Experimental design to test for seed bank of *Spartina densiflora* in Humboldt Bay salt marshes, year one

Dense-flowered cordgrass forming a continuous meadow on the salt marsh near the mouth of Jacoby Creek, Humboldt Bay National Wildlife Refuge.

Desiree Davenport, U.S. Fish and Wildlife Service

Outline

I. Goals of the Study

II. Importance to Management

III. Collecting in the Field and Processing in the Lab

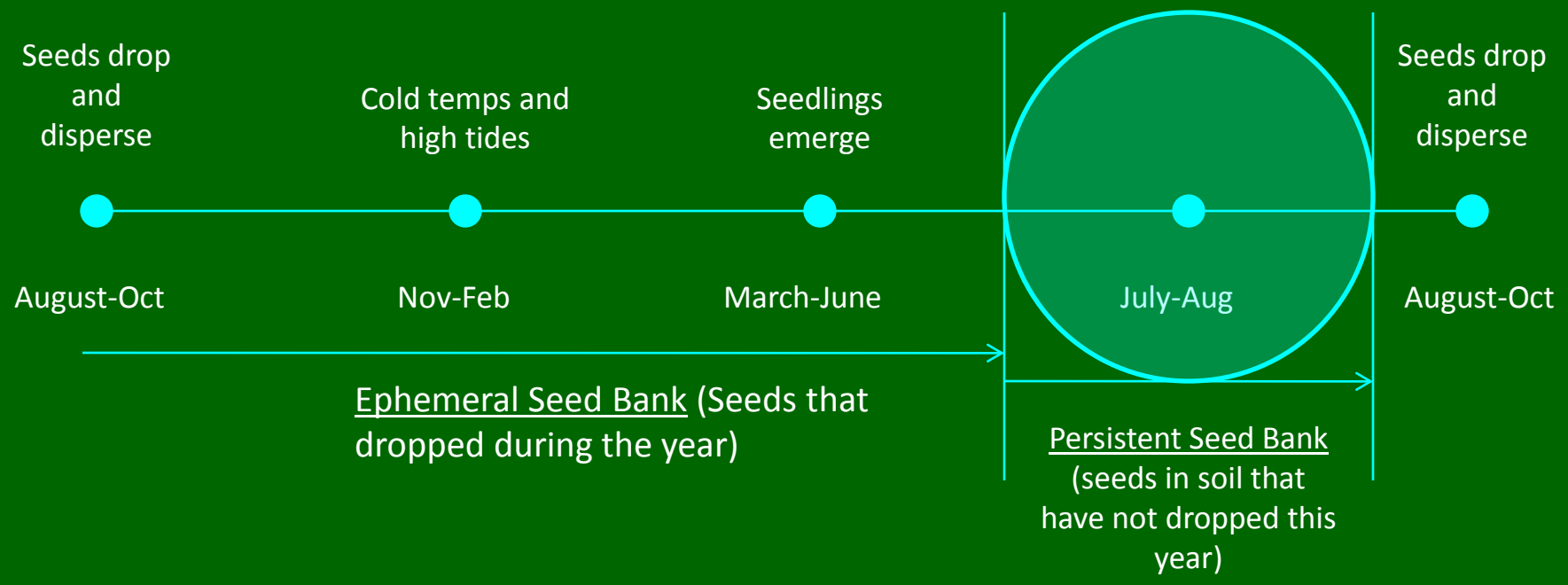
IV. Viability Results

