



# Enhancing Restored Marsh-Upland Transition Zones: Examples from SF Estuary Invasive Spartina Project



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Wetland Migration  
Workshop  
September 18, 2023



# Invasive Spartina Project

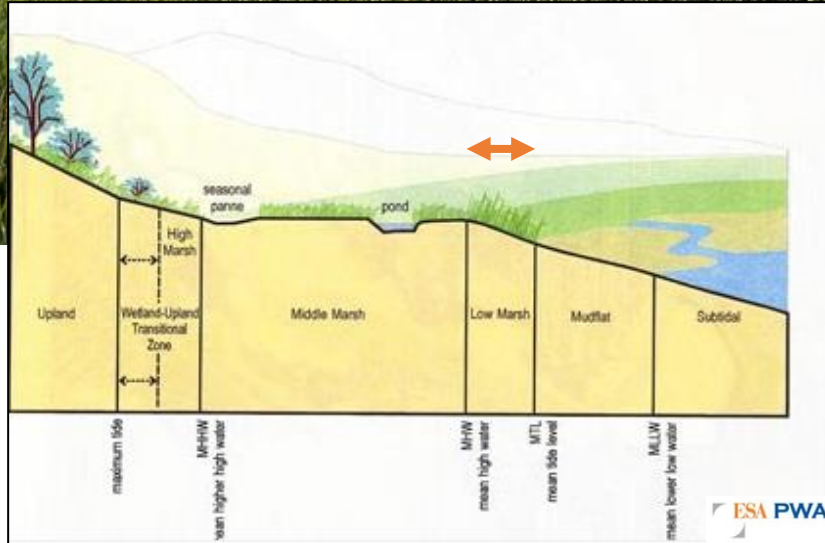


Established “to protect and improve natural lands and waterways, to help people get to and enjoy the outdoors, and to sustain local economies along **California's coast.**”



“Working with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.”

# Native Pacific Cordgrass *Spartina foliosa*



# ISP Restoration Program

Supports inventory/treatment of invasive *Spartina*

13 years: 2011-ongoing

Bay-wide scale

Focus on critical components of rail habitat: cover from predators for foraging, nesting, **high tide refuge**

