



October 2018

# WOLF BAY WATERSHED COMMUNITY MEETING

- I. Introductions
- II. Watershed Video
- III. Project Overview
- IV. Literature Review
- V. Group Participation
- VI. Steering Committee
- VII. Survey Monkey Results
- VIII. Next Steps





# Introductions

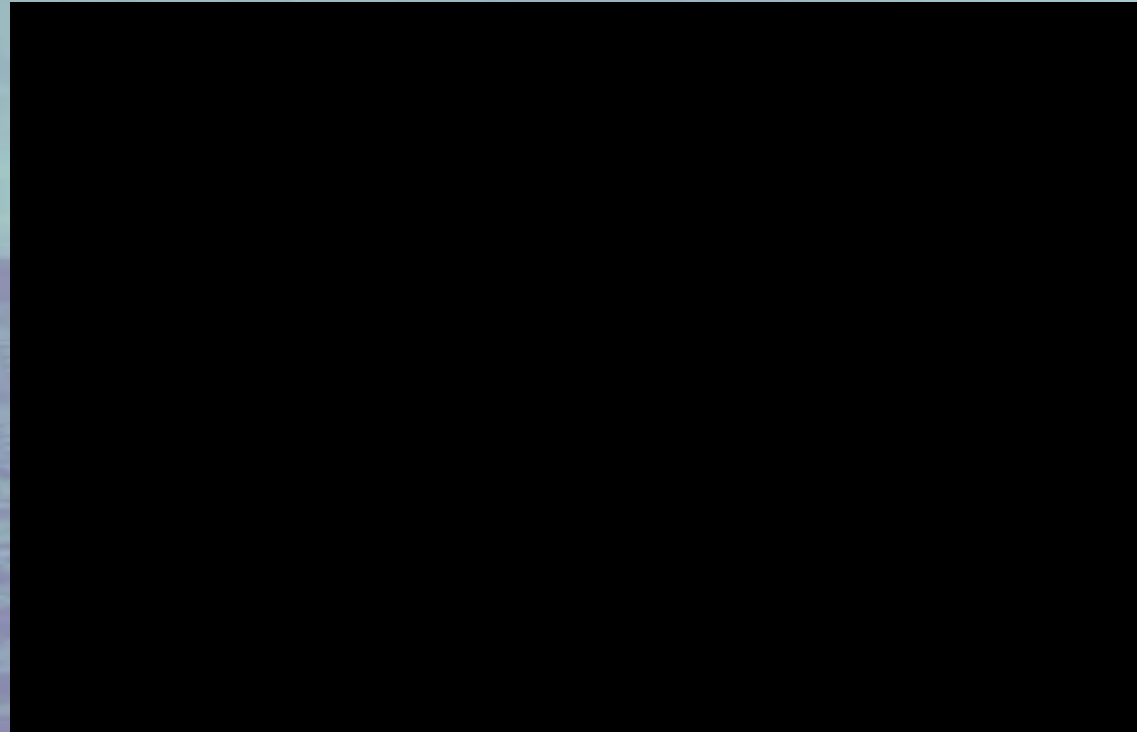


- MBNEP, Volkert, Allen ES and Steering Committee Members

# Steering Committee

Name	Affiliation	Email Address
Ralph Hellmich	City of Foley	<a href="mailto:RHellmich@ogb.state.al.us">RHellmich@ogb.state.al.us</a>
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# “Understanding Your Watershed”





# Watershed Planning Goals

1. **Improve water quality** to support healthy aquatic ecosystems, species, and safe recreational activity
2. **Improve habitats** to support wildlife and recreational activity
3. **Protect continued use of biological resources** to preserve culture, heritage, and knowledge of the watersheds
4. **Improve watershed resiliency** to impacts of climate change including sea level rise
5. **Expand opportunities for community access** to resources within the watersheds

# Watershed Planning Goals

1. **Build partnerships** – identify key stakeholders and solicit community input and concerns
2. **Characterize the watersheds** – create a natural and cultural resource inventory, identify causes and sources of impairment, identify data gaps, and estimate pollution loads
3. **Set goals and identify solutions** – determine current issues and concerns and identify management measures to achieve goals
4. **Design implementation program** – include schedule with interim milestones, criteria to measure progress, monitoring component with public participation, education/outreach program, and technical and financial support needed to implement plan



# **WOLF BAY WATERSHED DETAILS**



# Understanding Wolf Bay Watershed

- ◉ Located in the Southeastern Part of Baldwin County, Alabama.
- ◉ Our Focus will be on the Upper Portion of the Watershed.
- ◉ Three Sub-Watersheds: Sandy/Wolf Creek, Miflin Creek, and Graham Creek Watersheds.
- ◉ Baldwin County, City of Foley, and Town of Elberta.

# Understanding Wolf Bay Watershed

- ⦿ 36,300 Acres (57 Sq. Miles).
- ⦿ Current Landuse:
  - Agriculture,
  - Silviculture,
  - Single and Multifamily Residential,
  - Commercial, and
  - Industrial.



# Understanding Wolf Bay Watershed

- ◎ Baldwin County - Fastest Growing Areas in Alabama.
  - From 2010 to 2016, County 14.4% Increase in Population.
  - City of Foley's Population Rise of 20.5% from 2010 to 2016.
- ◎ Changes in Landuse.
  - Conversion to Urban
  - Point and Nonpoint Source Pollutants

A dramatic seascape with a storm brewing. The sky is filled with dark, heavy clouds, and a bright light source, possibly the sun or moon, is visible on the horizon, creating a strong lens flare and illuminating the water. A large white sailboat is visible in the foreground, its sail partially visible. The water is dark and choppy. The overall mood is intense and atmospheric.

# LITERATURE REVIEW



# Focuses of Water Quality Research

## Sediment

- Total Suspended Sediments (TSS)
- Bed Sediment
- Turbidity

## Water Chemistry

- pH
- Nutrients
- Dissolved Oxygen
- Pathogens

# Sediment

## ○ Total Suspended Sediments

- Sediments suspended in the water column
- Cook (2017) found that the largest amount of TSS was found in the east and west tributaries of Sandy Creek
  - Urban land use (22% of the watershed) contributes 63% of the sedimentation in Wolf Bay Watershed
  - Forestry (53% of the watershed) contributes under 3% of sediment in the Wolf Bay Watershed

## ○ Bed Sediments

- Those particles too large to be suspended in the water column
- Highest for Wolf Creek at McDuffie Road (more than twice that of the next highest)



# Sediment (cont.)

## ◎ Turbidity

- “Cloudiness” of water
- Reports of Sandy Creek turning a milky color following rain events
  - Possibly due to erosion exposing a white clay layer in soil
- Concerns also expressed about turbidity of Wolf Creek
  - Possibly due to increased construction in/around Town of Foley
  - Town of Foley passed ordinance requiring low impact development

# Water Chemistry

## ◉ Nutrients

- Excessive amounts can cause algae blooms and increased bacterial levels
- Nitrogen: Highest concentrations found in Miflin and Sandy Creek
  - Both watersheds dominated by crop and turf operations
- Phosphorous: Highest levels found in Wolf Creek

## ◉ Dissolved Oxygen

- Affected by many variables throughout the year
- Extremely low levels found at Wolf Creek headwaters in Foley from 2000-2010
  - City of Foley and MBNEP partnered to do a natural stream restoration
  - Normal levels of oxygen observed since



# Water Chemistry (cont.)

## ◎ Pathogens

- Typically caused by direct inputs to a system (point-source discharges, livestock, etc.)
- Monitoring showed Wolf Creek had unsafe levels of *E.coli* from 1999-2002
- Riviera utilities (wastewater treatment) discharges into Wolf Creek
  - Currently working on major upgrade to wastewater treatment plant that will reduce overflows
- Sampling in 2017 showed that Elberta Creek exhibited high bacteria counts which may represent a source of pathogens in the watershed

# Conclusions

- ◉ Cook (2017) concluded that, after reviewing all water quality parameters, the following watersheds exhibited the highest degree of impairment and should be targets for restoration:
  - Wolf Creek: Upstream from Doc McDuffie Road and Swift Church Road
  - Sandy Creek: the unnamed tributaries at sites along US Highway 98



# **GROUP PARTICIPATION**



A dramatic seascape with a storm brewing. The sky is filled with dark, heavy clouds, and a bright light source, possibly the sun or moon, is visible on the horizon, creating a strong reflection on the dark blue water. A white, curved shape, likely the hull of a boat, is visible in the foreground on the right. The overall mood is intense and atmospheric.

