

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

**REGION 10**

**August 16, 2021**

# Region 10 Lower Colorado-Lavaca RFPG

- 1. Call to Order**
- 2. Welcome**
- 3. Approval of minutes from the previous meeting**

Meeting Minutes  
Region 10 Lower Colorado-Lavaca Flood Planning Group Meeting  
July 19, 2021  
9:00 AM  
Zoom Virtual Meeting

Roll Call:

Voting Member	Interest Category	Present (x) /Absent ( ) Alternate Present (*)
<b>Terry Been</b>	<i>Agricultural interests</i>	X
<b>Phillip Spenrath</b>	<i>Counties</i>	X
<b>Jason Ludwig</b>	<i>Electric generating utilities</i>	
<b>Kirby Brown</b>	<i>Environmental interests</i>	X
<b>G. Nicholas “Nick” Textor</b>	<i>Flood districts</i>	X
<b>Brandon Klenzendorf</b>	<i>Industries</i>	X
<b>Matt Hollon</b>	<i>Municipalities</i>	X
<b>Frances Acuña</b>	<i>Public</i>	X (left during agenda item 8)
<b>Patrick Brzozowski</b>	<i>River authorities</i>	X
<b>Ann Yakimovicz</b>	<i>Small business</i>	X
<b>Kacey Cubine Paul</b>	<i>Water districts</i>	X
<b>Hank Smith</b>	<i>Water utilities</i>	
<b>Kelly Payne</b>	<i>River authorities</i>	X

Non-voting Member	Agency	Present(x)/Absent( )/ Alternate Present (*)
<b>Shonda Mace</b>	General Land Office	X
<b>Charles “CW” Schneider</b>	Texas Commission on Environmental Quality	X
<b>Lauren Mayes</b>	Texas Department of Agriculture	
<b>Natalie Johnson</b>	Texas Division of Emergency Management	X
<b>Beth Bendik</b>	Texas Parks and Wildlife Department	X
<b>Allen Nash</b>	Texas State Soil and Water Conservation Board	X
<b>Morgan White</b>	Texas Water Development Board	X
<b>Ronald G. Fieseler</b>	Region 11 – Guadalupe Liaison	X
<b>Mark Vogler</b>	Region 8 – Lower Brazos Liaison	X
<b>Cara Tackett</b>	Region 12 – San Antonio Liaison	X
<b>Chuck Brown</b>	Region 9 – Upper Colorado Liaison	X

**Quorum:**

Quorum: **Yes**

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

Number required for quorum per current voting membership of 13: 7

**Other Meeting Attendees: \*\***

Matt Nelson, TWDB  
Lauren Graber, LCRA  
Annette Keaveny, LCRA  
Marcin Tyszk, LCRA  
Mike Moya, Halff Associates, Inc.

Mike Personett, Halff Associates, Inc.  
Cindy Engelhardt, Halff Associates, Inc.  
Matt Bucchin, Halff Associates, Inc.  
Cris Parker, HDR, Inc.  
Karen Ford, WaterPR

Evan Adrian  
Abram Barker  
Fabiola de Carvalho  
Charlie Flatten  
Victoria Garcia  
Kathryn Johansen  
Stephen Johnson  
Nick Kincaid

Allison Land  
Mieko Mahi  
Colleen O'Neil  
Cory Shockley  
Jacob M. Torres

**\*\***Meeting attendee names were gathered from those who entered information for joining the Zoom meeting.

*All meeting materials are available for the public at:*  
[www.lowercoloradolavacaflood.org/meetings](http://www.lowercoloradolavacaflood.org/meetings)

### **Agenda:**

#### **1. Call to Order**

Chair Phillip Spenrath called the meeting to order at 9:00 AM. A roll call of the planning group members was taken to record attendance and a quorum was established prior to calling the meeting to order.

#### **2. Welcome**

Chair Phillip Spenrath welcomed members and other attendees to the meeting.

#### **3. Approval of minutes from the previous meeting**

The draft meeting minutes were reviewed, and no corrections or additions were made. Ann Yakimovicz moved to approve the minutes, seconded by Patrick Brzozowski. The motion passed by a vote of 11-0.

#### **4. Public comments– limit 3 minutes per person**

Chair Phillip Spenrath called for public comments.

No public comments were made.

#### **5. TWDB Update**

Morgan White from the Texas Water Development Board said that the State Legislature appropriated additional funding of \$10M that will be available September 1, 2021. A survey was distributed to flood planning group sponsors to gauge how funds should be appropriated between the 15 groups. More information to come.



## **6. Update from RFPG liaisons**

Ron Fieseler, reported that Region 11 Guadalupe is holding an in-person meeting at the Wimberley Community Center on August 4, at 4PM. There will be a public input component for flood information and potential projects, problem areas, and plans. The consulting team will be in attendance. Stakeholders from Austin, Caldwell, Hays, and Travis counties are invited to join.

## **7. Update from the Planning Group Sponsor**

Lauren Graber reported that the emergency orders to allow virtual meetings will expire on September 1, 2021. Future meetings will be held in person in Austin, with more details to be announced. Mileage is only item that can be reimbursed, and the start time may be adjusted to account for commuters. The sponsor will inquire as to whether certain members may be permitted to attend virtually.

## **8. Technical Consultant presentations and discussions related to regional flood planning Tasks 1-5, 8, and 10**

Mike Personett, Matt Bucchin, and Cindy Englehardt (all Halff Associates, Inc.), Karen Ford (WaterPR), and Cris Parker (HDR) provided updates, briefings, and discussion on the following: project status and outlook; public and stakeholder engagement strategies; requirements and approach to Task 2A/2B – Existing and Future Conditions Flood Risk Analysis; Task 3B – Floodplain Management; Tasks 4B and 5 – Flood Mitigation Evaluations, Flood Mitigation Strategies, and Flood Mitigation Projects; approach to Task 8 – Administrative, Regulatory, and Legislative Recommendations; and goals and plans for the August RFPG meeting.

## **9. Public comments– limit 3 minutes per person**

Chair Phillip Spenrath called for public comments.

Mieko Mahi expressed interest in having projects supported by the Flood Plan also help improve water quality to remove waterways from the impaired waterways list.

## **10. Consider date and agenda items for next meeting**

Chair Phillip Spenrath opened discussion to consider the date and agenda items for the next meeting. After general discussion, Chair Phillip Spenrath concluded that the next meeting will be held on Monday, August 16, 2021 or Tuesday, August 24, 2021, at 9:00 AM.

Lauren will let everyone know if the next meeting is the 16<sup>th</sup> or the 24<sup>th</sup>, and there will be two possible external presentations.

## **11. Adjourn**

Kelly Payne made a motion to adjourn, seconded by Kirby Brown. The motion passed 10-0 and the meeting adjourned at 11:07 AM CDT by Chair Phillip Spenrath.

*Approved by the Lower Colorado-Lavaca RFPG at a meeting held on DATE.*

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Matt Hollon, SECRETARY

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Phillip Spenrath, CHAIR

# Region 10 Lower Colorado-Lavaca RFPG

**4. Public comments – limit 3 minutes per person**

**5. TWDB Update**

**6. Update from RFPG liaisons**

**7. Update from the Planning Group Sponsor**

# Region 10 Lower Colorado-Lavaca RFPG

- 8. Technical Consultant presentations and discussions related to regional flood planning**
  - a. Project status
  - b. Public and stakeholder engagement strategies update
  - c. Task 1 – Planning Area Description: Present preliminary draft Chapter 1
  - d. Task 3A – Floodplain Management Practices: Present preliminary results
  - e. Task 3B – Floodplain Management Goals: Review draft goal statements
  - f. Task 4 – Present and discuss proposed process to identify and select Studies, Strategies, and Projects
  - g. Look-ahead – September 2021 RFPG meeting





# **LOWER COLORADO – LAVACA REGIONAL FLOOD PLAN**

## **A TEXAS INITIATIVE**

**REGIONAL FLOOD PLANNING GROUP MEETING | AUGUST 16, 2021**

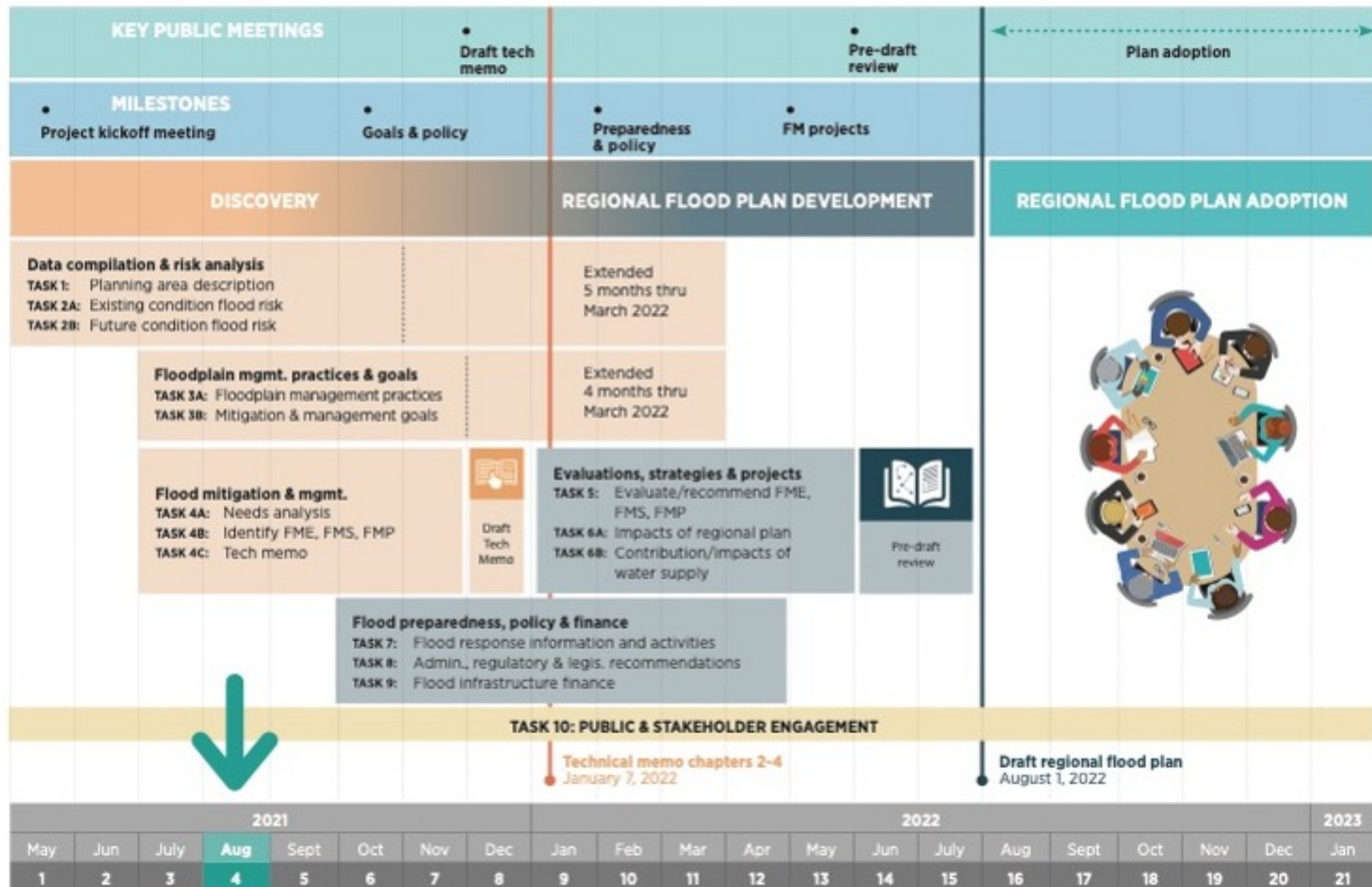


# AGENDA

- Project Status
- Public and Stakeholder Engagement Strategies – Update
- Task 1 - Planning Area Description: Preliminary draft Chapter 1
- Task 3A - Floodplain Management Practices: Preliminary results
- Task 3B - Floodplain Management Goals: Review draft goal statements
- Task 4 - Present and discuss proposed process to identify and select Studies, Strategies and Projects
- Look-ahead Calendar



# Project Status



Aug 16, 2021



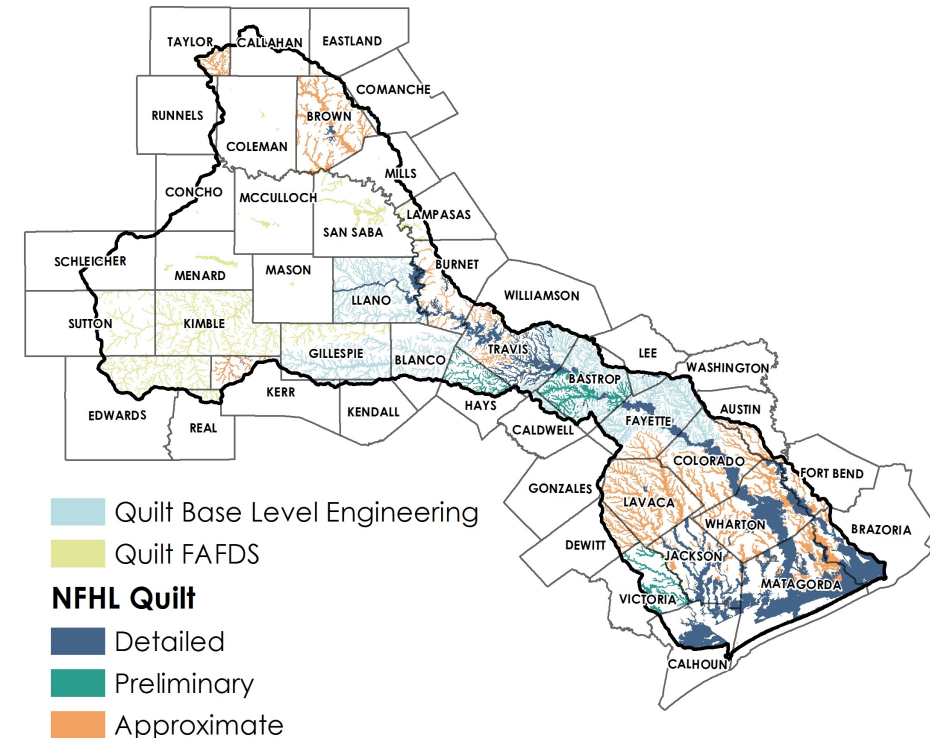
# WORK PLAN AND SCHEDULE ADJUSTMENTS

Cindy Engelhardt – HALFF



## Issue – Final TWDB Floodplain Quilt not available until October

- Data is critical to Task 2 – Existing and Future Flood Risk Analysis
- Fathom data will provide more accurate floodplain data where:
  - Data is missing (gaps)
  - Data is outdated/unreliable
- Recommended schedule adjustments
  - Task 2 finalization — late 2021 when complete Floodplain Quilt is available
  - Task 4A and 4B — late 2021/early 2022



