

Annex K Town of Wake Forest

K.1 PLANNING PROCESS

The table below lists the HMPC members who represented the Town of Wake Forest.

Table K.1 – HMPC Members

Agency	Representative	Position or Title
Town of Wake Forest	Patrick Reidy	Senior Planner – Development Services
N/A	Grif Bond	Citizen Stakeholder

K.2 COMMUNITY PROFILE

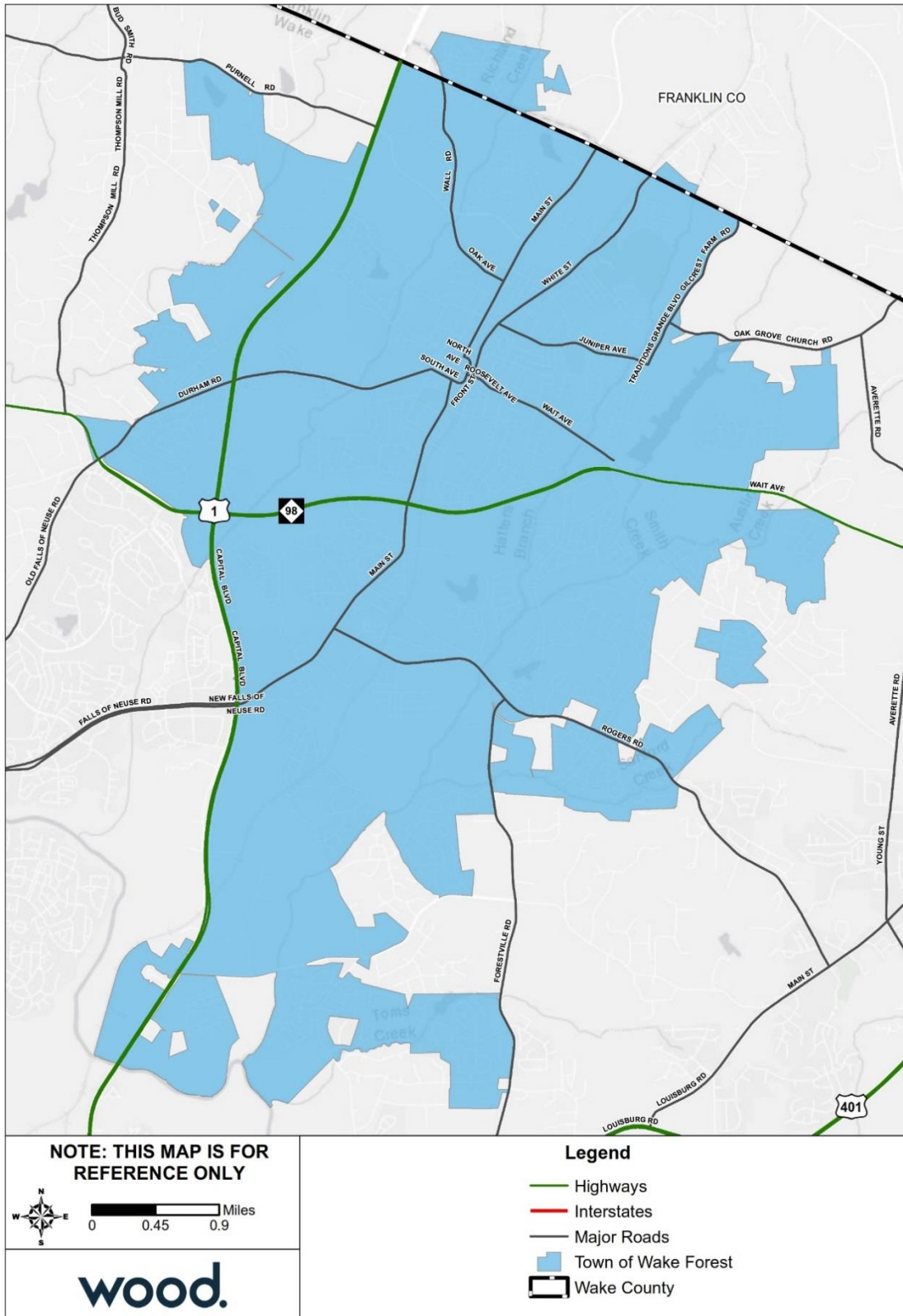
Geography

The Town of Wake Forest is located in northern Wake County. A small portion of the Town extends north into Franklin County. All statistics summarized in this section are for the entirety of the Town of Wake Forest. It is neighbored by Raleigh to the southwest and Rolesville to the southeast. The Town is part of the Raleigh, NC Metropolitan Statistical Area, which falls within the larger Raleigh-Durham-Chapel Hill, NC Combined Statistical Area. Wake Forest comprises a total land area of 15.1 square miles.

According to data from the U.S. Fish and Wildlife Service’s National Wetlands Inventory, there are approximately 1,456 acres of wetlands in Wake Forest.

Figure K.1 shows a base map of the major transportation routes in the Town of Wake Forest.

Figure K.1 – Major Transportation Routes – Town of Wake Forest



Source: Wake County GIS Open Data

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Population and Demographics

Table K.2 provides population counts and growth estimates for the Town of Wake Forest as compared to the County overall. Table K.3 provides demographic information for Wake Forest as compared to the whole County.

Table K.2 – Population Counts, Wake Forest, 2010-2017

Jurisdiction	2000 Census Population	2010 Census Population	2017 ACS Population Estimate	Total Change 2010-2017	% Change 2010-2017
Wake County total	627,846	900,993	1,023,811	122,818	13.6%
Town of Wake Forest	12,588	30,117	38,473	8,356	27.7%

Source: US Census Bureau Decennial Census 2000, Decennial Census 2010; American Community Survey 2013-2017 5-Year Estimates

Note: The total population of Wake Forest includes population residing in adjacent county.

