



Repetitive Loss Area Analysis

Osceola County, 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 located in areas at high risk of flooding. When floods occur, 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 has been paid to repetitive loss properties, about one-fourth of all NFIP payments. Despite some progress in mitigation, many 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.



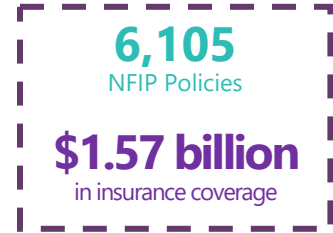
Private insurance companies faced with high losses have several options to keep turning a profit. They can raise income through premium rate increases, decrease payments to insurers or reduce the exposure to the hazard. Unfortunately, the NFIP can only do what is allowed by statute. If losses increase, 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 policyholder, 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 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.

Osceola County (CID-120189) has been a regular participant in the NFIP since February 3, 1982. In addition to meeting the basic requirements of the NFIP, Osceola County 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. Osceola County entered the CRS program in 1994 and is currently a CRS Class 6, which rewards all policyholders in the SFHA with a 20 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.

As of June 2021, there are 6,105 NFIP policies in force in the County with insurance coverage of over \$1.57 billion. There have been 444 paid losses against the NFIP within Osceola County, with payments totaling over \$2.1 million.



According to 2016 NFIP Repetitive Loss Data, which was the most current complete data available for this analysis, there are five repetitive loss properties in Osceola County. Three of these repetitive loss properties were insured as of 2016, and none of these properties have 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. A repetitive loss property is an insured property with two or more claims of \$1,000 or more. 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.

Based on the 2016 NFIP Repetitive Loss data, which reports five unmitigated repetitive loss properties within Osceola County, the County is a "Category B" community. The 2017 CRS Coordinator's Manual requires that a "Category B" community—any community with at least one but fewer than 50 repetitive loss properties—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 County has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. This RLAA will benefit the County by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program.

Setting

Osceola County is located in central Florida and makes up the south/central boundary of the Central Florida Region. The County has a total area of 1,506 square miles, of which 178 square miles is water. The

majority of the population and development in Osceola County, including the incorporated Cities of Kissimmee and St. Cloud, is located in the northwest quadrant of the county. As of 2019 American Community Survey (ACS) estimates, the population of Osceola County was 351,955.

The County is served by Florida's Turnpike, which runs north-south through the center of the County; U.S. Route 192, which runs east-west through the northern portion of the County; and Interstate 4 and U.S. Route 17 which run through the northwestern portion of the County.

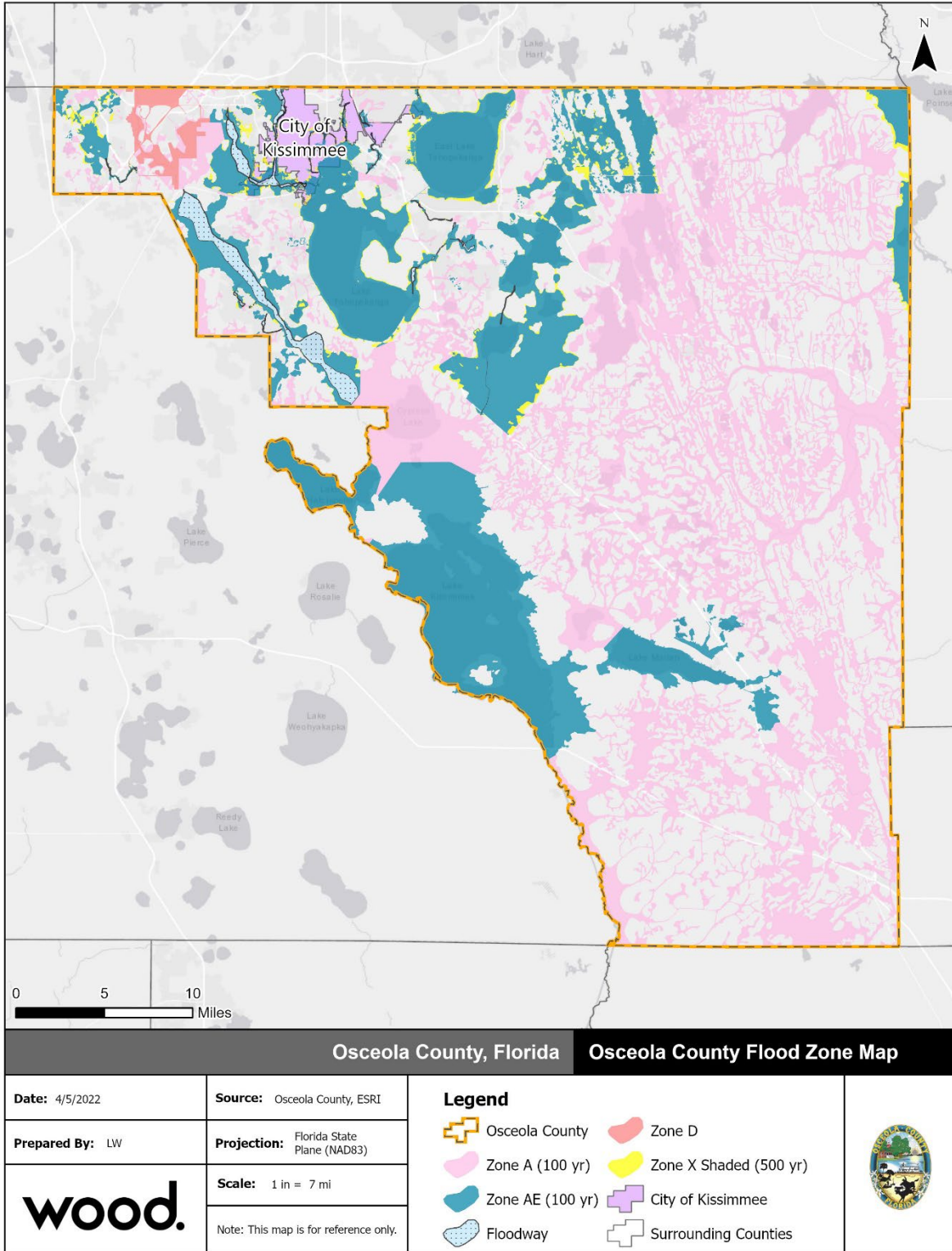
Osceola County is bound by the Kissimmee River to the west and contains the Kissimmee Chain of Lakes. The largest lake in the County is Lake Tohopekaliga, which sits just south of Kissimmee. Much of the area in the southern and eastern portions of the County is dominated by ranch lands, undeveloped prairie, woods, and marsh, including the State of Florida's wildlife management areas at Bull Creek, Prairie Lakes, and the Three Lakes.

Approximately 51.6% of the County falls within Zone A and Zone AE of the Special Flood Hazard Area (SFHA). Another 0.6% is protected from the 1% annual chance flood by a levee and 1.0% of the County falls within the moderate risk Shaded X Zone. The remaining 46.7% of the County is in the low-risk Zone X. Flooding can occur anywhere in the County as a result of localized stormwater issues.

