Section 4.0 – Listening Session

A listening session was held on Thursday, May 16, 2019 at the Amesbury Senior Community Center, from 7 pm – 8 pm (see invitation below). This session allowed members of the public to hear presentations about the Natural Resources Infrastructure Assessment project and to see the mapping products that were developed for Amesbury during this initiative. Community members were able to provide feedback to Amesbury leaders that can further inform the development of specific Nature Based Solutions for the Amesbury community. Ideas from the public were recorded on a flip board, and are noted in the table below:

Consider managing Lake Attitash water levels to create more flood storage capacity.
Amesbury should look for opportunities to collaborate with Merrimac about Lake Attitash. Merrimack just submitted an application for an MVP Planning Grant, so they are getting involved in the MVP process.

City of Amesbury
Department of Energy & Environmental Affairs
Thomas Barrasso, Director

Community Resilience Building

Get on the right path to resilience today...

AMESBURY MUNICIPAL VULNERABILITIES PREPAREDNESS PUBLIC LISTENING SESSIONS:

ATTEND THE CITY OF AMESBURY
MUNICIPAL VULNERABILITY PREPAREDNESS and
NATURAL RESOURCES INFRASTRUCTURE ASSESSMENT
LISTENING SESSIONS
WHEN: Thursday, May 16th, 6 pm - 8 pm
WHERE: AMESBURY SENIOR COMMUNITY CENTER
68 Elm Street
Amesbury, MA 01913

Questions? Call Tom Barrasso (978)388-8110 x314

MUNICIPAL VULNERABILITY PREPAREDNESS (MVP) LISTENING SESSION (6 PM – 7 PM): Come find out what your city has been doing to prepare for hazards resulting from our changing climate, such as: increased flooding due to severe storms and sea level rise, increased high heat and drought in the summer, and increased wind damage from storm events. Amesbury is in the process of achieving MVP certification, a pre-requisite for obtaining funding for state Action Grants that support community climate resiliency preparedness. The Amesbury MVP report will be available as of Monday, May 10th on the City of Amesbury's Department of Energy and Environmental Affairs website https://www.amesburyma.gov/energy-environment-affairs. Bring your questions and ideas!

NATURAL RESOURCES INFRASTRUCTURE ASSESSMENT LISTENING SESSION (7 PM – 8 PM): Immediately following the MVP Listening Session, a second listening session will be held. In support of the Amesbury MVP program, the city won a state grant to fund an assessment of natural resources within the city and opportunities to conserve, protect and restore ecological resources that provide flood storage, storm damage prevention, water quality improvement, pollution prevention, and fish and wildlife habitat. These services provided by wetlands, floodplains, forests and stream/river systems help protect Amesbury from the effects of climate change (heat, floods, storms). Come see the maps and results of the assessment and bring your questions and ideas. The Amesbury MVP report will be available as of Monday, May 6th, the Amesbury NRIA report will be available on the City of Amesbury's Department of Energy and Environmental Affairs website: https://www.amesburyma.gov/energy-environment-affairs.

Visit the Massachusetts Municipal Vulnerabilities Preparedness Program website to learn more at:

https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program

BSC GROUP

Invitation to MVP and Natural Resources Infrastructure Assessment Listening Sessions

References

- Anderson MG, Barnett A, Clark M, Ferree C, Olivero Sheldon A, Prince J (2016a) Resilient sites for terrestrial conservation in Eastern North America 2016 edition. The Nature Conservancy, Eastern Conservation Science, Boston, MA

- Costanza R, Peerez-Maqueo O, Martinez ML, Sutton P, Anderson SJ, Mulder K (2008) The value of coastal wetlands for hurricane protection. BioOne 37:241–248. doi: 10.1579/0044-7447(2008)37[241:TVOCWF]2.0.CO;2

- Fremier AK, Kiparsky M, Gmur S, Aycrigg J, Kundis Craig R, Svancara LK, Goble DD, Cosens B, Davis FW,
- Scott JM (2015) A riparian conservation network for ecological resilience. Biological Conservation 191:29–37. doi: 10.1016/J.BIOCON.2015.06.029

- Massachusetts Executive Office of Energy and Environmental Affairs Adaptation Advisory Committee. (2011). *Massachusetts Climate Change Adaptation Report.* Boston: Massachusetts Executive Office of Energy and Environmental Affairs.

- Moomaw, WR, Chmura GL, Davies GT, Finlayson, CM, Middleton BA, Natali SM, Perry JE, Roulet N, Sutton-Grier AE (2018) Wetlands In a Changing Climate: Science, Policy and Management. Wetlands 38(2):183-205. https://doi.org/10.1007/s13157-018-1023-8

- Naiman, RJ, Decamps H, & Pollock M. 1993. The role of riparian corridors in maintaining regional biodiversity. Ecological applications 3(2), 209-212.

- Narayan S, Beck MW, Wilson P, Thomas CJ, Guerrero A, Shepard CC, Reguero BG, Franco G, Ingram CJ, Trespalacios D (2017) The value of coastal wetlands for flood damage reduction in the northeastern USA. Scientific Reports 7:9463. doi: 10.1038/s41598-017-09269-z

APPENDICES

APPENDIX A:
AMESBURY CLIMATE RESILIENCY AND NATURAL RESOURCES MAPS

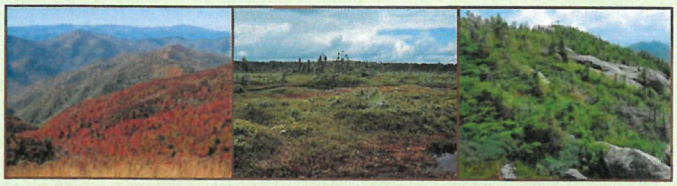
Resilient Sites for Conservation in the Eastern United States

The Nature Conservancy
Protecting nature. Preserving life.

Strongholds for Nature in a Changing Climate

Conserving the Stage: Climate change is creating an increasingly dynamic natural world by shifting species distributions and rearranging habitats. Consequently, conservationists need a way to identify important areas for protection that does not assume that the locations of existing plants and animals will stay the same. Rather than trying to protect diversity one species at a time, the key is to protect the different "stages" upon which the drama of nature unfolds. In the Eastern United States, these stages are based strongly on geology and consist of recognizable geophysical settings such as coastal sands, limestone valleys, granite summits, or silt floodplains, that each support a distinct set of species. Conserving a range of physical environments offers an approach to conservation that protects a diversity of plants and animals under both current and future climates.

Settings and Stages: The number of plants and animals in each state across the East is correlated with the number of geology types, the amount of limestone, the latitude, and range of elevation in the state. These geophysical factors form ecological regions across the landscape that support different species.



High Elevation Granite | High Elev. Limestone | High Elev. Mafic

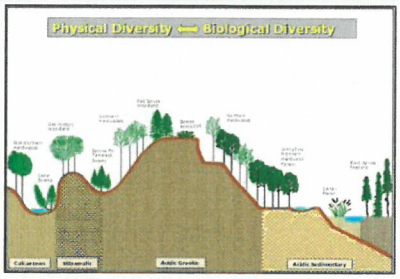
Low Elev. Sand | Low Elev. Sedimentary | Low Elev. Silt

Typical **geophysical settings** of the Eastern United States

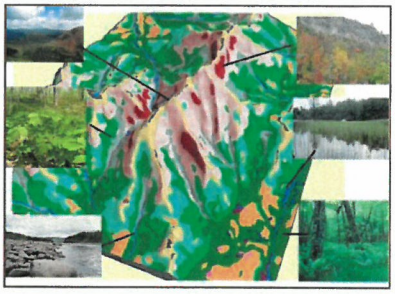
Natural Strongholds: Lasting conservation depends on identifying and protecting places where the effects of climate change are buffered by the natural properties of the site. Conserving these places is vital to maintaining a diversity of species and natural processes regardless of changes in the climate.

Natural strongholds are places where the direct effects of climate change are moderated by **complex** topography and **connected** natural cover, and where the current landscape contains **high quality biodiversity** features. Natural Strongholds can serve as a bridge to grant safe passage into the future for thousands of species.

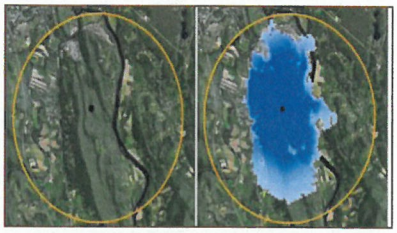
In these sites, species can find areas of suitable moisture and temperature within their local neighborhood. This allows resident species populations to remain strong and helps ensure that changes in the composition and structure of the communities will be more gradual.



GEOPHYSICAL SETTINGS
are unique combinations of geology, elevation, and landforms.



COMPLEX LANDSCAPES
create "micro-climates" that buffer change by providing species with a variety of local climates.



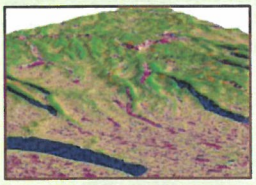
CONNECTED LANDSCAPES
offset the development, roads, and agriculture that can inhibit natural movements. Maintaining a connected area (BLUE REGION above) in which species can move ensures that the area can adapt to climate change.

Underlying data developed by The Nature Conservancy's Eastern Science Office with support from the Doris Duke Charitable Foundation and the Northeast Association of Fish and Wildlife Agencies.

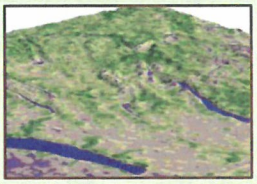
View the report, papers, and full-sized maps at:

http://www.nature.ly/TNCResilience

A Complex and Connected Landscape



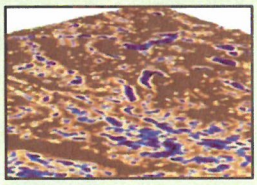
Landforms



Landform Variety

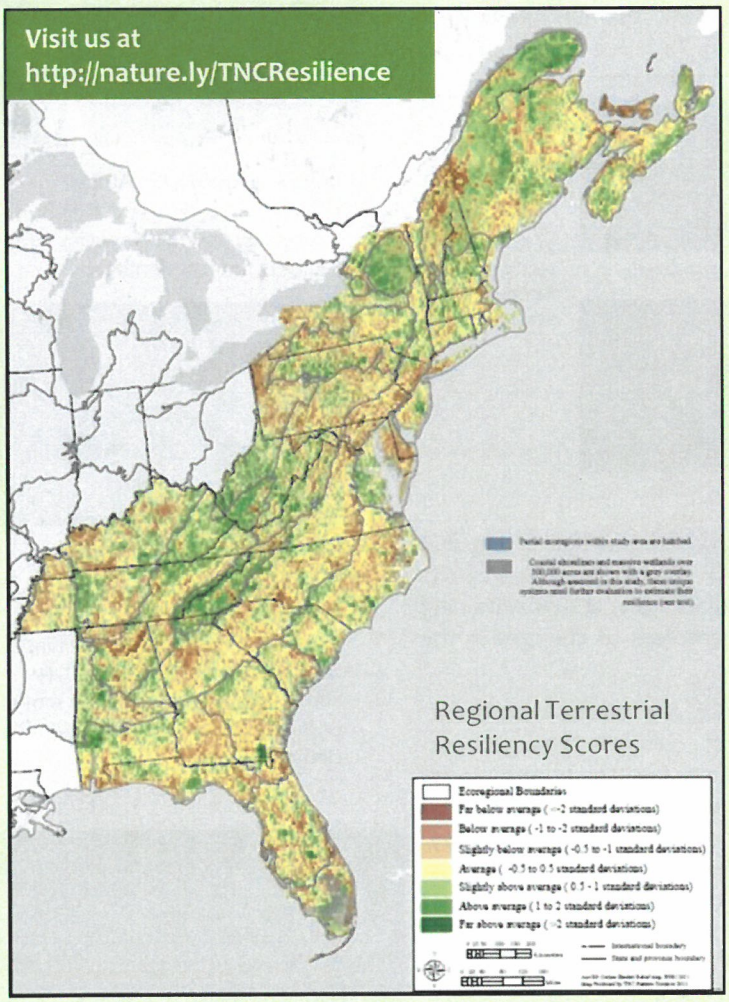
Complex Landscapes: are places that have an assortment of small, connected, local climates creating a range of temperature and moisture options for the resident species. In essence, complex topography and elevation gradients break the regional climate into a wide array of micro-climates.

Elevation Range



Wetland Density

Connected Landscapes: are places that allow species to move and disperse, and processes like fire or water movement can occur unimpeded. This facilitates the adjustments necessary for the natural world to stay balanced with the climate. Permeable landscapes have an abundance of connected natural cover.



Resilient Sites: With a changing climate, many places may become degraded and lose species, but some places will retain high quality habitat and continue to support a diverse array of plants and animals. Sites that have both **complex** topography and **connected** land cover are places where conservation action is most likely to succeed in the long term.

Permanent conservation of the resilient areas should be prioritized to ensure they can continue to provide habitat for species.

Securing resilient sites safeguards natural benefits such as fresh drinking water and clean air for local communities now and into the future.

