



COASTAL POLICY SOLUTIONS

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Richardson Bay Eelgrass Update Fall 2023 – Fall 2024

Presented to: Richardson Bay Regional Agency (RBRA) Board of Directors

Presented by: Rebecca Schwartz Lesberg, Coastal Policy Solutions

Date: January 9, 2025

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Outline

- Orientation
 - Who is Coastal Policy Solutions?
 - What is eelgrass and why are we protecting it?
 - About the RB eelgrass bed
- RBRA's eelgrass-related activities
 - Relevant documents
 - Eelgrass Restoration
 - Eelgrass Damage Surveys
 - Community-science waterbird monitoring
- Q&A



Healthy eelgrass in Central California. Photo: Melissa Ward



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Who is Coastal Policy Solutions?

- Boutique environmental consultancy
- Focus: helping government agencies and non-profits advance conservation projects
- Led by marine scientist Rebecca Schwartz Lesberg
- Woman-owned small business



An underwater photograph showing a dense field of eelgrass. The blades are long, narrow, and green, with some showing signs of wear or damage. The water is clear and blue, with sunlight filtering through, creating a bright and vibrant scene. The eelgrass is growing in a shallow, clear water environment.

What is eelgrass and why are we protecting it?



What is eelgrass and why are we protecting it?

- Seagrass, flowering plant
 - Scientific name: *Zostera marina*
- Underwater meadow
- Shallow bays and estuaries around the world
- Basis of SF Bay ecosystem





What is eelgrass and why are we protecting it?

Benefits to wildlife:

- Basis of food chain and ecosystem
- Habitat for:
 - Seals, porpoises, river otters
 - Dungeness crab, baby fish
 - Migrating birds
- Spawning habitat for herring
 - Last commercial fishery in SF Bay





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What is eelgrass and why are we protecting it?

Benefits to people:

- Fisheries support
- Improves water quality
- Reduces erosion
- Stabilizes shorelines
- Reduces ocean acidification
- Carbon sink

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LOCAL // ENVIRONMENT

Underwater meadows of California seagrass found to reverse symptom of climate change

 **Tara Duggan**
Updated: April 6, 2021 6:01 p.m.

   | 



What is eelgrass and why are we protecting it?

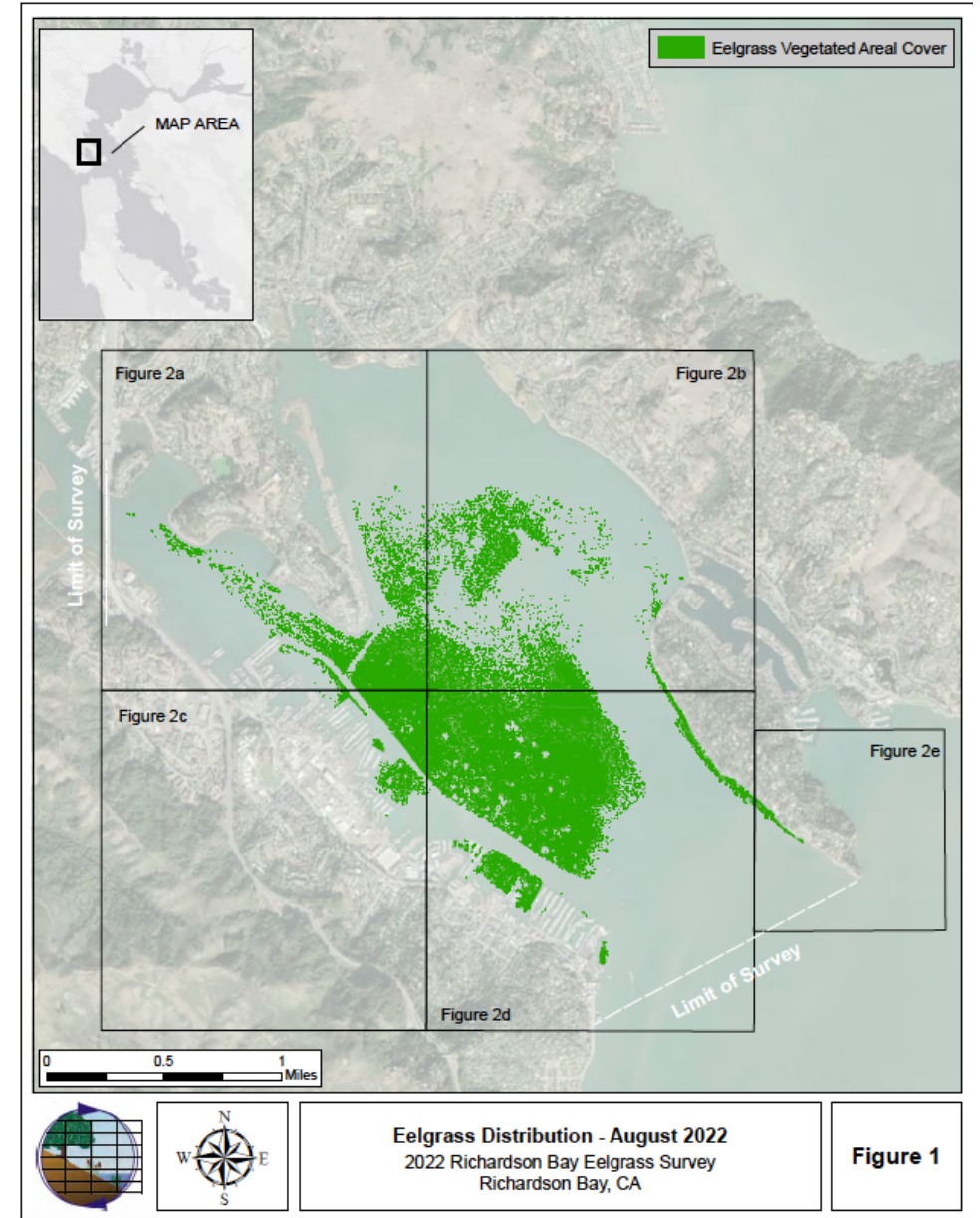
- Worldwide loss – 30,000 acres/year
 - Climate change, coastal development, sediment supply
 - Anchor scour – direct threat
- San Francisco Bay: 1/3 of all CA eelgrass
 - Major loss in early/mid 20th century





