

APPENDIX C

Fact Sheets

Flood Management Strategies

Flood Management Strategy (FMS)

Lower Colorado-Lavaca REGIONAL FLOOD PLANNING GROUP

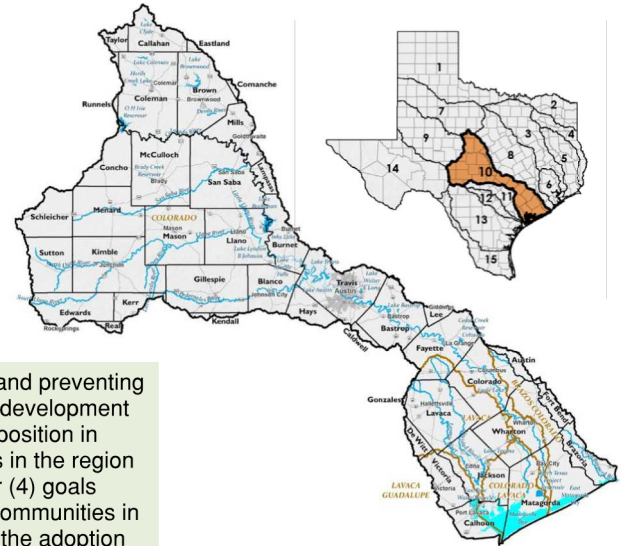
Title **Floodplain Management and Regulation** ID# **10200001**
Sponsor (name of entity) **Lower Colorado-Lavaca RFPG** Commitment Yes No
Technical committee recommend Yes No RFPG recommend Yes No

REGION 10

Strategy Type Strengthen floodplain management practices and floodplain regulation

Problem Area

Regional **Lower Colorado-Lavaca RFPG**
Sub-regional
Counties
City



Need for Strategy

Flood risk reduction begins with prevention—preventing new problems from developing and preventing existing problems from becoming worse. One key to prevention is effective regulation of development and redevelopment in and near floodplains. Overall, the LC-LV Region is in an enviable position in terms of floodplain management and regulation, with only eight (8) of 135 eligible entities in the region not currently participating in the National Flood Insurance Program (NFIP). Keyed to four (4) goals adopted by the RFPG (see below) there is a need to provide direct assistance to these communities in becoming NFIP participants. There is also a need to also assist cities and counties with the adoption and implementation of enhanced floodplain, land development, land use, and drainage regulations. This is particularly important in smaller communities that are or are expected to experience significant land development.

Description of Strategy

This proposed regional flood management strategy will consist of education, outreach and direct technical assistance to cities and counties throughout Region 10, with a particular focus on providing targeted assistance to: 1) cities that are eligible but not currently participating in the NFIP; and 2) other cities and counties with the identification, evaluation, adoption, and implementation of enhanced floodplain management practices and regulations and land development, land use, and comprehensive drainage regulations. Communities that are experiencing or are expected to experience significant land development will be targeted for assistance with enhanced floodplain management. This will include consultation upon request with regard to FEMA requirements for NFIP participation, workshops for local officials, provision of model ordinances and regulations for NFIP participation or for adoption of enhanced floodplain, land development, and land use requirements and standards. Implementation of this strategy by the RFPG will require grant funding, preferably early in the second regional flood planning cycle. Delivery of technical assistance would be provided contractually through consultants, retained by the RFPG sponsor or alternatively through the TWDB or an outside organization such as the Texas Floodplain management Association.

Related Goals

4.1 Increase the number of cities and counties participating in the National Flood Insurance Program (NFIP). 4.2 Increase the number of cities and counties that have adopted higher standards over and above NFIP minimum standards, including regulating to one or more feet above the Base Flood Elevation (BFE) for existing 1% annual change event (100-year) conditions. 4.3 Increase the number of cities and counties that have adopted regulations to reduce the risk from localized flooding. 4.4 Increase the number of cities and counties which provide alternate compliance options.