V. Future Research

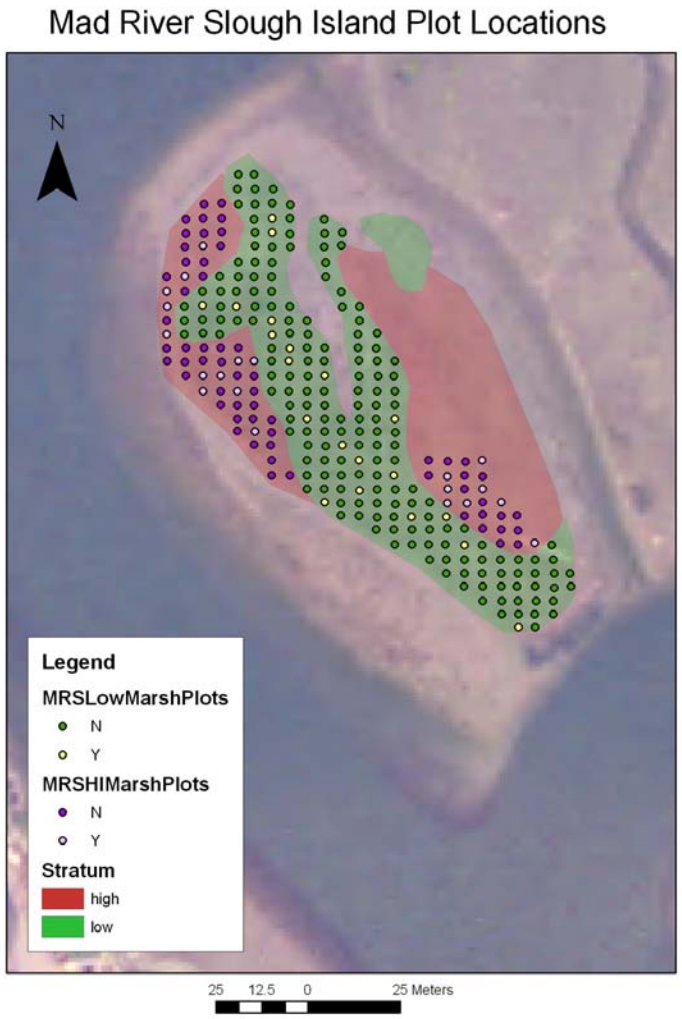
Goals of the study and why it is important for management

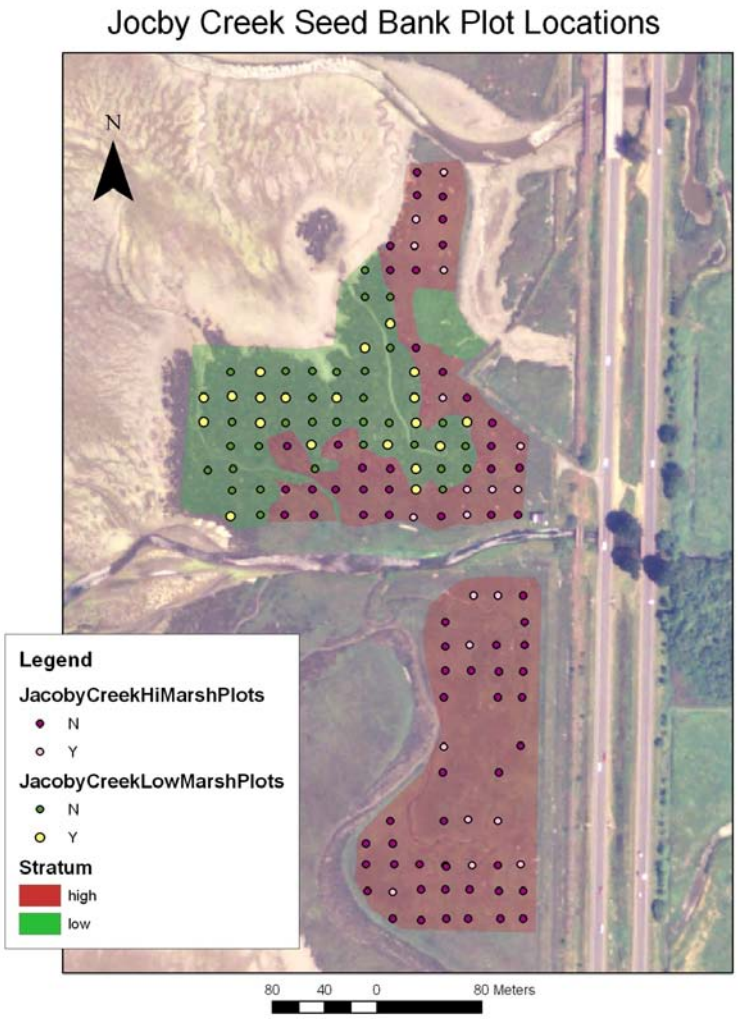
- To determine whether there is a persistent seed bank
- Previous literature unknown
- Profuse seed set
- Seeds dispersed by tides
- Regional eradication will take care of new seed dispersal but not a persistent seed bank
- The amount, longevity and spatial distribution of the seed bank all factor into our planning