# PROPOSED WORK PLAN AND SCHEDULE ADJUSTMENTS

Cindy Engelhardt – HALFF

## Recovery Plan:

- Advance Tasks 2 and 4 to extent possible without Fathom floodplains
- Initiate/Accelerate Task 7 – Flood Preparedness and Task 9 – Flood Infrastructure Finance
- Develop workplan for completion of all tasks for initial draft Regional Flood Plan by **8/1/22**
- Technical Memo Submittal:
  - Substantial progress on Tasks 1 and 3
  - Initial progress on Tasks 2 and 4

### Task 4C- Technical Memo Submittal Items

#### Scope of Work

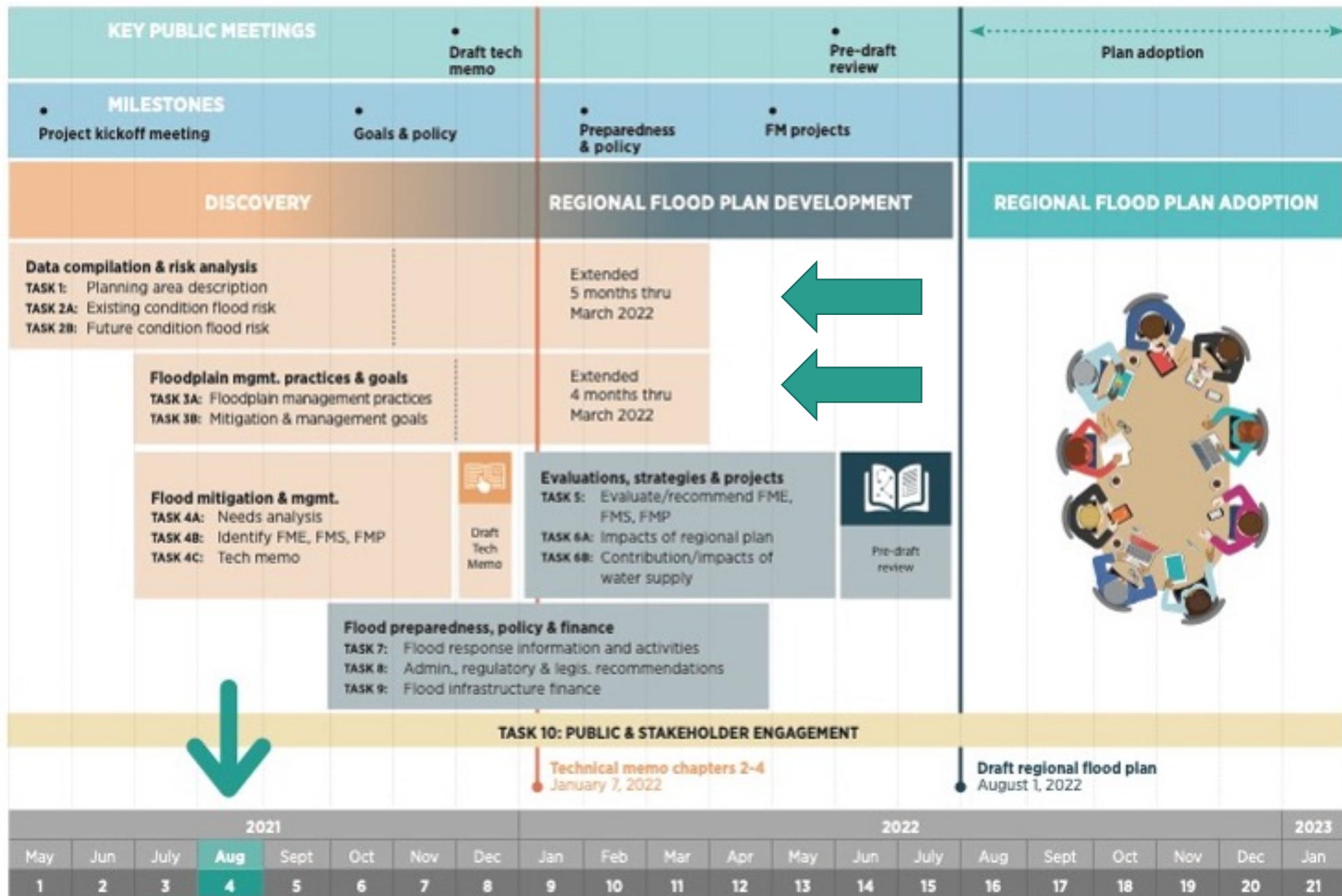
Yellow Highlights are items that are impacted to properly incorporate Fathom 3m dataset. Please note that some regions will be more impacted than others regarding what can be accomplished without the Fathom 3m dataset.

Turquoise Highlights are items that were already listed as technical memorandum deliverables that will include an initial submittal with the understanding that they will be advanced throughout the planning process.

In addition to generally meeting all applicable rules and statute requirements governing regional and state flood planning under 31 TAC Chapters 361 and 362, this portion of work must, in particular, include all work necessary to meet all the requirements of 31 TAC §361.13(e).

This Task includes, but is not limited to, performing all work in accordance with TWDB rules and guidance required to:

1. Prepare a concise Technical Memorandum to include:
  - a. A list of existing political subdivisions within the FPR that have flood-related authorities or responsibilities;
  - b. A list of previous flood studies considered by the RFPG to be relevant to development of the Regional Flood Plan;
  - c. A geodatabase and associated maps in accordance with TWDB Flood Planning guidance documents that the RFPG considers to be best representation of the region-wide 1% annual chance flood event and 0.2% annual chance flood event inundation boundaries, and the source of flooding for each area, for use in its risk analysis, including indications of locations where such boundaries remain undefined;
  - d. A geodatabase and associated maps in accordance with TWDB Flood Planning guidance documents that identifies additional flood-prone areas not described in (c) based on location of hydrologic features, historic flooding, and/or local knowledge;
  - e. A geodatabase and associated maps in accordance with TWDB Flood Planning guidance documents that identifies areas where existing hydrologic and hydraulic models needed to evaluate FMSs and FMPs are available;
  - f. A list of available flood-related models that the RFPG considers of most value in developing its plan;
  - g. The flood mitigation and floodplain management goals adopted by the RFPG per §361.36;
  - h. The documented process used by the RFPG to identify potentially feasible FMSs and FMPs;
  - i. A list of potential FMEs and potentially feasible FMSs and FMPs identified by the RFPG, if any; and
  - j. A list of FMSs and FMPs that were identified but determined by the RFPG to be infeasible, including the primary reason for it being infeasible.
2. Approve submittal of the Technical Memorandum to TWDB at a RFPG meeting subject notice requirements in accordance with 31 TAC §361.21(h). The Technical Memorandum must be submitted to TWDB in accordance with Section I Article I of the contract.



Aug 16, 2021



# TASK 8 – POLICY RECOMMENDATIONS

**Mike Personett – HALFF**

## Policy Issues and Topics:



- **Administrative**
  - Regional flood planning process improvements
  - Develop model ordinances for general law cities (e.g., building codes, Low Impact Design/Development)
- **Regulatory**
  - City and county regulatory authority re: regulation of land use and development in floodplains
- **Legislative**
  - Recurring appropriations to Flood Infrastructure Fund for Study, Strategy and Project implementation
  - State incentives for establishment of municipal drainage utilities
  - Legal impediments to use of public funds to improve private properties for flood risk reduction (e.g., elevation of structures in floodplains)

**Send ideas/suggestions to Mike Personett at [mpersonett@halff.com](mailto:mpersonett@halff.com)**

# PUBLIC OUTREACH AND ENGAGEMENT

Karen Ford – WaterPR



## Ongoing Strategies to Reach Audiences

- **Outreach to Community & Public Stakeholders for Survey**

- Mail Chimp blasts on July 19, 27, 28, August 4, 12
- Response reports to Team for follow-up

- **Digital Flier**

- Development of Spanish language flier

- **Website Updates & Additions**

- Spanish language page, in progress

- **Media Relations**

- Media Alert distributed re 8/16 meeting

- **Social Media**

- Facebook: posts/boosts
- Instagram: posts





# Task 1 - Planning Area Description



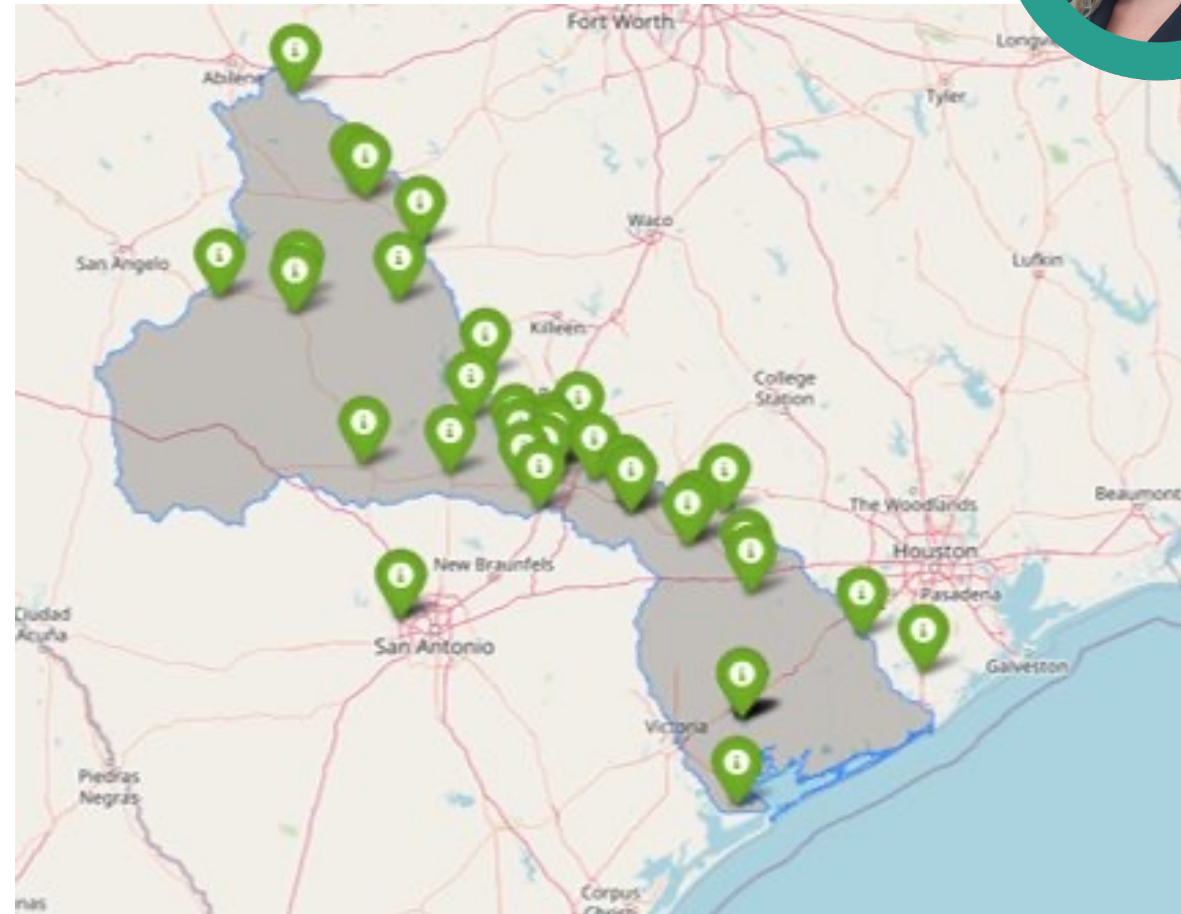
# TASK 1 – PLANNING AREA DESCRIPTION

Cindy Engelhardt – HALFF

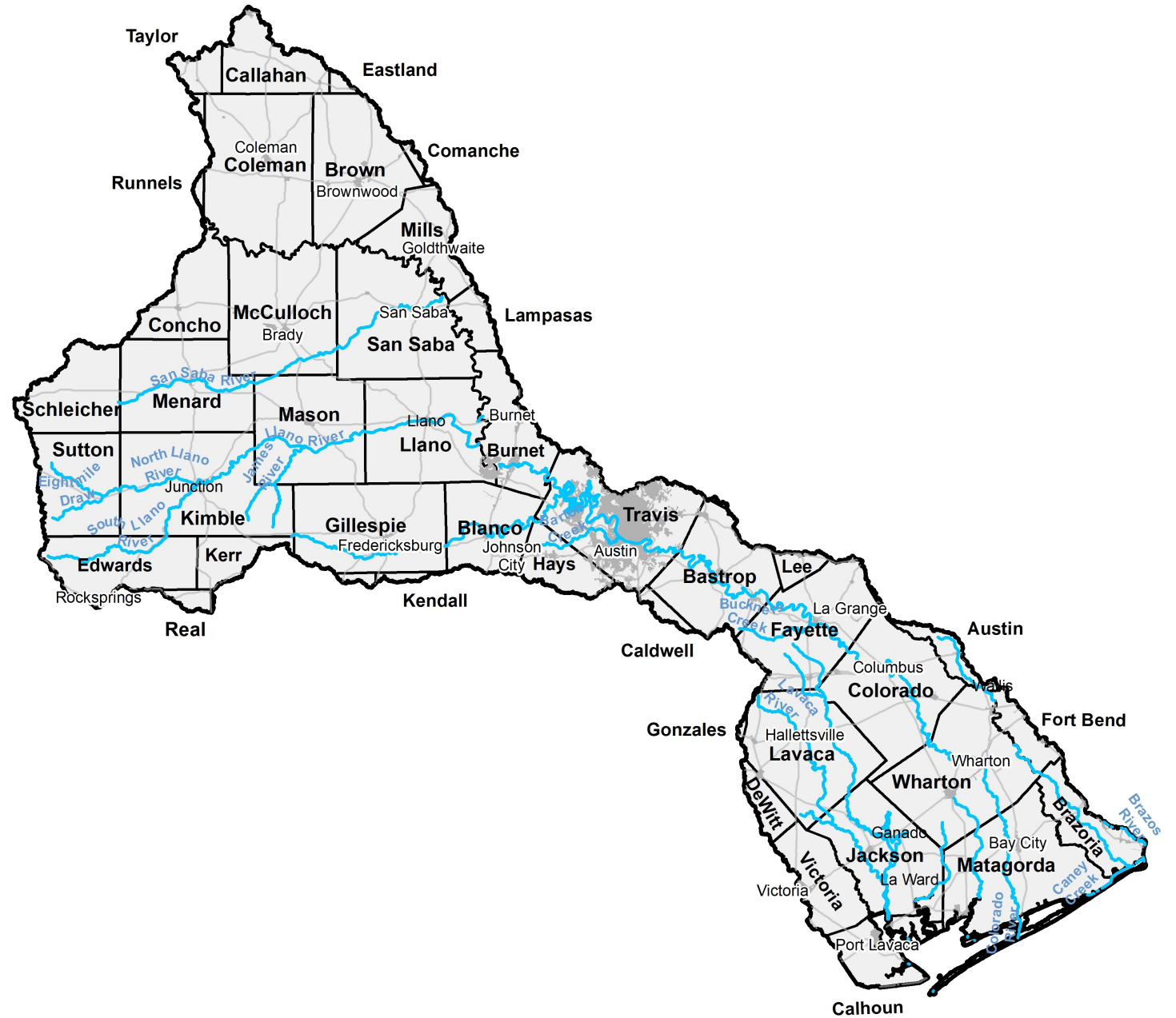


Survey closed August 6, 2021

- Participation
  - 328 users identified
  - 87 started survey
- Representation
  - 19 Counties
  - 16 Communities
  - 2 River Authorities
  - 1 MUD
  - 1 COG
- Geographic Diversity
  - 24 Rural
  - 15 Urban



