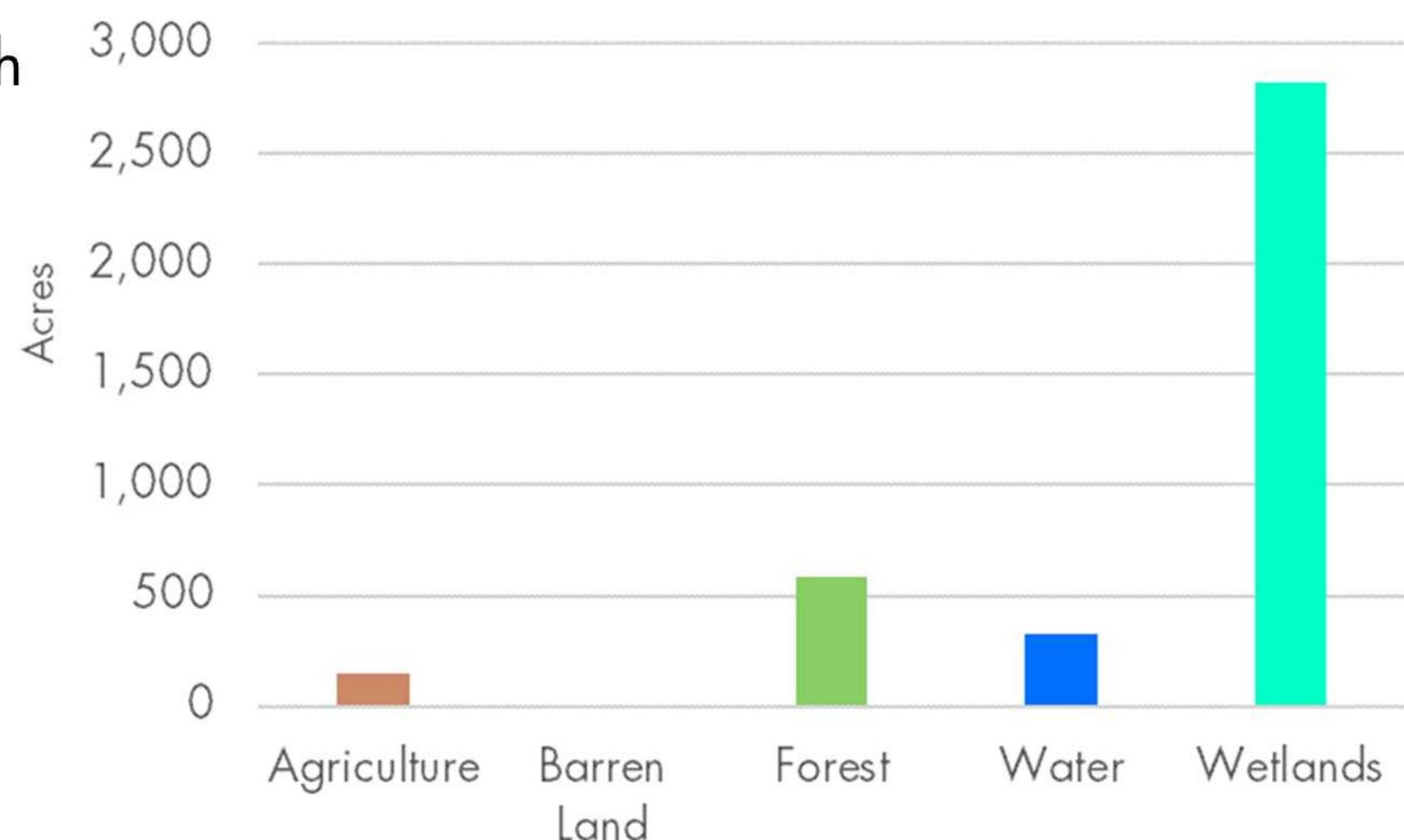
Unpreserved marsh room to move areas by landuse



