



Collier County, Florida

REPETITIVE LOSS AREA ANALYSIS





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1 REPETITIVE LOSS AREA ANALYSIS

1.1 BACKGROUND

Flooding is the most common natural hazard in the United States. Floods account for nearly 75 percent of all of the Presidential Disaster Declarations, and more than 22,000 communities experience floods and participate in the National Flood Insurance Program (NFIP). In the United States, over 8.7 million residential and commercial structures are currently located in areas at risk to flooding. When flood damage occurs, the cost of recovery is spread over local, state, and federal governments and the victims themselves, who are directly affected by these disasters.

The NFIP is continually faced with the challenge of balancing the financial soundness of the program with the competing expectation of keeping premiums affordable. Repetitive loss properties are one of the two largest obstacles to achieving financial soundness of the NFIP. Since the inception of the NFIP, almost \$12.9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments. While the NFIP has resulted in forty years of successful floodplain management, and many of these structures are no longer insured, repetitive loss properties are still a drain on the NFIP. Currently, repetitive loss properties represent 1.3% of all policies but are expected to account for 15% to 20% of future losses.



Private insurance companies faced with high losses have several options to keep turning a profit. They can raise income through premium rate increases, decrease payments to insurers or reduce the exposure to the hazard. Unfortunately, the NFIP can only do what is allowed by statute. If losses increase, the Federal Emergency Management Agency (FEMA) is authorized by Congress to make incremental adjustments to increase the premium rates and reduce overall coverage. FEMA is not permitted to eliminate coverage for any policy holder including high-risk properties. Actuarial rates cannot be charged to buildings built before State and local floodplain management regulations went into effect. Since repetitive flood claims must be paid, FEMA has no choice but to spread these costs among all policyholders.

Sometimes floodplain management regulations mitigate repetitive flood losses when a building is substantially damaged. A structure where the cost to repair is equal to or exceeds 50 percent of the building's value is considered substantially damaged. A substantially damaged building must be brought up to the same flood protection level as a new building under a community's floodplain management ordinance. However, many repetitive loss buildings are not in a regulated floodplain or do not get substantially damaged and remain at risk to future damage.

Many owners of properties that experience repetitive flooding are not aware of the magnitude of damage they are exposed to because they either purchased the property after the last flood or the seller or lender did not disclose the flood hazard. Disclosure of repetitive flooding is a problem because repetitive loss areas are not shown on Flood Insurance Rate Maps (FIRMs) but instead must be identified and mapped by local communities.

Collier County (CID-120067) has been a regular participant in the NFIP since September 14, 1979. In addition to meeting the basic requirements of the NFIP, the County has completed additional components to participate in the Community Rating System (CRS) program. Collier County is currently a CRS Class 5 which rewards all policyholders with a 25 percent reduction in their flood insurance premiums. Collier County has been participating in the CRS program since October 1, 1992.

As of May 13, 2025, there are currently 54,464 NFIP Policies in force in Collier County with insurance coverage of over \$14.6 billion. The County has 7,502 paid losses against the NFIP totaling more than \$445.6 million with 944 of those losses being substantial damage claims since 1978.

A repetitive loss property does not have to currently be carrying a flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. An insured property with claims on that property will make it a repetitive loss property. Once it is designated as a repetitive loss property, that property remains as a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. There are 271 repetitive loss properties in Collier County and 192 of those properties are currently insured (see Section 1.3 for greater detail).

TERMINOLOGY

Repetitive Loss: Any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. Two of the claims paid must be more than 10 days apart but, within 10 years of each other. A repetitive loss property may or may not be currently insured by the NFIP.

Severe Repetitive Loss (SRL): As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than \$5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

According to repetitive loss data received from FEMA as of December 11, 2023, there are a total of 253 unmitigated and 18 mitigated repetitive loss properties within unincorporated Collier County. Twenty-two of these properties are classified as severe repetitive loss, and seventeen severe repetitive loss properties remain unmitigated. The County has opted to complete this Repetitive Loss Area Analysis (RLAA) as it allows for the assessment of individual flood-prone properties and will help to identify strategies for mitigation for the most flood-vulnerable properties in the community. This plan was developed following the requirements in the 2017 *CRS Coordinator's Manual*. This RLAA will benefit the County by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program. This RLAA includes all repetitive loss areas in Collier County, which include all repetitive loss properties.

1.2 SETTING

Collier County is located in the southwestern Florida, with the Gulf of Mexico to the west and the Everglades to the East. It is bounded by Hendry County to north, Lee County to the northeast, Broward County to the east, Miami-Dade County to the southeast, and Monroe County to the South. Nearly all of the southeastern portion of the County falls within the Big Cypress National Preserve. The northern most portion of the Everglades National Park extends into the southern coastal part of the county. According to the U.S. Census Bureau, Collier County has a total area of 2,305 square miles, of which approximately 1,997 square miles is land area, and 307 square miles is water area. This analysis covers only the unincorporated areas of Collier County.

Collier County has a subtropical climate with mild winters and hot, humid summers, with an average annual high temperature of 84.7 degrees Fahrenheit and an average annual low temperature of 63.8 degrees Fahrenheit. Average annual rainfall is approximately 53 inches. The County has a generally flat topography with rich geographic diversity, from the beaches to the Big Cypress National Preserve, and Everglades National Park. Much of the County is covered by wetlands and tidal marshes. Figure 1.1 depicts Collier County's location as well as major roads. Figure 1.2 depicts the HUC-12 drainage basins that cover the county.

Figure 1.1 – Collier County Location Map

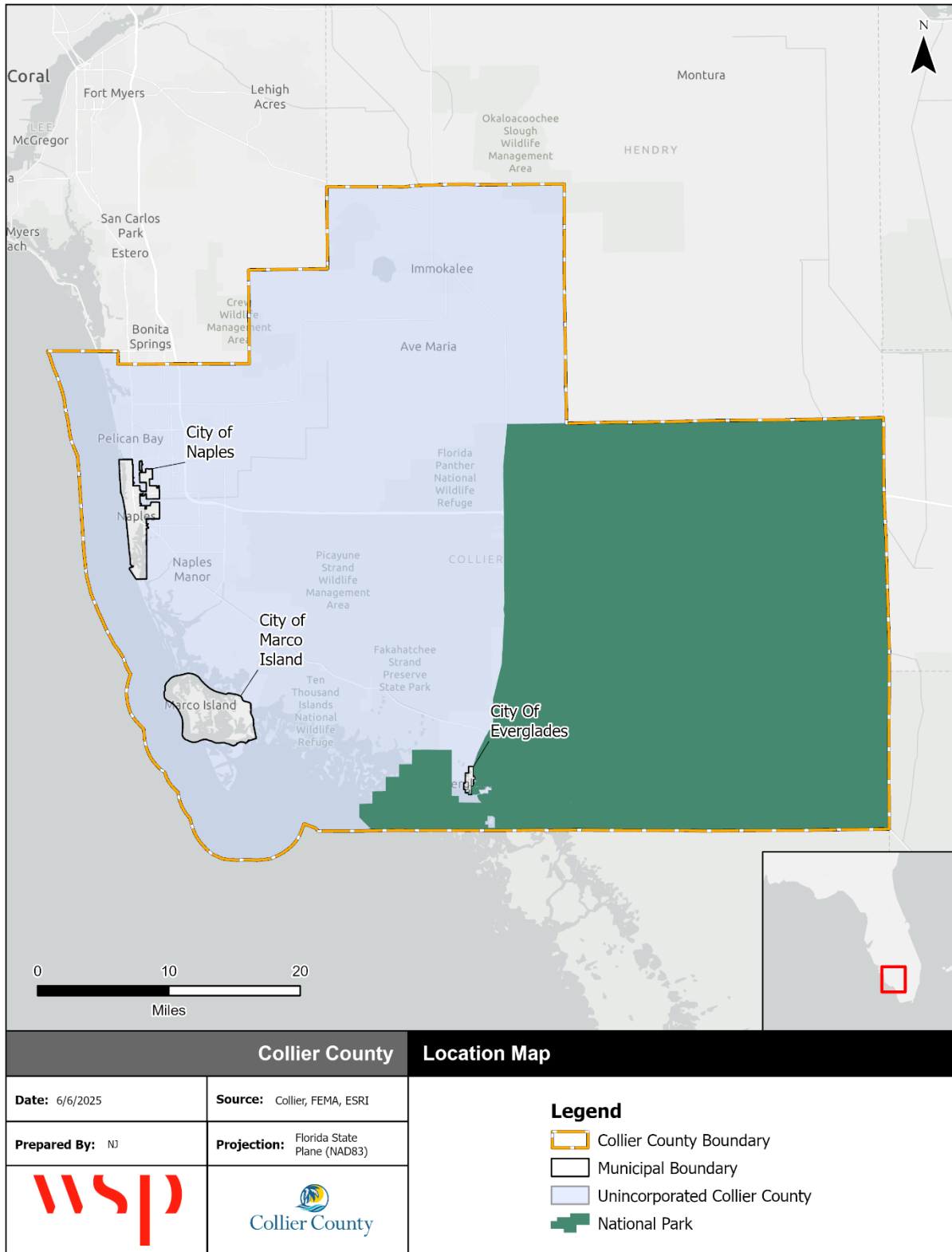
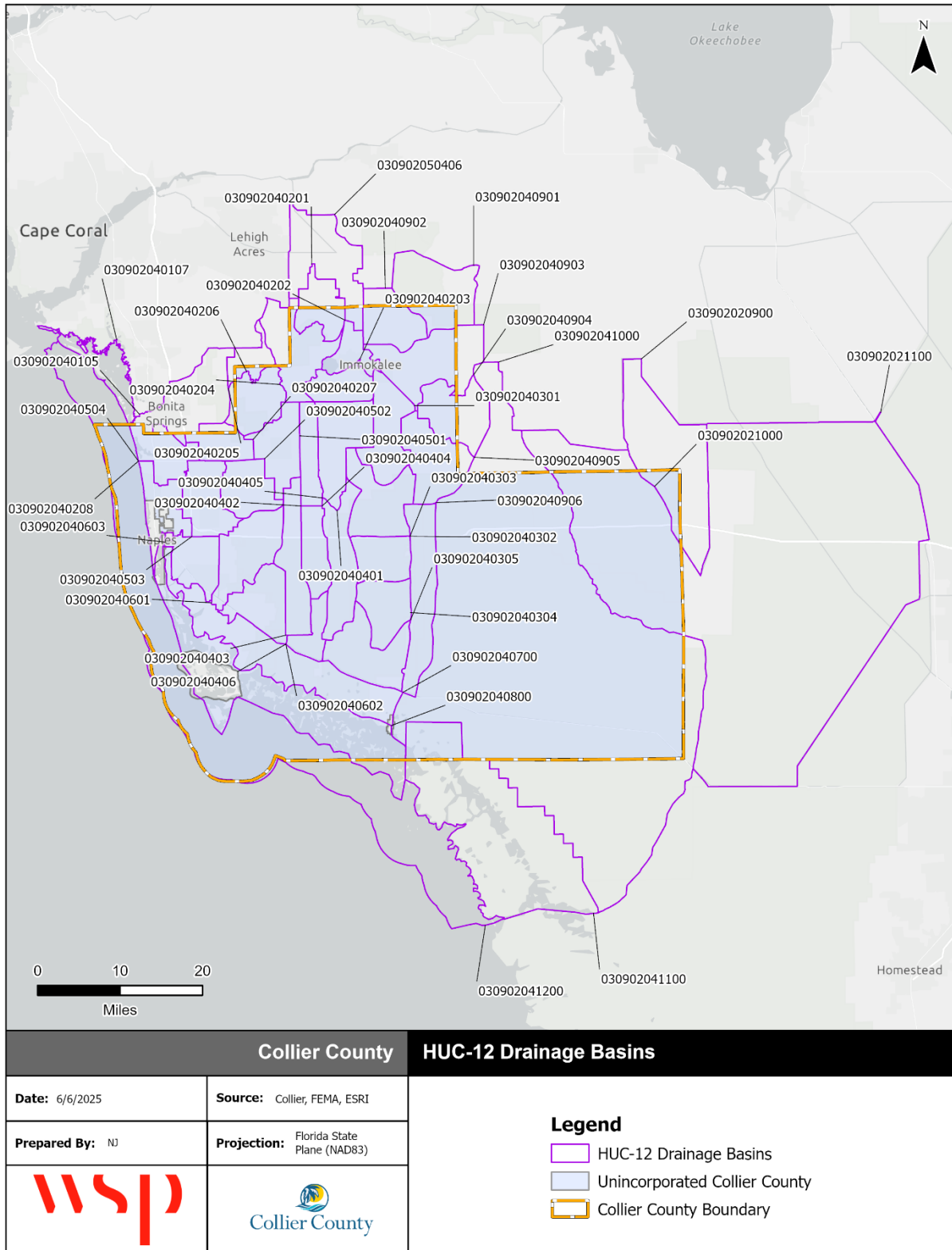


Figure 1.2 – Collier County Drainage Map



1.3 REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A:** A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B:** A community with at least one, but fewer than 50, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the location of all repetitive loss properties (areas) and complete an annual outreach activity directed to repetitive loss properties.
- **Category C:** A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss properties (areas) or prepare a RLAA for all repetitive loss areas.

According to data provided by FEMA dated December 11, 2024, Collier County has 253 unmitigated repetitive loss properties, which means the Town is designated as a Category C repetitive loss community under FEMA's Community Rating System (CRS) program. The repetitive loss properties are summarized in Table 1.1.

Table 1.1 – Summary of Unmitigated Repetitive Loss Properties

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X			X	2	\$4,393.58	\$5,790.68	\$10,184.26
AE	X		X		1	\$7,084.97	\$3,676.00	\$10,760.97
AE	X			X	2	\$15,119.73	\$0.00	\$15,119.73
AE	X		X		2	\$49,075.62	\$3,108.17	\$52,183.79
AE		X		X	2	\$15,952.69	\$0.00	\$15,952.69
AE		X	X		2	\$6,981.80	\$0.00	\$6,981.80
AE		X		X	2	\$11,993.52	\$0.00	\$11,993.52
X		X		X	2	\$4,779.04	\$0.00	\$4,779.04
AE	X			X	2	\$10,621.01	\$0.00	\$10,621.01
AH	X		X		2	\$13,130.94	\$972.80	\$14,103.74
X	X			X	2	\$6,734.16	\$0.00	\$6,734.16
AE	X			X	2	\$7,178.61	\$0.00	\$7,178.61
AE		X		X	2	\$13,623.81	\$0.00	\$13,623.81
AE	X			X	2	\$1,927.91	\$324.58	\$2,252.49
AE	X			X	2	\$31,427.06	\$29,935.83	\$61,362.89
AE	X			X	2	\$4,690.51	\$0.00	\$4,690.51
AE	X			X	3	\$18,553.80	\$43.76	\$18,597.56
AE	X		X		2	\$13,190.21	\$0.00	\$13,190.21
AH		X	X		2	\$115,986.39	\$0.00	\$115,986.39
X	X		X		2	\$56,214.43	\$1,878.54	\$58,092.97
AH		X	X		2	\$55,265.68	\$0.00	\$55,265.68

¹ Flood Zone reflects the current Effective FIRM zone for each property according to the 2012 and 2024 FIRMs

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AH		X	X		2	\$205,720.53	\$0.00	\$205,720.53
AHB		X	X		2	\$85,862.39	\$0.00	\$85,862.39
AHB	X			X	2	\$9,253.02	\$0.00	\$9,253.02
AH		X	X		2	\$63,038.55	\$0.00	\$63,038.55
AE	X			X	4	\$66,179.61	\$296.64	\$66,476.25
AH		X	X		2	\$94,564.17	\$0.00	\$94,564.17
AH	X		X		2	\$87,792.05	\$8,190.30	\$95,982.35
AE	X			X	4	\$63,560.68	\$6,292.28	\$69,852.96
AHB	X		X		2	\$18,407.00	\$6,967.04	\$25,374.04
X	X			X	2	\$28,194.46	\$0.00	\$28,194.46
AH	X		X		6	\$51,314.60	\$14,678.54	\$65,993.14
AHB		X		X	2	\$62,904.20	\$0.00	\$62,904.20
AH	X			X	2	\$35,250.90	\$9,724.40	\$44,975.30
AHB	X		X		2	\$62,509.02	\$11,595.80	\$74,104.82
AE	X		X		2	\$160,065.85	\$0.00	\$160,065.85
AH	X		X		2	\$15,424.99	\$0.00	\$15,424.99
AE	X		X		2	\$101,933.84	\$0.00	\$101,933.84
AE	X		X		2	\$185,391.55	\$20,000.00	\$205,391.55
AHB	X		X		3	\$21,796.00	\$0.00	\$21,796.00
AH	X		X		2	\$34,507.19	\$0.00	\$34,507.19
AE	X		X		2	\$37,613.32	\$0.00	\$37,613.32
AE	X		X		2	\$381,903.21	\$58,000.00	\$439,903.21
AE	X		X		2	\$91,126.20	\$0.00	\$91,126.20
AE	X		X		2	\$185,240.68	\$0.00	\$185,240.68
AE	X		X		2	\$13,212.61	\$0.00	\$13,212.61
AE	X		X		2	\$116,112.76	\$0.00	\$116,112.76
AE	X		X		2	\$12,781.43	\$0.00	\$12,781.43
AE	X			X	2	\$234,776.44	\$0.00	\$234,776.44
AHB	X			X	2	\$198,010.95	\$20,801.04	\$218,811.99
AH	X		X		2	\$59,864.86	\$0.00	\$59,864.86
AE	X			X	2	\$177,429.00	\$110,800.00	\$288,229.00
AE		X		X	2	\$21,700.00	\$31,262.69	\$52,962.69
AE	X			X	3	\$150,036.09	\$78,770.85	\$228,806.94
AE	X		X		3	\$154,284.29	\$21,400.00	\$175,684.29
AE	X			X	2	\$19,733.65	\$2,822.79	\$22,556.44
AE	X		X		2	\$44,277.96	\$0.00	\$44,277.96
AE	X		X		2	\$89,307.15	\$0.00	\$89,307.15
AE	X		X		2	\$192,119.73	\$0.00	\$192,119.73
AE	X		X		2	\$74,701.92	\$0.00	\$74,701.92
AE	X		X		2	\$78,749.86	\$0.00	\$78,749.86
AE	X		X		3	\$159,513.10	\$10,000.00	\$169,513.10
AE	X		X		2	\$146,984.21	\$14,947.39	\$161,931.60
AH	X		X		2	\$8,012.50	\$0.00	\$8,012.50
AE	X		X		2	\$102,218.55	\$0.00	\$102,218.55

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE		X	X		2	\$1,000,000.00	\$77,852.20	\$1,077,852.20
AE		X	X		3	\$16,024.92	\$0.00	\$16,024.92
AE	X		X		2	\$488,711.91	\$0.00	\$488,711.91
AE	X		X		4	\$180,950.43	\$67,976.36	\$248,926.79
AE	X		X		2	\$142,662.11	\$31,616.07	\$174,278.18
AE	X			X	2	\$152,016.86	\$39,405.28	\$191,422.14
VE	X		X		2	\$584,695.02	\$0.00	\$584,695.02
AE	X		X		3	\$102,749.15	\$0.00	\$102,749.15
AE	X		X		2	\$80,737.96	\$0.00	\$80,737.96
AE	X		X		2	\$54,365.27	\$8,132.66	\$62,497.93
AE	X		X		3	\$200,281.06	\$56,206.27	\$256,487.33
AE	X		X		3	\$65,183.87	\$14,348.39	\$79,532.26
AE	X		X		2	\$192,507.70	\$21,964.00	\$214,471.70
AE	X		X		3	\$119,807.03	\$9,584.27	\$129,391.30
AE	X		X		2	\$161,961.27	\$80,712.91	\$242,674.18
AE	X		X		2	\$5,852.29	\$0.00	\$5,852.29
AE	X		X		2	\$193,206.15	\$47,968.41	\$241,174.56
AE	X		X		2	\$12,800.39	\$0.00	\$12,800.39
AHB	X		X		2	\$10,909.32	\$0.00	\$10,909.32
AE	X		X		3	\$127,046.59	\$6,692.76	\$133,739.35
AE	X		X		2	\$220,376.42	\$68,632.78	\$289,009.20
AE	X		X		2	\$13,459.34	\$0.00	\$13,459.34
AE	X		X		3	\$34,214.35	\$5,019.32	\$39,233.67
AE	X		X		2	\$8,287.64	\$173.62	\$8,461.26
AE	X		X		2	\$25,737.08	\$0.00	\$25,737.08
AE	X		X		3	\$144,067.52	\$17,627.96	\$161,695.48
AE	X		X		2	\$12,580.06	\$0.00	\$12,580.06
AE	X		X		2	\$23,175.75	\$1,114.18	\$24,289.93
AE	X		X		2	\$112,377.10	\$0.00	\$112,377.10
AE	X		X		2	\$11,107.03	\$2,650.80	\$13,757.83
AE	X		X		2	\$184,766.77	\$66,557.79	\$251,324.56
AE	X		X		2	\$152,567.43	\$0.00	\$152,567.43
AE	X		X		3	\$0.00	\$26,028.63	\$26,028.63
AE	X		X		2	\$334,389.54	\$65,880.67	\$400,270.21
AE	X		X		2	\$11,085.76	\$0.00	\$11,085.76
AE	X		X		2	\$16,557.66	\$0.00	\$16,557.66
AE	X		X		3	\$176,224.36	\$24,397.05	\$200,621.41
AE	X		X		2	\$9,820.44	\$940.51	\$10,760.95
AE	X		X		2	\$201,027.51	\$0.00	\$201,027.51
AE	X		X		2	\$95,316.19	\$0.00	\$95,316.19
AE	X		X		2	\$126,186.99	\$16,939.20	\$143,126.19
AE	X		X		3	\$87,618.75	\$0.00	\$87,618.75
AE	X		X		2	\$106,150.70	\$0.00	\$106,150.70
AE	X		X		2	\$167,935.15	\$0.00	\$167,935.15

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X		X		2	\$262,877.46	\$53,000.00	\$315,877.46
VE	X		X		2	\$126,182.66	\$11,603.15	\$137,785.81
AE	X		X		2	\$299,925.33	\$25,000.00	\$324,925.33
AE	X		X		2	\$114,178.47	\$4,972.95	\$119,151.42
AE	X			X	2	\$122,256.48	\$20,500.00	\$142,756.48
AE	X			X	2	\$196,306.28	\$38,515.81	\$234,822.09
AE	X		X		2	\$4,167.69	\$184.40	\$4,352.09
AE		X	X		3	\$88,569.90	\$0.00	\$88,569.90
AE	X		X		2	\$48,561.41	\$11,689.92	\$60,251.33
AE	X		X		2	\$26,390.16	\$3,314.04	\$29,704.20
AE	X		X		2	\$36,208.36	\$0.00	\$36,208.36
AE		X	X		2	\$48,335.23	\$0.00	\$48,335.23
AE	X		X		2	\$9,276.55	\$0.00	\$9,276.55
AE	X		X		3	\$183,229.69	\$8,209.57	\$191,439.26
AE	X		X		2	\$143,093.76	\$45,777.25	\$188,871.01
AE		X	X		2	\$50,012.32	\$21,229.51	\$71,241.83
AE	X		X		2	\$37,073.20	\$13,677.01	\$50,750.21
AE	X			X	3	\$42,562.42	\$1,047.00	\$43,609.42
AE	X		X		2	\$5,642.18	\$0.00	\$5,642.18
AE	X		X		2	\$204,732.31	\$0.00	\$204,732.31
AE	X		X		2	\$349,699.22	\$0.00	\$349,699.22
AE	X		X		2	\$20,910.44	\$23,408.92	\$44,319.36
AE	X		X		3	\$85,279.65	\$11,032.13	\$96,311.78
AE	X		X		2	\$89,883.94	\$0.00	\$89,883.94
AE	X		X		2	\$149,786.54	\$146,165.72	\$295,952.26
AE	X		X		2	\$119,988.13	\$0.00	\$119,988.13
AE	X		X		2	\$137,681.10	\$0.00	\$137,681.10
AE	X		X		2	\$187,722.67	\$0.00	\$187,722.67
AE	X		X		2	\$160,257.98	\$0.00	\$160,257.98
AE	X		X		3	\$238,065.84	\$15,478.59	\$253,544.43
AE	X		X		3	\$84,401.08	\$36,362.05	\$120,763.13
AE	X		X		2	\$154,708.83	\$0.00	\$154,708.83
AE	X		X		2	\$91,875.25	\$3,000.00	\$94,875.25
AE		X	X		2	\$158,707.38	\$0.00	\$158,707.38
AE	X		X		2	\$317,856.61	\$76,400.00	\$394,256.61
AE	X		X		2	\$78,118.89	\$10,000.00	\$88,118.89
AE	X		X		2	\$4,692.46	\$0.00	\$4,692.46
AE	X		X		2	\$28,979.41	\$0.00	\$28,979.41
AE	X		X		2	\$111,476.26	\$86,874.18	\$198,350.44
AE	X		X		2	\$18,761.50	\$0.00	\$18,761.50
AE	X		X		2	\$168,132.42	\$11,981.64	\$180,114.06
AE	X		X		2	\$22,924.67	\$0.00	\$22,924.67
AE	X		X		2	\$23,434.55	\$0.00	\$23,434.55
AE	X		X		2	\$23,434.55	\$0.00	\$23,434.55

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X		X		2	\$18,579.40	\$0.00	\$18,579.40
AE	X		X		2	\$18,579.40	\$0.00	\$18,579.40
AE	X		X		2	\$23,010.95	\$0.00	\$23,010.95
AE	X			X	2	\$139,699.16	\$51,819.90	\$191,519.06
AE	X		X		2	\$74,851.15	\$14,214.48	\$89,065.63
AE	X		X		2	\$22,924.67	\$0.00	\$22,924.67
AE	X		X		2	\$23,367.05	\$0.00	\$23,367.05
AE	X		X		2	\$28,133.90	\$0.00	\$28,133.90
AE	X		X		2	\$23,570.75	\$0.00	\$23,570.75
AE	X		X		2	\$123,084.30	\$0.00	\$123,084.30
AE	X		X		3	\$44,816.87	\$2,421.52	\$47,238.39
AE	X		X		2	\$22,961.51	\$0.00	\$22,961.51
AE	X		X		2	\$22,924.67	\$0.00	\$22,924.67
AE	X		X		3	\$100,069.05	\$27,044.40	\$127,113.45
AE	X		X		2	\$23,434.55	\$0.00	\$23,434.55
AE	X		X		2	\$22,927.87	\$0.00	\$22,927.87
AE	X		X		2	\$22,958.31	\$0.00	\$22,958.31
AE	X		X		2	\$23,434.55	\$0.00	\$23,434.55
AE	X		X		2	\$22,924.73	\$0.00	\$22,924.73
AE	X		X		2	\$23,434.55	\$0.00	\$23,434.55
AE	X		X		2	\$18,582.76	\$0.00	\$18,582.76
AE	X		X		2	\$23,103.11	\$0.00	\$23,103.11
AE	X		X		2	\$73,938.24	\$5,203.34	\$79,141.58
AE	X		X		2	\$18,579.40	\$0.00	\$18,579.40
AE	X		X		2	\$118,435.92	\$0.00	\$118,435.92
AE	X		X		3	\$120,021.08	\$2,661.12	\$122,682.20
AE	X		X		2	\$133,513.08	\$0.00	\$133,513.08
AE	X		X		2	\$39,135.56	\$0.00	\$39,135.56
AE	X		X		3	\$203,164.74	\$3,882.03	\$207,046.77
AE	X		X		2	\$115,766.58	\$25,880.22	\$141,646.80
AE	X		X		2	\$41,891.99	\$0.00	\$41,891.99
AE		X	X		2	\$709,797.91	\$0.00	\$709,797.91
AE		X	X		2	\$79,480.24	\$18,292.38	\$97,772.62
AE	X		X		2	\$15,710.46	\$3,898.69	\$19,609.15
AE	X		X		2	\$18,399.69	\$0.00	\$18,399.69
AHB	X		X		3	\$116,522.22	\$12,378.02	\$128,900.24
AE	X		X		2	\$137,847.33	\$55,000.00	\$192,847.33
AE	X		X		2	\$67,822.92	\$0.00	\$67,822.92
AH	X		X		2	\$31,732.49	\$8,166.22	\$39,898.71
AE	X		X		2	\$15,097.93	\$5,455.79	\$20,553.72
AE	X		X		2	\$42,326.65	\$15,070.71	\$57,397.36
AE	X			X	2	\$74,144.28	\$7,594.98	\$81,739.26
AE	X		X		2	\$157,150.24	\$10,757.67	\$167,907.91
AE	X		X		3	\$20,633.95	\$5,180.94	\$25,814.89

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X		X		2	\$231,428.60	\$0.00	\$231,428.60
AE	X		X		3	\$598,157.64	\$0.00	\$598,157.64
AH	X		X		2	\$33,753.33	\$3,062.90	\$36,816.23
AE	X		X		2	\$80,886.17	\$0.00	\$80,886.17
AE	X		X		3	\$271,977.57	\$0.00	\$271,977.57
AE	X		X		2	\$69,332.50	\$0.00	\$69,332.50
AE	X		X		2	\$51,301.72	\$6,877.95	\$58,179.67
AE	X		X		2	\$124,642.95	\$74,800.00	\$199,442.95
AE	X		X		2	\$55,643.71	\$0.00	\$55,643.71
AE	X		X		2	\$15,609.51	\$550.12	\$16,159.63
AE	X		X		2	\$922,758.67	\$0.00	\$922,758.67
AHB	X		X		2	\$7,231.77	\$2,144.37	\$9,376.14
AH		X	X		2	\$49,169.92	\$3,818.46	\$52,988.38
AE	X		X		2	\$113,099.13	\$11,942.52	\$125,041.65
AH	X			X	2	\$124,406.48	\$0.00	\$124,406.48
AE	X		X		2	\$402,700.01	\$3,991.24	\$406,691.25
AE	X		X		2	\$6,551.81	\$943.23	\$7,495.04
AE	X		X		2	\$12,790.86	\$46.01	\$12,836.87
AE	X		X		2	\$1,557,176.96	\$0.00	\$1,557,176.96
AE	X		X		2	\$13,298.38	\$387.71	\$13,686.09
AE	X		X		2	\$160,678.29	\$0.00	\$160,678.29
AE	X		X		4	\$35,273.72	\$6,296.55	\$41,570.27
AE	X		X		4	\$232,279.00	\$291.34	\$232,570.34
AE	X		X		2	\$46,965.74	\$5,000.00	\$51,965.74
AE	X		X		2	\$188,378.86	\$0.00	\$188,378.86
AE	X		X		4	\$258,962.15	\$34,245.81	\$293,207.96
VE	X		X		2	\$341,836.14	\$0.00	\$341,836.14
AE	X		X		3	\$112,659.52	\$27,243.20	\$139,902.72
AE	X			X	3	\$207,403.02	\$0.00	\$207,403.02
AE	X		X		3	\$112,992.91	\$11,745.28	\$124,738.19
AE	X		X		2	\$427,861.05	\$17,543.87	\$445,404.92
AE	X		X		3	\$114,375.32	\$1,503.92	\$115,879.24
AE	X		X		3	\$59,241.64	\$0.00	\$59,241.64
AE	X		X		2	\$97,718.54	\$0.00	\$97,718.54
AE	X		X		3	\$123,926.20	\$0.00	\$123,926.20
AE	X		X		3	\$156,571.70	\$0.00	\$156,571.70
AE	X		X		2	\$28,301.44	\$0.00	\$28,301.44
AE	X		X		2	\$30,721.50	\$23,075.76	\$53,797.26
VE	X		X		2	\$84,333.57	\$0.00	\$84,333.57
VE		X	X		4	\$689,012.78	\$250,412.18	\$939,424.96
VE		X	X		2	\$103,772.49	\$0.00	\$103,772.49
AHB		X	X		2	\$38,982.28	\$0.00	\$38,982.28
AE	X		X		2	\$16,151.48	\$2,022.99	\$18,174.47
AE	X		X		2	\$153,897.80	\$0.00	\$153,897.80

Flood Zone ¹	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE		X	X		2	\$365,990.74	\$58,636.98	\$424,627.72
AE	X		X		2	\$190,684.23	\$0.00	\$190,684.23
AE	X		X		2	\$299,033.15	\$0.00	\$299,033.15
AHB	X		X		2	\$61,722.33	\$0.00	\$61,722.33
AE	X		X		2	\$178,873.60	\$57,900.00	\$236,773.60
AE	X		X		2	\$214,970.14	\$29,396.86	\$244,367.00
AE	X		X		2	\$30,244.05	\$0.00	\$30,244.05
AE	X		X		3	\$46,085.54	\$735.89	\$46,821.43
AE	X		X		2	\$17,589.78	\$0.00	\$17,589.78
AE	X		X		2	\$139,620.12	\$4,359.68	\$143,979.80
AE	X		X		3	\$146,197.47	\$34,045.72	\$180,243.19
AE	X		X		4	\$153,824.40	\$23,621.11	\$177,445.51
TOTAL	227	26	220	33	564	\$29,338,703.15	\$2,881,690.11	\$32,220,393.26

Source: NFIP Repetitive Loss Data, 12/11/2024

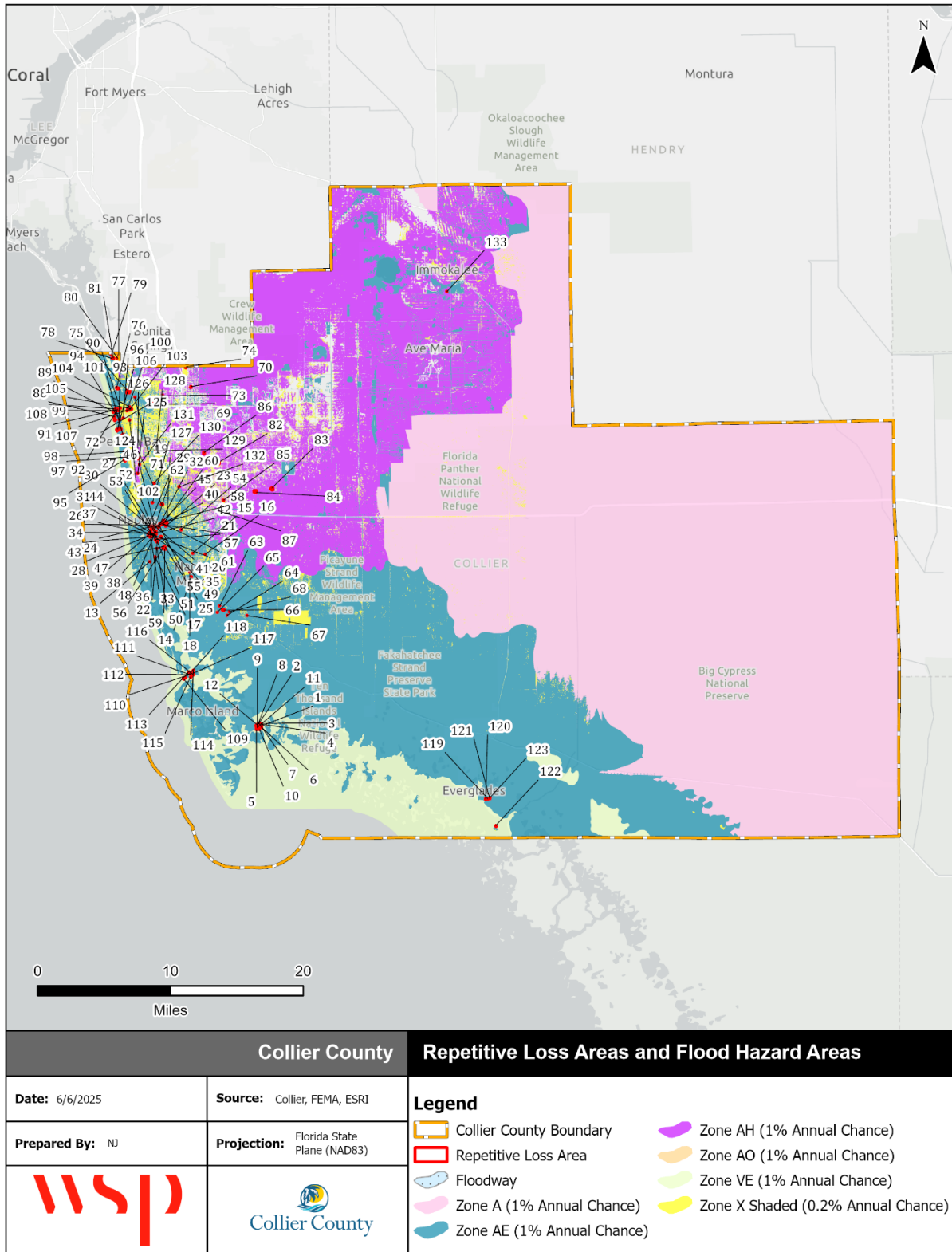
¹Flood Zone reflects the current Effective FIRM zone for each property according to the 2012 and 2024 FIRMs.

1.4 MAPPING REPETITIVE LOSS AREAS

One hundred and thirty-three Repetitive Loss Areas were identified within Collier County in accordance with the principles outlined in the CRS guidance titled *Mapping Repetitive Loss Areas* dated October 2015. The 133 Repetitive Loss Areas included the 253 unmitigated repetitive loss properties and 622 properties that have the same or similar flood conditions but have not had any claims paid against the NFIP. Therefore, a total of 875 properties were included within the RLAA. Note that this count of properties reflects structures in repetitive loss areas. Several structures included multiple units, some of which were evaluated independently during building data collection if building characteristics varied by unit; therefore, data was collected on 937 properties.

A detailed map of each Repetitive Loss Area is provided in Section 2. An overview map of the Collier County Repetitive Loss Areas relative to flood hazard areas is shown in Figure 1.3.

Figure 1.3 - Collier County Repetitive Loss Areas and Flood Hazard Areas



2 THE RLAA PROCESS

This RLAA was developed according to requirements and recommendations from the following guidance documents:

- 1 CRS publication *CRS Coordinator's Manual, 2017, Activity 510 Repetitive Loss Area Analysis*
- 2 FEMA publication *Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7*
- 3 CRS publication *Mapping Repetitive Loss Areas* dated August 15, 2008
- 4 Center for Hazards Assessment Response and Technology, University of New Orleans draft publication *The Guidebook to Conducting Repetitive Loss Area Analyses*

Most specifically, this RLAA included all five planning steps included in the 2017 *CRS Coordinator's Manual*:

Step 1: Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2: Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3: Visit each building in the repetitive loss area and collect basic data.

Step 4: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5 Document the findings. A separate analysis report must be prepared for each area.

Beyond these five planning steps, additional credit criteria for Activity 510 were also met. The repetitive loss areas were delineated in accordance with the criteria in Section 503 of the CRS Coordinator's Manual and areas were mapped as described in Section 503.a. The RLAA report will be submitted to the Board of County Commissioners and made available to the public. The RLAA will be formally adopted by the Board of County Commissioners or a delegated office. Moving forward, the County will prepare an annual progress report to the RLAA and will update the RLAA in time for each CRS cycle verification visit.

2.1 STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual letters were mailed to all property owners/residents within the 133 identified Repetitive Loss Areas on March 4, 2025.

Figure 2.1 on the following page shows an example of the property owner notification letter. Letters were mailed to all properties, including the repetitive loss properties, historic claims properties, and the additional properties with similar flooding conditions but which have no claims paid against the NFIP. Copies of all mailed letters are maintained on file with the Collier County Department of Growth Management. In accordance with the Privacy Act of 1974, the letters will not be shared with the general public.

2.1.1 MAILED QUESTIONNAIRE

A property owner questionnaire was included with each letter mailed to building owners (Figure 2.2 and Figure 2.3). The questionnaire asks about the type of foundation and if the building has a basement, has experienced any flooding, and the type of flooding, cause of flooding, flood protection measures and whether the owner has flood insurance. Property owners were given the option of mailing back their response or filling out the survey via QR code.

Figure 2.1 – Example RLAA Property Notification Letter

	Collier County GROWTH MANAGEMENT COMMUNITY DEVELOPMENT	
 [DATE]		
 [NAME]		
[ADDRESS]		
[CITY], FL [ZIP CODE]		
 Repetitive Loss Area Property Address: XXXXXXXX		
Parcel Number: XXXXXXXX		
 To the Owner or Resident of this Property:		
 You are receiving this letter because your property is in an area that has been flooded several times. As part of Collier County's participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS), the Growth Management Community Development Department is conducting a Repetitive Loss Area Analysis to evaluate properties that have experienced repetitive flood damage.		
The Repetitive Loss Area Analysis will involve the collection of community and property data, including:		
▪ Tax ID and lot and parcel number ▪ Structure and site elevation information ▪ Building information, such as construction type, building age, and building value ▪ Land information, such as topography, watershed, and drainage features ▪ Historical flood event information (when events occurred, amount of damage to property, etc.) ▪ Building codes/floodplain development regulations exceeding minimum standards		
 Within the next 45 days, Collier County's contractor, WSP, will visit your property to survey the flood risk and to take photographs. You do not need to take any action, but we encourage you to provide any relevant flooding information when the survey crew is in your neighborhood. The survey crew will be looking at the type and condition of your foundation, drainage patterns on the lot, and whether outside mechanical equipment is elevated. All on-site data collection will occur from the right-of-way.		
 You can help us perform this analysis by completing the enclosed questionnaire. Complete the questionnaire online using the QR code below or return a hard copy to the Community Planning & Resiliency Division, 2800 N Horseshoe Drive, Naples, Florida 34104. We also encourage you to review the recommendations on the following page for ways to protect yourself and your property from flooding.		
 The results of the Repetitive Loss Area Analysis will include a review of alternative approaches for mitigation, including property protection measures or drainage improvements, where feasible. Once the analysis is complete, a copy of the report can be obtained from the Community Planning & Resiliency Division. If you have any questions, please call me at (239) 252-1070.		
Flood 		
 Sincerely,		
 William Lang, FPEM, CFM, ANFI Community Planning & Resiliency Division Collier County Growth Management		
 Page 1 of 5		

Figure 2.2 – RLAA Survey, Page 1



Collier County
GROWTH MANAGEMENT
COMMUNITY DEVELOPMENT



Flood Protection Questionnaire

1. Name: _____

2. Repetitive Loss Area Property Address: _____

3. How many years have you occupied the building at this address?

☐ Less than 1	☐ 5-10 years
☐ 1-5 years	☐ 10+ years

4. Do you rent or own this building?

☐ Rent
☐ Own

5. What type of foundation does the building have?

☐ Slab	☐ Other: _____
☐ Crawl Space	
☐ Basement	

6. Has this building or property ever been flooded or had a water problem?

☐ Yes
☐ No (If "no", please skip to question 11)

7. In what year(s) did it flood? _____

8. Where did flooding occur and how deep did it get?

☐ In basement: _____ deep	☐ Over 1 st floor: _____ deep
☐ In crawl space: _____ deep	☐ In yard only: _____ deep
☐ Water was kept out of house by sandbagging, sewer valve, or other protective measure	

9. What was the longest time that water stayed in the building? _____

10. What do you feel was the cause of your flooding? Check all that affect your building.

☐ Storm sewer backup
☐ Sanitary sewer backup
☐ Standing water next to house/building
☐ Drainage from nearby properties
☐ Saturated ground / leaks in basement walls
☐ Storm surge or tidal flooding
☐ Other: _____

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Figure 2.3 – RLAA Survey, Page 2



Flood Protection Questionnaire (Continued)

11. What flood protection measures have you installed on the property?

- ☐ Sump pump
- ☐ Waterproofed the outside walls
- ☐ Re-graded yard to keep water away
- ☐ Moved things out of basement
- ☐ Backup power system / generator
- ☐ Sandbagged
- ☐ None
- ☐ Other _____

12. Did any of the measures checked in item 11 work? If so, which ones? If not, do you know why they did not work?

13. Is your building located in a Federal Emergency Management Agency (FEMA) mapped floodplain?

- ☐ Yes
- ☐ No
- ☐ I don't know

14. Do you have flood insurance?

- ☐ Yes
- ☐ No
- ☐ I don't know

15. Do you want information on protecting your building from flooding?

- ☐ Yes
- ☐ No

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Figure 2.4 – RLAA Survey, Page 3



Flood Protection Questionnaire (Continued)

16. Please include any additional information and comments you may have about flooding in your area:

Use one of the following options to complete and return this questionnaire by
March 7, 2024.

Option 1 – Respond Online https://forms.office.com/e/mAP6TGYvWs 	Option 2 – Email Scan and email this completed survey to abigail.moore@wsp.com	Option 3 – Mail Return this completed survey to WSP, Attn: Abigail Moore, 4021 Stirrup Creek Drive, Suite 100, Durham, NC 27613
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Collier County received 80 responses to the questionnaire which corresponds to a response rate of approximately six percent. The questionnaire responses are summarized below. Note: Respondents may have skipped questions and/or provided more than one response to a question.

Q1: How many years have you occupied the building at this address?

Answer Choices	Percentage	Number Responding
Less than 1	3.8%	3
1-5	21.5%	17
5-10	16.5%	13
10+	58.2%	46
Total	100.0	79

Q2: Do you rent or own this building?

Answer Choices	Percentage	Number Responding
Rent	0.0%	0
Own	100.0%	78
Total	100.0	78

Q3: What type of foundation does the building have?

Answer Choices	Percentage	Number Responding
Slab	71.1%	54
Crawl Space	5.3%	4
Basement	3.9%	3
Other	19.7%	15
Total	100.0	76

If other: stilts, pilings, columns, blocks

Q4: Has this building or property ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	81.0%	64
No	19.0%	15
Total	100.0	79

Q5: In what year(s) did it flood?

Among the 64 respondents who reported experiencing flooding, the years most frequently cited for such occurrences were 2017 (19), 2022 (33), and 2024 (31). Respondents could choose multiple years.