**IDENTIFY HOT SPOTS  
ON THE MAPS**

# Potential Management Actions



- What stream segments to restore?
- What stream areas need buffers?
- Where to place litter traps?
- Where can a regional detention facility be located?



# Potential Management Actions

- What land for habitat preservation & conservation easements?
- Where are there opportunities for living shorelines?





A dramatic seascape with a storm brewing. The sky is filled with dark, heavy clouds, and a bright light source, possibly the sun or moon, is visible on the horizon, creating a strong lens flare and illuminating the water. A large, dark, triangular shape, possibly a piece of land or a large object, dominates the foreground, partially obscuring the view of the sea. The overall mood is intense and mysterious.

# **BIG GROUP BRAINSTORMING**

# Wolf Bay Watershed Plan

WHAT IS THE MISSION?	WHAT ARE THE ISSUES TO BE ADDRESSED?

Identify and Prioritize

# Wolf Bay Watershed Plan

WHAT MANAGEMENT ACTIONS ARE DESIRED?	WHERE ARE THE BMPS NEEDED?

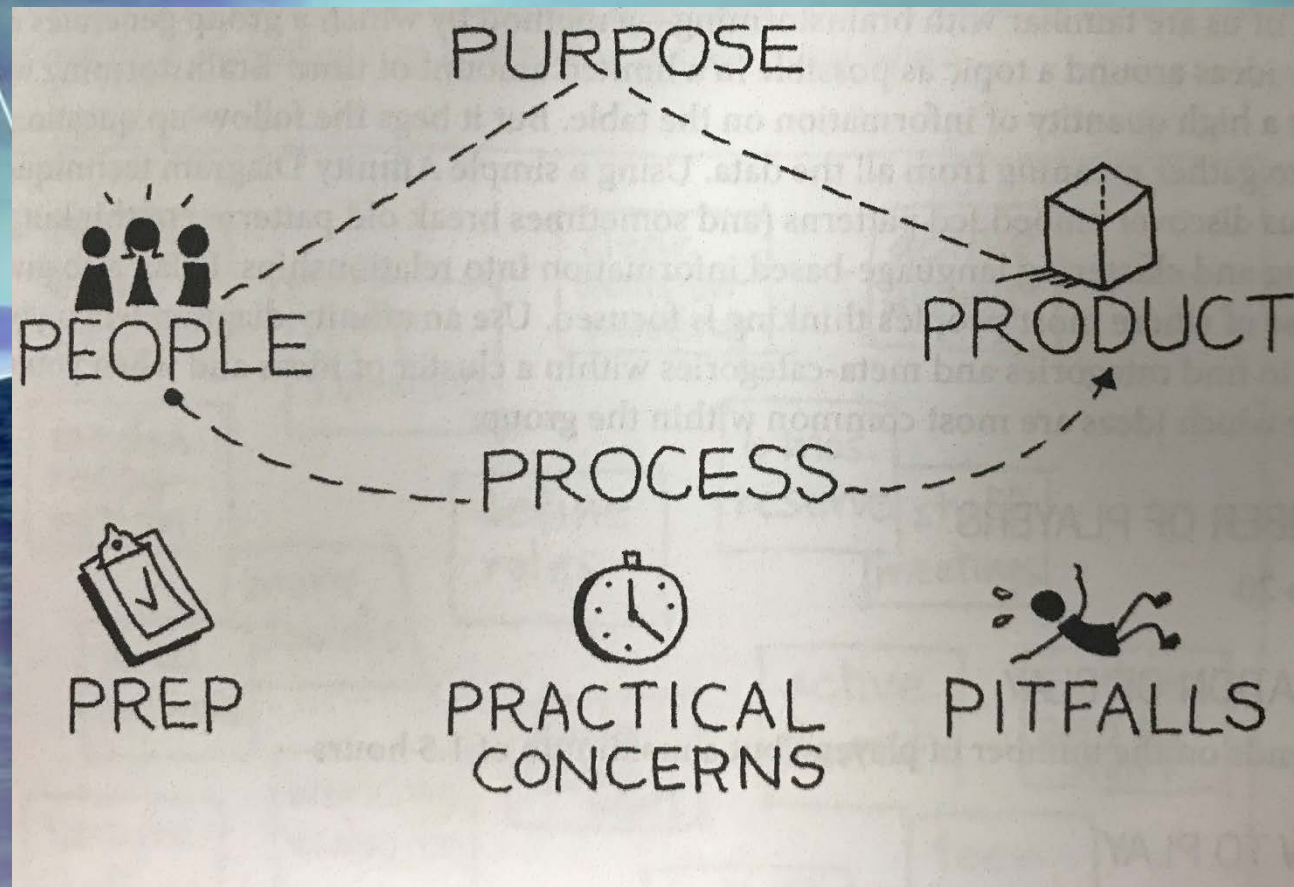
Identify and Prioritize





# **SMALL GROUPS GAMESTORMING**

# 7 P<sub>s</sub> FRAMEWORK EXERCISE



# What is the Overall Vision or Goal?

WHO	DO
EX: WBWW	EX: Continue Monitoring
EX: City of Foley	EX: Acquire X acres for Conservation
EX: Graham Creek Preserve	EX: Embrace the Gulf Festival in Year 2020





# **STEERING COMMITTEE FEEDBACK**

# SC's Desired Goals of Our Plan

- ◉ Improve Stormwater Management
- ◉ Identify Restoration, Conservation, and Green Infrastructure Opportunities
- ◉ Improve Public Access

# SC's Specifics Addressed

- ⦿ Erosion on Sandy Creek
- ⦿ Sediment on Wolf Creek
- ⦿ Stream Restoration Areas Identified
- ⦿ Nutrient Levels
- ⦿ Lack of Public Access
- ⦿ Proposed bridges
- ⦿ Identified Desired Acquisition for Conservation
- ⦿ Identified Good Locations for Signage
- ⦿ Identified Places for Litter Getter
- ⦿ Review and Strengthen SW and Development Regs



# SC's Desired Educational Measures

- ◎ Target Audience Education Workshops:
  - Baldwin County Contractors/Developers/Realtors
  - Wolf Bay Plantation Harbor RV Resort
  - Farmers Co-Op Meetings
- ◎ Signage – MBNEP may have funding for 10!



**WHAT HAS BEEN ACCOMPLISHED?**

# Small Meetings

- ◉ PLAN
- ◉ Foley's Planning Commission Meeting
- ◉ Elberta's Planning Commission Meeting



# Watershed Planning

## Wolf Bay Watershed

### What is a Watershed?

A watershed is an area of land where the water within it flows to a common point such as a lake, stream, river, bay, or estuary. A properly functioning watershed provides water quality, wildlife habitat, and protects homes and businesses from flooding. We all live in a watershed, and we all play a role in protecting our watershed.

### What is a Healthy Watershed?

A healthy watershed is one in which natural land cover supports:

- The natural processes of hydrology across the landscape,
- Habitat that supports native wildlife both on the land and in the water, and
- Water quality conditions that support healthy biological communities.