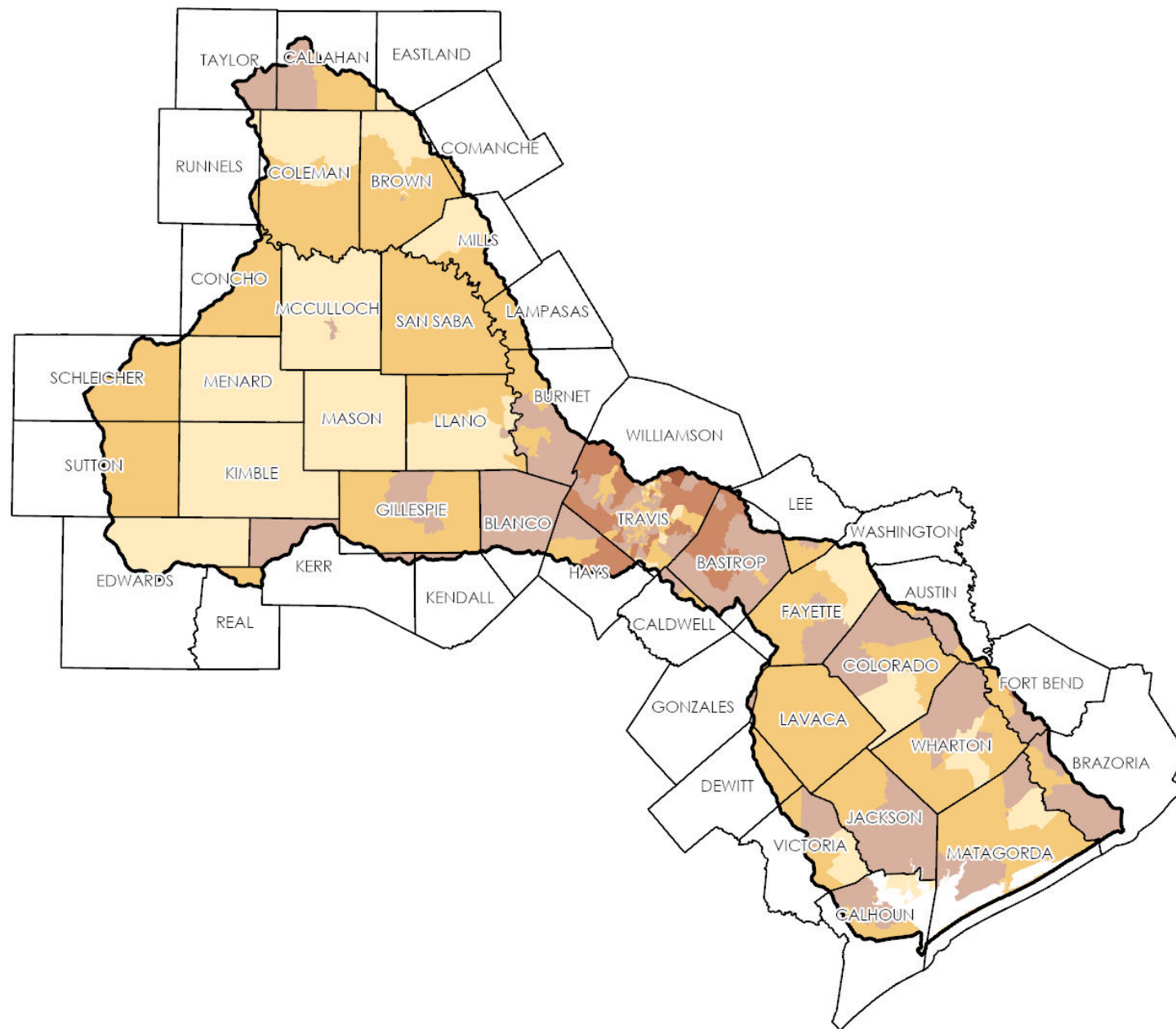
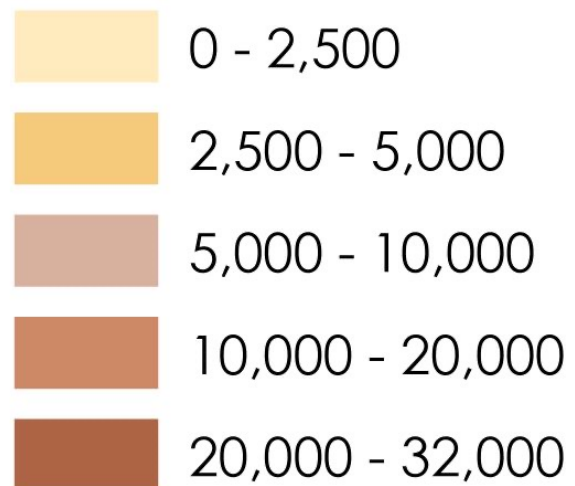
# Basin Entities





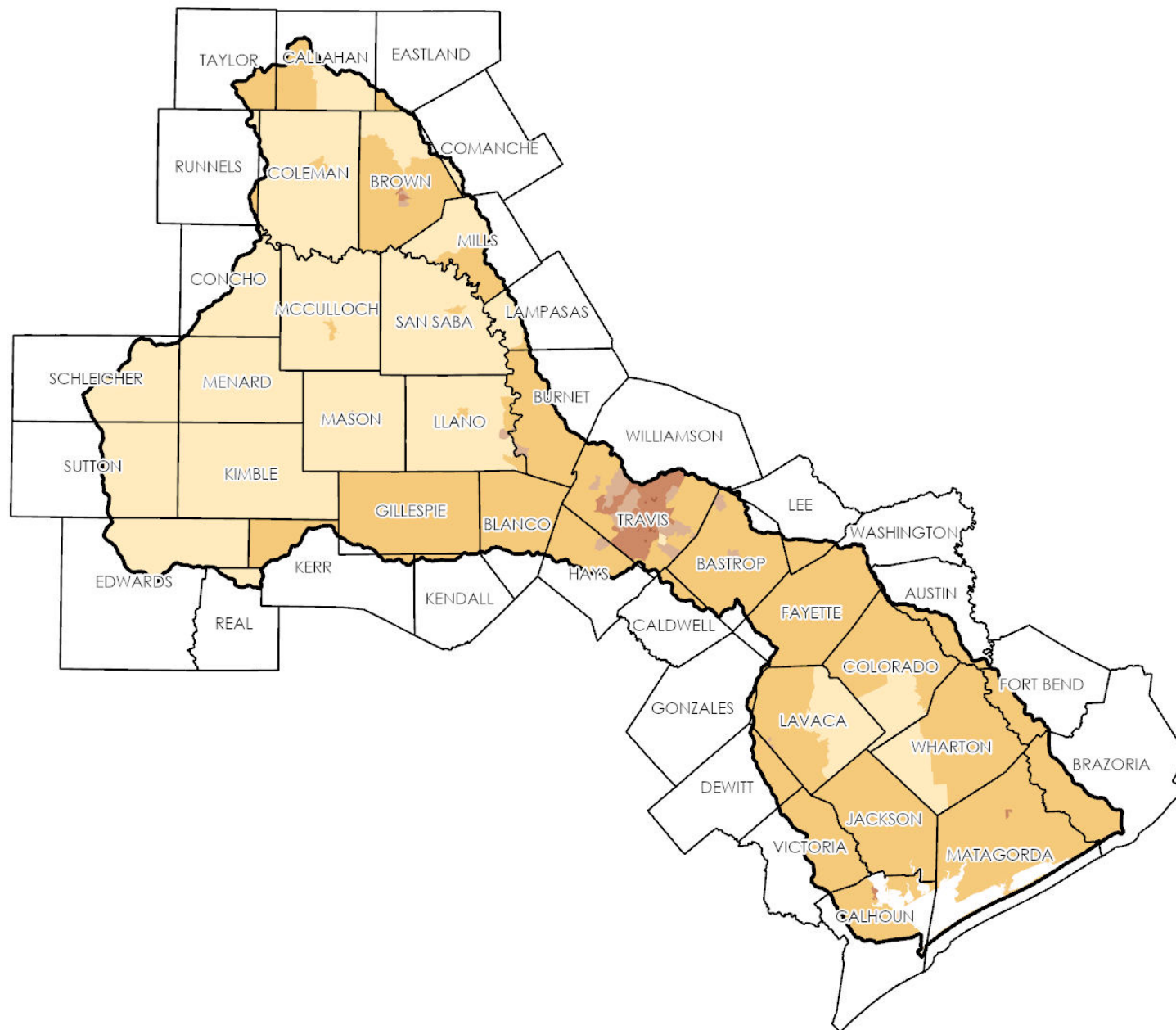
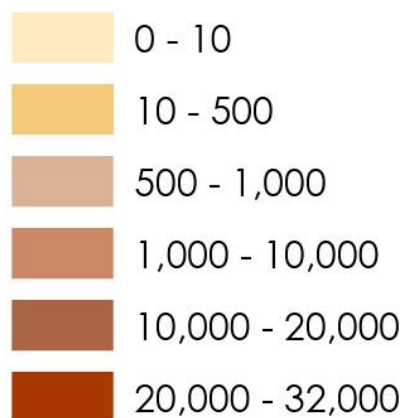
# Population

## 2021 Population

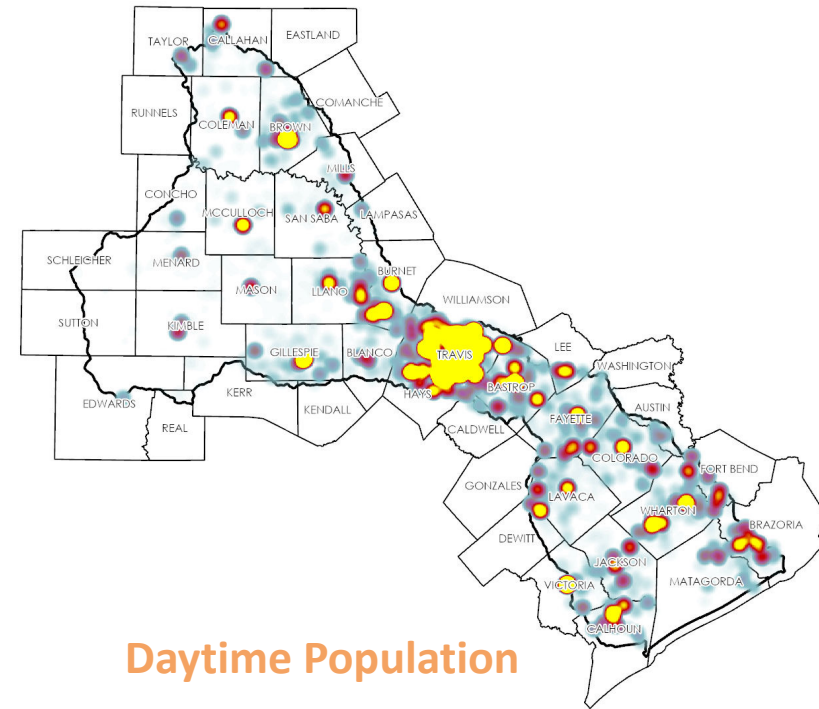


# Population Density

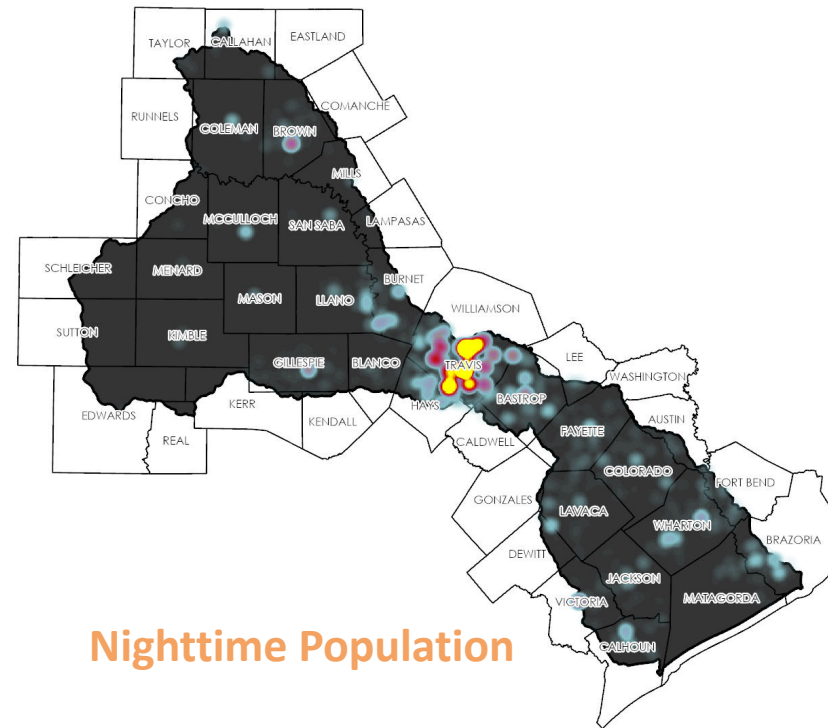
## 2021 Population Density (per sq. mi.)



