**Letter of Recommendations to the TWDB Promoting the Protection of**

**Natural Flood Mitigation Features**

**and Use of Nature Based Flood Mitigation Solutions**

***Background***

State legislation enabling the Regional Flood Plan process provided guidelines and deliverables to be accomplished by each flood planning group, with regional plans becoming the basis of a state flood plan. Included in deliverable was the request for proposed flood mitigation projects to be considered for future funding. Enabling legislation also directed the Texas Water Development Board (TWDB) to identify and evaluate natural flood mitigation features and include Nature Based Solutions (NBS) within proposed flood mitigation projects.

While TWDB has been very responsive to the questions and concerns expressed by the various Regional Flood Planning Groups (RFPG), the process highlighted several areas of concern regarding the evaluation of natural flood mitigation features for their level of function and use in flood mitigation. This process highlighted the current lack of data specific to Texas regions needed to accurately evaluate natural flood mitigation features and, therefore, the need for methods beyond a traditional Hydrologic Engineering Center's - River Analysis System (HEC-RAS) approach. In addition, Technical Consultant outreach to communities demonstrated the need to increase knowledge on incorporating not only the protection and restoration of natural flood mitigation features but also in general, NBS into flood control strategies.

Nature Based Solutions will need to be woven into every facet of this program and incorporated into future policies and strategies in order to empower community collaboration and leveraging the state’s vast network of natural ecosystems in building resilient communities.

***Recommendations***

Broad and specific recommendations have been collected across the state from RFPG committee members and collaborators, including:

1. Increase funding for and use of Nature Based Solutions, and reduce hurdles to their incorporation into the Regional Flood Plans as Flood Mitigation Strategies, Evaluations and Projects by:
	1. Increasing number of trainings and workshops on accurate cost benefit analysis and use of NBS;
	2. Improving modeling methods to provide greater sensitivity beyond traditional hydrological models to include soil porosity and moisture holding capacity, plant interception, evaporation, and transpiration; and other processes that affect flows and interactions with groundwater; as well as water quality improvements and groundwater recharge that can be realized with NBS;
	3. Expanding the TWDB’s concept of “adverse impact” to include loss of functioning floodplains and the resiliency that they provide;
	4. Incentivizing collaboration across watersheds and jurisdictions towards a regional approach to

floodplain management using NBS by prioritizing such projects.

1. Ensure that the TWDB’s cost benefit analysis appropriately weights projects offering:
	1. Increased social and environmental benefits,
	2. Reduced negative environmental impact,
	3. Reduced cost avoidance for infrastructure replacement (for data on gray infrastructure replacement costs: [https://mediaspace.du.edu/media/David+Skuodas+-+Seeing+the+Forest+and+the+Trees/1\_g90zp1xz](https://mediaspace.du.edu/media/David%2BSkuodas%2B-%2BSeeing%2Bthe%2BForest%2Band%2Bthe%2BTrees/1_g90zp1xz)), and
	4. Increased flood prevention for future conditions while also creating resiliency to recover after natural disasters.
2. Recognize the role that land development codes and location of infrastructure have on flood impacts:
	1. Educate on the need for counties to use their ability provided by the State to exert authority to influence development and reduce negative impacts to natural features that mitigate flooding and enable counties to levy stormwater/drainage utility fees to retrofit and maintain natural flood infrastructure,
	2. Promote and fund the use of NBS throughout watersheds with the understanding that most natural flood mitigation features, including floodplains, are in some state of degradation and can be improved with appropriate land use policies,
	3. Recommend policy changes that enable Counties or Groundwater Conservation Districts to protect Natural Aquifer Storage and Recovery features (e.g., karst, fracture zones, and sinkholes) that help mitigate flood severity while transferring potential flood water into aquifers, and
	4. Partner with other agencies to incorporate flood considerations into applicable agency activities (e.g., ensure TxDOT builds to 1% annual probability (“100-year”) standards and uses updated flood maps defined by the National Oceanic and Atmospheric Administration (currently the Atlas 14 data) and that such infrastructure does not increase downstream flooding nor damage floodplains and riparian corridors.
3. Specific project recommendations:
	1. Fund a Texas Watershed Initiative similar to Louisiana’s[[1]](#footnote-1) with a robust program on use and adoption of NBS,
	2. Provide training and technical resources to flood districts, river authorities, municipal utility districts, water control and improvement districts, and municipal and county floodplain managers to advance understanding and adoption of NBS and best practices for maintaining floodplains and other natural flood mitigation features to fully realize potential benefits,
	3. Use all available federal and state programs to prioritize the preservation and restoration of natural flood mitigation features throughout watersheds,
	4. Develop a compendium of Nature-Based resources for non-coastal communities, and
	5. Review submitted FMPs, FMEs and FMSs submitted for this first 5-year cycle to determine the feasibility to augment with NBS aspects.

***Conclusions***

If preventative flood mitigation strategies are not prioritized for funding, then flood events will be more frequent and cause greater harm, leading to much higher costs for Texas taxpayers. Similarly, if natural infrastructure that mitigates flooding is degraded, undoing the damage to some of these features may be cost-prohibitive. Retrofitting with flood control projects is also not cost-effective, given pathways for prevention already in use in many other states. Conversely, strategically protecting natural infrastructure and placing Nature Based Solutions throughout a watershed can significantly reduce flood risks along tributaries and major riverine systems alike.

1. https://watershed.la.gov/nature-based-solutions [↑](#footnote-ref-1)