Rapid enhancement



# Habitat Enhancements

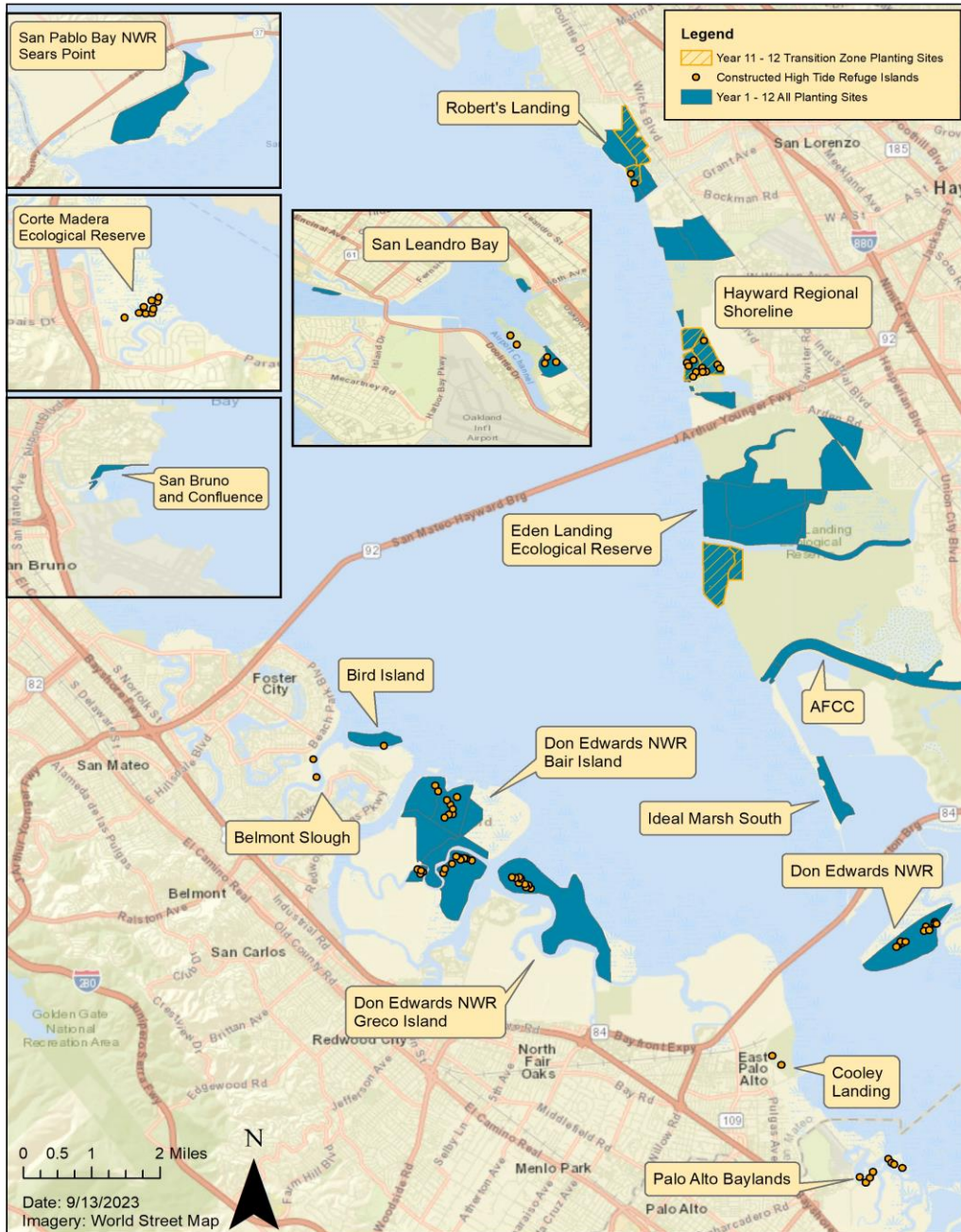
Program: 40+ sites, 500k+ plantings

Low marsh: Pacific cordgrass (*Spartina foliosa*)

Mid- to high marsh: marsh gumplant (*Grindelia stricta*)

High tide refuge:

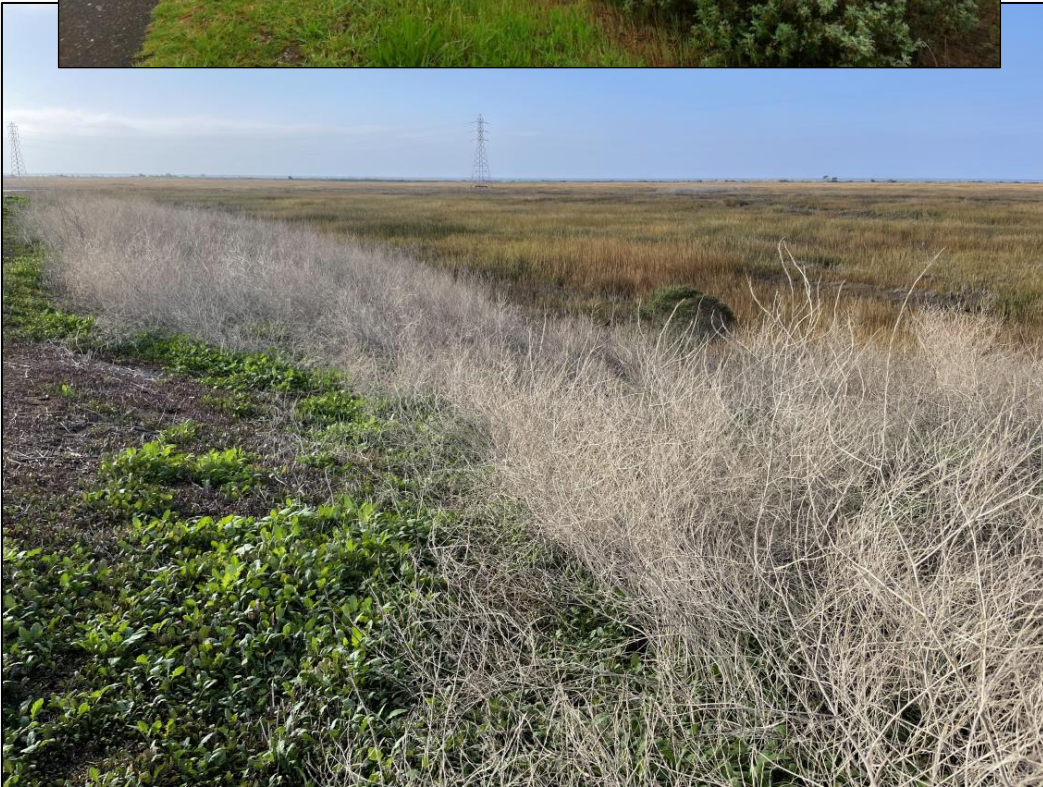
- Planted T-zones at 6 sites, ~23K plants
- Constructed 82 high tide refuge islands at 16 sites (H.T. Harvey & Associates)