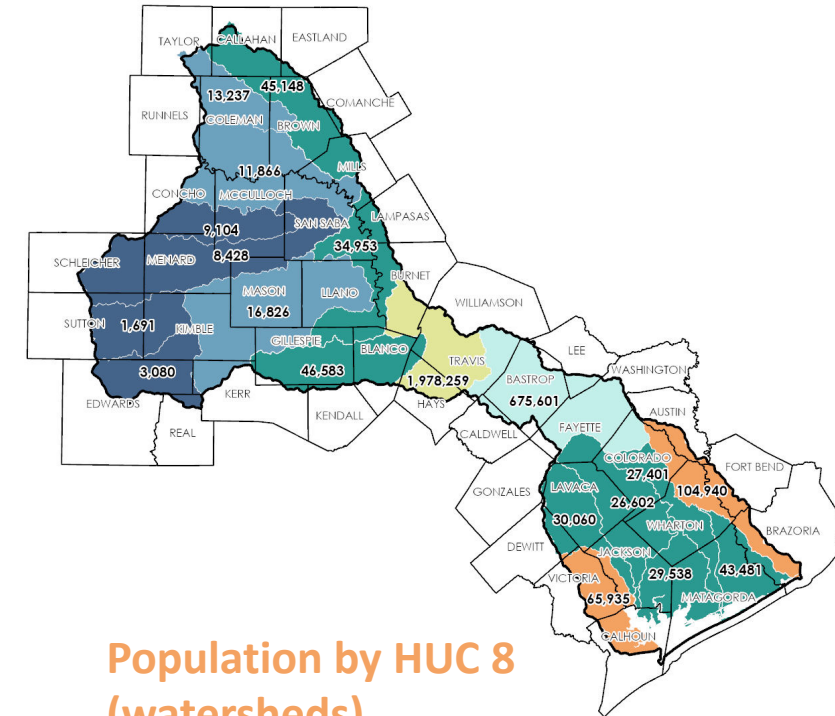
# Other Population Considerations



Daytime Population



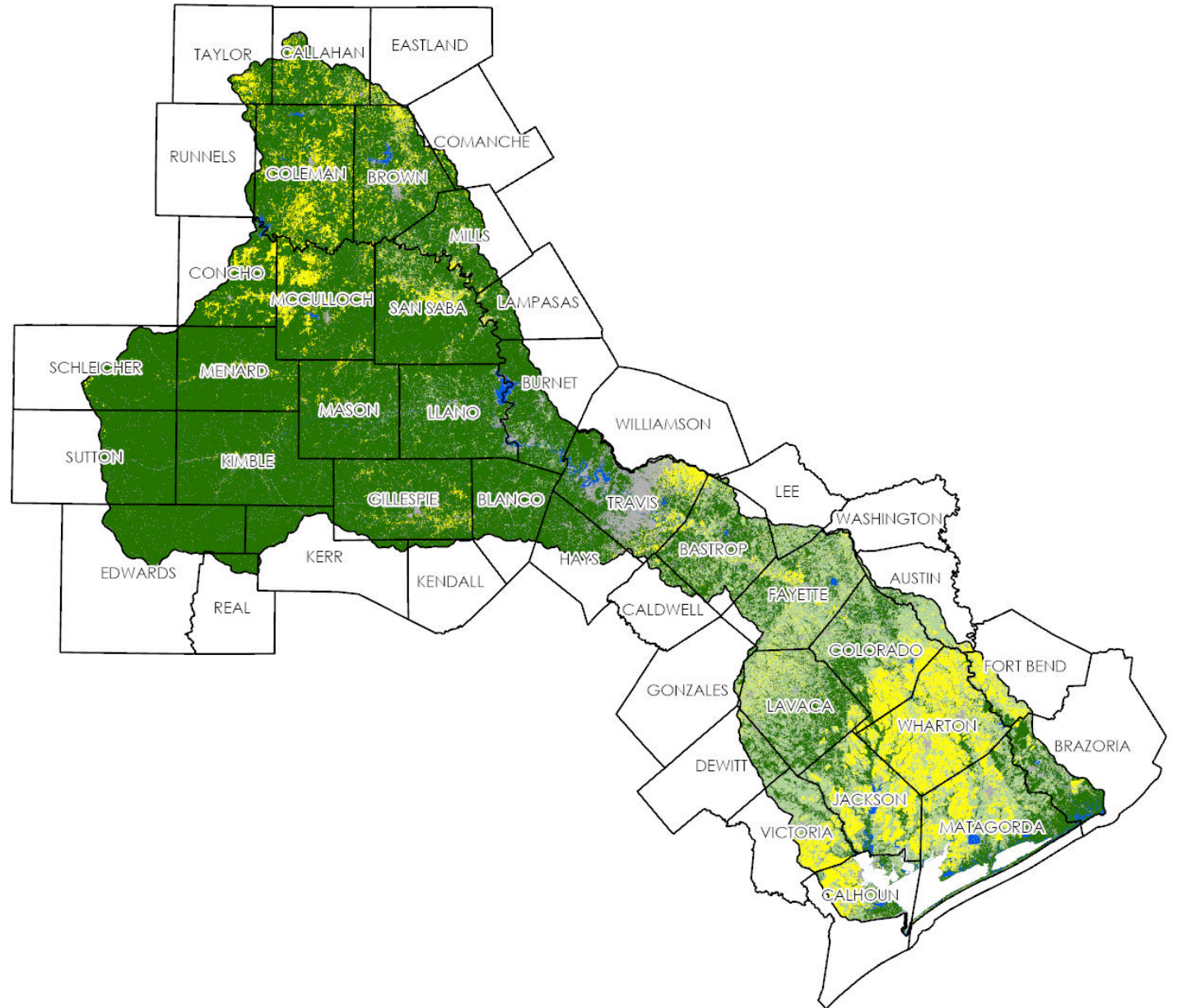
Nighttime Population



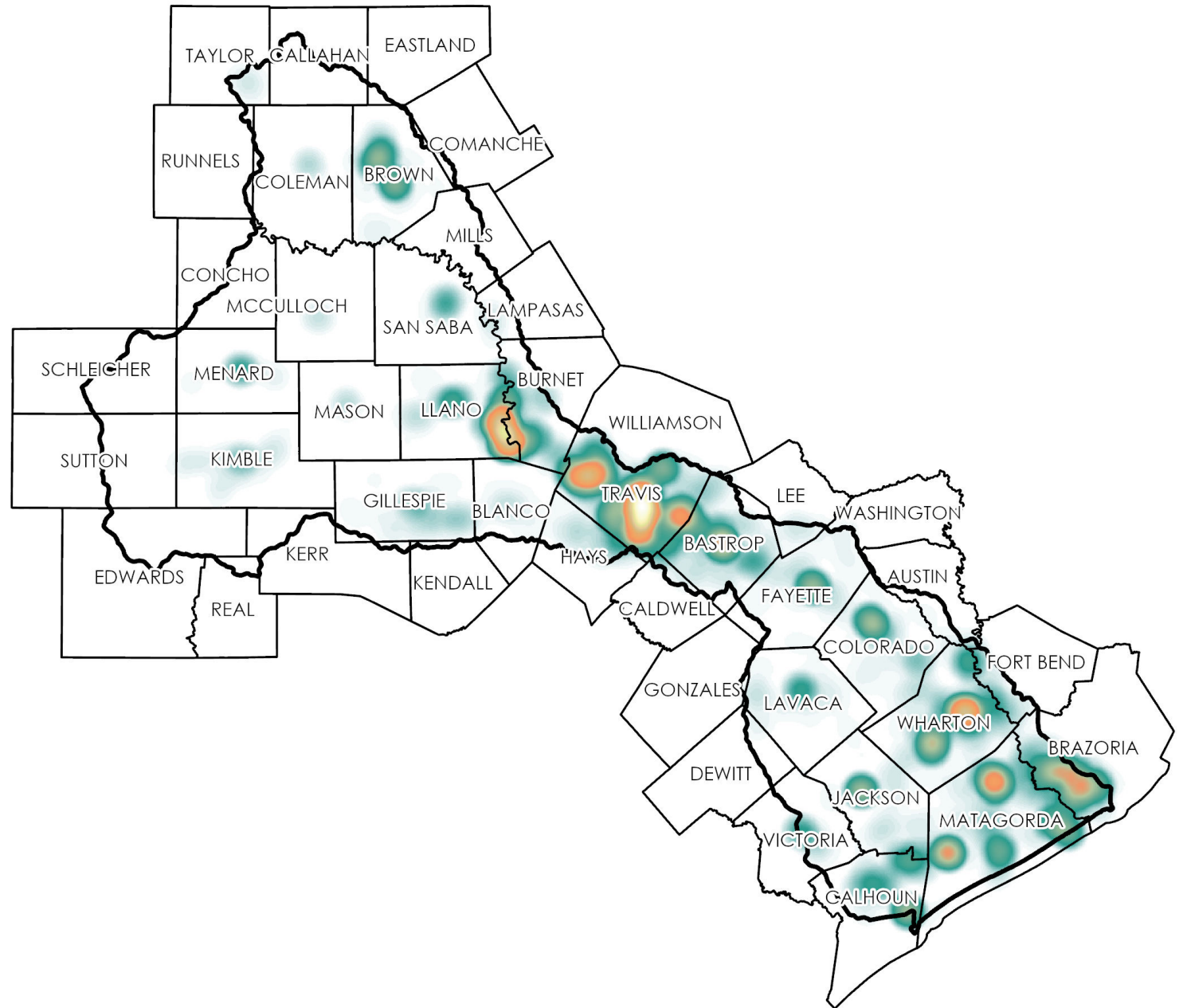


# Land Use

## USDA Landuse Classification



# Structures in Current Floodplain Quilt





# Task 3A - FLOODPLAIN MANAGEMENT PRACTICES



# TASK 3 – FLOODPLAIN MANAGEMENT PRACTICES

**Matt Bucchin – HALFF**



Entity	Floodplain management regulations	Adopted minimum regulations	NFIP Participant	Higher Standards Adopted	Floodplain Management Practices	Level of enforcement of practices	Existing Stormwater or Drainage Fee
County 1	Yes	Yes	Yes	No	Moderate	Moderate	Yes
City 1	No	No	No	No	Low	Low	No
Special Purpose District	Unknown	No	No	No	None	None	No

# TASK 3A – FLOODPLAIN MANAGEMENT PRACTICES

## Survey Results

Does your entity have floodplain management regulations?

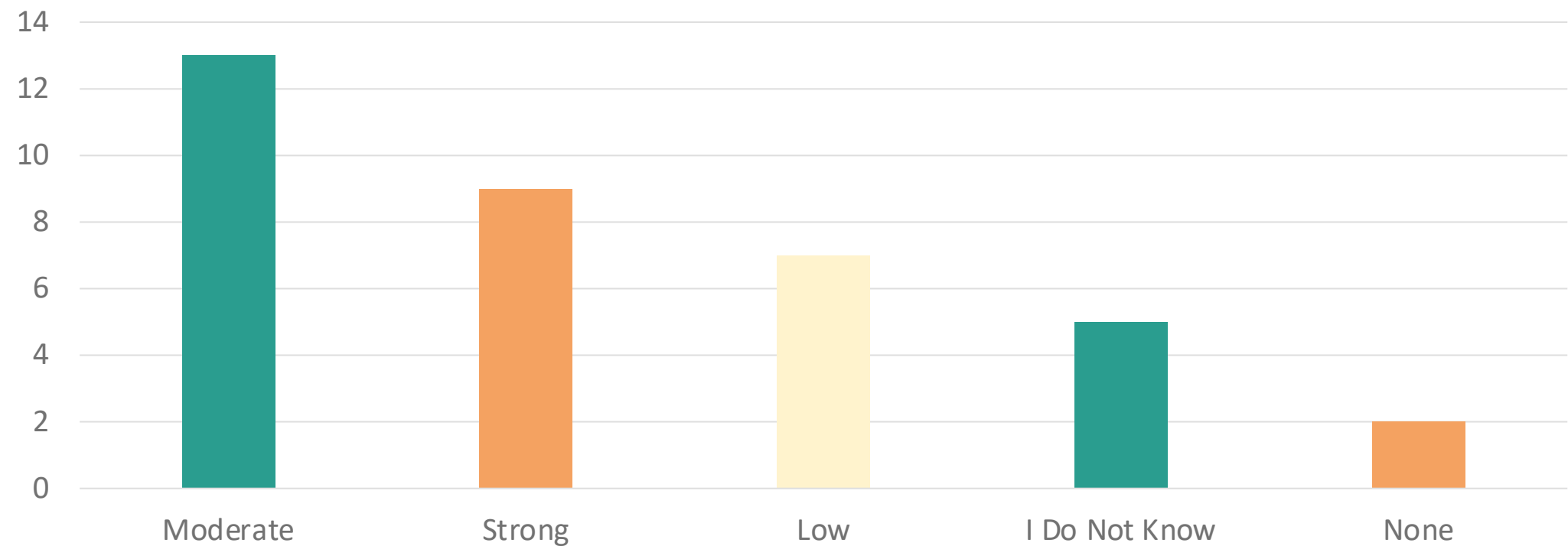




# TASK 3A – FLOODPLAIN MANAGEMENT PRACTICES

## Survey Results

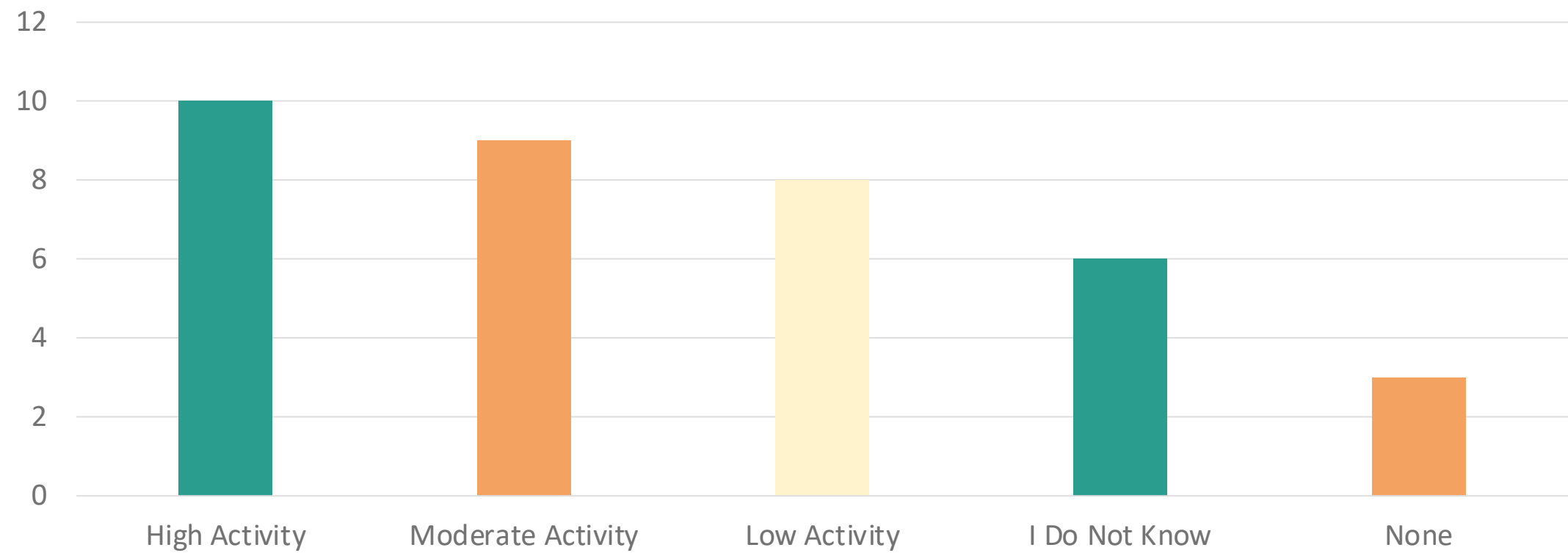
Which of the following best describes the activity of your jurisdiction in Floodplain Management practices?



