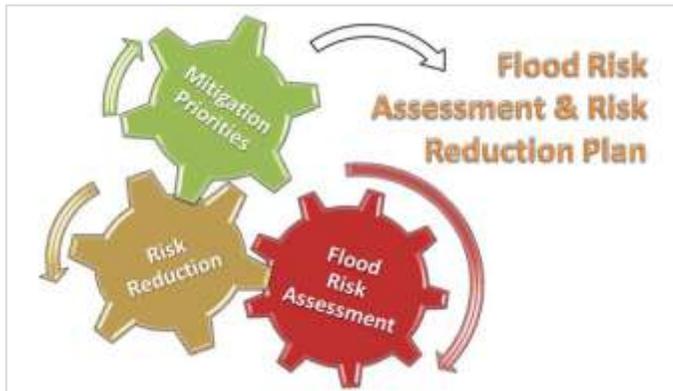


FY2015 Flood Risk Assessment and Risk Reduction Plan Implementation



May, 2014

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1. Purpose

The purpose of this document is to present the Fiscal Year 2015 (FY2015) implementation of the Flood Risk Assessment and Risk Reduction Plan (RA/RR Plan) (CMSWS, 2012). The RA/RR Plan was presented by Charlotte-Mecklenburg Storm Water Services (CMSWS) staff, endorsed by the Storm Water Advisory Committee and subsequently approved by the Mecklenburg County Board of County Commissioners in 2012. FY2015 will be the second year of implementation of the RA/RR Plan. The RA/RR Plan is intended to be a dynamic, continuously updated plan that will aid in identifying, prioritizing and planning flood mitigation projects. The RA/RR Plan includes three main elements which link Flood Risk Property Scores at the individual property level with Risk Reduction Recommendations that are then supported by Flood Mitigation Priority Scores. Each element builds upon the previous element to produce the results that will be assigned to the property as follows:

- ***Flood Risk Property Score***—consists of analyzing factors related to flood impacts, storm frequency, and structure location on an individual property basis.
- ***Risk Reduction Recommendations***—consists of evaluating 19 different flood mitigation techniques deemed most appropriate for Mecklenburg County and making a planning-level recommendation of either 1) Highly Effective, Recommended, 2) Effective, 3) Further Evaluation Needed, or 4) Not Recommended.
- ***Flood Mitigation Priority Scores***—consists of assessing and accounting for community benefits and other factors based on Risk Reduction Recommendations that are not accounted for in the Flood Risk Property Score. The Flood Mitigation Priority Score is used to prioritize individual properties as well as project areas (i.e., groups, or “clusters” of properties) for mitigation activities.

2. FY2015 Updates to the RA/RR Plan

Many of the datasets used to calculate the elements described above for FY2015 were updated from FY2014. Each updated dataset is as follows:

- ***Flood Rasters and Flood Polygons***—the most up-to-date flood rasters and flood polygons were utilized for the FY2015 RA/RR Plan. The complete datasets were only available for PMR 1 and PMR 2 (see Figure 1), therefore only properties within these areas were considered for implementation during FY2015.

- ***Sewer Projects***—updated Charlotte Mecklenburg Utility Department Capital Improvement Plan (CIP) data (projects expected to be constructed in the next 5 years) were used for the FY2015 analysis.
- ***Water Quality Capital Improvement Project Sites***—updated locations of Storm Water - Water Quality Capital Projects expected to be constructed in the next 5 years were included.

3. FY2015 Scores

In order to prioritize mitigation projects for FY2015 the Risk Assessment Risk Reduction Tool (RARRT) was updated with the datasets described in the previous section and new simulations performed. Simulations were completed for every active elevation certificate within the PRM 1 and PMR 2 study areas (Figure 1). A total of 5204 elevation certificates were analyzed and assigned scores. The scores ranged from a low of 0 (very low priority) to a high of 3832 (very high priority). In order to visually identify scores for individual properties the following color palette is used throughout this document:

- ***Highest Priority Properties***—Flood Mitigation Priority Scores of 1000 or more are colored red. Typically these properties exhibit flood elevations greater than finished floor elevations in more frequent events (such as the 10 year event).
- ***Moderate Priority Properties***—Flood Mitigation Priority Scores between 500 and 1000 are colored yellow. Moderate priority generally indicates finished floor flooding during less frequent events (100 year), limited access during more frequent events and location in previous project areas.
- ***Lower Priority Properties***—Flood Mitigation Priority Scores less than 500 are colored green. These scores could indicate conditions ranging from no impacts from the analyzed events (score of 0) to yard flooding or more substantial impacts.