Table K.3 – Racial Demographics, Wake Forest, 2017

Jurisdiction	White, %	Black, %	Asian, %	Other Race, %	Two or More Races, %	Persons of Hispanic or Latino Origin*, %
Wake County total	66.5%	20.4%	6.5%	3.6%	2.7%	10.0%
Town of Wake Forest	78.9%	14.5%	1.5%	0.9%	4.1%	4.8%

Source: US Census Bureau, American Community Survey 2013-2017 5-Year Estimates

*Persons of Hispanic origin may be of any race, so also are included in applicable race categories

Asset Inventory

The following tables summarize the asset inventory for Wake Forest in order to estimate the total physical exposure to hazards in this area. The locations of critical facilities are shown in Figure K.2 on the following page. Critical facilities are a subset of identified assets from the Critical Infrastructure & Key Resources dataset. Note that the counts are by building; where a critical facility comprises a cluster of buildings, each building is counted and displayed.

Table K.4 – Critical Infrastructure & Key Resources by Type

Jurisdiction	Food & Agriculture	Banking & Finance	Chemical	Commercial Facilities	Communications	Manufacturing	Defense	Government	Healthcare	IT	National Monuments	Nuclear	Postal & Shipping	Transportation	Energy	Emergency Services	Water	Other	Total
Town of Wake Forest	8	12	0	315	0	199	0	93	23	0	0	0	0	36	0	4	3	0	693

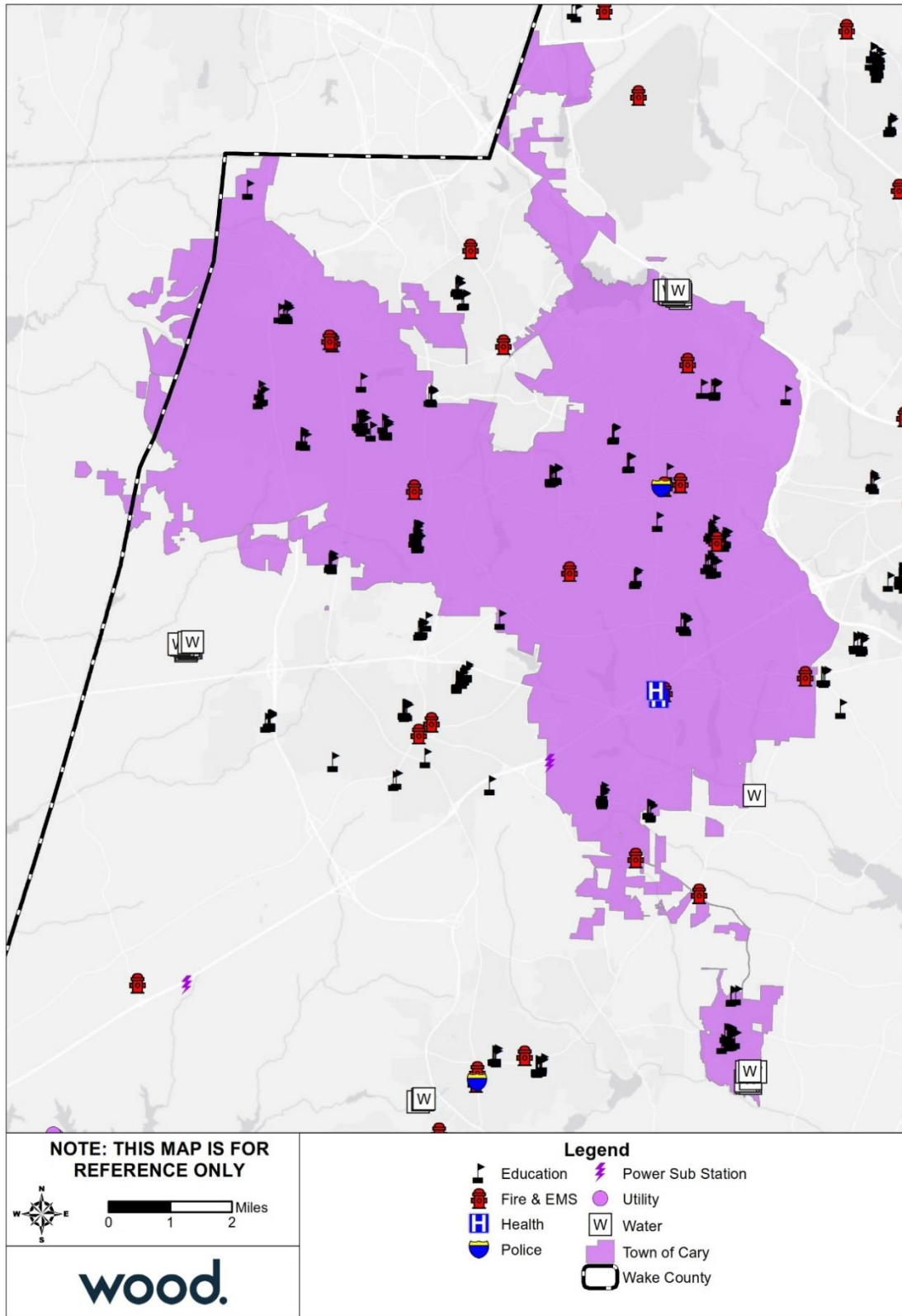
Source: NCEM Risk Management Tool

Table K.5 – High Potential Loss Facilities by Use

Jurisdiction	Residential	Commercial	Industrial	Government	Agricultural	Religious	Utilities	Other	Total
Town of Wake Forest	44	70	21	21	0	15	3	0	174

Source: NCEM Risk Management Tool

Figure K.2 – Critical Facilities, Town of Wake Forest



Source: NCEM IRISK Database, GIS Analysis

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To supplement the asset inventory and provide a clearer picture of the current asset exposure in the Town of Wake Forest, current parcel data was evaluated to identify development since 2010. This information is not incorporated into the risk assessment, which was prepared using NCEM’s IRISK database. However, this summary of development since 2010 provides some context to understand the degree to which the IRISK exposure and vulnerability numbers differ from current conditions.

Table K.6 provides a summary by land class of parcel development from January 2011 to April 2019.

Table K.6 – Parcels Developed 2011 or Later, Town of Wake Forest

Land Class	Number of Parcels	Sum of Building Value
Apartment	5	\$108,787,706
Commercial	52	\$96,539,284
Condo Complex	4	-
EXEMPT	9	\$42,148,445
HOA	2	\$326,705
Industrial	4	\$2,815,251
Part Exempt	21	\$6,572,261
Residential Less Than 10 Acres	3,409	\$895,793,767
Retirement Home	1	\$4,712,912
Grand Total	3,507	\$1,157,696,331

Source: Wake County Open Data; retrieved April 8, 2019

There are 18 listings on the National Register of Historic Places for the Town of Wake, including 6 historic districts. These sites are listed in the table below.

