

WITHLACOOCHEE RIVER AND SUGAR CREEK FLOODING ANALYSIS FOR THE CITY OF VALDOSTA

Lowndes County, Georgia Planning Assistance to States

Presented by Dave P. Apple, P.E.
Chief, Watershed Section, Planning & Policy Division
U.S. Army Corps of Engineers, Jacksonville District

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PURPOSE OF THE ANALYSIS

- Provide an analysis of potential structural and non-structural solutions*
- Suggest an economically justified solution for flood risk reduction in the study area
- Establish potential Federal interest in pursuing future USACE flood risk management studies related to the study area toward a more holistic approach
 - Continuing Authority Program
 - Watershed Study Authority Florida

* Preliminary analysis and not build-ready (equivalent to a Reconnaissance Study under USACE authority)



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MODELING CONCLUSION

- Modeling of existing conditions (10-, 50-, and 100-year storm events) **indicates flooding is due to rising water in the Withlacoochee River and Little River which backs up into Sugar Creek and Two Mile Branch**
- Conclusion confirmed anecdotally from observations during the 2009 and 2013 flood events, termed as “sunny-day” flooding (flooding occurring several days after the immediate rainfall event)

USACE will provide the certified Hydrologic Engineering Centers River Analysis System (HEC-RAS) model and supporting data to the City of Valdosta

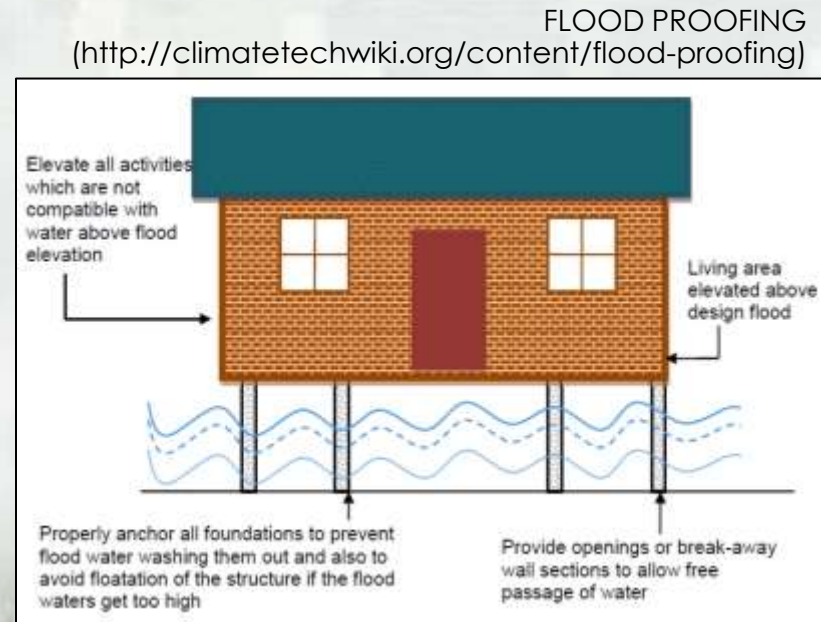


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PLAN FORMULATION

Several non-structural and structural alternatives were identified, compared and evaluated, resulting in one potential, feasible local solution for the purpose of this report

