



Executive Summary



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Executive Summary

ES.1 General Description of the Region

In 2019, the Texas Legislature adopted changes to the Texas Water Code Section (§)16.061 that established the regional and state flood planning process. Regional flood plans (RFPs) for 15 flood planning regions across the state will be compiled in the 2024 state flood plan (SFP). The SFP will be updated every five years. The Texas Water Development Board (TWDB) is charged with overseeing the development of the regional and state flood plans. The amended RFPs are due to TWDB by July 14, 2023.

TWDB appointed a regional flood planning group (RFPG) for each region and provided them funding to prepare their regional plans. The Nueces River Authority is the sponsor for the Nueces regional flood plan (NRFP). HDR Engineering (HDR) is the technical consultant for the NRFP flood planning effort. The Nueces Regional Flood Planning Group (NRFPG) is comprised of stakeholders from various interest groups, which include the public, counties, municipalities, industries, agriculture, environment, small business, electric-generating utilities, river authorities, water districts, water utilities, and flood districts. The members of the NRFPG for the first flood planning cycle are listed in Table ES-1 and Table ES-2.

Table ES-1. NRFPG Voting Membership

Member Name	Interest Category	Organization
Barbara Canales* (Chairman)	Industries	-
Andrew Rooke* (Vice-Chairman)	Small Business	F.B. Rooke & Sons
Robert Williams* (Secretary)	Public	City of Jourdanton
Shanna Owens*	Counties	San Patricio County DEMS
Lauren Williams*	Environmental	The Nature Conservancy
Debra Barrett	Agricultural	Barrett Ag
Larry Doalina	Water Utilities	City of Cotulla
Julie Lewey	River Authorities	Nueces River Authority
JR Ramirez	Water Utilities	Wintergarden GCD
Larry Thomas	Flood Districts	Bandera County River Authority
David Baker (resigned)	Electric Generating Utilities	City of Hondo
LJ Francis (resigned)	Municipalities	Consultant

*Executive Committee members

Table ES-2. NRFPG Non-Voting Membership

Member Name	Agency
Tressa Olsen	Texas Water Development Board
Jim Tolan	Texas Parks and Wildlife Department
Brian Hurtuk	Texas Division of Emergency Management
Kara Smith and Jami McCool	Texas Department of Agriculture
Kendria Ray	Texas State Soil and Water Conservation Board
Simone Sanders	General Land Office
Joel Anderson	Texas Commission on Environmental Quality
Open	Liaison to San Antonio RFPG and Rio Grande RFPG
Dave Mauk	Liaison from the San Antonio RFPG

This RFP has been developed according to 39 guiding principles per Texas Administrative Code (TAC) 362.3. The overarching goal of the RFP is “to protect against the loss of life and property”. A detailed summary of how this RFP specifically addresses each guiding principle is included in Chapter 10.

The NFPR, also referred to as Region 13, encompasses the entirety of the Nueces River basin and borders the San Antonio River basin (Region 12) to the north and the Lower Rio Grande basin (Region 15) to the south (See Figure ES-1). The planning area spans 24,094 square miles and is diverse in nature. The basin includes five of the 10 major ecosystems identified in Texas and is primarily represented by the south Texas plains ecosystem with the Edwards Plateau dominant in the upper basin and the gulf prairies and marshes dominant along the coast. The major water bodies are represented by the Nueces River and its principal tributaries of the Frio and Atascosa rivers. The Nueces River feeds into Corpus Christi Bay. The basin includes two major reservoirs, Choke Canyon and Lake Corpus Christi.

The NFPR was sub-divided into four subregions to facilitate stakeholder engagement amongst the basin’s varying geographic areas (see Figure ES-2).

The planning area includes 31 counties, 57 municipalities, and 50 other government entities. The basin is largely rural in nature with a population of 1,140,000 in 2020. Corpus Christi is the major population center in the basin with a population of 325,000 in 2020. Other nearby population centers include Laredo and San Antonio. The region is expected to grow to 1,516,000 or by 33% between 2020 and 2050. This growth is anticipated to be focused near the major population centers of Corpus Christi, Laredo, and San Antonio.

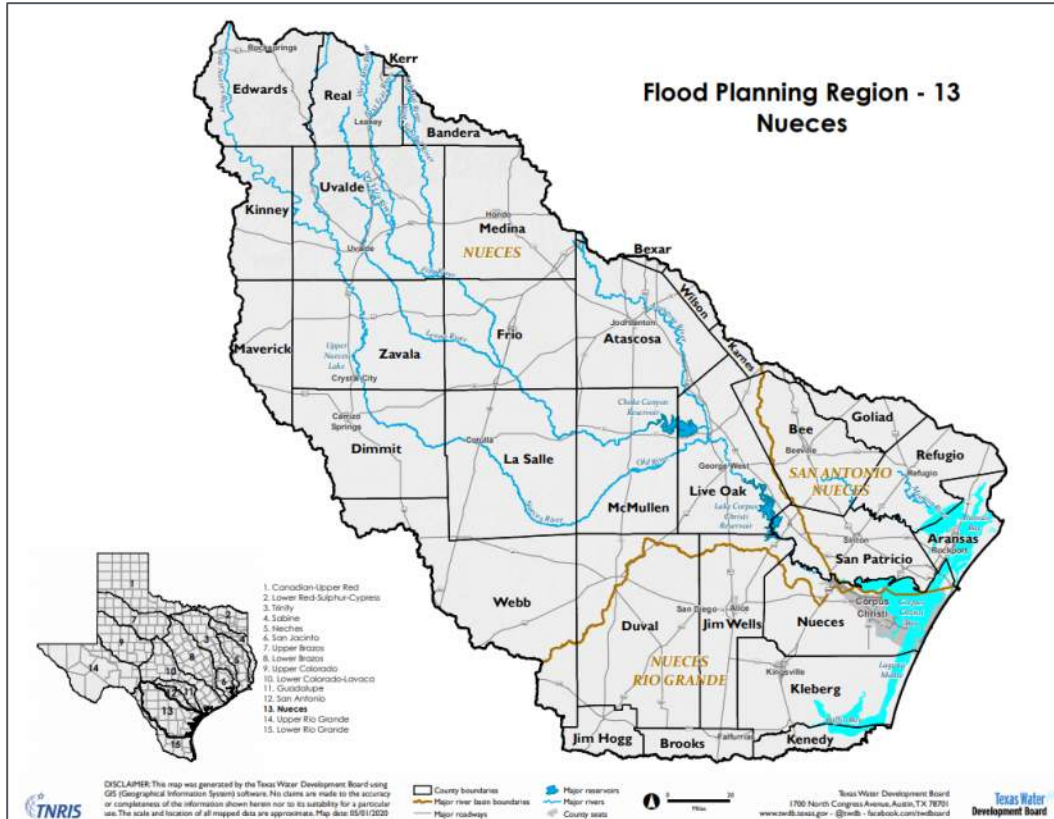


Figure ES-1. Nueces (Region 13) Flood Planning Region

Existing Infrastructure Assessment

The NRFP collected information on natural features and constructed major infrastructure and added this information to a geographic information system (GIS) geodatabase. This infrastructure was assessed as functional, non-functional, and deficient. Multiple dams were identified as non-functional (14) or deficient (22) per TCEQ Dam Safety program. One stormwater pump station in Aransas Pass assessed as non-functional. Being the first RFP, the condition of most constructed major infrastructure is still unknown and will be further described and assessed in future RFPs.

