



## ACTION PLAN 3 OF 3

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# PROMOTE PUBLIC HEALTH AND AWARENESS (PHA)

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Good water, sediment, and air quality are important to the ecological health of Galveston Bay. In turn, a healthy bay is important to the health of bay users. Bay users who consume fish or shellfish that contain toxins can become seriously ill. People who use surface water for contact recreation, such as swimming, wading, and windsurfing, risk exposure to waterborne pathogens that can cause gastrointestinal distress, infections, and other illnesses.

Elevated bacteria levels in open bay waters and the shoreline periodically close portions of the bay to recreational and commercial oyster harvesting, and many tributaries in the lower Galveston Bay watershed exceed state standards for safe contact recreation. Sediment is contaminated with toxic agents in localized areas, and portions of the Houston Ship Channel and upper Galveston Bay exceed fish-tissue quality criteria for select contaminants, increasing health risks associated with consuming contaminated seafood from those areas. Continued water quality monitoring, fish-tissue monitoring, and public education initiatives are essential to promoting public health and increasing the public's awareness of associated risks.

## Example of Public Health and Awareness Action Implementation

Bay waters are generally considered a low public health risk for contact recreation uses as they meet state water quality standards for contact recreation. Inland tributaries designated for contact recreation can have elevated levels of bacteria. Forty-six percent of assessed stream miles in the lower Galveston Bay watershed have a bacteria impairment for contact recreation (TCEQ, 2014, TCEQ\_AU\_Line\_14). Several of these impaired water bodies are covered under individual WBPs that recommend measures for their improvement.

Consumption of some fish and shellfish can pose a significant public health risk, particularly if harvested from certain areas of Galveston Bay. TDSHS issues *Health Consultations* reports that advise on the risk of consuming fish and shellfish. A characterization study for PCBs and dioxins that the GBEP began in the late 1990s continues to address the main toxins found in fish tissue.

TDSHS also classifies oyster-producing waters in the state as approved, conditionally approved, restricted, or prohibited for shellfish harvest. Consuming oysters, notably raw oysters, can pose a health risk as oysters concentrate bacterial and viral pathogens in their tissue. The Upper Texas Coast Oyster Waters TMDL / I-Plan was completed in January 2014 to address elevated concentrations of bacteria found in tributaries and runoff from shorelines entering the bay.

Since 1989, state and local agencies, such as the Texas General Land Office (GLO) and Galveston County Health District, perform bacteria testing to inform beach-goers about recreational water safety. Additional information is accessible electronically through the [Texas Beach Watch website](#). The Galveston Bay Foundation’s Water Monitoring Team collects enterococci bacteria data using “citizen scientists,” volunteers specially certified to collect a small amount of water to be tested. This program is a Texas Stream Team partner (learn more about Texas Stream Team under Plan Priority Three: Engage Communities). The annual *Galveston Bay Report Card* also provides residents with answers to questions about whether it is safe to swim in area surface water or to consume fish and shellfish harvested locally. Other initiatives, such as coordination between the EPA and Galveston Bay Foundation at the San Jacinto Waste Pits, make it easier for the public to be informed about complex issues. Signage in multiple languages at sites around Galveston Bay provides warnings to the public where fish consumption advisories are in place. Future efforts to provide subsistence fisherman with targeted information on fish consumption advisories will be explored under this Action Plan.

## Action Plan Overview

Increased public awareness (**PHA-1**) of current fish advisories and shellfish sanitation will help with decisions about when to eat fish that are caught, when or if to eat raw oysters, and when to allow children to play in local water bodies. Participation in existing watershed-based planning (**PHA-2**) is key to the improvement of Bay waters. Each WBP has measures for stakeholder involvement. The GBEP helps support WBP implementation and provides a technical forum for regional coordination.

