

GBRA

Guadalupe-Blanco River Authority

Your Trusted
Water Resource

GBRA.ORG

Region 11: Guadalupe Regional Flood Planning Executive Meeting

Tuesday, March 10, 2026
9:00am

Agenda

1. Attendance
2. Welcome
3. Meeting Minute Approval
4. RFPG Chair Updates
5. TWDB Updates
6. Region 10 & 12 Updates
7. GBRA Updates
8. TC Presentation & **Actions**
9. TWDB Nature Based Solutions Presentation
10. Future Meeting Dates
11. Date and Agenda Items for May
12. Public Comments
13. Adjourn

Call to Order / Roll Call

- Attendance
- Individuals attending: please sign-in

Agenda Item 1

Welcome

Agenda Item 2

Approval of Meeting Minutes

- Approval of minutes from the January 13, 2026 RFPG meeting

Agenda Item 3

Meeting Minutes – January 13, 2026

Region 11 Guadalupe Regional Flood Planning Group Meeting

GBRA River Annex at 2:00 PM

GBRA River Annex (905 Nolan Street, Seguin, Texas)

Roll Call:

<u>Voting Member</u>	<u>Interest Category</u>	<u>Present (x) /Absent () / Alternate Present (*)</u>
Don Durden	<i>Agricultural</i>	X
John Johnston Billy Jordan*	<i>Counties – Chair</i>	X
Doug Leacock	<i>Counties</i>	X
Melissa Reynolds	<i>Electric Generating Utilities</i>	X
Annalisa Peace Bill Barker*	<i>Environmental</i>	X
Doug Sethness	<i>Flood districts</i>	X
Zach Boyer	<i>Industries</i>	
Joe Ramos	<i>Municipalities</i>	X
Ken Gill	<i>Municipalities</i>	X
Kimberly Meitzen	<i>Public</i>	X
R. Brian Perkins Charlie Hickman*	<i>River Authorities</i>	X
Tara Bushnoe Shelby Taber*	<i>River Authorities</i>	X
Matthew Hoyt	<i>Small Business</i>	
Charlie Flatten	<i>Water Districts</i>	X
Steven Fonville	<i>Water Utilities</i>	

<u>Non-voting Member</u>	<u>Agency</u>	<u>Present(x)/Absent()/ Alternate Present (*)</u>
Sue Reilly Beth Bendik*	Texas Parks and Wildlife Department	X
Fernando Perez Regan Middleton*	Texas Division of Emergency Management	
Jami McCool Kristin Lambrecht*	Texas Department of Agriculture	
Allen Nash	Texas State Soil and Water Conservation Board	
Kris Robles Teresa Williams*	General Land Office	X
Cynthia Nolasco	Texas Water Development Board (TWDB)	X
Joel Klumpp	Texas Commission on Environmental Quality	
Leah Cuddeback	Public	X
Juan Sandoval	Region 12 Liaison	* Chelsea Vaser
Patrick Brzozowski Scott Hartl*	Region 10 Liaison	

Quorum:

Quorum: Yes

Number of voting members or alternates representing voting members present: 11

Number required for quorum per current voting positions of 8: 15

Other Meeting Attendees:

Sharon Warren, GBRA (Paralegal)

See sign-in sheets attached for additional attendees.

Leigh Crettenden, GBRA (IT)

Janis Childers (ICF)

Jay Scanlon (Freese & Nichols)

Katherine Smith (Freese & Nichols)

All meeting materials are available for the public at: <http://www.guadalupeRFPG.org>

AGENDA ITEM NO. 1: Call to Order

Chairman Johnston called the meeting to order at 2:03 PM. Sharon Warren called roll of the planning group members to record attendance, and a quorum was established.

AGENDA ITEM NO. 2: Welcome

Chairman Johnston welcomed members and guests to the meeting.

AGENDA ITEM NO. 3: Approval of minutes from the November 12, 2025, Region 11 RFPG Meeting.

Chairman Johnston opened the discussion on approving the minutes from the November 12, 2025, Region 11 RFPG Meeting.

A motion was made by Ken Gill to approve the November 12, 2025, Region 11 RFPG Meeting minutes. Doug Sethness seconded the motion. The meeting minutes were approved by consensus.

AGENDA ITEM NO. 4: Region 11 Guadalupe REPG Chair Updates

No updates were given by the Chair.

AGENDA ITEM NO. 5: Texas Water Development Board (TWDB) Updates

Chairman Johnston called on Cynthia Nolasco for TWDB updates. The Technical Memorandum was submitted on January 7, 2026. The TWDB will complete an administrative 30-day review for completeness and will notify the region to proceed to Task 5A or request additional information. An ordered list of FMEs is due to the board on or about March 26, 2026. A chair-led conference call was held on December 3, 2025, to discuss regional approaches to Task 5B, and the video and presentation slides are posted on the TWDB website.

AGENDA ITEM NO. 6: Inter-regional updates on Region 10 & Region 12

Chairman Johnston called on Annalisa Peace for a Region 12 update. Annalisa Peace provided a general update for Region 12 with a brief discussion on technical advisory committees. Charlie Flatten provided a brief update on Region 10.

AGENDA ITEM 7 – Consider nominating and potential action regarding election for the RFPG Officer position for 2026.

Annalisa Peace made a motion to nominate the following members to the executive committee:

- John Johnston, Chair
- Vice Chair, Kimberly Meitzen, PhD.
- Secretary, Brian Perkins
- At-Large, Charlie Flatten
- At-Large, Doug Sethness

Tara Bushnoe seconded the motion. The slate was approved by consensus.

AGENDA ITEM NO. 8: Guadalupe Region 11 RFPG Sponsor Guadalupe-Blanco River Authority (GBRA) Updates.

No updates were provided by GBRA.

AGENDA ITEM No. 9 – Discussion and potential action regarding administrative expenses to be submitted to the Texas Water Development Board for reimbursement.

Brian Perkins presented the administrative expenses to be presented to TWDB for reimbursement between GBRA and the technical consultant, totaling \$3,436.90 for September 1, 2025, through December 31, 2025. A motion made by Don Durben and seconded by Joe Ramos to approve the submittal of administrative expenses of GBRA for TWDB reimbursement. The motion carried.

AGENDA ITEM NO. 10: Discussion and updates regarding Region 11 RFPG Technical Consultants' work and schedule

- a. **Selection of FMEs to be performed by the Technical Consultant and Texas Water Development Board (Tasks 4C and 5B)**
- b. **Recommendations on Floodplain Management Practices (Task 3A)**

Jay Scanlon provided a task update to include a summary of what was submitted in the technical memorandum, 2026-2028 funding cycle, selection of the FMEs, recommended public flood plain management practices, and public comments.

The draft Intended Use Plan (“IUP”) will be issued, containing how they are going to award money and the requirements. Within a couple of weeks after the draft IUP is issued, they will announce the opening

of the abridged application process. A few months after that, the TWDB will be supplied a list for the final preliminary IUP that staff is bringing forward. A short list will then be developed based on available funding and the cost of those actions. This list should be finalized this coming summer, which will open up the full application process.