Table K.7 – Historic Properties

Ref#	Property Name	Status Date	Category	City
74001381	Powell House	10/15/1974	Building	Wake Forest
74001378	Wakefields	10/16/1974	Building	Wake Forest
75001298	Lea Laboratory	5/29/1975	Building	Wake Forest
88000238	Purefoy--Dunn Plantation	3/24/1988	District	Wake Forest
91001504	Royall Cotton Mill Commissary	10/16/1991	Building	Wake Forest
93000998	DuBois, W. E. B., School	10/5/1993	Building	Wake Forest
97000788	Purefoy--Dunn Plantation (Boundary Decrease)	7/25/1997	District	Wake Forest
98000689	Oakforest	6/11/1998	Building	Wake Forest
99001046	Glen Royall Mill Village Historic District	8/27/1999	District	Wake Forest
02000059	Downtown Wake Forest Historic District	2/20/2002	District	Wake Forest
02001719	Wakefield Dairy Complex	1/15/2003	Building	Wake Forest
03001301	Wake Forest Historic District	12/18/2003	District	Wake Forest
05001030	Thompson House	9/15/2005	Building	Wake Forest
07000879	Rock Cliff Farm	8/29/2007	District	Wake Forest
08001016	Purefoy-Chappell House and Outbuildings	10/22/2008	Building	Wake Forest
10001097	Bailey--Estes House	12/28/2010	Building	Wake Forest
14000265	South Brick House	5/27/2014	Building	Wake Forest
16000880	Jones, Dr. Calvin, House	12/22/2016	Building	Wake Forest

Source: National Parks Service, National Register of Historic Places, October 2018

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Housing

The table below details key housing statistics for Wake Forest as compared to the County overall.

Table K.8 – Housing Statistics, Wake Forest, 2010-2017

Jurisdiction	Housing Units (2010)	Housing Units (2017)	Housing Units Percent Change (2010-2017)	Owner-Occupied, % (2017)	Vacant Units, % (2017)	Median Home Value (2017)
Wake County total	371,836	411,632	10.7%	59.5%	7.2%	\$250,700
Town of Wake Forest	11,370	13,888	22.1%	67.2%	4.7%	\$278,600

Source: U.S. Census Bureau 2010 Decennial Census, American Community Survey 2013-2017 5-Year Estimates

Note: Owner-Occupied and vacant-unit measures are reported as a percent of the total number of housing units.

Economy

The following tables present key economic statistics for Wake Forest as compared to the County overall.

Table K.9 – Employment Statistics, Wake Forest, 2017

Jurisdiction	Population in Labor Force	Percent Employed* (%)	Percent Unemployed* (%)	Percent Not in Labor Force* (%)	Unemployment Rate (%)
Wake County	564,096	67.2	3.5	29.2	4.9
Town of Wake Forest	19,229	65.6	3.8	30.5	5.4

Source: U.S. Census Bureau, American Community Survey 2013-2017 5-Year Estimates

Note: This table reports only the civilian labor force. The labor force in armed services accounted for 0.3% or less of the population 16 and over in all jurisdictions. *Population employed, population unemployed, and Population not in labor force are reported as a percent of the total population aged 16 years and older.

Table K.10 – Percent of Employed Population by Occupation, Wake Forest, 2017

Occupation	Management, business, science and arts (%)	Service (%)	Sales and Office (%)	Natural Resources, Construction, and Maintenance (%)	Production, transportation, and material moving (%)
Wake County	50.1	13.8	23.4	6.0	6.7
Town of Wake Forest	53.4	13.2	25.0	4.0	4.4

Source: U.S. Census Bureau, American Community Survey 2013-2017 5-Year Estimates

K.3 RISK ASSESSMENT

This section contains a hazard profile and vulnerability assessment for those hazards that were rated with a higher priority for the Town of Wake Forest than for Wake County as a whole. Risk and vulnerability findings are also presented here for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flood and Wildfire.

K.3.1 Flood

Table K.11 Details the acreage of the Town of Wake Forest by flood zone on the effective DFIRM. Per this assessment, over 9 percent of the Town of Wake Forest falls within the mapped 1%-annual-chance floodplains.

Table K.11 – Flood Zone Acreage in the Town of Wake Forest

Flood Zone	Acreage	Percent of Total (%)
Zone A	3.94	0.03
Zone AE	1,253.05	9.02

Wake County

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Flood Zone	Acreage	Percent of Total (%)
Zone X (500-year)	113.01	0.81
Zone X Unshaded	12,516.72	90.13
Total	13,886.72	--

Source: FEMA Effective DFIRM; Wake County GIS

Figure K.3 reflects the effective mapped flood hazard zones for the Town of Wake Forest, and Figure K.4 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

To supplement the IRISK assessment of property at risk from the 1% annual chance flood event in Section 4 and provide a clearer picture of the current property at risk in the Town of Wake Forest, current parcel data was evaluated to identify parcels developed since 2010. Using GIS analysis, parcels developed after 2010 were compared to the boundaries of the 1% annual chance floodplain to identify the exposure of newly developed property to the base flood. In most cases, a parcel was considered exposed to the floodplain if any portion of the parcel was located in the floodplain.

This assessment does not evaluate flood impacts or provide damage estimates. However, this summary of development in or near the floodplain since 2010 provides some context to understand the degree to which the IRISK exposure and vulnerability numbers differ from current conditions.

Table K.12 provides a summary by land class of parcel development located in the 1% annual chance floodplain from January 2011 to April 2019.