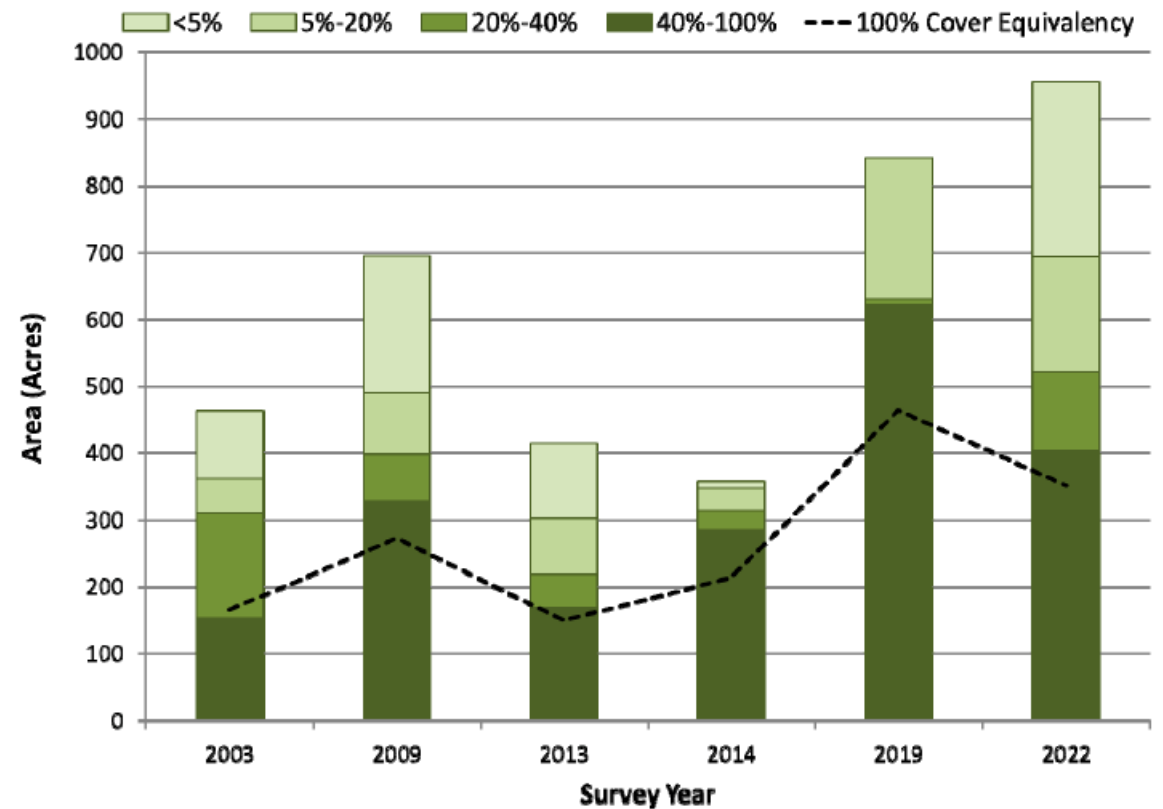
About the RB eelgrass bed

- 2nd largest bed in the SF Bay Area
- Core of bed in central bay
- Present but less dense in shallows (thermal limit/gets too warm)
- Absent from deeper parts of the bay (approx. 5 feet MLLW), consistent with light limits





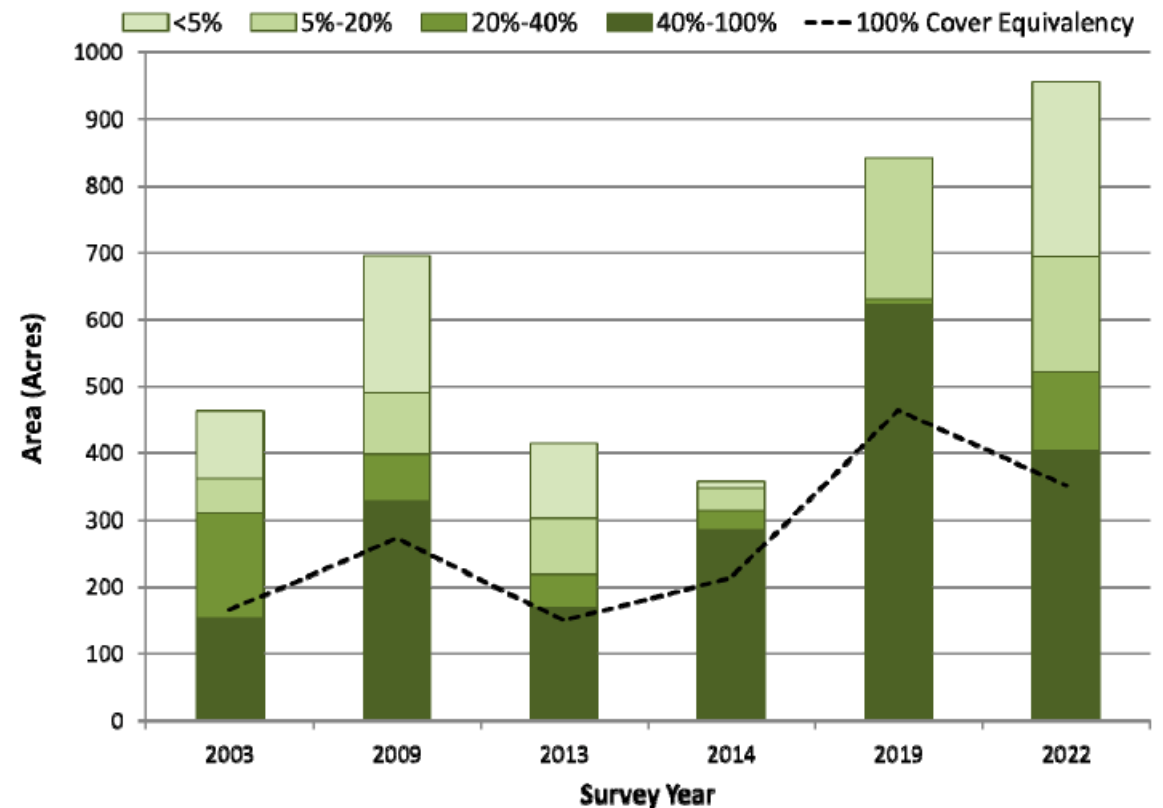
About the RB eelgrass bed – how big is it?





About the RB eelgrass bed – how big is it?

- Variable within and between years
- Most recent measure: 2022
 - ~950 acres across all cover classes
- Biggest size change:
 - 2009 → 2013: lost ~300 acres
 - 25% of loss attributed to anchor scour
 - Remainder of loss: unknown cause (temperature, salinity, sediment)





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About the RB eelgrass bed – is it healthy?