Task 4C/5B – Discussion of Region 11 FME selection criteria for projects to be performed by RFPG and TWDB. Region 11 will be recommending two TWDB projects. The levee study from Dewitt County was selected from the lower basin. The additional project from the upper basin is from Kerr County – evaluation of flood control structures. Draft scopes will be prepared for the meeting in March 2026.

An additional email poll will be sent out to members to discuss projects for the consultant-driven studies and will be presented at the March 2026 meeting.

Task 3A- Floodplain management recommendations: best management practices were discussed to include conservation, detention basins, development limits, management of impervious cover, creek and river buffer zones, improved and consistent floodplain modeling, low-impact development practices, and higher standards.

Task 10-Public participation and plan adoption:

Look ahead: Discussion of milestones and goals for 2026.

AGENDA ITEM 11: Discussion on future meeting dates for 2026.

Chairman Johnston presented dates for future meetings:

The following dates are scheduled:

- March 10, 2026 - 9:00 a.m. to 12:00 p.m., GBRA River Annex
- May 12, 2026 - 9:00 a.m. to 12:00 p.m., GBRA River Annex
- July 14, 2026 - 9:00 a.m. to 12:00 p.m., GBRA River Annex
- September 8, 2026 - 9:00 a.m. to 12:00 p.m., GBRA River Annex
- November 10, 2026 - 9:00 a.m. to 12:00 p.m., GBRA River Annex

AGENDA ITEM 12: Consider date and agenda items for next meeting.

Chairman Johnston provided the date for the next meeting to be held at the GBRA River Annex on Tuesday, March 10, 2026, from 9:00 a.m. to 12:00 p.m.

AGENDA ITEM No. 13: Public general comments on Regular Business:

No comments were made by the public.

AGENDA ITEM 14: Adjourn

Brian Perkins made a motion to adjourn the meeting. The motion was seconded by Doug Sethness. The motion was approved by consensus at 4:11 p.m.

Approved by the Region 11 Guadalupe RFPG at a meeting held on January 13, 2026.

Brian Perkins, SECRETARY

John Johnston, CHAIR

ATTENDANCE

Date: January 13, 2026

Please Print

Name	Organization	E-mail Address
1 Mariana Flores	Bastrop County	Mariana.Flores@co.bastrop.tx.us
2 Janis Childers	ICF	janis.childers@icf.com
3		
4		
5		
6		
7		
8		
9		
10		

Region 11 Guadalupe RFPG Chair Updates

Agenda Item 4

Texas Water Development Board (TWDB) Updates

Agenda Item 5

Inter-regional updates on Region 10 and Region 12

Agenda Item 6

Guadalupe Region 11 RFPG Sponsor Guadalupe-Blanco River Authority (GBRA) Updates

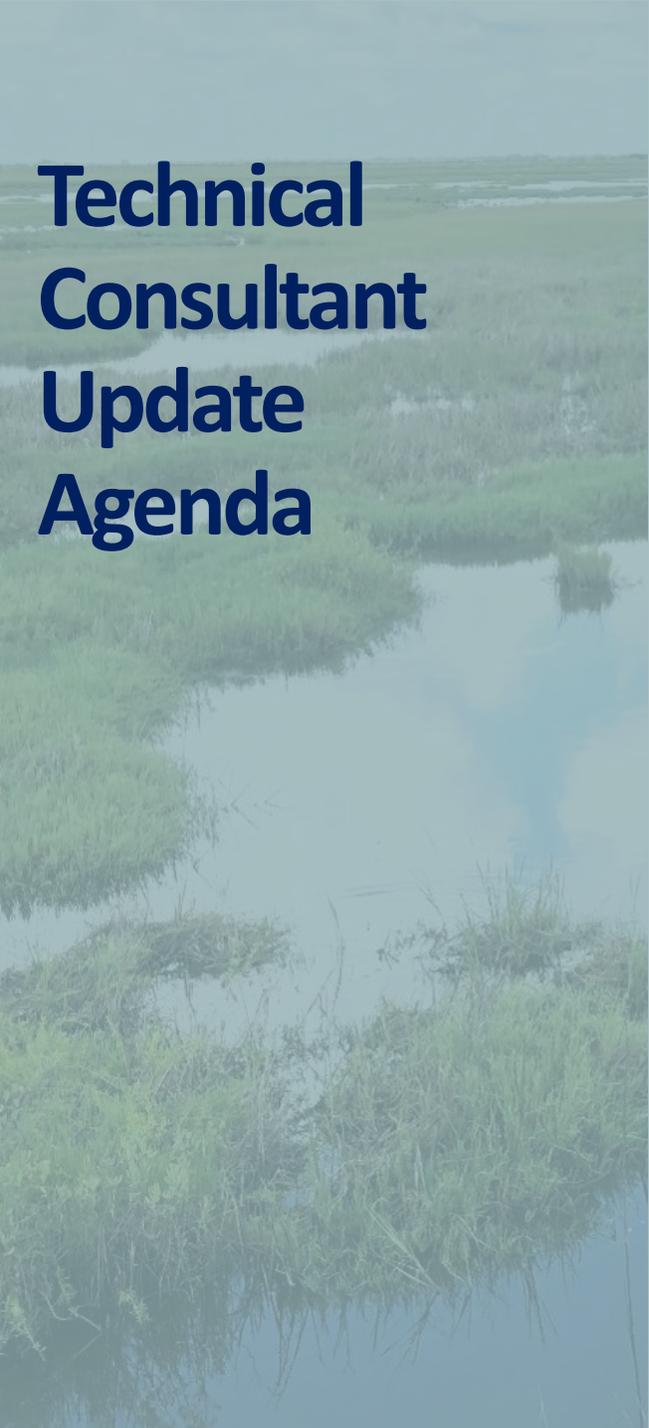
Agenda Item 7

Discussion and potential action regarding
administrative expenses to be submitted to the TWDB
for reimbursement