Q6: Where did you get water and how deep did it get?*

Answer Choices	Percentage	Number Responding
In basement	20.3%	13
In crawl space	6.3%	4
Over 1 st floor	65.6%	42
In yard only	18.8%	12
Water was kept out of house by sandbagging, sewer valve, or other protective measure	4.7%	3
Total		64

*Please note that respondents could select multiple answer choices. Therefore, the percentage represents the number of times an answer choice was included in a response. There are more answer choices selected than total responses.

Respondents reported depth of water that ranged from 2 inches to 12 ft.

Q5: What was the longest time that water stayed in house/building?

The duration of water presence inside or beneath homes varies, ranging from a few hours to a week. A few hours to a few days were the most common responses.

Q8: What do you feel was the cause of your flooding? Check all that affect your building.*

Answer Choices	Percentage	Number Responding
Storm sewer backup	18.8%	12
Sanitary sewer backup	7.8%	5
Standing water next to house/building	14.1%	9
Drainage from nearby properties	32.8%	21
Saturated ground / leaks in basement walls	14.1%	9
Storm surge or tidal flooding	87.5%	56
Other:	10.9%	7
Total		64

*Please note that respondents could select multiple answer choices. Therefore, the percentage represents the number of times an answer choice was included in a response. There are more answer choices selected than total responses.

If other:

- Neighboring lot has damaged seawall
- Drainage ditch (canal?) next to property location
- Mismanagement of weir system, flood gates were left open during high tide. Flooding in this area had never occurred before
- Water release from weirs and buildup of silt in canals
- High tide from Henderson Creek, floods during heavy rainstorms
- Road/sewer/drainage work in Naples Park
- Road/sewer/drainage work in Naples Park

Q9: What flood protection measures have you installed on the property?*

Answer Choices	Percentage	Number Responding
Sump pump	6%	3
Waterproofed the outside walls	16%	8
Re-graded yard to keep water away	10%	5
Moved things out of basement	22%	11
Backup power system / generator	10%	5
Sandbagged	42%	21
Other	38%	19
Total		50

*Please note that respondents could select multiple answer choices. Therefore, the percentage represents the number of times an answer choice was included in a response. There are more answer choices selected than total responses.

If other:

- All measures for the building were handled by the HOA
- Yard small drainage system
- Drainage tile w/catch basins going to sump basins
- Built originally higher
- Home made flood panels
- Have replaced ductwork under home 3 times, last time used different system. Metal ductwork coated with closed cell foam. Underside of mobile home also coated with closed cell foam

- Breakaway walls/basement, raised pool/spa equipment, remove all outside pool/accessory items, furniture, etc.
- French drains
- Tar tape around doors
- Installation of flood panels, taped and sealed doors, construction of elevated home
- Waterproofed the lower half of the interior walls with Enduro Walls (PVC) in the bottom floor and stairway
- I put waterproof tape & plastic over doors & windows
- Rugs by lanai doors
- Movement of properties to higher level upstairs
- Home is elevated
- French drains

Q10: Did any of the measures checked in question 9 work? If so, which ones? If not, do you know why they did not work?

A sample of responses are provided below:

- “No, nothing worked. Too much water and pressure to keep out. Had the house sealed with spray foam and water come in from under the foundation, eventually came in everywhere.”
- “Elevated generator worked great; we no longer store anything in the basement area.”
- “Worked really well until 2024 - 11.5" of rain at the beginning of season, land was saturated - so we also use flexseal flood putty & tape to keep water out of garage and back door.”
- “Water dams (quick dams) prevented entry into shed area. The new duct work system (\$23,000) unknown until next flooding event. Water has never entered home. All claim have been for replacement of duct work.”
- “We attempted to wrap any remaining appliances in visqueen. That did not work, they floated and tipped in 18" of water.”
- “Water surge was too strong and penetrated the building.”

Q11: Is the building located in a Federal Emergency Management Agency (FEMA) floodplain?

Answer Choices	Percentage	Number Responding
Yes	73.7%	56
No	2.6%	2
I don't know	25.0%	19
Total	100.0	76

Q12: Do you have FEMA Flood Insurance?

Answer Choices	Percentage	Number Responding
Yes	65.8%	50
No	31.6%	24
I don't know	2.6%	2
Total	100.0	76

Q12: Do you want information on protecting your home/building from flooding?

Answer Choices	Percentage	Number Responding
Yes	69.4%	50
No	30.6%	22
Total	100.0	72

Q13: Please include any additional information and comments you may have about flooding in your area:

A sample of responses are provided below:

- “Everyone in the neighborhood seems to believe that excess water, released from inland, contributes greatly to the flooding. River needs to be dredged, and water releases need to be more closely regulated. Our neighborhood is overwhelmed by water drainage from inland waters.”
- “If our canals were dug out I'm sure the water would have a place to drain out faster. Wilma, brought a lot of wind with her, and more has come with each storm there after, dredging canals would help immensely.”
- “There is a sewer drain (storm drain) in the front yard of my home that was installed by Collier County. After it rains, the sewer drain regularly backs up causing standing water in my front yard & the street (Guava Drive). Even during the brief summer storms that we get frequently, we can have a foot or so of standing water in the street overnight, because the water will not drain.
- “When there is a hurricane, then the sewer drain completely stops working. This results in flooding of homes nearby and Guava Drive. Additionally, the water covering Guava Drive makes the road extremely difficult to travel by car around the time of a hurricane.”
- “The development around West Wind has definitely impacted the efficacy of our drainage ditch r. e. Reflection Lakes, Naples Reserve, Royal Acres. The widening of US 41 and the county not clearing out access points to main culvert along 41 has also had an impact. Since these events I have had to file for 3 claims and invest more than \$30,000 of my own money, in addition to flood insurance payouts.”
- My community (West Wind Estates) has spent considerable funds to clean and clear the water ditch (canal) in an attempt to help alleviate the flooding issues.”
- “Storm drains ends at Terrace Ave Shadow north of that point has no drains”
- “We need sewers and water drainage system on the roads”
- “I have been here 15 years & never have flooded to the extent this neighborhood floods now. .Storm surge is horrific - I believe some of this was caused by the new golf course put in on Wiggins Pass Road.”
- House built in 1968. No floods until Hurricane Irma in 2017 (49 yrs). Then 2021 during Hurricane Ian then in 2024 with back to back Hurricanes Helene & Milton. Yard & street flood when it rains, sewer drains back up at 4 corners of street and road (Smugglers Cove) is damaged.

RESPONSE TRENDS & TAKEAWAYS

The following trends in survey responses should be considered when evaluating mitigation measures:

- Most respondents have owned their residences for 10 or more years, so they have a good understanding of flood problems and any changes in runoff. Most homes are slab on grade.
- Almost 70 percent of respondents do want information from the County for protecting their home/building from flooding.
- Approximately 65 percent of the respondents do currently have FEMA flood insurance; however, 25 percent of respondents did not know if their home is in a floodplain.
- Of those residents who have installed flood protection measures, approximately half (of those responding to the question) reported failure or issues with their flood protection measures. Those who reported positive outcomes mentioned drainage systems, sandbagging, elevation, and moving items upstairs as effective.
- Most respondents cited storm surge or tidal flooding (87.5%) as one of the causes of their flooding. This was followed by drainage from nearby properties (32.8%) and storm sewer backup (18.8%).
- Most flooding has been over the first floor of homes (65.6%).
- Several survey respondents mentioned the need for improvements to the sewer drainage system.

2.2 STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Collier County contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss areas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. Those agencies, reports and associated data which were analyzed and reviewed included:

- Federal Emergency Management Agency, Collier County, Florida and Incorporated Areas Flood Insurance Study, 2024
- Federal Emergency Management Agency (Repetitive Loss Data: 12-11-2023 & Flood Insurance Data: 5-13-2025)
- Collier County Capital Improvement Plan
- Collier County Growth Management Plan, 2022
- Collier County Multi-Jurisdictional Local Mitigation Strategy, 2025
- Collier County Code of Ordinances
 - Land Development Code
 - Floodplain Management Ordinance
 - Stormwater Utility Ordinance
- Collier County Growth Management – Community Planning & Resiliency Division

2.2.1 SUMMARY OF STUDIES AND REPORTS

2.2.1.1 FEMA FLOOD INSURANCE STUDY

FEMA most recent FIS for Collier County, FL is dated February 8, 2024. The FIS revises and updates information on the existence and severity of flood hazards within the County. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the County.

2.2.1.2 FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore, all claims data in this report are only discussed in general terms.

2.2.1.3 CAPITAL IMPROVEMENT PLAN

Preparation of the Collier County annual budget includes the preparation of a long-range Capital Improvement Program (CIP). This planning document is a five-year outlook for anticipated capital projects designed to facilitate decision makers in the replacement of capital assets. The projects are primarily related to improvement in roads and drainage, parks and recreation, public utilities and facilities. The Collier County Capital Improvement Plan (CIP) prioritizes funding for infrastructure projects that enhance hazard resilience.

2.2.1.4 COLLIER COUNTY GROWTH MANAGEMENT PLAN

Collier County's Growth Management Plan (GMP) establishes the vision, framework, and policies for future growth in Collier County, while maintaining compliance with the legislative requirements of the state of Florida. The GMP was last updated on April 22, 2022). The GMP includes several elements outlining the community's priorities including capital improvement, conservation and coastal management, economic, future land use, etc. Specifically, the plan limits density within Coastal High Hazard Areas (CHHAs).

2.2.1.5 *COLLIER COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY, 2025*

The primary reason for developing a Local Mitigation Strategy (LMS) is to reduce a community's exposure to natural hazards by taking proactive, pre-disaster planning steps to limit development in hazard sensitive areas, particularly floodplain or flood hazard areas. The second reason is to comply with the hazard mitigation planning requirements established by the Federal Emergency Management Agency (FEMA) and implemented through the Florida Division of Emergency Management. The Collier County LMS includes a number of recommendations for flood mitigation including acquisition of repetitive loss properties, elevation of repetitive loss properties, and conservation of wetlands.

2.2.1.6 *COLLIER COUNTY FLOODPLAIN MANAGEMENT PLAN, 2015*

The County's Floodplain Management Plan documents the County's flood hazard mitigation planning process and identifies relevant flood hazards and vulnerabilities as well as strategies the County will use to decrease vulnerability and increase resiliency and sustainability. The Plan examines flood occurrences, both coastal and inland; localized flooding areas identified by the County; coastal and stream bank erosion; flooding associated with sea level rise and climate change; and flooding associated with hurricane and tropical storm rain and storm surge.

2.3 STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted between February 25, 2025 and March 3, 2025. The National Tool Limited View was not utilized in this effort, but most of the information required by the National Tool was incorporated into a mobile application survey. The data collection forms generated by the mobile application are included in Appendix A. (Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public).

In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

- Existing mitigation observed
- Type and condition of the structure and foundation
- Number of stories
- Height above street grade and height above site grade
- Presence and type of appurtenant structures
- Likely areas and severity of damage on property
- Presence of any HVAC units that would be vulnerable

Data was also gathered, when possible, through conversations with property owners and/or residents. These conversations provided detail on the extent of flooding, potential causes of flooding, and recollections from past flood events, which help to better understand flooding issues for these areas.

Data was also incorporated from off-site research, including a review of FEMA Flood Insurance Rate Maps, and the location of the Repetitive Loss Areas in relation to FEMA flood zones.

Table 2.1 on the following page details the percentage of each repetitive loss area that falls within the 1%-annual-chance, 0.2%-annual-chance, or Unshaded Zone X flood zone.

Table 2.1 – Repetitive Loss Area Percentage of Acreage by Flood Zone

REPETITIVE LOSS AREA	TOTAL ACREAGE	PERCENTAGE OF AREA				
		ZONE AE 1%-ANNUAL- CHANCE	ZONE AH 1%-ANNUAL- CHANCE	ZONE VE 1%-ANNUAL- CHANCE	ZONE X SHADED 0.2%-ANNUAL- CHANCE	ZONE X UNSHADED
1	5.43	90.7			9.3	
2	1.92	96.1		3.9		
3	0.76	100.0		0.0		
4	0.60	97.3		2.7		
5	5.62	91.8		8.2		
6	4.02	100.0				
7	0.17	100.0				
8	1.07	100.0				
9	1.15	98.7		1.3		
10	0.57	78.9		21.1		
11	0.35	100.0				
12	0.92	100.0				
13	0.80	100.0				
14	2.59	100.0				
15	0.36	100.0				
16	0.55	96.3			3.7	
17	3.13	100.0				
18	1.11	100.0				
19	14.68	100.0				
20	0.97	100.0				
21	2.18	100.0				
22	1.23	100.0				
23	0.88	100.0				
24	8.89	100.0				
25	0.46	100.0				
26	1.31	100.0				
27	3.00	100.0				
28	0.84	100.0				
29	3.03	100.0				
30	0.49	100.0				
31	1.05	100.0				
32	0.81	100.0				
33	0.64	100.0				

PERCENTAGE OF AREA

REPETITIVE LOSS AREA	TOTAL ACREAGE	PERCENTAGE OF AREA				
		ZONE AE 1%-ANNUAL- CHANCE	ZONE AH 1%-ANNUAL- CHANCE	ZONE VE 1%-ANNUAL- CHANCE	ZONE X SHADED 0.2%-ANNUAL- CHANCE	ZONE X UNSHADED
34	0.57	100.0				
35	0.80	100.0				
36	1.88	100.0				
37	0.65	100.0				
38	2.63	100.0				
39	0.50	100.0				
40	0.44	100.0				
41	1.41	100.0				
42	0.67	100.0				
43	3.16	100.0				
44	0.49	100.0				
45	0.42	100.0				
46	1.10	100.0				
47	0.99	100.0				
48	0.68	100.0				
49	2.48	100.0				
50	0.62	100.0				
51	0.65	100.0				
52	0.93	100.0				
53	0.45	100.0				
54	0.94	100.0				
55	0.55	100.0				
56	0.73	100.0				
57	0.69	100.0				
58	7.27	100.0				
59	3.06	100.0				
60	1.35	100.0				
61	0.52	100.0				
62	0.48	100.0				
63	0.38	100.0				
64	0.30	100.0				
65	0.52	100.0				
66	3.74	100.0				
67	0.39	100.0				

PERCENTAGE OF AREA

REPETITIVE LOSS AREA	TOTAL ACREAGE	PERCENTAGE OF AREA				
		ZONE AE 1%-ANNUAL- CHANCE	ZONE AH 1%-ANNUAL- CHANCE	ZONE VE 1%-ANNUAL- CHANCE	ZONE X SHADED 0.2%-ANNUAL- CHANCE	ZONE X UNSHADED
68	0.21	100.0				
69	3.41	100.0				
70	2.70		39.5		24.7	35.8
71	0.56	100.0				
72	1.79	100.0				
73	0.69	45.0	55.0			
74	3.26		5.5		11.4	83.1
75	33.61	100.0				
76	7.29	90.9		1.6	7.6	
77	0.57				100.0	
78	0.72	100.0				
79	1.24	100.0				
80	0.95		98.5		1.5	
81	1.23	46.1	37.8		16.1	
82	6.59		63.3		23.0	13.7
83	12.17		100.0			
84	16.00		99.9		0.1	
85	0.69		12.0		88.0	
86	5.00		97.1		2.9	
87	1.19		93.2		6.8	
88	10.46	57.3		42.7		
89	3.27	59.5		40.5		
90	0.65				100.0	
91	0.66	100.0				
92	2.01	100.0				
93	6.78	77.6			22.4	
94	1.51	100.0				
95	15.06	83.6		7.0		9.3
96	0.64	88.4			11.6	
97	0.82	12.7			87.3	
98	5.55	100.0				
99	0.53				100.0	
100	0.57	50.3			49.7	
101	18.61	98.4			1.6	

PERCENTAGE OF AREA

REPETITIVE LOSS AREA	TOTAL ACREAGE	PERCENTAGE OF AREA				
		ZONE AE 1%-ANNUAL- CHANCE	ZONE AH 1%-ANNUAL- CHANCE	ZONE VE 1%-ANNUAL- CHANCE	ZONE X SHADED 0.2%-ANNUAL- CHANCE	ZONE X UNSHADED
102	1.24	100.0				
103	0.46	100.0				
104	0.46	100.0				
105	0.48	100.0				
106	5.66	40.4		0.1	59.5	
107	0.86	100.0				
108	1.59	100.0				
109	7.83	87.6		0.3	12.1	
110	2.37	100.0				
111	2.54	100.0				
112	2.31	100.0				
113	0.55	100.0				
114	1.12	100.0				
115	0.91	100.0				
116	1.21	100.0				
117	0.68	100.0				
118	1.21	100.0				
119	0.68	100.0				
120	0.98	100.0				
121	0.79	100.0				
122	1.24	29.6		70.4		
123	0.44	100.0				
124	4.70	100.0			0.0	
125	0.94		100.0			
126	4.17		77.8		0.8	21.4
127	0.98	100.0				
128	1.97				100.0	
129	2.45	85.9			14.1	
130	0.76	100.0				
131	0.63		100.0			
132	1.13	37.4		45.8		
133	0.59	100.0				

Source: 05/16/2021 and 02/08/2014 FIRM

2.3.1 COASTAL/TIDAL FLOODING ZONE

PROBLEM STATEMENT

The Coastal Zone in Collier County is primarily vulnerable to coastal, tidal flooding, storm surge, and flooding from heavy rains associated with tropical storms and hurricanes. Areas within this zone are in close proximity to the Gulf of Mexico. Properties within this zone may border the Gulf or other water bodies, including lagoons, bays, ponds, and canals. While the primary flood source in these areas is coastal or tidal flooding, some flooding in these repetitive loss areas is also considered flash flooding. Flash flooding can occur when the capacity of the stormwater system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Tidal influences can also exacerbate flash flooding in Collier County when heavy rains fall during a high tide, which prevents the stormwater infrastructure from draining floodwaters.

Past flood insurance claims for repetitive loss properties in this zone have been tied to Tropical Storm Jerry (1995), Tropical Storm Gabrielle (2001), Hurricane Harvey (1999), Tropical storm Gabrielle (2001), Hurricane Charley (2004), Hurricane Wilma (2005), Hurricane Irma (2017), Hurricane Ian (2022), Hurricane Idalia (2023), and a more localized heavy rain events over the past few decades. Some of these events are summarized below from National Weather Service and NOAA event narratives:

August 1995 – Tropical storm Jerry was a minimal tropical storm that brought heavy rains into Florida.

September 1999 - Tropical storm Harvey formed in the eastern Gulf of Mexico on September 19 and after moving toward west central Florida turned southeast and moved across the south Florida peninsula on September 21. As Harvey moved across south Florida it became poorly organized and exhibited characteristics of a frontal wave. Total damage from Harvey in south Florida is estimated at \$350 thousand, mainly in Collier County. Rainfall amounts were heaviest in Collier County with several reports of 10 inches in the Naples-Marco Island area which caused serious street flooding, but property damage was minimal. Rain estimates in mainland Monroe County were 6 to 10 inches. Rainfall in other areas of south Florida was 1 to 3 inches. The maximum storm surge was estimated at 1 to 2 feet along the southwest Florida coast causing minor flooding at Everglades City and minor beach erosion in Collier and mainland Monroe counties. Two brief tornadoes touched down, one tearing the roof off of a residence in the Naples area.

September 2001 - Tropical storm Gabrielle formed in the eastern Gulf of Mexico from a trough of low pressure that had lingered over Florida since September 8. Gabrielle moved east northeast at 7 to 12 mph with the center crossing the Florida west coast near Venice at noon on September 14. The minimum central pressure in Collier County was 999.4 mb at Naples. Maximum winds in Collier County were at Everglades City with sustained winds of 44 knots and peak gusts of 61 knots. Storm surge values of 3 to 5 feet were observed along much of the Collier County coast which caused some coastal flooding and minor to moderate beach erosion. The estimate to repair the beach erosion is \$3 million. Flooding by rainfall of 2 to 5 inches along with the storm surge damaged 60 to 70 residences and 12,500 customers lost electrical power.

August 2004 - On August 12, Hurricane Charley, after moving through the northwest Caribbean Sea, turned north and accelerated cross the western end of Cuba, and just west of the lower Florida Keys. Early on August 13, the hurricane intensified to Category 4 status and turned to a north-northeast direction before making landfall near Port Charlotte around 3 PM EDT. In Collier County, a peak wind gust of 84 mph was measured at 2:50 PM EDT on the top of a condominium at Vanderbilt Beach before the equipment failed. The Naples ASOS equipment failed well before the maximum winds or minimum pressure occurred. Wind gusts at La Belle were estimated at 80 mph. Rainfall in most locations in Collier County was around two inches with an unofficial amount of 7.5 inches reported in North Naples. Radar rainfall estimates of locally 8 to 10 inches were made in North Naples. Flooding was mostly minimal. Four persons in Naples suffered minor injuries when their vehicle was touched by a downed power line during the storm. Three persons in Collier County died from indirect causes after the hurricane. An estimated 130,000 customers in Collier County lost power. About 2,500 people took refuge in six shelters.

October 2005 – Hurricane Wilma made landfall as a category 3 storm shortly before 7 AM Monday, October 24th on the southwest Florida coast between Everglades City and Cape. The eye covered large portions of South Florida, including the eastern two-thirds of Collier County. Rainfall amounts across South Florida generally ranged from 2 to 4 inches across southern sections of the peninsula to 4 to 6 inches across western Collier County. A storm surge of around 8 feet was estimated in Marco Island, with 4 feet in Everglades City.

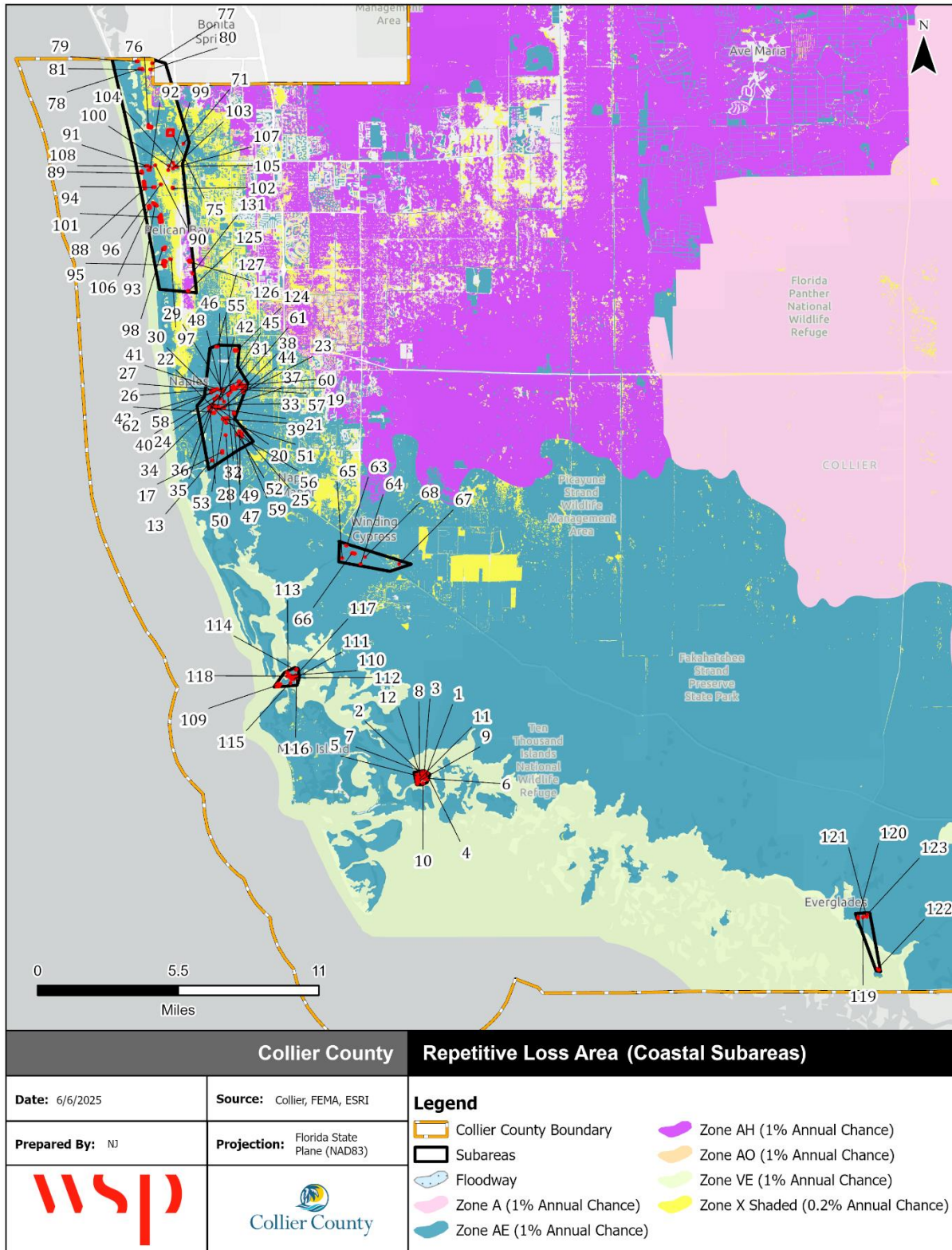
September 2017 - Major Hurricane Irma made landfall in Southwest Florida on Marco Island as a Category 3 hurricane around 3:30 PM EDT on September 10th. The storm traveled north through southwest Florida through the evening. Effects from Irma were felt across South Florida from September 9th through September 11th. Irma had reached Category 5 strength and a minimum central pressure of 914 MB east of the Bahamas, maintaining Category 5 intensity until landfall along the north coast of Cuba on September 9th. Irma made its first Florida landfall in the Lower Florida Keys early on September 10th as a Category 4 hurricane. Storm surge across Collier County ranged from 4 to 8 feet, highest in the Chokoloskee and Everglades City area and lowest at the northern Collier County coast. Impacts were most severe in Chokoloskee, Everglades City, Plantation Island and Goodland where numerous homes were flooded and suffered major to catastrophic damage. Storm survey and data from USGS rapid deployment gauges indicated highest inundation from storm surge in Chokoloskee with up to 8 feet at waterfront, approximately 8 feet above Mean Higher High Water (MHHW), as well as 3-5 feet of inundation across the island.

September 2022 – Hurricane Ian moved NE across the central Florida peninsula during the evening and night of Wednesday, September 28th, finally being downgraded to a tropical storm about 20 miles west of Melbourne at 5 AM Thursday, September 29th. Ian moved off the east coast of Florida just north of Cape Canaveral during the mid-morning hours of Thursday, September 29th. Ian produced a catastrophic storm surge across coastal sections of SW Florida on Wednesday, September 28th. Storm surge from surveys was estimated in the 8-11 ft range above MHHW along the Gulf beaches from Naples north to Barefoot Beach, and extending inland about 1 mile. Storm surge of 4-7 ft above MHHW was surveyed in the Naples Bay area and extending north to the Naples Airport area, as well as in North Naples near the Cocohatchee River. Farther south and east along the coast, storm surge values were estimated at 5-7 feet above MHHW in Marco Island and Goodland, and 4-6 ft MHHW in Everglades City and Chokoloskee. Reported damage estimate for the entire county is \$2.2 billion, which includes storm surge-related damage. Of that, \$1.7 billion is to residential properties and \$492 million to commercial properties. A total of 33 buildings were destroyed, with 3,515 residential and commercial buildings suffering major damage.

August 2023 - The center of Hurricane Idalia passed about 180 miles west of Naples as a Category 2 moving north over the eastern Gulf of Mexico. The outermost edge of Idalia's tropical storm force wind field skirted the SW Florida Gulf coast, and a few outer rain bands moved through South Florida on August 29th and 30th bringing brief tropical storm force wind gusts. A storm surge of about 3 feet, combined with high astronomical tides, led to minor coastal flooding in Collier County during the high tide cycles on August 29th and 30th. This resulted in street flooding of near-coastal areas in Naples and Everglades City during the high tide cycles of August 29th and 30th.

The most flood insurance claims for repetitive loss properties within the inland flooding zone occurred during Hurricane Ian (209) and Hurricane Irma (202).

Figure 2.5 - Subareas in the Coastal and Tidal Flooding Zone



2.3.1.1 SUBAREA 1

OVERVIEW

Subarea 1 contains 32 repetitive loss areas. Table 2.2 provides summary information for all repetitive loss areas in Subarea 1. A description and map of each of the identified repetitive loss area follows.

Table 2.2 – Overview of Subarea 1

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
71	1	2	Cocohatchee St	100%
75*	18	123	Belaire Ct, Grand Canal Dr, Venetian Way, Rainbow Ct, Park Ave, Glendale Ave	100%
76*	1	3	Dockside Dr	92.5%
77	1	2	3 rd St	0.57%
78	1	2	6 th St W	100%
79	1	6	1 st St	100%
80	1	4	7 th St	98.5%
81	1	4	6 th St, 7 th St, W Valley Dr	83.9%
88*	2	8	Gulf Shore Dr	100%
89	1	1	Gulf Shore Dr	100%
90	1	2	Vanderbilt Dr	0%
91	1	2	Egret Ave	100%
92	3	5	Connors Ave	100%
93*	2	1	Bay Colony Dr	77.6%
94	1	6	Oak Ave	100%
95*	2	2	Heron Point Dr, Turtle Bay Dr	83.6%
96	1	3	97 th Ave N	88.4%
97	1	4	Via Lugano	12.7%
98*	1	3	Pelican Bay Blvd	100%
99	1	2	106 th Ave N	0%
100	1	2	108 th Ave N	50.3%
101*	2	1	Pelican Bay Blvd	98.4%
102	2	5	94 th Ave N	100%
103	1	2	107 th Ave N	100%
104*	1	2	110 th Ave N	100%
105	1	2	108 th Ave N	100%
106*	1	1	Bay Colony Dr	40.5%
107	1	5	108 th Ave N	100%
108	1	5	Heron Ave	100%
125	1	2	Morningside Dr	100%
126	1	2	East Ave, Ridge Dr	77.8%
131	1	2	Napoli Dr	100%

*This area contains multi-unit structures. Property count reflects structure count, not unit count.

FINDINGS

Subarea 1 includes 272 residential, commercial, and vacant properties. Most properties are residential and single-family; however, the area does include several multi-story (15+ story) condominium buildings. Most of the properties within Subarea 1 back up to or are near canals, which are connected to the gulf or a bay. Several properties are located directly along the gulf or adjacent to a bay or lagoon. Therefore, most properties in this subarea experience flooding due to their proximity to oceanfront areas and/or waterways connected to the gulf.

Field data collection indicates that there is not a consistent approach to drainage within Subarea 1. Many properties, around 27% contain drainage ditches, while others have access to a drainage inlet (14%). Some properties had neither a ditch nor an inlet (17%). Responses to the flood protection questionnaire indicate that property owners in Subarea 1 often attribute flooding issues to storm surge; however, several survey responses linked drainage from nearby properties to flooding problems.

Within Subarea 1, almost half of the properties are elevated 2 feet or more, and of those properties, the majority are elevated at least 4 feet. Slab-on-grade is the most common foundation type (63%) however, elevated foundations, piers, posts, columns, or parallel sheer walls support 88 of the properties.

153 HVAC units were observable from the right-of-way. Through observation, it was noted that four HVAC units are not elevated; nine units are elevated but did not reach the first-floor level; 15 units are elevated to B.F.E; 69 are elevated to at least the first floor; and 56 are elevated above the first floor.

The questionnaire indicates that several of the respondents (15 of 23) in Subarea 1 would like additional information on how to protect their building from flooding. A few respondents suggested dredging the river/canal. Others expressed frustration at new development and its impact on flooding.



Property with living space elevated above parking area.



Property with drainage ditch in front yard.



House without drainage feature bordering canal.



House with drainage inlet in front yard.