Flooding in the Osceola County is generally due to prolonged heavy rainfall, particularly associated with hurricanes or tropical storms and when antecedent rainfall has saturated the ground. Even in areas outside the SFHA, these conditions can cause the stormwater system to overflow and lead to flooding, especially where inadequate main channels, undersized culverts, or clogged drainage inlets or outlets may prevent timely removal of accumulated surface water.

Figure 1.1 reflects the flood zones throughout Osceola County.

Figure 1.1 – Osceola County, 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.

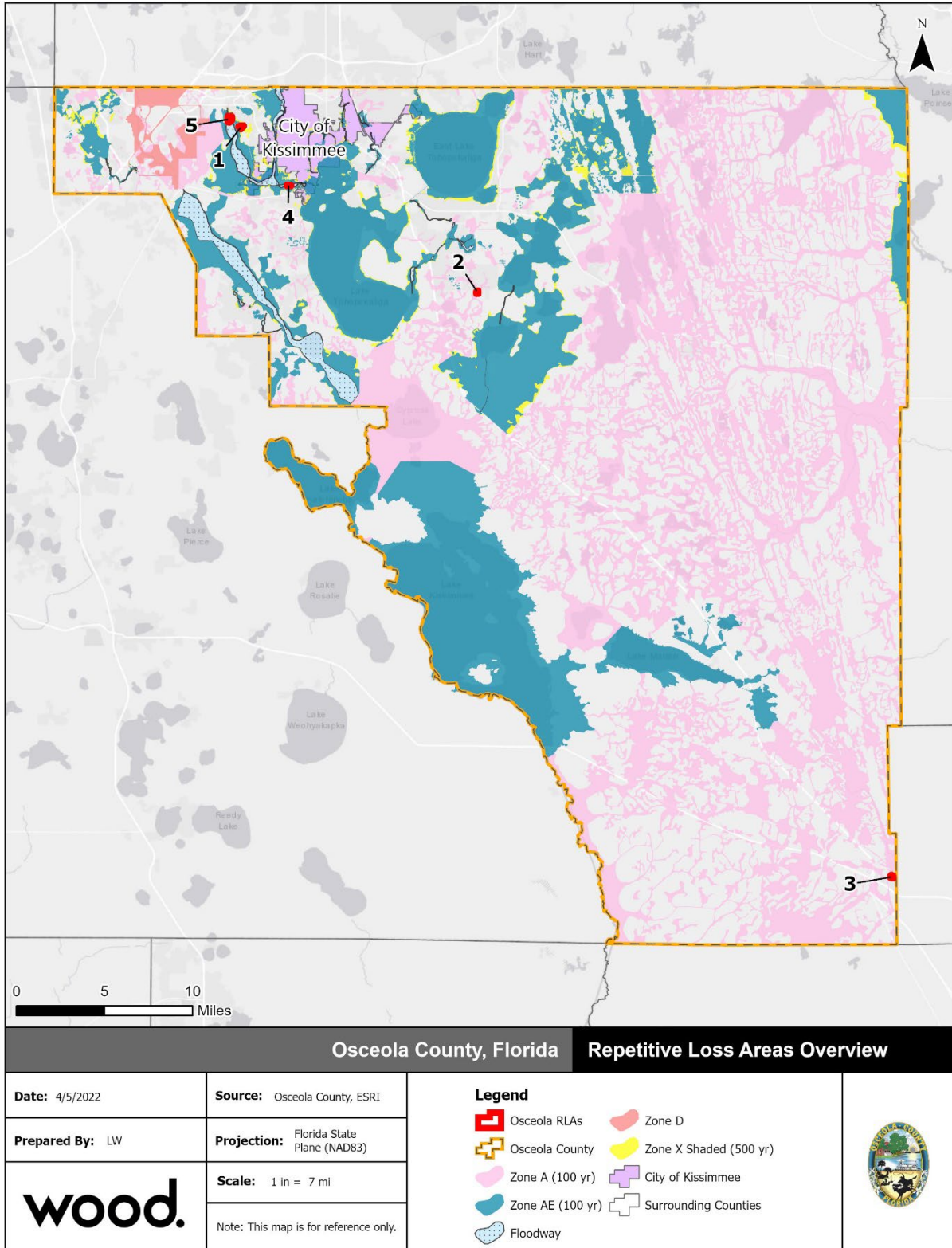
Based on 2016 NFIP Repetitive Loss data for Osceola County, which identifies five unmitigated repetitive loss properties, the County is designated as a Category B repetitive loss community.

Mapping Repetitive Loss Areas

Five Repetitive Loss Areas were identified within Osceola County in accordance with the principles outlined in the CRS guidance titled *Mapping Repetitive Loss Areas* dated August 15, 2008. The Repetitive Loss Areas include the five unmitigated repetitive loss properties as well as surrounding properties that have the same or similar flood conditions. Historic claims data from FEMA/ISO was also evaluated to identify those properties with one paid claim against the NFIP, or two claims more than 10 years apart) as these properties could become repetitive loss properties after another loss. Additionally, conditions such as topography and drainage infrastructure were used to identify surrounding properties with similar flood conditions and risk. A total of 442 properties were included in this RLAA.

This RLAA covers all repetitive loss properties and all areas within unincorporated Osceola County, Florida. Figure 1.2 on the following page shows the general locations of the five 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* as well as 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 2017 *CRS Coordinator's Manual*:

- Step 1:** Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.
- Step 2:** Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.
- Step 3:** Visit each building in the repetitive loss area and collect basic data.
- Step 4:** Review alternative approaches and determine whether any property protection measures, or drainage improvements are feasible.
- Step 5** Document the findings. A separate analysis report must be prepared for each area.

Beyond 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 all properties within the repetitive loss areas, including 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, 442 notification letters were mailed to property owners, 61 of which were returned as undeliverable. The letters were sent out on July 29, 2021. Copies of all mailed letters are maintained on file with the Osceola County Public Works Department. In accordance with the Privacy Act of 1974, the letters will not be shared with the general public.

Mailed Questionnaire

A questionnaire was included with each letter mailed to property owners. The questionnaire asked 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 Figure 2.2 and Figure 2.3 on the following pages.

Website Announcement

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



[DATE]

[NAME]
[ADDRESS]
St. Cloud, FL

Property Address: XXXXXX

Parcel Number: XXXXXXXXX

Dear Property Owner or Resident:

As part of Osceola County'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 damage to property, etc.)

In addition, Osceola County 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 407-742-0662.

You can help us perform this analysis by **completing this questionnaire and returning to me at Osceola County Public Works Department, 1 Courthouse Square, Suite 3100, Kissimmee, FL 34741**. If you have any questions, please call me at 407-742-0518.

Sincerely,

Jeremy Buchanon
CRS Coordinator
Osceola County

Figure 2.1 – Example RLAA Property Notification Letter



OSCEOLA COUNTY 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
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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
Installed sump pump		
Waterproofed the outside wall		
Re-graded yard to keep water away		
Moved things out of basement		

	Yes	No
Installed backup power system / generator		
Sandbagged		
Other:		

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 Jeremy Buchanon, info below.