Agenda Item 8

Region 11 RFPG Technical Consultants Presentation and Discussion

Agenda Item 8



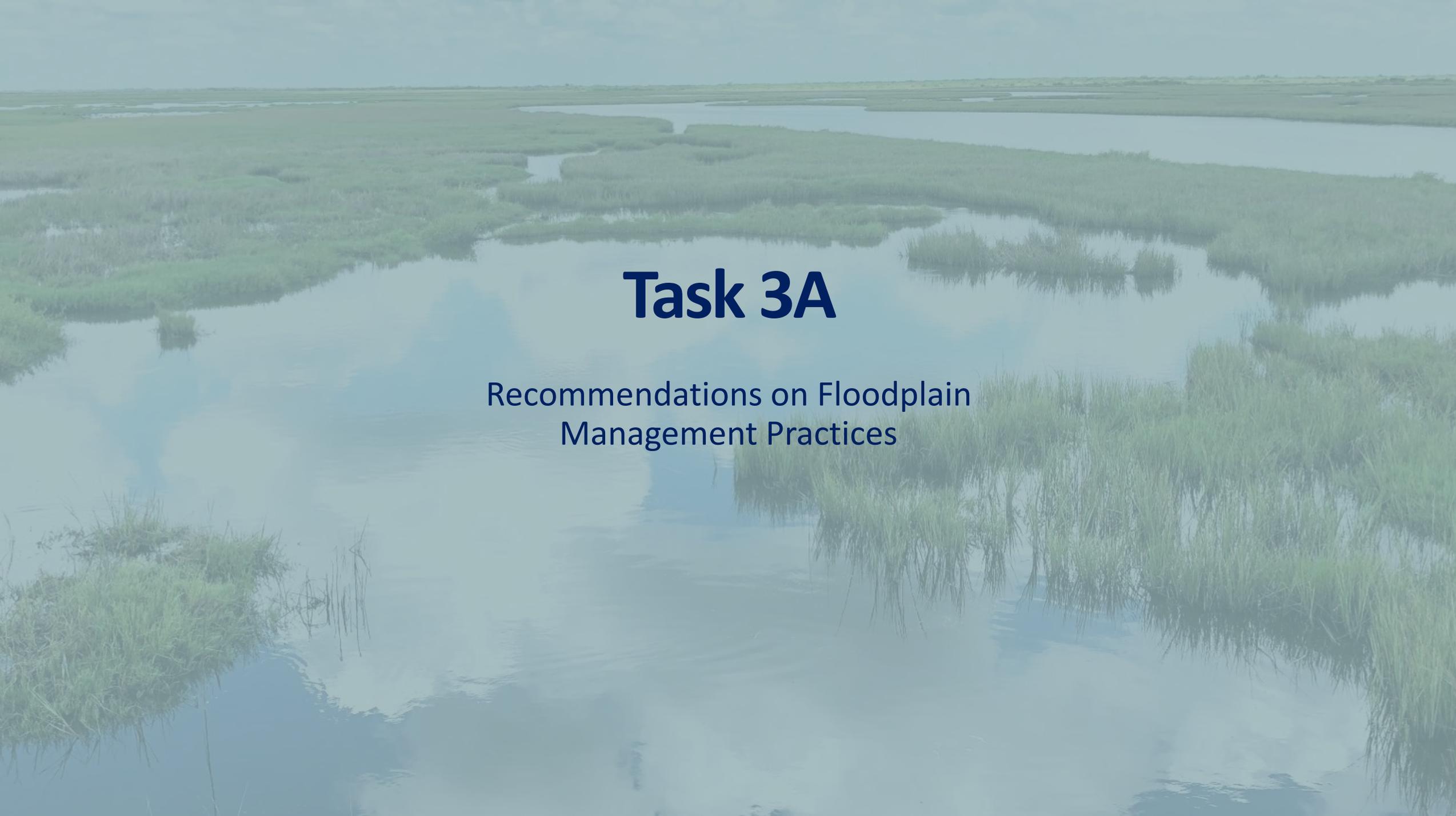
Technical Consultant Update Agenda

- TWDB IUP Update
- Task 3A Recommendations on Floodplain Management Practices
- FME Advancement Process
- Task 5B Discussion and possible actions to approve the process and recommendations for FMEs to be performed by the TWDB
 - 3 Formal Actions
- Task 4C Discussion and possible actions to approve the process and recommendation for FMEs to be performed by the RFPG Technical Consultant
- Next steps



TWDB FIF FY2026-2028

- **Process overview (TBD based on Draft IUP release):**
- Draft IUP in December 2025 (last cycle was December 1, 2023), followed by a 30-day public comment period
 - TWDB has not set a release for the Draft Intended Use Plan
- Solicitation for abridged applications (AA) open approximately 2 weeks later
- Final IUP to the TWDB Board (estimate 3-4 months after AA)
- Publication of List and Project review and scoring (begins after Board approval)
- First round of invitations to submit full applications late 2026 (TBD)

An aerial photograph of a vast wetland landscape. The scene is dominated by a network of winding water channels and shallow ponds, interspersed with dense, vibrant green vegetation, likely marsh grasses. The water reflects the overcast sky, creating a shimmering effect. The horizon is flat and distant, with a thin line of trees or structures visible under a heavy, grey sky. The overall color palette is muted, with various shades of green, blue, and grey.

Task 3A

Recommendations on Floodplain
Management Practices

Recommendations and Best Practices



- Land Conservation
- Detention Basins
- Development Limits and Management of Impervious Cover
- Creek and River Buffer Zones
- Improved and Consistent Floodplain Modeling
- Low-Impact Development (LID) Practices
- Higher Standards

An aerial photograph of a vast wetland landscape. The terrain is a mosaic of green marshland and blue water channels. The water reflects the sky and the surrounding vegetation. The overall scene is serene and natural.

FME Advancement Process

FME to FMP Advancement Criteria

Purpose and Goals

- Purpose
 - Raise FMEs to FMPs
 - \$500k Region Budget (Task 4C)
 - \$2 million TWDB budget (Task 5B)
- Regional Goals
 - Focus on Upper Basin
 - Focus on Rural
 - Focus on Specific/ Structural FMEs



Initial Filters

- Potential Cost
 - < \$150k for Region
 - > \$150k but < \$500k for TWDB
- Upper/Lower Basin
 - Upstream of I-35
 - Downstream of I-35
- Rural/Non-Rural