### Benefits of a Healthy Watershed

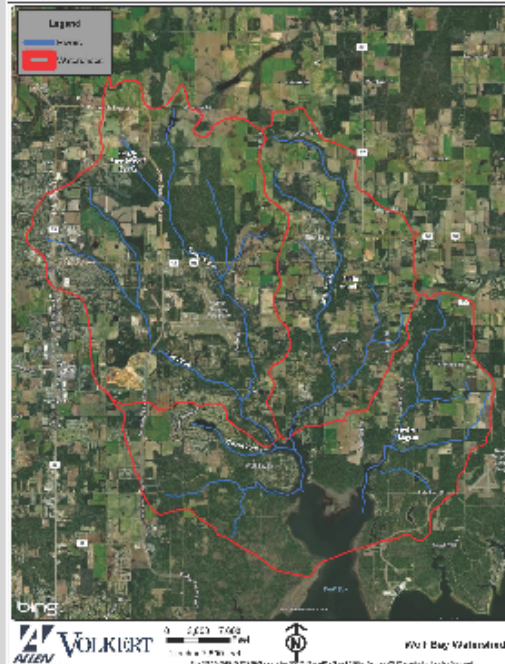
Healthy watersheds provide many important functions including:

- Nutrient cycling,
- Carbon storage,
- Erosion/sedimentation control,
- Biological diversity,
- Soil formation,
- Wildlife movement corridors,
- Water storage,
- Water filtration,
- Flood control,
- Food,
- Timber,
- Recreation,
- Reduced vulnerability to invasive species, and
- Reduced effects of climate change and other natural disasters.

### Tips to Improve Your Watershed

When we each do our part on a small scale, we can have a major impact on our watershed. The EPA offers tips on how you can help keep your watershed clean and healthy.

- Conserve water every day. Take shorter showers, fix leaks & turn off the water when not in use.
- Don't pour toxic household chemicals down the drain; take them to a hazardous waste center.
- Use hardy plants that require little or no watering, fertilizers or pesticides in your yard.
- Recycle yard waste in a compost pile & use a mulching mower.
- Use surfaces like wood, brick or gravel for decks & walkways; allows rain to soak in & not runoff.
- Never pour used oil or antifreeze into the storm drain or the street.
- Pick up after your pet, and dispose of the waste in the toilet or the trash.
- Drive less - walk or bike; many pollutants in our waters come from car exhaust and car leaks.



# Watershed Planning

## Wolf Bay Watershed

### What Can You Do to Help?

Please complete the survey at

<https://www.surveymonkey.com/r/WolfBay>

### Wolf Bay Facts and Figures:

- Wolf Bay is located on the Gulf of Mexico in Baldwin County, Alabama nestled between Perdido Bay to the east and Mobile Bay to the West.
- Wolf Bay is an estuary where freshwater and saltwater mix to create a diverse environment that fosters a rich array of plant and animal life.
- The Wolf Bay watershed covers about 44,700 acres, which is approximately 23% forest, 27% urban/suburban, 27% agricultural, 16% wetlands and 7% other uses.
- Streams that flow into Wolf Bay include Wolf Creek, Sandy Creek, Milfin Creek, Graham Creek, Owens Bayou, Moccasin Bayou, and Hammock Creek. Wolf Bay, in turn, flows into the Intracoastal Waterway, which flows into either Perdido Bay or Mobile Bay, depending on the moon, wind, and tide, and ultimately into the Gulf of Mexico.
- Wolf Bay and its watershed hosts a tremendous diversity of habitats including bald eagles, Florida manatees, sea turtles, Gulf sturgeons, red-cockaded woodpeckers, American alligators, Alabama red-bellied turtles and Eastern indigo snakes.
- The watershed is undergoing dramatic changes as forested and agricultural lands are converted into residential and commercial developments.
- The Wolf Bay Watershed Watch (WBWW) formed in 1998 and tests water quality.
- WBWW volunteer monitors have taken approximately 2,500 water quality samples at 44 sites.

### Steps in the Watershed Planning Process

Step 1:	Build partnerships
Step 2:	Characterize your watershed
Step 3:	Finalize goals and identify solutions
Step 4:	Design an implementation program
Step 5:	Implement the watershed plan
Step 6:	Measure progress and make adjustments



Sources:

Mobile Bay National Estuary Program

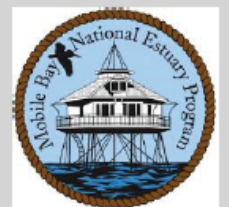
[www.mobilebaynep.com/the\\_watersheds/wolf\\_bay\\_watershed/](http://www.mobilebaynep.com/the_watersheds/wolf_bay_watershed/)

Environmental Protection Agency

<https://www.epa.gov/hwp>

The Nature Conservancy

<https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/watersheds-101.xml>





September  
2018

# **SURVEY MONKEY RESULTS**



# Survey Monkey Exercise

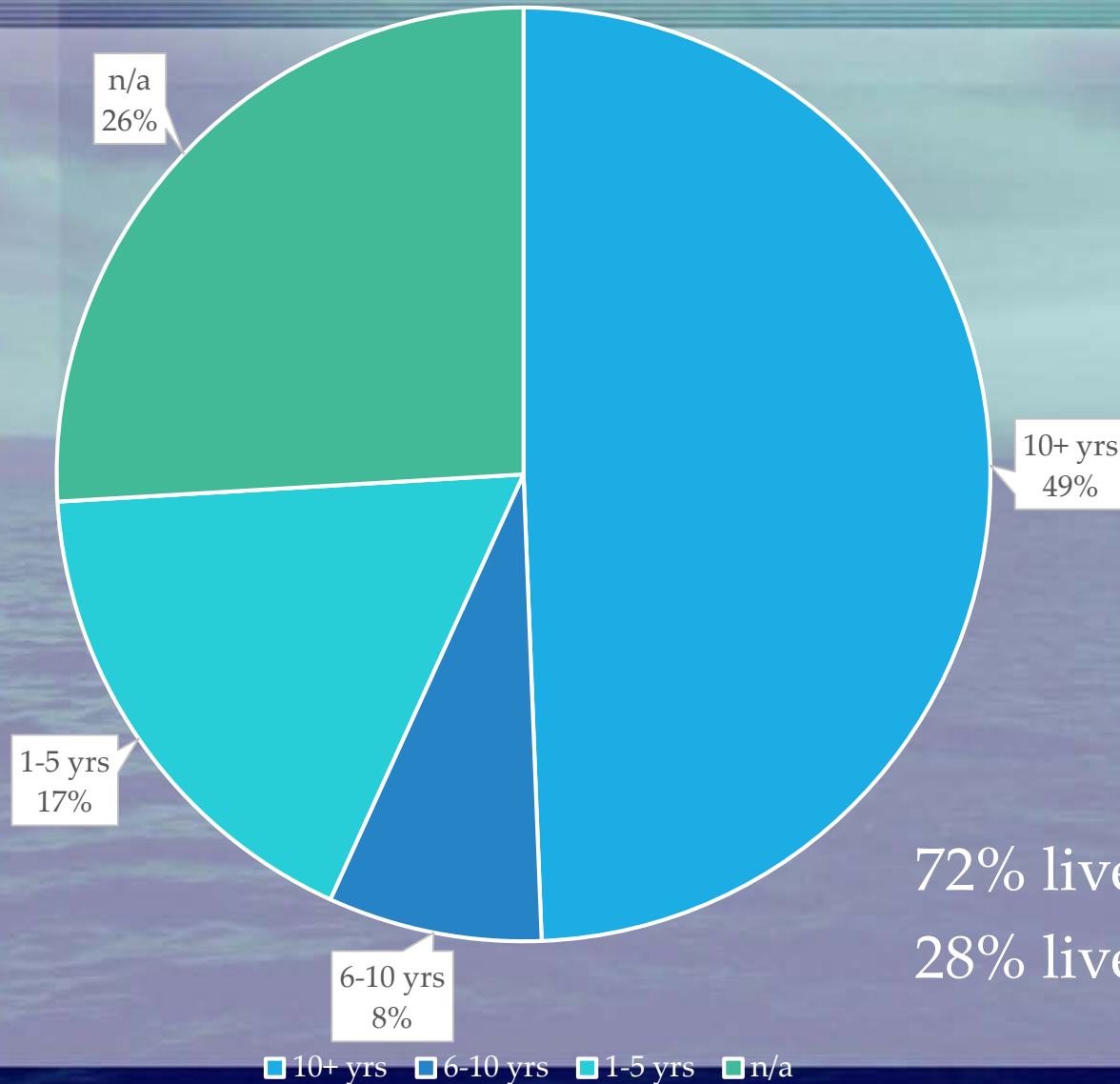
- <https://www.surveymonkey.com/r/WolfBay>

