2022

BERTIE COUNTY RESILIENCE STRATEGY

North Carolina Division of Coastal Management

Resilient Coastal Communities Program

Phase 1 and 2 Report

Prepared by SWCA Environmental Consultants

4/15/2022

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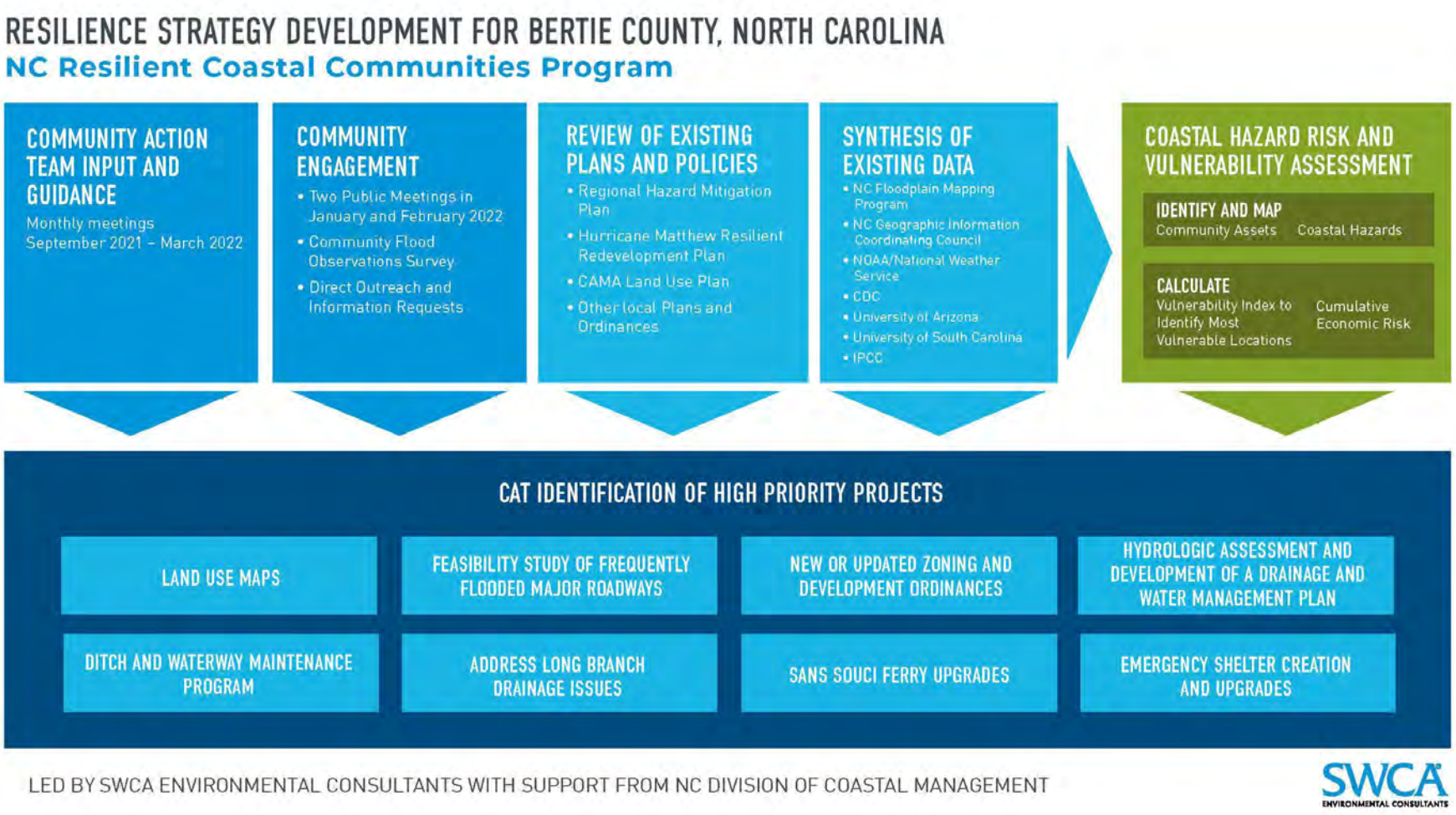
SUMMARY


RESILIENCE STRATEGY DEVELOPMENT FOR BERTIE COUNTY, NORTH CAROLINA
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SWCA
ENVIRONMENTAL CONSULTANTS

1 INTRODUCTION

This Resilience Strategy was developed for the Bertie County under the North Carolina Resilient Coastal Communities Program (RCCP) by the North Carolina Division of Coastal Management (DCM) and SWCA Environmental Consultants (SWCA) in consultation with a local Community Action Team (CAT). The objectives of the RCCP are to 1) address barriers to coastal resilience in North Carolina at the local level, such as limited capacity, economic constraints, and social inequities; 2) assist communities with risk and vulnerability assessments and developing a portfolio of planned and prioritized projects; 3) advance coastal resilience projects to be shovel-ready, or ready for implementation; and 4) link communities to funding streams for project implementation. The RCCP includes four phases.

- Phase 1: Community Engagement and Risk/Vulnerability Assessment
- Phase 2: Planning, Project Identification, and Prioritization
- Phase 3: Engineering and Design
- Phase 4: Project Implementation

This Resilience Strategy document includes the results of Phases 1 and 2 of the RCCP: a risk and vulnerability assessment and a priority resilience project portfolio. The process to develop this Resilience Strategy took place between August 2021 and April 2022 and included monthly CAT meetings, community engagement via two public open house meetings, a community flood observations survey, and direct outreach to local stakeholders. Projects identified through this process are intended to build on and align with existing plans such as the regional Hazard Mitigation Plan and Coastal Area Management Act (CAMA) Land Use Plan. At least one high-priority project identified through this process will be eligible for Phase 3 funding to support design and engineering work beginning in summer 2022, and subsequent Phase 4 funding will support project implementation.

1.1 Community Overview

Bertie County is situated on the northwest end of the Albemarle Sound with the Roanoke River forming its western border, the Chowan River forming its eastern border, and the Cashie River draining much of the interior of the county (Figure 1). Bertie County has a population of close to 18,000 people as of the 2020 census, and covers an area of 741 square miles, of which 42 square miles are water (U.S. Census Bureau 2012). Much of the land is used for agriculture or forestry. Most of the population resides in areas of the county. The largest town, and county seat, Windsor, has a population of about 3,300. Other towns in the county each have between 200 and 900 residents (U.S. Census Bureau 2021).

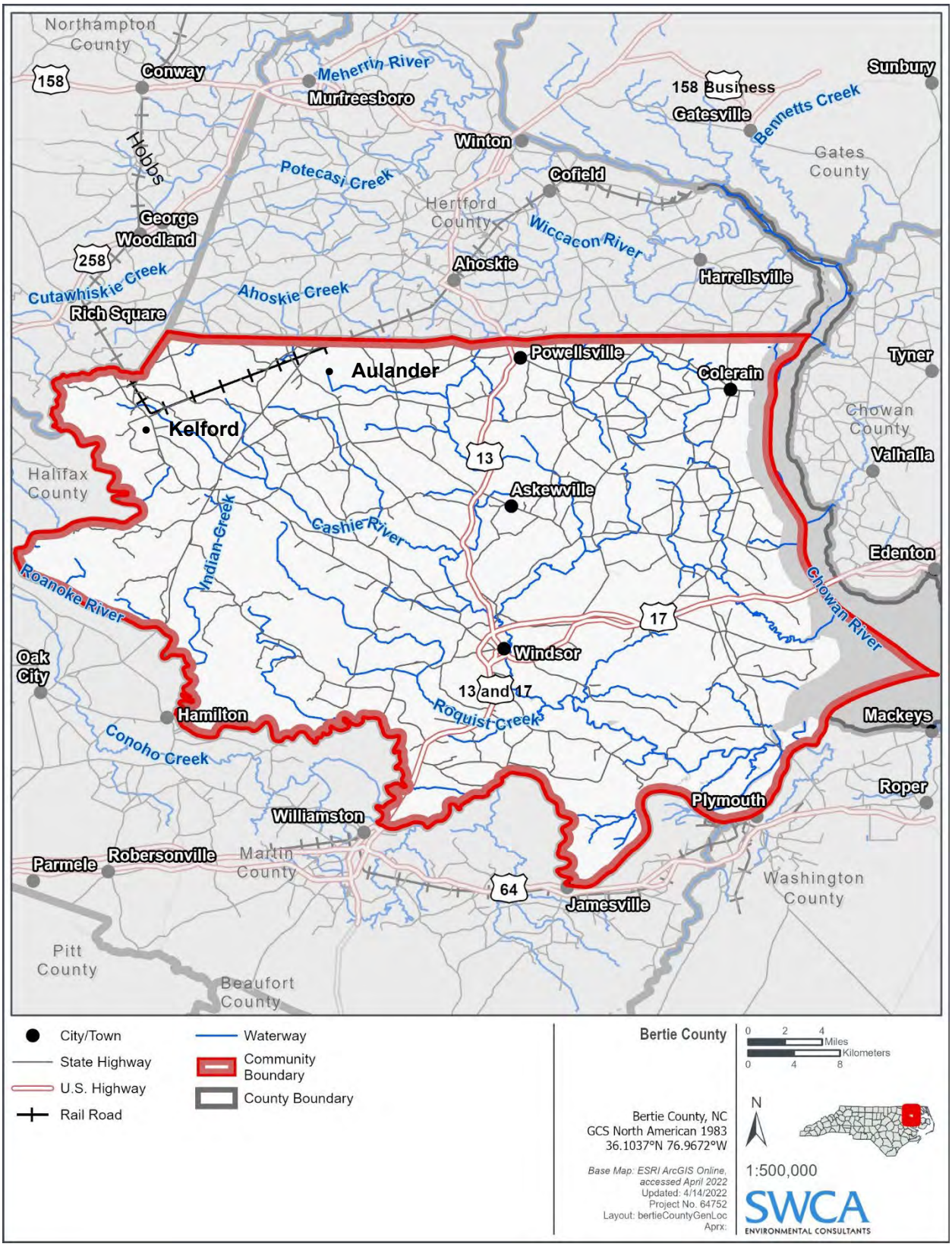

Figure 1. Map of Bertie County, North Carolina showing towns, waterways, and major roads.

2 COMMUNITY ACTION TEAM

Bertie County's Community Action Team (CAT) was formed in consultation with the County Planning Director and includes several county departmental directors, the Mayor of Lewiston-Woodville, the Town Administrator of Windsor, and a professor from East Carolina University. Several individuals, including other local mayors and town administrators, county commissioners, and the County Manager were copied on CAT correspondence, but did not participate in monthly CAT meetings. A complete list of members is provided in Appendix A.

The CAT reviewed and provided feedback on the relevant coastal hazards, helped identify asset locations, identified additional local contacts with information about assets, provided review and feedback on the vulnerability and risk assessment results, supported planning and hosting of public open house meetings, agreed on criteria for prioritization of projects, contributed to definition of candidate projects, and reached agreement on the final list of high-priority projects included in this Resilience Strategy document.

CAT meetings were held approximately monthly between October and March for a total of six CAT meetings. Summaries of all six CAT meetings are provided in Appendix B.

3 VISION AND GOALS

The following vision and goals informed the development of Bertie County's Resilience Strategy.

3.1 Vision

The Vision Statement was developed collaboratively by the CAT building on language provided in the recent NC Land of Water (NCLOW) Report "Flood Dynamics in the Bertie Water Crescent" to reflect their resilience vision for the county:

> *Communities within Bertie County seek to improve the local quality of life through sustainable economic development that enhances and protects the environment and culture of the region. Natural and cultural resource-based science, eco-tourism, and environmental education help to diversify the local economy while minimizing the impacts of hazards. We employ an integrated approach to coastal resilience that addresses both upstream and downstream hydrologic dynamics, the unique physical and environmental settings of inter-connected water bodies, and the ongoing changes in climate and sea level rise.*

3.2 Goals

Resilience Goals were developed collaboratively by the CAT following initial review of the Vulnerability and Risk Assessment results and preliminary project list. The goals are intended to reflect the general resilience priorities for the community and identify themes and concerns. Goals are intended to support the vision and to be used to identify priority projects.

1. Update CAMA Land Use Plan and include resilience recommendations
2. Address recurring flooding issues in roadways
3. Address recurring agricultural drainage and town flooding issues
4. Protect and restore wetlands and headwaters, including via local/county ordinances

5. Develop a plan for managing Roanoke River discharge in cooperation with upstream dam operators

The high-priority projects identified by the CAT are intended to align with this vision and move Bertie County toward completing these goals.

4 COMMUNITY ENGAGEMENT STRATEGY

The goals defined by the DCM for community engagement within the RCCP are to:

1. Promote representation and equitable outcomes for marginalized communities and vulnerable populations
2. Build trust, relationships, and partnerships
3. Provide feedback and validation of the Risk and Vulnerability Assessment developed by the CAT
4. Assist with prioritizing projects for Phases 3 and 4 of the Program

To achieve these goals, SWCA worked with the CAT to implement an approach to community engagement during Phases 1 and 2 of the RCCP that included the following elements.

4.1 Ongoing Online Engagement

Online engagement was conducted through the project website (Appendix C). The website included the following specific elements:

Interactive webmap – This map showed all the asset locations and hazard layers and allowed users to pan and zoom and turn on and off hazard layers to create a custom view showing the location and hazards of interest to them.

Online survey – The survey was available online and provided in hard copy at the first public meeting and asked respondents to identify the location, date, and time where they have observed flooding; describe the extend, observed depth, and maximum depth of the flooding; and to identify any critical locations or services they were unable to access during this flood event (e.g., school, workplace, medical facilities, clean water). The online version included an option for respondents to upload photographs of the flooding.

Links to additional resources about risk reduction/preparedness – These included the Ready NC Hurricane Preparedness Guide, guidance from the North Carolina Department of Health and Human Services on preventing and cleaning up mold/moisture, what to do with drinking water wells and septic systems in flooding conditions, and post-disaster resources from Legal Aid NC.

The website also included project contact information, a sign-up field to receive email updates, and information about upcoming public meetings.

4.2 Direct Two-Way Information Sharing

Two-way information-sharing methods included the two in-person public open house meetings (see attendance list in Appendix D), and individual outreach to key stakeholders. SWCA and the CAT members shared information with the community about the RCCP process, the public open house meetings, and the online survey via hard copy fliers, social media postings (Figure 2), emails to project contacts and existing listservs, and notices in local news outlets. Details of the specific strategies used to engage specific audiences in Bertie County during the RCCP process are detailed in Table 1.

Figure 2. Example social media post used to advertise the February public meeting.

Table 1. Engagement Strategies Used for Community Engagement in Bertie County, North Carolina

Strategy	Audience and Timing	Goals
Direct Outreach to Individual Stakeholders Via email and telephone	People who may have key information to share, including town and county staff and those who serve or represent vulnerable and underrepresented groups *December–February*	-Gather key information missing from our assessment -Understand perspectives of people otherwise underrepresented in this process
Public Open House No. 1 – Risk Assessment -"Where I live and work" map at sign-in table -Big interactive map for identifying assets and hazards -Posters explaining types of resilience projects -Collect questions for follow-up -Collect survey responses and other information to incorporate -Kids' corner with drawing prompt	Local residents, town and county staff, and business owners *Mid-January*	-Introduce RCCP -Hear and answer questions about hazards and provide personal actions to decrease risk -Ground-truth the asset and hazard information collected and gather feedback and validation of the Risk and Vulnerability Assessment developed by the CAT -Collect contact information for interested parties for updates and follow-up
Survey with Interactive Map -Identifying specific locations on the map that have flooded in the past -Identifying how hazards have impacted assets and access to assets in the past -Online and linked on all public outreach materials -In hard copy at the open house	Local residents and business owners, including those who were unable to attend the open house when it was scheduled *January, during and following first open house*	-Ground-truth the asset and hazard information collected -Gather feedback with which to validate the Risk and Vulnerability Assessment -Gather input on criteria to be used in prioritizing resilience projects -Collect contact information for interested parties for updates/follow-up
Public Open House No. 2 – Priority Projects -Posters conveying preliminary project list -Collect additional project ideas -Collect questions for follow-up -Collect comments to incorporate -Joint Meeting with the NC Floodplain Mapping Program	Local residents, town and county staff, and business owners *Late February*	-Review preliminary project list -Learn about which projects the community considers highest priority, to assist with prioritizing projects

Strategy	Audience and Timing	Goals
Provide hazard preparedness activity for children at Public Open House meeting	Youth *At first open house session*	-Engage vulnerable and underrepresented populations
Provide Spanish translations of RCCP program handout and some risk preparedness materials	People with limited English proficiency *For both open house sessions*	
Presentation to the County Commissioners	Decision-makers representing racial and ethnic minority populations and flood-prone areas *Prior to second open house session*	
Joint meeting and advertising with the NC Floodplain Mapping Program, which was sharing information about the new Flood Insurance Rate Maps	People living in flood-prone areas *Second open house session*	

5 REVIEW OF EXISTING LOCAL AND REGIONAL EFFORTS

SWCA reviewed existing local and regional plans, ordinances, policies, and programs to identify resilience strategies already in place, previously identified assets, previously identified coastal hazards, and potential resilience projects to inform the RCCP process. Results of this review are summarized below in Table 2.

Table 2. Existing Documents Reviewed for Bertie County

Document Name (Year)	Information Gleaned			
	Asset Locations	Hazard Information	Potential Resilience Projects	Resilience Strategies Already in Place
Northeast Region Hazard Mitigation Plan Update (2020)	•	•	•	•
NC State Resilience Plan (2020)				•
Bertie County Recreation Plan (2019)			•	
Bertie County Vulnerability Assessment (2010)	•	•	•	
State of North Carolina Hazard Mitigation Plan (2018)				•
Hurricane Matthew Resilient Redevelopment Plan – Bertie County (2017)			•	•
Northeast Region Hazard Mitigation Plan (2016)	•	•		•
CAMA Land Use Plan – Bertie County (2016)			•	•

6 RISK AND VULNERABILITY ASSESSMENT REPORT

To assess the overall coastal hazard risks and vulnerabilities Bertie County faces, SWCA identified important places in the County (assets) and types of coastal hazards that could impact the County (hazards), with input and oversight from the CAT. SWCA used this information to evaluate the County's vulnerabilities and economic risks. The methods and results of this analysis are detailed below.

6.1 Identification and Mapping of Assets and Hazards

For purposes of this assessment, critical assets and natural infrastructure (assets) were defined as places that are important for emergency preparedness, response, recovery, and sustaining community life and sense of place. The types of assets identified in Bertie County fell into the categories of Cultural Sites, Emergency Services, Employers, Hazardous Waste, Health and Medical, Law Enforcement/Corrections, Parks and Recreation, Residential, Roadways, and Utilities.

SWCA developed an initial asset list for the County starting with assets identified from existing information sources including the Northeast Regional Hazard Mitigation Plan and the National Register of Historic Places (NRHP). This list was then reviewed and revised by the CAT members and shared with other knowledgeable county staff for additional feedback. A preliminary map showing asset locations was shared during the first open house meeting in January and meeting attendees pointed out additional important locations, which were added to the asset list.

SWCA also inquired with the State Historic Preservation Office (SHPO) about additional eligible properties not yet listed in the NRHP within Bertie County. The SHPO reported there are 339 sites recorded in the county and 63 cultural resources reports on file for projects conducted in the county. Looking at all these sites was beyond the scope of the RCCP Phases 1 and 2. Should these be of interest to the county in the future to help identify additional community assets, the SHPO can provide more detail about these sites and reports.

To identify relevant coastal hazards, SWCA looked at those identified as [high hazard] in the Regional Hazard Mitigation Plan and identified appropriate data sets to represent these hazards at the local level. Hazards evaluated for the County include Sea Level Rise (both along coast lines and in low-lying areas where increases in the water table can result in inland flooding), Storm Surge inundation (coastal storm surge from increasing high tides during simulated storm events), and flooding because of high Precipitation events (areas likely to be flooded such as Federal Emergency Management Agency [FEMA]-defined 100-year and 500-year floodplains as well as historical records of event flooding). Data sets used to represent these historical accounts include both geospatial data and input from community members at open house events). Data sets used to represent community hazards were selected after an extensive review of data documentation and similar reports in the region and are detailed in Appendix E.

In total, we identified and assessed vulnerability and risk from coastal hazards to 121 total asset locations for Bertie County (Table 3).

6.2 Vulnerability Assessment

Vulnerability scores for county assets were calculated by expanding on the framework outlined in the RCCP Handbook. The handbook defined an asset's vulnerability as a combination of the risk to the asset from potential hazards based on the asset's location (Exposure), the degree to which an asset would be affected if exposed to hazards (Sensitivity), and any measures already taken to offset the negative impacts if the asset is exposed to hazards (Adaptive Capacity). To ensure a range of vulnerability scores for

project prioritization, Exposure, Sensitivity, and Adaptative Capacity scores were calculated using a 0 to 5 scale.

Asset Vulnerability = Exposure + Sensitivity – Adaptive Capacity

Exposure, ranked from 0 (no exposure) to 5 (high exposure), represents the combined hazard exposure as an average of Sea Level Rise Exposure, Precipitation Exposure, and Storm Surge Exposure. Individual hazard exposure scores for Sea Level Rise and Storm Surge were calculated by assigning scores 1 to 5 to capture the likelihood of an asset being exposed to a hazard and the severity of that hazard, then using an exposure matrix (Figure 3) to classify the exposure as none (0), low (1), moderately low (2), moderate (3), moderately high (4), and high (5) (see Figure 3). Precipitation Exposure was calculated using a similar approach, but to account for localized flooding during high-intensity storm events, a Reported Event Inundation Factor 2 or more points was added to each area to reflect the number of times data showed it had been flooded during historical events. Additional information on how hazard severity and probability were assigned for each hazard type is provided below in the description of vulnerability assessment fields.

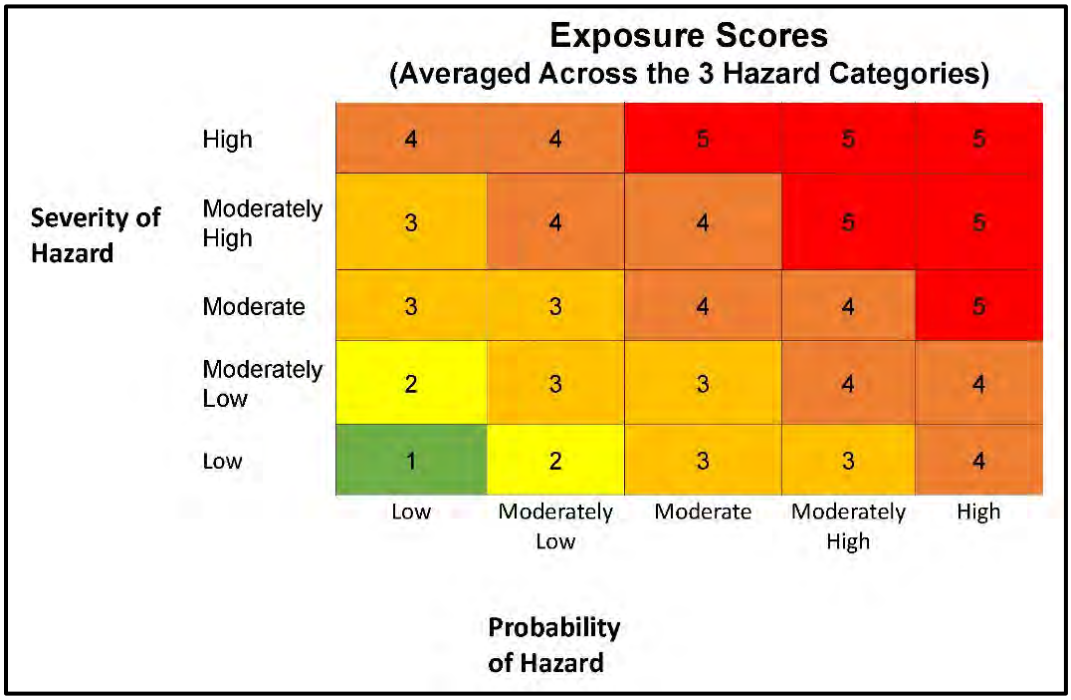

Figure 3. Exposure matrix used to calculate the level of exposure for each of three hazard categories.

Sensitivity, ranked 0 (no effect) to 5 (highly affected), is the sum of the asset type sensitivity (0–3) and social sensitivity (0–2) of an asset. Asset type sensitivity scores were assigned categorically using assumptions about how a hazard would affect the physical infrastructure and functionality of an asset. Social Sensitivity was calculated by determining if an asset is in or serves a socially sensitive community based on social vulnerability index scores and input from stakeholder meetings (1 point) and if an asset inherently serves a socially vulnerable population (1 point).

Adaptive Capacity, ranked 0 (no ability to moderate hazard damage), –1 (minor retrofits to moderate some hazard damage), –3 (retrofitted/modified to moderate most hazard damage), –5 (retrofitted/modified

to offset all hazard damage), was assigned on an asset-specific basis from CAT and community input during open house meetings.

All asset vulnerability scores, factors used to calculate asset vulnerability, and asset attribute data have been compiled into a holistic Asset List to provide additional details for planners and community members (Table 3). Fields in this table include the following:

Asset Attribute and Characteristics Fields

- **Asset ID** – Since an asset may function as multiple asset types and the town may have multiple assets with the same name, a singular unique Asset ID was assigned to each asset.
- **Asset Name** – An asset's proper name was used when available, otherwise nondescript names were assigned (e.g., pumping station, solar farm).
- **Asset Type** – Asset types were assigned to categorize assets based on the services they provide to the town. Some locations provide multiple services and, therefore, were assigned multiple asset types. For assets assigned to multiple type categories, all types were considered in analysis, but only the primary asset type was mapped (e.g., a high school that functions as an emergency shelter would be included in both Schools and Emergency Shelters Risk Evaluation but would be displayed in Schools on report figures) Asset type categories are Banks, Cemeteries, Childcare, Communications, Cultural Sites, Emergency Services, Employers, Food and Supplies, Government Facilities, Health and Medical, Law Enforcement/Corrections, Parks and Recreation (including natural resources), Restaurants, Roadways, Schools, and Utilities
- **Jurisdiction** – The physical location of assets in terms of jurisdictional boundaries (Town, unincorporated)
- **Address/Location** – Throughout the process of compiling assets, addresses and location descriptors such as plats and intersections were collected from text documents, web pages, county parcel data, and the CAT.
- **Ownership** – The ownership of each asset was pulled from ownership information in county parcel data and categorized into Federal, State, County, Town, and Private ownership designations.
- **Estimated Value** – To provide an estimated value for each town asset, estimated values were assigned by finding the maximum value (Parcel Value, Land Value, or Improvement Value) associated with an asset's parcel (maximum values were combined for assets that spanned multiple parcels). The location and types of some assets (e.g., pumping wells, elevated water towers, frequently flooded streets) resulted in an under- or overestimation of value. For those assets, the general cost of infrastructure was assigned based on CAT input and publicly available information about infrastructure values. These values are estimates only, and do not necessarily reflect market value or replacement value for the asset.

Vulnerability Assessment Fields

- **Vulnerability** – Scored 1 through 10 with assets having a score greater than or equal to 5 being considered at risk. Calculated as: Exposure (0–5) + Sensitivity (0–5) + Adaptive Capacity (0, –1, –3, –5)

- **Exposure** – This provides an overall evaluation of how exposed the site is to coastal hazards, calculated as the average of Precipitation Exposure, Sea Level Rise Exposure, and Storm Surge Exposure
- **Precipitation Exposure (**Figure 4**)** – Calculated as: Floodplain Exposure (Current or Potential) + Reported Event Inundation Factor.
- **Floodplain Exposure** – Current Floodplain Exposure was derived from FEMA DFIRM data (North Carolina Flood Mapping Program 2020) and calculated as a function of the annual probability of precipitation flooding hazard (moderately low, 1% annual probability, for 100-year flooding or low, 0.2% annual probability, for 500-year flooding) and the severity of precipitation flooding hazard (moderately high for assets in the 100-year floodplain during a 100-year flood event, moderately high for assets in the 500-year floodplain during a 500-year flood event, and high for assets in the 100-year floodplain during a 500-year flood event). To account for increases in precipitation due to climate change, low-lying areas (within an elevation range of 0 to 27 feet above mean sea level, defined by reviewing current floodplain elevations) not currently listed as being in a floodplain were given a blanket Floodplain Exposure score of 2 to represent a low probability of flooding hazard and a low severity of flooding hazard.
- **Reported Event Inundation Factor** – Additive factor used to highlight areas of known flooding during large precipitation events as reported from historical satellite imagery (Schaffer-Smith 2020) or community engagement. For areas with a Floodplain Exposure score greater than 0, 1 point was added for each historical flooding event recorded for that area. For areas with a Floodplain Exposure score of 0 that were reported as having historical flooding, 2 points were awarded to areas with at least one reported flooding event and 1 point was added for each additional storm event.
- **Sea Level Rise Exposure (**Figure 5**)** – Maximum Sea Level Rise Exposure score calculated for the asset. This exposure rating evaluated potential inundation from encroaching coastal lines and inland flooding as a result of higher water tables under 1- to 10-foot National Oceanic and Atmospheric Administration (NOAA) sea level rise projections (NOAA Office of Coastal Management 2017). Scores for the probability of an asset being affected by sea level rise were calculated by grouping scenarios into the following categories based off projected sea level rise under different Intergovernmental Panel on Climate Change (IPCC 2014) emission scenarios: high – 1 to 2 feet expected under all scenarios; moderately high – 3 to 4 feet expected under most scenarios, moderately low – 5 to 6 feet expected under some scenarios; low – 7 to 10 feet expected under only the highest scenario). The severity of sea level rise hazards was assigned considering the accumulative effects of subsequent increases in sea level. For example, under 1 to 2 feet of sea level rise an asset may have a moderately low severity, but under 3- to 4-foot sea level rise conditions that asset will see higher inundation levels and would have a severity score of moderate.

Interpreting Vulnerability Index Values *- It is not necessarily a problem for a site to have a higher vulnerability index value. Even a site with very high Exposure may still be resilient if it has low Sensitivity. For example, a public boat launch site could have a very high Exposure score of 5 because it is subject to regular flooding, but because the asset can easily recover after flooding, is not located in a socially vulnerable area, and is not providing critical services to vulnerable populations, it has a low Sensitivity score of 1. Though its overall Vulnerability Index value may be on the higher end (6), this is not concerning for this site.*

- **Storm Surge Exposure (**Figure 6**)** – Maximum Storm Surge Exposure score calculated for the asset. High tide, coastal storm surges from National Hurricane Center Slosh Model Simulated Category 1 through Category 5 storms (Zachry et al. 2015) were evaluated using the annual probability calculated from historical records for the state of North Carolina to assign probability values like Floodplain Exposure (Category 1 – high with greater than 10% annual probability; Categories 2, 3, and 4 – moderate with approximately 5% annual probability; Category 5 – moderately low with approximately 1% annual probability). Severity of exposure was calculated by categorizing simulated feet of inundation (low – 1 foot, moderately low – 2 to 3 feet, moderate – 4 to 5 feet, moderately high – 6 to 7 feet, high – greater than 8 feet)
- **Sensitivity** – Asset Type Sensitivity + Social Sensitivity, where social sensitivity is a function of both the social vulnerability by service type and by the asset's physical location
- **Asset Type Sensitivity** – For assets that were assigned multiple asset types, the highest categorical sensitivity score was used. Scores for asset categories are as follows: Cemetery, Parks and Recreation, and Restaurants (1); Banks, Cultural Site, Childcare, Employers, Schools (2); Communications, Emergency Services, Food and Supplies, Government, Hazardous Waste, Health and Medical, Law Enforcement/Corrections, Roadways, Utilities (3).
- **Social Vulnerability (geographic)** – Average of Asset Location Social Vulnerability Score and Asset Service Community Vulnerability Score where social vulnerability scores (SoVI) represent the potential negative effects on communities caused by external stresses on human health (calculated by CDC/ATSDR/Division of Toxicology and Human Health Sciences/Geospatial Research, Analysis & Services Program 2020; Hazards and Vulnerability Research Institute 2011), and the asset service community is all Census Blocks or Tracts that intersected a 1-mile radius of the asset (this area was assumed sufficient as vulnerability data is at the Census Block and Tract scale). Social vulnerability of the asset location and community were found by assigning threshold values to already calculated SoVI values as follows: top 10% of socially vulnerable areas (1), top 20% of socially vulnerable areas (0.75), top 30% of socially vulnerable areas (0.5), top 50% of socially vulnerable areas (0.25).
- **Social Vulnerability (by service type**) – Service Type sensitivity scores were assigned to asset locations that have been shown in the documentation to provide services to vulnerable populations, including the elderly (e.g., nursing homes, food distribution systems), chronically ill or physically disabled people (e.g. dialysis centers, medical facilities), less wealthy or food insecure individuals and families (e.g., food pantries, schools, public fishing access, local housing authorities), and historically marginalized groups (e.g., community organizations and cultural sites of significance to African American communities), people without adequate health insurance (e.g., EMS and Emergency Services), incarcerated individuals (e.g., correctional facilities), and those experiencing abuse or violence (e.g., law enforcement, medical facilities), youth and families (e.g., schools and childcare facilities, community centers, parks), and people without reliable internet access (e.g., libraries).
- **Adaptive Capacity –** Scores of 0, -3, and -5 were assigned based on the degree of adaptation described in CAT input.

More details regarding the specific data sets referenced in calculating each of these elements of the Vulnerability Index are summarized in Appendix E.

See Appendix F for detail maps showing assets and hazards in each of the numbered areas in Figure 7.

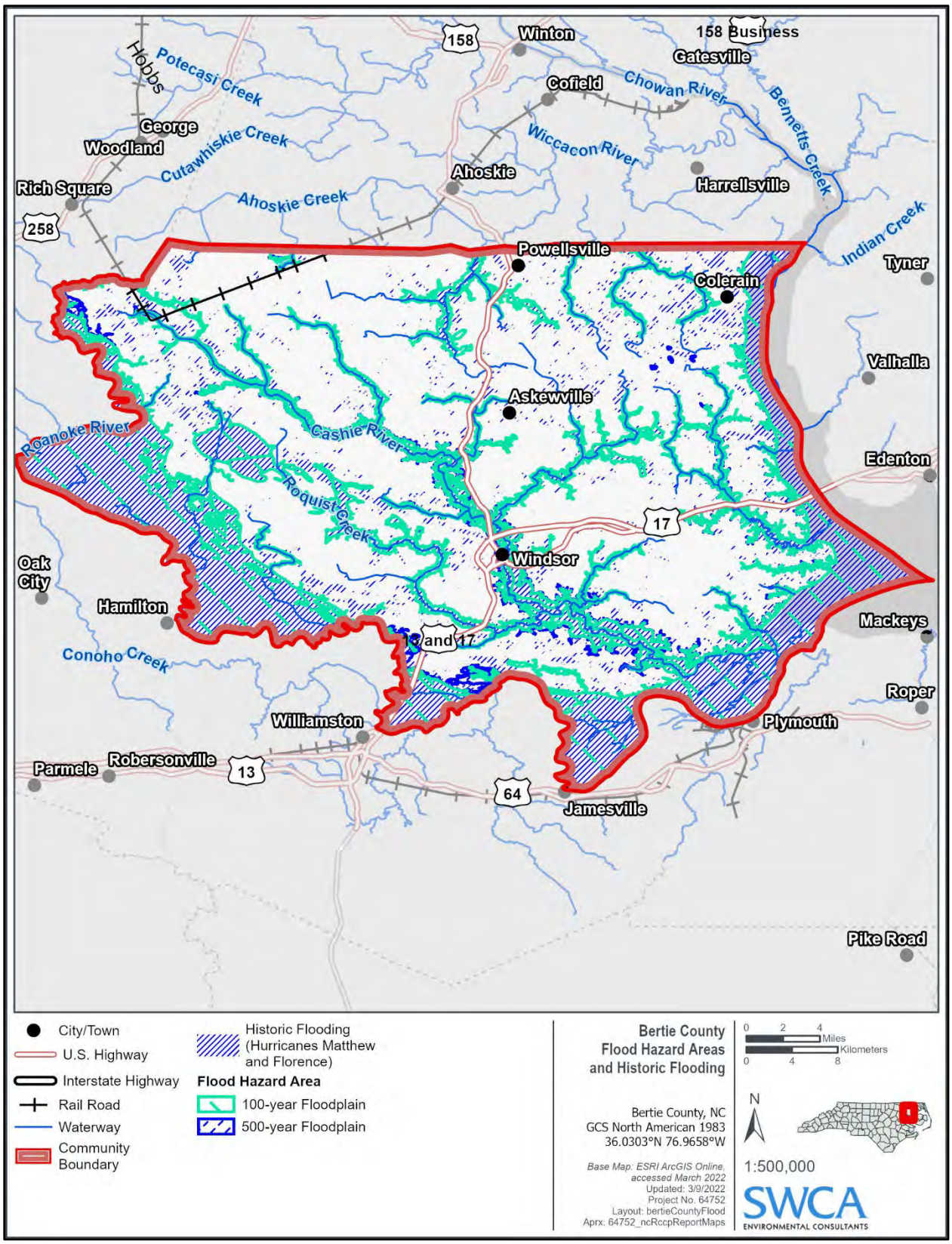

Figure 4. FEMA 100-year and 500-year floodplains and areas of historical flooding from Hurricanes Florence and Matthew around Bertie County, North Carolina.

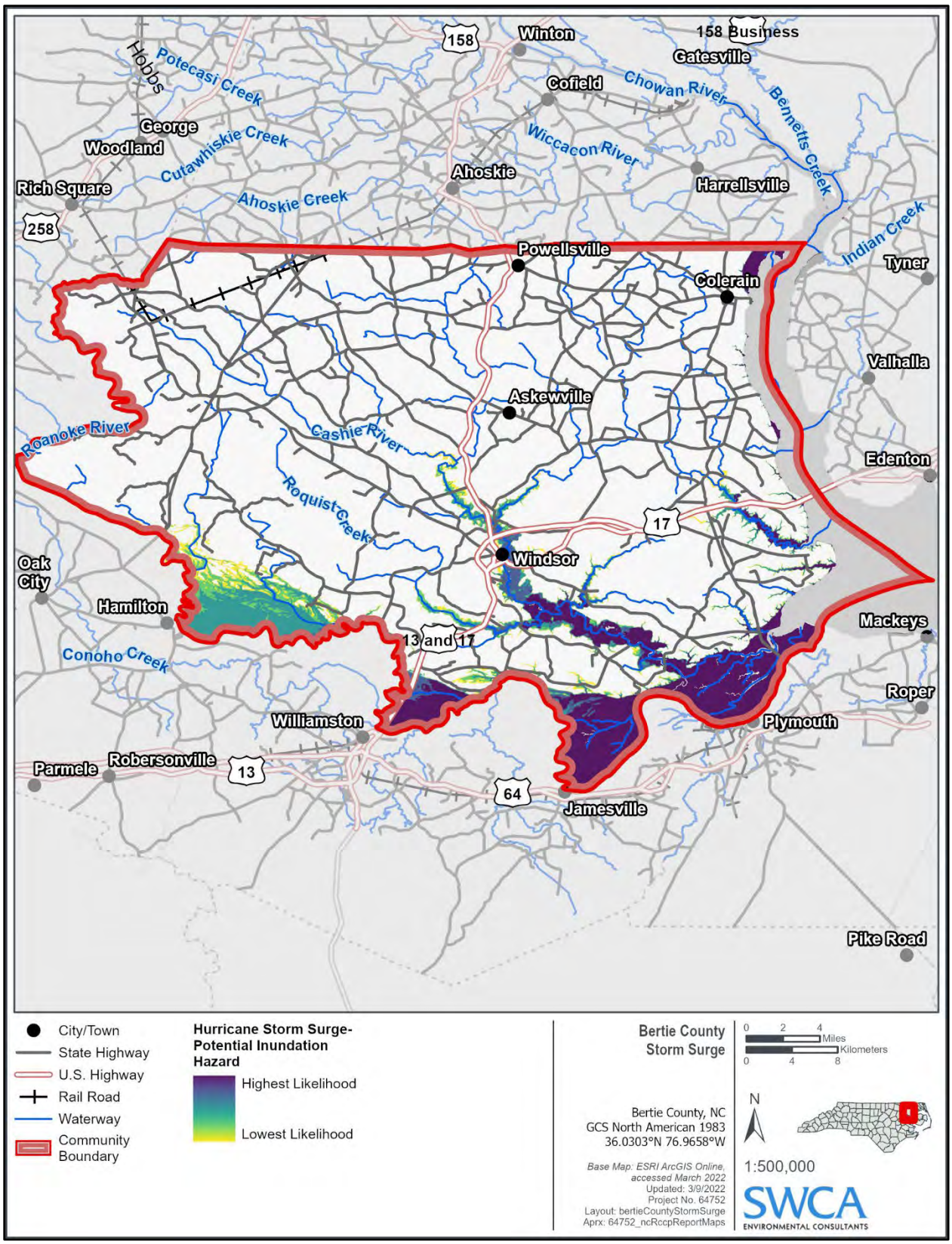

Figure 5. Areas with potential for storm surge inundation around Bertie County, North Carolina.

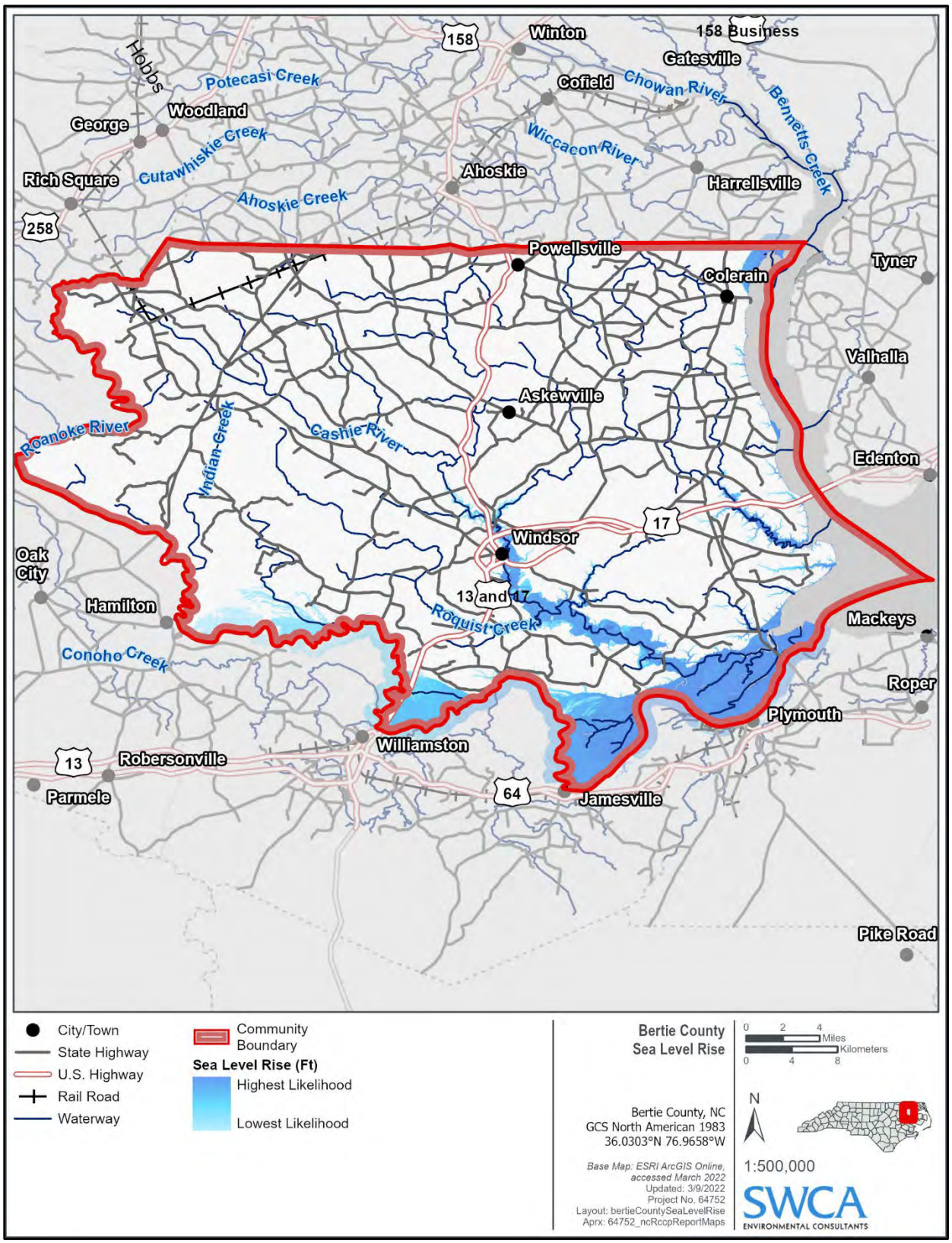

Figure 6. Areas at varying levels of risk from sea level rise from high likelihood of impact (dark blue) to lowest likelihood of impact (light blue) around Bertie County, North Carolina.