ES.2 Flood Risk Analysis

The flood plan determined the existing and future condition flood risk. The total flood risk is comprised of three components: hazard, exposure, and vulnerability. Hazard defines the location, magnitude, and frequency of flooding. Exposure defines who and what might be harmed. Vulnerability identifies vulnerable communities and critical facilities.

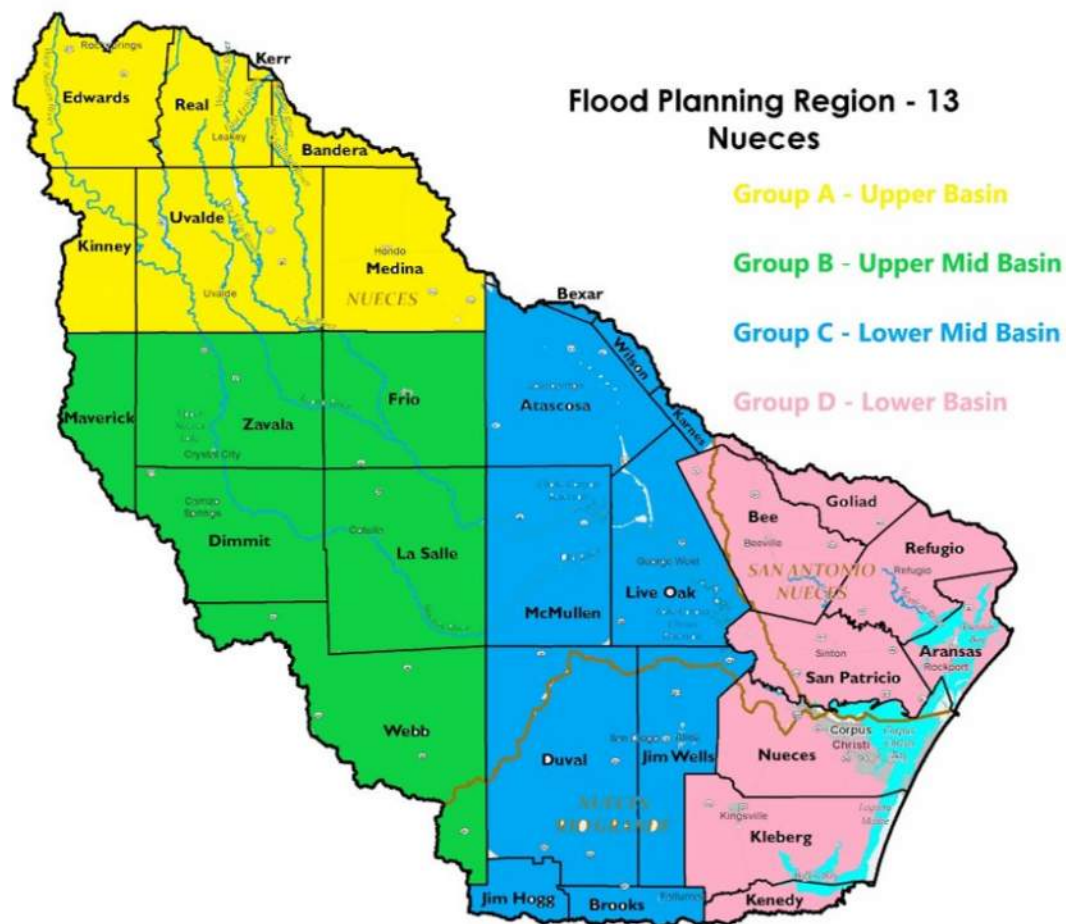


Figure ES-2. Nueces Flood Planning Area and Sub-Regions

Flood Hazard

The flood hazard is defined as the 1% and 0.2% annual flood risk inundation boundaries (i.e., 100-year and 500-year storm event floodplains) and known flood-prone areas. In total, 4,578 or 19.0% of all land in the basin is at risk of the 1% annual chance flood inundation in existing conditions with 71% of the 1% inundation occurring as the result of riverine flooding. This risk grows to 5,865 square miles or 24.3% of all land in the basin, for the 0.2% annual chance flood inundation.

Inundation Boundary Models

The flood inundation boundaries are defined for the entire region using best available data, including detailed and approximate modeling and mapping data. Detailed models used for inundation mapping include National Flood Hazard Layer (NFHL), Letters of Map Revision (LOMRs), and other project specific models. Other detailed models available and used for flood warning purposes include the U.S. Army Corps of Engineers' (USACE) Nueces and San Diego models and the U.S. Geological Survey's (USGS) Sabinal model. However, most of the basin is based on approximate data. Approximate flood inundation boundary data includes Base Level Engineering (BLE),

NFHL approximate, First American Flood Data Services (FAFDS), and Draft Cursory Floodplain Data. BLE is estimated to be available for the entire basin by 2023 per the TWDB BLE status viewer. See Figure ES-3 for source of flood inundation boundaries used in the NRFP.

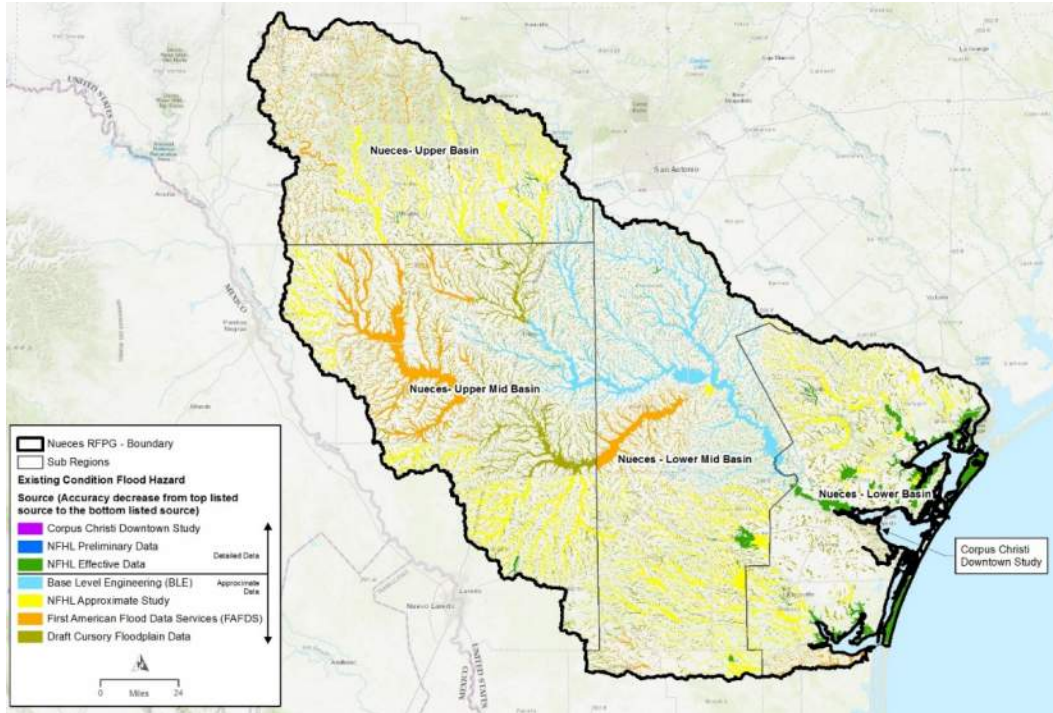


Figure ES-3. Source of Flood Modeling and Mapping Data (Map 5A)

Inundation Boundary Gaps

Many areas of the basin had no floodplain inundation maps (La Salle and Frio counties) prior to the regional flood planning efforts. Many other areas have potentially inaccurate or old mapping performed prior to 2010 (Edwards, Real, Kinney, Zavala, Dimmit, McMullen, Jim Hogg, and Kenedy). Other areas have mapping based on old rainfall data that differs from new rainfall data by more than 30% (Maverick, Uvalde, Bandera, Medina, Webb, Bee, Brooks, and Goliad). See Figure ES-4 for inundation boundary gaps.

