

**Is glyphosate a good choice for perennial  
pepperweed (*Lepidium latifolium*) control in  
tidal wetlands in the San Francisco Estuary?**

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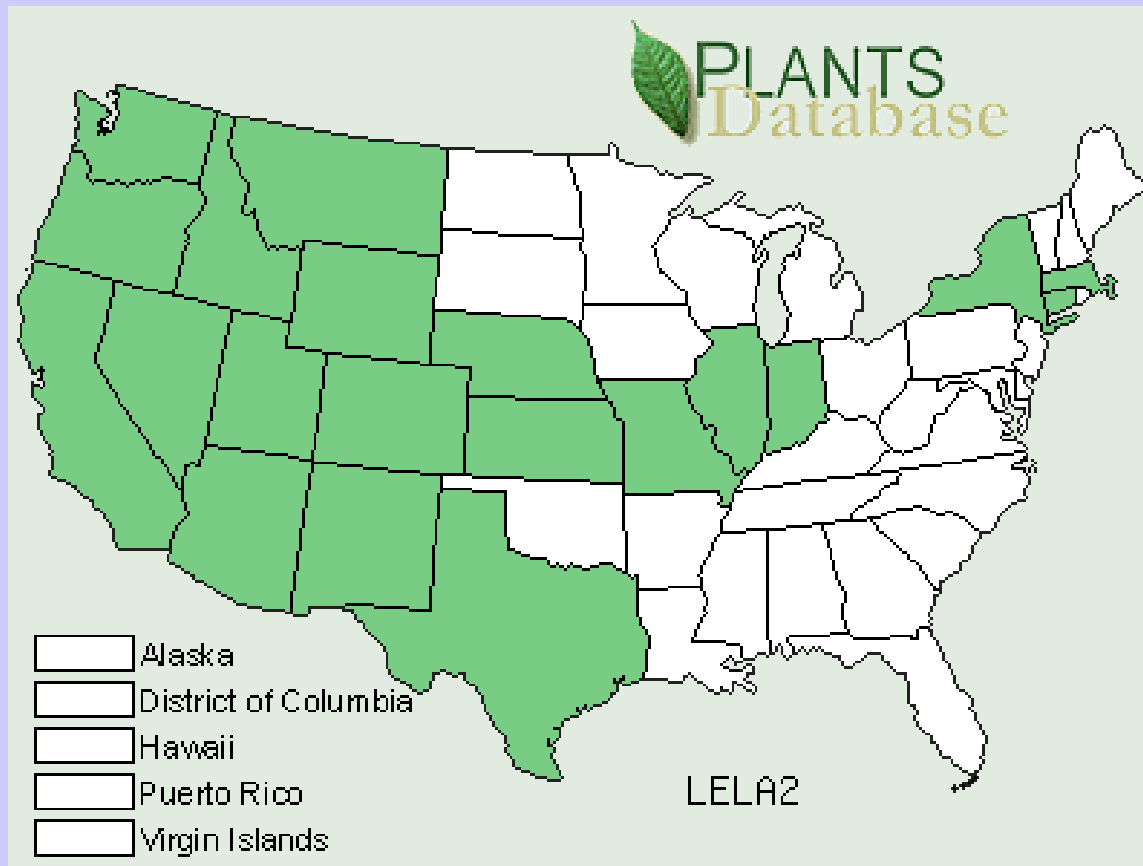
# *Lepidium latifolium*



- Cal-IPC “High” ranking
- CDFA class B weed
- Introduced - SW Asia
- Cosmopolitan importance
- Brassicaceae
- Adapted to various habitats
  - Top photo Colusa NWR by Mark Renz
  - Bottom photo Cosumnes River Preserve by Joe DiTomaso

# Distribution

<http://plants.usda.gov/java/profile?symbol=LELA2>





# Characteristics

- Disperses by root fragmentation and by seed (Leininger, 2006)
- Forms basal rosettes
- Produces 16 billion seeds/ha (Palmquist, unpublished)
- High seed viability (Miller et al., 1986; Spent et al., 2006)



