



Repetitive Loss Area Analysis

Town of Cutler Bay, Florida

September 2021

Public Version

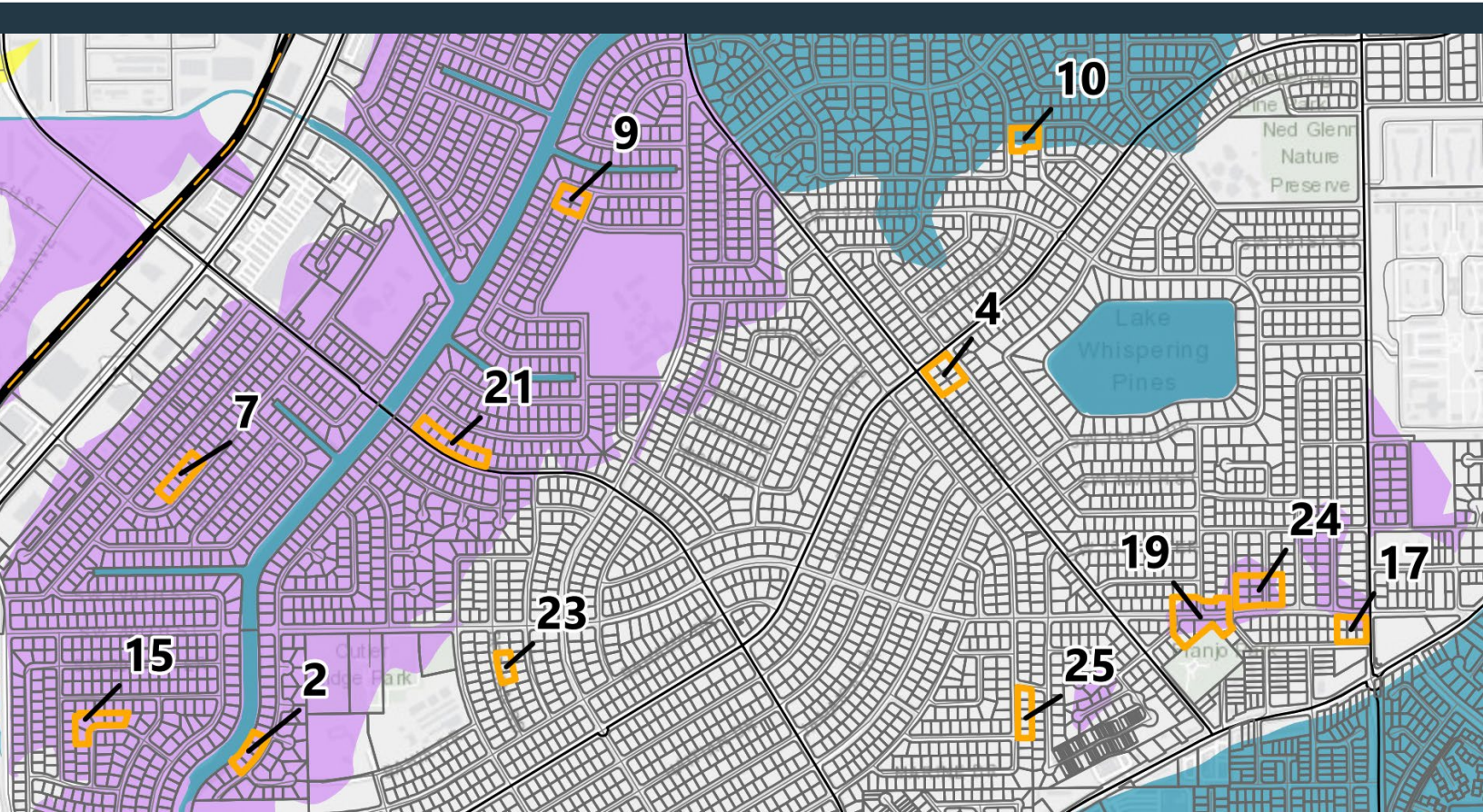


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1 Repetitive Loss Area Analysis

Background

Flooding is the most common and the costliest natural hazard in the United States. Floods account for nearly 75 percent of all 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 built in areas at high risk of flooding. 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, over \$12.5 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.

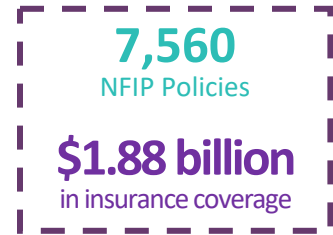


Private insurance companies faced with high losses have several options to keep turning a profit. They can raise income through premium rate increases, decrease payments to insurers or reduce the exposure to the hazard. Unfortunately, the NFIP can only do what is allowed by statute. If losses increase, 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 they do not get substantially damaged and thus 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.

The Town of Cutler Bay (CID-120218) has been a regular participant in the NFIP since August 31, 2006. In addition to meeting the basic requirements of the NFIP, the Town of Cutler Bay has completed additional floodplain management activities to participate in the Community Rating System (CRS) program, which rewards local communities with insurance premium discounts for taking actions to reduce flood risk and vulnerability. The Town of Cutler Bay is currently a CRS Class 4, which rewards all policyholders in the SFHA with a 30 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. Cutler Bay entered the CRS program on May 1, 2011.



As of November 2020, there are 7,560 NFIP policies in force in the Town with over \$1.88b in insurance coverage. There have been 210 paid losses against the NFIP with a total payment of nearly \$2.2m within Cutler Bay.

According to October 2017 NFIP Repetitive Loss Data, which was the most current data available for this analysis, there are 33 repetitive loss properties in Cutler Bay. Fourteen of the repetitive loss properties in the Town are currently insured. One property has been mitigated (see the Repetitive Loss Requirement Section).

A repetitive loss property does not have to currently be insured 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 or have not had a flood insurance policy for several years. An insured property with two or more claims of \$1,000 or more 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. However, the community does not need to address mitigated properties like other repetitive loss properties; they are provided for community planning purposes only.

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: 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 2017 NFIP Repetitive Loss data, there are a total of 32 unmitigated repetitive loss properties within the Town of Cutler Bay. The 2017 CRS Coordinator's Manual requires that any community with at least one but fewer than 50 repetitive loss properties—considered a "Category B" community—must map repetitive loss areas, describe its repetitive loss problem, and undertake outreach to all addresses in the repetitive loss areas that have insurable buildings. In fulfillment of this requirement and in an effort to take greater responsibility for these repetitive loss properties and encourage mitigation, the City has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. This RLAA will benefit the City by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program.

Setting

The Town of Cutler Bay was incorporated in November 2005. The Town has a total area of approximately 9.8 square miles. As of 2019, according to the American Community Survey (ACS) Annual Estimates, the

population of Cutler Bay was 44,801, which equates to an average population density of approximately 4,572 people per square mile.

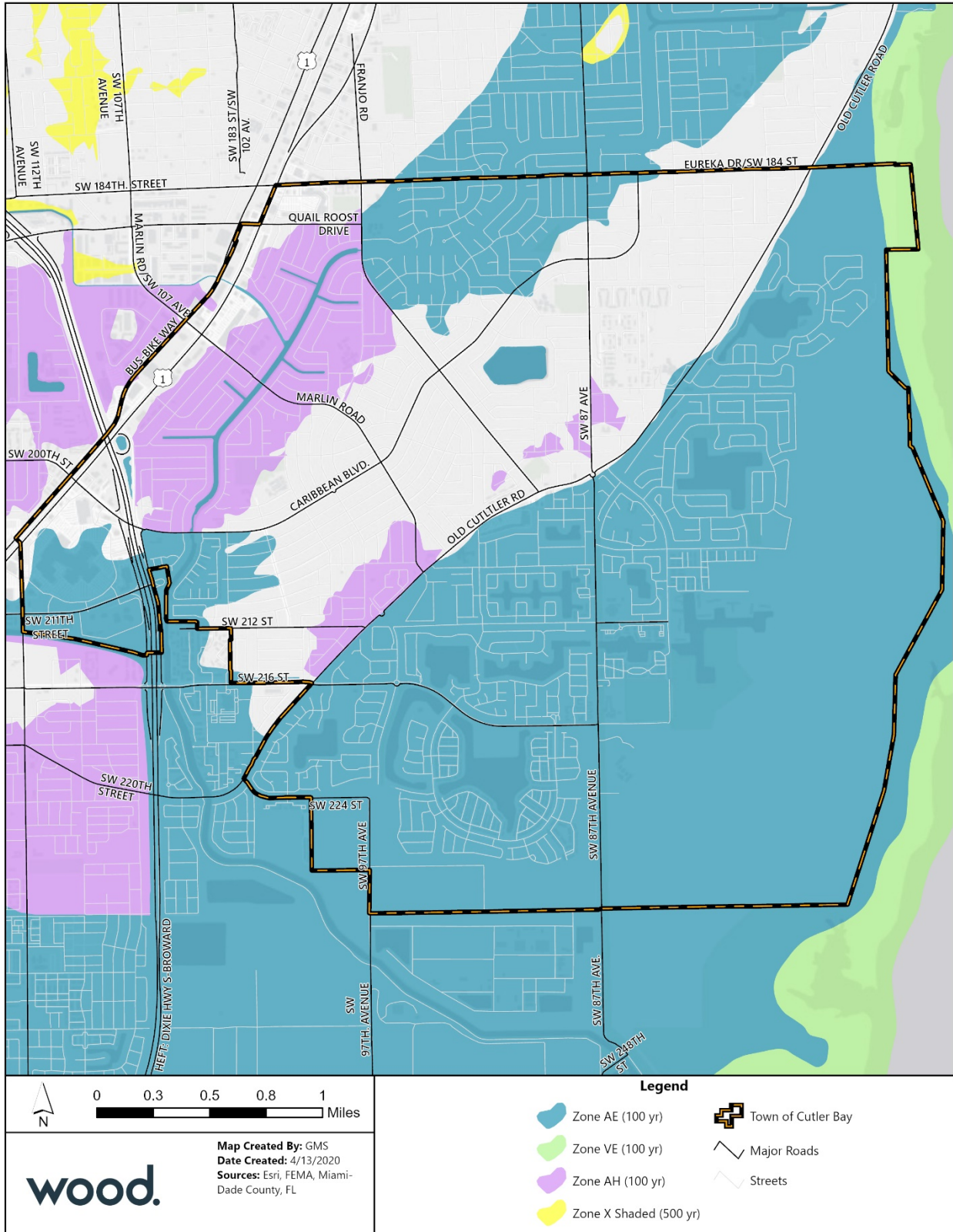
The Town of Cutler Bay is located along the Biscayne Bay in southern Miami-Dade County. The Town comprises approximately 10 square miles and is home to approximately 45,000 residents. The majority of the land use within Town is residential. Most buildings are slab-on-grade and therefore susceptible to flood damage from shallow flooding and drainage problems. Because the Town is located in a unique low-lying area, it is particularly susceptible to flooding from major rain events and storm surge. Flooding within the Town can be attributed to tidal flooding resulting from hurricanes and tropical storms and heavy rainfall that overburdens the drainage system within the community. The C-100 Canal is the largest canal and controls much of the flow within the Town. Because the canals within the Town are controlled by the South Florida Water Management District and Miami-Dade County, it is important to work together to educate residents of the risk and benefits of the canal system.

The Town limits include Biscayne National Park which borders Biscayne Bay and the Atlantic Ocean to the east and lies entirely within the 100-yr floodplain. In fact, almost 75% of the Town lies within the 100-year floodplain. It is important to realize, respect and maintain the natural flood protection benefits and floodplain functions provided by this treasured park land, and the natural and beneficial functions of this undeveloped coastal flood zone should be incorporated into local outreach and flood mitigation programs. The PPI should promote the environmental preservation and protection of coastal floodplain functions which include hydrologic and hydraulic processes, geomorphic processes and biologic processes. The seasonal and storm-generated variations in water flow, including periodic flooding, are part of the normal function of the floodplain. These variations keep erosion and accretion in equilibrium, replenish soils, recharge groundwater, and filter impurities. In coastal areas, water differences are based on tides, currents, wave action, and storm surges—all of which form shorelines, coastal wetlands, dunes, barrier islands, and estuaries.

The central portion of the Town has an area of X-Zone; however, this area which has a slightly higher elevation is still subject to low level flooding and has a number of repetitive loss properties.

Figure 1.1 reflects the flood zones throughout the Town of Cutler Bay.

Figure 1.1 – Town of Cutler Bay, Flood Hazard Areas



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.

Based on 2017 NFIP Repetitive Loss data for the Town of Cutler Bay, which identifies 32 unmitigated repetitive loss properties in the Town, Cutler Bay is designated as a Category B repetitive loss community. These 32 repetitive loss properties are summarized in Table 1.1.

Table 1.1 – Summary of Unmitigated Repetitive Loss Properties

Flood Zone ¹	Building Type		Building Count		Losses	Total Building Payment	Total Content Payment	Total Paid
	Residential	Non-Res.	Insured	Uninsured				
AE	X			X	2	6,143.87	1,099.99	7,243.86
AE	X			X	2	59,362.26	74,950.95	134,313.21
X	X		X		3	91,396.95	30,764.51	122,161.46
AE	X			X	2	13,836.20	15,941.39	29,777.59
AE	X		X		2	7,208.92	1,707.90	8,916.82
AE	X		X		2	90,523.83	42,324.97	132,848.80
AE	X		X		2	59,327.06	12,128.92	71,455.98
AE	X		X		2	39,862.86	17,761.47	57,624.33
AE	X			X	2	30,035.76	18,241.79	48,277.55
AE	X			X	2	5,093.29	1,033.95	6,127.24
AE	X			X	2	16,126.37	8,798.05	24,924.42
AE	X		X		2	33,991.66	9,597.94	43,589.60
AE	X			X	2	17,138.64	1,365.75	18,504.39
X	X			X	2	64,199.67	44,248.15	108,447.82
A10	X		X		3	28,855.52	0.00	28,855.52
AE	X			X	2	3,822.65	0.00	3,822.65
X	X			X	2	2,874.28	5,308.59	8,182.87
X	X			X	2	52,133.87	28,910.74	81,044.61
X	X			X	2	38,316.85	9,428.02	47,744.87
X	X		X		2	27,321.38	21,404.67	48,726.05
AH	X		X		3	60,925.42	24,443.47	85,368.89
AE	X			X	2	38,908.38	25,690.00	64,598.38
AE	X			X	2	6,941.09	0.00	6,941.09

Flood Zone ¹	Building Type		Building Count		Losses	Total Building Payment	Total Content Payment	Total Paid
	Residential	Non-Res.	Insured	Uninsured				
AE	X		X		2	38,780.24	0.00	38,780.24
AE	X		X		2	4,482.17	588.42	5,070.59
AE	X			X	2	9,924.40	0.00	9,924.40
AE	X			X	2	66,805.33	20,000.00	86,805.33
X	X		X		2	198,457.93	127,811.59	326,269.52
AE	X			X	4	18,658.60	24,634.14	43,292.74
X	X		X		3	41,386.79	9,252.62	50,639.41
AE	X			X	2	32,983.49	2,940.00	35,923.49
AE	X		X		2	27,800.07	2,478.41	30,278.48
Total	32	0	14	18	70	1,233,626	582,856	1,816,482

Source: 2017 NFIP Repetitive Loss Data

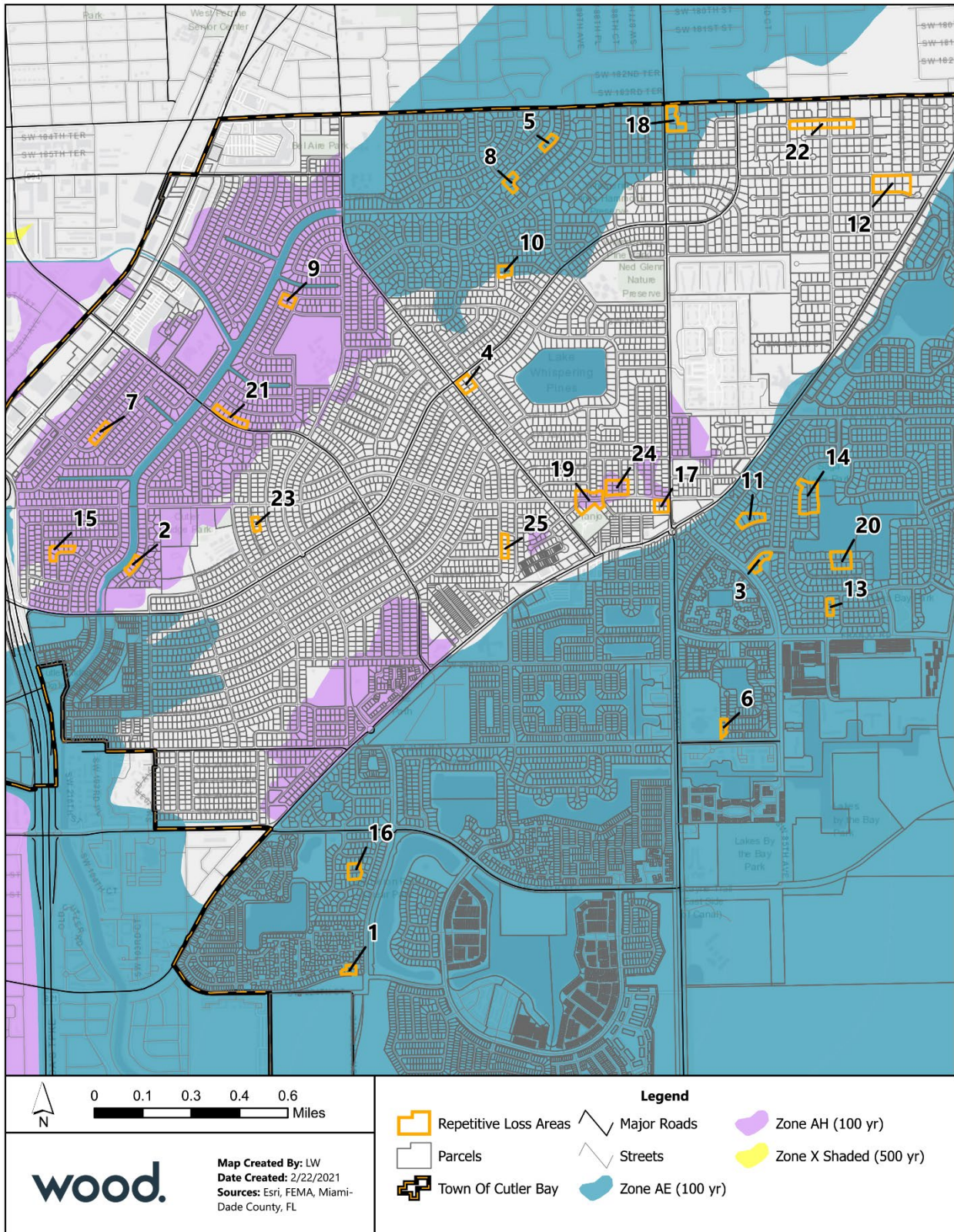
¹Flood Zone is based on historical FIRM when first loss occurred. These zones do not reflect the current Effective FIRM zone for each property.

Mapping Repetitive Loss Areas

There were 25 Repetitive Loss Areas identified within the Town of Cutler Bay in accordance with the principles outlined in the CRS guidance titled *Mapping Repetitive Loss Areas* dated August 15, 2008. The Repetitive Loss Areas include all 32 unmitigated repetitive loss properties as well as historic claims properties (those with one paid claim against the NFIP), plus additional surrounding properties that have the same or similar flood conditions but have not had any claims paid against the NFIP. A total of 144 properties were included in this RLAA. Figure 1.2 on the following page shows the general locations of the 25 Repetitive Loss Areas.

Note: This Repetitive Loss Area Analysis contains all repetitive loss properties and properties in all identified repetitive loss areas.

Figure 1.2 – Overview of Repetitive Loss Areas



2 The RLAA Process

The RLAA planning process incorporated requirements from Section 510 of the 2017 *CRS Coordinator's Manual*. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication *Reducing Damage from Localized Flooding: A Guide for Communities*, Part III Chapter 7; 2) CRS publication *Mapping Repetitive Loss Areas* dated August 15, 2008; and 3) 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 2013 *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 the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503.
2. The repetitive loss area must be mapped as described in Section 503.a.
3. The repetitive loss area analysis summary report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

STEP 1. Advise All Property Owners

Before field work began on the RLAA, individual letters were mailed to property owners within the identified Repetitive Loss Areas. Figure 2.1 on the following page shows an example of the property owner notification letter. Letters were mailed to repetitive loss properties, historical claims properties (those with one paid claim against the NFIP), and additional properties with similar flooding conditions but which have no claims paid against the NFIP. In total, 144 notification letters were mailed to property owners (two were returned as non-deliverable). The letters were sent out on January 21, 2021. Copies of all mailed letters are maintained on file with the Town of Cutler Bay Public Works Department. In accordance with the Privacy Act of 1974, the letters will not be shared with the general public.