82 surveys completed as of September 2018



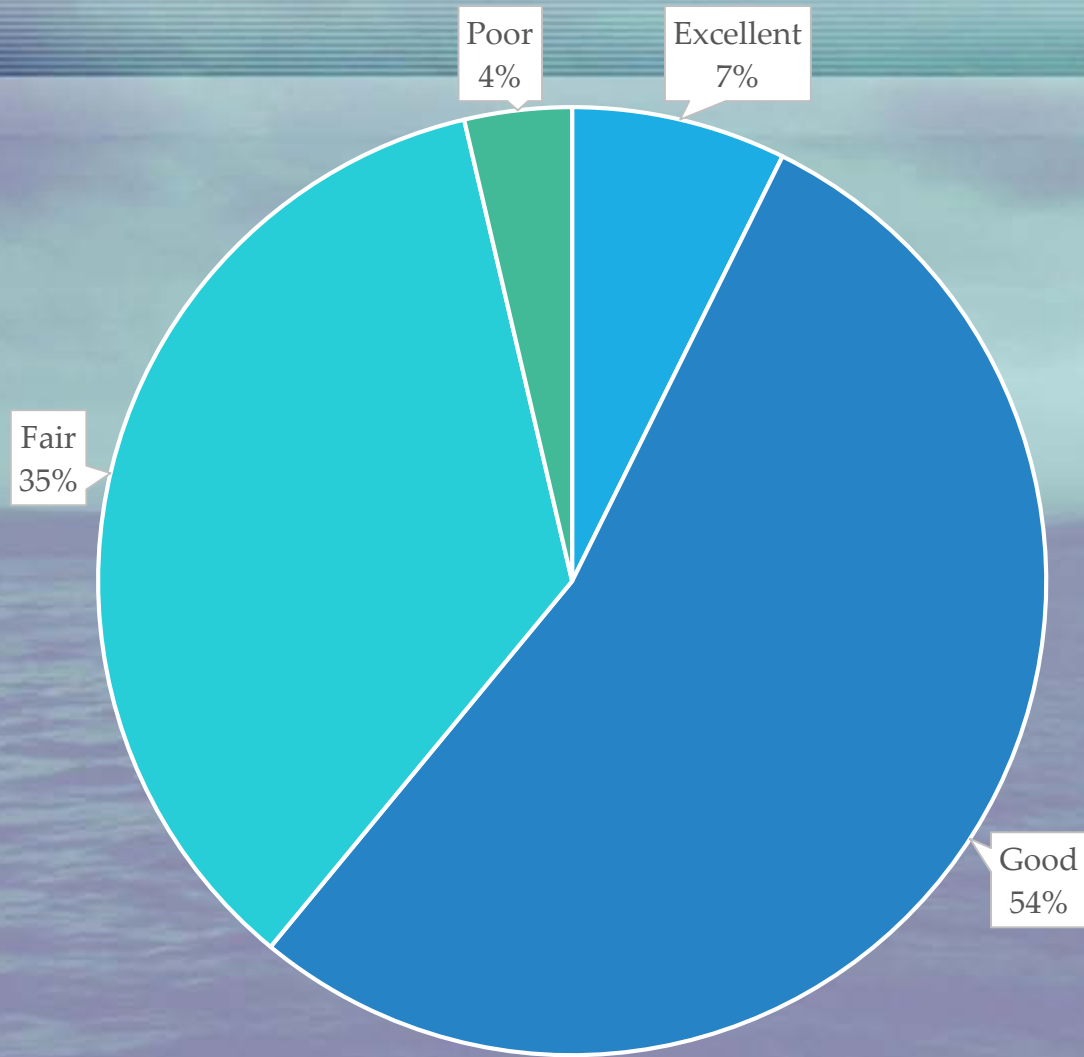


# Responders



72% live within watershed  
28% live outside watershed

# Condition of Watershed

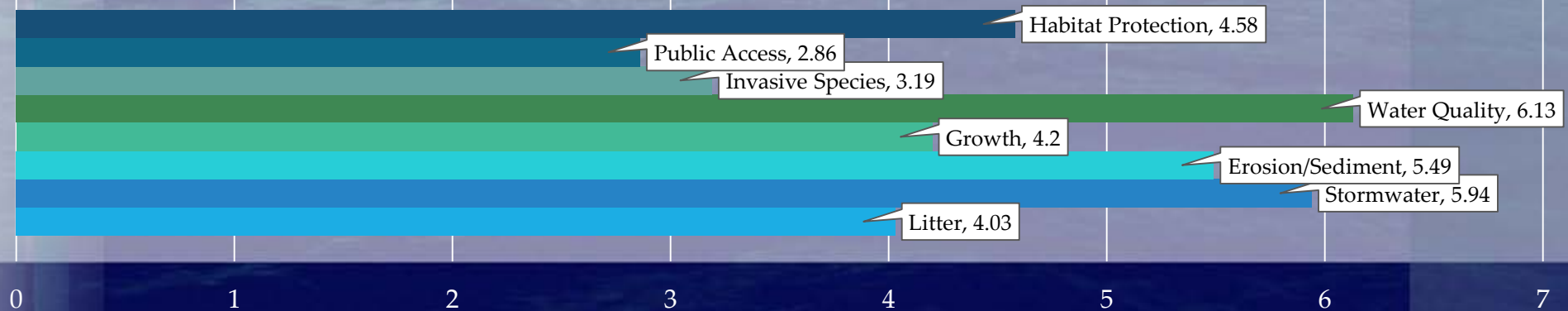


■ Excellent ■ Good ■ Fair ■ Poor

# Rank Watershed Issues

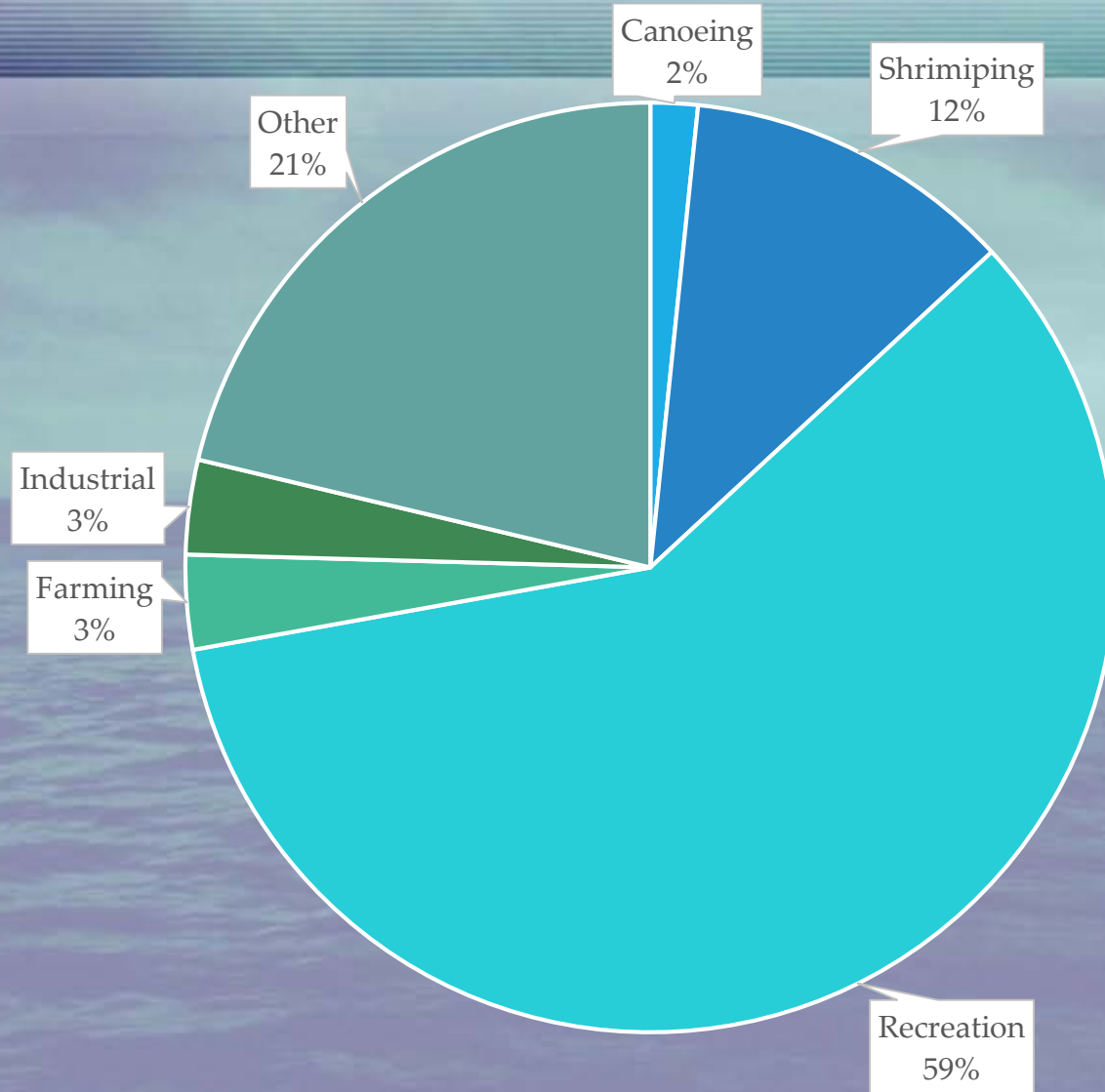