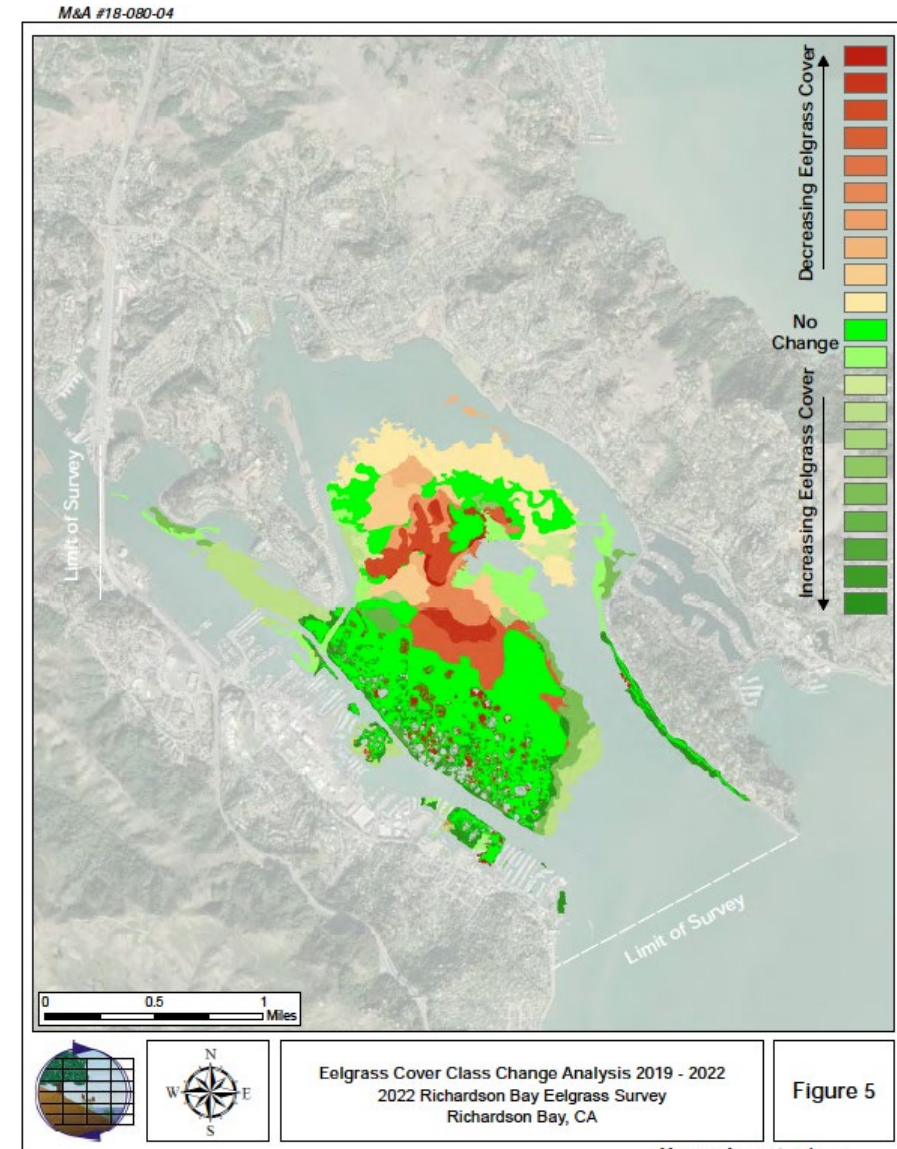


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About the RB eelgrass bed – is it healthy?

- Not a simple yes/no
- Positives:
 - Overall acreage expanding
 - Seeing recovery in vacated anchor scars
 - RB bed possible climate refuge
- Negatives:
 - Evidence of wasting disease
 - Evidence of thermal stress
 - High proportion of bed is in a low cover class (not dense)





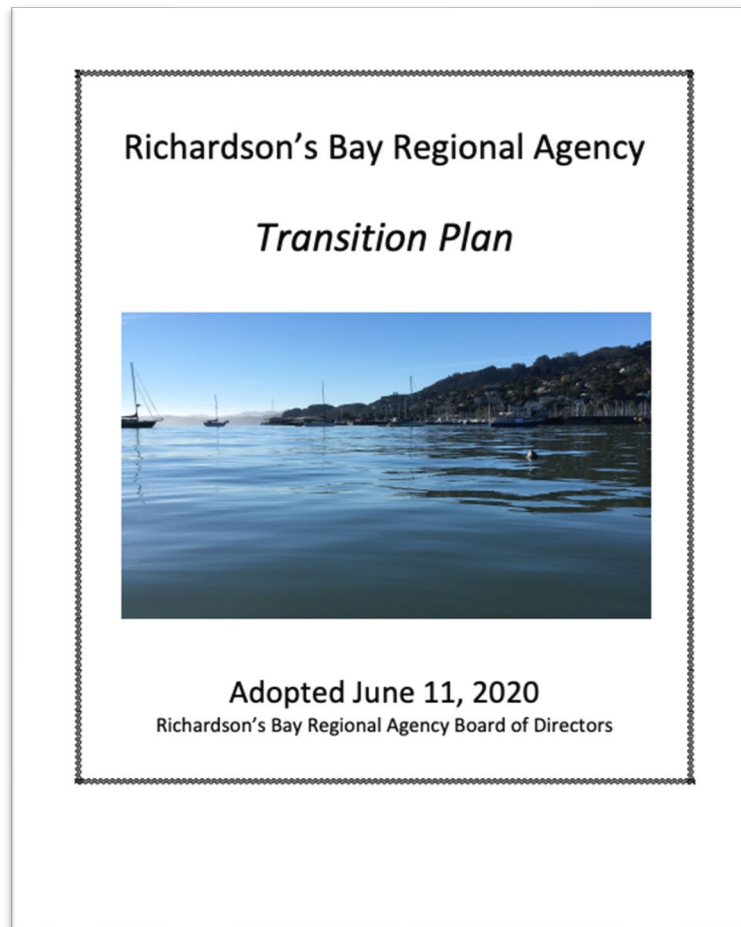
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Relevant documents: 1. Transition Plan



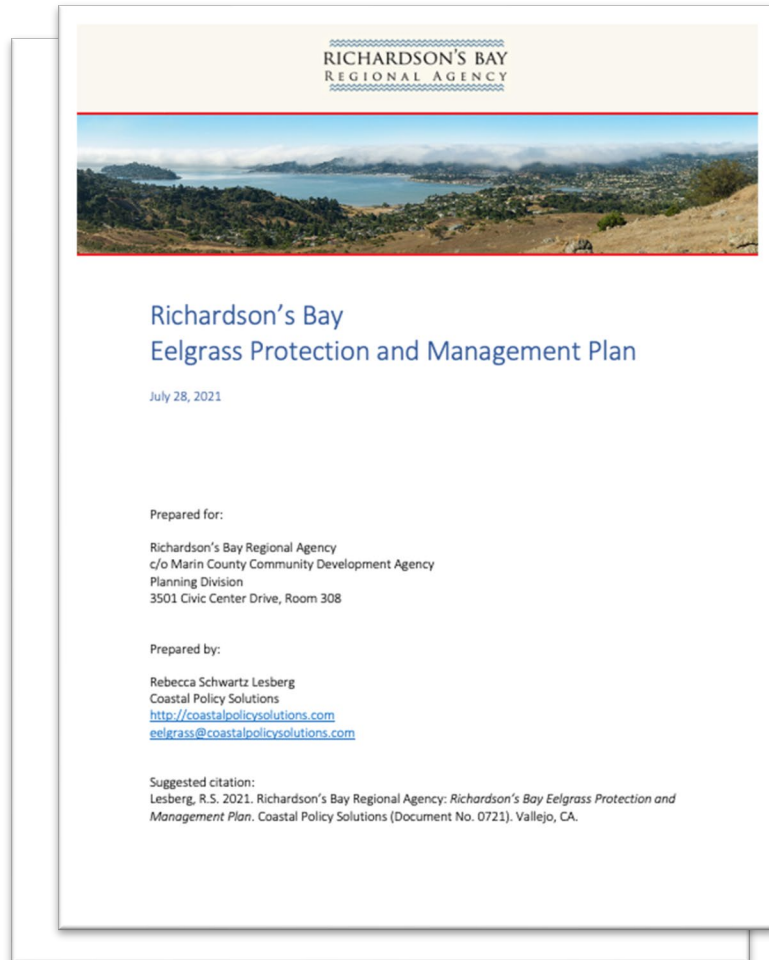
- Transition principle #5:
“Protect and promote eelgrass habitat and growth.”
- Transition policy direction #5:
“Working with agencies, organizations, and other stakeholders, develop eelgrass protection measures and consider specific eelgrass restoration funding and projects.”