Please help us by completing this survey by August 27, 2021 and returning it to:

Jeremy Buchanon, CFM
Osceola County Public Works
1 Courthouse Square, Suite 3100
Kissimmee, FL 34741

Surveys can also be emailed to Jeremy.Buchanon@osceola.org

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Figure 2.3 – RLAA Survey, Page 2

Of the 381 delivered letters and surveys, Osceola County received 23 responses from 4 of the 5 repetitive loss areas, which corresponds to a response rate of 6 percent. Survey responses are summarized below.

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

Answer Choices	Number Responding
Less than 1	3
1-5	9
5-10	4
10+	7
Total	23

Q2: Do you rent or own this building?

Answer Choices	Number Responding
Rent	4
Own	18
Total	22

Q3: What type of foundation does the building have?

Answer Choices	Number Responding
Slab	10
Crawl Space	9
Basement	1
Other	2
Total	22

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

Answer Choices	Number Responding
Yes	5
No	18
Total	23

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

Answer Choices	Number Responding
Yes	7
No	15
Total	22

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

- 2004, 2005, 2009, 2012, 2016
- 2017 with Irma, 2004 with Charlie, and 20 years ago
- More than 20 years ago
- [After] 2 inches of rain when good rain
- 1980
- Oct 2018 caused by lake flood gates

Q7: Where did you get water and how deep did it get?

Answer Choices	Number Responding
In basement	0
In crawl space	3
Over 1 st floor	0
In yard only	2
Water was kept out of house by sandbagging, sewer valve, or other protective measure	1
Total	5

Depth:

- 1 foot in crawl space
- 2 inches in crawl space; 3-4 inches in yard
- 6-8 feet in yard
- 5 inches or more in crawl space
- 6 feet in basement; 30" in yard

Q8: What was the longest time that water stayed in the building or on the property?

- 7 days
- Couple hours
- 3 weeks
- 1 week + more
- Around four weeks

Q9: What do you feel was the cause of your flooding? Check all that affect your building or property.

Answer Choices	Number Responding
Storm sewer backup	0
Sanitary sewer backup	0
Standing water next to house/building	1
Drainage from nearby properties	3
Saturated ground / leaks in basement walls	1
Flooding from ditch/creek/river: _____	4
Other	0

- Other: flood gates being close on Blue Cypress Lake – Lake Washington
- Other: flood gates not working

Q10: Have you taken any of these flood protection actions on the property?

Answer Choices	Number Responding "Yes"
Installed sump pump	1
Waterproofed the outside walls	1
Re-graded yard to keep water away	4
Moved things out of basement / crawl space	3
Installed backup power system / generator	3
Sandbagged	1
Other	2
None	1

- Other: asked for ditch to be cleaned out
- Other: should put in 2" of cement to raise side door porch
- Other: swales need to be re-dug since paving road; swales need to be maintained by County
- Other: French drain

Q11: Did any of the measures checked in item 9 work? If so, which ones? If not, do you know why they did not work?

- Property graded to drain into retaining pond with drain
- Dig drain area to roadway alongside of [neighboring property address], behind [neighboring property address]
- The owner of the property where I rent tells me that this problem does not belong to him, and he told me that I had to put a pump to draw the water and solve the problem myself
- Generator and sump pump with power left on
- I don't have any flood protection measure; I feel very unsafe

Q12: Is your home located in a Federal Emergency Management Agency (FEMA) floodplain?

Answer Choices	Number Responding
Yes	5
No	4
I don't know	14
Total	23

Q13: Do you have flood insurance?

Answer Choices	Number Responding
Yes	4
No	15
I don't know	4
Total	23

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

- Entirety of Prime Circle is complex Royal Oaks of Kissimmee managed by First Service Residential.
- Everything looks good.
- The ditch behind [resident's] house has too many weeds and fallen tree limbs.
- I was surprised when told by insurance rep that this property is on flood plain. It is the highest in this area. It also has vinyl siding and as of 2015 is well protected crawl space. Since I own in full, I chose not to get flood insurance.
- When it rains it pours? Just need ground picked and directed to street. From back porch, behind [neighboring property address] driveway & car port, back off [neighboring property address] towards street of London Street
- Our neighbor said his house has flooded but our house is at least 12" higher than his
- Cow Meadow Log Creek is in my backyard. It flows into Blue Cypress Creek which then flows into Blue Cypress Lake. Blue Cypress Creek needs to be cleaned out. There is storm debris, fallen trees, etc. jamming it up so that the flow of CML Creek has been drastically curtailed. Flood gates on Blue Cypress Lake need to remain open during storms to allow water to flow. Don't know what paving the roads will do here. We haven't had a storm yet.
- I live in Sherwood Forest. The Community has had flooding but my home sits higher up and has never come close to flooding. I don't believe I should have to pay flood insurance but never had it surveyed to make sure.
- The place floods when it rains a lot the air conditioners do not work, and the pipes are clogged right now with the rains the mobile home is sinking and I am afraid it will break or give me the land.
- We have very good understanding that if the system is up and operational, we are in good standing but if even one doesn't do their part then there should be consequences because the fault lies on the system and the operators
- Well, I live in a mobile home and my neighbor informed me that in the past this property has flooded. Also, as I'm renting, they don't let me to have rent insurance because it is a mobile home. Also, when raining in the evening the lot gets very muddy and the car gets stuck. I know that I'm not safe here because every time it rains it's very flooded in the street and the yard. But for now, I don't have another choice because I'm a single woman I can't afford another rent cost.

The following information from the survey responses should be considered when evaluating mitigation measures:

- Most (62%) property owners do not know whether their properties are in a FEMA mapped floodplain, and many respondents (67%) do not have flood insurance.

-
- Some flooding issues are reportedly due to drainage issues and may be remedied by maintenance. Some property owners have regraded their own properties to reduce flooding; however, it's unclear whether these actions have mitigated the flooding or simply shifted the problem elsewhere.
 - More than half of the respondents have occupied their property for five years or less and therefore may not be fully familiar with the flood conditions of their properties. The most recent flooding reported by respondents occurred in 2017.

STEP 2. Contact Agencies and Organizations

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

- FEMA Flood Insurance Study, Osceola County, FL and Incorporated Areas, Effective June 18, 2013
- Flood Insurance Claims Data
 - FEMA Community Information System Data, 2021
 - FEMA/ISO – Repetitive Loss Data, 2016
- Osceola County Comprehensive Plan 2024
- Osceola County Capital Improvement Plan, 2021-2025
- Osceola County Land Development Code
- Osceola County Local Mitigation Strategy, 2021 Update
- Osceola County Comprehensive Emergency Management Plan, 2021 Update

Summary of Studies and Reports

FEMA Flood Insurance Study, Effective June 18, 2013

FEMA’s Effective FIS for Osceola County, FL, including the City of St. Cloud, is dated June 18, 2013. The FIS also includes revised Flood Insurance Rate Maps (FIRMs) released on the same date. Per the FIS, flooding in the City of St. Cloud is generally due to prolonged heavy rainfall and is often more severe from rainfall associated with hurricanes or tropical storms. Flooding generally occurs along the lakes and the network of canals and drainage infrastructure.