Window of opportunity



Sites with randomly selected plots: Jacoby Creek, Table Bluff, Second Slough, Mad River Slough, and Indian Island





Navigating to randomly selected plots

Estimating percent cover using a meter square quadrant

Cutting seed heads from the plot

Cutting a 10x10x8 cm sample

Bagging samples and labeling them for the lab

Some samples stored in the refrigerator

5x5x4cm samples were cut, with the top 0.5cm removed, the 0.5-2cm depth was analyzed using water to break up the soil

The broken up soil was poured through a sieve

Looking for seeds at each level of the 4-part sieves

Counting seeds found before testing for viability

Example of Results: 3/6 seeds were viable by Tetrazolium.

Ransom Seed Laboratory, Inc.
P.O. Box 300, Carpinteria, CA 93014-0300, USA
Telephone: 805-684-3427 • FAX: 805-684-4157

Report of Seed Analysis

Analysis Report # **11639**

Date Received: **04 November 2009**

Date Completed: **06 November 2009**

Sender's Information
The information provided here is that of the sender and not of the laboratory.

Kind: **SPARTINA**
Variety: **DENSIFLORA**

Lot No: **JBC LM 20**

Other: **Seed Bank Study**
Extraction Date 10/12/09
6 Seeds

TO:
HUMBOLDT BAY NAT'L WILDLIFE REFUGE
6800 LANPHERE RD
ARCATA, CA 95521

Purity Analysis Not requested.

PURE SEED COMPONENT(S)

***SPARTINA DENSIFLORA**

* Sender's Identification

Other Crop Seed
Inert Matter
Weed Seed

OTHER CROP SEED
Seed/lb

INERT MATTER:

WEED SEED
Seed/lb

Seed/lb

Viability Analysis

Germination %	Dormant %	Hard Seed %		Total Viable %	Days Tested
Not requested					

REMARKS:

Noxious Weed Seed:

Seed/lb

**Cal. Formula **Other

OTHER DETERMINATIONS:

6 seeds submitted for testing.
3 seeds viable, determined by TZ.