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Relevant documents: 2. EPMP

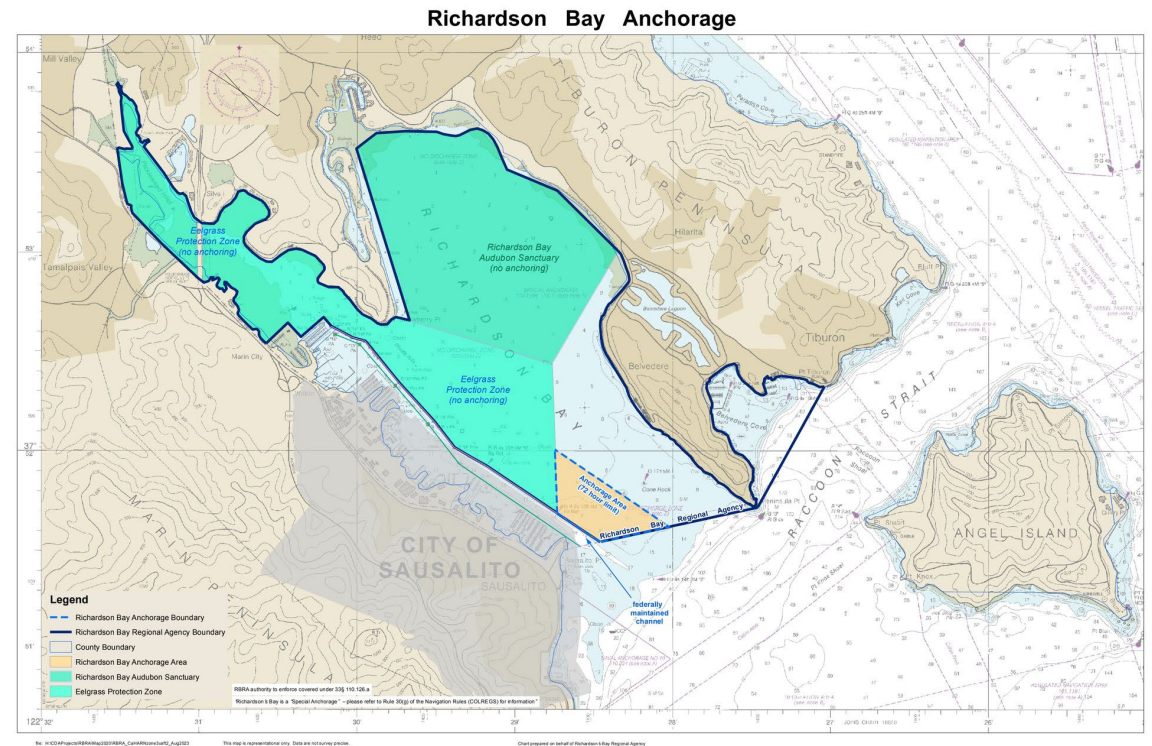


- Goal:
 - Establish boundaries for where anchoring can or cannot occur in Richardson Bay in order to protect eelgrass resources and prevent further damage to the bed from anchor scour.
- Process:
 - Spatial analysis (eelgrass, herring)
 - Policy analysis
 - Stakeholder outreach



Relevant documents: 2. EPMP

- EPMP adopted August 2021, established the EPZ (light teal)
- Anchoring prohibited within EPZ (RBRA Code §3.04.010)
- Only applies to anchoring; all other activities (kayaking, sailing, motoring, fishing, marinas, recreation, etc.) unaffected
- No change to shore access

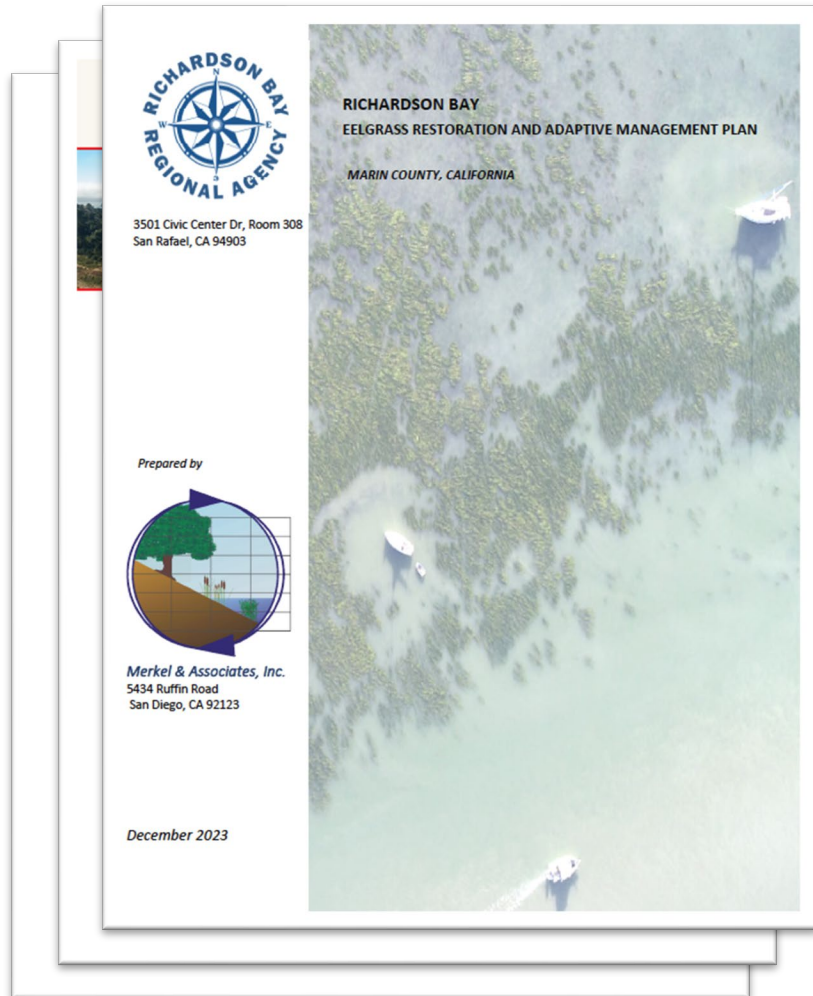




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Relevant documents: 3. RAMP



- 10-year adaptive management plan for eelgrass restoration in RB, including:
 - Pilot restoration
 - Planting methods
 - Restoration site selection
 - Donor site selection
 - Marine debris removal
 - Monitoring
 - Success criteria



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RBRA's eelgrass-related activities

1. Eelgrass Restoration

- \$2.8 million from US EPA San Francisco Bay Water Quality Improvement Fund
 - “Collaboratively Restoring Eelgrass in Richardson Bay to Improve Water Quality and Climate Resilience”
- Awarded to RBRA in May 2023
- Funded through the Bipartisan Infrastructure Law (BIL)



San Francisco Bay Program Office



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RBRA's eelgrass-related activities

1. Eelgrass Restoration

- Public-private partnership:

- San Francisco State University
- Audubon California
- Merkel & Associates
- Coastal Policy Solutions



- Deliverables:

- 15 acres of eelgrass restored over 3 years
- Provide training for early career conservationists from severely disadvantaged communities
- Develop shareable, scalable best-practices for eelgrass restoration in areas of anchor scour



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RBRA's eelgrass-related activities - restoration



Researchers from SFSU planting eelgrass in Richardson Bay. Photo: Kathy Boyer

- EPA-funded restoration activities so far:
Conducted by Merkel & Associates and SFSU
 - Fall 2023: Developed Restoration and Adaptive Management Plan (RAMP)
 - Spring 2024: Habitat surveys and site selection for 2024 planting
 - **Summer 2024: Restored (planted) 6 acres of eelgrass in RB anchor scars**
 - Two planting events: May 7-11, June 21-24
 - Work included: baseline data collection for site planning, donor site survey (CDFW scientific collection permit), active replanting, debris tagging
 - Fall 2024: season review and data analysis