# T-zone Site Selection

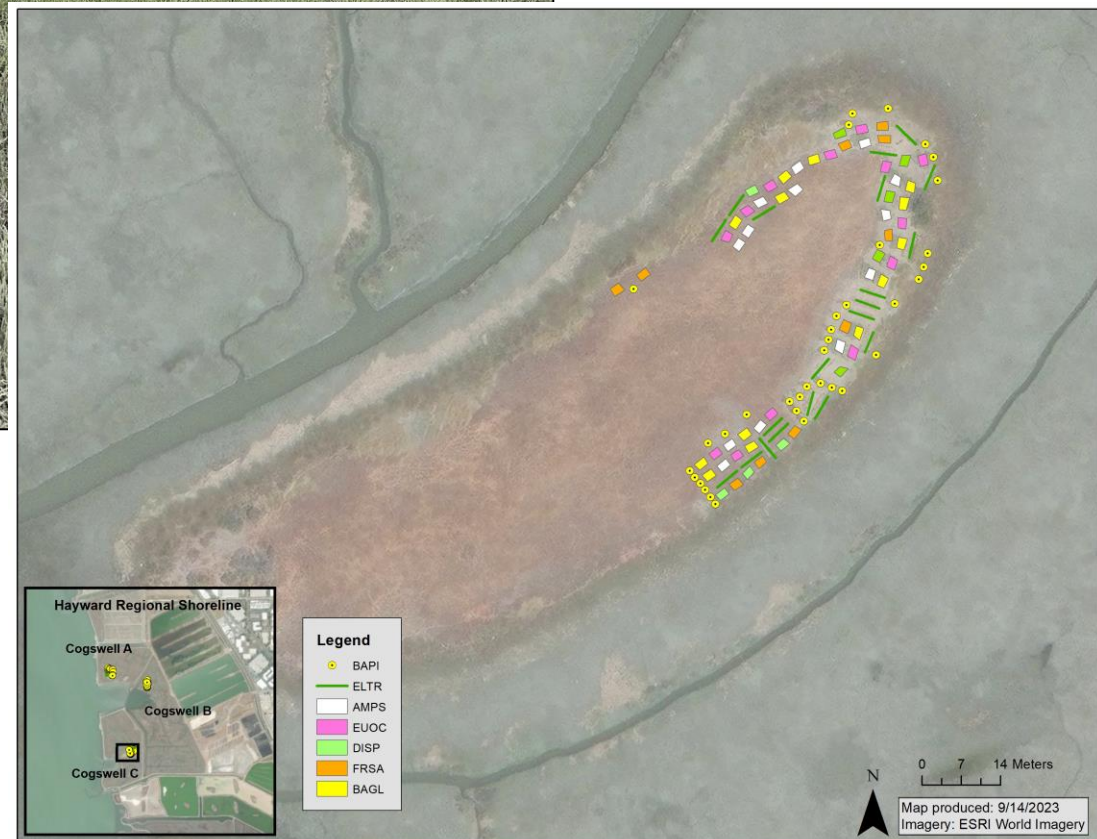
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- Goal – **functional native habitat** for California Ridgway's rail and other wildlife
- Focus on critical components of rail habitat: cover from predators for foraging, nesting, **high tide refuge**
- Focus on sites with impacts from invasive Spartina removal – habitat loss
- **Older Restoration sites** – levee edges, constructed features (“islands”), and other constructed T-zones
- Complement other org efforts (focus on difficult to access or not suitable for volunteers)





“Island” at Cogswell C, Hayward Regional Shoreline





Ensuring a Resilient Tidal Marsh Ecosystem through Healthy Upland Transition Zones: Assessment and Recommendations

In Partnership with



Contact: Julian Wood [jwood@pointblue.org](mailto:jwood@pointblue.org)

The following field-tested protocols, monitoring framework, restoration recommendations, and project reports will help restoration practitioners and scientists evaluate transition zone habitat and refine restoration practices that maximize the benefits of wetland-upland transition zone habitat to birds. Visit the links below to download the products. More information about the project- summary, background, and goals is provided below.