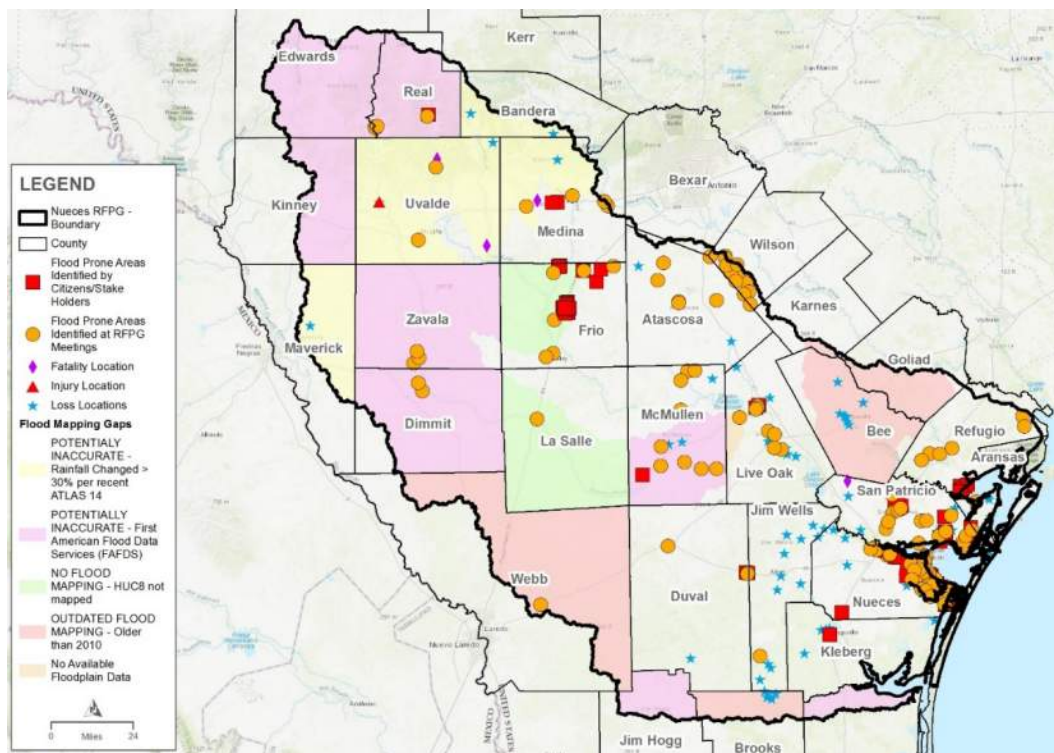


Figure ES-4. Inundation Boundary Gaps and Known Flood Prone Areas (Map 5C)

Additional Known Flood-Prone Areas

Additional known flood-prone areas were determined from historical flood data, local knowledge, and from low water crossing (LWC) data obtained from the Texas Natural Resources Information System (TNRIS). This data is depicted on a per county basis in Appendix B23 – Flood Hazard Risk, Flood Risk Score, and Recommended Flood Mitigation Actions.

- Historical data was gathered from the USGS, National Weather Service (NWS), and the Federal Emergency Management Agency (FEMA), and included information on property damage, fatalities, and injuries because of flooding. The most damaging flood event in the Nueces Basin was Hurricane Harvey, which caused \$4.3 billion in damages in 2017.
- Local knowledge of flood-prone areas was obtained through public and stakeholder outreach, which involved posting an interactive online public comment map on the Nueces River Authority’s Region 13 website, holding four subregional meetings during May of 2021, and performing additional outreach in February and March of 2022 where three subregional meetings and 20 interviews with stakeholders were held. The available flood hazard information was made available to the public at the June 28, 2021, NRFPG meeting to identify additional flood hazards that may not have been identified in the initial maps. A total of 274 flood-prone points from local knowledge were obtained for use in the NRFP (see Figure ES-5).

- Approximately 576 LWCs were identified from various sources but predominately from TNRIS LWC data.

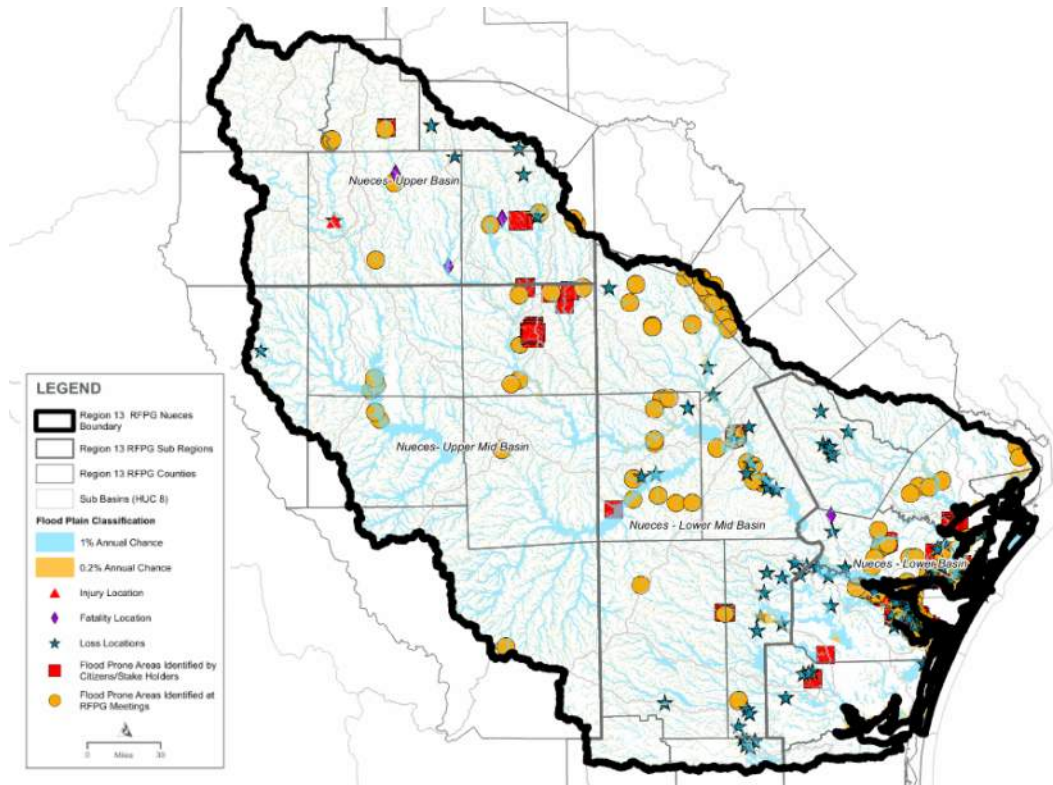


Figure ES-5. Additional Known Flood-Prone Areas

Future Condition Analysis

A future condition flood risk analysis was performed to approximate the flood hazard extents projected in 30 years’ time, or the year 2050, based on a “no-action” scenario. In future conditions, an additional 51 square miles of land or 4,629 square miles (19.2% of all land in basin) is anticipated to be at risk of the 1% annual chance flood inundation as compared to existing conditions. This total grows to 5,912 square miles (24.5% of all land in basin) for the 0.2% annual chance flood inundation.