WEST / EAST CREEKS / RIGGINS DITCH

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



WOODBURY / BIG TIMBER / NEWTON CREEKS Profile

Total area: 37,432 +/- acres

Counties: Camden, Gloucester

Municipalities:

Camden county:

- ◆ Audubon Borough
- ◆ Audubon Park Borough
- ◆ Barrington Borough
- ◆ Bellmawr Borough
- ◆ Brooklawn Borough
- ◆ Camden City
- ◆ Collingswood Borough
- ◆ Gloucester City
- ◆ Gloucester Township
- ◆ Haddon Heights Borough
- ◆ Haddon Township
- ◆ Haddonfield Borough
- ◆ Lawnside Borough
- ◆ Magnolia Borough
- ◆ Mount Ephraim Borough
- ◆ Oaklyn Borough
- ◆ Runnemede Borough
- ◆ Tavistock Borough
- ◆ Woodlynne Borough

Gloucester county:

- ◆ Deptford Township
- ◆ National Park Borough
- ◆ Paulsboro Borough
- ◆ Washington Township
- ◆ West Deptford Township
- ◆ Westville Borough
- ◆ Woodbury City
- ◆ Woodbury Heights Borough



Woodbury / Big Timber / Newton Creeks subwatershed

Overburdened Community

County boundary

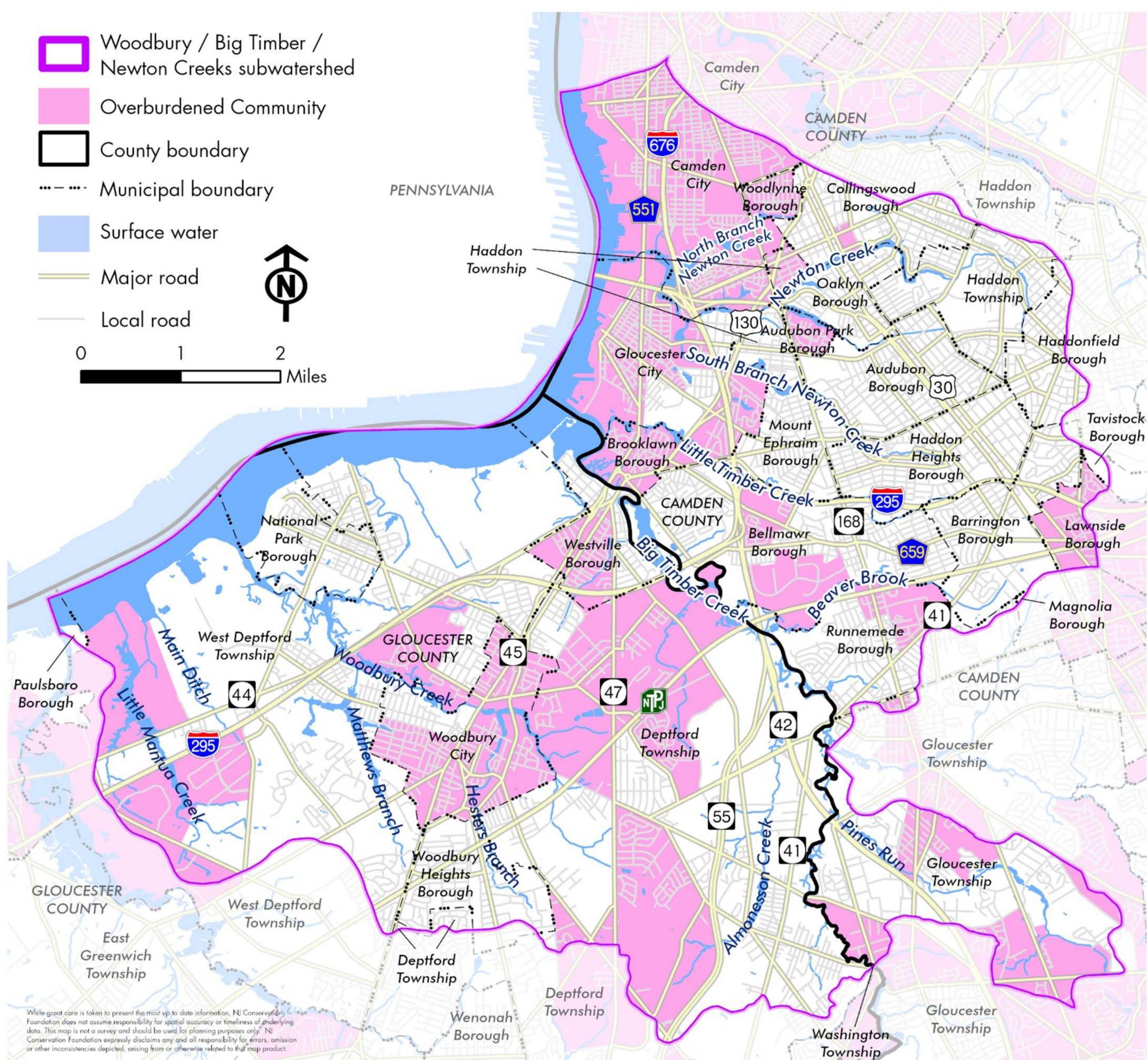
Municipal boundary

Surface water

Major road

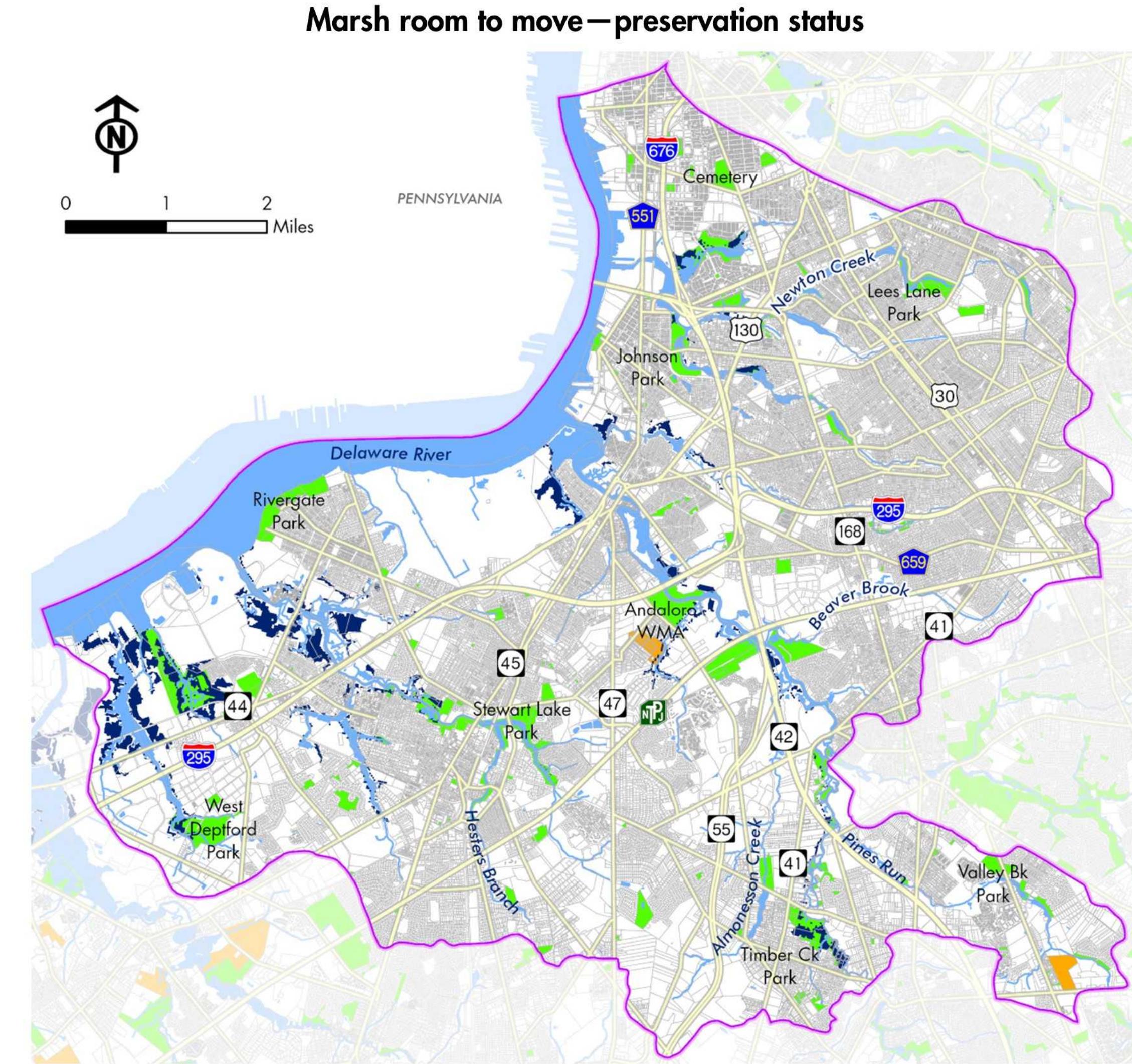
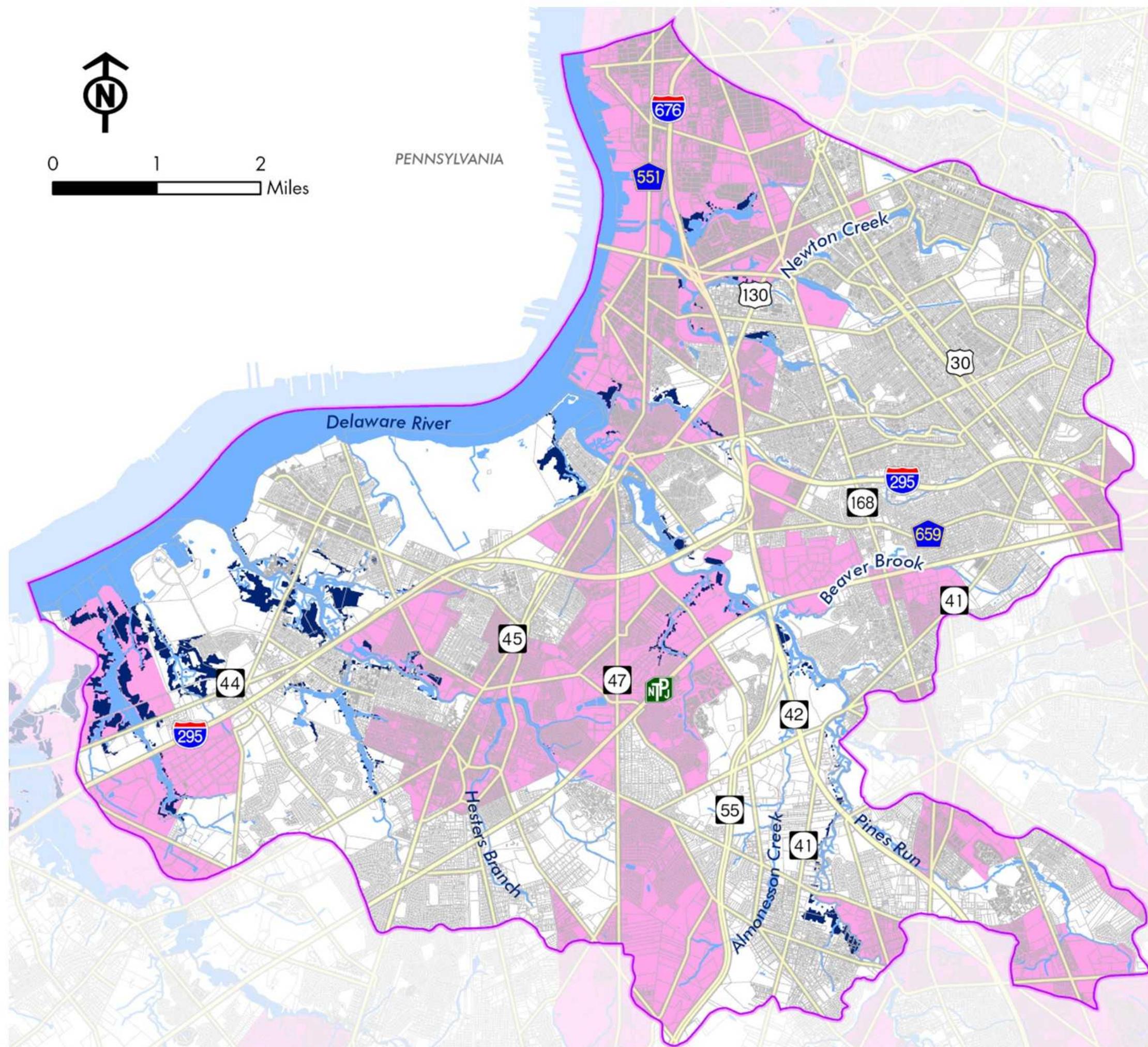
Local road