The grouping of the scores into the 3 previous categories for all 5204 elevation certificates analyzed is presented in Figure 2.

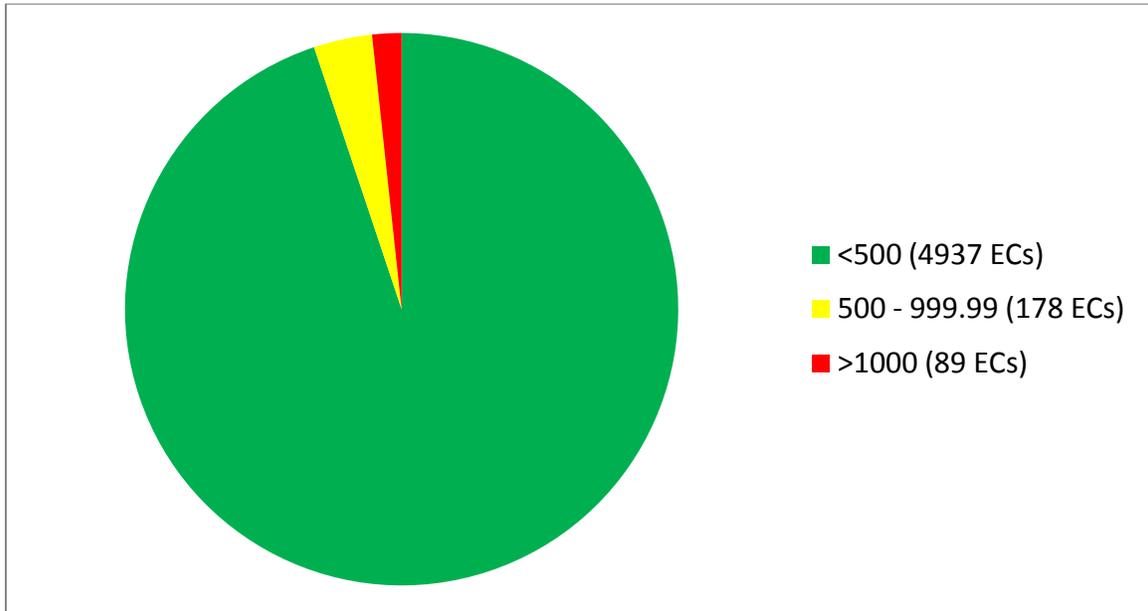


Figure 2: Breakdown of FY2015 Scores

Figure 3 presents the distribution of all 5204 elevation certificates analyzed.