Condominium building along Gulf with living space elevated above garage

Figure 2.6 - Subarea 1 Repetitive Loss Areas and FEMA Flood Zones

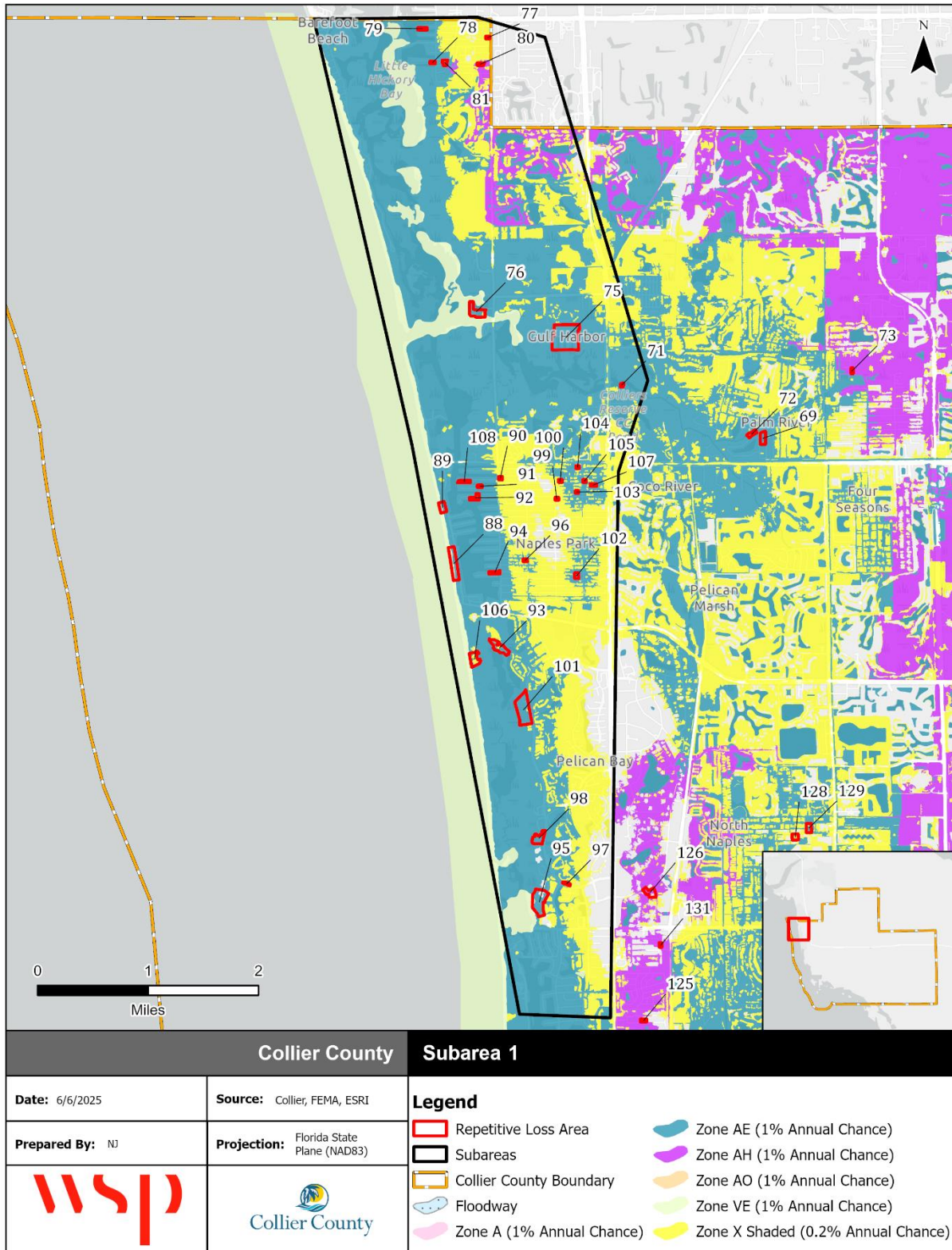


Figure 2.7 – Repetitive Loss Area 71



Figure 2.8 – Repetitive Loss Area 75

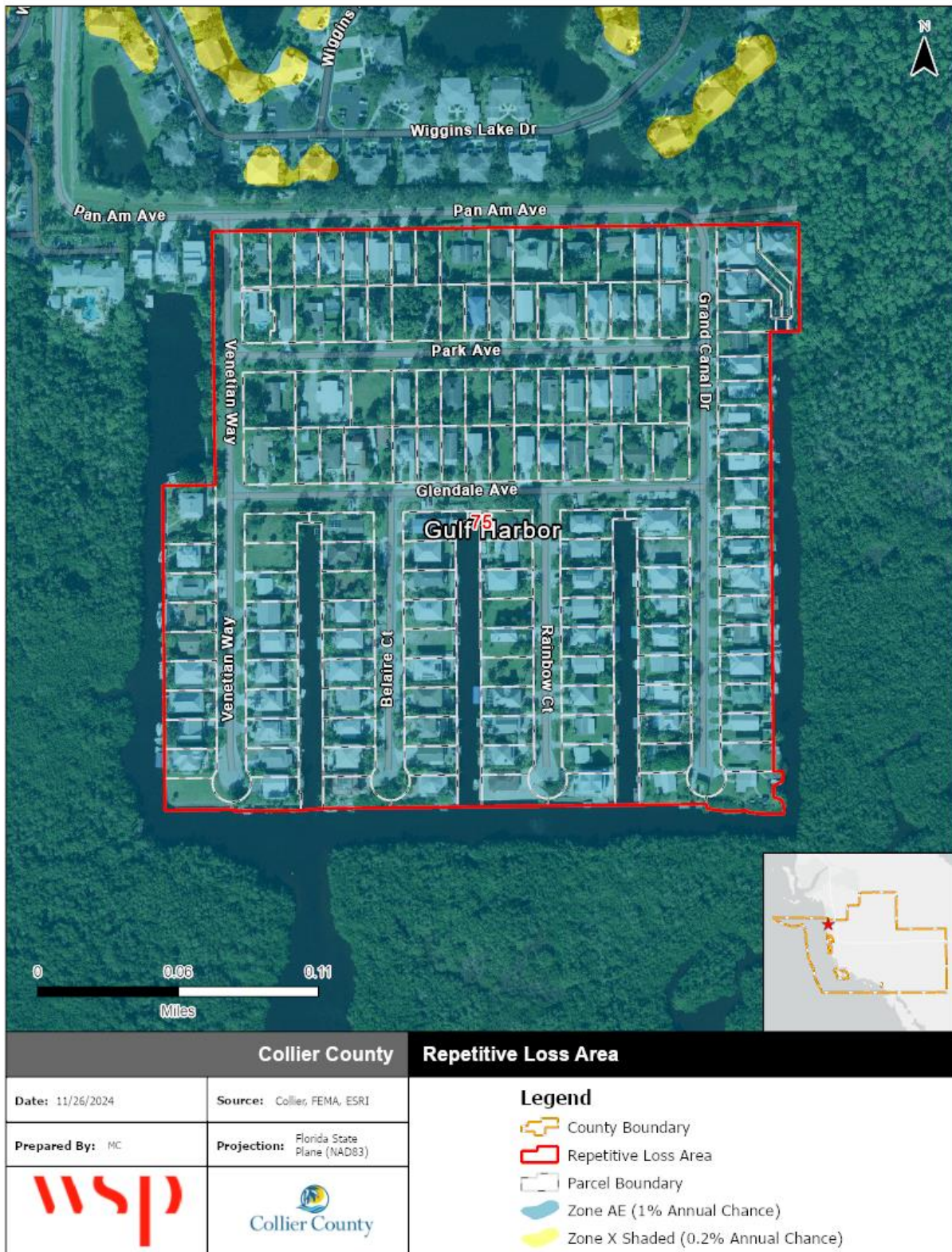


Figure 2.9 – Repetitive Loss Area 76

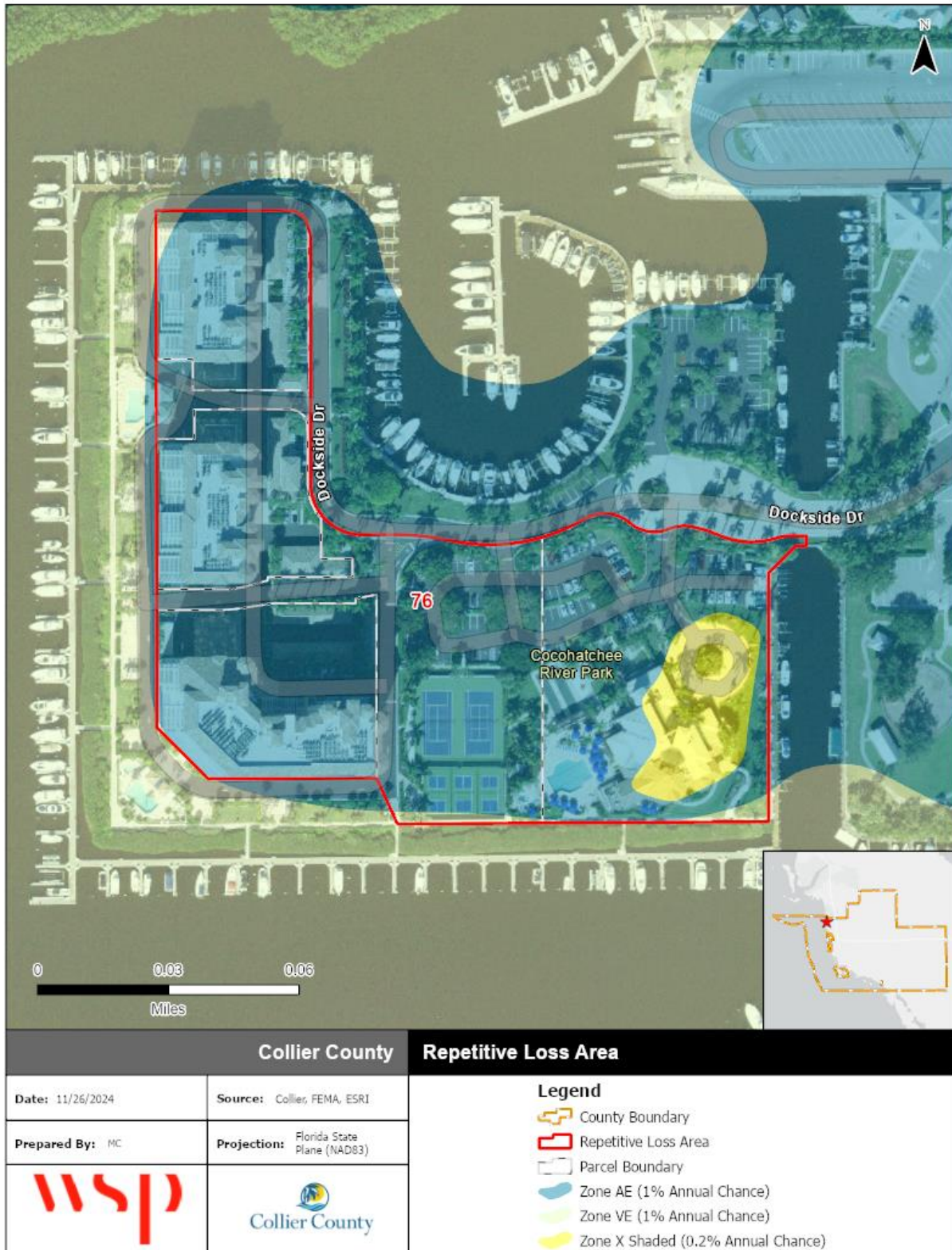


Figure 2.10 – Repetitive Loss Area 77



Figure 2.11 – Repetitive Loss Area 78

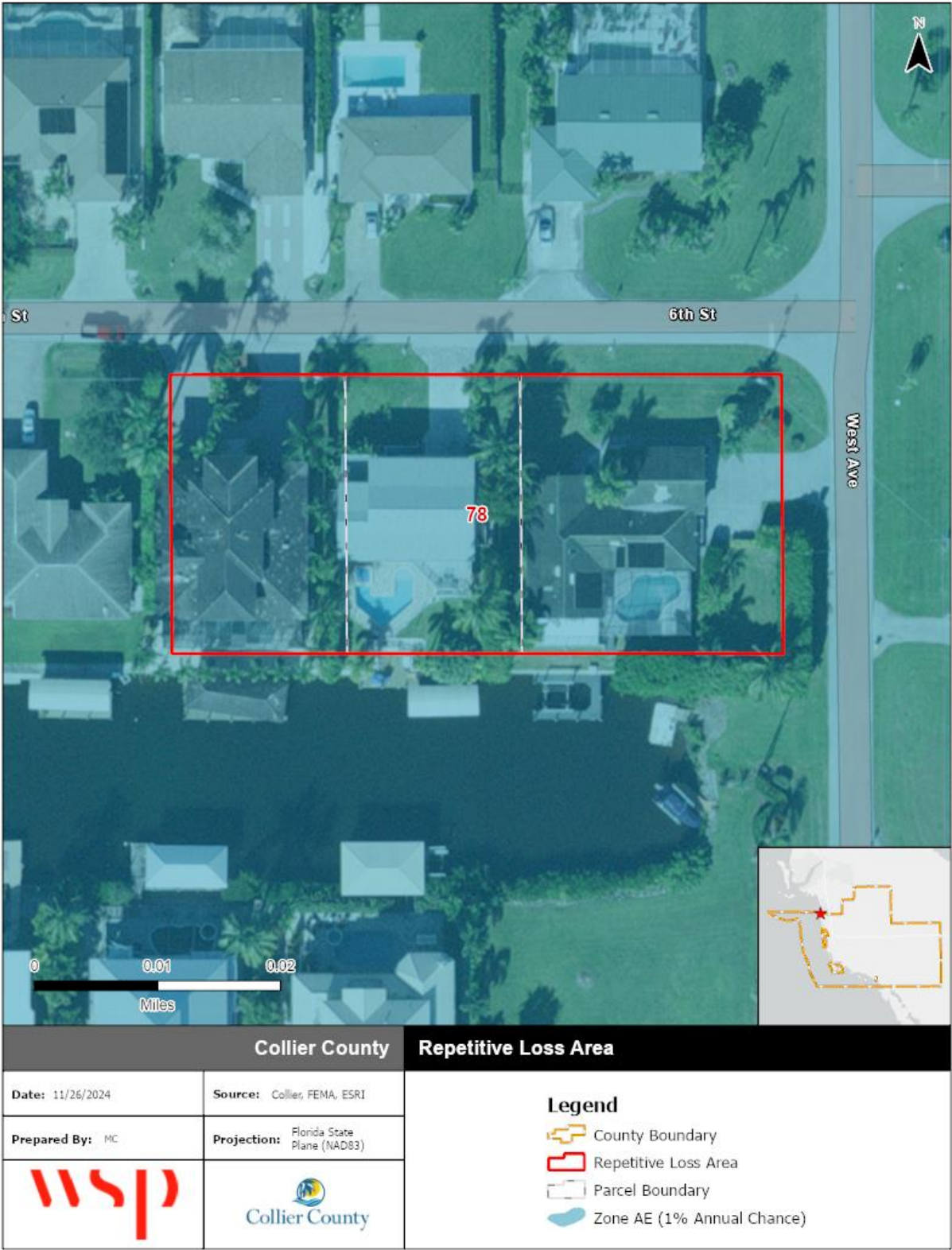


Figure 2.12 – Repetitive Loss Area 79

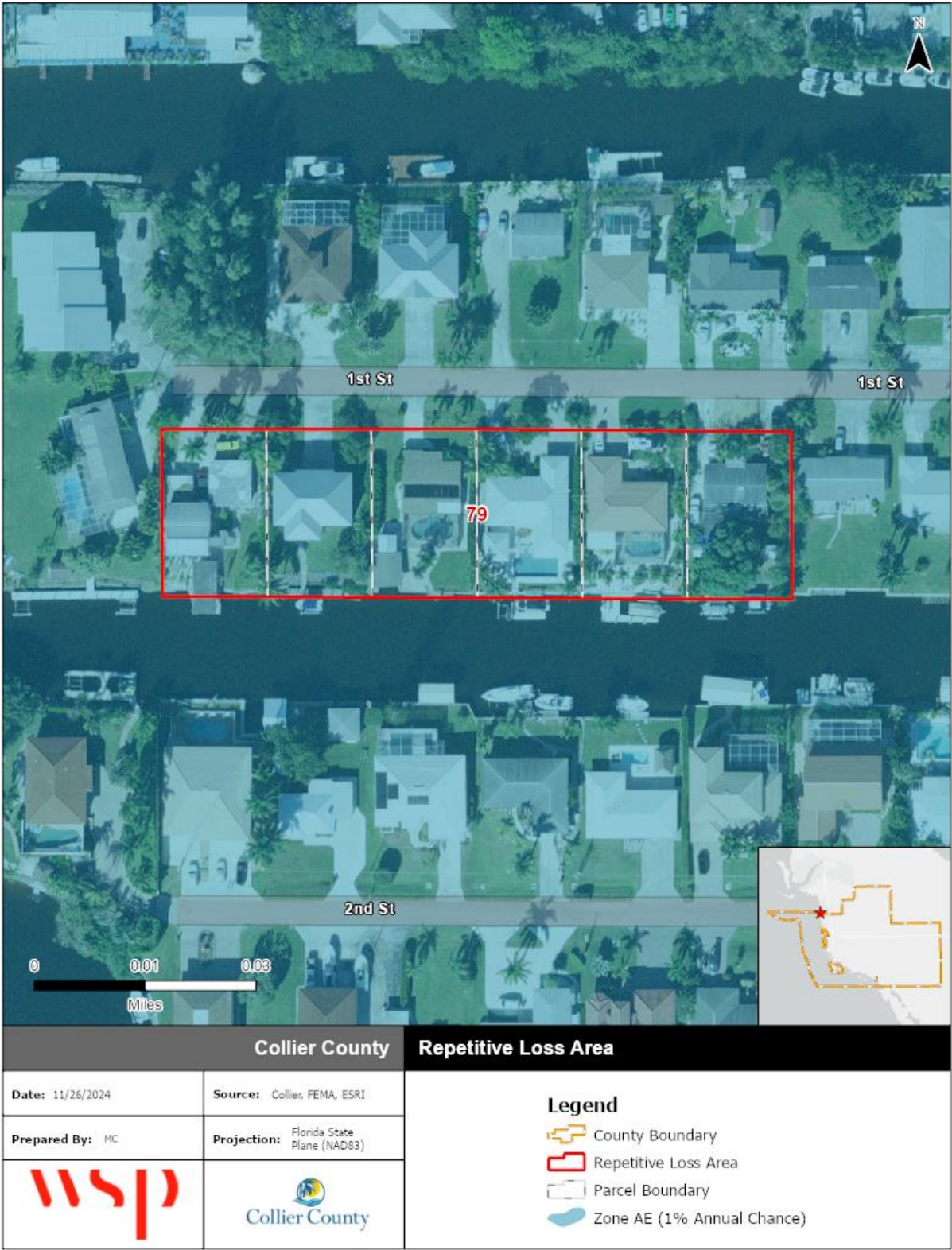


Figure 2.13 – Repetitive Loss Area 80

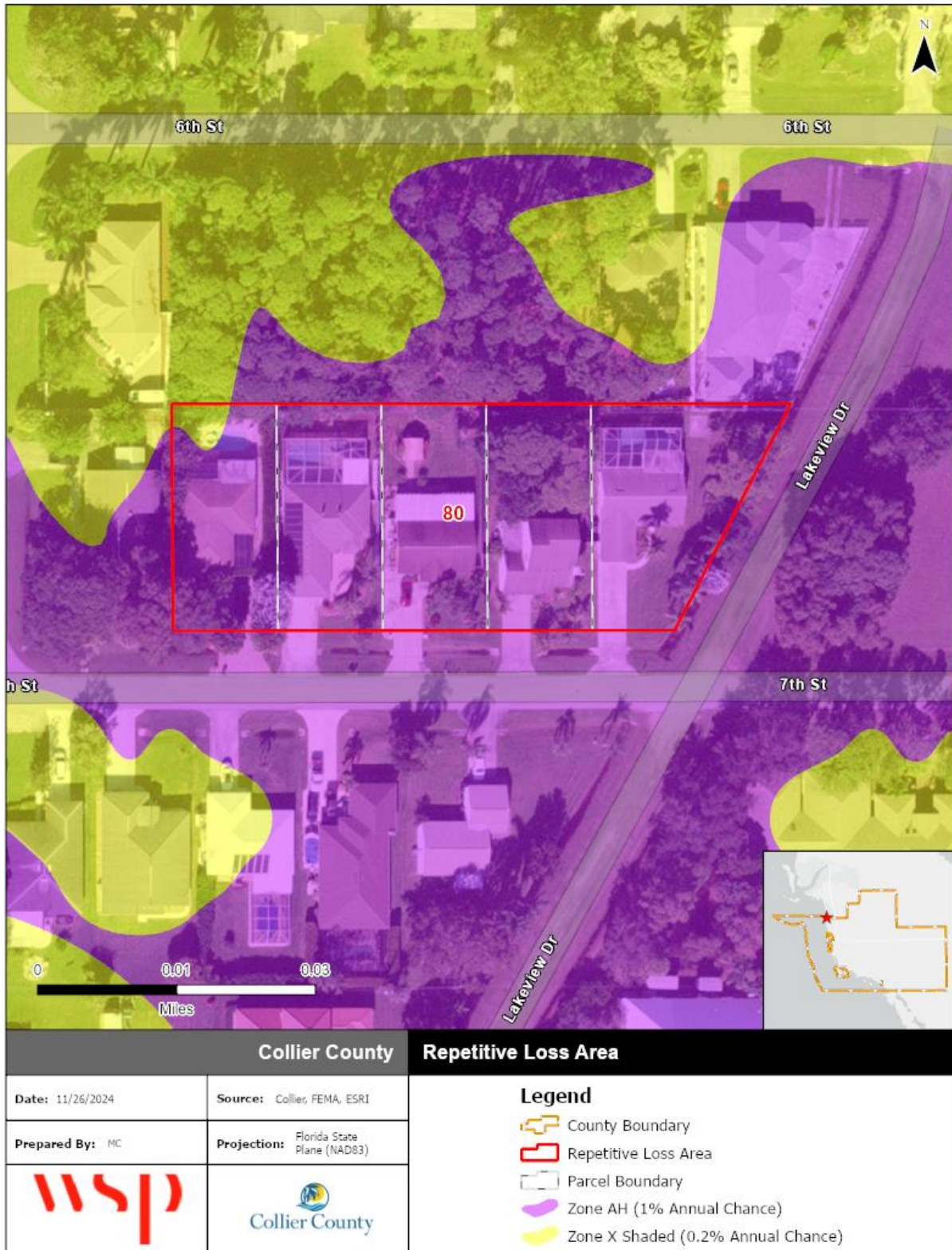


Figure 2.14 – Repetitive Loss Area 81

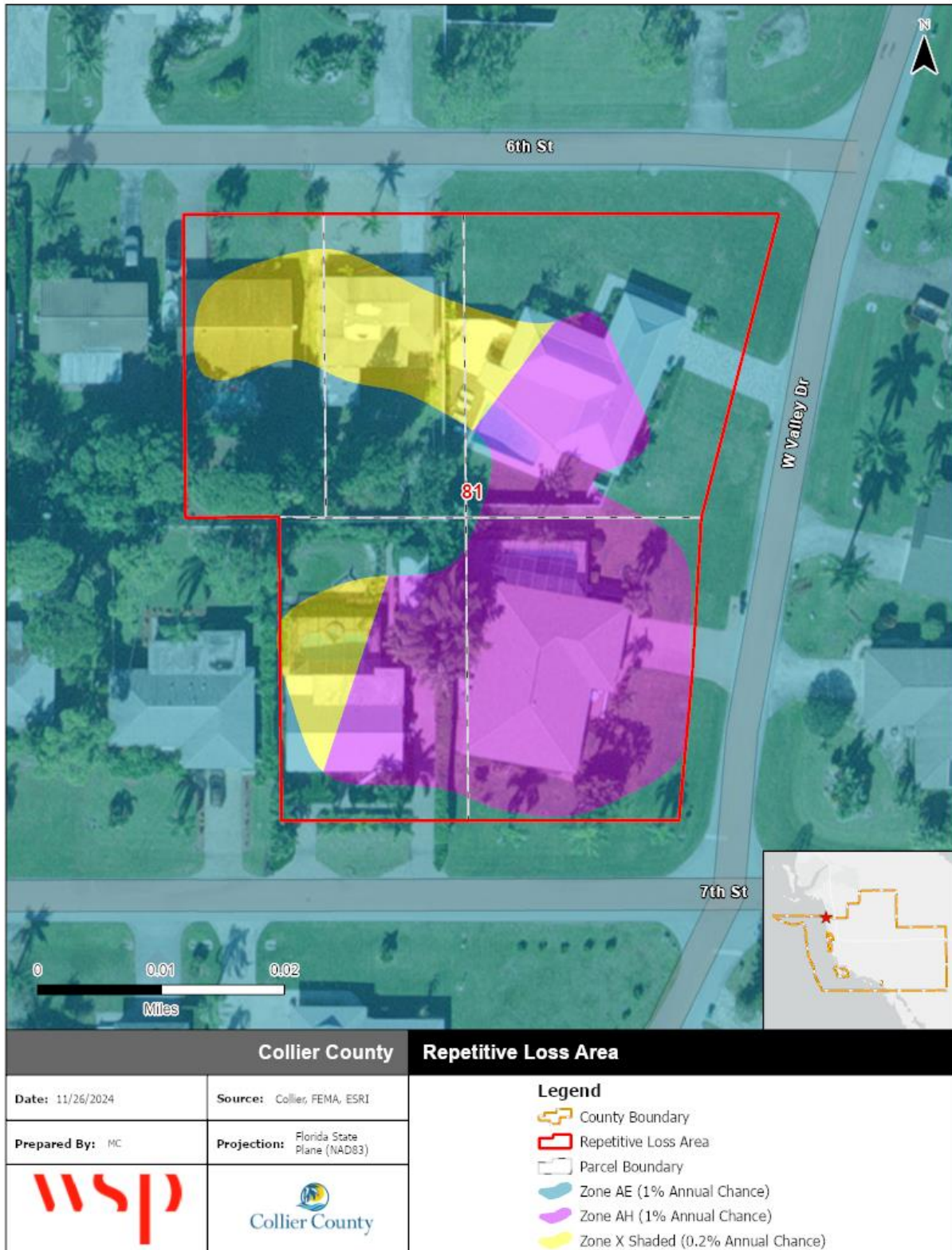


Figure 2.15 – Repetitive Loss Area 88

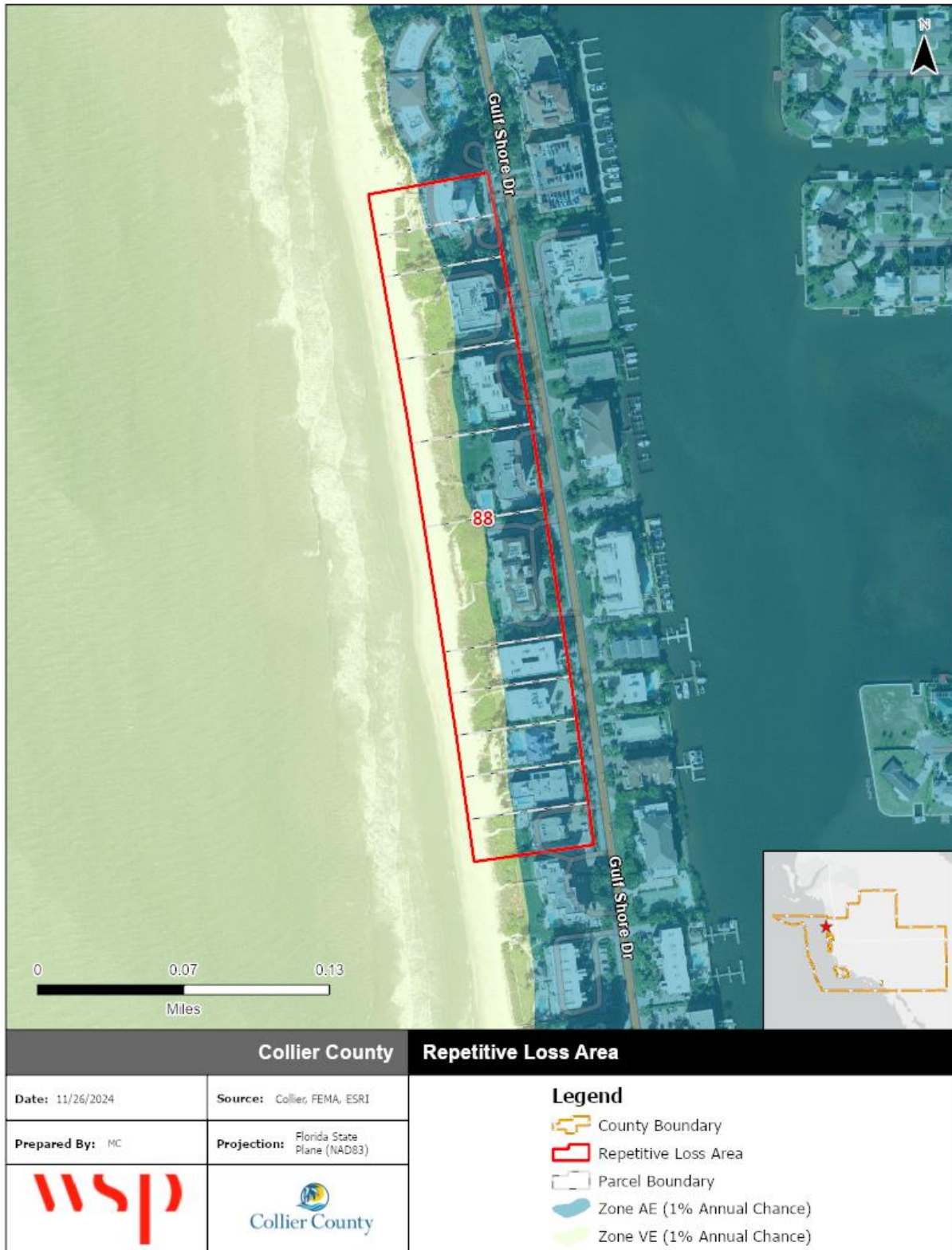


Figure 2.16 – Repetitive Loss Area 89



Figure 2.17 – Repetitive Loss Area 90



Figure 2.18 – Repetitive Loss Area 91



Figure 2.19 – Repetitive Loss Area 92



Figure 2.20 – Repetitive Loss Area 93

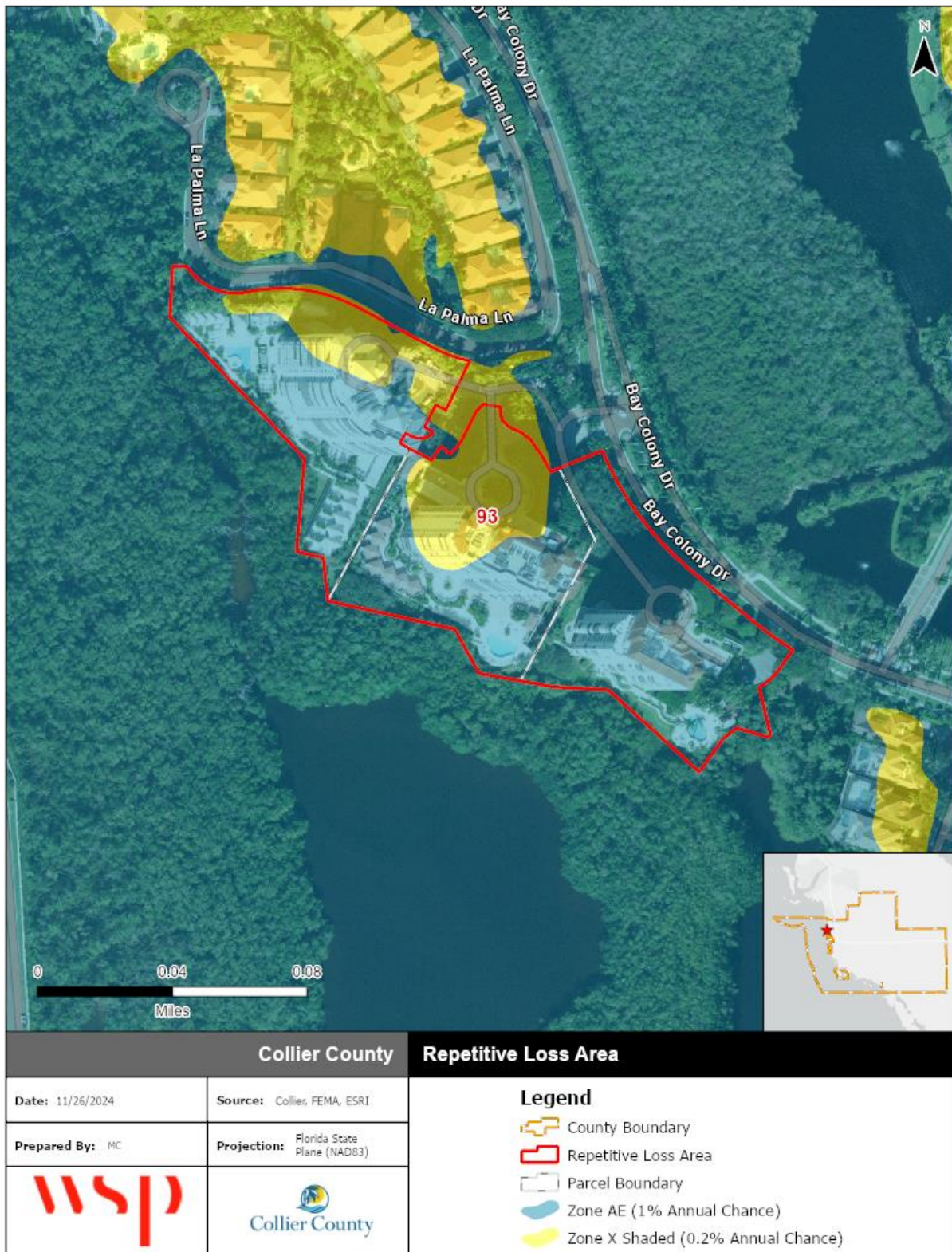


Figure 2.21 – Repetitive Loss Area 94



Figure 2.22 – Repetitive Loss Area 95



Figure 2.23 – Repetitive Loss Area 96

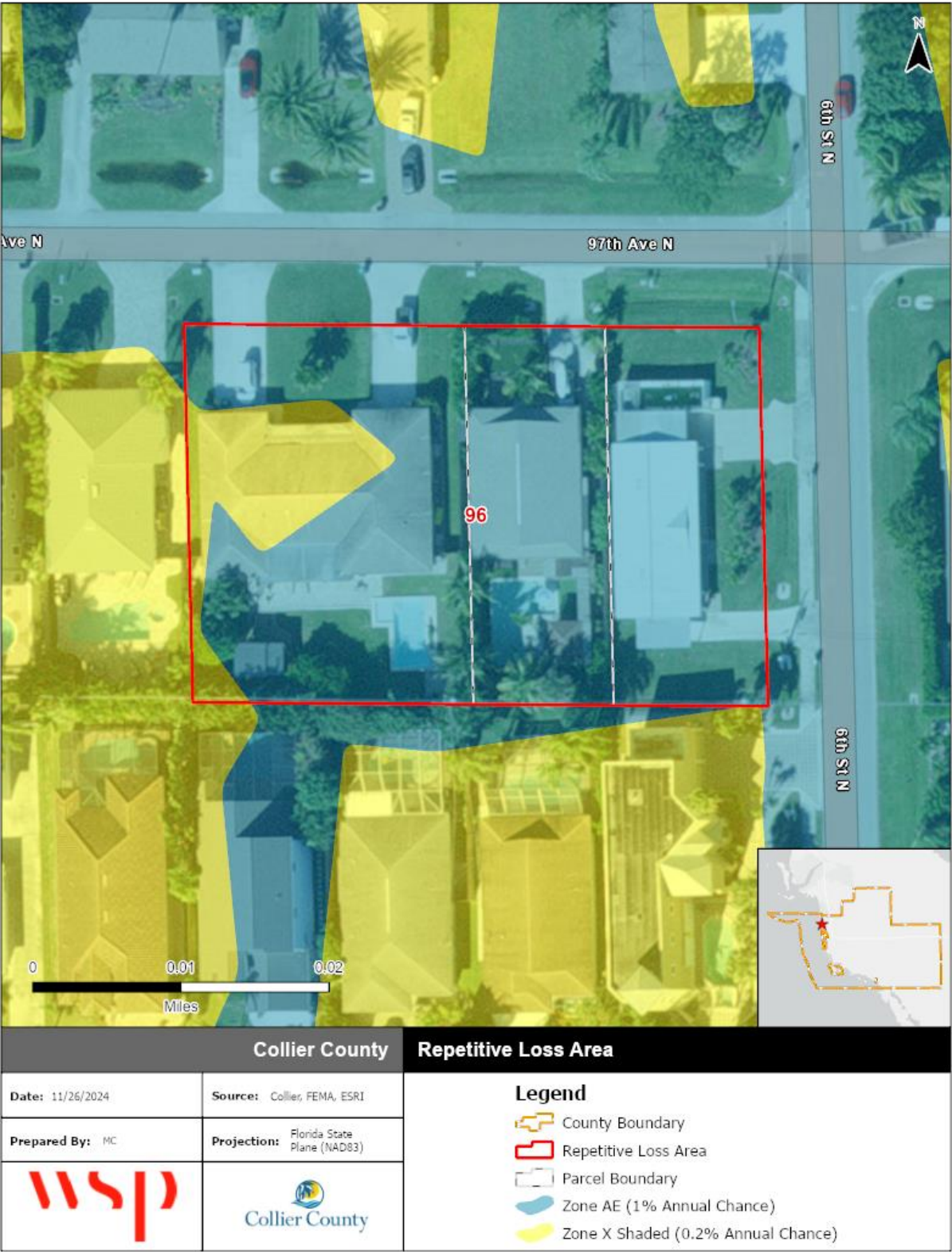


Figure 2.24 - Repetitive Loss Area 97

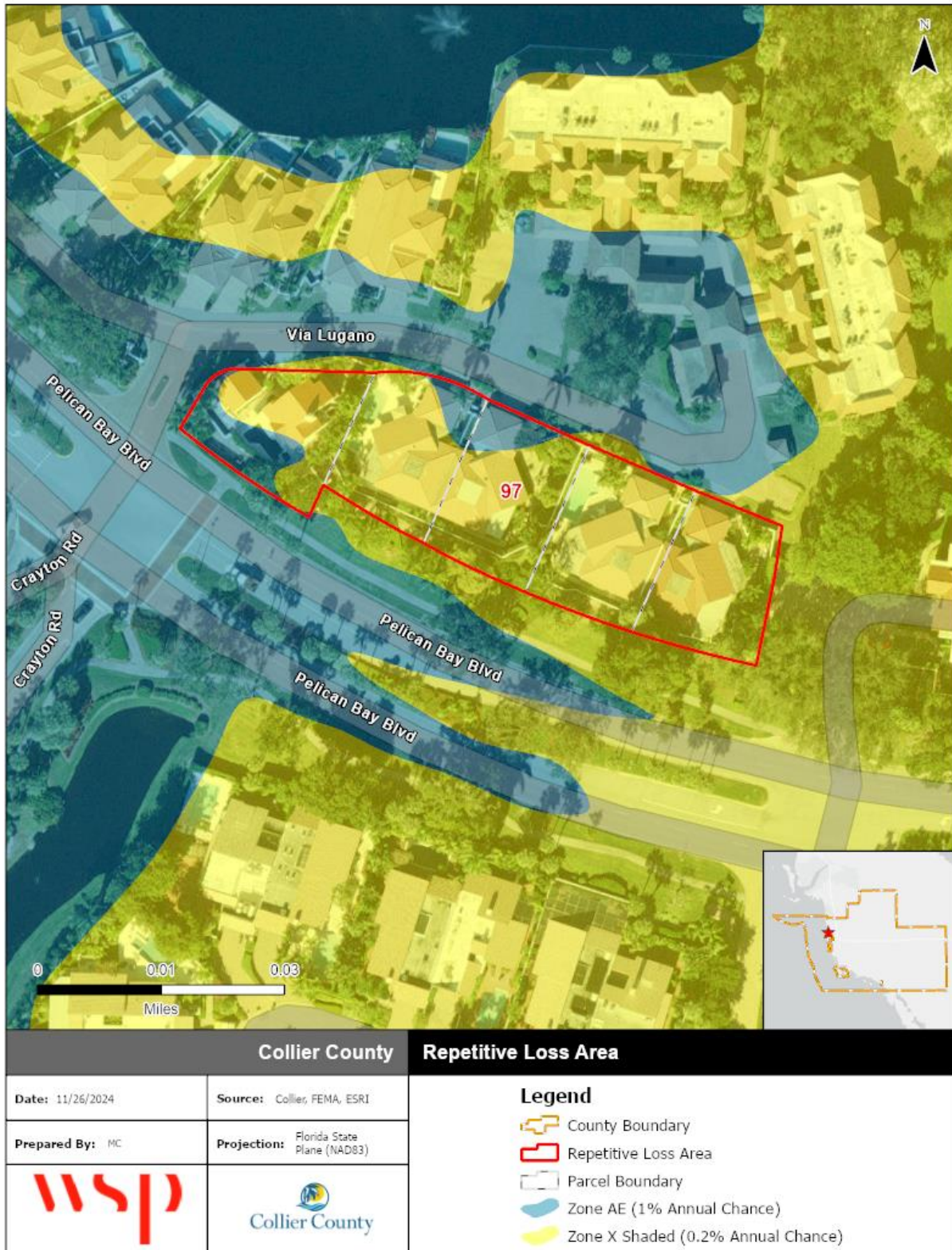


Figure 2.25 – Repetitive Loss Area 98



Figure 2.26 – Repetitive Loss Area 99



Figure 2.27 – Repetitive Loss Area 100

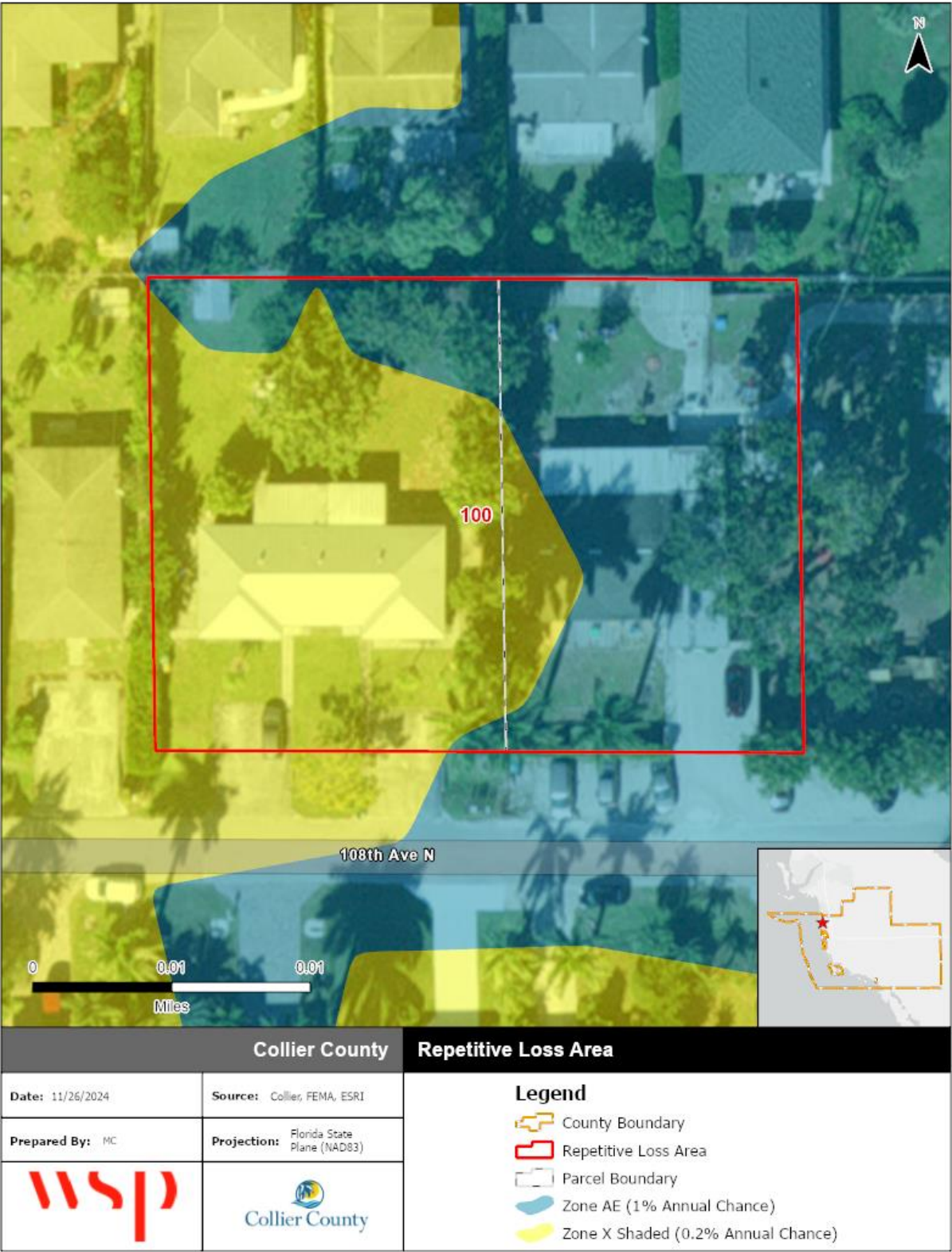


Figure 2.28 – Repetitive Loss Area 101

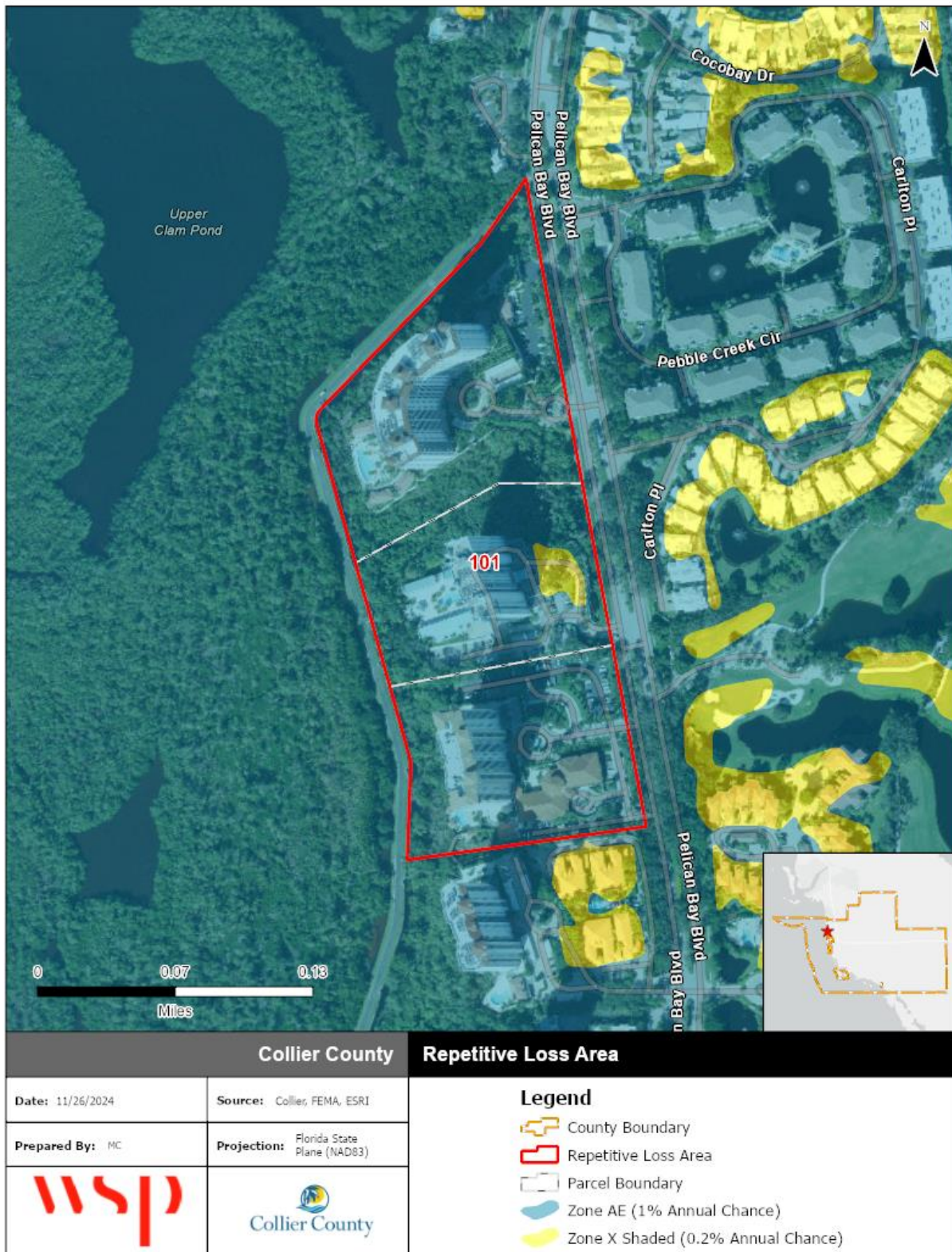


Figure 2.29 – Repetitive Loss Area 102

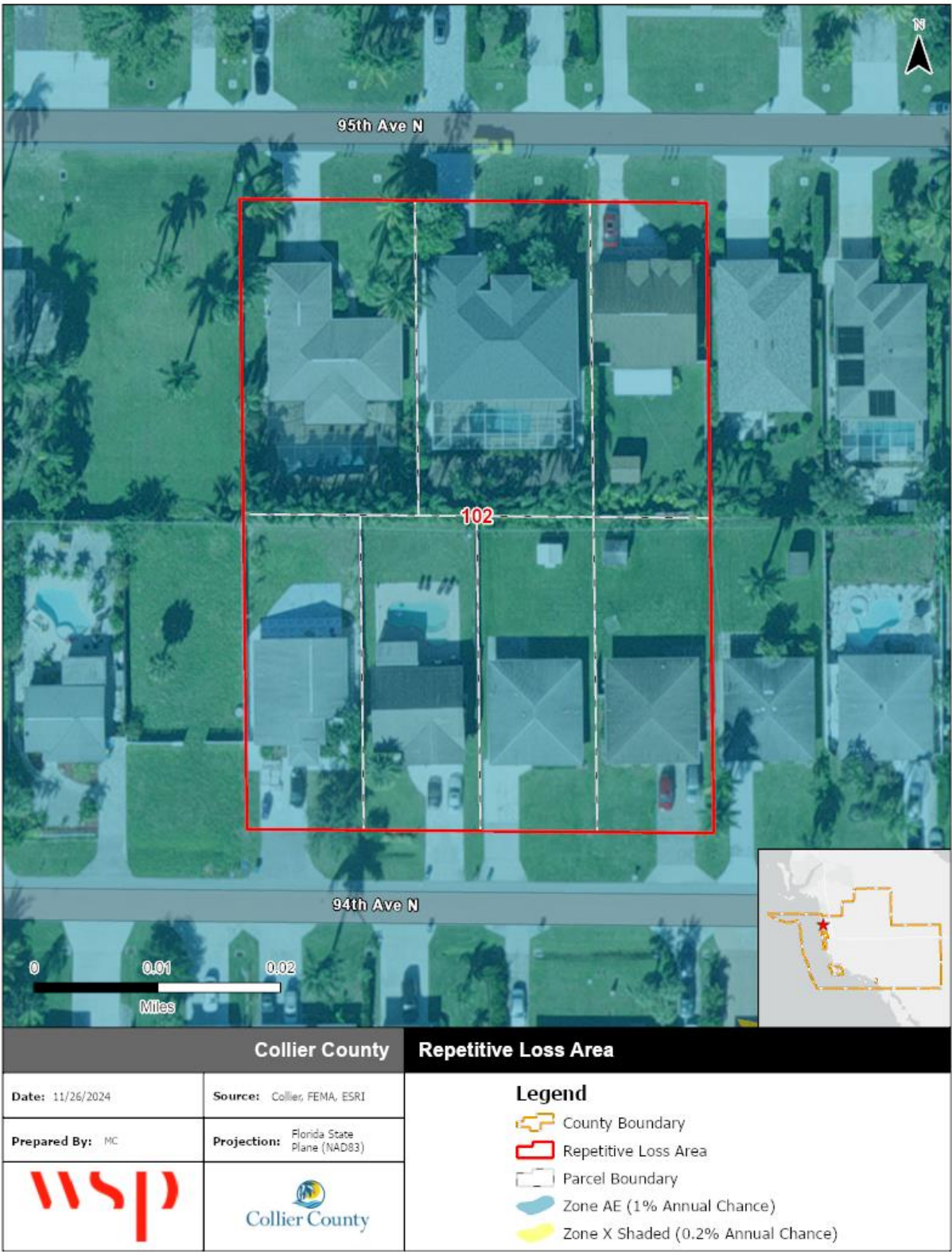


Figure 2.30 – Repetitive Loss Area 103



Figure 2.31 – Repetitive Loss Area 104



Figure 2.32 – Repetitive Loss Area 105



Figure 2.33 – Repetitive Loss Area 106



Figure 2.34 – Repetitive Loss Area 107



Figure 2.35 – Repetitive Loss Area 108

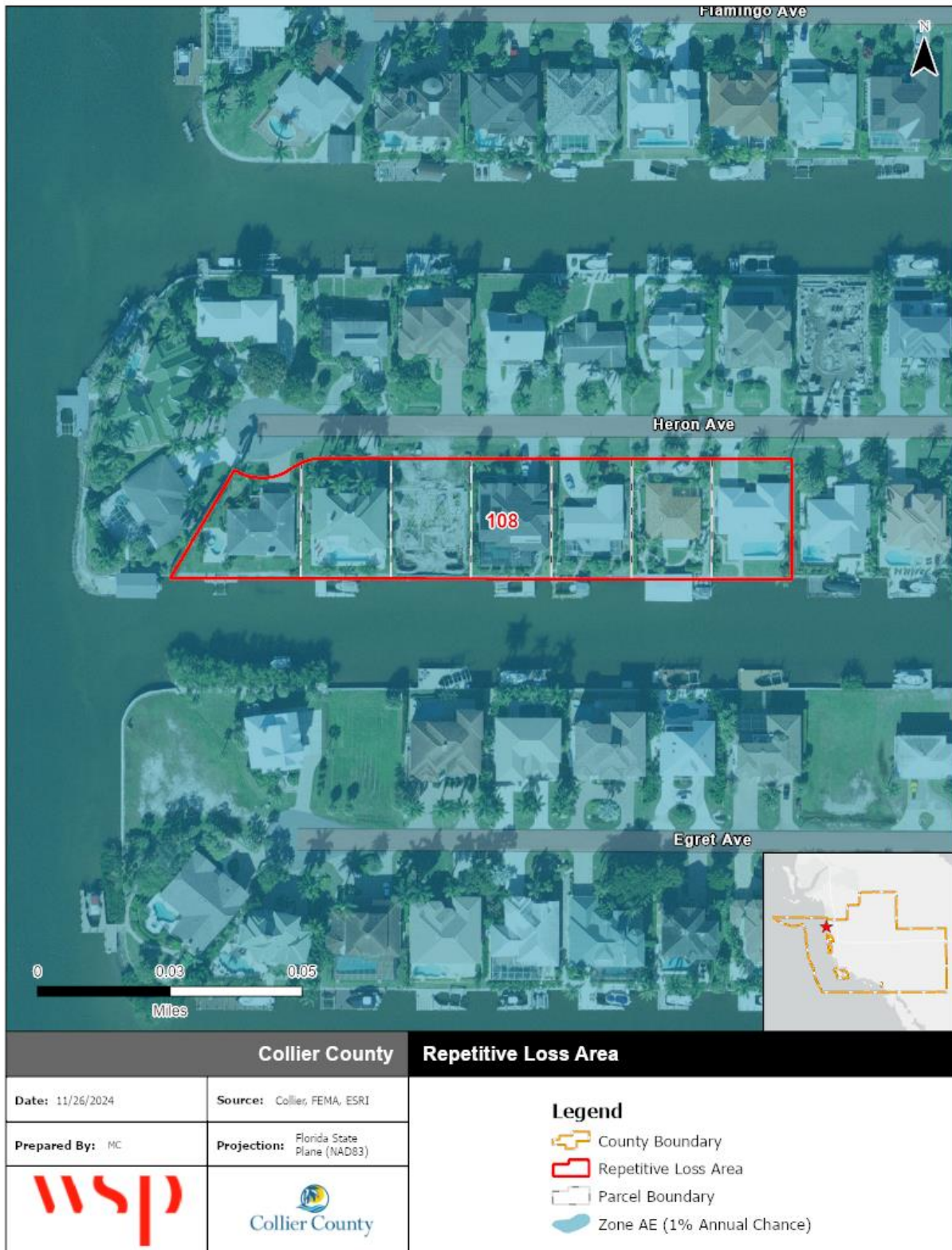


Figure 2.36 – Repetitive Loss Area 125

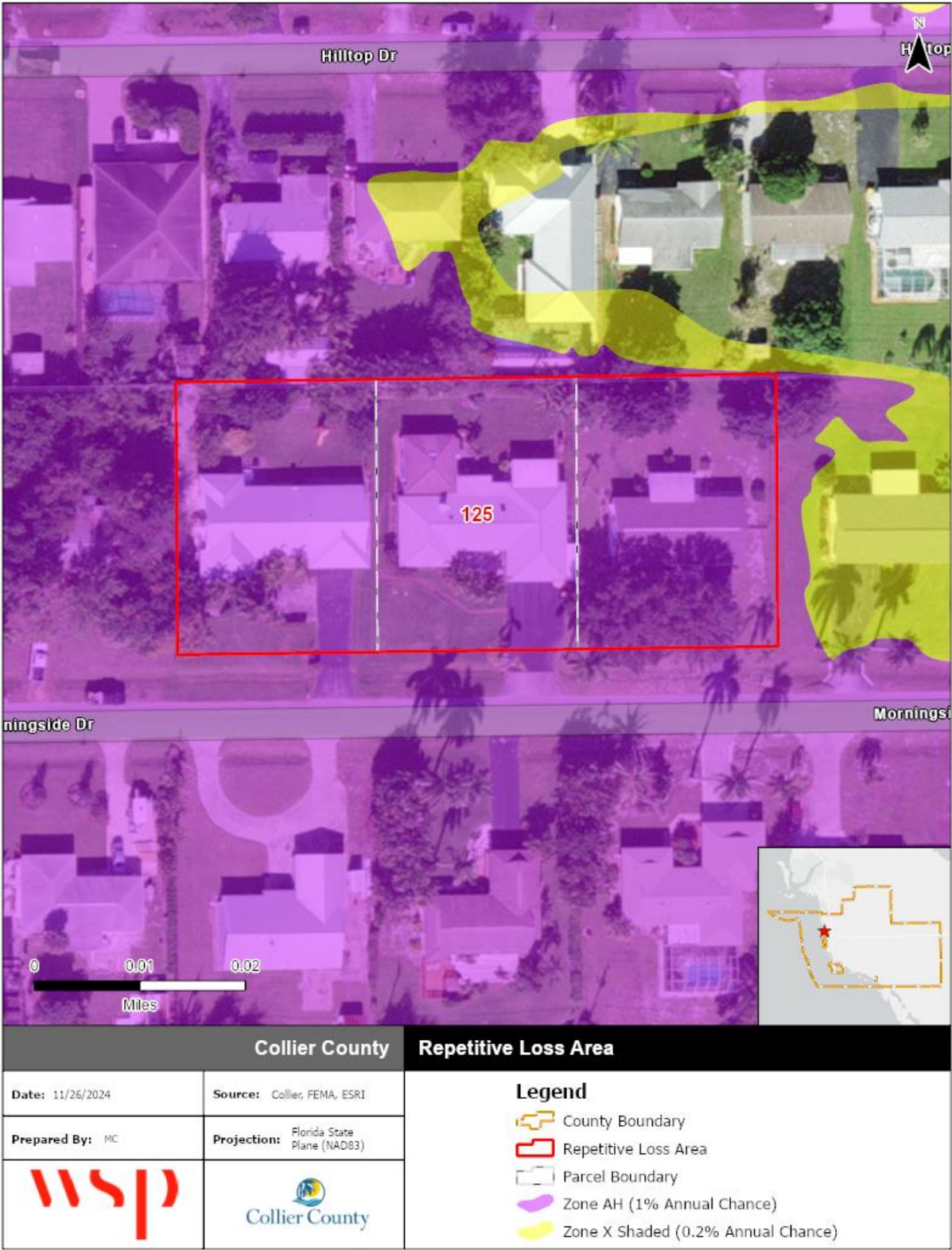


Figure 2.37 – Repetitive Loss Area 126

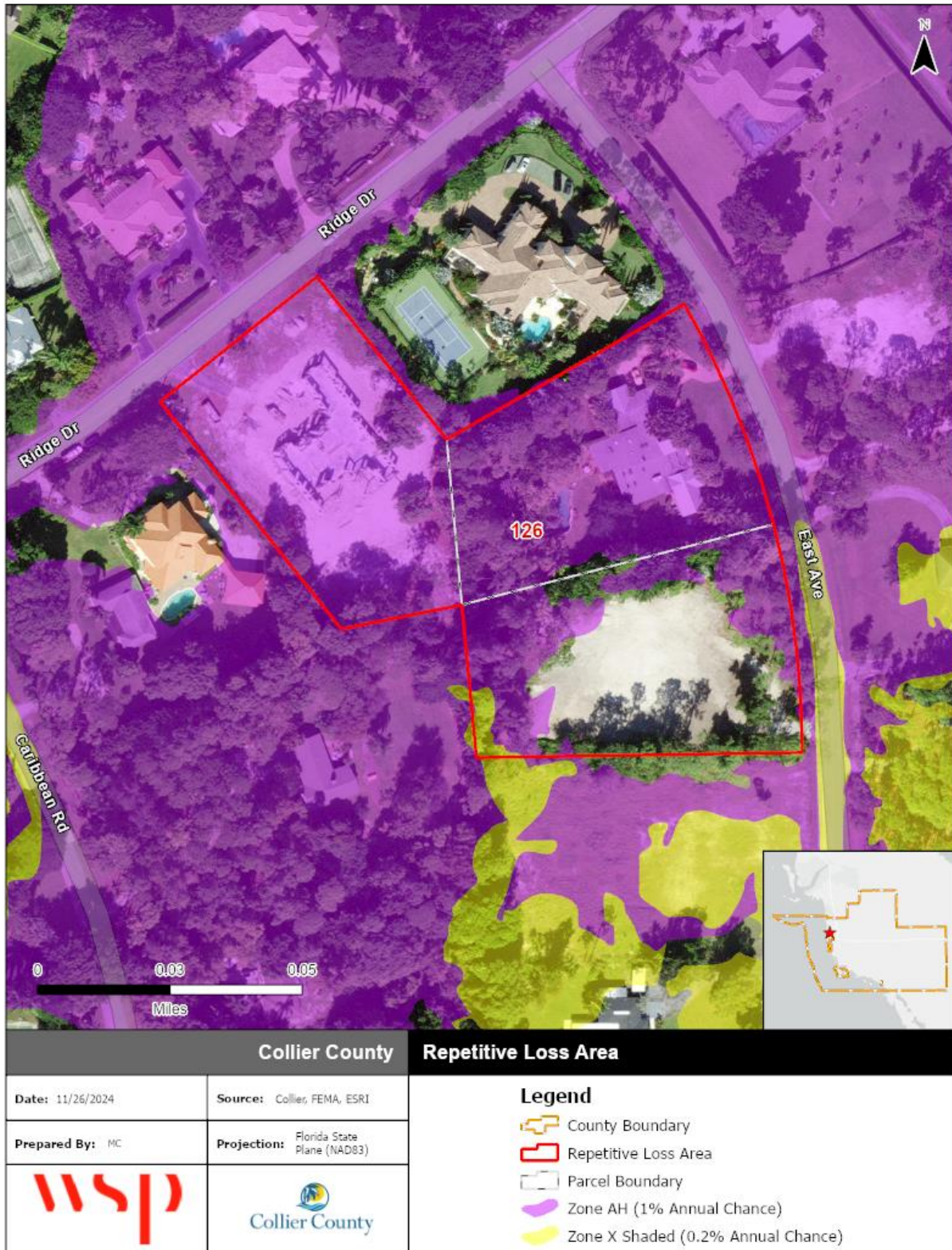
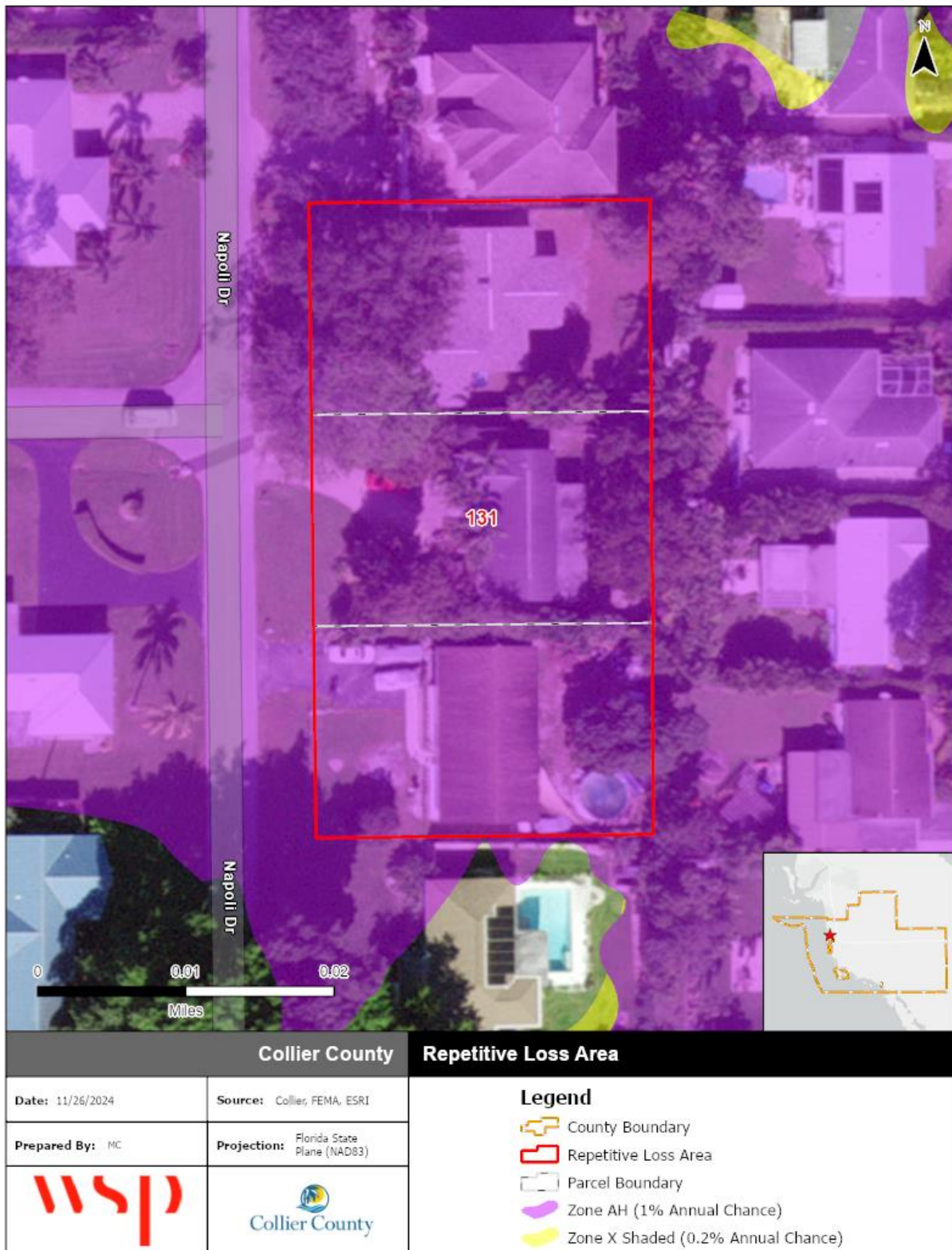


Figure 2.38 – Repetitive Loss Area 131



2.3.1.2 SUBAREA 2

OVERVIEW

Subarea 2 contains 47 repetitive loss areas. Table 2.3 provides summary information for all repetitive loss areas in Subarea 2. A description and map of each of the identified repetitive loss area follows.

Table 2.3 – Overview of Subarea 2

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
13	2	2	Danford St	100%
17	2	12	Palmetto Ct	100%
19	22	29	Coconut Cir W, Guava Dr, Lotus Dr, Coconut Cir S	100%
20	2	3	Jefferson Ave	100%
21	4	5	Becca Ave, Weeks Ave	100%
22	1	3	Becca Ave, Cypress St	100%
23	2	2	Estey Ave	100%
24	1	2	Airport Rd, Steeves Ave	100%
25	1	4	Enchanting Blvd	100%
26	2	4	Holiday Ln	100%
27	1	7	Christopher Ct	100%
28	1	2	Sandpiper Ct, Carter St	100%
29*	5	1	Estey Ave	100%
30	3	1	Holiday Ln	100%
31	3	4	Smugglers Cv	100%
32	1	3	Shadowlawn Dr	100%
33	1	2	Frederick St	100%
34	1	1	Palm St, Mills Ln	100%
35	2	2	Frederick St, Mills Ln, Monroe Ave,	100%
36	3	1	Davis Blvd	100%
37	1	3	Jefferson Ave	100%
38	3	4	Pelton Ave, Winifred Ave	100%
39	1	2	Frederick St	100%
40	2	1	Sunset Ln	100%
41	1	3	Harbor Rd	100%
42	1	4	Tamiami Trl E	100%
43	2	18	Rivard Rd	100%
44	1	2	Washington Ave	100%
45	1	3	Davis Blvd	100%
46	1	3	Harbor Rd	100%
47	1	10	Topaz Ln, Enchanting Blv	100%
48	1	2	Linwood Ave	100%
49	1	1	Airport Rd S	100%

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
50	1	2	Van Buren Ave	100%
51	1	2	Bayview Dr	100%
52	1	3	Weeks Ave	100%
53	1	2	Poplar St	100%
55	1	2	Estey Ave	100%
56	1	2	Guilford Rd	100%
57	1	2	Poinsettia Ave	100%
58	2	4	North Rd	100%
59	1	3	Guilford Rd	100%
60	2	5	Seagrape Ave, Croton Rd	100%
61	1	2	Seagrape Ave, Central Dr	100%
62	1	2	Harbor Ln	100%
124	5	7	Airport Rd N, Mercantile Ave	100%
127	1	3	Longboat Dr	100%

*This area contains multi-unit structures. Property count reflects structure count, not unit count.

FINDINGS

Subarea 2 includes 284 residential properties. Most properties in this zone experience flooding problems due to their proximity to the coast, tidal creeks and channels. Input from property owners and neighbors during data collection indicated that storm surge and tidal flooding cause a significant amount of flooding in this area. However, in many areas, drainage issues that may exacerbate flooding were discovered during field data collection. Respondents to the questionnaire indicated sewer back up failure as a common issue in the subarea.

Most structures in this area are concrete. Around 15% are wood frame and 5% are manufactured homes. Approximately nine structures in this zone are elevated on piers, posts, or pile foundations; most of these buildings are elevated around 8 feet or more. Around 266 structures in this zone have slab on grade foundations, with 9% of these buildings at street grade, and another 64% only 0-2 feet above grade. Five structures in this zone are below grade, which presents a significant risk for continued flood damages.

Ninety-eight HVAC units were observable from the right-of-way. Through observation, it was noted that 96 HVAC units were elevated; two units were not elevated.

Questionnaire responses from this zone indicate that flooding also occurred during Hurricanes Ian, Milton, and Irma. Most property owners attribute flooding to storm surge, drainage from nearby properties, overbank flooding from drainage ditches and canals, and standing water when the ground is saturated. A few property owners have installed sump pumps and waterproofed outside walls. Others have used sandbags and raised items off the ground level. Multiple property owners expressed interest in elevating their structures and interest in ways of protecting their home.