Mailed Questionnaire

A property owner questionnaire was included with each letter mailed to building owners. The questionnaire asks about the type of foundation and if the building has a basement, if the building has experienced any flooding and the type of flooding, cause of flooding, flood protection measures and whether the owner has flood insurance. The Flood Protection Questionnaire is shown in Figures 2.2 and 2.3 on the following pages.

Website Announcement

The completed document will be made available for review on the Town's website. This gives property owners an opportunity to review the general findings of the analysis and provide feedback to the Town to further improve the Town's and property owners' knowledge of flood issues.



[DATE]

[NAME]

[STREET ADDRESS]

Cutler Bay, FL

Property Address: XXXXXX

Parcel Number: XXXXXXXXX

Dear Property Owner or Resident:

As part of the Town of Cutler Bay's participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS), the Public Works Department is evaluating properties that have experienced repetitive flood damage. This analysis will include the review of all previous flood data and studies conducted in these locations.

The repetitive loss analysis involves the collection of the following property level data elements:

- Building permit records (including application and associated records)
- Structure and site elevation information (elevation certificate if available)
- Tax ID and lot and parcel number
- Building property value on record (assessed value, replacement value or both)
- Land property value on record
- Building codes/floodplain development regulations exceeding minimum standards
- Historical flood event information (when events occurred, amount of property damage, etc.)

In addition, the Town of Cutler Bay and its contractor will visit each property to survey the flood risk and to take photographs. Property owners are encouraged to provide any relevant flooding information. The survey crews will be looking at the type and condition of the foundation, drainage patterns on the lot and whether outside mechanical equipment is elevated.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy of the report can be obtained from the Public Works Department or by calling (305) 234-4262.

You can help us perform this analysis by **completing this questionnaire and returning to me at Town of Cutler Bay Public Works Department, 10720 Caribbean Blvd., Suite 105, Cutler Bay, FL 33189**. If you have any questions, please call me at (305) 234-4262.

Sincerely,

Alfredo Quintero
Director of Public Works
Town of Cutler Bay

Figure 2.1 – Example RLAA Property Notification Letter



TOWN OF CUTLER BAY FLOOD PROTECTION QUESTIONNAIRE

Name: _____

Property Address: _____

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

<input type="checkbox"/> Less than 1	<input type="checkbox"/> 5-10 years
<input type="checkbox"/> 1-5 years	<input type="checkbox"/> 10+ years

2. Do you rent or own this building?

<input type="checkbox"/> Rent
<input type="checkbox"/> Own

3. What type of foundation does the building have?

<input type="checkbox"/> Slab	<input type="checkbox"/> Basement
<input type="checkbox"/> Crawl Space	<input type="checkbox"/> Other: _____

4. Has this **building** ever been flooded or had a water problem?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

5. Has this **property** ever been flooded or had a water problem?

<input type="checkbox"/> Yes	<input type="checkbox"/> No – if no, skip to question 12.
------------------------------	---

6. In what year(s) did the building or property flood? _____

7. Where did you get water and how deep did it get?

<input type="checkbox"/> In basement; Depth: _____	<input type="checkbox"/> Over 1 st floor; Depth: _____
<input type="checkbox"/> In crawl space; Depth: _____	<input type="checkbox"/> In yard; Depth: _____
<input type="checkbox"/> Water was kept out of building by sandbagging, sewer valve, or other protective measure	

8. What was the longest time that water stayed in the building or on the property? _____

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

<input type="checkbox"/> Storm sewer backup	<input type="checkbox"/> Flooding from ditch/creek/river:
<input type="checkbox"/> Sanitary sewer backup	_____
<input type="checkbox"/> Standing water next to house/building	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Drainage from nearby properties	_____
<input type="checkbox"/> Saturated ground / leaks in basement walls	

10. Have you taken any of these flood protection actions on the property?

	Yes	No		Yes	No
Installed sump pump			Installed backup power system / generator		
Waterproofed the outside wall			Sandbagged		
Re-graded yard to keep water away			Other:		
Moved things out of basement			_____		

Figure 2.2 – RLAA Survey, Page 1



FLOOD PROTECTION QUESTIONNAIRE

(CONTINUED)

11. Which flood protection measures (checked in question 10) worked?

12. Is this building located in a FEMA floodplain?

- Yes
- No
- I don't know

13. Do you have flood insurance for this building?

- Yes
- No
- I don't know

14. Please include any additional information and comments you may have about flooding on this property or the surrounding area:

For more information on flood protection measures for your buildings or property, please contact Alfredo Quintero, info below.

Please help us by completing this survey by January 29, 2020 and returning it to:

Alfredo Quintero, Director of Public Works
 10720 Caribbean Blvd., Suite 105
 Cutler Bay, FL 33189
 (305) 234-4262

Surveys can also be emailed to aquintero@cutlerbay-fl.gov

Figure 2.3 – RLAA Survey, Page 2

Of the 142 delivered notification letters and questionnaires, the Town of Cutler Bay received 30 responses which corresponds to a response rate of approximately 21 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	6.7	2
1-5	16.7	5
5-10	20	6
10+	56.7	17
Total	-	30

Q2: Do you rent or own this building?

Answer Choices	Percentage	Number Responding
Rent	0	0
Own	100	30
Total	-	30

Q3: What type of foundation does the building have?

Answer Choices	Percentage	Number Responding
Slab	100	28
Crawl Space	0	0
Basement	0	0
Other	0	0
Total	-	28

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

Answer Choices	Percentage	Number Responding
Yes	16.7	5
No	83.3	25
Total	-	30

Q5: Has this property ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	20.7	6
No	79.3	23
Total	-	29

Q6: In what year(s) did the building or property flood?

- 1992 (3 times); Hurricane Andrew
- Hurricane Katrina

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

Answer Choices	Depth	Number Responding
In basement	-	0
In crawl space	-	0
Over 1 st floor	Less than 1", 14", 38", 4'	4
In yard only	5", ankle to calf deep	2
Water was kept out of house by sandbagging, sewer valve, or other protective measure	-	0
Total	-	6

Q7: What was the longest time that water stayed in the house/building?

- Minutes
- 1-2 hours
- 1 day
- 1 week
- Always drained fast

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

Answer Choices	Number Responding
Storm sewer backup	2
Sanitary sewer backup	-
Standing water next to house/building	-
Drainage from nearby properties	-
Saturated ground / leaks in basement walls	2
Flooding from ditch/creek/river: _____	1
Other	4
Total	6

Other: Hurricanes, not enough storm drains

Q9: Have you taken any of these flood protection actions on the property?

Answer Choices	Number Responding "Yes"
Installed sump pump	-
Waterproofed the outside walls	-
Re-graded yard to keep water away	-
Moved things out of basement	-
Installed backup power system / generator	2
Sandbagged	-
Other	1
None	2
Total	5

Other: I can't protect my home and yard from global warming

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

- Back yard was already graded when we purchased home. The flood water doesn't come close to the building

Q11: Is your home located in a Federal Emergency Management Agency (FEMA) floodplain?

Answer Choices	Percentage	Number Responding
Yes	41.4	12
No	13.8	4
I don't know	44.8	13
Total	-	29

Q12: Do you have flood insurance?

Answer Choices	Percentage	Number Responding
Yes	76.7	23
No	23.3	7
I don't know	0	0
Total	-	30

Q14: Please include any additional information and comments you may have about flooding in your area:

- "At this moment I haven't had any type of problems with flood."
- "I recently inherited this property from my father, so I don't know much about its history. The current tenants have been there for several years and may be a better source for prior flood history"
- "When house was completely rebuilt (after Andrew, 1996), it was elevated."
- "This area has never flooded since I have lived here since 2003 never happened even when hurricanes have come no rain has flooded this area so far."
- "Saga Bay is poorly designed all rainwater runoff is designed to flow into (and only) the lake. On extremely rainy conditions the lake fills up and the water has nowhere to go so the street and properties flood. This has to be corrected."
- "We are not located in a flood zone. We do not have any knowledge of flooding prior to our purchase of the home (October 2019)"
- "When it rains the street gets flooded. Clogged drains are the main problem. They have to clean the drains more often."
- "Only flooded in 1992 Hurricane Andrew"
- "None in 20 years never had flood even in my driveway"
- "Since I purchased this property Jan 2018, we have never experienced any flooding"
- "Heavy rains cause flooding on SW 216th Street and surrounding areas in Lakes By The Bay"
- "It would be nice if the neighbors would do something with their gutters to drain the water to the street. It seems to all drain to my property."
- "Never flooded while living here."
- Also has contents coverage. "The 3 times we have flooded was before extra flood drains were added to our intersection. 200 St & 89 Ave is the low point of our neighborhood, with 200 St & 88 Pl being the 2nd lowest. Since the new drains were added, after Hurricane Katrina, we have been high & dry"
- Owner says house has never flooded. Owner paid off house and has no flood insurance.
- "FEMA re-zoned our property years back as not located in flood zone"

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

- Property owners seem to be unaware of the flood history of their property beyond the years of their occupancy or ownership.

-
- Many respondents do not know if they are located in a FEMA mapped floodplain. However, it should be noted that most respondents who said they don't know if they are in a FEMA floodplain reported that they have flood insurance. Still, more outreach and education could be useful to teach residents whether or not they are located in a regulatory floodplain and what the flood zones mean, with an emphasis that low-risk zones do not indicate no flood risk.
 - Some reported flooding issues are related to stormwater drainage, and drainage improvement projects have mitigated concerns for some respondents. Additional stormwater improvements may prove beneficial.
 - Very few property owners report having taken any action to protect their property from the flood hazard. Educating and supporting property owners in property protection options, funding, and implementation may encourage more action.

STEP 2. Contact Agencies and Organizations

The Town of Cutler Bay 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 reports which were analyzed and reviewed included:

- FEMA Flood Insurance Study, Miami-Dade County, FL and Incorporated Areas, Effective September 11, 2009
- Flood Insurance Claims Data
 - FEMA Community Information System Data, 2020
 - FEMA/ISO – Repetitive Loss Data, 2017
- Town of Cutler Bay Watershed Master Plan, September 2018
- Town of Cutler Bay Capital Improvement Program, 2008-2018
- Town of Cutler Bay Code of Ordinances
- Miami-Dade County Comprehensive Development Master Plan, January 2016
- Miami-Dade County Local Mitigation Strategy, January 2018
- Miami-Dade County Comprehensive Emergency Management Plan, 2013

Summary of Studies and Reports

FEMA Flood Insurance Study, Effective September 11, 2009

A Flood Insurance Study (FIS) dated September 2009 was prepared by FEMA for Miami-Dade County, Florida and Incorporated Areas which includes the Town of Cutler Bay. The FIS identifies areas within Cutler Bay that are subject to flooding from the 1% annual chance flood event. This information is used by Cutler Bay to implement floodplain regulations as part of participation in the NFIP and to promote sound land use and floodplain development within the community.

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.

Town of Cutler Bay Stormwater Master Plan, 2008

The Stormwater Master Plan identifies opportunities to protect surface water quality and reduce flooding within the Town limits. The Stormwater Master Plan includes a comprehensive review of current data and existing conditions, an inventory of drainage structures and infrastructure, basin and sub-basin delineations, hydrologic and hydraulic modeling for the existing systems, and identification and analysis of alternatives for improvements needed to meet performance criteria. The plan also included development of a Capital Improvement Plan (CIP) to implement the identified improvements.

Town of Cutler Bay Watershed Master Plan, September 2018

The Watershed Master Plan provides the Town with a tool it can use to regulate future development in a way that does not increase runoff or flooding from future conditions. The plan examines and provides a comparison of pre- and post-development peak flows on the watershed level as well as the individual sub-basin level for those parcels within the Town that are currently undeveloped. Additionally, the plan identifies potential needs related to future capital improvement projects and provides recommendations for regulatory and development codes as they relate to stormwater management.

Town of Cutler Bay Capital Improvement Program (2008-2018)

The Town of Cutler Bay Stormwater Master Plan identified 17 priority sub-basins that were ranked from worst to best according to current performance against established Plan goals. The Capital Improvement Program (CIP) is based on the results of the 17 priority subbasin studies. Recommended improvements to achieve the stated performance goals were identified for each basin, and a ten-year CIP summary including preliminary budgets has been prepared for each basin. Some projects identified in the CIP are still in progress or awaiting implementation. An update to the CIP is currently underway.

Town of Cutler Bay Code of Ordinances

The purpose of the Land Development Regulations is to provide the minimum regulations necessary to facilitate safe and orderly growth, and to also ensure that growth forms an integral part of a community of functional neighborhoods, retail and commercial centers; increases collective security and community identity to promote civic awareness and responsibility; and enhances the quality of life for the entire Town to ensure the greatest possible economic and social benefits for all residents. These regulations are intended to promote consistency with the goals, objectives and policies of the Town's Growth Management Plan.

The Flood Damage Prevention Ordinance is perhaps the Town's most important flood mitigation tool. The Town first adopted the ordinance in May 2006, and the Town has been a participant in the NFIP since August 2006. The ordinance has been amended several times; the most recent amendment was made in May 2019. The ordinance contains numerous higher standards, including a one-foot freeboard, cumulative substantial improvement covering a five-year period, lower substantial improvement of 44 percent of the market value of a structure before repairs, protection of critical facilities, enclosure limits, and local drainage protection.

Town of Cutler Bay Comprehensive Growth Management Plan (2008)

A Comprehensive Plan, in broad terms, is a policy statement to guide the future placement and development of community facilities. It is the basis for a community's zoning, subdivision and design regulations and a community's official maps and amendments to the zoning, subdivision and design ordinances. The Comprehensive Plan identifies a future vision, values, principles and goals for the community, determines the projected growth for the community and identifies policies to plan, direct and accommodate anticipated growth. This document was adopted by the Town in April 2008. Goals from the Cutler Bay Growth Management Plan include:

- Future Land Use Goal
 - Protect and improve the Town's built and natural environment through the use of land in a manner that enhances existing neighborhoods, conserves resources, ensures the availability of public facilities and services, and realizes the community's vision for its future.
- Infrastructure Goals
 - To protect the health and safety of the public by ensuring stormwater management facilities and services are properly maintained, environmentally sound, cost effective, and meet the community's present and future demands.
 - The Town will continue to support and monitor county, South Florida Water Management District, state and federal efforts to protect, conserve and manage the quality and quantity of natural groundwater resources.
- Coastal Management Goal
 - Provide for the conservation, environmentally sound use and protection of all natural and historic resources; limit public expenditures in areas subject to destruction by natural disasters; and protect human life and property in the coastal area of the Town.

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- Conservation Goal
 - Protect and enhance the long-term environmental resources of the Town to ensure continued resource availability and environmental quality through prudent management, public education, appropriate regulations and enforcement, and active partnership with governmental and environmental entities.
 - Capital Improvements Goals
 - Identify the public facilities and infrastructure capacity needed, as outlined in the Growth Management Plan, to accommodate existing and future residents and businesses in the Town, to provide such facilities and infrastructure in a timely and efficient manner and adopt financial policies in order to guide the funding, scheduling and construction of improvements.
 - Develop and maintain a concurrency management system, including the adopted level of service standards, to track and issue development orders in order to ensure the availability of public facilities and infrastructure needed to support development are available concurrent with the impacts of such development.
 - Recreation & Open Space Goal
 - To provide and ensure a comprehensive system of public parks, open spaces and recreational programs that are well planned, convenient and customized to the recreational needs of the residents of Cutler Bay while preserving and protecting valuable natural resources for future generations.

Miami-Dade County Comprehensive Development Master Plan (CDMP), updated January 2016

The Miami-Dade County CDMP sets goals, objectives, and policies for the development and conservation of land and natural resources over the next 10 to 20 years. The 2020 and 2030 Land Use Map illustrates the general land use categories planned throughout the County and shows the expected expansion of the County's Urban Development Boundary, setting a growth strategy.

Miami-Dade County Local Mitigation Strategy, January 2018

The Miami-Dade Local Mitigation Strategy (LMS) is a multi-hazard mitigation plan for the county. The plan devotes a chapter to flooding, the NFIP, and the CRS, which assesses the flood hazard risk and vulnerability throughout the county and identifies mitigation projects that have been and/or can be implemented.

Miami-Dade County Comprehensive Emergency Management Plan, 2013

The Miami-Dade County Comprehensive Emergency Management Plan (CEMP) is designed to address "all hazards" threats to the County. In the event of a countywide emergency declaration, the corporate resources of the County and each of its municipalities work together for the mutual benefit of all residents and visitors of Miami-Dade County. Goals from Miami-Dade County CEMP are as follows:

- To provide an organized system of hazard vulnerability reduction to the citizens of and visitors to Miami-Dade County.
- To develop an enhanced level of awareness relative to emergency preparedness, throughout the population at large.
- To provide the most efficient response and recovery system possible through effective coordination and maximum utilization of all available resources.
- To coordinate the return of essential services to a normal state as quickly and effectively as possible after a disaster.
- To maintain a high level of readiness through community outreach and regular training.
- To reduce the public's vulnerability to recurrent hazards by the promotion of hazard mitigation strategies, particularly in the areas of critical infrastructure, land use, and building codes.

STEP 3. Building Data Collection

The on-site field survey for this analysis was conducted over two separate periods. An initial evaluation of all Repetitive Loss properties was conducted in 2012 as part of an earlier Repetitive Loss Area Analysis. This update identified new Repetitive Loss Areas, and evaluation of additional properties was conducted between February and March 2021. 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, 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 Area in relation to FEMA flood zones. Table 2.1 summarizes the total area by flood zone in each identified repetitive loss area.

Table 2.1 – Repetitive Loss Area Percent of Area by Flood Zone

Repetitive Loss Area	Acreage of Area by Flood Zone			Percent in SFHA
	Zone AE	Zone AH	Zone X Unshaded	
1	0.00	1.25	0.00	100.0%
2	0.00	0.88	0.00	100.0%
3	0.00	0.00	0.59	0.0%
4	0.00	1.14	0.00	100.0%
5	0.00	1.55	0.00	100.0%
6	0.00	0.88	0.00	100.0%
7	0.70	0.00	0.12	85.7%
8	0.97	0.00	0.00	100.0%
9	0.84	0.00	0.00	100.0%
10	1.89	0.00	0.00	100.0%
11	0.00	0.00	2.99	0.0%
12	0.00	0.00	3.83	0.0%
13	0.00	0.00	1.25	0.0%
14	0.00	1.85	0.14	92.7%
15	0.00	2.44	0.52	82.6%
16	0.00	0.00	0.98	0.0%
17	0.00	0.33	0.67	33.3%

Repetitive Loss Area	Acreage of Area by Flood Zone			Percent in SFHA
	Zone AE	Zone AH	Zone X Unshaded	
18	1.63	0.00	0.00	100.0%
19	3.50	0.00	0.00	100.0%
20	1.15	0.00	0.00	100.0%
21	2.06	0.00	0.00	100.0%
22	0.65	0.00	0.00	100.0%
23	0.61	0.00	0.00	100.0%
24	1.20	0.00	0.00	100.0%
25	0.66	0.00	0.00	100.0%

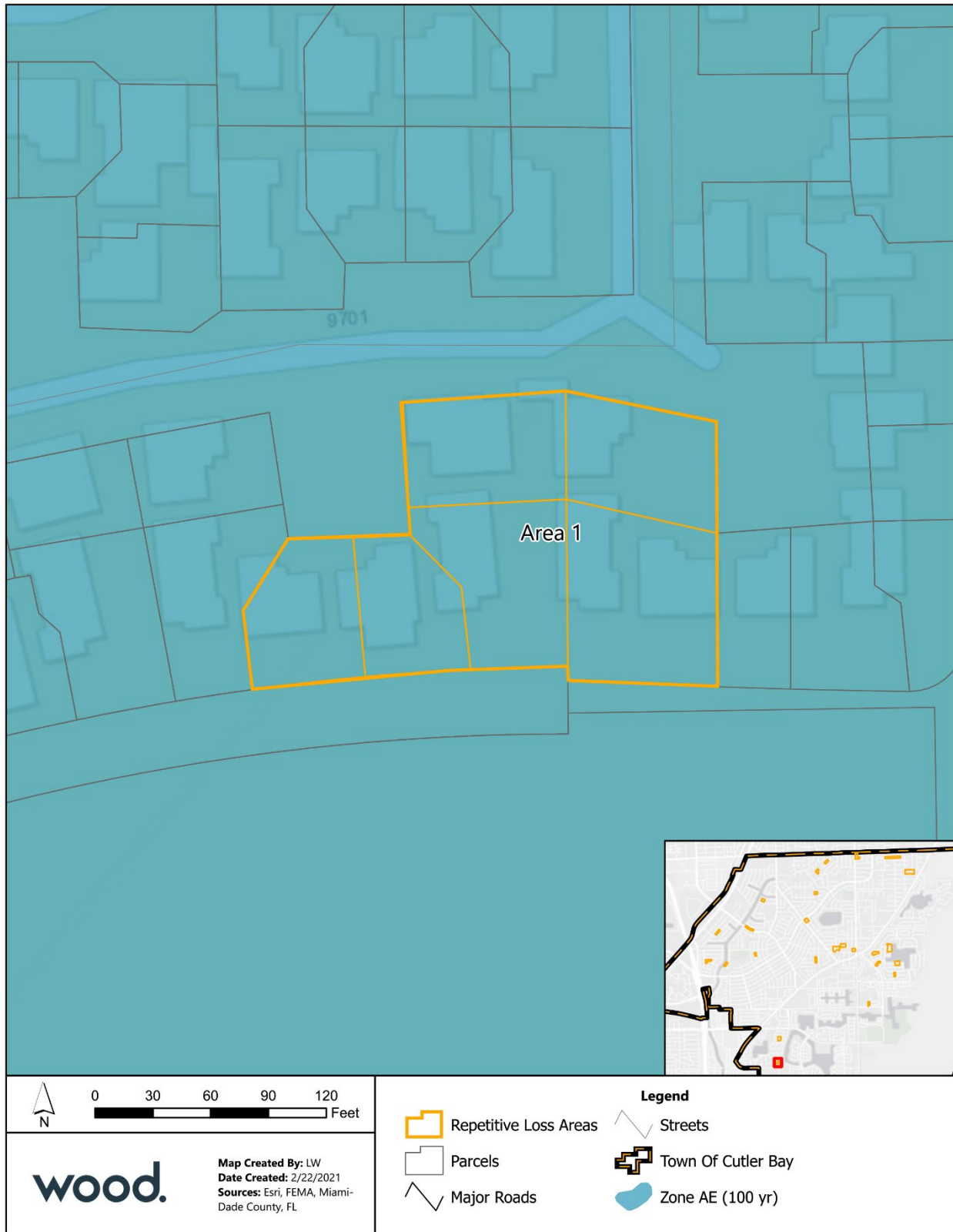
Problem Statement:

The Town of Cutler Bay is located along the Biscayne Bay and is susceptible to flooding from major rain events, storm surge, and tidal flooding. Approximately 75% of the Town is located in a Special Flood Hazard Area; however, flooding can occur anywhere in the Town, including along the ridge of higher elevation that sits outside the SFHA. Nearly half of the identified Repetitive Loss Areas are located entirely or partly within Zone AE floodplain, subject to flooding from the 1% annual chance flood event. Another third of the Repetitive Loss Areas are located entirely or partly within Zone AH floodplain, which is susceptible to shallow ponding of one to three feet from the 1% annual chance flood event. The remaining Repetitive Loss Areas are located outside the SFHA in low-risk flood zones.