Table K.12– Parcels Developed 2011 or Later and Located in 100-Year Floodplain

Land Class	Number of Parcels	Sum of Building Value
Commercial	1	\$6,625,596
Residential Less Than 10 Acres	26	\$8,943,999
Grand Total	27	\$15,569,595

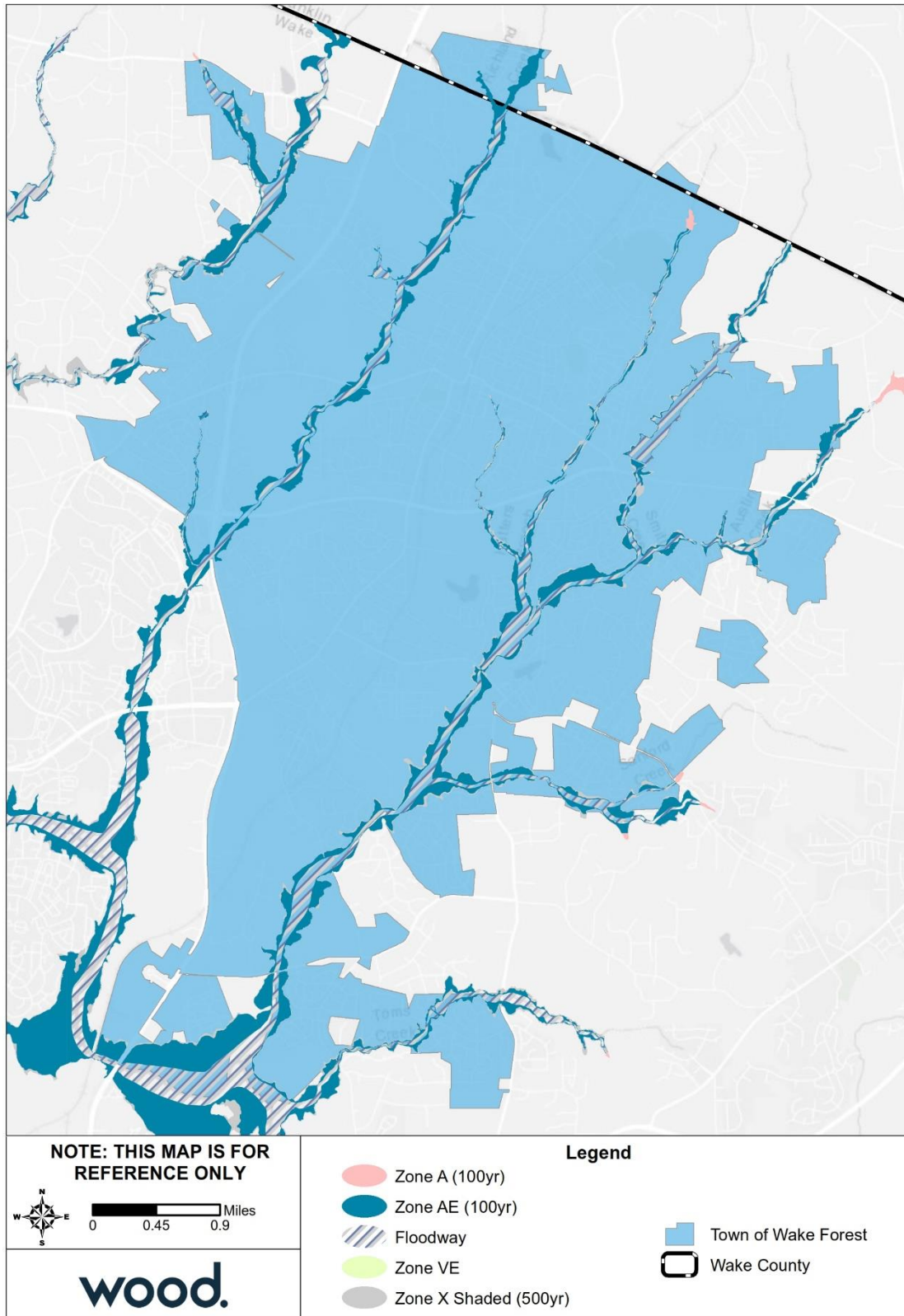
Source: Wake County Open Data; retrieved April 8, 2019; FEMA Effective DFIRM

Table K.13 provides building counts and estimated damages for Critical Infrastructure and Key Resources (CIKR) buildings by sector and flood event in the Town of Wake Forest.

Table K.13 – Critical Facilities Exposed to Flooding, Town of Wake Forest

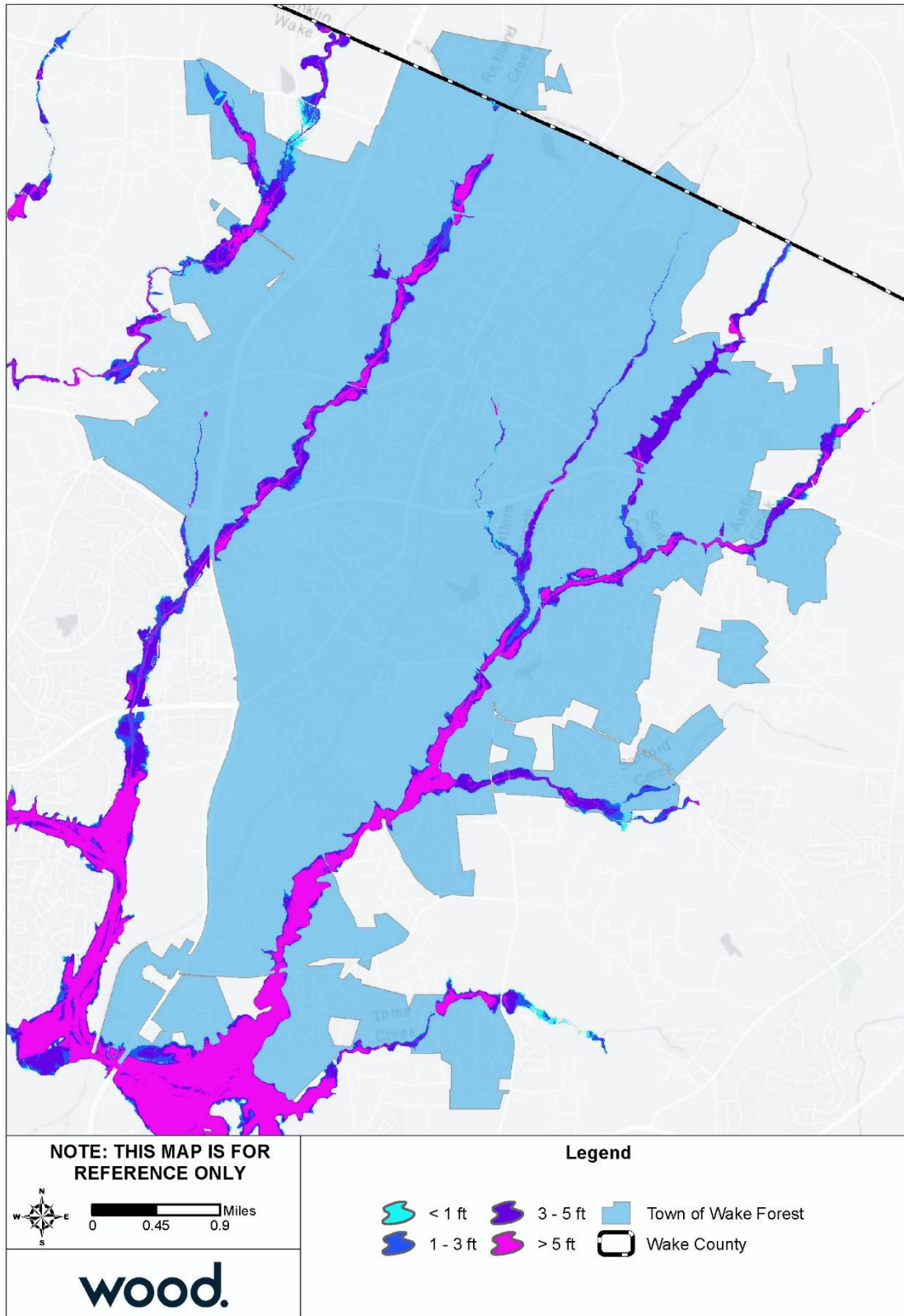
Sector	Event	Number of Buildings at Risk	Estimated Damages
Commercial Facilities	100 Year	1	\$25,973
All Categories	100 Year	1	\$25,973