Inland Future Condition

Population growth over the next 30 years is considered a significant factor in the future conditions flood risk for the Nueces Region’s riverine systems. A horizontal floodplain buffer was applied for areas with projected high growth, which for this flood plan were limited to areas surrounding cities and other concentrated populated areas.

Coastal Future Condition

Relative sea level rise is also considered a significant factor in the future condition flood risk along the coastline. Based on best available data from the National Oceanic and Atmospheric Administration’s (NOAA) Global & Regional Sea Level Rise Scenarios for

the United States (2022 update), a 1.1-foot relative sea level rise was adopted by the region on June 27, 2022, for the 2050 relative sea level rise condition. This sea level rise will be used to apply an appropriate horizontal buffer for the existing 1% annual chance (100-year) and 0.2% annual chance (500-year) storm event flood inundation boundaries. Due to timing, the future coastal conditions were evaluated but not applied to the future flood hazard layer in this amended plan.

Exposure Flood Analyses

In existing conditions, 61,000 structures, a population of 137,000, 3,200 miles of roadway, 5,400 roadway crossings, and 390 square miles of agricultural land are at potential risk of flooding from the 1% annual chance storm event. In future conditions, this risk is anticipated to grow to 78,000 structures, a population of 191,000, 3,500 miles of roadway, 5,500 roadway crossings, and 400 square miles of agricultural land. However, this does not include the potential for construction of new structures built in the floodplain in areas with unregulated development in the floodplain.

Hot spots for structural flooding in both the existing and future conditions include (1) the City of Corpus Christi, including Robstown; (2) the Rockport, Ingleside, and Port Aransas area; (3) cities in the lower basin, including Alice, Sinton, Kingsville, Falfurrias, and Beeville; (4) areas along the Nueces River from the City of Three Rivers to Corpus Christi; and (5) cities in the upper basin, including Crystal City, Knippa, D'Hanis, Uvalde, Hondo, Pearsall, Devine, Sabinal, and Dilley. Flood exposure for existing conditions is shown in Figure ES-6.

Vulnerability Analysis

Social Vulnerability Index (SVI) values from the Centers for Diseases Control and Prevention (CDC) were used to identify communities that may be less resilient and need more support before, during, or after disasters. SVI values were provided for all structures located in the region and an evaluation undertaken to determine where vulnerable structures are at flood risk in the basin. Additionally, the location of critical facilities at risk of flooding was also evaluated. Critical facilities include schools, hospitals, police stations, and fire stations. The analysis determined that 430 critical facilities are at risk of 1% annual chance storm event flood inundation. This increases to 560 critical facilities at risk in the future condition. Hot spots for structural flooding in vulnerable areas is shown in Figure ES-7. Not all hot spots for flood exposure are also hot spots for flood vulnerability, as some areas are considered more resilient. The most vulnerable areas to flood risk in both existing and future conditions are Corpus Christi, Robstown, Alice, and Crystal City. Other vulnerable areas to flood risk include Kingsville, Sinton, Falfurrias, Dilley, Pearsall, Devine, Uvalde, and Knippa.

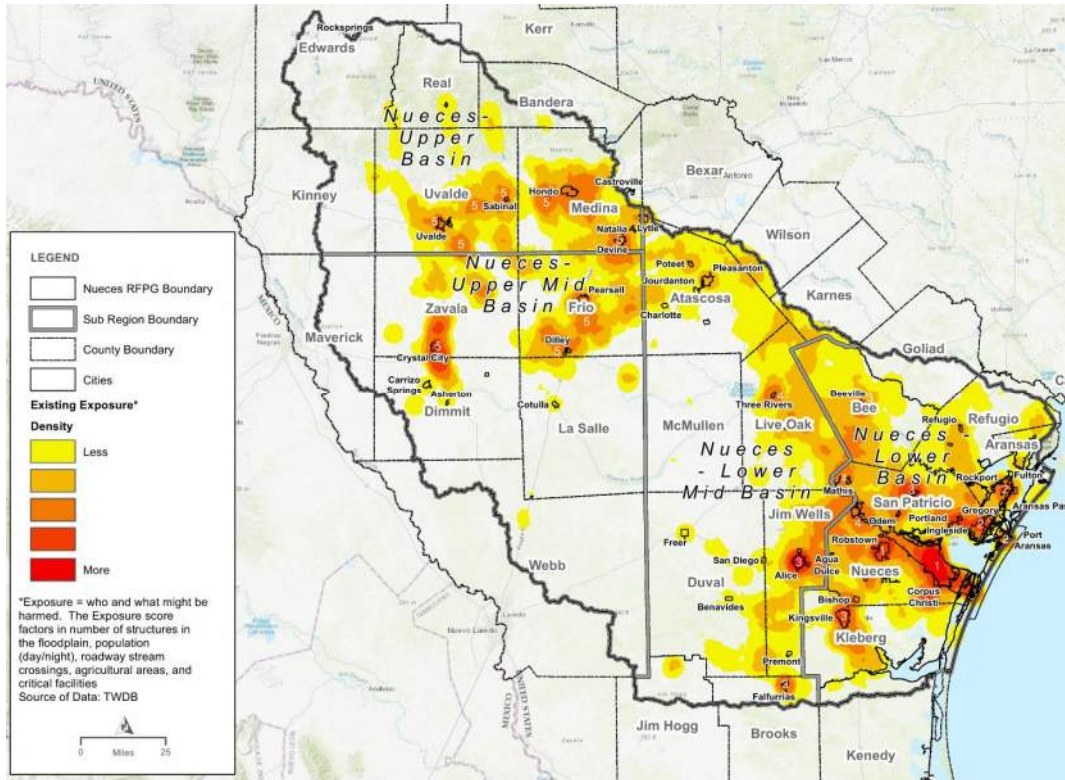


Figure ES-6. Existing Condition Exposure Heat Map (Map 6)