Sources of flooding in the Town of Cutler Bay include the C1-N Canal, C-100 Canal, C-1 Canal, and various lakes and ponds throughout the Town. Localized stormwater flooding may occur during periods of heavy rainfall because of drainage deficiencies or maintenance issues, such as if conveyance is blocked by debris, sediment, or other materials.

A map and description of each of the identified repetitive loss areas follows.

Figure 2.4 – Repetitive Loss Area 1



Repetitive Loss Area 1 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 222 Terrace and SW 97 Court. The area sits north of Cutler Wetlands Preserve and west of two ponds but is not directly adjacent to any flood sources. The area is in the Lakes by the Bay private residential community with private roads. The homes are single story masonry structures with slab on grade foundations, built in 1989. All the structures appear to be elevated between 12-16 inches above street level on fill, with the finished floors elevated approximately 6-8 inches above grade. None of the HVAC units were visible from the right of way. There was no observable source of flooding noted during the field survey.

Table 2.2 – Overview for Repetitive Loss Area 1

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	5	6	SW 222 Ter, SW 97 Ct

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 1

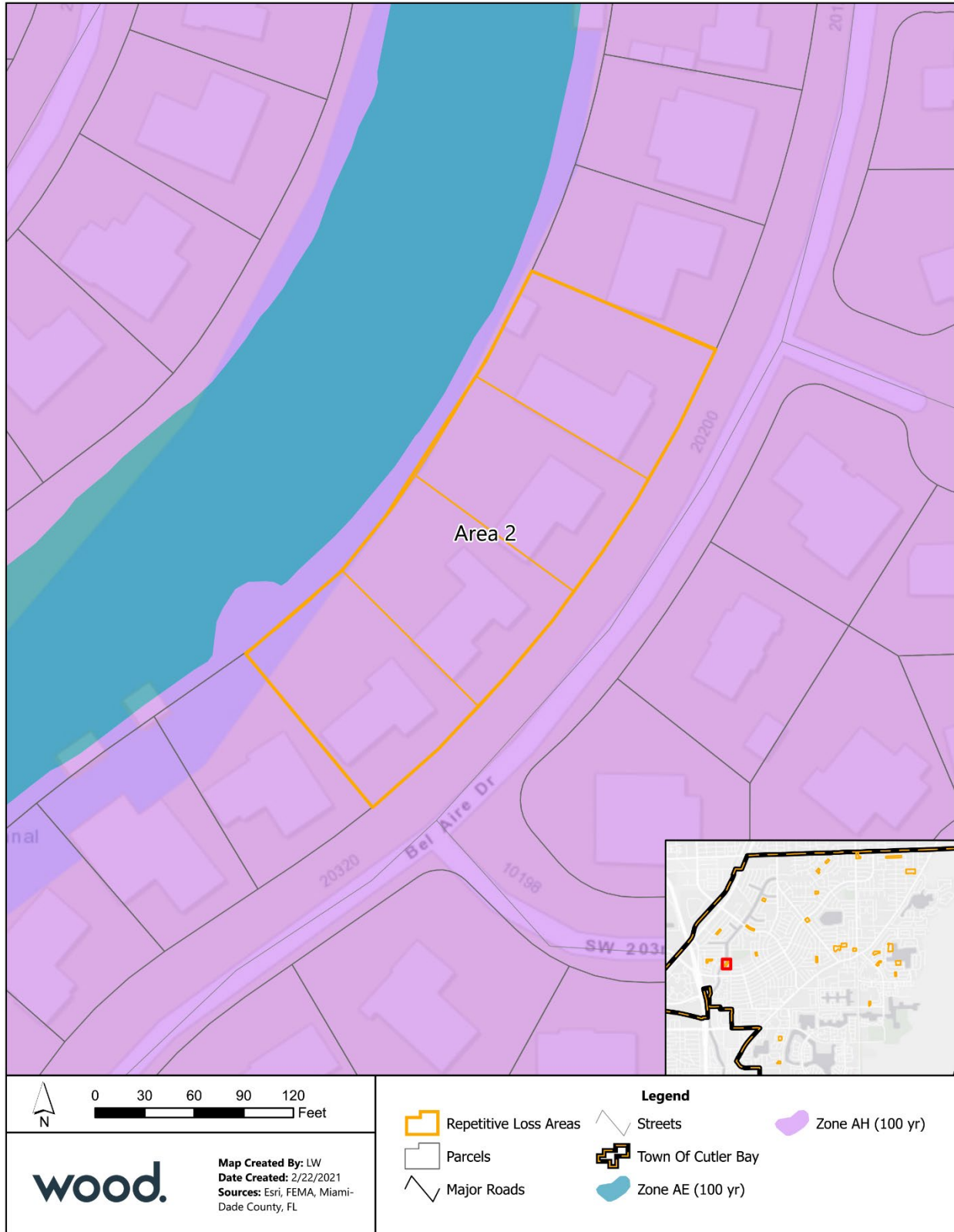


Property elevated on fill above street



Home elevated approximately 8" above grade

Figure 2.5 – Repetitive Loss Area 2



Repetitive Loss Area 2 is located completely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on Bel Aire Drive with their back yards abutting the C-100 Canal. The area sits just upstream of a point where the canal narrows. The homes are single story masonry structures with slab on grade foundations, originally built in 1968. All the structures appear to be elevated approximately 12 inches above street level, with the finished floors approximately 8 inches above grade. All of the observed HVAC units were elevated somewhat (between 3 and 6 inches) but not to the first-floor elevation. One property owner in this area noted no issues with flooding in a survey response.

Table 2.3 – Overview for Repetitive Loss Area 2

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	Bel Aire Dr

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 2

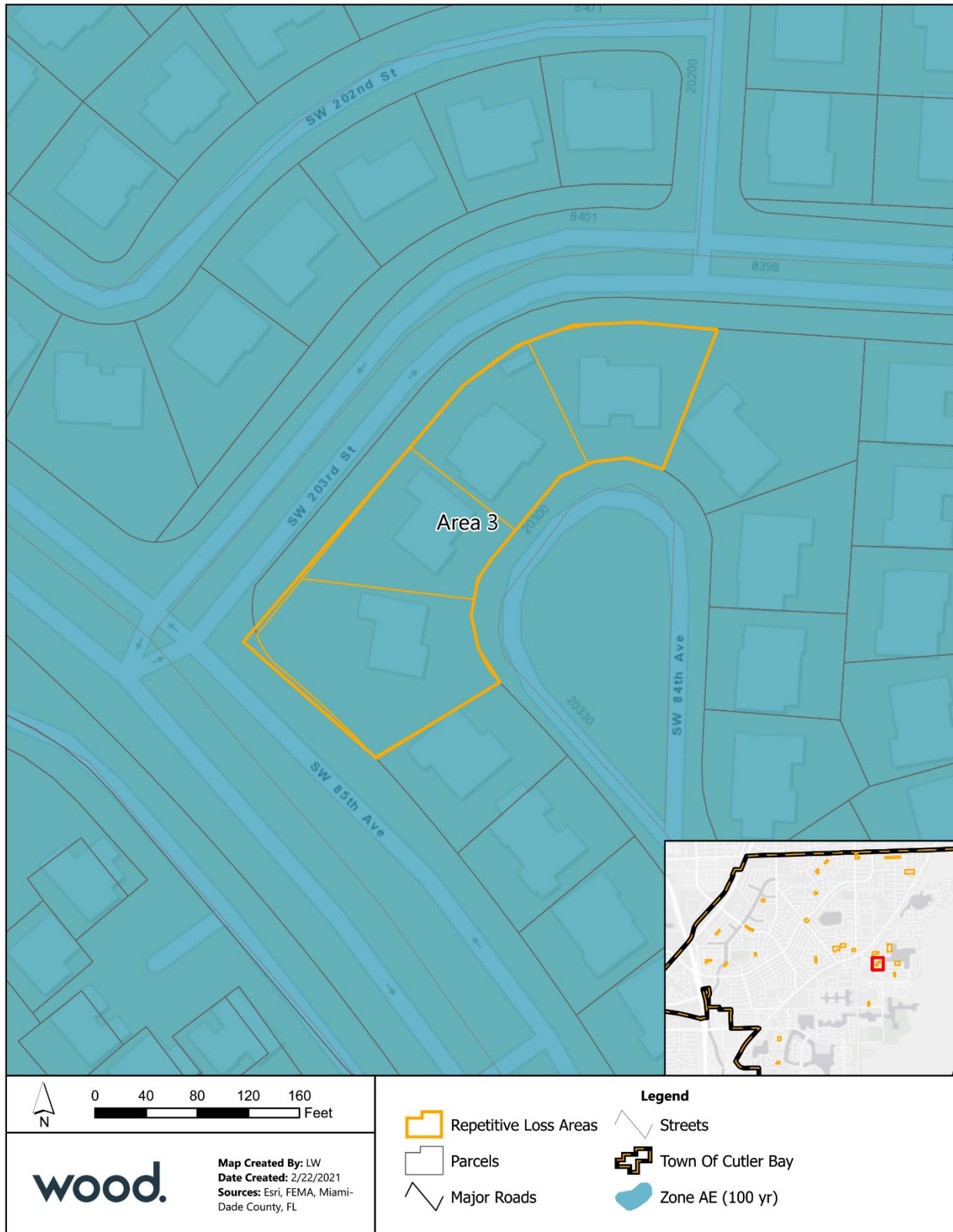


HVAC slightly elevated



Home elevated approximately 8" above grade; storm drain in front of house

Figure 2.6 – Repetitive Loss Area 3



Repetitive Loss Area 3 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 84 Ave. The area sits south of Old Cutler Road and is a block west from Saga Bay Retention Lake. The homes are single story masonry structures with slab on grade foundations, built between 1972 and 1987. All the structures appear to be elevated between 8 to 10 inches above street level, with the finished floors elevated approximately 10 to 14 inches above the front street grade and over 24 inches above the rear street grade. Visible HVAC units were elevated approximately 6 inches above grade. A property owner in this area reported no issues with flooding on the survey.

Table 2.4 – Overview for Repetitive Loss Area 3

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	SW 84 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 3

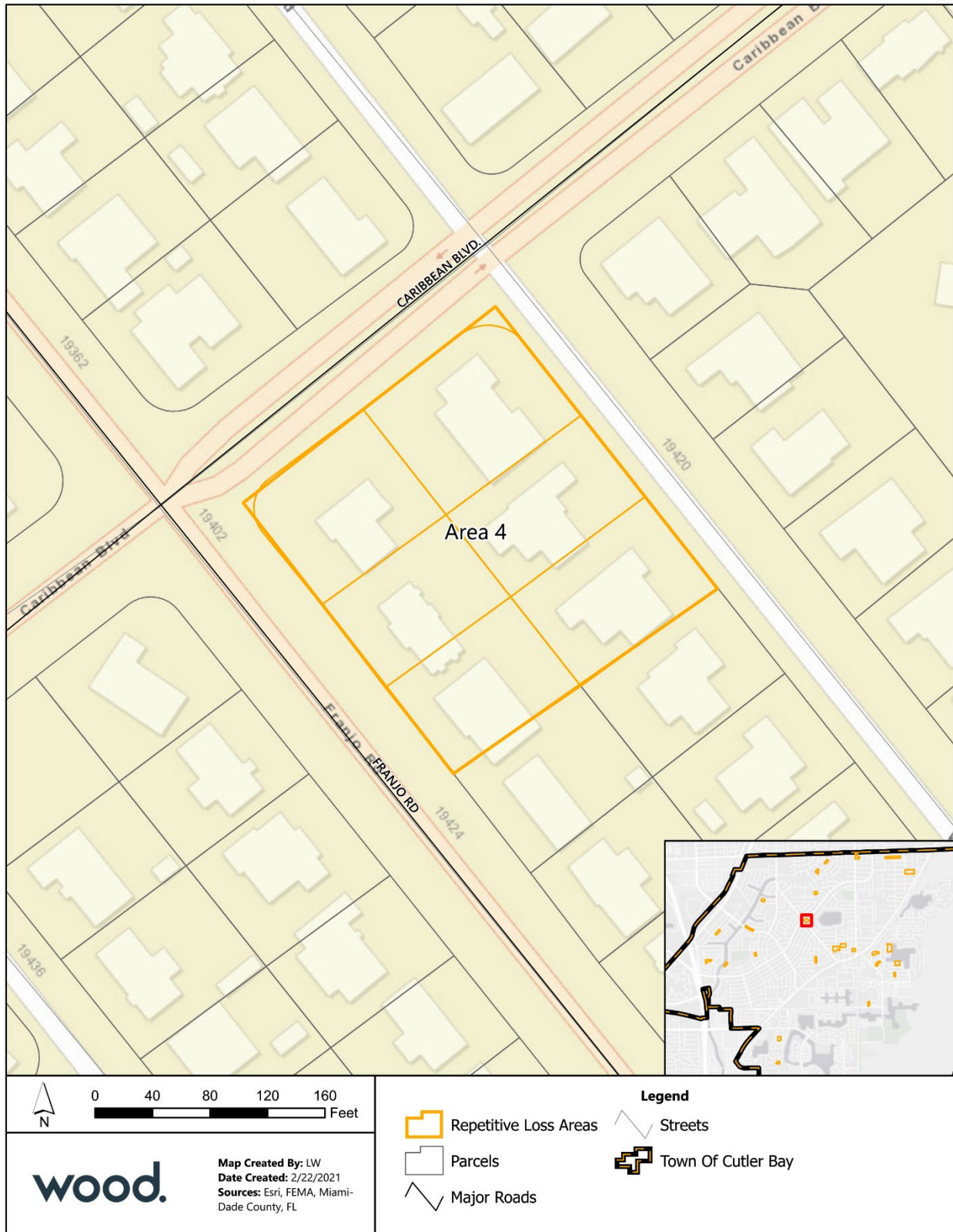


Property elevated on fill above street, home elevated above grade



HVAC elevated to first-floor elevation

Figure 2.7 – Repetitive Loss Area 4



Repetitive Loss Area 4 is located completely outside the 1-percent-annual-chance floodplain in the unshaded Zone X. The area comprises residential structures on Whispering Pines Road and Franjo Road, southeast of Caribbean Boulevard. The area sits west of Lake Whispering Pines and southeast of Caribbean Boulevard. It is not directly adjacent to any flood sources. The homes are single story masonry structures with slab on grade foundations. All the structures appear to be elevated on fill above street level, although the degree of elevation varies significantly from a low of 12 inches to a high of 30 inches above street level. Finished floors are elevated approximately 8-12 inches above grade. Only a few HVAC units were visible from the right of way; elevation varied from none to 12 inches. There was no observable source of flooding noted during the field survey, but the area is on public streets with storm drains nearby, so it's possible that stormwater infrastructure improvements could reduce flood risk.

Table 2.5 – Overview for Repetitive Loss Area 4

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	5	6	Whispering Pines Rd, Franjo Rd

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 4

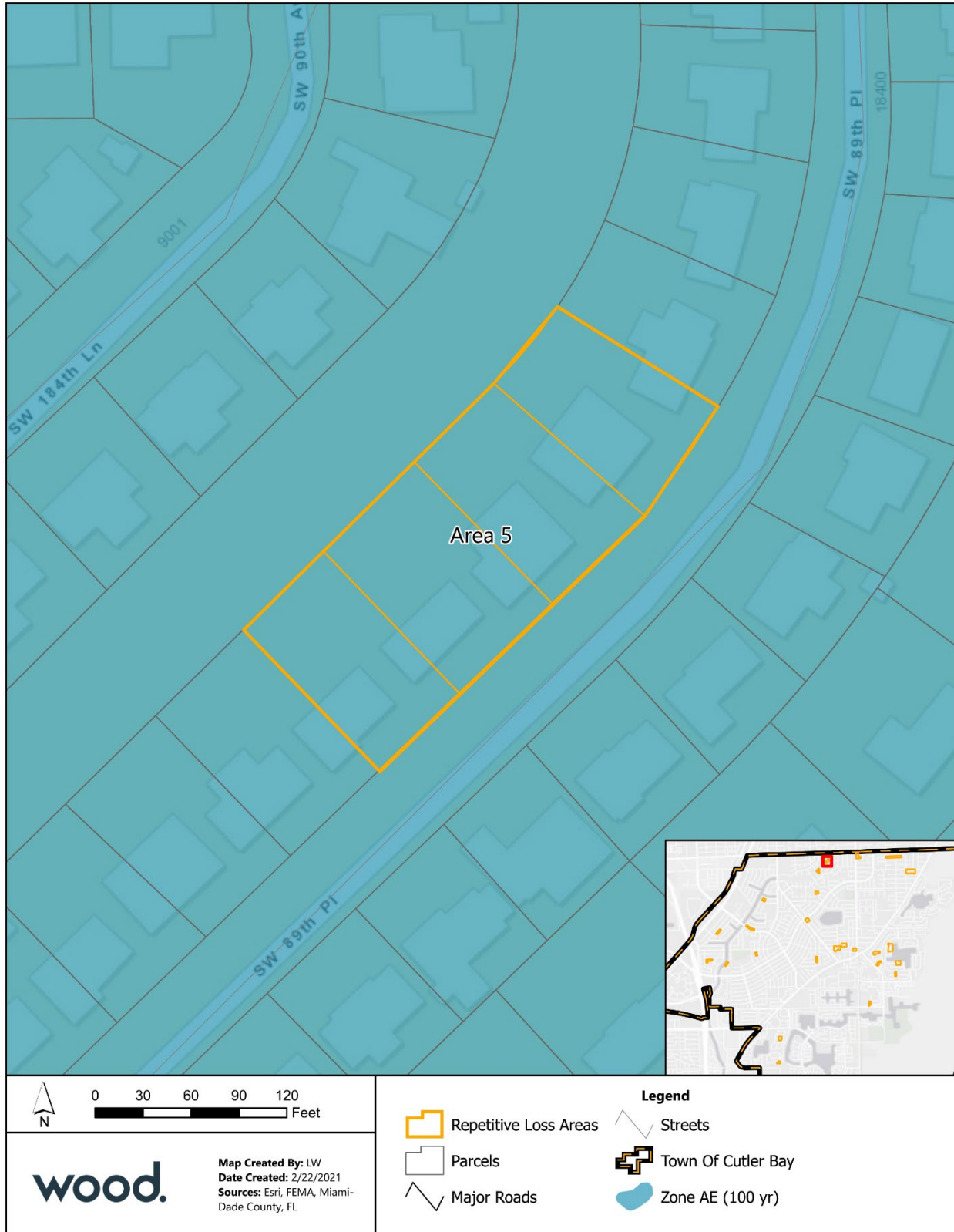


Property elevated approximately 10" above grade



HVAC elevated approximately 6" above grade

Figure 2.8 – Repetitive Loss Area 5



Repetitive Loss Area 5 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 89 Place. The C100-B Canal runs behind the properties. There are also several storm drains nearby. The properties were all built in 1972, though at least three have had subsequent additions. The homes are single story masonry structures with slab on grade foundations. All the structures appear to be elevated between 1-3 feet above the street, with most finished floors elevated approximately 6-8 inches above grade; one structure is elevated approximately 28 inches above grade. Of the observable HVAC units, two were elevated less than a foot, another was elevated 2 feet. The large range in property protection and elevation is likely attributable to post-storm mitigation, as one survey response from this area indicates that their property was rebuilt and elevated after Hurricane Andrew. Expanding property protection opportunities to additional properties in this area could further reduce risk.