Resiliency Scores: The map shows areas that offer the greatest potential for species to adapt as the climate changes. A dark green color indicates that the area has high estimated resilience. Brown indicates areas vulnerable to climate change. The analysis estimates resiliency scores by each ecological region (gray lines) in the East.

Coastal shorelines and wetlands over 300,000 acres need further analysis.

For more information and full-sized maps, see the complete report: **http://nature.ly/TNCResilience**

Terrestrial Resilience Core Concepts

Resilient Site: An area of land with sufficient variability and microclimate options to enable species and ecosystems to persist in the face of climate change and which will maintain this ability over time.

Geophysical Settings: Broadly defined landscape types that contain a variety of plants, animals and natural habitats that occur in similar geologic environment (e.g. similar bedrock, soils and elevation zone). If conservation succeeds, each geophysical setting will support species and communities that thrive in conditions defined by its physical properties, although the species in the future may differ from those currently present. In this study, we defined geophysical settings by mapping and classifying combinations of geology and elevation.

Natural Stronghold: a resilient site that currently supports exemplary habitats, wildlife, or rare species, and may provide refuge for these elements as the climate changes.

Two Example Settings:

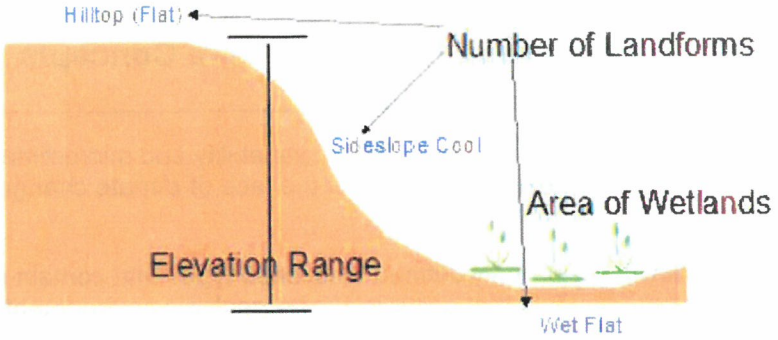
Coarse sand: Longleaf pine in Weymouth Woods SP, © Albert Herring.

Sedimentary: Sandstone at the Altamaha Rocks, © Alan Cressler.

Resilience Score: A site's Resilience Score estimates its capacity to maintain species diversity and ecological function as the climate changes. The score is relative to all other sites with the same geophysical setting and is described on a relative basis as above or below average. For example, granite mountains were compared with other granite mountains, and coastal plain sands were compared with other coastal plain sands. Our goal was to identify the places most resilient to climate change for each type of setting. A site's final resilience score was determined by evaluating physical characteristics that foster resilience, particularly the site's landscape diversity and local connectedness.

Characteristics that Foster Resilience: A resilient site is one that offers many options to species and ecosystems. Such options, include topographic and elevation diversity that provide a range of habitat types and microclimates (landscape diversity), and minimal barriers that restrict adaptive movement of species or ecosystems (local connectedness).

Landscape Diversity: Refers to the microhabitats and climatic gradients available in one's immediate neighborhood. Topographic diversity buffers against climatic effects because the persistence of species in an area increases in landscapes with a wide variety of microclimates. In this study, we measure microclimates by counting the variety of landforms, measuring elevation range, and the density of wetlands in a 100 acre neighborhood around every point on the landscape.



Local Connectedness: refers to the number of barriers and the degree of fragmentation within a landscape. A highly connected landscape promotes resilience by allowing species to move around the landscape and find suitable microclimates where they can persist. In this study, we measure local connectedness by measuring the amount of natural land cover and configuration of human-created barriers like major roads, developments, and agricultural land.

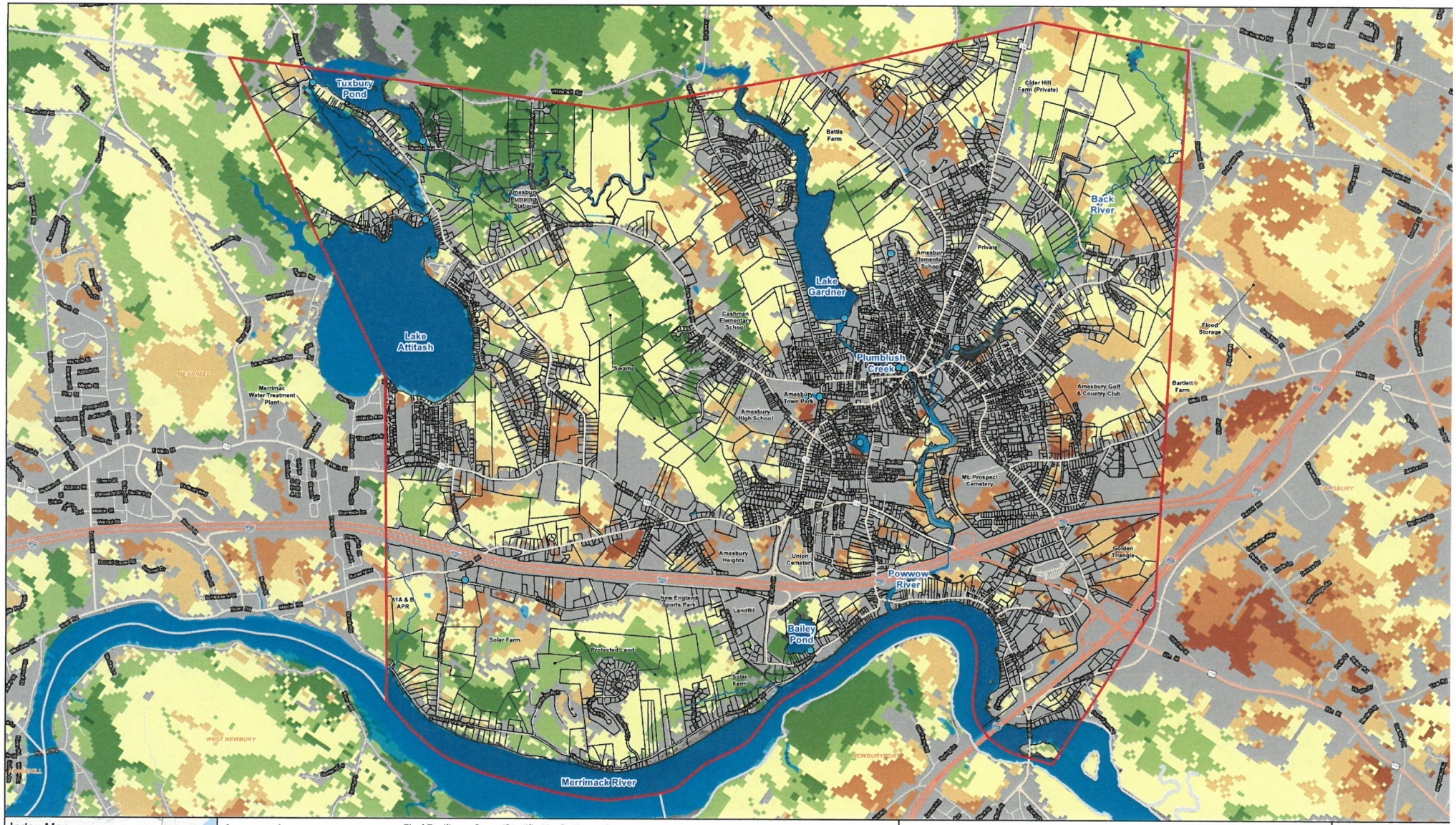
Many barriers. Low Local Connectivty

No barriers. High Local Connectivty

Riparian Climate Corridors: Riparian areas are the floodplains and zones along water bodies that serve as interfaces between terrestrial and aquatic ecosystems. With respect to climate change, riparian areas feature micro-climate refugia that are significantly cooler and more humid than immediately surrounding areas. Our objective was to identify intact riparian floodplain areas that serve as natural corridors to facilitate movement of plants and wildlife linearly, taking advantage of the cooler moister environment within these areas.

1. **High Flow Riparian Corridors, largely within resilient land:** These riparian corridors have high regional terrestrial permeability flow and have >75% of their land area within resilient land. They have a minimum size of 1,000 acres and are considered highly intact and resilient.
2. **High Flow Riparian Corridors, largely outside resilient land:** These riparian corridors have high regional terrestrial permeability flow, but are <75% within resilient land. They have a minimum size of 5,000 acres and touch at least 3 prioritized diversity features. They are considered more vulnerable given a significant portion of their area falls on non-resilient land.

File Location: \\bscbosiwer\GIS-WDR\GISPrj0000001\George\Malloy\Amesbury\MXD\Amesbury_TNC_Resilience_20180907.mxd
Date Saved: 3/1/2019 12:42:55 PM



Index Map

Legend

- River Centerline
- Amesbury Parcels
- Amesbury Town Boundary
- MADEP Waterbody
- Town Boundaries
- Dam

Final Resilience Score (Stratified by Setting and Ecoregion with Regional Override)

- Far Above Average (>2
- Above Average (1 SD to 2 SD)
- Slightly Above Average (0.5 to 1
- Average (-0.5 to 0.5 SD)
- Slightly Below Average (-0.5 to -1 SD)
- Below Average (-1 to -2 SD)
- Far Below Average (<-2 SD)
- Developed

1 inch = 1,150 feet

0 2,300 4,600

Feet

N

Source:
-MassGIS, UMASS CAPS, MassAudubon
The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Ecological Climate Resiliency Map

(Based on the Nature Conservancy's Reslient & Connected Landscapes)

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbuswor\GIS-WOR\GIS\Prj\00000001\George\Malloy\Amesbury\MXD\Amesbury_TNC_ResilienceRegional_20180301.mxd
Date Saved: 3/1/2018 12:56:24 PM

Index Map

Legend

Amesbury Town Boundary

Final Resilience Score (Stratified by Setting and Ecoregion with Regional Override)

- Far Above Average (>2
- Above Average (1 SD to 2 SD)
- Slightly Above Average (0.5 to 1
- Average (-0.5 to 0.5 SD)
- Slightly Below Average (-0.5 to -1 SD)
- Below Average (-1 to -2 SD)
- Far Below Average (<-2 SD)
- Developed

1 inch = 8,000 feet

0 16,000 32,000

Feet

N

Source:
-MassGIS, UMASS CAPS, MassAudubon, The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Ecological Climate Resiliency Regional Map

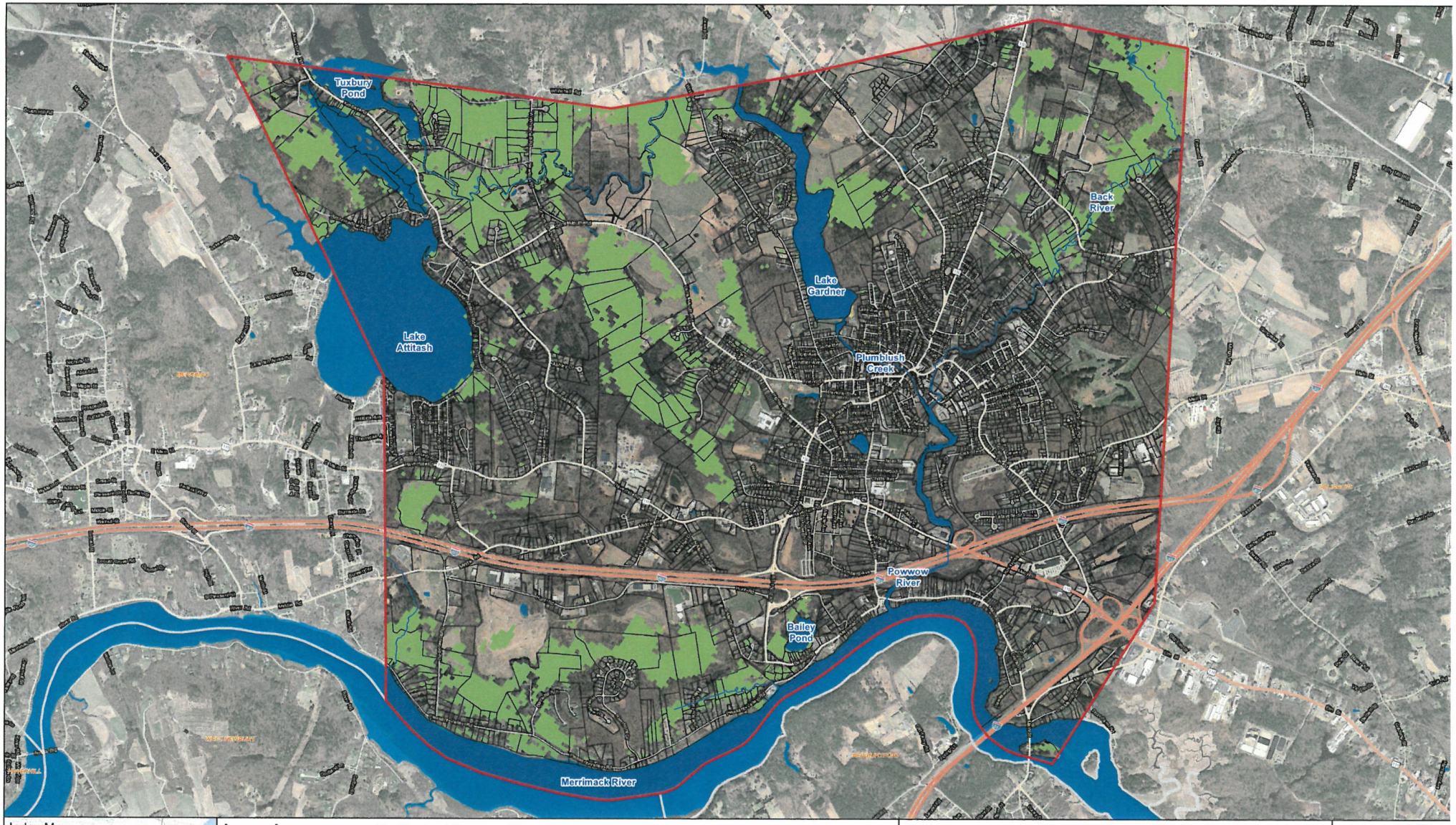
(Based on the Nature Conservancy's Reslient & Connected Landscapes)