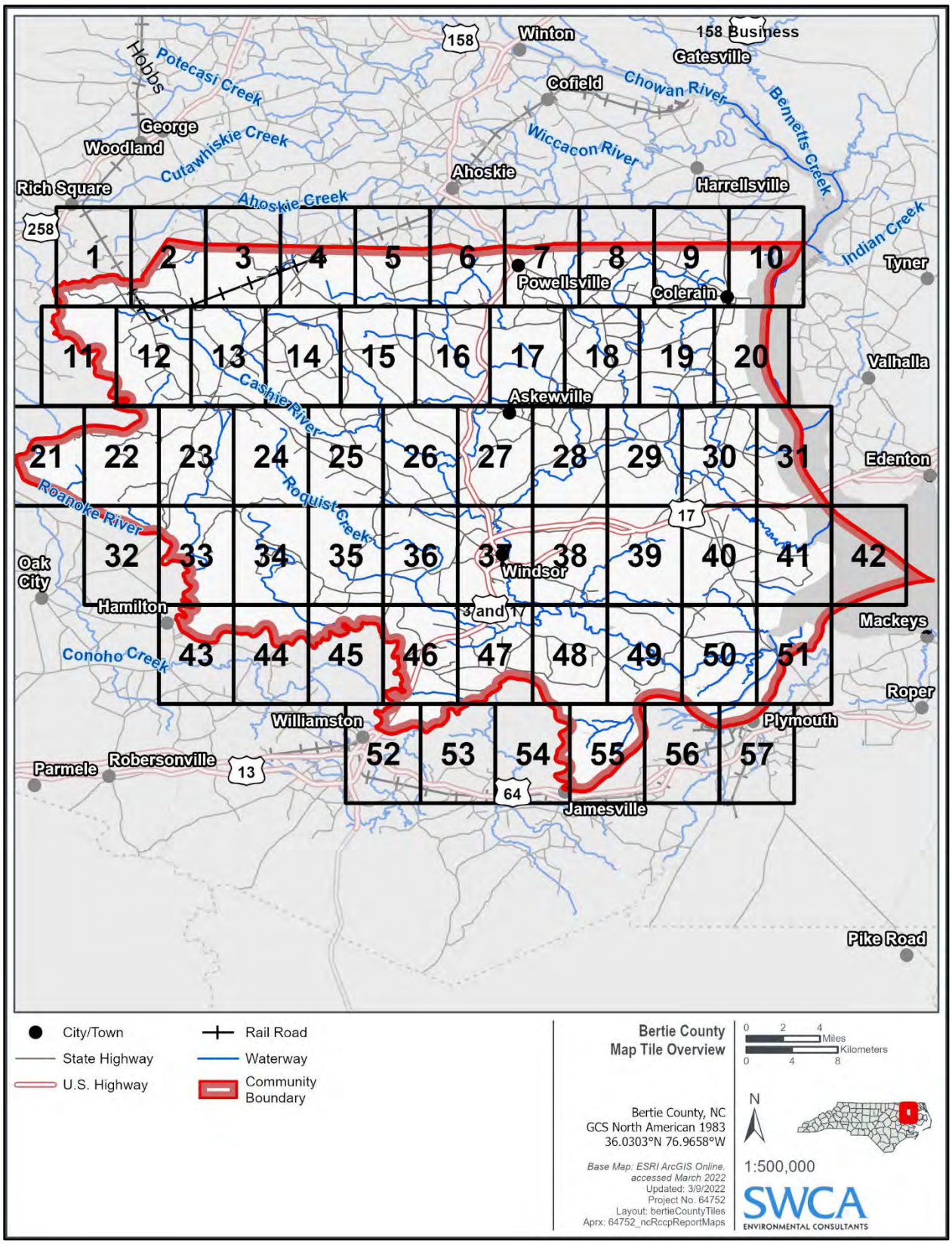

Figure 7. Map tile overview for maps showing details of assets and hazards around Bertie County, North Carolina. Individual maps can be found in Appendix F.

Table 3. Asset Information and Calculation of Vulnerability Index for Each Asset for Bertie County, North Carolina. (Assets are listed from highest vulnerability to lowest vulnerability index; see Section 6.2 above for description of how scores were calculated.)

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-086	Windsor House Nursing Home	Health and Medical	336 South Rhodes Avenue	Private	1,008,017	Bertie County	9	4	5	4	2	5	3	1	1	0
BC-096	Batchelor Bay Residential Area	Residential	Batchelor Bay Road along the Chowan River	Private	1,030,415	Bertie County	8	5	5	5	4	3	3	0	0	0
BC-097	Scotch Hall Preserve Residential Area	Residential	105 Scotch Hall Ct,	Private	1,030,415	Bertie County	8	5	5	5	4	3	3	0	0	0
BC-098	Mount Gould Residential Area	Residential	Mount Gould River Rd along the Chowan River	Private	1,030,415	Bertie County	8	5	5	5	4	3	3	0	0	0
BC-110	Portion of U.S. Highway 17 South/ Highway 13	Roadways	US 17 S/ Hwy 13	Federal	400,000	Bertie County	8	4	5	4	3	4	3	1	0	0
BC-112	Portion of Highway 17	Roadways	Hwy 17	Federal	400,000	Bertie County	8	5	5	5	4	3	3	0	0	0
BC-081	Elmwood	Cultural Site	637 Avoca Farm Rd	Private	382,337	Bertie County	7	5	5	5	4	2	2	0	0	0
BC-082	Hermitage, The	Cultural Site	Off State Road 1358	Private	1,780,781	Bertie County	7	5	5	5	4	2	2	0	0	0
BC-084	Avoca, Inc.	Employers	841 Avoca Farm Rd	Private	443,903	Bertie County	7	5	5	5	4	2	2	0	0	0
BC-087	Roanoke River National Wildlife Refuge	Parks and Recreation	Multiple areas in south Bertie County	Federal	8,480,039	Bertie County	7	5	5	5	4	2	1	1	0	0
BC-089	Hoggard Mill Pond Natural Area	Parks and Recreation	Along Hoggard Mill Creek near Hwy 13	Private	146,206	Bertie County	7	5	5	5	4	2	1	1	0	0

[1] These values are based on state assessor data and other publicly available information. These are estimates only, and do not necessarily reflect market value or replacement value for the asset. Values for historic districts include all parcels within the historic district.

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-093	Kuralt Trail	Parks and Recreation	Off in Hwy 17 Roanoke River National Wildlife Refuge	Federal	2,209	Bertie County	7	5	5	5	4	2	1	1	0	0
BC-052	Bertie Martin Regional Jail	Law Enforcement/ Corrections	230 County Farm Road	County	2,792,313	Bertie County	6	1	1	2	0	5	3	1	1	0
BC-053	Astoria Landing/ Jamesville Public Fishing Access	Parks and Recreation	1333 Astoria Dr	State	0	Town of Jamesville	6	4	3	5	4	2	1	0	1	0
BC-062	Sans Souci Ferry Boat Access Area	Parks and Recreation	2156 Woodard Rd	State	0	Bertie County	6	5	5	5	4	1	1	0	0	0
BC-088	Chowan Swamp Game Land	Parks and Recreation	Multiple areas along the Chowan River	State	99,236	Bertie County	6	5	5	5	4	1	1	0	0	0
BC-090	Salmon Creek Natural Area and Education Center	Parks and Recreation	Near the confluence of Salmon Creek and Albemarle Sound	State	10,185,612	Bertie County	6	5	5	5	4	1	1	0	0	0
BC-091	Chowan River Conservation Area	Parks and Recreation	Approximately 1 mile northeast of Colerain along the Chowan River	State	233,787	Bertie County	6	5	5	5	4	1	1	0	0	0
BC-092	Keel Creek Natural Area	Parks and Recreation	Cumtuk/Cow Island	State	41,471	Bertie County	6	5	5	5	4	1	1	0	0	0
BC-095	Quitsna Road Residential Area	Residential	Intersection of Ceasars Island and Quitsna Rd	Private	1,030,415	Bertie County	6	3	5	4	1	3	3	0	0	0
BC-099	Portion of School Road	Roadways	School Rd	County	200,000	Bertie County	6	3	5	4	1	3	3	0	0	0
BC-108	Portion of Weeping Mary Road	Roadways	Weeping Mary Rd	County	200,000	Bertie County	6	2	5	0	0	4	3	1	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-034	White Oak Medical Transport	Emergency Services	446 White Oak Rd	Private	120,601	Bertie County	5	0	0	0	0	5	3	1	1	0
BC-058	Lewiston Woodville Public Fishing Area/Boat Access	Parks and Recreation	838 Weeping Mary Rd	State	20,625	Bertie County	5	2	5	0	0	3	1	1	1	0
BC-075	Bertie County Water Facilities	Utilities	207 County Farm Rd	County	115,147	Bertie County	5	1	1	2	0	4	3	1	0	0
BC-085	East Carolina Environmental Regional Landfill – Active	Hazardous Waste	1922 Republican Road, Aulander	Private	10,089,767	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-094	Indian Woods Road Residential Area	Residential	Intersection of Green Pond Rd and Indian Woods Rd	Private	1,030,415	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-105	Portion of Bull Hill Road	Roadways	Bull Hill Rd	County	200,000	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-106	Portion of Bethany Church Road	Roadways	Bethany Church Rd	County	200,000	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-107	Portion of Pine Ridge Road	Roadways	Pine Ridge Rd	County	200,000	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-109	Portion of E Main Street	Roadways	E Main St	County	200,000	Bertie County	5	2	5	0	0	3	3	0	0	0
BC-114	Portion of Governors Road	Roadways	Governors Rd	Town	200,000	Town of Kelford	5	2	5	0	0	3	3	0	0	0
BC-118	Portion of 72 Siding Road	Roadways	72 Siding Rd	Town	200,000	Town of Kelford	5	2	5	0	0	3	3	0	0	0
BC-119	Portion of Front Street	Roadways	Front St	Town	200,000	Town of Kelford	5	2	5	0	0	3	3	0	0	0
BC-019	Askewville Volunteer Fire Department	Emergency Services	105 Askewville North Railroad Street	Private	126709	Town of Askewville	4	0	0	0	0	4	3	0	1	0
BC-020	Aulander Police & Fire Department	Emergency Services	124 W Main St	Town	149,373	Town of Aulander	4	0	0	0	0	4	3	0	1	0
BC-021	Blue Jay Volunteer Fire Company	Emergency Services	1653 Indian Woods Rd	Private	107,109	Bertie County	4	0	0	0	0	4	3	0	1	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-022	Colerain Rescue Squad	Emergency Services	110 Winton St	Town	250,779	Town of Colerain	4	0	0	0	0	4	3	0	1	0
BC-023	Colerain Volunteer Fire Department	Emergency Services	105 W River St	Town	51,685	Town of Colerain	4	0	0	0	0	4	3	0	1	0
BC-024	Kelford Fire Department	Emergency Services	106 N Main St	Private	80,134	Town of Kelford	4	0	0	0	0	4	3	0	1	0
BC-025	Lewiston Woodville Fire and Emergency Medical Services	Emergency Services	103 W Church St	Private	194,027	Town of Lewiston Woodville	4	0	0	0	0	4	3	0	1	0
BC-026	Lewiston Woodville Police Department	Emergency Services	103 E Church St	Private	194,027	Town of Lewiston Woodville	4	0	0	0	0	4	3	0	1	0
BC-027	Merry Hill–Midway Fire Department	Emergency Services	109 State Highway 45 N	Private	93,437	Bertie County	4	0	0	0	0	4	3	0	1	0
BC-028	Perrytown Fire Department	Emergency Services	850 Perrytown Rd	Town	483,285	Town of Bertie	4	0	0	0	0	4	3	0	1	0
BC-029	Powellsville Volunteer Fire Department	Emergency Services	105 Curtis St	Private	198,381	Town of Powellsville	4	0	0	0	0	4	3	0	1	0
BC-030	Roxobel Volunteer Fire Department	Emergency Services	204 S Main St	Private	189,437	Town of Roxobel	4	0	0	0	0	4	3	0	1	0
BC-031	Trap Fire Department	Emergency Services	1404 Meadow Rd	Private	205,642	Bertie County	4	0	0	0	0	4	3	0	1	0
BC-032	Medi-Port Inc.	Emergency Services	344 School Rd	Private	31,228	Bertie County	4	0	0	0	0	4	3	0	1	0
BC-033	NC Division of Forest Resources District 7	Emergency Services	105 Wakelon Rd	State	46,580	Bertie County	4	0	0	0	0	4	3	1	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-060	Roanoke River Trail Paddle Access at NC WRC Boat Ramp at Hamilton	Parks and Recreation	310 E Main St	State	0	Bertie County	4	2	5	0	0	2	1	1	0	0
BC-061	Roanoke River Trail Paddle Access at North Carolina Wildlife Resources Commission Boat Ramp at Williamston	Parks and Recreation	744 River Rd	Private	0	Town of Willamston	4	2	3	0	2	2	1	1	0	0
BC-064	Bertie Early College High School/Emergency Shelter	Schools, Emergency Services	819 Governors Rd	Private	2,061,562	Bertie County	4	0	0	0	0	4	3	0	1	0
BC-069	Colerain Elementary/ Emergency Shelter	Schools, Emergency Services, Parks and Recreation	202 N Academy St	County	2,670,168	Town of Colerain	4	0	0	0	0	4	3	0	1	0
BC-071	West Bertie Elementary/ Emergency Shelter	Schools, Emergency Services	3734 Governors Rd	County	3,367,908	Bertie County	4	0	0	0	0	4	3	0	1	0
BC-077	Wastewater Treatment Plant	Utilities	149 County Farm Rd	Private	415,095	Bertie County	4	0	1	0	0	4	3	1	0	0
BC-078	Substation	Utilities	110 East St	Town	26,695	Bertie County	4	0	1	0	0	4	3	1	0	0
BC-100	Portion of Williford Avenue	Roadways	Williford Ave	County	200,000	Bertie County	4	0	0	0	0	4	3	1	0	0
BC-101	Portion of Braxton Avenue	Roadways	Braxton Ave	County	200,000	Bertie County	4	0	1	0	0	4	3	1	0	0
BC-120	Solar Farm – Built 2016	Utilities	Off 516 Old US 17N	Private	151,806	Bertie County	4	0	1	0	0	4	3	1	0	0
BC-001	State Employees Credit Union	Banks	46 Grabtown Rd	State	1,293,409	Bertie County	3	0	0	0	0	3	2	1	0	0
BC-016	Jordan House	Cultural Site	Windor on SR 1522	Private	138,563	Bertie County	3	1	2	0	0	2	2	0	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-018	Rosefield	Cultural Site	210 W Gray St	Private	106,502	Bertie County	3	0	1	0	0	3	2	1	0	0
BC-037	Aulander Post Office	Government	107 W Main St	Private	126,230	Town of Aulander	3	0	0	0	0	3	3	0	0	0
BC-038	Aulander Town Hall	Government	124 W Main St	Town	149,373	Town of Aulander	3	0	0	0	0	3	3	0	0	0
BC-039	Colerain Post Office	Government	107 W River St	Private	66,972	Town of Colerain	3	0	0	0	0	3	3	0	0	0
BC-040	Colerain Town Hall	Government	101 Winton St No. B	Town	51,685	Town of Colerain	3	0	0	0	0	3	3	0	0	0
BC-041	Kelford Post Office/Clerk's Office	Government	108 South Main Street	Private	25,971	Town of Kelford	3	0	0	0	0	3	3	0	0	0
BC-042	Kelford Town Hall/Clerk's Office	Government	106 N Main St B	Private	80,134	Town of Kelford	3	0	0	0	0	3	3	0	0	0
BC-043	Lewiston Woodville Post Office	Government	125 Main St	Private	46,400	Town of Lewiston Woodville	3	0	0	0	0	3	3	0	0	0
BC-044	Lewiston-Woodville Town Hall/Clerk's Office	Government	103 W Church St	Private	194,027	Town of Lewiston Woodville	3	0	0	0	0	3	3	0	0	0
BC-045	Merry Hill Post Office	Government	335 Old Merry Hill Rd	Private	30,915	Bertie County	3	0	0	0	0	3	3	0	0	0
BC-046	Powellsville Post Office	Government	103 Bethlehem Church Rd	Private	29,449	Town of Powellsville	3	0	0	0	0	3	3	0	0	0
BC-047	Powellsville Town Hall	Government	Curtis St	Private	198,381	Town of Powellsville	3	0	0	0	0	3	3	0	0	0
BC-048	Roxobel Post Office	Government	106 W Church St	Private	30,117	Town of Roxobel	3	0	0	0	0	3	3	0	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-049	Roxobel Town Hall	Government	204 S Main St	Private	189,437	Town of Roxobel	3	0	0	0	0	3	3	0	0	0
BC-050	Bertie County Regional Landfill – Closed	Hazardous Waste	1028 Charles Taylor Rd	County	171,729	Bertie County	3	0	0	0	0	3	3	0	0	0
BC-051	R.J. Reynolds Landfill	Hazardous Waste	Unknown	Private	52,575	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-059	Unmarked Paddle Access	Parks and Recreation	Unknown	State	0	Martin County	3	2	3	0	2	1	1	0	0	0
BC-063	Aulander Elementary	Schools, Parks and Recreation	2515 State Highway 305	County	2,193,145	Bertie County	3	0	0	0	0	3	2	0	1	0
BC-065	Bertie High School	Schools	716 US Highway 13 North	County	15,651,001	Bertie County	3	0	0	0	0	3	2	0	1	0
BC-066	Bertie Middle School	Schools	652 US Highway 13 North	County	11,277,308	Bertie County	3	0	0	0	0	3	2	0	1	0
BC-067	Bertie STEM High School	Schools	716 US Highway 13 North	County	4,746,914	Bertie County	3	0	1	0	0	3	2	0	1	0
BC-068	Bethel Assembly Christian Academy	Schools	105 Askewville Bryant St	Private	2,530,349	Town of Askewville	3	0	0	0	0	3	2	0	1	0
BC-070	Lawrence Academy	Schools	148 Avoca Farm Rd	Private	1,836,896	Bertie County	3	0	0	0	0	3	2	0	1	0
BC-072	Sallie H Jenkins Memorial Library	Government	302 Broad S	Private	107,106	Town of Aulander	3	0	0	0	0	3	2	0	1	0
BC-073	Hive House	Cultural Site	103 Mitchell St	County	128,920	Town of Lewiston Woodville	3	0	0	0	0	3	2	0	1	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-074	Vitality Center	Cultural Site	121 Main Street	Town	148,147	Town of Lewiston Woodville	3	0	0	0	0	3	2	0	1	0
BC-076	Powellsville Municipal Water Facilities	Utilities	106 E Main St, P.O. Box 22	Private	6853	Town of Powellsville	3	0	0	0	0	3	3	0	0	0
BC-102	Portion of Cowan Lane	Roadways	Cowan Ln	County	200,000	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-103	Portion of Highway 13	Roadways	Hwy 13	Federal	200,000	Bertie County	3	0	0	0	0	3	3	0	0	0
BC-104	Portion of Hoggart Mill Road	Roadways	Hoggart Mill Rd	County	200,000	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-111	Portion of Gov Eden House Road	Roadways	Gov Eden House Rd	County	200,000	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-113	Portion of South Main Street	Roadways	S Main St	Town	200,000	Town of Roxobel	3	0	0	0	0	3	3	0	0	0
BC-115	Portion of 3rd Street	Roadways	3rd St	Town	200,000	Town of Kelford	3	0	0	0	0	3	3	0	0	0
BC-116	Portion of 4th Street	Roadways	4th St	Town	200,000	Town of Kelford	3	0	0	0	0	3	3	0	0	0
BC-117	Portion of East Church Street	Roadways	E Church St	Town	200,000	Town of Kelford	3	0	0	0	0	3	3	0	0	0
BC-121	Liverman Solar Site – Built 2017	Utilities	729 Black Jack Rd	Private	259,704	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-122	Solar Farm – Built 2015	Utilities	113 Griffins Qt Rd	Private	438,310	Bertie County	3	0	0	0	0	3	3	0	0	0
BC-124	Solar Farm – Built 2017	Utilities	3656 Governors Rd	Private	1,032,209	Bertie County	3	0	1	0	0	3	3	0	0	0
BC-002	Barden Cemetery	Cemetery	4203 Governors Rd	Private	34,132	Bertie County	2	0	0	0	0	2	1	1	0	0
BC-007	Ashland	Cultural Site	NC 45, 0.25 mile north of junction with NC 1360	Private	75,775	Bertie County	2	0	1	0	0	2	2	0	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-008	Garrett-White House	Cultural Site	North of State Hwy 42	Private	972,917	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-009	King-Freeman-Speight House	Cultural Site	Republican area	Private	204,504	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-010	Oaklana	Cultural Site	North of Roxobel off State Route 1249	Private	203,377	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-011	Saint Frances Methodist Church	Cultural Site	409 S Main St	Private	36,376	Town of Lewiston Woodville	2	0	0	0	0	2	2	0	0	0
BC-012	Scotch Hall	Cultural Site	726 Sutton Rd	Private	485,059	Bertie County	2	0	1	0	0	2	2	0	0	0
BC-013	William H. Lee House	Cultural Site	Lewiston area	Private	10,184	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-014	Woodbourne	Cultural Site	West of Roxobel on SR 1139	Private	311,204	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-015	Hope Plantation	Cultural Site	4 miles northwest of Windsor off NC 308	Private	138,370	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-017	King House	Cultural Site	Northwest of Windsor off NC 308	Private	1,075,358	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-035	Bertie County Board of Education	Employers	715 US 13, Windsor, NC 27983	County	4,746,914	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-036	Perdue Products, Inc.	Employers	3539 Governors Rd	Private	8,332,415	Bertie County	2	0	0	0	0	2	2	0	0	0
BC-056	Kelford Community Park	Parks and Recreation	107 N Main St	Private	5,532	Town of Kelford	2	0	0	0	0	2	1	0	1	0
BC-079	Woodville Historic District	Cultural Site	Woodville	Private	2,390,054	Town of Lewiston Woodville	2	0	1	0	0	2	2	0	0	0
BC-080	Colerain Historic District	Cultural Site	106 Winton St	County, Town, Private	11,755,473	Town of Colerain	2	0	1	0	0	2	2	0	0	0

Asset ID	Asset Name	Asset Type	Location	Ownership	Estimated Value ($)[1]	Jurisdiction	Vulnerability Index	Average Exposure (0–5)	Precipitation (0–5)	Sea Level Rise (0–5)	Storm Surge (0–5)	Total Sensitivity (0-5)	Sensitivity (0–3, by asset type)	Social Vulnerability (by location)	Social Vulnerability (by service)	Adaptive Capacity
BC-083	Pineview	Cultural Site	Off SR 1249	Private	6,854	Bertie County	2	0	1	0	0	2	2	0	0	0
BC-003	Eastview Cemetery	Cemetery	127 Brick Mill Rd	Town	24,649	Town of Aulander	1	0	0	0	0	1	1	0	0	0
BC-004	Hoggard Cemetery	Cemetery	330 NC 11 N	Town	19,630	Town of Lewiston Woodville	1	0	0	0	0	1	1	0	0	0
BC-005	Norfleet Cemetery	Cemetery	304 Norfleet Ferry Rd	Private	73,689	Bertie County	1	0	0	0	0	1	1	0	0	0
BC-006	Roxobel-Kelford Cemetery	Cemetery	229 A C Smith Rd	Private	19,668	Town of Roxobel	1	0	0	0	0	1	1	0	0	0

6.3 Evaluation of Risk

To quantify the potential economic risk to town assets, Estimated Values for assets with a vulnerability score of 5 or greater were summarized by asset type and ownership (Table 4 and Table 5). Estimated values were assigned by finding the maximum value (Parcel Value, Land Value, or Improvement Value) associated with an asset's parcel. A threshold of 5 for the risk evaluation was used because it represents assets in a community with an average or above average vulnerability. In Bertie County 34 assets with an estimated total value of $43,691,917 were determined to be at risk (defined as Vulnerability Index of 5 or higher). This value was calculated by assuming the value of assets that overlap are reflected in the cost estimate of the larger asset area (i.e., the cost of a government building in a historic district would be captured in the overall estimated cost for the historic district). This assumption was carried over into grouped estimated value calculations, and spatial duplicates were removed within each category. Estimated values for each Asset Type should be considered independently since assets with multiple type designations were included in the evaluation of each of their assigned types.

Table 4. Calculation of Total Asset Value at Risk (defined as Vulnerability Index of 5 or higher) for Each Asset Type for Bertie County, North Carolina

Asset Type	Number of Assets at Risk	Estimated Asset Value at Risk ($)
Cultural Sites[2]	2	2,163,118
Emergency Services	1	120,601
Employers	1	443,903
Hazardous Waste	1	10,089,767
Health and Medical	1	1,008,017
Law Enforcement/Corrections	1	2,792,313
Parks and Recreation	10	19,206,976
Residential	5	5,152,075
Roadways	11	2,600,000
Utilities	1	115,147

Table 5. Calculation of Total Asset Value at Risk (defined as Vulnerability Index of 5 or higher) for Each Ownership Type for Bertie County, North Carolina

Ownership	Count	Estimated Asset Value at Risk ($)
Private	12	19,123,687
Federal	4	9,280,039
State	7	10,580,731
County	8	4,107,460
Town of Kelford	3	600,000

[2] Includes all parcels within historic districts

7 PROJECT PORTFOLIO

7.1 Identification and Prioritization of Resilience Projects

The overall purpose of the RCCP is to support coastal communities to identify and pursue priority resilience projects that reduce and minimize risks posed by coastal hazards. The CAT referenced the following criteria (based on those in the RCCP Handbook) as well as their vision and goals in reaching agreement on a set of eight high-priority resilience projects for the County.

- Impact
  - Overall benefit to the community as a whole
  - Advances prior efforts/aligns with other plans
  - Has potential co-benefits, e.g., provides a recreational amenity, contributes to local economy, preserves a habitat, strengthens resilience to non-climate stressors like pandemics
  - Important for long-term resilience (i.e., taking climate change, sea level rise, and other future conditions into account)
  - Reduces vulnerability of key assets to coastal hazards
  - Reduces economic risk posed by coastal hazards in one or more sectors
  - Supports social equity
- Feasibility
  - Capacity to implement
  - Technical soundness
  - Likely positive benefit-cost ratio
  - Identifiable sources of funding

7.2 Prioritization Process

To develop a priority list of resilience projects for Bertie County, SWCA first created a list of potential projects based on review of existing documents including the Northeast Regional Hazard Mitigation Plan Update (North Carolina Emergency Management Division [NCEM] 2020) and the Bertie County Hurricane Matthew Resilient Redevelopment Plan (NCEM 2017).

Project prioritization proceeded in three rounds. In the first round, the CAT reviewed the full list of potential projects compiled from existing resources to remove projects already completed or no longer relevant to the County and add any additional projects for consideration. In the second round, CAT members added or refined some project ideas based on the criteria above and selected a short list to bring to the second public meeting for review and feedback. In the third round, CAT members refined and adjusted their high-priority list based on the criteria above and to better reflect public input and the vulnerability assessment results.

The eight high-priority projects agreed upon by the CAT are described in more detail in the tables below. Generally, these projects were understood by the CAT to have broad community-wide risk-reduction benefits or to benefit vulnerable populations, to be feasible, to align with the County's long-term resilience goals, to build upon other plans, and to link to efforts already underway.

All other projects considered by the CAT are documented in Appendix G. Some of the other projects considered were not prioritized because they had been completed or were already in progress since being

identified in previous planning efforts. Others were very localized and not perceived by the CAT to have sufficient benefit to the community at large to be considered high priority. Others would not substantially contribute to reducing coastal hazard risks or were considered infeasible by the CAT for any of the reasons noted in the criteria above, and so were not prioritized.

7.3 High-Priority Projects

The following eight projects were identified as high priority by the Bertie County CAT. Projects are *not* listed in order of priority; they are all high priority projects. Click the links below to jump to more details for each project:

7.3.1 Land Use Maps

Project Description	Continue to develop a Geographic Information System (GIS) to map current land uses and to map proposed future land uses (CAMA Land Use Plan Update) as an aid in assessing community vulnerability. Future land use map classifications include Conservation I (areas to be preserved: natural landscape and waterscape with civic uses, such as parks and public access, farms, forestry, and fishing) and Conservation II (areas to be protected; restricted land uses due to wetlands and flood hazards). As new maps are developed, facilitate the public review process and adoption.
Location	Countywide
Source	Northeastern NC Regional Hazard Mitigation Plan 2020, CAMA Land Use Plan 2016
Scoping Questions	Need to define a sequence of discrete mapping tasks that could be completed in house or contracted out.
Hazard(s) Addressed by Project	Storm surge, runoff, riverine flooding, sea level rise, erosion
FEMA Community Lifelines	Safety and Security
Type of Solution	Local Plans and Policies
Project Estimated Timeline	Ongoing
Responsible Entity	County Planning Department
Potential Partners	County Tax Office, External GIS service Providers
Existing Funding	None identified by CAT
Potential Funding Sources	Building Resilient Infrastructure and Communities (BRIC) State Allocation, National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund
Project Estimated Cost	Low – $10,000-$50,000 Depending on scope of mapping needed.
Anticipated Benefit	High – Action would have a significant impact on risk reduction. This is currently an obstacle to updating plans and coordinating with boards.
Priority Rating	High

Completed by NCDOT

7.3.2 Feasibility Study of Frequently Flooded Major Roadways

Project Description	Look at roadways and maintenance of waterways to identify most appropriate actions to reduce flood risk. 1.Salmon Creek Bridge was topped and the surrounding area flooded which blockage of U.S. Highway 17 resulting in no access for supplies to east and west counties, and elimination of access to five counties north of Bertie County. The study looks at mitigation of flooding upstream based on findings from the Windsor Flood Reduction Feasibility Study and regular maintenance of debris before it reaches this location. 2.School Road washed out and stranded many people and the High School (shelter operations) was cut off. This Cashie River swamp area floods regularly. The study looks at construction of a higher bridge over the swamp area to maintain better access, and development of a water control process according to findings from the Windsor Flood Reduction Feasibility Study. 3.This bridge over Ahoskie Creek routinely washes out, eliminating access to the local hospital for residents of both Bertie County and Hertford County. The study looks at raising the bridge elevation and regular cleaning of debris underneath.
Location	Salmon Creek bridge on U.S. Highway 17 near Midway School Road near Bertie High School US 13 at Ahoskie Creek, Powellsville
Source	Hurricane Matthew Resilient Redevelopment Plan - Bertie County, Discussion with CAT
Scoping Questions	Is there any funding in the State Transportation Improvement Plan that could be applicable to this effort?
Hazard(s) Addressed by Project	Precipitation-based flooding
FEMA Community Lifelines	Safety and Security; Transportation
Type of Solution	Structure and Infrastructure
Project Estimated Timeline	1 year
Responsible Entity	County Planning Department
Potential Partners	NC DOT, RPO, NRCS, County Planning Board
Existing Funding	None identified by CAT
Potential Funding Sources	Building Resilient Infrastructure and Communities (BRIC) State Allocation
Project Estimated Cost	Medium - $100,000
Anticipated Benefit	High - Action would have a significant impact on risk reduction.
Priority Rating	High

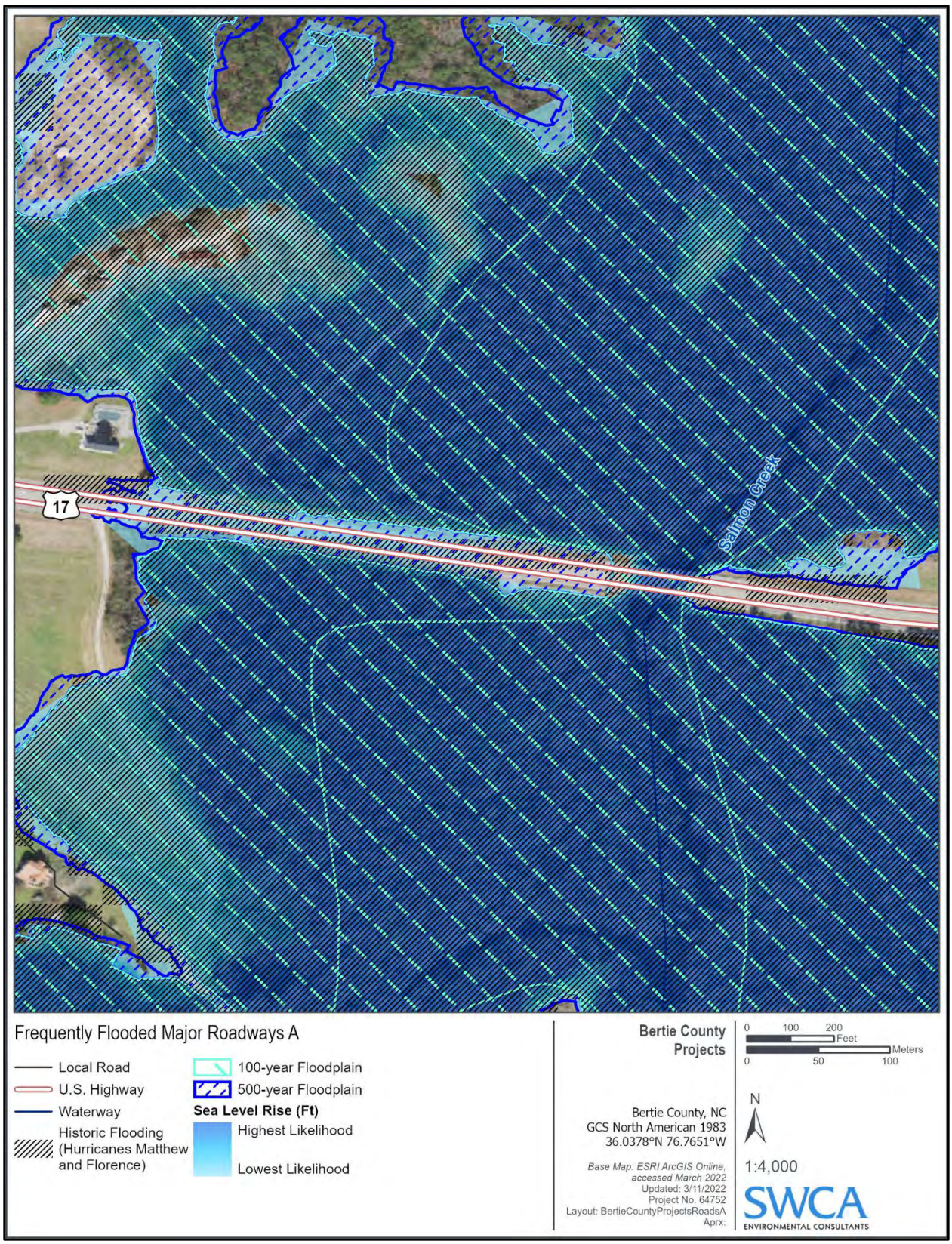

Figure 8. Location of frequently flooded major roadways at Salmon Creek.

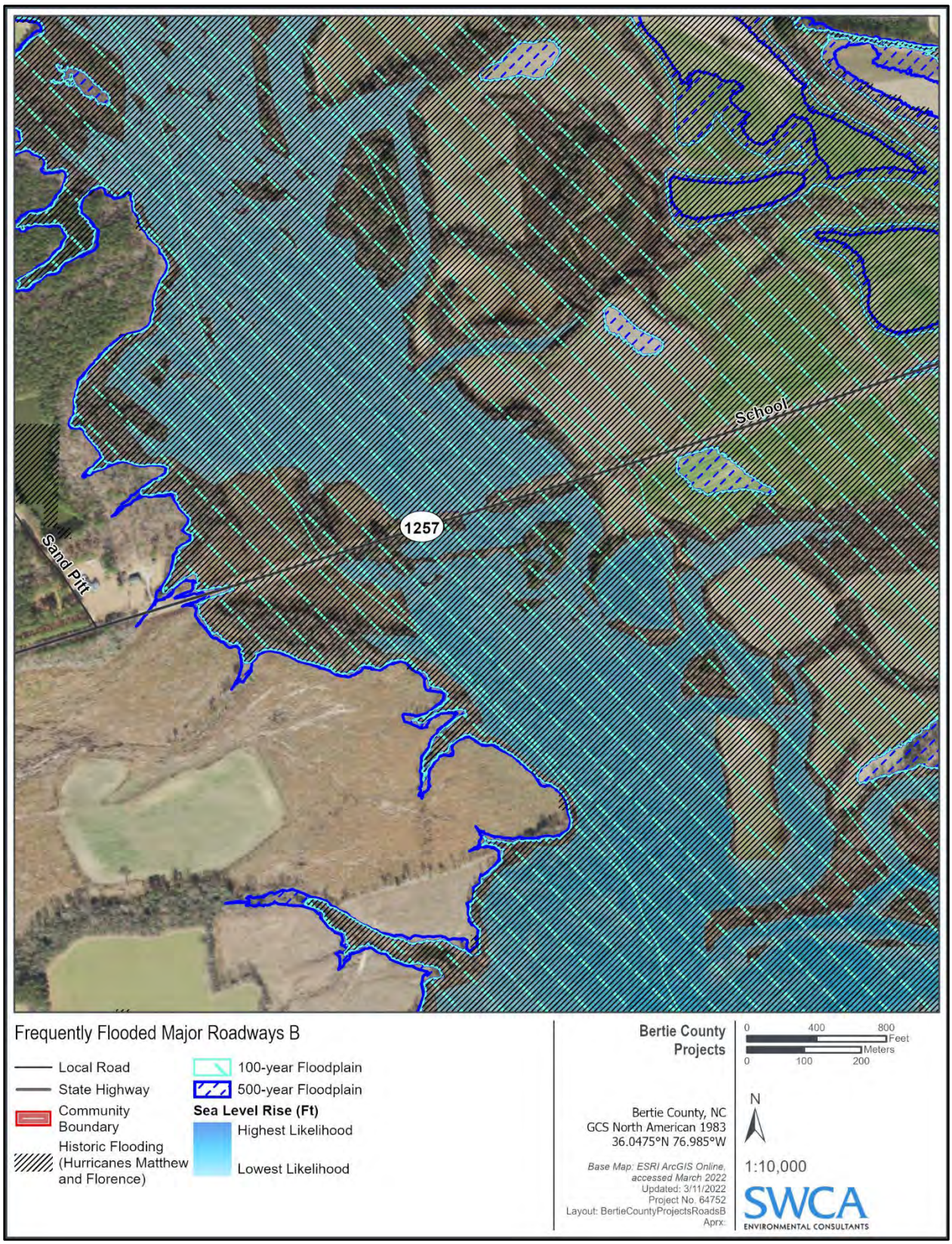

Figure 9. Location of frequently flooded major roadways at School Road.

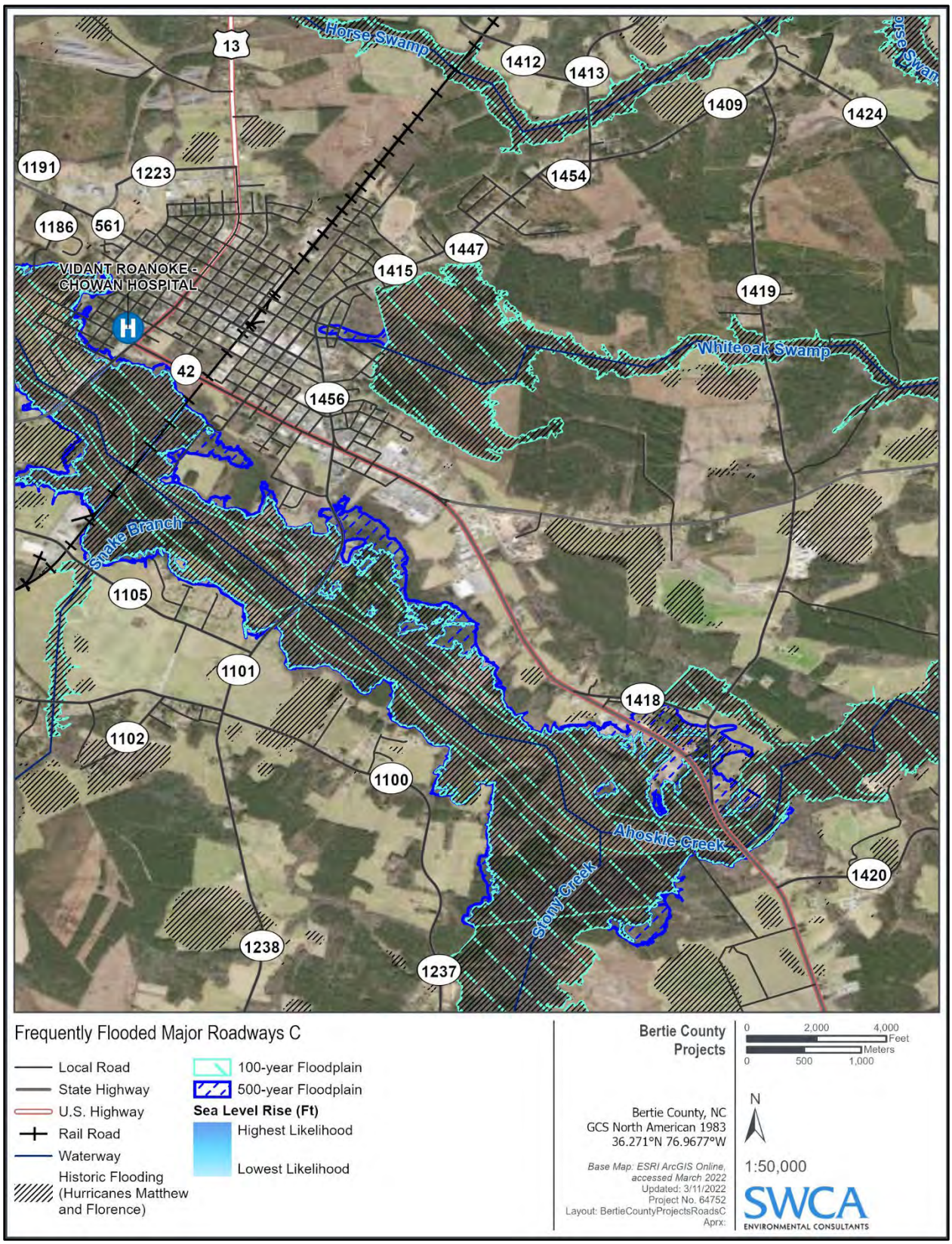

Figure 10. Location of frequently flooded major roadways at Ahoskie Creek.

7.3.3 New or Updated Zoning and Development Ordinances

Project Description	Establish zoning districts and sets standards for future development. Include standards for clustering of residential lot development to help preserve flood hazard areas from development. Include a flood hazard overlay zone to ensure that inappropriate development is adequately controlled
Location	Countywide
Source	Northeastern NC Regional Hazard Mitigation Plan 2020
Scoping Questions	What was in the previous zoning ordinance drafted with the Mideast Commission several years ago?
Hazard(s) Addressed by Project	Storm surge, runoff, riverine flooding, sea level rise, erosion
FEMA Community Lifelines	Safety and Security
Type of Solution	Local Plans and Regulations
Project Estimated Timeline	1 to 2 years
Responsible Entity	County Planning Department
Potential Partners	Board of Commissioners, Consultants or Mideast Commission
Existing Funding	None identified by CAT
Potential Funding Sources	Building Resilient Infrastructure and Communities (BRIC) State Allocation, future general fund allocation
Project Estimated Cost	Low - $75,000
Anticipated Benefit	High - Action would have a significant impact on risk reduction.
Priority Rating	High

7.3.4 Hydrologic Assessment and Development of a Drainage and Water Management Plan

Project Description	1. Conduct a Hydrologic Assessment to determine water management and maintenance priorities and planning, including: 2. Determine if existing Hoggard's Mill Pond dam structure and levee wall in the upper Cashie watershed could be used as water storage facilities to manage flood and drought waters. Impounding water would reduce downstream impacts on developed areas. 3.Develop a Cashie River drainage system that utilizes integrated natural and historic water control structures in the upstream portions of the black-water drainage systems (e.g., conservation easements, vegetation buffer zones, design road dams to slow down the water and create temporary holding ponds); develop partnerships to implement the program; revisit historic mill dam locations as water storage facilities. 4.Siding Road Water Storage and Diversion - A 20-foot wall of water washed out the railroad track and parallel roadway. Develop a primary water storage area and construct a diversion mechanism. 5.White Oak Drainage - Water is impounded by US 17 without a way to drain across to the south. The White Oak area receives that excess floodwater inundating the neighborhood. US 17 needs additional drainage installed so that water flows across and under the corridor for future events.
Location	Countywide, with focus on the areas noted above
Source	Hurricane Matthew Resilient Redevelopment Plan, Flood Dynamics in the Bertie Water Crescent (NCLOW), Hurricane Matthew Resilient Redevelopment Plan - Bertie County, Discussion with CAT
Scoping Questions	
Hazard(s) Addressed by Project	Riverine flooding, storm surge, sea level rise, runoff
FEMA Community Lifelines	Safety and Security
Type of Solution	Local Plans and Policies
Project Estimated Timeline	9 months to 1 year
Responsible Entity	County Planning Department with a consultant
Potential Partners	Coordinate with Vic Thompson NRCS/Soil & Water, Town of Windsor
Existing Funding	None identified by CAT
Potential Funding Sources	Building Resilient Infrastructure and Communities (BRIC) State Allocation
Project Estimated Cost	Medium - $100,000–$200,000
Anticipated Benefit	High – Action would have a significant impact on risk reduction.
Priority Rating	High

7.3.5 Ditch and Waterway Maintenance Program

Project Description	Adopt a drainage and water management plan based on results of the Hydrologic Assessment that establishes a program of regular maintenance of ditches and waterways
Location	Countywide, with focus on locations identified via the Hydrologic Assessment
Source	Discussion with CAT, Public Meeting Input
Scoping Questions	
Hazard(s) Addressed by Project	Storm surge, runoff, riverine flooding
FEMA Community Lifelines	Safety and Security
Type of Solution	Non-regulatory Program
Project Estimated Timeline	Ongoing
Responsible Entity	NRCS
Potential Partners	NCDOT, County Planning Department, towns
Existing Funding	None identified by CAT
Potential Funding Sources	Building Resilient Infrastructure and Communities (BRIC) State Allocation, Streamflow Rehabilitation Assistance Program (StRAP) - includes debris removal:
Project Estimated Cost	High - $75,000–$100,000 annually (depending on local conditions and natural events)
Anticipated Benefit	High - Action would have a significant impact on risk reduction.
Priority Rating	High

7.3.6 Address Long Branch Drainage Issues **Completed 2022/23**

Project Description	Address recurring nuisance flooding in this African American community that is surrounded by swamp to the west and north. To the south is farmland which might be utilized to supplement water storage under high flood conditions.
Location	Around Long Branch Road near Colerain
Source	Discussion with CAT
Scoping Questions and Notes	Previous BRIC application may not have been viewed as favorably by FEMA because of the reference to lack of maintenance. FEMA generally does not fund projects that seek to address issues on sites that have not been maintained.
Hazard(s) Addressed by Project	Riverine flooding
FEMA Community Lifelines	Safety and Security
Type of Solution	Structure and Infrastructure
Project Estimated Timeline	
Responsible Entity	Town of Colerain and Bertie County
Potential Partners	NRCS Soil and Water Conservation District, nearby farm owners that may be able to benefit from rerouted drainage to help irrigate the farmland (e.g., via public/private partnership of some kind)
Existing Funding	Pending – The County and NRCS have submitted a StRAP application in the 2022 application cycle
Potential Funding Sources	Streamflow Rehabilitation Assistance Program (StRAP)
Project Estimated Cost	Medium - $198,500
Anticipated Benefit	High – Action would have a significant impact on risk reduction.
Priority Rating	High

Figure 11. Location of Long Branch drainage issues.