## Wolf Bay Watershed

Habitat Protection   Public Access   Invasive Species   Water Quality  
Growth   Erosion/Sediment   Stormwater   Litter



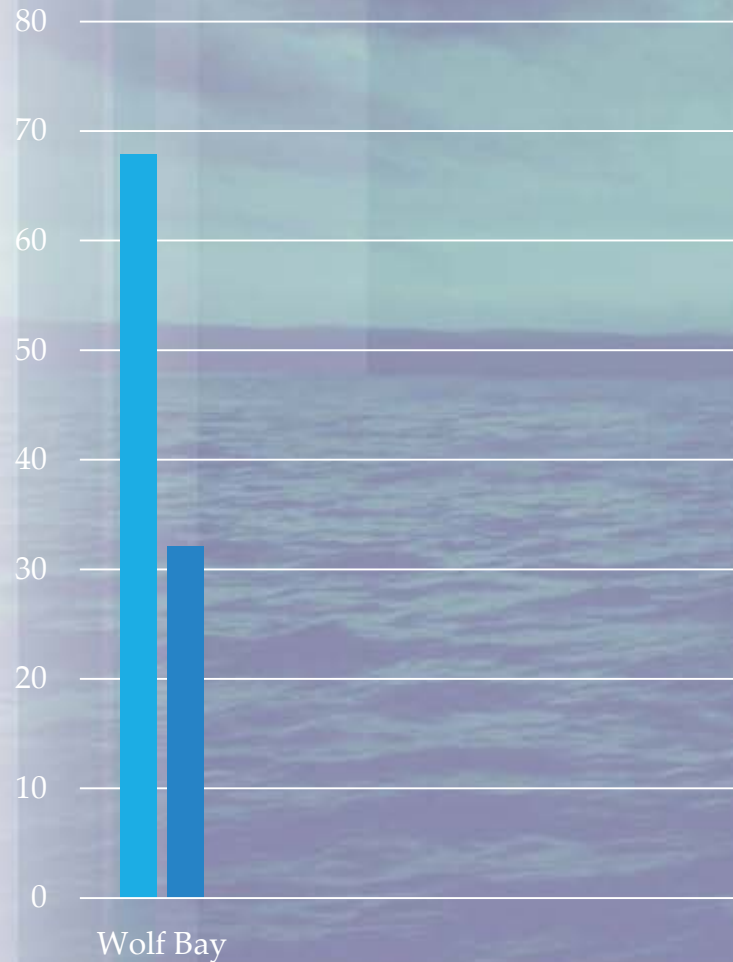


# Use of Watershed



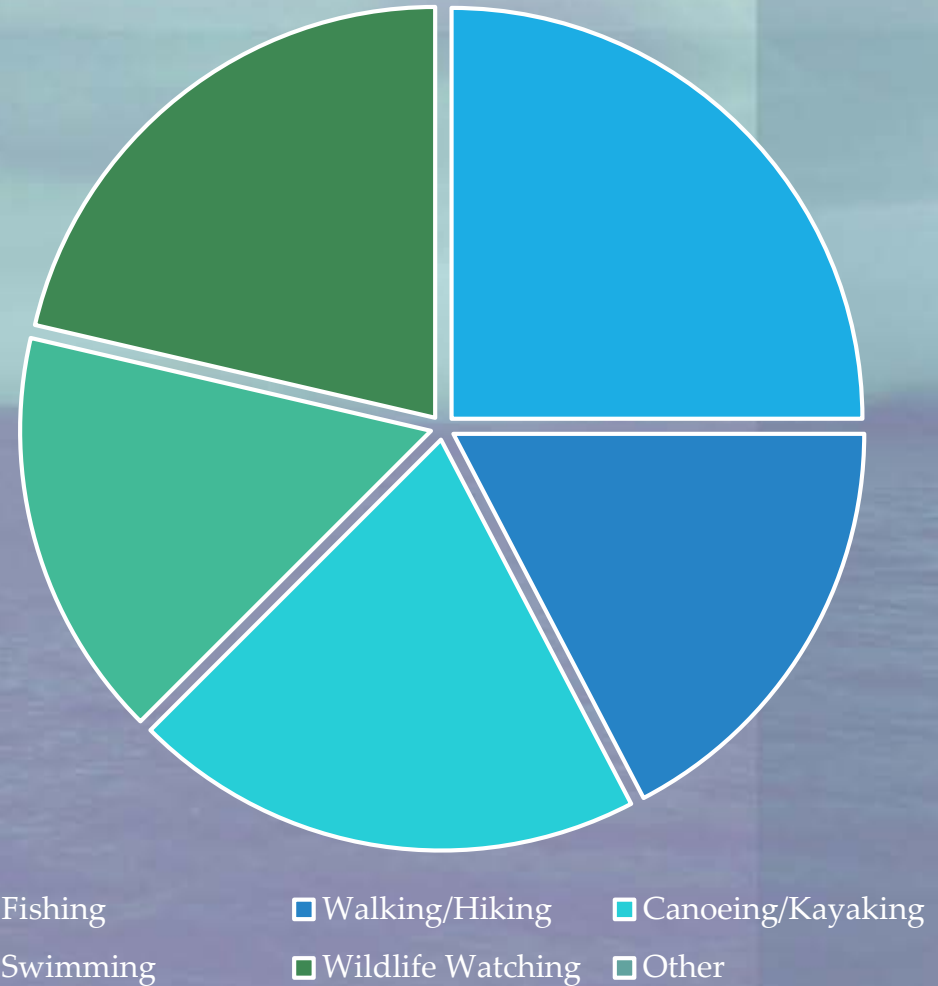
Canoeing Shrimiping Recreation Farming Industrial Other