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.

Osceola County Comprehensive Plan 2024

The Osceola County Comprehensive Plan defines the principles, guidelines, standards, and strategies for the orderly and balanced future economic, social, physical, environmental, and fiscal development of the area. The plan establishes an Urban Growth Boundary, including an urban infill area and an urban expansion area, to discourage sprawl and encourage development that can be efficiently served by public facilities and services. The plan also provides future land use planning and maps, which serve as a guide for future development. The plan enables Transfer of Development Rights to preserve rural lands and encourage development within urban growth areas. The plan encourages traditional neighborhood development and transit-oriented development. In addition to establishing tools for growth management, the plan mandates annual reviews of Federal and State hazard mitigation reports to ensure Future Land Use is appropriate for reduction of property losses and promotion of public welfare. Future Land Use changes must also consider the Local Mitigation Strategy to ensure there are no conflicts.

Osceola County Capital Improvement Plan, 2021-2025

The County’s 5-Year Capital Improvement Plan (CIP) coordinates the financing and timing of planned projects or items that have a useful life of at least 10 years and cost \$25,000 or more. CIP projects also include construction, software, and/or land purchases.

The 2021-2025 CIP includes over \$17.5 million in planned stormwater improvements, including: Buenaventura/Floral Avenue Outfall, Buenaventura/Simpson Outfall, East Lake Toho Water Quality

Improvements, Kempfer Road Culvert Replacement, Culvert Upgrades, Diversion Wall at Lake Toho, Hickory Tree Stormwater Pond, Old Canoe Creek Road Culvert Crossing, and Old Lake Wilson Road/Davenport Creek Culvert Replacement.

Osceola County Land Development Code

Osceola County's Land Development Code establishes provisions for flood damage prevention within the Site Design and Development Standards. The standards coordinate with the Florida Building Code. The Land Development Code also includes Conservation/Wetland/Environmental standards, which dictate a Safe Development Line for all lakes in the County as well as wetland buffers. Additionally, the code contains stormwater design standards and erosion control requirements.

Osceola County Local Mitigation Strategy, 2021 Update

The Osceola County Local Mitigation Strategy was recently updated and approved by Florida Department of Emergency Management in April 2021. The plan identifies and evaluates flood hazard risk and includes strategies for flood mitigation in Osceola County, including culvert replacements, lift station improvements, property protection and relocation, stormwater upgrades, and other flood mitigation projects. The plan specifically addresses the reduction of repetitive flooding in Osceola County.

Osceola County Comprehensive Emergency Management Plan, 2021 Update

The Osceola County Comprehensive Emergency Management Plan (CEMP) was recently updated and approved by Florida Department of Emergency Management in April 2021. The plan provides direction on when to activate and how to operate the County's Emergency Operations Center.

STEP 3. Building Data Collection

The site survey for this analysis was conducted on July 13, 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, photos were taken of each structure surveyed. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. Where possible, 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 additional 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
	Floodway	Zone AE	Zone A	Zone X Shaded	Zone X Unshaded	
1	-	-	-	15.84	4.93	0.0%
2	-	-	5.54	-	6.08	47.7%
3	-	-	14.20	-	1.12	92.7%
4	7.97	2.60	-	-	-	100.0%
5	17.77	32.24	-	-	-	100.0%

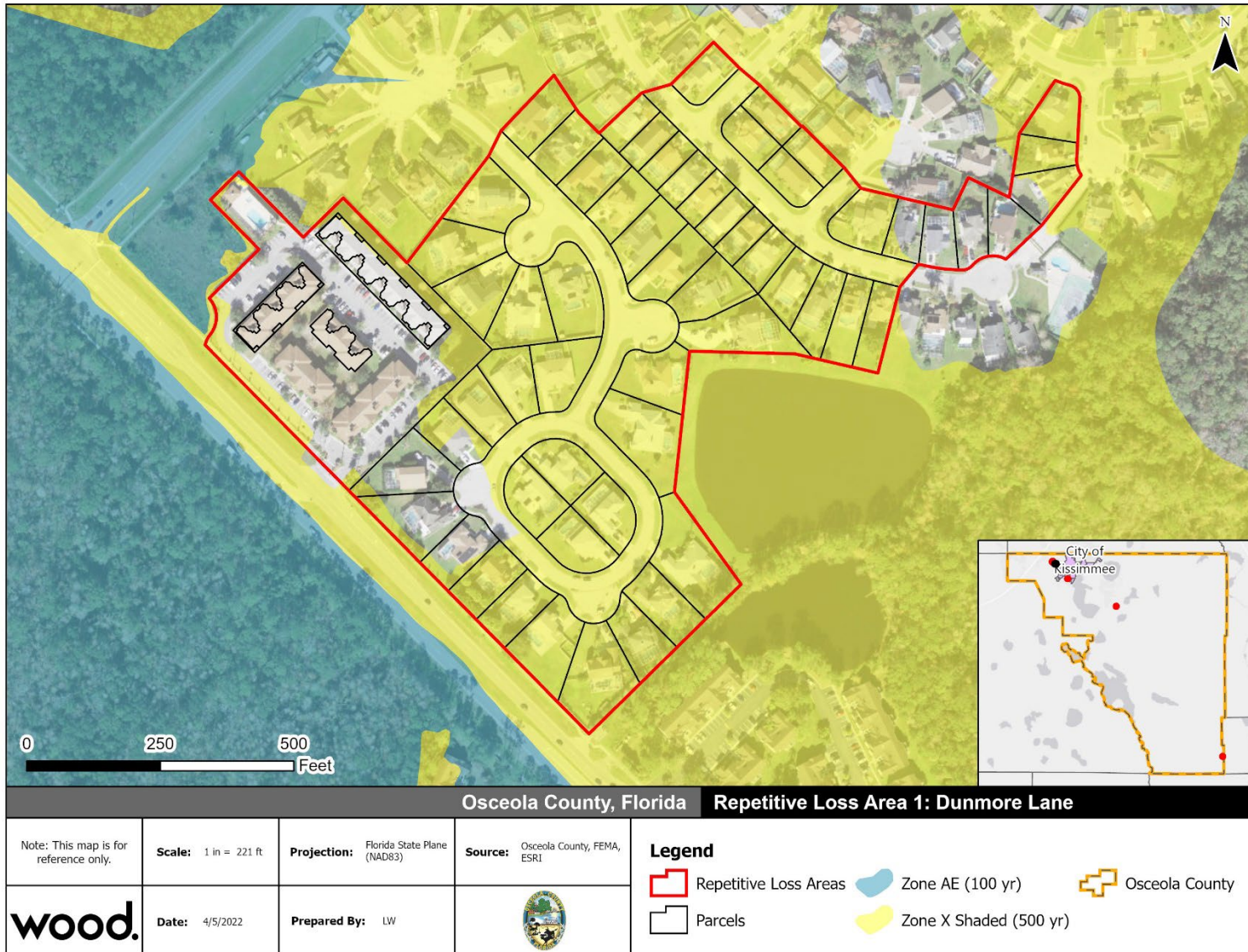
Problem Statement:

The Repetitive Loss Areas identified in Osceola County are vulnerable to flooding from the interconnected lake system as well as stormwater and urbanized localized flooding. The County's flat topography and network of regional drainage features makes it particularly susceptible to stormwater flooding.

