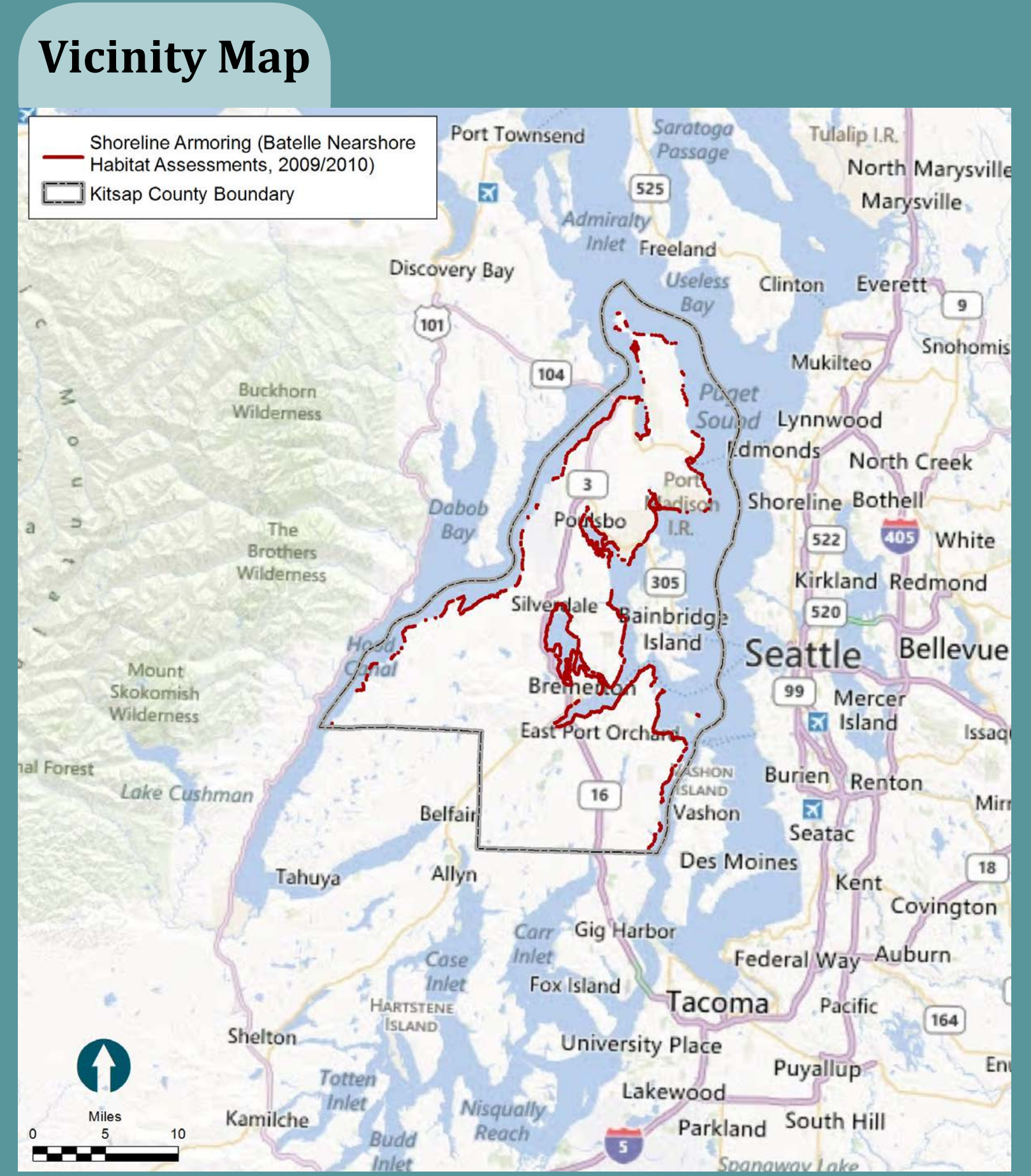


Kitsap County Shoreline Restoration

Sediment Input Mapping, Priority and Feasibility Analysis, and Site Selection

OVERVIEW



Kitsap County, excluding Bainbridge Island, has 205 miles of shoreline, 75 miles (37 percent) of which are armored. This project, focusing on unincorporated Kitsap County, assesses the shoreline for restoration and protection by:

- Inventory sediment input sources to shoreline beaches using existing data
- Rating the suitability for protection/restoration of drift cells and reaches through GIS analysis based on:
 - » potential for input (assuming connectivity between bluff and beach)
 - » existing input (accounting for current condition of disconnection between bluffs and beach due to armoring, structures, etc.)
 - » relative position of source within drift cell
 - » effective wave energy
 - » sediment type
 - » documented forage fish spawning
 - » proximity to accretion landform (e.g., barrier split)
- Evaluating the feasibility of potential restoration sites based on:
 - » suitability rankings combined with willing shoreline landowners location
 - » structure distance from shoreline
 - » on-site evaluation of shoreline and upland processes and potential risks

Although restoration (i.e., bulkhead removal) projects are already taking place on public lands, such as the example provided here at J.A. Anna F. Smith Park, private landowners are critical to overall restoration goals. Including public input and participation in the restoration/protection process is the only guarantee of success.

Wendy Gerstel (360) 754-2409
wendy@qwgappliedgeology.com
www.qwgappliedgeology.com

Paul Schlenger (206) 601-1405
paul.schlenger@confenv.com
www.confenv.com

John Small, Erin Iverson, Betsy Yanasak, Ashley Otherson (206) 287-9130
www.anchorgea.com

Christina Kereki, Patty Charnas, Kathlene Barnhart (360) 337-5777
www.kitsapgov.com

This project was funded in part by a grant from the U.S. Environmental Protection Agency to support local initiatives to identify, prioritize, garner support for, and restore shoreline processes.

INVENTORY

Predominantly Shallow Landslides

- Mapped or photo-identified debris flows, slides, and avalanches, as well as block falls and topples
- Generally occur within narrow zone of the upland immediately adjacent to the shoreline
- Can contribute a few to tens of cubic yards of sediment in any single event

Predominantly Deep-Seated Landslides

- Generally involve a much broader zone of upland
- Can extend inland 0.5 miles or more
- Can contribute tens to hundreds of cubic yards of sediment, with a recurrence interval on the order of decades
- Shallow landslides may be superimposed on deep-seated landslide features

Mixed Shallow and Deep-Seated Landslides

- Composite of landslide types mapped where a combination of landslide processes is evident; either where:
 - » shallow landslides are superimposed on the scarps/toes of deep-seated landslides; or
 - » shoreline reach segments would be too short to break out each landslide type at a practical mapping scale