Table 2.6 – Overview for Repetitive Loss Area 5

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	SW 89 Pl

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 5

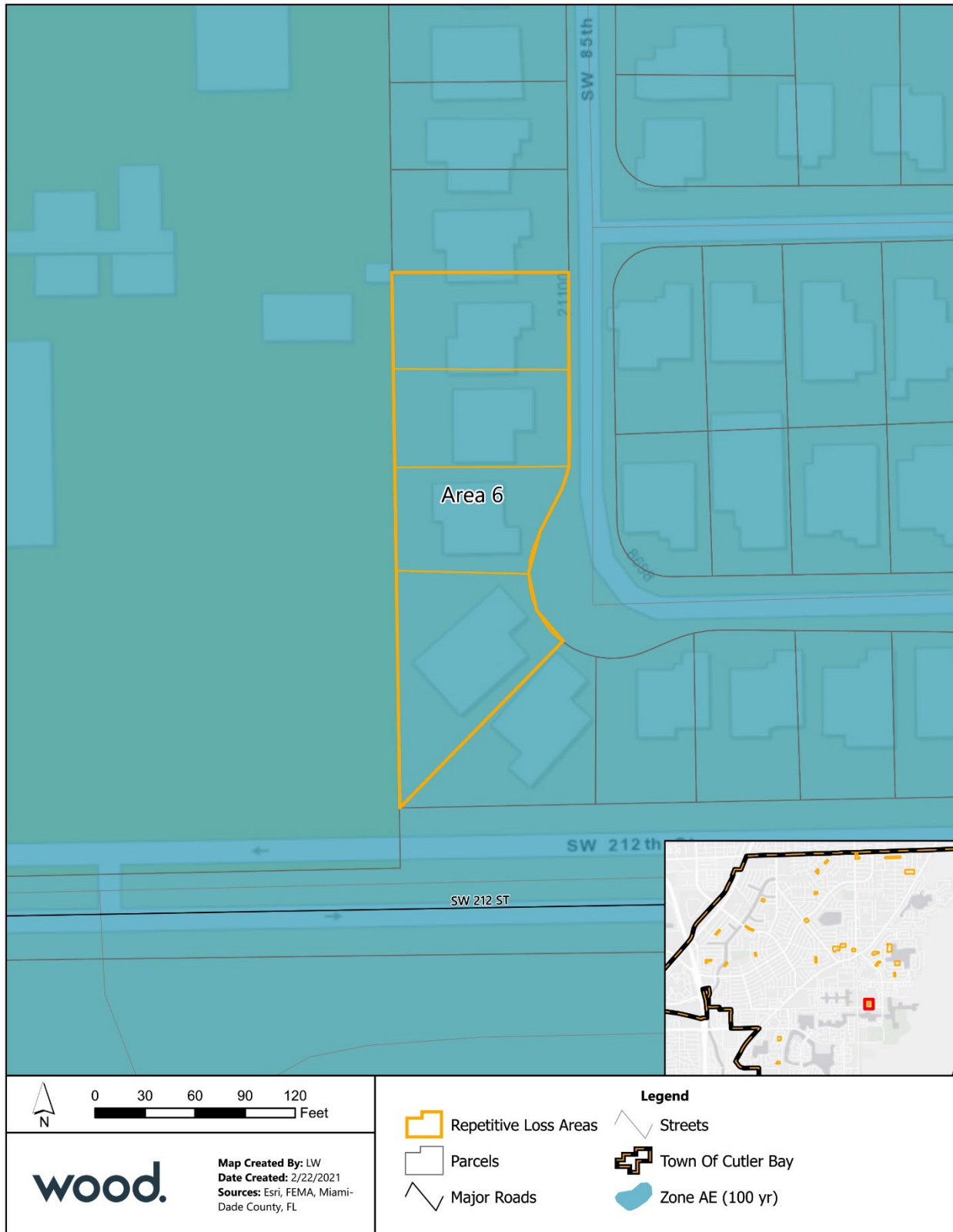


Property elevated on fill above street



HVAC elevated nearly 2 feet above grade

Figure 2.9 – Repetitive Loss Area 6



Repetitive Loss Area 6 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 85 Passage, adjacent to Cutler Bay High School. The area is south of a retention lake, but it is not directly adjacent to any flood sources. The area is in a private community with private roads. The homes are single story masonry structures with slab on grade foundations, built in 1989. Most of the structures appear to be elevated approximately 14 inches above the street, with the finished floor elevation approximately 8 inches above grade. One structure is elevated less than one foot. All visible HVAC units were less than 1 foot above grade. There was no observable source of flooding noted during the field survey; however, the Town has recently completed stormwater infrastructure improvements around this area, which may have mitigated flooding issues. Two survey respondents in this area noted no known history of flooding on their properties.

Table 2.7 – Overview for Repetitive Loss Area 6

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	SW 85 Psge

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 6

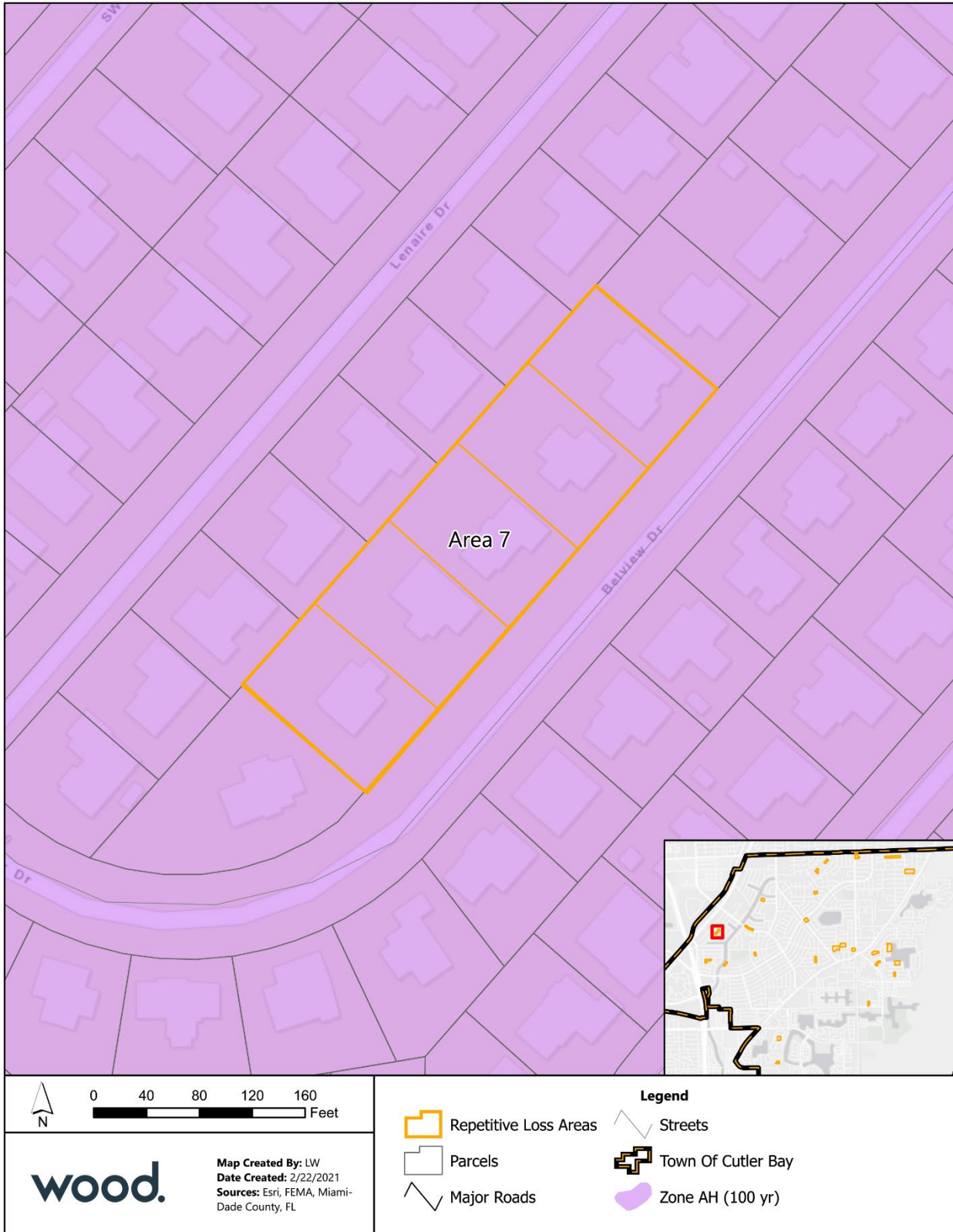


Finished floor elevated above grade



HVAC elevated above grade

Figure 2.10 – Repetitive Loss Area 7



Repetitive Loss Area 7 is located completely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on Belview Drive. The area sits northwest of the C-100B canal but is not directly adjacent to any flood sources. Storm drains in the area were previously observed to be severely clogged. The area is public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built in 1959, with some additions since then. All the structures appear to be elevated about a foot above street level on fill, with the finished floors elevated approximately 8 inches above grade. HVAC units were visible at grade. There was no observable source of flooding noted during the field survey other than possible stormwater drainage issues. One survey respondent from this area indicated they have not had any flooding issues during the last 18 years.

Table 2.8 – Overview for Repetitive Loss Area 7

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	4	5	Belview Dr

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 7

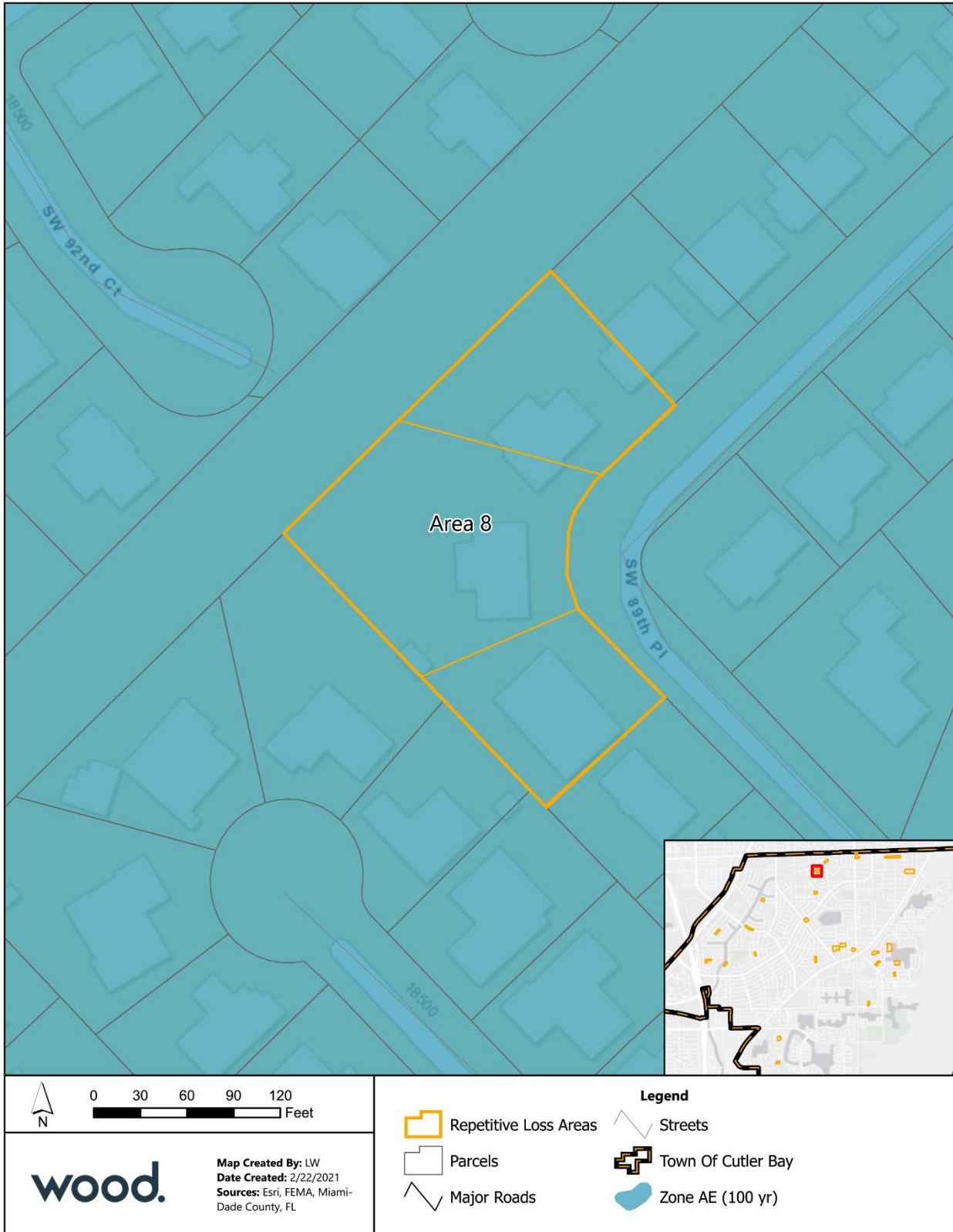


HVAC secured at grade



Home elevated approximately 8" above grade

Figure 2.11 – Repetitive Loss Area 8



Repetitive Loss Area 8 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 89 Place, located adjacent to the C100B canal. Aside from proximity to the canal, there was no obvious source of flooding noted during the field survey. The area is on public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built in 1972 with subsequent additions. The structures are elevated between 16-18 inches above street level on fill, with the finished floors elevated approximately 6 inches above grade. HVAC units were observed at or slightly above grade.

Table 2.9 – Overview for Repetitive Loss Area 8

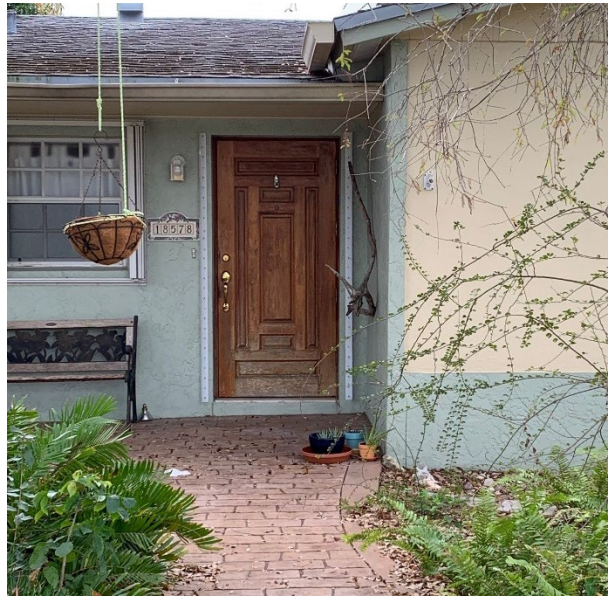
# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	2	3	SW 89 th Pl

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 8



HVAC secured at grade



Home elevated approximately 8" above grade

Figure 2.12 – Repetitive Loss Area 9



Repetitive Loss Area 9 is located completely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on Bel Aire Drive and SW 99 Avenue. The area sits southeast of the C100-B Canal; flooding in the area may be related to stormwater drainage and proximity to the canal. The area is located on public roads and there are storm drains in the area. The homes are single story masonry structures with slab on grade foundations, built in 1966. All the structures appear to be elevated between 12-16 inches above street level on fill, with the finished floors elevated approximately 6-12 inches above grade. One HVAC unit was elevated approximately two feet above grade; all others were less than 8" above grade or at grade.

Table 2.10 – Overview for Repetitive Loss Area 9

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	Bel Aire Dr, SW 99 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 9

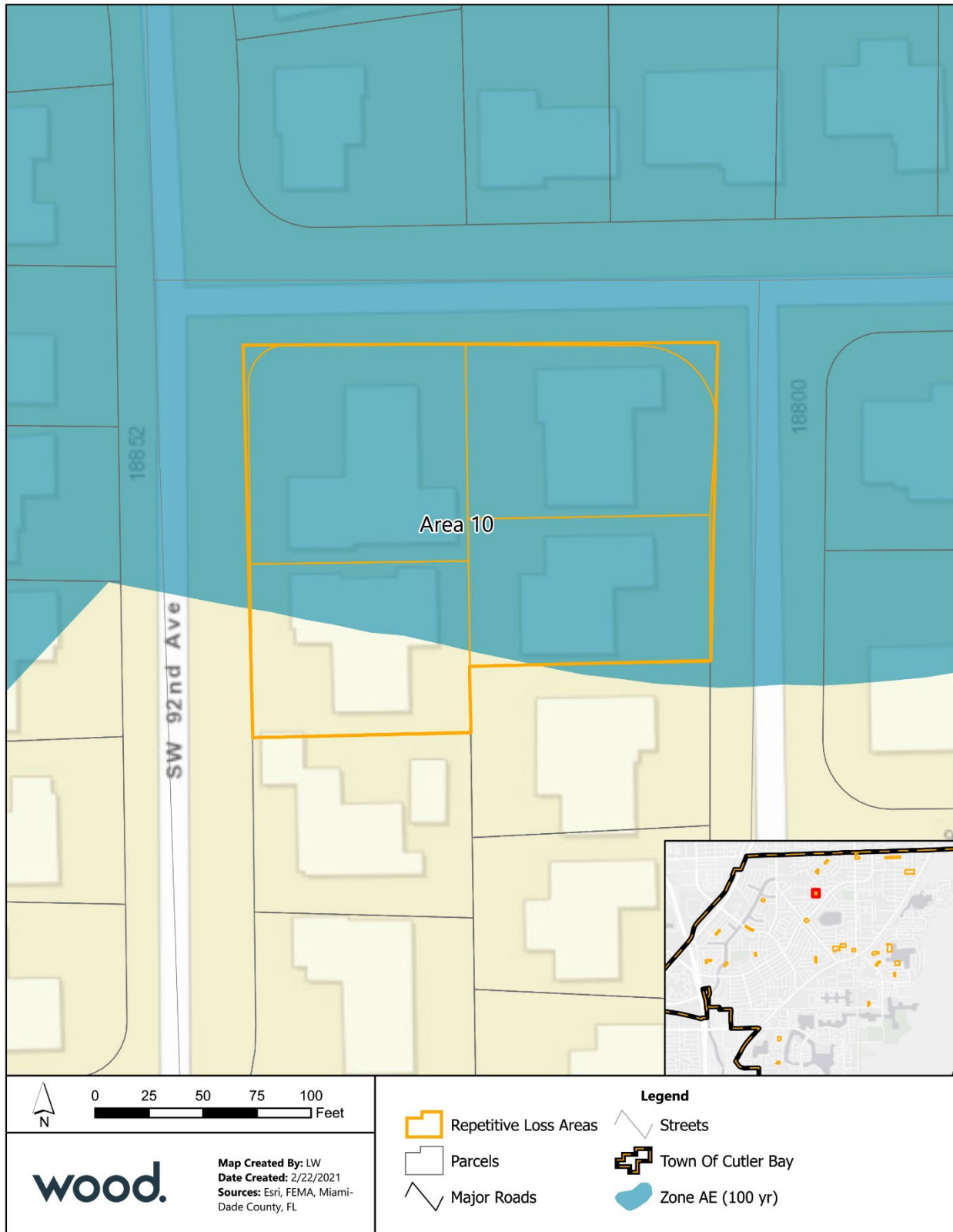


HVAC elevated above first floor elevation



HVAC below first-floor elevation

Figure 2.13 – Repetitive Loss Area 10



Repetitive Loss Area 10 is located almost completely in the 1-percent-annual-chance floodplain in Zone AE, with part of one property falling in Zone X. The area comprises residential structures on SW 91 Avenue and SW 92 Avenue. The area is on public roads and there are several storm drains in the area. It is possible that any flooding issues in the area may be mitigated by stormwater improvements. The homes are single story masonry structures with slab on grade foundations, built between 1969 and 1972. All the structures appear to be elevated a foot or less above street level, with finished floors approximately 8 inches above grade. One property owner in this area responded to the survey and reported not having experienced any flooding in this area. Observable HVAC units were at or slightly above grade. There was no flood source noted during the field survey.