# How Enhance Older Restoration T-zones?



The screenshot shows a webpage titled "Competitive Planting" under the heading "Methods for Managing Weeds in Wetlands: Non-chemical Control". It includes sections for "On This Page", "Overview", "How to Use", "Special Tips", "Optimal Conditions for Use", "Caveats", "Potential Hazards to Humans, Environment, and Cultural Resources", "Consider Combining with the Following Non-Chemical Methods", "Don't Use This Technique Where/For", "References", "Supplementary Information", "Authors and Credits", and "Efficacy". The "Overview" section explains that competitive planting involves planting native plants or otherwise desirable plant species to compete with weeds, reduce their abundance, and eventually displace them. It notes that this technique is most effective when used in conjunction with other weed management practices.

## T-zone Restoration Recommendations for Tidal Marsh Birds

- Dense vegetation: at least 15% of area covered in dense veg (>30cm from ground)
- Tall plants: 50-100cm, associated with increasing RIRA populations
- Wider transition zones: >25m wide good for tidal marsh bird population growth
- Steep levees have benefits: wide better but no negative effect of steep sloped T-zone
- Multiple species
- Grasses can be beneficial

Existing T-zone vegetation = primarily annual WEEDS

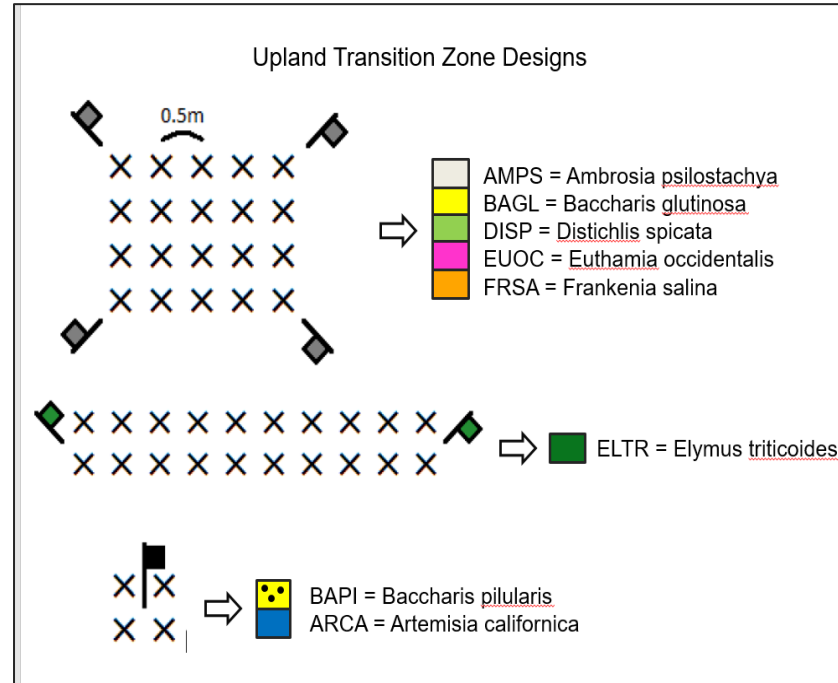
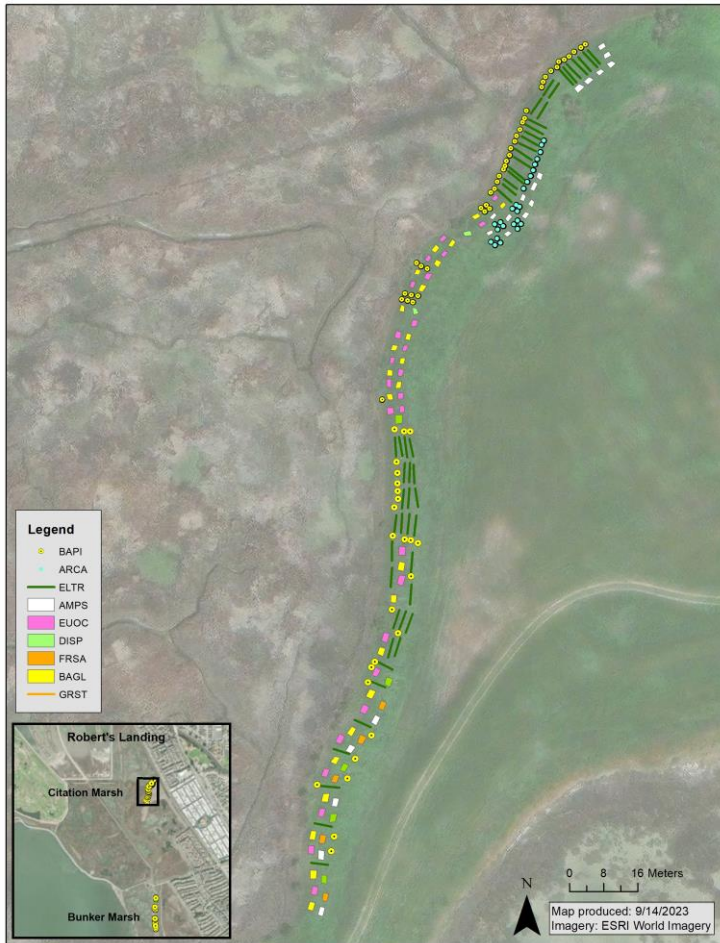
Use competitive planting to help reduce weeds:

- Hardy, salt tolerant, “weedy” natives
- Rhizomatous perennial forbs and grasses
- Dense planting designs
- Container plants





# T-zone Planting Designs



Design: dense, single species “clusters” of tall and/or “spreading” perennials

Species to date:

- Western goldenrod – rhizomatous
- Western ragweed – rhizomatous
- Marsh baccharis – rhizomatous
- Alkali heath – rhizomatous
- Salt grass – rhizomatous
- Creeping wild rye grass – rhizomatous
- Coyote brush – shrub
- CA sagebrush - shrub



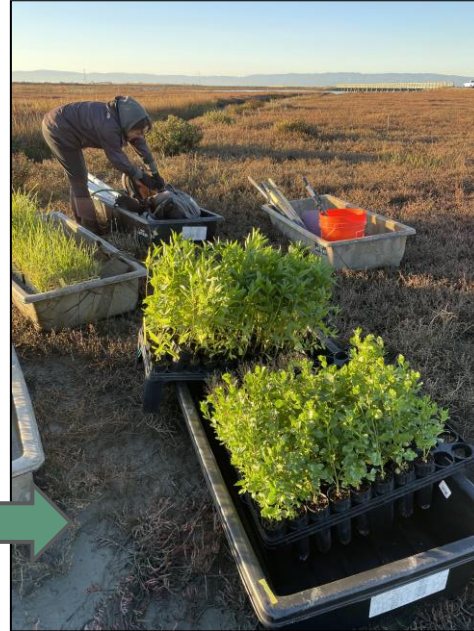
# Planting Process



April - Jan  
Propagation to final plant  
delivery at sites



Nov - Jan  
Site prep and GTing



Nov - Jan  
Planting by contractors



Feb - May  
Targeted weeding, treat "edges"



Aug - Oct  
Monitoring

Dec - June  
Watering when needed, dry  
years = 2x month



# Site Prep and Maintenance – mow/treat/plant/weed...

Before enhancement



Mowed and planted



Constraints – endangered species habitat (SMHM RIRA)

- Trained biologists monitor activities, clear areas before work
- Timing – mowing/planting outside RIRA breeding season (before Feb 1)
- Access adjacent or through RIRA breeding habitat - limits on activities during breeding season (Feb 1 – Aug 31)
- Access – many sites difficult during wet weather

