CRS Activity 510 Triple Crown: A Sure Bet for the City of Savannah, GA

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David Stroud, CFM Emergency & Hazard Mitigation Lead: Amec Foster Wheeler
Objectives

- Savannah’s participation in the CRS Program - A historical look
- 5-year requirement to update City’s Floodplain Management Plan
- Savannah’s intention to receive credit in all 3 CRS elements in Activity 510
- Benefits provided for a CRS FMP, RLAA and NFP
- How multiple planning projects can be carried out simultaneously
- Technical aspects of individual planning processes
- Managing information and data
- Innovative ways to bring 3 plans to completion
Savannah: A Coastal and Port City

- 53% of City is in SFHA
- Flat topography
- Inadequate drainage system
- Tidal influences
- Combined storm/sanitary sewers
- Many pre-FIRM buildings
Inadequate Drainage - Setting the Stage

Flooded street after 1999 thunderstorm

FIRM Zones
Typical Flooding/Drainage Problems

Midtown/Historic

South Savanah
Savannah’s CRS Participation

- Entered CRS in 1992
  - Class 9 through 1998
- Class Change in 1999
  - Improved to Class 8
- Class Change in 2010
  - Improved to Class 6
- Class Change in 2016
  - Improved to Class 5
Five-year Update Requirement

- Previous Floodplain Management Plan was adopted by City in October 2009
  - In October of 2014 plan is 5 years old and must be updated for CRS
  - New planning criteria in 2013 CRS Coordinator’s Manual
- City not only wanted an updated FMP, but they also wanted
  - A Repetitive Loss Area Analysis &
  - Natural Floodplain Functions Plan
First in the Nation

510 FLOODPLAIN MANAGEMENT PLANNING—Summary

Maximum credit: 522 points

512 Elements

a. Floodplain management planning (FMP): 382 points for a community-wide floodplain management plan that follows a 10-step planning process:
   - Step 1. Organize
   - Step 2. Involve the public
   - Step 3. Coordinate
   - Step 4. Assess the hazard
   - Step 5. Assess the problem
   - Step 6. Set goals
   - Step 7. Review possible activities
   - Step 8. Draft an action plan
   - Step 9. Adopt the plan
   - Step 10. Implement, evaluate, revise.

b. Repetitive loss area analysis (RLAA): 140 points for a detailed mitigation plan for a repetitive loss area.

c. Natural floodplain functions plan (NFP): 100 points for adopting plans that protect one or more natural functions within the community’s floodplain.

Credit Criteria
Each element has a separate section discussing credit criteria.

Impact Adjustment
The impact adjustments for FMP and RLAA are described in separate sections. There is no impact adjustment for NFP.

Documentation Provided by the Community
Each element has a separate section describing needed documentation.

► Received 1.0 Ratio for all three elements in Activity 510

Three Elements in Activity 510

► Floodplain Management Plan: 361 Points
  ◆ 94.5% of total credit - covers entire community

► Repetitive Loss Area Analysis: 140 Points
  ◆ Full credit - covers all repetitive loss areas

► Natural Floodplain Protection Plan: 80 Points
  ◆ Full credit for NFP1 (once adopted)

581 Total Points (over 1 CRS Class)
Savannah’s 2015 CRS Cycle Visit

- May 1, 2016 CRS Classification 5
  - 2,940 points
- Future Modification - Class 4
  - 80 points Activity 510 Natural Floodplain Protection Plan
    - Adopted Watershed Master Plan

211.c. Class 4 Prerequisites

A Class 4 or better community must demonstrate that it has programs that minimize flood losses, minimize increases in future flooding, protect natural floodplain functions, and protect people from the dangers of flooding. Even though it may have enough points, a community that cleared most of the buildings from its floodplain with disaster assistance funds after a flood cannot be a Class 4 or better if it does not have an effective regulatory program to prevent a recurrence of the problem.

In order to be a Class 4 or better, a community must demonstrate that it has enough points to warrant the class and meet the following prerequisites.