Table 2.11 – Overview for Repetitive Loss Area 10

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	SW 91 Ave, SW 92 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 10

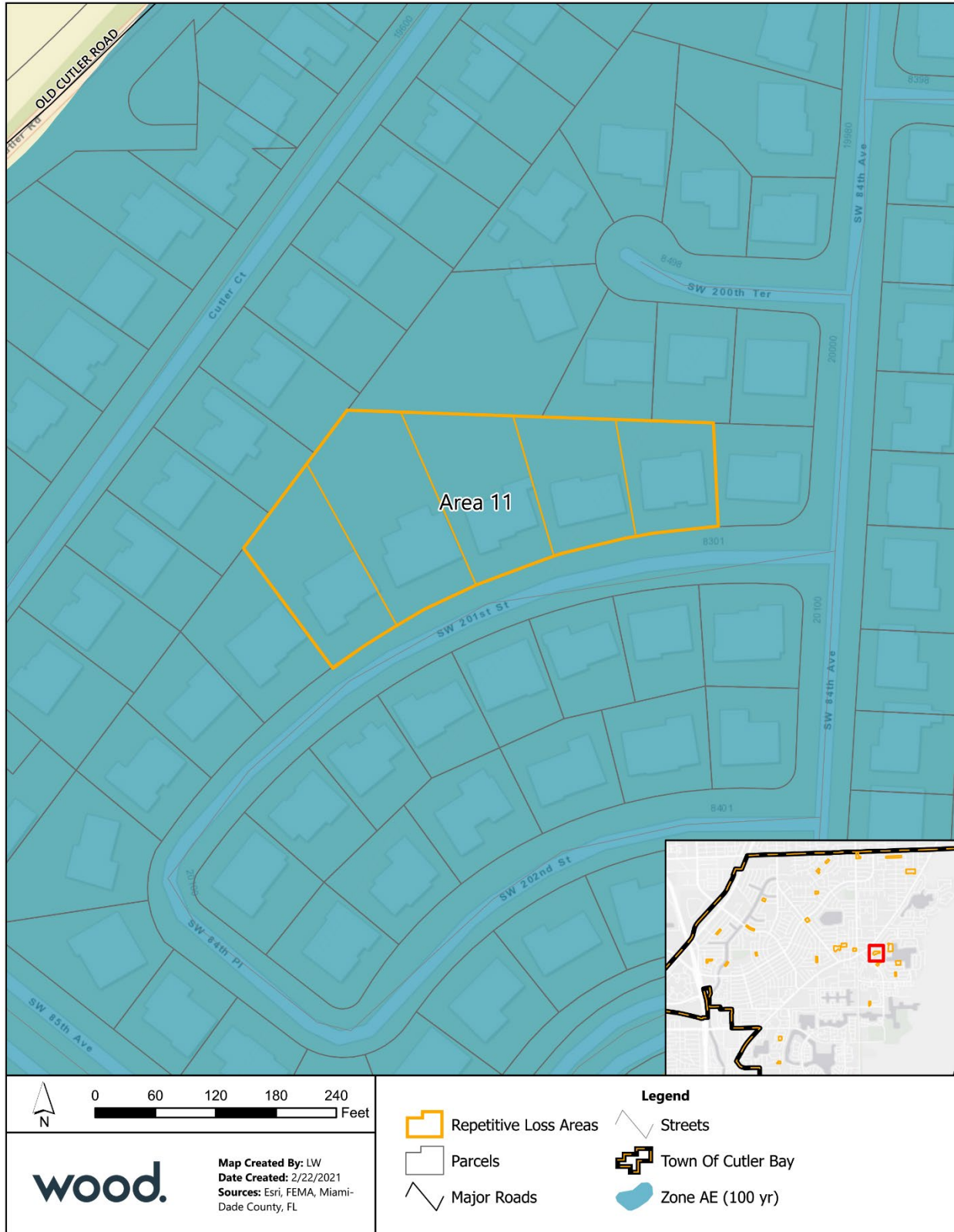


Property elevated 8" above grade, guttering drains to front yard at foundation



Home on fill one foot above street level

Figure 2.14 – Repetitive Loss Area 11



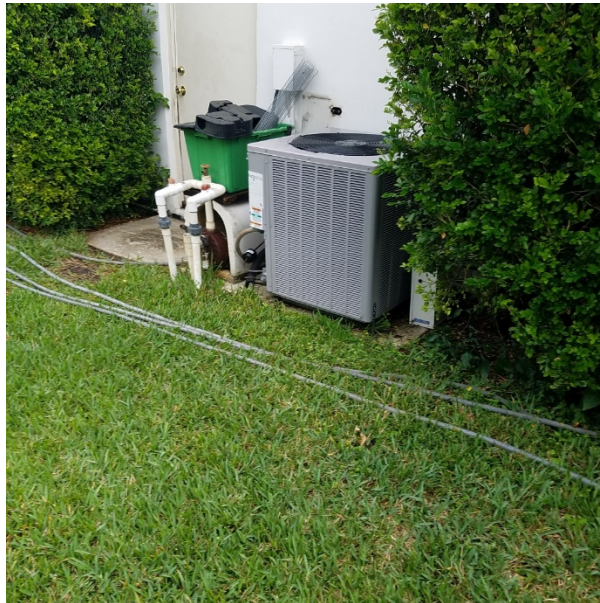
Repetitive Loss Area 11 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 201 Street. The area sits just south of Old Cutler Road and west of Saga Bay Retention Lake. The area is on public roads and there are storm drains nearby but not in the area. The homes are single story masonry structures with slab on grade foundations, built in 1973. All the structures appear to be elevated about one foot above street level, with the finished floors elevated approximately 6-8 inches above grade. Three HVAC units were observed at or slightly above grade; all were below the finished floor elevation. Two property owners in this area responded to the survey and reported past flooding, with depths ranging from 5 inches in the yard to 14 inches over the first floor. These respondents attributed flooding issues to storm sewer backup and drainage from other properties. One reported the last flood event was in 1992 during Hurricane Andrew. There was no observable source of flooding noted during the field survey. It is possible that drainage and/or stormwater improvements could mitigate flooding in the area.

Table 2.12 – Overview for Repetitive Loss Area 11

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	4	5	SW 201 St

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 11

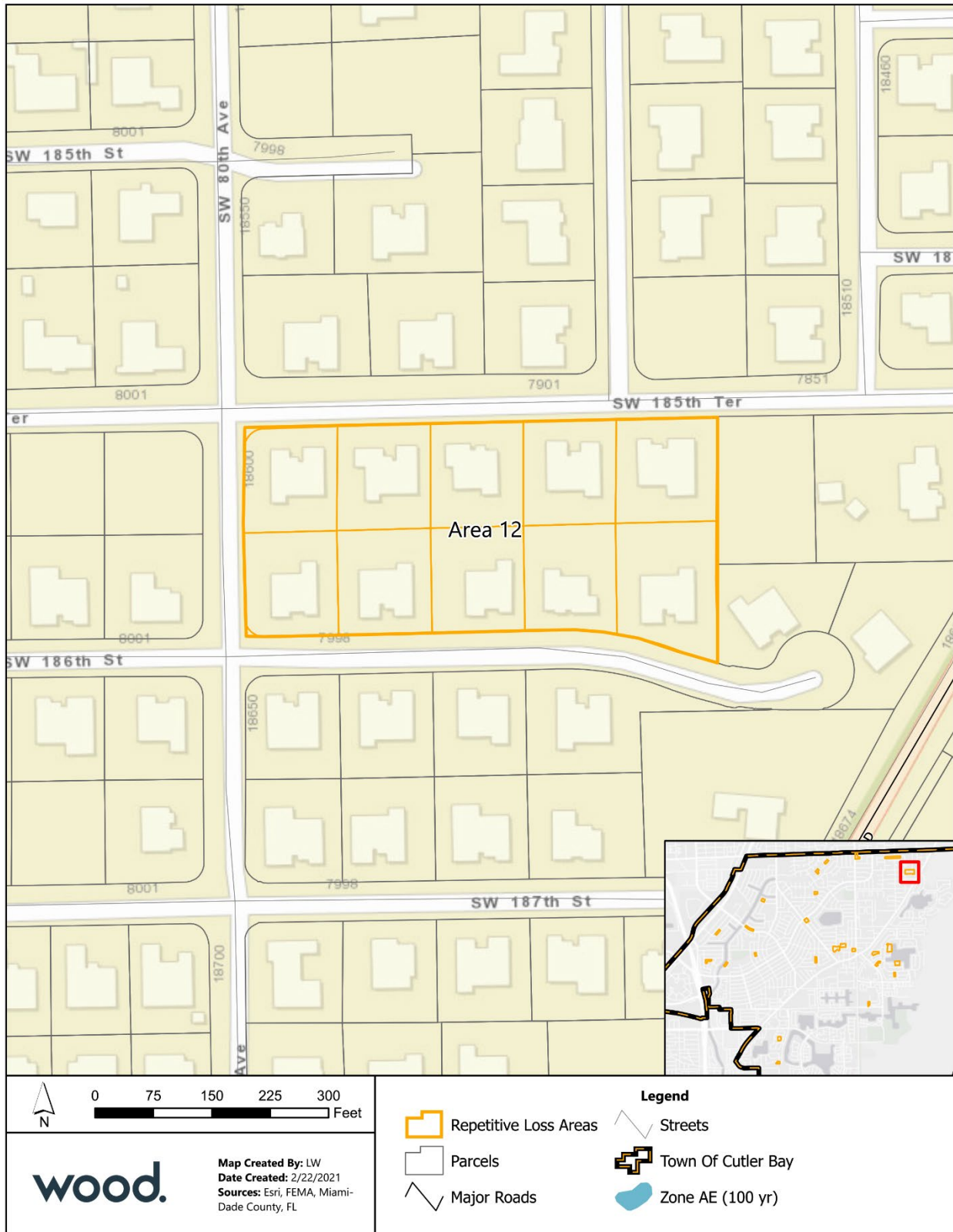


Property elevated on fill above street



Home elevated approximately 8" above grade

Figure 2.15 – Repetitive Loss Area 12



Repetitive Loss Area 12 is located completely outside the 1-percent-annual-chance floodplain in unshaded Zone X. The area comprises one- and two-story residential structures on SW 185 Terrace and SW 186 Street, just northwest of Old Cutler Road. The area is not adjacent to any ponds or canals, and no obvious flood source could be identified during the field survey. The area is in the Cutler Country Grove neighborhood, located on public roads with storm drains nearby. The homes are masonry structures with slab on grade foundations, built between 1994 and 1995. Elevation of the structures varies across the area, with some structures elevated as much as 12-16 inches above grade and 30-36 inches above street level, while others are only 6 inches above grade and 18 inches above street level. These variations across lots may affect drainage patterns and flooding in the area. Where accessible, HVAC units were found to be less than half a foot above grade. Three property owners in this area reported never having experienced flooding in this area; one property owner reported brief flooding during Katrina and noted that during rain events the street floods due to clogged storm drains. It is possible increased maintenance could mitigate flooding issues in this area.

Table 2.13 – Overview for Repetitive Loss Area 12

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	8	10	SW 185 Ter, SW 186 St

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 12

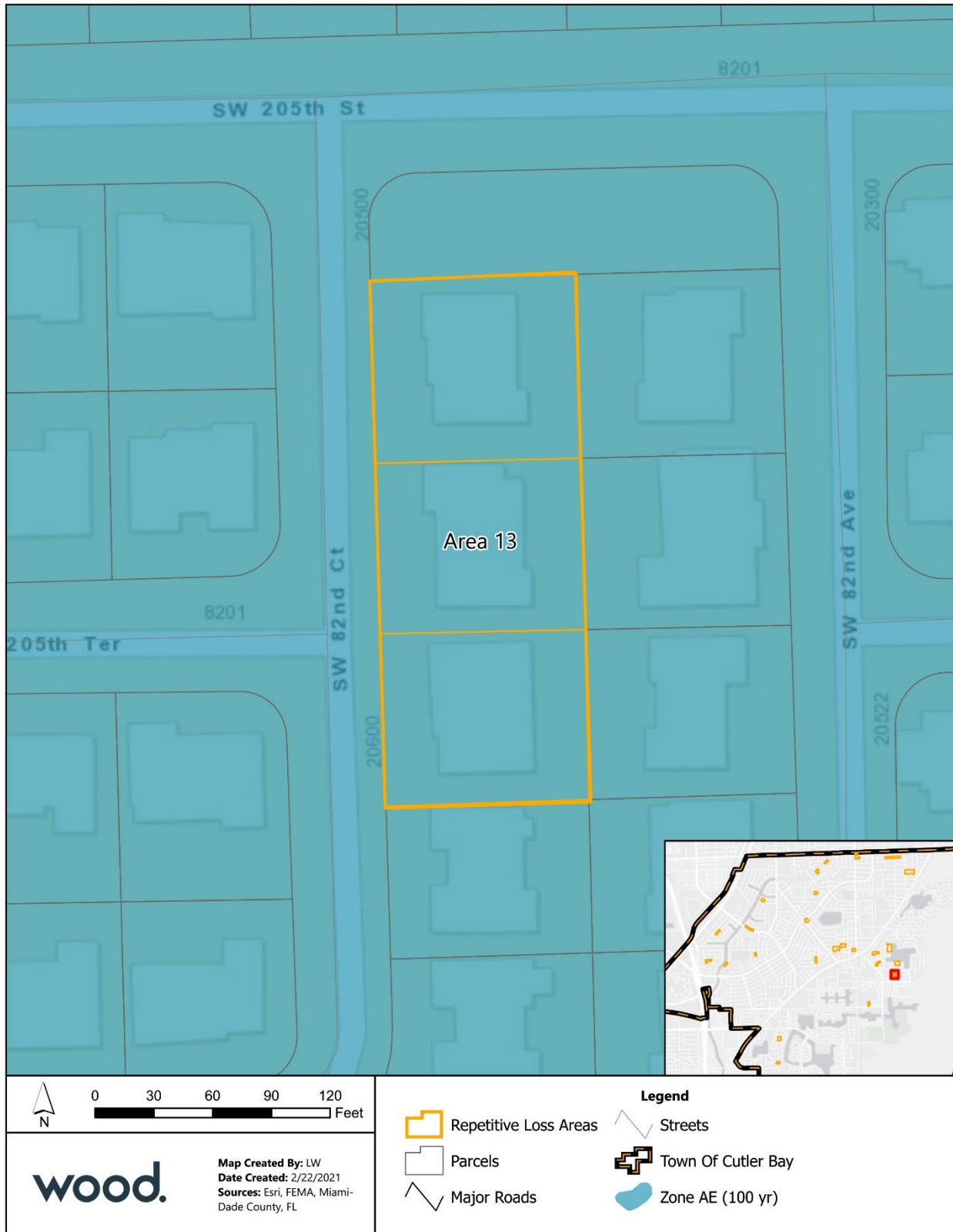


Stormwater drain in front of property



First floor elevated one foot above grade

Figure 2.16 – Repetitive Loss Area 13



Repetitive Loss Area 13 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 82 Court, a few blocks south of Saga Bay Retention Lake. The area is located on public roads and there are multiple storm drains nearby. Stormwater backup or drainage issues could cause flooding in the area. The homes are single story masonry structures with slab on grade foundations, built in 1974. All the structures appear to be elevated between 10-12 inches above street level, with the finished floors elevated approximately 6-8 inches above grade. None of the HVAC units were visible from the right of way. No source of flooding could be determined during the field survey.

Table 2.14 – Overview for Repetitive Loss Area 13

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	2	3	SW 82 Ct

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 13

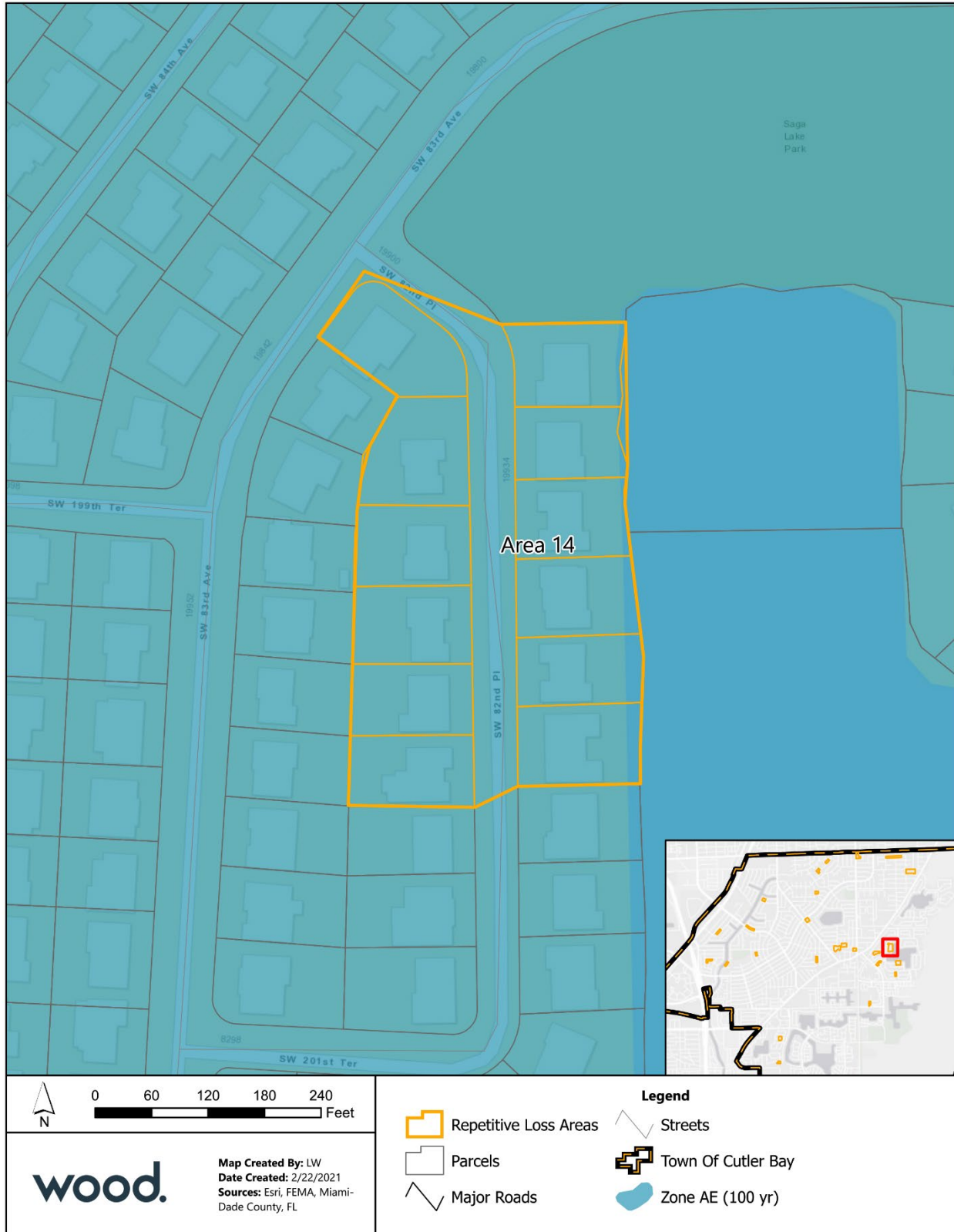


Property elevated approximately 1' above street



Home elevated approximately 6" above grade; guttering drains to driveway

Figure 2.17 – Repetitive Loss Area 14



Repetitive Loss Area 14 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 82 Place and SW 83 Avenue. The area sits adjacent to Saga Bay Retention Lake on public roads with nearby storm drains. The homes are single story masonry structures with slab on grade foundations, built between 1973 and 1974. Most of the structures appear to be elevated at least 12 inches above street level on fill, with the finished floors at least 8-10 inches above grade; however, a few structures were only 4-6" above grade and 8-10" above street level. These elevation variations may affect drainage patterns and flooding in the area. Few HVAC units were visible from the right-of-way, but two HVAC units were found to be elevated 3-4 feet above grade; two others were at grade. Two residents of this area responded in the survey that they experienced flooding in 1992/from Hurricane Andrew; both reported 3 to 4 feet of flooding over their first floor. However, neither reported additional flooding since then.