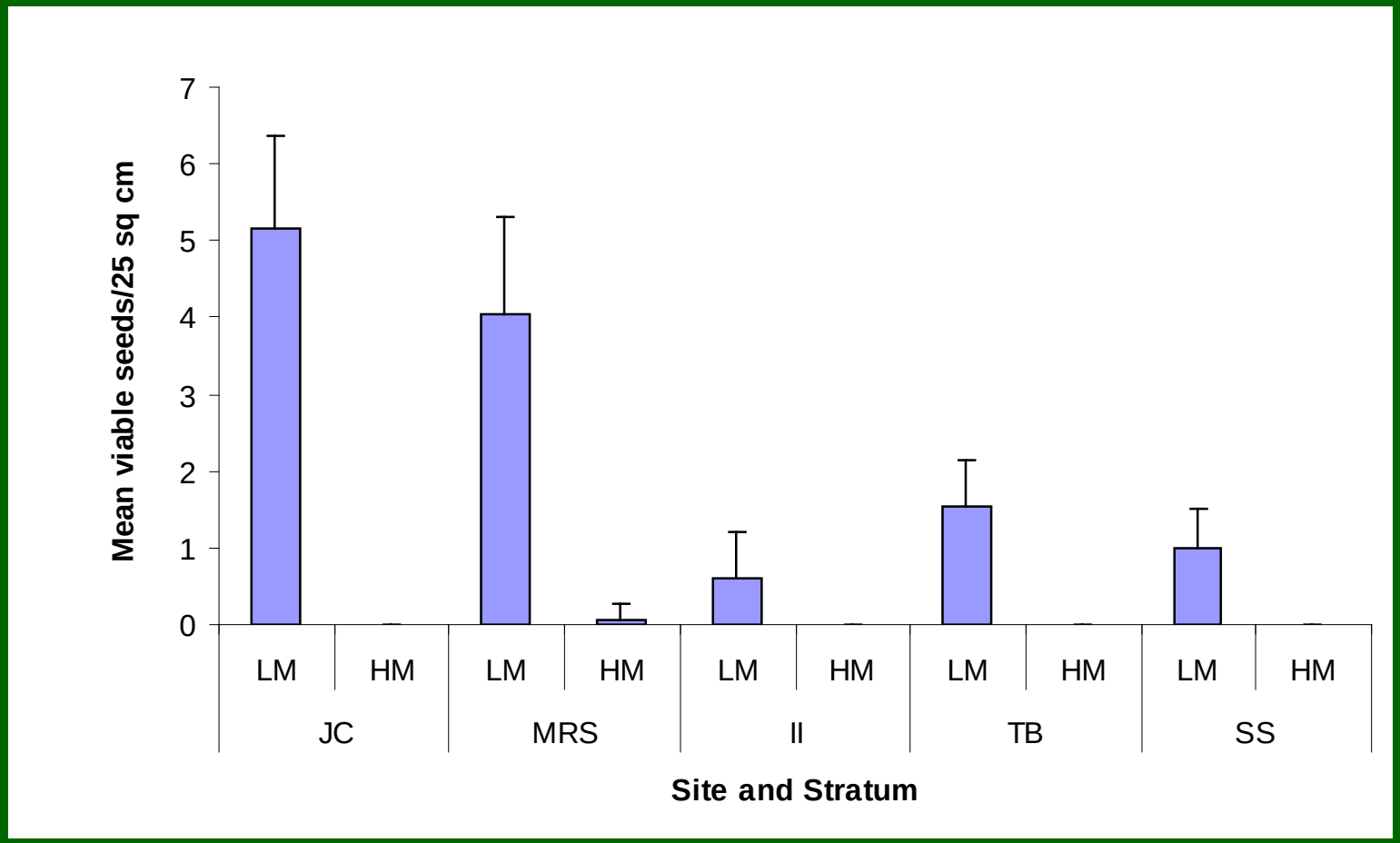
Analysis: Reissue

AUTHORIZED REGISTERED SEED TECHNOLOGIST

This certifies that the submitted sample of seed of the lot designated above has been analyzed in accordance with the Association of Official Seed Analysts (AOSA) rules unless otherwise specified.

Issued by Registered Member No. 307, Society of Commercial Seed Technologists Aleta Meyn, RST Michael Aberle, RST Susan Alvarez, RST

Results: persistent seed bank



Potential seeds/acre = 3,998,292

Future research needed

- Quantify persistent seed bank density
  - We will repeat this study but clip seed heads and cover with exclusion netting to prevent seeds from coming in
- Determine longevity of seed bank
  - More interested in longevity of a mowed area. With funding from the Coastal Conservancy, we will treat plots and cover with exclusion netting after initial seedling flush then follow for several years, sieve out seeds if emergence stops

Acknowledgements

- Heather Block
- Heather Rickard
- Zack Grazul
- Trevor Goodman
- Luc Lagarde
- Derek Weatherbee
- Andrea Pickart
- Eric Jules