Amesbury, MA

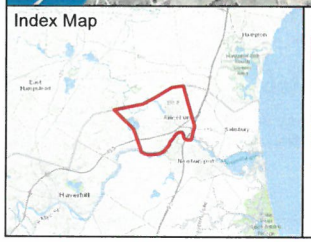
BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\wor\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_ResConnectedLandscapes_20180907.mxd
Date Saved: 2/27/2019 3:34:41 PM



Index Map



Legend

- Amesbury Boundary
- Town Boundaries
- Amesbury Parcel
- MADEP Waterbody
- River Centerline

Resilient and Connected Networks

- Resilient Only with Secured Lands — A place buffered from climate change because it contains many connected micro-climates that create climate options for species.
- Resilient Area with Confirmed Diversity — A resilient area that contains known locations of rare species of unique communities based on ground inventory. Unconfirmed areas may contain the same species.

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS, UMASS CAPS, The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Priority Resilient and Connected Landscapes Map

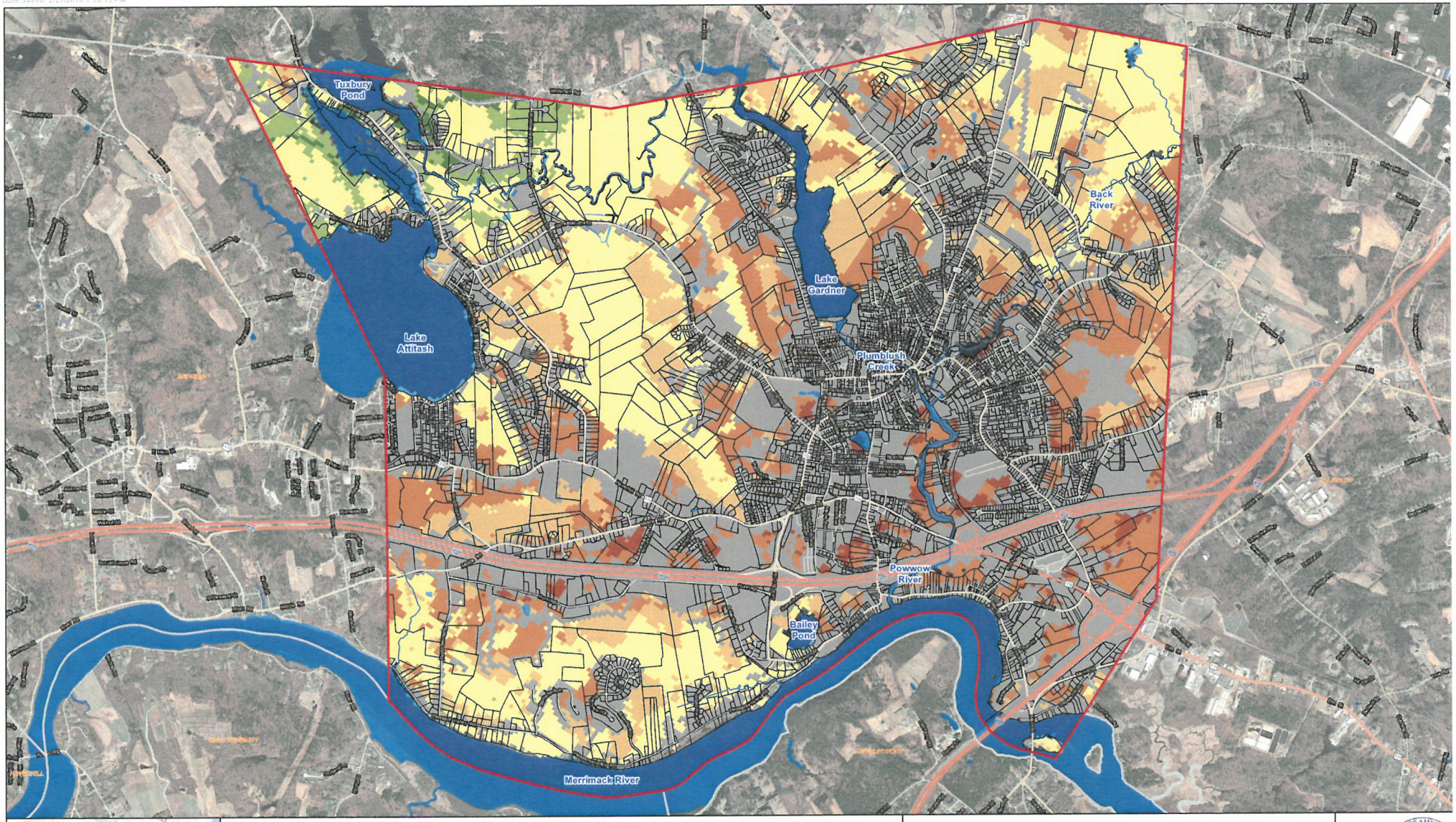
(Based on the Nature Conservancy's Reslient & Connected Landscapes)

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\work\GIS-WORK\GIS\Proj\00000901\George\Malloy\Amesbury\MXD\Amesbury_TNC_Connectedness_20180907.mxd
Date Saved: 2/27/2019 3:55:13 PM



Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- MADEP Waterbody
- Town Boundaries

Local Connectedness Stratified by Setting and Ecoregion with Regional Override

- Far Above Average (>2
- Above Average (1 SD to 2 SD)
- Slightly Above Average (0.5 to 1
- Average (-0.5 to 0.5 SD)
- Slightly Below Average (-0.5 to -1 SD)
- Below Average (-1 to -2 SD)
- Far Below Average (<-2 SD)
- Developed

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS, UMASS CAPS, MassAudubon
The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, I-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Local Connectedness Map

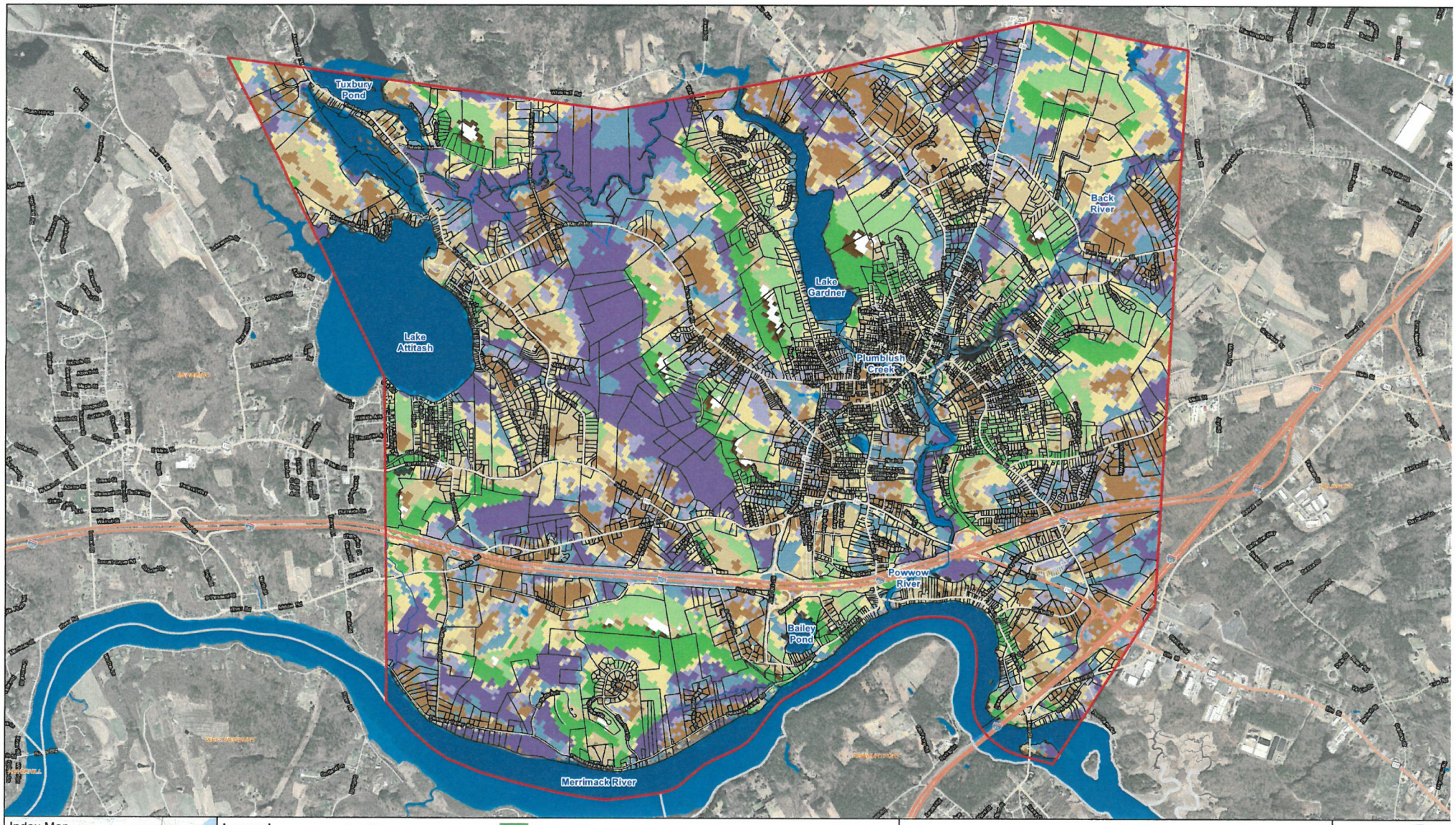
(Based on the Nature Conservancy's Reslient & Connected Landscapes)

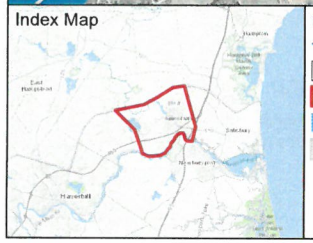
Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbeslwor\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_TNC_Landforms_20180907.mxd
Date Saved: 2/27/2019 3:45:56 PM





Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- MADEP Waterbody
- Town Boundaries

Landforms

- 3: Steep slope cool aspect
- 11: Summit/ridgetop
- 13: Slope crest
- 21: Hilltop (flat)
- 22: Hill (gentle slope)
- 23: Sideslope cool aspect
- 24: Sideslope warm aspect
- 30: Dry flats
- 31: Wet flats
- 32: Valley/toeslope
- 39: Moist flats in upland landcover
- 41: Flat at bottom of steep slope
- 44: Cove/footslope warm aspect

N

1 inch = 1,150 feet

0 2,400 4,800

Feet

Source:
-MassGIS, UMASS CAPS, MassAudubon
The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Landforms Map