Table 2.15 – Overview for Repetitive Loss Area 14

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	10	12	SW 82 Pl, SW 83 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 14

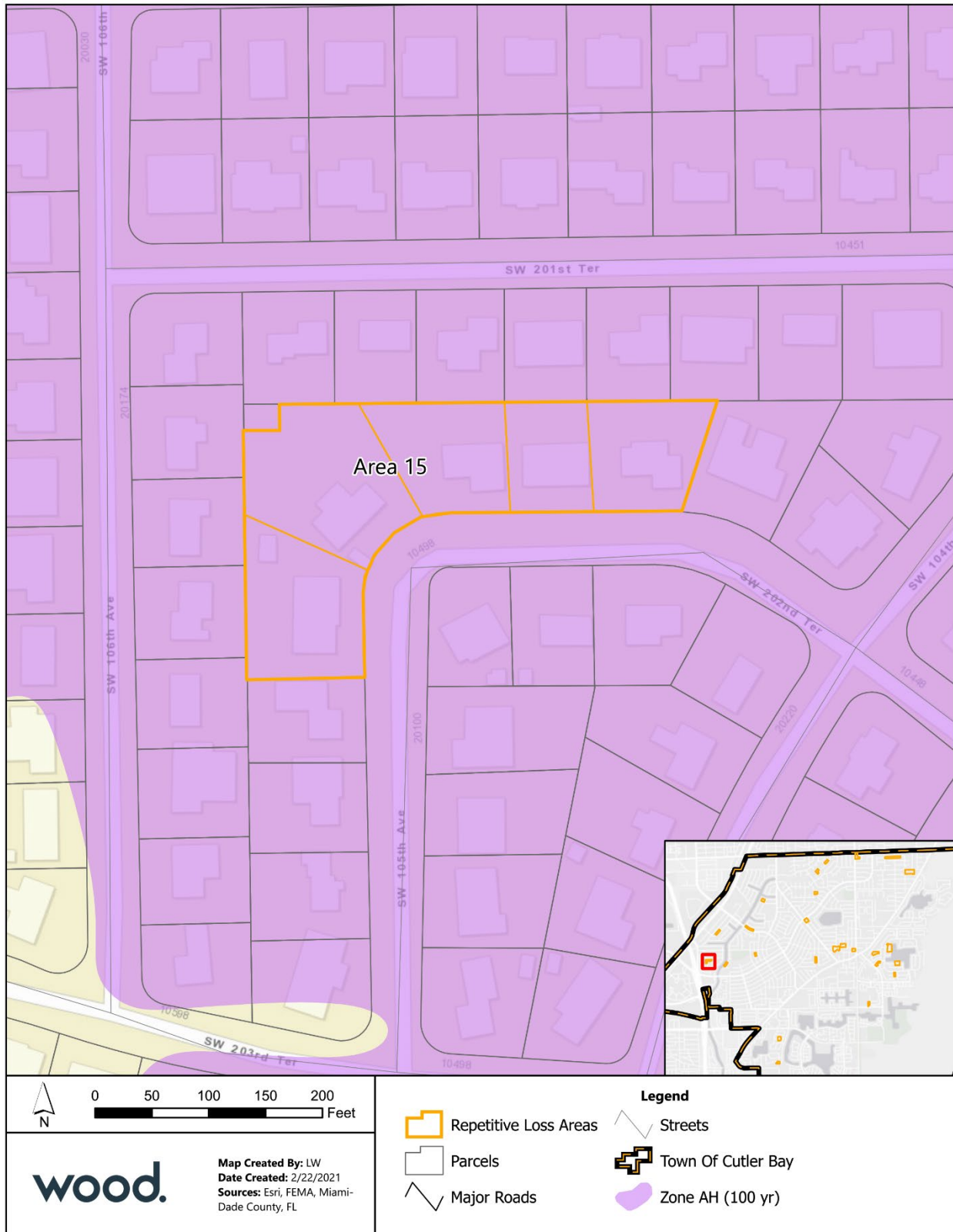


Some yard waste accumulating at edge of driveway and street



HVAC elevated and secured 3' above grade

Figure 2.18 – Repetitive Loss Area 15



Repetitive Loss Area 15 is located completely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on SW 202 Terrace and SW 105 Avenue. The area sits a few blocks west of the C-100B Canal. The area is in the Benson Manor neighborhood, on public roads with a storm drain nearby. The homes are single story masonry structures with slab on grade foundations, built in 1963; several have undergone subsequent additions. All the structures appear to be elevated between 12-16 inches above street level on fill, with the finished floors elevated approximately 6-10 inches above grade. Only two HVAC units were visible from the right of way; both were at or slightly above grade. Some structures have a substantial amount of impervious surface, which may affect drainage and flooding. There was no observable source of flooding noted during the field survey. One survey respondent in this area reported not having experienced any flooding during their 5-10 years of home ownership.

Table 2.16 – Overview for Repetitive Loss Area 15

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	4	5	SW 202 Ter, SW 105 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 15



Property elevated on fill above street



Parking pad may limit drainage away from house

Figure 2.19 – Repetitive Loss Area 16



Repetitive Loss Area 16 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 218 Street in the Lakes by the Bay neighborhood. The area sits a few blocks west of Short-billed Dowitcher Lake but is not directly adjacent to any flood sources. The homes are one- and two-story masonry structures with slab on grade foundations, built between 1988 and 1989. Several HVAC units were observed at grade. The elevation of structures varied significantly from 12-24 inches above street level, with the finished floors varying between 6-14 inches above grade. These variations may affect drainage, with the possibility that water may pool toward the properties at lower elevation during flood events. One property owner noted in their survey response that neighbors' guttering drains toward their property and that their patio floods during heavy rain events. Another survey respondent noted that heavy rains cause flooding on SW 216th Street but their property has not been affected by flooding. A source of flooding could not be determined during the field survey.

Table 2.17 – Overview for Repetitive Loss Area 16

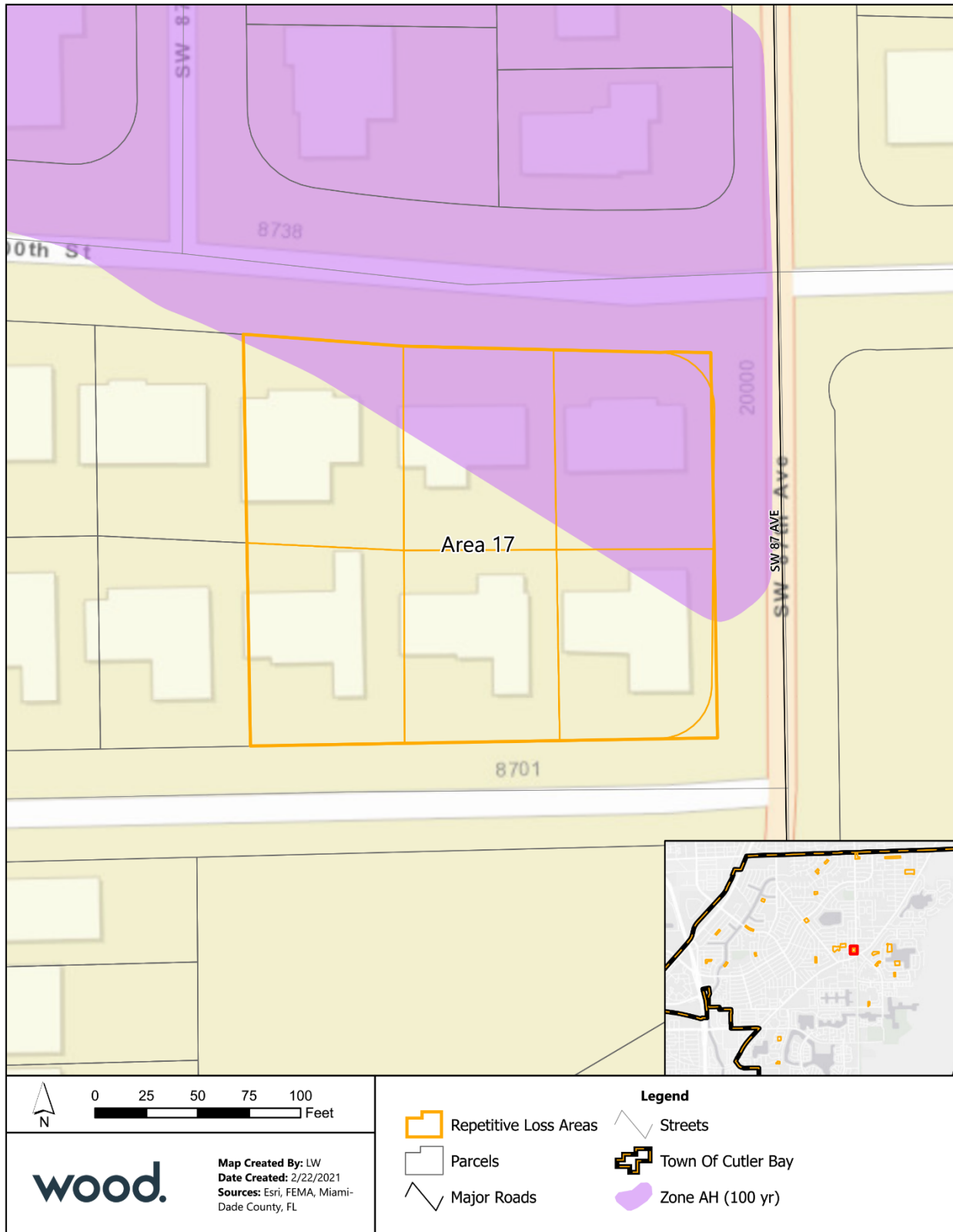
# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	5	6	SW 218 St

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 16



Figure 2.20 – Repetitive Loss Area 17



Repetitive Loss Area 17 is located partly in the 1-percent-annual-chance floodplain in Zone AH, with the remainder in the unshaded Zone X. The area comprises residential structures on SW 200 Terrace and SW 200 Street. The area sits just north of Old Cutler Road; it is not directly adjacent to any flood sources. The area is located on public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built between 1969 and 1971. All the structures appear to be elevated between 12-30 inches above street level on fill, with the finished floors elevated approximately 4-6 inches above grade. Several HVAC units were observed at grade. One survey respondent indicated they have not experienced any flooding in this area. A source of flooding could not be determined during the field survey.

Table 2.18 – Overview for Repetitive Loss Area 17

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	5	6	SW 200 Ter, SW 200 St

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 17

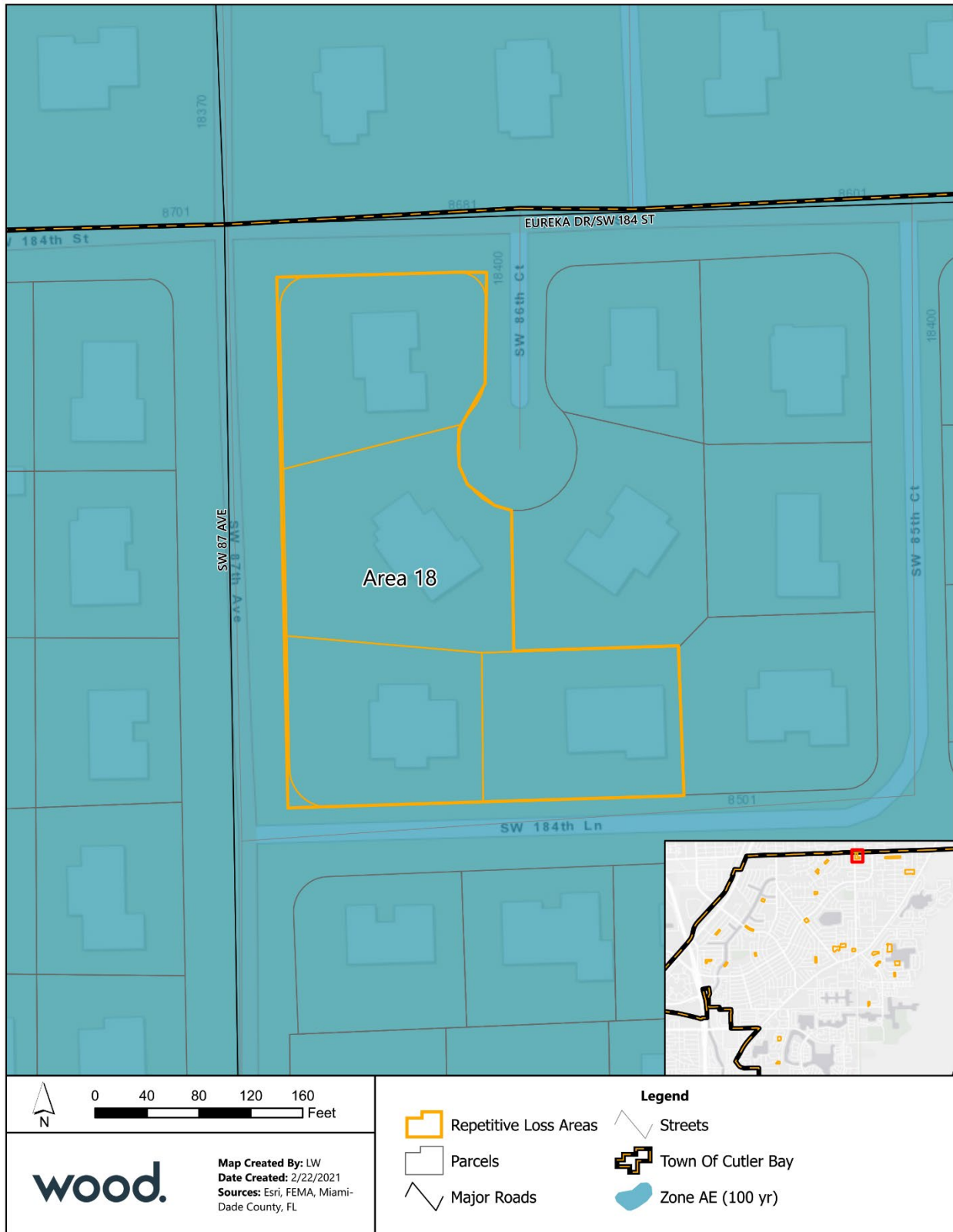


Guttering draining onto driveway



HVAC at grade

Figure 2.21 – Repetitive Loss Area 18



Repetitive Loss Area 18 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 184 Lane and SW 86 Court. The area is not directly adjacent to any flood sources. The homes are single story masonry structures with slab on grade foundations, built between 1974 and 1978, with subsequent additions. Properties in this area are elevated between 42-48 inches above street level on fill, with finished floor elevations roughly 6-8 inches above grade. Two HVAC units were visible during field survey; both were at or slightly above grade. Three survey respondents in this area indicated they have not experienced any flooding on their properties. There was no identifiable source of flooding noted during the field survey; however, it was noted that one property has a rear patio at grade which could be affected by flooding off of SW 87 Ave.

Table 2.19 – Overview for Repetitive Loss Area 18

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	SW 184 Ln, SW 86 Ct

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 18

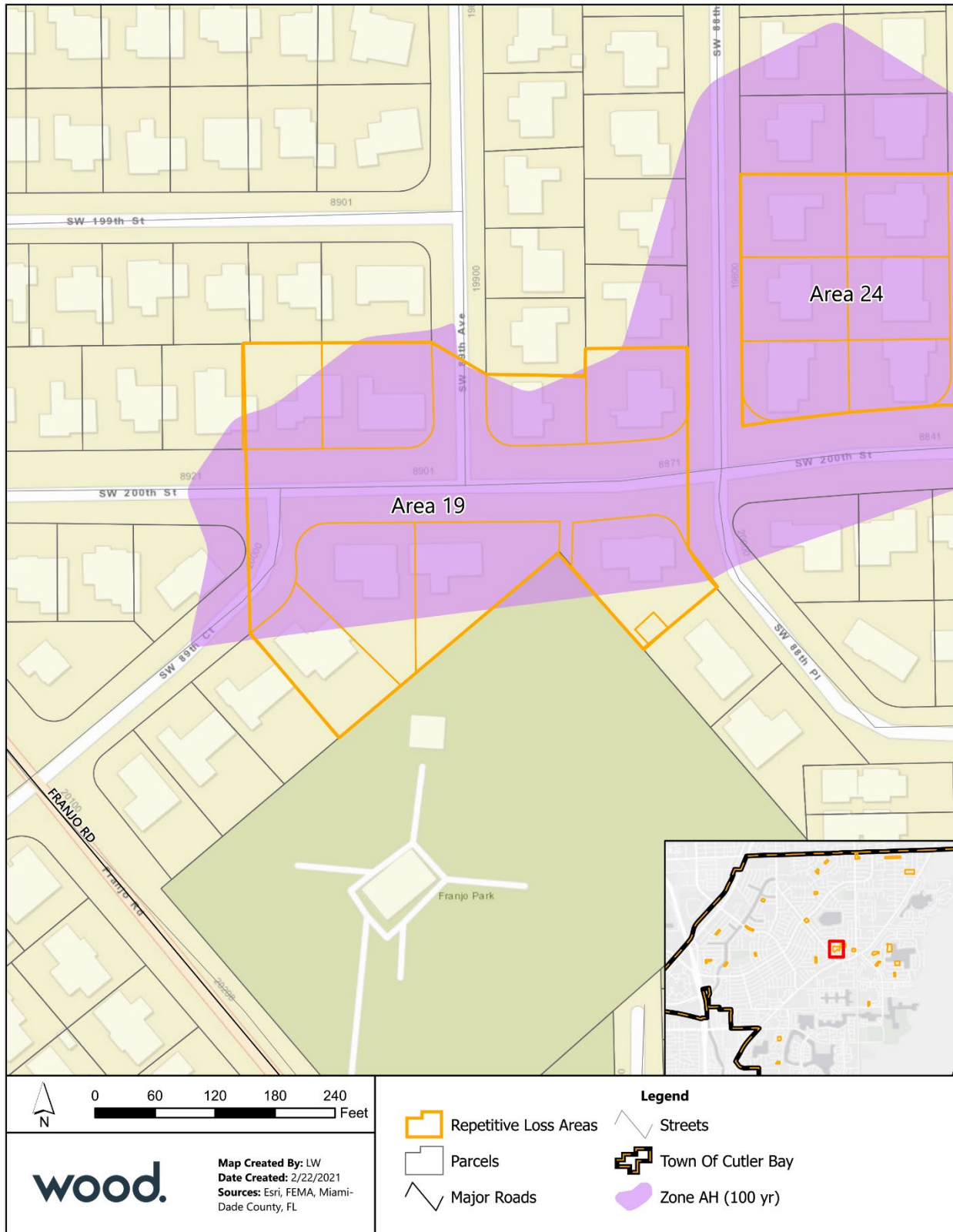


Property elevated on fill approximately 42" above street level



Guttering drains off front patio to garden area graded away from house

Figure 2.22 – Repetitive Loss Area 19



Repetitive Loss Area 19 is located partly in the 1-percent-annual-chance floodplain in Zone AH, with the remainder of the area falling in the unshaded Zone X. The area comprises residential structures on SW 200 Street, SW 89 Place, SW 88 Place and SW 89 Court. The area is northwest of Old Cutler Road and is not directly adjacent to any flood sources. The area is in the Cutler Ridge Pines neighborhood and sits just north of Franjo Park. The homes are single story masonry structures with slab on grade foundations, built between 1961 and 1970. Property elevations vary significantly across this area; finished floor elevations are between 4-8 inches above grade, but some lots are elevated as much as 32 inches above street level on fill, while others are only about 10 inches above street level. Two HVAC units were found at or slightly above grade. One property owner responded to the survey and indicated that they experienced flooding over their first floor which they attributed to storm sewer backup and drainage from nearby properties. They noted that they flooded three times prior to the addition of extra flood drains to their intersection, as 200 St and 89 Ave as well as 200 Street and 88 Place were the lowest points in the neighborhood. They have not experienced any flooding since the improvements were made.

