

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 (RFPG) 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 1,359 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. The existing condition exposure analysis revealed that approximately 5,252 square miles or 21 percent of the Lower Colorado-Lavaca Region including an estimated population of 244,671 are currently at-risk of flooding. 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. This likely results in population and property that are exposed unnecessarily to flood risk. As reported in *Chapter 5*, 151 Flood Management Evaluations (FMEs) are recommended and when implemented will close some 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 114 include modeling and mapping to identify flood risk, flood mitigation alternatives analysis and feasibility studies, and preliminary engineering studies, among others. The FME study areas, in aggregate, encompass areas and populations with insufficient data by approximately 3,120 square miles (study area) with a population of approximately 19,700.

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; however, flood risk is generally defined for the existing condition 1 percent annual chance (100-year) flood event. 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. Implementing the Regional Flood Plan will reduce areas previously impacted by approximately 0.2 percent or a reduction of approximately 9.35 square miles.

Table 6.1 Reduction in Existing Flood Impacted Areas

Annual Chance Event Flood Risk	Area in Floodplain (square miles)	Reduction of Floodplain after Implementation (square miles)	Decrease in Floodplain Impacted
1%	4,526	7.05	0.2%
0.2%	726	2.3	0.3%
Total	5,252	9.35	0.2%

Table 6.2 Reductions in Future Flood Impacted Areas

Annual Chance Event Flood Risk	Area in Floodplain (square miles)	Reduction of Floodplain after Implementation (square miles)	Decrease in Floodplain Impacted
1%	5,385	7.05	0.2%
0.2%	578	2.3	0.3%
Total	5,963	9.35	0.2%

Benefits to Population and Structures at Risk

The direct beneficiaries of implementation of this Regional Flood Plan are the populations that reside in areas with reduced flood risk as well as public and private assets (e.g., structures, roads, utilities). The estimated population removed from the flood risk area 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 could be significant. Public safety benefits will be a result of changing flood characteristics to reduce flood risk to structures, roads, and property (structural flood mitigation projects) and by changing the way people interact with flood risk (non-structural flood mitigation projects and strategies) through regulatory improvements, educating people about flood risks, and by implementing flood early warning and evacuation measures.

Table 6.3 Population Removed from the Floodplain

Annual Chance Event Flood Risk	Existing At-Risk Population	Reduction of At-Risk Population after Implementation	Decrease in Population Impacted
1%	149,831	1,940	1.3%

Implementation of this plan provides benefits by removing existing structures within flood hazard areas. These include structures that are inundated for short periods and those inundated for extended periods within areas with relatively flat topography, such as the coastal areas. *Table 6.4* shows the estimated number of structures that will be removed with implementation of the Regional Flood Plan.

Table 6.4 Structures Removed from the Floodplain

Annual Chance Event Flood Risk	Existing At-Risk Structures	Reduction of At-Risk Structures after Implementation	Decrease in Structures Impacted
1%	67,826	1,359	2.0%
0.2%	34,486	810	2.3%
Total	102,312	2,169	2.1%

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

Table 6.5 Critical Facilities Removed from the Floodplain

Annual Chance Event Flood Risk	Existing At-Risk Critical Facilities	Reduction of At-Risk Critical Facilities after Implementation	Decrease in Critical Facilities Impacted
1%	118	5	4.2%
0.2%	87	0	0.0%
Total	205	5	2.4%

Low Water Crossings and Impacted Roadways

Implementing FMSs and FMPs across the region will significantly impact the number of existing low water crossings and/or the degree of risk at those crossings. As projects are implemented, the number of low water crossings will be reduced. In addition to removing low water crossings, there will be significant risk reduction of many crossings which will reduce the frequency and duration of road closures due to severe flooding. The total number of low water crossings being removed and/or those with reduced flood risk is shown in *Table 6.6*.

Table 6.6 Low Water Crossings Removed

Annual Chance Event Flood Risk	Existing At-Risk Low Water Crossings	Reduction of At-Risk Low Water Crossings after Implementation	Decrease in Low Water Crossings Impacted
1%	1,109	56	5.0%
0.2%	23	0	0.0%
Total	1,132	56	4.9%

In addition to the number of low water crossings being removed, flooded roadways also benefit from implementing the Regional Flood Plan. Information in *Table 6.7* shows the benefit to transportation infrastructure by reducing the time a roadway is closed or removing it from flooding altogether.

Table 6.7 Removal of Roads from Flood Risks

Annual Chance Event Flood Risk	Existing At-Risk Roadways (miles)	Reduction of At-Risk Roadways after Implementation	Decrease in Roadways Impacted
1%	2,374	29	1.2%

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 of 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 in 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 FMEs, FMSs, and FMPs. The benefits, although not readily quantifiable, will provide greater protection of public health and safety throughout the region. This is accomplished by reducing the frequency and severity of flooding in flood-prone areas, by removing populations, structures, and roadways from flooding with expanded improved warning systems and by providing officials with the tools to effectively manage flood-prone areas.

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:

- 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)

- Direct benefits (i.e., increases) water availability
- Indirectly benefits water availability
- 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).

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