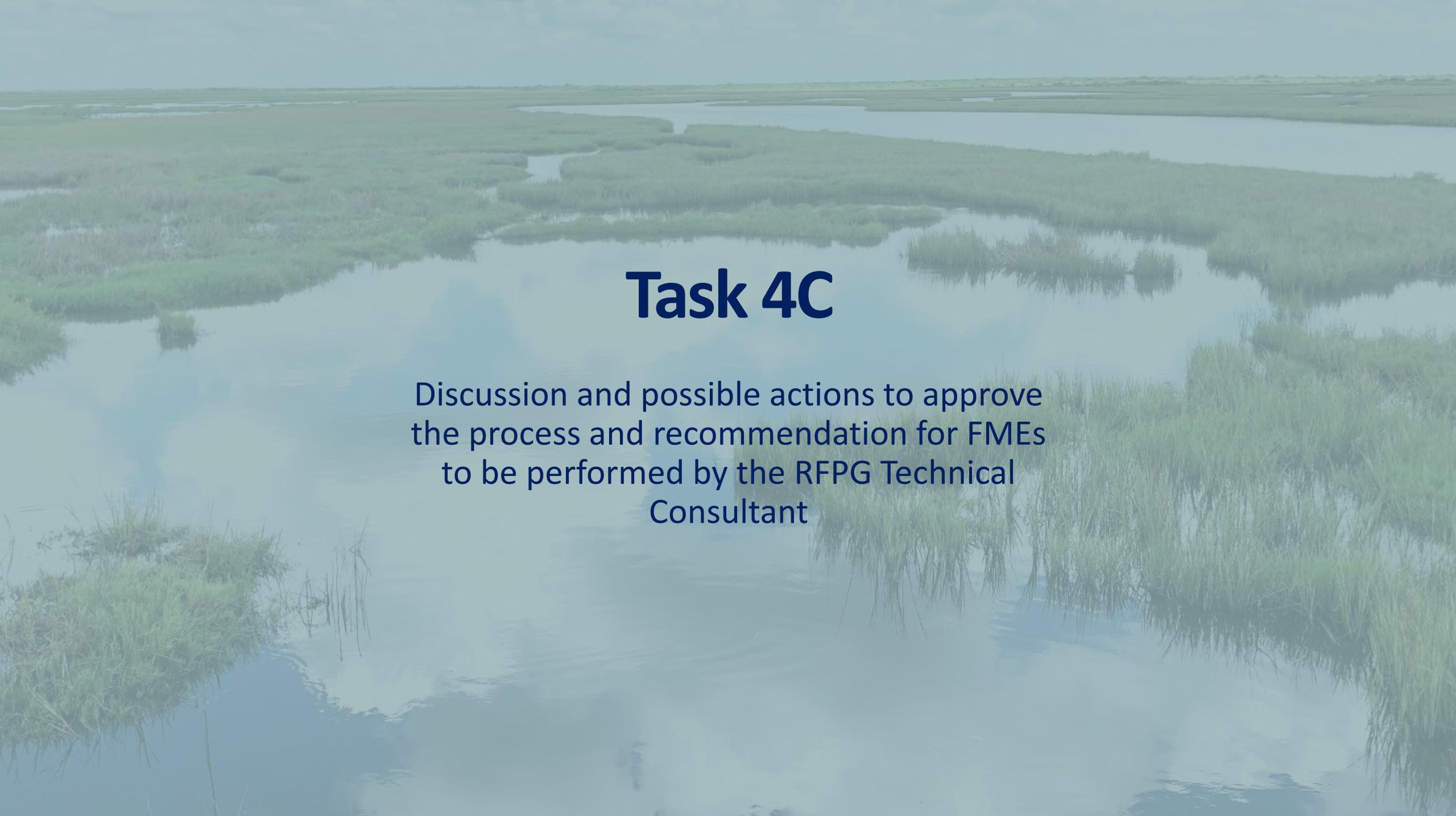
Scoring and Ranking

- Scoring Criteria
 - Population at flood risk
 - Structures at flood risk
 - Rural/Non-Rural
 - Critical Facilities
 - Low Water Crossings
- Ranking Procedure
 - Pairwise weighting
 - Calculating Z statistics and normalizing scores
 - Sum scores and rank



Project Selection

- TWDB Selection
 - Based on initial rank
 - RFPG discussion/ selection
 - One upper and one lower basin
 - Remaining within budget
- Region 11 Selection
 - Based on initial rank
 - Determine if any completed
 - Consult sponsors
 - Select FMEs within budget

An aerial photograph of a wetland landscape. A central waterway winds through a vast expanse of green, marshy terrain. The water reflects the sky and the surrounding vegetation. The horizon is flat, with a line of trees or distant land visible under a pale, overcast sky. The overall scene is serene and natural.

Task 4C

Discussion and possible actions to approve
the process and recommendation for FMEs
to be performed by the RFPG Technical
Consultant

FME to FMP Advancement Results for Region (4C)

Project Selection

- Region 11 Selection
 - Based on filtering
- Determine if any completed
- Consult sponsors
- Selecting FMEs



Sponsor	Number of FMEs Ranked
Caldwell	17
Garden Ridge	1
Kerrville	6
New Braunfels	1
Nordheim	1
San Marcos	4
Victoria (City)	1
Victoria (County)	2
Wimberley	15
Total	48

FME to FMP Advancement Results for Region (4C)

Project Selection

- Region 11 Selection
- Based on filtering
- Determining if any are completed
- Consulting with sponsors
- Select FMEs



Sponsor	Number of FMEs Ranked
Caldwell	17
Garden Ridge	1
Kerrville	6
New Braunfels	1
Nordheim	1
San Marcos	4
Victoria (City)	1
Victoria (County)	2
Wimberley	15
Total	48

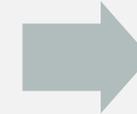
FME to FMP Advancement Results for Region (4C)

Project Selection

- Region 11 Selection
- Based on filtering
- Determining if any are completed
- Consulting with sponsors
- **Selecting FMEs**
 - ~ \$560K total cost
 - Spread throughout Basin



Sponsor	Number of FMEs Ranked
Caldwell	17
Garden Ridge	1
Kerrville	6
New Braunfels	1
Nordheim	1
San Marcos	4
Victoria (City)	1
Victoria (County)	2
Wimberley	15
Total	48