Estimated Strategy Cost

Cost **TBD** Potential funding source(s) **TWDB, TDEM, FEMA**

Flood Management Strategy (FMS)

Lower Colorado-Lavaca REGIONAL FLOOD PLANNING GROUP

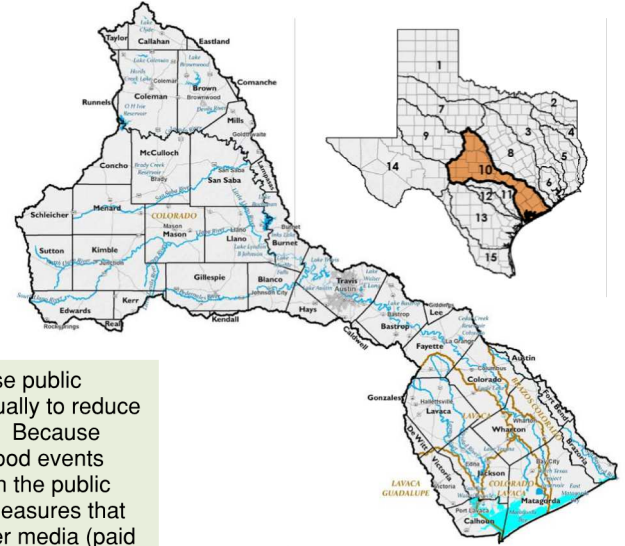
Title ID#
Sponsor (name of entity) Commitment Yes No
Technical committee recommend Yes No RFPG recommend Yes No

REGION 10

Strategy Type

Problem Area

Regional
Sub-regional
Counties
City



Need for Strategy

An essential element of any comprehensive approach to flood risk reduction is to increase public awareness of flood risk and educate the public as to measures that can be taken individually to reduce risk to themselves and others. The goal is prevention, particularly in terms public safety. Because flooding is episodic, public awareness often wanes over time as memories of previous flood events fade. It is therefore important that there be ongoing efforts to communicate regularly with the public about flood risk, personal behavior to minimize personal risk, and about preparedness measures that can be taken in advance of flood events. This can include the use of broadcast and other media (paid and free), school education programs, ready access to information sources during flood events, and other approaches. One example is "Turn Around Don't Drown" messaging.

It is also important that information be provided to the public and key stakeholders on an ongoing basis with regard to the state and regional flood planning processes.

Description of Strategy

This strategy consists of two parts. First would be ongoing TWDB grant funding of the Lower Colorado-Lavaca RFPG to continue its public outreach and engagement efforts during the interim between regional flood planning cycles. It is important that momentum gained through the first planning cycle be maintained and increased in advance of the second planning cycle. This would include the periodic e-mail news blasts, additional public meetings to present the Initial RFP, and continuing outreach to key stakeholders (e.g., state and local elected officials, floodplain administrators, emergency coordinators). Ongoing stakeholder engagement is particularly important to improve information about flood problem areas and increase local input with regard to potential Flood Management Evaluations, Flood Management Strategies, and Flood Mitigation Projects.

Note that this strategy is a companion to a legislative recommendation (Task 8/Chapter 8) that the State of Texas provide funding assistance for an ongoing educational campaign on flood awareness and preparation. This could include a seasonal media campaign, perhaps modeled on the Don't Mess with Texas campaign, development of education materials for use by local entities, and public school education curricula and materials akin to the TWDB Major Rivers school education program. Potential sources of funding include the TWDB Flood Infrastructure Fund and/or funding provided through the Texas Division of Emergency Management (TXDEM).

Related Goals

1.1 – Increase the number of public outreach and educational communications and activities conducted by the RFPG to improve awareness of flood hazards and benefits of flood planning in the flood planning region.

Estimated Strategy Cost

Cost Potential funding source(s)

Flood Management Strategy (FMS)