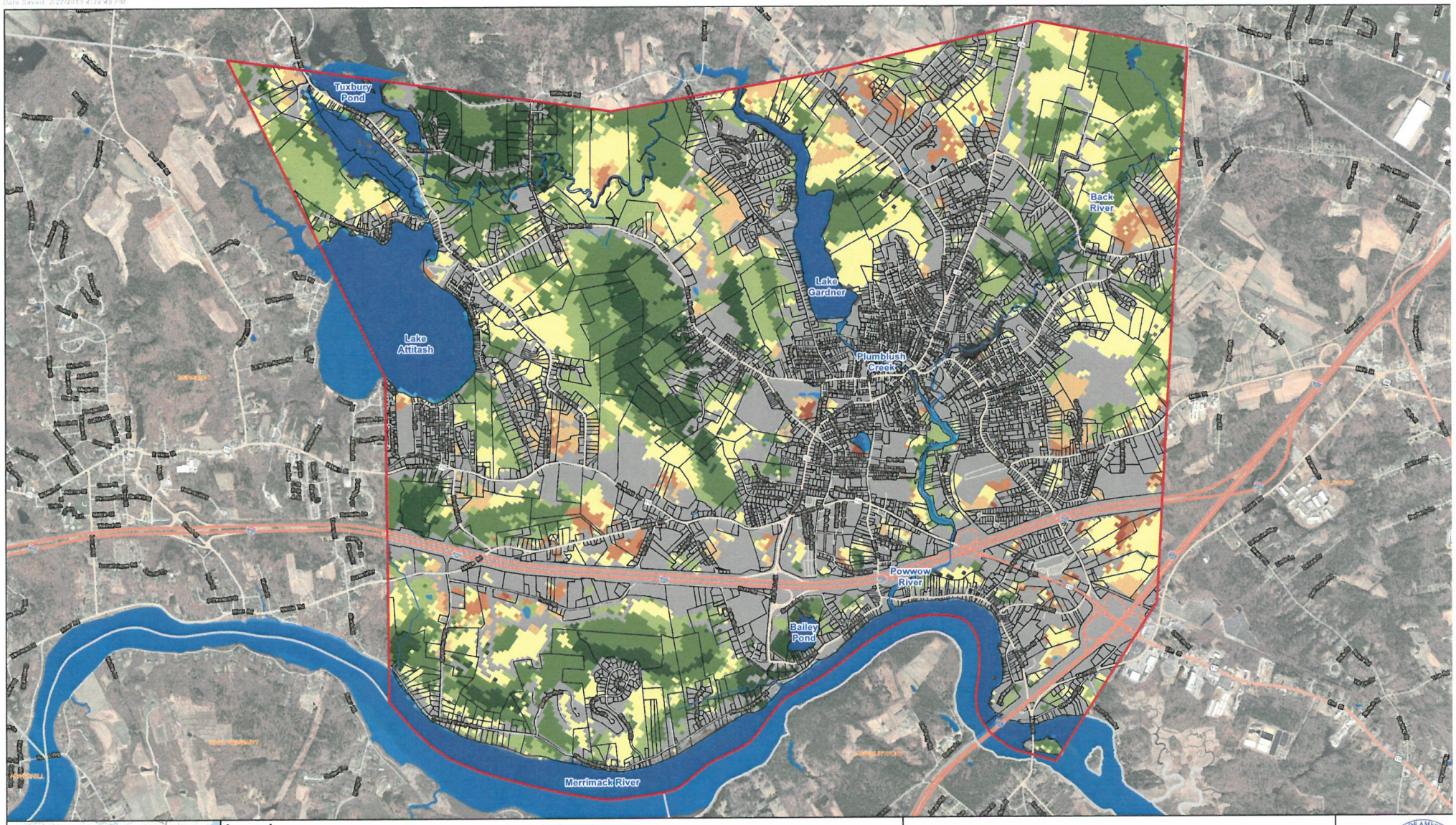
(Based on the Nature Conservancy's Reslient & Connected Landscapes)

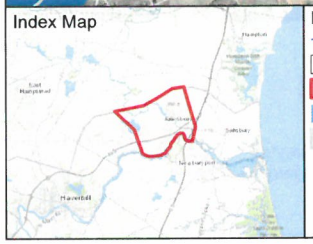
Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbuslworl\GIS-WOR\GISPrj\00000011\George\Malloy\Amesbury\MXD\Amesbury_TNC_LandscapeDiversity_20150907.mxd
Date Saved: 2/27/2015 4:39:49 PM





Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- MADEP Waterbody
- Town Boundaries

Landscape Diversity Score Stratified by Setting and Ecoregion with Regional Override

- Far Above Average (>2 SD)
- Above Average (1 SD to 2 SD)
- Slightly Above Average (0.5 to 1 SD)
- Average (-0.5 to 0.5 SD)
- Slightly Below Average (-0.5 to -1 SD)
- Below Average (-1 to -2 SD)
- Far Below Average (<-2 SD)
- Developed

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS, UMASS CAPS, MassAudubon
The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, I-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Landscape Diversity Map

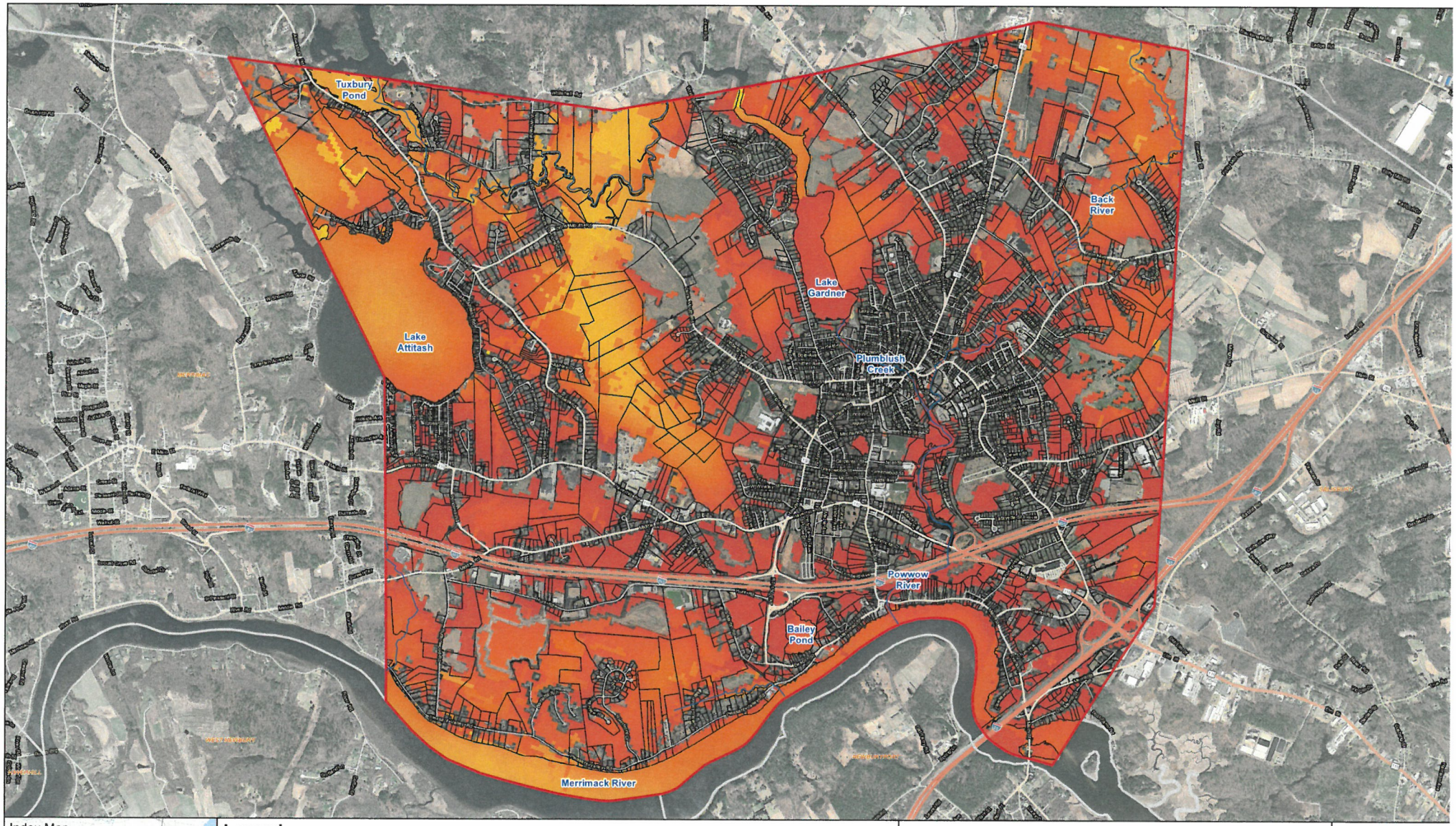
(Based on the Nature Conservancy's Reslient & Connected Landscapes)

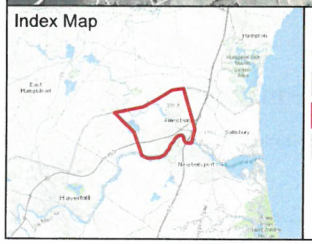
Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\wor\GIS-WOR\GISProj\0000001\George\Malloy\Amesbury\MXD\Amesbury_IEI_20160904.mxd
Date Saved: 2/27/2019 2:20:03 PM





Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- Town Boundaries

Ecological Integrity Index

High : 100

Low : 1

1 inch = 1,150 feet

0 2,300 4,600

Feet

N

Source:
-MassGIS, UMASS CAPS Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

Ecological Integrity Index Map

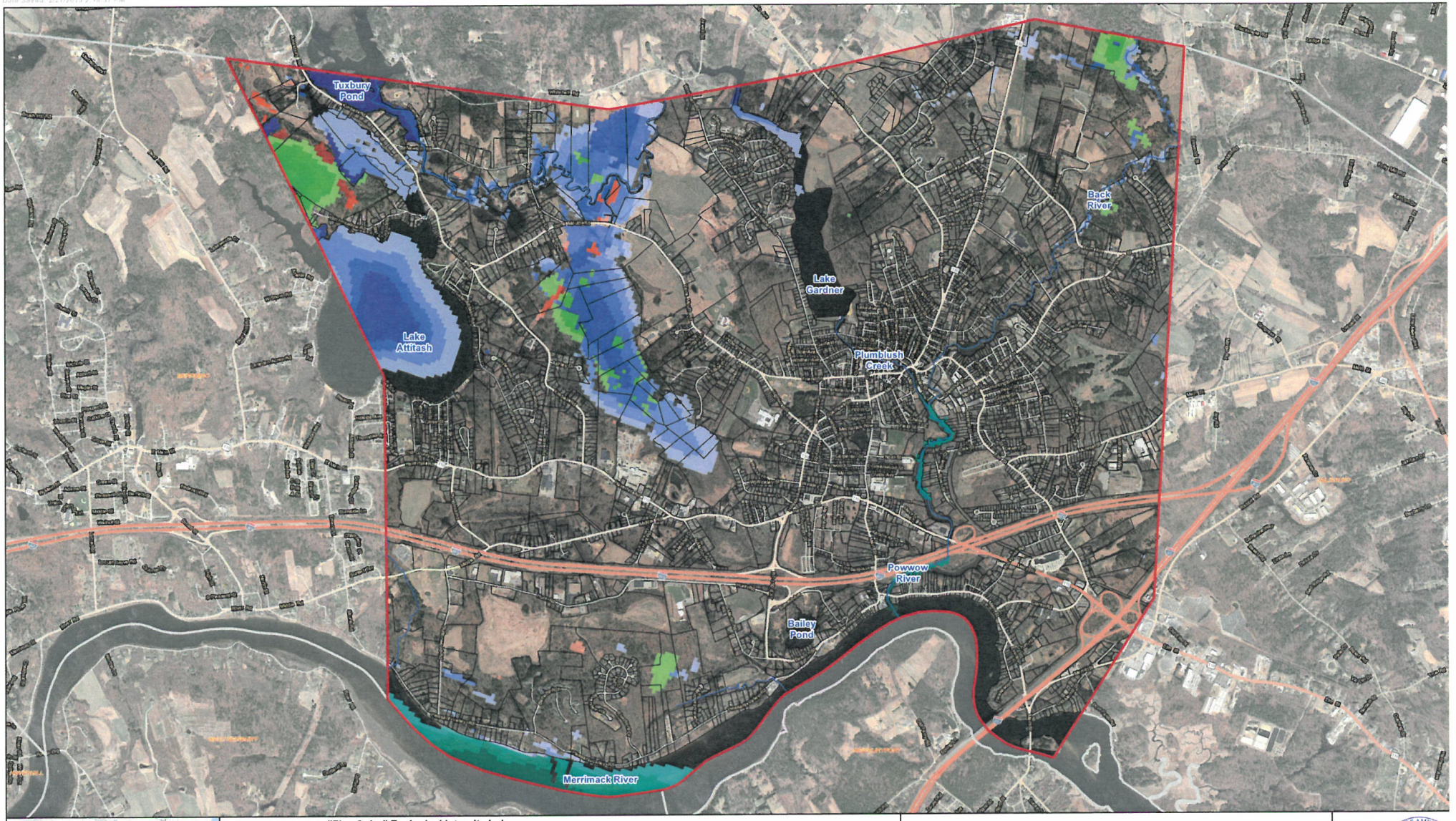
(Based on the UMass CAPS MA Index of Ecological Integrity)

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbus\work\GIS-WORK\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_IEI_5Color_20180904.mxd
Date Saved: 2/27/2019 2:18:37 PM



Index Map

Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- Town Boundaries

"Five Color" Ecological Integrity Index

- Forest
- Shrubland
- Coastal Upland
- Freshwater Wetland & Aquatic
- Coastal Wetland & Aquatic

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS, UMASS CAPS Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