Table 2.20 – Overview for Repetitive Loss Area 19

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	8	9	SW 200 St, SW 89 Ave, SW 88 Pl, SW 89 Ct

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 19

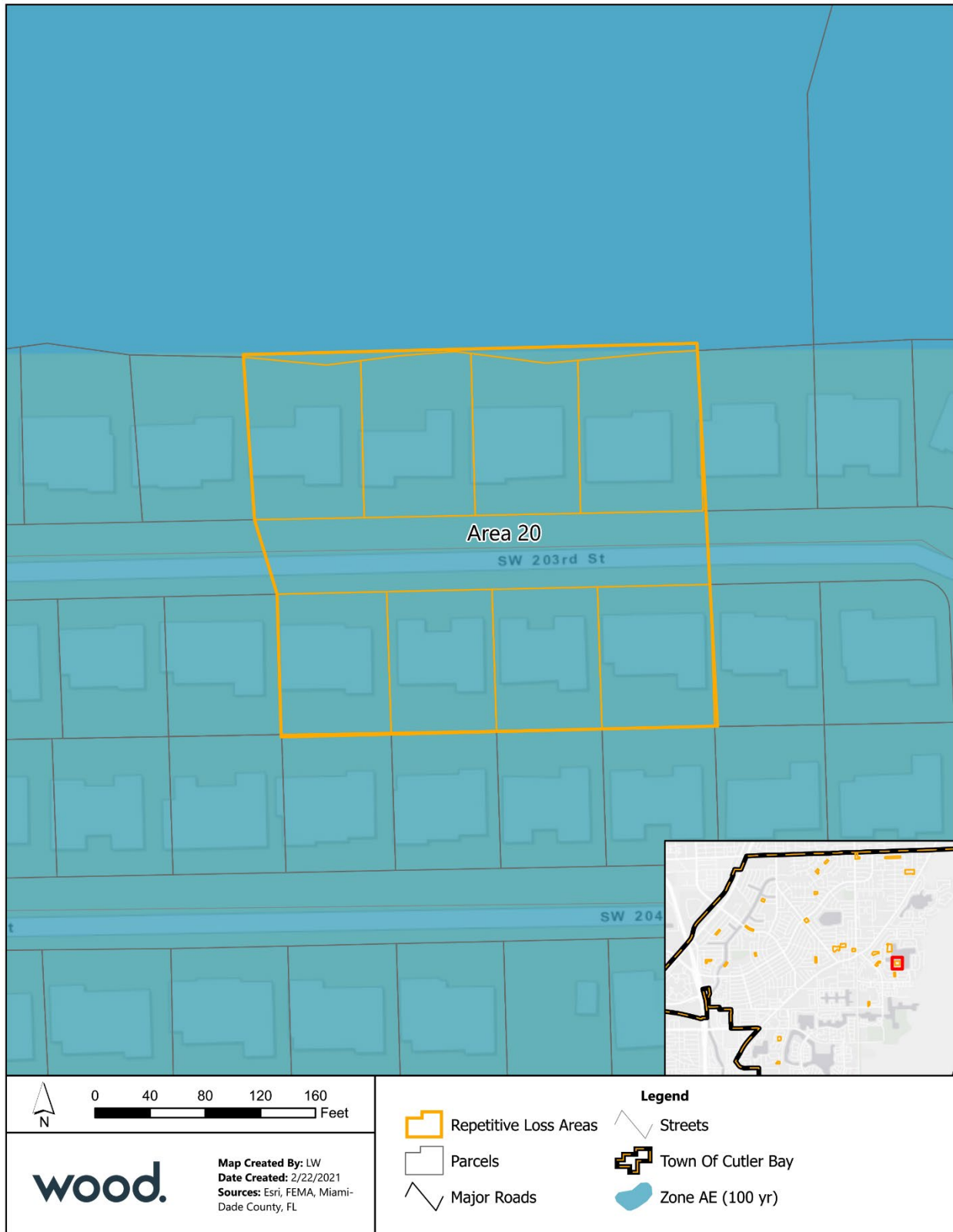


Storm drain in front of property



HVAC elevated less than a foot

Figure 2.23 – Repetitive Loss Area 20



Repetitive Loss Area 20 is located completely in the 1-percent-annual-chance floodplain in Zone AE. The area comprises residential structures on SW 203 Street, located directly adjacent to Saga Bay Retention Lake. The area is located on public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built between 1970 and 1974. All the structures appear to be elevated between 10-12 inches above street level on fill, with the finished floors elevated approximately 6-8 inches above grade. Three HVAC units were visible at or slightly above grade. One property owner in the area indicated that their only flood insurance claim was after Hurricane Andrew. Property owners in nearby areas reported that Saga Bay Retention Lake has previously exceeded its capacity during and after heavy rain events and has flooded surrounding areas.

Table 2.21 – Overview for Repetitive Loss Area 20

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	6	8	SW 203 St

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 20

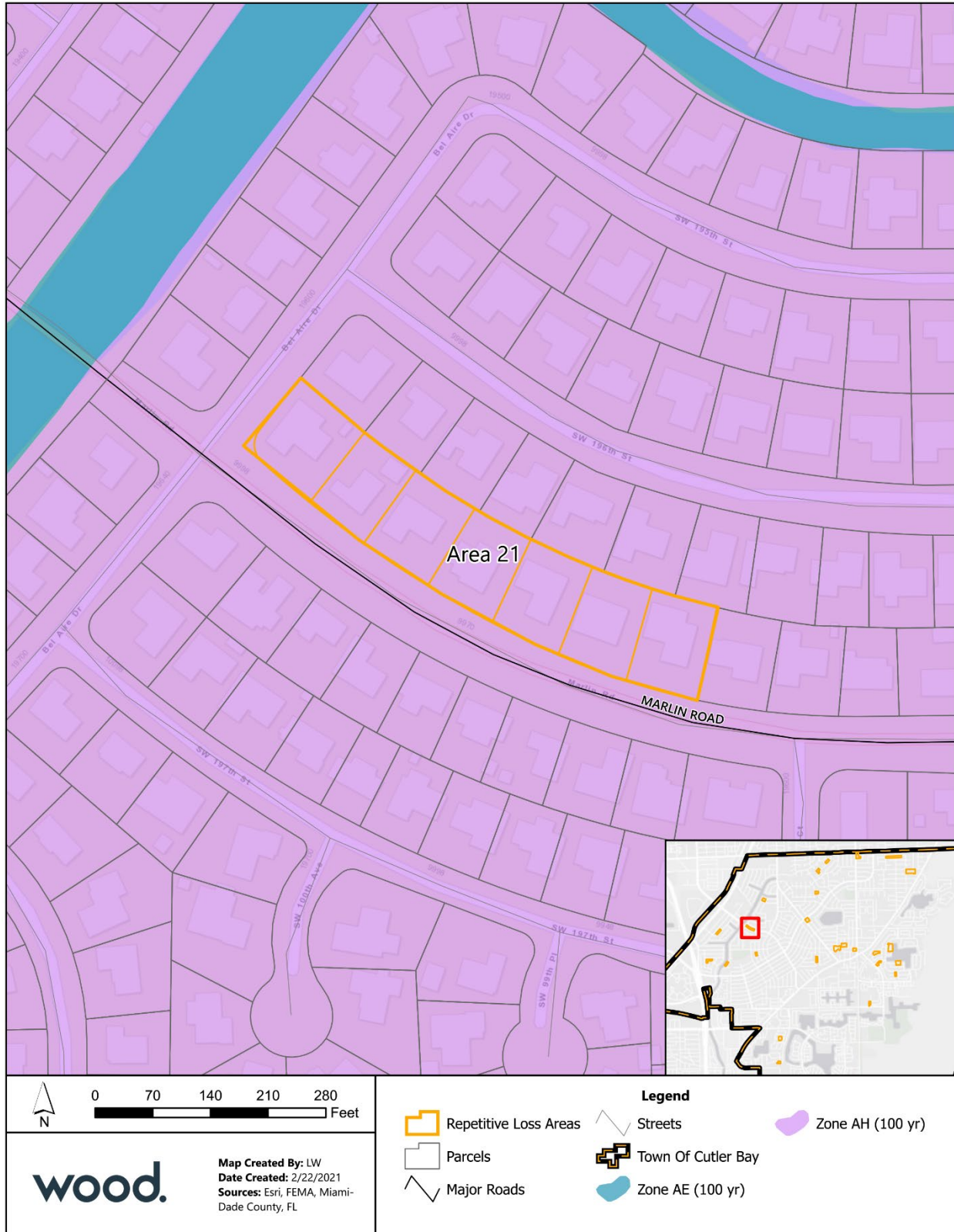


Guttering drains to front garden bed; slight grading away from house



Home elevated approximately 6" above grade

Figure 2.24 – Repetitive Loss Area 21



Repetitive Loss Area 21 is located completely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on Marlin Road near the C-100B Canal. The area is located on public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built in 1967. All the structures appear to be elevated between 14-24 inches above street level on fill, with the finished floors elevated approximately 6-10 inches above grade. Five HVAC units were visible at or slightly above grade. There was no observable source of flooding noted during the field survey. One property owner indicated never having experienced a flood in this area.

Table 2.22 – Overview for Repetitive Loss Area 21

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	5	7	Marlin Rd

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 21

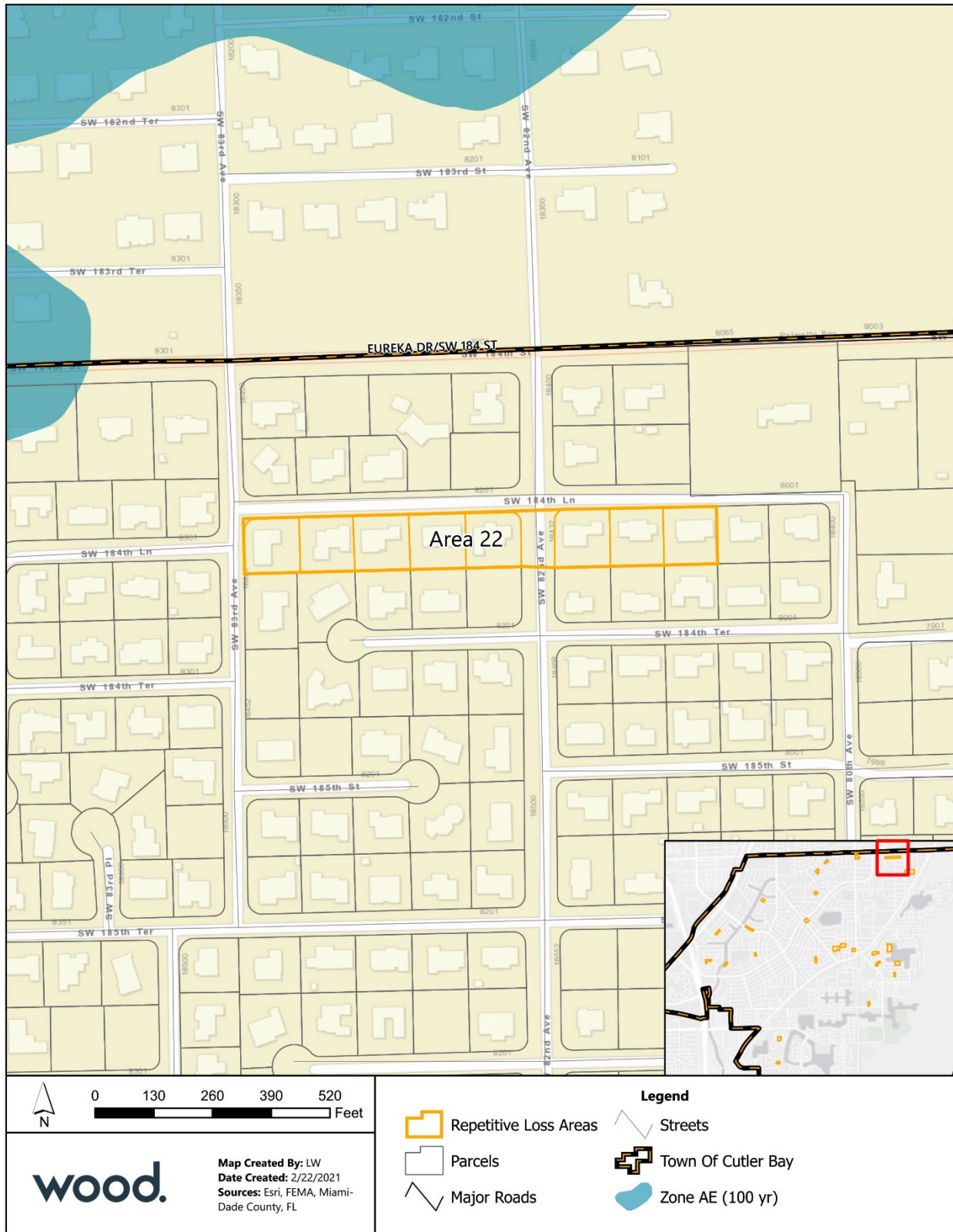


Home has partial guttering; drains next to foundation



HVAC elevated approximately 4" above grade

Figure 2.25 – Repetitive Loss Area 22



Repetitive Loss Area 22 is located completely outside the 1-percent-annual-chance floodplain in the unshaded Zone X. The area comprises residential structures on SW 184 Lane and SW 82 Avenue. The area is not near any obvious flood sources. The area includes Benz Estates and Eureka Drive Estates neighborhoods and is on public roads with numerous storm drains in the area. Some storm drains had debris and weeds growing over them during the field survey. The homes are one- and two-story masonry structures with slab on grade foundations, built between 1961 and 1978; several structures have since had additions. Structure elevations vary throughout the area, from 10-18 inches above street level on fill, with the finished floors elevated between 6-16 inches above grade. Two HVAC units were visible at grade and two were slightly above grade. There was no observable source of flooding noted during the field survey. One survey respondent indicated that they have never experienced a flood in this area. Flooding issues may be related to stormwater drainage issues and thus highly localized.

Table 2.23 – Overview for Repetitive Loss Area 22

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	6	8	SW 184 Ln, SW 82 Ave

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 22

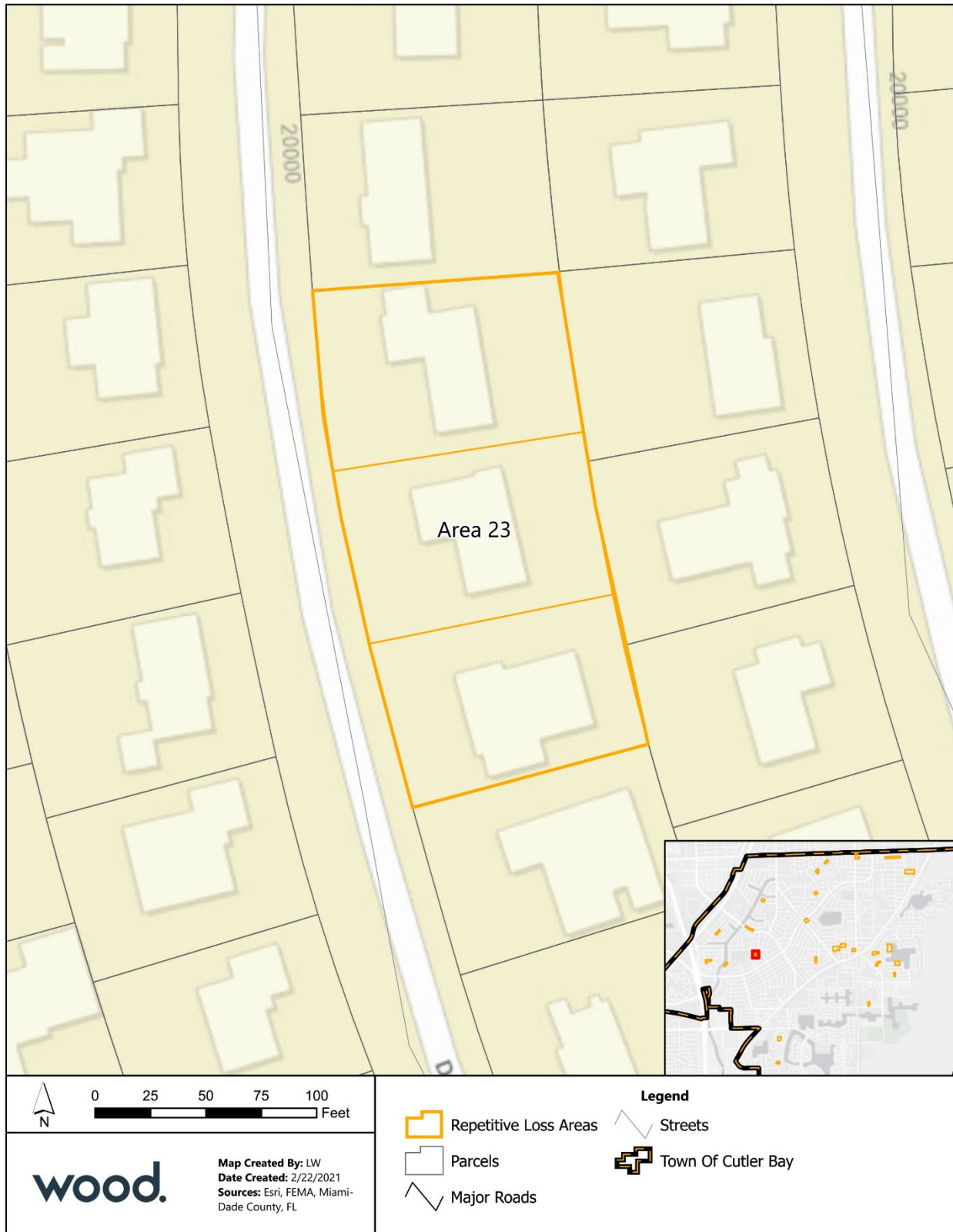


Yard debris accumulating at street



Home elevated approximately 16" above street

Figure 2.26 – Repetitive Loss Area 23



Repetitive Loss Area 23 is located completely outside the 1-percent-annual-chance floodplain in the unshaded Zone X. The area comprises residential structures on Dothan Road. The area is not directly adjacent to any flood sources. The area is on public roads with storm drains nearby. The homes are single story masonry structures with slab on grade foundations, built in 1956 with some subsequent additions. The structures are elevated between 14-20 inches above street level on fill, with the finished floors elevated approximately 10-12 inches above grade. All HVAC units were at or slightly above grade. No flood source could be determined during the field survey, but it is possible that stormwater improvements could mitigate any flood issues. One property owner indicated never having experienced a flood in this area.

Table 2.24 – Overview for Repetitive Loss Area 23

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	2	3	Dothan Rd

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 23

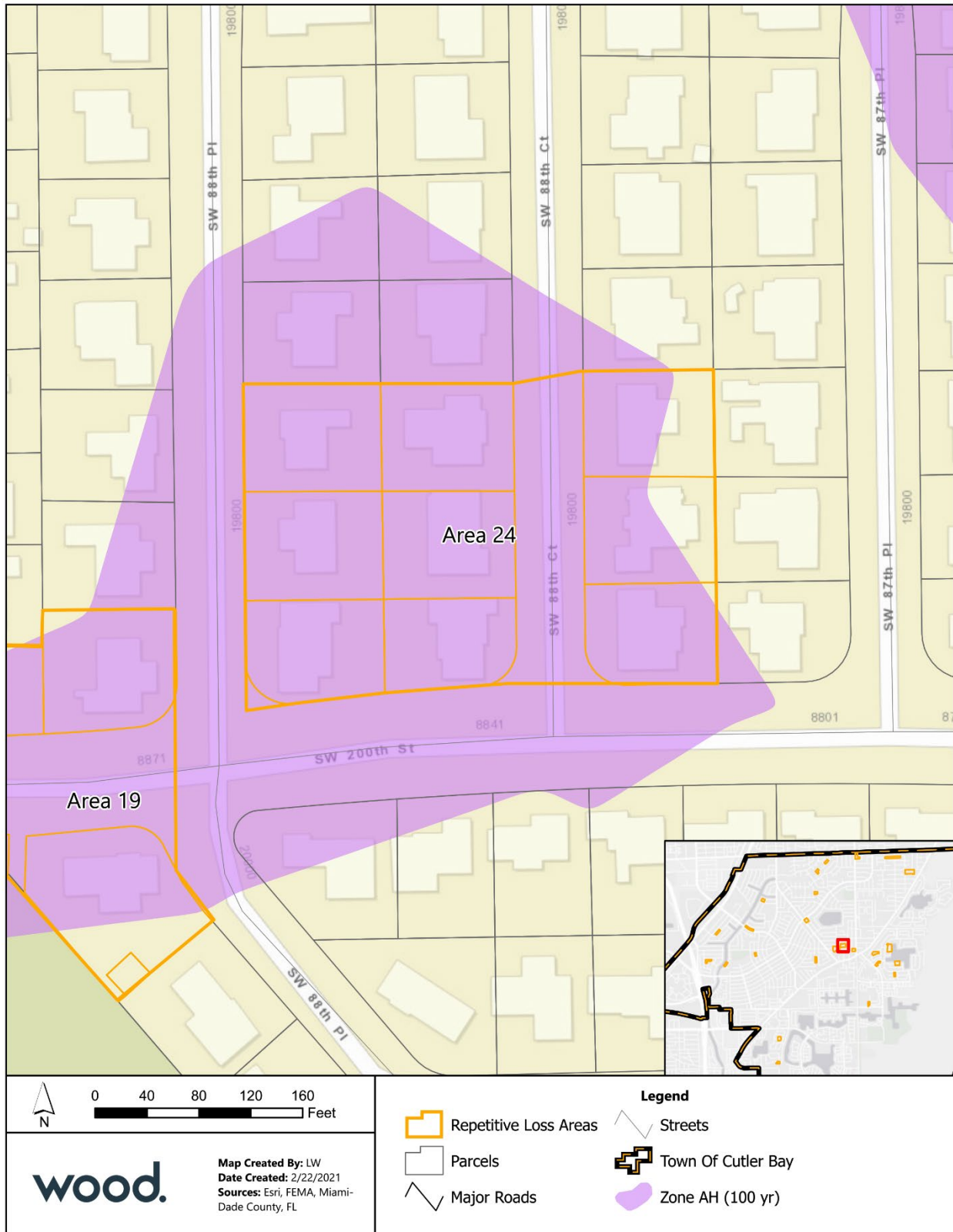


Driveway/Parking pad creates large amount of impervious surface



Finished floor elevated approximately 10" above grade

Figure 2.27 – Repetitive Loss Area 24



Repetitive Loss Area 24 is located almost entirely in the 1-percent-annual-chance floodplain in Zone AH. The area comprises residential structures on SW 88 Place and SW 88 Court. The area sits north of Cutler Ridge Road; it is not directly adjacent to any flood sources. The area is on public roads with storm drains in the area. The homes are single story masonry structures with slab on grade foundations, built between 1961 and 1968. All the structures appear to be elevated between 8-12 inches above street level, with the finished floors elevated approximately 4-8 inches above grade. Several HVAC units were visible at or slightly above grade; however, some property owners have elevated HVAC and other equipment a foot or more above grade. Two property owners reported repeat flooding issues during the field survey. It is possible that improving the stormwater system capacity could mitigate flood issues.