# TASK 3A – FLOODPLAIN MANAGEMENT PRACTICES

## Survey Results

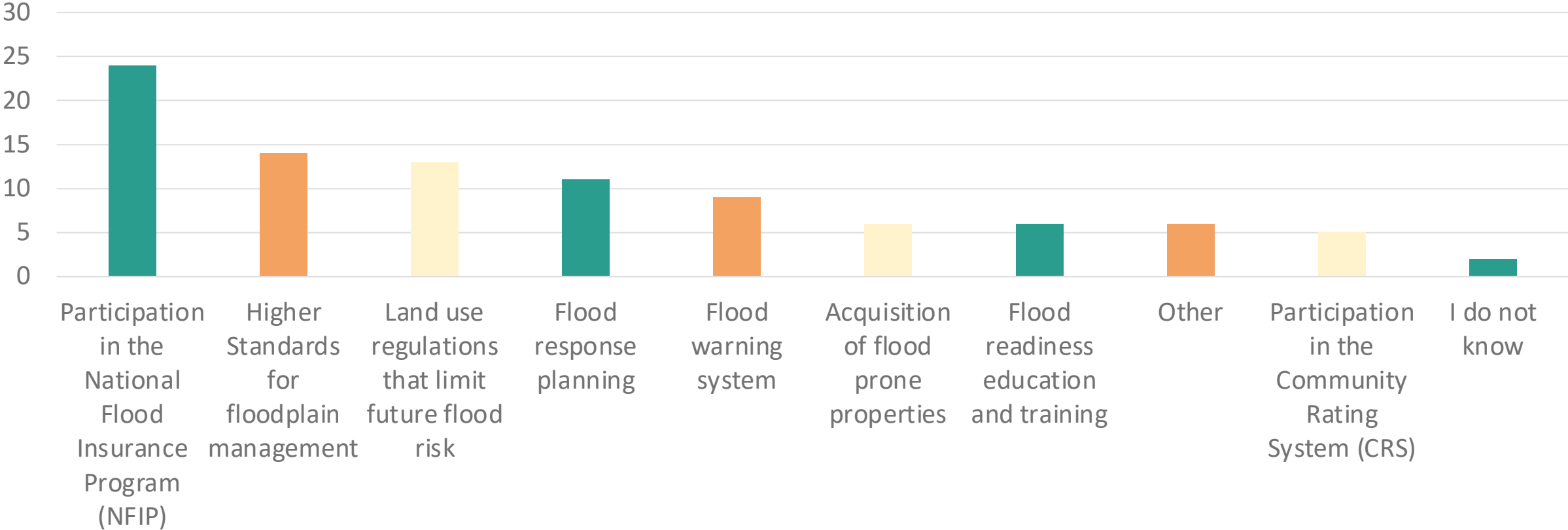
Which of the following best describes your jurisdiction's level of enforcement of its Floodplain Management practices?



# TASK 3A – FLOODPLAIN MANAGEMENT PRACTICES

## Survey Results

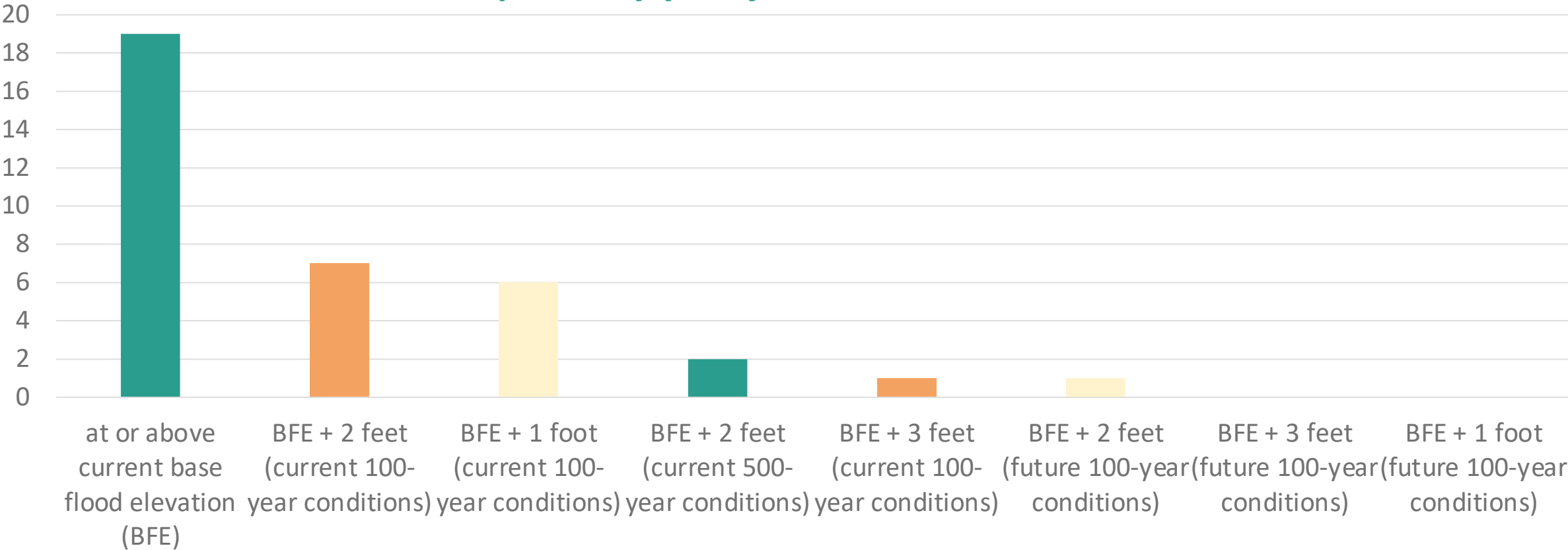
Select the measures your jurisdiction is taking to promote resilience within flood-prone areas. Select all that apply.



# TASK 3A – FLOODPLAIN MANAGEMENT PRACTICES

## Survey Results

Which of the following describes the higher standards required by your jurisdiction? Select one.





# Task 3B – Floodplain Management Goals

# TASK 3B FLOODPLAIN MANAGEMENT GOALS

Matt Bucchin – HALFF



## Goals Framework & Statements

- Explored values – June
- Overviewed framework – July
- Homework – July/Aug
- Refinements – Today
- Public comment – October



Regional Flood Planning Goal Setting  
Preliminary input on draft goals framework and statements

### Benefits

Once the regional flood plan is complete, realization of the goals will occur through the implementation of the associated FMSs, FMEs, and FMPs established in this plan. Implementation of the goals will demonstrate progress towards the overall purpose and intent of this regional flood planning study and will provide a series of benefits to individuals, communities, and the overall flood planning region as a whole. The benefits are set in Table 3.1, below.

Table 3.1, Flood Planning Goal Categories and Benefits

Benefits / Overarching Goals	Category 1 Flood Education and Outreach	Category 2 Flood Warning and Readiness	Category 3 Flood Studies and Analysis	Category 4 Flood Prevention	Category 5 Non-Structural Flood Infrastructure Projects	Category 6 Structural Flood Infrastructure Projects
Protect life	○	●	○	○	●	●
Protect infrastructure		○	○	●	○	●
Protect property		○	○	●	●	●
Protect the environment			○	●	●	●
Protect/enhance water supply				○	○	○
Sustain the economy		○		○	●	○
Realize multiple benefits*				○	○	○
Increase public awareness	●	●	○	○	○	
Build community support	●	●	○	○		

○ – Potential benefit

● – Direct benefit

\* multiple benefits could include improved flood protection while improving water supply, increasing public recreation opportunities, etc.

### Specific Goal Statements

#### Category 1. Education and Outreach

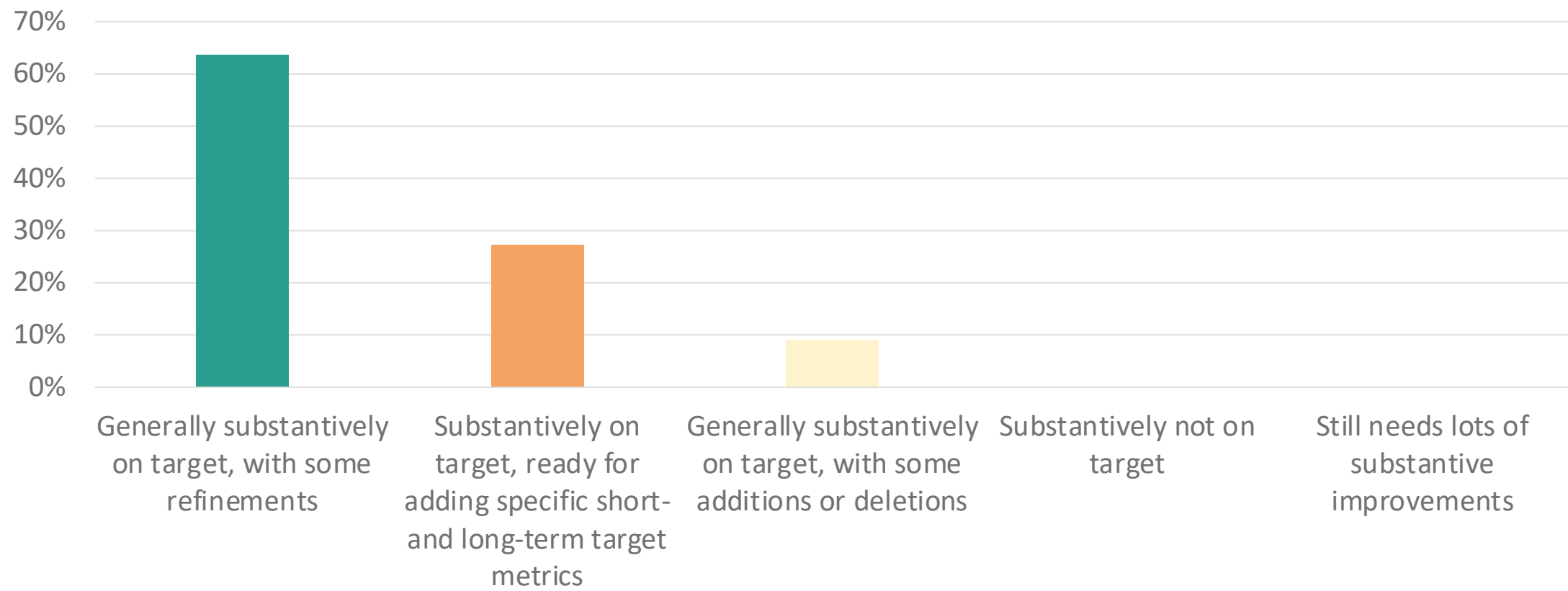
Increase the amount of flood education and outreach opportunities to improve awareness of flood hazards and future participation throughout the flood planning region (FPR).

Specific Goal Statements	Short Term (2033)	Long Term (2053)	Potential Measurement
Increase the number of public stakeholder participants in the regional flood planning data collection (survey) process by X percent per each cycle.	TBD%	TBD%	Number of individual public stakeholders that respond to survey or comment on documents
Increase the number of entities participating in the regional flood planning process by X percent per each cycle.	TBD%	TBD%	Number of entities that respond to survey or comment on documents
Increase the number of public outreach and education activities to improve awareness of flood hazards and benefits of flood planning in the FPR by X occurrences.	TBD	TBD	Number of public service announcements (emails, social media, news blasts)

# TASK 3B FLOODPLAIN MANAGEMENT GOALS

## Homework Results

Substantively, how on target is the goals framework and statements?



# CATEGORY 1 – EDUCATION AND OUTREACH




## Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
1	<b>Increase number of public stakeholder participants</b> in the regional flood planning data collection (survey) process by <b>X</b> percent per each cycle.	✓ +
2	<b>Increase number of entities participating</b> in the regional flood planning process by <b>X</b> percent per each cycle.	☑
3	<b>Increase number of public outreach and education activities</b> to improve awareness of flood hazards and benefits of flood planning in Region 10 by <b>X</b> occurrences.	☑



## CATEGORY 2 – FLOOD WARNING AND READINESS

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
4	Support development of a <b>regionally coordinated warning and emergency response program</b> that can detect the flood threat and provide timely warning of impending flood danger.	
5	<b>Increase number of flood response measures</b> utilized by regional entities by <b>X</b> percent per each cycle.	 -
6	<b>Increase number of flood gauges</b> (rainfall, stream, reservoir, etc.) in Region 10 by <b>X</b> gauges.	

## CATEGORY 3 – FLOOD STUDIES AND ANALYSIS

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
7	Increase <b>number of entities which utilize/adopt Atlas 14</b> (Volume 11) revised rainfall data as part of revisions to design criteria and flood prevention regulations by <b>X</b> percent. (region specific)	<input checked="" type="checkbox"/>
8	<b>Increase coverage of flood hazard data</b> in the FPR by completing studies to reduce areas identified as having current gaps in flood mapping by <b>X</b> percent.	<input checked="" type="checkbox"/>
9	Increase number of <b>entities that conduct detailed studies</b> to update their FEMA Flood Insurance Rate Maps (NFHL/FIRMs/FIS) by <b>X</b> .	<input checked="" type="checkbox"/>





## CATEGORY 3 – FLOOD STUDIES AND ANALYSIS

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
10	<b>Increase number of completed Studies</b> (FMEs) by <b>X</b> percent per each cycle.	<input checked="" type="checkbox"/> ?
11	<b>Increase number of entities that study</b> localized/urban flooding impacts by <b>X</b> .	<input checked="" type="checkbox"/>
12	Increase number of entities which have <b>up-to-date digital flood insurance rate maps</b> (DFIRMs) by <b>X</b> .	<input checked="" type="checkbox"/> ?
13	<b>Decrease average age of FEMA Flood Insurance Rate Maps</b> (NFHL/FIRMs/FIS) by <b>X</b> years.	<input checked="" type="checkbox"/>

## CATEGORY 4 – FLOOD PREVENTION




### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
14	<b>Reduce number of non-participating entities</b> in the National Flood Insurance Program (NFIP) in Region 10 by <b>X</b> .	
15	<b>Increase number of entities participating in Community Rating System (CRS)</b> in Region 10 by <b>X</b> .	
16	<b>Increase number of entities which regulate to the future conditions and floodplains</b> as part of new development and redevelopment by <b>X</b> .	
17	Increase number of <b>entities that have a dedicated municipal drainage charge</b> , drainage district fee, or other continuous funding mechanism by <b>X</b> , to implement future Studies/FMEs and <b>Projects/FMPs</b> .	