FMPs for
2028 Flood
Plan

Task 4C Actions

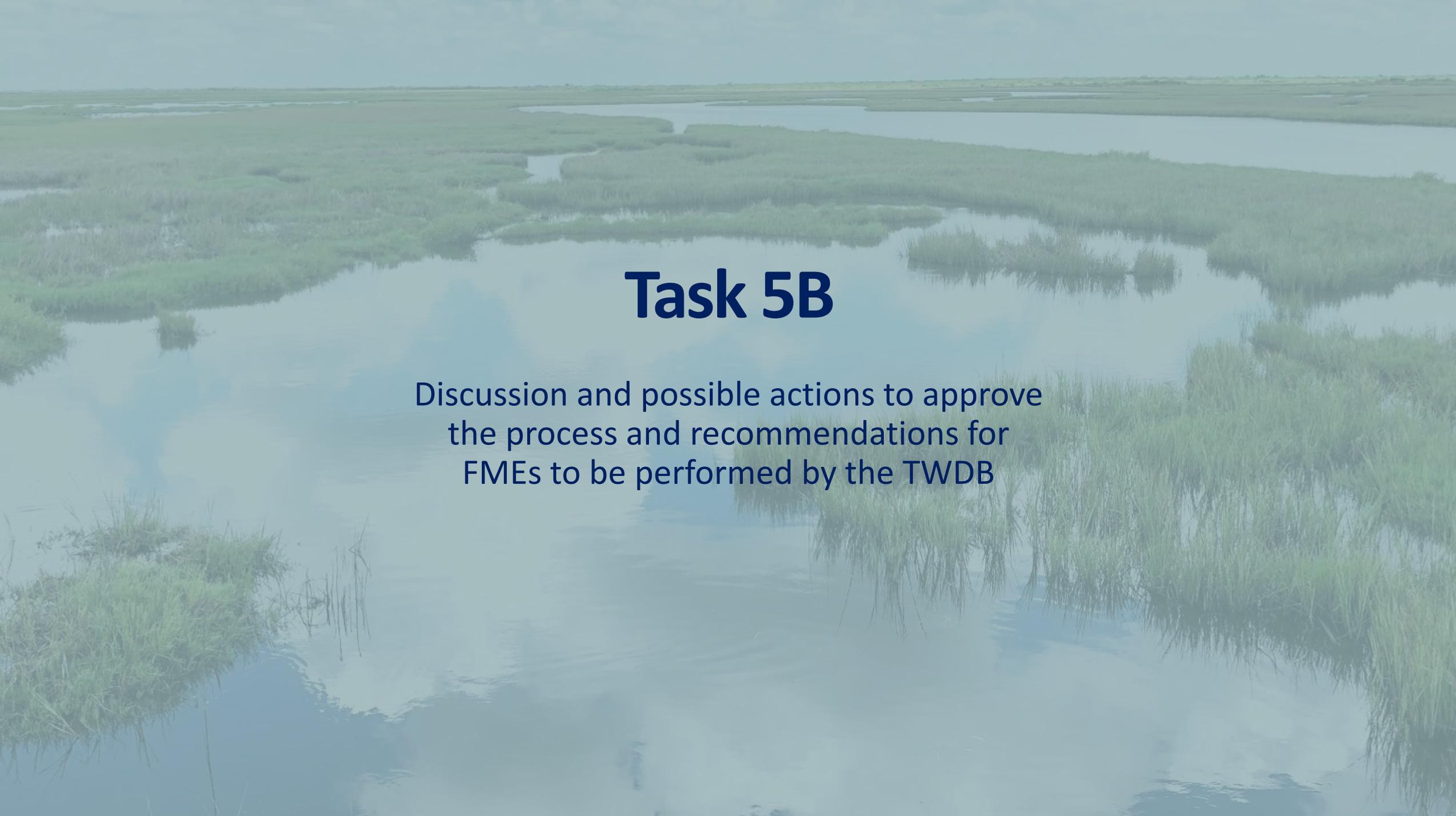


Approve:

- The process to prioritize FMEs

Recommend:

- Technical consultant begin reaching out to prioritized communities to discuss performing FMEs

An aerial photograph of a wetland landscape. A central waterway winds through a vast expanse of green, marshy terrain. The water reflects the sky and surrounding vegetation. The horizon is flat and distant under a pale, overcast sky.

Task 5B

Discussion and possible actions to approve
the process and recommendations for
FMEs to be performed by the TWDB

Definition of Rural – TWDB 2024 Flood Intended Use Plan

- Water Supply or Sewer Service Corporation
 - No part of its service area is in an urban area with a population over 50,000.
- Municipality
 - Population of 10,000 or less OR
 - located entirely in a county where no urban area has a population over 50,000
- County
 - No urban area in that county has a population over 50,000.

FME to FMP Advancement Results for Region (5B)

Project Selection

- Region 11 Selection
 - Based on filtering
- Determine if any completed
- Consult sponsors
- Selecting FMEs



Sponsor	Number of FMEs Ranked
Canyon Regional Water Authority	1
Comal Master WID	1
Dewitt County Drainage District 1	2
Flatonia	1
Gonzales	1
Hays	2
Kerrville	2
New Braunfels	6
San Marcos	4
Seguin	1
Uhland	1
Upper Guadalupe River Authority	1
Victoria (City)	2
Total	25

FME to FMP Advancement Results for Region (5B)

Project Selection

- Region 11 Selection
- Based on filtering
- Determined if any are completed
- Consulted with sponsors
- Selected FMEs

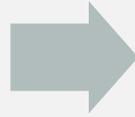


Sponsor	Number of FMEs Ranked
Canyon Regional Water Authority	1
Comal Master WID	1
Dewitt County Drainage District 1	2
Flatonia	1
Gonzales	1
Hays	2
Kerrville	2
New Braunfels	6
San Marcos	4
Seguin	1
Uhland	1
Upper Guadalupe River Authority	1
Victoria (City)	2
Total	25

FME to FMP Advancement Results for Region (5B)

Project Selection

- Region 11 Selection
- Based on filtering
- Determined if any are completed
- Consulted with sponsors
 - **Selected Top 2 FMEs**



Sponsor	FME Name	Description
Dewitt County Drainage District 1	Green DeWitt County Drainage District Cuero Levee Study	Feasibility study of potential levee/berm or other mitigation strategies to protect City from river flooding with risk to life/safety and catastrophic damage, as has been experienced in Cuero on numerous occasions.
Upper Guadalupe River Authority	Upper Guadalupe River Authority Evaluation of Water and Sediment Control Facilities	Study to evaluate the flood benefits and cost-effectiveness of UGRA's existing nine Kerr County facilities and other potential facilities. Evaluation would include H&H modeling and financial data to determine flood risk reduction. Results could guide decisions on future facilities and prevention/mitigation strategies.

FME to FMP Advancement Results for Region (5B)

Project Selection

- Region 11 Selection
- Based on filtering
- Determining if any are completed
- Consulting with sponsors
- Selecting 5 additional FMEs
 - ~ \$4M total



Rank	FME Name	Sponsor	Basin Location	Estimated Study Cost
3	Hays County Drainage Project Planning (Willow Springs Creek between McCarty Lane and Hunter Road)	Hays	Upper	\$800,000
4	Hays County Drainage Project Planning (Willow Springs Creek between Hunter Rd and the Railroad)	Hays	Upper	\$1,200,00
5	Project planning for proposed project to install drop basket structure and reconstruct drainage channels to control flooding and erosion. Structure will assist in stabilizing banks and holding bottoms of channel on grade	Green DeWitt County Drainage District	Lower	\$250,000
6	Project planning for proposed project to mitigate against flooding by increasing the capacity of drainage routes to contain the storm water. Proposed drainage improvements will reduce flood waters backing up into the City.	Uhland	Upper	\$800,000
7	City of Gonzales Tinsley Creek Flood Mitigation Project Planning	Gonzales	Lower	\$500K
Total				\$4.10M

FME Name	Description	Sponsor	Approx. Study Cost	Status
Upper Guadalupe River Authority Evaluation of Water and Sediment Control Facilities	Study to evaluate the flood benefits and cost-effectiveness of UGRA’s existing nine Kerr County facilities and other potential facilities. Evaluation would include H&H modeling and financial data to determine flood risk reduction. Results could guide decisions on future facilities and prevention/mitigation strategies.	Upper Guadalupe River Authority	\$250,000	To be submitted to TWDB
Hays County Drainage Project Planning (Willow Springs Creek between McCarty Lane and Hunter Road)	Project planning for channel improvement and/or property acquisition project to reduce flood damages along Willow Springs Creek from McCarty Lane to Hunter Road.	Hays	\$800,000	Coordinating
Hays County Drainage Project Planning (Willow Springs Creek between Hunter Rd and the Railroad)	Project planning for detention project to reduce flood damages along Willow Springs Creek from Hunter Road to the railroad.	Hays	\$1,200,000	Coordinating
Green DeWitt County Drainage District Channel Improvements Project Planning	Project planning for proposed project to install drop basket structure and reconstruct drainage channels to control flooding and erosion. Structure will assist in stabilizing banks and holding bottoms of channel on grade	Green DeWitt County Drainage District	\$250,000	Coordinating
Green DeWitt County Drainage District Cuero Levee Study	Feasibility study of potential levee/berm or other mitigation strategies to protect City from river flooding with risk to life/safety and catastrophic damage, as has been experienced in Cuero on numerous occasions.	Green DeWitt County Drainage District	\$250,000	To be submitted to TWDB
City of Uhland Drainage Improvement Project Planning	Project planning for proposed project to mitigate against flooding by increasing the capacity of drainage routes to contain the storm water. Proposed drainage improvements will reduce flood waters backing up into the City.	Uhland	\$1,334,000	Coordinating
City of Gonzales Tinsley Creek Flood Mitigation Project Planning	Project planning for proposed improvements along Tinsley Creek include replacing a low water crossing at Johnson Street, adding culverts under Johnson Street, and replacing box culvert crossings with free span bridge crossings at several streets.	Gonzales	\$430,000	Complete
City of San Marcos Upper San Marcos Site 4 & 5 Dam Evaluations	This project planning will include a re-evaluation of NRCS dams 4 and 5 with Atlas 14 rainfall and an analysis of potential updates to the dams that could improve flood reduction within the City of San Marcos.	San Marcos	\$300,000	Already submitted for funding
Comal County Master Water Improvement District River Road Low Water Crossing Improvement Project Planning	Project planning for proposed project to implement low water crossing improvements at River Road.	Comal Master WID	\$700,000	Coordinating
City of Victoria Regional Drainage Solutions Project Planning	Project planning for proposed project for five regional drainage solutions within the City: the Gardens Apartment diversion, Shenandoah ditch improvements, Anthony Road outfall improvements, Lone Tree Road outfall improvements, and Clegg Ditch outfall.	Victoria	\$1,327,962	Coordinating
City of San Marcos USACE Regional Flooding Mitigation Bypass Channel	Update existing study for alternatives, preliminary engineering and design of selected alternative	San Marcos	\$740,000	Coordinating