Most flooding in the County's Repetitive Loss Areas occurs from heavy rain events. Stormwater flooding can result from prolonged periods of rain that saturate the ground and eventually overwhelm the drainage system. Flood risk can also be exacerbated if stormwater conveyance is obstructed by debris, sediment, and other materials that limit the volume of drainage. Clogged inlets prevent conveyance into the stormwater system and clogged outlets prevent drainage out of the system.

The approach to reducing repetitive flooding in these areas may require a combination of floodproofing techniques, education, and drainage improvement projects.

Figure 2.4 – Repetitive Loss Area 1



Repetitive Loss Area 1 is located primarily in the 0.2-percent-annual-chance floodplain and partially in the low-risk Unshaded Zone X. The area comprises residential structures northeast of the intersection of North Poinciana Boulevard and Siesta Lago Drive. The houses are primarily two-story wood frame structures with slab on grade foundations. Few structures appear to be elevated on fill; most are at grade or less than one foot above grade if elevated. A few structures have elevated slabs, placing the first-floor elevation 1-2 feet above grade. Most structures in the area lack guttering; where guttering is in place it often is routed directly to the driveway. All but two of the HVAC units that were visible from the right of way were at grade; two units were elevated less than one foot. There are two large retention ponds adjacent to several properties in the southeastern corner of the area. These ponds, as well as connected stormwater drainage infrastructure throughout the area, may be a source of flooding. Five residents of this area responded to the questionnaire; all respondents said they have not experienced flooding on their properties, and none reported having flood insurance.

Table 2.2 – Overview for Repetitive Loss Area 1

# of RL Properties	# of Historic Claims	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	10	52	63	Berkshire Court, Dunmore Lane, Rochelle Avenue, Chadwick Circle, Prime Circle, Lounsbury Court, Davenport Circle, Tennyson Court

Note: Additional data on each building is located on the field survey forms in Appendix A. There were 16 mailed questionnaires returned as undeliverable from this area, which may indicate that these properties are vacant.

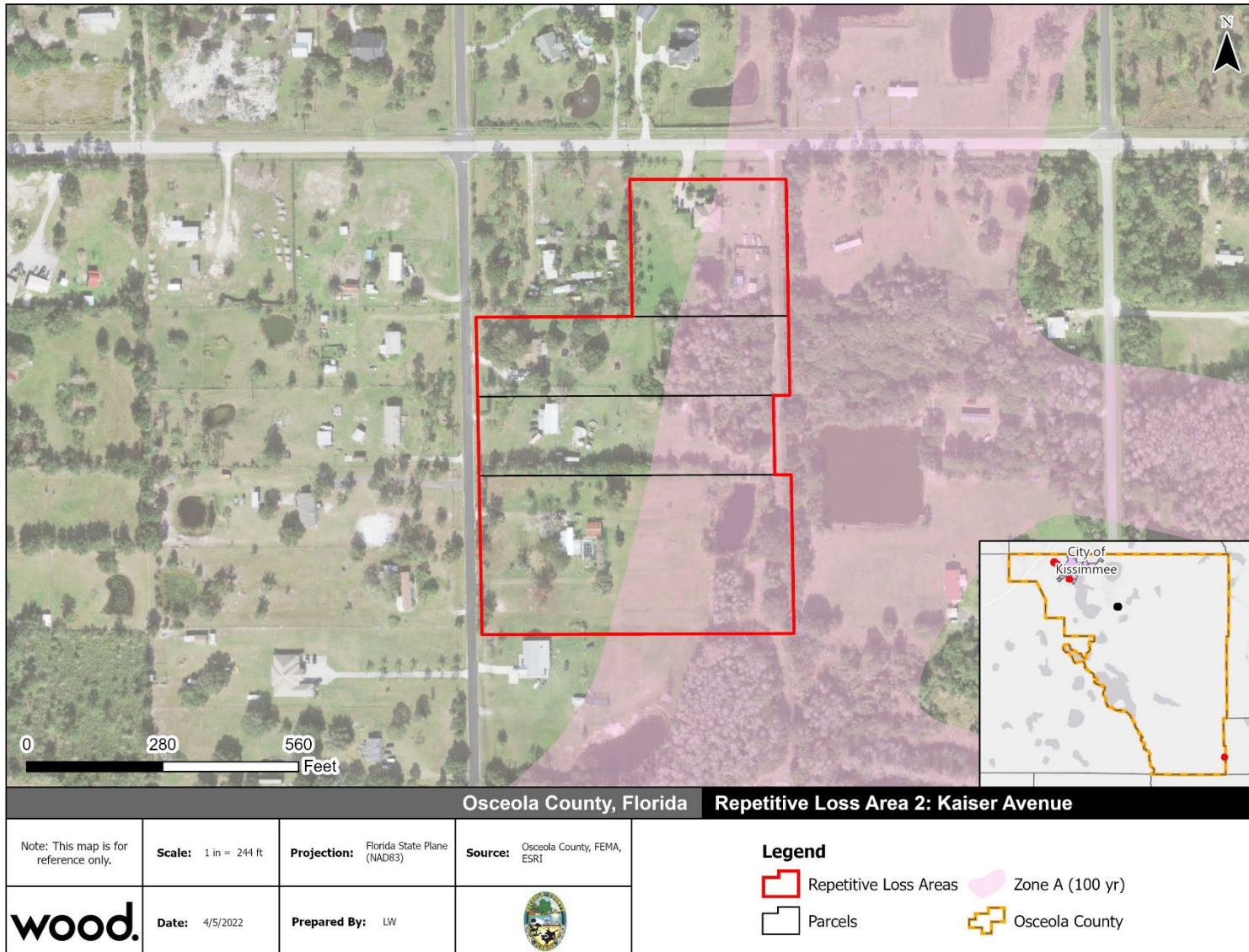
Example Properties in Area 1



Stormwater inlet in front of house



Figure 2.5 – Repetitive Loss Area 2



Repetitive Loss Area 2 is located partly in the 1-percent-annual-chance floodplain in Zone A and partly in the low-risk Unshaded Zone X. The area comprises residential structures on Kaiser Avenue and Deer Run Road. The properties on Kaiser Avenue are older single-story manufactured homes and a masonry building, all in fair to poor condition. Most of these lots are at or below grade, and structures are at grade or minimally elevated. A drainage ditch runs along the road, with culverts under each driveway, many of which appear to be blocked or overgrown. The house on Deer Run Road is a newer two-story masonry structure elevated on fill with a drainage ditch and culvert along the road. No guttering was observed. HVAC units were not visible from the right of way.