7.3.7 Sans Souci Ferry Upgrades

Project Description	Flooding prevents operation of the ferry. Update the roadway and ferry terminal to protect it from flooding and develop this site as a cultural/ecological tourism destination. The Sans Souci Ferry is a critical piece of transportation history in the lower Coastal Plain known as "North Carolina's Land of Water" where small ferries operated at most landings on every major water body since human occupation. Small ferries of many types were essential factors for subsistence and the economic development of NC. The Sans Souci ferry is one of the last two-car ferries in NC, is a crucial piece of NC history, and is a critical component for the ongoing development of a sustainable eco-tourism business in the "Bertie Water Crescent." Because of water level problems, the ferry cannot operate consistently, which reduces usage and makes the ferry seem less valuable to the operating company and to NCDOT. This situation makes the ferry operation at risk of closure. Upgrades to be made: Road improvements, connection at ferry landing (at high water levels, the ferry cannot connect with the road.) Tourism additions could be shade kiosks with picnic tables, a restroom. Kayakers can use the site currently.
Location	Sans Souci Road/Woodard Road/SR1500 where it crosses the lower Cashie River
Scoping Questions	
Hazard(s) Addressed by Project	Precipitation-based flooding, storm surge, sea level rise
FEMA Community Lifelines	Safety and Security; Transportation
Type of Solution	Structure and Infrastructure
Project Estimated Timeline	To be determined
Responsible Entity	NCDOT - NCDOT contracts with a local business to manage operations
Potential Partners	Bertie County, Town of Windsor, NRCS, Historic Society, NCLand of Water (Dr. Stanley Riggs)
Existing Funding	None identified by CAT
Potential Funding Sources	Scenic Byway (Sans Souci Ferry is on the Windsor/Edenton loop), NCDOT
Project Estimated Cost	To be determined
Anticipated Benefit	Medium – Action would have an impact on risk reduction.
Priority Rating	High

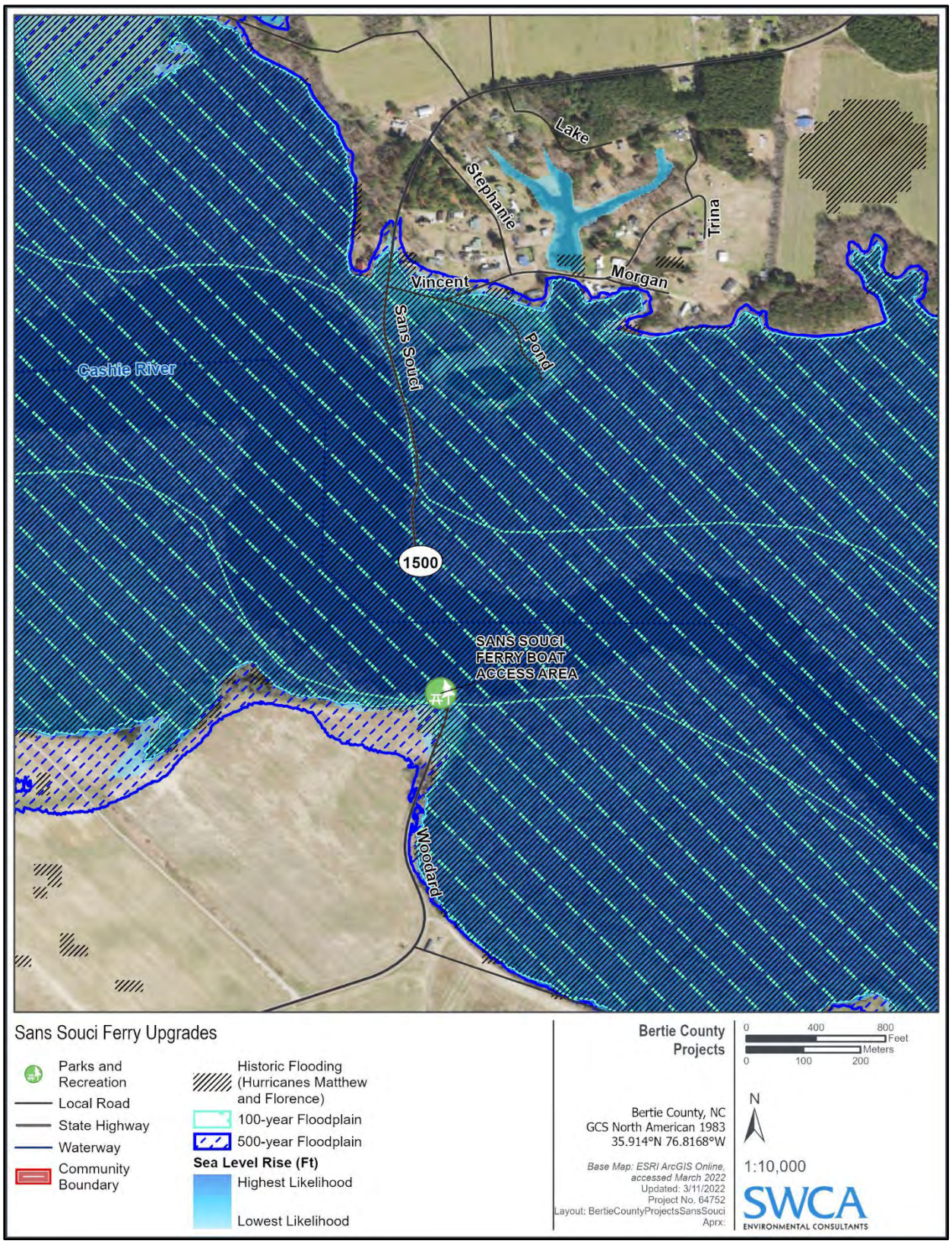

Figure 12. Location of Sans Souci Ferry upgrades.

7.3.8 Emergency Shelter Creation and Upgrades

Project Description	Upgrade and/or establish local shelters in each community so that residents do not have to travel as far or face flooding-related impediments to reach a suitable shelter. Might include: Retrofit the former school at NC 308 and School Road to meet Red Cross standards. Develop a generator resource and relay switches so that power and heat can be regularly supplied during an event.
Location	Countywide at existing shelters and creating at least one shelter location in each town
Source	Discussion with CAT
Scoping Questions	
Hazard(s) Addressed by Project	Precipitation-based flooding, sea level rise, storm surge
FEMA Community Lifelines	Safety and Security; Food, Water, Shelter
Type of Solution	Structure and infrastructure
Project Estimated Timeline	1-2 years
Responsible Entity	Bertie County Emergency Management/EMS
Potential Partners	
Existing Funding	None identified by CAT
Potential Funding Sources	Hazard Mitigation Grant Program (HMGP)
Project Estimated Cost	To be determined
Anticipated Benefit	High – Action would have a significant impact on risk reduction.
Priority Rating	High

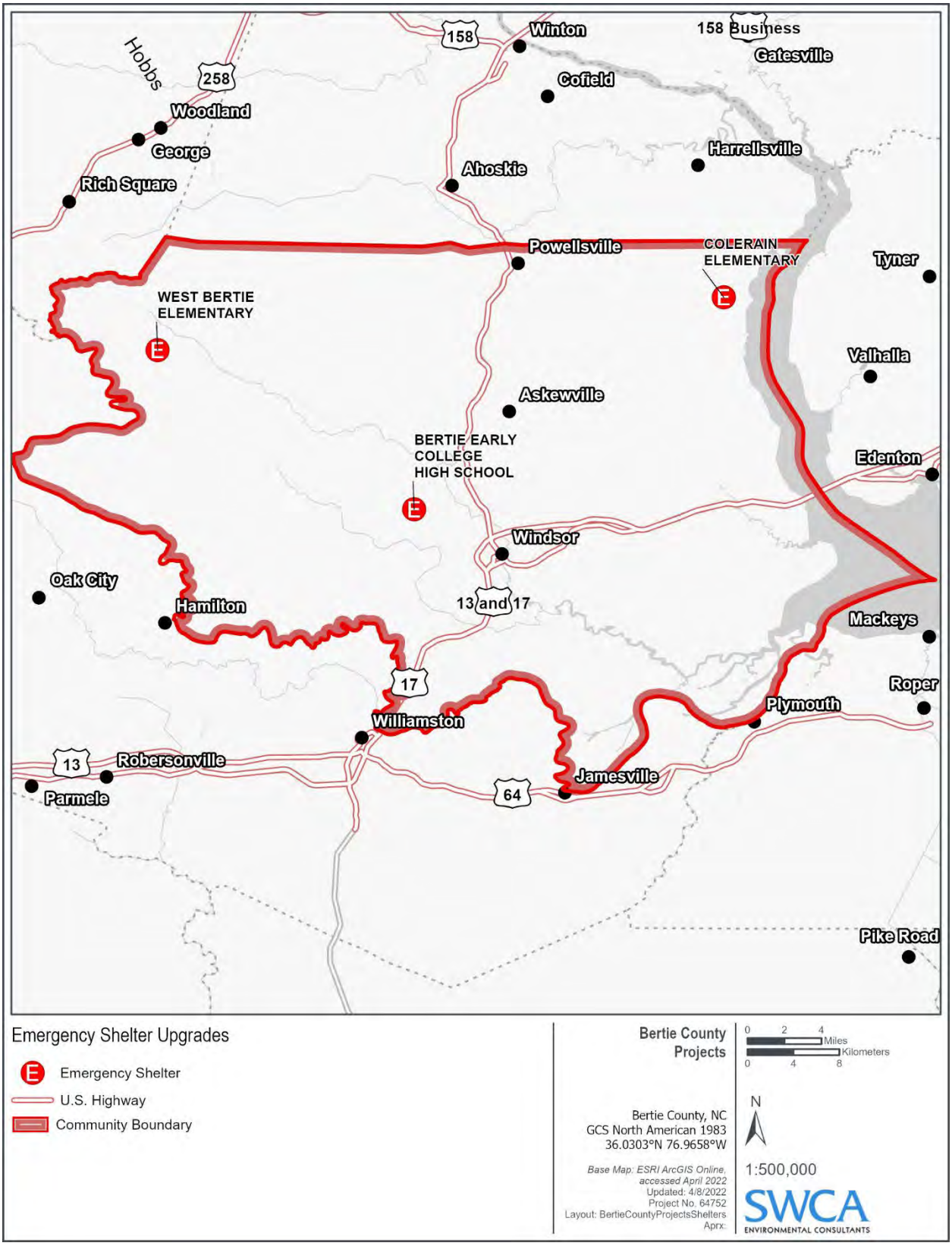

Figure 13. Location of current emergency shelters.

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APPENDIX A

Community Action Team Members

Table A-1. Community Action Team Members for Bertie County, North Carolina

Name	Title/Affiliation
Steve Biggs	Bertie County Economic Development Director
Allen Castelloe	Town Administrator, Town of Windsor
Mitch Cooper	Bertie County Emergency Services Director
Chris Cordon	Mayor, Town of Lewiston-Woodville
Robin Payne	Bertie County Consultant
Stanley Riggs	East Carolina University/NC Land of Water (NCLOW)
David Scarborough	Bertie County Assistant County Manager
Traci White	Bertie County Director Planning and Inspections
Copied	
Brian Boutin	The Nature Conservancy
Kay Brantly	Town Commissioner, Town of Askewville
Gloria Bryant	Mayor, Town of Askewville
Larry Drew	Mayor, Town of Aulander
Marie Garris	Clerk & Finance Officer, Town of Kelford
William (Bill) Harrell	Mayor, Town of Colerain
Gary Johnson	Mayor, Town of Roxobel
Baily Parker, Sr.	Mayor, Town of Kelford
James L. Peele	Mayor, Town of Powellsville
Juan Vaughan, II	Bertie County Manager
Windi White	Clerk, Town of Askewville
	Bertie County Commissioners

APPENDIX B

Community Action Team Meeting Summaries

Ctrl+Click to jump to the summary of a specific meeting:

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 1, Tuesday September 28, 2021, from 3:00 to 4:00 p.m.

Meeting Objectives

- Introduce the purpose, milestones, and schedule for the RCCP process
- Review and answer any questions about the role of the CAT members
- Review existing information available and gaps for consideration under RCCP, including:
    - Priority hazards for assessment
    - Initial discussion of assets to be mapped
- Confirm next steps following this meeting

Participants

Bertie County Staff
Steve Biggs, Economic Development
Robin Payne, Robin Payne Consulting
Tracy White, Planning & Inspections

Other Members
Allen Castelloe, Town of Windsor
James Peele, Town of Powellsville
Stanley Riggs, NC Land of Water

Facilitation and Support Staff
Kathryn Gardner, SWCA Environmental Consultants
Tom Hale, SWCA Environmental Consultants
Tancred Miller, NC Division of Coastal Management
Meg Perry, SWCA Environmental Consultants

Action Items

CAT Members

- Share any additional existing materials to review, hazards or assets to focus on, or recommended avenues for sharing information with the community beyond this group - by Monday, Oct. 11

SWCA

- Share meeting recording and summary with CAT members – by Monday, Oct. 4
- Share examples of vision statements for CAT consideration – by Monday, Oct. 4
- Invite CAT members to access the SharePoint folder – by Monday, Oct. 4
- Follow up with Tracy White about status of new flood maps – by Friday, Oct. 8
- Confirm the location of the following – by Friday, Oct. 8
    - Wastewater treatment facility (including the one at Scotch Hall Preserve)
    - New Public Beach Area
    - Purdue Plant and other major employers
    - Acquisition sites (including what level of information can be shared with the public)

Summary of Key Points from Presentation and Discussion

Program Overview

Meg Perry, SWCA Environmental Consultants, introduced the four-phase Resilient Coastal Communities Program (RCCP). The four phases of the program are outlined below and explained in further detail in the Program Handbook:

- *Phase 1: Risk and Vulnerability Assessment* (approximately September – December 2021) Evaluating local assets, hazards, and vulnerabilities. This phase will include one public open-house event.
- *Phase 2: Planning, Project Identification, & Prioritization* (approximately December – March 2022) Identifying priority actions (such as infrastructure repair or creation of living shorelines) to reduce the risks identified in Phase 1. This phase will include a second public open-house event.
- *Phase 3: Engineering and Design* (approximately February – September, 2022)
- *Phase 4: Project Implementation*

Tancred Miller, Division of Coastal Management (DCM), explained that DCM will share information about how to apply for funding from the state for Phase 3 in early 2022. DCM expects to provide approximately $40,000 – 50,000 to each of the 26 communities currently participating in the program. These funds will support Phase 3 design for one priority project. Phase 3 is expected to run through late summer/early fall of 2022. After Phase 3, communities will have the opportunity to apply via a competitive proposal process for Phase 4 implementation funds.

Ms. Perry explained that the Division of Coastal Management has contracted with SWCA to provide technical support to four communities in completing Phases 1 and 2 of the Program between now and March 2022. The four communities SWCA is supporting are Bertie County, Hertford County, Town of Hertford, and Town of Windsor.

Community Action Team Role

Ms. Perry explained the role of the CAT is to provide guidance and input for Phases 1 and 2 to ensure the Resilience Strategy developed by SWCA reflects the community's vision and goals and accurately reflets the issues and needs in the community.

Meetings are scheduled for November and December to discuss the Risk and Vulnerability Assessment process and results. Additional meetings will be scheduled in January – March 2022 focused on development of the prioritized project portfolio and review of the final Resilience Strategy document.

Community Resilience Goals

Ms. Perry shared the following general goals for this effort:

1. Prepare the County to implement projects that reduce risks and speed recovery from coastal hazards by evaluating local risks and vulnerabilities and identifying and scoping priority coastal resilience projects.
2. Qualify the County for project funding through the RCCP and other funding programs

She asked CAT members to consider what specific vision and goals for resilience this program can help Bertie County pursue. This will be discussed further in subsequent meetings.

Review of Existing Materials

Ms. Perry explained that the SWCA team has begun reviewing the existing materials related to resilience planning that the County has previously created or approved. She asked CAT members to share any other

existing information that might be relevant to SWCA's analysis. The following is a list of studies and plans SWCA is currently reviewing:

- NE Regional Hazard Mitigation Plan (2020)
- NCLOW Flood Dynamics Report (2019)
- County Hurricane Matthew Resilient Redevelopment Plan (2017)
- CAMA Land Use Plan (2016)
- County Vulnerability Assessment (2010)
- Capital Improvement Plan (2021 – 2025)
- Comprehensive Recreation Plan (2018 – 2028)

Discussion of Hazards

In addition to general hazard types that SWCA plans to assess, which include flooding, rainfall/runoff, storm surge, dam releases, erosion, and sea level rise, the group identified some specific hazard concerns, as follows:

- Rainfall/runoff flooding due to incorrectly sized culverts
- Flooding to communities due to beaver dams

Discussion of Assets

The group identified a preliminary list of assets that may not be captured in existing plans and reports, including:

- Regional landfill
- Wastewater treatment facilities
- Major employers like Perdue

Next Steps

The hazards and assets discussed during this call will inform work by SWCA to map the County's coastal hazards and community assets, building on information in the existing plans and reports the County has already developed or approved. The next meeting of the CAT is scheduled for **Monday, November 1 from 2:00 – 3:00 p.m.**

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 2, Monday November 1, 2021, from 2:00 to 3:00 p.m.

Meeting Objectives

- Review Vision Statement
- Review draft map of information available and gaps for consideration under RCCP, including:
  - Priority hazards for assessment
  - Assets to be mapped
- Confirm next steps following this meeting

Participants

CAT Members
Steve Biggs, Economic Development
Brian Boutin, TNC
Chris Cordon, Mayor of Lewiston-Woodville
Robin Payne, Robin Payne Consulting
Marie Garris - Town of Kelford
Stanley Riggs, NC Land of Water
Tracy White, Planning & Inspections

Facilitation and Support Staff
Kathryn Gardner, SWCA Environmental Consultants
Tancred Miller, NC Division of Coastal Management
Meg Perry, SWCA Environmental Consultants
Mackenzie Todd, NC Division of Coastal Management

Action Items

CAT Members

- Review draft vision statement and provide any suggested edits to Meg Perry (meg.perry@swca.com) by Friday, Nov. 19
- Review asset list and send suggested additions to Meg Perry (meg.perry@swca.com) by Tuesday Nov. 30

SWCA

- Share draft asset list and link to interactive draft asset and hazard map for CAT members to review by Friday Nov. 12
- Confirm timing and location for 1st Public Input Meeting by Friday Nov. 19

Summary of Key Points from Presentation and Discussion

RCCP Process

Ms. Perry reminded the group about the four phases of the RCCP process. The CAT and SWCA are currently focused on Phase 1 Risk and Vulnerability Assessment (see Figure 1 below).

Figure 14. Phases of the Resilient Coastal Communities Program.

Elements of Phase 1 In Progress

The Phase 1 Vulnerability Assessment will look at all the community asset locations to determine: 1) their Exposure – what hazards might occur at this location, 2) Sensitivity – how damaging those hazards would be to the asset, and 3) Adaptive Capacity – how much opportunity is there for this asset to change or adjust to reduce risk from coastal hazards. These factors will be summarized in a single number (Vulnerability Index) for each asset that indicates how vulnerable it is to hazards.

Phase 1 also includes a Risk Assessment that will estimate the cumulative economic risk of hazard impacts in the community.

The current work to collect and map asset and hazard information will ultimately feed into these two assessments.

Vision Statement

Each community needs a Vision Statement to help guide decision making and prioritization. It is also useful to have a Vision Statement prepared when applying for funding. Ms. Perry shared the following elements of a vision statement to help guide the CAT in developing theirs (Figure 2).

Figure B.15. Elements of a resilience vision statement.

During the meeting, the group reviewed a draft vision statement developed based on existing language in the recent NC Land of Water (NCLOW) Report. The group made some adjustments to the draft language to generate the following preliminary vision statement:

> **Communities within Bertie County seek to improve the local quality of life through sustainable economic development that enhances and protects the environment and culture of the region. Natural and cultural resource-based science, eco-tourism, and environmental education help to diversify the local economy while minimizing the impacts of hazards. We employ an integrated approach to coastal resilience that addresses both upstream and downstream hydrologic dynamics, the unique physical and environmental settings of inter-connected water bodies, and the ongoing changes in climate and sea level rise.**

CAT members should send any suggested adjustments to this vision statement language to Ms. Perry (meg.perry@swca.com).

Draft Hazard and Asset Map Review

The group reviewed a preliminary version of the assets and hazards map which included assets and hazards from the following sources:

Asset Data Sources	**Hazards Identified**
2016 & 2020 Regional Hazard Mitigation Plans	100 & 500 year flood plain
USGS Data	National Hurricane Center high tide inundation storm surge (by storm category)
National Register of Historic Places	Historical Hurricane Florence Data
Sites Identified During 1st CAT Meeting	

The group identified additional hazard and asset types it would like to see included in the final version, including:

Assets Needed	**Hazards Needed**
Natural & Cultural Features	Historical Hurricane Matthew Data
Utilities	Sea Level Rise Projections (at least out to 30 year)
Economic Hubs	Localized drainage and inland flooding data
Transportation (like Sans Souci Ferry)	NC DOT Road flooding data based on rainfall not storm surge

Next Steps

The next CAT Meeting will focus on review of the draft Risk and Vulnerability Assessment and initial discussion of the resilience projects. The first of two public open house meetings is tentatively scheduled for mid-December. The next meeting of the CAT is scheduled for **Wednesday, December 8 from 3:00 – 4:00 p.m.**

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 3, Wednesday December 8, 2021, from 3:00 to 4:00 p.m.

Meeting Objectives

- Provide Risk Assessment Status Update
- Plan for Public Meeting(s) in January
    - Review public outreach materials in development
    - Confirm meeting format, timing, and next steps
- Confirm next steps
    - Schedule for 2022 CAT Meetings

Participants

CAT Members
Allen Castelloe, Town of Windsor
Robin Payne, Robin Payne Consulting
Stanley Riggs, NC Land of Water
Traci White, Bertie County

Facilitation and Support Staff
Kathryn Gardner, SWCA Environmental Consultants
Meg Perry, SWCA Environmental Consultants
Mackenzie Todd, NC Division of Coastal Management

Action Items

CAT Members

- Review draft asset list and provide any suggested edits to Meg Perry (meg.perry@swca.com) by Monday, Dec. 13

SWCA

- Update maps in preparation for public open house by Monday, Jan. 3
- Finalize materials for public open house advertising by Monday, Dec. 20

Summary of Key Points from Presentation and Discussion

Review of Hazard Maps
Three maps were provided for review by the CAT:

1) Flood Plain Map – shows the 100 and 500 year flood plain
2) Historical Flood Map – shows historical data of area flooded during Hurricanes Matthew and Florence, data was collected via satellite imagery
3) Sea Level Rise Map – shows areas at risk of sea level rise based on 'bathtub' modeling. Areas lower in the landscape are more susceptible to sea level rise first and areas higher in the landscape would be impacted at more severe levels of sea level rise. This is not based on a timeline prediction because there are many factors that may influence how quickly sea level rise occurs.

There was discussion among the group about additional erosion hazards (especially on the western shore of the Chowan River) and how to accurately depict that on a hazard map. Erosion tends to happen in sporadic intervals tied to storm events.

Asset Discussion

Assets noted as missing that need to be added:

- Tall Glass of Water
- Salmon Creek Natural Area
- Hoggard's Millpond (newly purchased 350 acre property)
- Colerain Natural Heritage Area (newly purchase 1,300 acre property)
- All boat access points including at Williamston
- Roanoke River Paddle Trail (camping platforms, boat ramps)
- Hive House
- Vitality Center

CAT members should respond to Meg (meg.perry@swca.com) no later than Monday, December 13 to identify any other missing assets. Examples include:

- Community landmarks and gathering places
- Locations important for safety during a storm
- Assets important for recovery and rebuilding after a storm

Public Open House

The first of two open house meetings is tentatively planned for the week of **January 24th at the new County Library in Windsor**. Meg will coordinate after the meeting with Traci and Robin to finalize the meeting time and space. CAT members are asked to attend if available to help answer questions from attendees. Mackenzie offered DCM to help with refreshments.

Dr. Riggs noted he has topographic maps of the county that could be used for the public meetings. Meg will reach out Dr. Riggs and County staff to find copies of these maps.

Next Steps

The next CAT Meeting will focus preparation for the first public open house and is scheduled for **Wednesday, January 5 from 2:00 – 3:00 p.m.**

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 4, Wednesday January 5, 2022, from 2:00 to 3:00 p.m.

Meeting Objectives

- Prepare for Open House Meeting
- Hear an update and share input on the Vulnerability and Risk Assessment

Participants

CAT Members
Steve Biggs, Bertie Co Economic Dev
Mayor Corden, Lewiston
Robin Payne, Robin Payne Consulting
Traci White, Bertie County

Facilitation and Support Staff
Kathryn Gardner, SWCA Environmental Consultants
Meg Perry, SWCA Environmental Consultants
Mackenzie Todd, Division of Coastal Management

Action Items

CAT Members

- Help advertise the public meeting on 1/27

SWCA

- Prepare print materials for public meeting by 1/27
- Create master list of existing project ideas and add new project ideas - Prior to next CAT meeting

Summary of Key Points from Presentation and Discussion

Public Meeting Preparation
The group reviewed plans and publicity materials for the upcoming Open House Meeting. Meg Perry, SWCA, explained that SWCA has arranged for newspaper and radio announcements. CAT members were encouraged to circulate the announcement using the flier and social media post prepared by SWCA.

The website for program information and survey collection is now live and accessible to the public: https://nc-rccp-community-portal-swcagis.hub.arcgis.com/

Information collected during this meeting will inform the vulnerability assessment and help identify potential projects to include on the project list. A brief report on key themes from the public meeting will be circulated to the CAT following the meeting.

Risk and Vulnerability Assessment
Meg explained the next step in the process will be to evaluate each asset based on 3 criteria:

1) Exposure – How often or severely is an asset exposed to flooding hazards
2) Sensitivity – How much would this location be impacted by flooding (e.g., temporarily impacted and easy to repair, significant repairs needed and longer duration of inoperability, or likely to be completely destroyed by a flood)

3) Adaptive Capacity – What measures are already in place to protect or reduce flooding impacts at this location?

This information will be used to develop a "Vulnerability Index" – a single number that indicates how vulnerable that location is to coastal hazards. This will enable the CAT to compare the vulnerability of different sites and can help identify and prioritize potential resilience projects.

Next Steps

The next CAT Meeting will focus on review of the vulnerability assessment results and preliminary project list on **Wednesday, February 2 from 2:00 – 3:00 p.m.**

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 5, Monday February 7, 2022, from 11:00 a.m. to 12:00 p.m.

Meeting Objectives

- Review Preliminary Project List and Discuss Resilience Goals
- Review Preliminary Vulnerability Scores
- Prepare for February Open House

Participants

CAT Members
Mayor Chris Corden, Lewiston
Robin Payne, Robin Payne Consulting
David Scarborough, Bertie County
Stan Riggs, NC Land of Water

Facilitation and Support Staff
Kathryn Gardner, SWCA EnvironmentalConsultants
Meg Perry, SWCA Environmental Consultants
Mackenzie Todd, Division of Coastal Management

Action Items

CAT Members

- Help advertise the public meeting on 2/23 by making direct invitations

SWCA

- Prepare print materials for public meeting by 2/23

Summary of Key Points from Presentation and Discussion

Preliminary Project List

The group reviewed slides describing different project types, and a preliminary list of potential projects identified from previous studies and public meetings to be discussed in more detail at the public meeting on Wednesday February 23.

Resilience Goals

Meg explained that the final report will need to describe the goals of the County regarding resilience. The group collaborated on a list of draft goals to be refined before finishing the final report.

Draft Goals

- Update CAMA land and include resilience recommendations
- Address recurring flooding issues in roadways
- Address recurring agricultural drainage and town flooding issues
- Protect and restore wetlands and headwaters – including via local/county ordinances
- Develop a plan for managing Roanoke River discharge in cooperation with upstream dam operators

Vulnerability Scores

Meg reviewed the preliminary results of the Vulnerability Analysis and received feedback from the group to help refine this analysis to accurately reflect the exposure and sensitivity of Bertie County asset locations to the coastal hazards (riverine and rainfall induced flooding, storm surge, and sea level rise). Final results of this assessment will be included in the final report in March and used to identify any additional high-priority projects.

Public Meeting Preparation

The second of two open house meetings is scheduled for Wednesday February 23 from 3-6pm at the Bertie County Library. The group reviewed plans and publicity materials for the upcoming Open House Meeting. Meg explained that SWCA has arranged for newspaper announcements. CAT members were encouraged to personally invite members of the community to attend and provided with copies of a flier and social media posts to use.

Next Steps

The next CAT Meeting will focus on confirming the CAT's high-priority project list and is scheduled for **Wednesday, March 2 from 2:00 – 3:00 p.m.**

MEETING SUMMARY
BERTIE COUNTY CAT

Meeting No. 6, Wednesday March 2, 2022, from 2:00 to 3:00 p.m.

Meeting Objectives

- Confirm high priority projects
- Confirm plans for review of draft report

Participants

CAT Members
Steve Biggs, Bertie County Economic Development
Robin Payne, Robin Payne Consulting
Traci White, Bertie County Planning

Facilitation and Support Staff
Kathryn Gardner, SWCA EnvironmentalConsultants
Meg Perry, SWCA Environmental Consultants
Mackenzie Todd, Division of Coastal Management

Action Items

SWCA

- Draft final Resilience Strategy report and send to CAT for review by 3/14

CAT Members

- Provide feedback on draft report by 4/1

Summary of Key Points from Presentation and Discussion

Priority Project List

The group reviewed and discussed the project list in light of feedback and discussions at the public meeting, previously identified criteria and goals, and the results of the vulnerability assessment. The CAT member agreed on five high priority projects to be described in more detail in the final Resilience Strategy report:

- Upgrades to County Emergency Shelters to Meet Red Cross Standards
- County Map Updates
- Feasibility Study of Frequently Flooded Major Roadways
- Updates to and Creation of Zoning and Development Ordinances that Address Flood Risks
- Hydrologic Assessment to Determine Water Management and Drainage Maintenance Priorities

Next Steps

Meg Perry with SWCA will provide a draft report to the CAT members by **March 14th** for review. CAT members are requested to review the draft report and provide feedback by **April 1st**. The final report will be delivered by mid-April.

APPENDIX C

Project Website Content

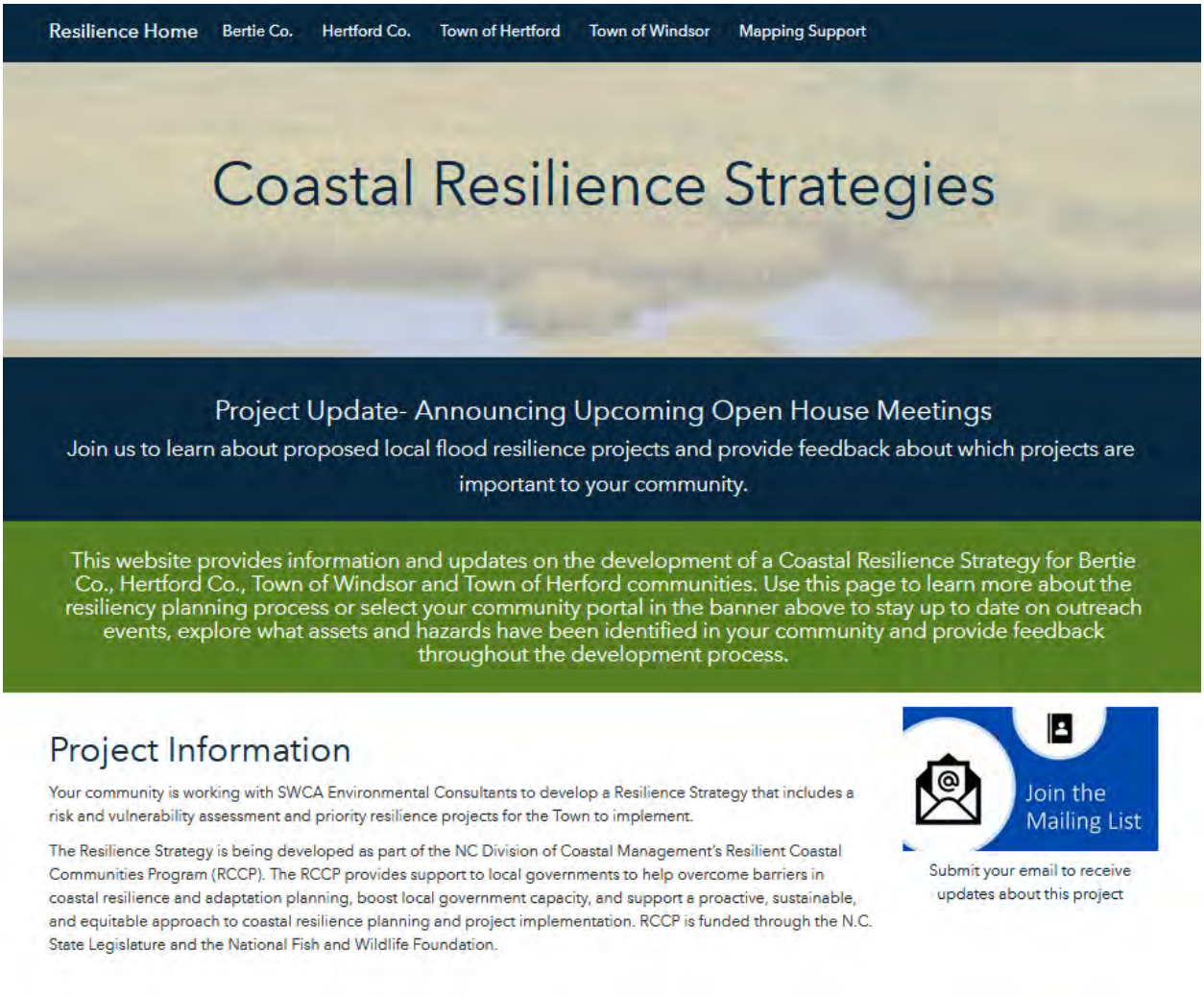


Figure C-1. Example screenshot of the project website, 1 of 4.

The four phases of the program include:

Phase 1: Community Engagement and Risk & Vulnerability Assessment- Current Phase

Phase 2: Planning, Project Selection and Prioritization

Phase 3: Engineering and Design

Phase 4: Implementation

By completing the Resilience Strategy (Phases 1 and 2), the town becomes eligible for additional state funding to support design and engineering for a priority resilience project and will strengthen grant proposals to other funders.

North Carolina
RESILIENT COASTAL COMMUNITIES PROGRAM

Learn more about the N.C. Resilient Coastal Communities Program

What does the Resilience Strategy do?

A Resilience Strategy-

- Identifies areas at risk from coastal hazards such as flooding, storm surge, and sea level rise
- Integrates hazard data and local knowledge to identify where community assets may be at risk
- Identifies strategies to reduce risks from coastal hazards
- Identifies priority projects for resilience funding

Timeline for Completion

The target completion date for the Resilience Strategy is March 2022.

Be Prepared!

Check out the resources below to prepare your household for future floods and storms:

- Ready NC Hurricane Preparedness Guide (also available in Spanish)
- Preventing and Cleaning Up Mold/Moisture
- What to do with Drinking Water Wells and Septic Systems in Flooding Conditions
- Post-Disaster Resources from Legal Aid NC

Planning Process and Community Engagement

To create the Resilience Strategy, your community and its supporting contractor, SWCA Environmental Consultants will:

- Create a Community Action Team (CAT) to help guide the planning process
- Define a resilience vision and goals
- Map assets and coastal hazards
- Assess vulnerability and economic risk
- Identify strategies to reduce vulnerability to coastal hazards
- Develop a priority list of resilience projects for funding and implementation

Community members will have the opportunity to provide input in three ways:

- Online survey – January 2022
- Public Open House meeting focused on community assets and hazard areas – January 2022
- Public Open House meeting focused on resilience project priorities – February 2022

Contact Us

Additional Information on community contacts can be found on your community portal.

Project Contact- Meg Perry- Project Manager, SWCA Environmental Consultants

- Phone: 984.275.4317
- Email: meg.perry@swca.com

Technical Support Contact

- Email Project Team

Figure C-2. Example screenshot of the project website, 2 of 4.

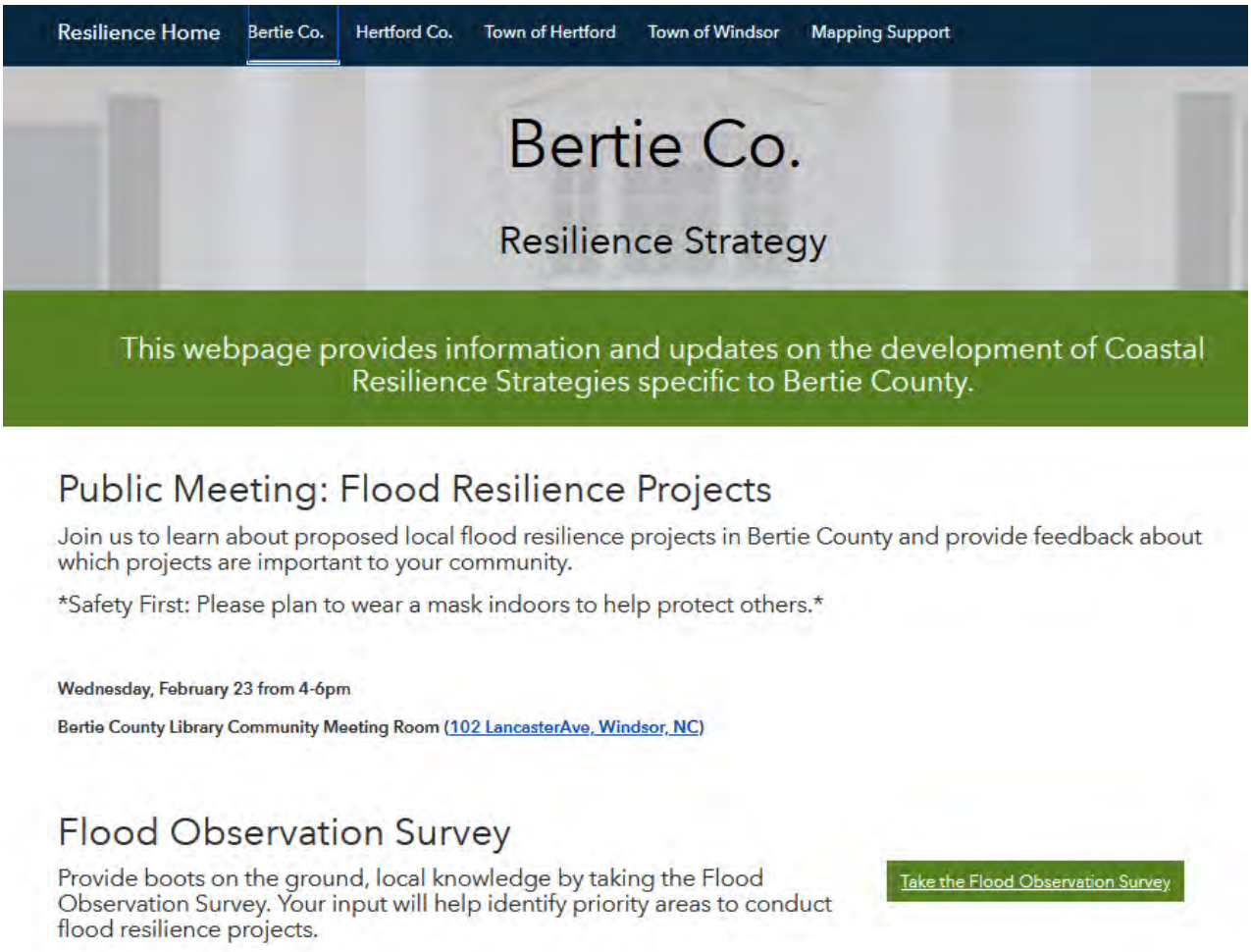


Figure C-3. Example screenshot of the project website, 3 of 4.

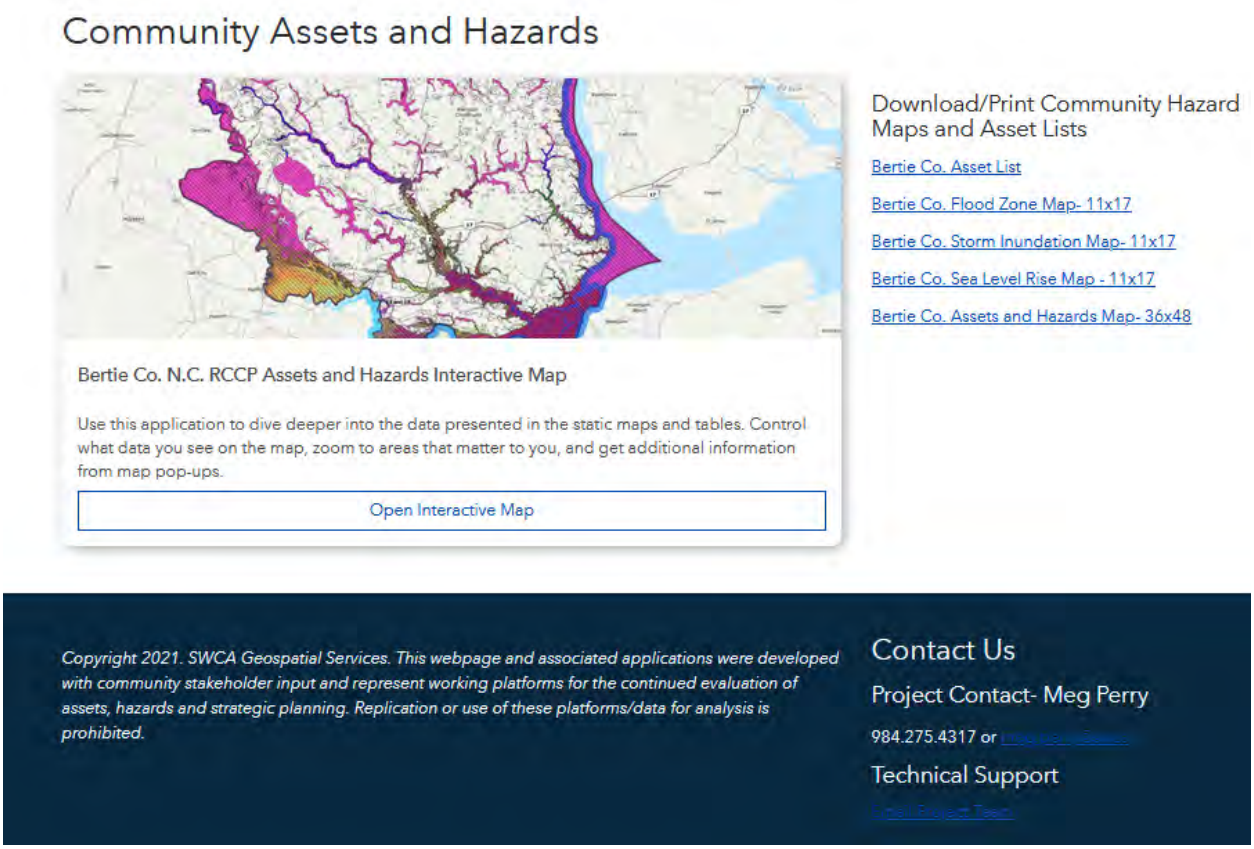


Figure C-4. Example screenshot of the project website, 4 of 4.