0 1 2 Miles



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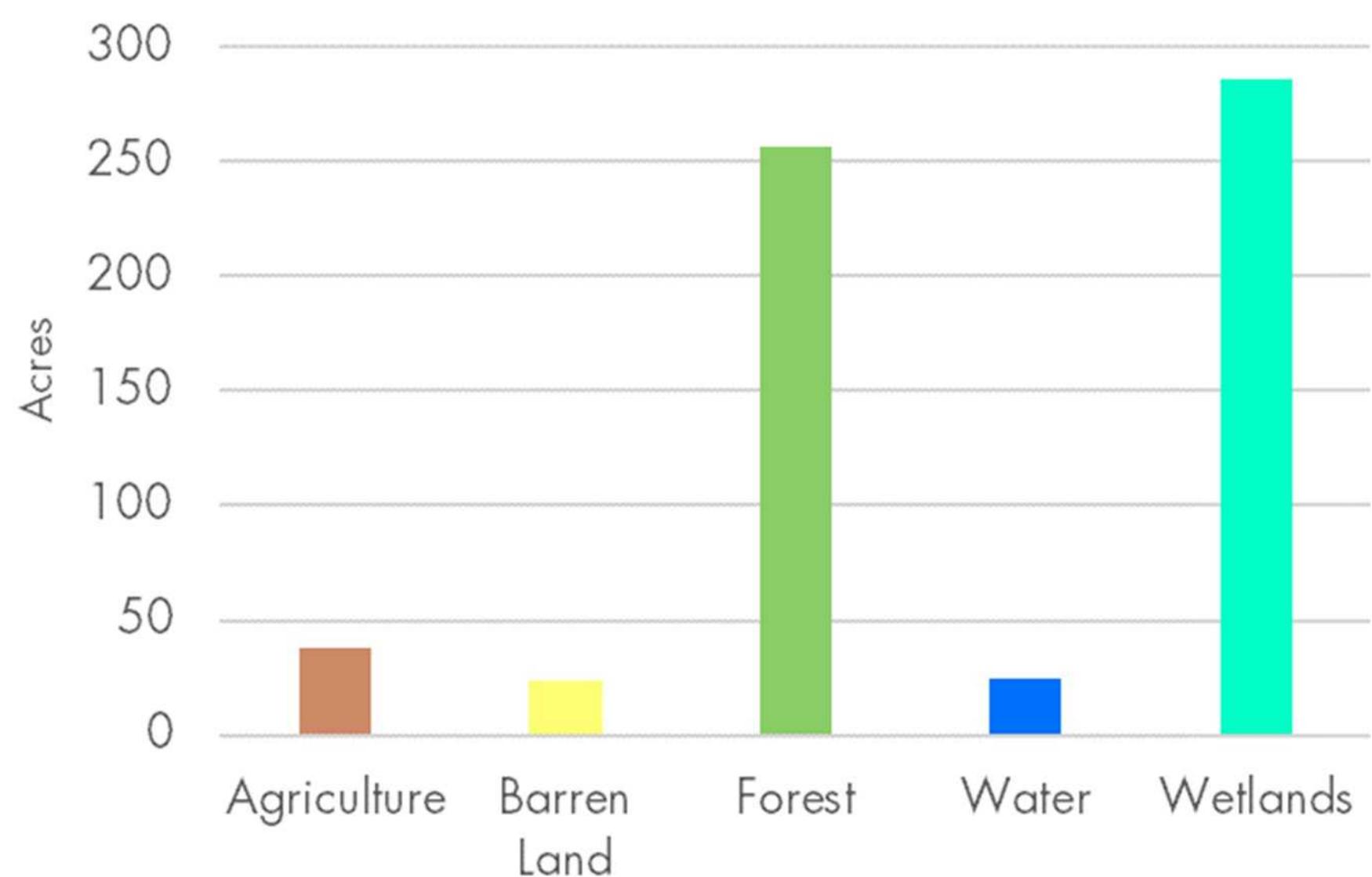
WOODBURY / BIG TIMBER / NEWTON CREEKS Marsh room to move