Slightly above grade home with drain and ditch in front yard



At grade home with drain and ditch



Condo, multi-family property at grade with large impervious surface lot



Elevated home with drain in front yard

Figure 2.39 – Subarea 2 Repetitive Loss Areas and FEMA Flood Zones

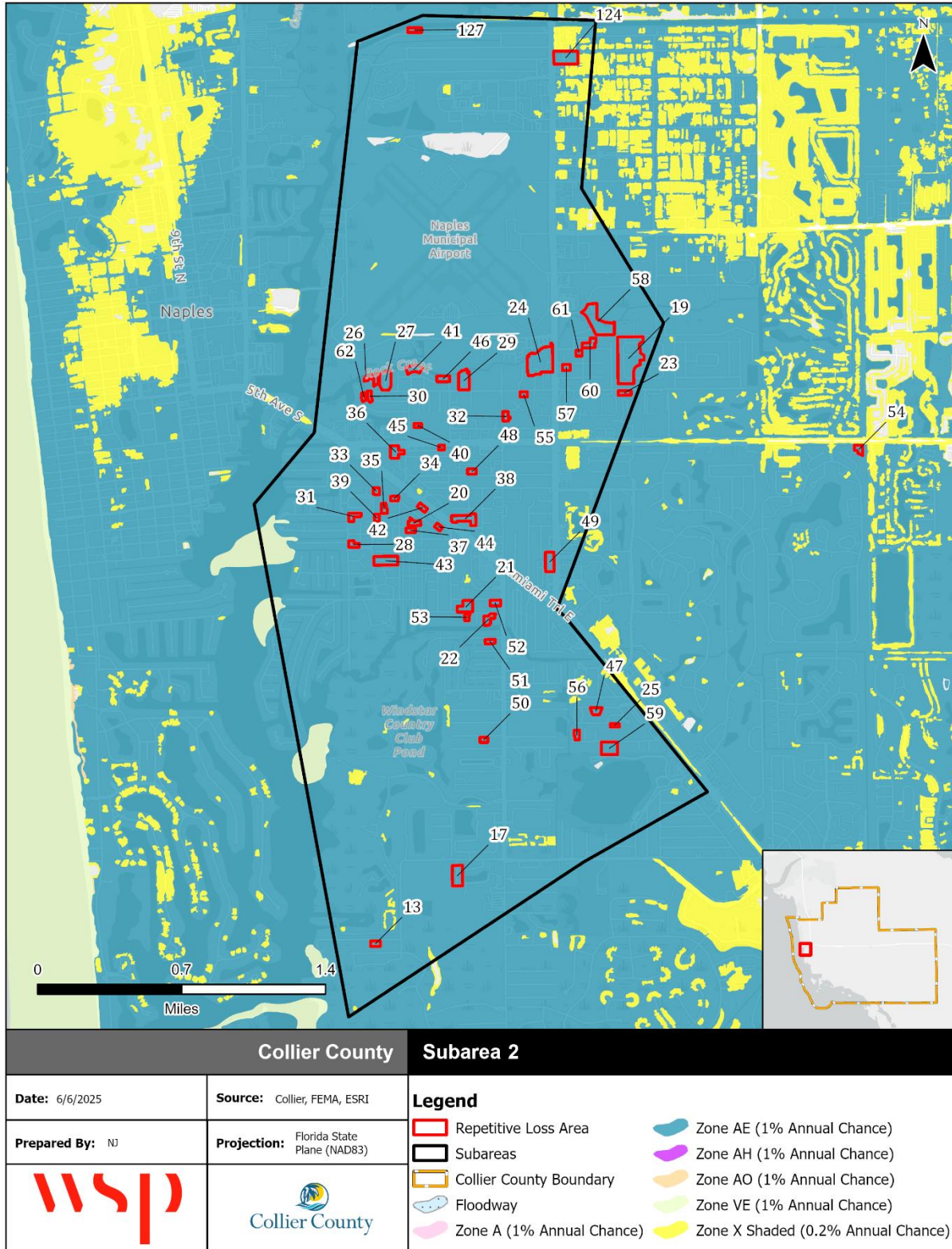


Figure 2.40 – Repetitive Loss Area 13

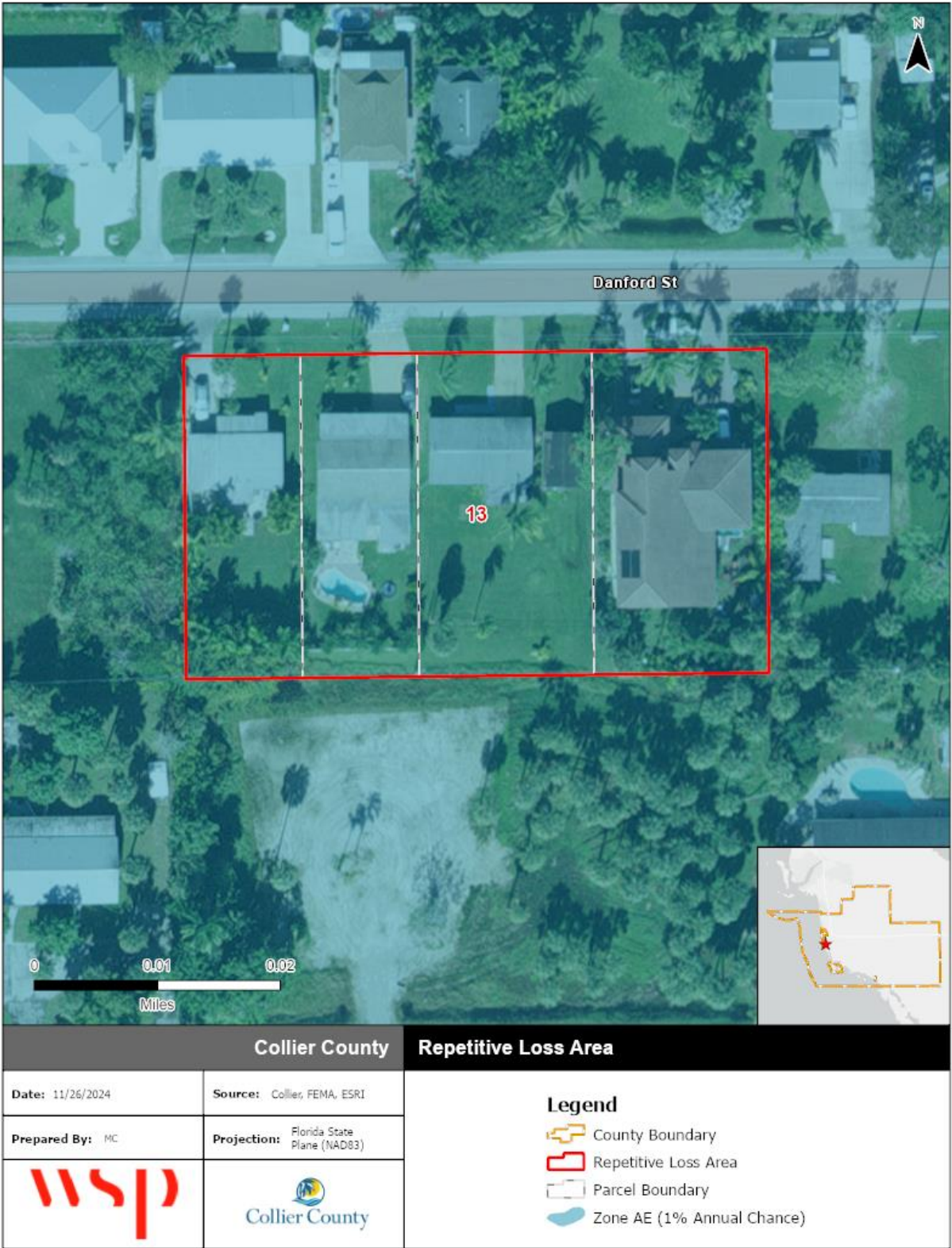


Figure 2.41 - Repetitive Loss Area 17



Figure 2.42 – Repetitive Loss Area 19

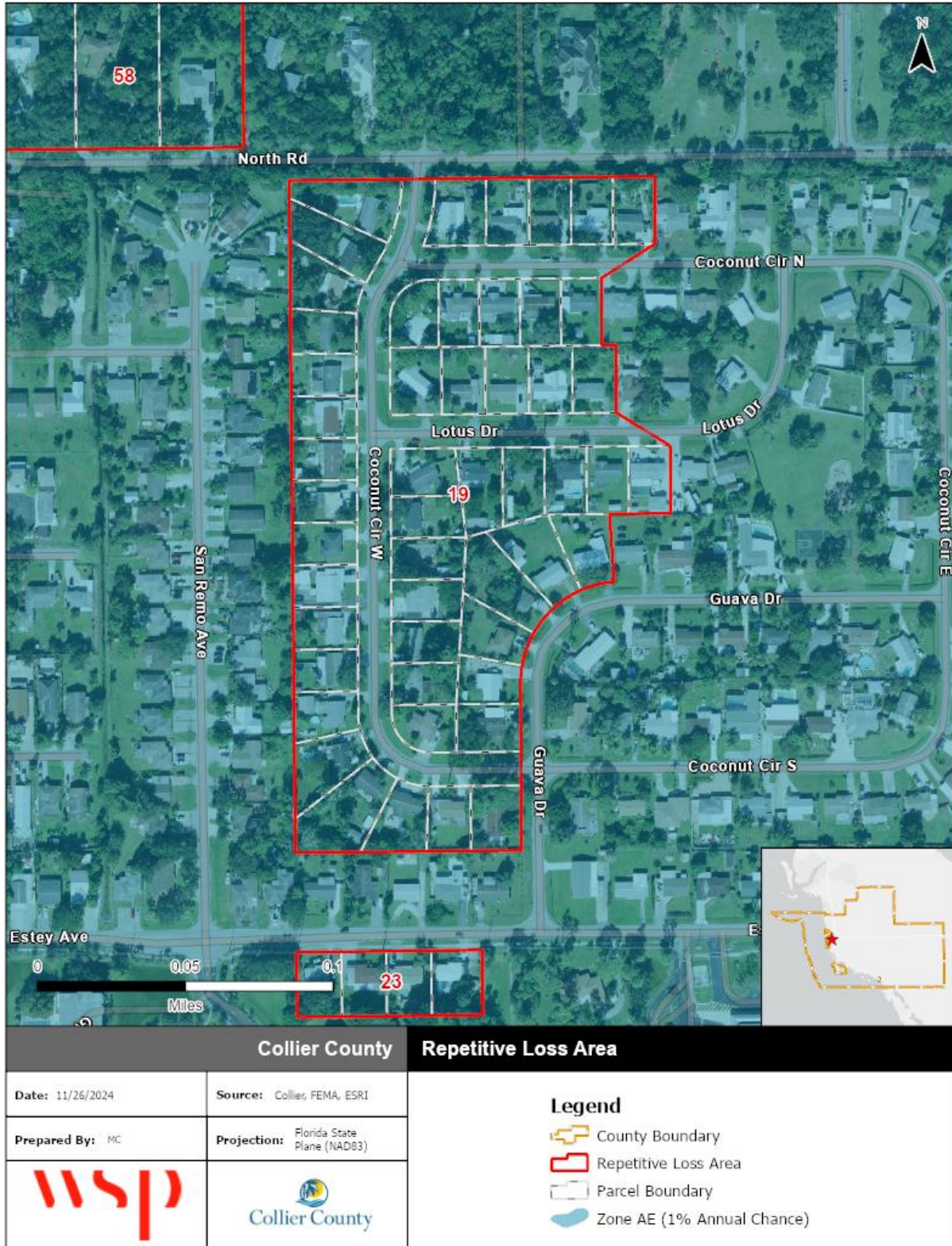


Figure 2.43 – Repetitive Loss Area 20

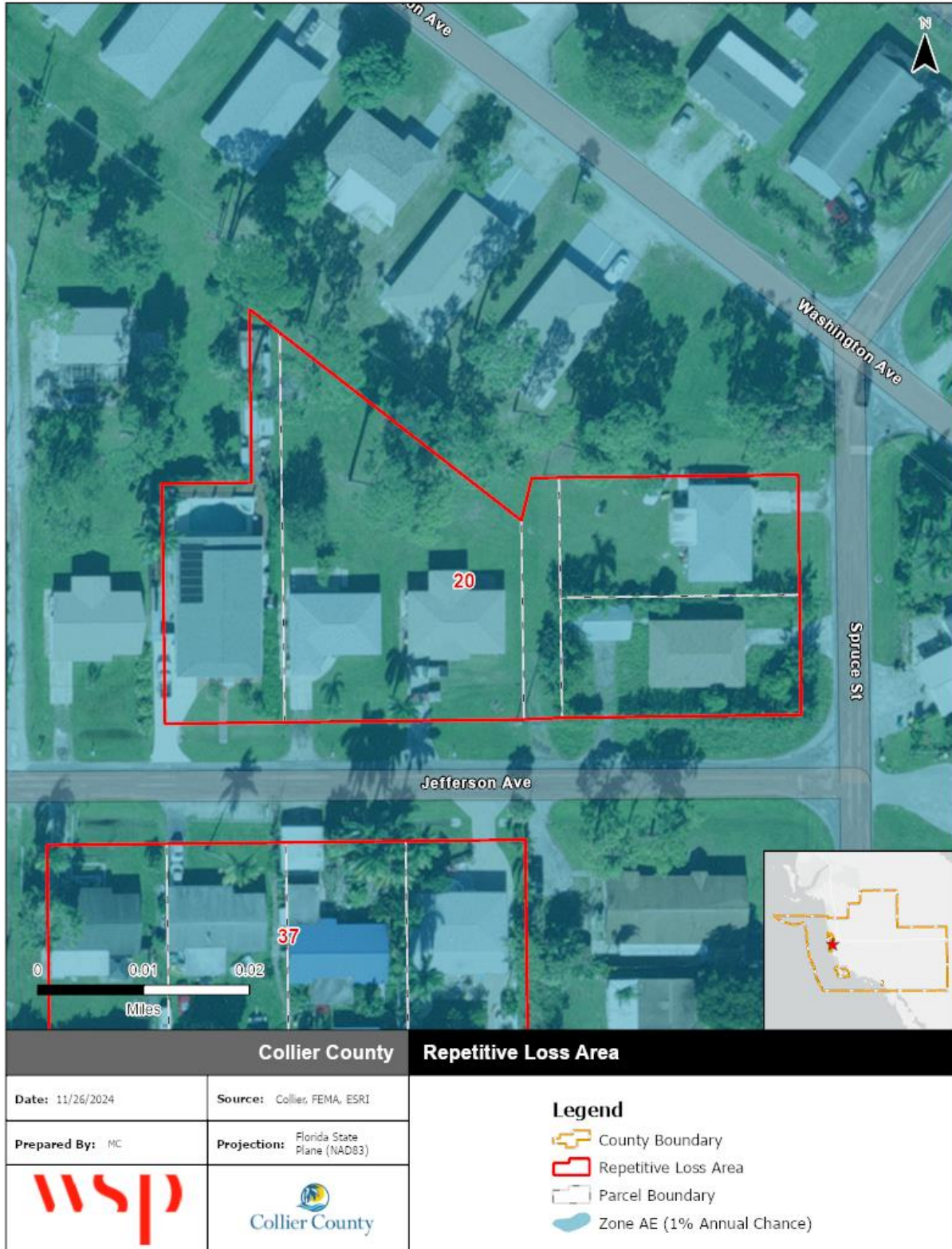


Figure 2.44 - Repetitive Loss Area 21

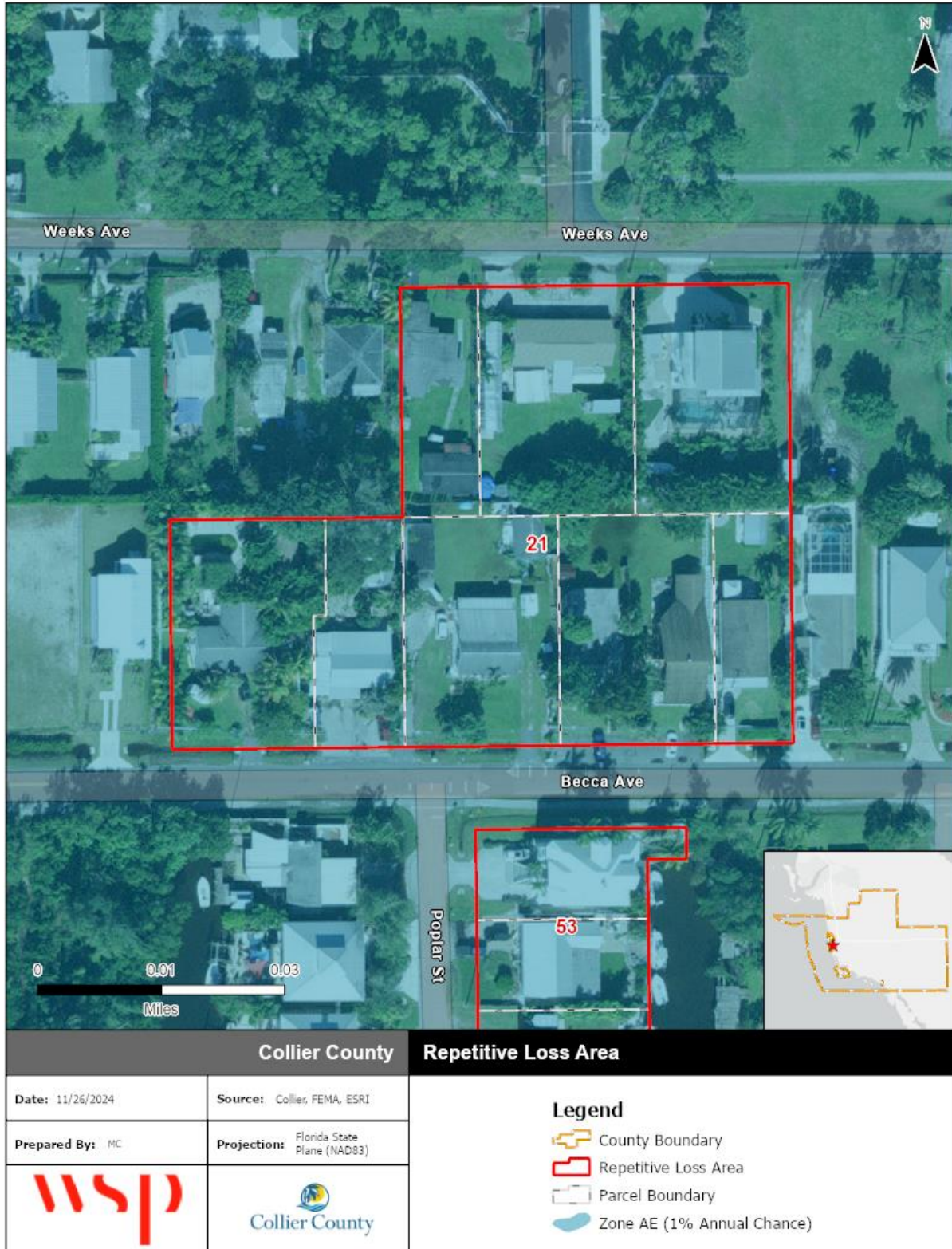


Figure 2.45 – Repetitive Loss Area 22

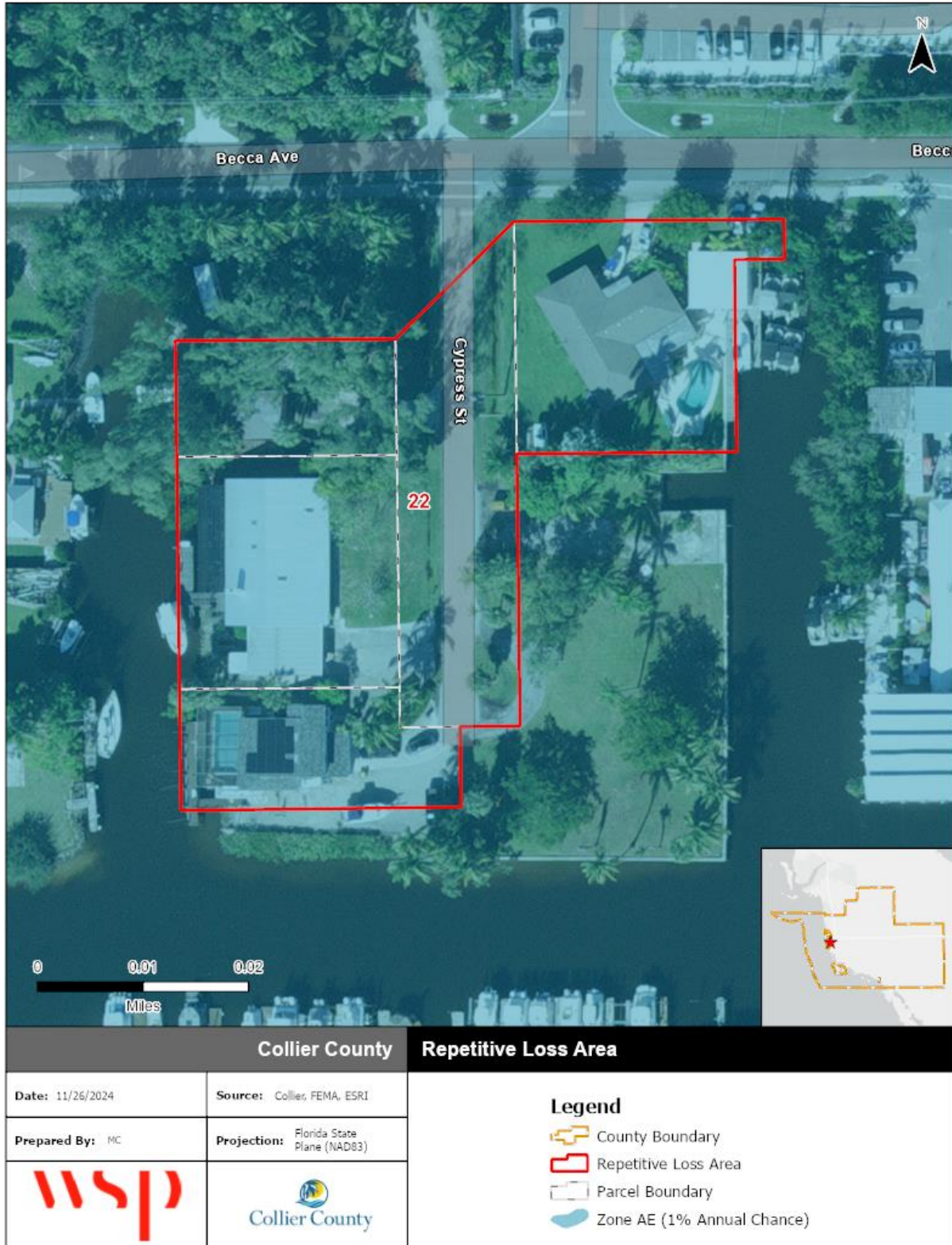


Figure 2.46 – Repetitive Loss Area 23

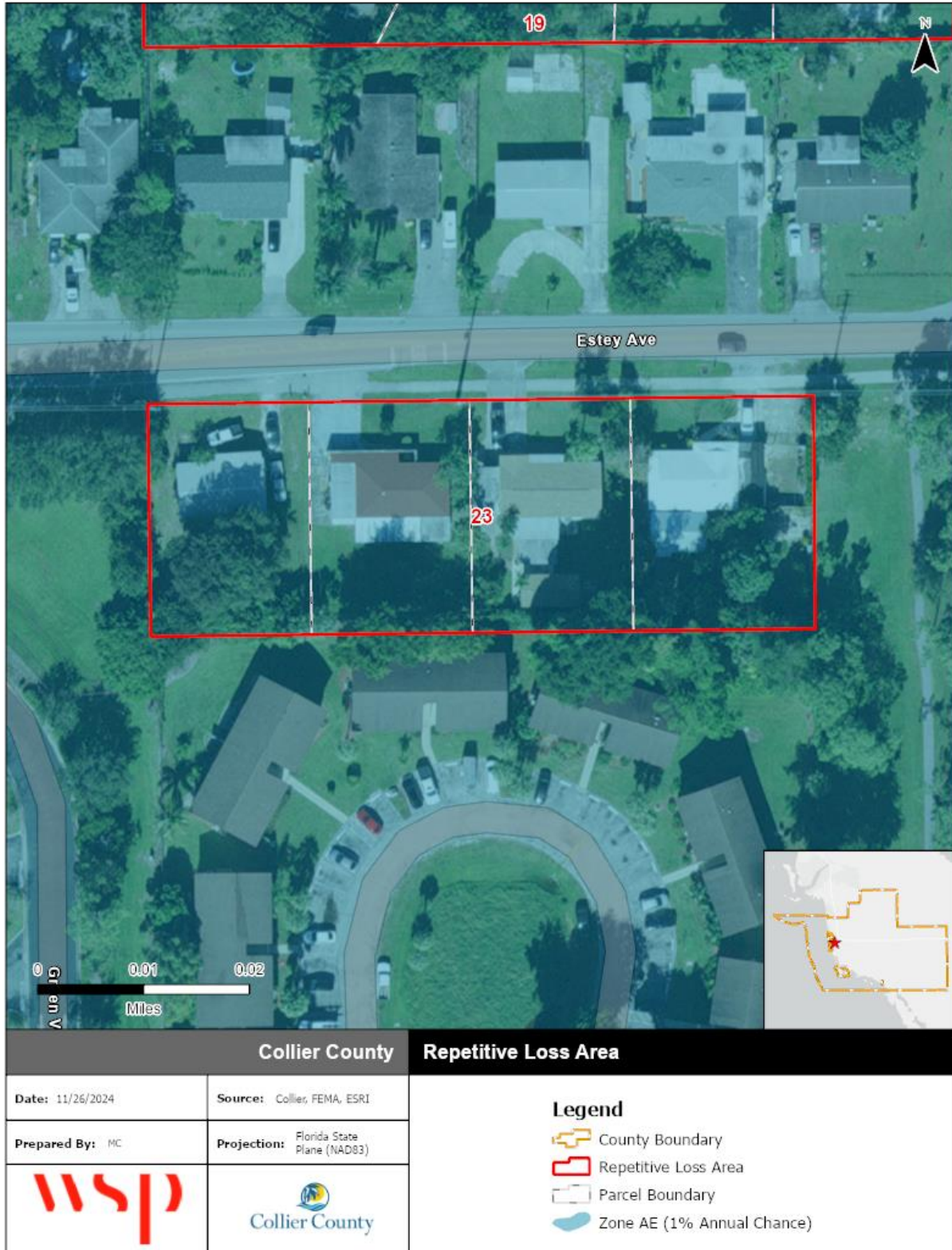


Figure 2.47 – Repetitive Loss Area 24

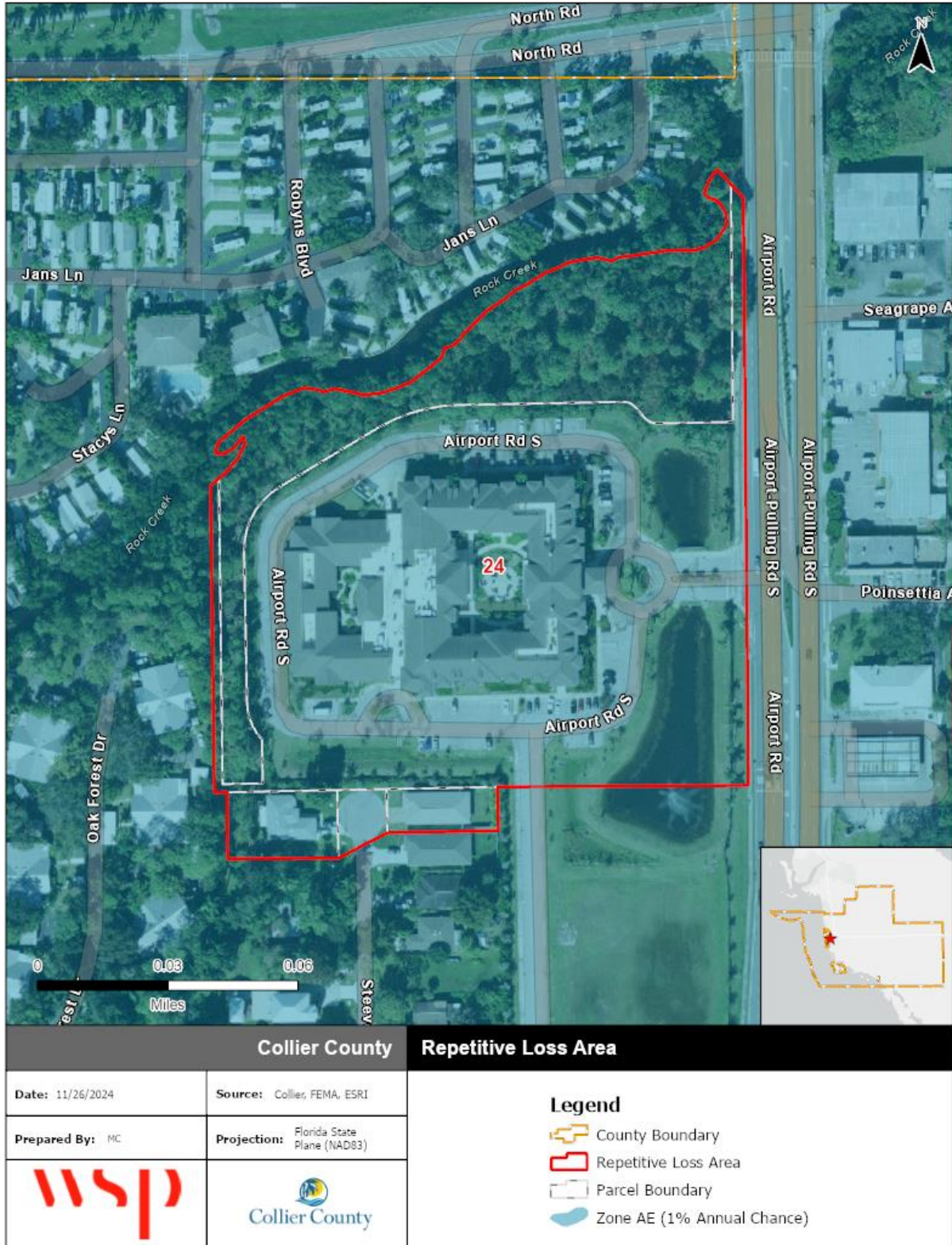


Figure 2.48 – Repetitive Loss Area 25



Figure 2.49 – Repetitive Loss Area 26

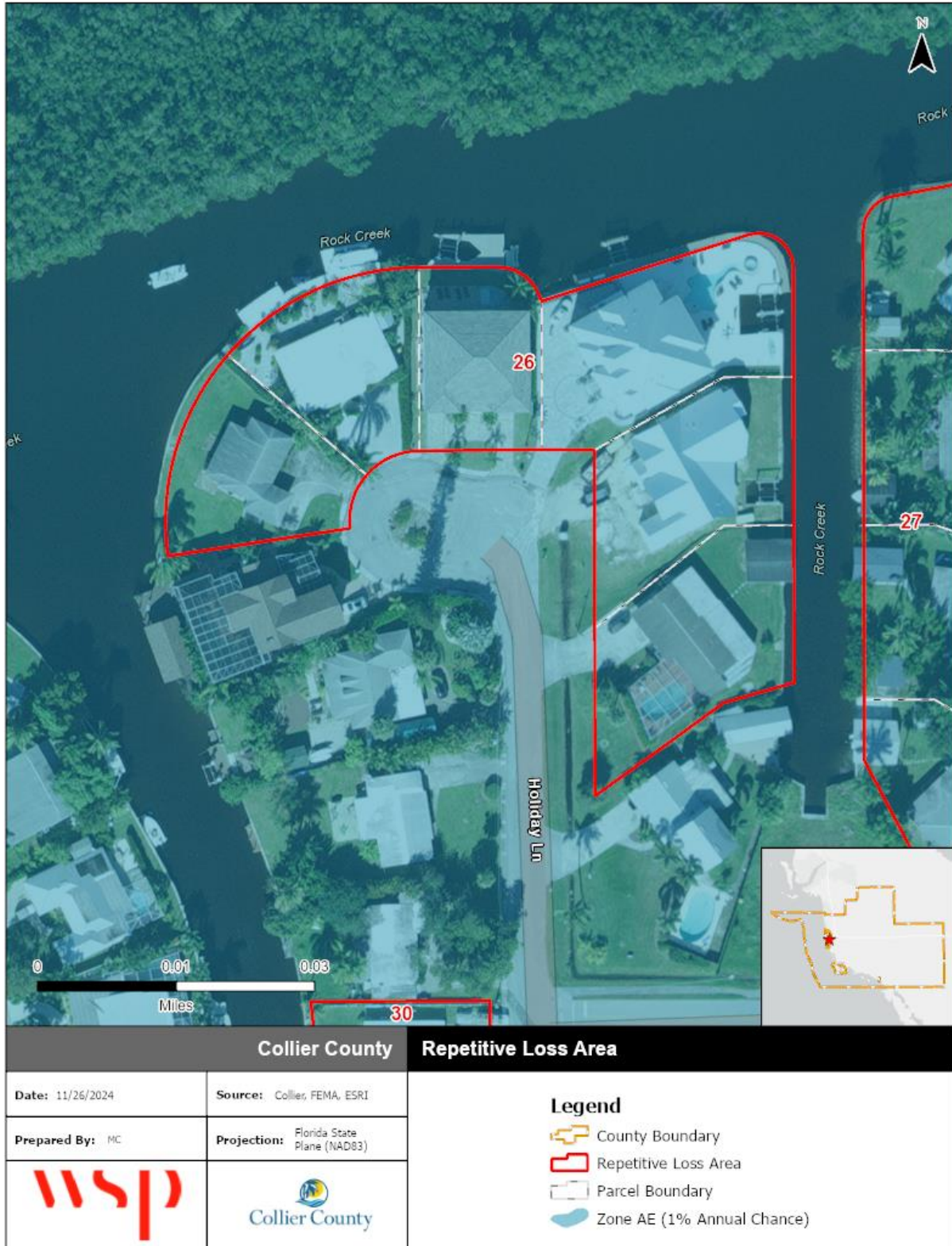


Figure 2.50 - Repetitive Loss Area 27

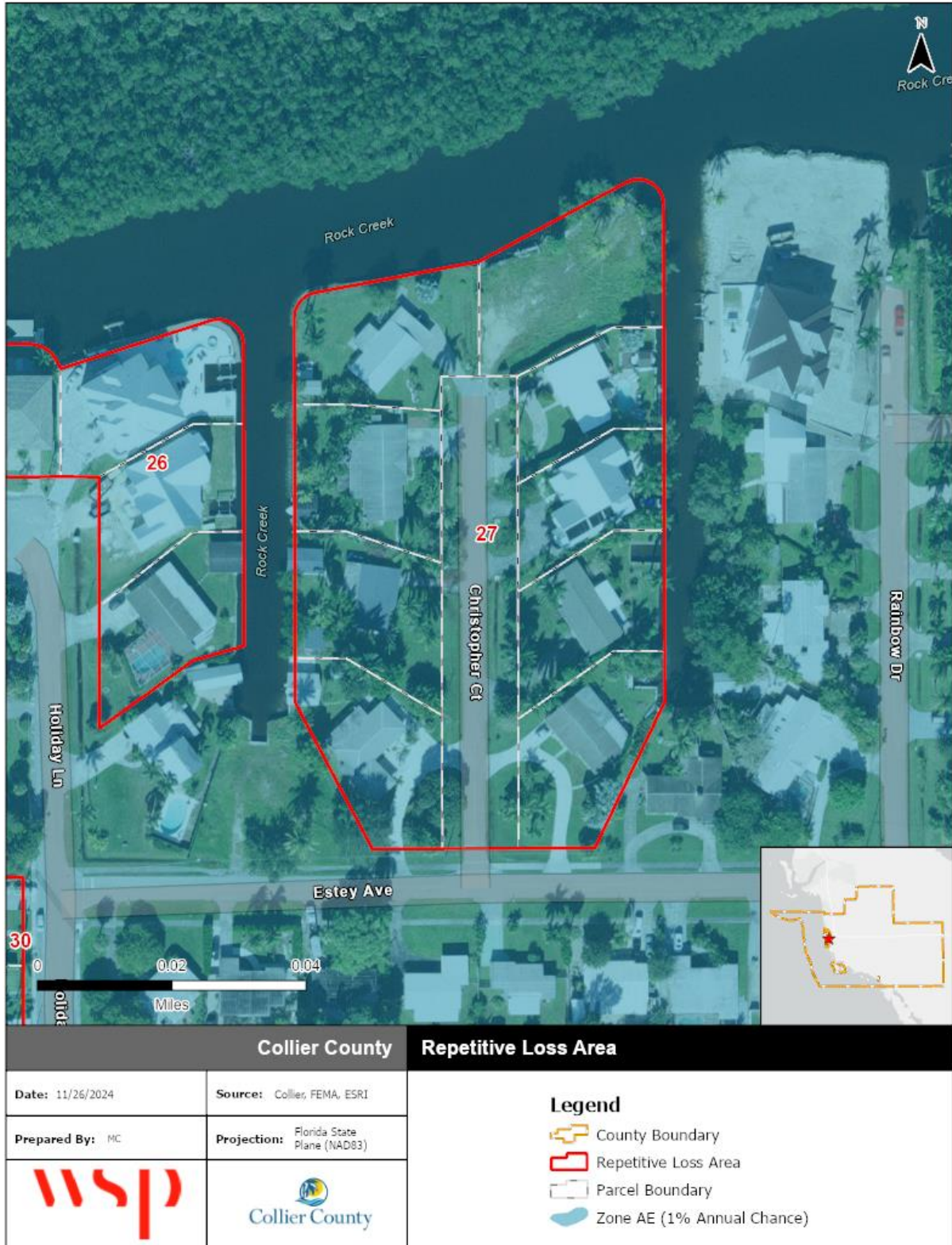


Figure 2.51 – Repetitive Loss Area 28



Figure 2.52 – Repetitive Loss Area 29



Figure 2.53 - Repetitive Loss Area 30

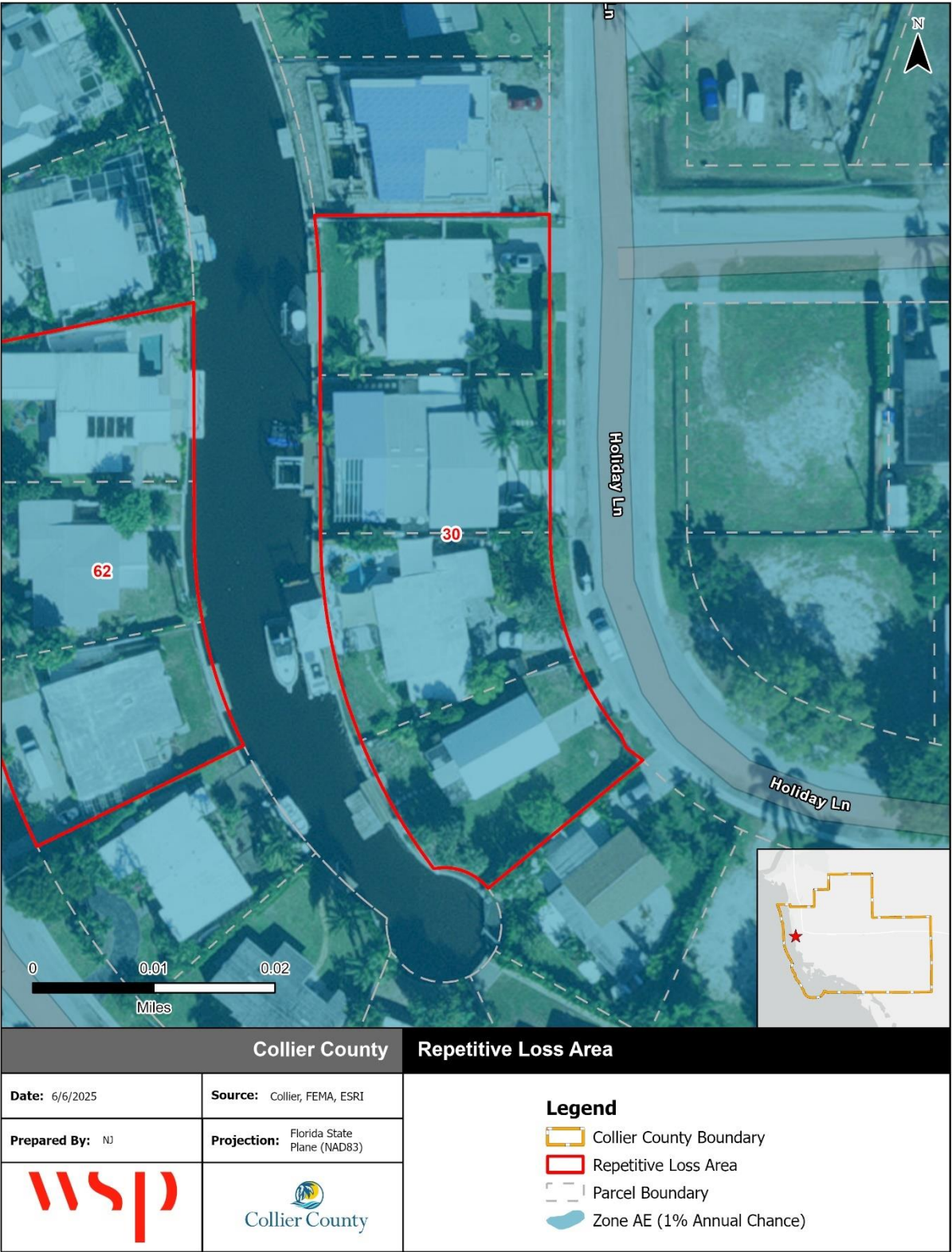


Figure 2.54 – Repetitive Loss Area 31

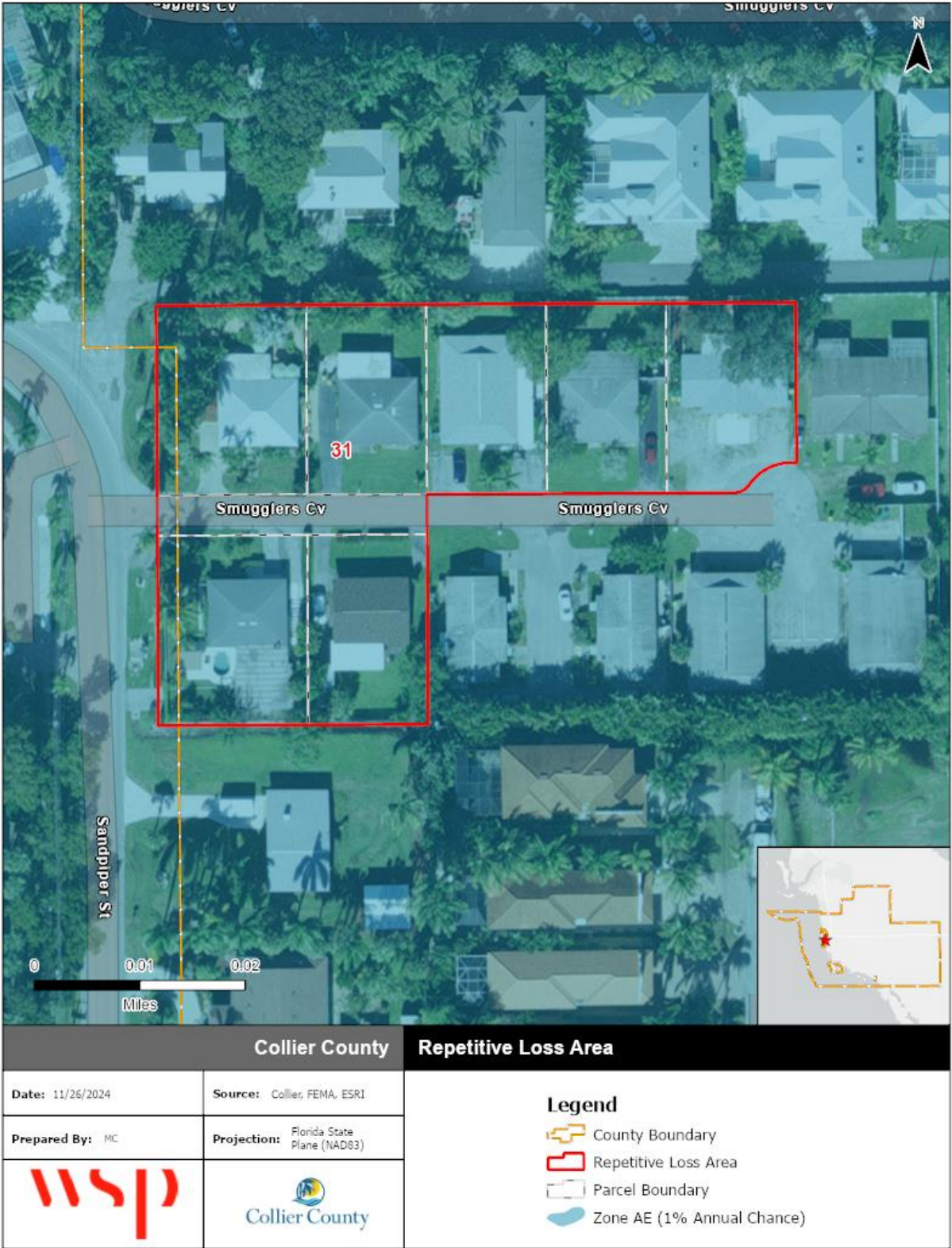


Figure 2.55 - Repetitive Loss Area 32

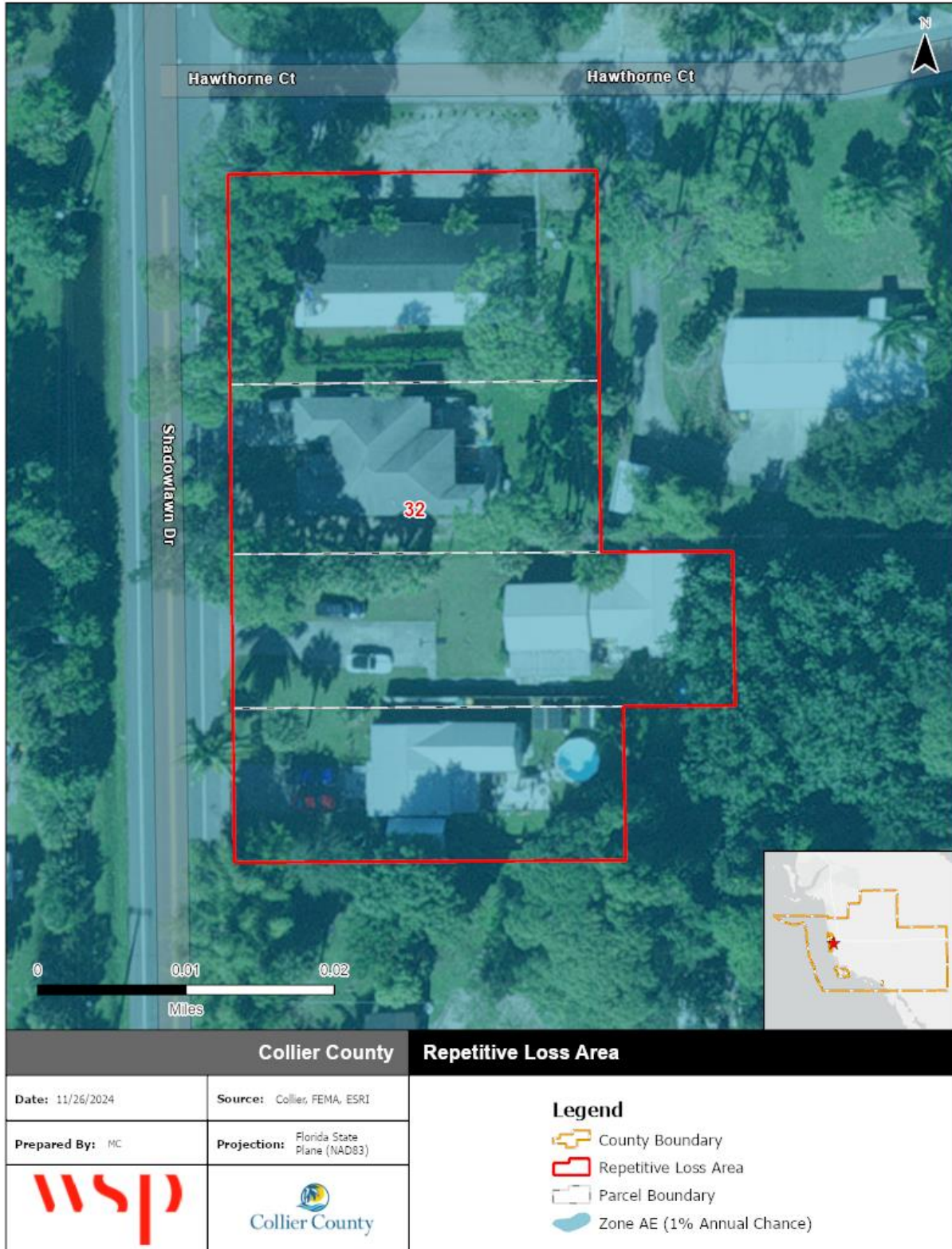


Figure 2.56 – Repetitive Loss Area 33



Figure 2.57 – Repetitive Loss Area 34



Figure 2.58 – Repetitive Loss Area 35



Figure 2.59 – Repetitive Loss Area 36



Figure 2.60 – Repetitive Loss Area 37



Figure 2.61 – Repetitive Loss Area 38



Figure 2.62 – Repetitive Loss Area 39



Figure 2.63 – Repetitive Loss Area 40



Figure 2.64 - Repetitive Loss Area 41

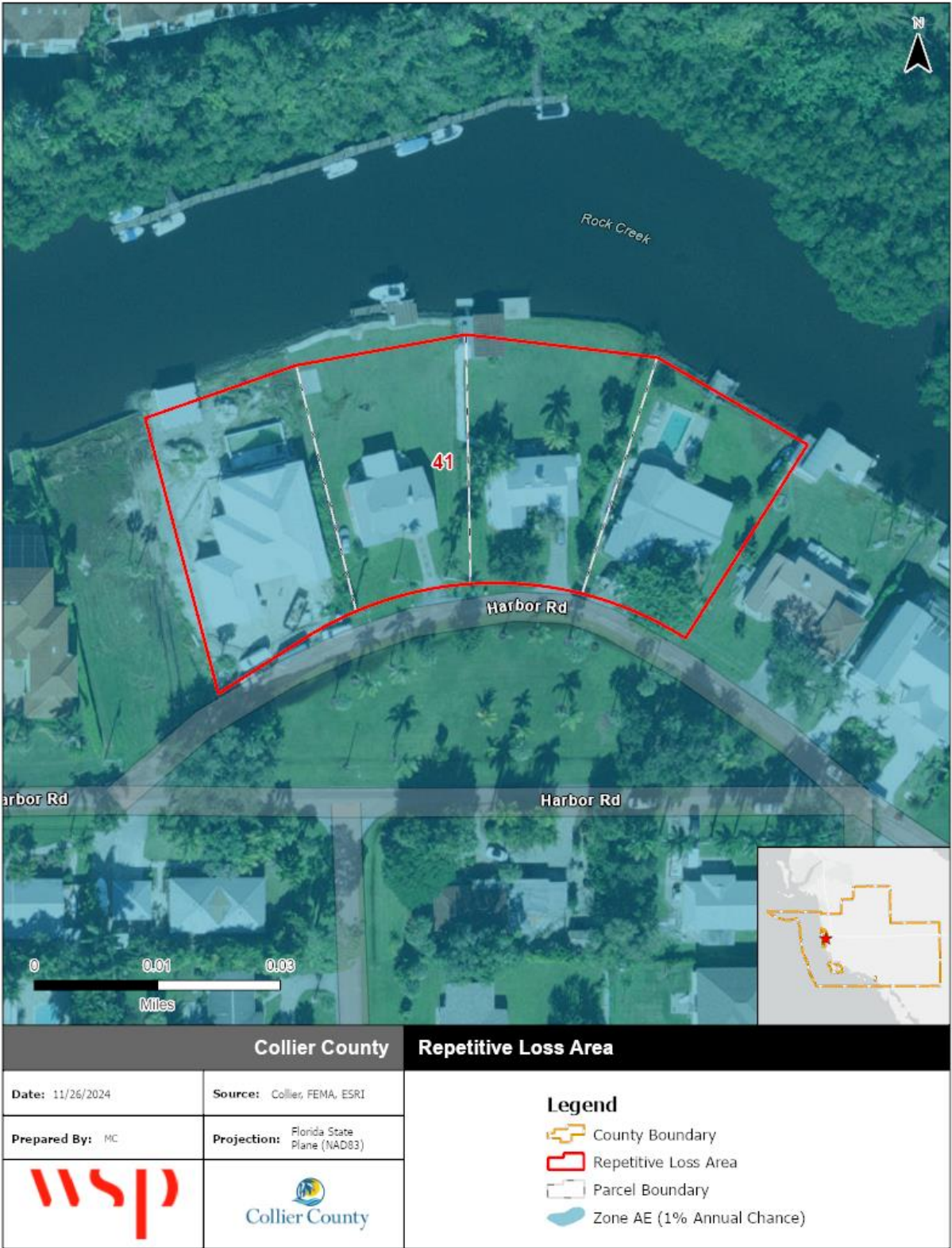


Figure 2.65 – Repetitive Loss Area 42

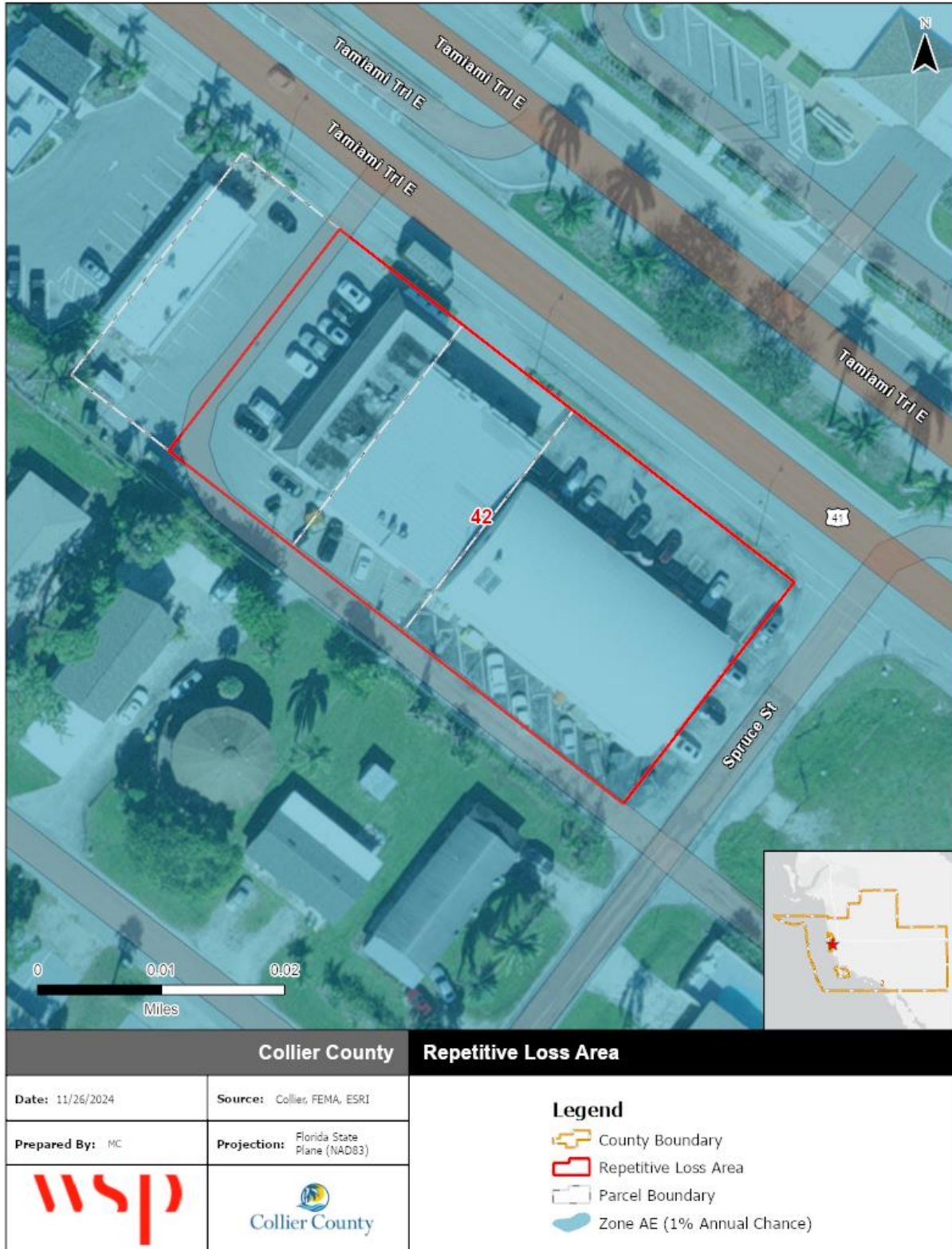


Figure 2.66 – Repetitive Loss Area 43



Figure 2.67 – Repetitive Loss Area 44



Figure 2.68 – Repetitive Loss Area 45



Figure 2.69 – Repetitive Loss Area 46



Figure 2.70 - Repetitive Loss Area 47

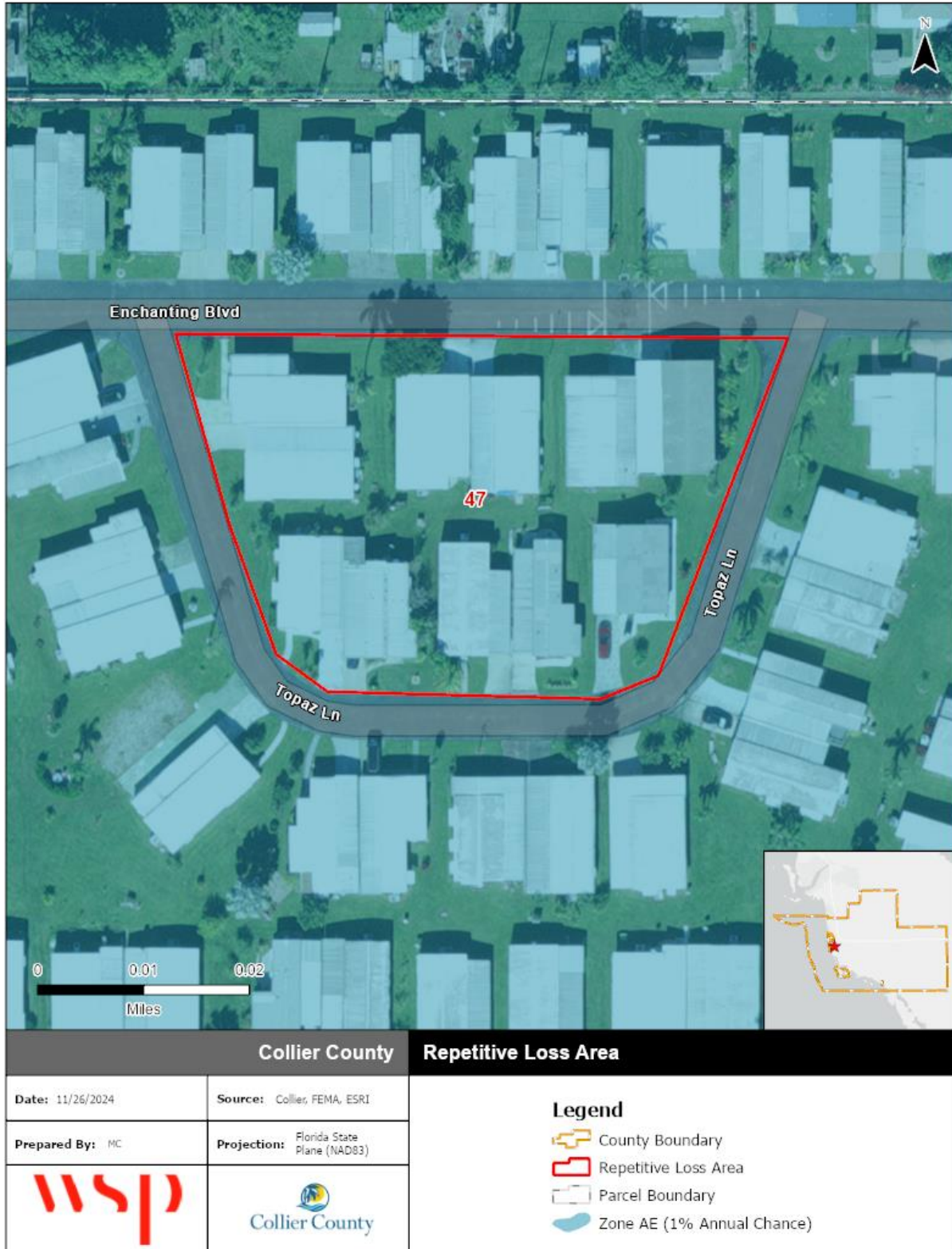


Figure 2.71 - Repetitive Loss Area 48



Figure 2.72 – Repetitive Loss Area 49



Figure 2.73 – Repetitive Loss Area 50



Figure 2.74 – Repetitive Loss Area 51



Figure 2.75 – Repetitive Loss Area 52

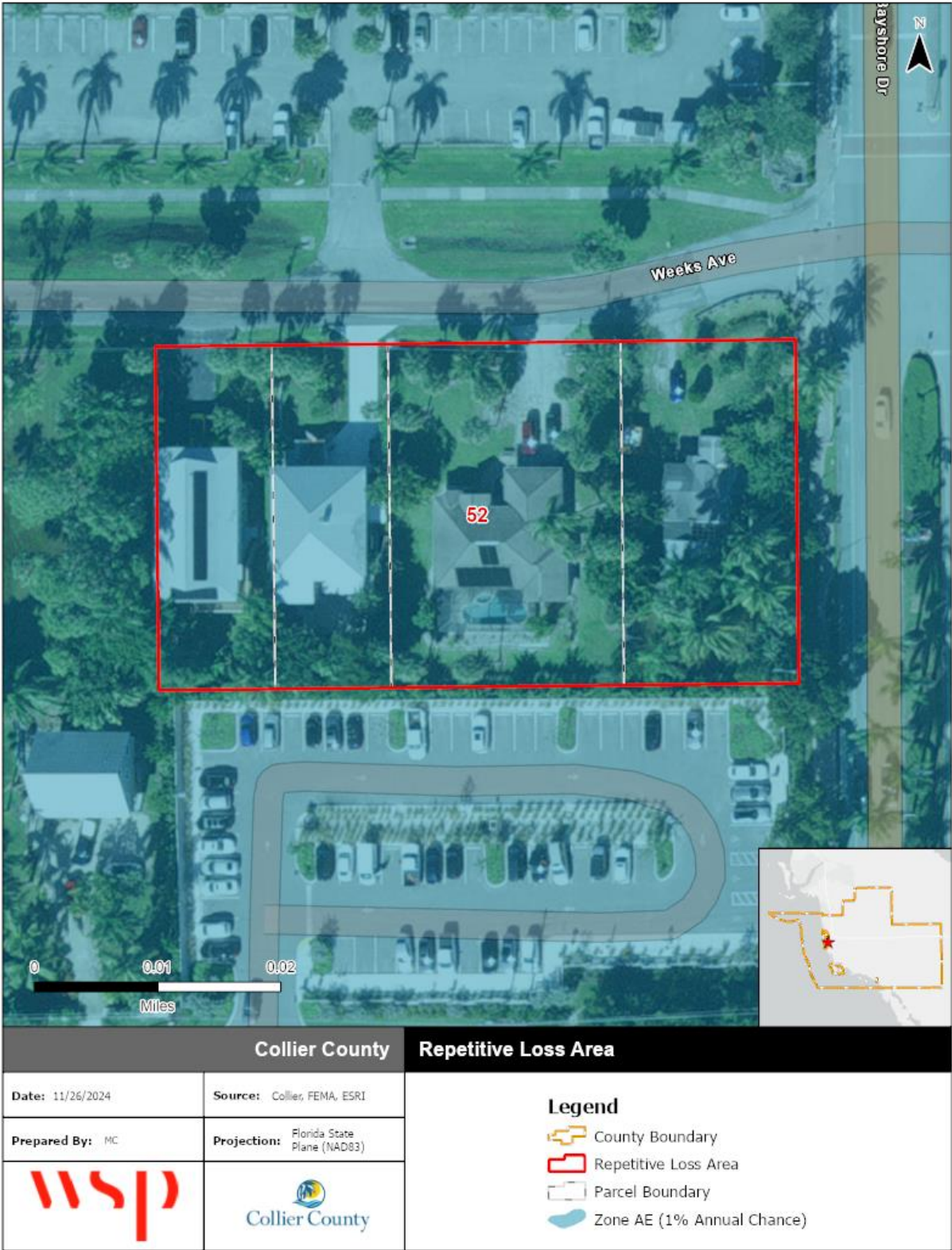


Figure 2.76 – Repetitive Loss Area 53

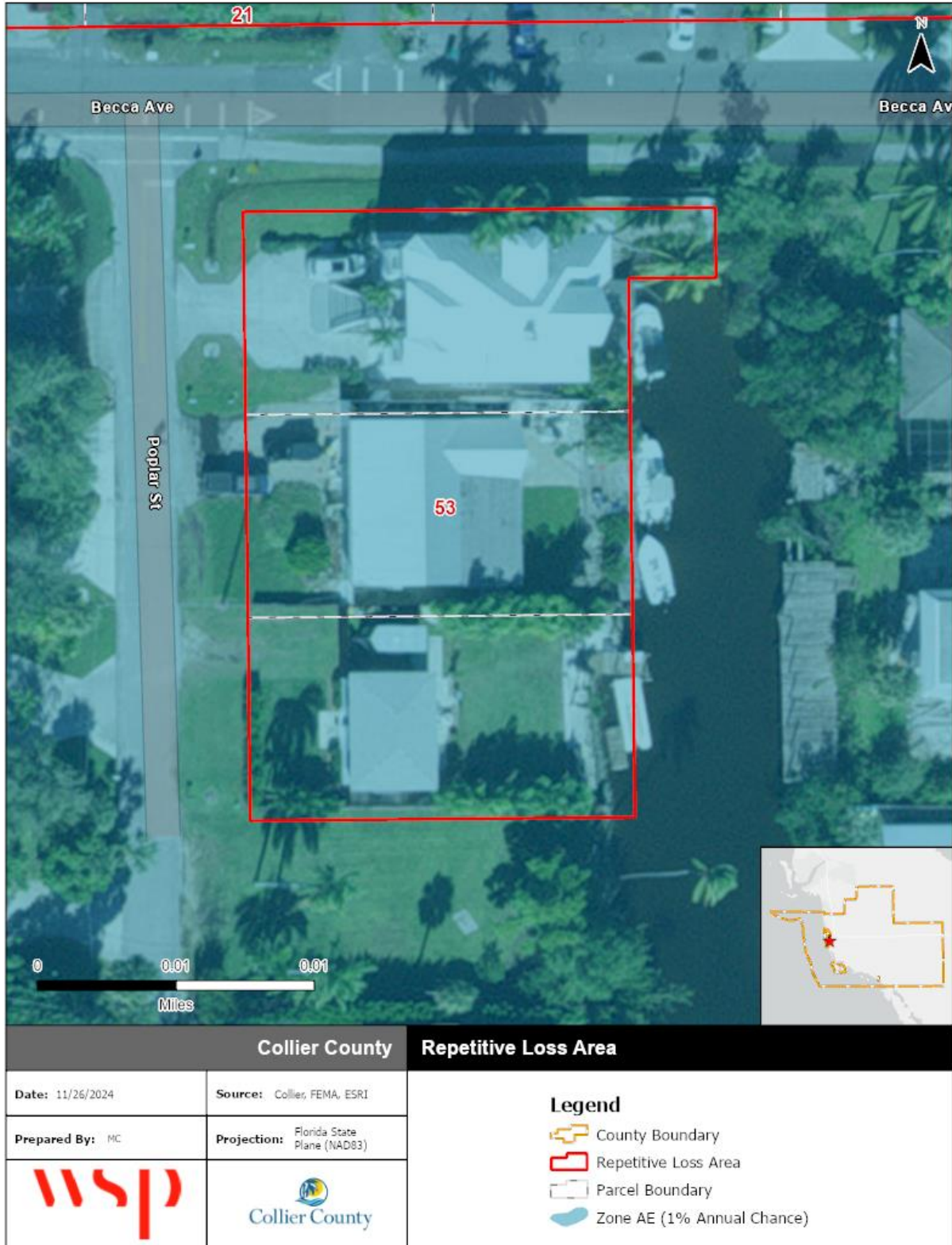


Figure 2.77 – Repetitive Loss Area 55



Figure 2.78 – Repetitive Loss Area 56

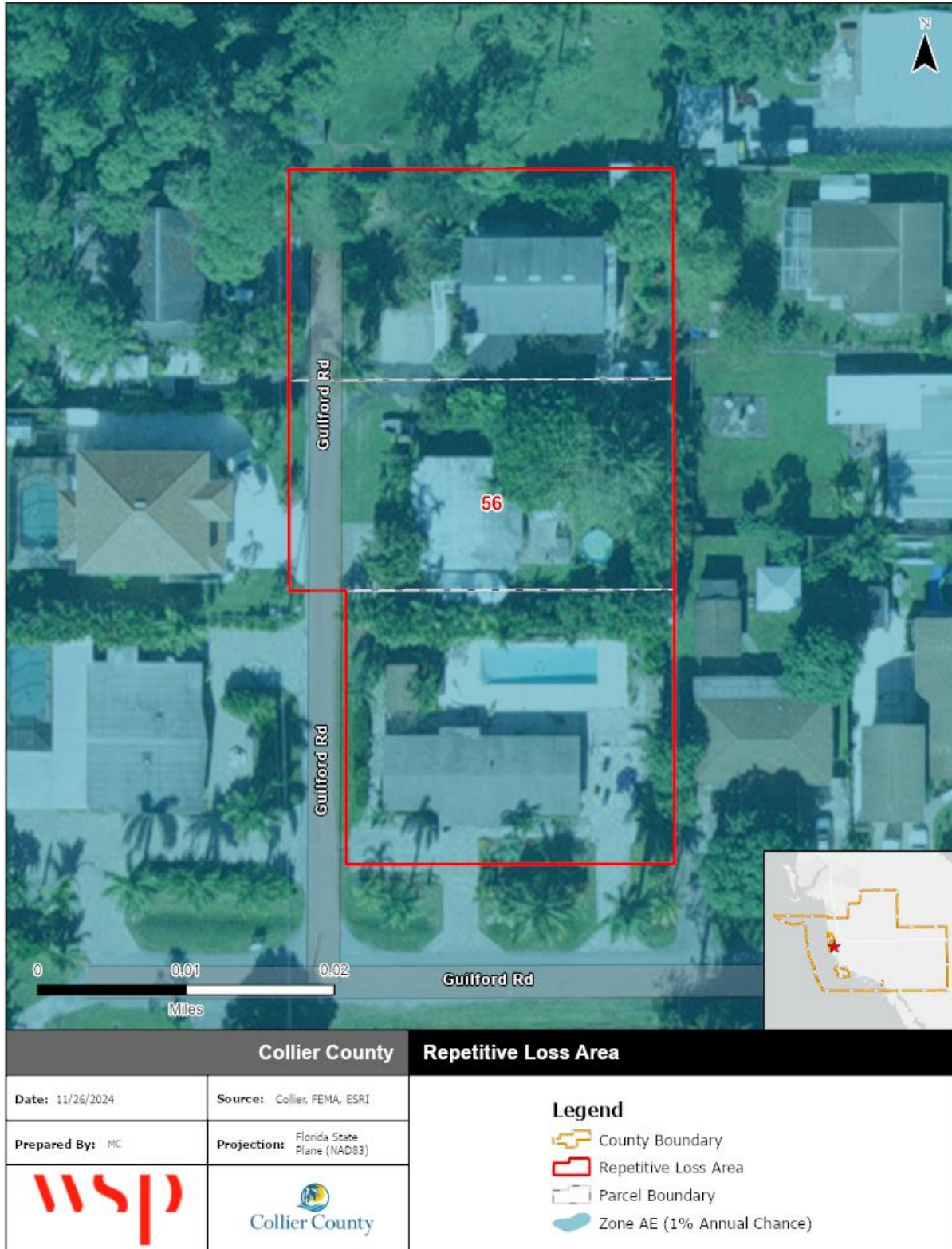


Figure 2.79 – Repetitive Loss Area 57



Figure 2.80 – Repetitive Loss Area 58

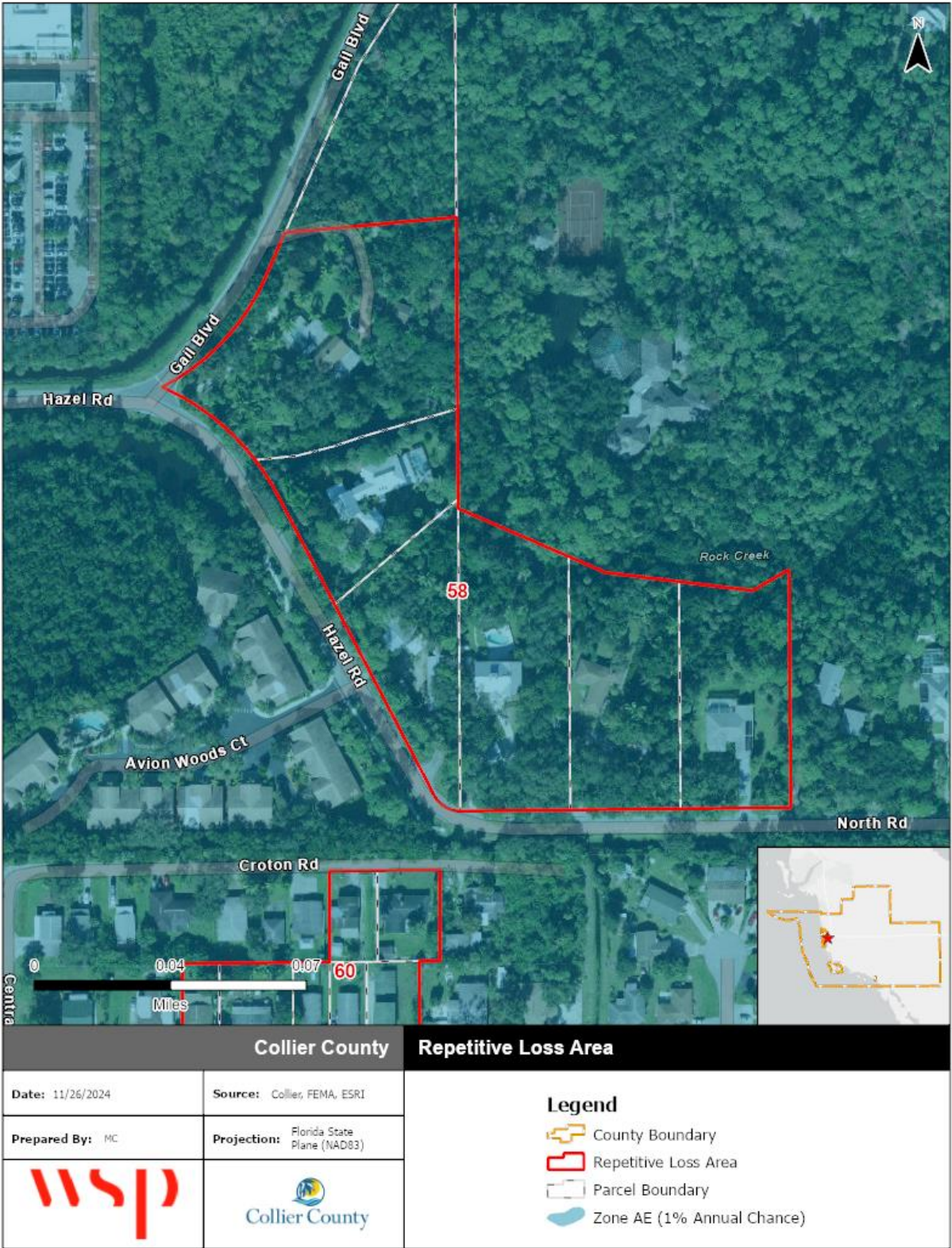


Figure 2.81 – Repetitive Loss Area 59

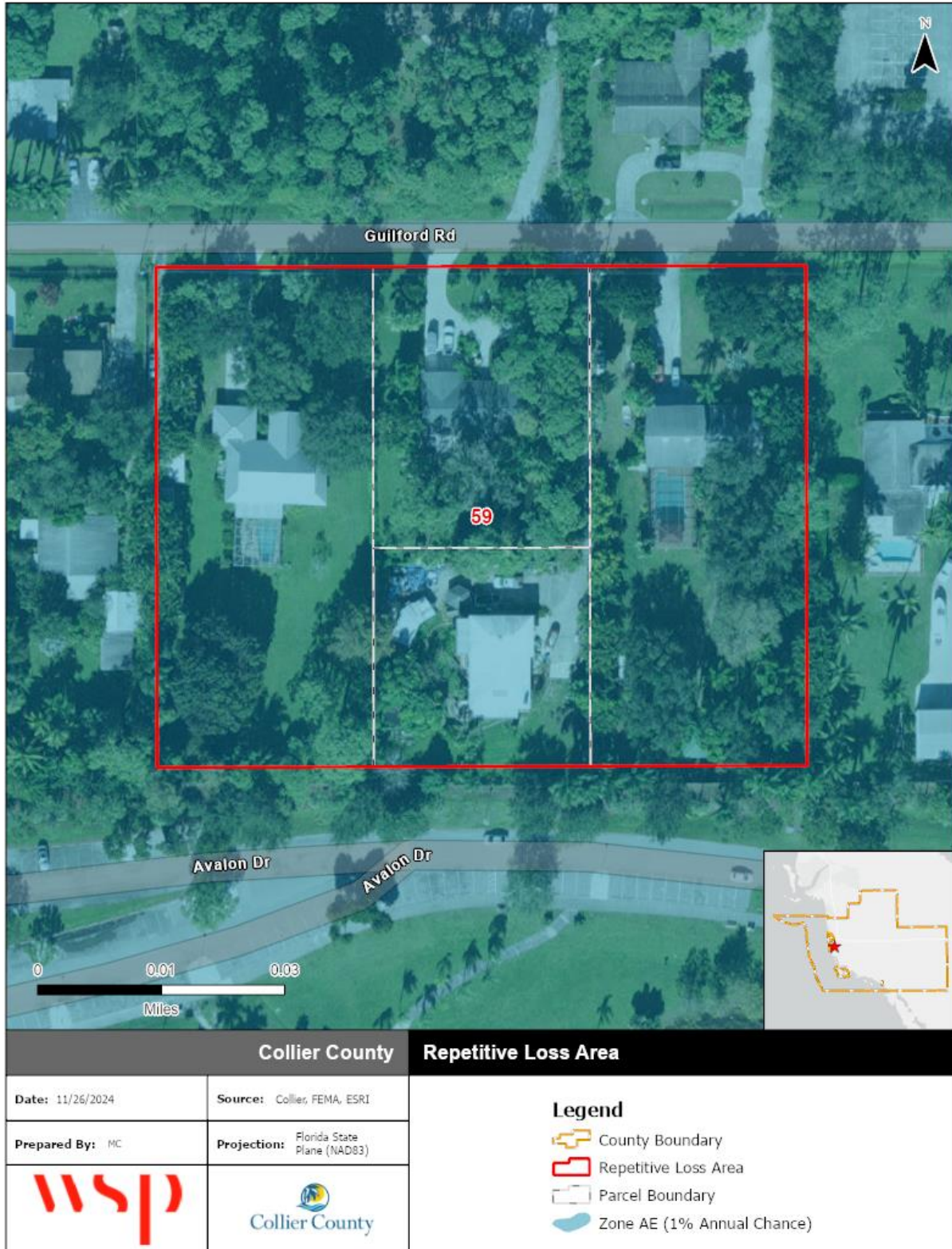


Figure 2.82 – Repetitive Loss Area 60

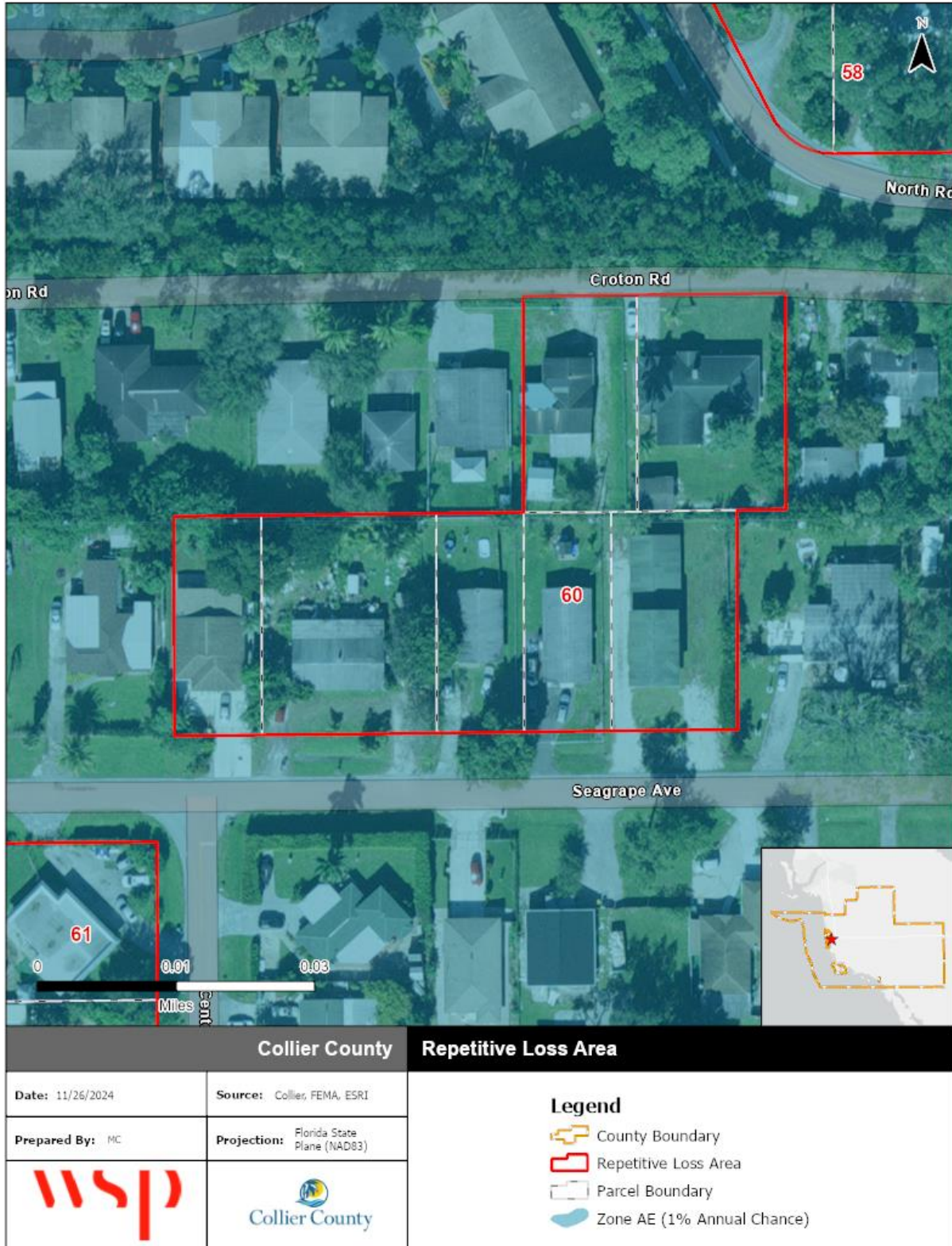


Figure 2.83 – Repetitive Loss Area 61



Figure 2.84 - Repetitive Loss Area 62



Figure 2.85 - Repetitive Loss Area 124

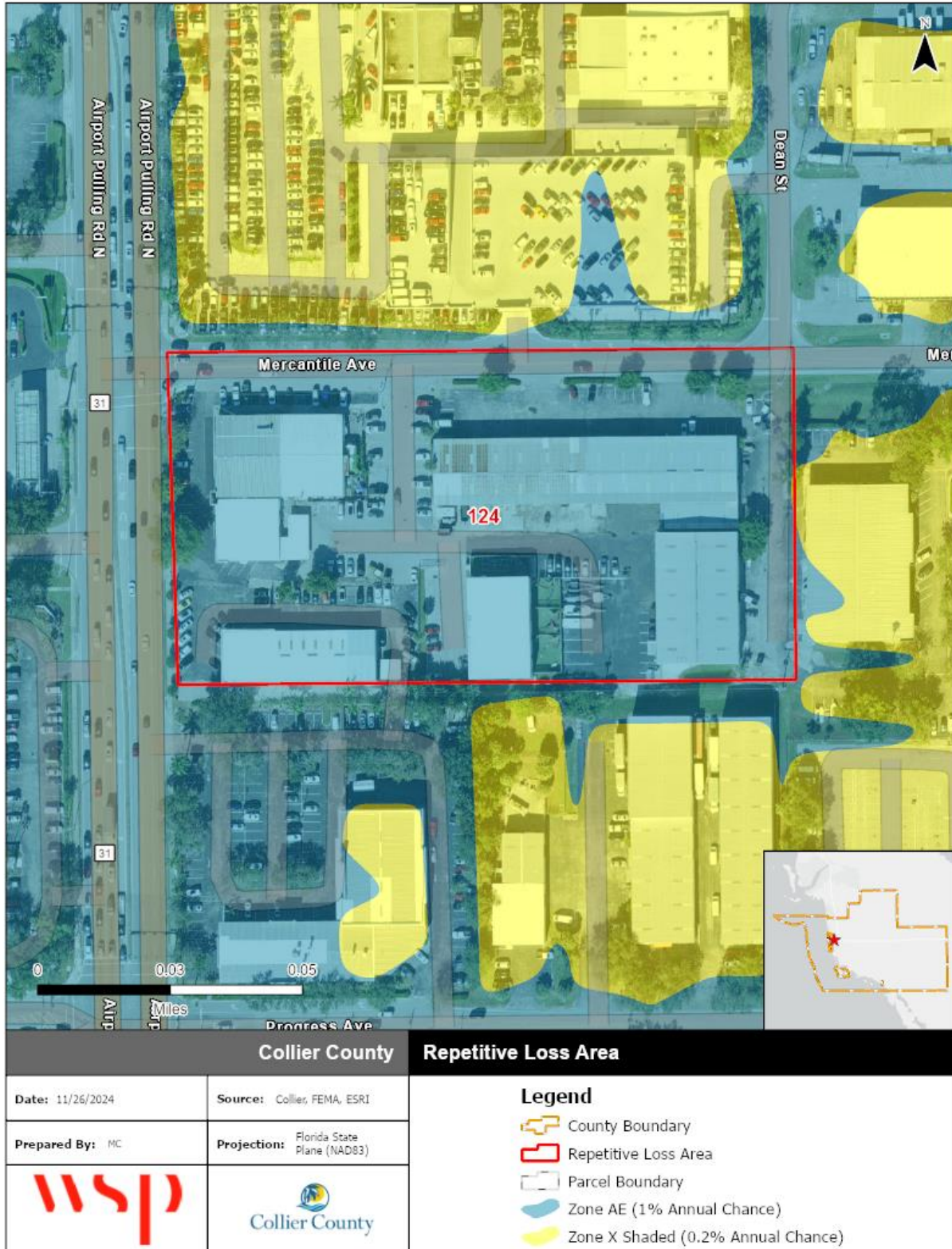
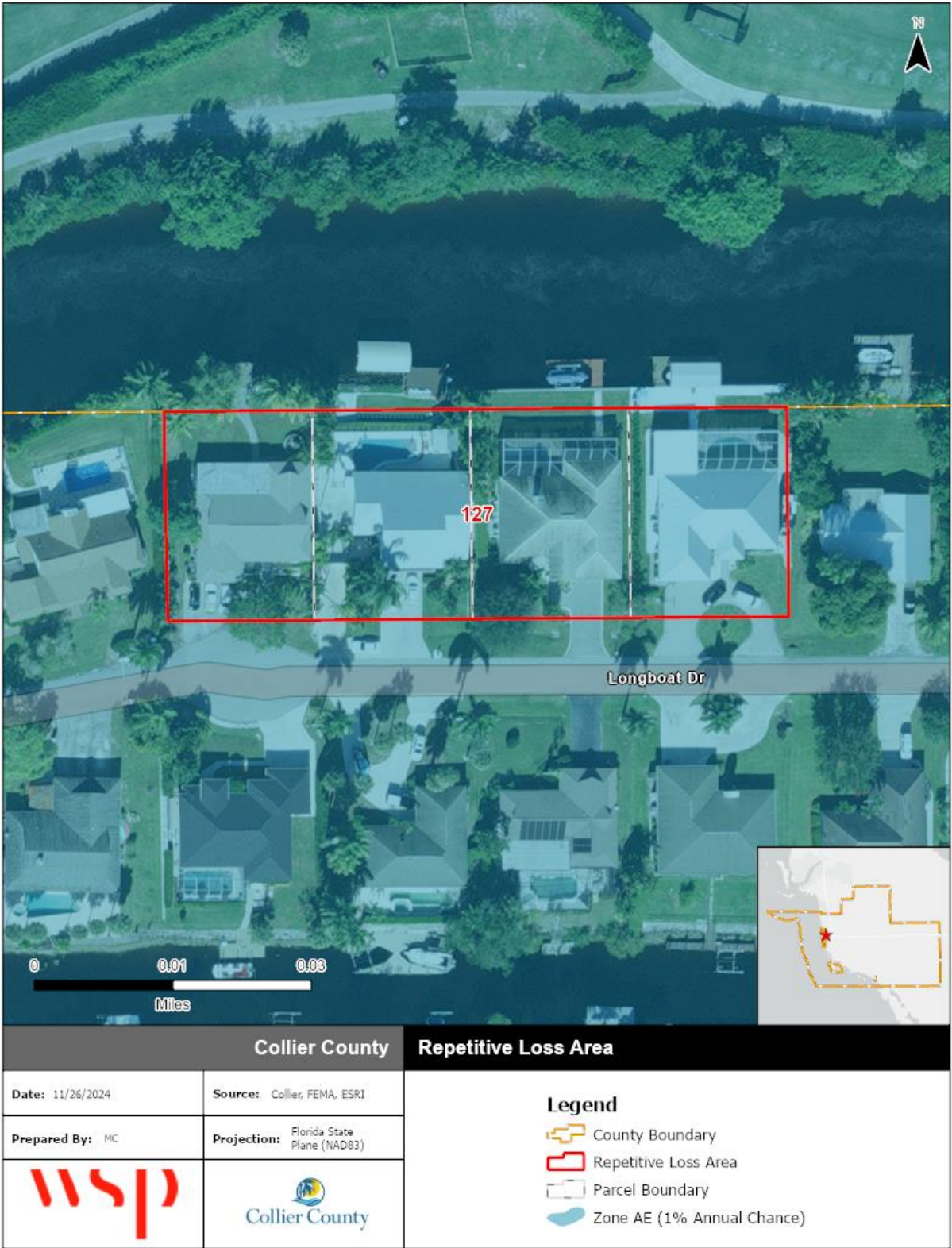


Figure 2.86 – Repetitive Loss Area 127



2.3.1.3 SUBAREA 3

OVERVIEW

Subarea 3 contains six repetitive loss areas. Table 2.4 provides summary information for all repetitive loss areas in Subarea 3. A description and map of each of the identified repetitive loss area follows.

Table 2.4 – Overview of Subarea 3

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
63	1	2	Jasmine Ln, Rose Ln	100.0%
64	1	2	Needle Palm Ln	100.0%
65	1	2	Rookery Rd	100.0%
66	2	11	Henderson Dr	100.0%
67	1	3	Sugar Loaf Ln, Grassy Key Ln	100.0%
68	1	3	Jade Dr, Onyx Dr	100.0%

FINDINGS

Subarea 3 includes 30 residential properties. Properties in this zone are primarily vulnerable to flooding due to their location near tidal creeks and localized stormwater issues, including overwhelmed stormwater ponds and overgrown or undersized drainage ditches adjacent to some properties.