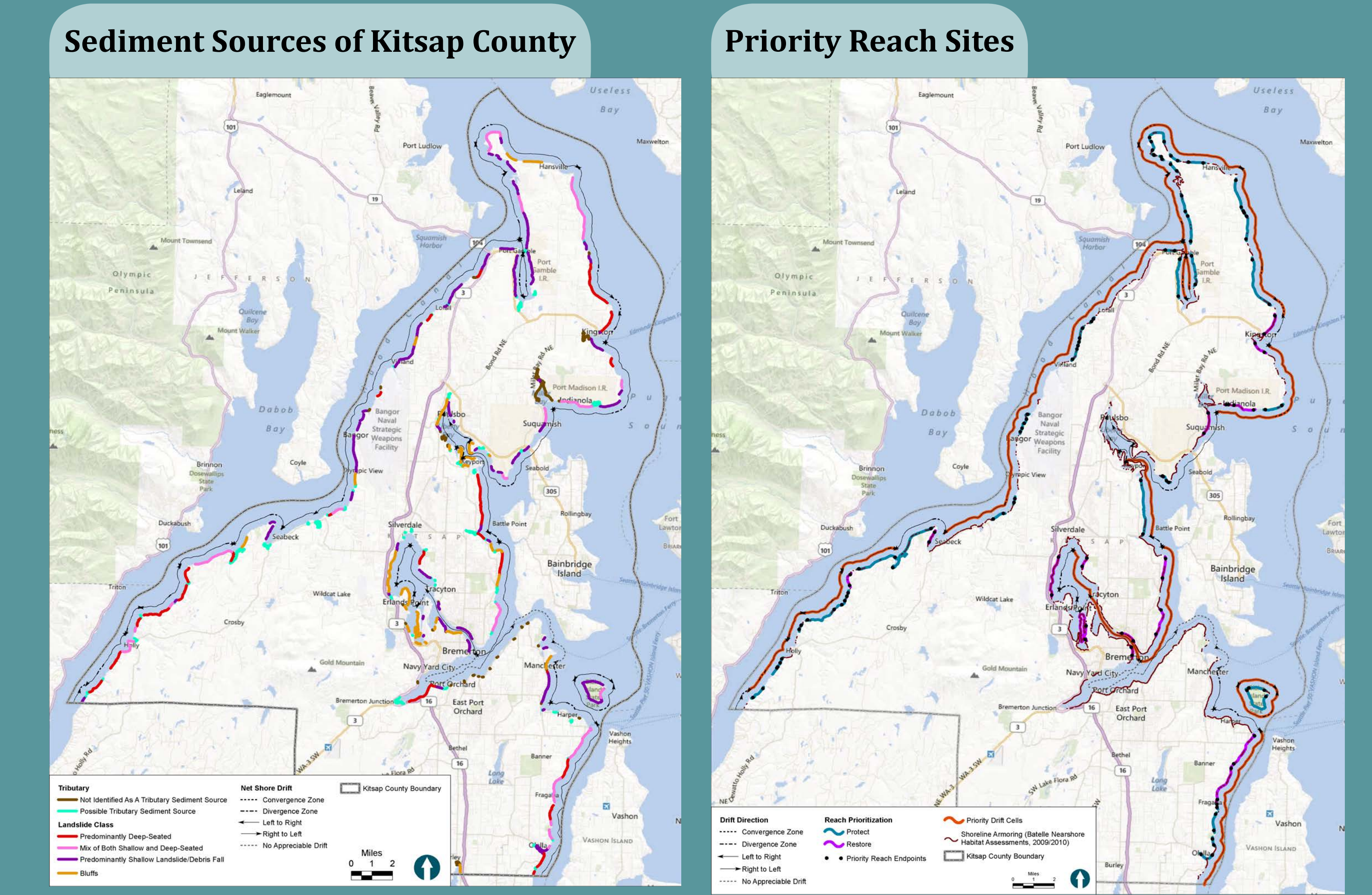
Bluffs

- Defined as "bold, steep, sometimes rounded coastal slopes on which soil and vegetation conceal, or largely conceal the underlying rock formations ..." (Bird 2005)
- Term used to distinguish steep slopes with landslides (and readily available sediment), from those not likely to make significant sediment contributions under current coastal conditions

Tributary Streams

- Can contribute sediment to the nearshore through fluvial processes of suspended and bedload transport from the stream into the nearshore environment where it is subject to shoreline drift processes
- Relative tributary inputs were qualitatively ranked by basin characteristics such as landslide density, morphology, and delta processes

ANALYSIS



The following terminology is listed in order of highest importance to analysis:

Features identify the primary sediment-contributing landforms and the basis for the mapping units.