"Five Color" Ecological Integrity Index Map

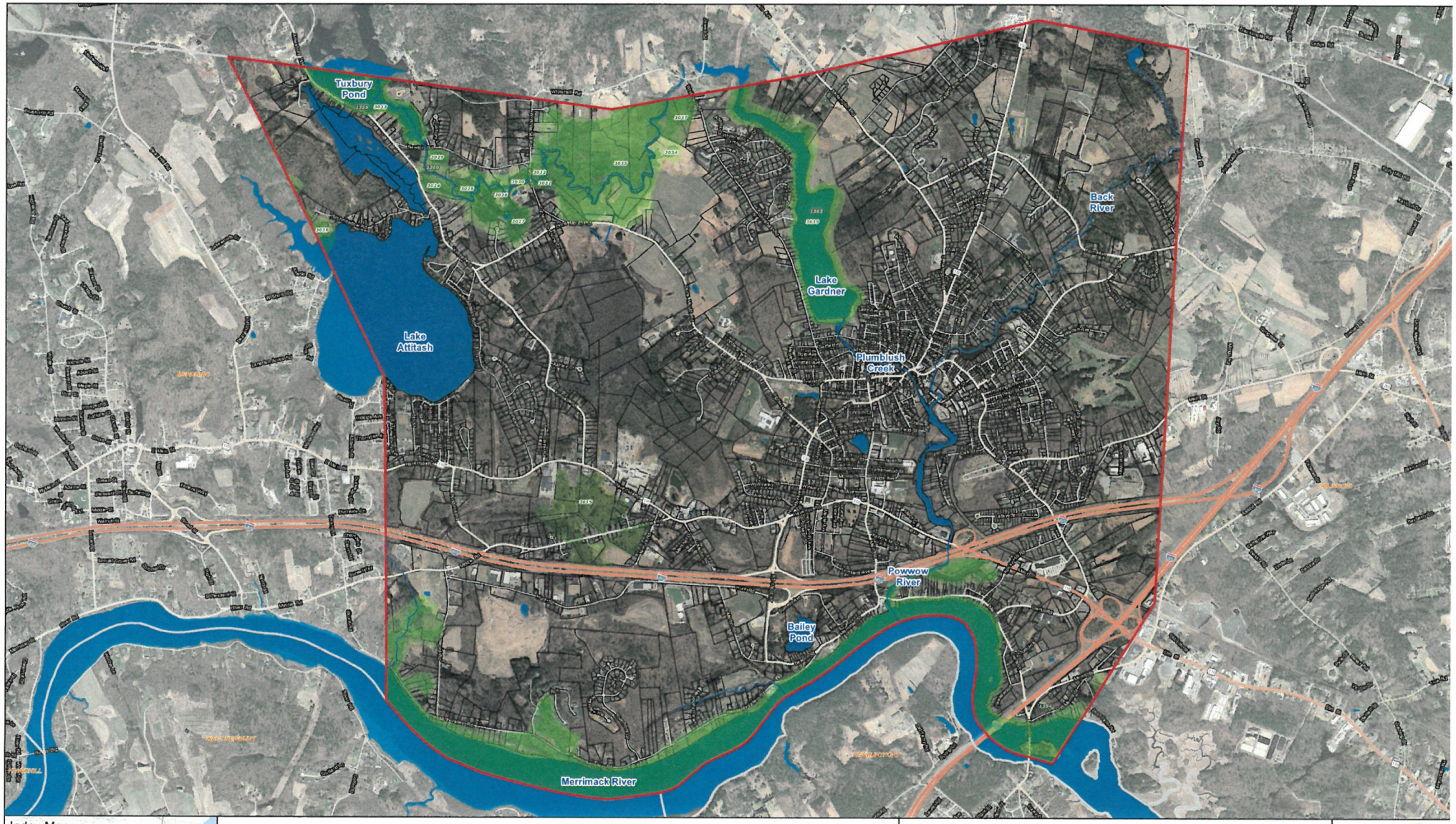
(Based on the UMass CAPS MA Index of Ecological Integrity)

Amesbury, MA

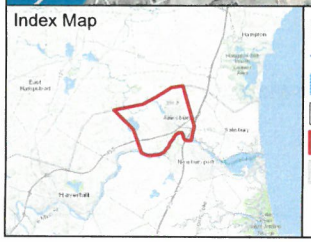
BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\wor\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_BioMapTNC_20180904.mxd
Date Saved: 2/28/2019 11:47:32 AM



Index Map



Legend

- River Centerline
- MADEP Waterbody
- Amesbury Parcel
- Amesbury Boundary
- Town Boundaries
- BioMap2 Core Habitat — *identifies key areas to ensure the long-term persistence of species of conservation concern, exemplary natural communities, and intact ecosystems across the Commonwealth.*
- BioMap2 Critical Natural Landscape — *identifies larger landscape areas that are better able to support ecological processes, disturbances, and wide-ranging species.*

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

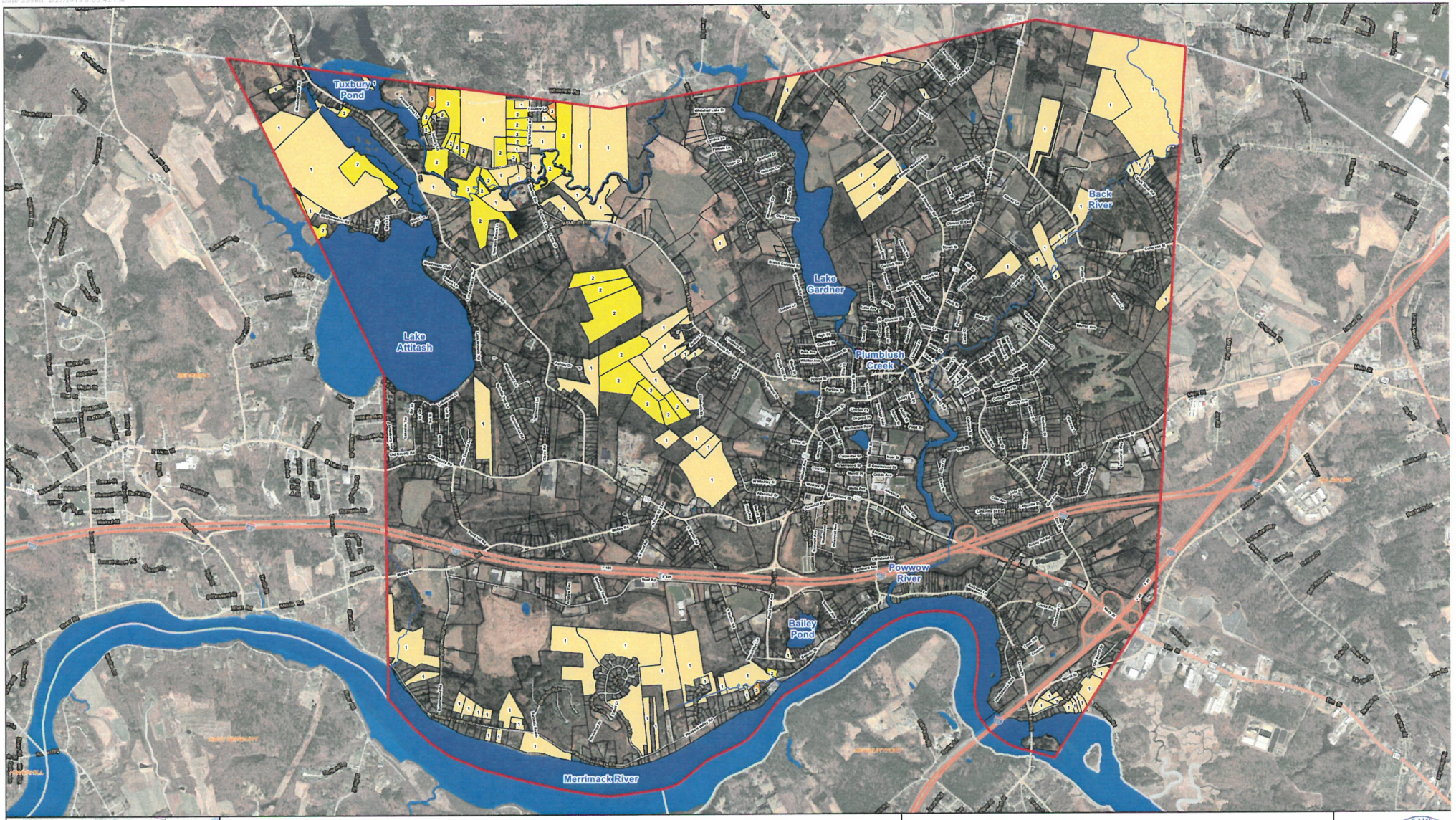
BioMap2 Map

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscboswvr\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_MAPPR_Resilience_20180307.mxd
Date Saved: 2/27/2018 8:05:45 PM



Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- MADEP Waterbody
- Town Boundaries

MAPPR Resilience Model

- 1
- 2
- 3

Mapping and Prioritizing Parcels for Resilience (MAPPR) allows land conservationists to identify the parcels within an area of interest that are the highest priorities for protection based on habitat quality, climate change resilience, and other metrics such as parcel size and adjacency to existing protected parcels. The higher the number and darker the color, the more critical that parcel is for conservation based on selected inputs.

1 inch = 1,150 feet

0 2,300 4,600

Feet

N

Source:
-MassGIS, UMASS CAPS, MassAudubon, The Nature Conservancy
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

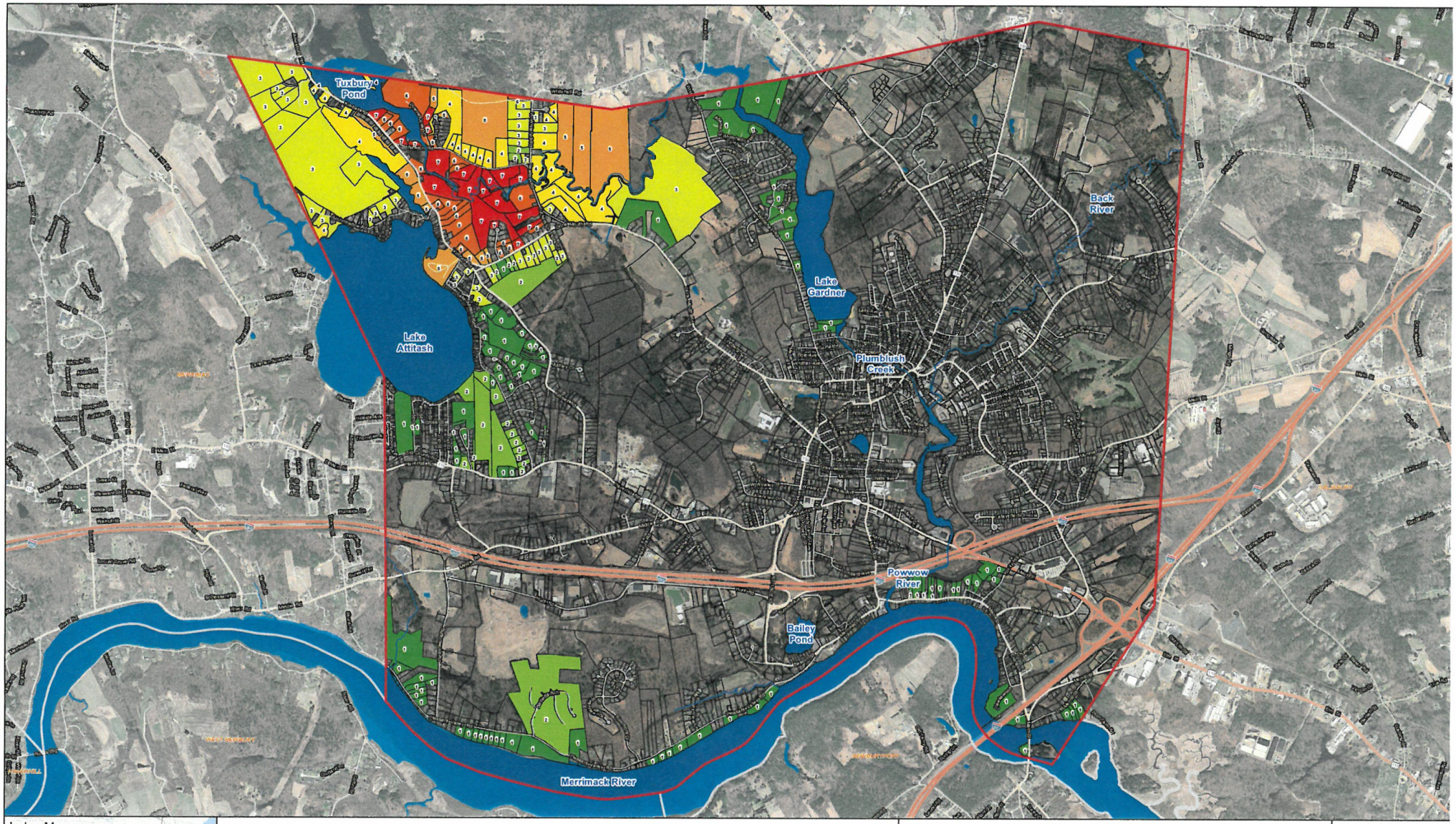
MAPPR Resilience Model Map

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbosiwor\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_MAPPR_Aquatic_20180907.mxd
Date Saved: 2/27/2019 8:05:12 PM



Legend

- River Centerline
- Amesbury Parcel
- Amesbury Boundary
- MADEP Waterbody
- Town Boundaries

MAPPR Aquatic Model

1 2 3 4 5 6 7

Mapping and Prioritizing Parcels for Resilience (MAPPR) allows land conservationists to identify the parcels within an area of interest that are the highest priorities for protection based on habitat quality, climate change resilience, and other metrics such as parcel size and adjacency to existing protected parcels. The higher the number and darker the color, the more critical that parcel is for conservation based on selected inputs.