Table 2.3 – Overview for Repetitive Loss Area 2

# of RL Properties	# of Historic Claims	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	3	4	Kaiser Avenue, Deer Run Road

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

Example Properties in Area 2

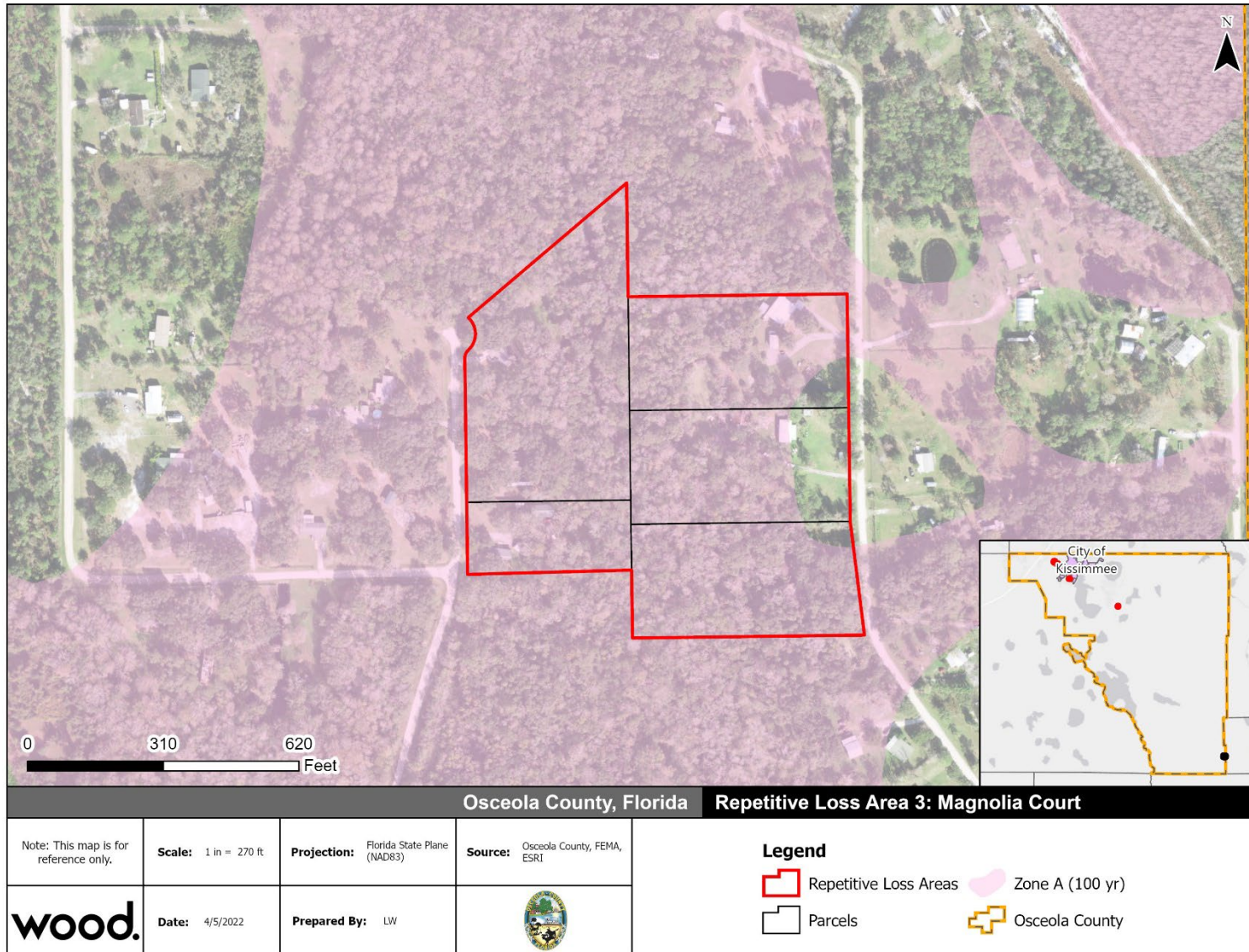


Drainage ditch and culvert along road and under driveway



Below grade lot with elevated unit

Figure 2.6 – Repetitive Loss Area 3



Repetitive Loss Area 3 is located almost entirely within the 1-percent-annual-chance floodplain in Zone A. The area comprises residential structures on Magnolia Court and Cypress Drive on either side of Cow Log Branch. The houses are primarily manufactured homes with post/block foundations. None of the lots are elevated on fill, but the structures, where visible, were elevated about one foot above grade. One property owner in this area responded on the questionnaire and reported regular flooding in this area every 3-4 years from 2004-2016. They also noted that there are drainage issues in Cow Meadow Log Creek, Blue Cypress Creek, and Blue Cypress Lake. Specifically, they noted that Blue Cypress Creek is blocked with storm debris and fallen trees, which limits flow of the Cow Meadow Log Branch. Additionally, they expressed concern that flooding occurs upstream when flood gates on Blue Cypress Lake are not left open. They also suggested that swales and drainage ditches in the area may need to be redone or maintained since the recent paving of roads in the area. Given this feedback, it's possible that flooding issues in this area may be addressed with stormwater improvements and maintenance.

Table 2.4 – Overview for Repetitive Loss Area 3

# of RL Properties	# of Historic Claims	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	0	4	5	Magnolia Court, Cypress Drive