Figure K.3 – FEMA Flood Hazard Areas, Town of Wake Forest



Source: FEMA Effective DFIRM

Figure K.4 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Wake Forest



Source: FEMA Effective DFIRM

K.3.2 Wildfire

Table K.14 summarizes the acreage in the Town of Wake Forest that falls within the Wildland Urban Interface (WUI), categorized by housing density. Areas in the WUI are those where development may intermix with flammable vegetation. Over 10 percent of the Town of Wake Forest is not included in the WUI.

Table K.14 – Wildland Urban Interface Acreage, Town of Wake Forest

	Housing Density	Total Acreage	Percent of Total Acreage
	<i>Not in WUI</i>	1,408.5	10.3%
	LT 1hs/40ac	698.0	5.1%
	1hs/40ac to 1hs/20ac	645.8	4.7%
	1hs/20ac to 1hs/10ac	676.2	4.9%
	1hs/10ac to 1hs/5ac	968.5	7.1%
	1hs/5ac to 1hs/2ac	1,848.4	13.5%
	1hs/2ac to 3hs/1ac	7,033.4	51.5%
	GT 3hs/1ac	387.4	2.8%
	Total	13,666.3	

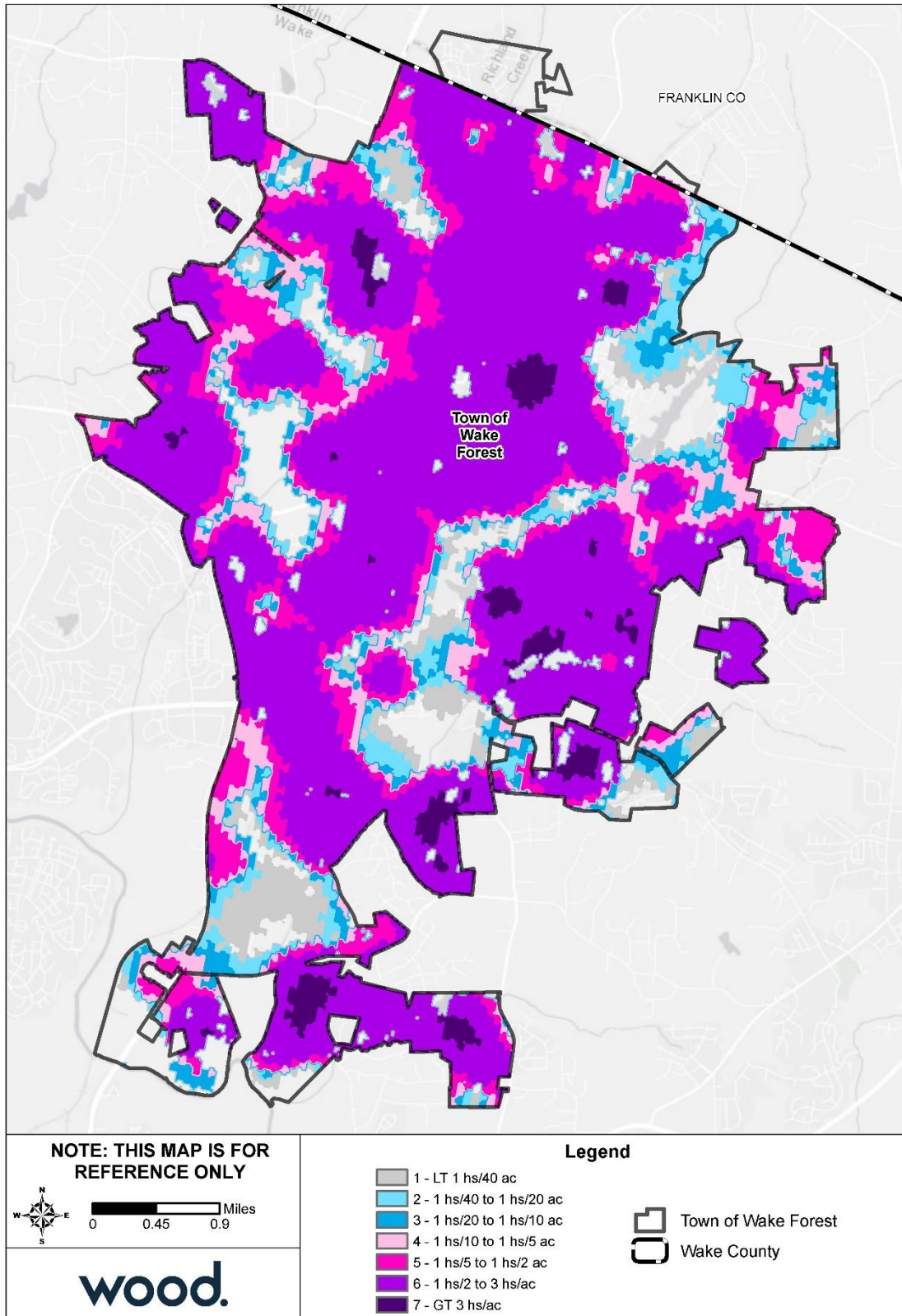
Source: Southern Wildfire Risk Assessment

Potential fire intensity is highest in central and west Wake Forest. These areas are in the WUI, but they do not have a high burn probability. Overall, the Town of Wake Forest does not have a high burn probability.