APPENDIX D

Public Meeting Attendees

Table D-1. Attendance at the Two Public Meetings Held in January and February 2022 for Bertie County, North Carolina

First Name	Last Name	Affiliation	Meeting 1	Meeting 2
Attendees				
Langston	Alexander	Nicholas School of the Environment, Duke University	X	
Billy	Barrow	NC Cooperative Extension – Bertie County		X
Steve	Biggs	CAT/Bertie County Economic Development	X	
Kenneth	Cain	Town Council Member, Town of Kelford	X	
Fix	Cain	Alliance of Native Seedkeepers/Tuscarora Nation	X	
Allen	Castelloe	CAT/Town of Windsor		X
Crystal	Freeman	Bertie County Emergency Management		X
Marie	Garris	Clerk, Town of Kelford	X	
Robin	Payne	CAT/Bertie County Consultant	X	X
Beth	Roach	Alliance of Native Seedkeepers	X	
Randy	Robtoy	Mayor, Town of Kelford	X	
David	Scarborough	Bertie County Assistant Manager		X
Robert	Spivey	Resident		X
Juan	Vaughan	Bertie County Manager		X
Randy	Walston	Town of Windsor		X
Traci	White	CAT/Bertie County Planning	X	X
Bernard	White	Resident		X
Sonya	White	Resident		X
		Total Attendees	**9**	**11**
Support Staff				
Kathryn	Gardner	SWCA Environmental Consultants		X
Tancred	Miller	NC Division of Coastal Management	X	
Meg	Perry	SWCA Environmental Consultants	X	X
Mackenzie	Todd	NC Division of Coastal Management		X

APPENDIX E

Data Used in Vulnerability and Risk Assessment

Table E-1. Data Used in Assessment of Asset Vulnerability and Risk for Bertie County, North Carolina

Field/Variable	Data Used to Define Field/Variable	Data Summary	Use in Risk and Vulnerability Assessment	Additional Information on Source Data
Flood Plain Exposure	North Carolina Preliminary Flood Zones	Areas representing the area within the flood mapping boundaries defined by the engineering models for the 100-year (1% annual chance), 500-year (0.2% annual chance) and floodway (river channel and adjacent land areas for flood discharge).	Floodplain type was categorized and used to assess current climate precipitation induced flood risk under varying conditions across the landscape.	Data was produced by North Carolina Floodplain Mapping Program in 2020 at 6-m spatial resolution
Flood Plain Exposure	High Resolution Elevation (DEM 20')	Elevation data was created using LiDAR collected by NC Floodplain Mapping Program	Elevation data was processed to find low-lying areas outside the current 500-year flood plains that have the potential for precipitation-induced flood risk under future climate conditions across the landscape.	Data was produced by North Carolina Department of Transportation in conjunction with the North Carolina Floodplain Mapping Program in 2020 at 6-m spatial resolution
Reported Event Inundation Factor	Hurricane Matthew Inundated Areas	Areas that experienced flooding during Hurricane Matthew, based on aerial photographs taken October 8 to 16, 2016.	Inundated areas were used assess extreme precipitation event flood risk across the landscape.	Data was produced by the Center for Biodiversity Outcomes, Arizona State University in 2020 at 5-m spatial resolution
Reported Event Inundation Factor	Hurricane Florence Inundated Areas	Areas that experienced flooding during Hurricane Florence, based on aerial photographs taken September 18 to 22, 2018.	Inundated areas were used assess extreme precipitation event flood risk across the landscape.	Data was produced by the Center for Biodiversity Outcomes, Arizona State University in 2020 at 5-m spatial resolution
Reported Event Inundation Factor	Community Flood Reporting Point	Areas outside of the 100- and 500-year floodplains that were identified by the public as having frequent or severe flooding during large precipitation events.	Point locations were converted to inundated areas based on the underlying elevation and topography. These inundated areas were used to assess extreme precipitation flood risk across the landscape.	Data was collected via analog maps at community stakeholder engagement meetings and online flood reporting survey
Sea Level Rise Exposure	Sea Level Rise (SLR) Inundation Extent 1-foot to 10-foot Scenarios	Data represents where water would be present along coast lines and intertidal waterways (under normal, non-flood conditions) at increasing sea levels. This is based on a "modified bathtub model," which identified the areas of land that would be covered with water if you increased the water height by a specific amount. It does not address when or how quickly the sea level might increase.	Simulated scenario data was combined with Sea Level Rise (Low) Inundation data and categorized into severity values 1 through 5 used to assess sea-level rise risk under varying conditions across the landscape.	Data was produced by the National Oceanic and Atmospheric Administration, Office for Coastal Management in 2017 at 10-m spatial resolution

Field/Variable	Data Used to Define Field/Variable	Data Summary	Use in Risk and Vulnerability Assessment	Additional Information on Source Data
Sea Level Rise Exposure	Sea Level Rise (Low) Inundation Extent 1-to 10-foot Scenarios	Data represents where water would be present in inland areas (under normal, non-flood conditions) at increasing sea levels. This is based on a "modified bathtub model," which identified the areas of land that would be covered with water if you increased the water height by a specific amount. It does not address when or how quickly the sea level might increase.	Simulated scenario data was combined with Sea Level Rise (SLR) Inundation data and categorized into severity values 1 through 5 used to assess sea-level rise risk under varying conditions across the landscape.	Data was produced by the National Oceanic and Atmospheric Administration, Office for Coastal Management in 2017 at 10-m spatial resolution
Sea Level Rise Exposure	Duck Pier Local Sea Level Rise Scenario Statistics	Data lists northern North Carolina regional projected sea level rise in feet sea for five IPCC emissions scenarios.	Data was used to determine the likelihood of sea level rise inundation per emission scenario	Data was produced by the National Oceanic and Atmospheric Administration, National Weather Service in coordination with the IPCC in 2017
Storm Surge Exposure	Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Category 1–5 High Tide Simulations	Data depicts the simulated storm surges from tropical cyclones, developed using tens of thousands of simulations of climatology-based hypothetical tropical cyclones.	Modeled data from Category 1 through 5 storms were combined and inundation depth was categorized into severity values 1 through 5 used to assess storm surge risk under varying conditions across the landscape.	Data was produced by the National Oceanic and Atmospheric Administration, National Weather Service, National Hurricane Center in 2018 at 30-m spatial resolution
Storm Surge Exposure	Hurricane Landfall Statistics	Data lists all recorded hurricanes by category that have made landfall in the state of North Carolina since 1851.	Data was used to determine likelihood of storm surge exposure event by hurricane category.	Data was produced by the National Oceanic and Atmospheric Administration, National Weather Service
Social Vulnerability (geographic)	Social Vulnerability Index (SVI) 2018	Data represents a combination of socioeconomic factors that are used to identify and map the communities that will most likely need support before, during, and after a hazardous event.	Total SVI rankings were categorized using the flag approach and used to assess the most current socially vulnerable populations in the community.	Data was produced by the CDC's Division of Toxicology and Human Health Sciences, Geospatial Research, Analysis & Services Program (GRASP) in 2020 at the tract level
Social Vulnerability (geographic)	Social Vulnerability Index (SoVI) 2000	Data represents a combination of socioeconomic factors that are used to identify and map the communities that will most likely need support before, during, and after a hazardous event.	Total SoVI rankings were categorized using the flag approach and used to assess the socially vulnerable populations in the community at a localized scale.	Data was produced by the Hazards and Vulnerability Research Institute, University of South Carolina in 2011 at the block group level

Field/Variable	Data Used to Define Field/Variable	Data Summary	Use in Risk and Vulnerability Assessment	Additional Information on Source Data
Estimated Cost	Assessor Parcel Boundaries	Data represents county-level parcels with standardized attributes such as ownership, addresses, and assessed monetary values.	Monetary value fields such as Parcel Value, Land Value, and Improvement Value were used to calculate total estimated cost values for assets considered at risk.	Data was produced by the North Carolina Geographic Information Coordinating Council in coordination with local government agencies and last updated 2022

APPENDIX F

Detail Maps of Assets and Hazards

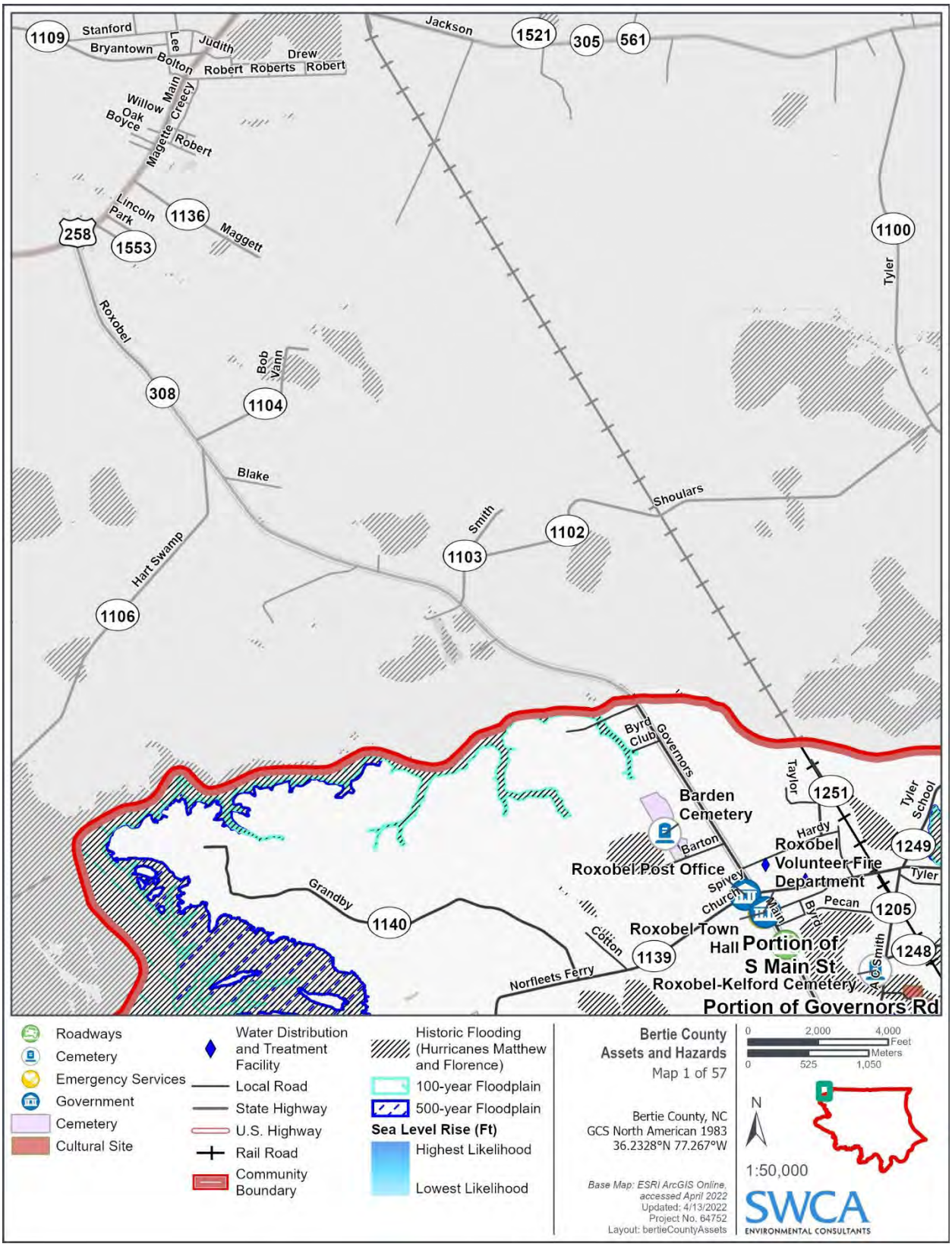


Figure F-1. Detail map of assets and hazards, keys to Figure 7.

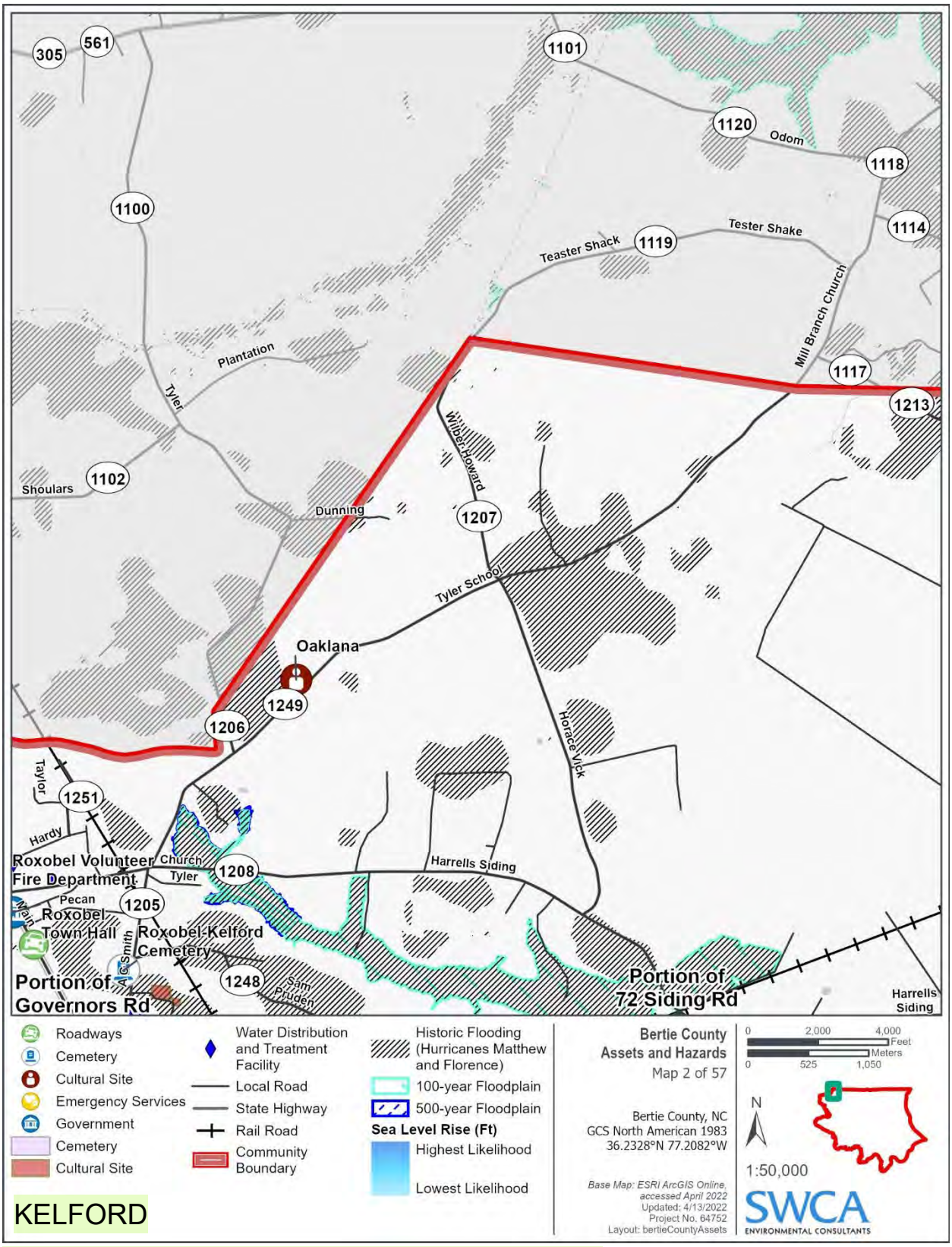


Figure F-2. Detail map of assets and hazards, keys to Figure 7.

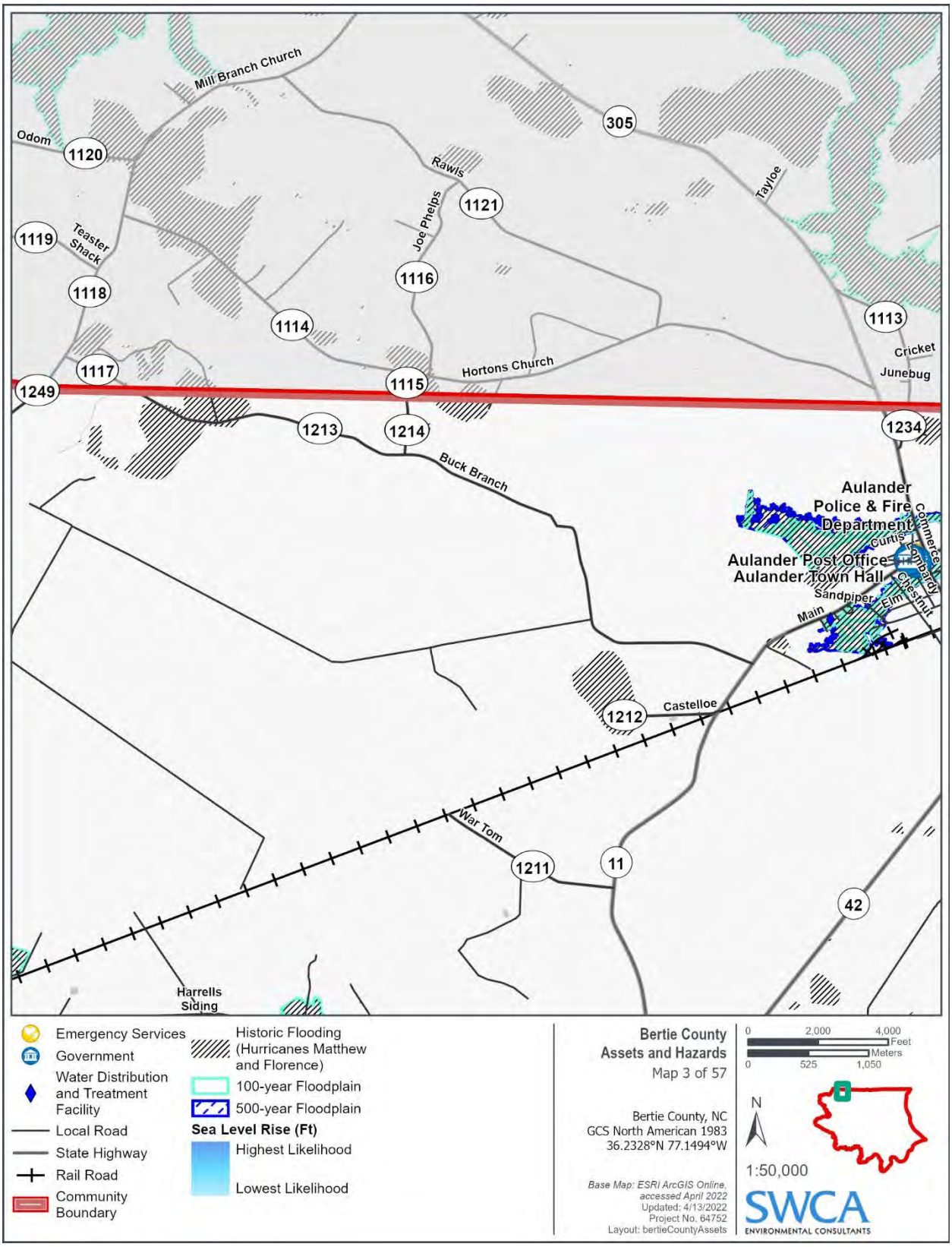


Figure F-3. Detail map of assets and hazards, keys to Figure 7.

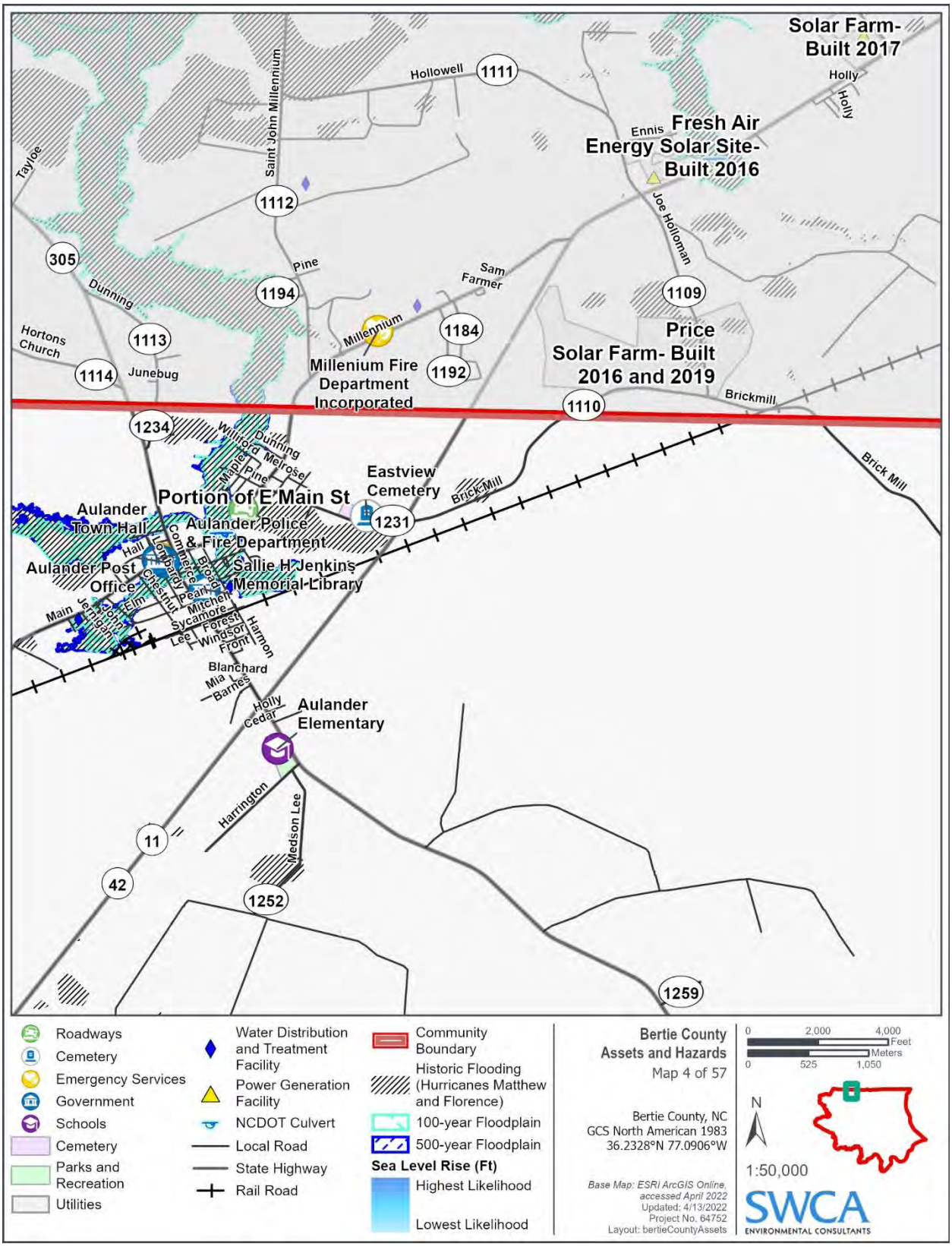


Figure F-4. Detail map of assets and hazards, keys to Figure 7.

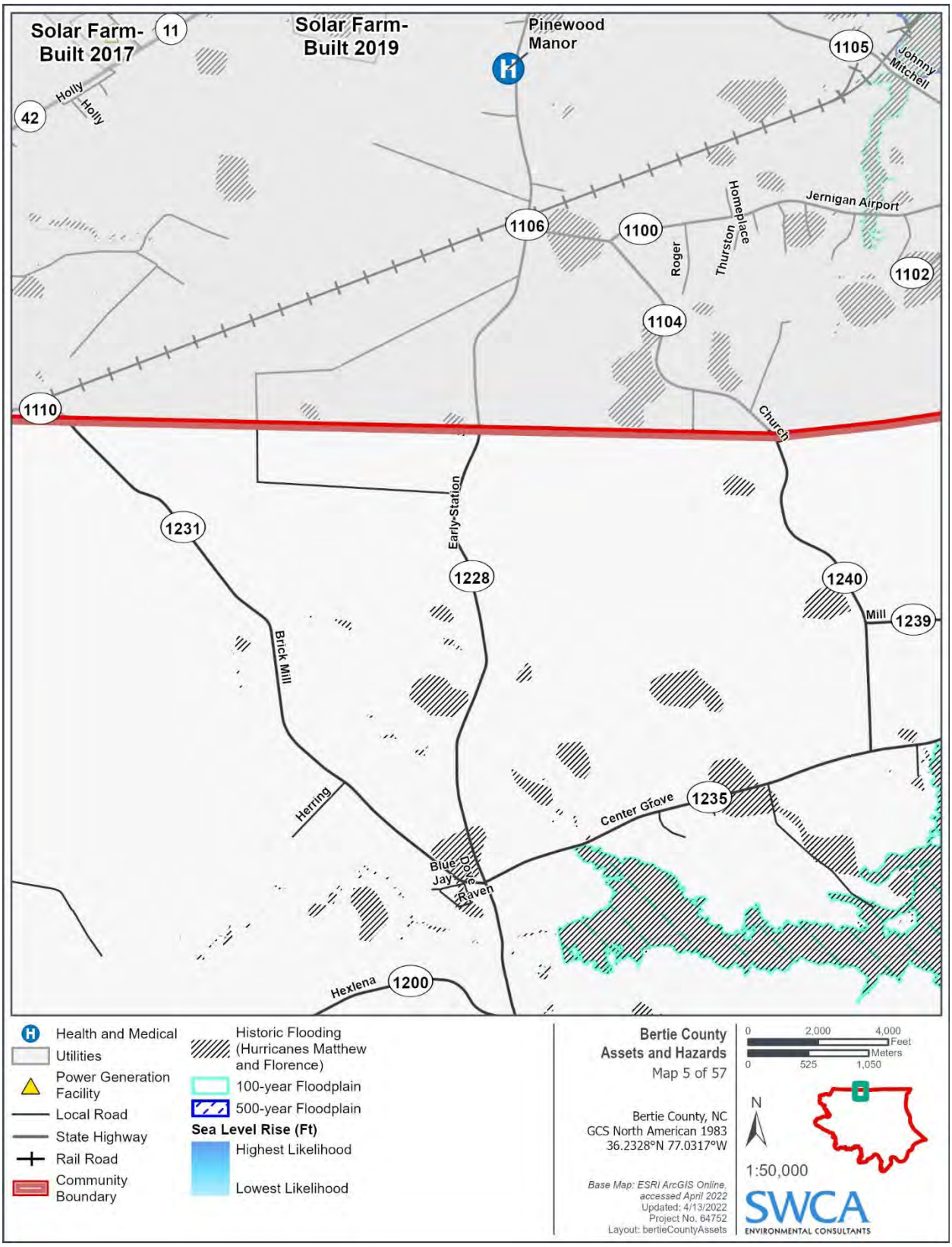


Figure F-5. Detail map of assets and hazards, keys to Figure 7.

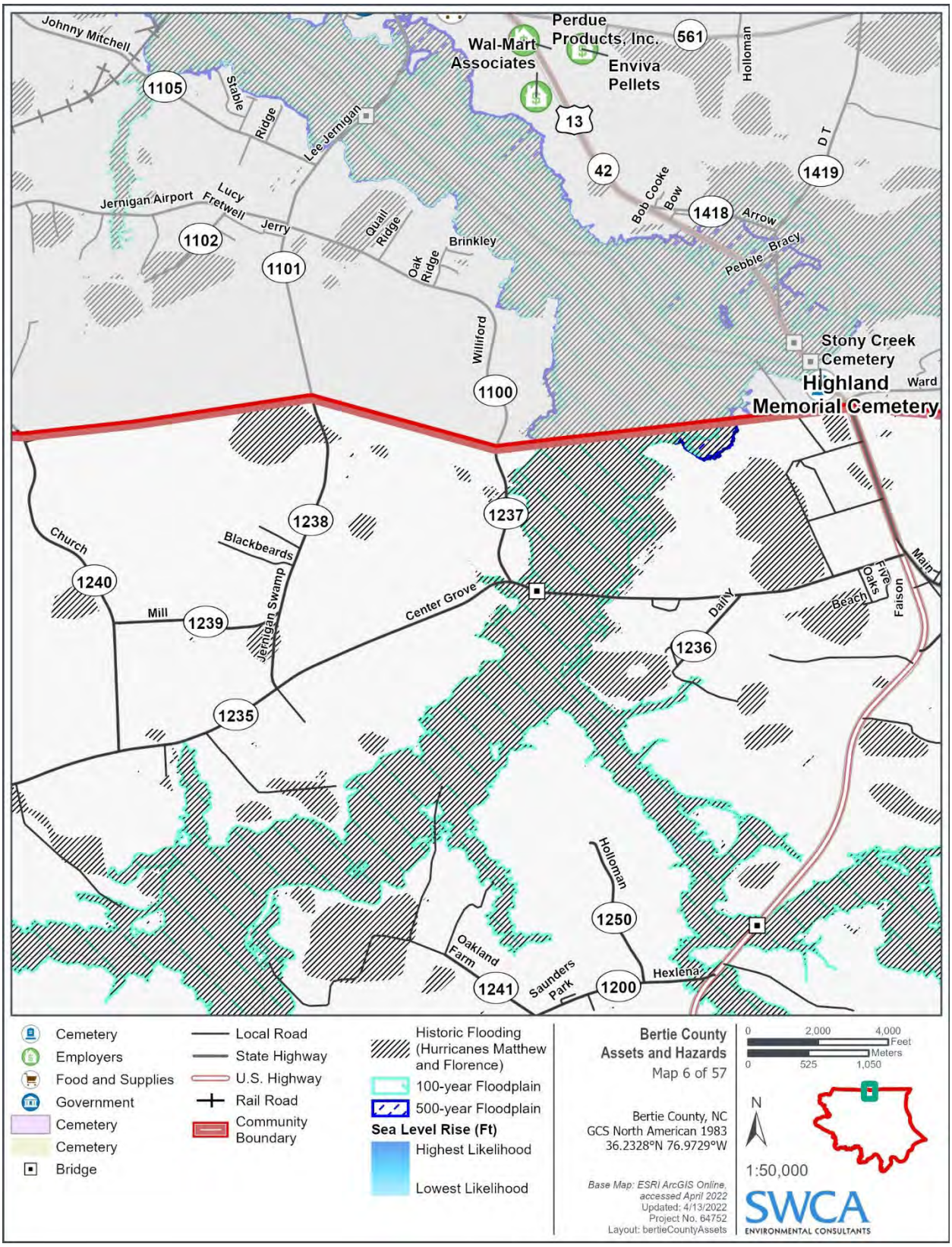


Figure F-6. Detail map of assets and hazards, keys to Figure 7.

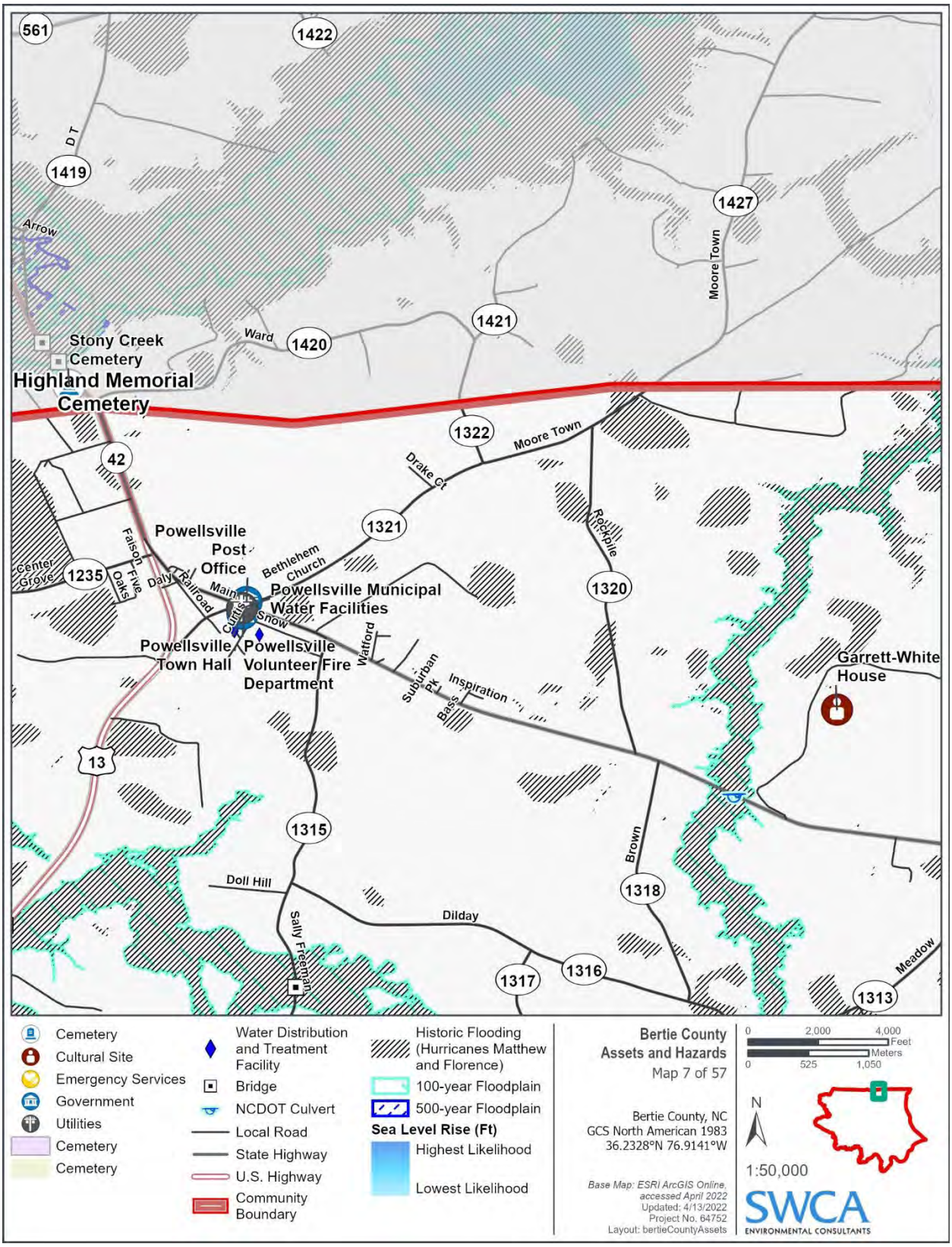


Figure F-7. Detail map of assets and hazards, keys to Figure 7.

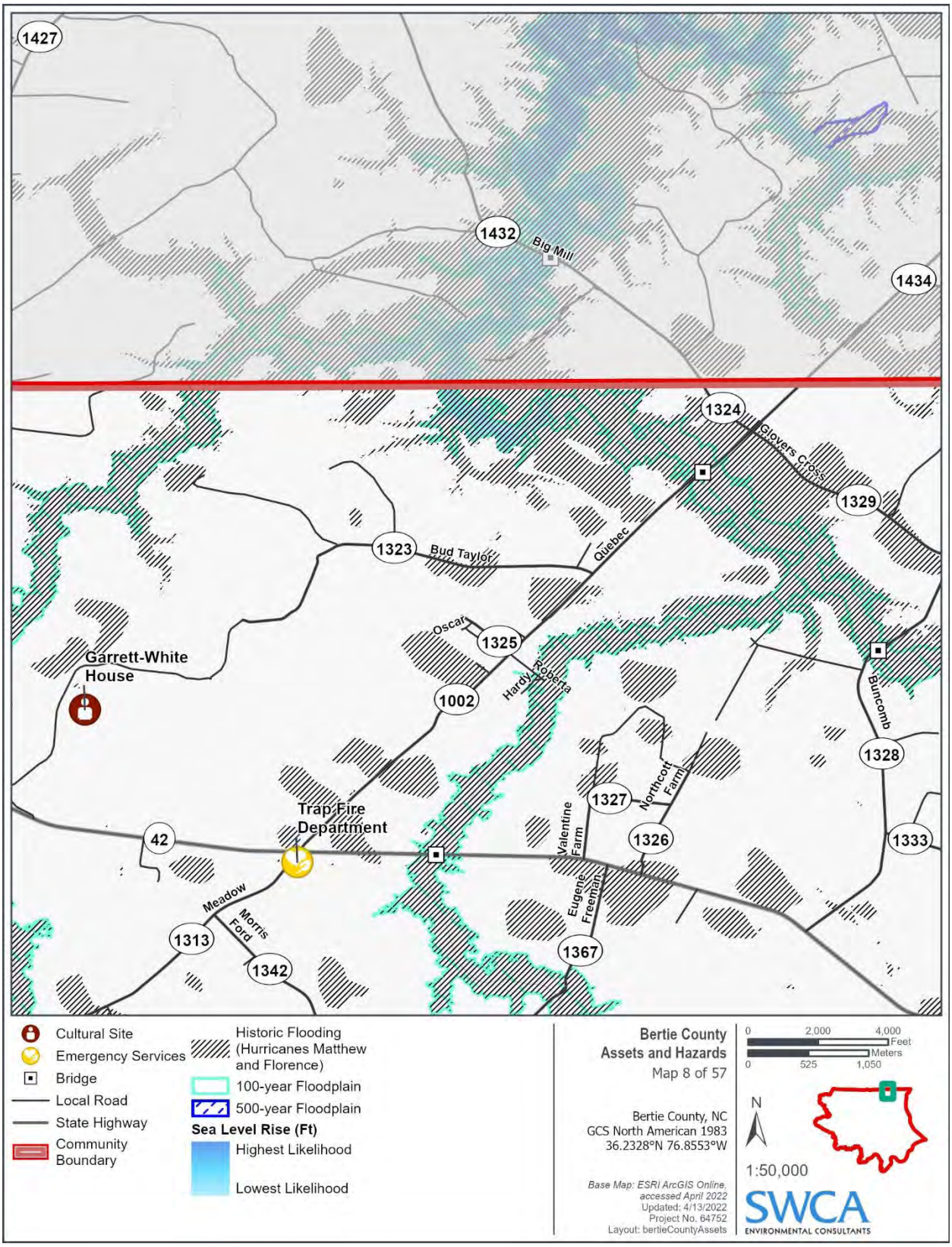


Figure F-8. Detail map of assets and hazards, keys to Figure 7.

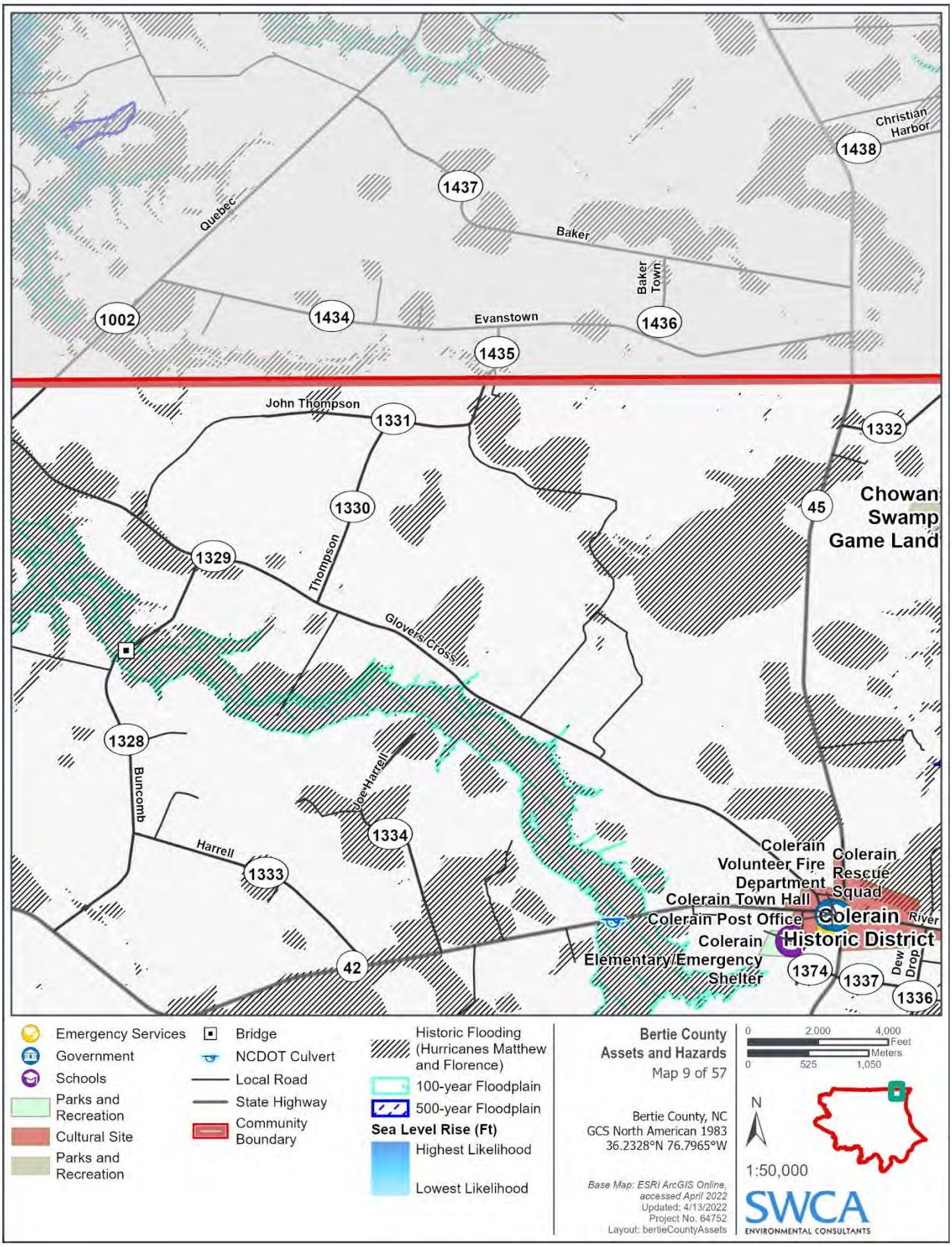


Figure F-9. Detail map of assets and hazards, keys to Figure 7.

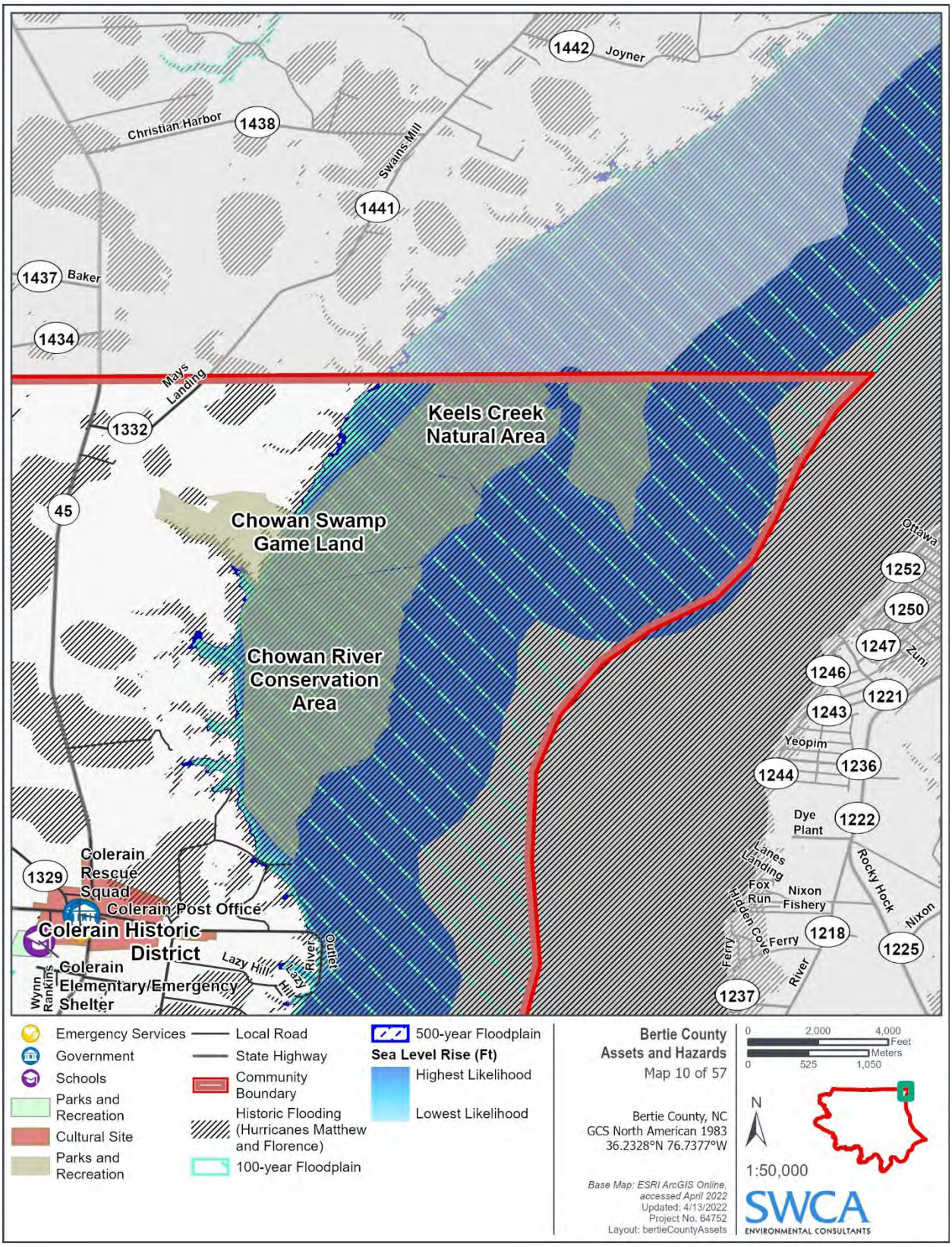


Figure F-10. Detail map of assets and hazards, keys to Figure 7.