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

Example Properties in Area 3

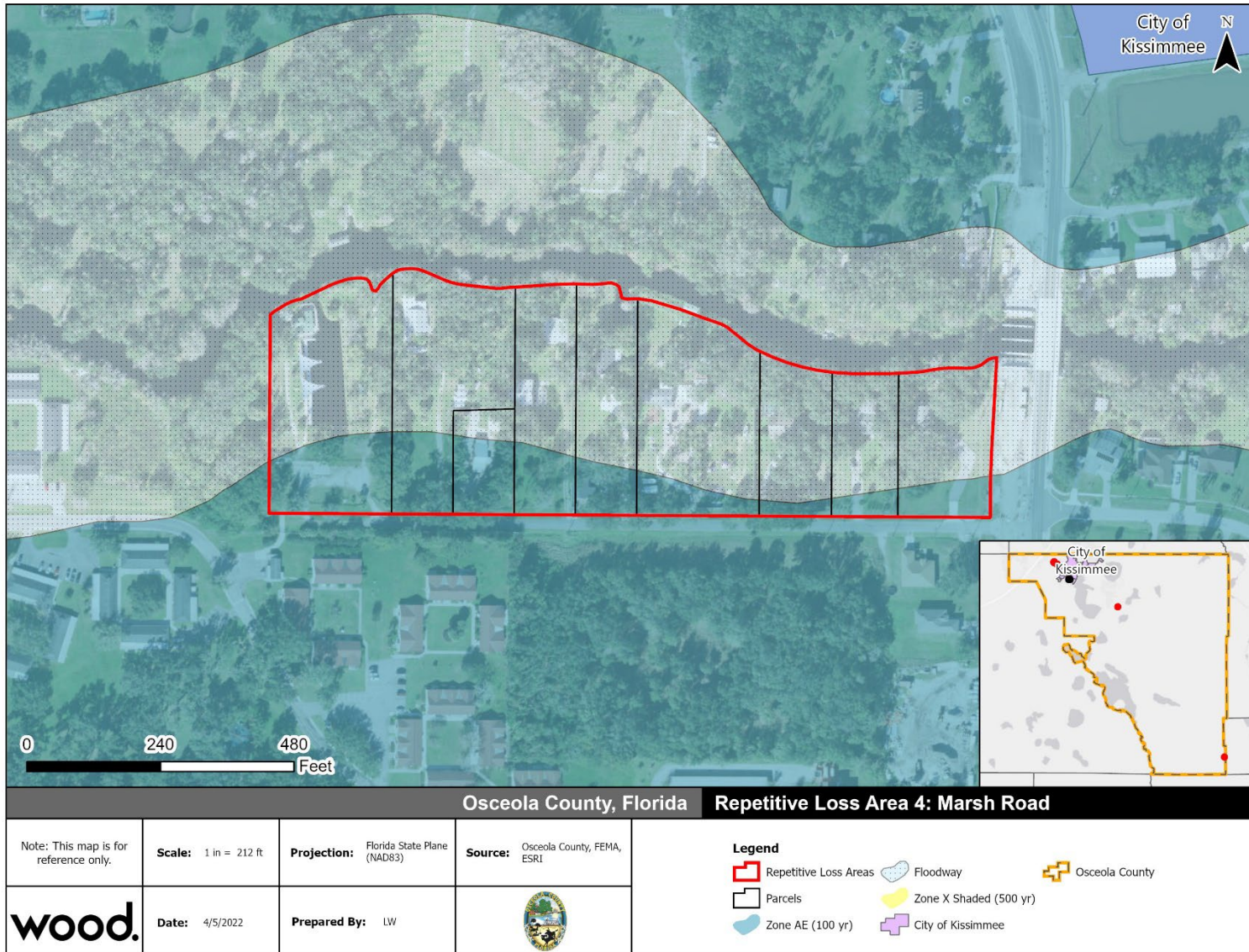


Manufactured home raised on block foundation



Drainage ditch and culvert under driveway

Figure 2.7 – Repetitive Loss Area 4



Repetitive Loss Area 4 is located completely in the 1-percent-annual-chance floodplain in Zone AE, with a majority of the structures in the area located in the floodway. The area comprises eight residential structures and one commercial structure on Marsh Road. The houses are one- and two-story wood-frame structures with a variety of foundation types, including slab on grade, crawlspace, and post/pier foundations. Several structures are below grade or have below grade enclosures/garage space. A drainage ditch runs along Marsh Road, with culverts under driveways. Shingle Creek runs behind the structures in the area. In some cases, the creek or creek access/boat launch is less than 50 feet from the structure. HVAC units were not visible from the right of way. One property owner in this area responded to the questionnaire that they have not experienced flooding in their 1-5 years of ownership but to have flood insurance despite not knowing whether they are in the floodplain or not.

Table 2.5 – Overview for Repetitive Loss Area 4

# of RL Properties	# of Historic Claims	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	1	7	9	Marsh Road

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

Example Properties in Area 4

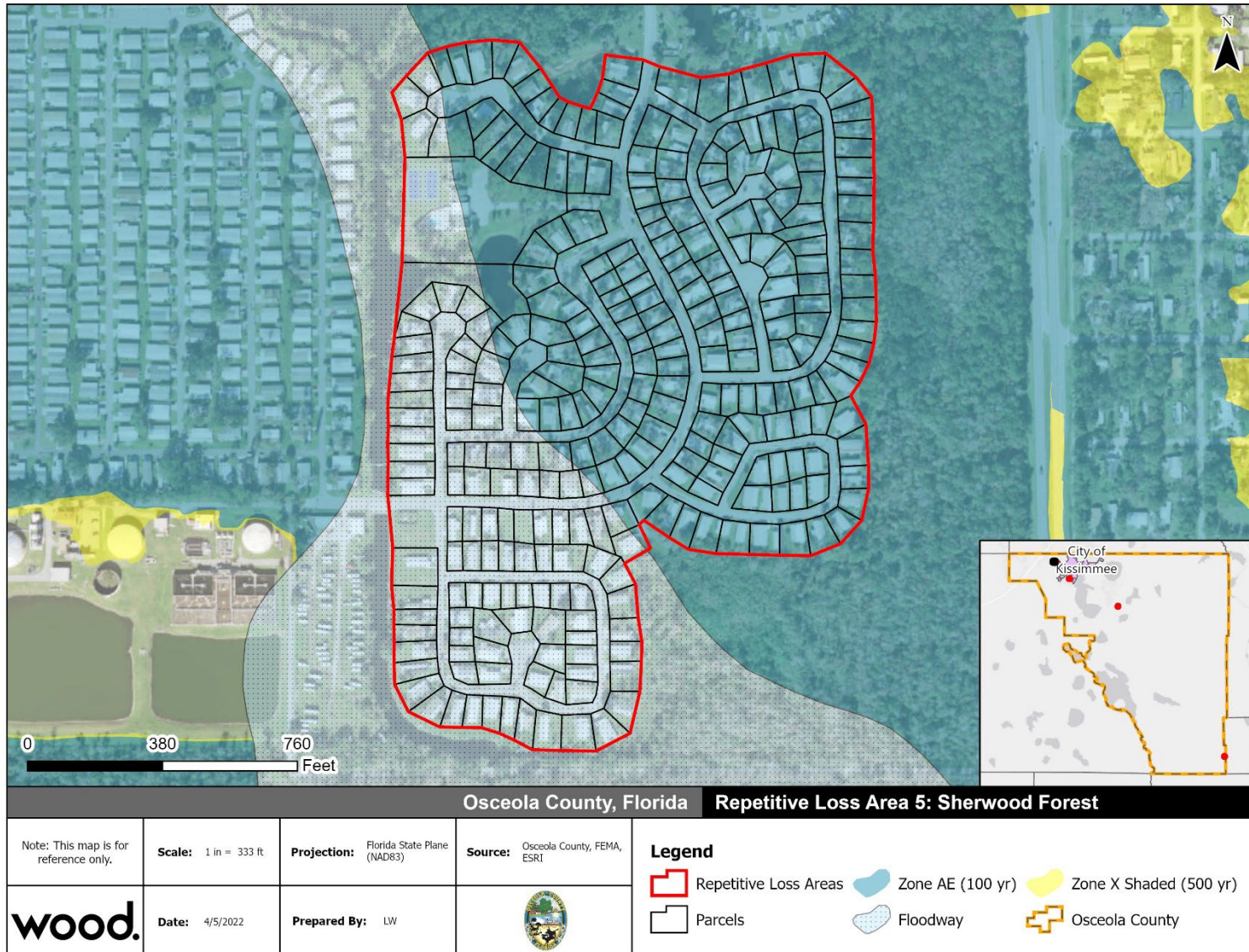


Residential structure with below-grade driveway/garage/storage



Creek behind house with below grade entrance

Figure 2.8 – Repetitive Loss Area 5



Repetitive Loss Area 5 is located completely in the 1-percent-annual-chance floodplain in Zone AE, with some structures located in the floodway. The area comprises residential mobile/manufactured homes in the Sherwood Forest subdivision. The structures are single story with crawlspace foundations; few of the structures appear to be elevated on fill. There is also one larger commercial slab-on-grade building that serves as a community clubhouse. Elevation of the residential structures varies throughout the community; the lowest structures are only 1-2 feet above grade, while some newer structures are elevated as much as 6 feet above grade. Many HVAC units were observed at grade. Many structures have guttering, with some draining to driveways and others diverting to side yards. However, the small lot sizes and flat topography leave little area for drainage between properties. Six residents of this area reported past flooding of their buildings or property, with flooding varying from 2 inches for a couple hours to 5 inches or more for over a week. This entire area is located in the 1% annual chance floodplain, yet 10 of the 14 questionnaire respondents said they don't know if they are located in the floodplain and 1 said they are not in the floodplain. Additionally, only one of these respondents said they have flood insurance.