All the structures in this area are manufactured homes. Nearly one third of the structures have slab on grade foundations all of which are built at grade and have the first floor elevated at least one foot. The remaining homes have crawl spaces, all of which are also elevated at least one foot from the ground. Over half of the homes in this area have vents and just under a third have either a gutter or drainage ditch close to the property. Most HVAC units were not observed from the right-of-way, however around a third of the properties have elevated units.

Questionnaire responses from this zone indicate that most property owners attribute flooding to high tides, hurricanes and storm surge, drainage from nearby properties, overwhelmed retention ponds, and overgrown ditches. One respondent noted a pattern of increased drainage issues and runoff in his neighborhood as a result of increased development in the area. Property owners have regraded their yards, cleared ditches, sandbagged, coated ductwork and underside of home with closed cell foam, and raised items or moved them off of ground level to reduce impacts from flooding. Some of these interventions have been successful; however, several respondents noted a need for more help or indicated that the flood problems are beyond their means to address. Several property owners noted they've needed to replace duct work and AC systems multiple times. Property owners noted a need for drainage improvements and expanded capacity of canals and retentions ponds to better alleviate flood.



Manufactured home with drainage ditch along property and gutter that drains towards the adjacent property



Manufactured home with elevated HVAC and drain in yard



Elevated manufactured home with crawlspace

Figure 2.87 – Subarea 3 Repetitive Loss Areas and FEMA Flood Zones

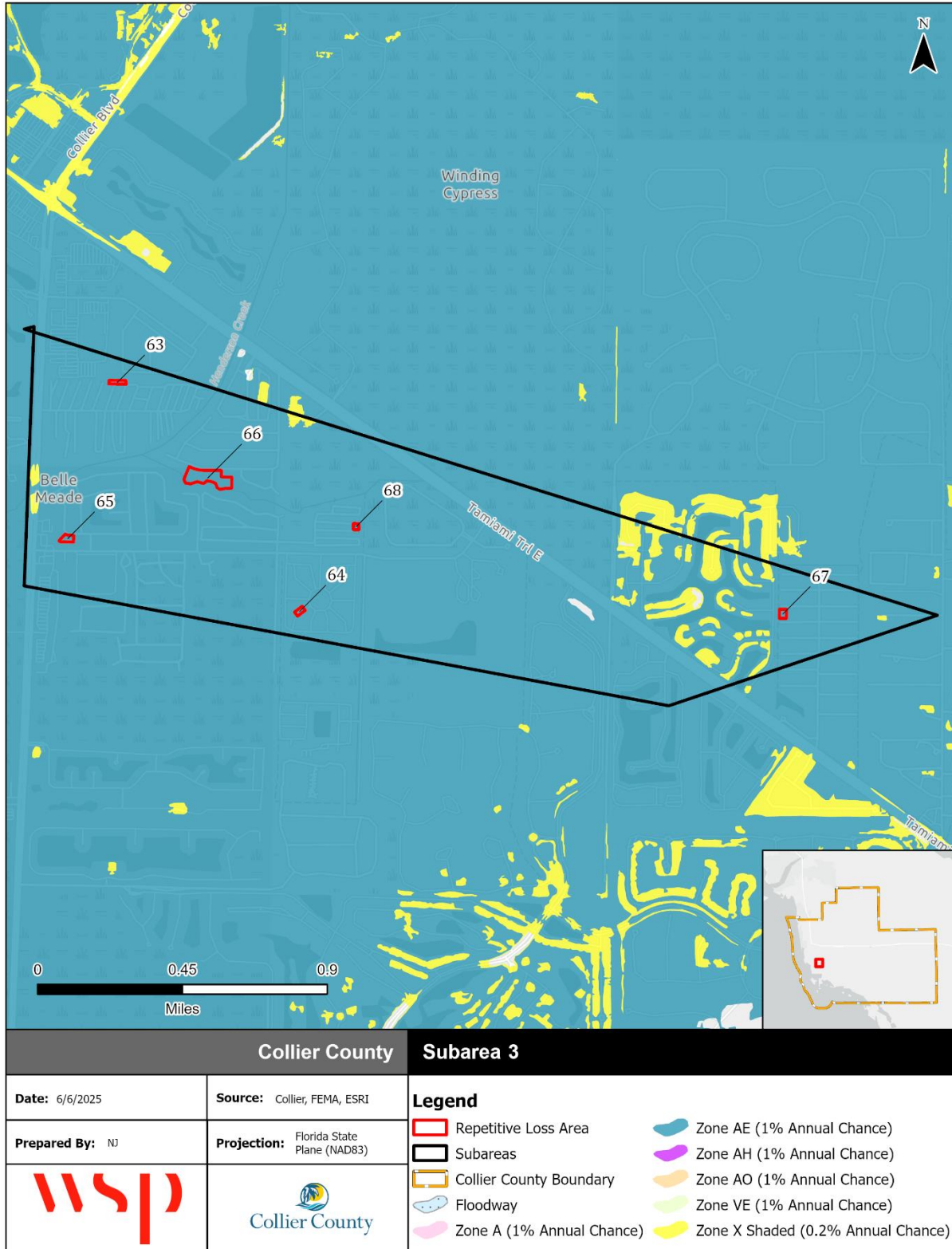


Figure 2.88 – Repetitive Loss Area 63



Figure 2.89 – Repetitive Loss Area 64



Figure 2.90 – Repetitive Loss Area 65



Figure 2.91 - Repetitive Loss Area 66



Figure 2.92 – Repetitive Loss Area 67

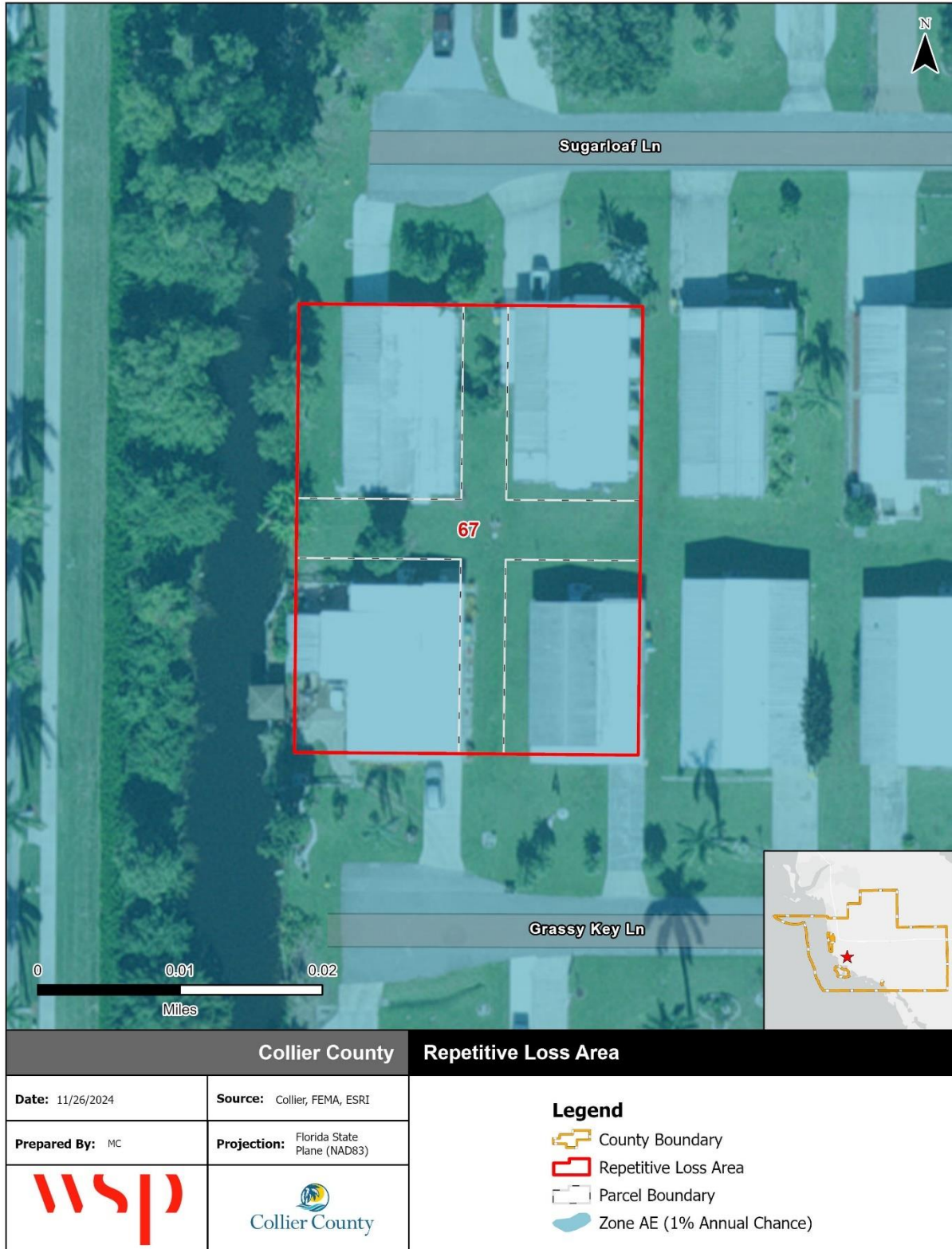


Figure 2.93 – Repetitive Loss Area 68



2.3.1.4 SUBAREA 4

OVERVIEW

Subarea 4 contains 10 repetitive loss areas. Table 2.5 provides summary information for all repetitive loss areas in Subarea 4. A description and map of each of the identified repetitive loss area follows.

Table 2.5 – Overview of Subarea 4

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
109*	3	1	La Peninsula Blvd	87.9%
110	3	10	Jamaica Dr, Tahiti Cir, Capri Blvd	100%
111	3	8	Tahiti St	100%
112	2	10	San Salvador St	100%
113	1	2	Pago Pago Dr W	100%
114	1	4	Capri Blvd	100%
115	1	2	Pelican St E	100%
116	2	8	Trinidad St	100%
117	1	3	E Hilo St	100%
118	1	7	Tahiti Cir	100%

*This area contains multi-unit structures. Property count reflects structure count, not unit count.

FINDINGS

Subarea 4 includes 72 residential and commercial structures (including units in multi-family buildings). Most structures are residential, and several of the properties contain multifamily condominium buildings. This subarea is located on a peninsula in close proximity to Marco Island and surrounded by the Gulf. Therefore, properties found in this subarea are highly vulnerable to stormwater surge.

Approximately 30 of the properties are elevated at least 2 feet or more, and five of the properties are elevated at least 4 feet. However, approximately half of the properties have minimal elevation of less than 2 feet. Most properties without significant elevation are single-family homes. The large condominium complexes within this subarea appear to have their living spaces elevated above first-floor garages.

Most properties appear to have a slab-on-grade foundation, and 13 of the properties are noted as having drainage pipes under their driveways. Over 44% of the properties have HVAC units that are elevated above the first floor.

Almost all questionnaire respondents (9 of 10) indicated that their building has flooded in the past and that the cause of their flooding is linked to storm surge or tidal flooding (8 of 10). A few respondents stated that they have tried to implement flood protection including re-grading yards, moving things out of basement, sandbagging, and adding French drains. The property owner, who hasn't experienced flooding, mentioned that their property was constructed 5 feet above grade.