Task 5B Actions

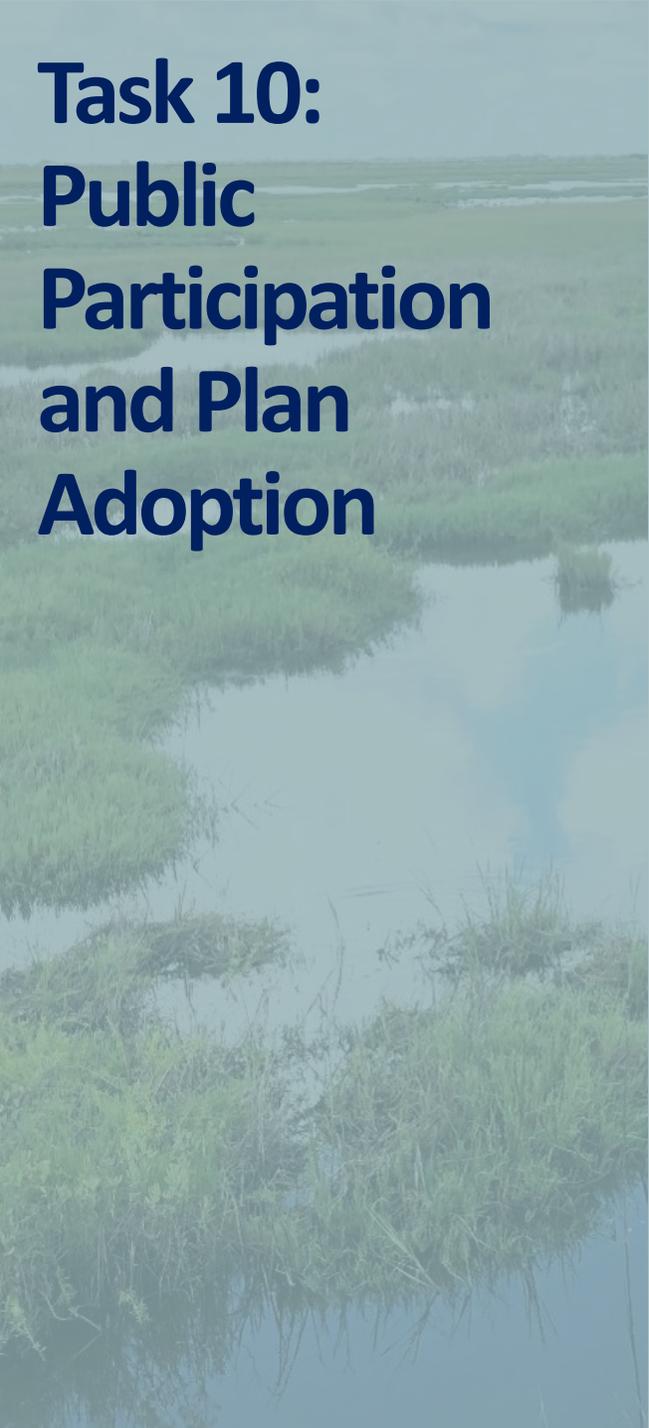


Approve:

- The process to prioritize FMEs
- Definition of rural (used TWDB definition)
- Scope for the Top 2 FMEs

Recommend:

- Technical consultant submit the prioritized list and scope for the top 2 FMEs to the TWDB on or before March 26, 2026



Task 10: Public Participation and Plan Adoption

No Public Comments via comments@guadaluperfpg.org Since 2/27 and at the January RFPG Meeting

To increase engagement, we refined the eBlast message.

- Ensure officials understand the regional flood planning process and the importance of their participation.
- Especially important given that there are new officials either appointed or elected since the first flood planning cycle.

The eBlast answers questions like these:

Why get involved in flood planning?

What is the RFPG group and what happens at the meetings?

eBlast Distribution List and Message

The eBlast distribution list includes:

- 751 stakeholders
- 336 are elected officials at the County or municipal level

The eBlast is the main way to reach these stakeholders.

In the past, the eBlast focused on information about the next meeting, and now it includes more background.

Subject Line: Guadalupe River Basin Flood Planning – March 10 Meeting

Why get involved in flood planning for the Guadalupe River Basin?

The Guadalupe River lies in Texas' "flash flood alley" and has a long history of severe flood events, including the July 2025 floods. Public and stakeholder participation is essential for shaping and prioritizing flood risk reduction projects that may qualify for funding.

What is the Guadalupe Regional Flood Planning Group and what happens at the meetings?

Region 11 (the Guadalupe River Basin) is one of 15 regional flood planning areas in Texas. Each Regional Flood Planning Group (RFPG) develops a Regional Flood Plan that ultimately feeds into the State Flood Plan. Projects included in the State Flood Plan may be eligible for funding through the Flood Infrastructure Fund.

The Guadalupe RFPG is responsible for identifying and evaluating flood risks, setting goals for reducing those risks, and recommending flood risk reduction strategies, studies, and projects proposed by local governments for inclusion in the Regional Flood Plan. *The RFPG does not have the authority to regulate, implement flood projects, nor conduct emergency response or recovery as these responsibilities remain with local governments.*

The Guadalupe RFPG holds meetings every two months. Stakeholders and the public are encouraged to attend or view past materials and recordings on the Guadalupe RFPG website at: www.guadalupefpg.org.

Below is information regarding this upcoming meeting:

When: Tuesday, March 10, 2026 at 9:00 AM to Noon

Where: The Guadalupe-Blanco River Authority River Annex
905 Nolan Street, Seguin, TX 78155

Unable to attend in person? Meetings are recorded and can be found at: www.guadalupefpg.org.

Where is more information about the meeting and the flood planning process?

The meeting agenda, materials, details, and the flood planning process can be found at: www.guadalupefpg.org. Also, please find attached the agenda for this meeting and a fact sheet on the Guadalupe Regional Flood Planning process.