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WOODBURY / BIG TIMBER / NEWTON CREEKS

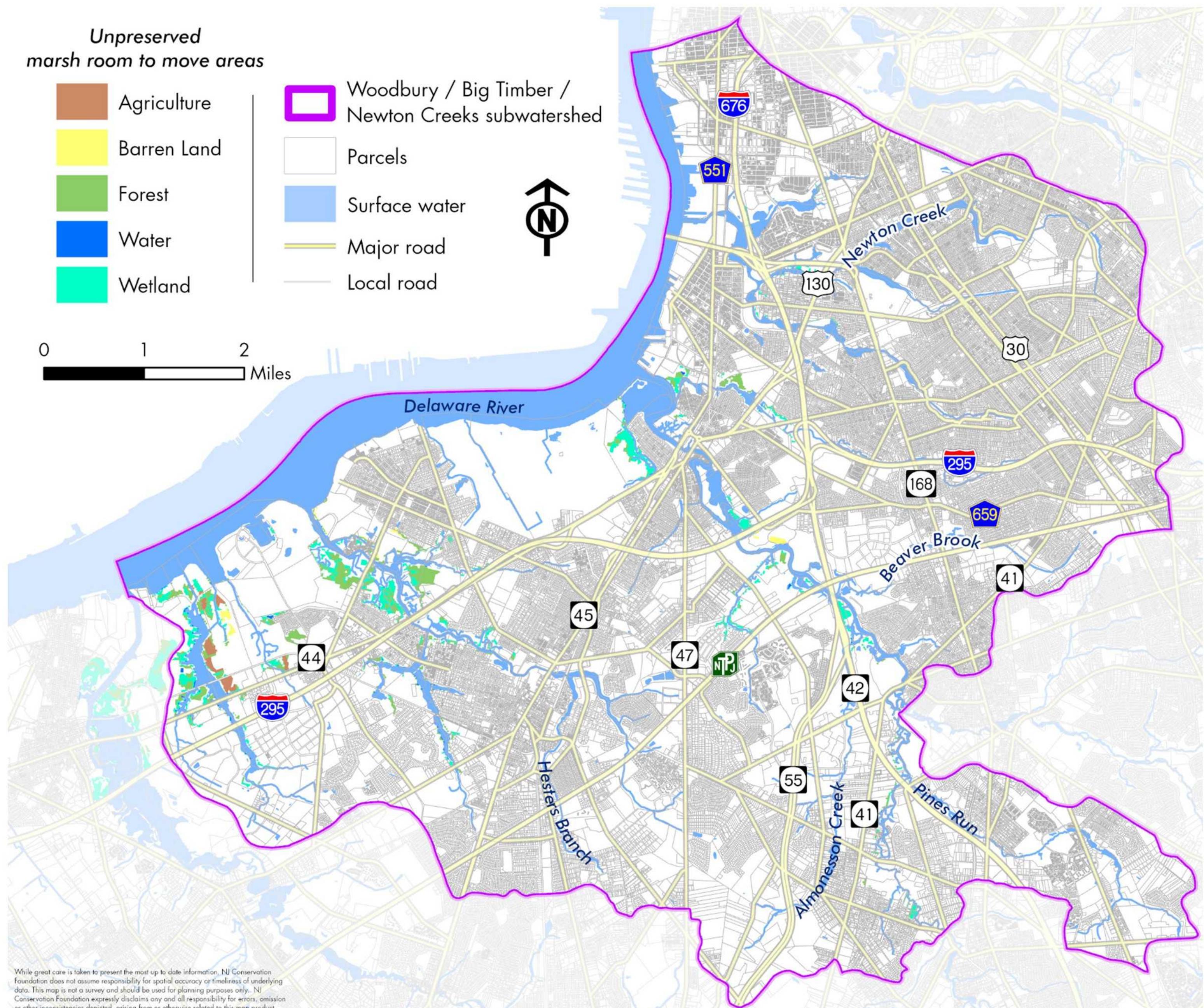
Unpreserved marsh room to move
areas by landuse