Condominium building with living space elevated above first-floor.



Single-family home with slab-on-grade foundation.



Single-family home with drainage pipe under driveway.

Figure 2 - Subarea 4 Repetitive Loss Areas and FEMA Flood Zones

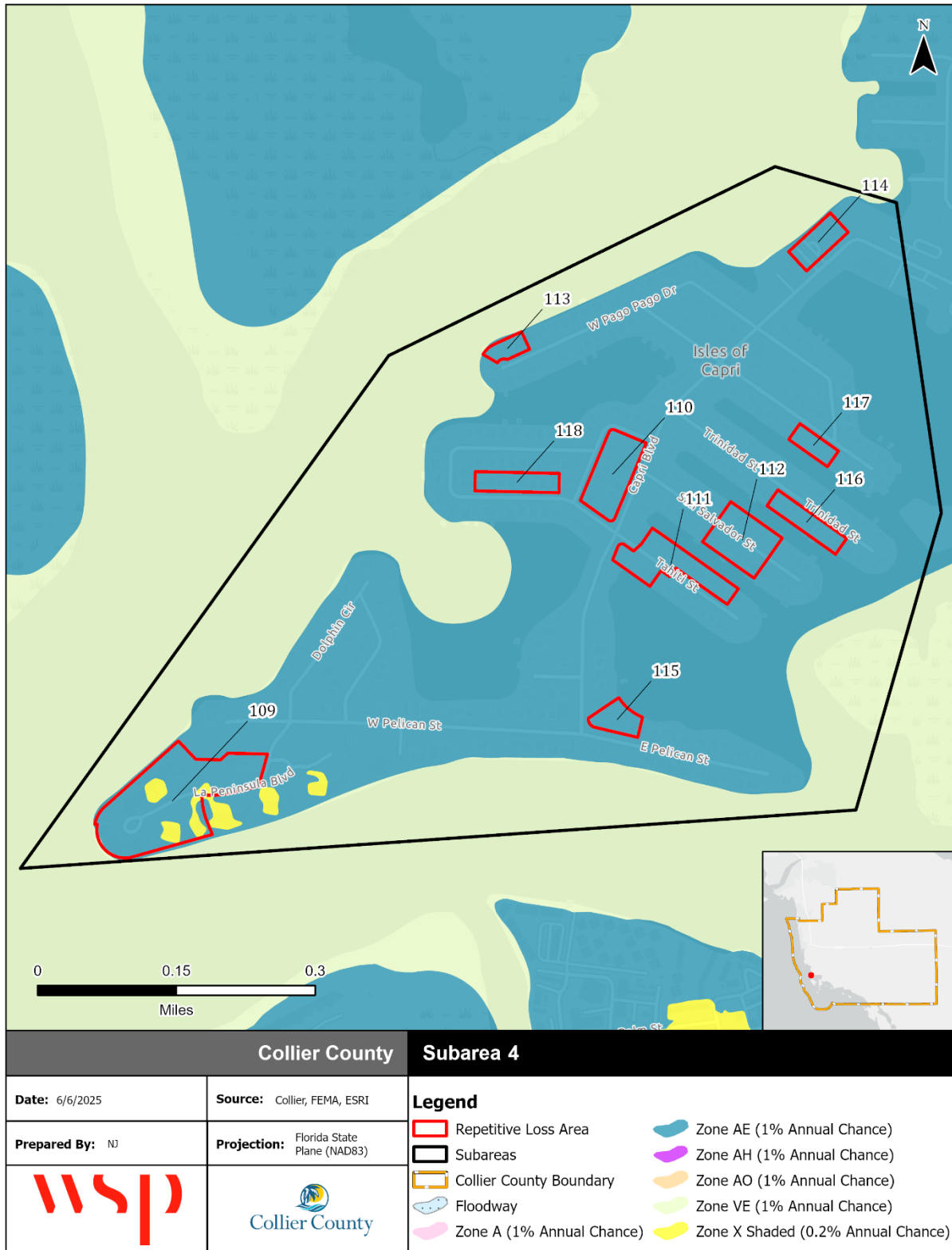


Figure 2.94 – Repetitive Loss Area 109



Figure 2.95 - Repetitive Loss Area 110



Figure 2.96 – Repetitive Loss Area 111



Figure 2.97 – Repetitive Loss Area 112

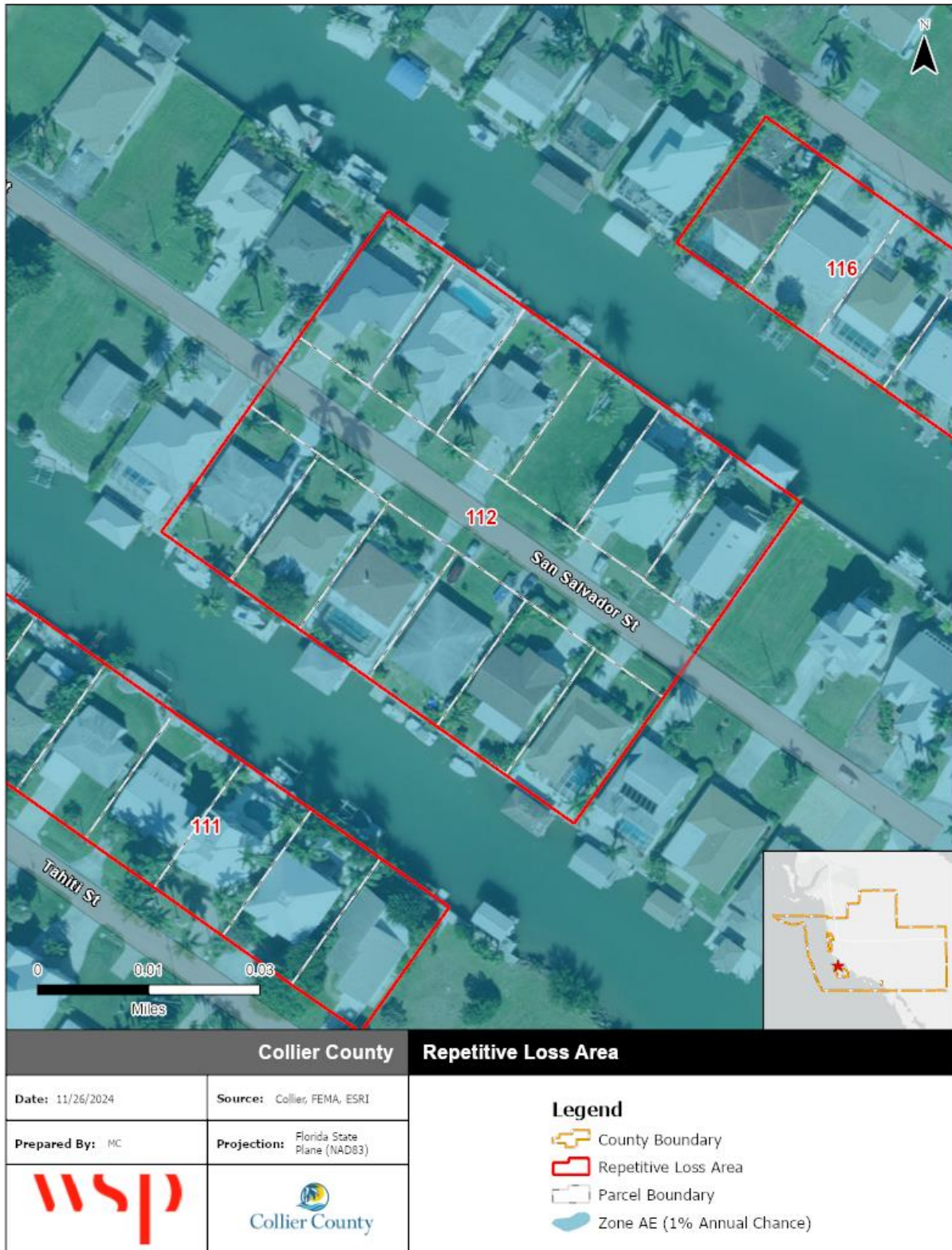


Figure 2.98 – Repetitive Loss Area 113



Figure 2.99 – Repetitive Loss Area 114



Figure 2.100 – Repetitive Loss Area 115



Figure 2.101 – Repetitive Loss Area 116

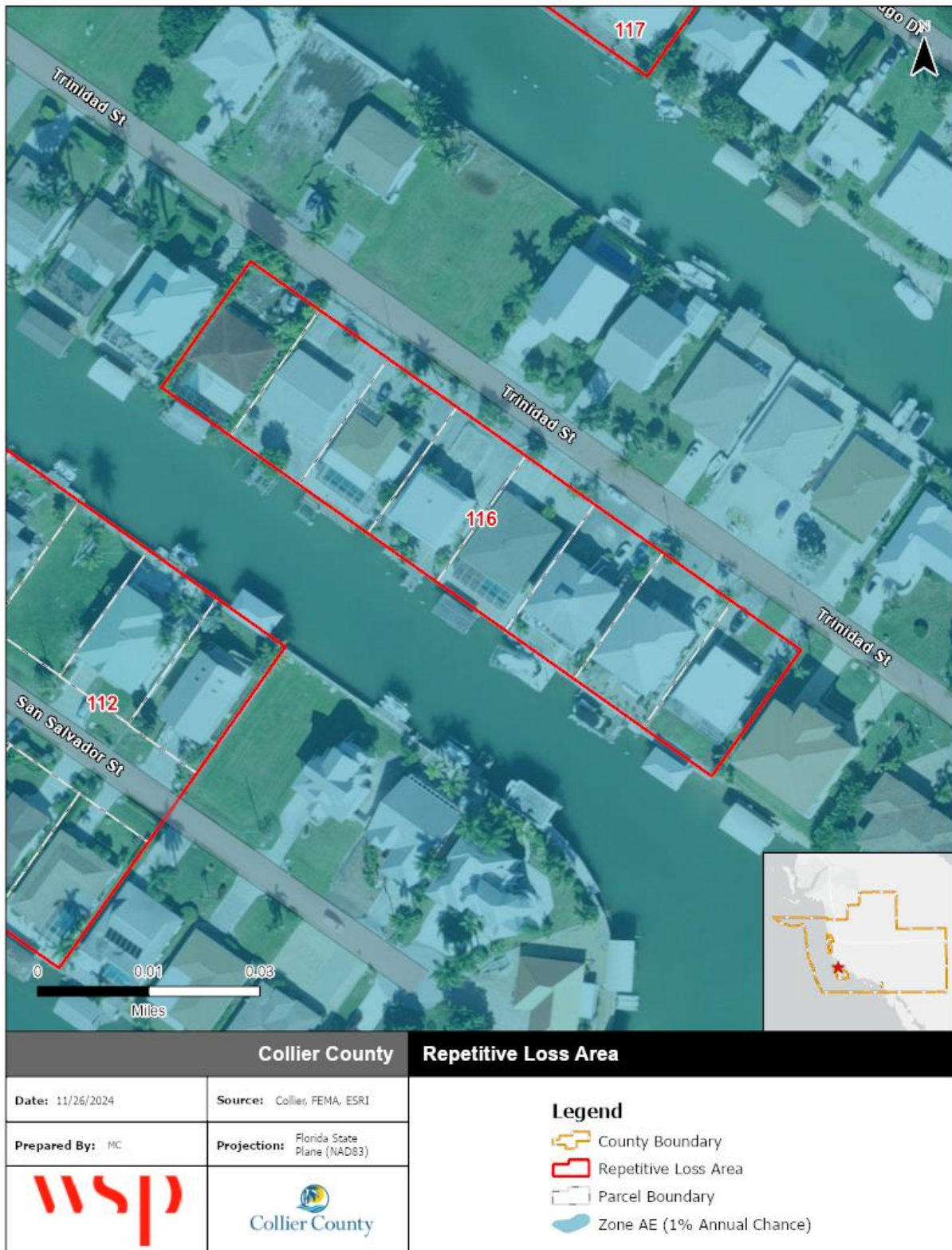


Figure 2.102 – Repetitive Loss Area 117



Figure 2.103 – Repetitive Loss Area 118



2.3.1.5 SUBAREA 5

OVERVIEW

Subarea 5 contains 12 repetitive loss areas. Table 2.6 provides summary information for all repetitive loss areas in Subarea 5. A description and map of each of the identified repetitive loss area follows.

Table 2.6 – Overview of Subarea 5

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
1	4	21	Pear Tree, Mango Ave, Goodland Dr W	90.7%
2	3	7	Harbor Pl N	100.0%
3	3	3	Bayshore Way	100.0%
4	2	2	Goodland Dr E	100.0%
5*	23	1	Angler Dr	100.0%
6	3	23	Coconut Ave, Palm Ave	100.0%
7	1	4	Papaya St	100.0%
8	1	6	Sunset Ct, Sunset Dr	100.0%
9	3	3	Palm Ave	100.0%
10	1	1	Palm Point Dr	100.0%
11	1	1	Coconut Ave	100.0%
12	1	6	Goodland Dr W	100.0%

*This area contains multi-unit structures. Property count reflects structure count, not unit count.

FINDINGS

Subarea 5 includes 124 residential properties, and structures are single-family or duplex. This subarea is located on Marco Island and is surrounded by Goodland Bay and features a series of canals that feed into the bay. Therefore, properties found in this subarea highly vulnerable to stormwater surge.

Twenty-eight structures are elevated 8-12 feet with most locating living space above a garage or parking area. However, most structures, around 67%, are located at grade or are elevated less than 2 feet. Most properties appear to have a slab-on-grade foundation. Over a third of the structures are manufactures homes, which may experience a greater vulnerability to flooding.

Over half of the HVAC units were observable from the right-of-way. Through observation, it was noted that one HVAC units is not elevated; five units are window units; one unit is elevated to B.F.E; two are elevated to the first floor; and 50 out of the 59 observable units are elevated above the first floor

Six out of eight questionnaire respondents in this area indicated that their building has flooded in the past and that the cause of their flooding is linked to storm surge or tidal flooding. A few respondents stated that they have tried to implement flood protection including sandbagging, sump pump, re-grading yard, and waterproofing outside walls.



Duplex with living space elevated above garage.



Manufactured home on stilts.



Single-family home with window-unit.

Figure 2.104 – Subarea 5 Repetitive Loss Areas and FEMA Flood Zones

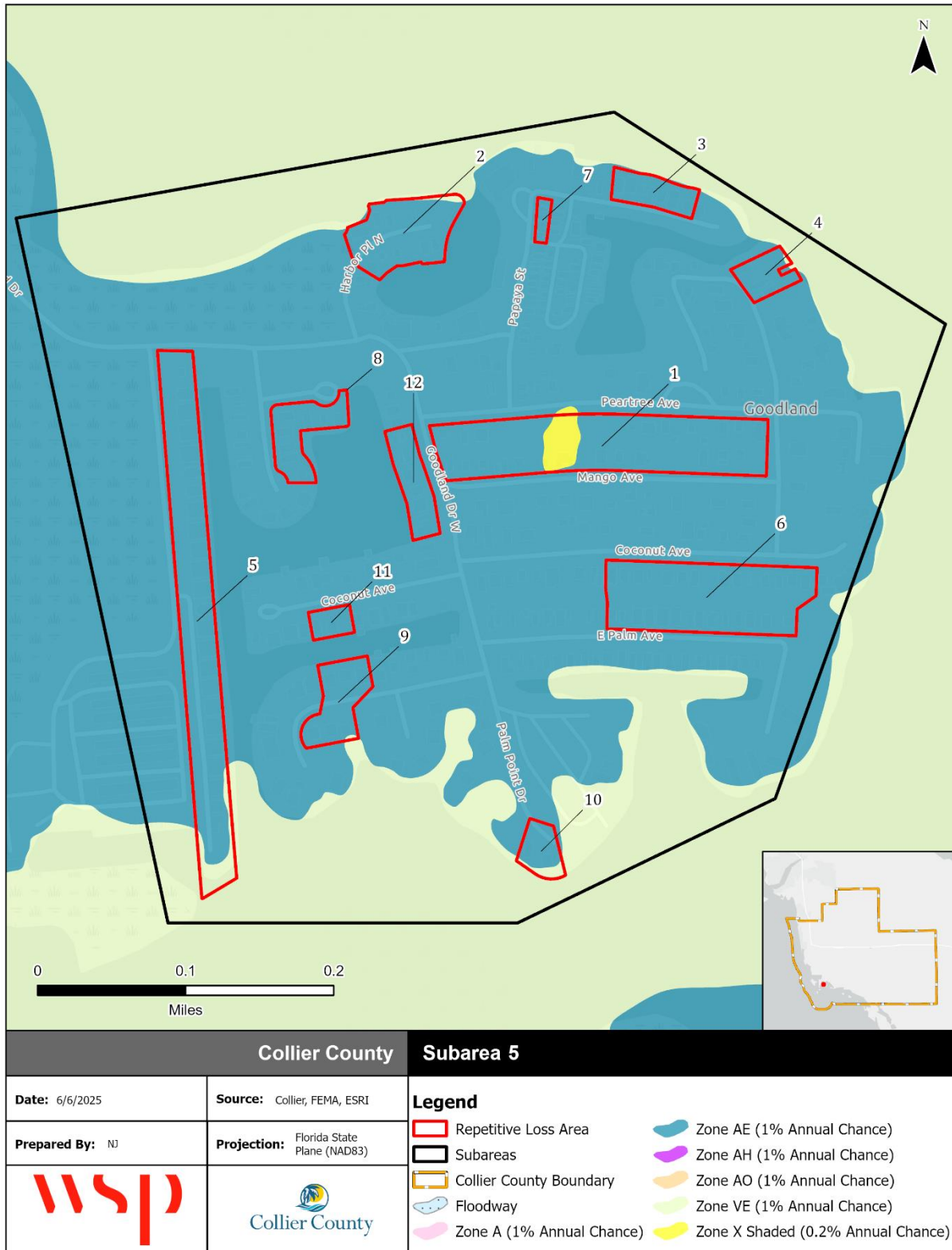


Figure 2.105 – Repetitive Loss Area 1

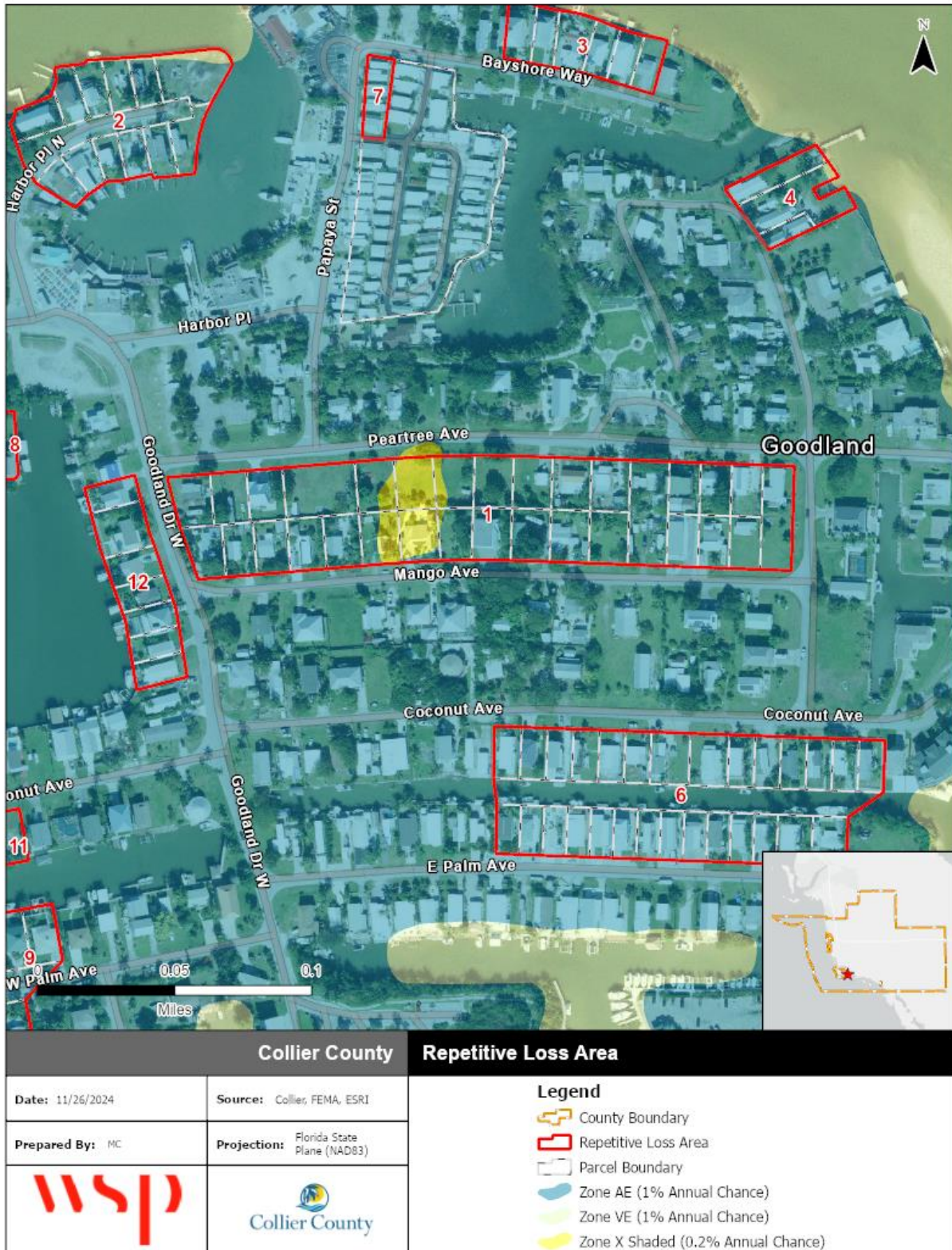


Figure 2.106 – Repetitive Loss Area 2



Figure 2.107 – Repetitive Loss Area 3



Figure 2.108 – Repetitive Loss Area 4



Figure 2.109 – Repetitive Loss Area 5



Figure 2.110 – Repetitive Loss Area 6



Figure 2.111 – Repetitive Loss Area 7

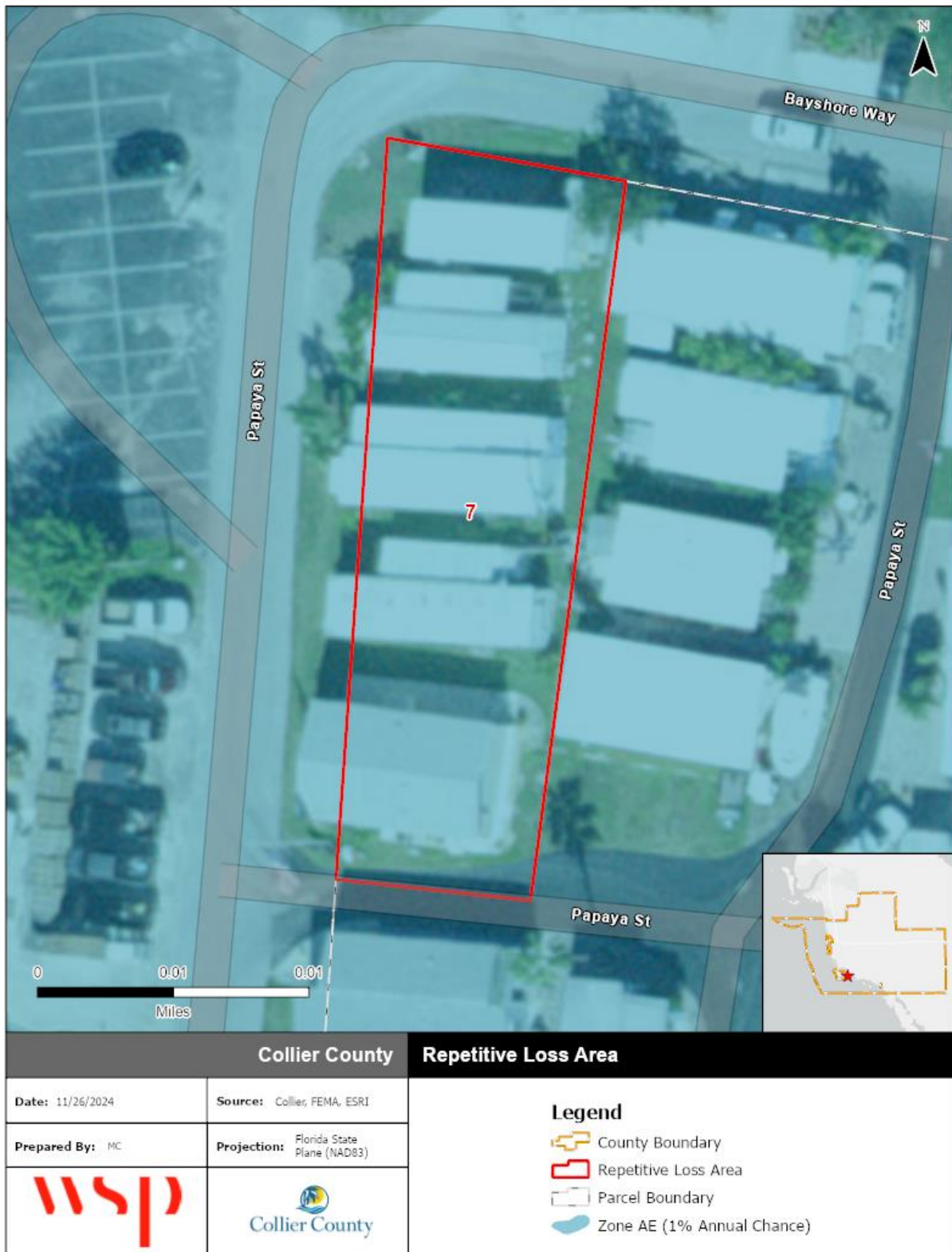


Figure 2.112 – Repetitive Loss Area 8



Figure 2.113 - Repetitive Loss Area 9



Figure 2.114 - Repetitive Loss Area 10



Figure 2.115 – Repetitive Loss Area 11



Figure 2.116 – Repetitive Loss Area 12



2.3.1.6 SUBAREA 6

OVERVIEW

Subarea 6 contains 5 repetitive loss areas. Table 2.7 provides summary information for all repetitive loss areas in Subarea 6. A description and map of each of the identified repetitive loss area follows.