1 inch = 1,150 feet

0 2,300 4,600

Feet

N

Source:
-MassGIS, UMASS CAPS, MassAudubon
The Nature Conservancy
Basemap & Environmental Data
Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

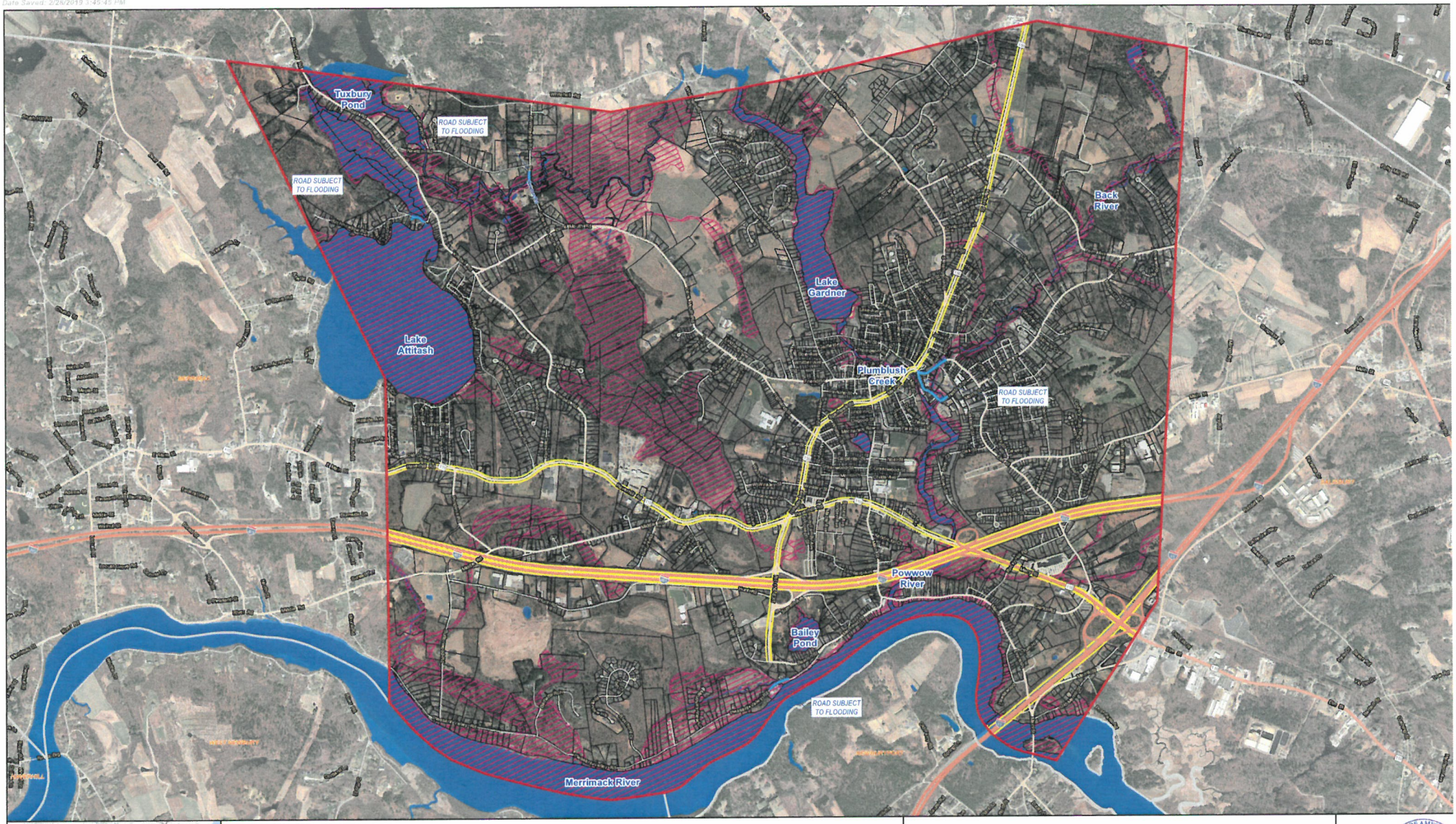
MAPPR Aquatic Model Map

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscboswvr\GIS-WOR\GISProj\6949246\Output\Maps\MXD\ReportMaps\Amesbury_RoadMap_20130207.mxd
Date Saved: 2/26/2013 3:45:45 PM



Index Map

Legend

- Designated Evacuation Routes
- Road Subject to Flooding
- River
- MADEP Waterbody
- FEMA 100yr Floodplain
- Amesbury Parcels
- Amesbury Town Boundary
- Town Boundaries

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

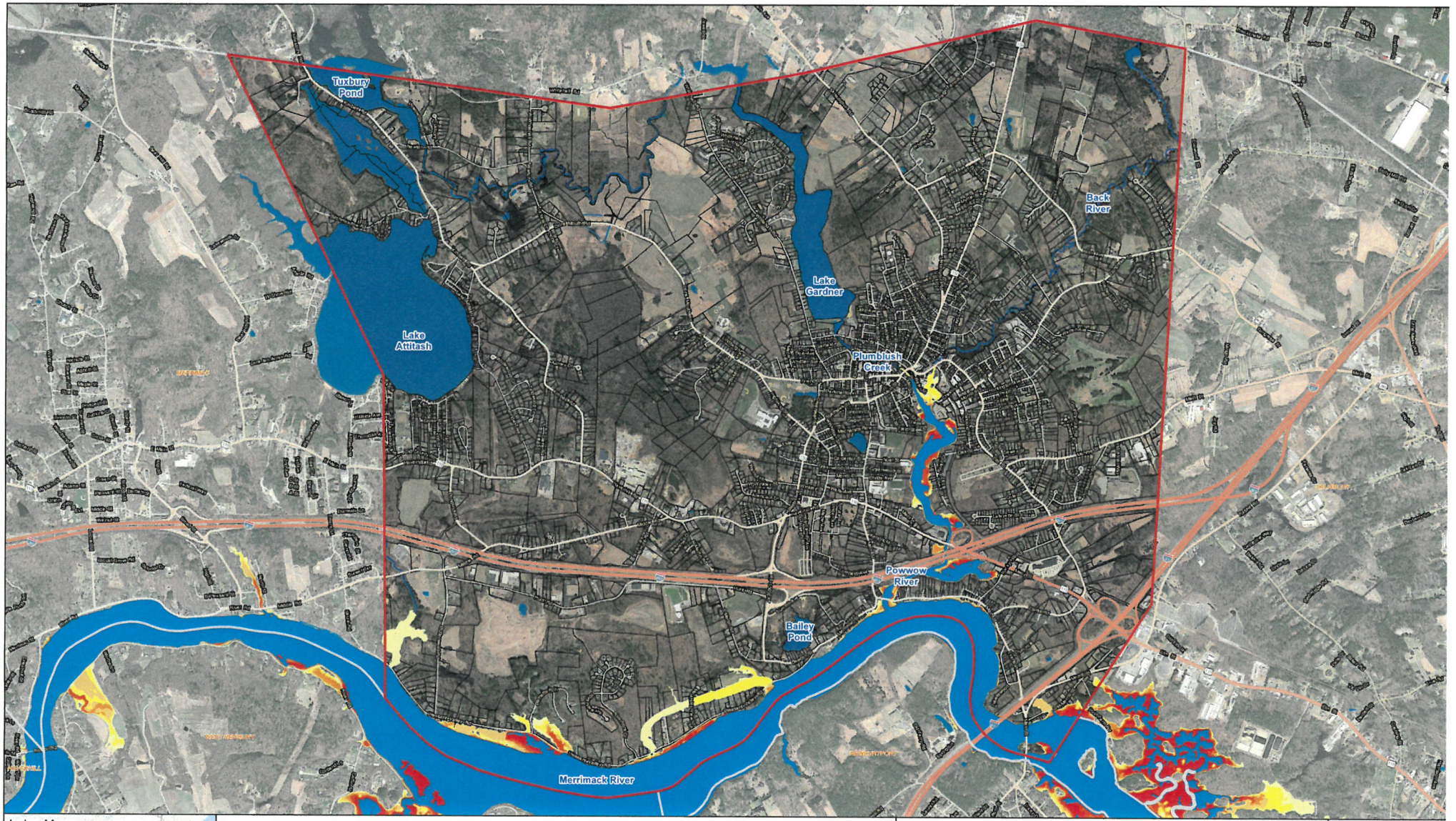
Street & 100-Year Floodplain Map

Amesbury, MA

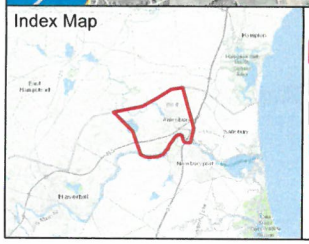
BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\wor\GIS-WOR\GISPrj\0000001\George\Malloy\Amesbury\MXD\Amesbury_SLRMap_20180129.mxd
Date Saved: 2/28/2019 7:09:01 PM



Index Map



Legend

- Amesbury Boundary
- Town Boundaries
- Amesbury Parcel
- MADEP Waterbody
- River

CZM/NOAA Sea Level Rise

- Current Mean Higher High Water
- 1ft Sea Level Rise
- 2ft Sea Level Rise
- 3ft Sea Level Rise
- 4ft Sea Level Rise
- 5ft Sea Level Rise
- 6ft Sea Level Rise

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, ICN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

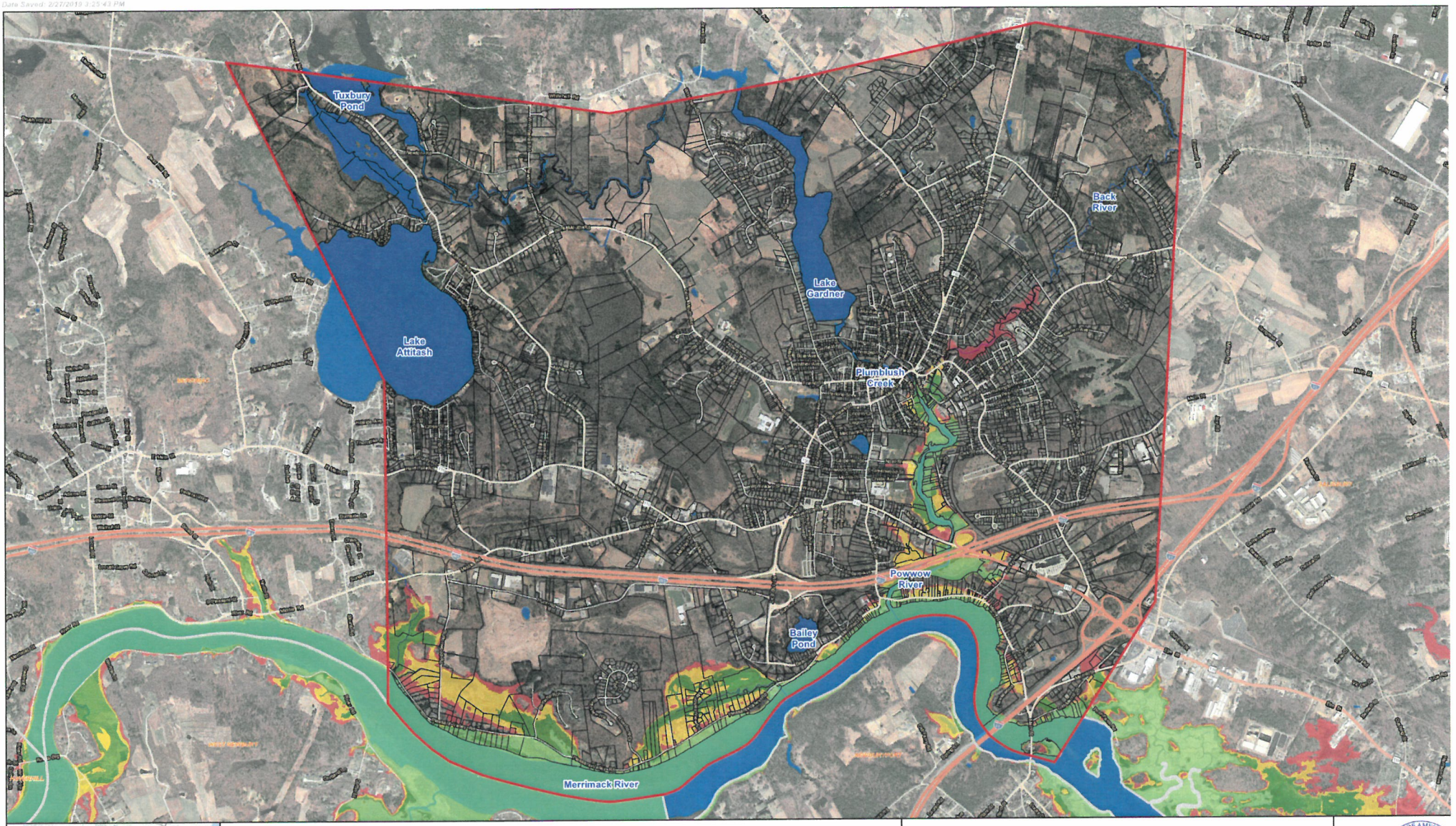
Sea Level Rise Inundation Map

Amesbury, MA

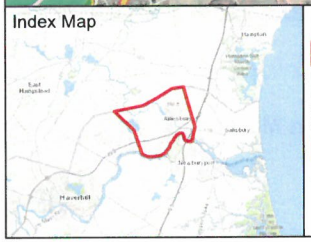
BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bschos\wori\GIS-WORK\GIS\Proj-0000001\George\Malloy\Amesbury\MXD\Amesbury_SurgeMap_20180129.mxd
Date Saved: 2/27/2018 1:25:43 PM