Table 2.6 – Overview for Repetitive Loss Area 5

# of RL Properties	# of Historic Claims	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	1	323	325	Scott Boulevard, Newcastle Drive, Pickering Drive, Fincastle Drive, Durham Circle, Ivanhoe Court, Windsor Court, London Drive, York Court

Note: Additional data on each building is located on the field survey forms in Appendix A. There were 45 mailed questionnaires returned as undeliverable from this area, which may indicate that these properties are vacant.

Example Properties in Area 5



Structure and HVAC elevated above BFE



Structure elevated 1-2 feet; guttering draining to driveway and street

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

Figure 2.9 – 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

Acquisitions or elevations may prove effective in some repetitive loss areas, especially where flooding problems are localized. Several repetitive loss areas are entirely within the 1% annual chance floodplain, which means individual property buyouts may not prove cost effective. Elevating properties in the repetitive loss area would be similarly cost ineffective in these areas. In some cases, improving the stormwater drainage system, drainage maintenance, and storage capacity near the repetitive loss area and throughout the watershed may eliminate additional building damage in the repetitive loss area. These structural methods require large capital expenditures and cooperation from private property owners and may take years to implement. Therefore, additional measures should also be considered, especially in the short term. Promoting floodproofing techniques and flood insurance and increasing public education and awareness of the flood hazards may also reduce damages. Encouraging property owners to elevate mechanical and electrical equipment could also significantly reduce damages from future floods.

Mitigation Funding

There are several types of mitigation measures, listed in Table 2.2, 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 2.7 – Mitigation Grant Programs

Types of Projects Funded	HMGP	FMA	BRIC	SRL	IIC	SBA
Acquisition of the entire property by a gov't	✓	✓	✓	✓		
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	✓			✓	✓	✓
Local drainage and small flood control projects	✓			✓		
Dry floodproofing (non-residential buildings)		✓	✓	✓	✓	✓
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 City'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 County'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>Promote the purchase of flood insurance.</p>
<p>Elevate structures and damage-prone components, such as the furnace or air conditioning unit, above the BFE.</p>	<p>Relocate internal supplies, products/goods above the flooding depth.</p>
<p>Construct engineered structural barriers, berms, and floodwalls (Note: Assuming lot has required space for a structural addition).</p>	<p>Improve the County'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 County's 2021-2025 Capital Improvement Plan includes over \$17.5 million in planned stormwater improvements, including: Buenaventura/Floral Avenue Outfall, Buenaventura/Simpson Outfall, East Lake Toho Water Quality Improvements, Kempfer Road Culvert Replacement, Culvert Upgrades, Diversion Wall at Lake Toho, Hickory Tree Stormwater Pond, Old Canoe Creek Road Culvert Crossing, and Old Lake Wilson Road/Davenport Creek Culvert Replacement.

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 2.8 – 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 2.9 – 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 properties located in Osceola County’s Repetitive Loss Areas have slab-on-grade foundations. This mitigation alternative will likely be cost-prohibitive for those properties.

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 2.10 – 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 2.11 – 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 2.12 – 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 2.13 – 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 2.14 – 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 properties located in Osceola County’s Repetitive Loss Areas have slab-on-grade foundations. This mitigation alternative may be cost-prohibitive for those properties. 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 2.15 – 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 building 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, Osceola County has identified several projects that could be implemented for the identified Repetitive Loss Area, detailed below under Recommendations. Table 2.11 summarizes past and current mitigation actions in this area.

Table 2.16 – Past and Current Mitigation Actions

Past and Current Mitigation Actions	
1	The County has undertaken capital improvement projects to improve drainage and continues to budget for these improvements.
2	Some property owners are taking steps to protect their property, such as regrading their property, sandbagging, waterproofing, installing backup power and/or sump pumps, and moving things out of their basement or crawlspace.

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 2.12. 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 approach for mitigating repetitive losses in Osceola County should include a combination of structural mitigation, property protection, and public education. The County should encourage property owners to use floodproofing measures to help protect lower levels of their property. The County should also increase its public education efforts to increase awareness of flood risk, flood preparedness, and flood protection measures including moving valuable items to above the flood elevation and permanently elevating vulnerable HVAC units. At the same time, the County should work with property owners and residents, the State, and other regional and federal agencies to implement capital improvement projects which will help to eliminate flooding in the repetitive loss areas.

Mitigation Action 1: Flood Insurance Promotion

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The County will 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 County's Program for Public Information (PPI).

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

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

Priority: High

Mitigation Action 2: Property Protection Information

The County will increase its outreach efforts on an **annual basis** for the identified repetitive loss area to promote property protection activities. Activities to be promoted could include (1) elevating or moving valuable personal property in lower areas or areas that might be slightly below grade since personal property is not covered by a flood insurance policy without contents coverage; (2) keeping drainage pathways and storm drains clear of yard waste and debris; and (3) sandbagging areas subject to entry of water when flooding is imminent.

Responsibility: The County's Public Works 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 County's operating budget.

Priority: High

Mitigation Action 3: CIP Drainage Improvements

Questionnaire responses suggested that drainage improvements could resolve flooding issues in some repetitive loss areas. The County should prioritize CIP projects to focus on drainage issues in the identified repetitive loss area and throughout the drainage basin.

Responsibility: The County's Public Works Department.

Funding: The cost may be paid for by the County's operating budget as well as State or Federal grant funds.

Priority: Medium

Mitigation Action 4: Elevate Mechanical Equipment

Many HVAC units were found at or below grade. The County will encourage property owners to elevate inside and outside mechanical equipment above the BFE.

Responsibility: The County'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 in an on-going program.

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

Priority: Medium

Prioritization Table

Table 2.17 – 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: Outreach to promote flood insurance	2	2	1	1	1	1.55
2: Outreach about personal property protection	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	2	3	2	1	2.10

3 References

Osceola County Comprehensive Plan 2024.

Osceola County Capital Improvement Plan 2021-2025.

Osceola County Land Development Code.

Osceola County Local Mitigation Strategy, 2021 Update.

Federal Emergency Management Agency, Community Information System. June 2021.

Federal Emergency Management Agency, Flood Insurance Study, Osceola County and Incorporated Areas. Effective June 18, 2013.

Federal Emergency Management Agency/ISO, Osceola County Repetitive Loss Data, 2016.

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

Federal Emergency Management Agency, National Flood Mitigation Data Collection Tool and RLP Viewer, User's Guide. FEMA 497/August 2008.

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.