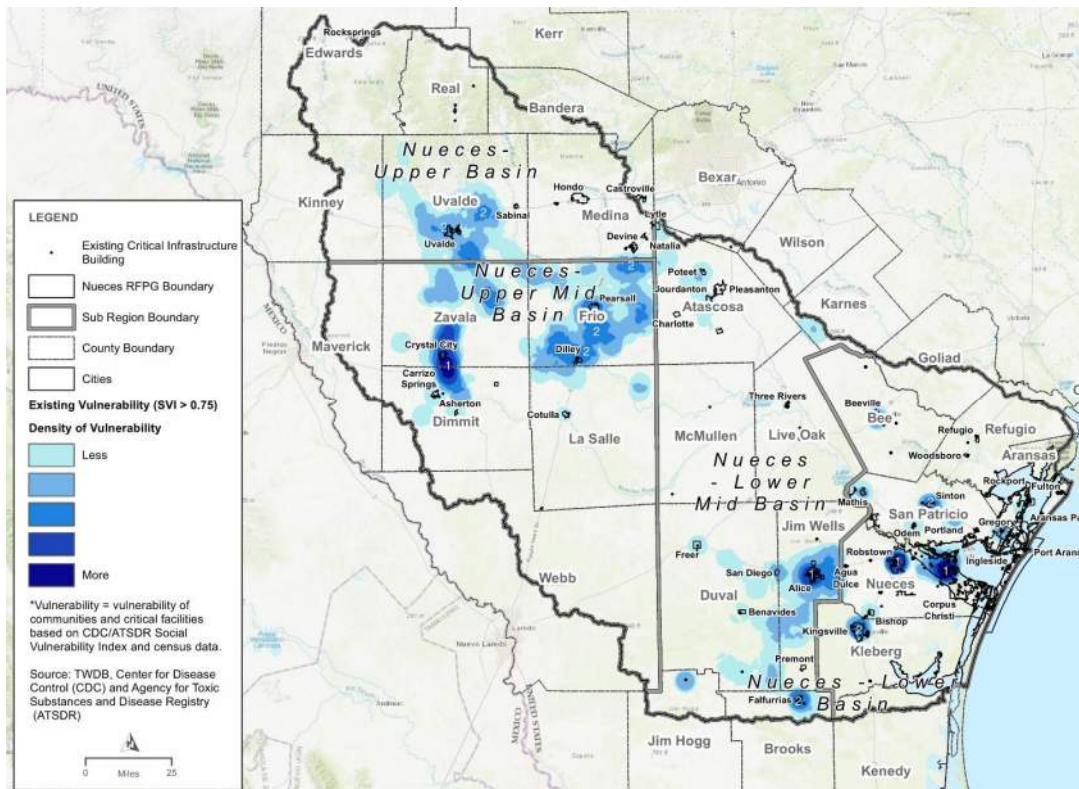


Figure ES-7. Existing Condition Vulnerability Heat Map and Location of Critical Infrastructure (Map 7)

ES.3 Floodplain Management Practices and Flood Protection Goals

Evaluation and Recommendation on Floodplain Management Practices

One of the goals of the NRFP is to evaluate and make recommendations on forward-looking floodplain management, land use, and economic practices. These practices play a key role in preventing the creation of additional flood risk in the future.

Extent of Local Regulations and Development Codes

A survey of entities with flood-related authority was conducted during the regional flood planning and confirmed 13 of 31 counties (42%) and 12 of 57 cities (21%) have floodplain management regulations. Of these, 11 counties and 11 cities were found to have moderate or strong floodplain management practices and enforcement (see Figure ES-8).

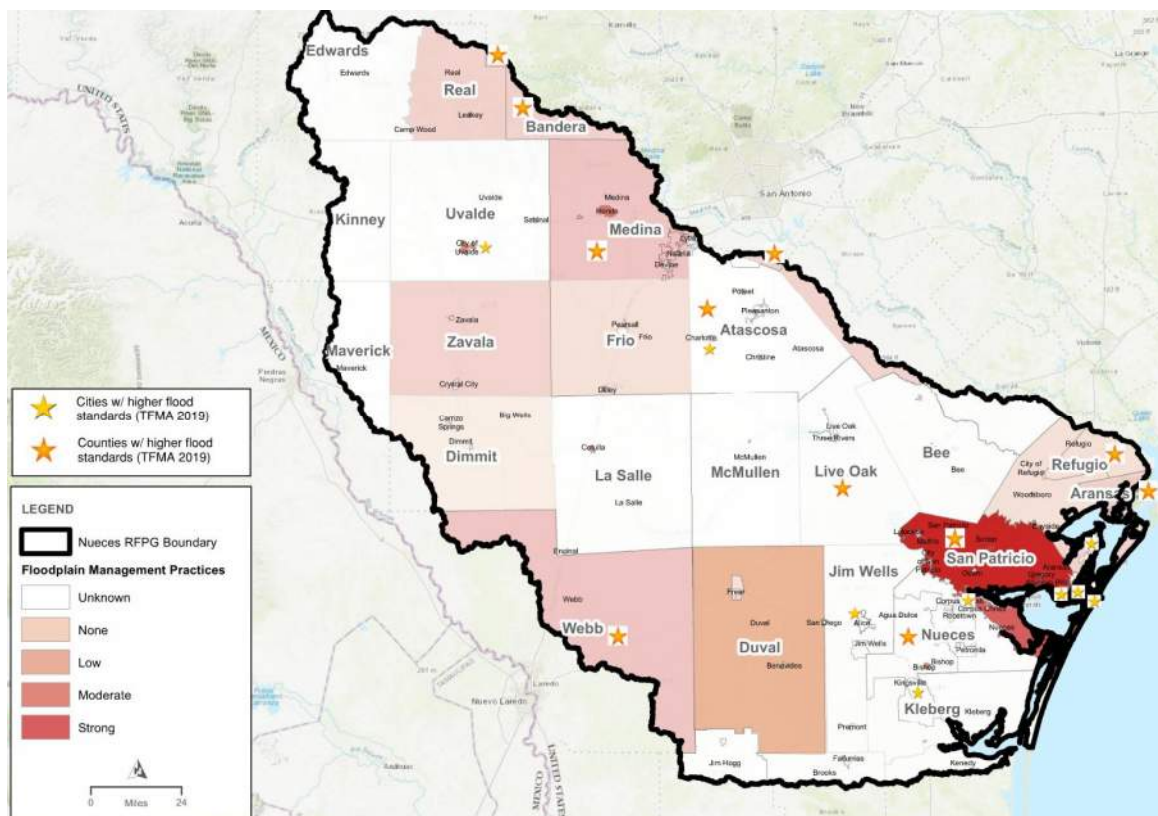


Figure ES-8. Degree of Floodplain Management Standards (Map 13)

Most entities with flood-related authority have minimum floodplain management regulations while adoption of higher floodplain management standards is less common. These elements are discussed further below.

Minimum Floodplain Management Standards

Minimum floodplain management regulations include compliance with Texas Water Code § 16.3145 and FEMA’s National Flood Insurance Program (NFIP) participation. Section 16.3145 requires the adoption of necessary ordinances or orders for a city or county to be eligible for participation in the NFIP. NFIP participation is a wide-spread practice in the Nueces Basin with 85 of 86 reporting cities and counties participating.

Higher Floodplain Management Standards

Higher floodplain management standards can include an assortment of practices to further reduce flood risk above and beyond minimal standards. The Texas Floodplain Management Association (TFMA) produced a guide for higher standards in 2018 that describes 32 higher standard practices that, if implemented, would reduce flood risks. According to the TFMA 2019 higher standard survey, 10 counties and 9 municipalities in the basin have adopted higher standards. This list includes the counties of Aransas, Atascosa, Bandera, Bexar, Kerr, Live Oak, Medina, Nueces, Refugio, and San Patricio and the cities of Alice, Aransas Pass, Charlotte, Corpus Christi, Ingleside, Kingsville, Port Aransas, Rockport, and Uvalde.

Recommended Floodplain Practices

The NRFPG does not have the authority to enact or enforce floodplain management, land use, or other infrastructure design standards. Thus, the NRFPG aims to encourage implementation of recommended floodplain practices by local entities in the region with flood-related authority.

Of the high-standard practices, the implementation of freeboard requirements was listed as the single most effective means for reducing flood risks. Freeboard is the standard for placing the first floor of a structure above the elevation of the calculated 1% annual chance (100-year) storm event flood level to allow for nature’s uncertainty and future changes in the watershed that will increase flood levels.