## CATEGORY 4 – FLOOD PREVENTION

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
18	Support <b>development of minimum stormwater infrastructure design standards</b> applicable across Region 10.	
19	<b>Reduce number of communities that do not have floodplain standards</b> that meet or exceed the NFIP minimum standards by <b>X</b> .	
20	<b>Increase number of entities that have adopted higher standards</b> (more stringent than NFIP minimum standards) by <b>X</b> .	




## CATEGORY 4 – FLOOD PREVENTION

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
21	Increase number of entities that have adopted regulations to reduce the risk from localized flooding by X.	
22	Increase number of entities which designate their floodplain management practices as “strong” in the regional flood planning process by X percent per each cycle.	
23	Increase number of entities which designate their level of enforcement of floodplain management as “high activity” by X percent per each cycle.	

## CATEGORY 4 – FLOOD PREVENTION

### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
24	Increase number of entities which regulate to one or more feet above the base flood elevation (BFE) for existing 1% annual chance event (100-year) conditions by <b>X</b> per each cycle.	
25	Increase number of entities which provide alternate compliance options that allow or incentivize nature-based solutions to reduce future flood risk by <b>X</b> .	
26	Increase number of entities in Region 10 that designate the 1% annual chance (100-year) floodplain on the entity's future land use plan by <b>X</b> .	

## CATEGORY 5 – NON-STRUCTURAL FLOOD INFRASTRUCTURE PROJECTS




### Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
27	<b>Reduce number of vulnerable properties</b> (i.e. through property/easement buyouts, acquisitions, relocations and/or structural elevation), with a special emphasis on those that have been repeatedly damaged by floods in Region 10 by <b>X</b> percent.	<input checked="" type="checkbox"/>
28	<b>Increase number of acres of publicly protected open space</b> by <b>X</b> as part of property buyouts, land conservation and acquisitions to reduce future impacts of flooding.	<input checked="" type="checkbox"/> ?
29	<b>Reduce number of NFIP repetitive-loss properties</b> in Region 10 by <b>X</b> .	<input checked="" type="checkbox"/>





# CATEGORY 6 – STRUCTURAL FLOOD INFRASTRUCTURE PROJECTS

## Proposed Goal Statements

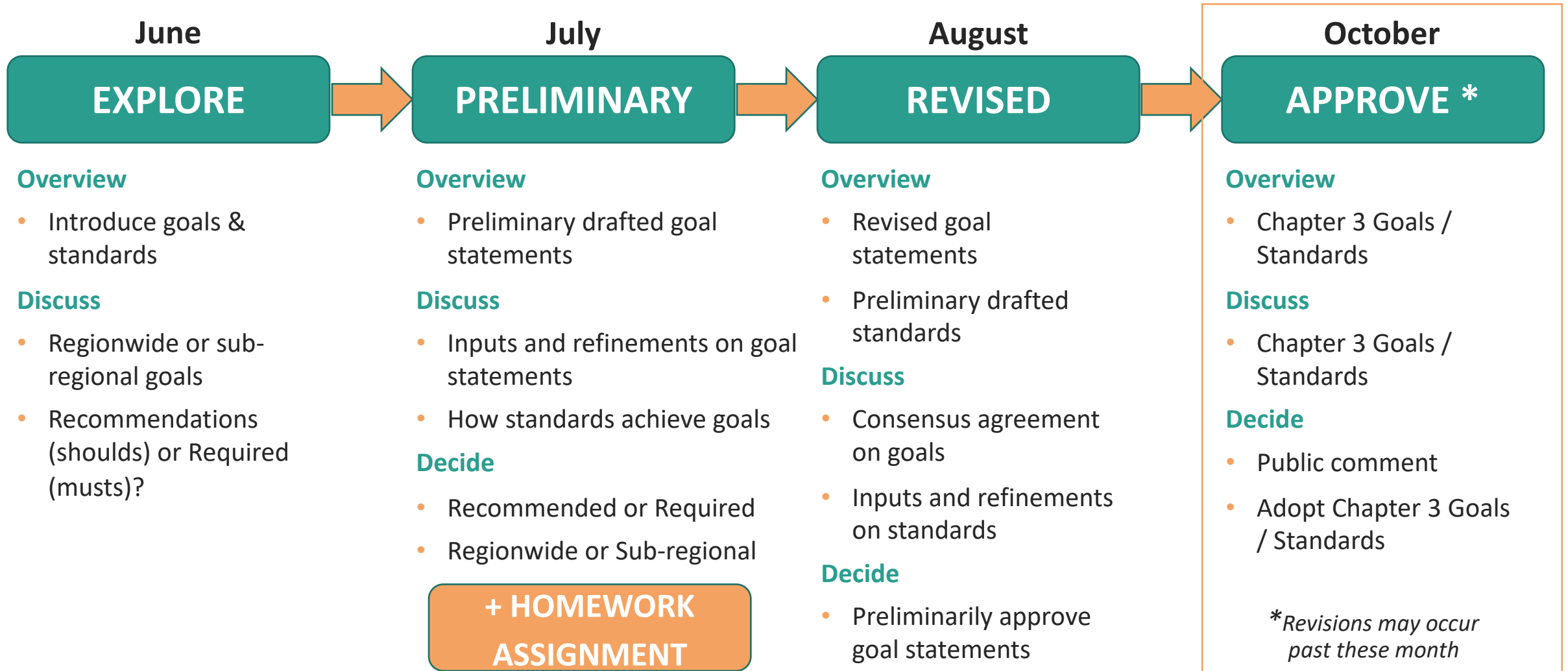
SPECIFIC GOAL STATEMENTS		GENERAL OPINION
30	<b>Reduce number of vulnerable critical facilities</b> located within the existing and future 1% annual chance (100-year) floodplain by <b>X</b> .	
31	<b>Reduce number of vulnerable roadway segments</b> located within existing and future 1% annual chance (100-year) floodplain by <b>X</b> .	
32	<b>Reduce number of low water crossings</b> located within existing and future 1% annual chance floodplain by <b>X</b> .	

# CATEGORY 6 – STRUCTURAL FLOOD INFRASTRUCTURE PROJECTS

## Proposed Goal Statements

SPECIFIC GOAL STATEMENTS		GENERAL OPINION
33	<b>Increase number of nature-based practices</b> as part of flood risk reduction projects by <b>X</b> .	
35	<b>Increase</b> number of entities in Region 10 that provide <b>regional detention</b> as part of overall floodplain management program by <b>X</b> .	

# TASK 3 – DEVELOPMENT OF FLOODPLAIN MITIGATION AND MANAGEMENT GOALS & STANDARDS



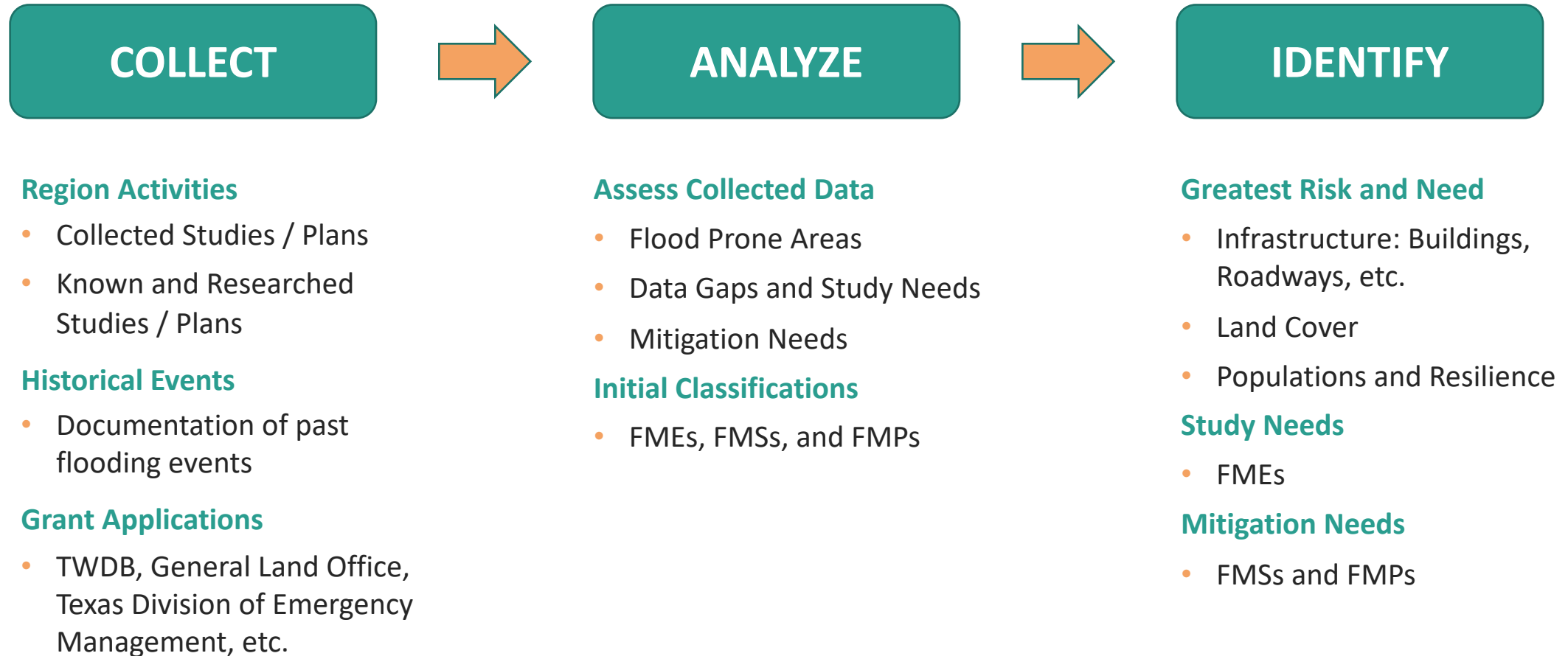


# Task 4B – Potential Studies (FMEs), Strategies (FMSs) and Projects (FMPs)



# TASK 4A – FLOOD MITIGATION NEEDS ANALYSIS

## Approach



# TASK 4B – POTENTIAL FMEs, FMSs AND FMPs

## Overview

### FLOOD MANAGEMENT STRATEGIES (FMSs)

- Infrastructure Projects
- Property/Easement Acquisition
- Elevation of Structures
- Education and Outreach
- Flood Warning and Measurement
- Regulatory and Guidance

### FLOOD MANAGEMENT EVALUATIONS (FMEs)

#### Studies

Flood  
Preparedness  
Study

Modeling and  
Mapping /  
Risk  
Identification

#### Risk Reduction Analysis

Alternatives  
Analysis /  
Feasibility  
Assessment

Preliminary  
Engineering  
(30% design)

### FLOOD MITIGATION PROJECTS (FMPs)

#### Structural Infrastructure

Advanced Analysis /  
Design / Construction  
(30 - 100% design)

#### Non-Structural

#### Project Implementation

- Property/Easement Acquisition
- Elevation of Structures
- Floodproofing
- Flood Readiness and Resilience
- Flood Warning, Gauges
- Regulatory Requirements

# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES



## Proposed Selection Process – Task 4B-5 General Steps

**STEP 1**

**INITIAL SCREENING OF *STUDIES, PROJECTS & STRATEGIES* RECEIVED**

Screen for minimum TWDB rules and guidance requirements

**STEP 2**

**SCREENING OF *PROJECTS***

Screen per TWDB flowchart and guidance

**STEP 3**

**SCREENING OF *STUDIES***

Screen for minimum TWDB guidance requirements

**STEP 4**

**SCREENING OF *STRATEGIES***

Screen for minimum TWDB guidance requirements

**STEP 5**

**DETAILED EVALUATIONS OF  
*SELECTED STUDIES, PROJECTS & STRATEGIES***

**STEP 6**

**FINAL RECOMMENDATIONS OF *STUDIES, PROJECTS & STRATEGIES***

# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 1

### INITIAL SCREENING OF *STUDIES, PROJECTS & STRATEGIES* RECEIVED

Screen for minimum TWDB rules and guidance requirements

- 1.1 Flood mitigation or floodplain management goal
- 1.2 Meets an emergency need
- 1.3 Flood problem with drainage area of 1 square mile or greater\*
- 1.4 Reduces flood risk for 100-year (1% annual chance) flood

\*except in instances of flooding of critical facilities or transportation routes or for other reasons, including levels of risk or project size, determined by the RFPG



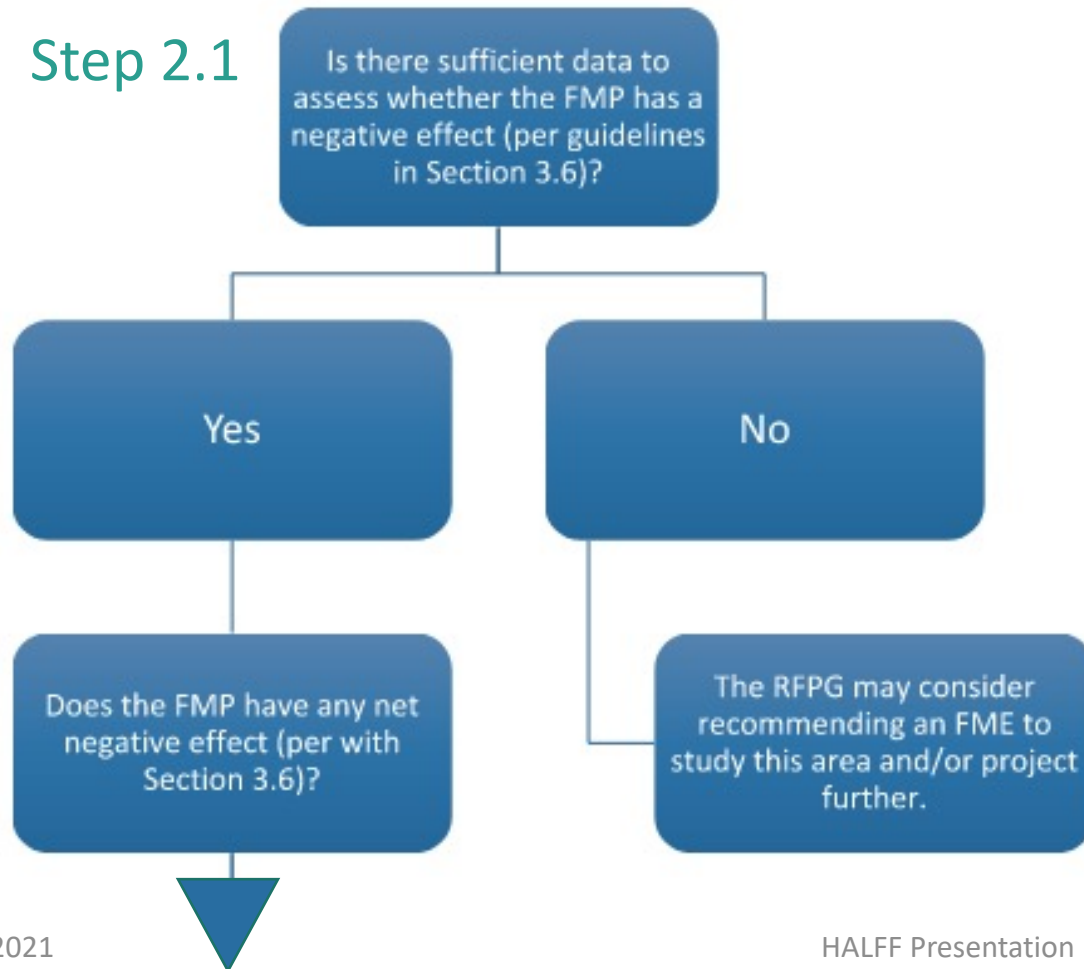
# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 2