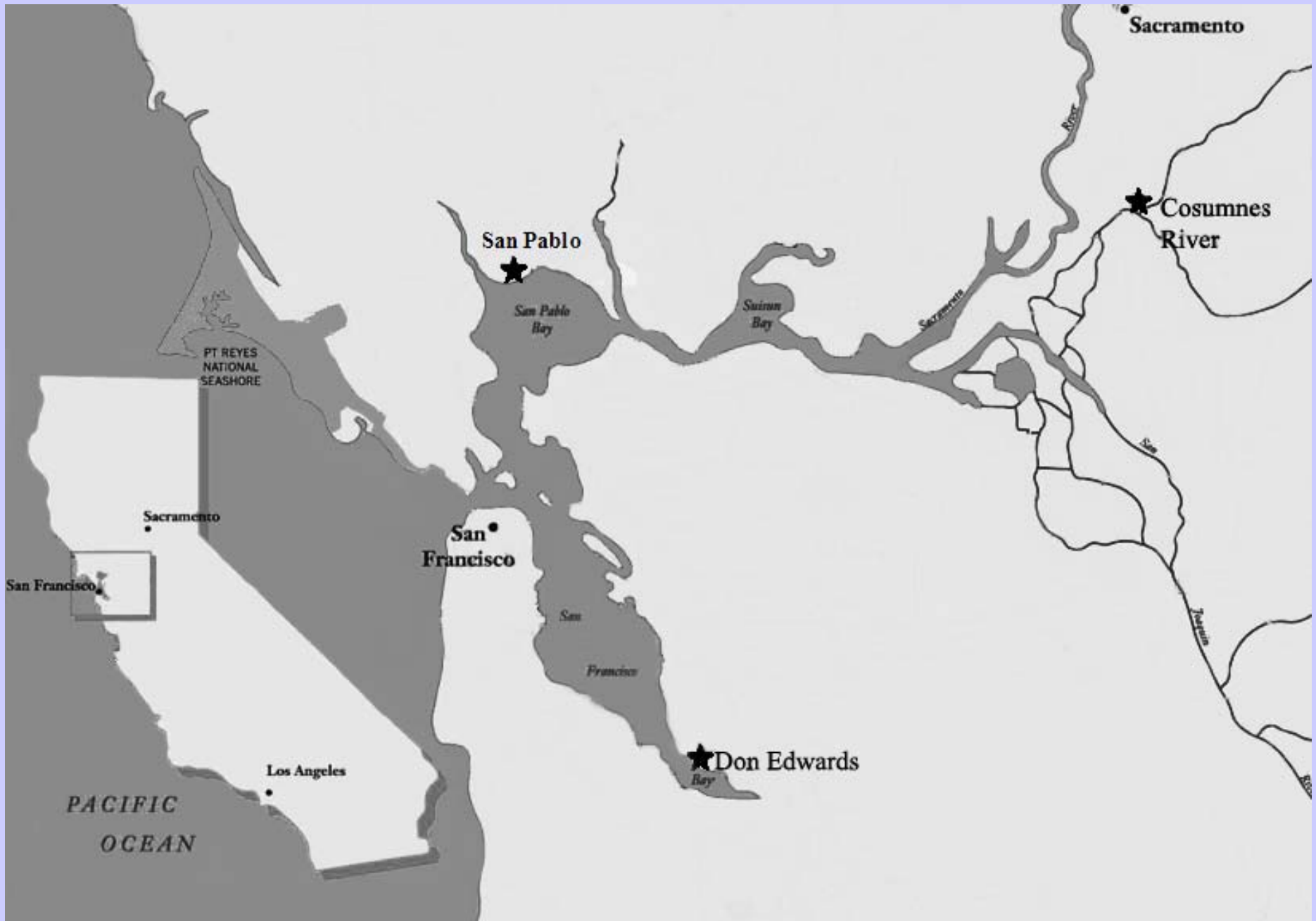
# Consequences of invasion

- Changes root & canopy architecture
- Displaces native species
- In upper marsh, may decrease biodiversity, displace endangered plant species
- May degrade nesting habitat for birds?
- Salt ion pumping