(1) The community must meet all the Class 6 prerequisites.

(2) The community must have received and continue to maintain a classification of 4/4 or better under the BCEGS.

(3) The community must demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses. To do this, a Class 4 or better community must receive credit for the following CRS activities.
Savannah Bets on Three Plans

- Community-wide
- Building Specific
- Natural Areas

Floodplains
Floodplain Management Plan

- Climate change and sea level rise
- Coastal and canal bank erosion
- Dam and levee failure
- Flood 100/500-year
- Flood storm water/localized flooding
- Hurricane and Tropical Storms (including storm surge)
Repetitive Loss Area Analysis

- 185 Unmitigated Repetitive Loss Properties
- 83 Historic properties (only 1 loss)
- 585 properties with same or similar flood condition
- 87 Repetitive Loss Areas
  - Grouped in 16 subareas
  - Divided into 3 major areas
Natural Floodplain Protection Plan

- Natural resource inventory
- Preservation capability assessment
- Action plan with detailed actions
- Implementation strategy
Developing 3 Different Plans Simultaneously

- FMP and RLAA have 10 and 5 step standard planning process respectively. NFP does not have a standard planning process
  - Both FMP and RLAA have public outreach requirements
- FMP, RLAA and NFP are data rich plans which require both research and working with other agencies to obtain certain data
  - FEMA, State NFIP Coordinator, Department of Natural Resources, etc.
- RLAA requires field verification work
  - Labor intensive
Developing 3 Different Plans Simultaneously

- **Keys to success**
  - Develop upfront public outreach strategy
    - Members of your FMPC
      - 50% Citizens and stakeholders
    - Coordinate with other stakeholders
    - How to involve the public in other ways besides attending meetings
  - Utilize latest Repetitive Loss Data
    - Include “historical” properties in development of areas
    - Decide how many analyses; i.e. different types of flooding or buildings
Developing 3 Different Plans Simultaneously

- Keys to success
  - Utilize latest Repetitive Loss Data
    - Include “historical” properties in development of areas
    - Decide how many analyses; i.e. different types of flooding or buildings
      - 3 different “areas” analyses
      - 16 subareas
      - 87 repetitive loss areas
        - 185 unmitigated RL properties
        - 83 historic properties
        - 585 properties with same or similar flood condition
Developing 3 Different Plans Simultaneously

- Keys to success
  - Identify data sources
    - Local
    - State Department of Natural Resources
  - US Fish and Wildlife
    - Information and Planning & Conservation System (IPaC)
  - Cover entire floodplain or entire community
  - Endangered species
    - Federal status
    - State status
    - Protected habitat available
  - 35 threatened, endangered or candidates in Savannah