The NRFPG recommends minimum finished floor elevations be set 1 foot above base flood elevations (BFEs; i.e., 1% annual chance storm event flood levels) or above local ordinances, whichever is higher, in the basin. The NRFPG strongly encourages cities and counties in the Nueces Basin to actively consider minimum 2 feet above base flood elevations, consistent with upcoming 2025 FEMA ordinances. Such higher standards build more resilience for the homeowners in the future. The NRFPG did not adopt region-specific minimum floodplain management, land use, or other standards that impact flood-risk that each entity in the flood planning region must adopt prior to inclusion of any of their flood mitigation actions in the regional flood plan.

Implementation of this recommendation along with defining accurate floodplain limits through the development of detailed hydrologic and hydraulic models and mapping in areas of anticipated high development and population growth is the best approach to

address future development and population growth and to limit exposure of new development to the existing and future flood hazard.

Other high-standard practices that should be considered include participation in the NFIP's Community Rating System (CRS), requiring new development to mitigate adverse impacts to other properties throughout the watershed, providing standards and restrictions for the placement of fill or development activity in a floodplain, and the use of setbacks, which limit use/development areas along waterways.

Floodplain mitigation studies in the Nueces Basin are encouraged to consider natural systems and beneficial functions of floodplains, including flood peak attenuation and ecosystem services when identifying projects to reduce flood risk. Flood mitigation design approaches that work together with natural floodplain patterns is advised. Most natural flood mitigation features, including floodplains, are in need of maintenance and can be improved with land use management.

Floodplain Mitigation and Floodplain Management Goals

The regional flood plan developed short- and long-term goals with the objective to protect against the loss of life and property. The short-term goals have a target date of 10 years or 2033 and the long-term goals a target date of 30 years or 2053. These goals identify specific and achievable flood mitigation and floodplain management goals that, when implemented, will demonstrate progress towards the overarching objective to protect life and property. The NRFPG formed a sub-committee to discuss floodplain priorities and prepare the goals for NRFPG consideration. The following 10 flood mitigation and floodplain management goals are defined under four major categories.

Protect against loss of life caused by flooding

1. Improve safety at LWCs
2. Reduce risks at high-hazard dams
3. Implement flood warning systems and improve regional data collection

Protect against property damage caused by flooding

4. Perform flood mapping evaluations and update floodplain maps
5. Reduce the number of structures within the 1% annual chance floodplain

Floodplain management

6. Prepare minimum flood management standards
7. Implement nature-based practices through land conservation and restoration programs
8. Develop public information campaign

Funding

9. Increase funding for maintenance of drainage systems
10. Identify funding for community outreach and for permit support

These goals were discussed during the September 27, 2021, NRFBG meeting, and comments received with a public comment period remaining open for 30 days after the meeting. The goals, if implemented, would not remove all potential flood risks and thus residual risks remain.

ES.4 Flood Mitigation Needs Analysis

The regional plan performed an assessment and identified flood mitigation needs. This analysis identified where the greatest flood risk knowledge gaps exist and where known flood risk and flood mitigation needs are located within the NFPR. This analysis resulted in information that guided the identification of recommended flood mitigation actions.

Greatest Flood Risk and Flood Mitigation Needs

The areas of greatest known flood risk and flood mitigation needs in the NFPR are defined as areas with elevated levels of risk to property and life. The level of risk is defined by looking at the location and magnitude of flooding from the 1% (100-year) and 0.2% (500-year) annual chance flood event (flood hazard), who and what may be harmed (flood exposure), and what communities and critical facilities may be vulnerable (flood vulnerability).

An analysis of known flood risk data was performed based on 627 hydrologic unit code (HUC)-12 individual watersheds. The flood risk data related to property damage and life loss risk was evaluated for each watershed in the basin. This included assigning weighting percentages to data on historical property damage, historical life loss, property damage in terms of exposure and vulnerability, and life loss potential at LWCs and downstream of hydraulically inadequate or deficient potential hazardous dams. As a result of this analysis, each watershed was assigned a score of 0 to 5 with no risk represented by a score of zero and the highest risk represented by a score of 5 (see Figure ES-9).

Greatest Flood Risk Knowledge Gaps

The greatest flood risk knowledge gap considered the following three conditions:

- Where the flood inundation boundaries are either not defined or considered inaccurate. Without accurate flood inundation boundaries, the existing flood risk is not well understood; therefore, controlling future risk through floodplain management regulations is difficult. The availability of detailed modeling and mapping in the basin is very limited in the Nueces Basin, as shown in Figure 2-4. Detailed modeling is generally only available for Nueces County, select watersheds along the coast, the City of Cotulla, downtown Corpus Christi, along Nueces River from Corpus Christi up to near Choke Canyon, City of San Diego, and along Sabinal River upstream of Utopia.