Lower Colorado-Lavaca REGIONAL FLOOD PLANNING GROUP

Title ID#

Sponsor (name of entity) Commitment Yes No

Technical committee recommend Yes No RFPG recommend Yes No

REGION 10

Strategy Type

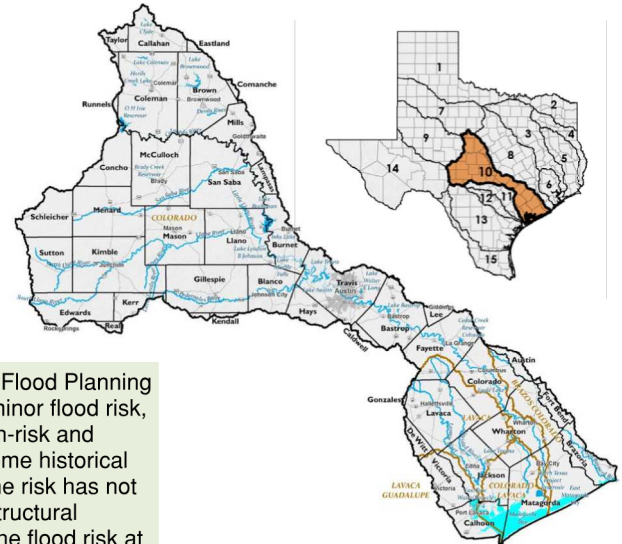
Problem Area

Regional

Sub-regional

Counties

City



Need for Strategy

There are 1,352 low-water roadway crossings (LWC) within the Lower Colorado-Lavaca Flood Planning Region. Many of these crossings experience frequent flooding but may have relatively minor flood risk, in terms of public safety and/or the integrity of the roadway. Others, however, are at high-risk and experience flood depths and velocities that do pose a significant risk. While there are some historical records of fatalities at some LWCs, much of the available information is anecdotal and the risk has not been fully assessed. Furthermore, the cost to mitigate flood risk at high-risk LWC with structural solutions (e.g., bridges) is typically very high, often prohibitive. It is therefore important the flood risk at LWCs be systematically and fully evaluated in order to prioritize those LWCs in need of mitigation, either through structural measures or non-structural (e.g., closures) measures.

Description of Strategy

Some of the more urbanized areas in Region 10, specifically Travis County and the City of Austin, have relatively good information about LWCs within their jurisdictions, including flood risk and prioritization for improvements. Many other areas have little information other than the location, perhaps observations during floods, and perhaps historical and/or anecdotal information. Similar to the recommended regional strategy to conduct outreach and provide technical assistance to counties and cities with floodplain management and regulation, this strategy is to provide technical assistance with the assessment of flood risk at LWCs. This strategy will be implemented by the LC-LV RFPG during interim between flood planning cycles if the required funding is provided by TWDB or from other sources.

Note that this strategy is a companion to a legislative recommendation (Task 8/Chapter 8) that the State of Texas provide funding assistance both for assessment of flood risk at LWCs and for implementation of flood risk reduction measures, either structural or non-structural. Potential funding sources could include TXDOT, the TWDB Flood Infrastructure Fund, and/or funding provided through the Texas Division of Emergency Management.

Related Goals

6.2 – Increase the number of entities that mitigate flood risk at vulnerable roadways or waterways (e.g., low-water crossings, irrigation canals, etc.).

Estimated Strategy Cost

Cost Potential funding source(s)

Flood Management Strategy (FMS)

Lower Colorado-Lavaca REGIONAL FLOOD PLANNING GROUP

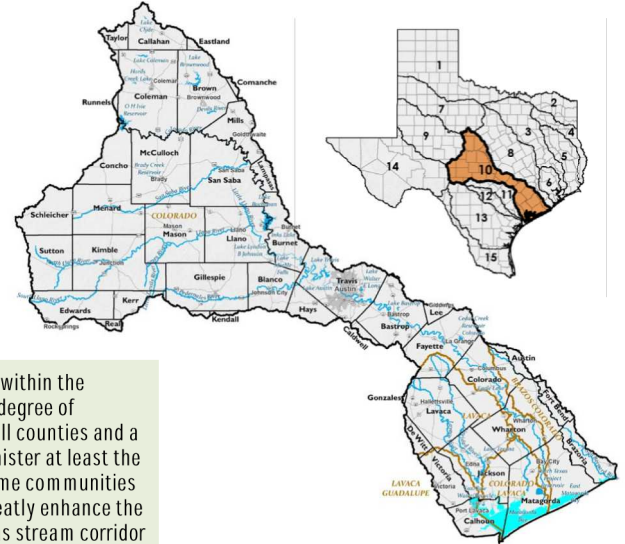
Title **Stream Corridor Protection and Restoration** ID# **102000004**
Sponsor (name of entity) **Lower Colorado-Lavaca RFPG** Commitment Yes No
Technical committee recommend Yes No RFPG recommend Yes No