Unpreserved
marsh room to move areas



0 1 2 Miles

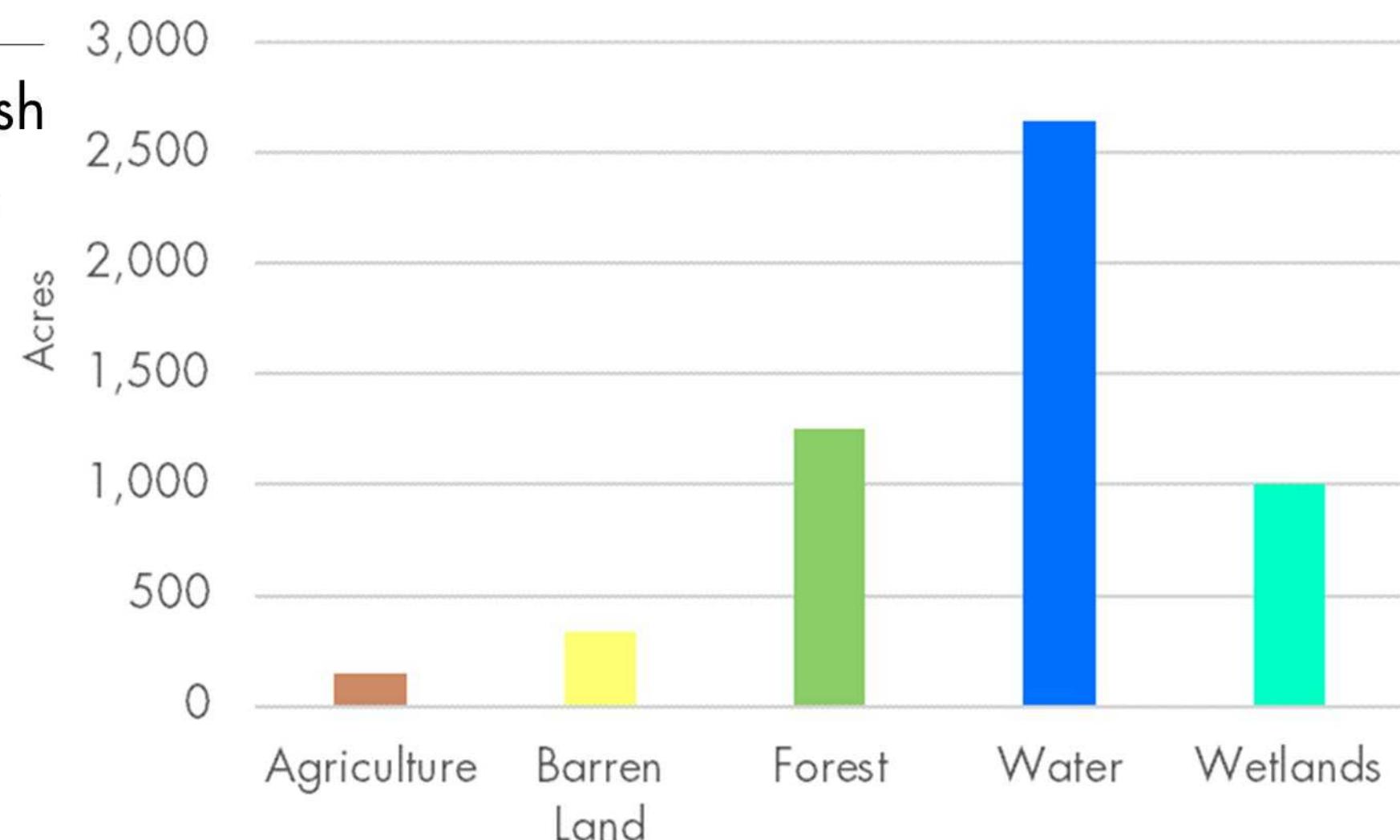


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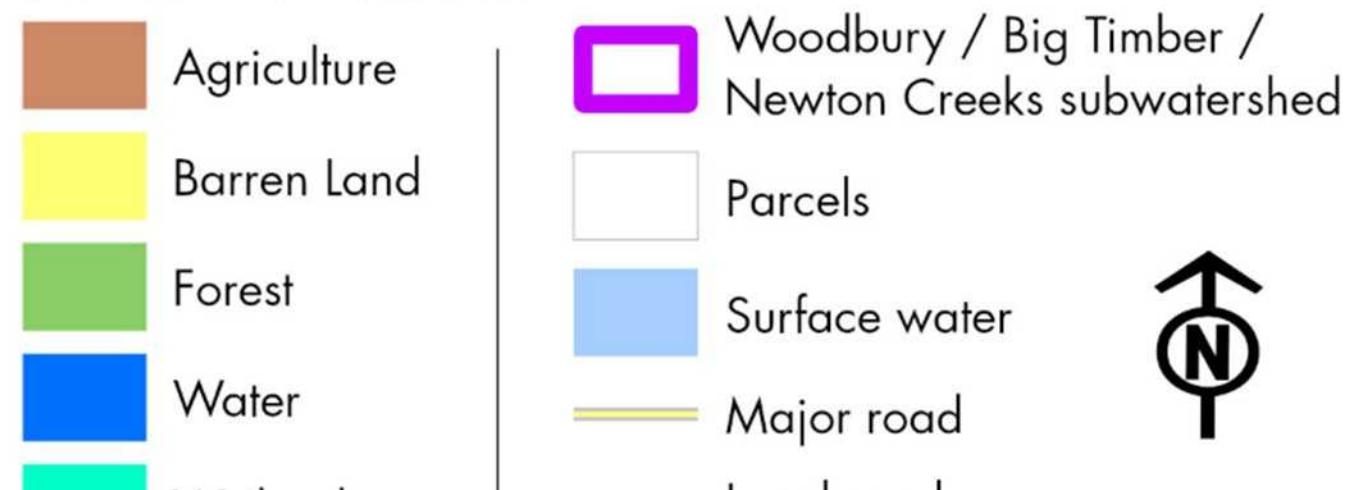
WOODBURY / BIG TIMBER / NEWTON CREEKS

Unpreserved lands* adjacent to marsh room to move areas, that support the marsh ecosystem

*not marsh room to move areas



Unpreserved lands* adjacent
to marsh room to move areas



0 1 2 Miles