### SCREENING OF *PROJECTS*

Screen per TWDB flowchart and guidance

#### Step 2.1



#### “Sufficient data”

- H&H modeling, mapping, and basis for mitigation project analysis generally meets Section 3.5 of TWDB technical guidelines
  - Reliable
  - Minimal uncertainty

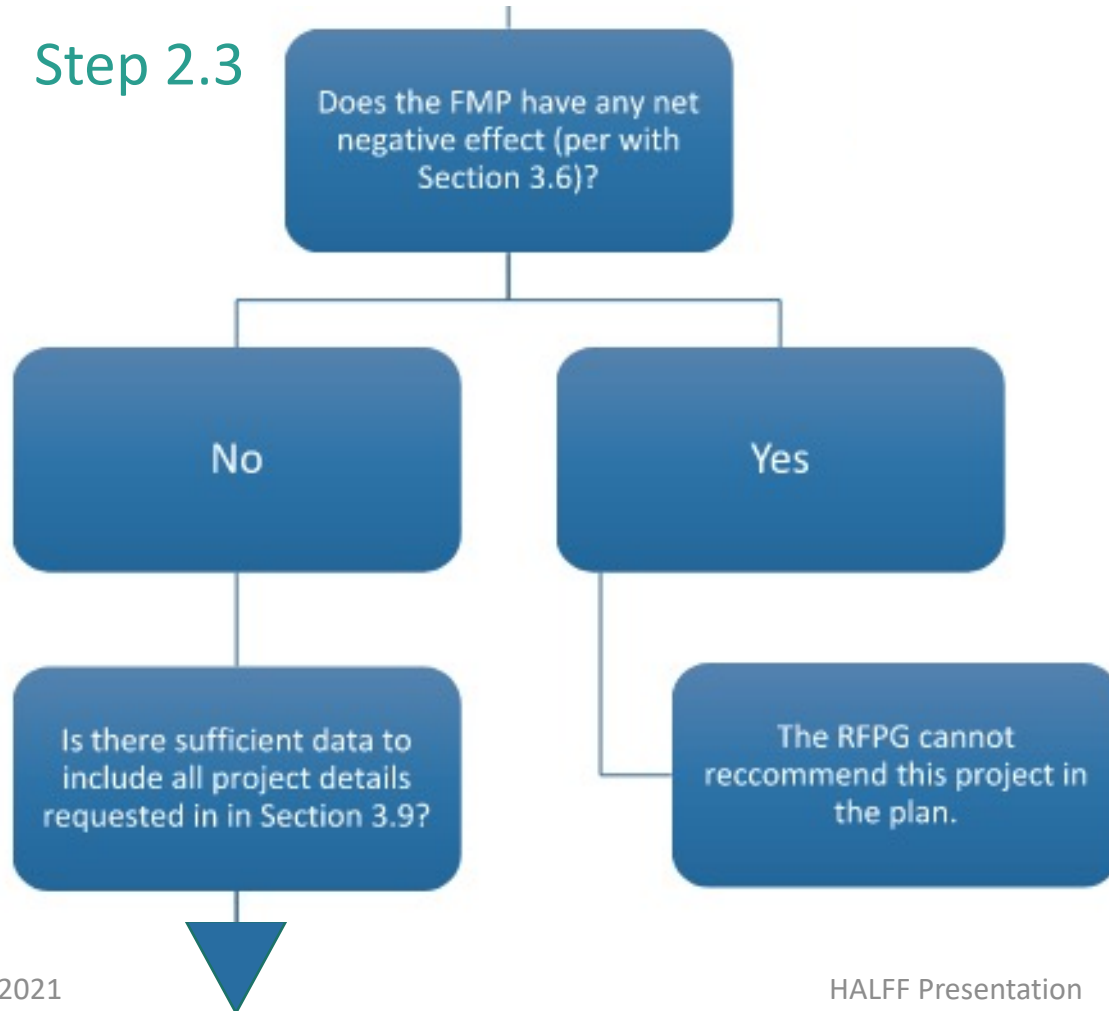
# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 2

### SCREENING OF *PROJECTS* (CONTINUED)

Screen per TWDB flowchart and guidance

#### Step 2.3



#### “Negative effect”

- For the 100-year (1% annual chance) flood event, no rise in flood elevation or discharge should be permissible. Projects should not:
  - Increase inundation on homes or commercial buildings
  - Increase inundation beyond ROW or easements
  - Increase inundation beyond existing drainage infrastructure capacity

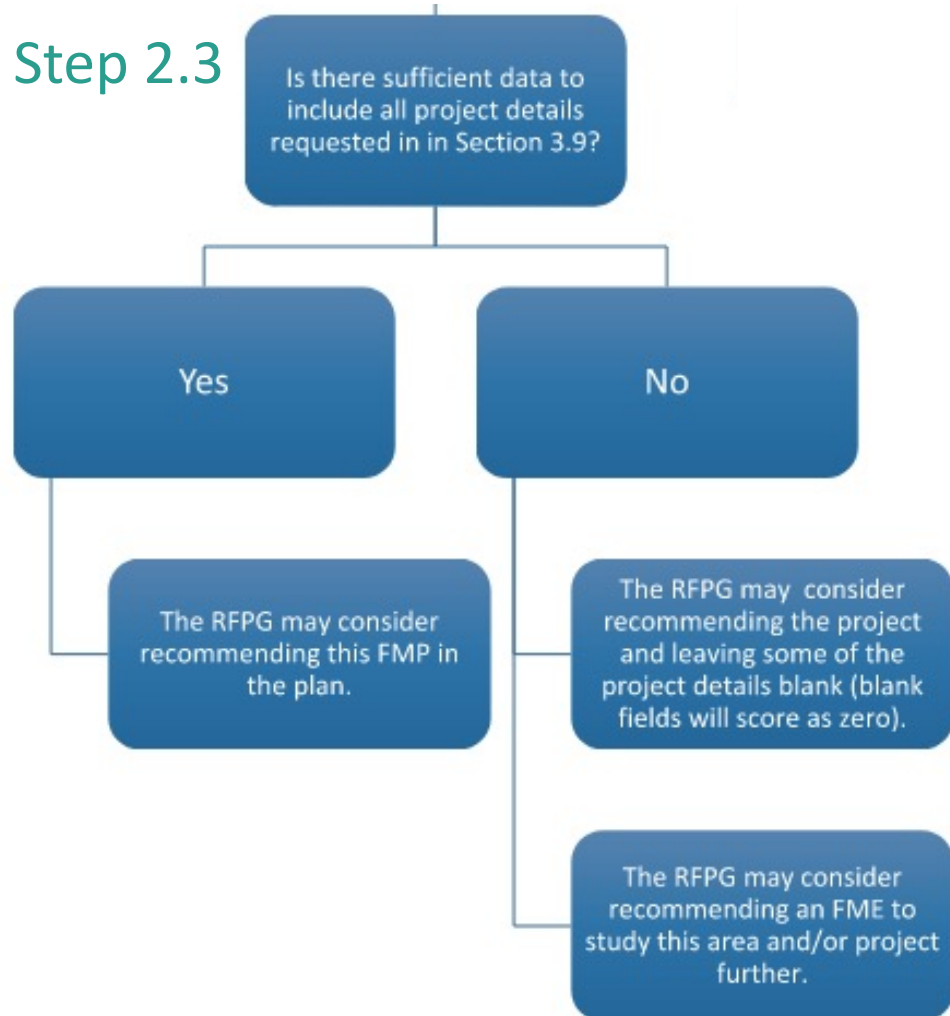
# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 2

### SCREENING OF *PROJECTS* (CONTINUED)

Screen per TWDB flowchart and guidance

#### Step 2.3



### Section 3.9 “Project Details”

- Flood severity level metrics
- Flood risk/damage reduction metrics
- Estimated capital and O&M cost
- Benefit/Cost Ratios
- Environmental benefits/impacts
- Implementation constraints
- Water supply benefits
- Others...

# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 3

### SCREENING OF *STUDIES*

Screen for minimum TWDB guidance requirements

#### Three General Categories of *Studies*:

- Projects (FMPs) that didn't make the cut in Step 2
- Planned flood studies or flood risk reduction alternatives analyses provided by communities
- Flood study or flood risk reduction alternatives analysis needs identified in Task 4A

3.1 If detailed H&H and mitigation alternatives analysis → *Project* or *Strategy*

3.2 Sensible

3.3 Reasonable planning-level cost estimate

3.4 Identified sponsor(s)

3.5 Structures, population and critical facilities at risk

3.6 Roadways at risk

3.7 Area of farm and ranch land at risk

# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 4

### SCREENING OF *STRATEGIES*

Screen for minimum TWDB guidance requirements

**“A proposed plan to reduce flood risk or mitigate flood hazards to life or property”**

- Any proposed action that doesn’t qualify as an FME or FMP
- RFPG has flexibility with Strategies
- Flood study or flood risk reduction alternatives analysis needs identified in Task 4A

#### Step 1 – Initial Screening

*1.1 Flood mitigation or floodplain management **goal***

*1.2 Meets an emergency need*

*1.3 Flood problem with drainage area of 1 square mile or greater\**

*1.4 Reduces flood risk for 100-year (1% annual chance) flood*

**4.1** Planning-level cost estimate

**4.2** Identified sponsor(s)

**4.3** Estimated flood risk and flood risk reduction



# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 5

### DETAILED EVALUATIONS OF SELECTED *STUDIES, PROJECTS & STRATEGIES*

- 5.1 Project benefit-cost ratios  $> 1.0$
- 5.2 Have identified a *willing* sponsor(s)
- 5.3 No known insurmountable implementation constraints or hurdles (ROW, utility conflicts, permitting, etc.)
- 5.4 Evaluate RFPG specific requirements to incorporate a project or strategy into the RFP?
  - Example: Must include X% of “other” benefits?
    - Environmental/water quality
    - Water Supply
    - Erosion/sedimentation
    - Recreational
  - Example: X% of project includes nature-based solutions?

# TASK 4B – POTENTIAL STUDIES, PROJECTS & STRATEGIES

## STEP 6

### FINAL RECOMMENDATIONS OF *STUDIES, PROJECTS & STRATEGIES*

Incorporate into the draft and final Reginal Flood Plan

6.1 Public comment of Recommended FMEs, FMSs and FMPs

6.2 Initial/Final adoption

#### Technical Memorandum

- Potentially feasible
- Potentially not feasible

#### Draft Regional Flood Plan

- Recommended FMEs, FMSs and FMPs



# Look-Ahead Calendar

**September–December 2021**

# SEPTEMBER–OCTOBER 2021

## RFPG Meeting

### September

- Recommend not having a meeting in September

### October

- Review and approve preliminary draft Chapter 1
- Receive public comment on proposed:
  - Goals
  - Process for identification and evaluation potential studies, strategies and projects
- Present and discuss initial preliminary results of Task 2A/B and Task 4 A/B
- Present and discuss annotated outline of Technical Memorandum

# NOVEMBER–DECEMBER 2021

## RFPG Meeting

### November

- Review draft Technical Memorandum

### December

- Discuss and approve submittal of Technical Memo (due 01/07/22)





# Wrap Up

# Region 10 Lower Colorado-Lavaca RFPG

## **9. Presentation: Nature-based Solutions for Flood Mitigation: Overview for Region 10 RFPG**

# Nature-Based Solutions for Flood Mitigation

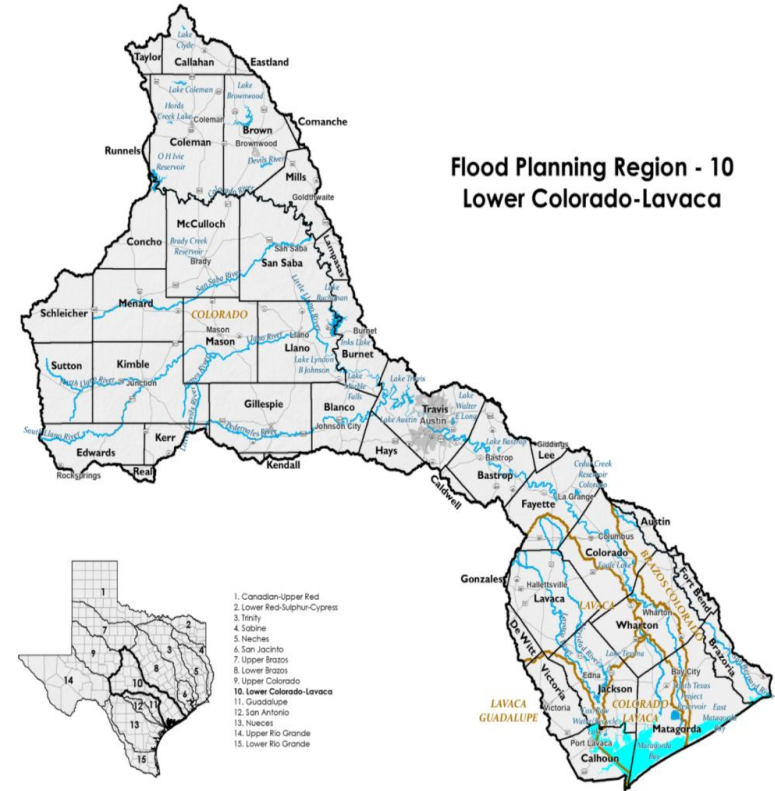
Overview for Region 10 RFPG



National Wildlife Federation

# Presentation Outline

- Region 10 flooding concerns
- What are nature-based solutions?
- Examples of nature-based solutions
- Co-benefits
- Case studies
- Funding for nature-based solutions
- Local recommendations
- Equity concerns