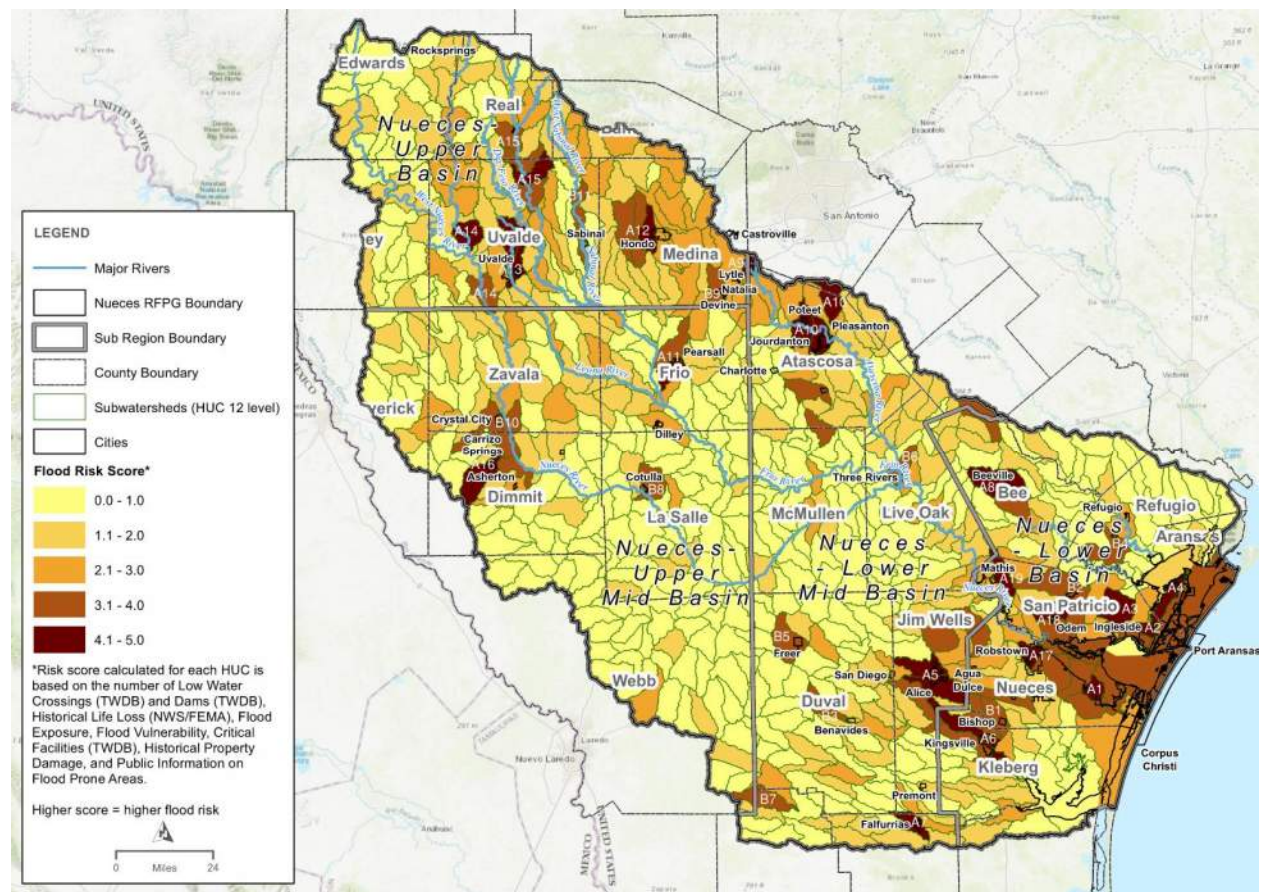


Figure ES-9. Overall Flood Risk per HUC 12 Watershed (Map 15)

- Where flood studies or projects have not occurred in the recent past or are ongoing. Flood studies are used to identify existing and future flood risks and often recommend mitigation or corrective solutions to reduce those risks. Without a flood study, it is difficult to implement actionable steps to reduce flood risk. For the NFPR, generally, flood studies have occurred or are occurring for counties near the coast. Major flood studies include the General Land Office (GLO) Regional Flood Study, and various county-wide flood studies for the counties of Duval, San Patricio, Nueces, Jim Wells, Kleberg, and Bee. A list of 93 proposed and on-going flood mitigation projects for cities, counties, and Texas Department of Transportation (TxDOT) were also considered.
- Where flood management practices do not exist or are not effectively enforced. Without effective flood management practices new development activity may place additional property and population in flood hazard areas. There are many potential gaps in flood management practices, as shown in Figure 3-1. Moderate to strong floodplain practices tend to be prevalent for entities with flood-related authority located near the high growth areas of Corpus Christi, Laredo, and San Antonio.

These three gap considerations were overlaid with the areas of greatest known flood risk and flood mitigation needs as shown in Figure 4-3, Figure 4-4, and Figure 4-5. Then the greatest flood risk areas were listed in Table 4-2 with indication of whether the areas are located within exposure/vulnerability hot spots and the three knowledge gap areas. This table summarizes the greatest flood mitigation needs in the basin and can be used to prioritize future investments in detailed hydrologic and hydraulic models, flood studies, and enhancement of flood management practices.

ES.5 Identification, Evaluation, and Recommendation of Flood Mitigation Actions

The regional flood planning efforts identified, evaluated, and recommended flood management actions, which include flood mitigation projects (FMPs), flood management evaluations (FMEs), and flood management strategies (FMSs). Flood management actions were identified to reduce the risk identified in the existing and future condition flood risk analyses, to address flood mitigation and floodplain management goals, and to address the greatest flood risk and flood mitigation needs.

An FME is a proposed flood study of a specific, flood-prone area that is needed to assess flood risk and/or determine whether there are potentially feasible FMSs or FMPs. An FMP is a proposed project, either structural or non-structural, that has non-zero capital costs or other non-recurring costs and, when implemented, will reduce flood risk and mitigate flood hazards to life or property. Identifying FMPs is one of the primary objectives of the NRFP. A FMS is a proposed plan to reduce flood risk or mitigate flood hazards to life or property and typical includes flood mitigation education and outreach, buyout programs, and flood management regulations.

Process to Identify, Evaluate, and Recommend Flood Mitigation Actions

The NRFPG developed a process to identify, evaluate and recommend flood mitigation actions. The Initial draft process was developed by a subcommittee and presented and approved by the NRFPG at the September 27, 2021, regional flood planning meeting. To identify flood mitigation actions, a review of previous relevant flood studies was conducted, stakeholder outreach was conducted, and an evaluation performed to determine additional studies needed to address the greatest known flood risk, flood mitigation needs, and unmet floodplain mitigation and floodplain management goals.

While there is an abundant need across the Nueces Region and the State of Texas for data collection, strategy implementation, and project construction to reduce or remove risk of flooding, not every flood mitigation action can be recommended in the NRFP or included in the SFP. The NRFPG considered recommendations on flood mitigation actions through a multi-step process. The NRFPG created a Technical Subcommittee tasked with establishing a selection methodology, implementing the evaluation and selection process, and reporting their findings and recommendations back to the

NRFBPG for formal approval. The methodology included screening all potential flood mitigation actions considering TWDB requirements for inclusion in the flood plan and any other additional considerations established by the Technical Subcommittee. The reasons for not recommending a particular flood mitigation action were clearly documented as part of the evaluation and recommendation process.

Recommended Flood Mitigation Actions in the 2023 NRFB

On May 6, 2022, the NRFBPG voted to recommend FMEs, FMPs, and FMSs as presented, for inclusion in the 2023 NRFB due January 2023. This meeting was held in accordance with the requirements of the RFBPG bylaws, the Texas Open Meetings Act, and the general requirements of the Texas Water Code and the flood planning process.

This resulted in the recommendation of 163 FMEs. No FMPs were recommended due to the high level of detail required for consideration as an FMP. A total of 40 FMSs were recommended across the region. In all, 203 flood mitigation actions were previously recommended in the 2023 NRFB.

Additional Evaluations Performed to Amend the 2023 NRFB

Multiple FMEs from the 2023 NRFB were selected by the NRFBPG to be further evaluated to identify additional FMPs and advance FMEs for inclusion in the Amended 2023 NRFB. The process for identifying FMEs for further evaluation included prioritizing FMEs in the highest flood risk areas, seeking FMEs in areas where there are no on-going flood studies, and identifying FMEs that were close to qualifying as FMPs. On September 26, 2022, the NRFBPG voted to approve the list of additional evaluations, as presented. This list is summarized in Table 5-2 and encompassed additional evaluations in 19 high risk flood areas across the region and identified the potential for over 30 FMPs. Upwards of 70% of the additional evaluations were focused in the highest flood risk areas to evaluate potential flood risk reduction solutions for places that did not previously have on-going or proposed flood mitigation studies, including in and within the vicinity of the cities of Crystal City, Devine, Jourdanton, Pearsall, Pleasanton, Poteet, and areas of Uvalde and Real counties.

Summary of Additional Evaluations

The additional evaluations were performed from October 2022 through May 2023. As part of this process, additional outreach to identified potential sponsors occurred, which resulted in additional refinement and advancement of new potential flood mitigation actions. In total, additional evaluations were performed for 36 entities with flood authority in the Nueces basin, which resulted in the identification of 31 new FMPs and 54 new FMEs. One-page summaries of these new FMPs and FMEs and supporting technical memorandums documenting assumptions and findings of the evaluations are provided in Appendices C9, C10, and C11.