Figure K.5 depicts the WUI for the Town of Wake Forest. The WUI is the area where housing development is built near or among areas of vegetation that may be prone to wildfire. Figure K.6 depicts the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure K.7 depicts Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

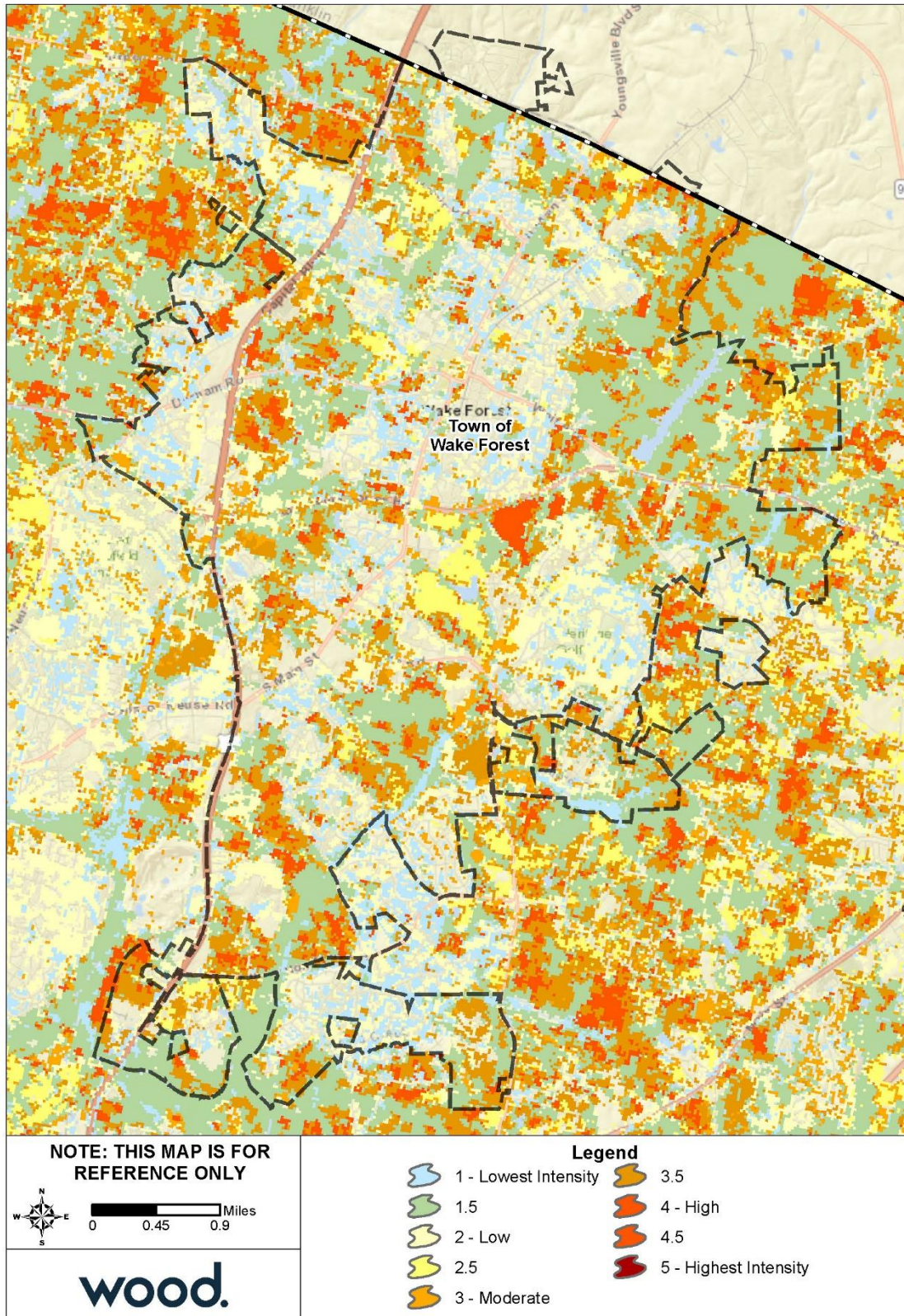
Potential fire intensity is highest in central and west Wake Forest. These areas are in the WUI, but they do not have a high burn probability. Overall, the Town of Wake Forest does not have a high burn probability.