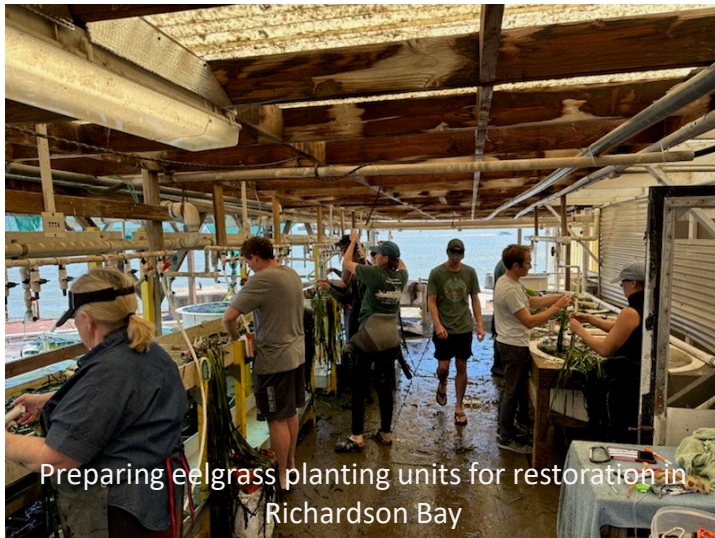
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Harvesting donor eelgrass shoots for restoration.



Preparing eelgrass shoots for replanting.



Preparing eelgrass planting units for restoration in Richardson Bay



Preparing eelgrass planting units for restoration in Richardson Bay

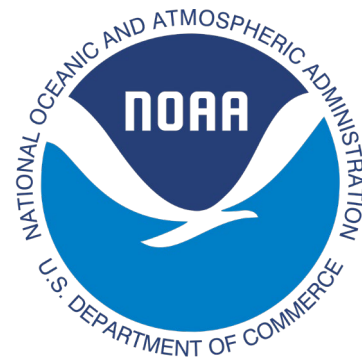


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RBRA's eelgrass-related activities

1. Eelgrass Restoration (SFSU and Merkel & Associates)
2. Eelgrass Damage Surveys (Audubon California)
 - Also funded through EPA grant
 - Previous funders: NOAA Marine Debris Program, CA Ocean Protection Council
 - Annual aerial photography of Richardson Bay since 2017
 - Goal: document and quantify damage from anchor scour and identify evidence of recovery (if applicable)



An aerial photo of Richardson Bay off Sausalito, CA, taken in July 2022

Photo: 111th Group, courtesy Audubon CA



An aerial photo of Richardson Bay off Sausalito, CA, taken in July 2017

Photo: 111th Group, courtesy Audubon CA



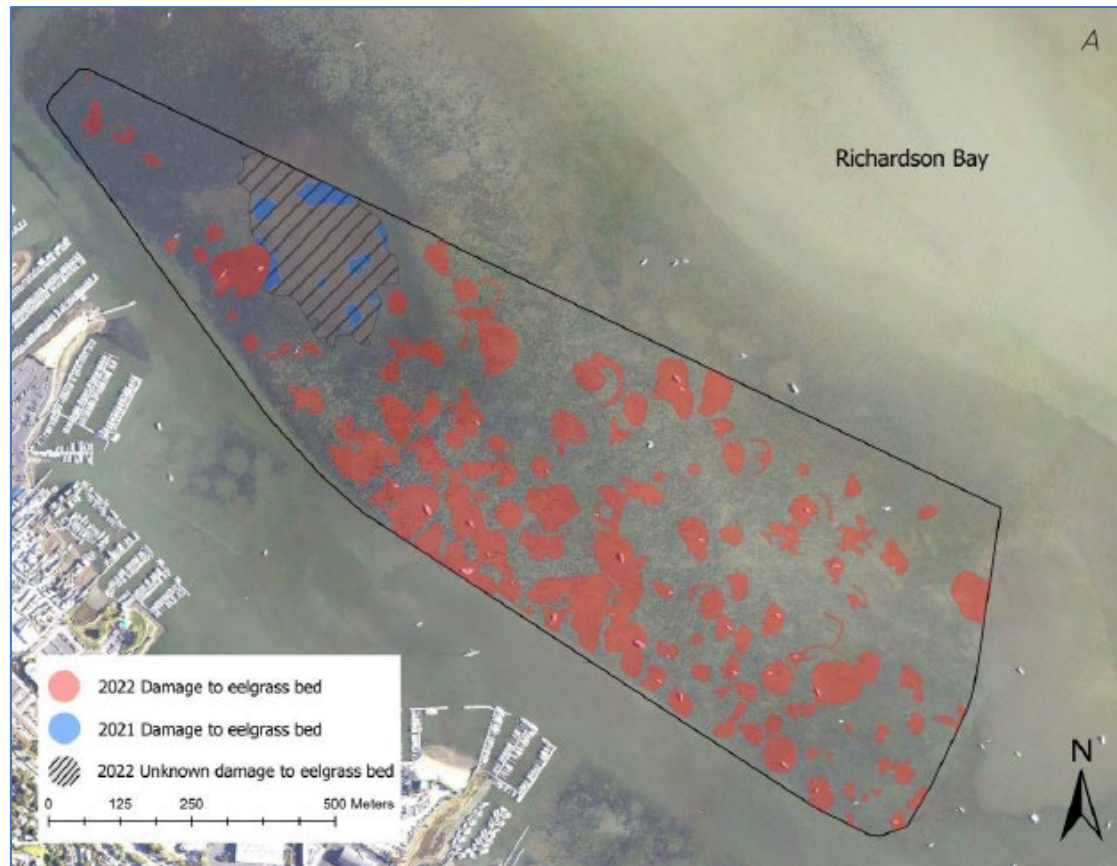
North

400 ft.



