

## Task 6: Impact and Contribution of the Regional Flood Plan



*Lake Marble Falls*

The objective of this task is to assess and summarize the impacts and contributions, in the aggregate, associated with the implementation of this Regional Flood Plan. In previous chapters, existing flood hazard and exposure conditions were assessed based on the 1 percent and 0.2 percent annual chance flood events. In addition, an inventory of existing infrastructure and natural features was compiled for use as a baseline. Flood risk reduction or mitigation needs were identified, leading to the Region Flood Planning Group (RFP) adoption of recommendations presented in the previous chapter of flood management evaluations, strategies, and mitigation projects. This chapter compares those identified risks with the potential estimated positive and negative benefits of implementing the Regional Flood Plan. Additionally, in the second part of this chapter, potential contributions to and impacts on water supply development and the State Water Plan are assessed.

### Task 6A: Impacts of the Regional Flood Plan

Implementation of the Regional Flood Plan can be expected to provide numerous benefits to the areas served by local Sponsors and will not negatively impact neighboring areas within or outside of the region. More specifically, implementing recommended flood mitigation projects (FMPs) are expected to reduce the number and/or spatial extent of areas with high flood hazard and exposure. For example, implementing recommended FMPs is expected to remove an estimated XXX at-risk structures from flood-prone areas. However, the benefits will vary across the region due to the highly variable and local nature of most flood hazard areas, as well as with the types of studies, strategies, and projects implemented. Further discussion of the potential benefits of implementing this Regional Flood Plan is provided below.

## Floodplain Management and Modeling

Information was compiled during the baseline development of the Regional Flood Plan. As part of the compilation, data gaps were identified within the region. The information and data gaps were found in areas of low to high flood risks that lack floodplain management practices, adequate enforcement of floodplain standards and regulations, detailed hydrologic and hydraulic models, and flood inundation mapping. Combined, these areas cover approximately **XXX** square miles or **XX** percent of the Lower Colorado-Lavaca Region and include an estimated population of **XX**. The lack of information hinders local entities' ability to effectively manage floodplains activities, adequately assess flood risks and exposure, evaluate potentially feasible flood risk reduction strategies and solutions, and select a preferred option(s) for implementation. Overall this likely results in population and property that are exposed unnecessarily to flood risk. As reported in Chapter 5, **XXX** Flood Management Evaluations (FMEs) are recommended and when implemented will close data and information gaps and set in motion the process of developing and implementing flood risk reduction solutions. Seven recommended FMEs are specifically focused on watershed modeling and mapping, and **XX** includes modeling and mapping to identify flood risk, flood mitigation alternatives analysis and feasibility studies, and preliminary engineering studies, among others. There is a total of **XX** FMEs identified within the Regional Flood Plan. The FMEs will reduce the areas and population not covered by flood risk evaluations by approximately **XX** miles and approximately **XX**, respectively.

## Reduction in Flood Impacted Areas

Existing and future flood hazard areas were identified and quantified for both 1 percent and 0.2 percent annual chance flood events. The tables below show the flood-impacted areas in square miles for both existing and future scenarios based on both annual chance flood events and the reduction of impacted areas. A series of FMEs, FMSs, and FMPs were identified to reduce impact during flood events. Implementing the Regional Flood Plan will reduce areas previously impacted by approximately **XX** percent or a reduction of approximately **XX** square miles.

**Table 6.1 Reduction in Existing Flood Impacted Areas (Table to be completed Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Area in Floodplain (square miles)	Reduction of Floodplain after Implementation (square miles)	Decrease in Floodplain Impacted
1%	4,526	<b>XX</b>	<b>XX%</b>
0.2%	726	<b>XX</b>	<b>XX%</b>
Total	5,252	<b>XX</b>	<b>XX%</b>

**Table 6.2 Reductions in Future Flood Impacted Areas (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Area in Floodplain (square miles)	Reduction of Floodplain after Implementation (square miles)	Decrease in Floodplain Impacted
1%	5,385	<b>XX</b>	<b>XX%</b>
0.2%	578	<b>XX</b>	<b>XX%</b>
Total	5,963	<b>XX</b>	<b>XX%</b>