# Do Recreational Opportunities Need Improvement?

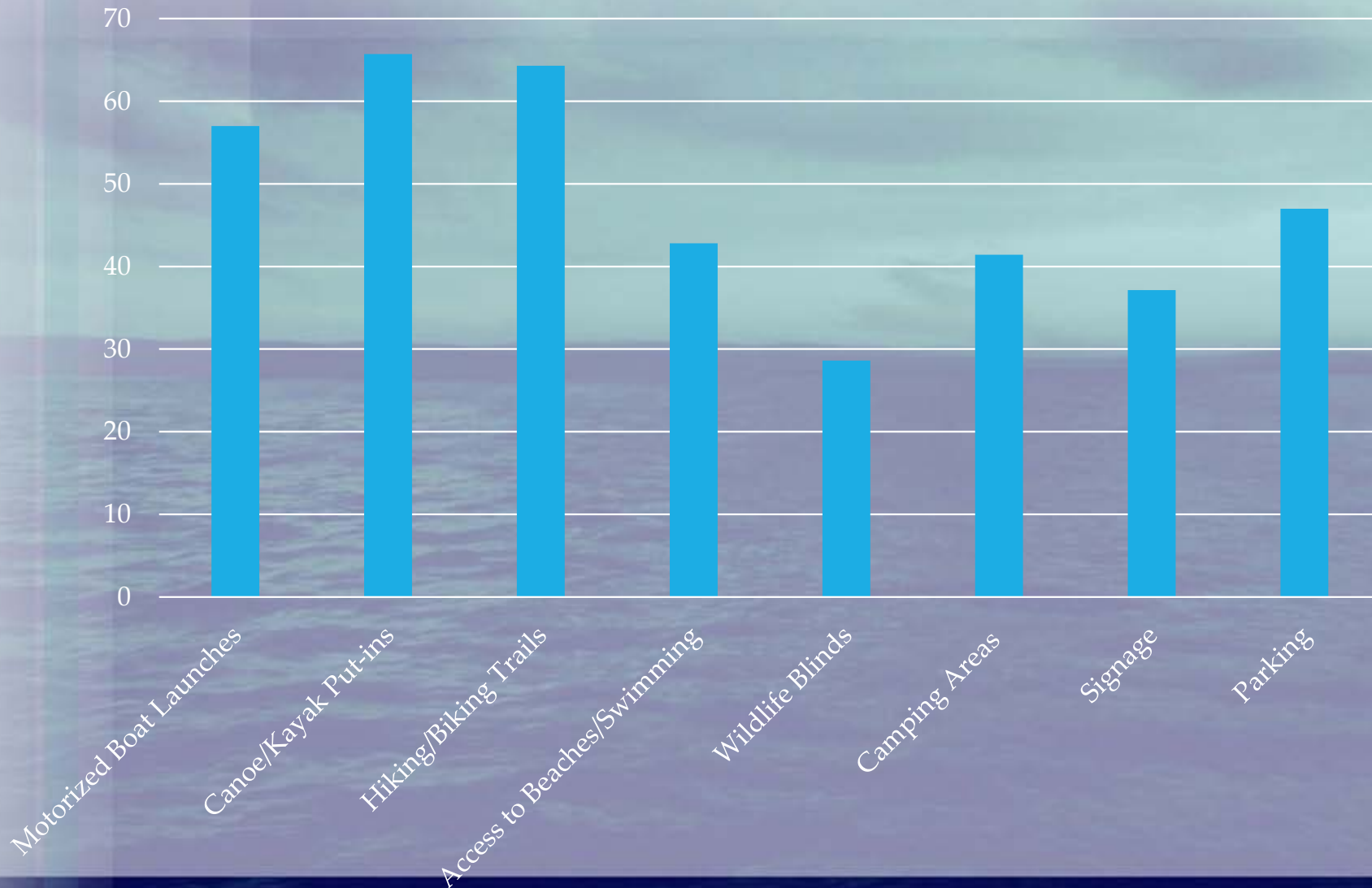


■ Yes ■ No

# What do You and Your Family Enjoy Doing?

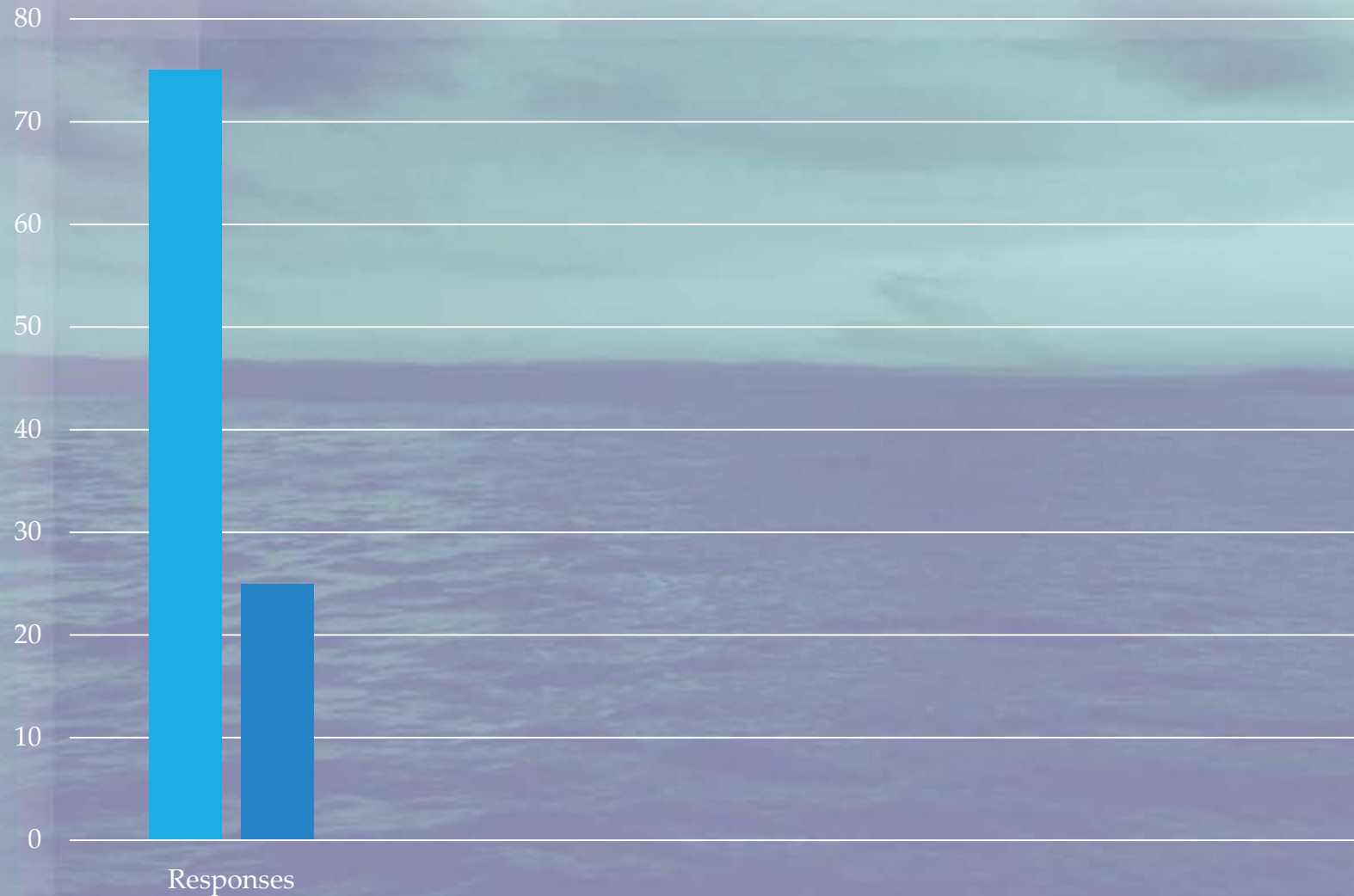


# How can Recreational Opportunities be Improved?



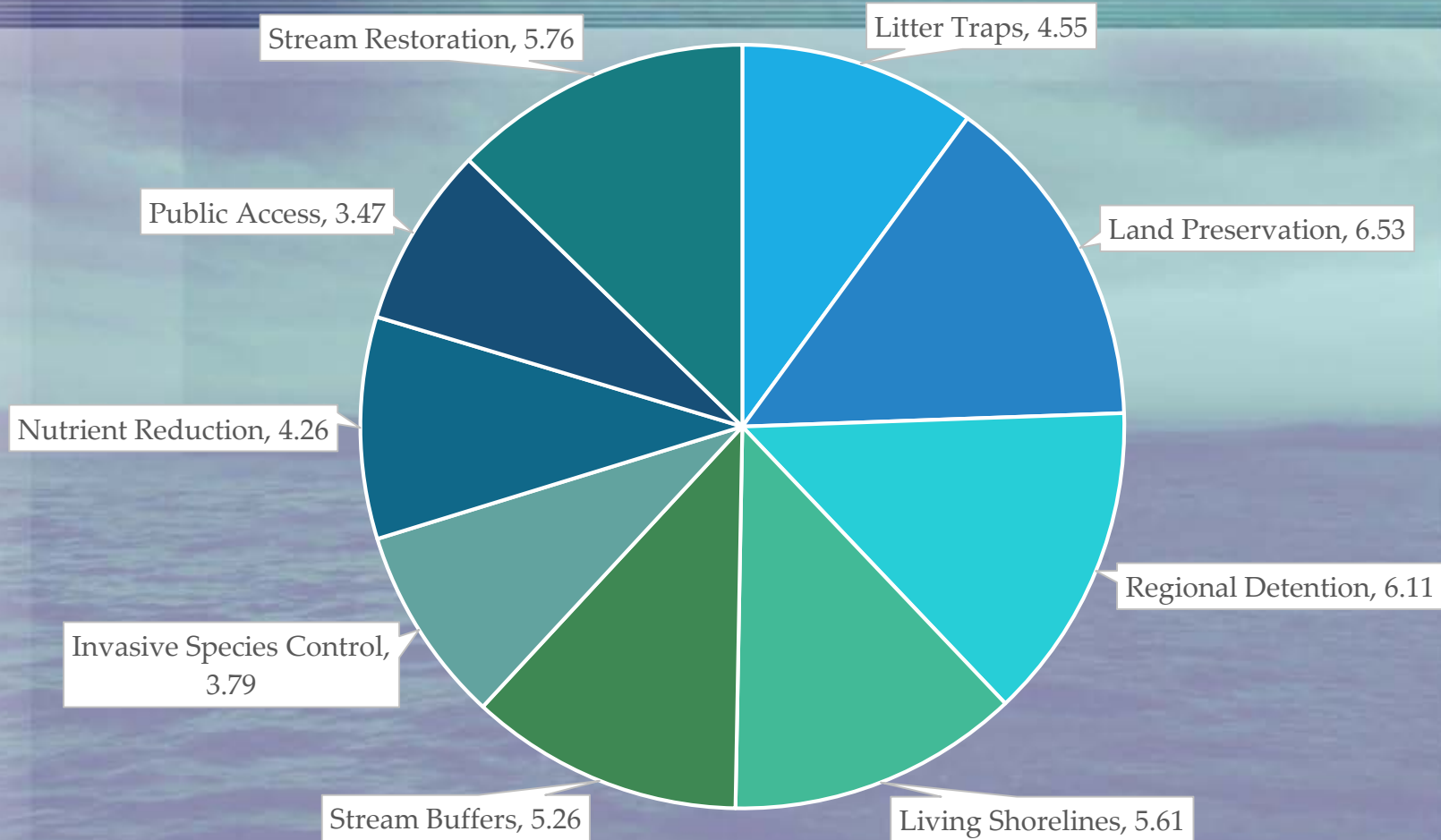


# Would You Use a Public Access Point if One was Provided?



■ Yes ■ No

# Prioritize Management Actions

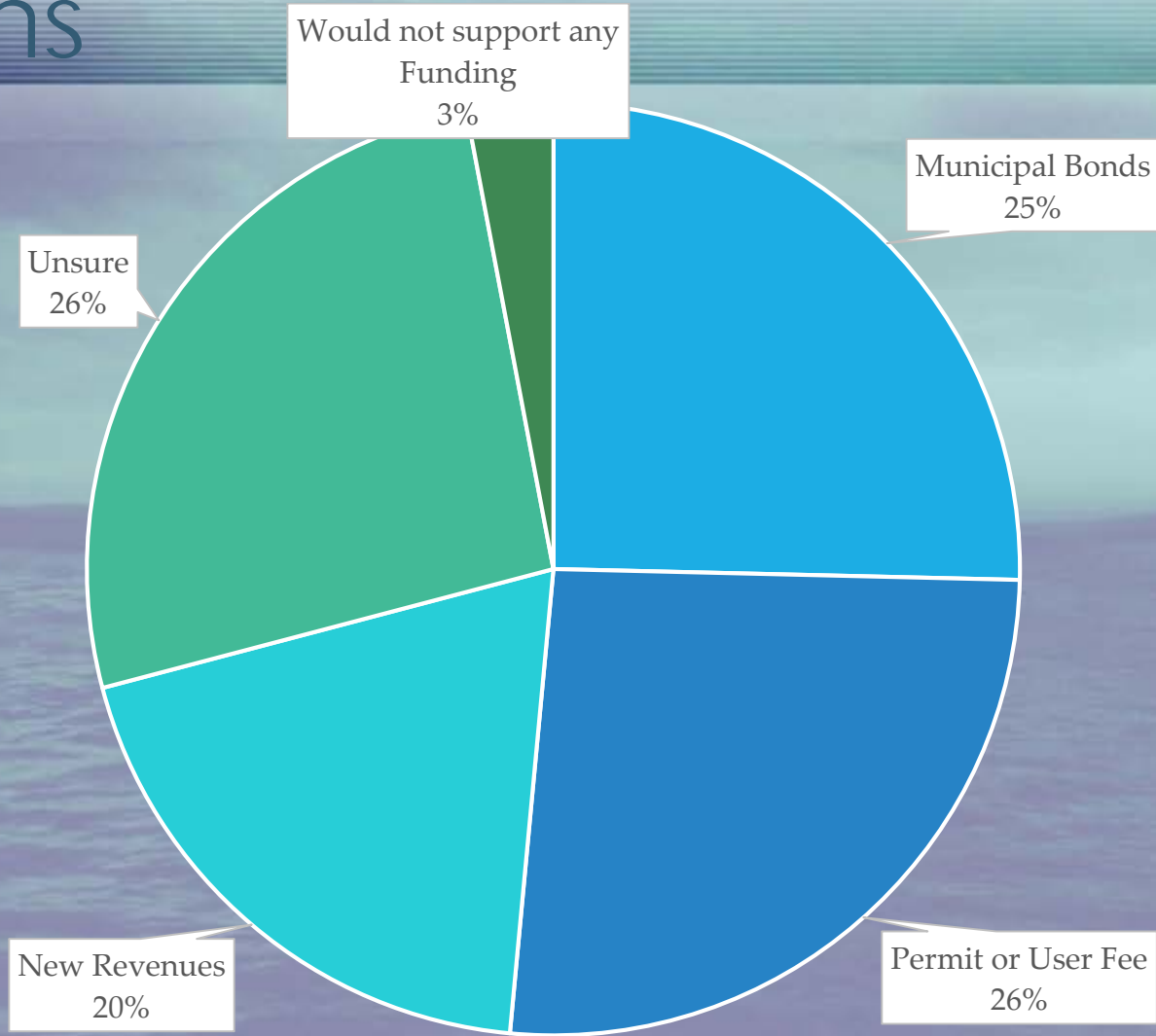


# Top Six Management Actions Desired

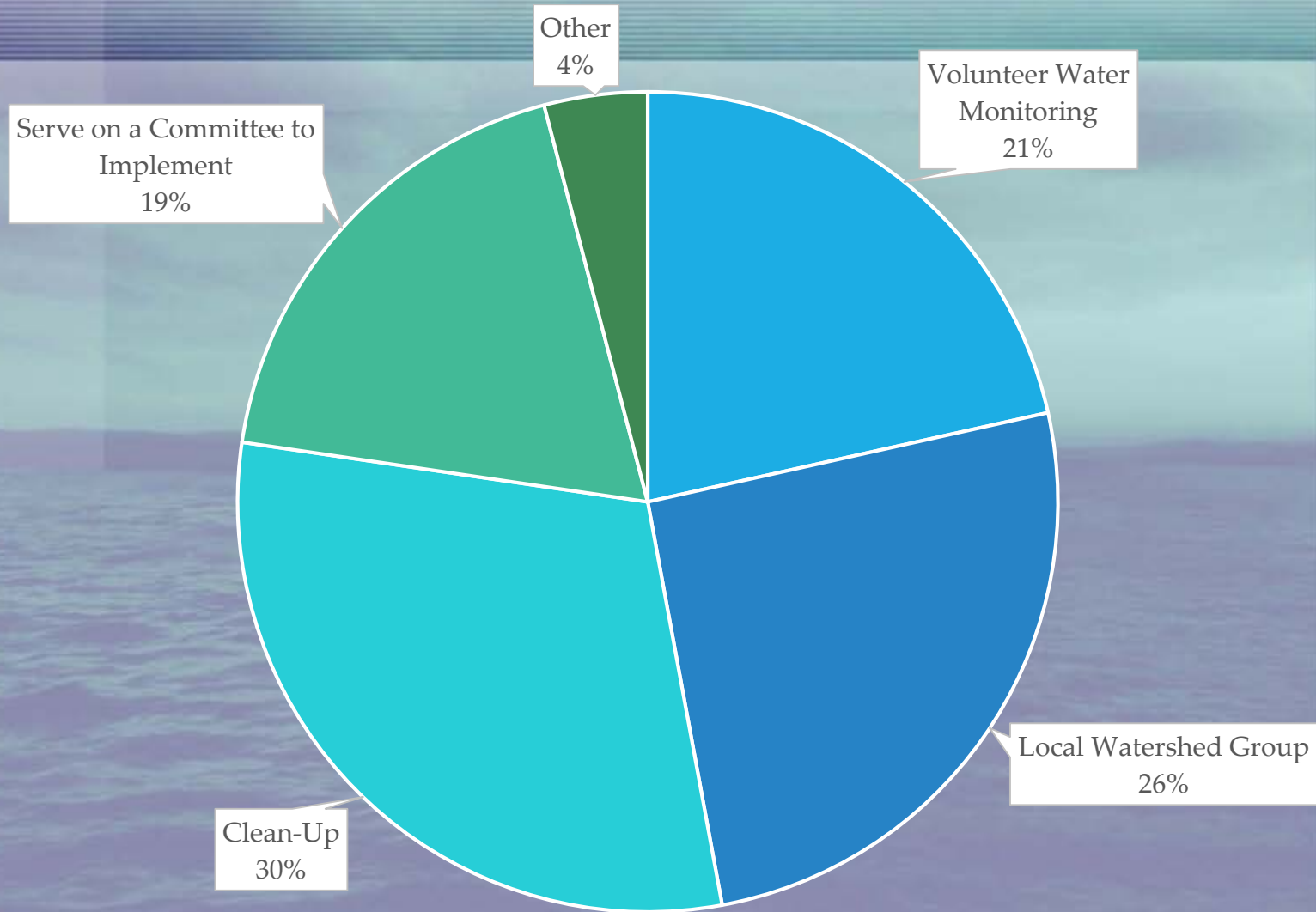
1. Land Preservation
2. Regional Detention for Flood Control
3. Stream Restoration
4. Living Shorelines