How can I provide input or comments?

Please submit comments, questions, or requests for additional information to: comments@guadalupeRFPG.org and include "Region 11 Flood Planning Group" in the subject line of your email.

We appreciate your participation and look forward to continuing to work with our stakeholders throughout this planning process,

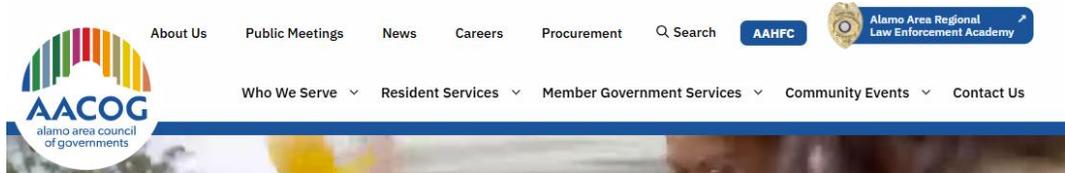
Members of the Guadalupe RFPG

Outreach to Local Councils of Governments (COGs)

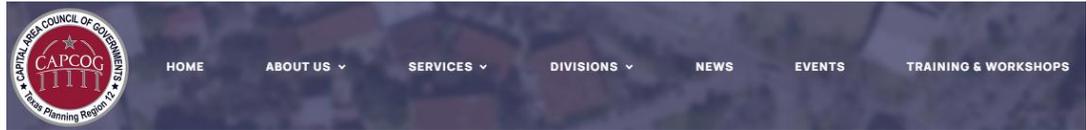
Coordinate with the local COGs:

- Amplify information about meetings and the flood planning process
- Enhance current outreach to increase engagement

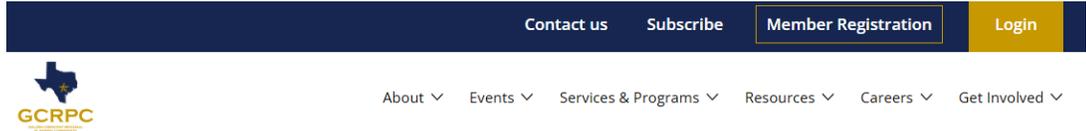
Alamo Area COG



Capital Area COG



Golden Crescent Regional Planning Commission



Presentation:
Nature-Based Solutions for Flood Resilience

Agenda Item 9

Nature-Based Solutions for Flood Resilience

Region 11 Guadalupe Regional Flood Planning Group

Texas Water Development Board

Freese and Nichols, Inc.

The Nature Conservancy



Agenda

- Purpose of the NBS for Flood Resilience Guidance Manual
- Definition and Examples of NBS for Flood Resilience
- Publishing Schedule
- Guidance Manual Content
- How to Promote NBS through Regional Flood Planning
- Key Takeaways



NBS in the State Flood Plan



FMP Type	Recommended FMP Count
Low Water Crossing or Bridge Improvement	94
Infrastructure	148
Regional Detention Ponds	73
Regional Channel Improvements	79
Storm Drain Improvements	47
Dam Improvements, Maintenance, and Repair	5
Flood Walls and Levees	4
Coastal Protections	1
Nature-Based Solutions	8
Comprehensive Regional Projects	83
Property or Easement Acquisition	13
Elevation of Individual Structures	4
Flood Readiness and Resilience	53
Other	3
Total	615

Project Goals

01

Synthesize Research & **Guidance** on the use of NBS for Flood Mitigation into a **Single, Statewide Manual** for Texas Communities

02

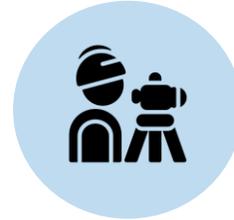
Provide **Strategies & Tools** to Address Common **Barriers & Challenges**

03

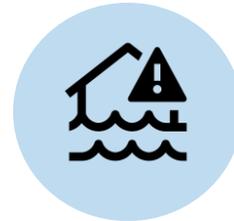
Support The Implementation Of NBS Into The **Regional Flood Planning Process & Community-Driven Efforts**

Intended Users

- Local government officials or representatives charged with planning, developing, or managing community infrastructure or assets
 - City Engineers
 - Floodplain Managers
 - Planners
 - Regional Flood Planning Group (RFPG)
- Practitioners
- Developers



City Engineer CIP Planning (Master Drainage Plans/Studies, Preliminary Engineering, etc.)



RFPG & Technical Consultant Teams Project alternative identification



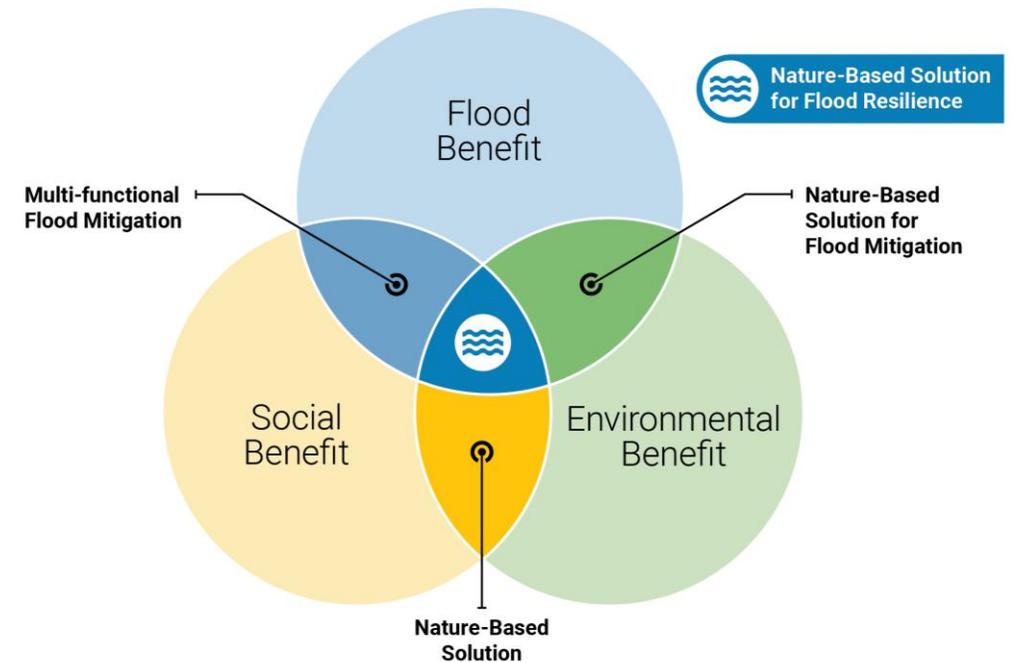
Floodplain Administrator Example floodplain regulation, polices and incentives for more flood resilient community (e.g. floodplain buffers/setbacks)

Defining Nature-Based Solutions (NBS)

NBS use or imitate natural features and/or processes to increase resilience while providing sustainable benefits to people and the environment.