Table 2.7 – Overview of Zone 6

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
119	1	1	Pelican Dr	100.0%
120	2	3	Flicker Ln	100.0%
121	1	3	Spoonbill Ave	100.0%
122	1	7	N Lopez Ln	100.0%
123	1	1	Spoonbill Ave	100.0%

FINDINGS

Subarea 6 includes 21 residential properties. This subarea includes Plantation Island and a portion of Chokoloskee and borders the Chokoloskee Bay. The subarea features canals, which connect to the Chokoloskee Bay.

Two thirds of the structures are elevated at least 2 feet, and seven of those structures are elevated at least 4 feet. Five structures are elevated 8-12 feet. Eight structures are located at grade or are elevated less than 2 feet. Most structures (65%) are manufactured homes, which may experience a greater vulnerability to flooding. Only five HVAC units were observable from the right-of-way. HVAC units were either window units (2) or elevated to the first floor (3).

Three questionnaire responses were received for this area. Two of the respondents reported flooding depth greater than 20 inches during past events. Respondents suggested digging out canals and providing a comprehensive stormwater system for the area.



Manufactured home that has been slightly elevated.



Mobiles homes elevated on cinder blocks.



Manufactured home on stilts.

Figure 2.117 - Subarea 6 Repetitive Loss Areas and FEMA Flood Zones

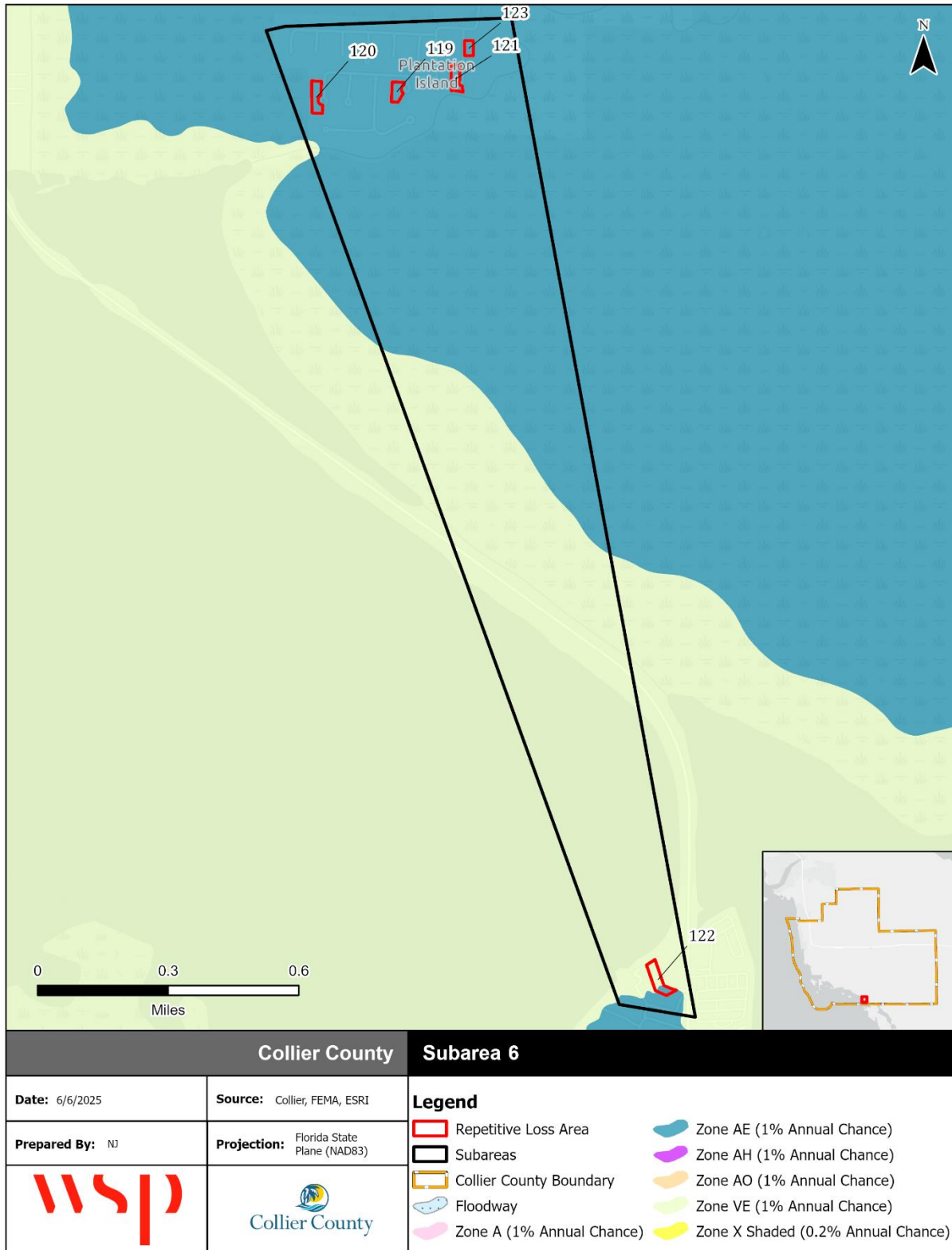


Figure 2.118 – Repetitive Loss Area 119

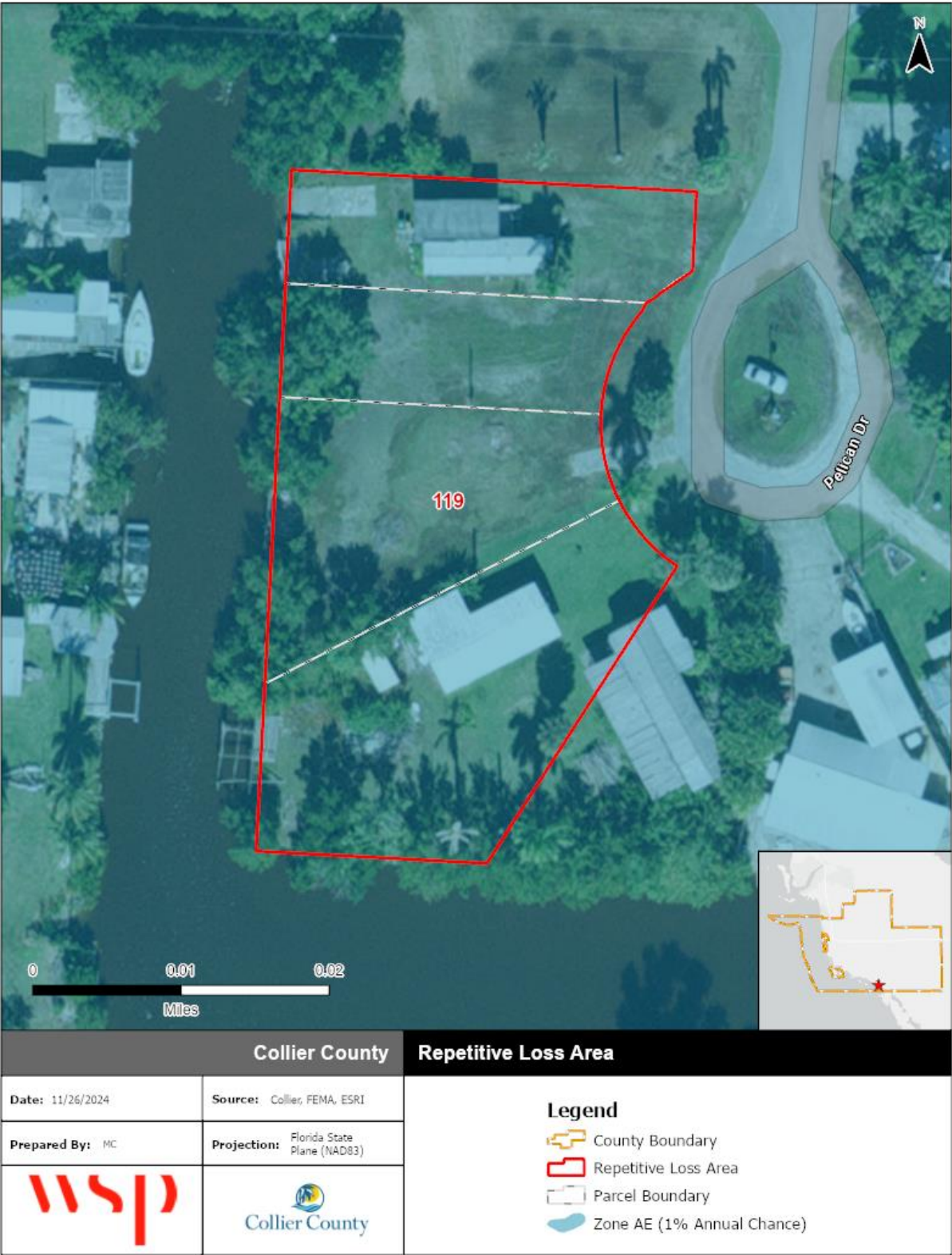


Figure 2.119 – Repetitive Loss Area 120



Figure 2.120 – Repetitive Loss Area 121



Figure 2.121 - Repetitive Loss Area 122

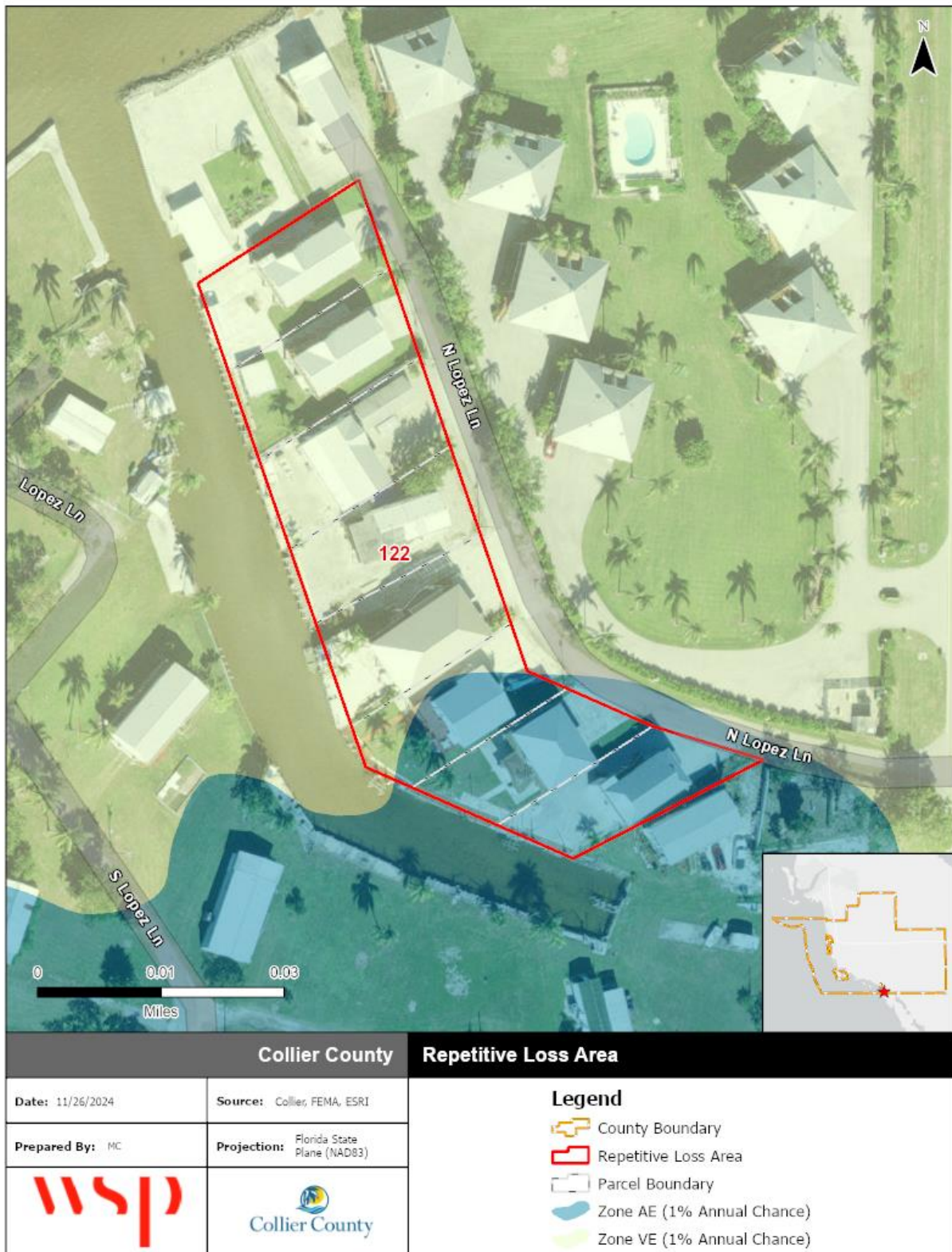


Figure 2.122 – Repetitive Loss Area 123



2.3.2 INLAND FLOODING ZONE

PROBLEM STATEMENT

Collier County is also susceptible to compound flooding that results from a combination of rainfall and tidal influences. Flooding within inland areas is associated with heavy rainfall events, which can cause ponds and canals to overflow and can overwhelm drainage systems causing localized stormwater flooding.

According to the Effective FIRM, all repetitive loss areas in this zone contain Special Flood Hazard Area (SFHA).

Past flood insurance claims for repetitive loss properties in this zone have been tied to major storm events including Tropical Storm Jerry (August 1995), Tropical Storm Harvey (September 1999), Hurricane Irma (September 2017), Hurricane Ian (September 2022), which are detailed in Section 2.3.1. Additionally, repetitive loss properties are tied to Tropical Storm Faye and smaller, more localized events, which are detailed below:

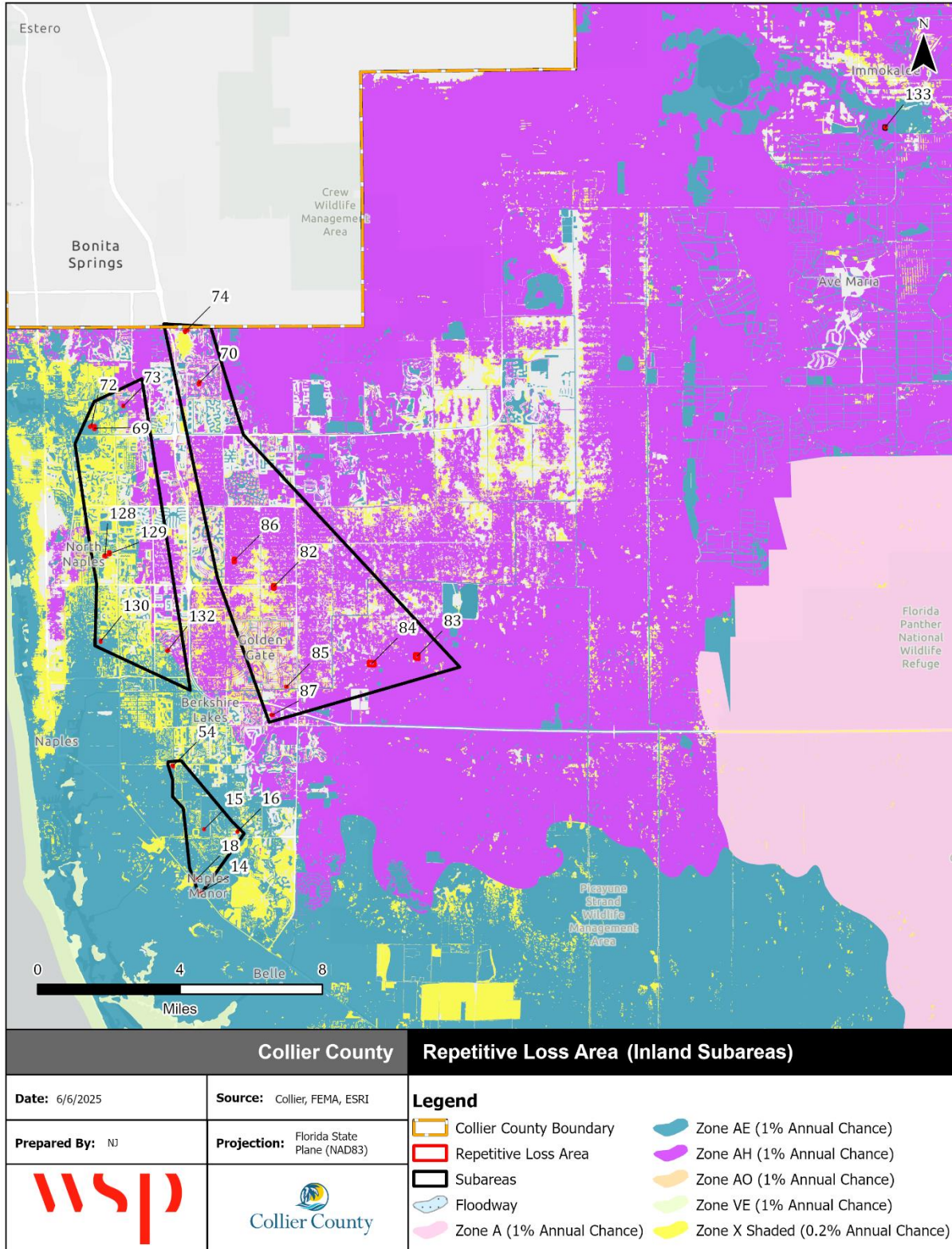
September 2001 – A heavy rain event brought between 3 to 5 inches of rain with local amounts of up to 8 inches leading to street flooding.

August 2008 – Tropical Storm Faye brought 6-8 inches of rain to southwest Florida and tropical storm force winds.

August 2014 – Intense rainfall associated with several bands of thunderstorms developed across much of the Naples area during the early afternoon. The first report of flooding was received from a trained spotter at 1405 EDT and stated that at least two feet of water was on roads near Airport Road and Mercantile Avenue with cars stalled out. The Collier County Sheriffs Office reported at around 1510 EDT that there was severe flooding and stalled vehicles from Collier Blvd. to Tamiami Trail with some roads closed. Rainfall totals included 7 inches at Naples Beach Hotel and Club with 6.73 inches at the Naples Municipal Airport. A trained spotter measured 4.21 inches in just under an hour around Airport and Pine Ridge Roads.

The most flood insurance claims for repetitive loss properties within the inland flooding zone occurred during Hurricane Irma (19) and Hurricane Ian (12).

Figure 2.123 - Subareas in the Inland Flooding Zone



2.3.2.1 SUBAREA 7

OVERVIEW

Subarea 7 contains seven repetitive loss areas. Table 2.8 provides summary information for all repetitive loss areas in Subarea 7. A description and map of each of the identified repetitive loss area follows.

Table 2.8 – Overview of Subarea 7

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
69	2	10	Palm River Blvd, Palm View Dr	100%
72	2	2	Sharwood Dr	100%
73	1	2	Corbel Dr	100%
128*	1	3	J and C Blvd, Corporation Blvd	0%
129*	1	1	J and C Blvd	86%
130	1	3	Poinciana St, Tortuga Way	100%
132	1	3	Courtside Dr	37%

*This area contains multi-unit structures. Property count reflects structure count, not unit count.

FINDINGS

Subarea seven contains 34 residential and commercial properties that mostly experience flooding problems through a combination of heavy rainfall, stormwater flooding and tidal flooding. Drainage issues may exacerbate flooding in this area. During field data collection, 94% of the homes within this zone were noted to be in close proximity to a stormwater pond or canal. Several properties have ditches adjacent to homes that may be overflowing during heavy rain events.

One resident noted that their home sits lower than surrounding properties causing flood waters to drain into their yard. The resident reported flooding over the first floor with standing water about 4 inches deep.

Approximately 72% of all structures in this zone are masonry while the rest are a small combination of wood frame, steel, and concrete. A majority of both the structure and foundation conditions were rated as “good” or “fair” according to the collected field data.

Over half of the homes within this zone were built at street grade, five homes (9%) are 1-2 feet above grade, and three structures are elevated 2-3 feet. Additionally, 27% of HVACs that were observable from the right-of-way within this zone were elevated.



Slightly above grade home with drain in front yard



At grade home with drain along the front yard



Commercial property at grade with large impervious surface lot

Figure 2.124 - Subarea 7 Repetitive Loss Areas and FEMA Flood Zones

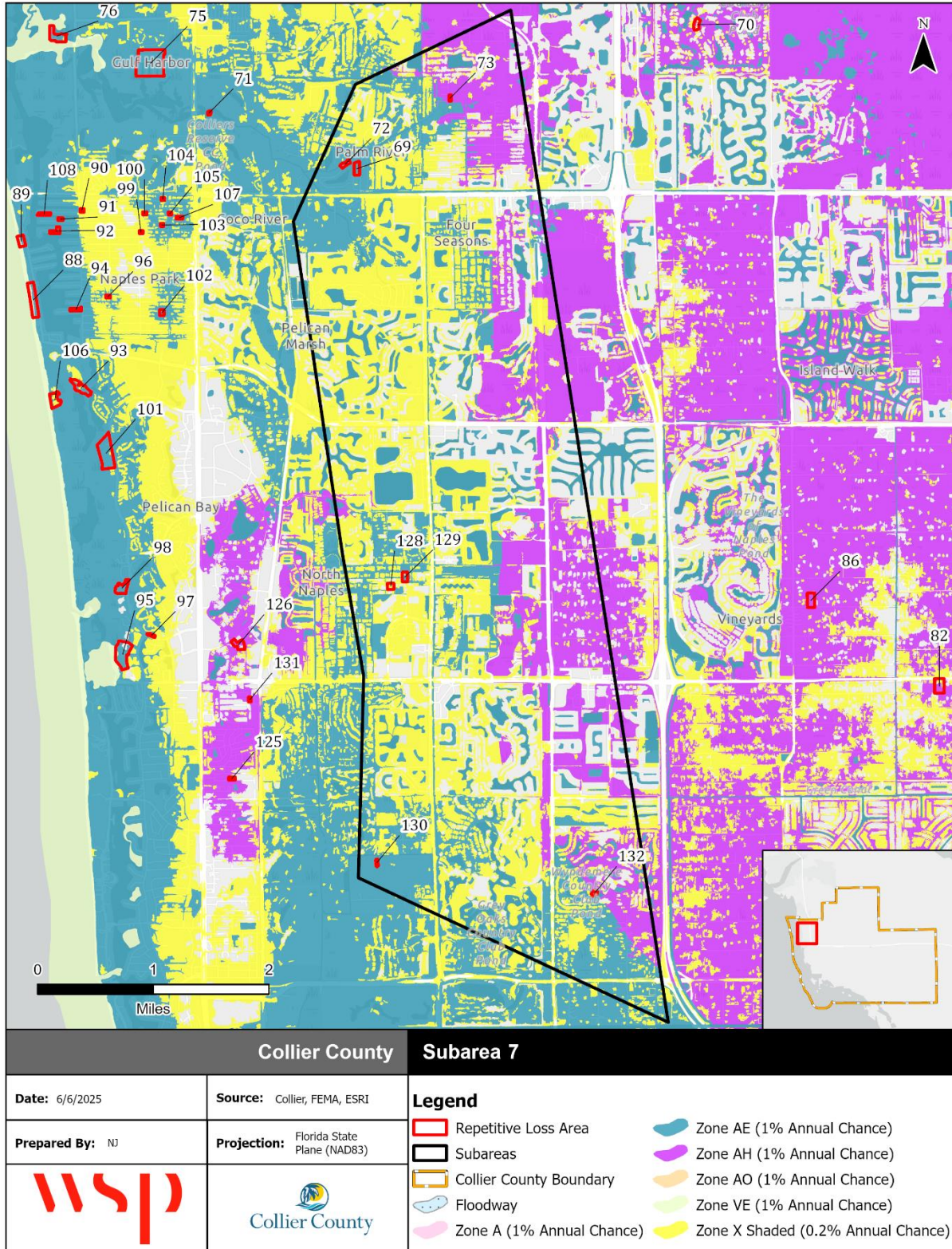


Figure 2.125 - Repetitive Loss Area 69

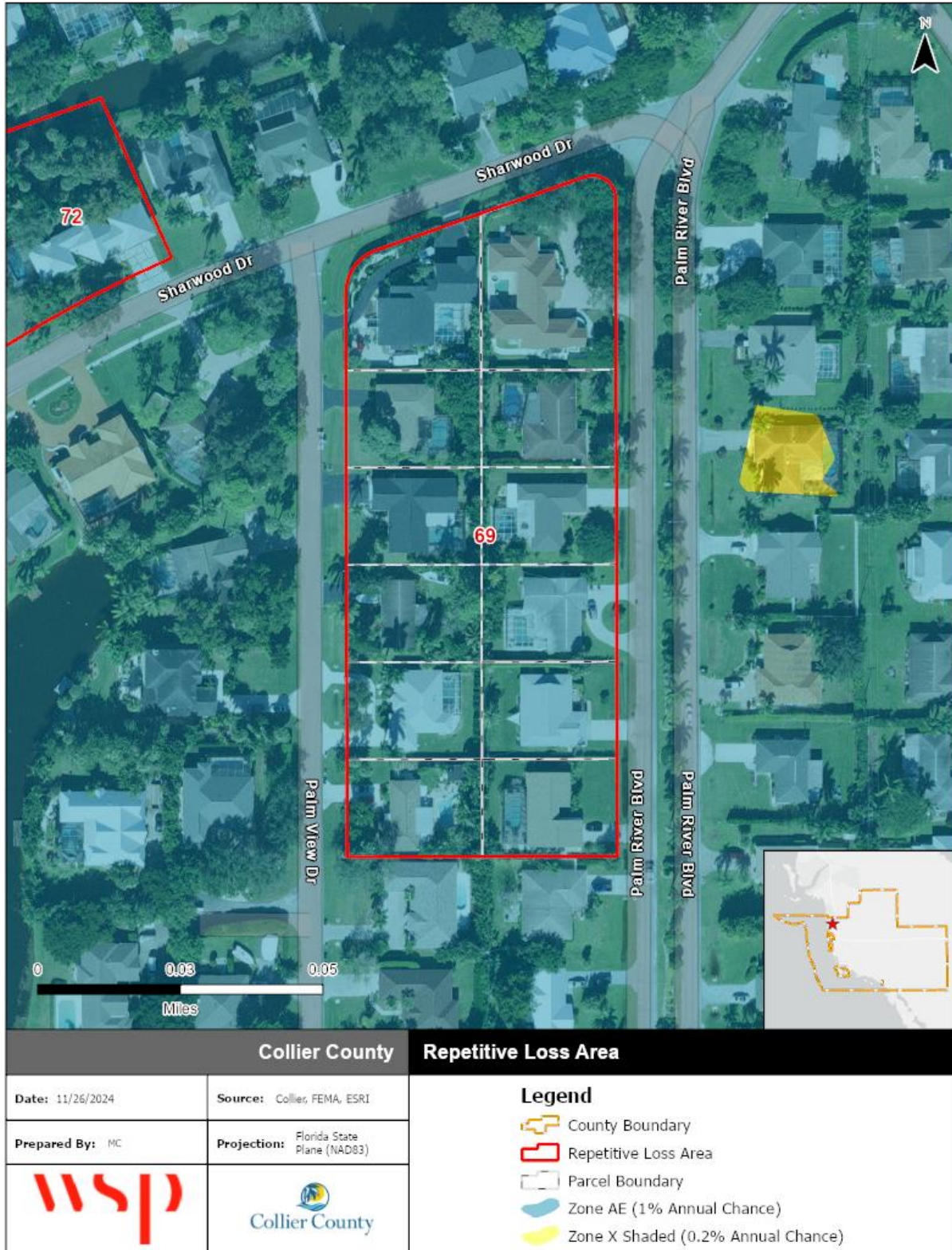


Figure 2.126 - Repetitive Loss Area 72

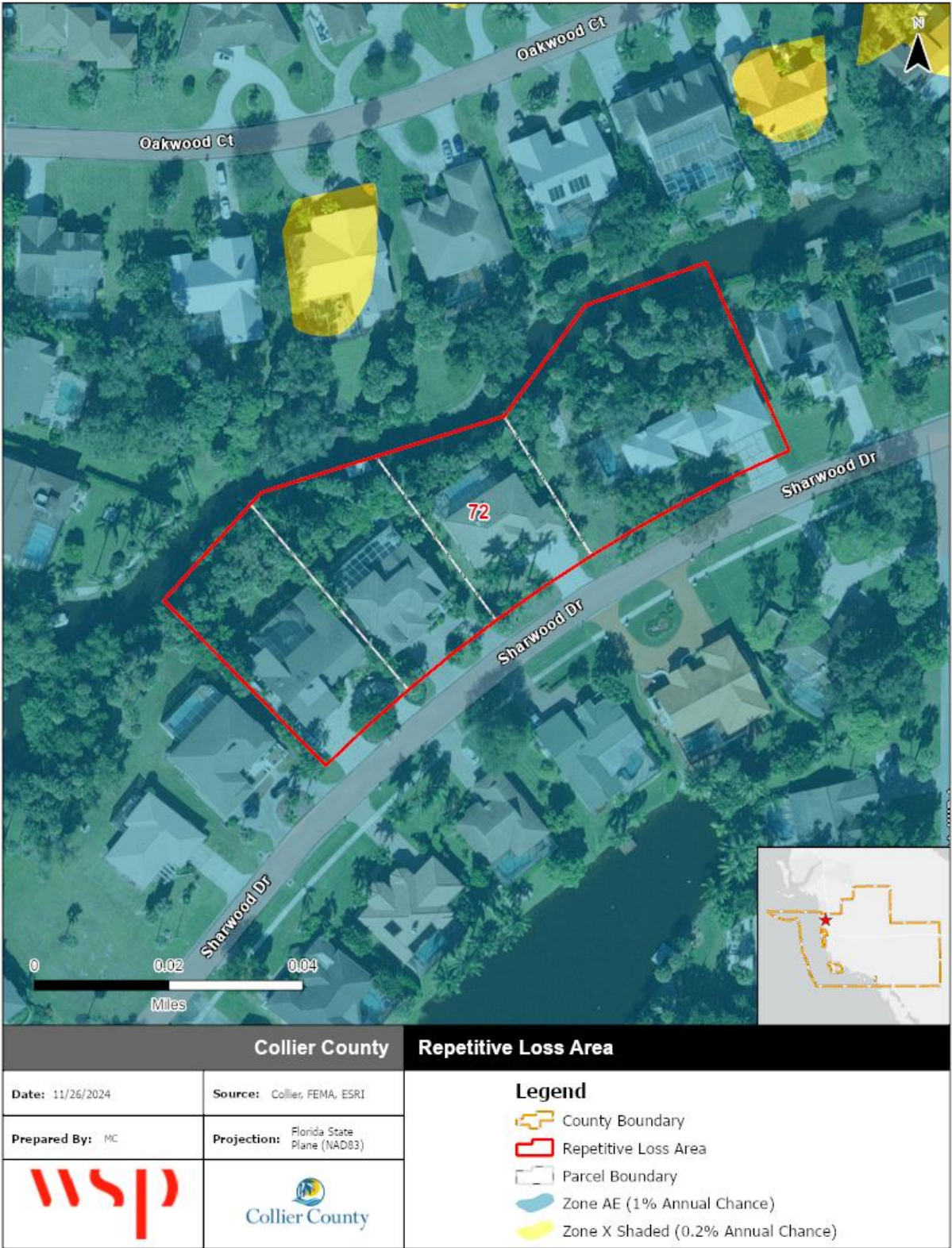


Figure 2.127 - Repetitive Loss Area 73



Figure 2.128 - Repetitive Loss Area 128



Figure 2.129 - Repetitive Loss Area 129



Figure 2.130 – Repetitive Loss Area 130

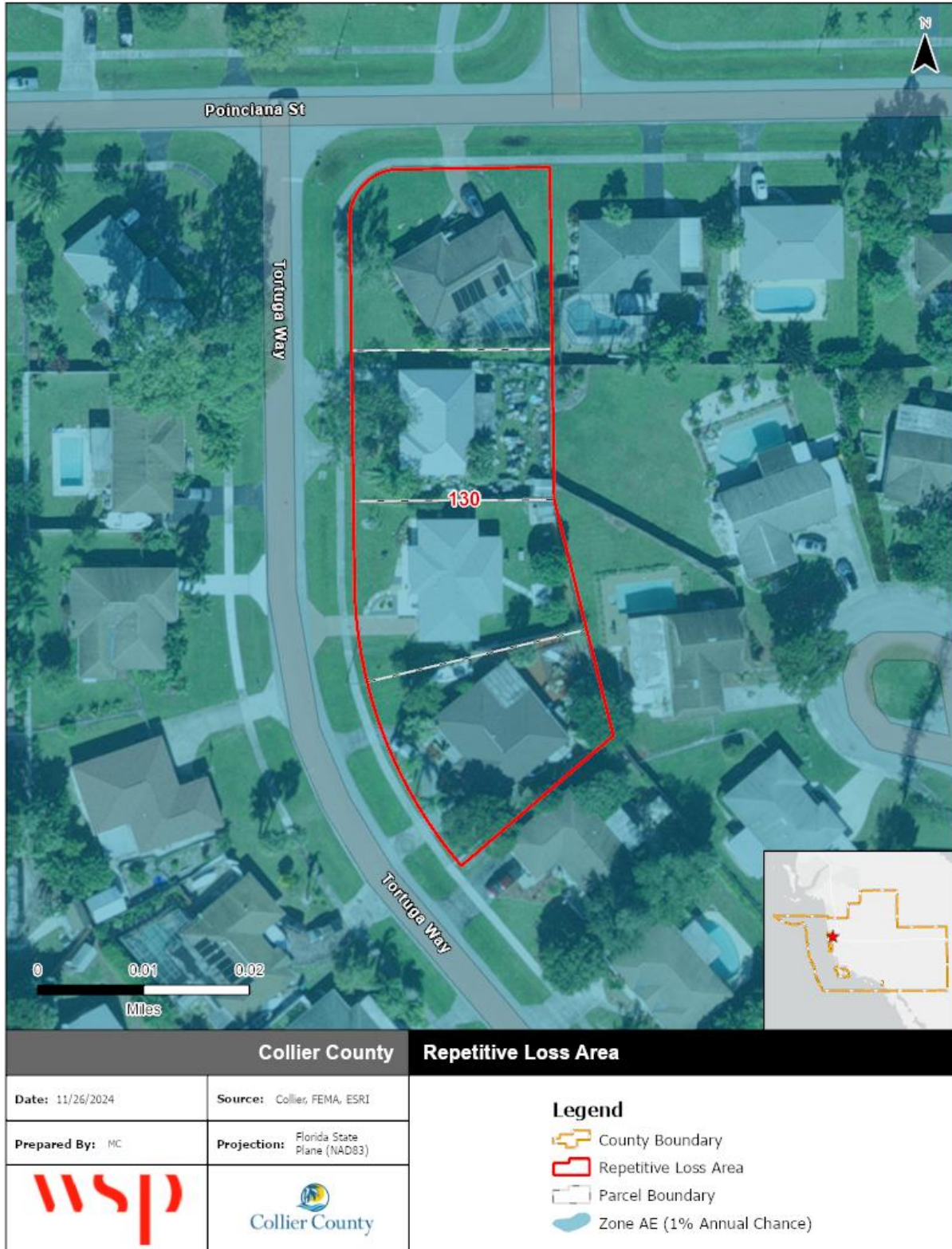
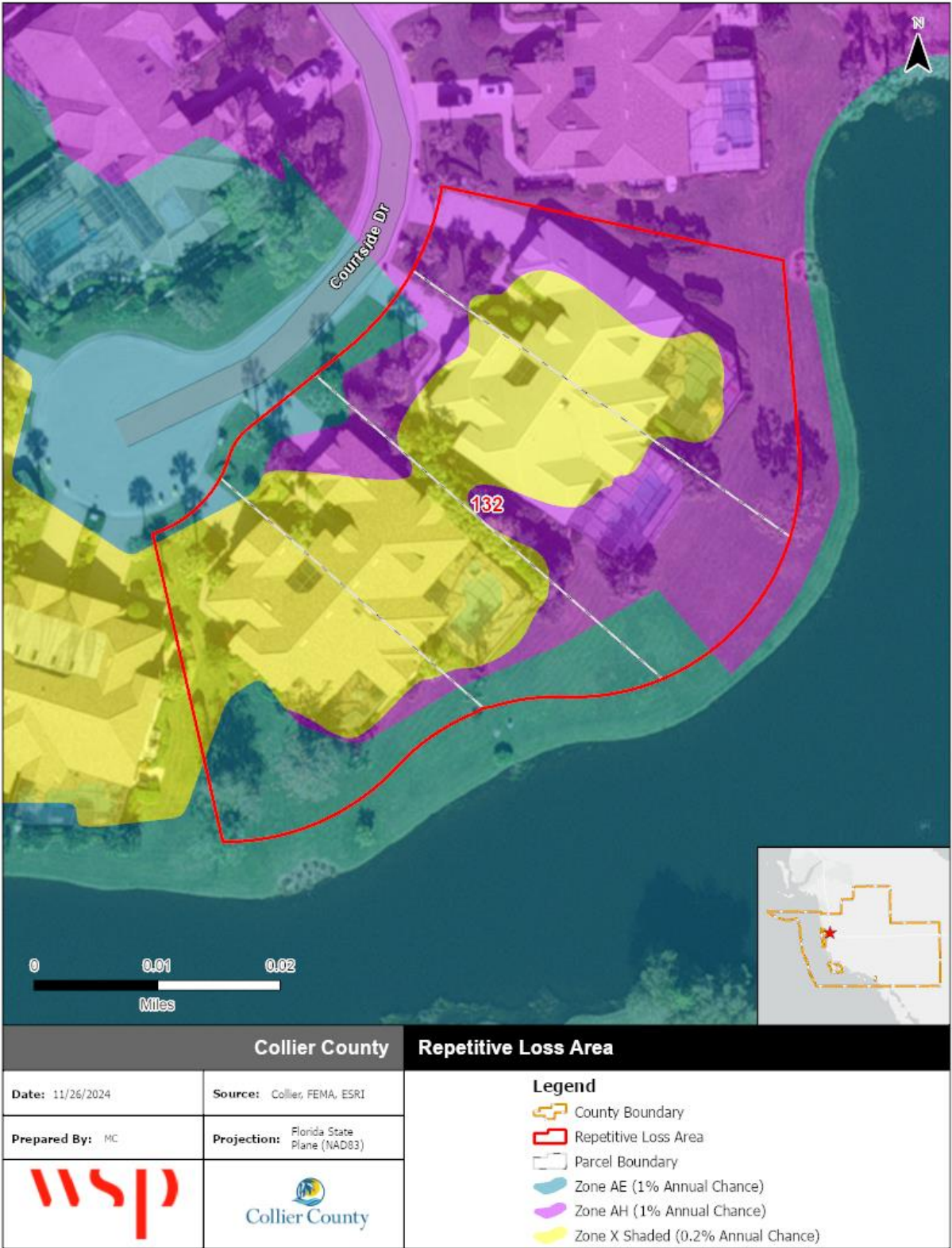


Figure 2.131 – Repetitive Loss Area 132



2.3.2.2 SUBAREA 8

OVERVIEW

Subarea 8 contains 8 repetitive loss areas. Table 2.9 provides summary information for all repetitive loss areas in Subarea 8. A description and map of each of the identified repetitive loss area follows.

Table 2.9 – Overview of Subarea 8

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
70	1	2	Valewood Dr	40%
74	1	2	Brynwood Dr, Burnham Rd	6%
82	1	2	Pine Ridge Rd	63%
83	1	1	Keane Ave	100%
84	1	2	Garland Rd	99%
85	1	2	32 nd Ave SW	12%
86	1	1	Palmetto Woods Dr	97%
87	1	2	Pine Cone Ln	93%

FINDINGS

Subarea eight contains 23 properties that primarily experience flooding when nearby ponds, tributaries, and canals overflow their banks into their surrounding floodplains due to heavy rains often associated with tropical storms. Repetitive loss areas 70 and 74 are in golf course communities with several ponds and heavily landscaped greens which can cause any overflow to runoff to nearby properties. During field data collection, many drainage ditches were noted adjacent to homes. Several were overgrown and covered by grass and debris. Drainage issues in areas that are low lying can exacerbate flooding due to inadequate drainage.

Owners were unavailable during field data collection and no residents from within this zone participated in the questionnaire. Further residential input from the residents in subarea eight would be beneficial to indicating the exact causes to flooding of these properties.

Most structures in this subarea are wood frame or concrete homes. Three homes have elevated foundation walls with full or partial enclosure. One home is elevated on piers, posts, or pile foundation. The remaining structures have slab on grade foundations. Most structures in subarea eight are built slightly above grade with only six structures at grade level.

Of the observable HVAC units, nine are elevated to the first floor or BFE, one was not elevated and at grade level, the remaining units were not observable from the right of way.