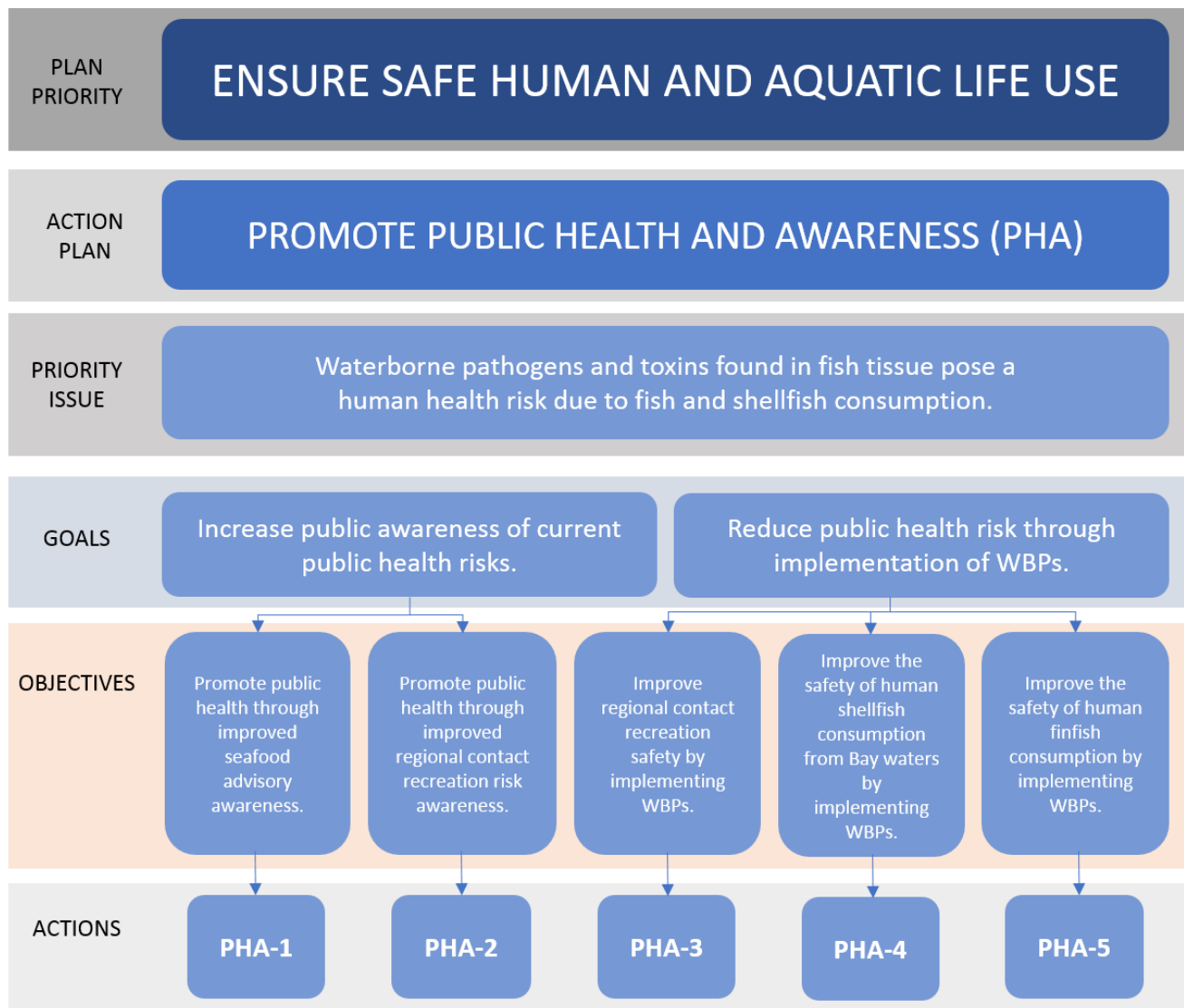
**FIGURE 16**  
**PHA ACTION PLAN MATRIX**

ACTION PLANS AND CORRESPONDING ACTIONS		PLAN PRIORITIES			
		Ensure Safe Human and Aquatic Life Use	Protect and Sustain Living Resources	Engage Communities	Inform Science-Based Decision Making
<b>Action Plan: Promote Public Health and Awareness</b>					
PHA-1	Improve Seafood Advisory Awareness	x		x	x
PHA-2	Improve Regional Contact Recreation Risk Awareness	x		x	
PHA-3	Improve Contact Recreation Safety Through Watershed-Based Plans (WBPs)	x			x
PHA-4	Improve Shellfish Consumption Safety Through WBPs	x		x	x
PHA-5	Improve Finfish Consumption Safety Through WBPs	x		x	x

Successful implementation of **PHA-1** and **PHA-2** requires coordination with the PPE subcommittee of the Galveston Bay Council on Action **PEA-1**, included under Plan Priority Three: Engage Communities. Education of the public about health risks from legacy pollutants, waterborne pathogens, air pollution, and fish-tissue contamination will drive **PHA-3**, **PHA-4**, and **PHA-5**. Successful implementation of all Actions requires coordination with the PPE and M&R subcommittees of the Council.

More information on **PEA-1** is provided on page 116.

**FIGURE 17**  
**PUBLIC HEALTH AWARENESS ACTION PLAN**



# PHA-1

## Improve Seafood Advisory Awareness

Objective: Promote public health through improved seafood advisory awareness.