# Using prior results from seasonal wetlands to develop a management plan

- Chemical control: chlorsulfuron, glyphosate, tryclopypyr, and 2,4-D amine tested for *L. latifolium* control efficacy (Renz, 2002; Young et al., 1998; Trumbo, 1994).
  - Chlorsulfuron 90% effective 3 y.a.t. (Young et al., 1998)
  - Glyphosate, 2-4 D, 0% effective 3 y.a.t. (Renz and DiTomaso, 1999; Young et al., 1998)
- Treatment options for tidal wetlands: glyphosate, 2-4 D, (now, imazapypyr)
  - Long term management and monitoring

*The project goal was to evaluate the impact of herbicide treatment on local pepperweed eradication and on recovery of the native plant community*





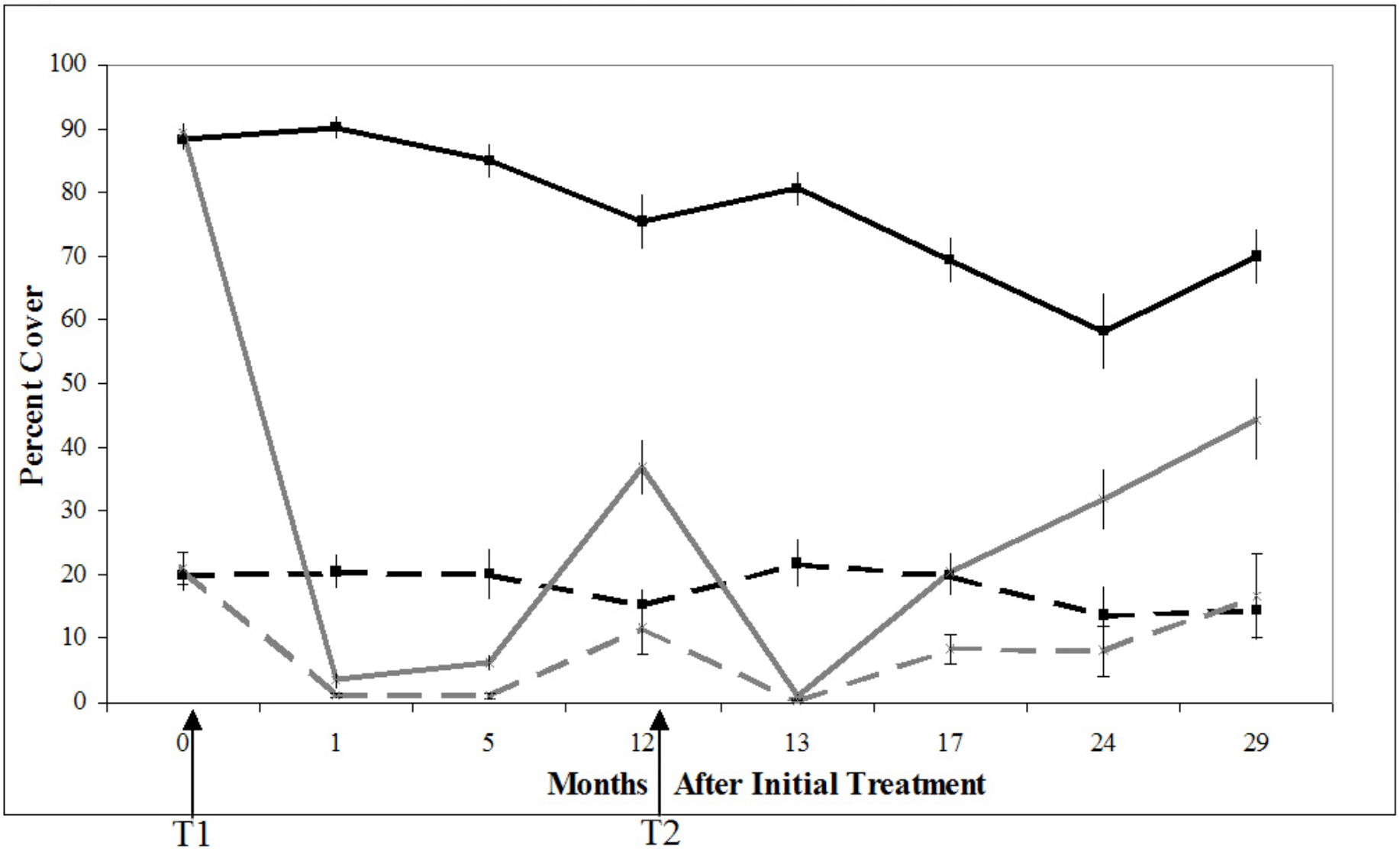


# Experimental Design

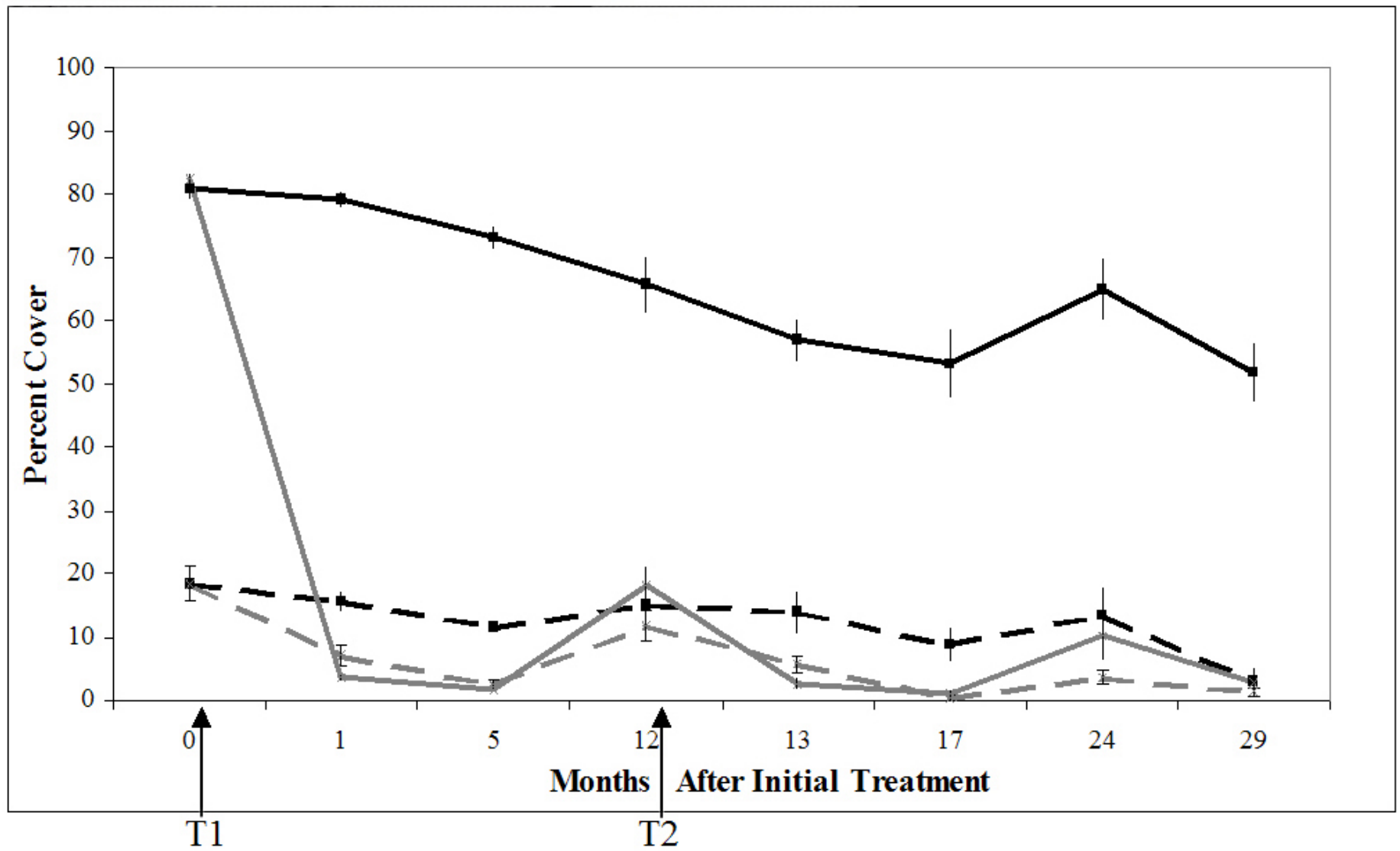
- Salinity effects
- 16 low density & 16 high density plots
- Treated annually for 2 years