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Species Name</th>
<th>Federal Status</th>
<th>State Status</th>
<th>Potential Habitat Available</th>
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<tbody>
<tr>
<td>Amphibians</td>
<td></td>
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</tr>
<tr>
<td>Frosted Flatwoods Salamander</td>
<td>Ambystoma cingulatum</td>
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<tr>
<td>Gopher Frog</td>
<td>Lithobates capito</td>
<td>--</td>
<td>T</td>
<td>Yes</td>
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<tr>
<td>Striped Newt</td>
<td>Notophthalmus perstriatus</td>
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<td>T</td>
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<tr>
<td>Birds</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>American Oystercatcher</td>
<td>Haematopus palliatus</td>
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<td>R</td>
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<tr>
<td>Bald Eagle</td>
<td>Haliaeetus leucocephalus</td>
<td>BGEPA</td>
<td>T</td>
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<tr>
<td>Black Skimmer</td>
<td>Rynchops niger</td>
<td>--</td>
<td>R</td>
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<td>Sternula antillarum</td>
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<td>Calidris canutus rufa</td>
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<tr>
<td>Red Cockaded Woodpecker</td>
<td>Paroncinus bennesi</td>
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<td>Western Kingbird</td>
<td>Myiarchus borealis</td>
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<tr>
<td>Fish</td>
<td></td>
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<tr>
<td>Atlantic Sturgeon</td>
<td>Acipenser oxyrinchus oxyrinchus</td>
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<tr>
<td>Bluebarred Pygmy Sunfish</td>
<td>Elassoma okatie</td>
<td>--</td>
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<tr>
<td>Robust Redhorse</td>
<td>Moxostoma robustum</td>
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<td>Acipenser brevirostrum</td>
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<tr>
<td>Flowering Plants</td>
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<tr>
<td>Climbing Buckhorn</td>
<td>Sageretia minutiflora</td>
<td>--</td>
<td>T</td>
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</tr>
<tr>
<td>Florida Wild Privet</td>
<td>Forestiera segregata</td>
<td>--</td>
<td>R</td>
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</tr>
<tr>
<td>Georgia Indigo Bush</td>
<td>Amorpha georgiana</td>
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<tr>
<td>Wood Stork</td>
<td>Mycteria americana</td>
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<td>E</td>
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</tr>
<tr>
<td>Mammals</td>
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<td></td>
<td></td>
<td></td>
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<td>North Atlantic Right Whale</td>
<td>Eubalaena glacialis</td>
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<td>No</td>
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<tr>
<td>West Indian Manatee</td>
<td>Trichechus manatus</td>
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<tr>
<td>Reptiles</td>
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<tr>
<td>Diamondback Terrapin</td>
<td>Malaclemys terrapin</td>
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<tr>
<td>Eastern Indigo Snake</td>
<td>Drymarchon corais couperi</td>
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<td>T</td>
<td>Yes</td>
</tr>
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<td>Gopher Tortoise</td>
<td>Gopherus polyphemus</td>
<td>C</td>
<td>T</td>
<td>Yes</td>
</tr>
<tr>
<td>Green Sea Turtle</td>
<td>Chelonia mydas</td>
<td>E</td>
<td>T</td>
<td>No</td>
</tr>
<tr>
<td>Kemp’s Ridley Sea Turtle</td>
<td>Lepidochelys kempii</td>
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</tr>
<tr>
<td>Loggerhead Sea Turtle</td>
<td>Caretta caretta</td>
<td>T</td>
<td>E</td>
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<tr>
<td>Southern Hognose Snake</td>
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<tr>
<td>Spotted Turtle</td>
<td>Clemmys guttata</td>
<td>--</td>
<td>U</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Common Name
- Sustainable Savannas
- Department of Natural Resources
Developing 3 Different Plans Simultaneously

- Amphibian and Reptile Habitat
- Habitat preservation
  - Suitable
  - Options for conserving
- Recommendations
- Preserve or increase habitat
Planning Process - Additional Public Input

- Beyond attending public meetings
  - Website
  - Posting draft HIRA
  - Posting draft plan
  - Local television reporting
  - Articles about planning process in newspaper
  - Survey/Questionnaire
  - Hard copy available of plan at various locations
  - Government television
Planning Process - Additional Public Input
Planning Process - Additional Public Input

- FMP & RLAA Questionnaires
  - FMP - Response from Savannah Tree Foundation requesting more open space
  - RLAA - 801 mailed questionnaires
    - 171 responses
    - 21% response rate
    - Many personal comments
Planning Process - Additional Public Input

Q2: What type of foundation does your home/building have?

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Percentage</th>
<th>Number Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab</td>
<td>53%</td>
<td>84</td>
</tr>
<tr>
<td>Crawlspace</td>
<td>43%</td>
<td>76</td>
</tr>
<tr>
<td>Basement</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>176</td>
</tr>
</tbody>
</table>

Q3: Has your home/building or property ever been flooded or had a water problem?

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Percentage</th>
<th>Number Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41%</td>
<td>68</td>
</tr>
<tr>
<td>No</td>
<td>59%</td>
<td>98</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>166</td>
</tr>
</tbody>
</table>

Q5: Where did you get water? How deep did the water get?