Recommended Flood Mitigation Actions in the Amended 2023 NRFP

On May 15, 2023, the NRFPG voted to amend the 2023 NRFP list of recommended FMEs, FMPs, and FMSs, which included removals, refinements, and additions of flood mitigation actions. This resulted in 269 recommended flood mitigation actions for the Amended 2023 RFP, of which 31 are FMPs, 198 are FMEs, and 40 are FMSs. This is an increase of 31 FMPs and 35 FMEs when compared to the 2023 RFP (note 19 FMEs identified previously in the 2023 NRFP were removed). The list of recommended FMSs from the 2023 NRFP was not changed with the Amended 2023 NRFP. The list of recommended flood mitigation actions can be viewed on an individual county level in Appendix B23 – Flood Hazard Risk, Flood Risk Score, and Recommended Flood Mitigation Actions.

The costs of the recommended 31 FMPs, 198 FMEs, and 40 FMSs are estimated to be \$1,205 million, \$285 million, and \$20 million, respectively. This represents a combined flood mitigation action cost of about \$1.510 billion across the entire basin.

ES.6 Impact and Contribution of the Regional Flood Plan

The RFP evaluates the impacts and contributions of implementing the plan would have on reducing flood risks and on water supply development.

Impacts of Regional Flood Plan

Impacts are determined before and after RFP implementation of recommended flood mitigation actions relative to existing and future flood risk. The comparison of before and after RFP implementation estimates both how much the region's existing flood risk will be reduced through implementation of the plan as well as how much additional, future flood risk (that might otherwise arise if no changes are made to floodplain policies etc.) will be avoided through RFP implementation, including recommended changes/improvements to the region's floodplain management policies.

The evaluation estimates the full implementation of recommended FMPs and minimum floodplain management standards would reduce the future 1% annual chance flood risk for structures by 23% (-17,000), for population by 30% (-55,000), for square miles of land by 1% (-52), for critical facilities by 1% (-118), for miles of roadway by 10% (-322), and for low water crossings by 32% (-173). Most of this flood reduction benefit comes from the implementation of the recommended floodplain management standards, which puts measures in place to avoid incurring the placement of future property and life at risk of flooding. By implementing the RFP, the existing floodplain management standards identified in Chapter 3 will be leveraged and will have basis to bolster and expand local regulations to protect future life and structures from high flood risk events.

Contributions to and Impacts on Water Supply Development and the State Water Plan

Flood mitigation actions were reviewed to determine whether impacts to water supply/availability exists. A coordinated effort with representatives from multiple regional water planning groups occurred to identify water management strategies that could be impacted. Those regional water planning groups include Region N (Coastal Bend), Region L (South Central Texas), and Region M (Rio Grande). The NRPFG identified four flood mitigation actions on June 27, 2022, that have benefits related to water supply development. These include a two-way pipeline between Choke Canyon Reservoir and Lake Corpus Christi, a Nueces off-channel reservoir with or without ASR configuration, sediment removal at Lake Corpus Christi, and a Nueces River Diversion from the Nueces River to Choke Canyon Reservoir. There are no anticipated negative impacts from these four recommended FMSs on water supply, water availability, or projects in the state water plan.

ES.7 Flood Response Information and Activities

Flood response information was gathered through stakeholder outreach to flood-related authorities in the Nueces Basin. Flood response activities, preparedness, response, and recovery measures are summarized for the various entities in the basin. The plan also summarizes state and federal agency roles in flood response support and provides a description of various means by which data is collected and disseminated in a flood event. This information is provided to help others in the basin develop flood response and recovery programs. Note the NRFP only summarizes the nature and types of flood response preparations in the basin, including recovery, but does not perform analyses or other activities related to planning for disaster response or recovery.

ES.8 Administrative, Regulatory, and Legislative Recommendations

The NRFP provides administrative, regulatory, or other recommendations for inclusion in the 2023 NRFP. These recommendations were developed by a subcommittee and presented and adopted by the NRPFG on May 16, 2022. Overall, 19 recommendations were provided within the categories of administration, regulatory/policy, and legislation. The recommendations are provided in detail in Chapter 8 – Administrative, Regulatory, and Legislative Recommendations. Recommendations generally addressed a variety of needs and issues, including facilitating public outreach; improving coordination; addresses funding deficiencies for a variety of needs such as road and bridge improvements, maintenance, nature-based incentive programs, public information campaigns; improving flood mitigation practices to consider nature-based solutions; adopting higher standard regulations for buildings; addressing socioeconomic disadvantaged communities; empowering county governments over land development

activities; enabling regional authorities; and addressing removal of debris/sediment deposited after storm events.

ES.9 Flood Infrastructure Financing Analysis

The NRFP describes common sources of local, state, and federal flood funding.

Local Funding

Local funding mechanisms identified include use of a general fund, bond program, permitting fees, dedicated stormwater or drainage fees, and special districts. The plan identifies two entities with dedicated drainage fees, which includes Corpus Christi and the City of Portland. The plan identified four special districts focused on drainage, which includes Nueces County Bishop Driscoll Drainage District 3, Nueces County Drainage and Conservation District 2, Refugio County Drainage District 1, and San Patricio County Drainage District.

State Funding

State funding for flood projects is primarily through TWDB and Texas State Soil and Water Conservation Board (TSSWCB). In the Nueces Basin, several counties and cities have received support from the TWDB Flood Infrastructure Fund (FIF) and many coastal communities have applied for FEMA grants. After the first SFP is adopted, only projects included in the most recently adopted state plan will be eligible for funding from the FIF.

Federal Funding

There are multiple avenues to receive federal funding through the various federal agencies, including FEMA, U.S. Department of Housing and Urban Development (HUD), USACE, U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), and special appropriations. Recent special appropriations of note include the 2021 American Rescue Plan Act (ARPA) and the 2021 Infrastructure Investment and Jobs Act (IIJA), also called the Bipartisan Infrastructure Law (BIL). ARPA delivered \$350 billion directly to local, state, and tribal governments through the Coronavirus State and Local Fiscal Recovery Funds (SLFRF). And BIL authorized over \$1 trillion for infrastructure spending across the U.S. and provides a significant infusion of resources over the next several years into existing federal financial assistance programs. Note, the recent federal special provision ARPA and BIL funding has not yet been allocated and made available for flood mitigation studies and projects that would be eligible under the state flood plan.

Overall Need for Funding

Overall, a total of \$1.510 billion is needed to implement the recommended FMEs, FMPs, and FMSs identified in this Amended 2023 NRFP. From the total cost, it is projected that \$1.435 billion in state and federal funding is needed.

ES.10 Adoption of Plan and Public Participation

The NRFPG met all requirements under the Texas Open Meetings Act and Public Information Act during development of the NRFP. The NRFP incorporated public participation from the onset. This included opportunities at all regional flood planning group meetings for the public to comment on any aspect of the plan or planning process, press releases and notices of public meetings, and a dedicated website for NRFPG information.

The NRFPG submitted an approved, draft RFP to the TWDB on August 1, 2022. A public in-person hearing for the draft plan was held on September 26, 2022, at 11:00 a.m. at the McMullen County Emergency Management Office and a public virtual hearing for the draft plan was held on September 26, 2022, at 6:30 p.m. via a zoom meeting. Comments received on the draft plan and responses to comments were approved by the NRFPG on December 12, 2022, and are included in Appendix D.

The NRFPG approved the 2023 NRFP on December 12, 2022, for submittal to the TWDB. Comments on the 2023 NRFP were provided by the TWDB on March 13, 2023 and discussed by the NRFPG on March 27, 2023. The TWDB comments and responses to comments are included in Appendix D.

The Amended 2023 NRFP was adopted by the NRFPG on **TBD** for submittal to the TWDB.