Figure K.5 – Wildland Urban Interface, Town of Wake Forest



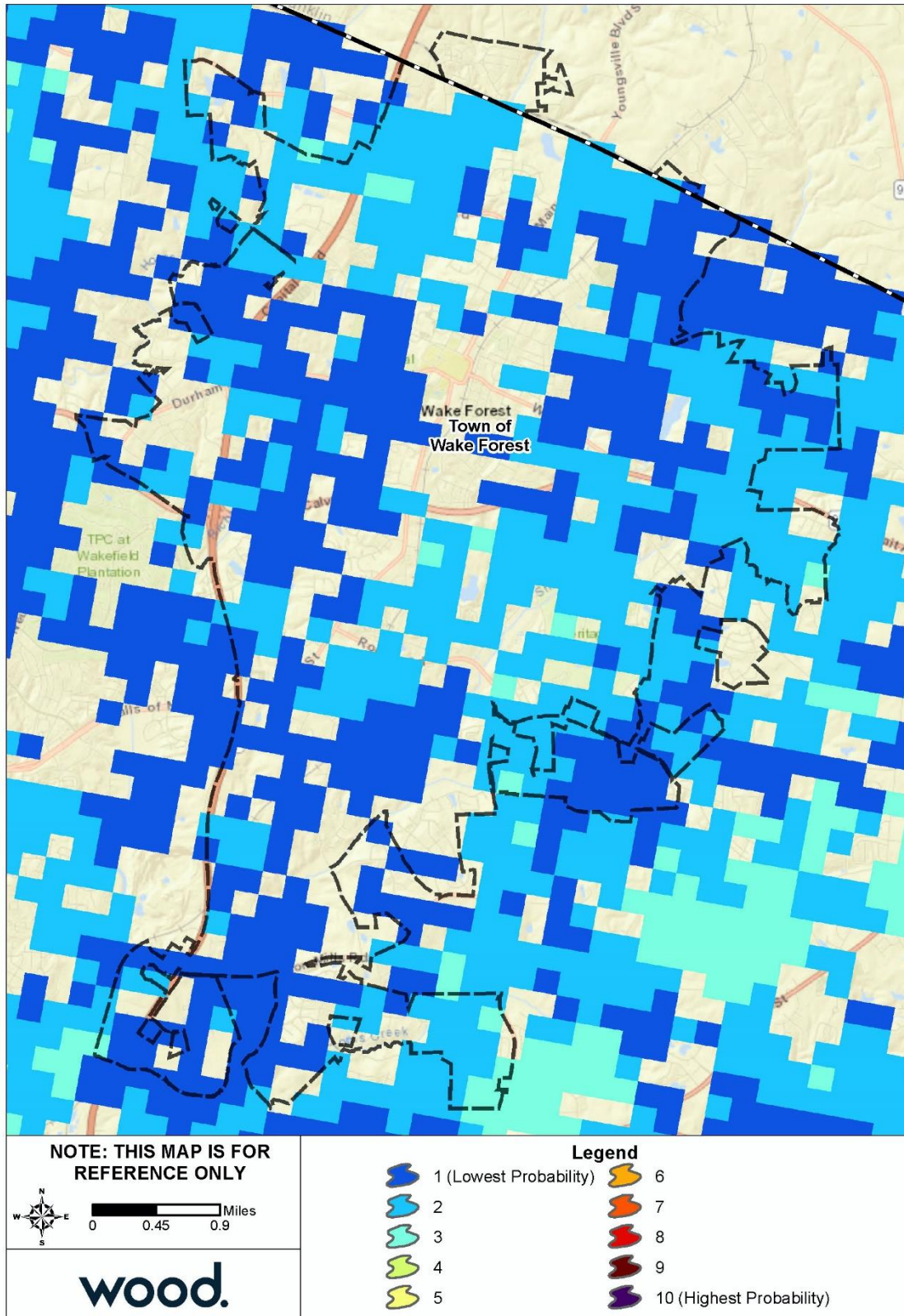
Source: Southern Wildfire Risk Assessment

Figure K.6 – Fire Intensity Scale, Town of Wake Forest



Source: Southern Wildfire Risk Assessment

Figure K.7 – Burn Probability, Town of Wake Forest



Source: Southern Wildfire Risk Assessment

K.4 CAPABILITY ASSESSMENT

K.4.1 Overall Capability

Details on the tools and resources in place and available to the Town of Wake Forest were provided by the Town’s HMPC representatives and are summarized in Section 5 Capability Assessment. Based on that information and using the scoring methodology detailed in that section, Wake Forest has an overall capability rating of High. The Town’s Self-Assessment of key capability areas is summarized in Table K.15 below.

Table K.15 – Capability Self-Assessment, Wake Forest

Capability Area	Rating
Plans, Ordinances, Codes and Programs	High
Administrative and Technical Capability	High
Fiscal Capability	High
Education and Outreach Capability	Moderate
Mitigation Capability	Limited
Political Capability	High
Overall Capability	High

K.4.2 Floodplain Management

The Town of Wake Forest joined the NFIP through emergency entry in March 1974 and has been a regular participant since July 1978. The following tables reflect NFIP policy and claims data for the Town categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

Table K.16 – NFIP Policy and Claims Data by Structure Type

Structure Type	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	142	\$56,421	\$42,541,700		
2-4 Family	2	\$501	\$260,000		
All Other Residential	1	\$298	\$258,000		
Non-Residential	4	\$3,219	\$850,000		
Total	149	\$60,439	\$43,909,700	0	\$0.00

Source: FEMA Community Information System, accessed November 2018

Table K.17 – NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	27	\$12,963	\$8,050,200		
A Zones	0	\$0	\$0		
AO Zones	0	\$0	\$0		
AH Zones	0	\$0	\$0		
AR Zones	0	\$0	\$0		
A99 Zones	0	\$0	\$0		
V01-30 & VE Zones	0	\$0	\$0		
V Zones	0	\$0	\$0		

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Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
D Zones	0	\$0	\$0		
B, C & X Zone					
Standard	6	\$4,083	\$1,877,500		
Preferred	116	\$43,393	\$33,982,000		
Total	149	\$60,439	\$43,909,700	0	\$0.00

Source: FEMA Community Information System, accessed November 2018

Table K.18 – NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	0	\$0	\$0		
A Zones	0	\$0	\$0		
AO Zones	0	\$0	\$0		
AH Zones	0	\$0	\$0		
AR Zones	0	\$0	\$0		
A99 Zones	0	\$0	\$0		
V01-30 & VE Zones	0	\$0	\$0		
V Zones	0	\$0	\$0		
D Zones	0	\$0	\$0		
B, C & X Zone	4	\$1,366	\$1,085,000		
Standard	0	\$0	\$0		
Preferred	4	\$1,366	\$1,085,000		
Total	4	\$1,366	\$1,085,000	0	\$0.00

Source: FEMA Community Information System, accessed November 2018

Table K.19 – NFIP Policy and Claims Data Post-FIRM

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	27	\$12,963	\$8,050,200		
A Zones	0	\$0	\$0		
AO Zones	0	\$0	\$0		
AH Zones	0	\$0	\$0		
AR Zones	0	\$0	\$0		
A99 Zones	0	\$0	\$0		
V01-30 & VE Zones	0	\$0	\$0		
V Zones	0	\$0	\$0		
D Zones	0	\$0	\$0		
B, C & X Zone	118	\$46,110	\$34,774,500		
Standard	6	\$4,083	\$1,877,500		
Preferred	112	\$42,027	\$32,897,000		
Total	145	\$59,073	\$42,824,700	0	\$0.00