REGION 10

Strategy Type **Protect, preserve, and restore natural flood attenuation functions of stream corridors and the ecological services provided by healthy riparian zones**

Problem Area

Regional **Regional Flood Planning Area**
Sub-regional
Counties
City



Need for Strategy

Healthy stream corridors provide important "ecosystem services" including some attenuation of flooding within the riparian zone and floodplain. Regulation of land use and development activities in a floodplain provides a degree of protection for the natural functions and services of stream corridors. The LC-LV Region is fortunate that all counties and a majority of eligible communities participate in the National Flood Insurance Program and therefore administer at least the minimum required standards and regulations governing human activity within regulatory floodplains. Some communities in the region (and many elsewhere in the U.S.) go much further and have also adopted regulations that greatly enhance the protection of stream corridors, for example, the establishment of stream buffers, sometimes referred to as stream corridor protection zones. Except for few municipalities in the region, most stream corridors in the LC-LV Region are not protected under such "enhanced" standards and regulations, particularly in rural areas. In addition to encouraging communities to adopt enhanced floodplain management practices, standards, and regulations, there is a need for collaboration among governmental and non-governmental organizations and private property owners to undertake voluntary actions to protect and restore sensitive stream corridors within the LC-LV Flood Planning Region.

Description of Strategy

This proposed regional Flood Management Strategy is focused on encouraging public/private partnerships to enhance protection and restoration of sensitive stream corridors. The essence of this strategy is open space acquisition, either through fee simple purchases of property within sensitive stream corridors or through voluntary agreements (i.e., conservation easements) between governmental and/or non-governmental organizations and private landowners. There are numerous examples of this approach within the LC-LV Region, some focused specifically on protection of sensitive watersheds and stream corridors. For example, the City of Austin's Water Quality Protection Lands (WQPL), acquired through both fee simple purchases and conservation easements, have protected significant portions of the largely rural undeveloped watersheds and stream corridors in the Barton Springs-Edwards Aquifer contributing and recharge zones. Funding for the acquisitions of conservation easements for several large WQPL tracts has been through a combination of City of Austin open space bond funds, federal grant funds (e.g., Natural Resources Conservation Service), federal tax incentives, non-governmental land trust organizations (e.g., The Nature Conservancy), and contributions by the private landowner (e.g., donation of a portion of the market value of the property). The objective of this strategy is to build on such successes to increase publicly protected open space within sensitive stream corridors throughout the LC-LV Region.

This strategy is intended to complement the LC-LV RFPG's strategy to encourage full participation by eligible cities in the NFIP, as well as to encourage the adoption of enhanced or higher practices, standards, and regulations for floodplain management by cities and counties currently participating in the NFIP. It is also a complement to a Task/Chapter 8 policy recommendation that the Texas Legislature consider property tax policies that will provide incentives for private property owners to protect lands within stream corridors.

Related Goals

5.2 Increase acreage of publicly protected open space to reduce future impacts of flooding through property buyouts, land conservation easements, acquisitions or other comparable means.

Estimated Strategy Cost

Cost **N/A** Potential funding source(s) **Federal, state, local government; non-governmental organizations; private property owners**

Flood Management Strategy (FMS)

Lower Colorado-Lavaca
**REGIONAL FLOOD
PLANNING GROUP**

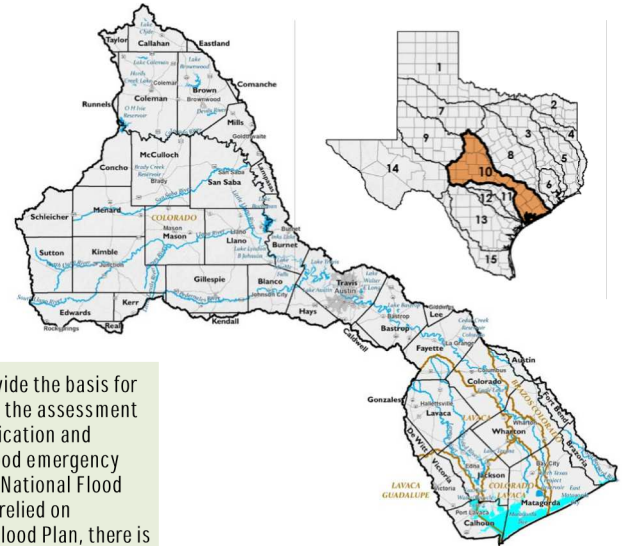
Title **Watershed Modeling and Floodplain Mapping** ID# **102000005**
Sponsor (name of entity) **Lower Colorado-Lavaca RFPG** Commitment Yes No
Technical committee recommend Yes No RFPG recommend Yes No