Priority Issue: Waterborne pathogens and toxins found in fish tissue pose a human health risk due to fish and shellfish consumption.

Description: The GBEP and its partners are supporting effective seafood advisory outreach.

The GBEP and its partners are working with the PPE subcommittee and stakeholders on outreach, education, and awareness efforts to assist the public in evaluating risks from consuming Galveston Bay fish and / or shellfish. These efforts will leverage and build upon existing outreach and awareness initiatives.

Implementation location: Lower Galveston Bay watershed.

ACTIVITIES	TIMEFRAME AND OUTPUT(S)	IMPLEMENTATION COST
Work with PPE subcommittee to develop a Seafood Advisory Awareness Outreach Plan.	Within 2-5 years, develop Seafood Advisory Awareness Outreach Plan. Identify specific goals for increasing awareness (goals TBD).	\$0 - \$200,000
Finalize Seafood Advisory Awareness Outreach Plan and begin implementation.	Within 5-10 years, see significant progress on Outreach Plan goals (50% of goals met).	\$0 - \$200,000
	Within 10-plus years, see significant progress on Outreach Plan goals (100% of goals met).	\$200,000 - \$1 Million
Successfully implement Seafood Advisory Awareness Outreach Plan and track results.	Within 10-plus years, assess effectiveness of Outreach Plan by tracking number of groups and individuals reached.	\$0 - \$200,000

### POTENTIAL IMPLEMENTERS

County Health Departments  
Galveston Bay Foundation  
Galveston County Health District  
Harris County Pollution Control

Local / City Governments  
Texas Department of State Health Services  
Texas Parks and Wildlife Department  
Texas Sea Grant

### PERFORMANCE MEASURES

1. Seafood Advisory Awareness Outreach Plan completed.
2. Number of groups and individuals reached through outreach and education.

### REFERENCES

GBP'95: PH-1

SAP Reference: Ecosystem and Human Health - Public-Health Protection: Goal 3 / Objective B

## PHA-2



### Improve Regional Contact Recreation Risk Awareness

Objective: Promote public health through improved regional contact recreation risk awareness.

Priority Issue: Waterborne pathogens pose a human health risk due to contact recreation exposure.

Description: The GBEP and its partners are working with the PPE subcommittee to develop a public contact recreation risk advisory program. These efforts will leverage and build upon existing outreach and awareness initiatives.

Implementation location: Lower Galveston Bay watershed.

ACTIVITIES	TIMEFRAME AND OUTPUT(S)	IMPLEMENTATION COST
Work with PPE subcommittee to develop a Contact Recreation Outreach Plan.	Within 2-5 years, develop Contact Recreation Outreach Plan. Identify specific goals for increasing awareness (goals TBD).	\$0 - \$200,000
Finalize Contact Recreation Outreach Plan and begin implementation.	Within 5-10 years, significant progress on Outreach Plan goals (50% of goals met).	\$0 - \$200,000
	Within 10-plus years, significant progress on Outreach Plan goals (100% of goals met).	\$200,000 - \$1 Million
Successfully implement Contact Recreation Outreach Plan and track results.	Within 10-plus years, assess effectiveness of Outreach Plan by tracking number of groups and individuals reached.	\$0 - \$200,000

### POTENTIAL IMPLEMENTERS

Bayou Preservation Association  
County Health Departments  
Galveston Bay Foundation  
Harris County Pollution Control

H-GAC  
Local Governments  
Texas Sea Grant

### PERFORMANCE MEASURES

- Contact Recreation Outreach Plan completed.
- Number of groups and individuals reached through outreach and education.

### REFERENCES

GBP'95: PH-3

SAP Reference: Ecosystem and Human Health - Public-Health Protection: Goal 3 / Objective A

# PHA-3

## Improve Contact Recreation Safety Through Watershed-Based Plans

Objective: Improve regional contact recreation safety by implementing WBPs.



Priority Issue: Waterborne pathogens pose a human health risk due to contact recreation exposure.

Description: The GBEP and its partners are supporting and facilitating the development and implementation of WBPs, including TMDLs and WPPs, to address bacteria impaired contact recreation waters.

Support may also include continuing the stakeholder process or funding specific BMPs from WBPs.

Implementation location: Lower Galveston Bay watershed.