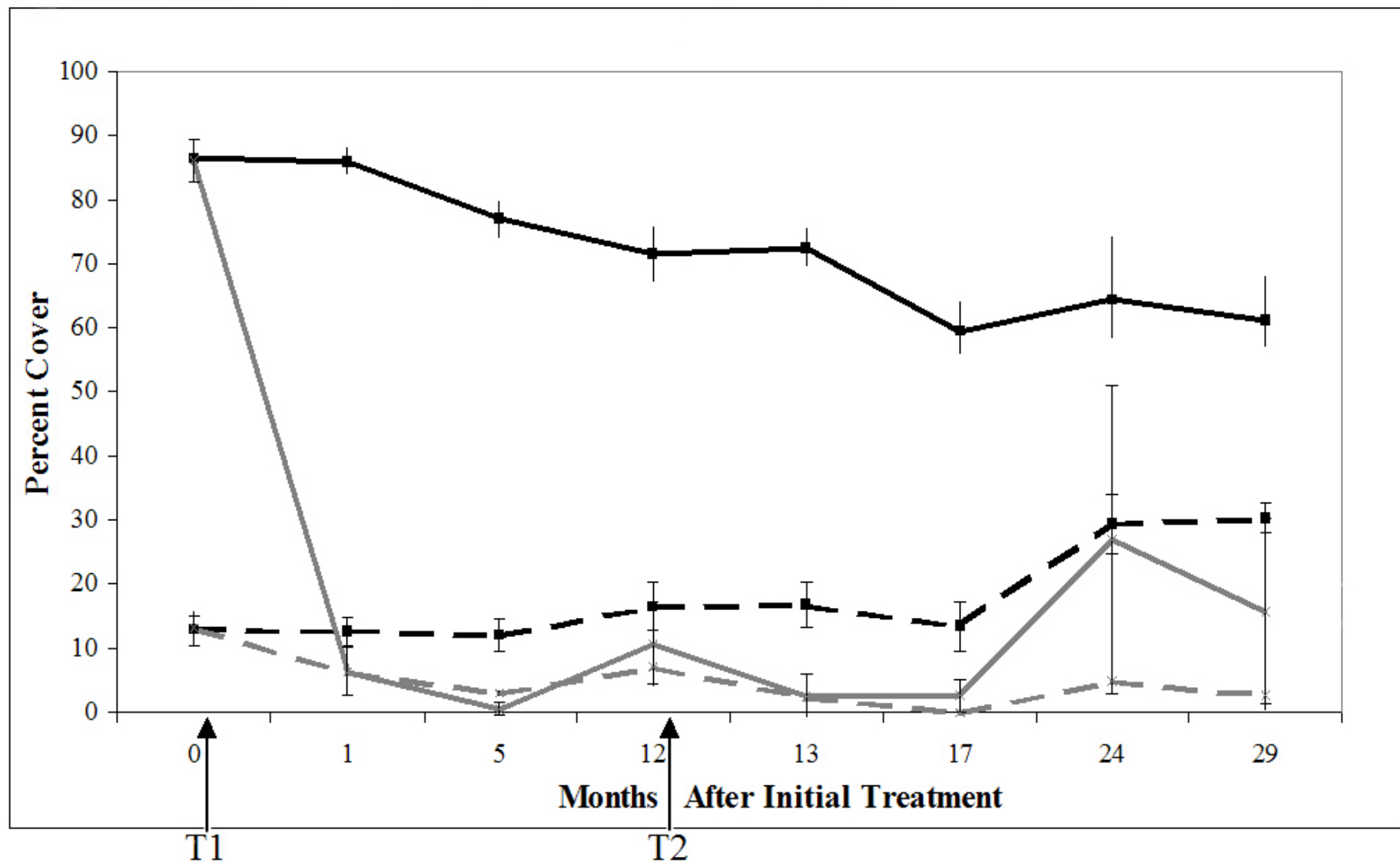
# Cosumnes River