Attributes describe specific characteristics of features informing relative rate and volume of input, including:

- Bank height and geology (for slopes)
- Relative sediment contribution from tributaries

Modifiers describe either a process or an interruption of a process, and can serve as a proxy for sediment input rates, including:

- Net shore drift and relative wave exposure (natural modifiers)
- Armoring (human modifiers)

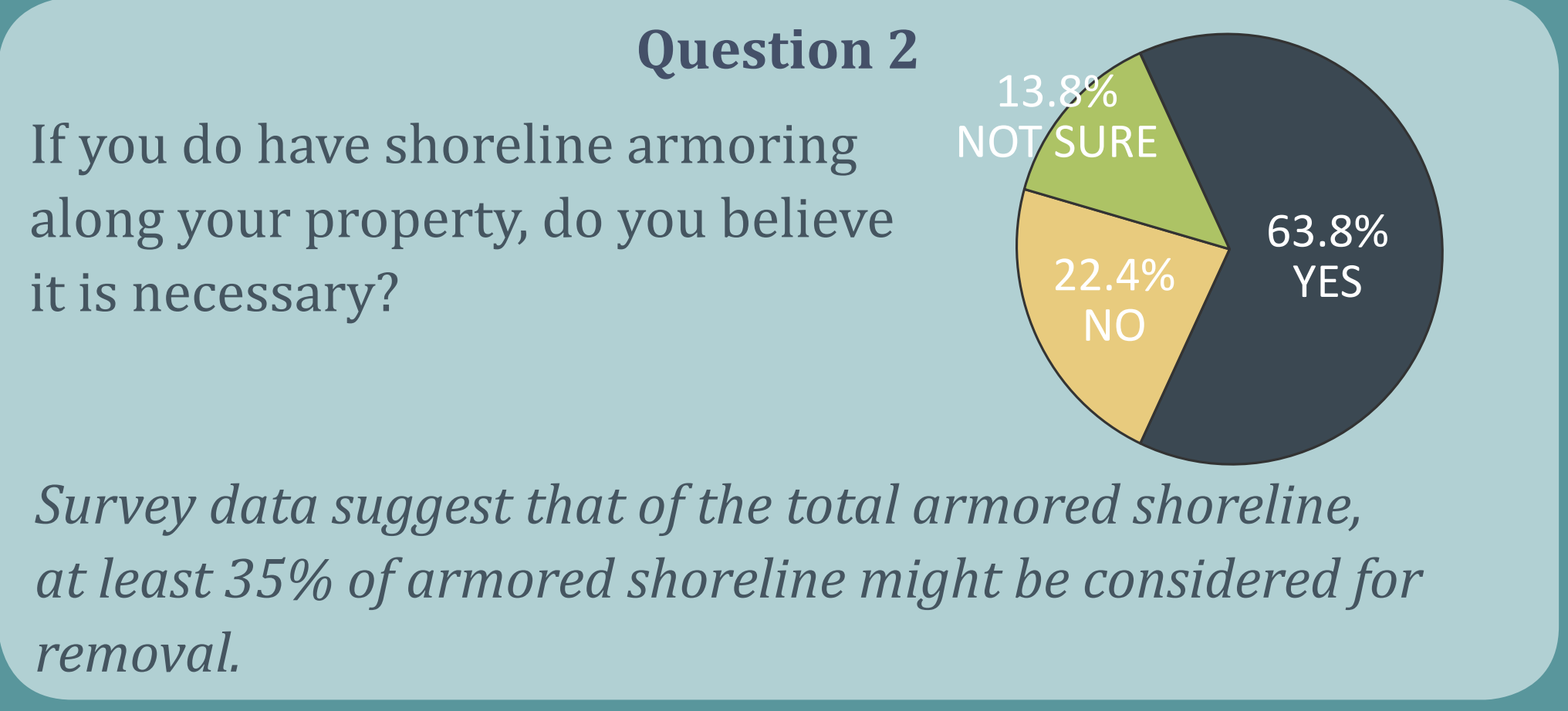
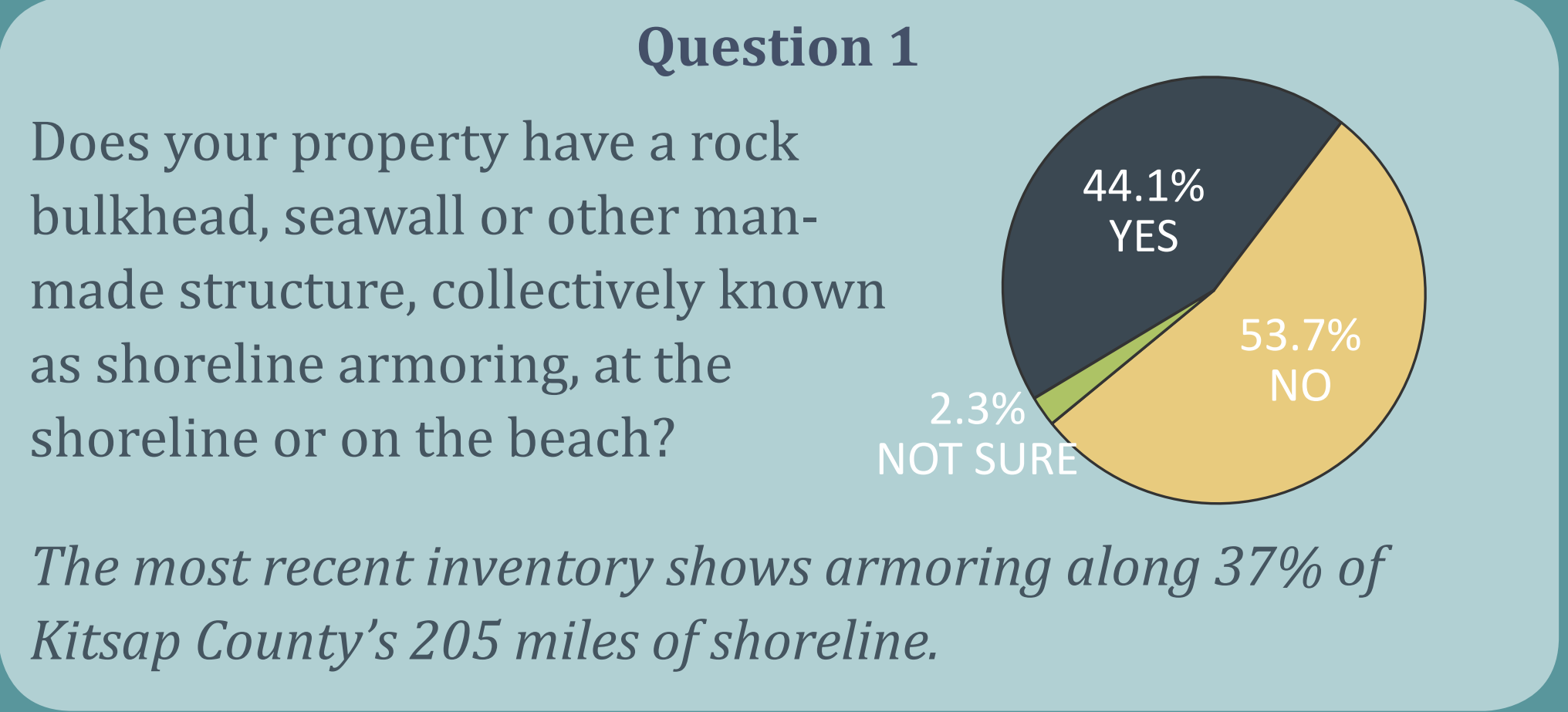
Additional considerations for priority ranking and feasibility include documented forage fish spawning, proximity to accretion landforms, distance to infrastructure to shoreline, and position of sediment source within a drift cell.

LANDOWNER OUTREACH

A Public Input Survey was conducted to:

- Gather information and perspective on issues important to shoreline land owners
- Provide an opportunity for their participation in restoration and protection efforts

The data summarized here includes responses from 172 people. The survey remains open and currently includes 192 responses.



FIRST OPPORTUNITIES



South view of Dyes Inlet shoreline near J.A. & Anna F. Smith Park.

- Key takeaway project messages include:
- Provide technical assistance to identify hazards and mitigation options
 - Improve understanding of and provide examples for "softer" erosion control or avoidance options
 - Need for open discussion on risk sharing
 - Build trust between public and private groups and interests
 - Facilitate opportunities for neighbors to collaborate on restoration opportunities