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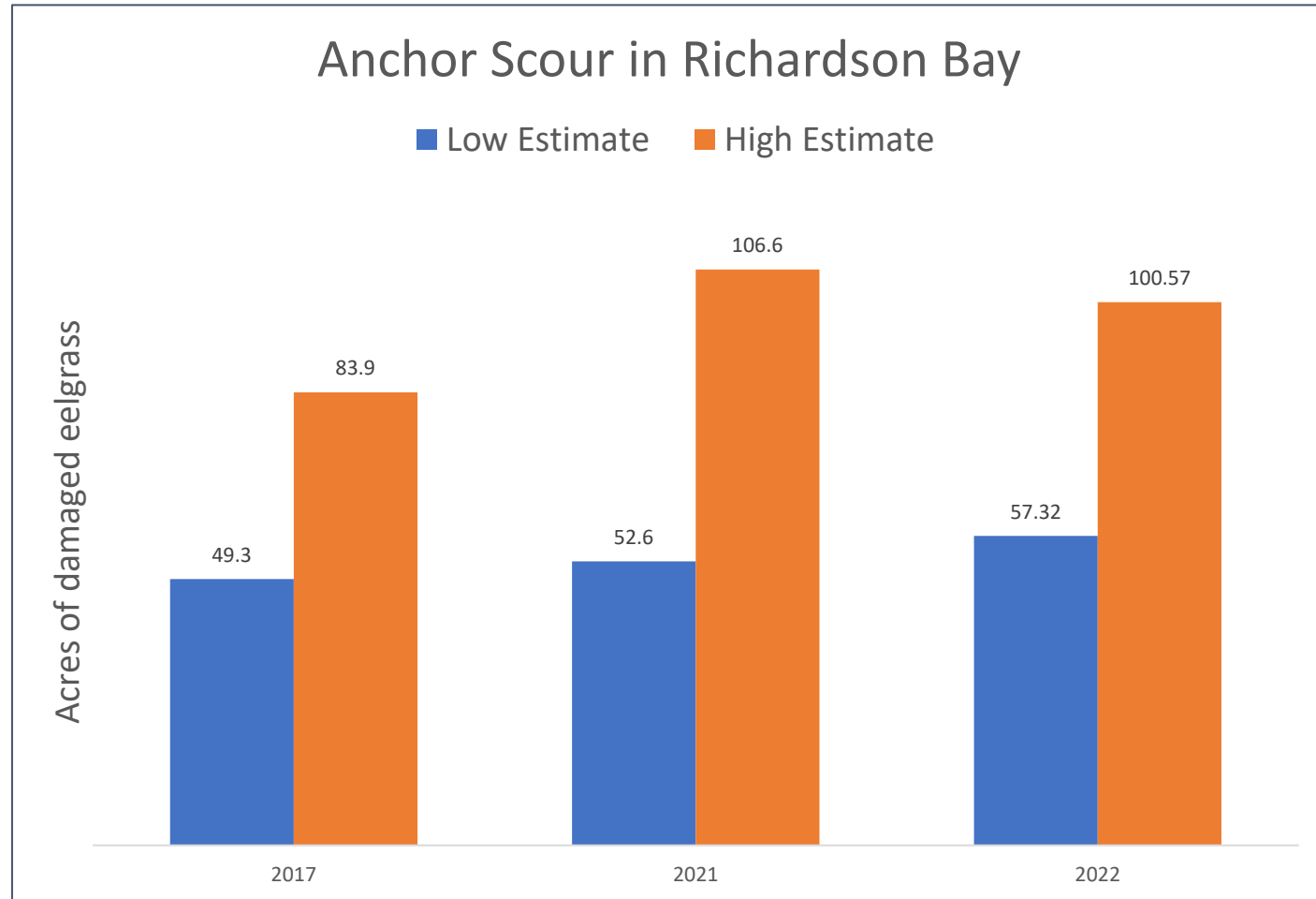


Description: The two images above are aerial photographs of Richardson Bay overlaid with red polygons to show the location and extent of damage to eelgrass from anchor scour, providing both low (left) and high (right) estimates of damage. Images courtesy of Audubon California.



RBRA's eelgrass-related activities

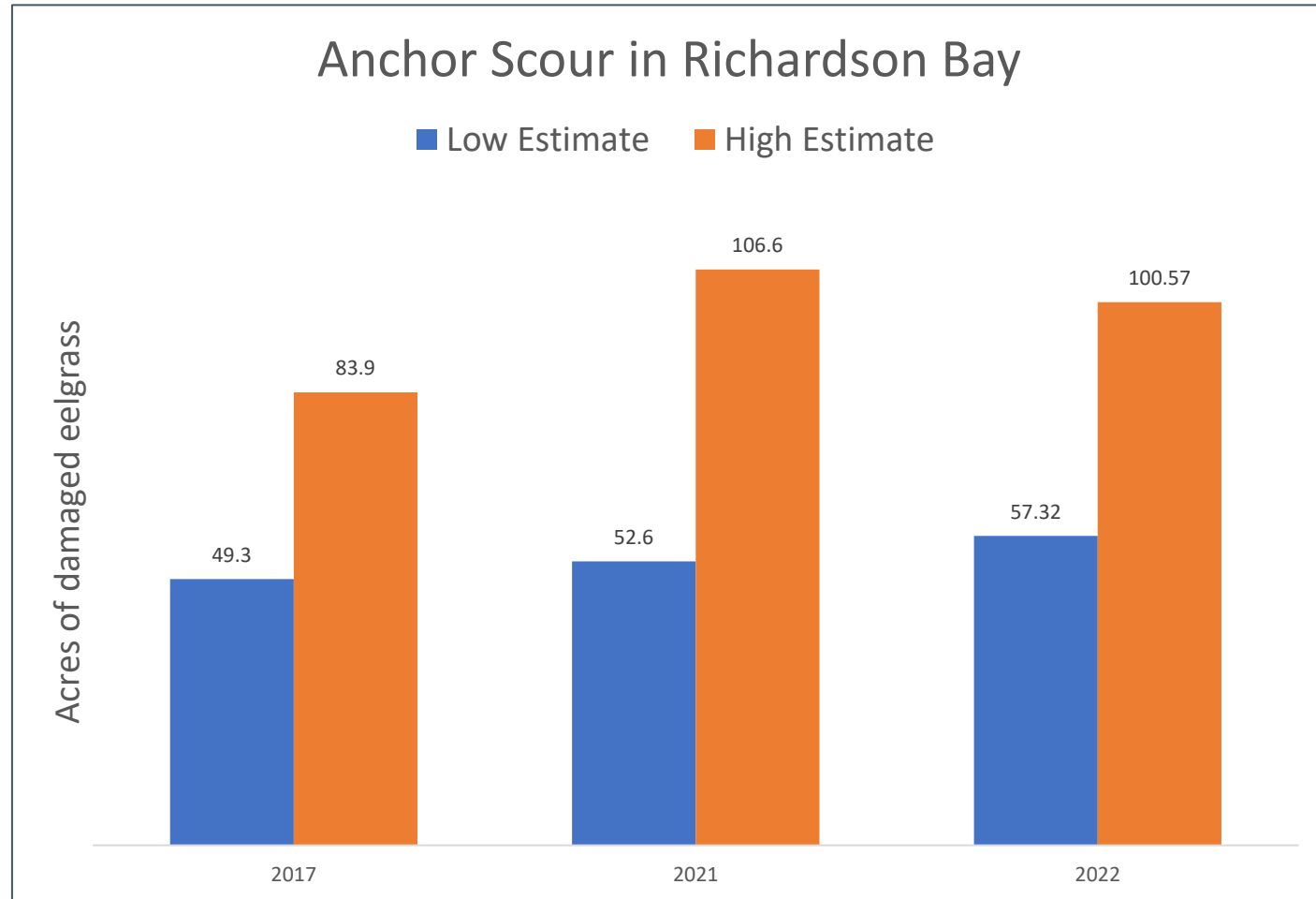
1. Eelgrass Restoration
2. Eelgrass Damage Surveys
 - Damage increased between 2017 and 2021, seems to have plateaued





RBRA's eelgrass-related activities

1. Eelgrass Restoration
2. Eelgrass Damage Surveys
 - Damage increased between 2017 and 2021, seems to have plateaued
 - 2023 and 2024: no survey possible due to algae cover