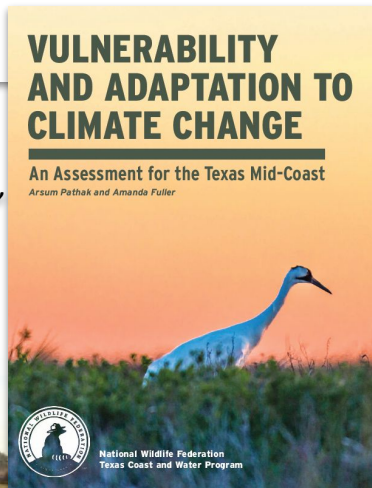
# Region 10 Flooding Concerns

Flooding event	Current vulnerability	Future vulnerability
Extreme precipitation	5-12% increase in extreme rainfall amounts	12-20% increase by mid-21st century <i>due to increase in temperature</i>
Flash floods and tropical storms	110 major flood events have occurred in last 20 year in TX (the Halloween flood of 2013 around Onion Creek)	Projected increase in flood intensity and severity <i>due to loss of vegetation and impervious surfaces, inadequate drainage systems</i>
Sea level rise	Increased frequency of nuisance flooding by 5 to 10 times since the 1960s	Projected increase in nuisance flooding <i>due to relative sea level rise and land subsidence</i>

## Climate Change Recommendations for Regional Flood Planning

John Nielsen-Gammon and Savannah Jorgensen  
Office of the Texas State Climatologist  
Dept. of Atmospheric Sciences, Texas A&M University  
n-g@tamu.edu 979-862-2248  
April 16, 2021  
OSC Report 2021-01

**Central Texas is  
often called  
“Flash Flood Alley”**

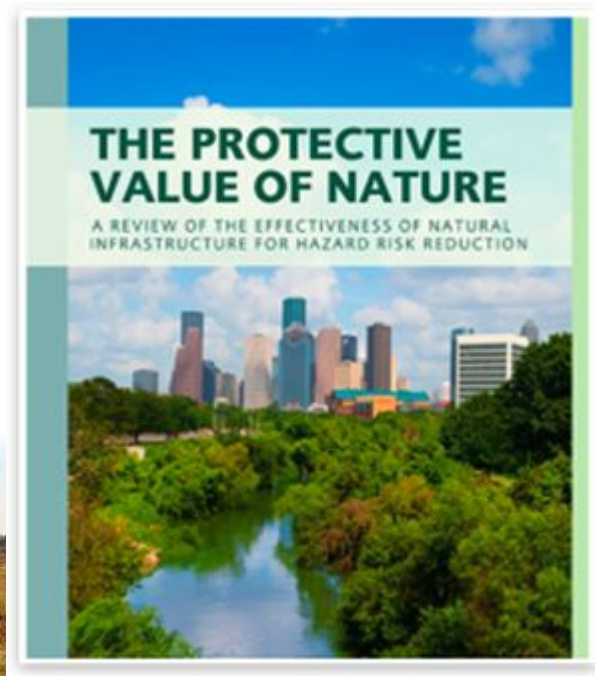




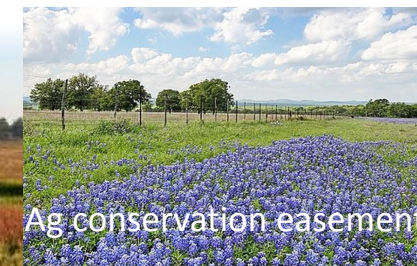
# What are Nature-Based Solutions?

Nature-based flood mitigation includes “*mitigation approaches involving the use of natural features, materials, and processes to reduce the risk and impacts of flooding*” (TAC 361.10).

- Includes **natural ecosystems** and **engineered features** that use materials that are designed to *mimic functioning of natural ecosystems*
- Centers around **conservation**, **restoration**, or **emulation** of an existing natural ecosystem
- Provide flood protection while **increasing resilience** and providing **additional co-benefits**



# Nature-based Flood Solutions





# Types of Nature-Based Infrastructure

## 1. Stream Restoration

Re-establish structure, function and the **self-sustaining behavior** of stream system.

Preservation or restoration of **tributaries and their headwaters** is a priority to mitigate flooding and protect downstream floodplains.

The Watershed Protection Department (City of Austin) oversees the [riparian restoration program](#)



*Following the 2015 Memorial Day Flooding, several Blanco River restoration projects to rehabilitate riparian zones went into effect*

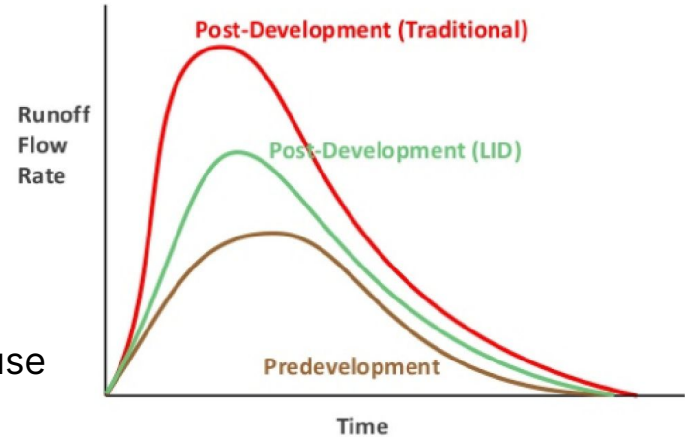


# Types of Nature-Based Infrastructure

## 2. Low Impact Development (LID)

A variety of development practices that **use** or **mimic natural processes** that result in the infiltration and/or use of stormwater

**Reduces floodwaters** by storing stormwater allowing it to infiltrate



Source: Michael F. Bloom, P.E., 2017





# Types of Nature-Based Infrastructure

## 3. Conservation easements

Landowner **voluntarily gives an easement holder** (e.g., Colorado River Land Trust, Hill Country Conservancy) certain rights to **limit uses** of the land in perpetuity to **promote conservation**.

## 4. Buyouts

Removes **built structures** from areas vulnerable to flooding typically through **voluntary purchases** (e.g., Williamson Creek and Onion Creek buyouts).





# Types of Nature-Based Infrastructure

## 5. Wetland Restoration and Constructed wetlands

Uses restored or built wetlands to store and filter up to 330,000 gallons of water per acre

### INVISTA Wetland in Victoria, Texas



## 6. Living Shorelines

Range of **shoreline stabilization techniques** to reduce erosion through the use of ecological approaches

### Bulkhead



### Living Shoreline



Source: <https://www.visd.net/apps/pages/INVISTA>, Smith et. al, 2018, <https://www.eesi.org/papers/view/fact-sheet-nature-as-resilient-infrastructure-an-overview-of-nature-based-solutions>

# Co-Benefits of Nature-based Solutions

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . a ***description of potential . . . benefits*** from the FMS or FMP to the ***environment, agriculture, recreational resources, navigation, water quality, erosion, sedimentation***, and impacts to any other resources deemed relevant.”



Urban heat islands  
(Willis & Petrokofsky, 2017)



Water quality  
improvement (Guerrero  
et al., 2020)



Human health and  
societal benefits (Spano  
et al., 2021)



Recreation and eco-  
tourism (Bureau of  
Economic Analysis, 2019)



Green economies and  
jobs (Kabisch et al., 2017)

# Hybrid Infrastructure

## Service

## Potential Sources of Infrastructure Cost Reduction

### River flood management

Floodplains lower costs for gray infrastructure such as flood control embankments, sluice gates, and pumping stations. The floodplains store flood waters and lower flood levels, thus potentially lowering the cost and/or improving the resilience of the built solution.

### Urban stormwater management

Stormwater retention areas lower costs for stormwater drains, pump stations, and treatment of wastewater discharges. They filter pollutants and can remove up to 90% of heavy metals from stormwater.

Chain of Wetlands, Dallas Floodway Extension



Green Alley Demonstration Project





Source: Browder et. al., 2019





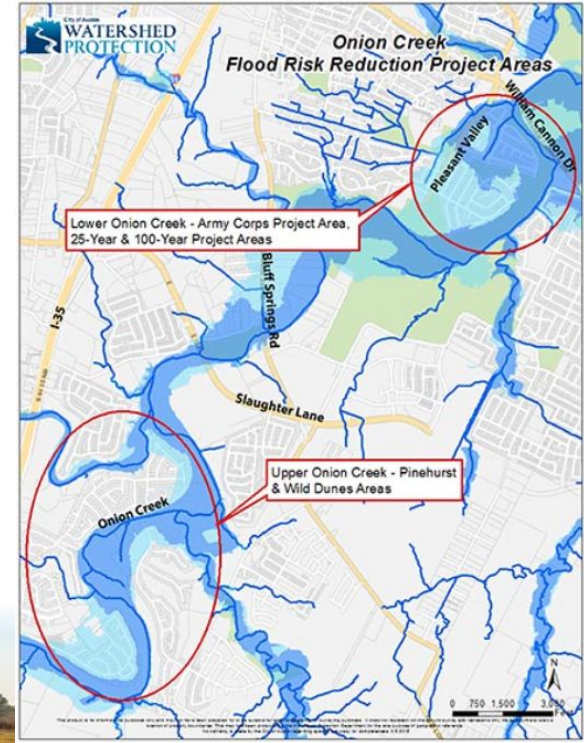
## REILLY ELEMENTARY SCHOOL BIOFILTRATION FACILITY

*Biofiltration system (left) and diagram of both flood detention and biofiltration facilities (right)*

# Case Study: Onion Creek Flood Risk Reduction Project

- The City of Austin purchased over **500 of the most flood prone homes** in the Onion Creek area
- Plans and funding to purchase another **355 homes**
- The land will be designated for open space (nature trails, community gardens, wildflower meadows)





# Case Study: Living Shoreline in Tres Palacios Bay

- Hybrid stabilization project using **600 feet** of riprap and **4000 feet** of concrete breakwater with marsh plantings
- The project protects approximately **2,800 feet** of shoreline and **25 acres** of natural and restored smooth cordgrass marsh that captures sediment, promotes recreational fishing, and supports oyster growth





# Funding Opportunities for Nature-Based Infrastructure

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . .an indication regarding the ***potential use of federal funds, or other sources of funding*** as a component of the total funding mechanism.”

## ***Federal Funding Sources***

- FEMA's Building Resilient Infrastructures and Communities (**BRIC**) Program
- HUD's Community Development Block Grant for Mitigation (**CDBG-MIT**) Funds
- National Resources Conservation Service's (NRCS) Emergency Watershed Protection Program (**EWPP**)\*

\*Note: This funding source allows the NRCS (not a local governmental entity or non profit) to purchase conservation easements

# Funding Opportunities for Nature-Based Infrastructure

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . .an indication regarding the ***potential use of federal funds, or other sources of funding*** as a component of the total funding mechanism.”

## ***State and Local Funding Sources***

- Clean Water State Revolving (**CWSRF**) Funds
- Flood Infrastructure Fund (**FIF**)
- Watershed Wise Rebate Program
- Hays County Parks and Open Spaces Bond (2020)



# Funding Opportunities for Nature-Based Infrastructure

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . .an indication regarding the ***potential use of federal funds, or other sources of funding*** as a component of the total funding mechanism.”

## ***State and Local Funding Sources***

- Clean Water State Revolving (**CWSRF**) Funds
  - *Green Project Reserve available for nonpoint source protection or estuary management projects*
- Flood Infrastructure Fund (**FIF**)
  - *Priority points and extra grant opportunities available for nature based projects*
- Watershed Wise Rebate Program
- Hays County Parks and Open Spaces Bond (2020)



# Local Recommendations for Nature-Based Flood Mitigation

RFPGs are required to *describe natural flood mitigation features* in the RFP (TAC Rule 361.31) and *shall identify and evaluate* potential FME's and *potentially feasible FMSs and FMPs, including nature-based solutions, some of which may have already been identified by previous evaluations and analyses by others* (TAC Rule 361.38).

Expand the city's green infrastructure network to include such elements as preserves and parks, trails, stream corridors, green streets, greenways, and agricultural lands.

- ***Imagine Austin Comprehensive Plan***

Strict regulations for localized flooding such as preventing increasing impervious cover in neighborhood areas or in any redevelopment.

- ***Go Austin/Vamos Austin (GAVA)***

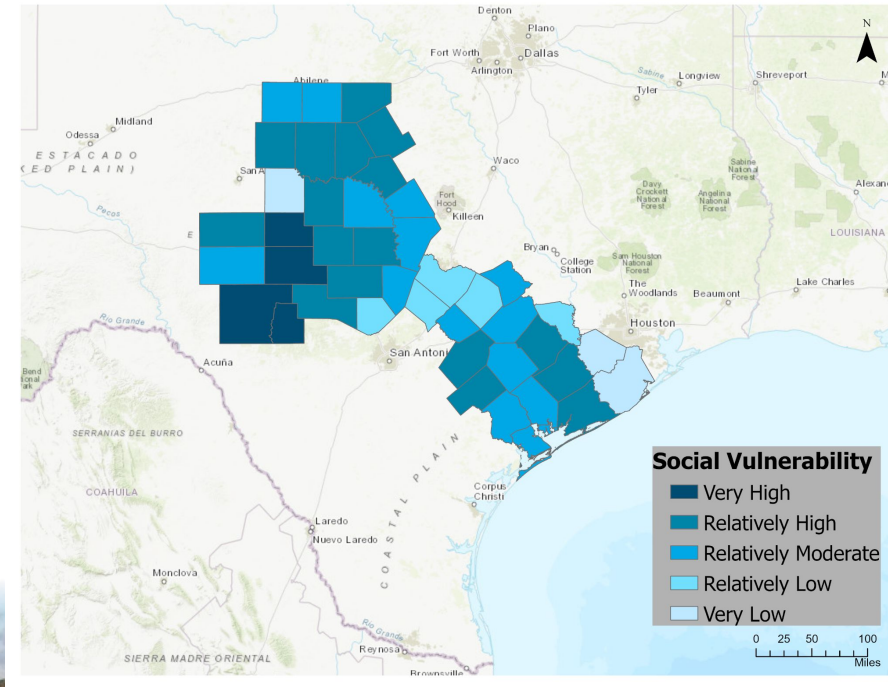
Impervious Cover Credits are allowed in the sizing of stormwater basins.

- ***Permanent Low Impact Development Practices, Travis County***





# Equity Considerations



Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . . an ***equitable comparison*** between consistent assessment of all FMSs and FMPs that the RFPGs determine to be potentially feasible.”



# Thank you!

**Arsum Pathak, Ph.D.**

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National Wildlife Federation

# Region 10 Lower Colorado-Lavaca RFPG

**10. Public comments– limit 3 minutes per person**

**11. Consider date and agenda items for next meeting**

**12. Adjourn**