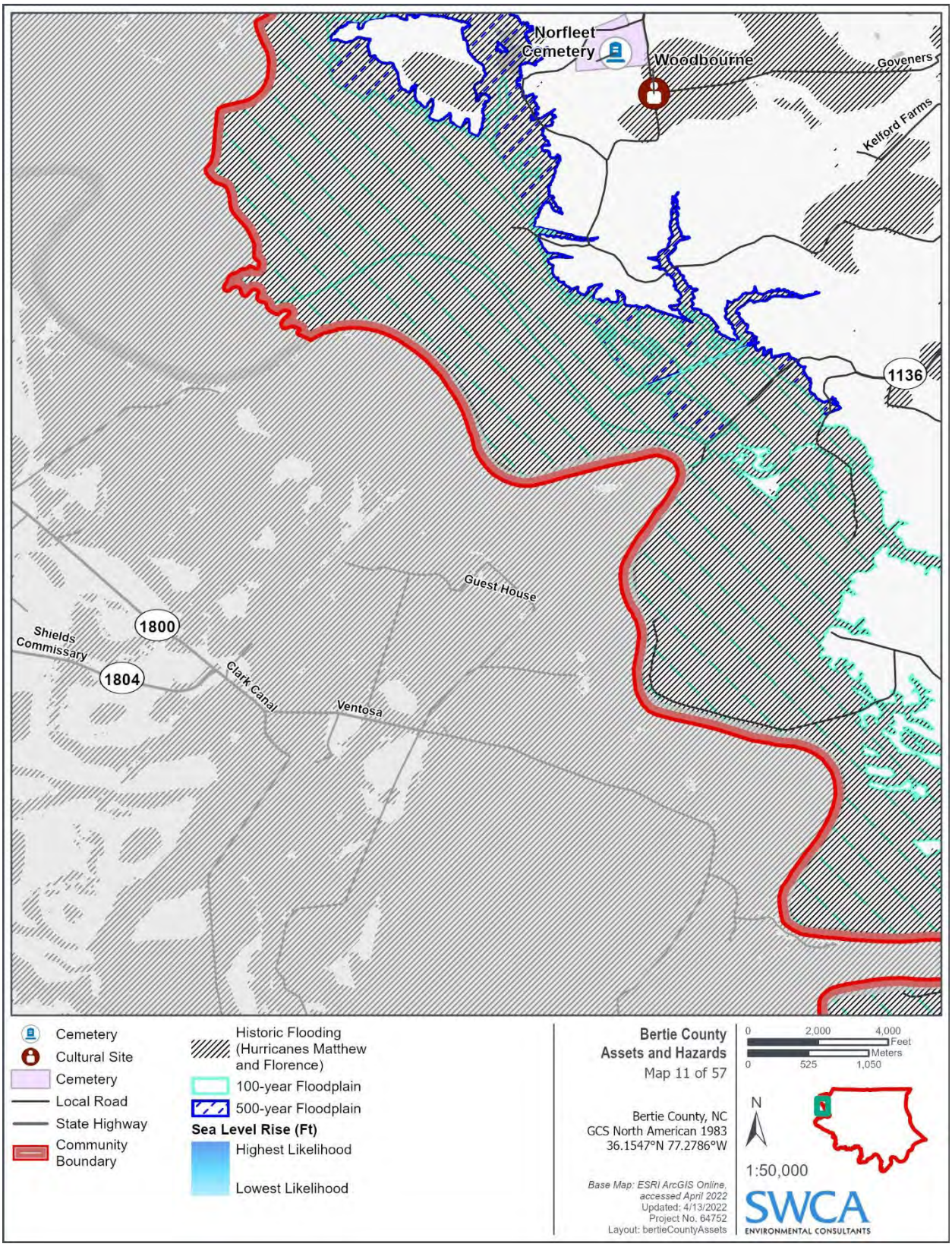


Figure F-11. Detail map of assets and hazards, keys to Figure 7.

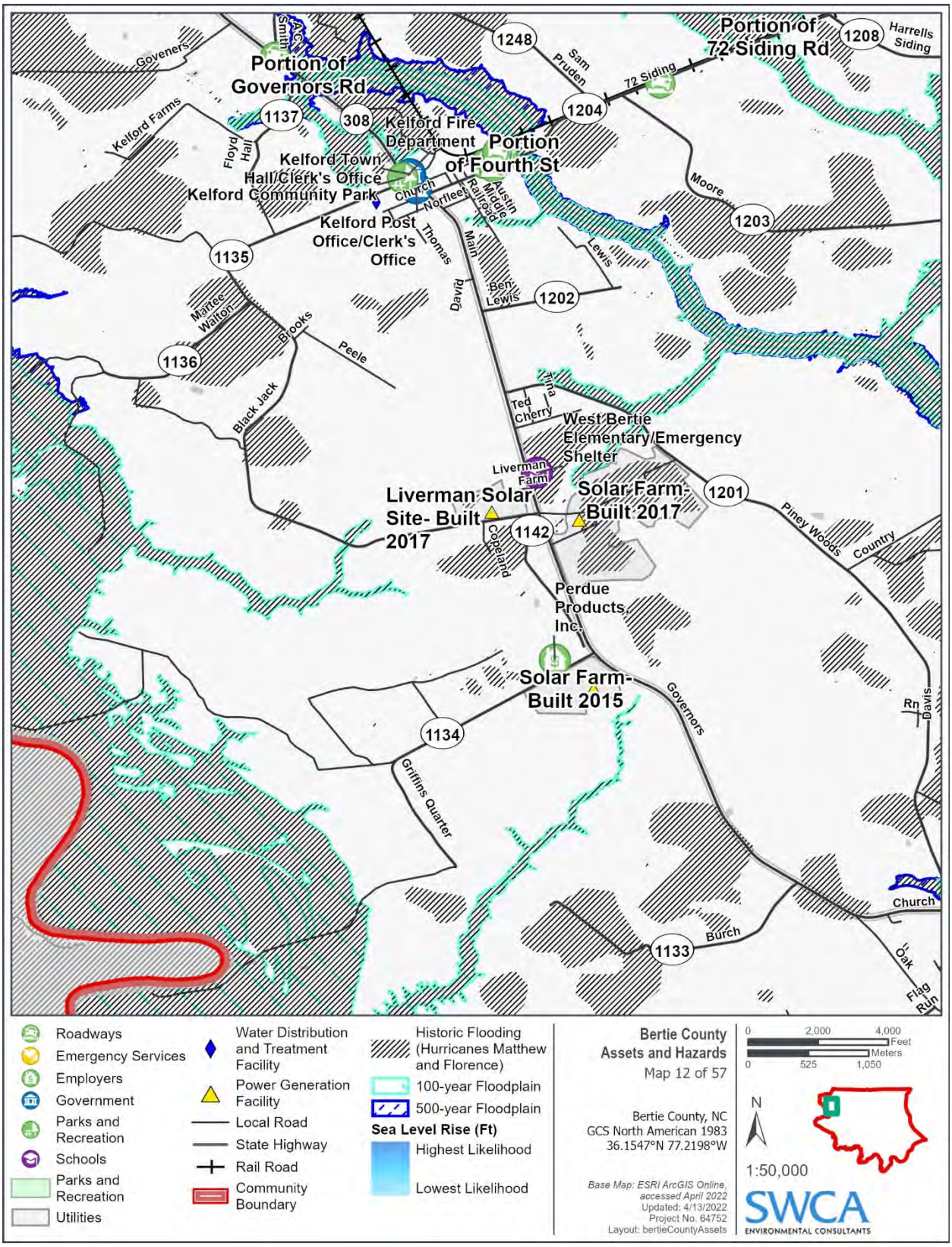


Figure F-12. Detail map of assets and hazards, keys to Figure 7.

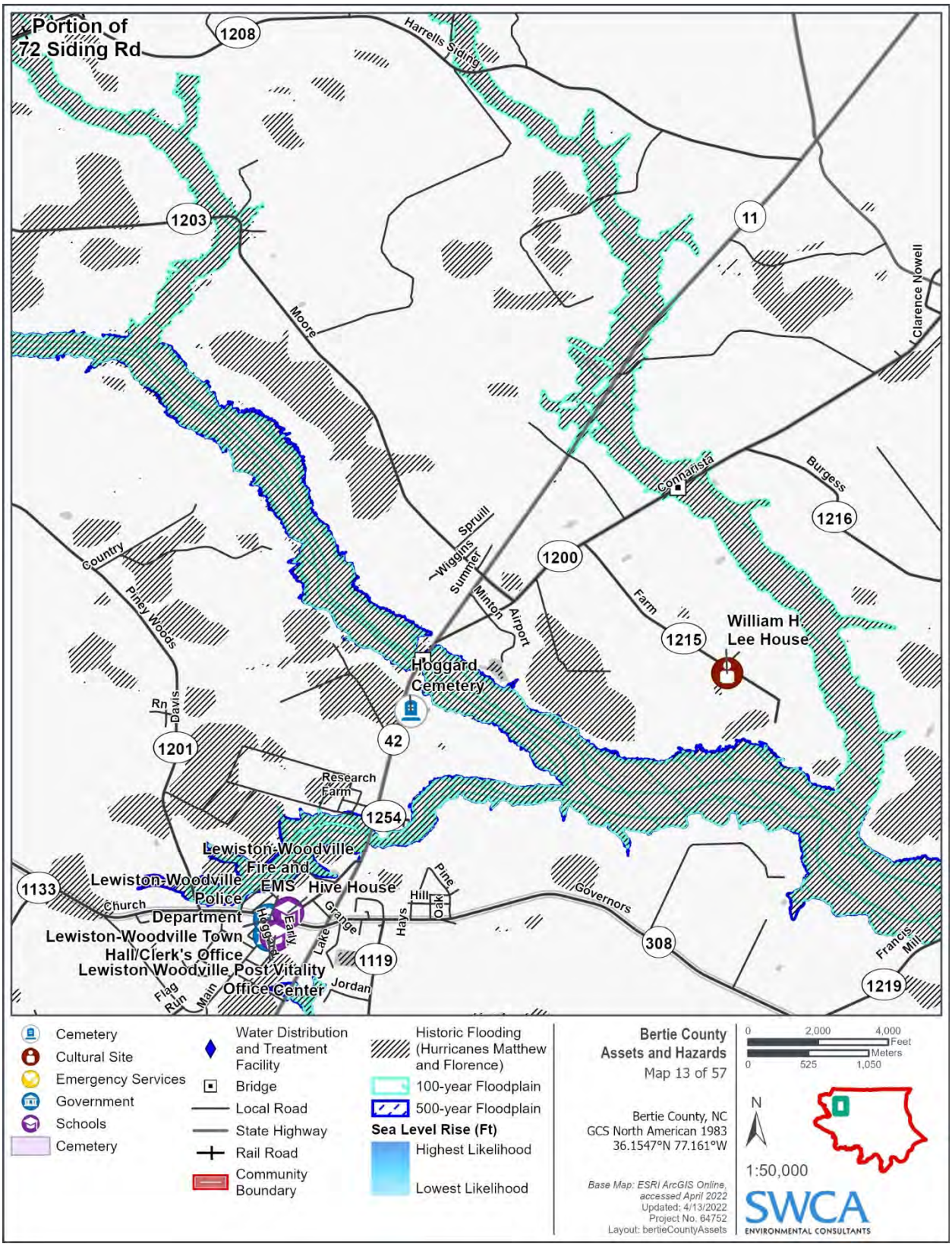


Figure F-13. Detail map of assets and hazards, keys to Figure 7.

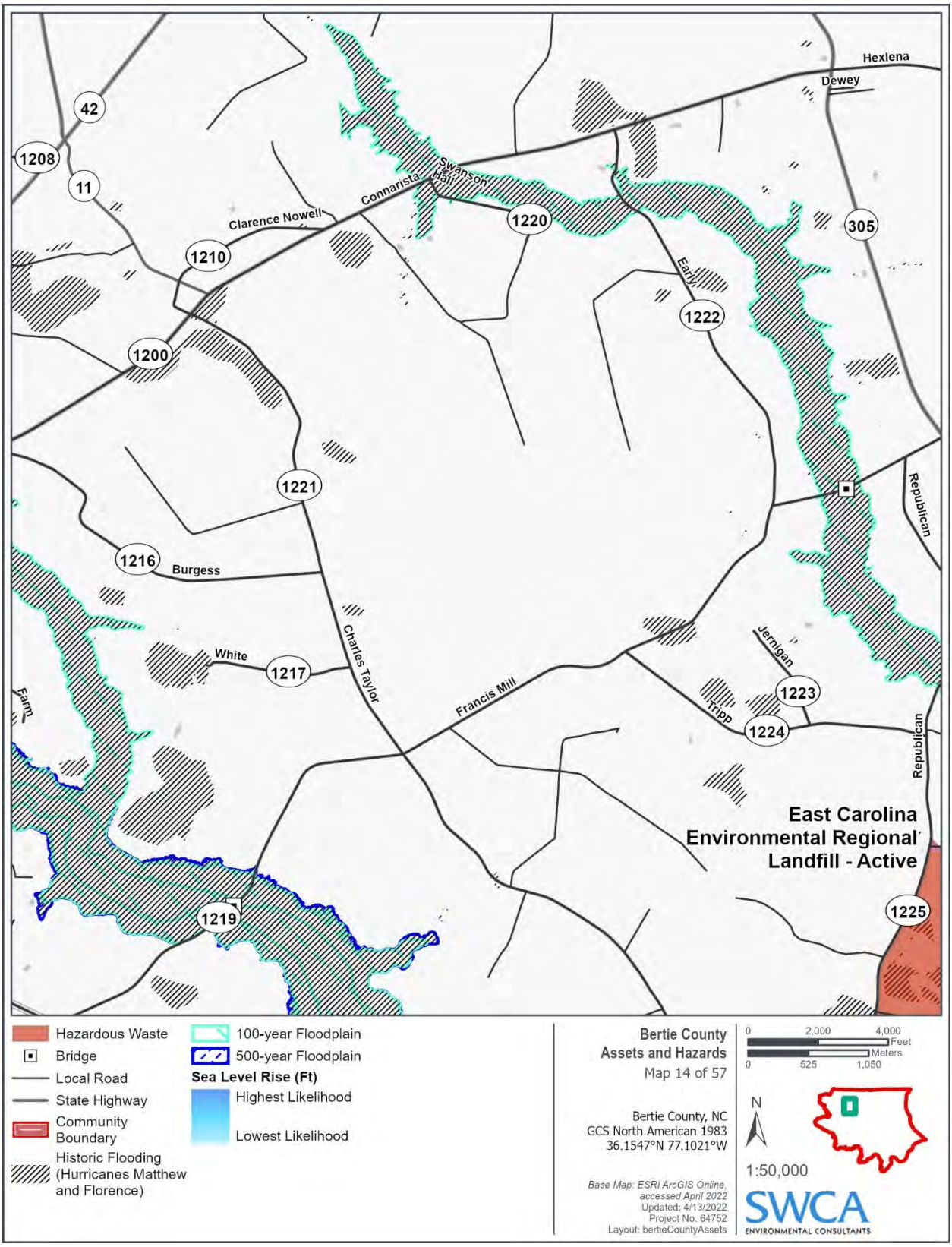


Figure F-14. Detail map of assets and hazards, keys to Figure 7.

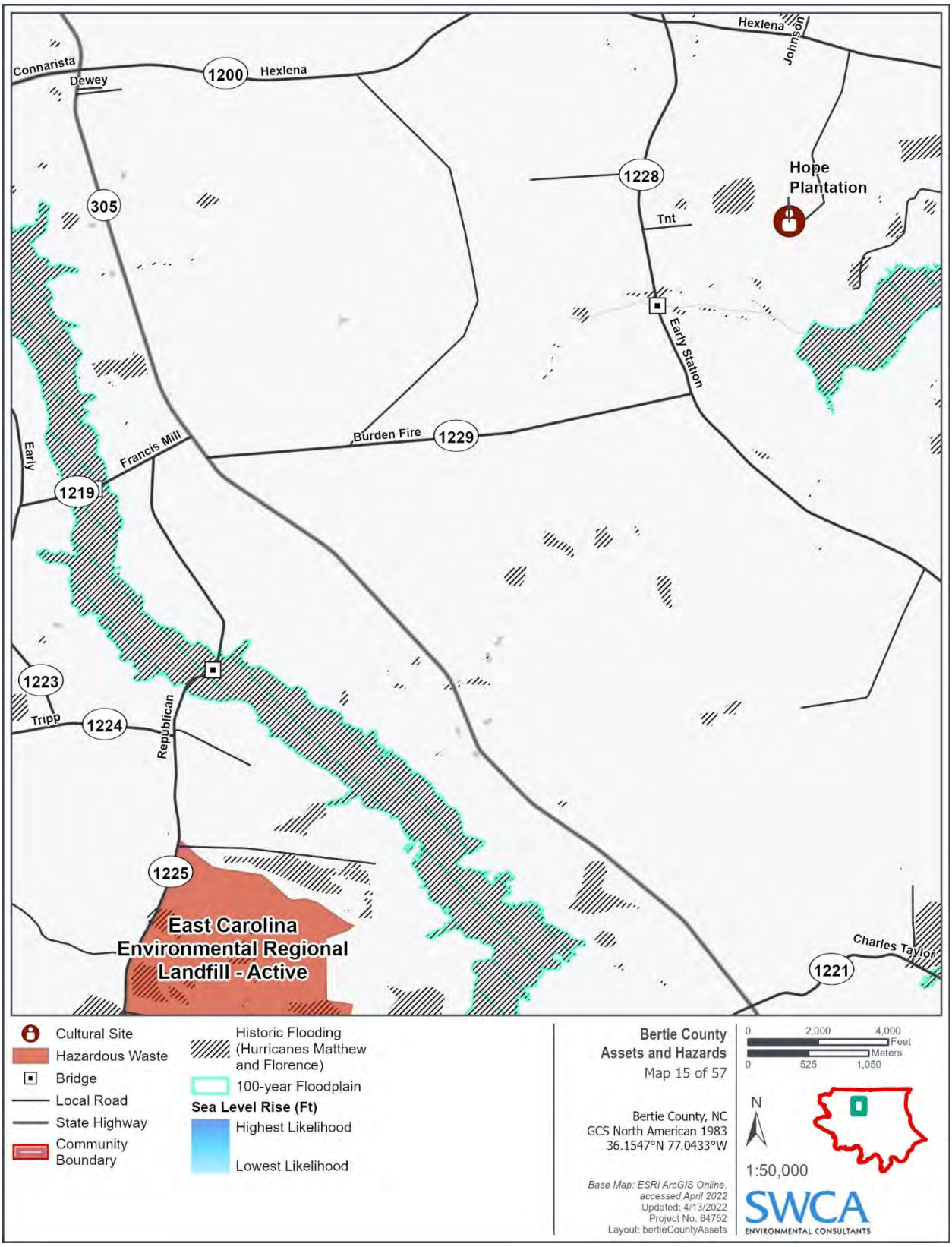


Figure F-15. Detail map of assets and hazards, keys to Figure 7.

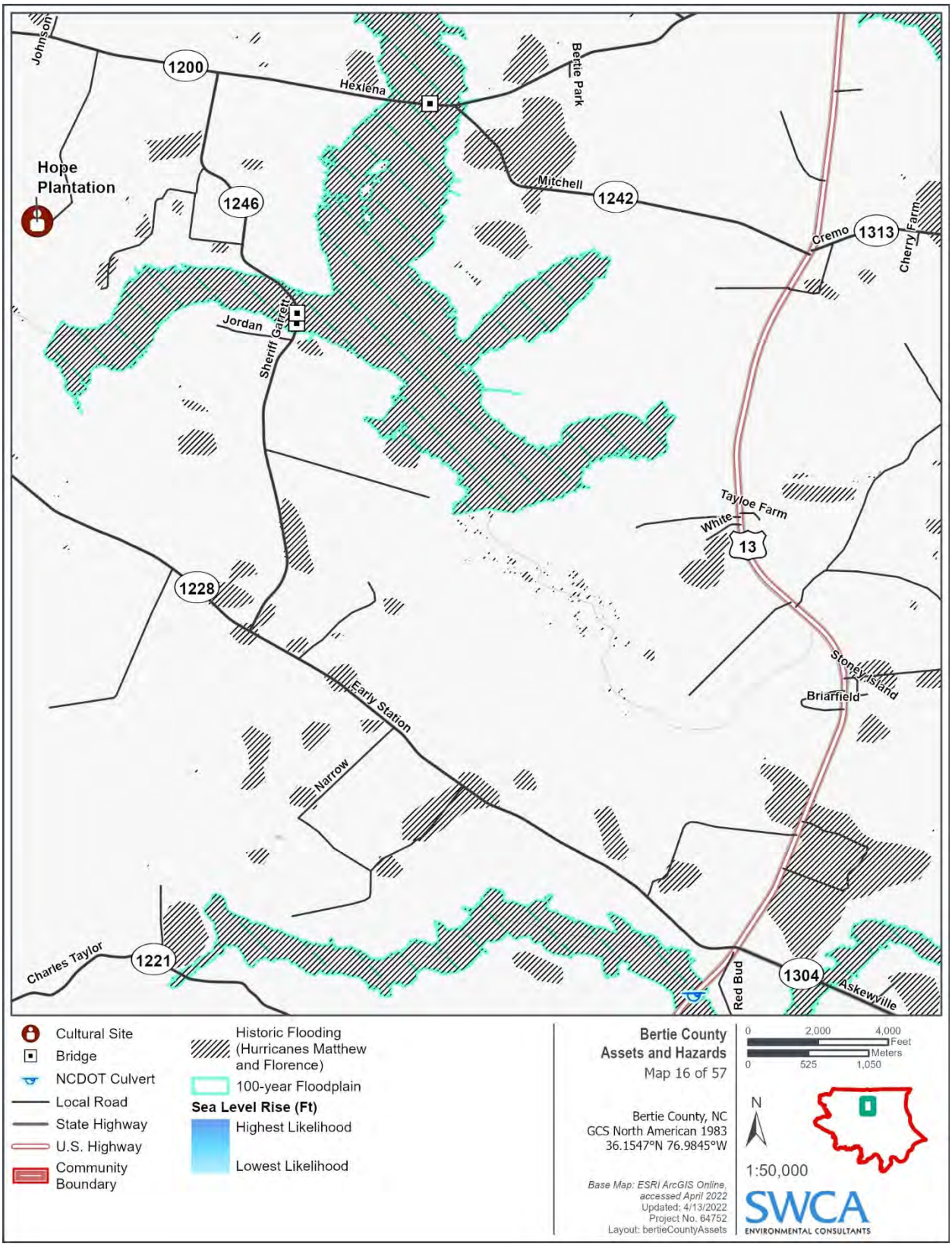


Figure F-16. Detail map of assets and hazards, keys to Figure 7.

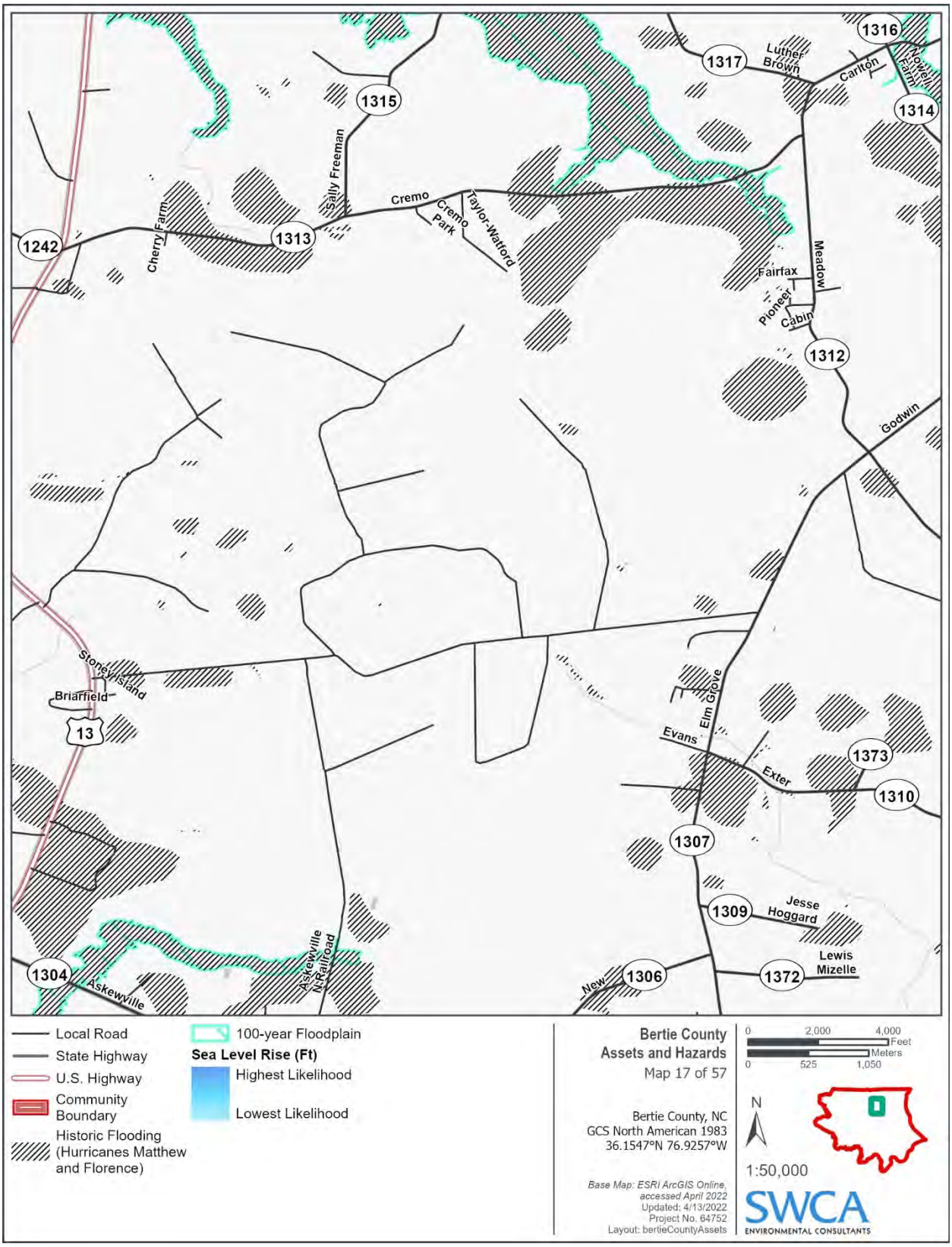


Figure F-17. Detail map of assets and hazards, keys to Figure 7.

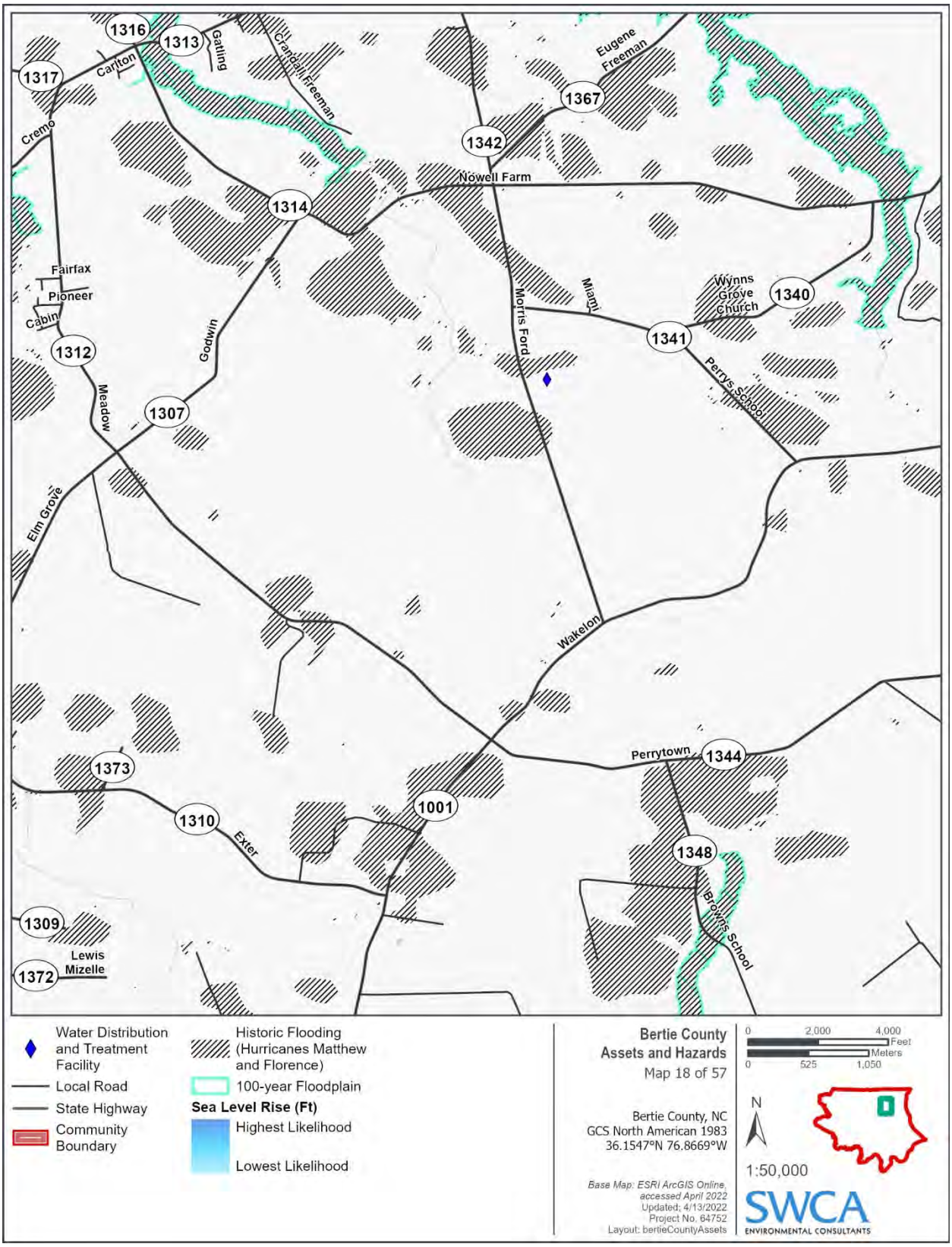


Figure F-18. Detail map of assets and hazards, keys to Figure 7.

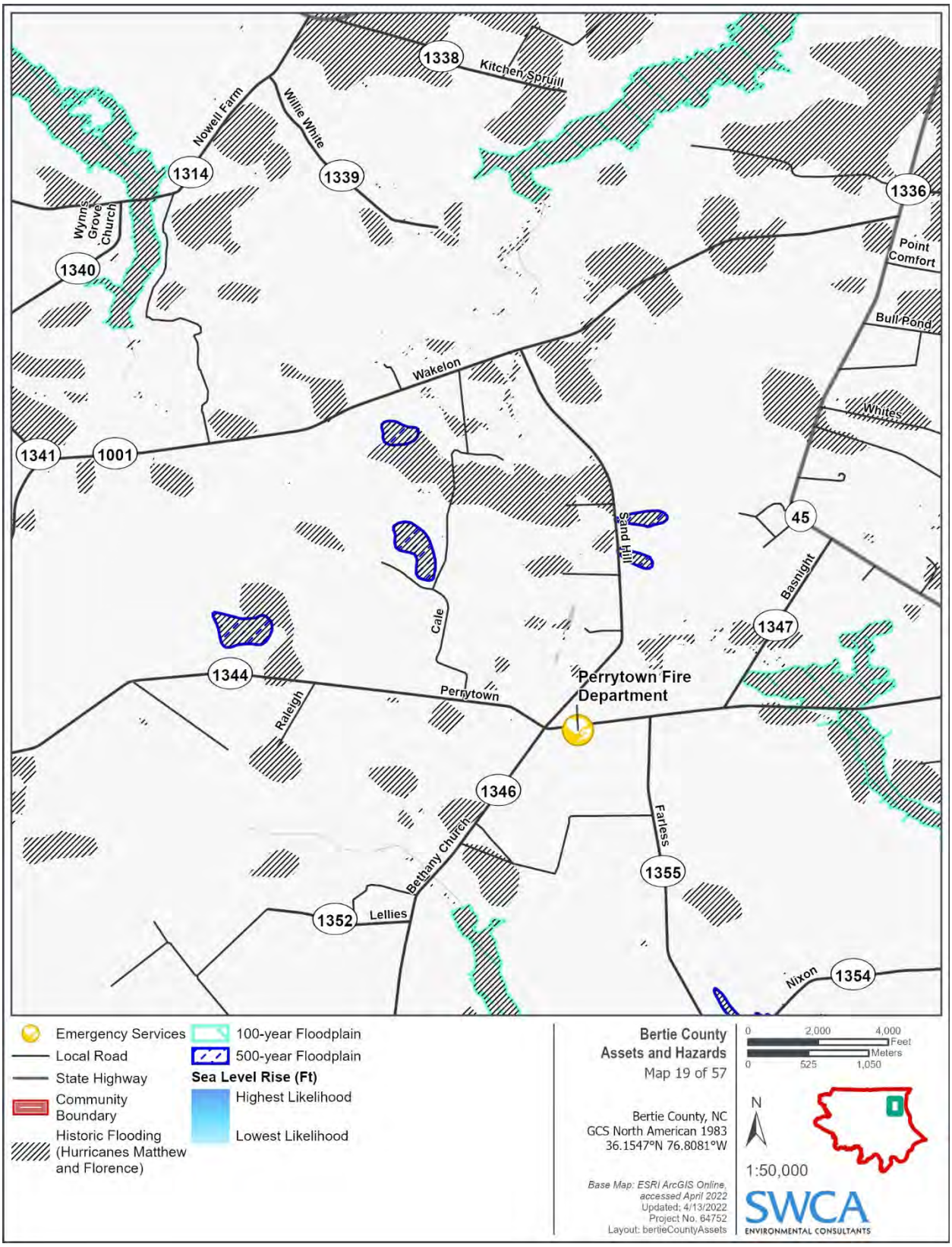


Figure F-19. Detail map of assets and hazards, keys to Figure 7.

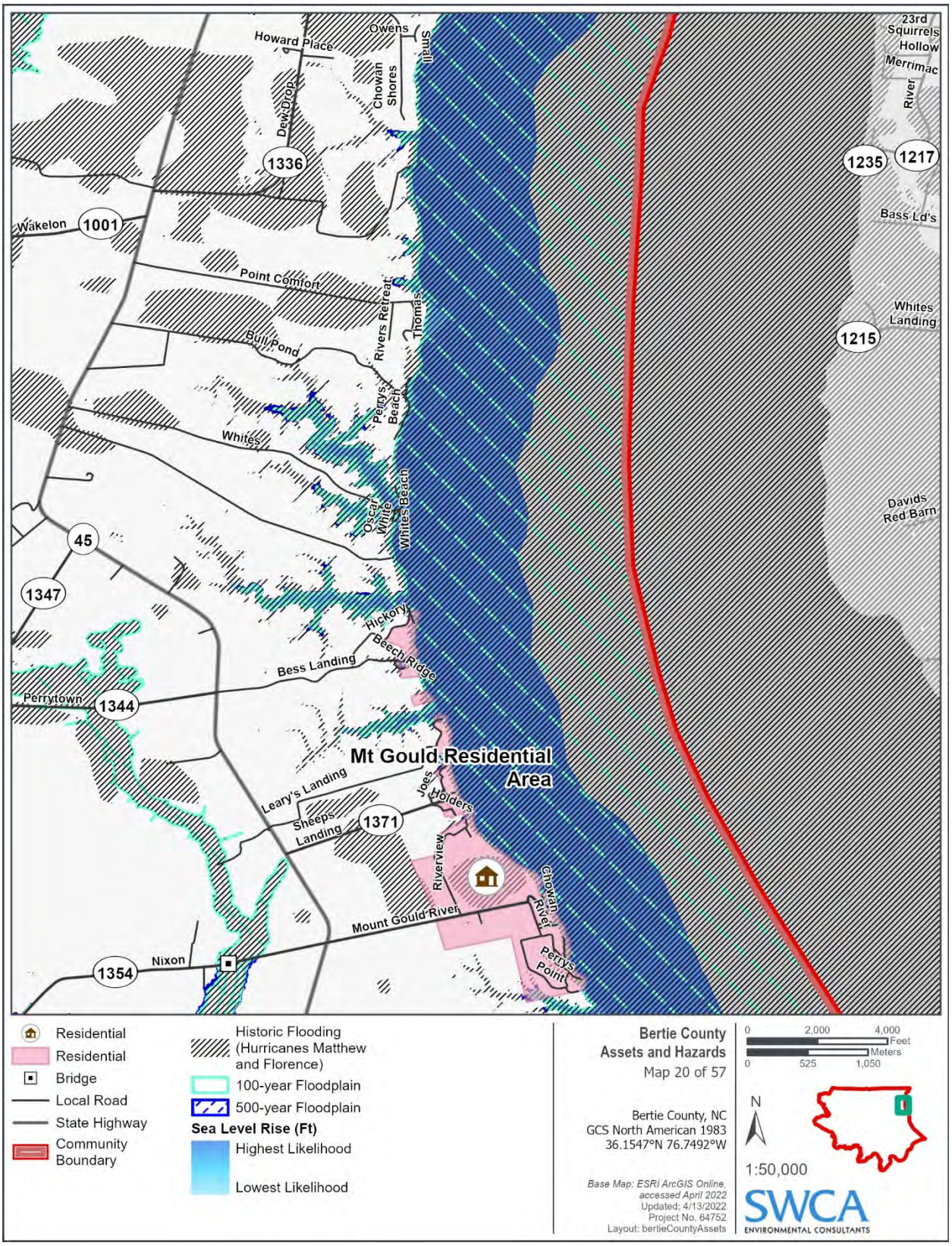
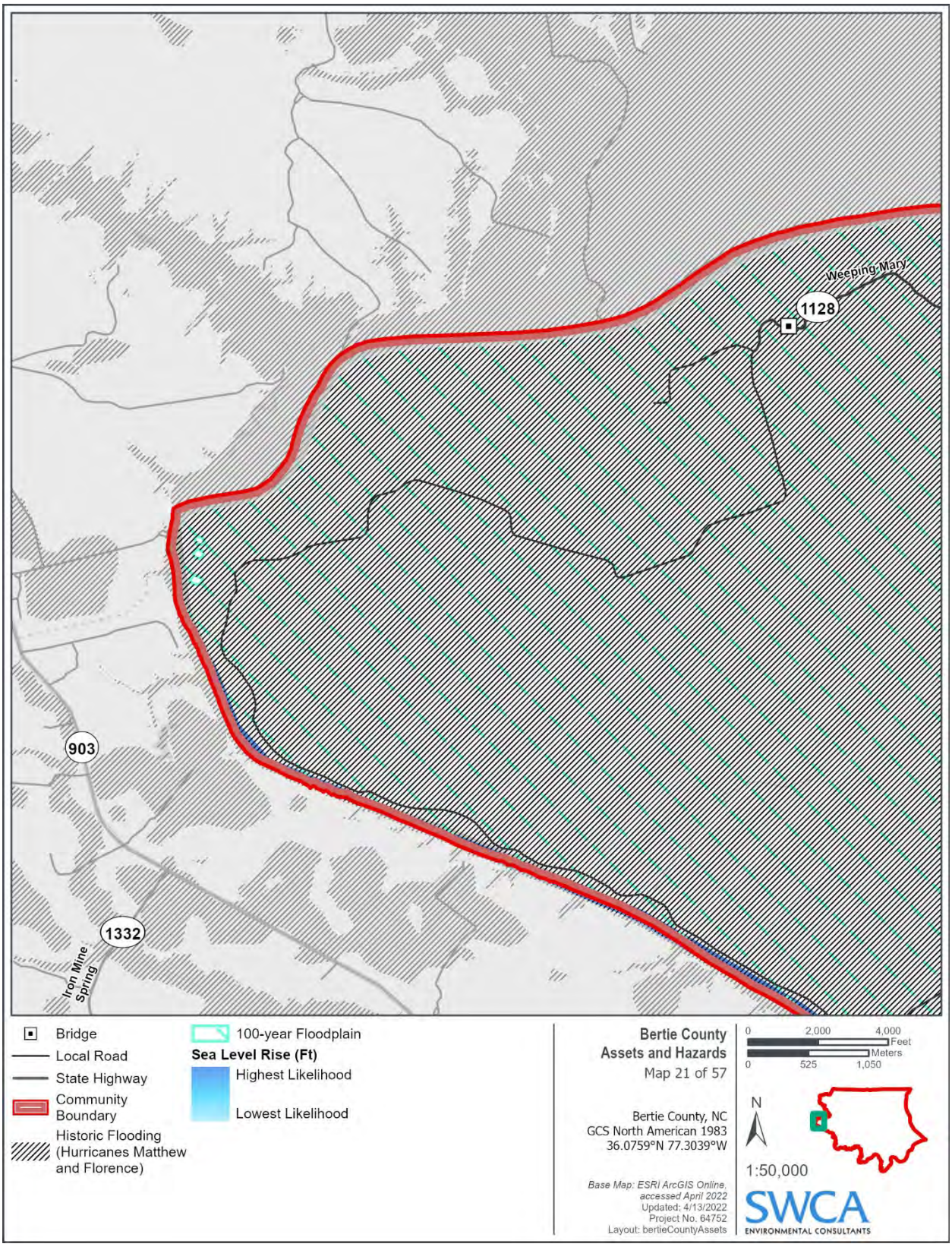


Figure F-20. Detail map of assets and hazards, keys to Figure 7.