### *Benefits to Population and Structures at Risk*

With the number of square miles affected by flooding being reduced with the implementation of this Regional Flood Plan, the ultimate beneficiaries are populations residing in those areas as well as public and private assets (e.g., structures, roads, utilities). Since the area of impacted land will be reduced, the region's subsequent population benefitting from the plan is estimated to be **XX**. The socioeconomic benefits to the population will vary based upon location. Additional descriptions of those benefits will be provided in Chapter 5. The estimated population removed from the floodplain is shown in *Table 6.3*. While the number of potentially avoidable injuries and deaths associated with implementing this plan is not quantifiable, the expected benefits can be substantial. The benefits will be generated by changing flood characteristics to reduce flood risk to structures, roads, and property (structural flood mitigation projects) and changing the way people interact with flood risk (non-structural flood mitigation projects and strategies) through regulatory improvements, educating people about flood risks, implementing flood early warning and evacuation measures.

**Table 6.3 Population Removed from the Floodplain (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Population Impacted	Estimated Population Impacted after Implementation	Decrease in Population Impacted
1%	149,831	XX	XX%
0.2%	94,840	XX	XX%
Total	244,671	XX	XX%

This plan provides additional benefits to removing existing structures located within flood hazard areas. Removing structures from flood danger benefits communities that rely on those structures for residences, work, industry, and critical facilities. These include structures that are inundated for short periods to those for extended periods along the flatter topographical areas within the region. *Table 6.4* shows the estimated reduction in the number of structures that will be removed by implementing the Regional Flood Plan.

**Table 6.4 Structures Removed from the Floodplain (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Structures Impacted	Estimated Structures Impacted after Implementation	Decrease in Structures Impacted
1%	67,826	XX	XX%
0.2%	34,486	XX	XX%
Total	102,312	XX	XX%

Critical facilities are generally identified as municipal utilities and buildings, hospitals and care facilities, and schools are of special importance that will benefit from this plan. *Table 6.5* shows the estimated number of critical facilities impacted and those that will be removed from the floodplain through this plan's implementation.

**Table 6.5 Critical Facilities Removed from the Floodplain (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Critical Facilities Impacted	Estimated Critical Facilities Impacted after Implementation	Decrease in Critical Facilities Impacted
1%	118	XX	XX%
0.2%	87	XX	XX%
Total	205	XX	XX%

## Low Water Crossings and Impacted Roadways

Implementing FMSs and FMPs across the region will significantly impact the number of existing low water crossings. As projects are implemented, the number of low water crossings will be reduced, saving life and property. The total number of low water crossings being removed due to implementing this plan is shown in Table 6.6.

**Table 6.6 Low Water Crossings Removed (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Low Water Crossings Impacted	Estimated Low Water Crossings Impacted after Implementation	Decrease in Low Water Crossings Impacted
1%	1,109	XX	XX%
0.2%	23	XX	XX%
Total	1,132	XX	XX%

In addition to the number of low water crossings being removed, flooded roadways also benefit from implementing the Regional Flood Plan. Roadways often closed due to flooding pose risks to life, property, and transportation. Information in Table 6.7 and

Table 6.8 show the benefit to transportation infrastructure by reducing the time a roadway is closed or removing it from flooding altogether.

**Table 6.7 Reduction in Roadway Closures (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Road Closures Impacted	Estimated Reduction of Roadway Closures after Implementation	Decrease in Roadway Closures
1%	XX	XX	XX%
0.2%	XX	XX	XX%
Total	XX	XX	XX%

**Table 6.8 Removal of Roads from Flood Risks (Table to be completed with Guidance Tables 13 and 14)**

Annual Chance Event Flood Risk	Existing Roads in Floodplain (miles)	Estimated Roadways Removed from Floodplain after Implementation	Decrease in Roads in Floodplain
1%	2,374	XX	XX%
0.2%	911	XX	XX%
Total	3,285	XX	XX%