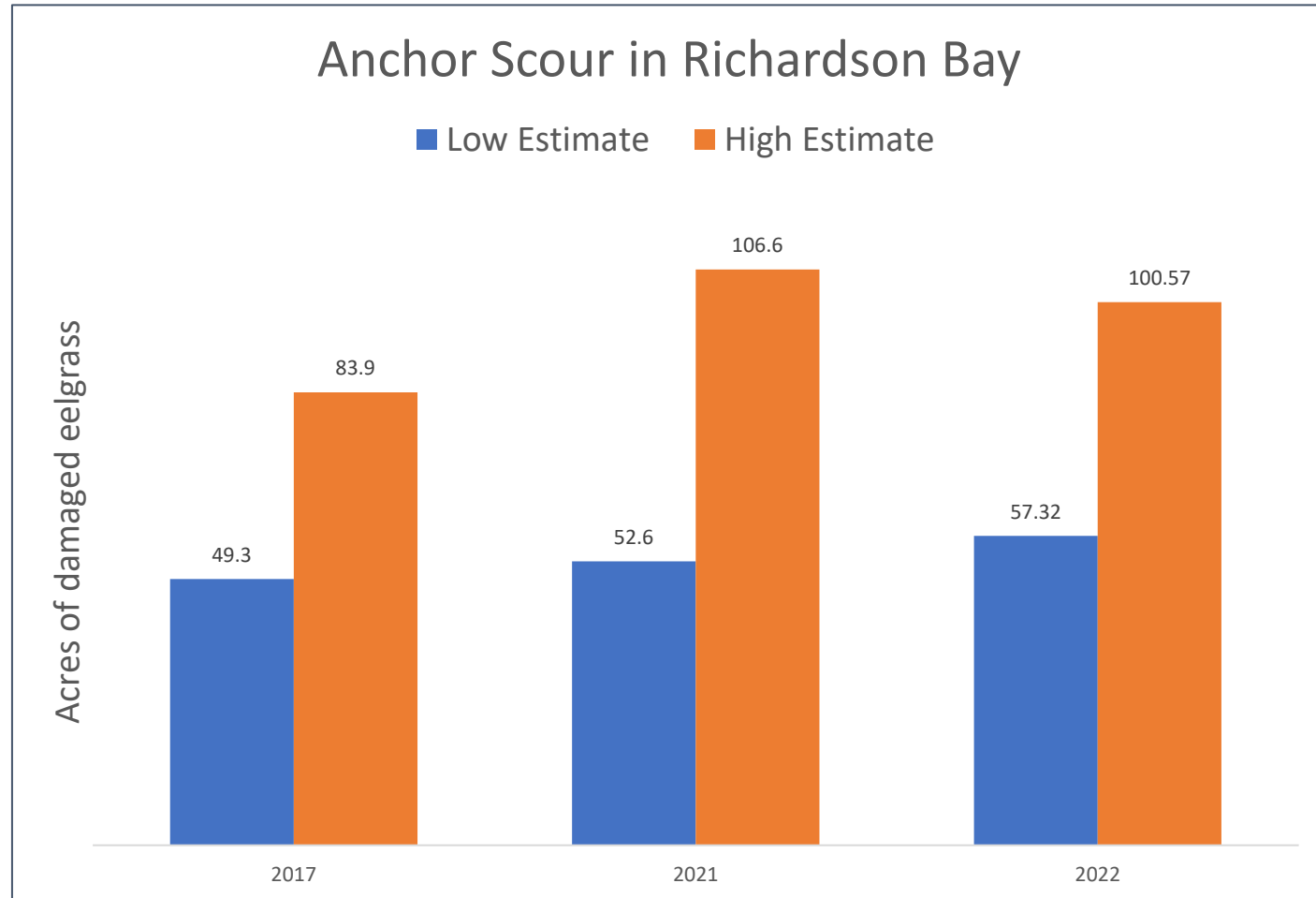


2023 & 2024 Surveys:
Full assessment not possible due to macroalgal
mat obscuring the eelgrass bed from view



RBRA's eelgrass-related activities

1. Eelgrass Restoration
2. Eelgrass Damage Surveys
 - Damage increased between 2017 and 2021, seems to have plateaued
 - 2023 and 2024: no survey possible due to algae cover
 - Evidence of Recovery:
 - When boats are removed scars show signs of recovery (crop circles become less well defined)
 - When boats persist, so do scars