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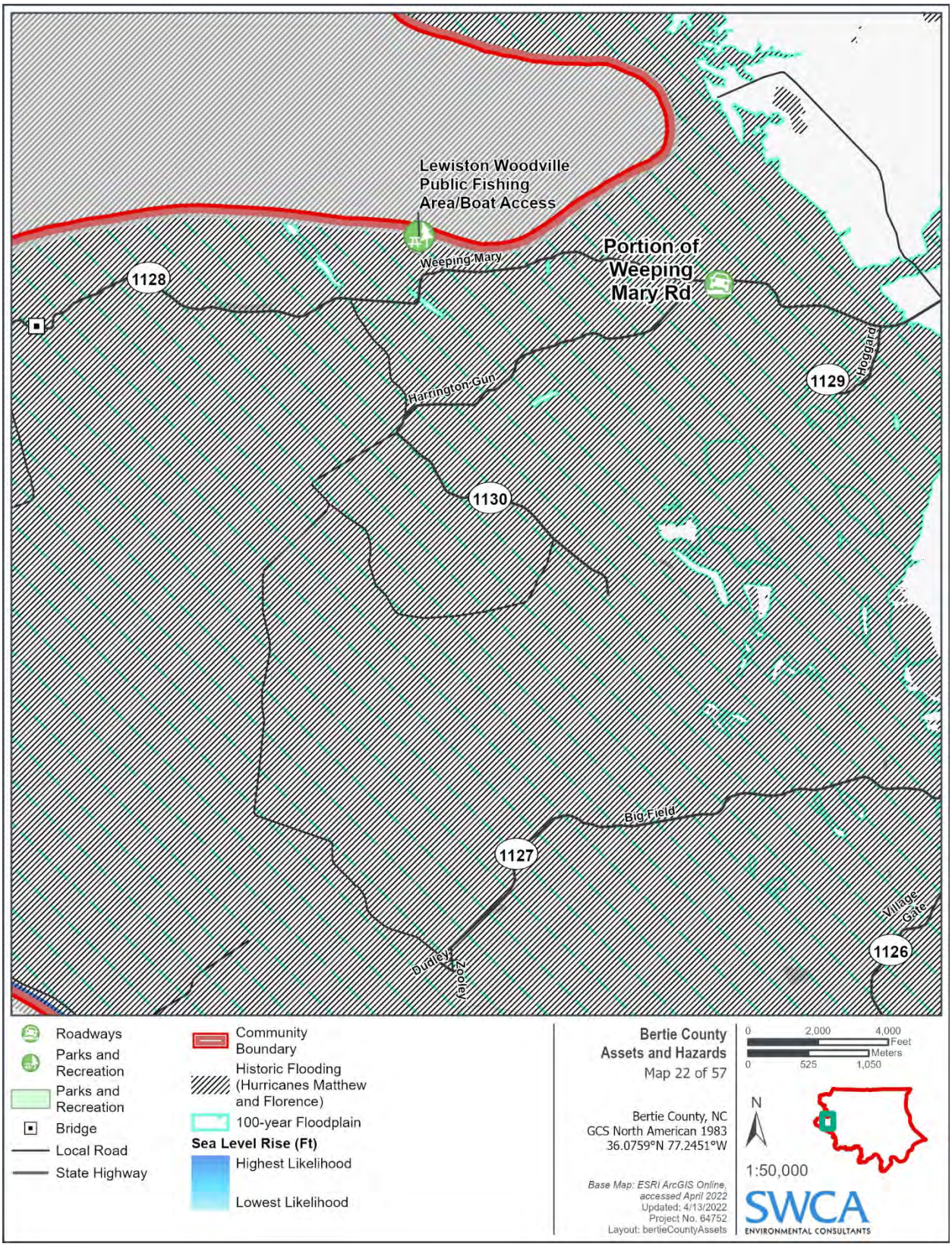

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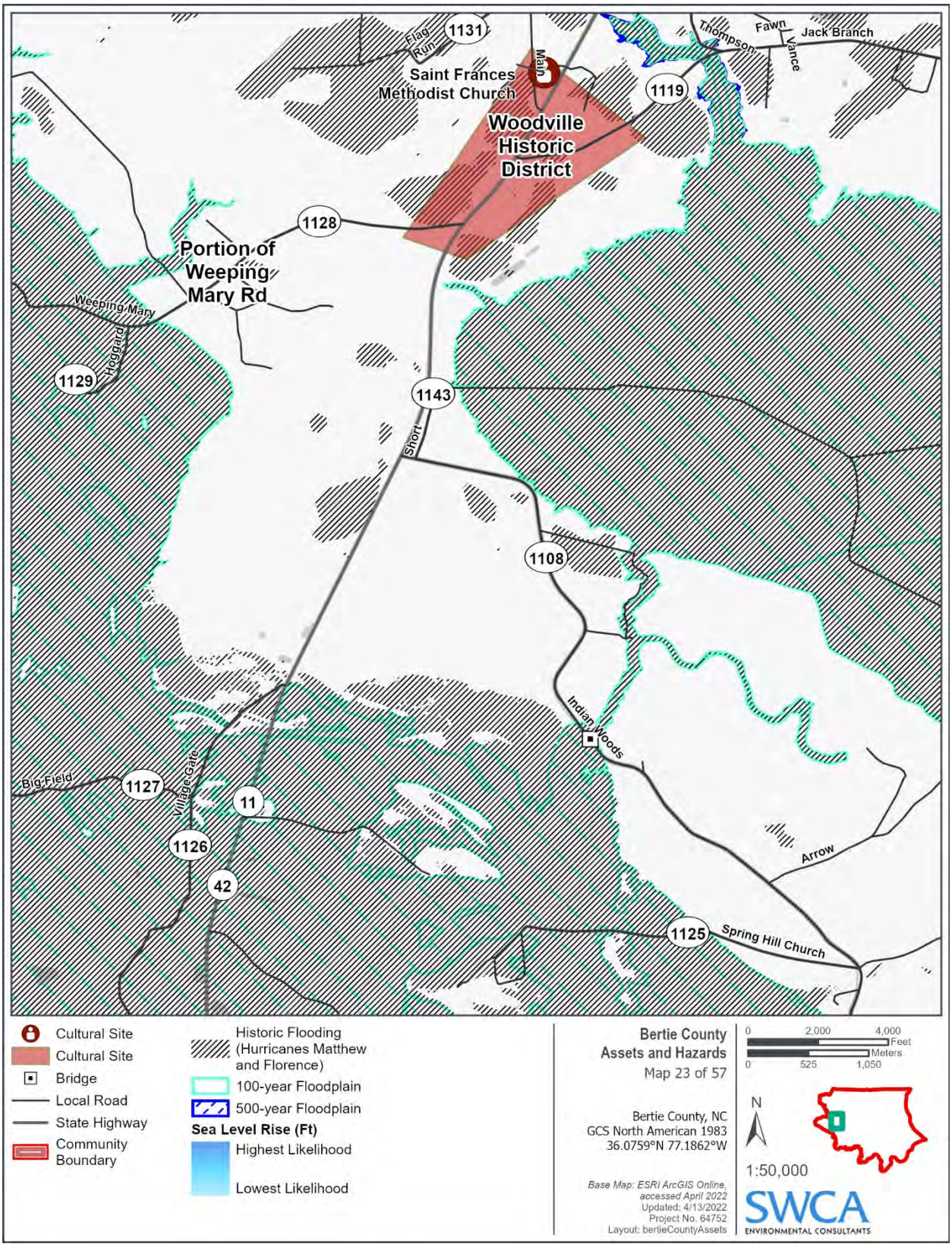

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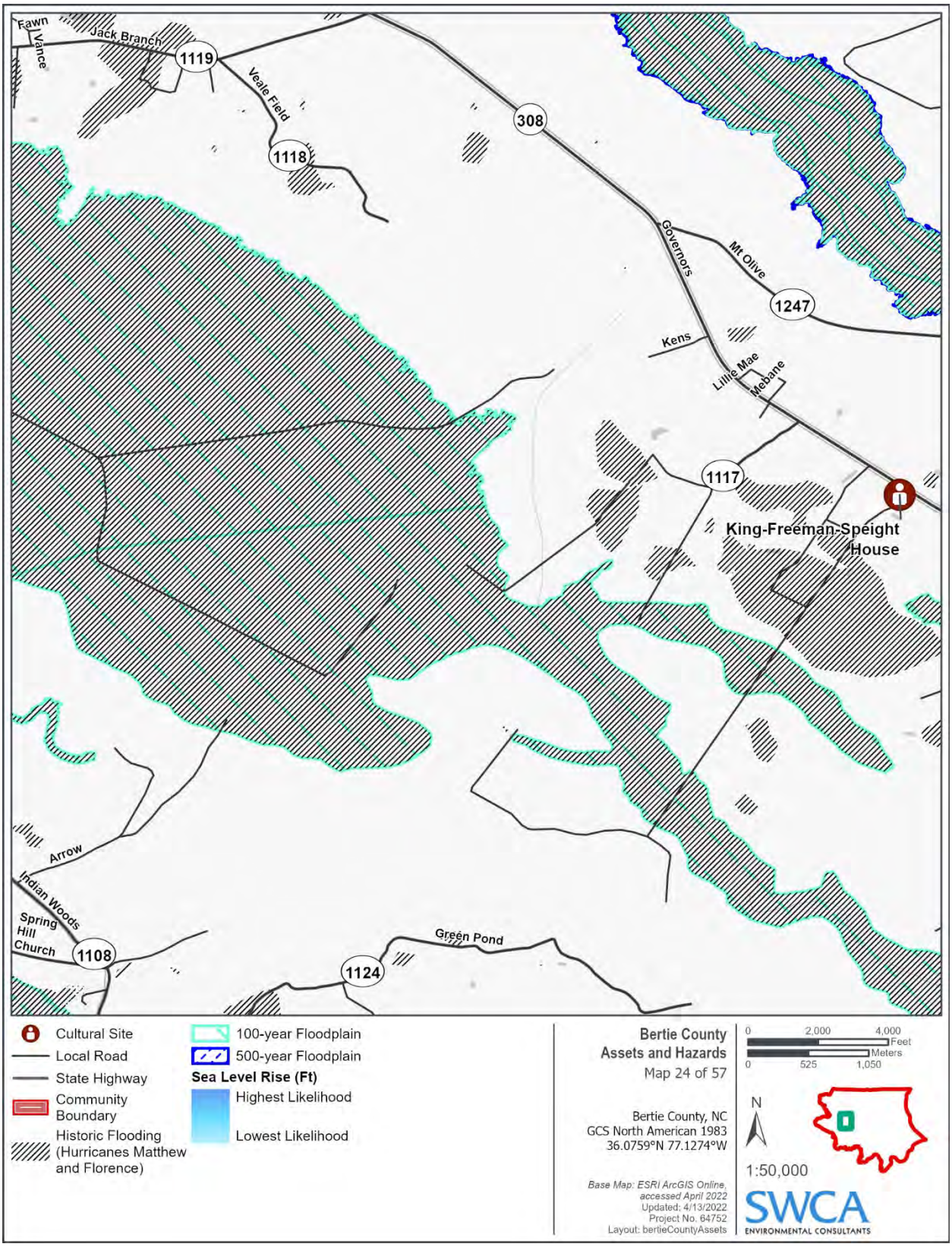

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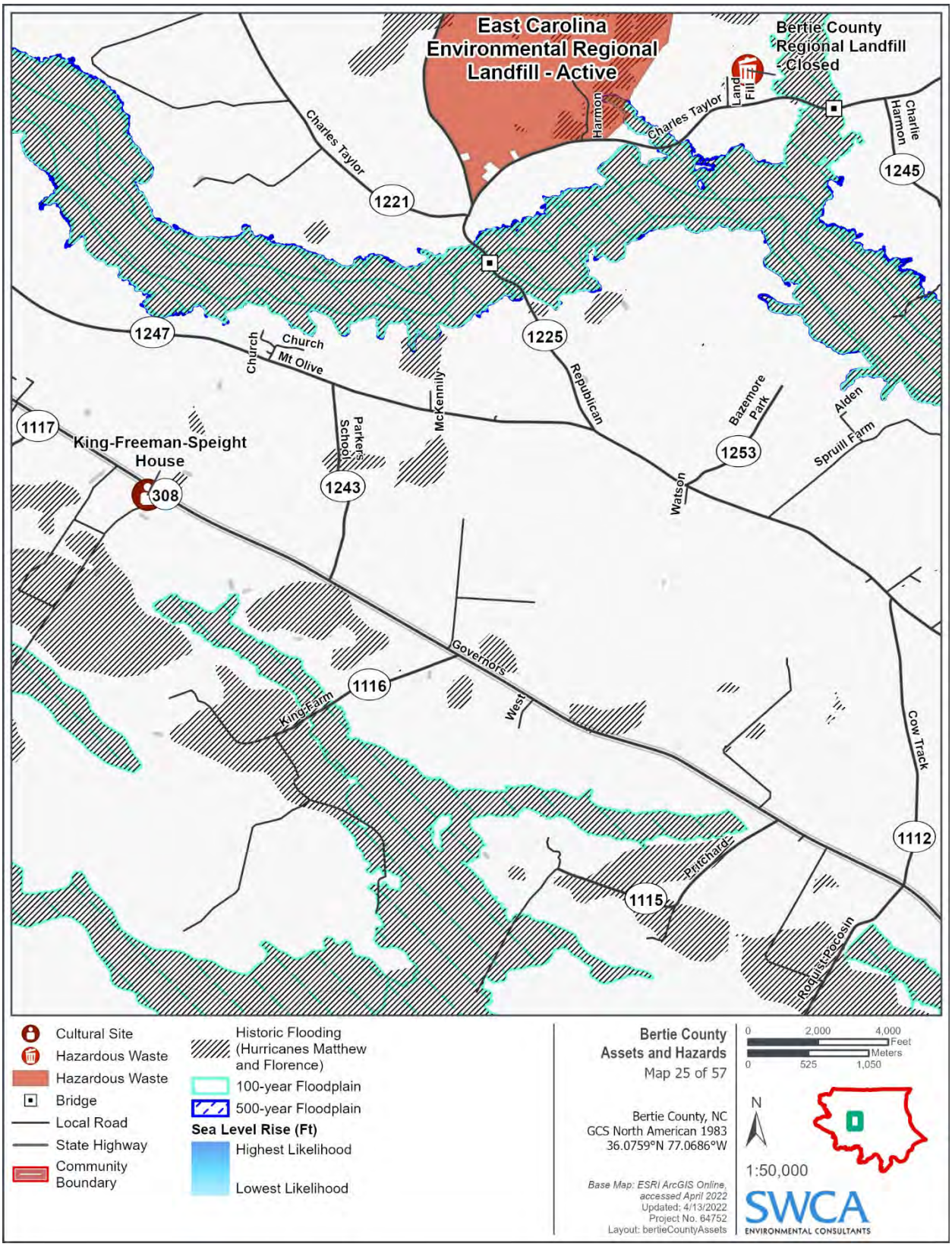

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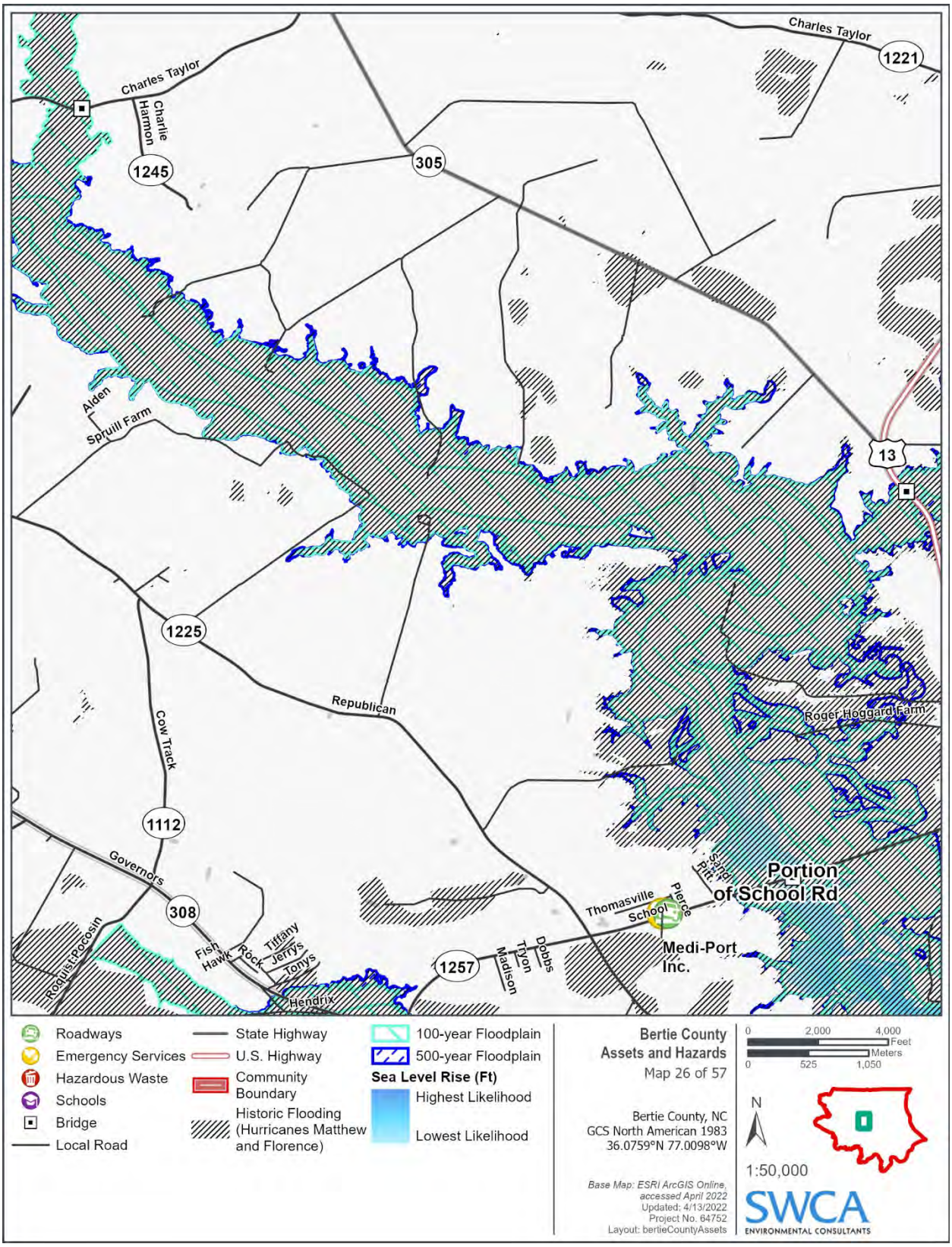

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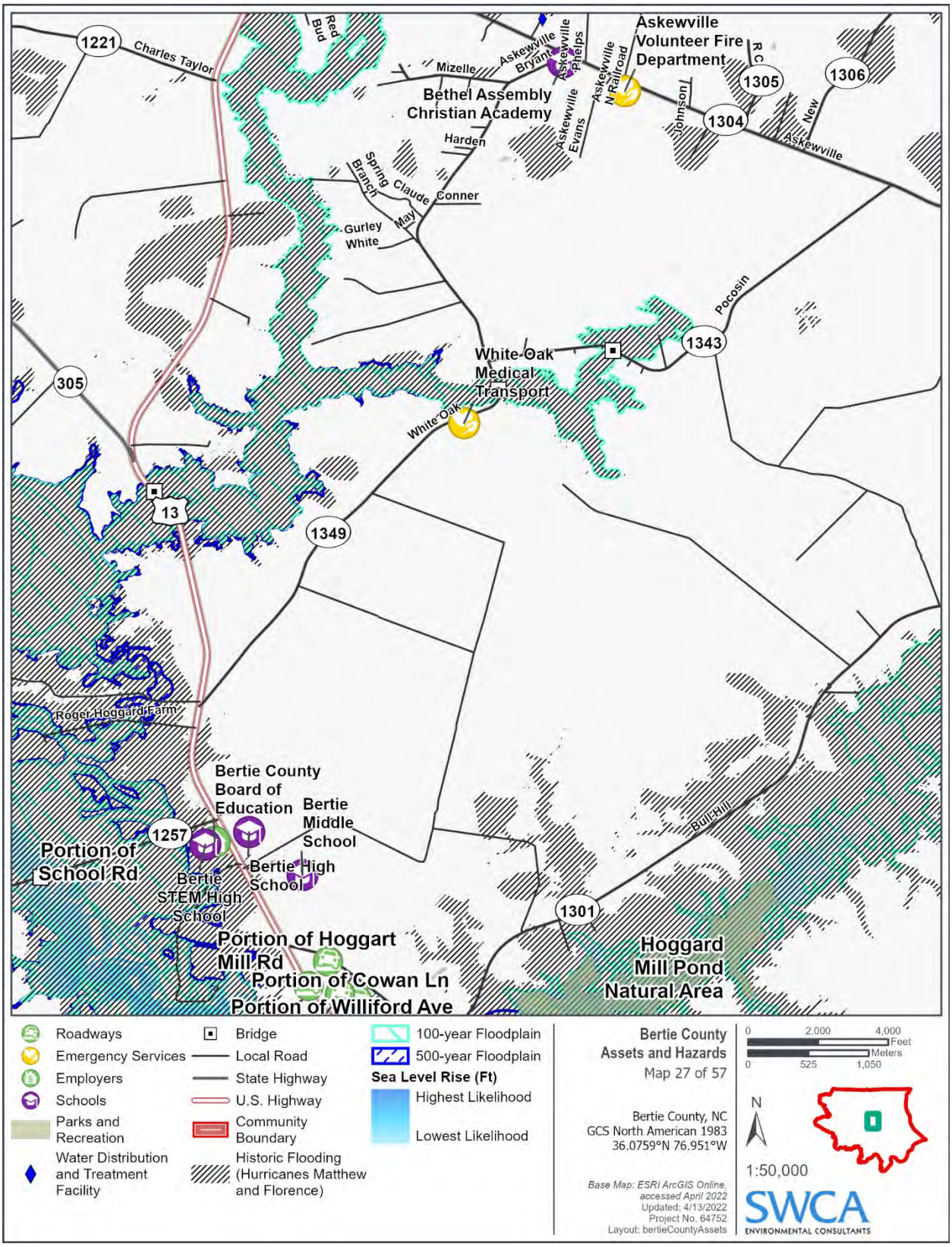

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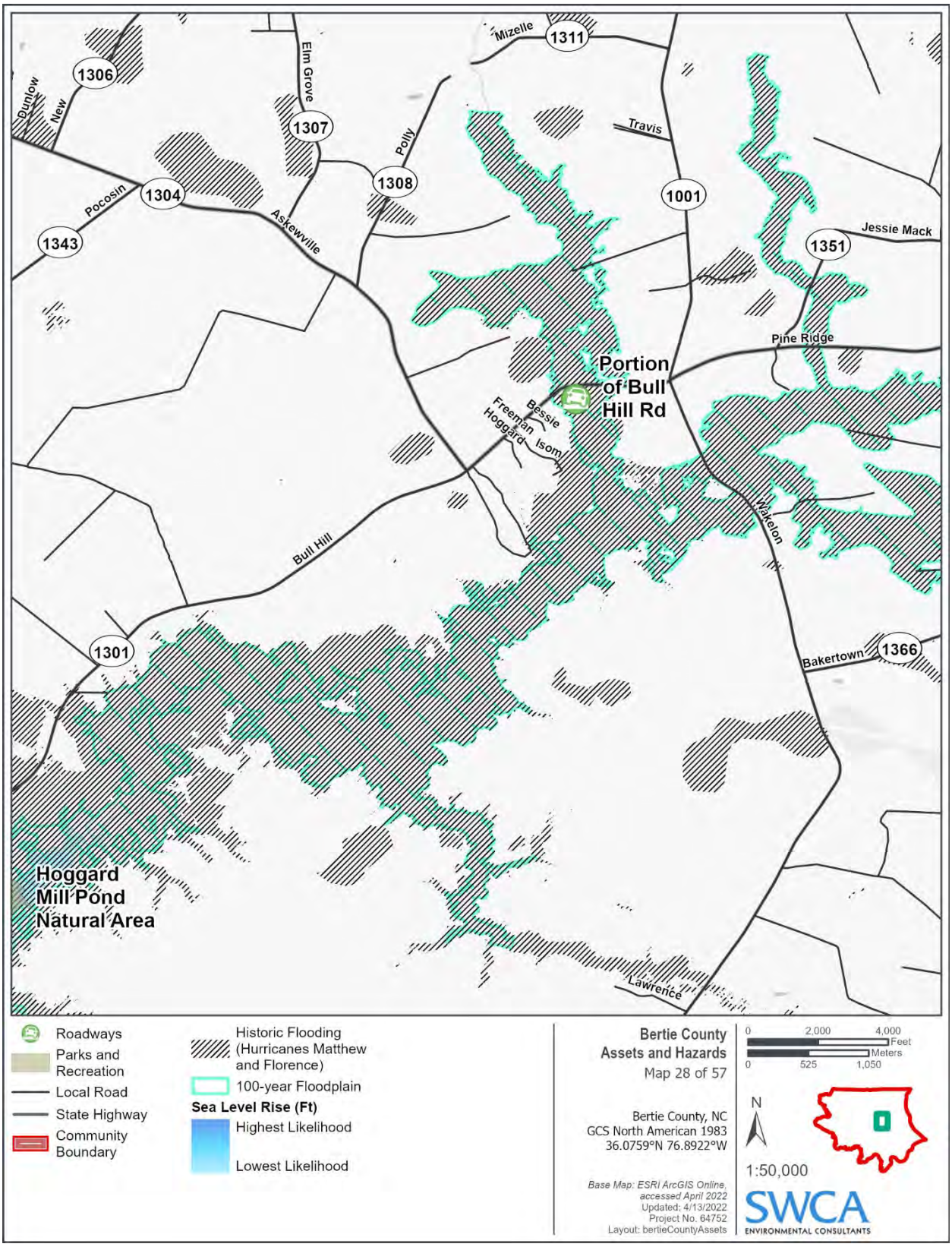

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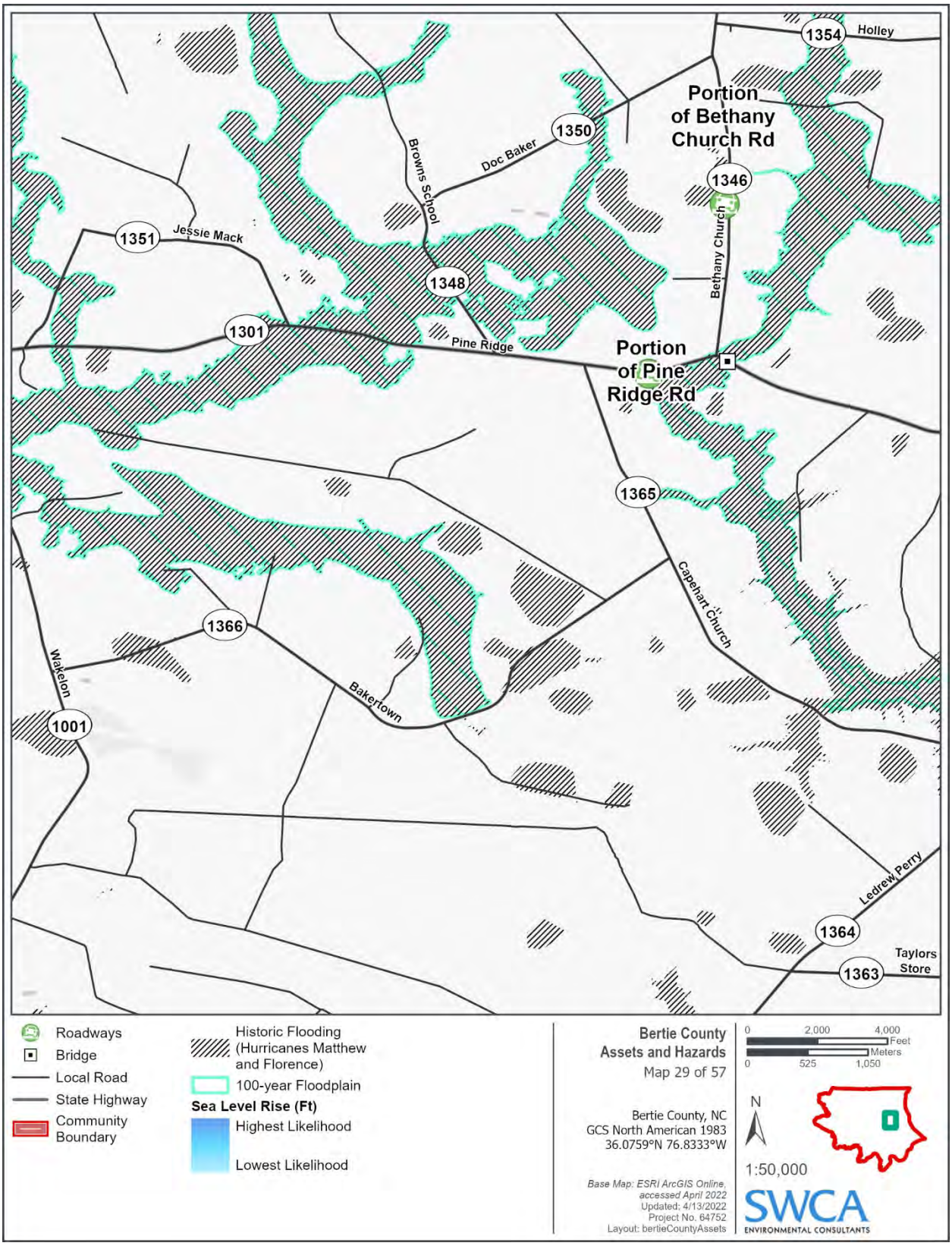

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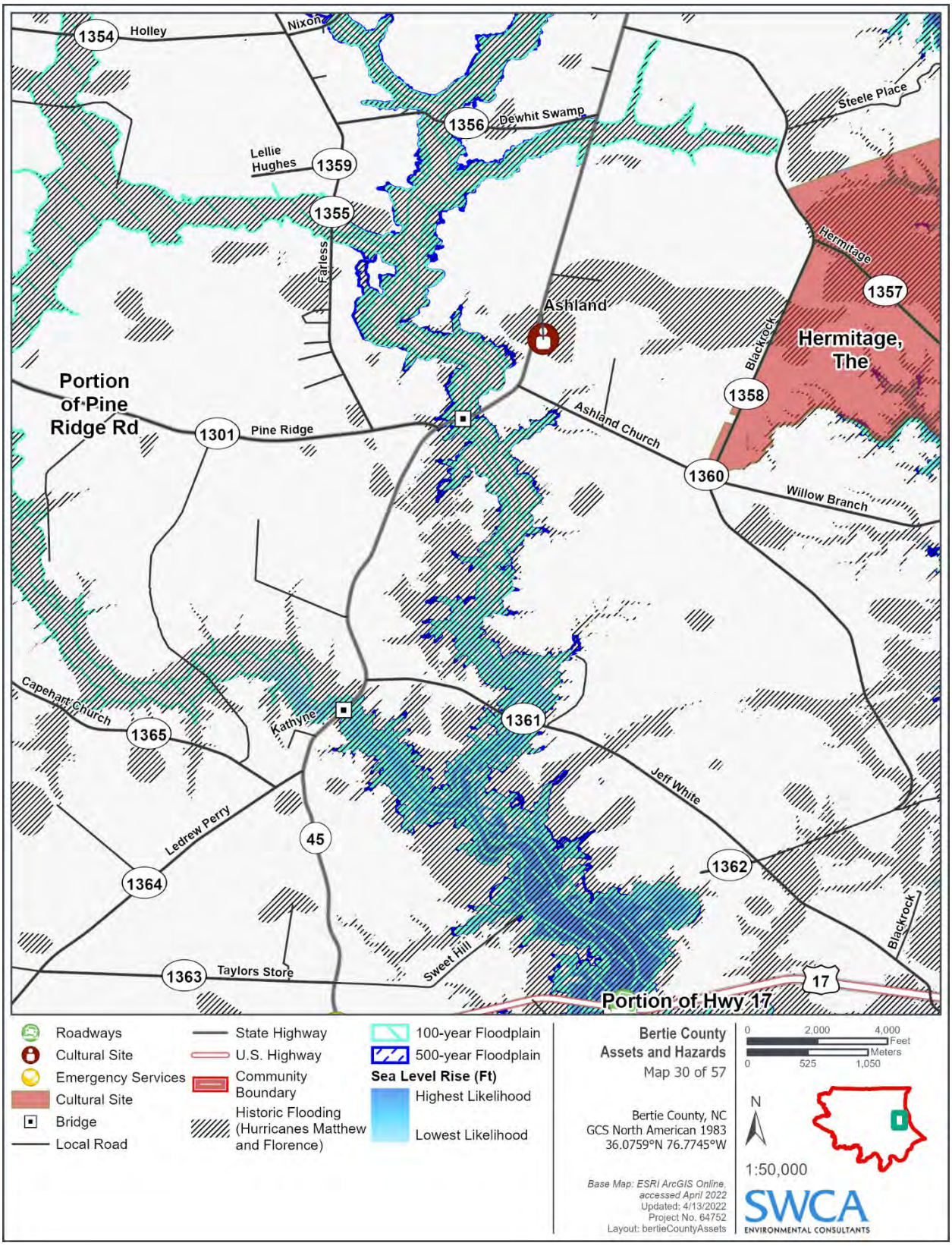

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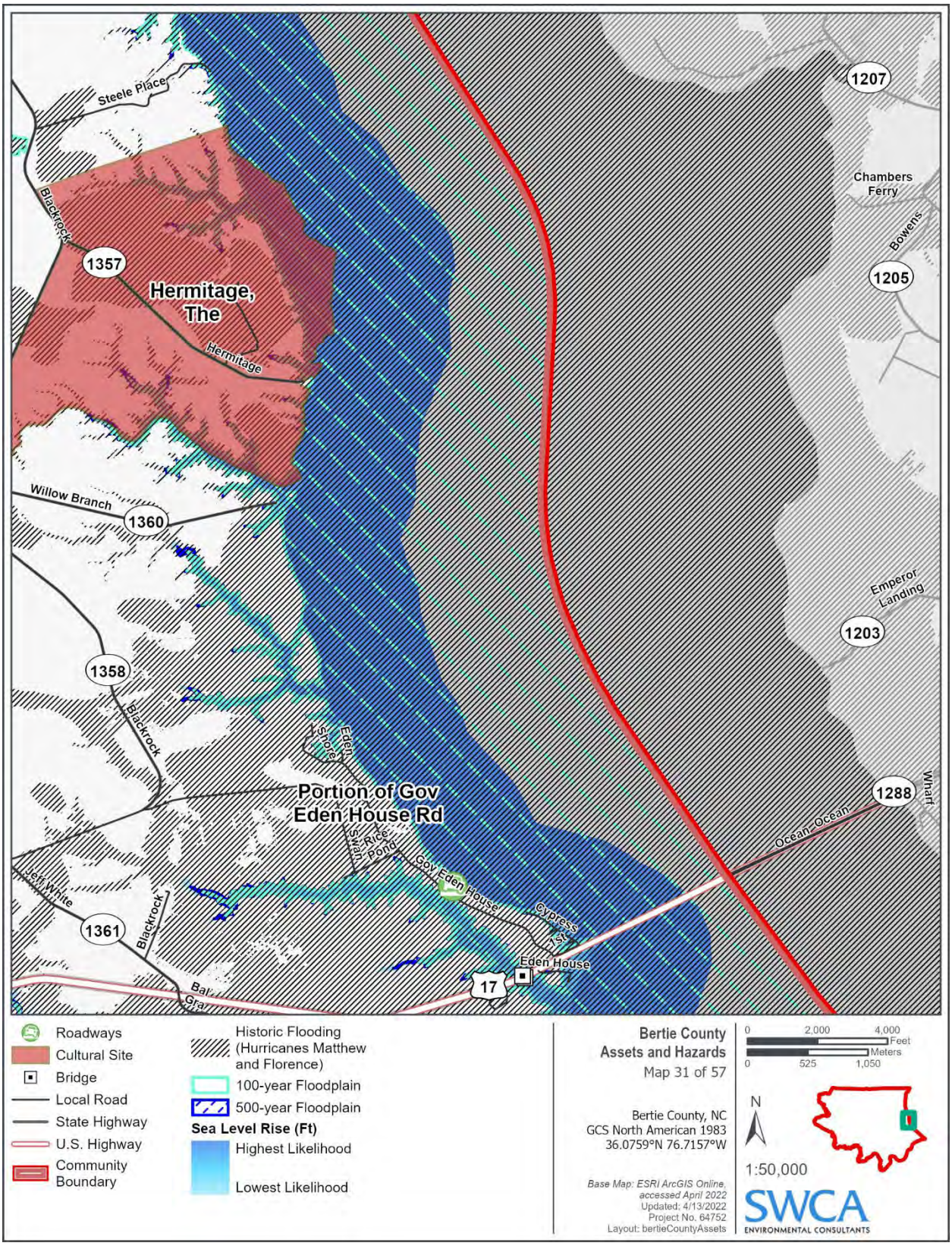

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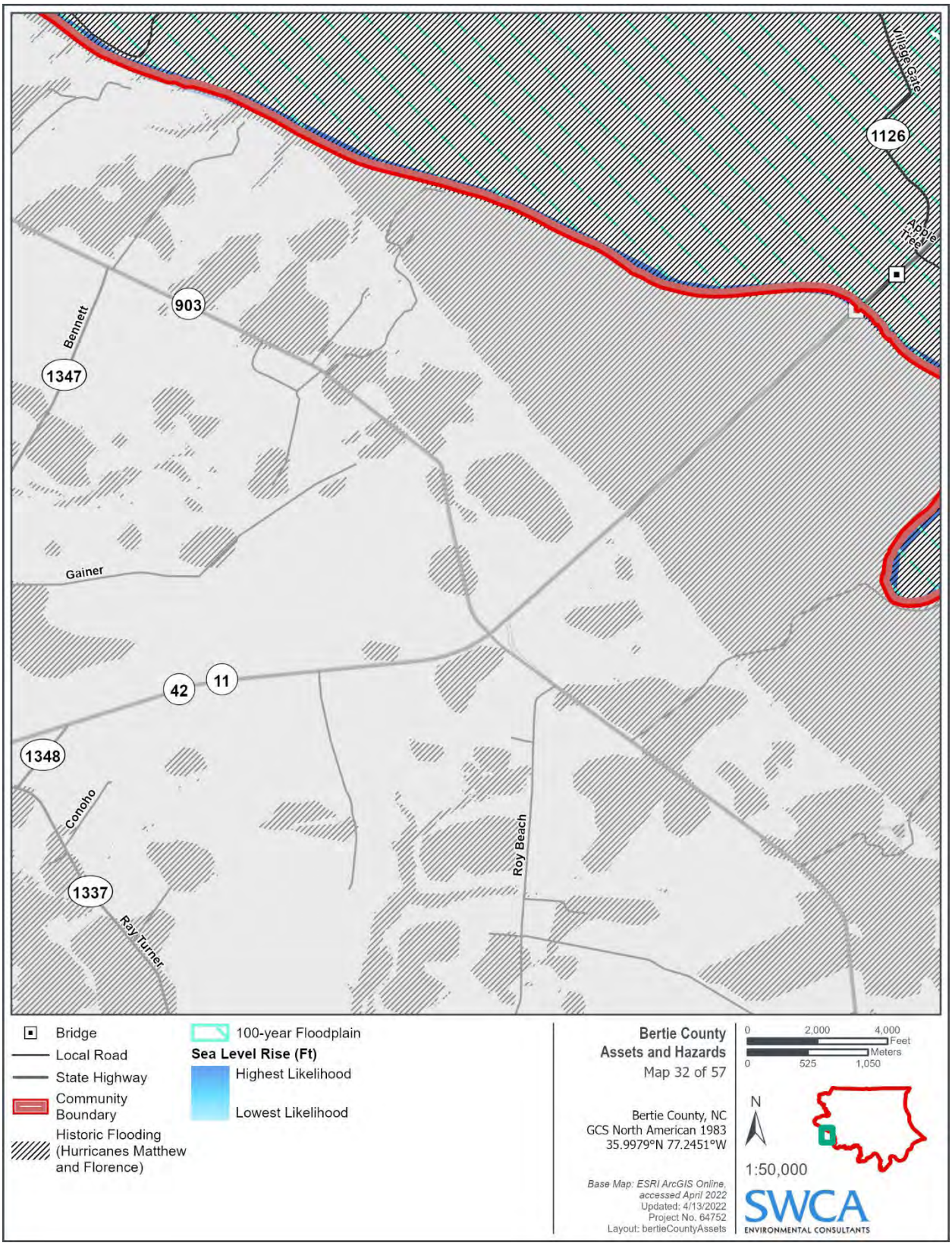

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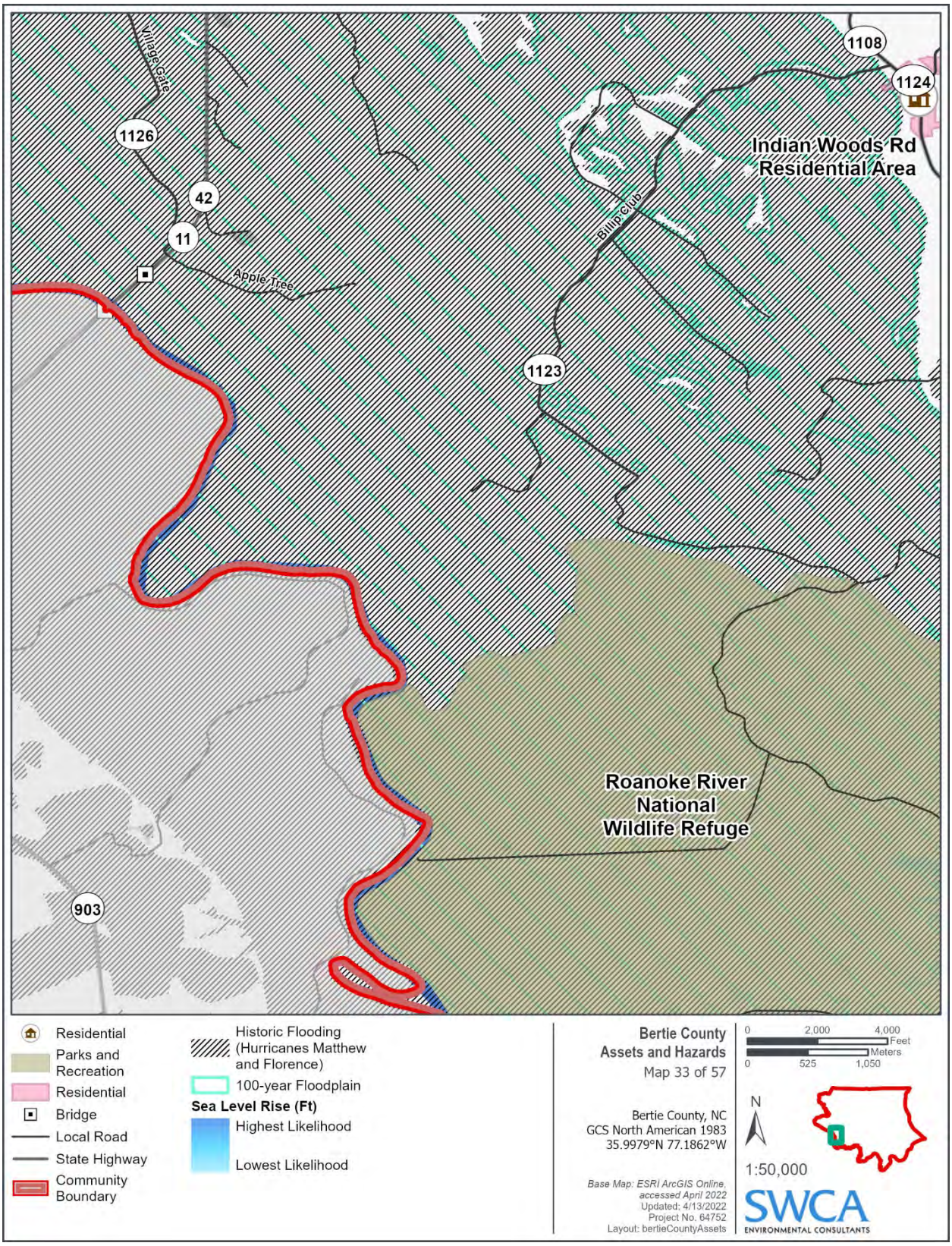

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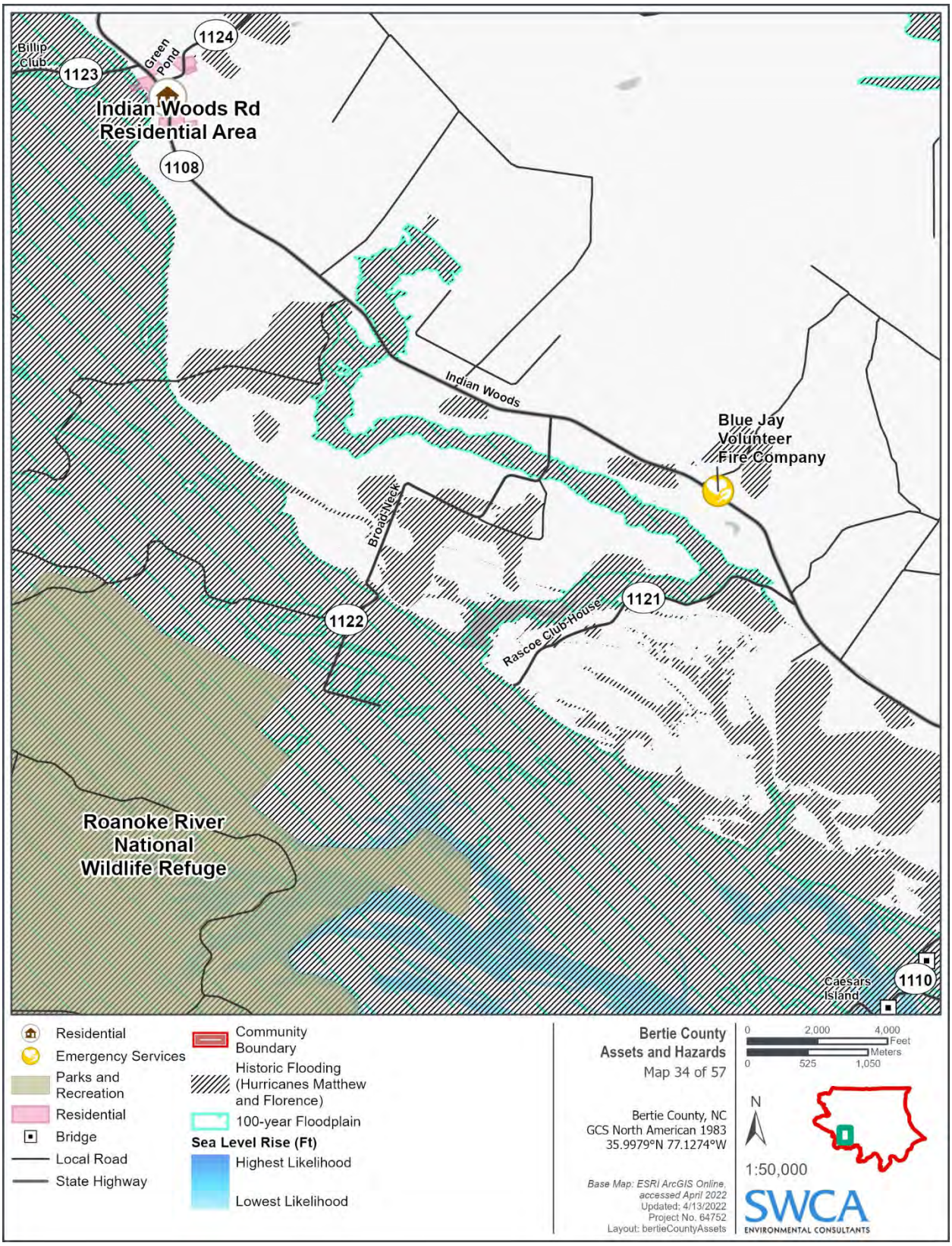