Index Map



Legend

- Amesbury Boundary
- Town Boundaries
- Amesbury Parcel
- MADEP Waterbody
- River

Hurricane Surge Inundation Zones

- Category 1
- Category 2
- Category 3
- Category 4

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

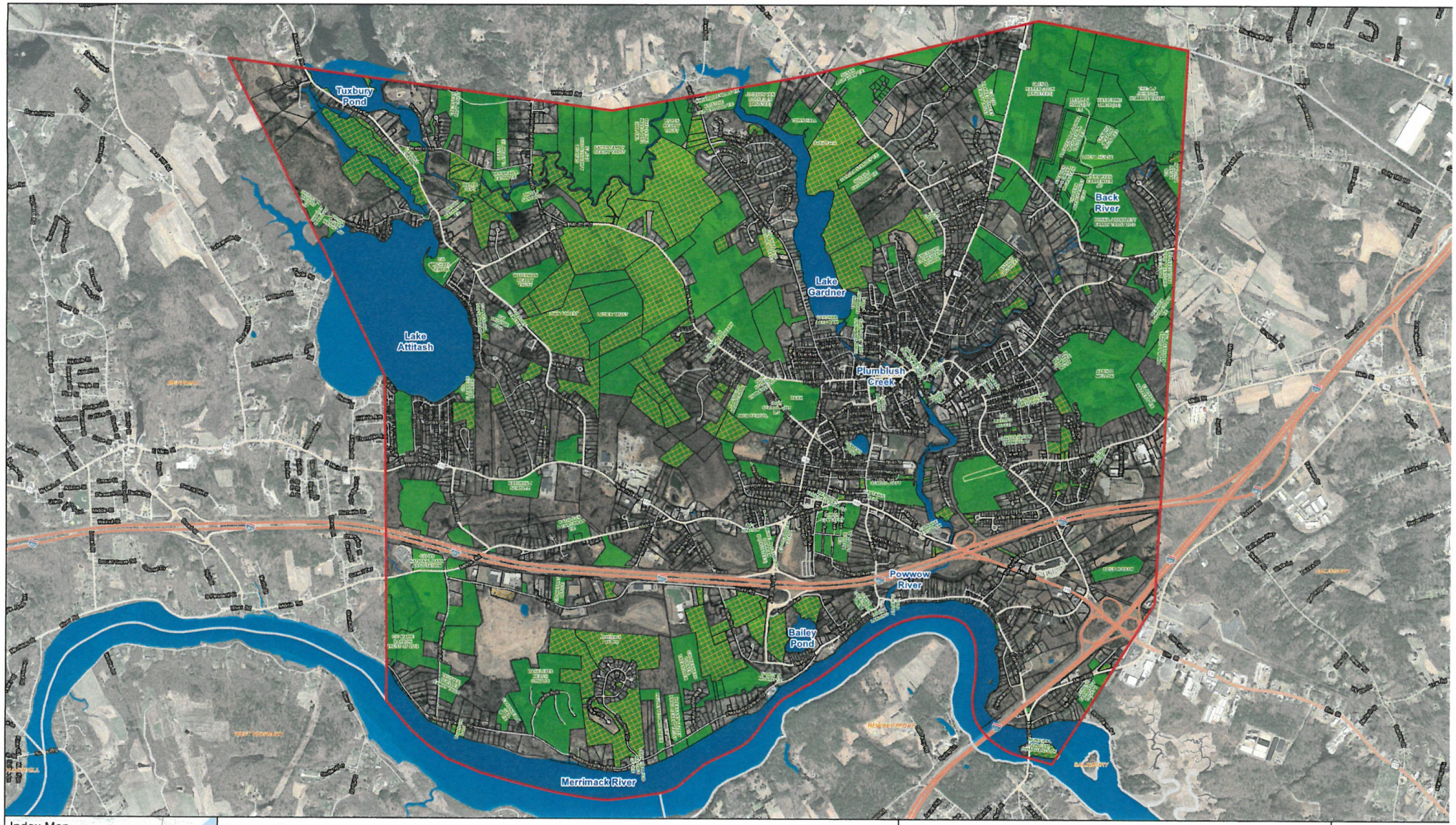
Hurricane Storm Surge Map

Amesbury, MA

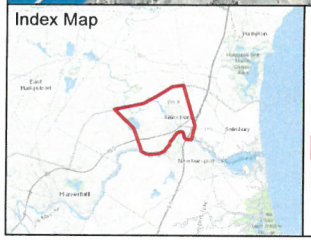
BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscbos\wor\GIS-WOR\GISPrj\8949246\Output\Maps\MXD\ReportMaps\Amesbury_MunilMap_20190227.mxd
Date Saved: 2/27/2019 3:04:52 PM



Index Map



Legend

- River
- MADEP Waterbody
- Amesbury Parcels
- Amesbury Town Boundary
- Town Boundaries
- Open Space
- Municipal Owned Parcel

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

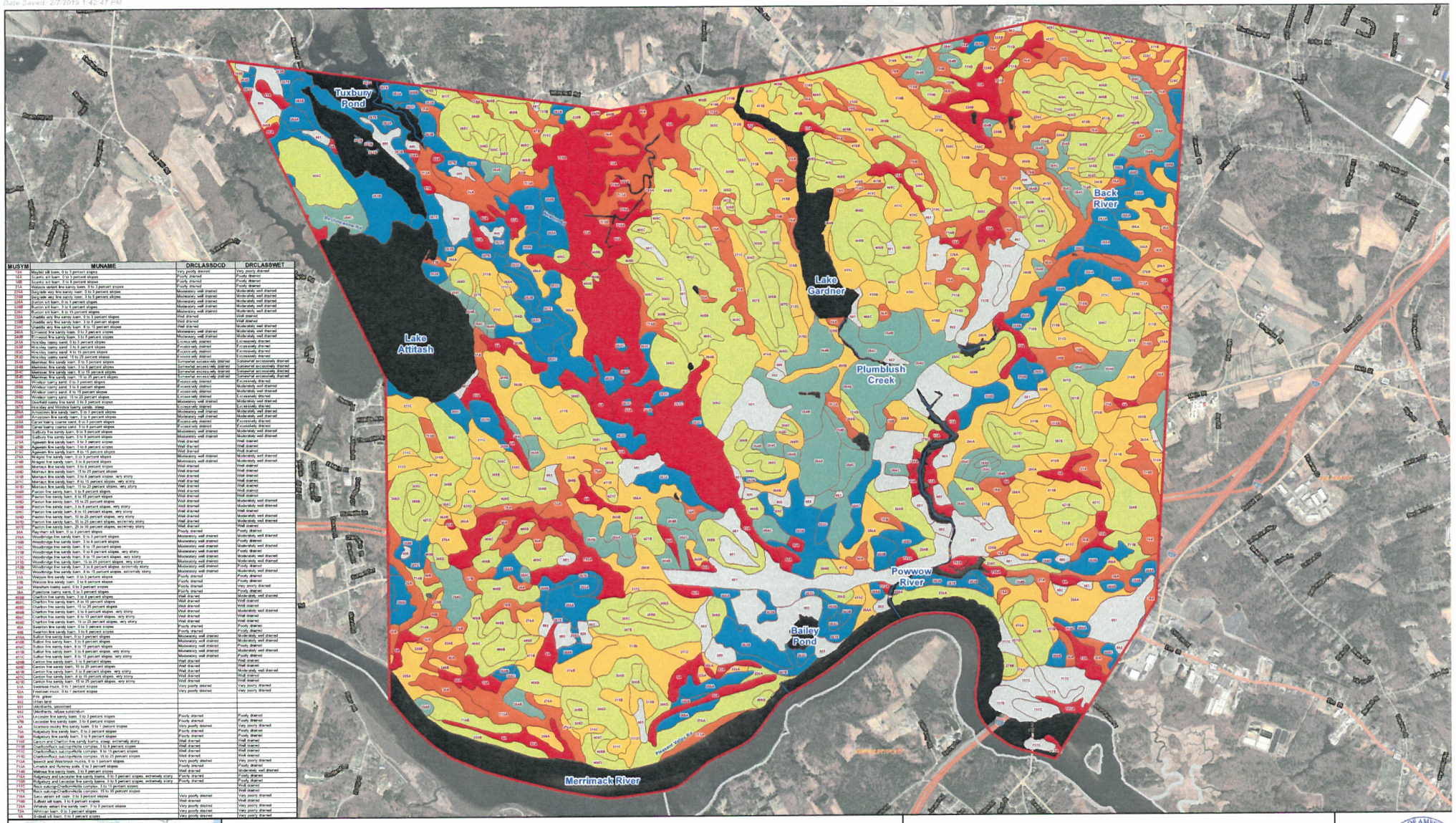
Municipal Land & Open Space Map

Amesbury, MA

BSC GF

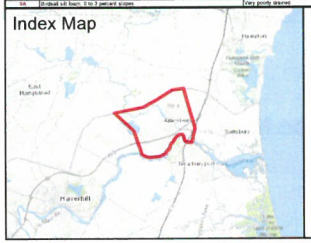
THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

File Location: \\bscshoiswn\GIS-WOR\GIS\Prj\8949246\Output\Maps\MXD\ReportMaps\Amesbury_SoilsMap_20190207.mxd
Date Saved: 2/7/2019 1:42:47 PM