## Socioeconomic and Recreational Impacts

### Socioeconomic

Implementing the Regional Flood Plan, as shown in the previous sections, benefits the entire region. As part of this effort, socioeconomic impacts were considered to evenly distribute flood risk reduction benefits among all groups across the region as much as practical. The region has a diverse population with wide-ranging economic levels requiring extra attention to improve conditions for everyone. Disadvantaged socioeconomic populations have limited access to resources hindering response and recovery from flood events. Processes in developing the appropriate FMSs, FMPs, and FMEs included reducing the impacts to flood events and improving the lives of all socioeconomic groups ensuring the most disadvantaged were well represented. This can be shown in the locations of FMSs, FMPs, and FMEs identified throughout the region.

### Recreation Impacts

There can be many opportunities to benefit recreation through implementing the Regional Flood Plan. Many parks located along waterfronts are designed to be flooded periodically with infrastructure minimally impacted. Floodplains and wetlands can support recreation and tourism. Although not specifically identified in this plan, as FMSs and FMPs are implemented that remove structures from floodplains and reduce existing floodplains, new opportunities become available for local sponsors. These areas are often utilized in cities throughout the state for hiking and biking trails. The RFPG will encourage secondary benefits such as recreational opportunities. While the Regional Flood Plan will provide opportunities, it will not negatively impact existing recreation activities throughout the region.

### Overall Impacts

Implementing the Regional Flood Plan provides numerous benefits associated with the primary purposes of FMSs, FMPs, and FMEs. The benefits, although not readily quantifiable, will protect the health and safety of the region. This is done by reducing flooding frequency and severity, advanced flood warning systems, removing roads from flooding, and providing officials with the tools to properly manage flood-prone areas.

*Will review information on final list of FMPs and FMPs to determine additional impacts.*

None of the FMSs, FMEs, and FMPs specifically address water supply issues and are not expected to impact water supply. The following section focuses on water supply.