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Percentage</th>
<th>Number Responding</th>
<th>&lt; 3 ft</th>
<th>&gt; 3 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
<td>6%</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Crawlspace</td>
<td>13%</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Over first floor</td>
<td>15%</td>
<td>18</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Yard only</td>
<td>22%</td>
<td>24</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td>Water kept out of house by sandbagging, sewer valve, or other protective measures</td>
<td>31%</td>
<td>36</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>79</td>
<td>61</td>
<td>12</td>
</tr>
</tbody>
</table>

Q6: What was the longest time that water stayed in the house/building?

<table>
<thead>
<tr>
<th>Responses Received</th>
<th>Percentage</th>
<th>Number Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 hours</td>
<td>15%</td>
<td>6</td>
</tr>
<tr>
<td>3-4 hours</td>
<td>31%</td>
<td>12</td>
</tr>
<tr>
<td>5-6 hours</td>
<td>8%</td>
<td>3</td>
</tr>
<tr>
<td>7+ hours</td>
<td>5%</td>
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<td>9-16 hours</td>
<td>5%</td>
<td>2</td>
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<tr>
<td>18 hours</td>
<td>3%</td>
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<td>30 hours</td>
<td>3%</td>
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</tr>
<tr>
<td>1-2 days</td>
<td>20%</td>
<td>9</td>
</tr>
<tr>
<td>3-4 days</td>
<td>10%</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>39</td>
</tr>
</tbody>
</table>
Planning Process - Additional Public Input

- Results of questionnaires
  - Not a high level of trust
  - 50% not insured
  - Sump pumps/drainage improvements
  - 35% storm sewer backup major problem
  - 50% diagram 1A construction
  - Majority have been flooded over 1st floor or in crawl space

The following trends in survey responses should be considered when evaluating mitigation measures for General Areas 1, 2 and 3:

- 52 percent of respondents do not want information from the City of protecting their home building from flooding. This could indicate a lack of trust in the City or a lack of interest in installing floodproofing measures.
- Over half of the respondents do currently have FEMA flood insurance.
- Of those respondents who have installed flood protection measures, re-grading of property and sump pumps were the most popular methods; furthermore, re-grading of property, sump pumps and city initiated drainage improvement projects appear to be the most effective measures for reducing flooding.
- 35 percent of respondents feel that storm sewer backup is the cause of flooding issues on their property. Drainage from nearby properties and overbank flooding are the next most popular responses.
- Over 50 percent of respondents have a slab foundation. 41 percent have been flooded.
- The majority of flooding has been over the first floor of the home and in crawl spaces. The majority of flooding lasted between one and four hours.
Planning Process - Additional Public Input
Planning Process - Additional Public Input
Managing Data and Information

Table 4.21 - Historic District Exposure to Flood Hazards

<table>
<thead>
<tr>
<th>National Register Historic District</th>
<th>Exposure to Flood Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Riverine Flooding</td>
</tr>
<tr>
<td>Archeley Park-Chatham Cemetery</td>
<td></td>
</tr>
<tr>
<td>Central Georgia Railroad</td>
<td></td>
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<tr>
<td>Cayler-Beverly</td>
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<tr>
<td>Daffin Park-Parkside Place</td>
<td></td>
</tr>
<tr>
<td>Eastside</td>
<td></td>
</tr>
<tr>
<td>Georgia City</td>
<td></td>
</tr>
<tr>
<td>Savannah Historic District</td>
<td></td>
</tr>
<tr>
<td>Savannah Victorian</td>
<td></td>
</tr>
<tr>
<td>Thomas Square Historic District</td>
<td></td>
</tr>
<tr>
<td>Savannah Out of Area</td>
<td></td>
</tr>
</tbody>
</table>

1Based on history of local flooding identified by the F3PC.
Managing Data and Information
Managing Data and Information

801 Repetitive Loss Buildings
Managing Data and Information
Bringing Plans to Successful Completion

- Savannah State Students - Emergency Management
- Be persistent (endangered species data, repetitive loss data, etc.)
- Juggle multiple deadlines
- Value advice/information from residents
- Listen
- Tom McDonald!
Questions

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