Source: FEMA Community Information System, accessed November 2018

K.5 MITIGATION STRATEGY

Town of Wake Forest											
Action #	Description	Goal	Objective	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	2019 Status	Status Comments/Explanation
Prevention											
P-1	Prepare a Storm Drainage Master Plan to include all storm drainage, infrastructure, and capacity analysis.	2	2	Flood	High	Wake Forest Engineering	\$400,000	General Fund	2019	In-Progress – Carry Forward	75% complete, completion scheduled June 2019
P-2	Put electric distribution lines underground.	3	1	Hurricane, Severe Weather, Severe Winter Storm, Tornado, Wildfire	Low	Wake Forest Power	\$10,000,000	Electric Fund, General Fund, and Bonds	2024	In-Progress – Carry Forward	Where feasible, electric lines have been put underground. However, there are still some lines that could be buried and the town will look into carrying that out going forward.
P-3	Become a CRS community	2	2	Flood	Low	Wake Forest Public Works	\$100,000	General Fund	2022	New	Work towards becoming a CRS community
P-4	Explore the use of Stormwater Utility Fees	3	1	Flood	Moderate	Wake Forest Administration	\$100,000	General Fund that would become a User Fee if implemented	2020	New	As subdivisions age, their covenants could expire after 20 years leaving the town with maintaining additional stormwater control measures. These fees could help offset necessary maintenance.
P-5	Maintain a GIS database of building footprints and use it to regularly update a map of critical facilities and vulnerable buildings.	2	2	All	Moderate	Wake Forest GIS	Staff time	General Fund	Ongoing Annually	New	Updated data will be used to identify properties that should be prioritized for mitigation.
Property Protection											
PP-1	Document each historic structure in Wake Forest town limits and ETJ	3	1	Hurricane, Severe Weather, Severe Winter Storm, Tornado, Wildfire, Flood	Moderate	Wake Forest Planning	\$75,000	General Fund	2020	New	Photographs and taken every other year in the local historic district. A baseline photographic inventory of all historic structures in the town limits and ETJ will be taken and repeated every 5 years. If damage occurred due to a natural disaster, it would be easier to secure funding to replace/repair back to its historical integrity.
PP-2	Provide for primary or mobile generators to shelter sites.	2	1	All	Moderate	Wake County Emergency Management	\$500,000	General Fund	2024	In-Progress – Carry Forward	Heritage High School has generators. Town is constructing Joyner Park with intention to be used as a shelter site if needed. Generator is being included with the building.
PP-3	Assess facilities for the need for emergency generation, giving consideration to alternate facility sites.	2	1	All	High	Wake Forest Power	\$250,000	General Fund	2023	In-Progress – Carry Forward	The town has assessed facilities for the need for emergency generation and many facilities have been fitted with generators. However, additional facilities with emergency generation would be useful.
Natural Resource Protection											
NRP-1	Manage the Wake Forest Reservoir for hazard mitigation	2	1	Drought, Flood, Dam Failure	Moderate	Wake Forest Public Works	\$300,000	General Fund	2021	New	The City of Raleigh is in the process of transferring the Wake Forest Reservoir to the town. Staff is investigating all details associated with the reservoir ownership from a hazard mitigation standpoint, such as flooding/breaching potential.
NRP-2	Expansion of our greenway trail network	3	2	Flood, Hurricane, Extreme Heat	Moderate	Wake Forest Planning	\$16,100,000	General Fund and Bonds	2024	New	The Town has multiple greenway extensions and new routes planned. By installing greenways along our waterways, it gives the Town a better opportunity to remove fallen debris and trash that helps alleviate possible flooding.
Structural Projects											
SP-1	Conduct stream mitigation projects on Old Mill Stream, Richland Creek, and others subject to flooding or erosion.	3	2	Flood	Moderate	Wake Forest Engineering	\$2,350,000	General Fund, Clean Water Management Trust Fund, Ecosystem Enhancement Program	2024	In-Progress – Carry Forward	Some mitigation projects have been conducted on these water bodies, but there is significant effort that is still needed to reduce potential erosion. Current projects include: Old Mill Stream and Richland Creek - construction plans @ 90%. Ailey Young Dam - completion June 2019; Smith Creek - quote has been requested for work to be done. Stream erosion throughout town continues to be an ongoing process as needed
Emergency Services											

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Town of Wake Forest											
Action #	Description	Goal	Objective	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	2019 Status	Status Comments/Explanation
ES-1	Investigate methods of encouraging gas stations to acquire backup generators.	1	1	All	High	Wake Forest Public Works and Inspections	\$50,000	General Fund	2022	In-Progress – Carry Forward	Grocery stores and gas stations are encouraged to have back up generators. Wal-Mart added a generator with the help of the town. Wegmans which will be constructed in the next two years will have a generator on site. These sites will help provide necessary food and supplies to residents.
ES-2	See that all nursing homes and assisted living facilities have backup generators.	1	1	All	High	Property owners	\$150,000	Property owners	2023	In-Progress – Carry Forward	New facilities are being encouraged to include generators. Existing facilities without generators are financially constrained and have little ability to add generators.
ES-3	Require, in the contract, that fuel suppliers have backup generators.	3	1	All	High	Wake Forest Administration, Finance, and Public Works	\$25,000	General Fund	2024	In-Progress – Carry Forward	This is the Town's current policy and we continue to monitor new contracts for compliance.
ES-4	Adopt and Implement an Emergency Operations Plan	3	2	All	High	Wake Forest Administration	\$100,000	General Fund	2021	New	A draft EOP has been created; adoption expected in 2019
ES-5	Adopt a SARA Title III Plan	4	2	All	Moderate	Wake Forest Fire Department	\$150,000	General Fund	2023	New	Investigate the ability to create a SARA Title III Plan to have clearer knowledge and how to better handle chemical releases from facilities that could impact the town.
Public Education and Awareness											
PEA-1	Develop a policy and advise the public that all outside above ground LP or propane gas tanks be cut off during a major event.	1	1	All	Moderate	Wake Forest Communications	\$10,000	General Fund	2020	In-Progress – Carry Forward	Past communications have included information advising the public of turning off propane tanks during a storm, but better outreach is needed to ensure this occurs. A policy should be put in place to ensure it is regularly communicated. Perhaps it can be included as part of the EOP.