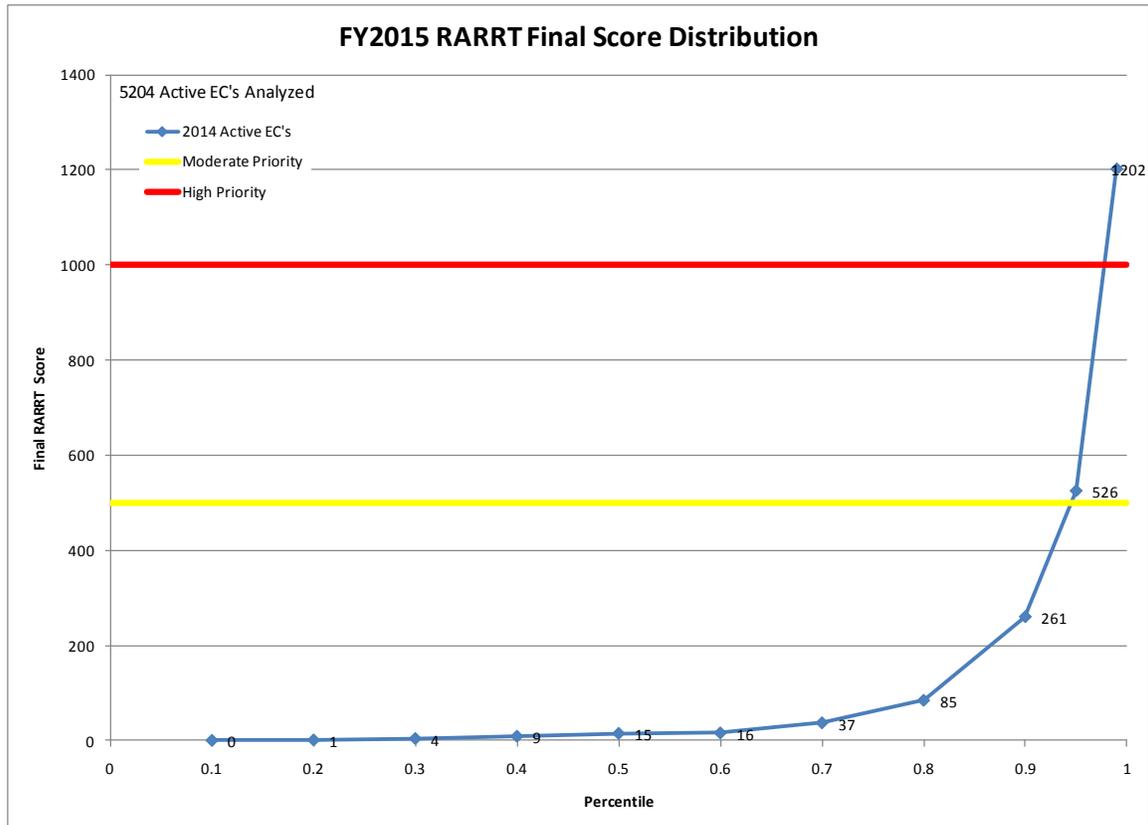


Figure 3: Distribution of FY2015 Scores

Figure 4 presents the geographic distribution of the FY2015 scores by six square mile sub-basin. Note that the color indicates the overall flood mitigation score (red indicates generally higher scores relative to other basins) and does not directly correlate to high, moderate and low priority basins. The labels indicate the total number of elevation certificates analyzed in the basin for FY2015.