# Site Maintenance: weeding...

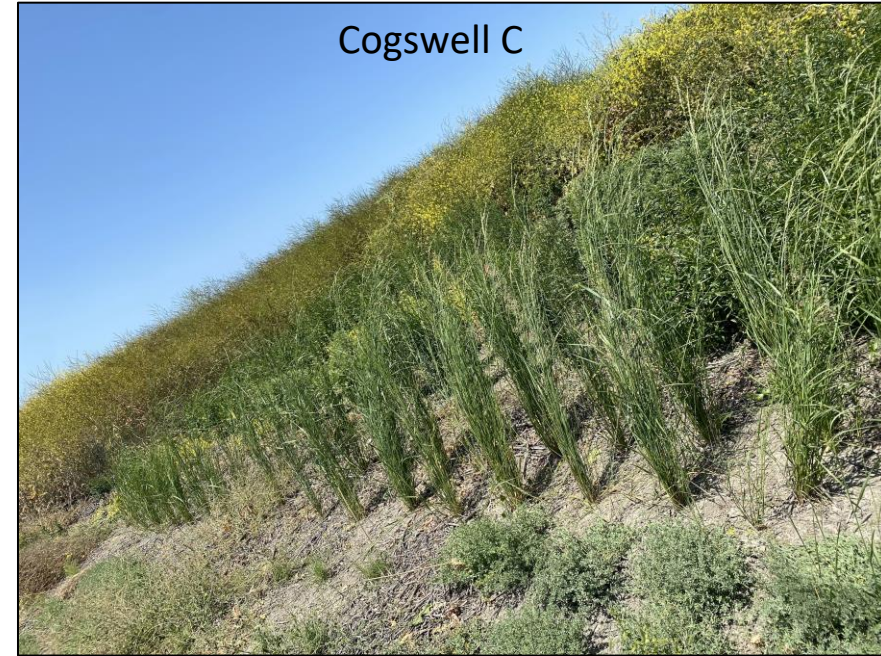
Citation Marsh



Cogswell A



Cogswell C



Citation Marsh



Citation Marsh



Cogswell A

21-22 planted areas  
AFTER weeding in May/June 2023



Cogswell C



## Site Maintenance – watering as needed



Watering: only first spring after planting, 2x month ending June 30

Constraints: endangered species habitat (SMHM RIRA)

- Access - through or adjacent to RIRA breeding habitat, limits on activities during breeding season (Feb 1 – Aug 31)
- Monitoring - trained biologists monitor watering
- Timing – no watering after June 30 (mimics more natural conditions and protective of breeding RIRA)



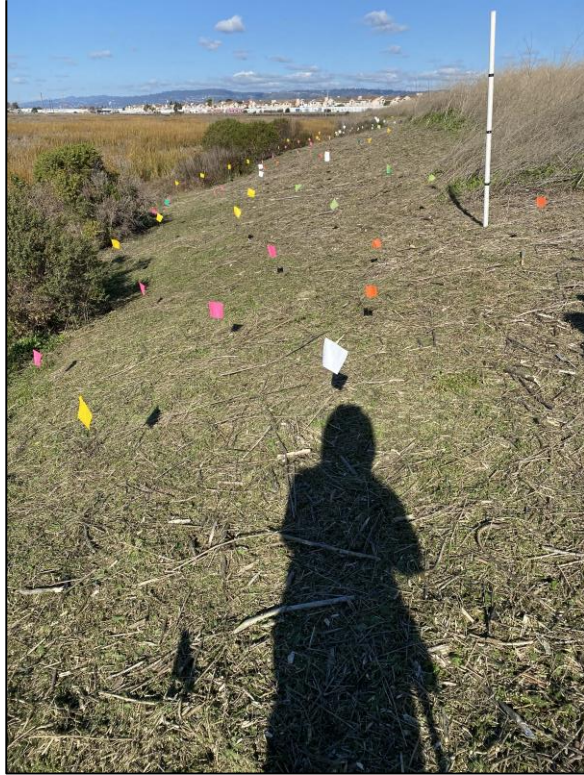
## Cogswell A

Creeping wild rye (*Elymus triticoides*)



Competitive planting success?

- 24 plugs planted in 2012-13
- no weeding, no watering



Citation 20dPP10  
Jan 2022



Sept 2022



Sept 2023

## Monitoring Results



Cogswell B 20nPP20  
Jan 2023



Sept 2023





Bunker 20gPP07  
Jan 2022



Bunker 20gPP07  
Oct 2022



Bunker 20gPP07  
Sept 2023

Cogswell C 20oPP26  
Dec 2022



Jan 2023 Planted



Sept 2023



Citation 21-22 planted T-zone



Citation 22-23 planted T-zone





# Lessons Learned

Success – high survivorship both years

- Lots of expansion of 2021-22 plots!

Competitive planting

- Plant “weedy” natives
- Plant rhizomatous “spreaders” perennials – can survive dry years, bounce back in wet years
- Plant high density, single species plots – grow together quickly, crowd out weeds

Site-specific conditions/context

- Access/logistics
- Soil conditions – compacted, salinity
- Seed bank – what are your weeds?
- Prep and maintenance – weeding
- Wet year... more weeding effort
- Constraints on timing/activities

Watering

- Plan for dry years!



# Questions?

Thank you to all our partners and to the dedicated ISP staff!



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