Table 2.25 – Overview for Repetitive Loss Area 24

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	7	9	SW 88 Pl, SW 88 Ct

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 24

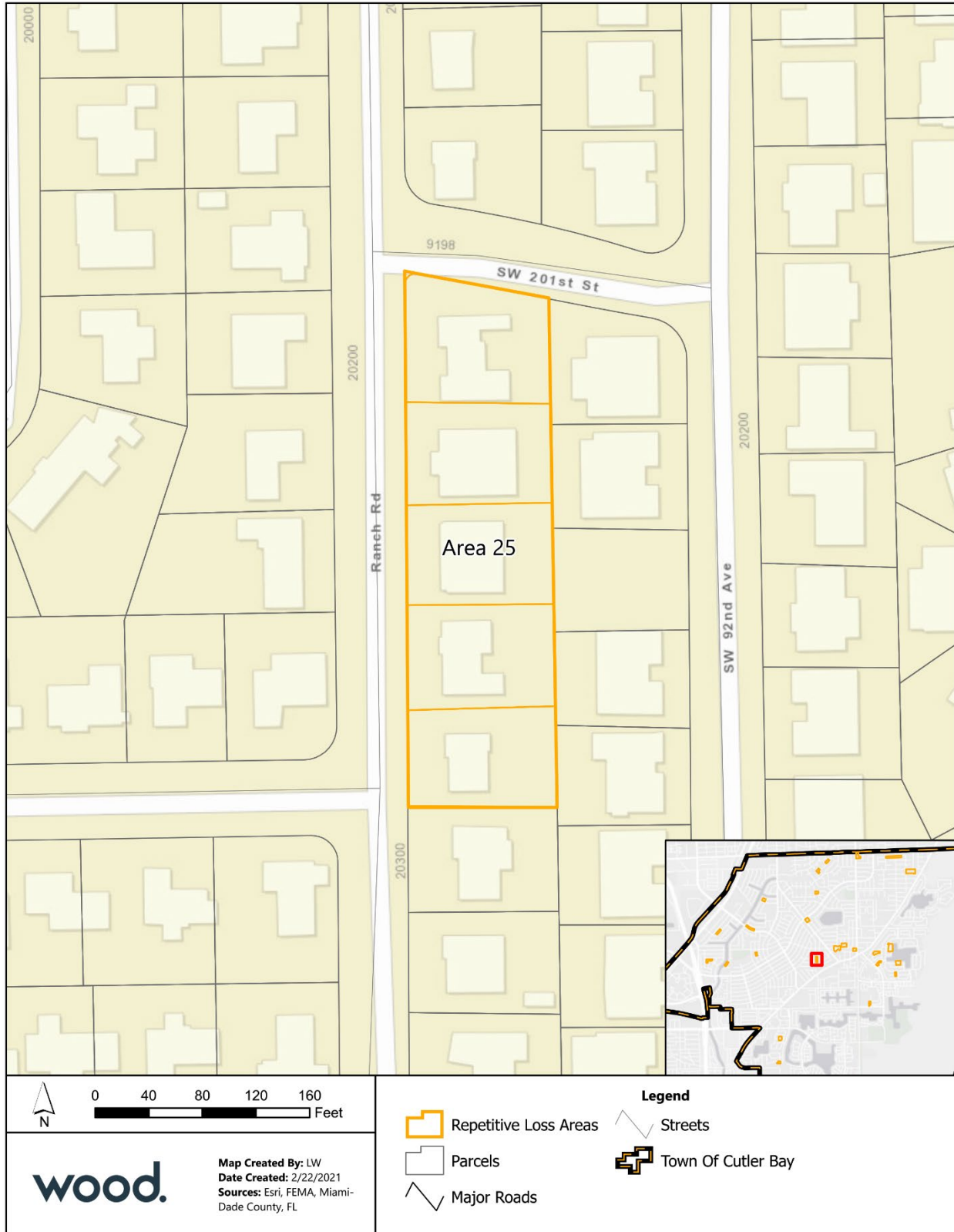


Property elevated 8" above grade



Guttering drains to driveway

Figure 2.28 – Repetitive Loss Area 25



Repetitive Loss Area 25 is located completely outside the 1-percent-annual-chance floodplain in the unshaded Zone X. The area comprises residential structures on Ranch Road, north of Old Cutler Road. It is not directly adjacent to any flood sources, but several storm drains are in the area. The homes are single story masonry structures with slab on grade foundations, mostly built in 1970. All the structures appear to be elevated between 12-14 inches above street level on fill, with the finished floors elevated approximately 8-10 inches above grade. Two HVAC units were seen at grade. There was no observable source of flooding noted during the field survey. One resident of the area reported that the street floods, but their property has not flooded.

Table 2.26 – Overview for Repetitive Loss Area 25

# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
2	0	3	5	Ranch Rd

Note: Additional data on each building is located on the field survey forms in Appendix A.

Example Properties in Area 25



Property elevated about 1 foot above street



HVAC elevated approximately 4" above grade

STEP 4. Review Alternative Mitigation Approaches

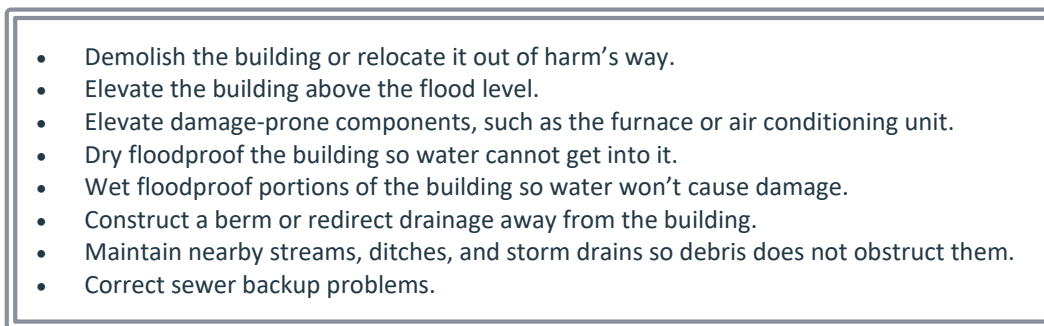
Mitigation Alternatives

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 2.29 below, found in the 2017 CRS Coordinator’s Manual, lists typical property protection measures.

Figure 2.29 – Typical Property Protection Measures

- 
- Demolish the building or relocate it out of harm’s way.
 - Elevate the building above the flood level.
 - Elevate damage-prone components, such as the furnace or air conditioning unit.
 - Dry floodproof the building so water cannot get into it.
 - Wet floodproof portions of the building so water won’t cause damage.
 - Construct a berm or redirect drainage away from the building.
 - Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
 - Correct sewer backup problems.

Source: 2017 CRS Coordinators Manual

A diverse set of mitigation efforts may prove most effective and feasible for reducing flood losses in repetitive loss areas. Improving the stormwater drainage system, drainage maintenance, and storage capacity throughout the Town of Cutler Bay may mitigate flooding issues in the repetitive loss areas but requires large capital expenditures. Encouraging property protection and floodproofing techniques may also reduce potential future damages but requires cooperation from private property owners. Increasing public education and awareness of the flood hazards and flood insurance can be the next best alternative for property owners in this area. The Town’s websites, e-mail distribution lists, press releases, and other outreach programs can help get these messages out to property owners and residents.

Mitigation Funding

There are several types of mitigation measures, listed in Table 2.27, 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. Please note, the Biggert-Waters 2012 National Flood Insurance Reform Act eliminated the previously available Repetitive Flood Claims grant program.

Table 2.27 – Mitigation Grant Programs

Types of Projects Funded	HMGP	FMA	PDM	SRL	IIC	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

Potential Mitigation Measures

Structural Alternatives	Non-Structural Alternatives
<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>Implement volume control and runoff reduction measures in the Town’s Stormwater Management Ordinance.</p>
<p>For basements, especially with combined storm sewer and sewer systems, backflow preventer valves can prevent storm water and sewer from entering crawlspaces and basements.</p>	<p>Consider expanding riparian impervious surface setbacks.</p>
<p>Acquire and/or relocate properties/target abandoned properties.</p>	<p>Relocate internal supplies, products/goods above the flooding depth.</p>
<p>Elevate structures and damage-prone components, such as the furnace or air conditioning unit, above the BFE.</p>	<p>Promote the purchase of flood insurance.</p>
<p>Construct engineered structural barriers, berms, and floodwalls (Note: Assuming lot has required space for a structural addition).</p>	<p>Improve the Town’s floodplain and zoning ordinances</p>
<p>Increase road elevations above the BFE of the 100-year floodplain.</p>	
<p>Implement drainage improvements such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.</p>	
<p>Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.</p>	

Current Mitigation Projects

Stormwater Drainage Capital Improvements

The Town is currently updating its Capital Improvement Plan, but existing CIP drainage projects were identified through the 2008 Stormwater Master Plan and 2018 Watershed Master Plan. Current projects include:

- County's DTPW Project: Drainage Improvements Project (SW 216 St from SW 94 Ave to SW 87 Ave – This project was initiated due to flood complaints and involves construction of a storm drainage system consisting of exfiltration trenches and solid pipe along with drainage inlets and storm manholes
- Cutler Ridge Section 3 Resurfacing and Drainage Improvement Project – This project involves drainage improvements in the area bounded by and including Montego Bay Drive to the north, Bluewater Road to the east, Pan American Drive to the south, and Anchor Road to the west
- Franjo Park Restoration and Improvements – This project includes a drainage system between fields in the park and may affect Areas 19 and 24

The following table details areas of localized stormwater flooding that the Town has mitigated over the last five years.

Street Name or Intersection	Mitigation
Sterling Dr and SW 93 St	Regular Storm Drain cleaning as per Town schedule has improved the area flooding tremendously. No flooding has been observed by Town Staff since.
Manta Drive at Old Cutler Rd	Resolved with completion of Manta Drive Roadway/Drainage improvement project and Old Cutler Road JPA project.
Old Cutler Road southwest of the intersection of Franjo Road.	Resolved with completion of the Old Cutler Road JPA project.
SW 79 Ave at SW 79 Ct	Resolved with completion of the Saga Bay 1.2 Drainage Improvement Project.
SW 197 Terrace at SW 196 Terrace	Resolved with completion of the Saga Bay 1.2 Drainage Improvement Project.
SW 212 St between SW 85 Ave and SW 87 Ave	Resolved with completion of the SW 212 Street Roadway/Drainage Improvement project.
SW 92 Ave between Old Cutler Road and SW 208 St	Resolved with completion of a minor drainage project installing a Drainage Structure with exfiltration trench in the swale.
SW 97 Ave between SW 219 St and SW 224 St	Resolved with completion of drainage project in this segment of SW 97 Avenue.

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 it may not be able to offer complete protection from large flood events and may impact flood risk on other properties. Where drainage issues are the source of repetitive flooding, drainage improvements can provide flood mitigation benefits to multiple properties. Each of these solutions is discussed in greater detail below.

Acquisition:

Property acquisition and/or 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 it 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 2.28 – Advantages and Disadvantages of Acquisition

Advantages	Disadvantages
<ul style="list-style-type: none"> • Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs. 	<ul style="list-style-type: none"> • 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 3 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 100-year floodplain.

Relocation:

Relocation involves lifting and placing a structure on a wheeled vehicle and transporting that structure to a site outside the 100-year floodplain and placed on a new permanent foundation. Like acquisition, this is one of the most effective mitigation measures.

Table 2.29 – Advantages and Disadvantages of Relocation

Advantages	Disadvantages
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

NOTE: Many if not all of the properties located in the Town of Cutler Bay’s Repetitive Loss Area have slab-on-grade foundations, which may mean this mitigation alternative would be cost-prohibitive.

The cost for relocation will vary based on the type of structure 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



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 2.30 – Advantages and Disadvantages of Barriers

Advantages	Disadvantages
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 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

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 2.31 – Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
<ul style="list-style-type: none"> • Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> • 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. Making the structure watertight involves sealing the walls with waterproof coatings, impermeable membranes, or a supplemental layer of masonry or concrete; installing watertight shields over windows and doors; and installing measures to prevent sewer backup.

Table 2.32 – Advantages and Disadvantages of Dry Floodproofing

Advantage	Disadvantages
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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.

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 2.33 – Advantages and Disadvantages of Drainage Improvements

Advantages	Disadvantages
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

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 2.34 – Advantages and Disadvantages of Elevation

Advantages	Disadvantages
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

NOTE: Many of the properties located in Cutler Bay’s Repetitive Loss Area have slab-on-grade foundations, which may mean this mitigation alternative will be cost-prohibitive. Elevating a structure with a slab-on-grade foundation can cost over 30 percent more than elevating a structure on a crawlspace foundation.

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 work.

Table 2.35 – Advantages and Disadvantages of Flood Insurance

Advantages	Disadvantages
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Cost may be prohibitive. • Policyholders may have trouble understanding policy and filing claims. • Does not prevent or mitigate damage.

STEP 5. Conclusion and Recommendations

Conclusion

Based on the field survey and collection of data, the analysis of existing studies and reports, the evaluation of various structural and non-structural mitigation measures, and a review of past and current mitigation activities in the Town, the Town of Cutler Bay has identified several projects that could be implemented for the identified Repetitive Loss Area, detailed below under Recommendations. Table 2.36 summarizes past and current mitigation actions in this area.

Table 2.36 – Past and Current Mitigation Actions

Past and Current Mitigation Actions	
1	The Town has undertaken capital improvement projects to improve drainage and mitigate flooding. The Town continues to budget for these improvements.
2	Some property owners have elevated HVAC systems and other mechanical or electrical equipment.
3	Many property owners maintain flood insurance on their property.

Prioritization

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

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

The priority rating for the following mitigation actions is summarized in Table 2.37. Each of the above prioritization variables was rated on a scale of 1 to 5, with 5 indicating the greatest difficulty for implement. The weight of each variable is indicated in the prioritization table. Those mitigation actions with the lowest overall priority scores should 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

Recommendations

The Town will pursue a variety of mitigation strategies that balance cost, funding and administrative capabilities, and willingness of property owners to participate. The Town will encourage property owners to use floodproofing measures to help protect lower levels of their property. The Town will also increase public education efforts to increase awareness of flood preparedness and flood protection measures. At the same time, the Town will work with property owners, residents, the State and other regional and federal agencies to implement capital improvement projects which will help to mitigate flooding in the repetitive loss areas. 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 Town will continue on an annual basis to target all properties in the repetitive loss areas reminding them of the advantages to maintaining flood insurance through its annual outreach effort. Repetitive Loss Areas are noted as a target area in the Town’s Program for Public Information (PPI).

Responsibility: The Public Works Department will provide relevant flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost can be paid for from the Town's operating budget.

Priority: High

Mitigation Action 2: Property Protection Information

Property owners should not store valuable personal property in lower areas or areas that might be slightly below grade because personal property is not covered by a flood insurance policy without contents coverage. The Town will include this information in targeted outreach efforts to the repetitive loss areas on an annual basis.

Responsibility: The City's Building Department will provide the most relevant up-to-date information to all property owners within the repetitive loss areas.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Mitigation Action 3: Prioritize Drainage-Related CIP Projects

Several respondents to the flood protection questionnaire responded that they have never experienced flooding issues, which suggests that flooding in some repetitive loss areas may be highly localized and best solved through drainage improvements. The Town will prioritize CIP drainage projects in the identified repetitive loss areas and the drainage basins that contain them.

Responsibility: The Town's Public Works Department.

Funding: The cost will be paid for by the Town's Stormwater Utility Fund and other county, state, and federal partner funds.

Priority: Medium

Mitigation Action 4: Encourage Property Owners to Elevate Mechanical Equipment

In all areas, HVAC units were either found to be not elevated or could not be seen for confirmation of elevation. The Town will encourage property owners to elevate inside and outside mechanical equipment above the BFE.

Responsibility: The Town's Public Works Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures.

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

Priority: Medium

Mitigation Action 5: Encourage Renters to Purchase Contents Coverage

Through the survey and the field visits, it was determined that some residents of repetitive loss areas are renters. Renters typically have less power to implement physical changes to mitigate flooding, but they do have the ability to protect themselves and their contents with flood insurance. Therefore, the Town's Public Works Department will encourage renters to purchase flood insurance for their contents.

Responsibility: The Town's Public Works Department along with local insurance agents will promote the benefits of renter's insurance.

Funding: Outreach will be paid for through the Town's operating budget. The cost of insurance will be paid for by individual policyholders.

Priority: Medium

Mitigation Action 6: Encourage Low-Impact Development Techniques

Flooding in most areas is affected by stormwater runoff and the local drainage system. Encouraging property owners to install low-impact development projects on their properties, such as rain barrels, rain gardens, can permeable paving, can help manage stormwater on site and reduce the burden on the local stormwater system, thus mitigating flash flooding and localized stormwater flooding. The Town has a Stormwater Manual with information on Best Management Practices. The Town's Public Works Department will encourage property owners to implement these projects on their properties. Cost varies by project, but some options like rain barrels provide a low-cost option that reduces the barrier to participation.

Responsibility: The Town's Public Works Department will encourage property-owners to implement low-impact development projects and will provide information on project opportunities.

Funding: The cost of implementation will be paid for by individual property owners.

Priority: Medium

Prioritization Table

Table 2.37 – 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: Property protection information	2	2	1	1	1	1.55
3: Prioritize drainage-related CIP projects	4	2	2	3	4	2.95
4: Encourage property owners to elevate mechanical equipment	2	3	3	2	1	2.35
5: Encourage renters to purchase contents coverage	2	2	3	2	2	2.20
6: Encourage low-impact development techniques	2	3	3	2	2	2.45

3 References

Town of Cutler Bay Comprehensive Growth Management Plan, 2008.

Town of Cutler Bay Code of Ordinances.

Town of Cutler Bay Capital Improvement Program (2008-2018).

Town of Cutler Bay Current Capital Improvement Projects.

Town of Cutler Bay Watershed Master Plan, 2018.

Town of Cutler Bay Stormwater Master Plan, 2008.

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Miami-Dade County Comprehensive Development Master Plan (CDMP), updated January 2016.

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Federal Emergency Management Agency, Community Information System. November 2020.

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Federal Emergency Management Agency/ISO, Town of Cutler Bay Repetitive Loss Data, 2017.

Federal Emergency Management Agency, National Flood Insurance Program, Community Rating System CRS Coordinator's Manual. FIA-15/2017. Section 510.

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Federal Emergency Management Agency, Reducing Damage from Localized Flooding: A Guide for Communities. FEMA 511/June 2005. Part III Chapter 7.

Federal Emergency Management Agency, Selecting Appropriate Mitigation Measures for Floodprone Structures. FEMA 551/March 2007.

Federal Emergency Management Agency, National Flood Insurance Program, Community Rating System, Mapping Repetitive Loss Areas, August 2008.

University of New Orleans, Center for Hazards Assessment, Response and Technology, Draft Guidebook to Conducting Repetitive Loss Area Analyses, 2012.

Appendix A – Building Survey Data

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