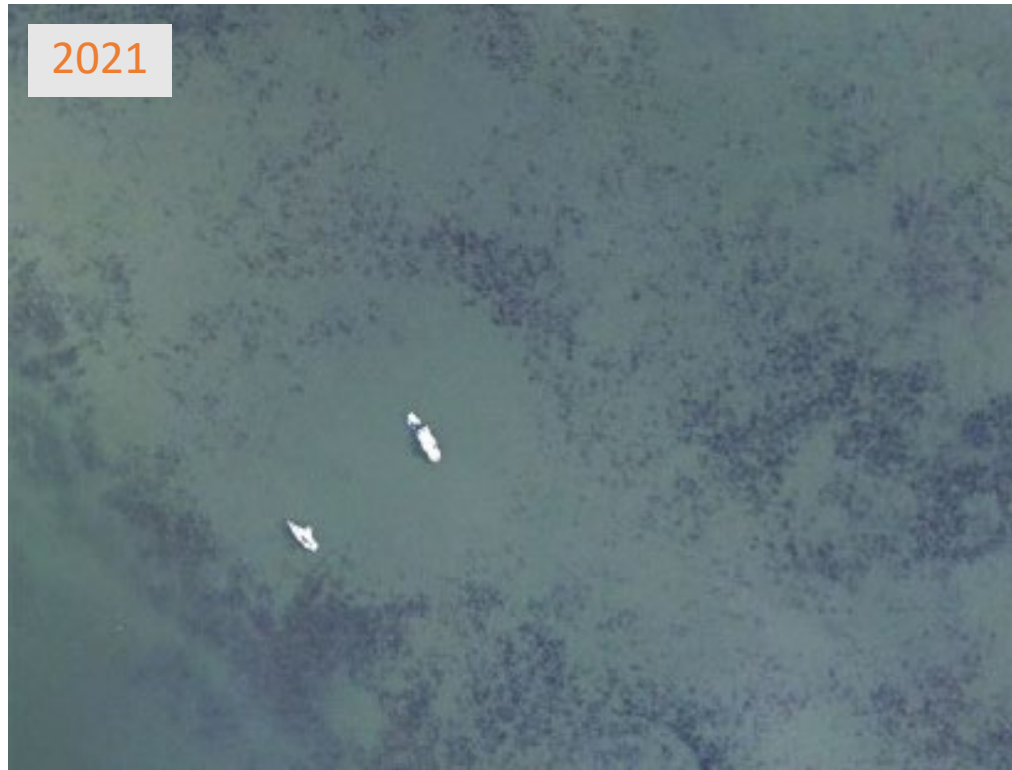




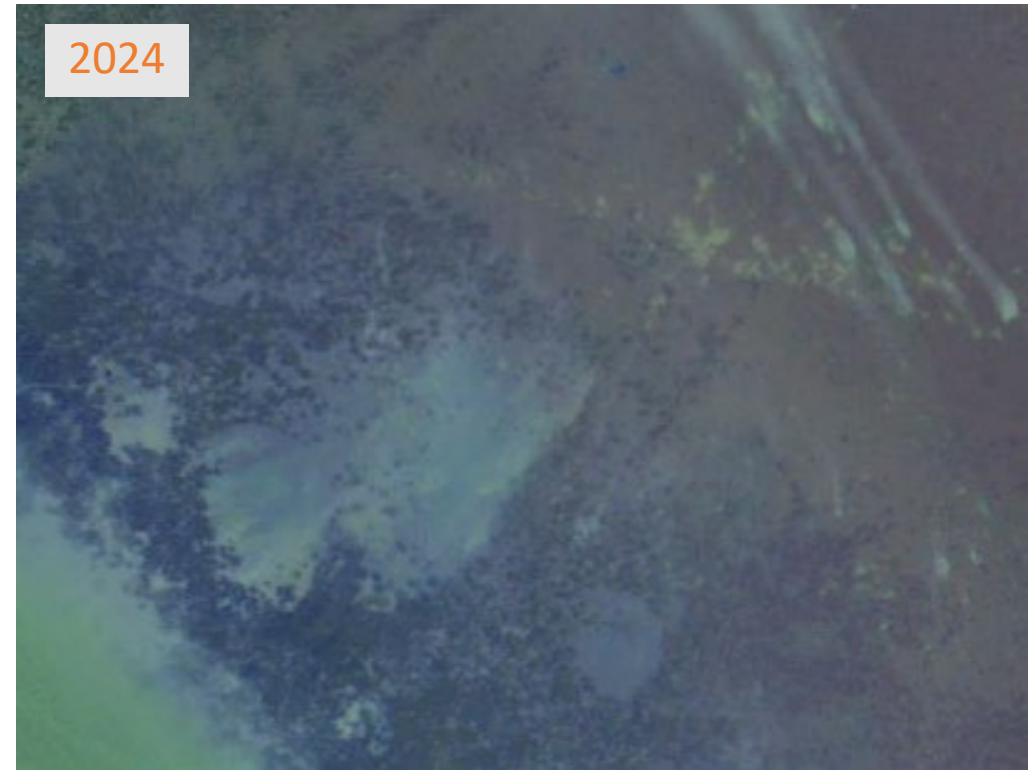
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Scar Recovery



2021



2024

Description: The two images above are aerial photographs of the same spot in Richardson Bay in 2021 (left) and again in 2024 (right). In the 2021 image, two boats are present with clearly defined anchor scars (also called “crop circles”) beneath them where eelgrass had been removed by ground tackle. In the image on the right, the boats have been removed and the eelgrass shows signs of recovery. Images courtesy of Audubon California.



Scar Recovery and Persistence



Description: The two images above are aerial photographs of the same spot in Richardson Bay in 2021 (left) and again in 2024 (right). In the two images, some scars show evidence of recovery when a vessel has moved (green circles) but new scars in the location where the boat has relocated to (red circles). In other cases, persistent damage is visible when boats persist in the same location (yellow circles). Images courtesy of Audubon California.



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RBRA's eelgrass-related activities

1. Eelgrass Restoration (SFSU and Merkel & Associates)
2. Eelgrass Damage Surveys (Audubon California)
3. Community-science waterbird monitoring





Goal of drone monitoring:
Where are birds rafting in Richardson Bay?
(Rafts = groups of up to 10,000 birds resting on the water's surface)



Why ask that question?

Tells us how management actions may be affecting target species.



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Waterbirds Rafting in Richardson Bay
Photo: Paige Fernandez



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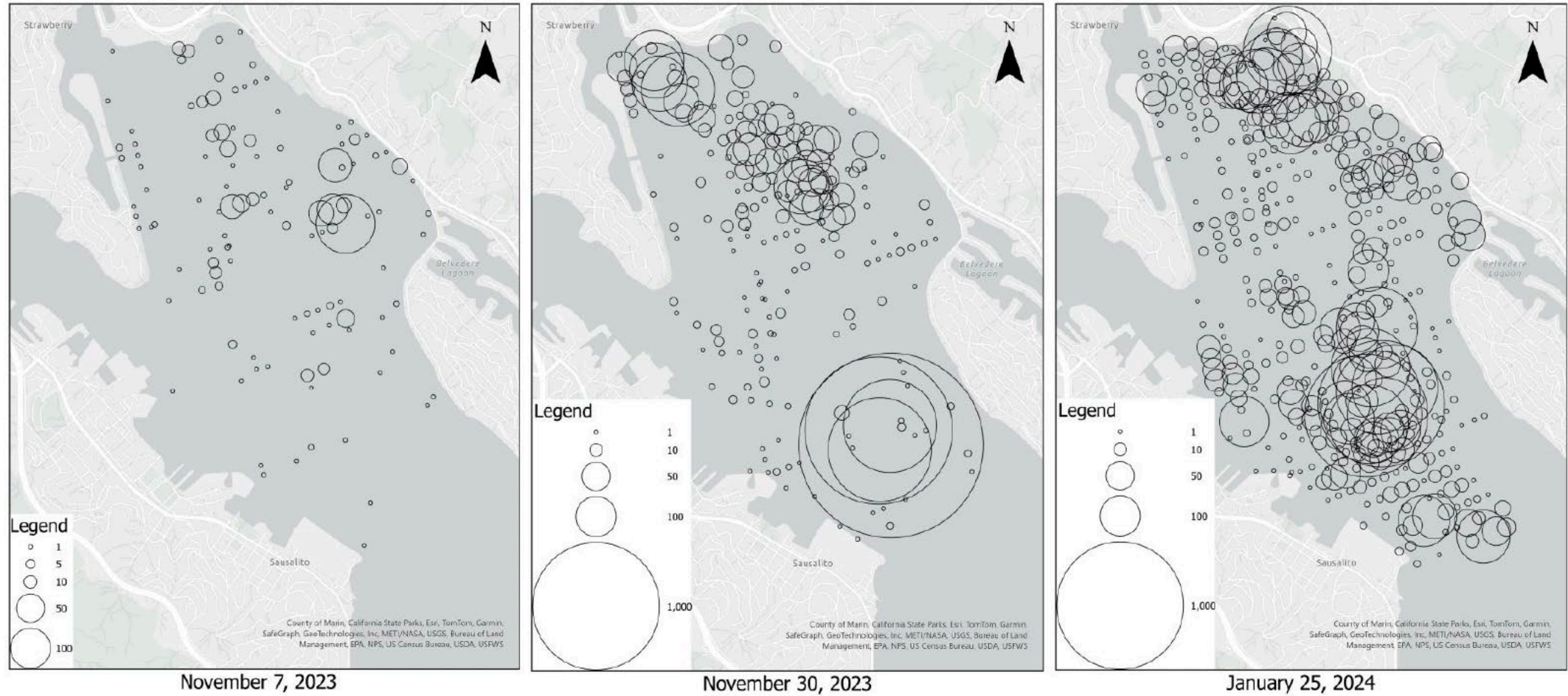


Figure 6a: Rafting waterbirds in Richardson Bay across 2023-2024 survey period. Concentric circle sizes correspond to number of waterbirds counted within each whole or partial raft. Please note, each varying legends on each survey. Areas without circles indicate an image where no birds were observed.



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RBRA's eelgrass-related activities

1. Eelgrass Restoration (SFSU and Merkel & Associates)
2. Eelgrass Damage Surveys (Audubon California)
3. Community-science waterbird monitoring
 - Upcoming paper



Quantifying waterbird activity and habitat use in Richardson Bay during winter migrations, 2006-2023

Prepared by:
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Lead Scientist, Thriving Oceans Collective
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In collaboration with:
Rebecca Schwartz Lesberg, Coastal Policy Solutions
Paige Fernandez, Audubon California
Casey Skinner, Audubon California



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RBRA's eelgrass-related activities

1. Eelgrass Restoration (SFSU and Merkel & Associates)
2. Eelgrass Damage Surveys (Audubon California)
3. Community-science waterbird monitoring
4. Outreach



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RBRA staff and consultants conducting outreach at Galilee Harbor's Mariner's Day on August 3, 2024





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Supporters gathered on October 30, 2024, to celebrate the launch of Richardson Bay's Eelgrass Protection Zone



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*Audubon Youth Leaders (AYL) birding during winter waterbird season at Richardson Bay.
Photo credit: Audubon CA*





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Questions?