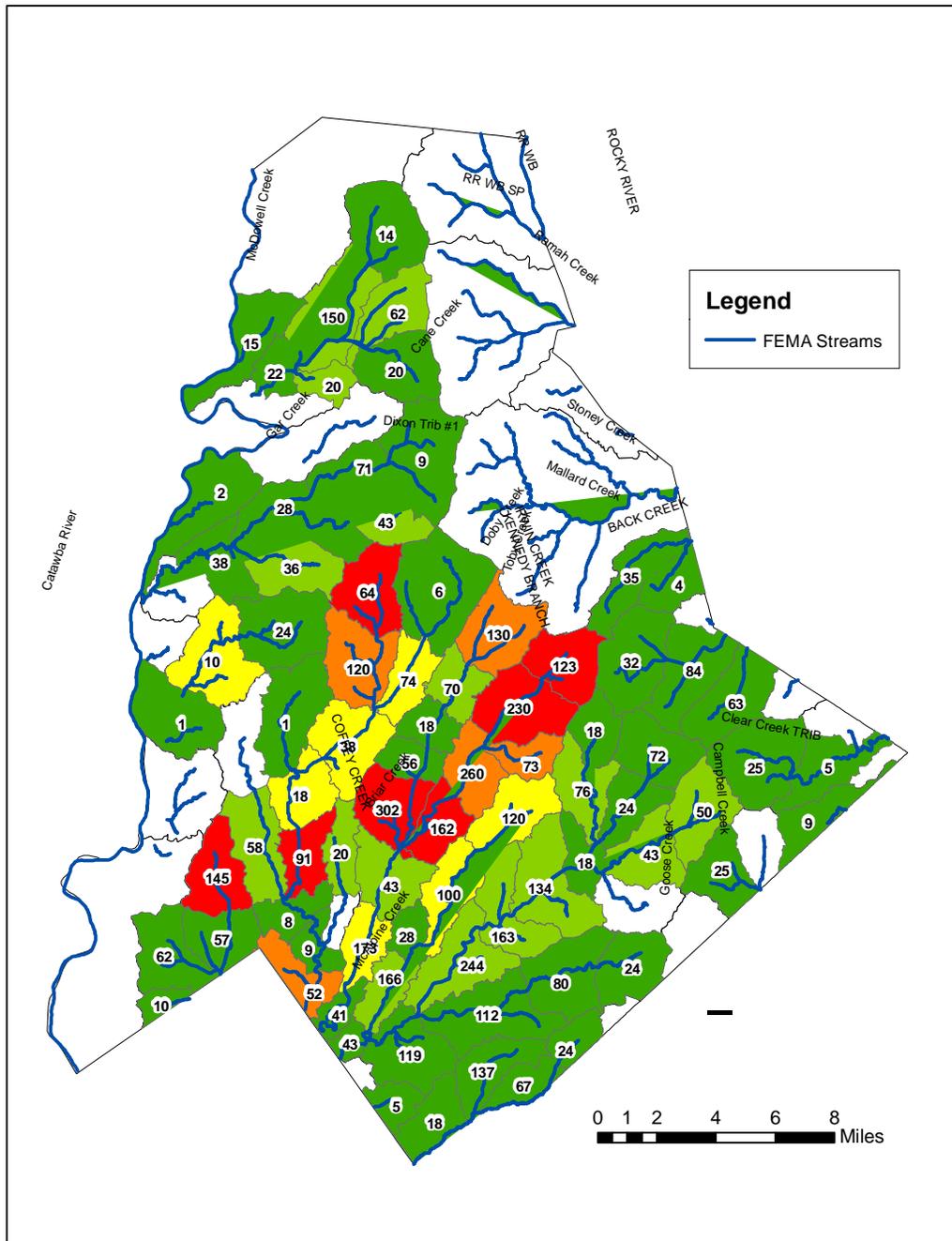


Figure 4: Geographic Distribution of FY2015 Scores

As expected, the older and more built-up areas of Mecklenburg County tend to have the highest Flood Mitigation Scores. Most of these basins are located within the City of Charlotte. It is important to note that these areas were largely developed prior to the adoption of flood plain ordinances. Conversely, areas that developed after the adoption of the ordinances tend to exhibit lower scores, such as Huntersville, Cornelius, Matthews and Mint Hill. This geographic distribution of scores is an indication of the effectiveness of our local flood plain ordinances.

4. FY2015 Prioritization

The FY2015 prioritization is focused upon properties with high and moderate Flood Mitigation Priority Scores. Each of these properties with a score of 500 or more was placed into one of four categories depending upon several factors not considered in the RARRT. The four categories along with an associated description are as follows:

- a. **Category 1: Grant Eligible Properties**—FEMA has announced Hazard Mitigation Assistance (HMA) funding for properties that are categorized as Severe Repetitive Loss (SRL). Essentially these are properties that carry flood insurance, have had 4 or more claims on their flood insurance policy and are deemed beneficial to acquire or elevate. All properties that are categorized as SRL and have an acquisition cost of \$280,000 or less are deemed beneficial. Similarly, properties that are SRL and have a cost to elevate of \$140,000 or less are deemed beneficial. If the cost to implement either of these techniques exceeds the designated limit, a cost:benefit calculation can be performed to determine grant eligibility.