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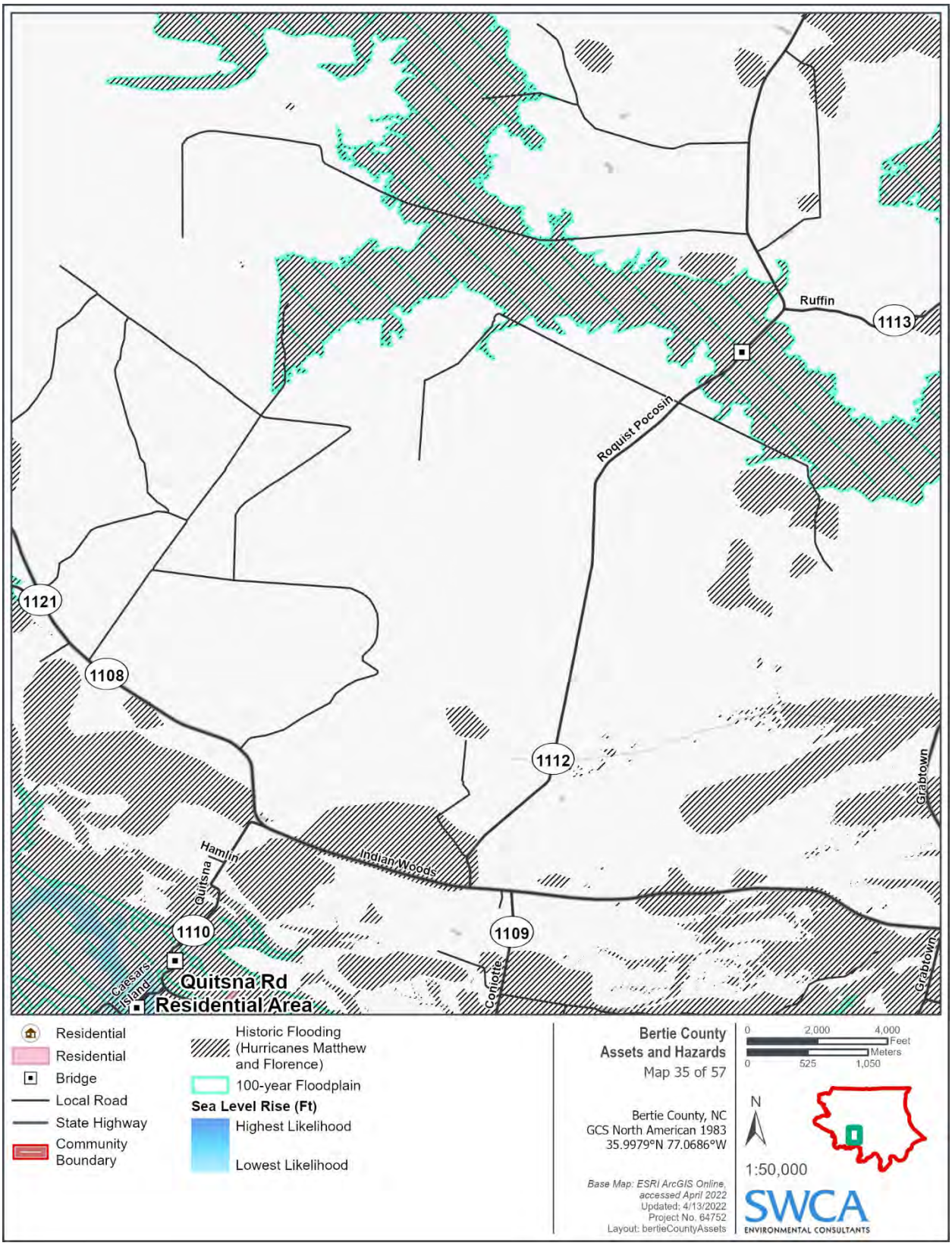

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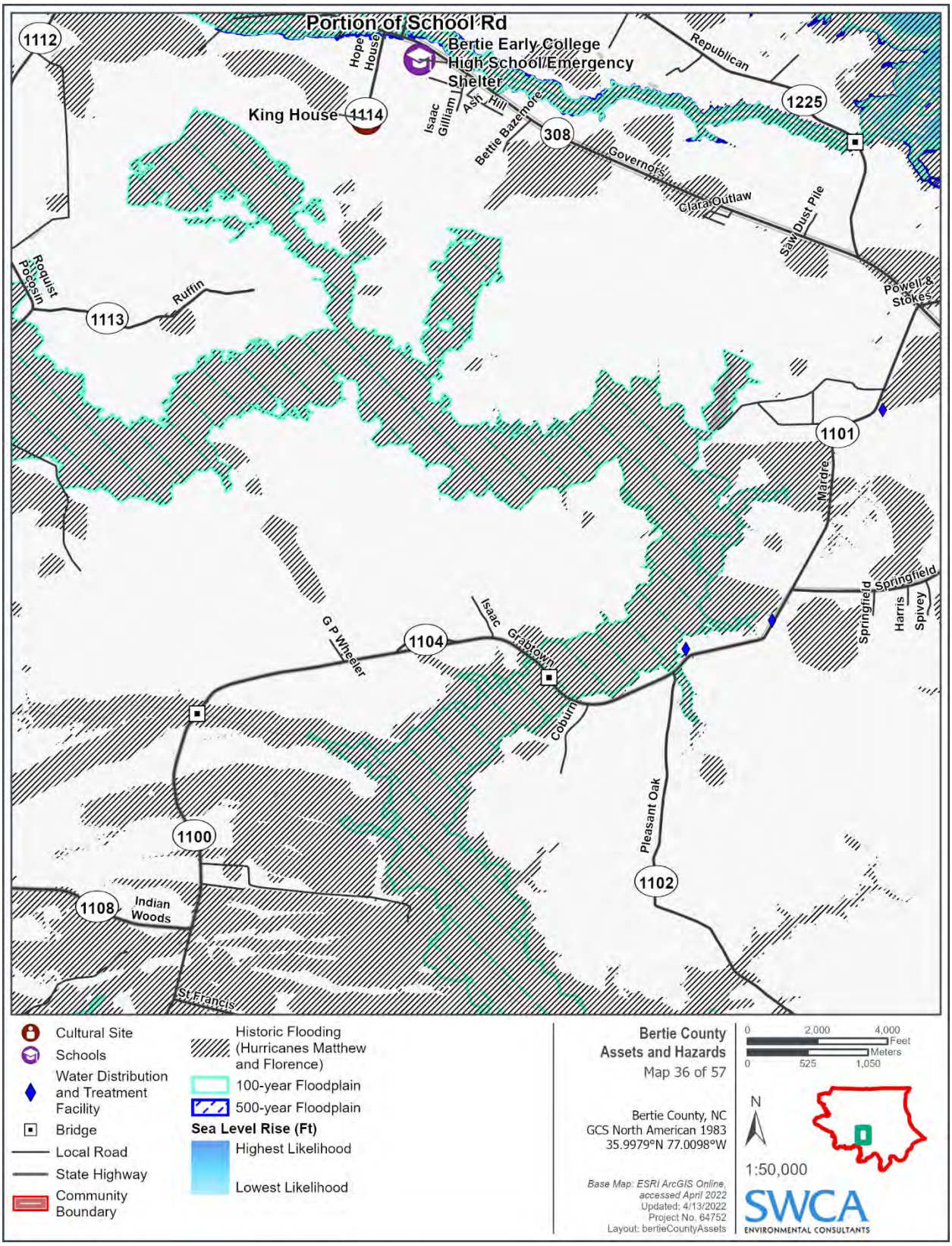

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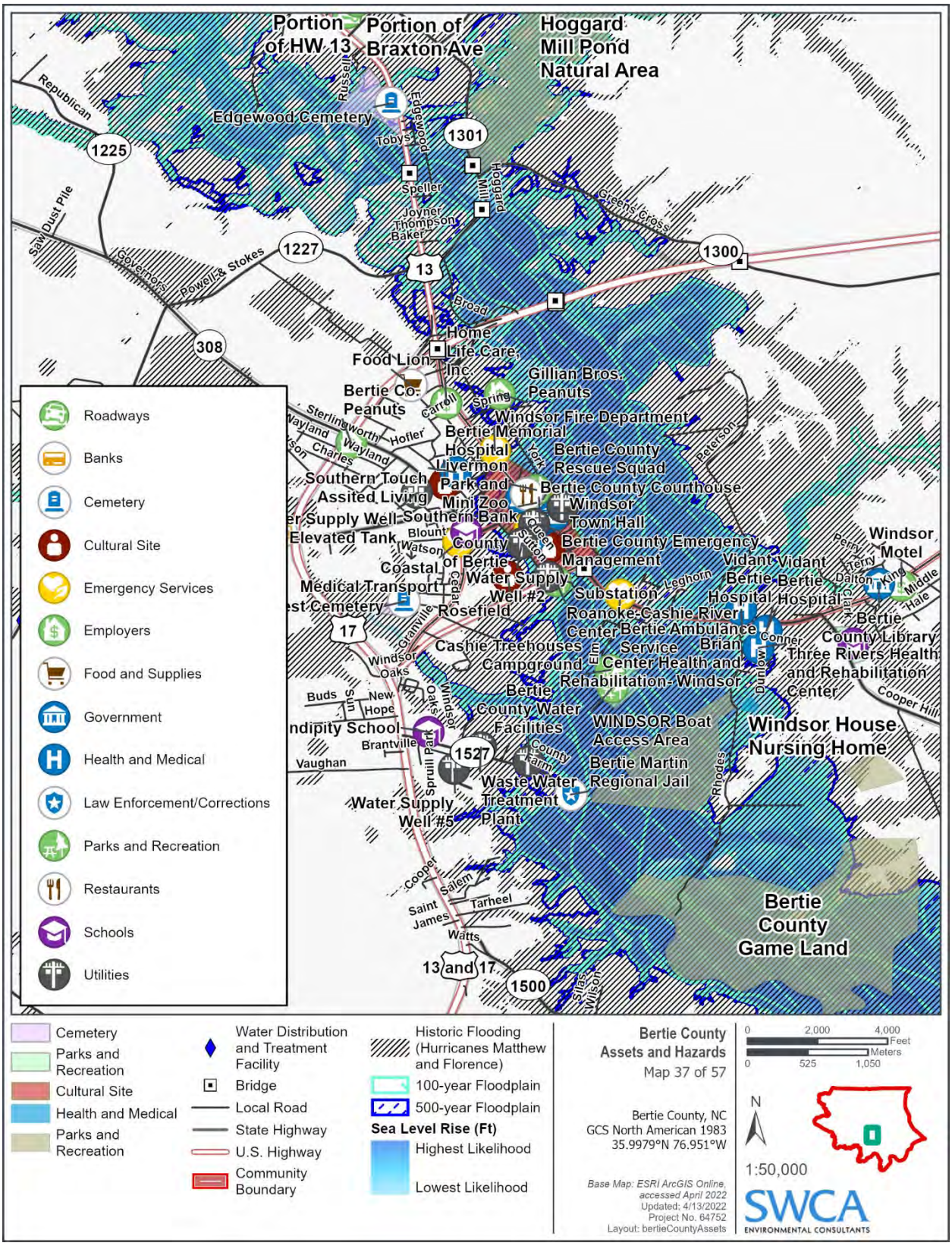

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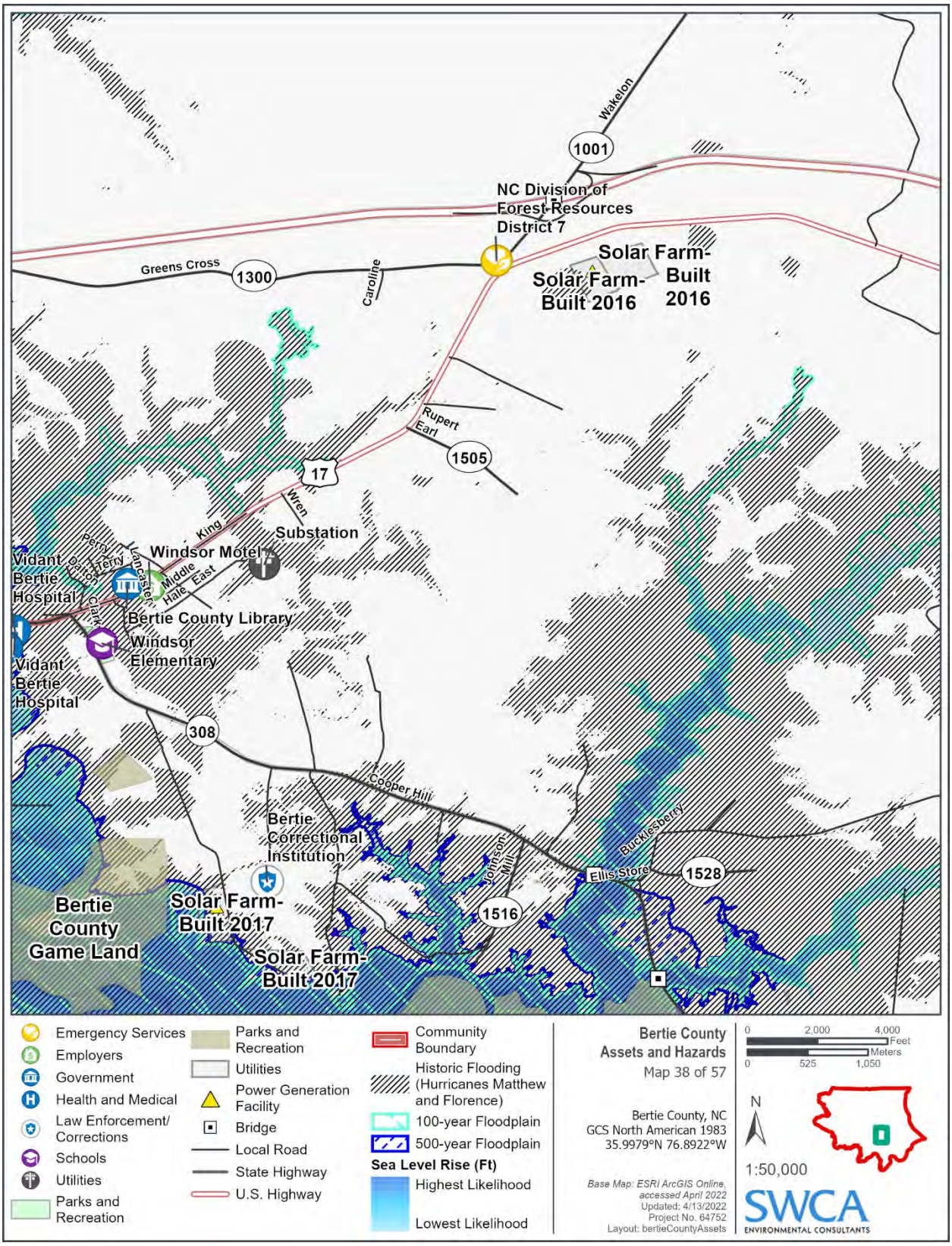

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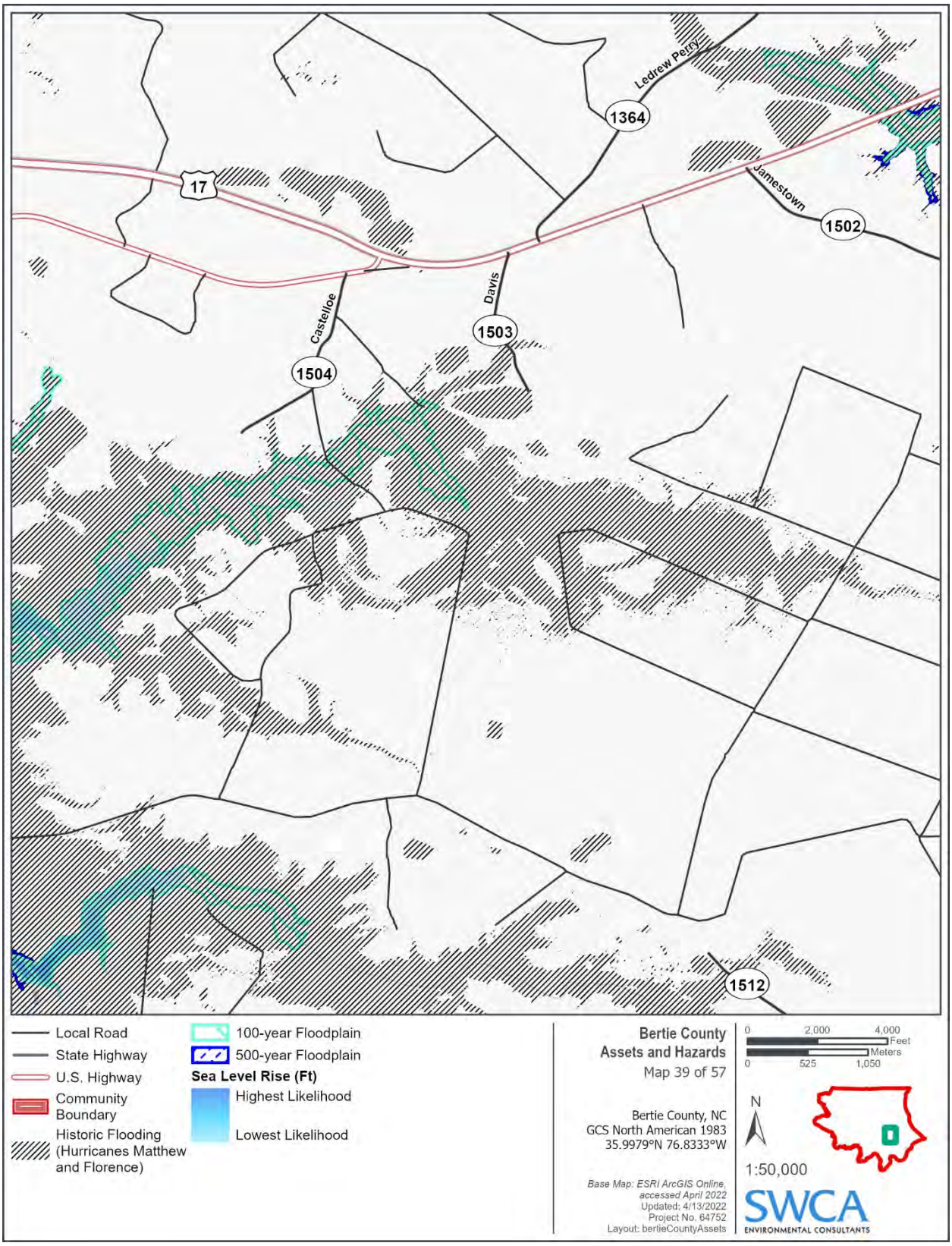

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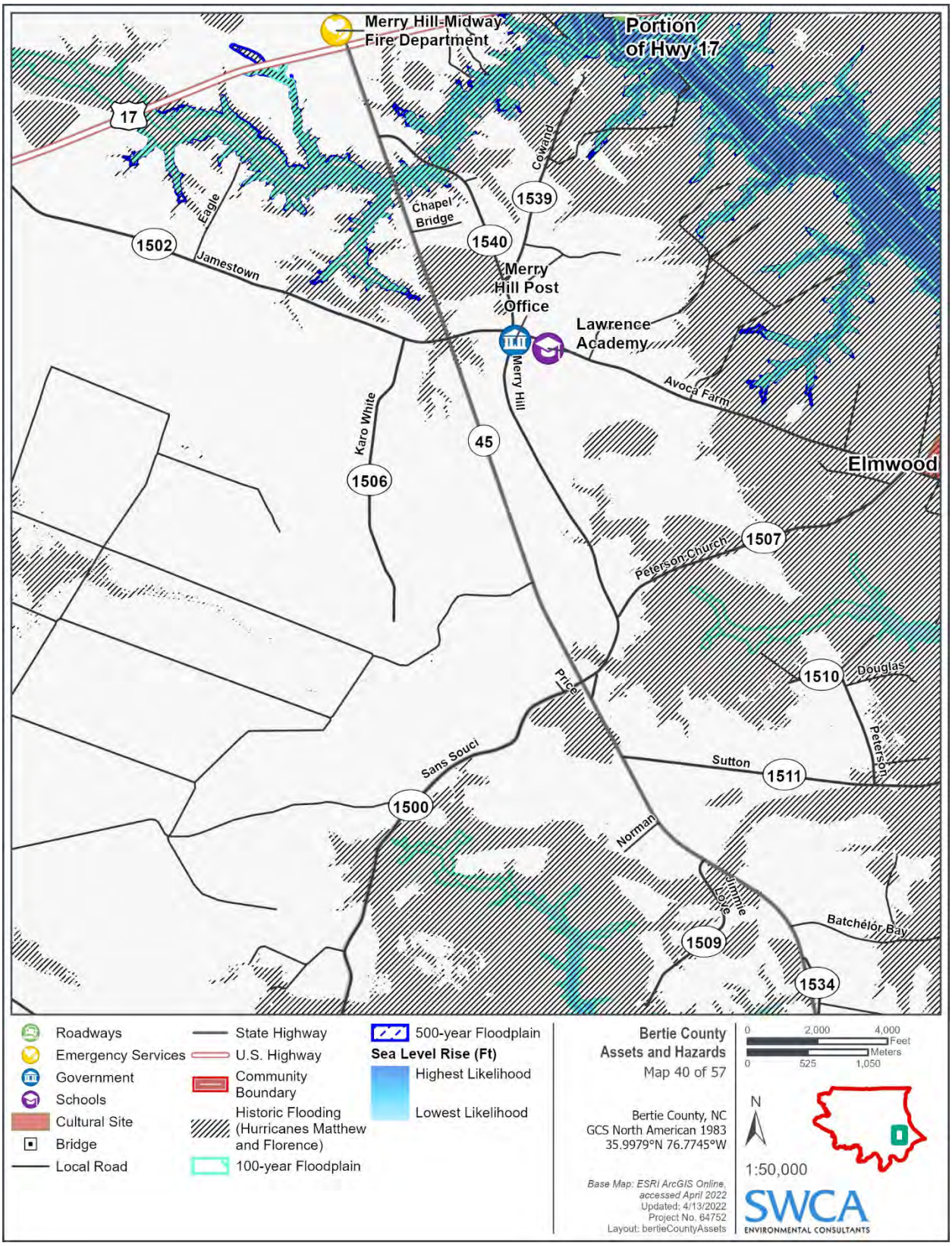

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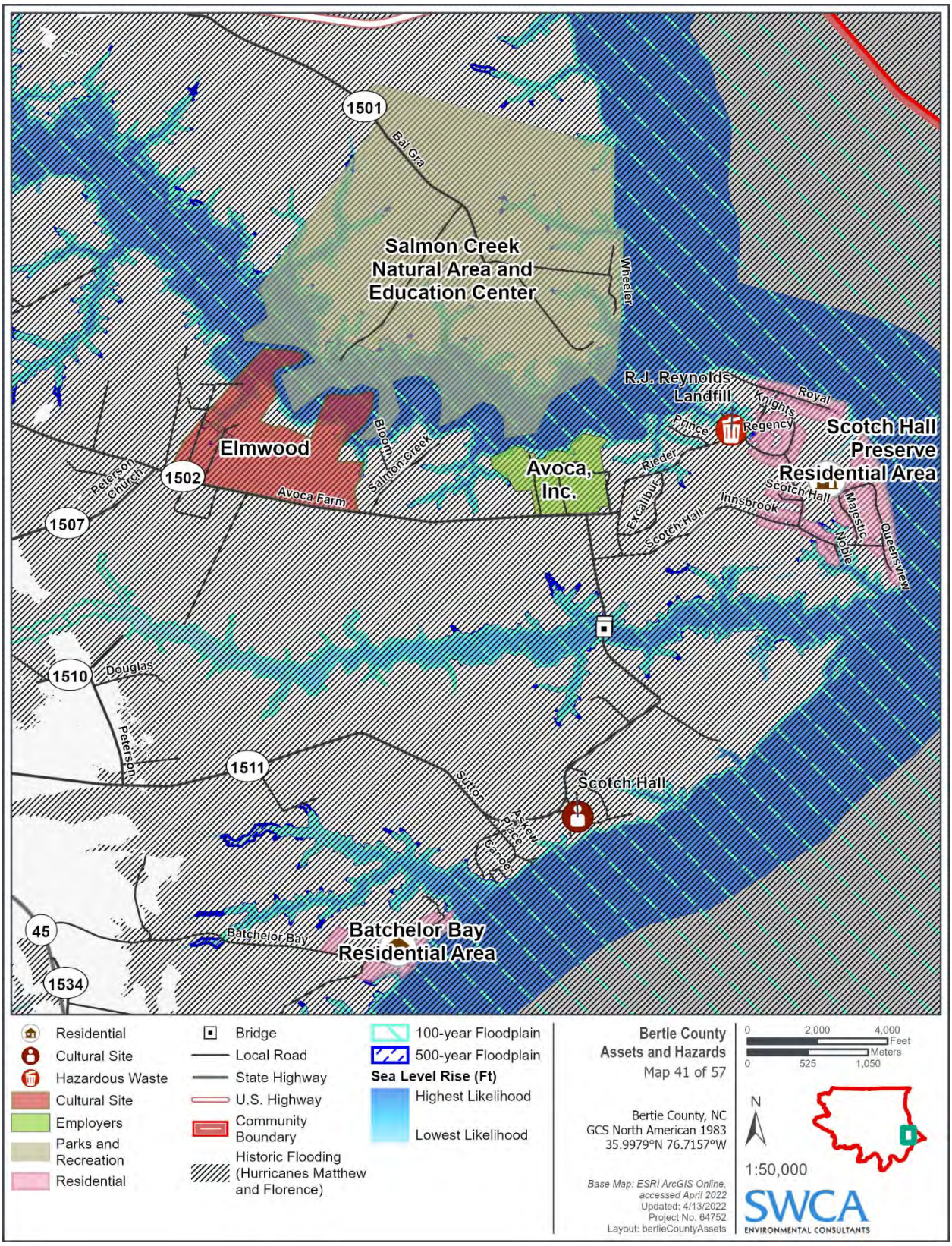

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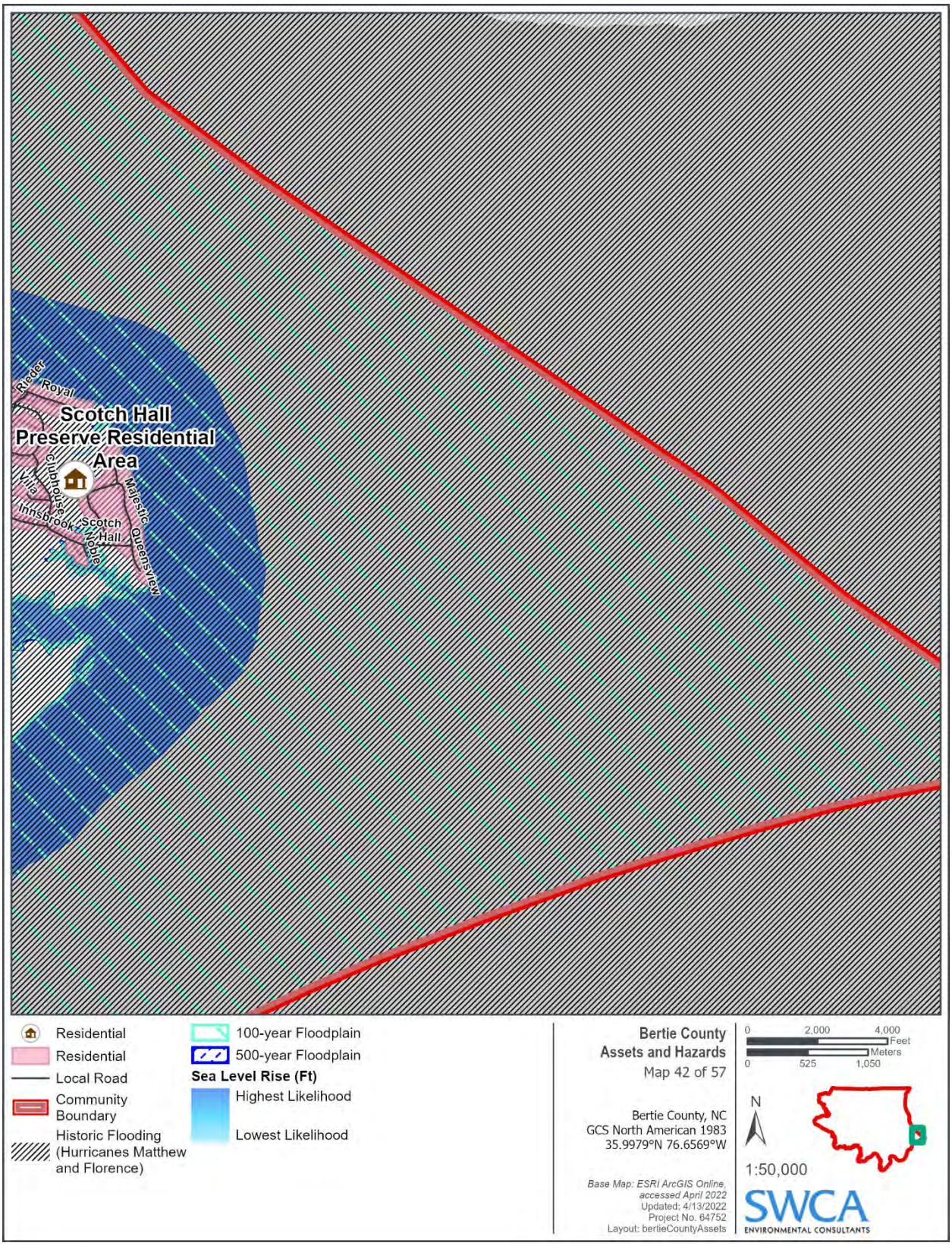

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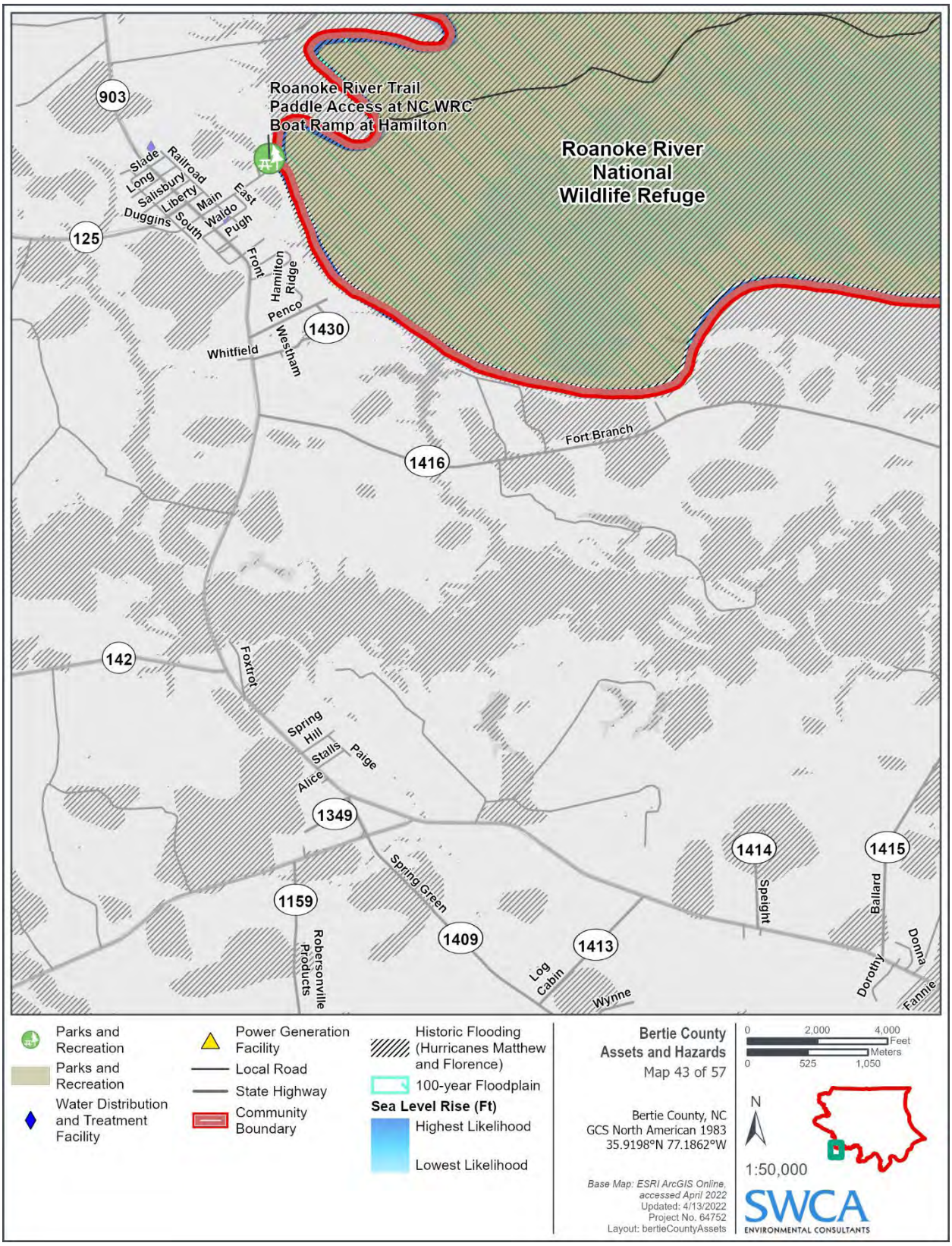

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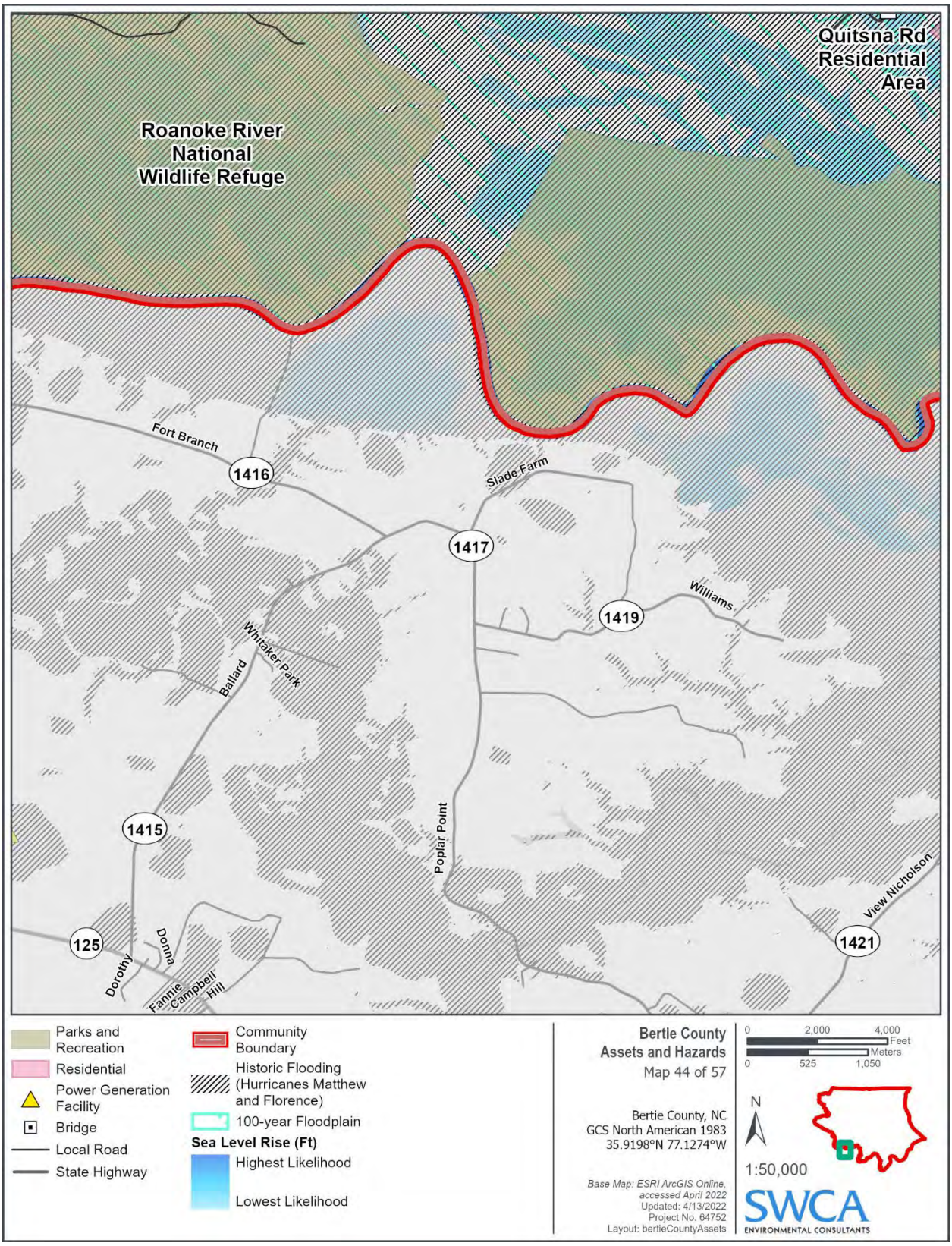
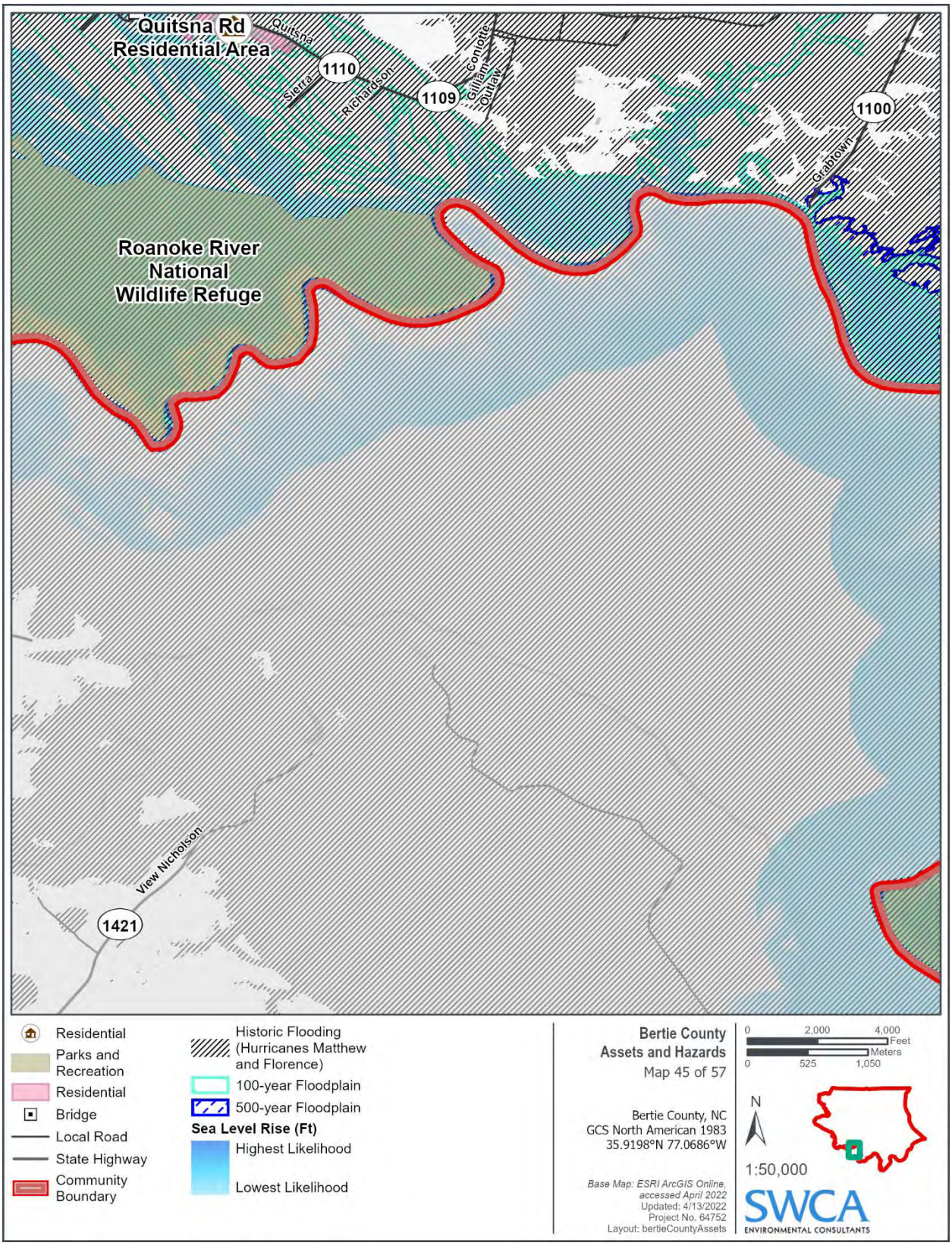


Figure F-44. Detail map of assets and hazards, keys to Figure 7.