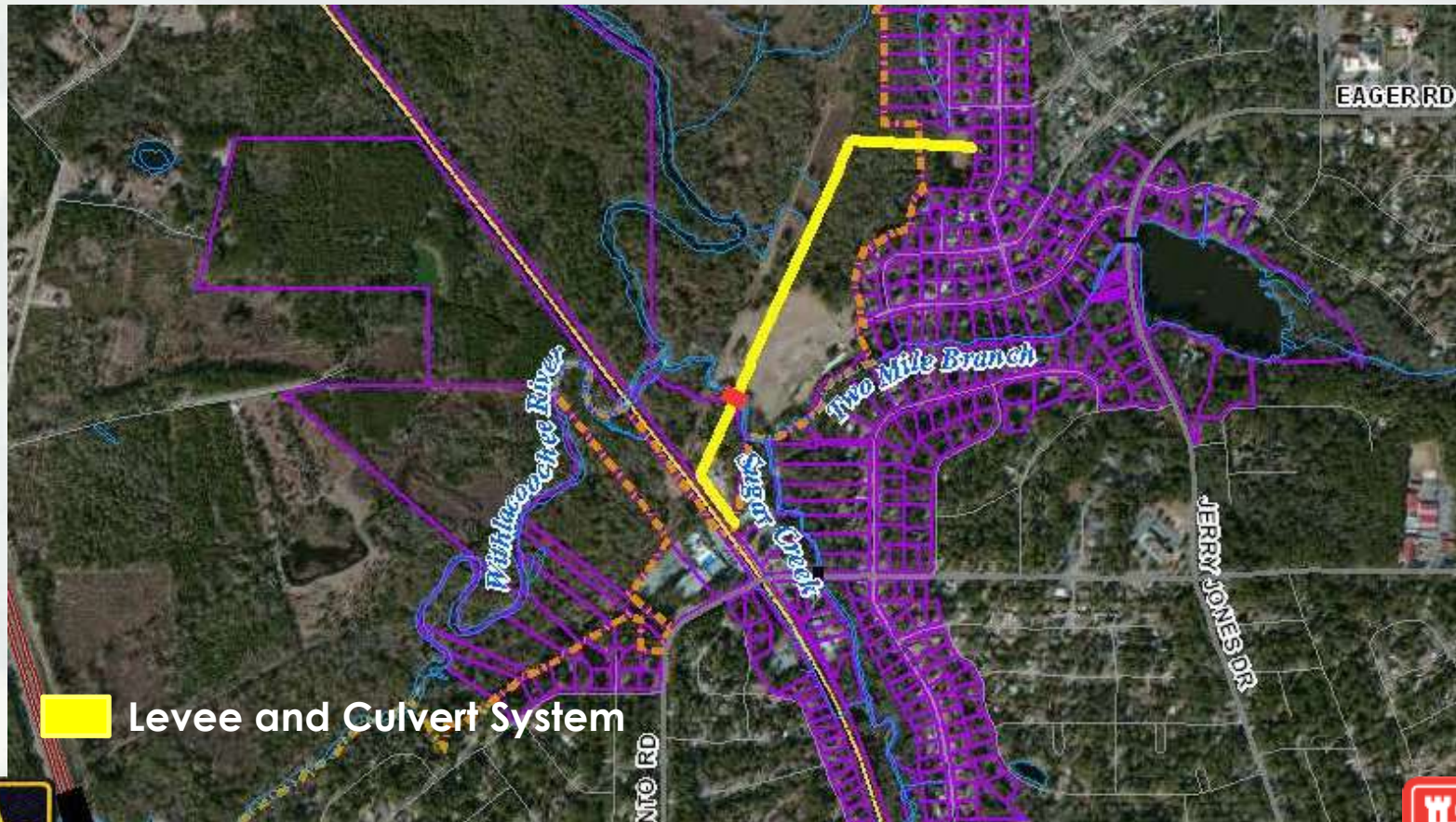
- Alt 1:** Full acquisition
- Alt 2:** Elevation
- Alt 3:** Elevation and acquisition
- Alt 4:** Flood proofing
- Alt 5:** Channelization of the Withlacoochee
- Alt 6:** Alteration of the confluence of the Withlacoochee River and Little River
- Alt 7:** Flood control levee and structure in Sugar Creek at the confluence with the Withlacoochee River