## Task 6B: Contributions to and impacts on water supply development and the State Water Plan

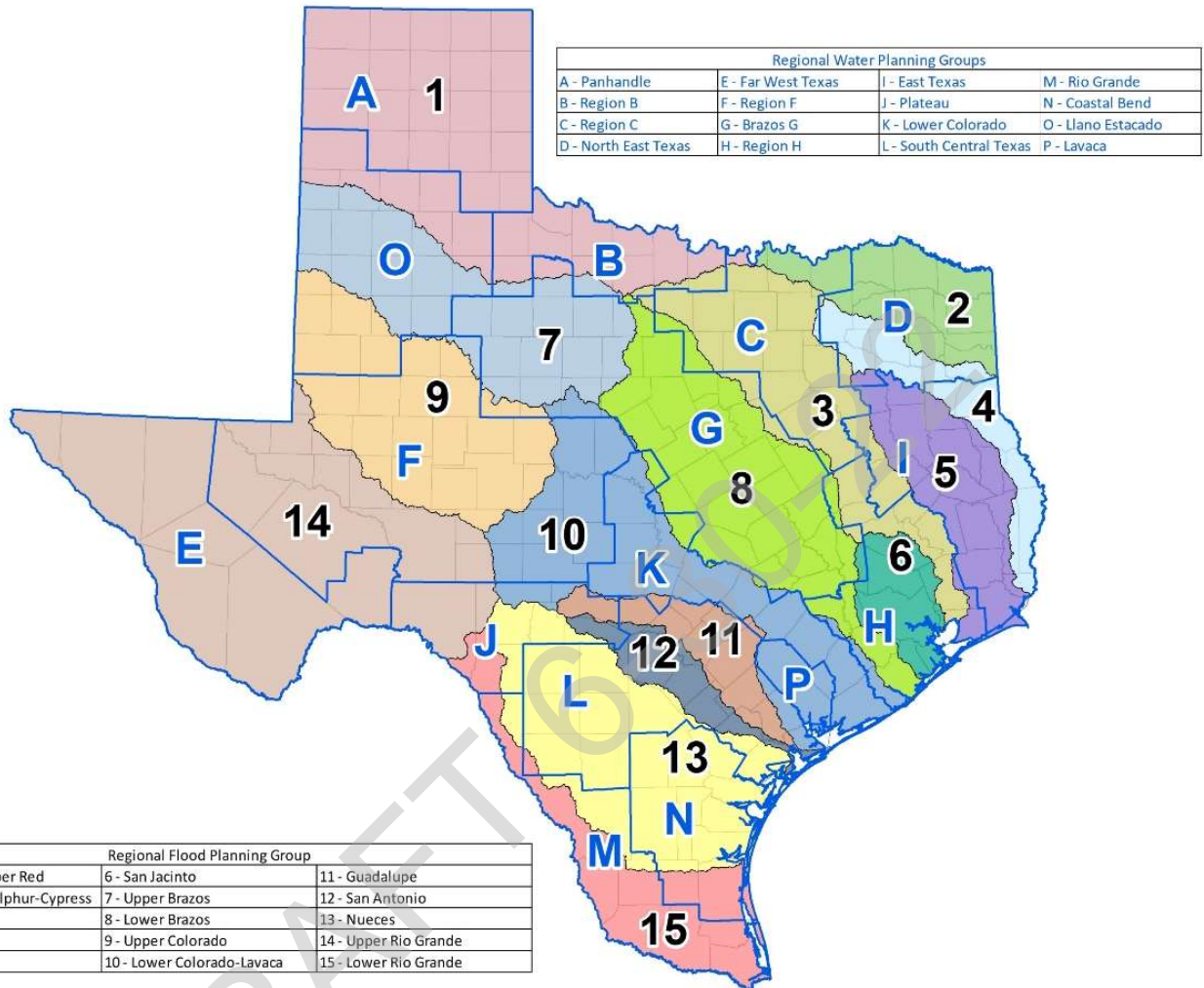
Regional Flood Plans must include a region-wide assessment of the potential contributions and impacts that implementation can be expected to have on water supplies and the State Water Plan. As part of this analysis, each FMS and FMP was reviewed to determine whether there are potential impacts on existing water supplies or the availability of water supplies. Impacts include potential contributions to, as well as reductions in water supply and availability. These impacts, as determined, would be placed in one of the following categories:

1. Involves direct impacts on available water supply yield during a drought-of-record, which requires both availability and directly connecting supply to a specific water user group(s)
2. Direct benefits (i.e., increases) water availability
3. Indirectly benefits water availability
4. Has no anticipated impact on the water supply

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 F, Region G (Brazos), Region H, Region J (Plateau), Region K (Lower Colorado), Region L (South Central Texas), and Region P (Lavaca). The results of those analyses and discussions are provided in the following tables.

It was determined that there were no anticipated impacts from the recommended FMSs and FMPs on water supply, water availability, or projects in the State Water Plan based on no anticipated measurable impact.

**Figure 6.1 Flood Planning Regions versus Regional Water Plan Boundaries**



The table below includes all FMS and FMPs identified to measurably contribute to water supply/availability or have no impact.

**Table 6.9 FMS/FMP Contributions to Water Supply (TBD)**

Name	FMS/FMP	Volume (acre-feet)	Water Supply	Direct Water Availability	Indirect Water Availability	No Impact

*Comments – Review all new flood reduction structures for quantifiable impacts to surface water rights permits, structures located over aquifer recharge zones for increased recharge, changes in reservoir operations impacting water supply storage (decrease in conservation pool to accommodate additional flood protections), these are just a few examples for both tables*

*The table below includes all FMS and FMPs that were identified to negatively impact or measurably reduce water supply/availability.*

**Table 6-10 – FMS/FMP Negatively Impacting Water Supply (TBD)**

Name	FMS/FMP	Volume (acre-feet)	Water Supply	Direct Water Availability	Indirect Water Availability	No Impact

*Insert a paragraph providing a summary of the reductions in the Region’s water supply. Highlight the number of structures and volume of water supply reduction.*

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