Slightly above grade home with drain in front yard



Drainage with overgrown vegetation



Property with large, paved driveway



Property slightly above grade with drainage along front yard

Figure 2.132 – Subarea 8 Repetitive Loss Areas and FEMA Flood Zones

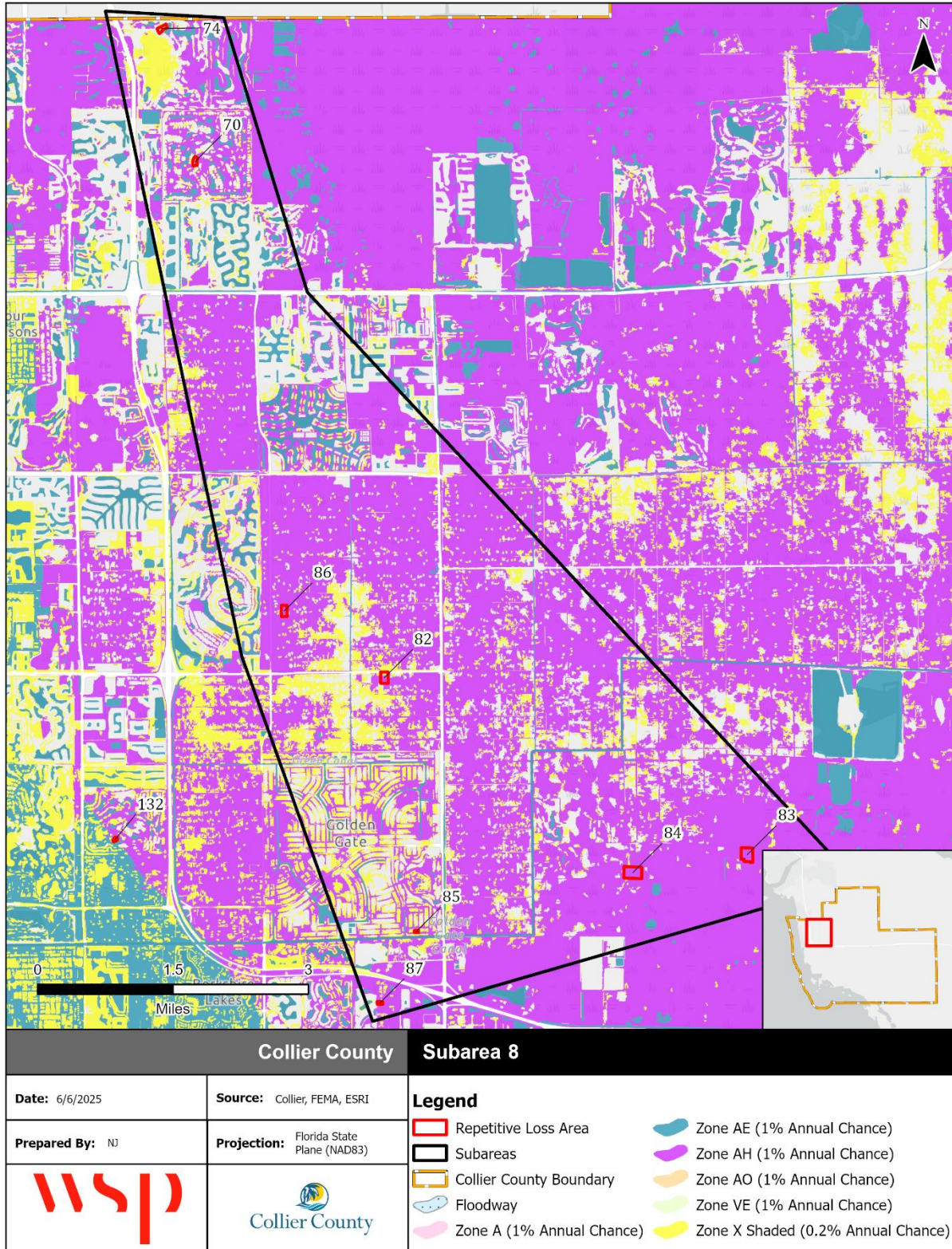


Figure 2.133 - Repetitive Loss Area 70



Figure 2.134 - Repetitive Loss Area 74



Figure 2.135 - Repetitive Loss Area 82

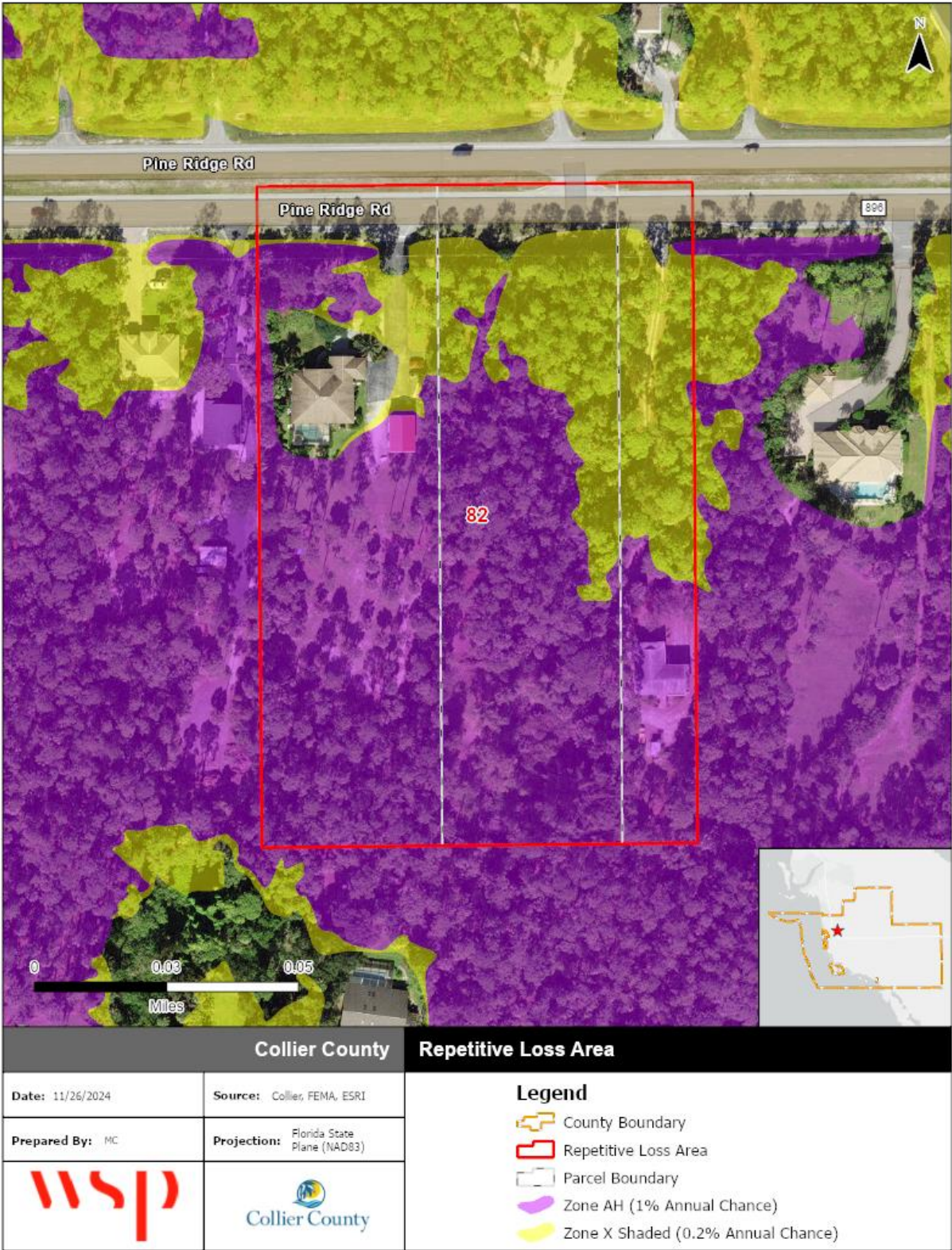


Figure 2.136 – Repetitive Loss Area 83



Figure 2.137 - Repetitive Loss Area 84

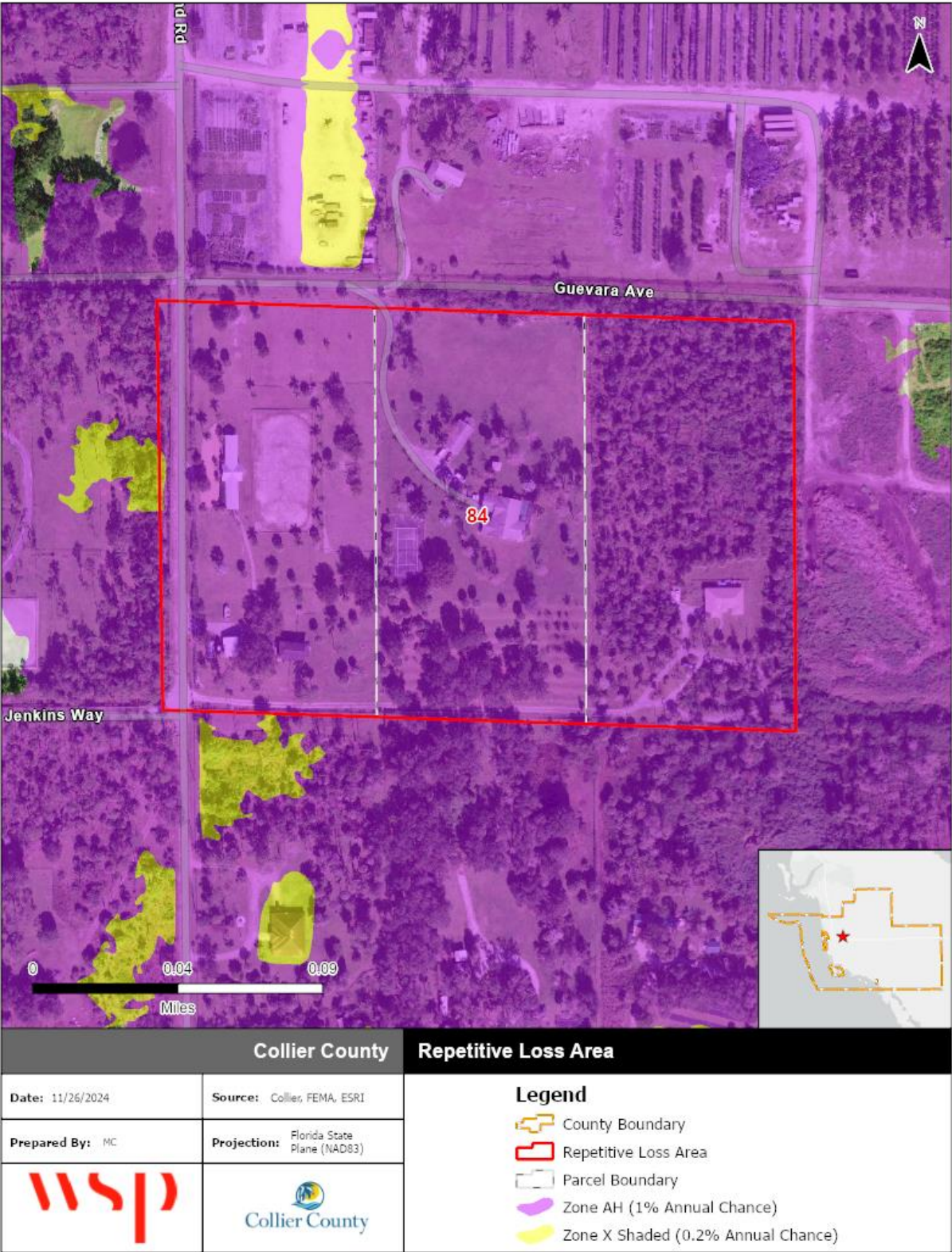


Figure 2.138 - Repetitive Loss Area 85



Figure 2.139 - Repetitive Loss Area 86



Figure 2.140 – Repetitive Loss Area 87



2.3.2.3 SUBAREA 9

OVERVIEW

Subarea 9 contains five repetitive loss areas. Table 2.10 provides summary information for all repetitive loss areas in Subarea 9. A description and map of each of the identified repetitive loss area follows.

Table 2.10 – Overview of Subarea 9

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
14	1	1	Tamiami Trl E	100%
15	1	2	Foxwood Ln, Glenwood Ln	100%
16	1	1	Sawgrass Ln	96%
18	1	3	Johns St	100%
54	1	2	Round Table Ln	100%

FINDINGS

Subarea nine contains 14 residential and commercial properties that mostly experience flooding problems through a combination of heavy rainfall and drainage issues. During field data collection, 50% of the homes within this area do not have drainage ditches which may cause excess standing water and runoff towards properties. Ditches adjacent to homes may be overflowing during heavy rain events.

Owners were unavailable during field data collection and no residents from within this zone participated in the questionnaire. Further residential input from subarea nine would be beneficial to indicating the exact causes to flooding of these properties.

Most structures in this zone are wood frame, concrete, or manufactured homes. All of the homes in this subarea have slab on grade foundations. Around 71% of the structures in subarea nine are built at grade with the remaining four structures elevated between 1 – 3 feet above grade.

Only two HVAC units were observable from the right-of-way; one was elevated just below the first floor while the other was elevated the BFE.



Manufactured home with gutter that drains away from property



Commercial property with drainage



At grade property with drainage under driveway



Property slightly above grade with no drainage

Figure 2.141 - Subarea 9 Repetitive Loss Areas and FEMA Flood Zones

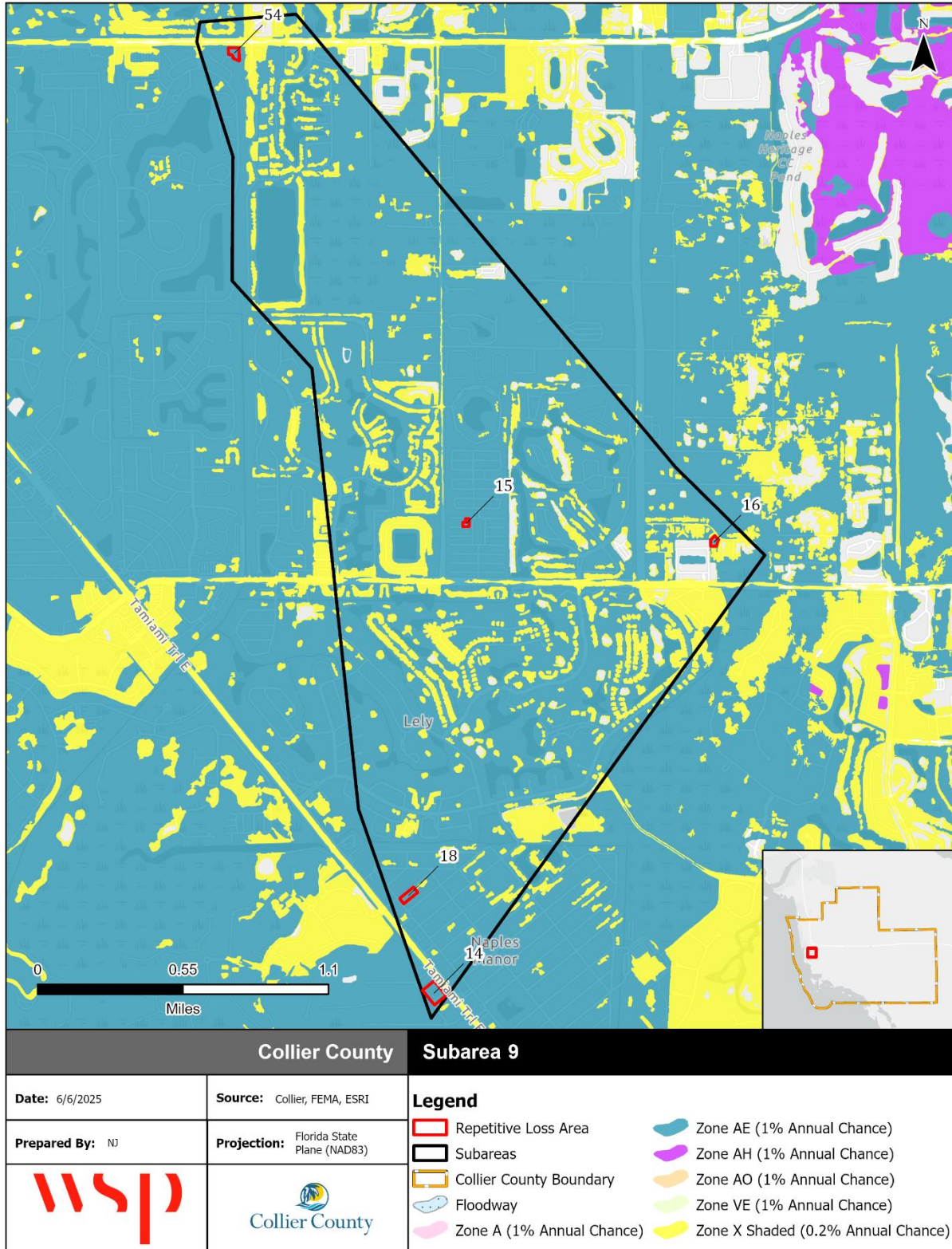


Figure 2.142 - Repetitive Loss Areas 14



Figure 2.143 - Repetitive Loss Area 15



Figure 2.144 - Repetitive Loss Area 16

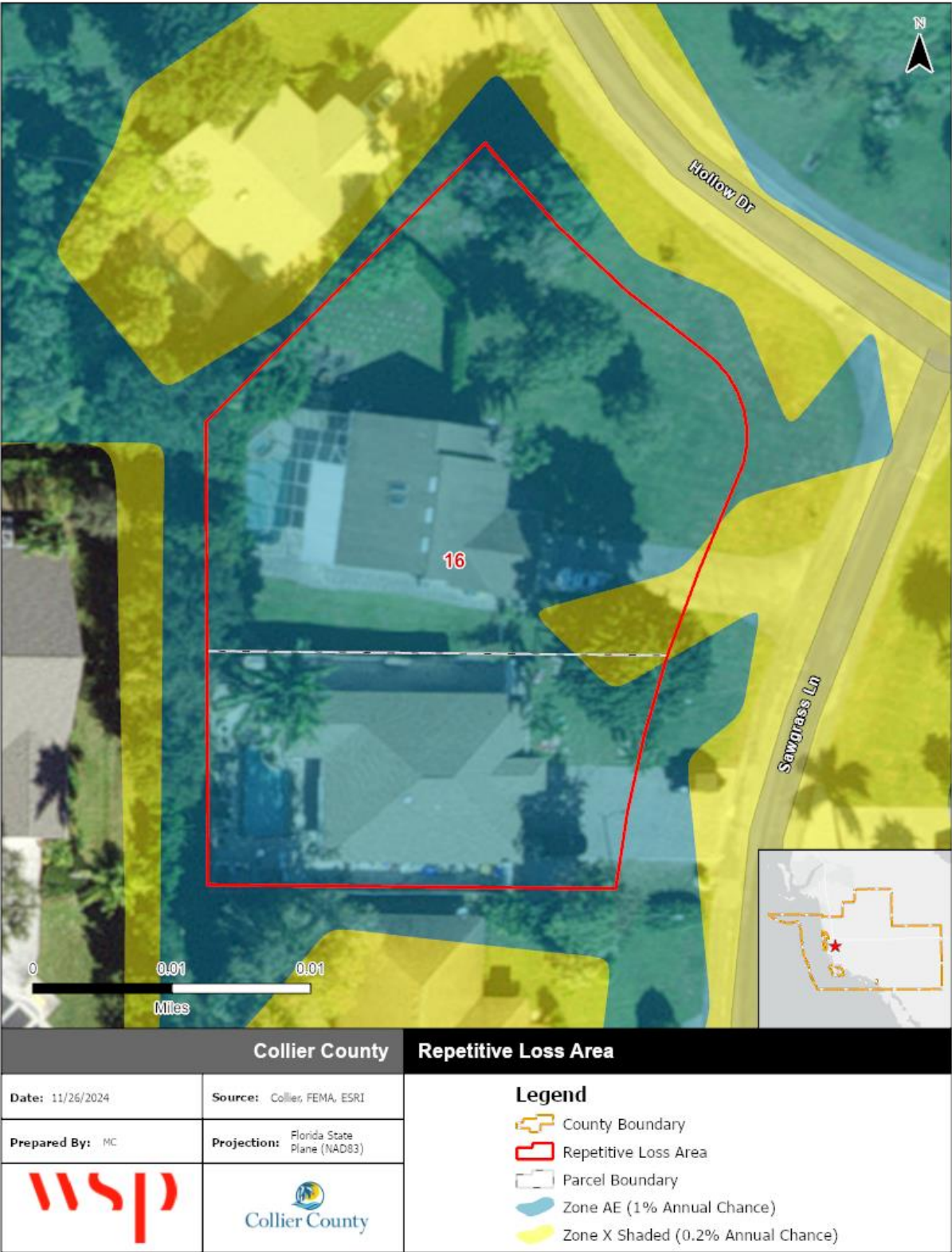
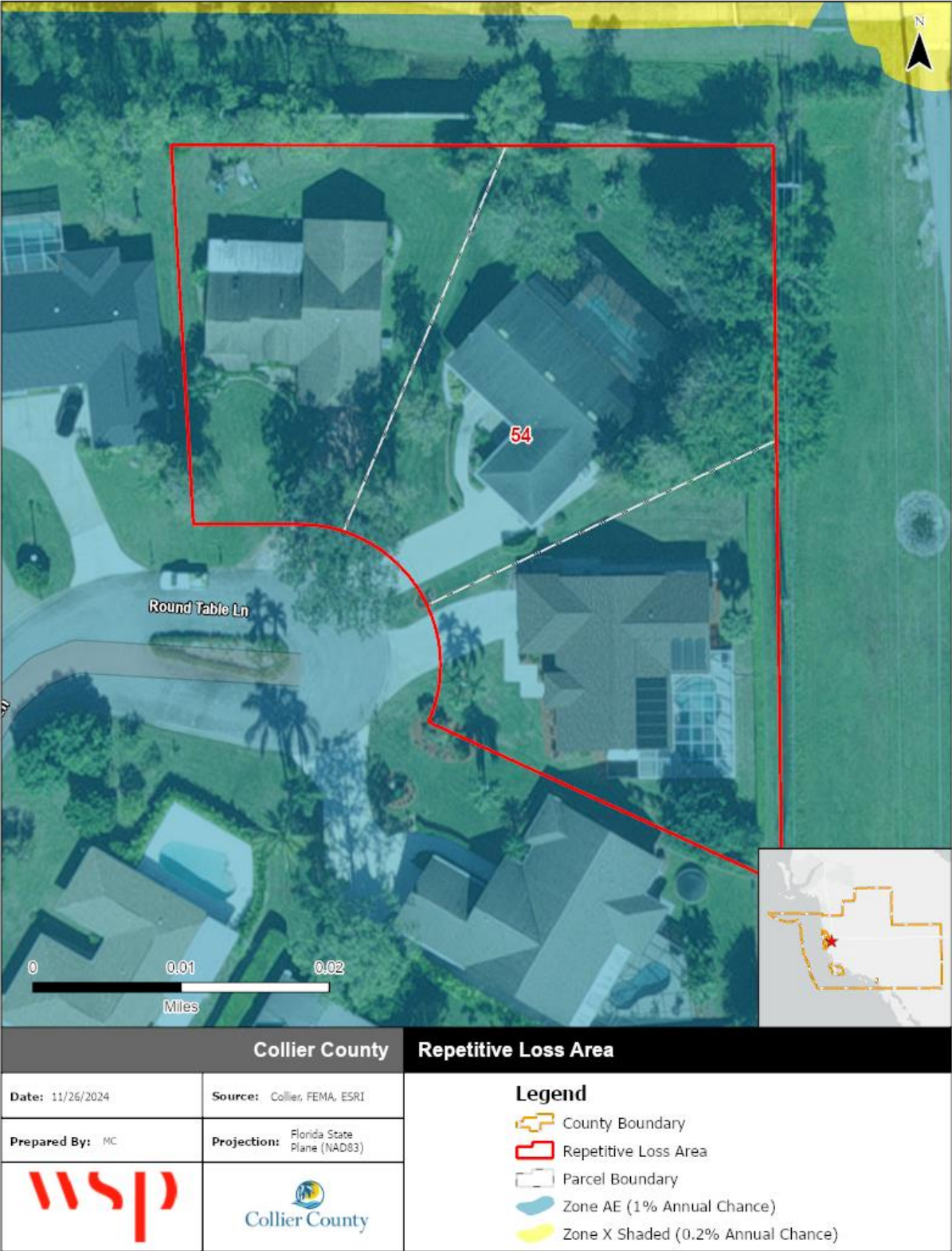


Figure 2.145 - Repetitive Loss Area 18



Figure 2.146 - Repetitive Loss Area 54



2.3.2.4 SUBAREA 10

OVERVIEW

Subarea 10 contains one repetitive loss area. Table 2.11 provides summary information for all repetitive loss areas in Subarea 10. A description and map of the identified repetitive loss area follows.

Table 2.11 – Overview of Zone 10

AREA	# OF RL PROPERTIES	# OF ADDITIONAL PROPERTIES	PRIMARY STREETS	% OF AREA IN SFHA
133	1	2	Breezewood Dr	100%

FINDINGS

Subarea 10 contains three residential properties that mostly experience flooding problems through a combination of heavy rainfall and drainage issues. All three properties have drains that run under the driveways. Drainage pipes are small, and some are partially covered by grass and dirt. Drains adjacent to homes may be overflowing during heavy rain events.

Owners were unavailable during field data collection and no residents from within this zone participated in the questionnaire. Further residential input from subarea 10 would be beneficial to indicating the exact causes to flooding of these properties.

All three structures in this area are concrete homes. All of the homes in this subarea have slab on grade foundations and are built at grade.



At grade home with drain under driveway



At grade home with drain under driveway

Figure 2.147 – Subarea 10 Repetitive Loss Areas and FEMA Flood Zones

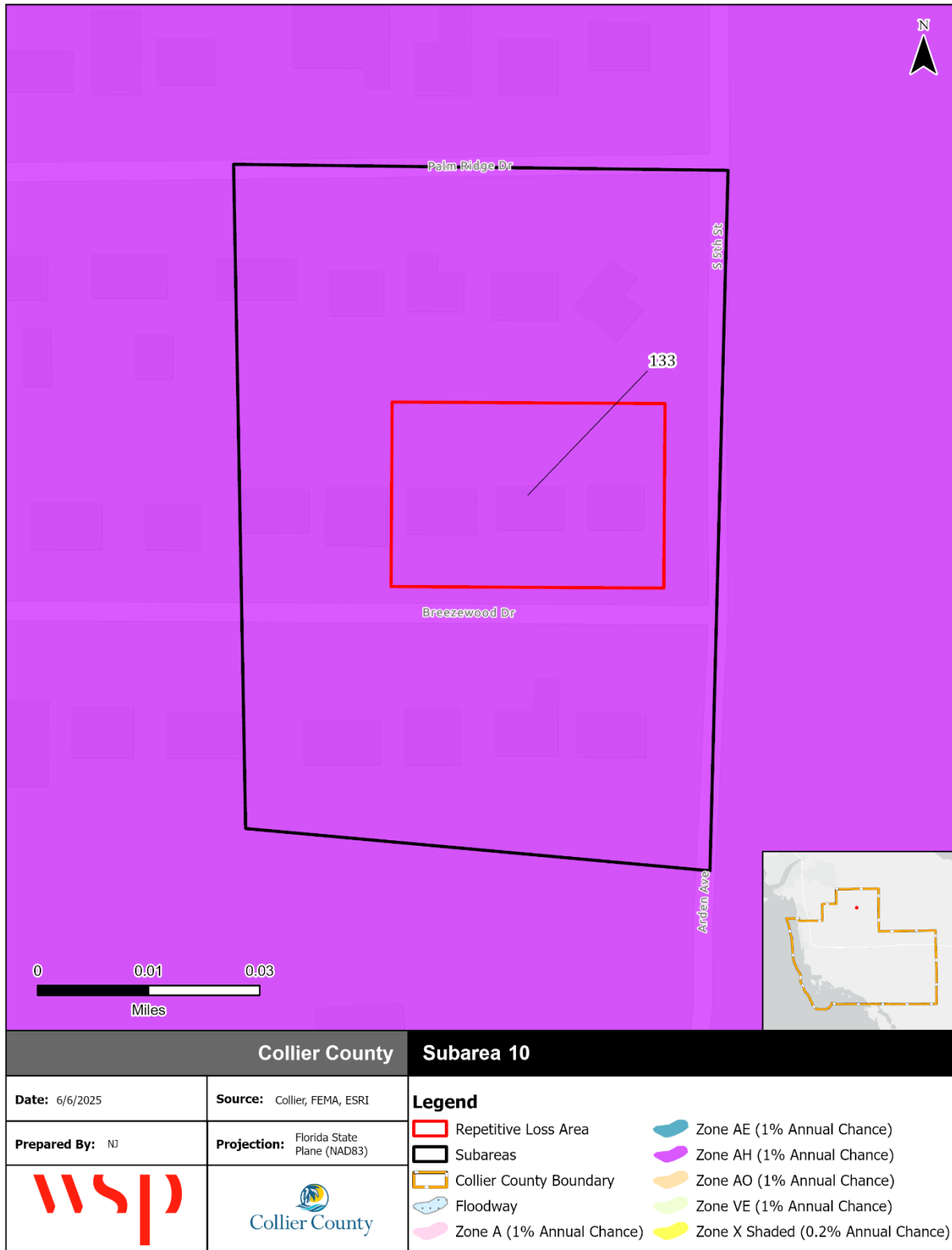


Figure 2.148 – Repetitive Loss Area 133



2.4 STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

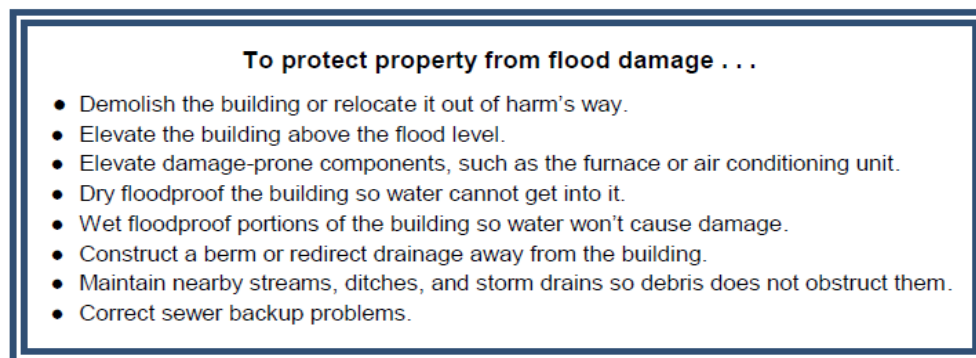
2.4.1 MITIGATION ALTERNATIVES

According to the 2017 CRS Coordinator's Manual, mitigation measures should fall into one of the following floodplain management categories:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

Property protection is essential to mitigating repetitive loss properties and reducing future flood losses. There are many ways to protect a property from flood damage. Property protection measures recognized in the 2017 CRS Coordinator's Manual include relocation, acquisition, building elevation, retrofitting, sewer backup protection, and insurance. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 2.149 below, found in the 2017 CRS Coordinator's Manual, lists typical property protection measures.

Figure 2.149 – Typical Property Protection Measures



Source: 2017 CRS Coordinators Manual.

A diverse set of mitigation options will enable the County, property owners, and outside entities to reduce flooding and minimize future losses. Improving stormwater drainage and storage capacity throughout Collier County can eliminate some building damage and road closures in areas subject to coastal and tidal flooding as well as those subject to localized stormwater flooding. Similarly, improving and protecting natural floodplain functions can help manage tidal floodwaters and reduce flood damages resulting from high tides, storm surge, and sea level rise. These structural and large-scale mitigation methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and flood insurance coverage and increasing public education and awareness of the flood hazards can reduce flood damage for property owners in areas where large capital projects are not feasible. The County's websites, e-mail distribution lists, press releases, and variable message boards can help get these messages out to business owners and residents.

2.4.2 MITIGATION FUNDING

There are several types of mitigation measures, listed in Table 2.12, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on

the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 2.12 – Mitigation Grant Programs

Types of Projects Funded	HMGP	FMA	BRIC	SRL	ICC	SBA
Acquisition of the entire property by a gov't agency	✓	✓	✓	✓		
Relocation of the building to a flood free site	✓	✓	✓	✓	✓	✓
Demolition of the structure	✓	✓	✓	✓	✓	✓
Elevation of the structure above flood levels	✓	✓	✓	✓	✓	✓
Replacing the old building with a new elevated one	✓			✓	✓	✓
Local drainage and small flood control projects	✓			✓		
Dry floodproofing (non-residential buildings only)		✓	✓	✓	✓	✓
Percent paid by Federal program	75%	75%	75%	75%	100%	0
Application Notes	1,2	1	1	1	3	2,4

Application notes:

1. Requires a grant application from your local government
2. Only available after a federal disaster declaration
3. Requires the building to have a flood insurance policy and to have been flooded to such an extent that the local government declares it to be substantially damaged. Pays 100% up to \$30,000
4. This is a low interest loan that must be paid back

2.4.3 POTENTIAL MITIGATION MEASURES

2.4.3.1 STRUCTURAL ALTERNATIVES:

Structural Alternatives
Dry floodproofing. Commercial structures and even residential structures are eligible for dry floodproofing; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner, especially in a heavy rainfall event.
Wet floodproofing. Wet floodproofing a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
Backflow valves. For basements, especially with combined storm sewer and sewer systems, backflow preventer valves can prevent storm water and sewer from entering crawlspaces and basements.
Acquisition. Acquire and/or relocate properties/target abandoned properties.
Elevation. Elevate structures and damage-prone components, such as the furnace or air conditioning unit, above the BFE.
Barriers. Construct engineered structural barriers, berms, and floodwalls (Note: Assuming lot has required space for a structural addition).
Roadway improvements. Increase road elevations above the BFE of the 100-year floodplain.
Drainage improvements. Implement drainage improvements such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
Drainage maintenance. Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

2.4.3.2 NON-STRUCTURAL ALTERNATIVES:

Non Structural Alternatives
Education. Provide public education through posting information about local flood hazards on Town's websites, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
Runoff Reduction. Implement volume control and runoff reduction measures in the Town's Stormwater Management Ordinance.
Setbacks. Expand riparian impervious surface setbacks.
Elevate contents. Relocate internal supplies, products/goods above the flooding depth.
Flood insurance. Promote the purchase of flood insurance.
Zoning. Improve the Town's floodplain and zoning ordinances

2.4.4 CURRENT MITIGATION PROJECTS

ROAD AND DRAINAGE CAPITAL IMPROVEMENT PROGRAMS

The Collier County Transportation Management Services' Capital Project Planning, Impact Fees, and Program Management Division manages road and drainage improvements throughout the County. Several of the County's current projects directly address drainage issues, some of which include areas close to the repetitive loss areas. Therefore, specific drainage issues in the identified repetitive loss areas may be addressed through existing mitigation efforts. Current budgeted projects that involve drainage improvements are listed below:

- Griffin Road Area Stormwater Improvement Project
- West Goodlette-Frank Road Area Joint Stormwater-Sewer Project
- Freedom Park Bypass Ditch
- Golden Gate City Stormwater System Improvements

2.4.5 PAST MITIGATION PROJECTS

Both the County and individual property owners have undertaken projects to reduce flooding in repetitive loss areas. Table 2.13 summarizes past mitigation actions in the repetitive loss areas.

Table 2.13 – Past Mitigation Actions

Past Mitigation Actions	
1	Property owners have installed sump pumps, regraded their yards, waterproofed their outside walls, and undertaken other permanent property protection measures to mitigate flooding. Many of these efforts have proven successful; however, some property owners report a need for additional measures.
2	At least one property owner has elevated their HVAC unit and backup generator. They reported that elevating the structures protected them from the most recent flood event.
3	The County has previously eliminated 18 properties from the repetitive loss list through acquisition and demolition.
4	The County has undertaken capital improvement projects to improve drainage throughout the county.

2.4.6 ADVANTAGES AND DISADVANTAGES OF MITIGATION MEASURES

Seven primary mitigation measures are discussed here: acquisition, relocation, barriers, floodproofing, drainage, elevation, and insurance. In general, the cost of acquisition and relocation will be higher than other mitigation measures but can completely mitigate risk of any future flood damage. Building small barriers to protect single structures is a lower cost solution but may not be able to offer complete protection from large flood events and may impact flood risk on other properties. When drainage cause repetitive flooding, improving the drainage can mitigate flooding and benefit multiple properties. Each of these solutions is discussed in greater detail below.

2.4.6.1 ACQUISITION:

Property acquisition and relocation are complex processes requiring transferring private property to property owned by the local government for open space purposes. Acquisition is a relatively expensive mitigation measure but provides the greatest benefit in the lives and property are protected from flood damage. The major cost for the acquisition method is for purchasing the structure and land. The total estimated cost for acquisition should be based on the following:

- Purchase of Structure and land
- Demolition
- Debris removal, including any landfill processing fees
- Grading and stabilizing the property site
- Permits and plan review

Table 2.14 – Advantages and Disadvantages of Acquisition

ADVANTAGES	DISADVANTAGES
• Permanently removes problem since the structure no longer exists. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

There are three criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 1%-annual-chance floodplain.

2.4.6.2 RELOCATION:

Relocation involves lifting and placing a structure on a wheeled vehicle and transporting that structure to a site outside the 1%-annual-chance floodplain and placed on a new permanent foundation. Like acquisition, this is one of the most effective mitigation measures.

Table 2.15 – Advantages and Disadvantages of Relocation

ADVANTAGES	DISADVANTAGES
• Removes flood problem since the structure is relocated out of the flood-prone area. • Allows a substantially damaged or substantially improved structure to be brought into compliance with a community's floodplain management ordinance. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Additional costs are likely if the structure must be brought into compliance with current code requirements for plumbing, electrical, and energy systems.

The cost for relocation will vary based on the type and the condition of the structure. It is considerably less expensive to relocate a home that is built on a basement or crawl space as opposed to a structure that is a slab on grade. Additionally, wood sided structures are less expensive to relocate than structures with brick veneer. Items to consider in estimating cost for relocation include the following:

- Site selection and analysis and design of the new location
- Analysis of existing size of structure
- Analysis and preparation of the moving route
- Preparation of the structure prior to the move
- Moving the structure to the new location
- Preparation of the new site
- Construction of the new foundation
- Connection of the structure to the new foundation
- Restoration of the old site



2.4.6.3 BARRIERS:

A flood protection barrier is usually an earthen levee/berm or a concrete retaining wall. While levees and retaining walls can be large spanning miles along a river, they can also be constructed on a much smaller scale to protect a single home or group of homes.

Table 2.16 – Advantages and Disadvantages of Barriers

ADVANTAGES	DISADVANTAGES
• Relative cost of mitigation is less expensive than other alternatives. • No alterations to the actual structure or foundation are required. • Homeowners can typically construct their own barriers that will complement the style and functionality of their house and yard.	• Property is still located within the floodplain and has potential to be damaged by flood if barrier fails or waters overtop it. • Solution is only practical for flooding depths less than 3 feet. • Barriers cannot be used in areas with soils that have high infiltration rates.

The cost of constructing a barrier will depend on the type of barrier and the size required to provide adequate protection. An earthen berm will generally be less expensive compared to an equivalent concrete barrier primarily due to the cost of the materials. Another consideration is space; an earthen barrier requires a lot of additional width per height of structure compared to a concrete barrier to ensure proper stability. Key items to consider for barriers:

- There needs to be adequate room on the lot
- A pump is required to remove water that either falls or seeps onto the protected side of the barrier
- Human intervention will be required to sandbag or otherwise close any openings in the barrier during the entire flood event

2.4.6.4 FLOODPROOFING:

Wet floodproofing a structure consists of modifying the uninhabited portions (such as a crawlspace or an unfinished basement) to allow floodwaters to enter and exit. This ensures equal hydrostatic pressure on the interior and exterior of the structure which reduces the likelihood of wall failures and structural damage. Wet floodproofing is practical in only a limited number of situations.

Table 2.17 – Advantages and Disadvantages of Wet Floodproofing

ADVANTAGES	DISADVANTAGES
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

A dry floodproofed structure is made watertight below the level that needs flood protection to prevent floodwaters from entering. Creating a watertight structure involves sealing walls using waterproof coatings, impermeable membranes, or additional layers of masonry or concrete. It also includes installing watertight shields over windows and doors, as well as implementing measures to prevent sewer backup.

Table 2.18 – Advantages and Disadvantages of Dry Floodproofing

ADVANTAGES	DISADVANTAGES
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

2.4.6.5 DRAINAGE IMPROVEMENTS:

Methods of drainage improvements include overflow channels, channel straightening, restrictive crossing replacements, and runoff storage. Modifying the channel attempts to provide a greater carrying capacity for moving floodwaters away from areas where damage occurs. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Table 2.19 – Advantages and Disadvantages of Drainage Improvements

ADVANTAGES	DISADVANTAGES
• Could increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

2.4.6.6 ELEVATION:

Elevating a structure to prevent floodwaters from reaching living areas is an effective and one of the most common mitigation methods. Elevation may also apply to roadways and walkways. The goal of the elevation process is to raise the lowest floor of a structure or roadway/walkway bed to or above the required level of protection.

Table 2.20 – Advantages and Disadvantages of Elevation

ADVANTAGES	DISADVANTAGES
• Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. • Often reduces flood insurance premiums. • Reduces or eliminates road closures due to overtopping. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • The appearance of the structure and access to it may be adversely affected. • May require property owner cooperation and right-of-way acquisition. • May require road or walkway closures during construction.

2.4.6.7 FLOOD INSURANCE:

Insurance differs from other property protection activities in that it does not mitigate or prevent damage caused by a flood. However, flood insurance does help the owner repair and rebuild their property after a flood, and it can enable the owner to afford incorporating other property protection measures in that process. Insurance offers the advantage of protecting the property, as long as the policy is in force, without requiring human intervention for the measure to be effective.

Table 2.21 – Advantages and Disadvantages of Flood Insurance

ADVANTAGES	DISADVANTAGES
• Provides protection outside of what is covered by a homeowners' insurance policy. • Can help to fund other property protection measures after a flood through increased cost of compliance (ICC) coverage. • Provides protection for both structure and contents. • Can be purchased anywhere in a community, including outside of a flood zone.	• Cost may be prohibitive. • Policyholders may have trouble understanding policy and filing claims. • Does not prevent or mitigate damage.

2.5 STEP 5. CONCLUSION AND RECOMMENDATIONS

2.5.1 CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, Collier County has pinpointed several projects suitable for implementation in identified repetitive loss areas. These projects are outlined in Section 2.7.3 Recommendations.

2.5.2 PRIORITIZATION

In order to facilitate the implementation of the following recommended mitigation actions, a prioritization schedule is included based on the following:

- | | |
|------------------------|--|
| — Cost | — Willingness of Property Owner to Participate |
| — Funding Availability | — Additional Planning Requirements |
| — Staff Resources | |

The priority rating for the following mitigation actions is summarized in Table 2.22. Each of the above prioritization variables was rated on a scale of 1 to 5, with 5 indicating the greatest difficulty for implementation. The weight of each variable is indicated in the prioritization table. Those mitigation actions with the lowest overall priority scores are expected to be the easiest to implement and should therefore be implemented first. An overall priority rating of high, medium, or low is assigned to each recommended action, using the following scale:

- High Priority (should be completed within 2 years): Score of 0.00 – 1.99
- Medium Priority (should be completed within 2 to 4 years): Score of 2.00 – 3.99
- Low Priority (should be completed within 4 to 5 years): Score of 4.00 – 5.00

2.5.3 RECOMMENDATIONS

The County will pursue a variety of mitigation strategies that balance cost, funding and administrative capabilities, and willingness of property owners to participate. Unless otherwise noted, these mitigation actions are recommended for all repetitive loss areas.

Mitigation Action 1: Flood Insurance Promotion

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The County will target all properties in the repetitive loss areas on an **annual basis** to remind them of the advantages of maintaining flood insurance. The County will also educate the public on Increased Cost of Compliance (ICC) coverage through this and other outreach efforts.

Responsibility: The County’s Growth Management department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost of ongoing outreach will be paid for from the County’s operating budget.

Priority: High

Areas: All Repetitive Loss Areas

Mitigation Action 2: Encourage Floodproofing Techniques

Several properties in the coastal and tidal areas are prone to flooding from storm surge and tidal flooding. When appropriate, especially for non-residential structures, property owners should consider floodproofing measures such as flood gates or shields, flood walls, hydraulic pumps, and elevating electrical services including electrical outlets. The County should regularly provide information on potential floodproofing techniques for property owners to implement.

Responsibility: The County’s Growth Management Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an on-going program.

Funding: The cost for protection measures will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the County’s operating budget.

Priority: Medium

Areas: All Repetitive Loss Areas; preferred for Subareas 2, 7, 8, 9

Mitigation Action 3: Elevate or Acquire Properties

Continue acquisition/demolition mitigation and/or elevation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection. This effort can be coordinated with the County’s ongoing mitigation and resilience efforts. Existing plans can help the County to specifically target the properties in these repetitive loss

areas that will also be most likely to experience continued and worsening flooding as a result of sea level rise. Must be undertaken as a voluntary program where property owner elects to participate.

Responsibility: The County's Department of Growth Management will continue to target properties for acquisition/demolition and integrate this effort with the County's other mitigation and resilience work.

Funding: FEMA Hazard Mitigation Assistance Grants and other State and organizational grant funding. Staff time to develop the list of target properties will require funds from the County's operating budget.

Priority: Low

Areas: All Repetitive Loss Areas

Mitigation Action 4: Prioritize Drainage-Related Capital Projects

Many respondents to the flood protection questionnaire noted that drainage issues from neighboring properties impact them. This observation suggests that improving drainage could be the most effective solution to addressing flooding in certain repetitive loss areas. The County should prioritize funding for drainage projects in the identified repetitive loss areas and their associated drainage basins. Local funds can serve as a match for federal grants to undertake larger scale, more costly improvement projects that support mitigation. This type of mitigation presents an opportunity for incorporation of nature-based solutions and natural resource protection.

Responsibility: The County's Division of Capital Project Planning, Impact Fees, and Program Management already manages the roads and drainage capital improvements and will work to prioritize repetitive loss areas for drainage improvements.

Funding: The cost will be paid for by the capital improvement funding.

Priority: Medium

Areas: All Repetitive Loss Areas; preferred for Subareas 7, 8, 9, and 10

Mitigation Action 5: Encourage Property Owners to Elevate Mechanical Equipment

Encourage property owners to elevate inside and outside mechanical equipment above the BFE, install flood resistant materials in crawl spaces, and consider additional flood protection measures.

Responsibility: The County's Department of Growth Management will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures.

Funding: The cost of flood protection measures will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the County's operating budget.

Priority: Medium

Areas: All Repetitive Loss Areas

Mitigation Action 6: Stormwater Conveyance Systems Expansion and Maintenance

Property owners and field survey indicated that some conveyance systems in the repetitive loss areas no longer have the capacity to manage floodwaters. Field surveys also indicated that some areas lack any conveyance to move water away from properties. The County should expand stormwater conveyance systems and identify opportunities for improvements to existing systems where drainage capacity is inadequate. Installation of new conveyance systems will be costlier than improvements to existing systems. Some issues may be mitigated through increased maintenance.

Responsibility: The County's Division of Capital Project Planning, Impact Fees, and Program Management and Growth Management Department will coordinate on this effort.

Funding: The cost will be paid for by the County's capital improvement funding.

Priority: Medium

Areas: All Repetitive Loss Areas; preferred for Subareas 7, 8, 9, and 10.

2.5.4 PRIORITIZATION TABLE

Table 2.22 – Prioritization of Recommended Mitigation Actions

MITIGATION ACTION #	PRIORITIZATION VARIABLES (WEIGHT)					TOTAL
	Cost (30%)	Funding Availability (25%)	Property Owner Willingness (20%)	Staff Resources (15%)	Planning Needs (10%)	
1: Flood insurance promotion	2	2	1	1	1	1.55
2: Encourage floodproofing techniques	2	3	4	2	2	2.65
3: Elevation or acquisition	5	4	5	3	4	4.35
4: Drainage-related CIP projects	4	2	1	3	4	2.75
5: Encourage elevation of mechanical equipment	2	2	3	2	1	2.10
6: Stormwater conveyance systems and maintenance	4	3	1	3	4	3.00

3 REFERENCES

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APPENDIX A BUILDING SURVEY DATA

Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public.