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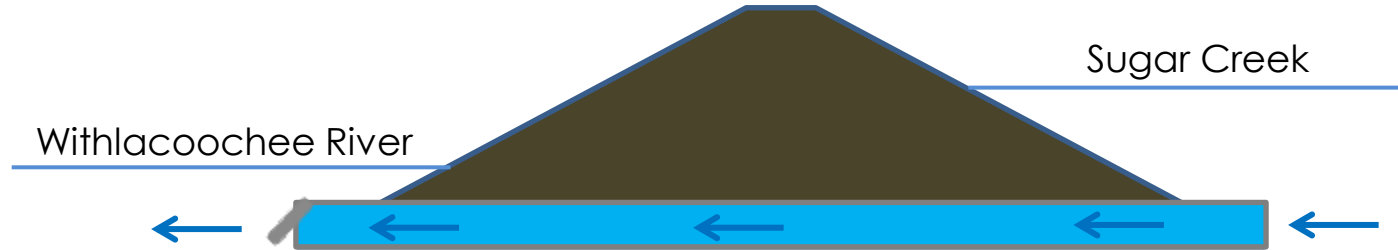
ALTERNATIVE 7

After comparison and evaluation of all alternatives using USACE criteria, Alternative 7 was considered to be the most effective at reducing flood risk in the study area, most cost effective, and having the least environmental impacts



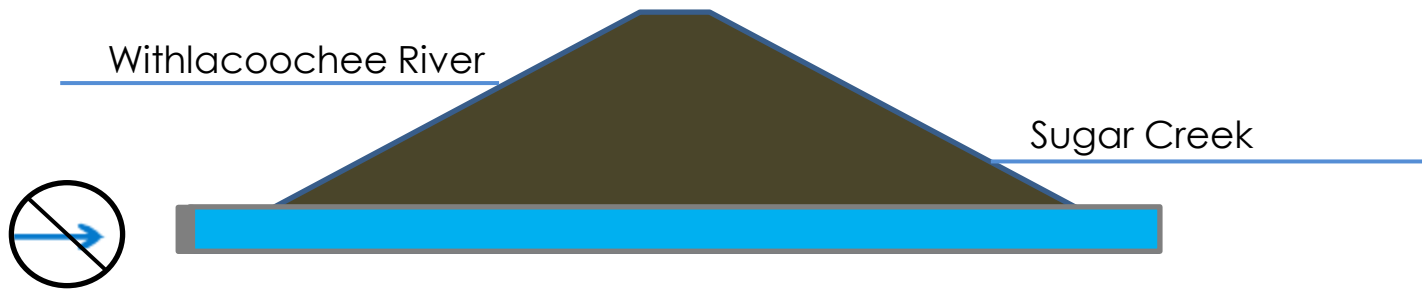
ALTERNATIVE 7 - LEVEE AND CULVERT CONCEPT