REGION 10

Strategy Type Update of watershed models and floodplain maps used for flood hazard identification, exposure analysis, NFIP flood insurance

Problem Area

Regional **Lower Colorado-Lavaca Regional Flood Planning Area (Region 10)**
Sub-regional
Counties
City



Need for Strategy

Watershed modeling and the resulting geospatial products (i.e., flood risk products, floodplain maps) provide the basis for much of local, regional, and state flood planning. Accurate, up-to-date models and maps are essential to the assessment of current and future flood risk (Chapter 2); to effective floodplain management (Chapter 3); to the identification and evaluation of flood risk reduction alternative and the selection of a preferred option (Chapter 5); and to flood emergency preparedness and response (Chapter 7). And of course, accurate floodplain maps are a centerpiece of the National Flood Insurance Program. As it is, much of the analyses conducted for this regional flood planning process has relied on incomplete, "coarse", and/or outdated data and maps. As discussed in various chapters of this Regional Flood Plan, there is an ongoing need, actually an imperative, that watershed models and map products be periodically updated, which is typically both a relatively costly and time-consuming process, typically spanning several years and costing hundreds of thousands of dollars per watershed. There are several reasons why model and map updates should be a high priority: 1) many if not most available maps are based on less precise data than is currently available, and were developed using modeling tools that are dated; 2) watershed conditions change over time due to a variety of reasons (e.g., upstream development, changes in stream channel geometry, etc.); and 3). Most significant is that a very large portion of Region 10 falls within areas affected by the new higher rainfall rates for "design storms" reported in the updated Atlas 14 publication.

Description of Strategy

This recommended regional Flood Management Strategy is intended to elevate the need for an immediate region-wide effort and funding for updates to watershed models and associated geospatial products and tools that are essential to understanding flood risk and exposure; to effective floodplain management; to the identification and evaluation of flood risk reduction solutions; and to flood emergency preparedness and response. The strategy is focused on significantly increasing available state funding assistance, with appropriate levels of non-federal cost-sharing, to expedite action to update watershed models and geospatial products and tools. Funding should of course also be provided for development of models and maps in areas lacking such and where local conditions dictate a need for such (e.g., areas experiencing or expected to experience rapid urbanization). State funding through the State Flood Infrastructure Fund (FIF) has been made available for modeling and mapping and that should continue as a high priority. Similarly, FEMA, through its Cooperating Technical Partners (CTP) Program, should also increase funding for direct technical assistance to local entities, particularly current NFIP participating entities, with the update of watershed models and map products necessary for effective implementation of the the National Flood Insurance Program.

This strategy is intended to advance multiple goals adopted by the Region 10 RFPG. Some but not all are listed below. It is also a complement to a policy recommendation included in Chapter 8:

8.1.6 increase State funding and technical assistance for the development and maintenance of accurate watershed models and FEMA Flood Rate Insurance Maps (FIRMs) floodplain maps;

Related Goals

3.1 Increase the number of cities and counties that have updated watershed models and floodplain maps to reflect current data (e.g., Atlas 14 revised rainfall data). 3.2 Increase the number of cities and counties that have evaluated priority flood risk areas and flood risk reduction measures (e.g., alternatives analysis and preliminary engineering). 3.3 Increase the number of counties that have digital flood insurance rate maps (DFIRMs) that reflect current conditions. 4.1 Increase the number of cities and counties that are participating in the National Flood Insurance Program (NFIP). 4.2 Increase the number of cities and counties that have adopted higher standards over and above NFIP minimums

Estimated Strategy Cost

Cost **TBD** Potential funding source(s) **FEMA Cooperating Technical Partners (CTP) Program, TWDB FIF, local funds**