5. Stream Buffers
6. Litter Traps



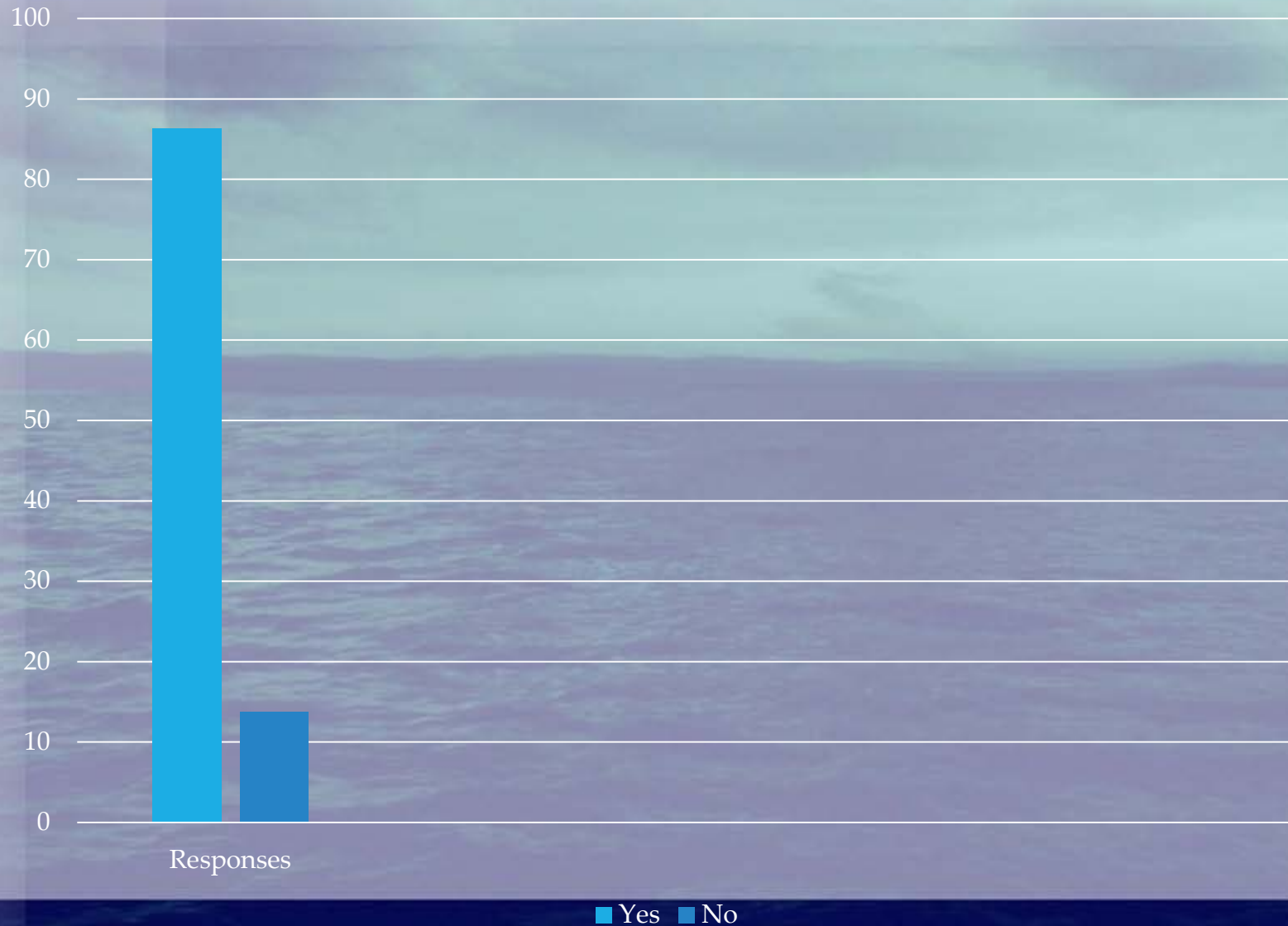
# Support of Funding Options



# How Will You Participate?



# Would You Attend Educational Workshops if Provided?





# Survey Monkey Highlights

- Most think the watershed is in good shape.
- Most use watershed for recreational purposes.
- Most Important Issues:
  - Water Quality
  - Stormwater Management
  - Erosion/Sediment Control
  - Habitat Protection





# Survey Monkey Highlights

- Most Important Management Actions:

- Land Preservation
- Regional Detention
- Stream Restoration
- Living Shorelines
- Stream Buffers
- Litter Traps





# Survey Monkey Highlights

- Majority support for increasing public access.
- Most would volunteer to monitor or serve on a watershed group.
- Majority would participate in educational workshops.





# So what do these results tell us?

- ⦿ Treasured resource
- ⦿ High recreational use
- ⦿ Focus on preserving watershed condition/character



# Path Forward...

- ID Hotspots
- Ground Truth
- Development of draft document
- Additional meetings with Steering Committee
- Review of draft WMP
- Resolution of comments
- Final review by Steering Committee
- Outreach Strategy





Questions?