FLOW OF WATER WHEN WITHLACOOCHEE RIVER HAS LOWER WATER LEVELS THAN SUGAR CREEK



Flap gate open – water flow

FLOW OF WATER WHEN WITHLACOOCHEE RIVER HAS HIGHER WATER LEVELS THAN SUGAR CREEK



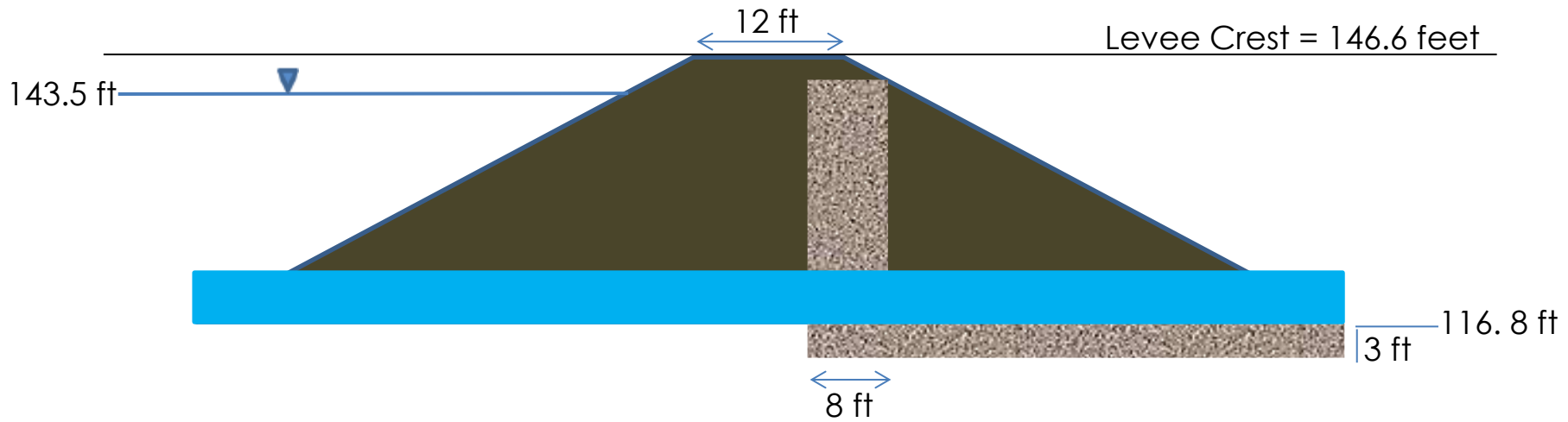
Flap gate closed – no water flow






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ALTERNATIVE 7 FEATURES

- Levee Length = 3,950 feet
- Slide slopes = 3H to 1V
- Average Height = 24 feet
- Top Width = 12 feet
- Quantity for Levee = 308,000 cy
- Culvert Structure = 6 barrels (6x6 feet each)



| | |
|--|--------------------------------|
|  | Six (6 x 6 foot) Culvert Pipes |
|  | Fine aggregate |
|  | Levee |

* Not to Scale, Elevations are in NAVD88



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ALTERNATIVE 7 BENEFITS

This plan would not prevent flooding but **would reduce the depth and duration of flooding**

DEPTH

Modeling Results: water surface elevation reduction

- 10-year event: Reduced by 0.1 feet
- 50-year: Reduced by 1.7 feet
- 100-year: Reduced by 2.8 feet

Benefit: potentially less inundation due to lower water stages; actual level of benefit depends on home elevation



DURATION

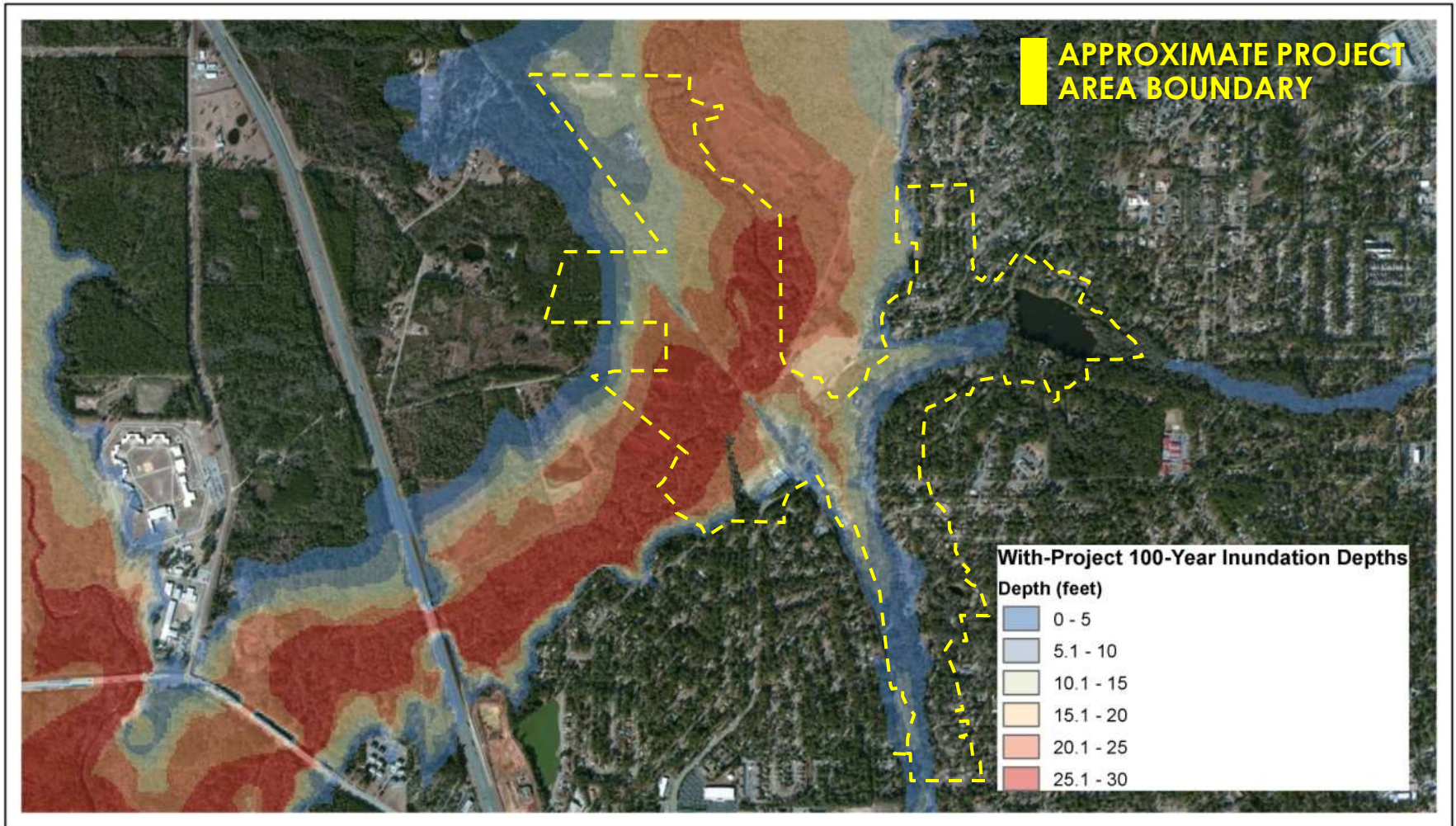
Modeling Results: reduction in flooding (also, the duration of flooding, in some cases, was reduced from days to a few hours)