ACTIVITIES	TIMEFRAME AND OUTPUT(S)	IMPLEMENTATION COST
Support the implementation of ongoing WBPs and development of 3-4 new WBPs.	Within 2-5 years, support and facilitate the implementation of current and development of one to two new WBPs.	\$0 - \$200,000
	Within 5-10 years, support and facilitate the implementation of current and development of an additional two WBPs.	\$200,000 - \$1 Million
Successfully develop 3-4 WBPs and track results.	Within 10-plus years, assess impact of supported WBPs by tracking the number of BMPs implemented and number of improved assessment units.	\$0 - \$200,000

### POTENTIAL IMPLEMENTERS

Bayou Preservation Association  
City of Houston  
County Health Departments  
Galveston Bay Foundation  
Harris County Pollution Control Department  
H-GAC

HARC  
TCEQ  
Texas A&M AgriLife Extension Service  
Texas Sea Grant  
Texas State Soil and Water Conservation Board  
Watershed-Based Plan Owners / Stakeholders

### PERFORMANCE MEASURES

1. Number of WBPs developed and implemented.
2. Number of BMPs implemented.
3. Number of improved assessment units.

### REFERENCES

GBP'95: PH-3

SAP Reference: Ecosystem and Human Health - Public-Health Protection: Goal 3 / Objective B

# PHA-4

## Improve Shellfish Consumption Safety Through Watershed-Based Plans

Objective: Improve the safety of human shellfish consumption from Bay waters by implementing WBPs.



Priority Issue: Waterborne pathogens and toxins found in edible tissue pose a human health risk due to shellfish consumption.

Description: The GBEP and its partners are supporting implementation of WBPs, such as the Upper Texas Coast Oyster Waters TMDL / I-Plan to address bacteria-impaired oyster waters.

Support also includes continuing the stakeholder process or funding specific measures of WBPs.

Implementation location: Lower Galveston Bay watershed.

ACTIVITIES	TIMEFRAME AND OUTPUT(S)	IMPLEMENTATION COST
Demonstrate a change in shoreline bacteria concentrations.	Within 2-5 years, support implementation of the Upper Texas Coast Oyster Waters TMDL / I-Plan and report on status.	\$0 - \$200,000
	Within 5-10 years, continue to support implementation of the Upper Texas Coast Oyster Waters TMDL / I-Plan and report on status.	\$0 - \$200,000
	Within 10-plus years, review water quality data to determine whether a decrease in bacteria concentrations occurred.	\$0 - \$200,000

### POTENTIAL IMPLEMENTERS

City of Houston  
Galveston Bay Foundation  
Galveston County Health District  
Harris County Pollution Control Department

Texas A&M AgriLife Extension Service  
TCEQ  
Texas Department of State Health Services  
Texas Sea Grant

### PERFORMANCE MEASURES

1. Upper Texas Coast Oyster Waters TMDL/I-Plan implemented.
2. Number of improved assessment units for bacteria concentrations.

### REFERENCES

GBP'95: PH-2

SAP Reference: Ecosystem and Human Health - Public-Health Protection: Goal 1 / Objective B; Ecosystem and Human Health - Public-Health Protection: Goal 2 / Objective A

# PHA-5

## Improve Finfish Consumption Safety Through Watershed-Based Plans

Objective: Improve the safety of human finfish consumption by implementing WBPs.



Priority issue: Waterborne pathogens and toxins found in fish tissue pose a human health risk due to fish consumption.

Description: The GBEP and its partners are supporting and facilitating the development and implementation of legacy and toxin WBPs, as the need arises.

The GBEP and its partners are also providing support, as needed, for existing PCB and dioxins TMDL studies.

Implementation location: Lower Galveston Bay watershed.

ACTIVITIES	TIMEFRAME AND OUTPUT(S)	IMPLEMENTATION COST
Support the implementation of current and / or development of 3-4 new WBPs.	Within 2-5 years, support and facilitate the development of one to two WBPs.	\$0 - \$200,000
	Within 5-10 years, support and facilitate the development of an additional two WBPs.	\$200,000 - \$1 Million
Complete impact assessment and results tracking of the 3-4 developed WBPs.	Within 10-plus years, assess impact of supported WBPs by tracking the number of BMPs implemented and number of improved assessment units.	\$0 - \$200,000

### POTENTIAL IMPLEMENTERS

City of Houston  
Galveston Bay Foundation  
Galveston County Health District  
Harris County Pollution Control Department

TCEQ  
Texas A&M AgriLife Extension Service  
Texas Department of State Health Services  
Texas Sea Grant

### PERFORMANCE MEASURES

1. Number of WBPs completed.
2. Number of BMPs implemented.
3. Number of improved assessment units.

### REFERENCES

**GBP'95:** WSQ-1, WSQ-2, WSQ-3, WSQ-4

**SAP Reference:** Ecosystem and Human Health - Public-Health Protection: Goal 1 / Objective B; Ecosystem and Human Health - Public-Health Protection: Goal 2 / Objective A