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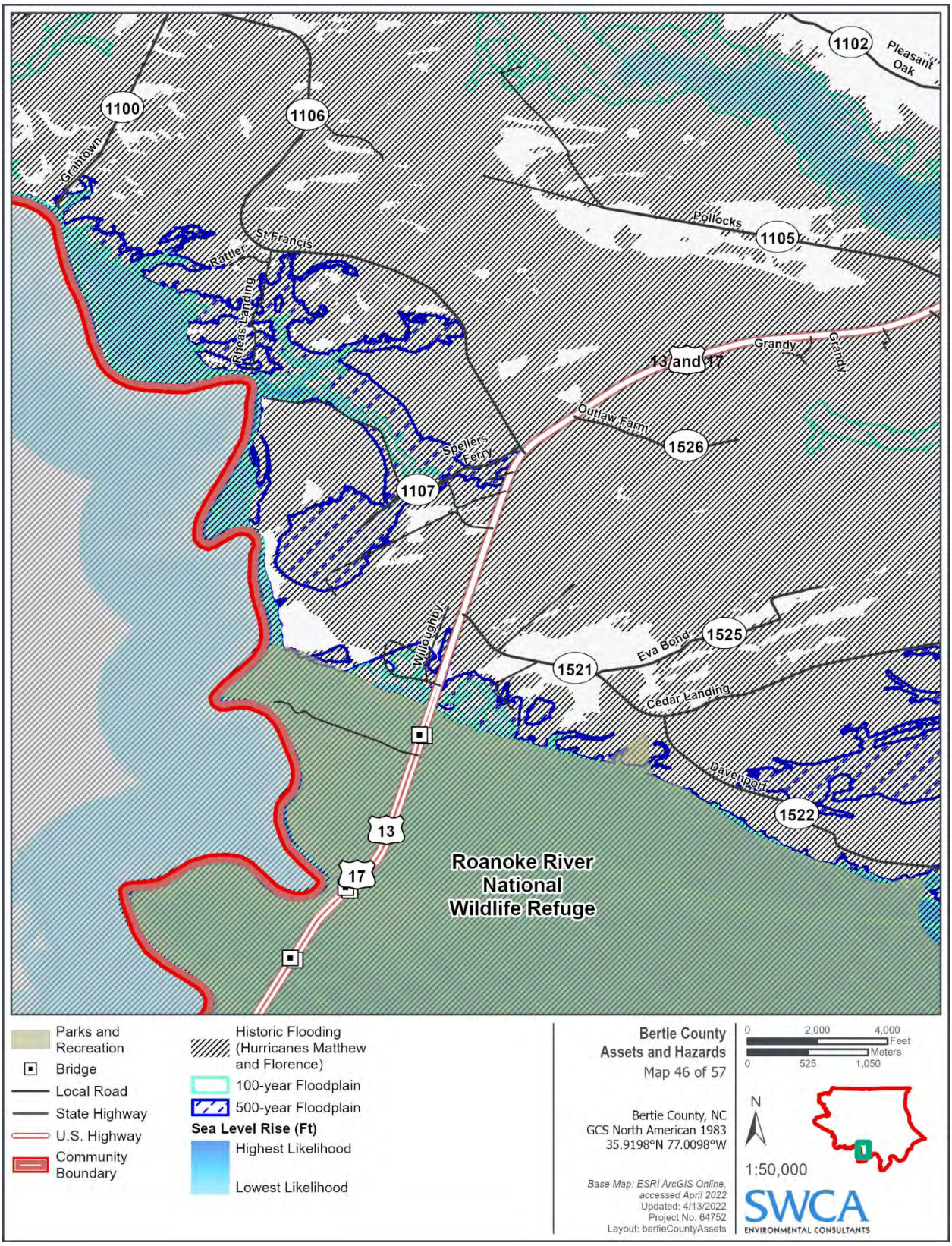

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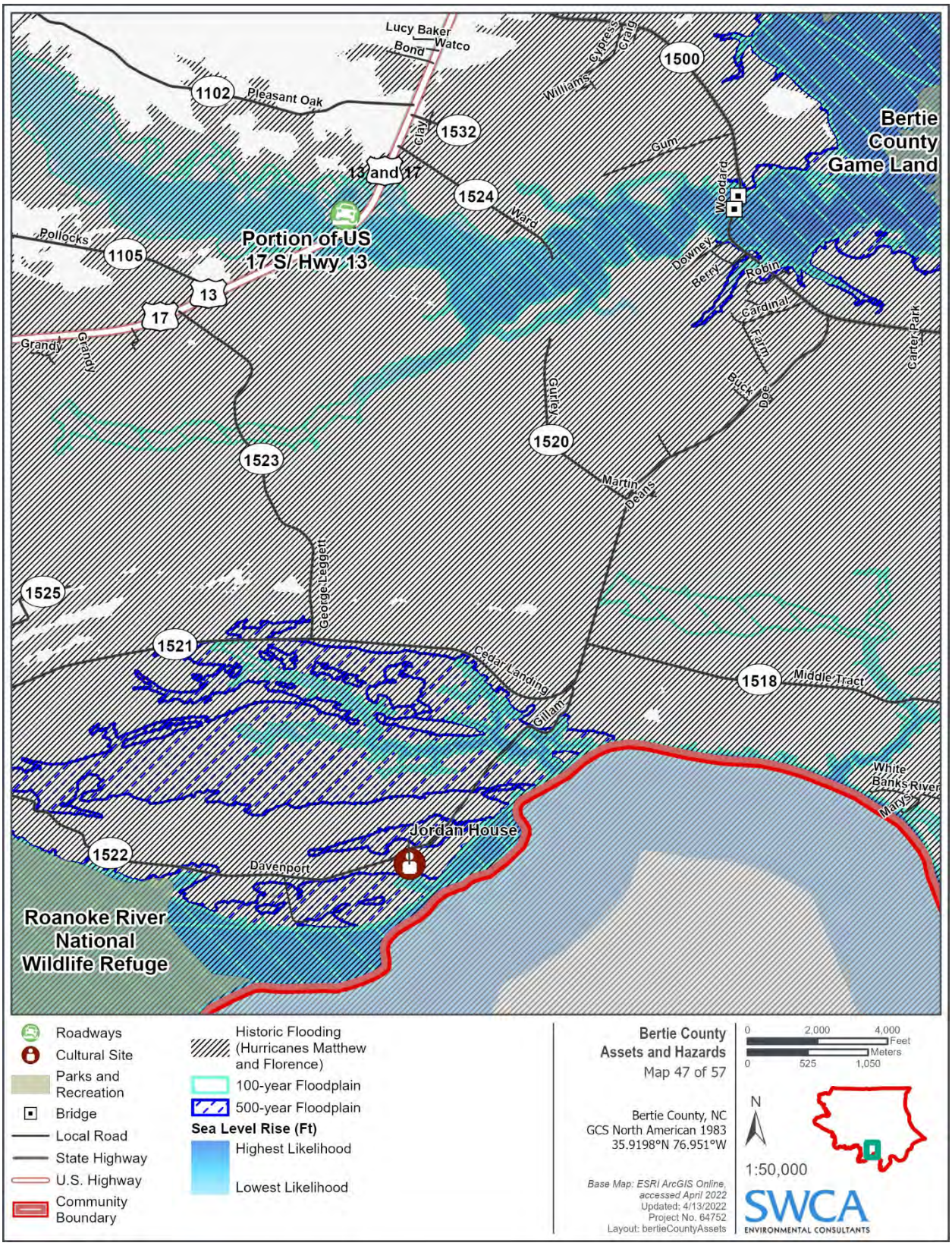

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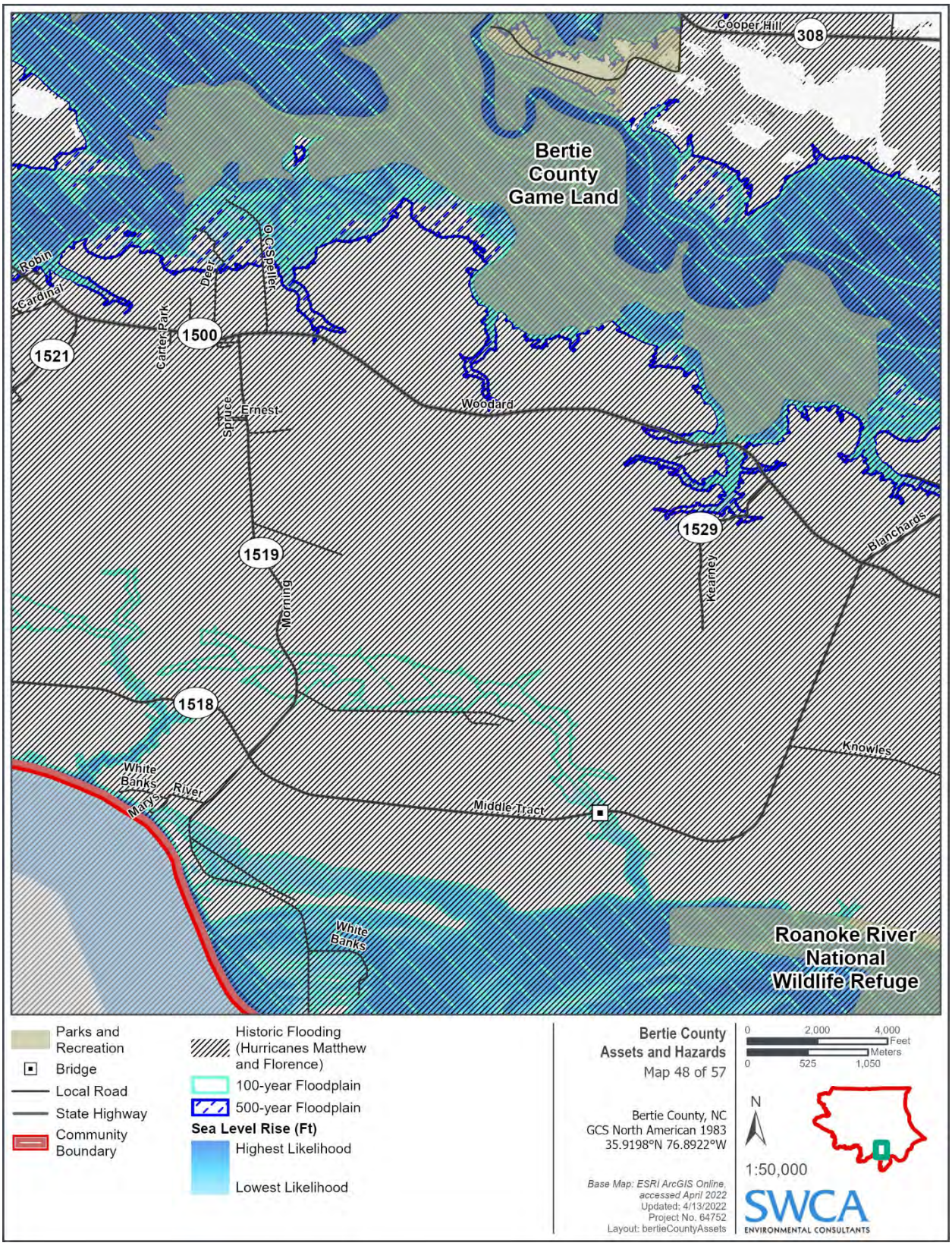

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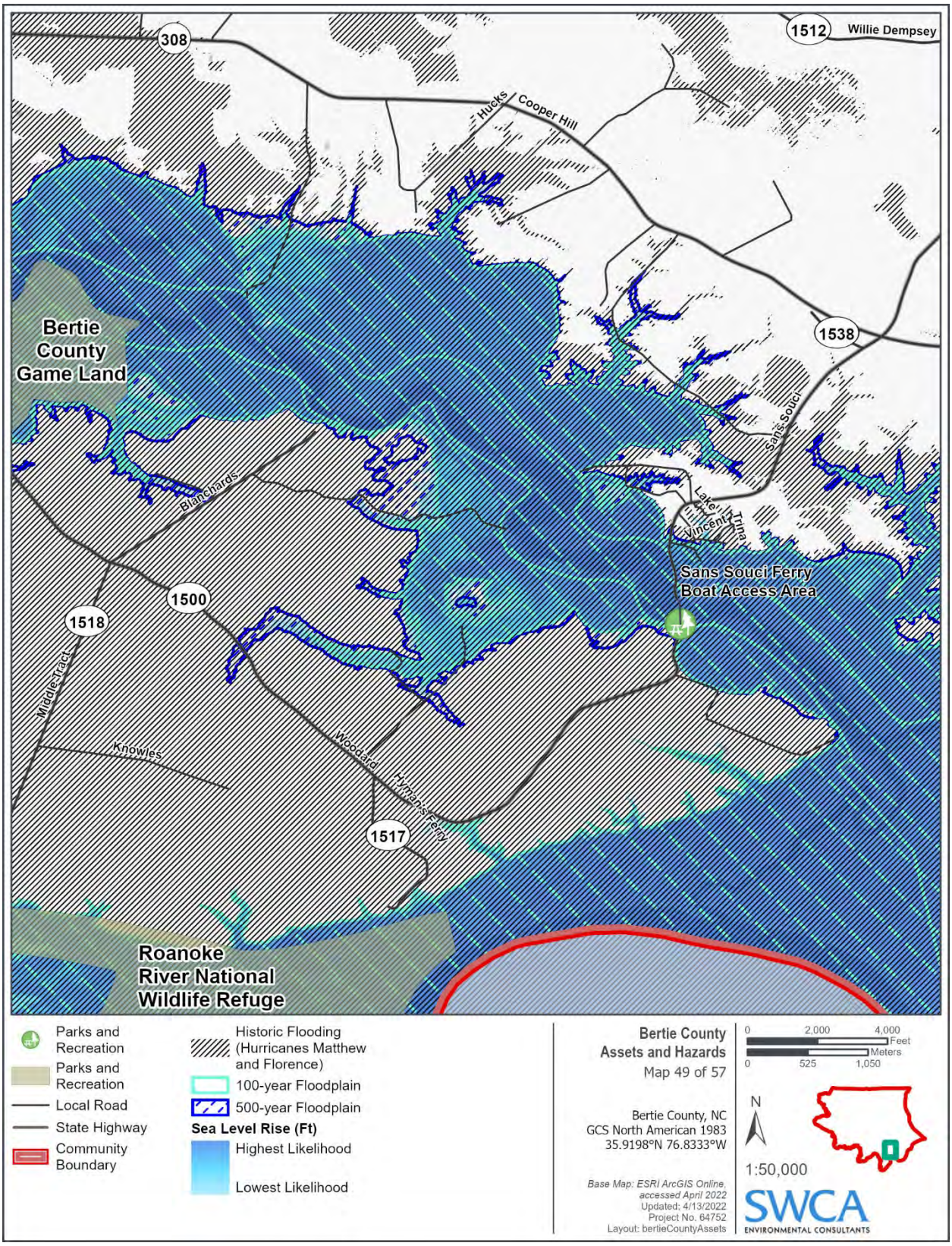

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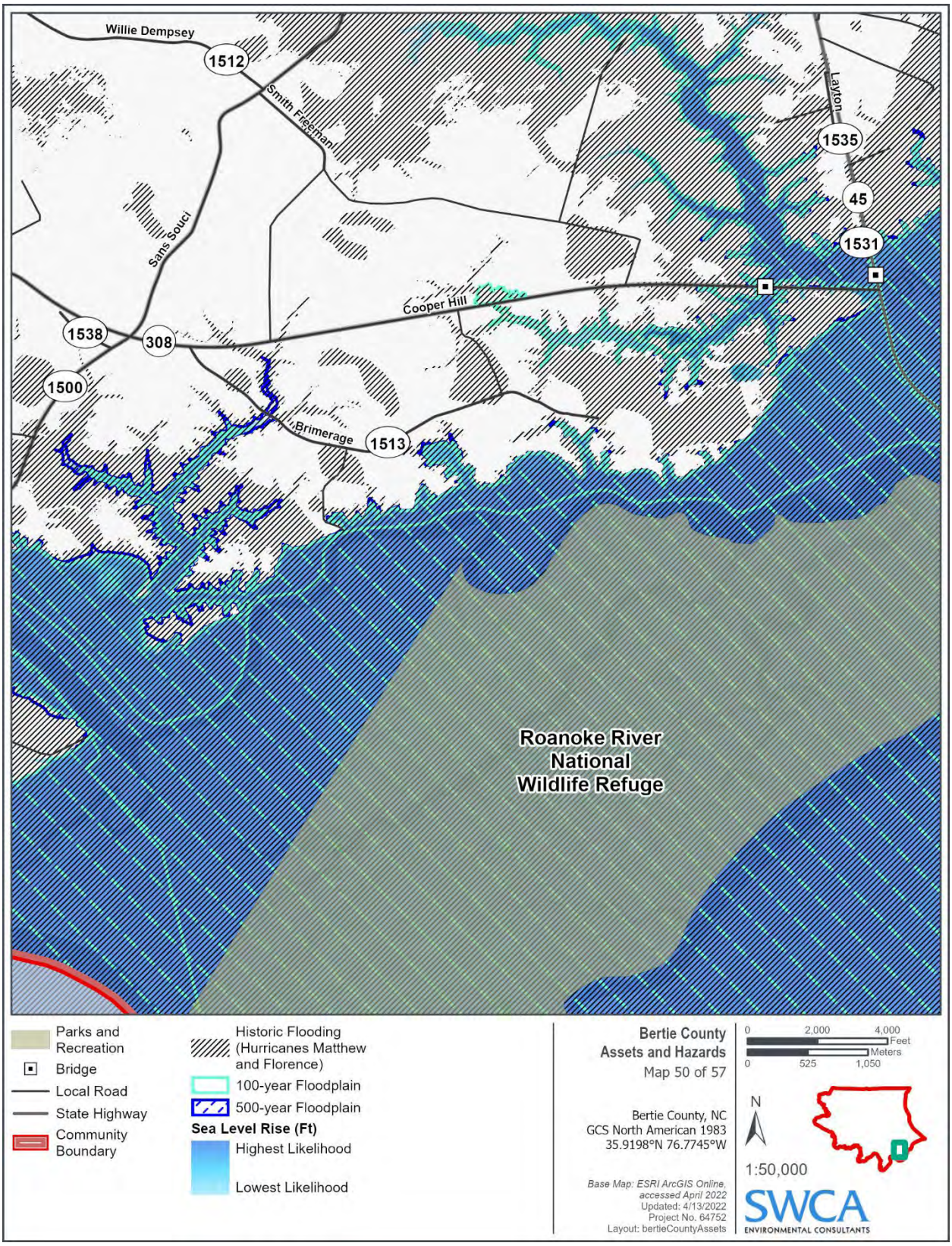

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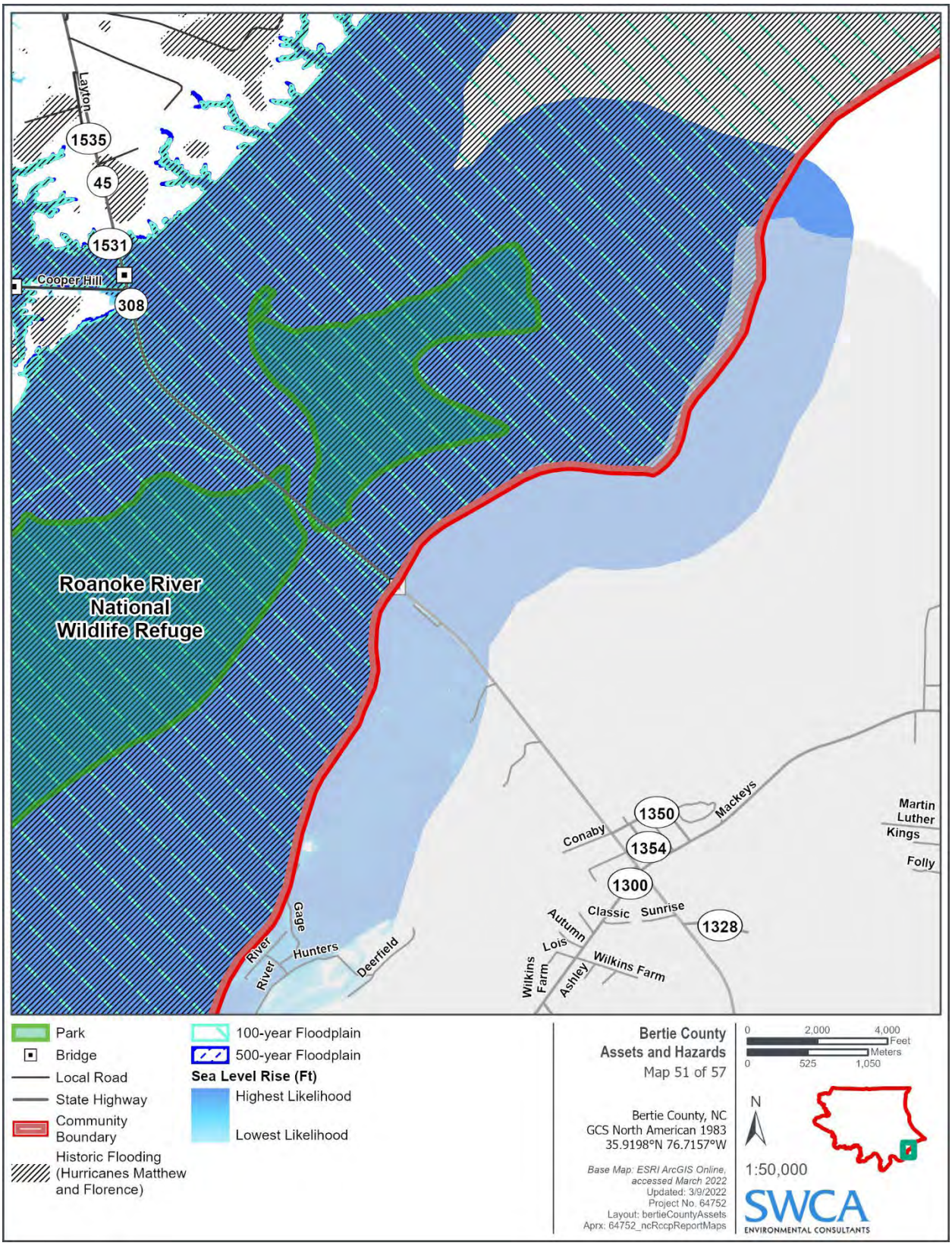

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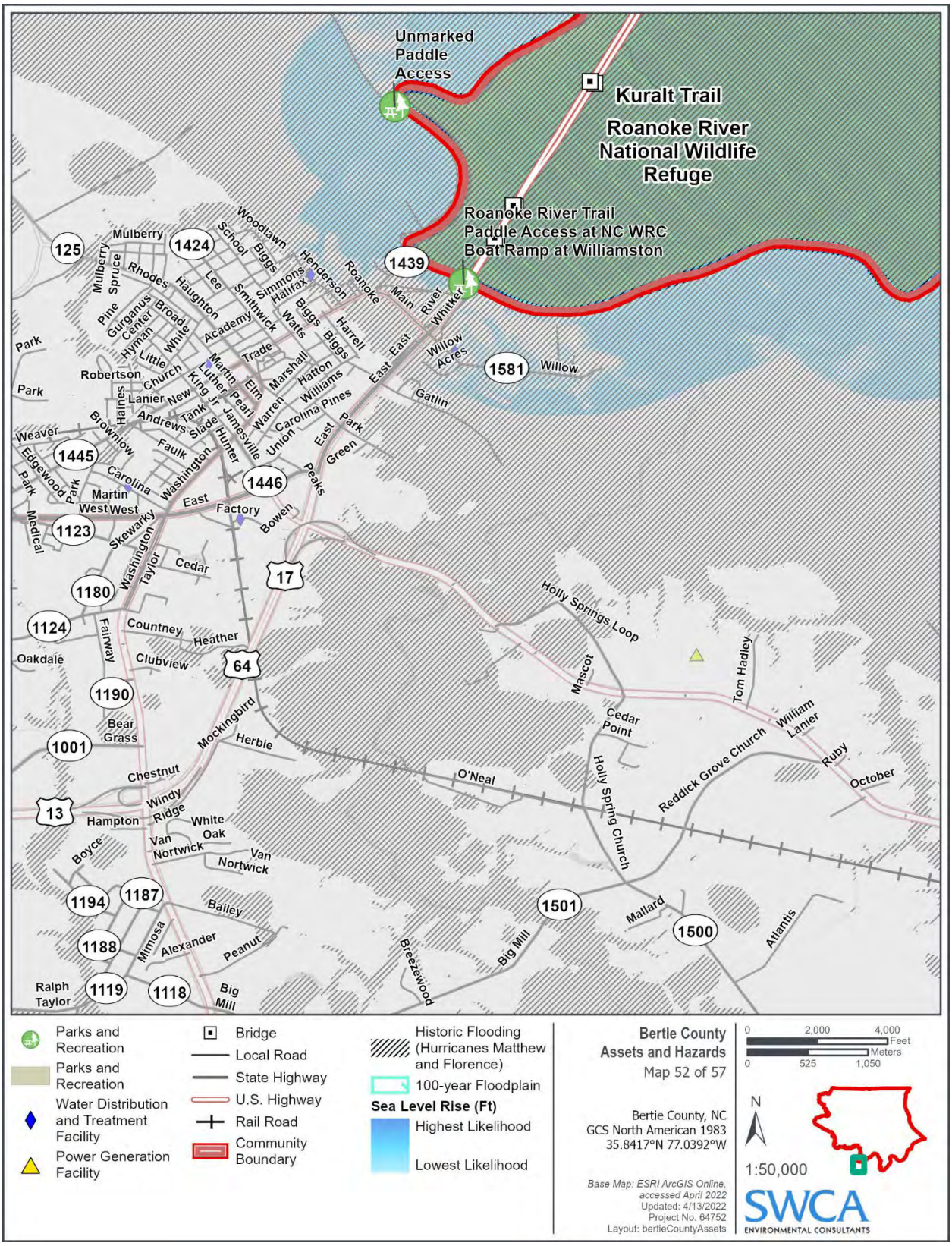

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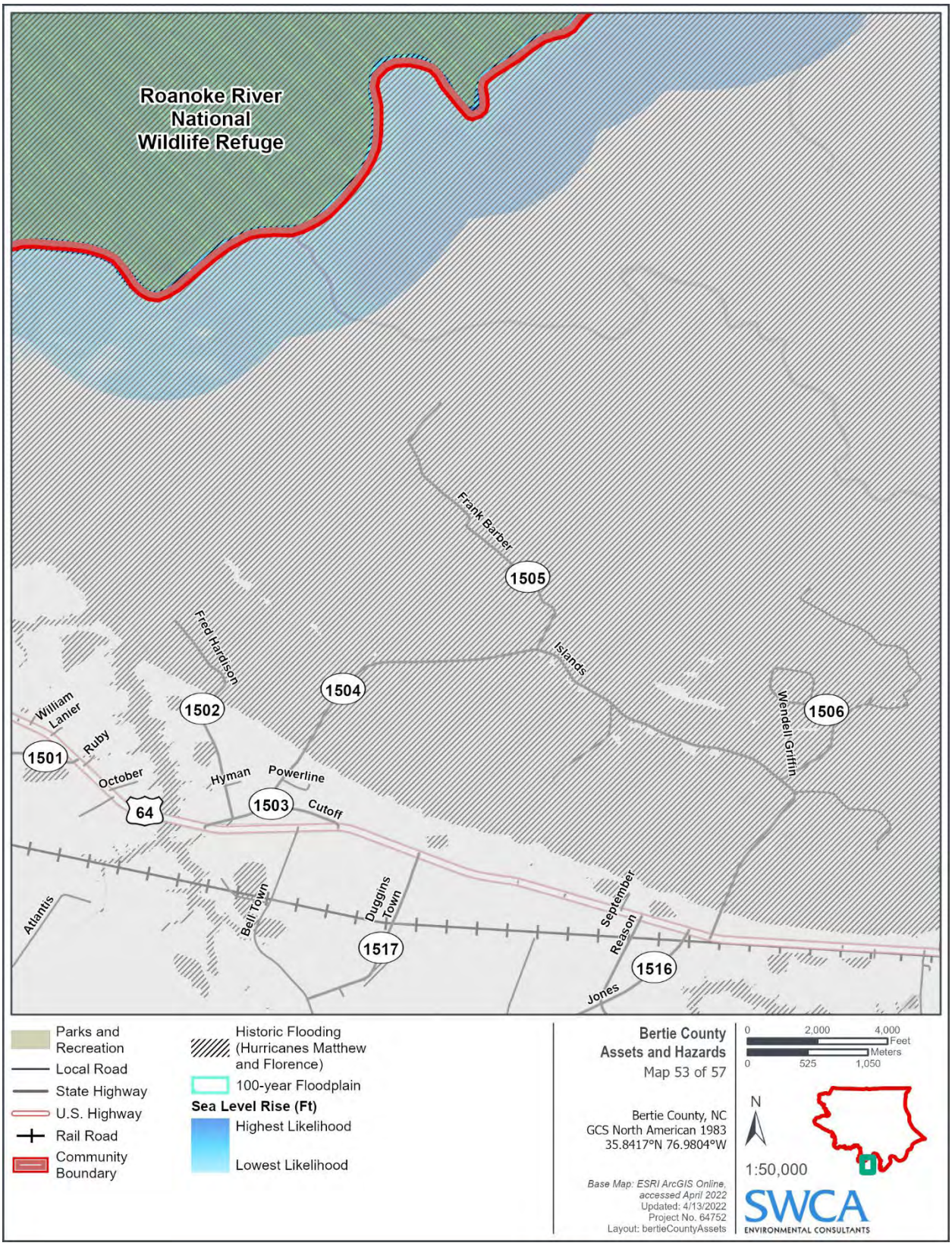


Figure F-53. Detail map of assets and hazards, keys to Figure 7.

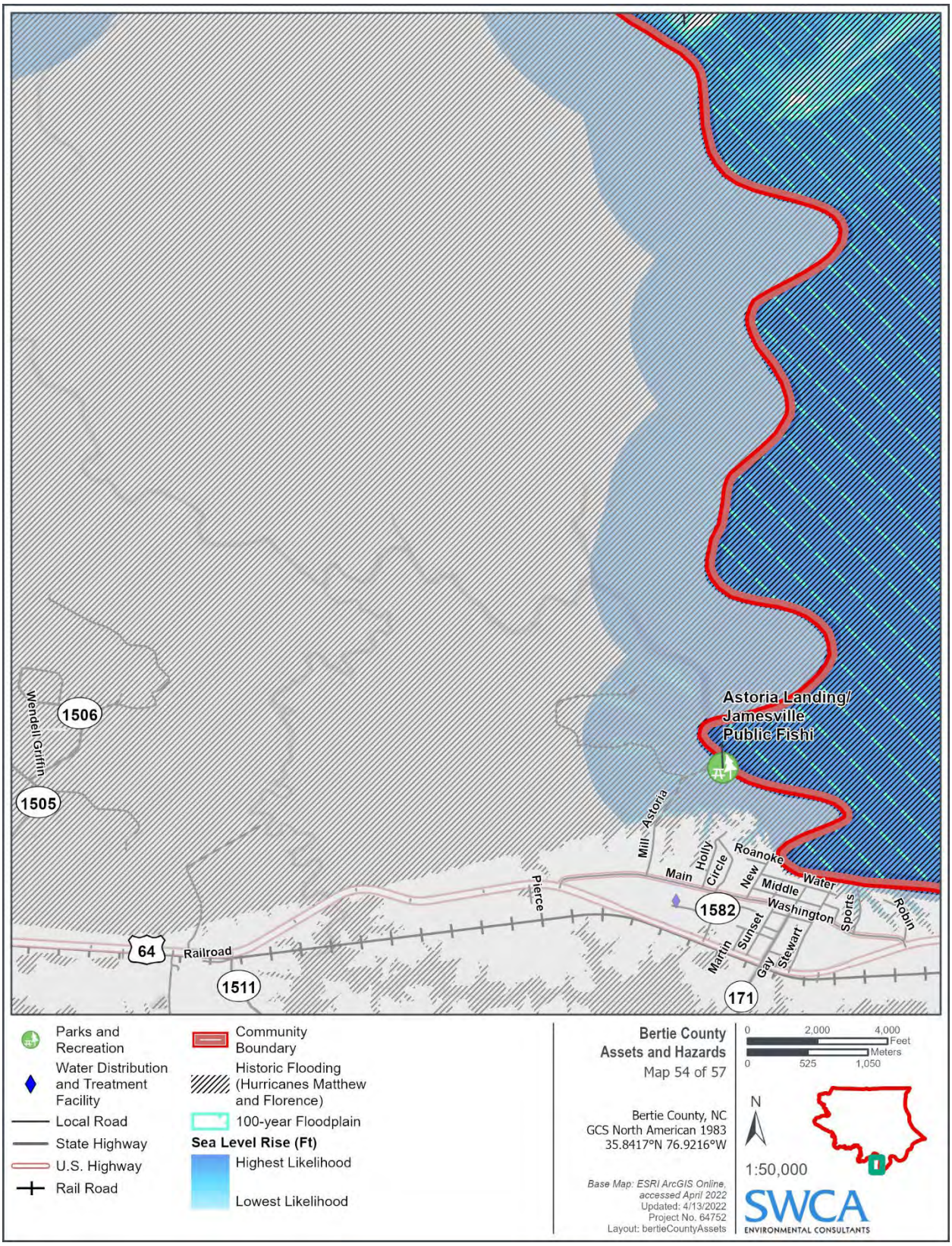
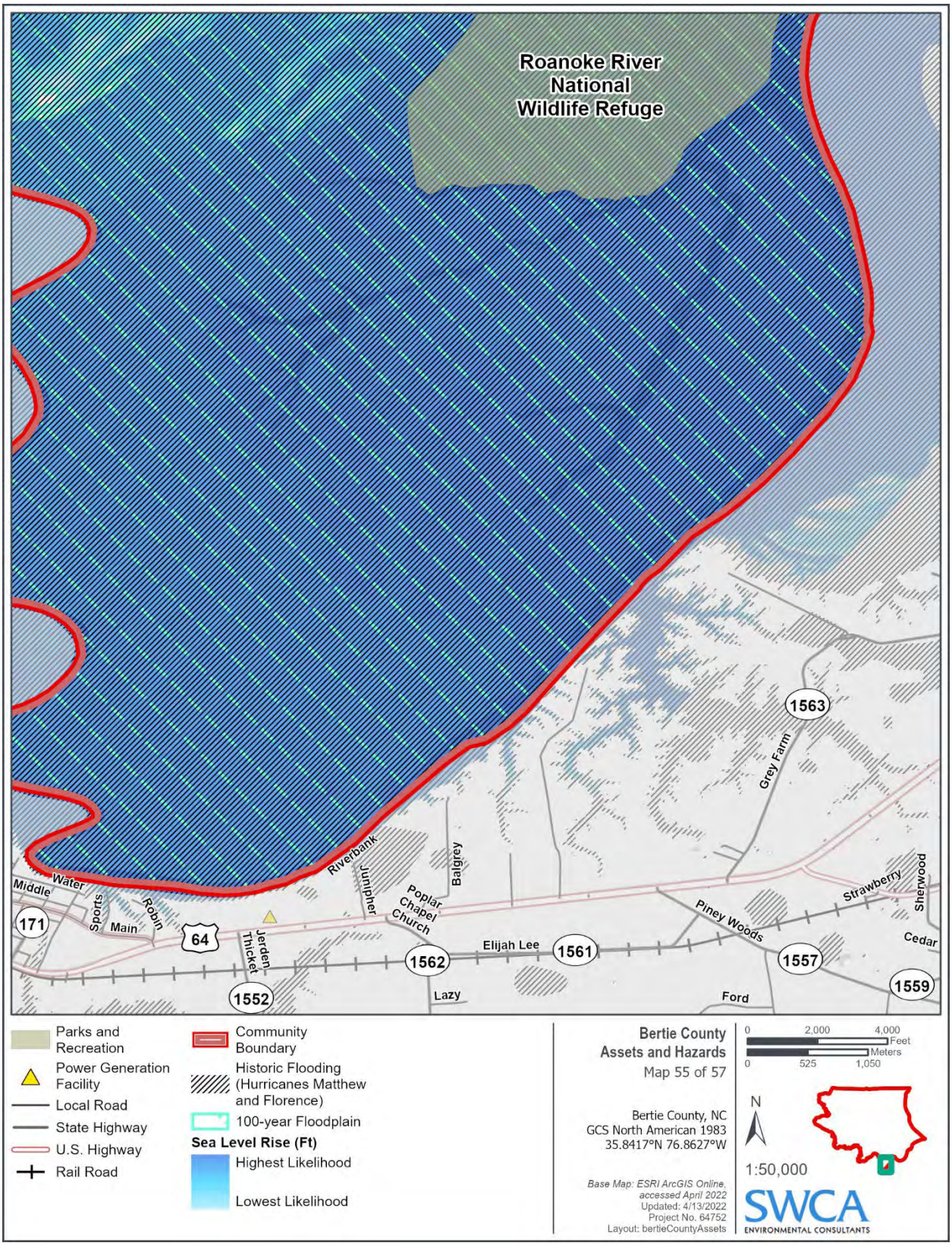


Figure F-54. Detail map of assets and hazards, keys to Figure 7.



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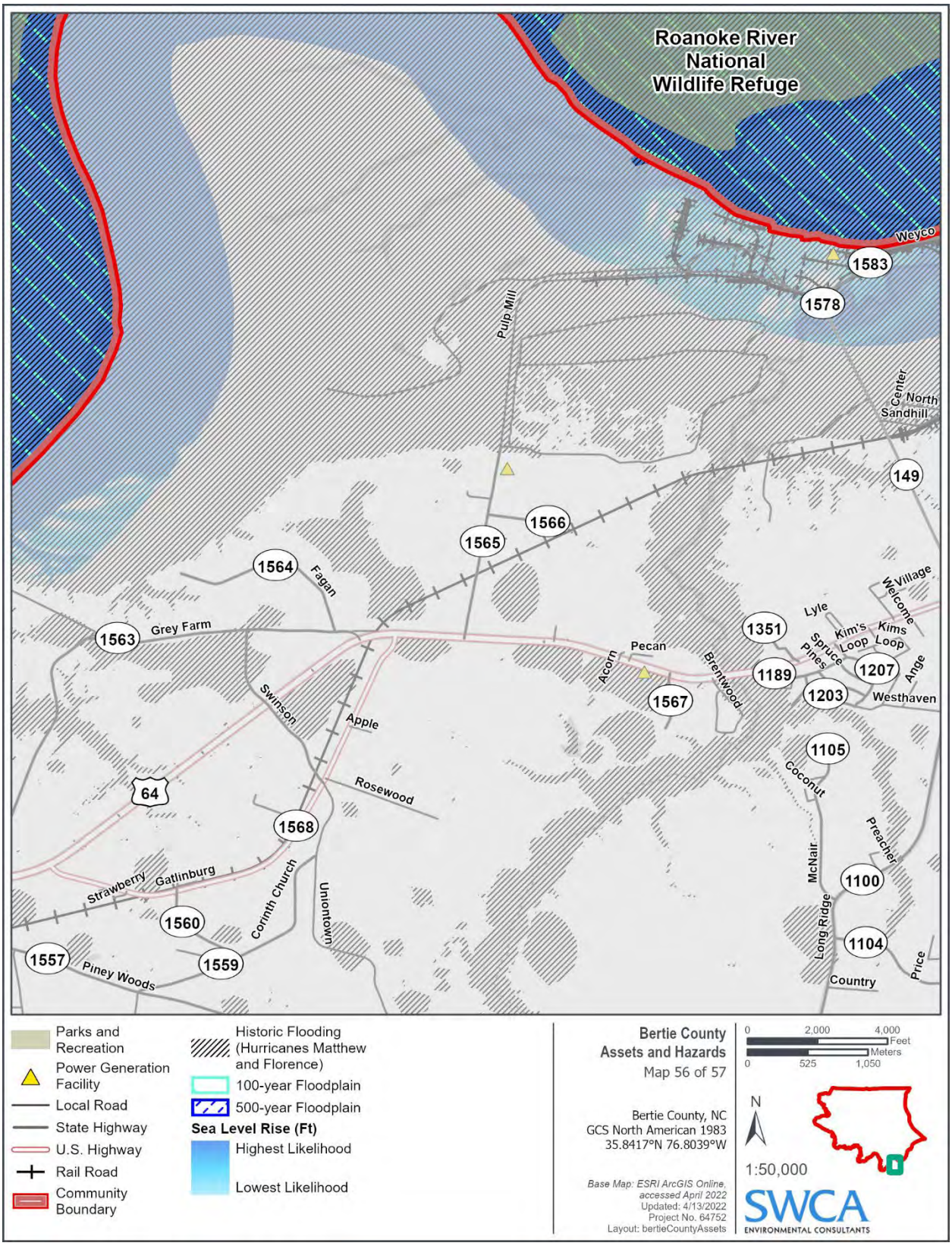

Figure F-56. Detail map of assets and hazards, keys to Figure 7.

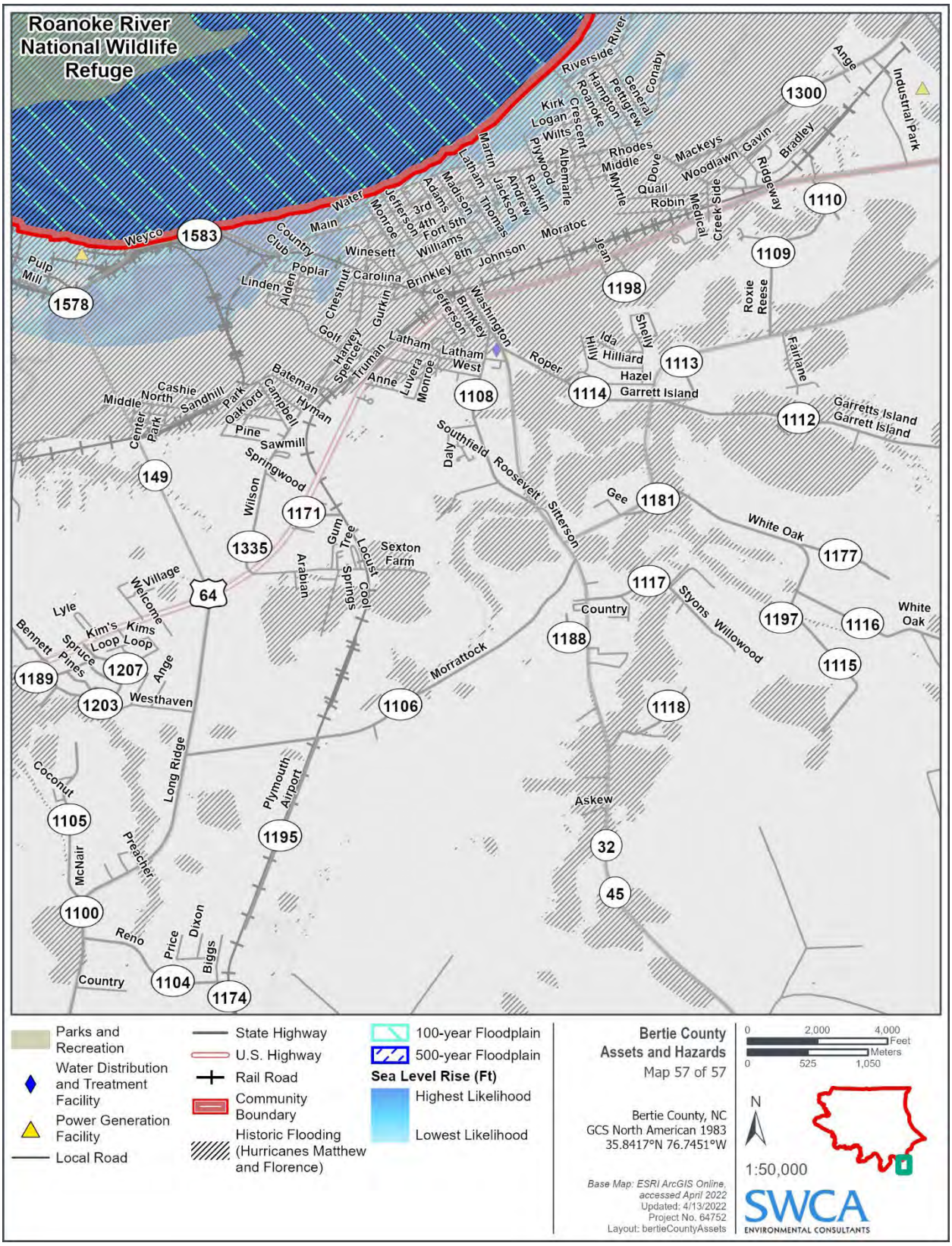

Figure F-57. Detail map of assets and hazards, keys to Figure 7.

APPENDIX G

Other Projects Considered

Table G-1. Other Projects Considered for Bertie County, North Carolina

Project Name	Project Description	Source
Develop STEM curriculum	Regional schools should integrate the coastal landscape, hydrology, climate change, and cultural history of the unique northeastern North Carolina coastal region.	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water- S.R. Riggs)
Public workshops for long-term flood management program	Increase the understanding of interrelationships between the basics of coastal system science, healthy resource systems, and high-quality, sustainable economics by providing workshops for business, agricultural communities, and private landowners. Partner with existing extension programs and outreach programs and universities.	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water – S.R. Riggs)
Water level recorders and monitor plan for Lower Cashie River, Lower Chowan River, and Upper Albemarle Sound	Install four new and/or upgrade permanent water-level recorders and weather stations to monitor the downstream water systems relevant to the Cashie River flooding. Connect to emergency management centers. Maintain gauges and manage data.	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water – S.R. Riggs); Application to the RCCP
Countywide Emergency Warning System	Seven flood gauges and seven weather stations at key locations around Bertie County to increase county awareness of environmental conditions. Data can be used by EMS officials, schools, state agencies, and other organizations. System will provide a more complete warning system for impending storm events and allow county personnel to deploy to strategic locations more effectively.	Hurricane Matthew Resilient Redevelopment Plan – Bertie County
Modern and Historic Storm Data	Mine historical storm data for the Bertie region from pre-existing sources including the U.S. Geological Survey, NOAA, USDA, Library of Congress, NC Archives and History.	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water – S.R. Riggs)
Roanoke Floodplain Geo-Zone Plan	Geo-zone Plan with recommended policies for land use practices in flood-prone lands (reclaiming flooded ag fields, conservation easements, recreation); update dam discharge policies factoring in geomorphology.	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water – S.R. Riggs)
Establish policies and organizational oversight	Policies and organizational oversight structures that will 1) protect the resource, 2) preserve the ecosystem function, 3) prepare the resource for utilization as a key part of a sustainable eco-tourism destination, and 4) partner with key land trusts, government agencies, and non-profits to help build the “Bertie Water Crescent” (the 4 P’s)	Flood Dynamics in the Bertie Water Crescent (North Carolina Land of Water – S.R. Riggs)
Community Rating System participation	Consider participating in the Community Rating System to reduce flood insurance premiums for citizens.	Northeastern NC Regional Hazard Mitigation Plan 2020
CAMA land use plan updates	Establish specific growth guidelines and policies. Delineate sensitive environmental areas for protection. Adopt a policy limiting the types of uses allowed within flood hazard areas. Adopt a policy to not extend public services and utilities into flood hazard or other environmentally sensitive areas to discourage growth.	Northeastern NC Regional Hazard Mitigation Plan 2020
Property divisions	Consider adopting subdivision regulations that include minimum standards for property divisions.	Northeastern NC Regional Hazard Mitigation Plan 2020
Stormwater coordination committee	Establish a coordinating committee to ensure that all parties responsible for stormwater management within the county communicate to ensure maximum cooperation in developing and maintaining stormwater drainage systems.	Northeastern NC Regional Hazard Mitigation Plan 2020

Project Name	Project Description	Source
Emergency notification system	Work to improve the emergency notification system to increase awareness regarding the locations of shelters and evacuation routes during natural hazard events.	Northeastern NC Regional Hazard Mitigation Plan 2020
Seek grant funding	Seek grant funding for mitigation opportunities eligible under Unified Hazard Mitigation Assistance guidance and Public Assistance 406 Mitigation Guidance. Projects may include acquisition/elevation, mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Northeastern NC Regional Hazard Mitigation Plan 2020
Repetitive flood loss policy	(In progress) Review rebuilding activities in wake of recent hurricanes and flooding and establish policies/procedures for minimizing repetitive flood losses.	Northeastern NC Regional Hazard Mitigation Plan 2020
Update Flood Damage Prevention Ordinance (FDPO)	(In progress) Review and update the flood damage prevention ordinance to ensure maximum protection from flood hazard events. Raise the minimum finished floor elevation to at least 2 feet above base flood elevation (BFE) to provide more flood protection for new or substantially improved structures. Consider prohibiting any fill within the 100-year floodplain to discourage development. Prohibit enclosures to the lower areas of elevated buildings, including breakaway walls. Continue to require and maintain FEMA elevation certificates for all permits for new buildings or improvements to buildings on lots including any portion of the 100-year floodplain.	Northeastern NC Regional Hazard Mitigation Plan 2020; CAMA Land Use Plan 2016
Address Kelford, Lewiston, Drainage Issues	Upgrade infrastructure and roadways to reduce frequency of flooding around Kelford and Lewiston including • Road 308 Windsor to Lewiston – Midway • Road 11 Lewiston to Aulander • 204 Thompson Drive Lewiston Woodville • 10 Flag Run Road Lewiston Woodville • Saint Luke Church in Lewiston Woodville.	Public Meeting #1; Public Input
Debris inspection program	(In progress) Establish and maintain a coordinated debris inspection and removal program.	Northeastern NC Regional Hazard Mitigation Plan 2020
Power supply for critical facilities	(In progress) Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	Northeastern NC Regional Hazard Mitigation Plan 2020
Acquire and Relocate Repetitive Loss Properties	(In progress) Identify repetitive flood loss properties for acquisition and relocation. Seek federal and state funding (voluntary program).	Northeastern NC Regional Hazard Mitigation Plan 2020
Retrofitting homes and businesses	(In progress) Advise/assist property owners in retrofitting homes and businesses. The Bertie County Planning and Inspection Department works closely with property owners and builders to retrofit homes to minimize future flood damages. Potential partner: Carolina Rebuilding Ministries (crmhome.org)	Northeastern NC Regional Hazard Mitigation Plan 2020

Project Name	Project Description	Source
Shoreline erosion at Wicomoco Bluff	Erosion of the Wicomoco "Talbot Terrace" bluffs respond to rain, wind, and storm surges causing massive slumps that are subsequently reworked into the associated beaches. Along with the land slumps is abundant vegetation that can regrow and form natural vegetation buffers that temporarily protect the shoreline.	Application to the RCCP
Additional Conservation Lands Along North Side of Lower Roanoke River	Frequently flooded areas to be put into conservation and restoration to increase flood capacity where appropriate	Public Meeting #1
Shoreline erosion at TGOW Tall Glass of Water Project	(In progress) The TGOW property has 2,200 linear feet of shoreline with eroding bluff that provides sand for the narrow beach. However, the protection of Roanoke Colonist's era artifacts adjacent to the bluff and the need to retain acreage for public activities require that erosion control be addressed. At the base of the bluff coir logs will protect cypress saplings. At the top of the bluff natural vegetation will be planted to stabilize the upper portion	Application to the RCCP
Water quality planting in ravines at TGOW	(In progress) Cypress trees will provide shoreline protection by creating thin but effective sand bars	Application to the RCCP