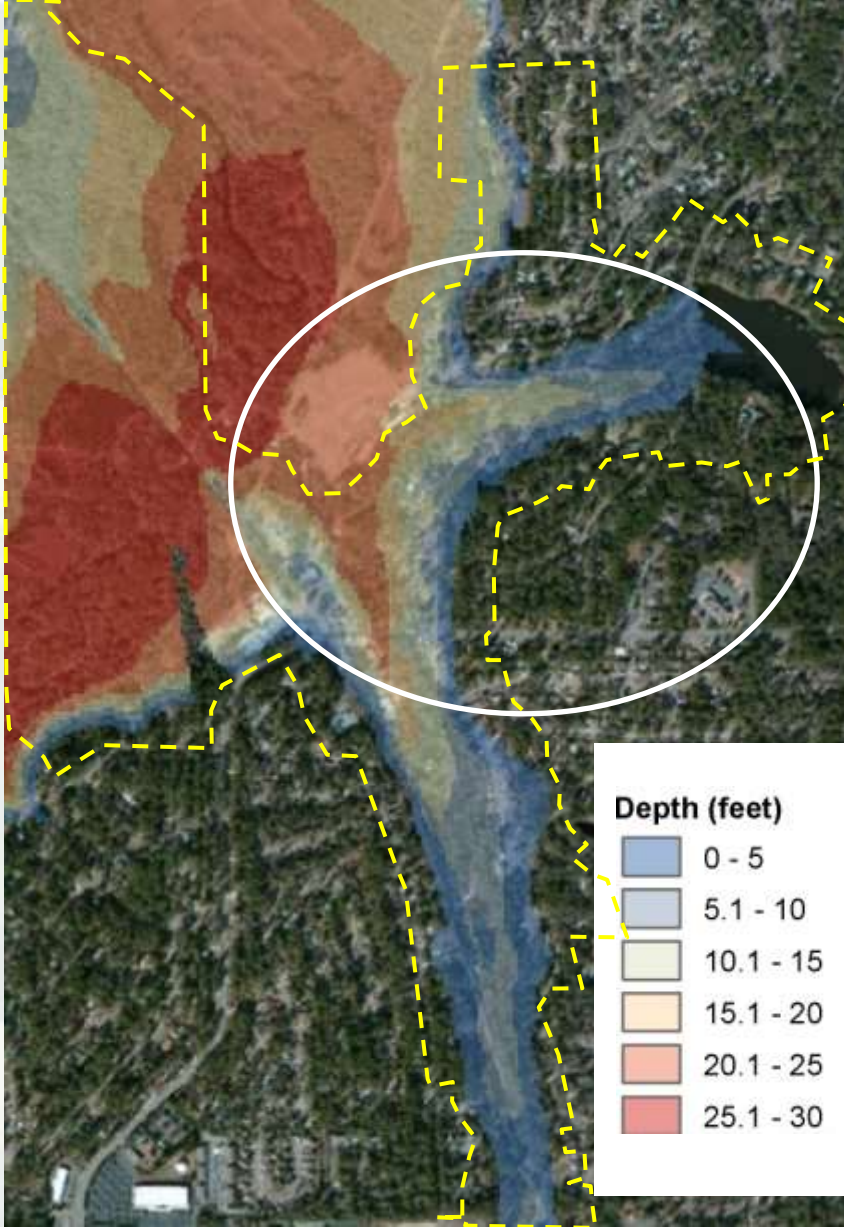
Benefit: more time for homeowners and businesses to access property; potentially less damage due to less standing water