MUSYM	MUNAME	DRCLASSDCD	DRCLASSWET
102B	Mayfield silt loam, 0 to 3 percent slopes	Very poorly drained	Very poorly drained
104A	Scantic silt loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
106B	Scantic silt loam, 3 to 8 percent slopes	Poorly drained	Poorly drained
311A	Walpole variant fine sandy loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
255A	Sargent very fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
255B	Sargent very fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
245A	Scarlon silt loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
245B	Scarlon silt loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
245C	Scarlon silt loam, 8 to 15 percent slopes	Moderately well drained	Moderately well drained
250A	Shaddla very fine sandy loam, 0 to 3 percent slopes	Well drained	Well drained
250B	Shaddla very fine sandy loam, 3 to 8 percent slopes	Well drained	Well drained
250C	Shaddla very fine sandy loam, 8 to 15 percent slopes	Well drained	Moderately well drained
260A	Elmwood fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
260B	Elmwood fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
261A	Hinckley loamy sand, 0 to 3 percent slopes	Excessively drained	Excessively drained
261B	Hinckley loamy sand, 3 to 8 percent slopes	Excessively drained	Excessively drained
261C	Hinckley loamy sand, 8 to 15 percent slopes	Excessively drained	Excessively drained
261D	Hinckley loamy sand, 15 to 25 percent slopes	Excessively drained	Excessively drained
314A	Manchaug fine sandy loam, 0 to 3 percent slopes	Somewhat excessively drained	Somewhat excessively drained
314B	Manchaug fine sandy loam, 3 to 8 percent slopes	Somewhat excessively drained	Somewhat excessively drained
314C	Manchaug fine sandy loam, 8 to 15 percent slopes	Somewhat excessively drained	Somewhat excessively drained
314D	Manchaug fine sandy loam, 15 to 25 percent slopes	Somewhat excessively drained	Somewhat excessively drained
261A	Windsor loamy sand, 0 to 3 percent slopes	Excessively drained	Excessively drained
261B	Windsor loamy sand, 3 to 8 percent slopes	Excessively drained	Moderately well drained
261C	Windsor loamy sand, 8 to 15 percent slopes	Excessively drained	Moderately well drained
261D	Windsor loamy sand, 15 to 25 percent slopes	Excessively drained	Excessively drained
260A	Deerfield loamy fine sand, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
307C	Hinckley and Windsor loamy sands, steep	Excessively drained	Excessively drained
306A	Amostown fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
306B	Amostown fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
284A	Carver loamy coarse sand, 0 to 3 percent slopes	Excessively drained	Excessively drained
284B	Carver loamy coarse sand, 3 to 8 percent slopes	Excessively drained	Excessively drained
304A	Sudbury fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
304B	Sudbury fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
215A	Agawam fine sandy loam, 0 to 3 percent slopes	Well drained	Well drained
215B	Agawam fine sandy loam, 3 to 8 percent slopes	Well drained	Well drained
215C	Agawam fine sandy loam, 8 to 15 percent slopes	Well drained	Well drained
276A	Ridgebury fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
276B	Ridgebury fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
306B	Montauk fine sandy loam, 3 to 8 percent slopes	Well drained	Well drained
306C	Montauk fine sandy loam, 8 to 15 percent slopes	Well drained	Well drained
301B	Montauk fine sandy loam, 3 to 8 percent slopes, very stony	Well drained	Well drained
301C	Montauk fine sandy loam, 8 to 15 percent slopes, very stony	Well drained	Well drained
301D	Montauk fine sandy loam, 15 to 25 percent slopes, very stony	Well drained	Well drained
308B	Paxton fine sandy loam, 3 to 8 percent slopes	Well drained	Well drained
308C	Paxton fine sandy loam, 8 to 15 percent slopes	Well drained	Well drained
308D	Paxton fine sandy loam, 15 to 25 percent slopes	Well drained	Moderately well drained
308B	Paxton fine sandy loam, 3 to 8 percent slopes, very stony	Well drained	Moderately well drained
308C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	Well drained	Moderately well drained
308D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	Well drained	Moderately well drained
307B	Paxton fine sandy loam, 3 to 8 percent slopes, extremely stony	Well drained	Well drained
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	Well drained	Well drained
307D	Paxton fine sandy loam, 25 to 35 percent slopes, extremely stony	Poorly drained	Poorly drained
84A	Rey-Ham silt loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
216A	Woodbridge fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Poorly drained
216B	Woodbridge fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Poorly drained
216C	Woodbridge fine sandy loam, 8 to 15 percent slopes	Moderately well drained	Poorly drained
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	Moderately well drained	Moderately well drained
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	Moderately well drained	Moderately well drained
311D	Woodbridge fine sandy loam, 15 to 25 percent slopes, very stony	Moderately well drained	Poorly drained
312B	Woodbridge fine sandy loam, 3 to 8 percent slopes, extremely stony	Moderately well drained	Poorly drained
312C	Woodbridge fine sandy loam, 8 to 15 percent slopes, extremely stony	Moderately well drained	Moderately well drained
31A	Walpole fine sandy loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
31B	Walpole fine sandy loam, 3 to 8 percent slopes	Poorly drained	Poorly drained
32A	Wareham loamy sand, 0 to 3 percent slopes	Poorly drained	Very poorly drained
39A	Freetown muck, 0 to 1 percent slopes	Poorly drained	Poorly drained
402B	Charlton fine sandy loam, 3 to 8 percent slopes	Well drained	Moderately well drained
402C	Charlton fine sandy loam, 8 to 15 percent slopes	Well drained	Well drained
402D	Charlton fine sandy loam, 15 to 25 percent slopes	Well drained	Well drained
403B	Charlton fine sandy loam, 3 to 8 percent slopes, very stony	Well drained	Moderately well drained
403C	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	Well drained	Well drained
403D	Charlton fine sandy loam, 15 to 25 percent slopes, very stony	Well drained	Well drained
46A	Swanton fine sandy loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
46B	Swanton fine sandy loam, 3 to 8 percent slopes	Poorly drained	Poorly drained
410A	Sutton fine sandy loam, 0 to 3 percent slopes	Moderately well drained	Moderately well drained
410B	Sutton fine sandy loam, 3 to 8 percent slopes	Moderately well drained	Moderately well drained
410C	Sutton fine sandy loam, 8 to 15 percent slopes	Moderately well drained	Moderately well drained
411B	Sutton fine sandy loam, 3 to 8 percent slopes, very stony	Moderately well drained	Poorly drained
411C	Sutton fine sandy loam, 8 to 15 percent slopes, very stony	Moderately well drained	Poorly drained
420B	Canton fine sandy loam, 3 to 8 percent slopes	Well drained	Well drained
420C	Canton fine sandy loam, 10 to 25 percent slopes	Well drained	Well drained
421B	Canton fine sandy loam, 3 to 8 percent slopes, very stony	Well drained	Moderately well drained
421C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	Well drained	Well drained
421D	Canton fine sandy loam, 15 to 25 percent slopes, very stony	Well drained	Well drained
51A	Swansea muck, 0 to 1 percent slopes	Very poorly drained	Very poorly drained
53A	Freetown muck, 0 to 1 percent slopes	Very poorly drained	Very poorly drained
99A	Pits, gravel		
99D	Urban land		
99W	Miscellaneous, saturated		
99Z	Miscellaneous, refuse substratum		
61A	Leicester fine sandy loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
61B	Leicester fine sandy loam, 3 to 8 percent slopes	Poorly drained	Poorly drained
1A	Scituate muckly fine sandy loam, 0 to 1 percent slopes	Very poorly drained	Very poorly drained
75A	Ridgebury fine sandy loam, 0 to 3 percent slopes	Poorly drained	Poorly drained
75B	Ridgebury fine sandy loam, 3 to 8 percent slopes	Poorly drained	Poorly drained
710E	Canton and Charlton fine sandy loams, steep, extremely stony	Well drained	Well drained
701B	Charlton-Rock outcrop-Hollis complex, 3 to 8 percent slopes	Well drained	Well drained
701C	Charlton-Rock outcrop-Hollis complex, 8 to 15 percent slopes	Well drained	Well drained
701D	Charlton-Rock outcrop-Hollis complex, 15 to 25 percent slopes	Well drained	Well drained
710A	Ipswich and Westbrook mucks, 0 to 1 percent slopes	Very poorly drained	Very poorly drained
713A	Lumaco and Runney soils, 0 to 3 percent slopes	Poorly drained	Poorly drained
714B	Melrose fine sandy loam, 3 to 8 percent slopes	Well drained	Moderately well drained
716A	Ridgebury and Leicester fine sandy loams, 0 to 3 percent slopes, extremely stony	Poorly drained	Poorly drained
716B	Ridgebury and Leicester fine sandy loams, 3 to 8 percent slopes, extremely stony	Poorly drained	Poorly drained
717C	Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes		Well drained
717E	Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes		Well drained
719A	Saco variant silt loam, 0 to 3 percent slopes	Very poorly drained	Very poorly drained
719B	Scituate silt loam, 3 to 8 percent slopes	Well drained	Well drained
72AA	Whitman variant fine sandy loam, 0 to 3 percent slopes	Very poorly drained	Very poorly drained
72A	Whitman loam, 0 to 3 percent slopes	Very poorly drained	Very poorly drained
9A	Birdsall silt loam, 0 to 3 percent slopes	Very poorly drained	Very poorly drained

Index Map



Legend

Soils Drainage Class

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Poorly drained
- Very poorly drained
- No value

- Amesbury Boundary
- Town Boundaries
- Amesbury Parcel
- River

N

1 inch = 1,150 feet

0 2,300 4,600

Feet

Source:
-MassGIS
Basemap & Environmental Data
-Aerial & Topo Imagery
ESRI, DigitalGlobe, GeoEye, i-cubed, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., AEX, GEBCO, USDA, USGS, FAO, NPS, NRCAN, GeoBase, Getmapping, Aerogrid, IGP, IGN, Kadaster NL, Ordnance Survey, ESRI japan, METI, ESRI China (Hong Kong), swisstopo, & the GIS User Community

CITY OF AMESBURY

NRCS SSURGO Soils Map

Amesbury, MA

BSC GF

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

RIMMER ENVIRONMENTAL
CONSULTING, LLC
57 BOSTON ROAD
NEWBURY, MA 01951

Invoice

Date	Invoice #
4/4/2019	1969

Bill To
Conservation Commission Town Hall 62 Friend Street Amesbury, MA 01913

P.O. No.	Terms	Project
	Net 30	8632.10 Global Prop...

Quantity	Description	Rate	Serviced	Amount
2	Project Meeting	130.00	2/13/2019	260.00
1.5	Peer Review revised plan, OOC	130.00	2/27/2019	195.00
2	Peer Review revised plan, OOC	130.00	2/28/2019	260.00
2.5	Peer Review revised plan, OOC	130.00	3/1/2019	325.00
1	Site Inspection soil inspection	130.00	3/21/2019	130.00
0.25	review OOC	130.00	3/25/2019	32.50
1	review OOC	130.00	3/27/2019	130.00
1.5	Tel. Consult.	130.00	3/29/2019	195.00
2	Peer Review review OOC	130.00	4/1/2019	260.00
2	Conservation Commission Hearing	130.00	4/1/2019	260.00

Total $2,047.50

Job Total Balance $5,037.50

RIMMER ENVIRONMENTAL
CONSULTING, LLC
57 BOSTON ROAD
NEWBURY, MA 01951

Invoice

Date	Invoice #
4/4/2019	1969

Bill To

Conservation Commission
Town Hall
62 Friend Street
Amesbury, MA 01913

P.O. No.	Terms	Project
	Net 30	8632.10 Global Prop...

Quantity	Description	Rate	Serviced	Amount
2	Project Meeting	130.00	2/13/2019	260.00
1.5	Peer Review revised plan, OOC	130.00	2/27/2019	195.00
2	Peer Review revised plan, OOC	130.00	2/28/2019	260.00
2.5	Peer Review revised plan, OOC	130.00	3/1/2019	325.00
1	Site Inspection soil inspection	130.00	3/21/2019	130.00
0.25	review OOC	130.00	3/25/2019	32.50
1	review OOC	130.00	3/27/2019	130.00
1.5	Tel. Consult.	130.00	3/29/2019	195.00
2	Peer Review review OOC	130.00	4/1/2019	260.00
2	Conservation Commission Hearing	130.00	4/1/2019	260.00

Total $2,047.50

Job Total Balance $5,037.50

APPENDIX B:
NRIA TEAM MEETING MEMORANDA

BSC GROUP

MEMORANDUM

33 WALDO STREET, WORCESTER, MA 01608 - www.bscgroup.com
TEL 508-792-4500 - 800-288-8123

To:	Tom Barrasso and John Lopez	**Date:**	December 17, 2018
From:	BSC Group	**Proj. No.**	89492.46
Re:	December 17, 2018 MVP Natural Resources Infrastructure Assessment Meeting Outcome Summary		

Meeting Attendees: Tom Barrasso (Director of Energy & Environmental Affairs), John Lopez (Conservation Agent), Robert Desmarais (DPW), Gillian Davies (BSC Group)

Purpose

1. To review existing natural resources information that the City of Amesbury has and that BSC has generated, and to identify information that should be provided to BSC for review;
2. To have an in-depth review and discussion of ecological climate resiliency mapping of the City of Amesbury (TNC Resilient Land and Audubon MAPPR mapping);
3. To review priority hazard locations in the city;
4. To review, with priority hazard locations in mind, existing natural resource infrastructure and opportunities for nature-based solutions that will support community and ecological climate resiliency.

A summary of discussion outcomes is provided below.

Outcomes

1. Existing Resources:
    a. 2007 Hazard Mitigation Plan - needs updating
    b. Open Space Plan – needs updating
    c. Master Plan – likely has not incorporated flooding issues
    d. MVPC staff: Girard Witten (GIS mapping), Joe Cosgrove (environmental), Jim Terlizzi (traffic, etc.)
2. Discussion and review of maps: evaluation of large areas of open space
    a. Woodsom Farms – large city-owned property in upper watershed that drains to downtown area. Potential to identify a future project to do detailed analysis of opportunities to preserve and enhance flood storage capacity of wetlands and floodplains, while still accommodating city needs for building in upland areas. Planning for this property has not likely included assessment of flood storage ecosystem services.
    b. Natural Resources Assessment should focus on horseshoe arc of land from Merrimac River to Woodsom Farms to Powwow River and the Lakes to the downtown area. Other open/less developed areas are largely privately owned or constrained for other reasons. Downtown area can be assessed for LID and Green Infrastructure opportunities. Could lead to proposal for more detailed studies & specific projects in the future.
3. Public outreach and education is needed (potential future project)
    a. City leadership
    b. Citizens and stakeholders
4. Regional planning and coordination is needed (potential future project)
    a. Amesbury receives water from adjacent and upstream towns (Massachusetts and New Hampshire). Flood control planning could be coordinated on watershed/bi-state basis.

Next Steps

    b. Schedule January Core Team Meeting
    c. Schedule January Natural Resources Assessment Meeting with site visit to Woodsom Farms and downtown area.
    d. Amesbury provides documents in item #1 to BSC
    e. BSC coordinates with Amesbury to select Community Resilience Building meeting date.
    f. Amesbury compiles contact information for invitees to the CRB meeting.