The 42 properties identified as SRL were evaluated using 3 tests to determine their ultimate suitability for inclusion in an HMA Grant. The tests are as follow:

Table 1: Test 1 Questions

Q1	Is the property located on the minor system?	If yes, property is excluded.
Q2	Is RARRT recommendation on acquisition either effective or highly effective?	If no, property is excluded
Q3	Is the property a part of a larger multi-family development?	If yes, property is excluded (based upon complexity)

Table 2: Test 2 Questions

Q1	Is the cost for acquisition more than \$500,000	If yes, property is excluded (cost benefit ratio is not favorable).
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Table 3: Test 3 Questions

Q1	Is the cost to mitigate high compared with the RARRT score	A value of >500 on this metric is excluded. These properties tend to be very expensive for the risk mitigated.
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Of the 42 SRL properties in Mecklenburg County, 4 passed the 3 suitability tests and will be further evaluated for inclusion in an HMA grant. A listing of each property and the data used to answer the 3 test is included with this document as Appendix A. Note that HMA funding covers 100% of the cost of acquisition up to \$280,000 and 100% of the cost of elevation up to \$140,000.

b. **Category 2: Locally Funded Acquisitions**—Properties with Flood Mitigation Priority scores of more than 500 were considered for this category. When appropriate, properties were grouped into project areas. Project areas were then prioritized based upon Flood Mitigation Priority Score (higher score equated to a higher rank). For multiple properties within a project area the highest scoring property within the project area was used to rank the project area. Occasionally, properties with a Flood Mitigation Priority Score of less than 500 were included in a project area if the property met the following criteria:

- Property was a part of a previous unsuccessful mitigation effort.
- Surrounding acquisitions would have left property as a ‘patchwork’ of un-mitigated properties
- Property is critical to a future CIP project

A total of 55 properties in 19 different project areas were included in this category. CMSWS anticipates a total budget of approximately \$5,000,000 will be allocated to fund acquisition. In total the 55 properties will cost approximately \$9,200,000 to acquire and mitigate. Past experience indicates that some property owners will not wish to participate. Additionally, other properties will be excluded for various reasons. If these issues are encountered, the next property or project area on the list will be included to take the place of the excluded property. Properties identified in Category 2 are included as Appendix B.

c. **Category 3: Real Estate Studies**—properties assigned to the study category can be grouped into one of the following sub-categories:

- Complicated real estate situations involving very valuable commercial property. Several commercial properties with Flood Mitigation Priority Scores in excess of 1000 were identified in this sub-category. It is likely that acquisition of these properties would take place over several years.

- Complicated real estate situations involving multiple buildings on a single parcel where some are in the flood zone and some are not. These properties will require sub-division and have proven to be very challenging acquisitions in the past.
- Properties protected by un-regulated levees. Several un-regulated levees exist in Mecklenburg County. These situations will be evaluated to determine their suitability for bringing into compliance
- Properties that could be protected by new levees.
- Properties with probable elevation certificate errors that require field verification.

Properties identified in Category 3 were grouped into project areas and project areas were prioritized based upon the highest scoring component. Studies will be completed for the top 5 projects during FY 2015. All Category 3 properties are presented in Appendix C.

- d. **Category 4: Other**—properties that have Flood Mitigation Priority Scores greater than 500 and did not fit into the other categories. The unifying characteristic of these properties is no action is recommended to be initiated during FY2015. These properties tended to be grouped into the following sub-categories:
- Mitigation is currently underway though inclusion with earlier grants, demolition permits or a permit to elevate. These properties will be compliant with floodplain ordinances after mitigation is complete.
 - Non-participants. The owners of these properties have been approached about participation in the Storm Water - Flood Mitigation program but have declined. These properties will be periodically re-evaluated for inclusion.
 - Contaminated properties. Several commercial properties with high Flood Mitigation Priority Scores have known environmental contamination issues. These properties will not be acquired with local or FEMA funds.
 - Self mitigation. Several areas of the county are experiencing rapid re-development of single family residential property. Typically, these properties have land values that greatly outweigh the building values. In these areas, investors are often acquiring homes located in a flood zone and either tearing them down and rebuilding or are elevating them. In either case, the result is a structure that is compliant with floodplain ordinances. Properties in these areas will be monitored in the coming years for self mitigation and inclusion in the acquisition category.

Properties assigned to Category 4 are presented in Appendix D. There are 108 properties in Category 4. As mentioned above, the RA/RR Plan is dynamic

and properties in Category 4 will change as current mitigation efforts are implemented or not due to non-participating property owners.

5. References Cited

Charlotte-Mecklenburg Storm Water Services, 2012. Flood Risk Assessment and Risk Reduction Plan, January, 2012.