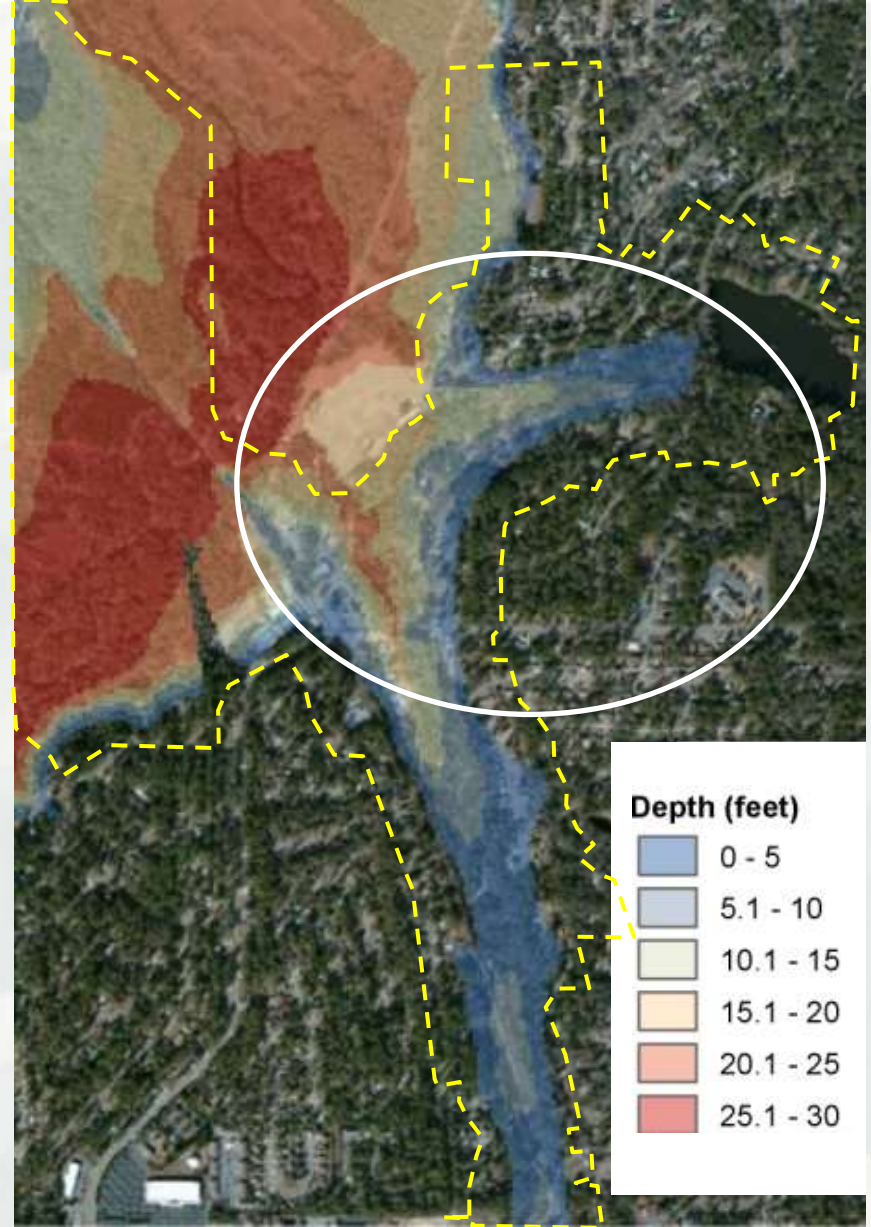
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With-Project Conditions
100-Year Flood Event