Co-benefits Examples:

- Water Supply and Drought Mitigation
- Water Quality and Public Health
- Urban Heat Reduction and Air Quality
- Recreation and Social Assets



NBS for Flood Resilience Spectrum



Traditional (Gray)

Hard, gray, engineered structures built to address development and flood risk reduction objectives

Hybrid

Combination of hard engineering solutions incorporated with natural and nature-based features to accomplish flood risk reduction objectives

Natural

Creation, protection, or restoration of natural systems or processes to accomplish flood risk reduction objectives

Adapted from the International Guidelines on Natural and Nature Based Features for Flood Risk Management

NBS for Flood Resilience Examples

Stream and Floodplain Restoration



Bioretention



Structural NBS for Flood Resilience



Watershed

- Stream Restoration
- Floodplain Restoration
- Levee Setback
- Wetland Restoration
- Playa Lake Restoration



Neighborhood

- Bioretention
- Vegetated Swale
- Permeable Pavement
- Vegetative Filter Strips
- Wet Ponds
- Constructed Wetlands
- Tree Trenches
- Rainwater Harvesting
- Stormwater Parks



Coastal

- Beach Nourishment and Dune Restoration
- Coastal Marsh, Seagrass, and Prairie Restoration
- Natural Breakwaters and Oyster Reefs
- Waterfront Parks

Non-Structural NBS for Flood Resilience

- Property Acquisition and Conservation
- Regulating Development in Floodplains
- Promoting Native Vegetation in Design Criteria

Model Ordinance

Section 01 Purpose

The Model Ordinance to Support Nature Based Solutions is designed to support sustainable development practices and flood risk reduction projects that incorporate nature-based solutions. The purpose of the regulations contained in this Ordinance is to increase resilience of flooding to people and property while providing sustainable benefits to people and the environment within the **Municipality**. These regulations are designed to promote sustainable development and conservation practices to reduce the impact of development of future flood risk. These regulations are written to be included in an existing zoning ordinance. Language that is variable is indicated by **red text** and commentary is indicated by *blue italic text*.

The language developed in this document is for educational purposes only and is not inclusive nor a substitute for any existing regulations. The information in this document is not a substitute for legal advice. Those wishing to incorporate the ideas presented in this document should consult an attorney.

Section 02 Floodplain Preservation

Floodplain Preservation

Floodplains provide storage for, collect sediment deposits of, and dissipate the energy of flood waters. Preserving the hydrologic connection between a watercourse and its floodplain is necessary to protect the nearby infrastructure. Construction activities within the floodplain such as building, roadways, or utilities, can reduce or block the watercourse's floodplain connection.

This Model Floodplain Preservation Ordinance was developed based on City of San Antonio, Texas Code of Ordinances



NBS Guidance Manual Schedule

- **Spring 2026** Draft Guidance Manual for Public Comment
- **Summer 2026** Final Guidance Manual Published
- <https://www.twdb.texas.gov/flood/research/Nature-based-Solutions-2022/index.asp>



INITIATING NBS

PLANNING NBS

IMPLEMENTING NBS

CHAPTERS 1-3

Defining Nature Based Solutions (NBS), Various Types and Overcoming Challenges and Barriers

- 1 Laying the Groundwork for NBS
- 2 Introduce NBS for Flood Resilience
- 3 Embrace Guiding Principles for NBS

CHAPTERS 4-5

Reviewing Regulations, Incentives and Funding Opportunities

- 4 Assess Ordinances, Incentives, and Regulations
- 5 Establish Funding Strategies

CHAPTER 6

Integrate NBS into Planning Processes

- 6.1 Recognize the Role of Planning
- 6.2 Understand the Characteristics of Your Region
- 6.3 Engage Stakeholders

CHAPTER 7

Understand Flood Risk and Identify NBS Opportunities

- 7.1 Understand Flood Risk and Vulnerability
- 7.2 Identify NBS Opportunities
- 7.3 Identify Non-Structural Solutions
- 7.4 Identify Structural Solutions

CHAPTER 8

Evaluate NBS Feasibility

- 8.1 Evaluate Site Conditions
- 8.2 Assess Regulations and Permitting
- 8.3 Perform Benefit-Cost Analysis (BCA)
- 8.4 Prioritize NBS Alternatives

CHAPTERS 9-12

Designing and Building NBS Across Different Contexts

- 9 Design and Build NBS
- 10 Apply Watershed Design and Construction Considerations
- 11 Apply Neighborhood Design and Construction Considerations
- 12 Apply Coastal Design and Construction Considerations

CHAPTER 13

Monitoring, Measuring and Maintaining NBS to Maximize Efficacy

- 13 Operate, Maintain and Adaptively Manage NBS



The feedback loop represents the embodiment of learning and adapting, one of our four guiding principles presented in Chapter 2. It also acknowledges that planning and implementing are not linear processes and may require refinement and iteration before a project can be built.

Promote NBS through Regional Flood Planning

Task 3	Task 4A	Task 4C	Task 5A
<ul style="list-style-type: none"> • Set goal for NBS implementation • Recommend NBS floodplain management practices 	<ul style="list-style-type: none"> • Discuss NBS opportunities with local sponsors • Identify potential FMPs and FMSs 	<ul style="list-style-type: none"> • Consider potential for co-benefits when selecting FMEs to evaluate • Develop NBS alternatives while performing FMEs 	<ul style="list-style-type: none"> • Document project benefits, % NBS by cost • Include ecosystem services, co-benefits in project BCAs
NBS Guidance Manual Resource	NBS Guidance Manual Resource	NBS Guidance Manual Resource	NBS Guidance Manual Resource
<ul style="list-style-type: none"> • Guiding Principles • Example NBS floodplain management practices • Model Ordinance for NBS 	<ul style="list-style-type: none"> • How to: developing a proactive stakeholder engagement strategy • How to: identify structural and non-structural NBS • Matrix of flood mitigation, environmental, and social benefits by NBS type 	<ul style="list-style-type: none"> • Example alternative prioritization approach • Matrix of site suitability characteristics by NBS type • One Pager by NBS Type 	<ul style="list-style-type: none"> • How to: calculate expected flood damages • Monetary value of ecosystem services • Conceptual BCA for NBS

Key FMP Criteria to Capture for NBS

- Nature-Based Solution (% by cost)
 - *Engineering Judgement*
- Other/Multiple Benefits

Key Takeaways – NBS for Flood Resilience

- Have more co-benefits than mono-functional flood infrastructure
- Should be considered in planning phase, before design begins
- Offer additional funding opportunities

Questions?

Kim Patak, PE, CFM, ENV SP | KKP@freese.com

Justin Kozak, PhD, CFM | Justin.Kozak@tnc.org

Discussion on future meeting dates for 2026

Placeholder invitations sent for:

- Tuesday, May 11, 2026 (9:00am)
- Tuesday, July 14, 2026 (9:00am)
- Tuesday, September 8, 2026 (9:00am)
- Tuesday, November 10, 2026 (9:00am)

Next Meeting

Agenda Item 11

Meeting	Milestones / Goals
May 2026	RFPG Meeting Present and Discuss Chapters 7 & 8

Public general comments – limit 3 minutes per person

Agenda Item 12

Adjourn

Agenda Item 13