100-YEAR EVENT
EXISTING CONDITIONS



100-YEAR EVENT
WITH-PROJECT CONDITIONS

ALTERNATIVE 7 - COST AND ASSUMPTIONS

The preliminary cost estimate did not include real estate, operation and maintenance, and assumed onsite borrow material. Cost would increase if onsite material is not available.

| TOTAL COST | |
|--|--------------------|
| Mobilization, Demobilization, Preparation Work | \$268,391 |
| Clearing and Grubbing | \$26,537 |
| Levee Construction | \$1,670,699 |
| Care and Diversion of Water | \$178,927 |
| Culvert Structure | \$1,392,683 |
| Site Grading and Landscaping | \$44,449 |
| TOTAL COST | \$3,581,686 |

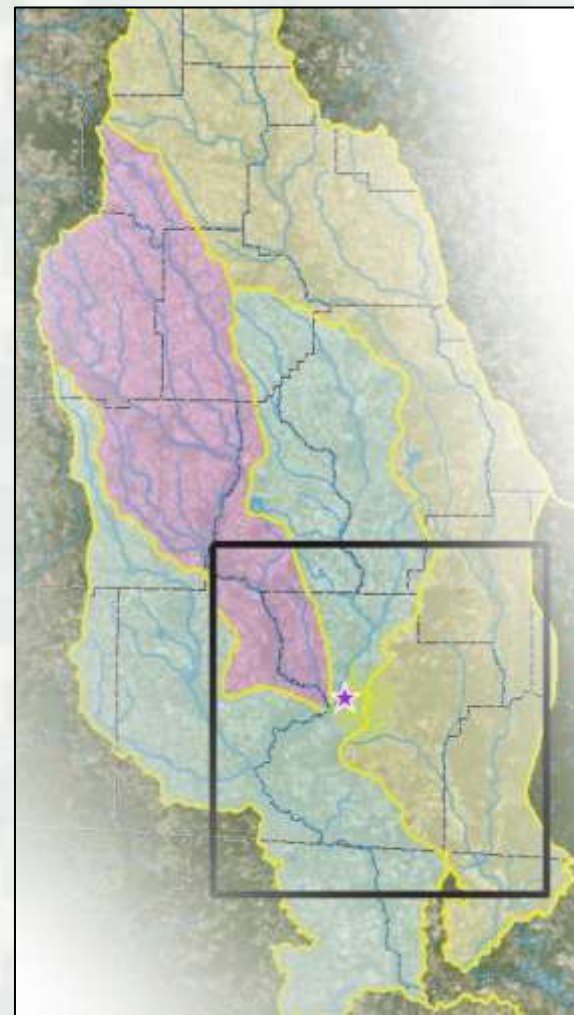
Benefit to Cost Ratio Estimated to be 1.4



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CONCLUSION

- Alternative 7 could reduce depth and duration of flooding, but not prevent it
- The underlying problems related to the frequency, depth and duration of water are due to the overall river basin and watershed complexity – which a future study could address in greater detail and more holistically
- This report established that there could be Federal interest in pursuing future flood management risk studies under other USACE authorities
 - Continuing Authority Program
 - Watershed Study Authority



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