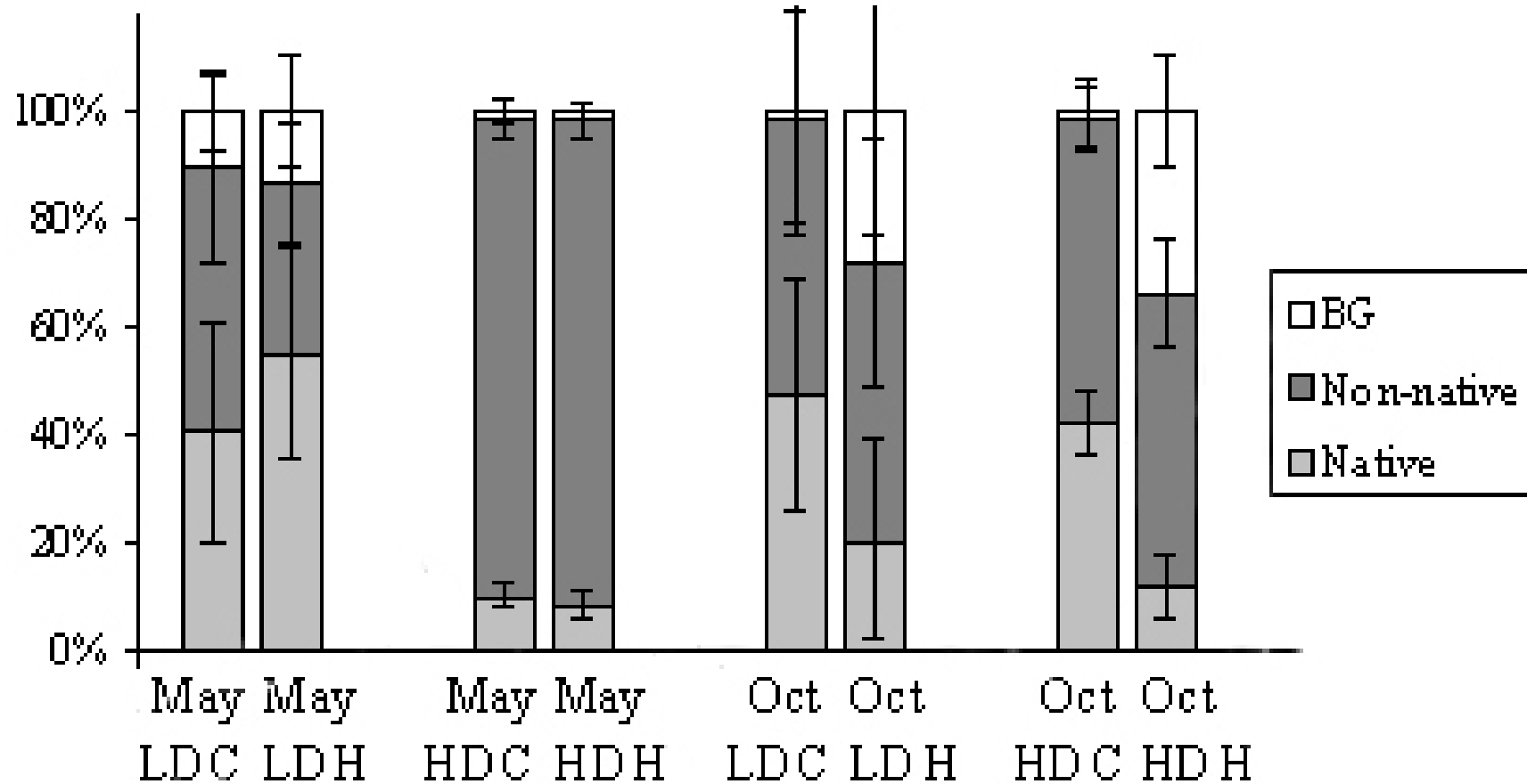
# San Pablo



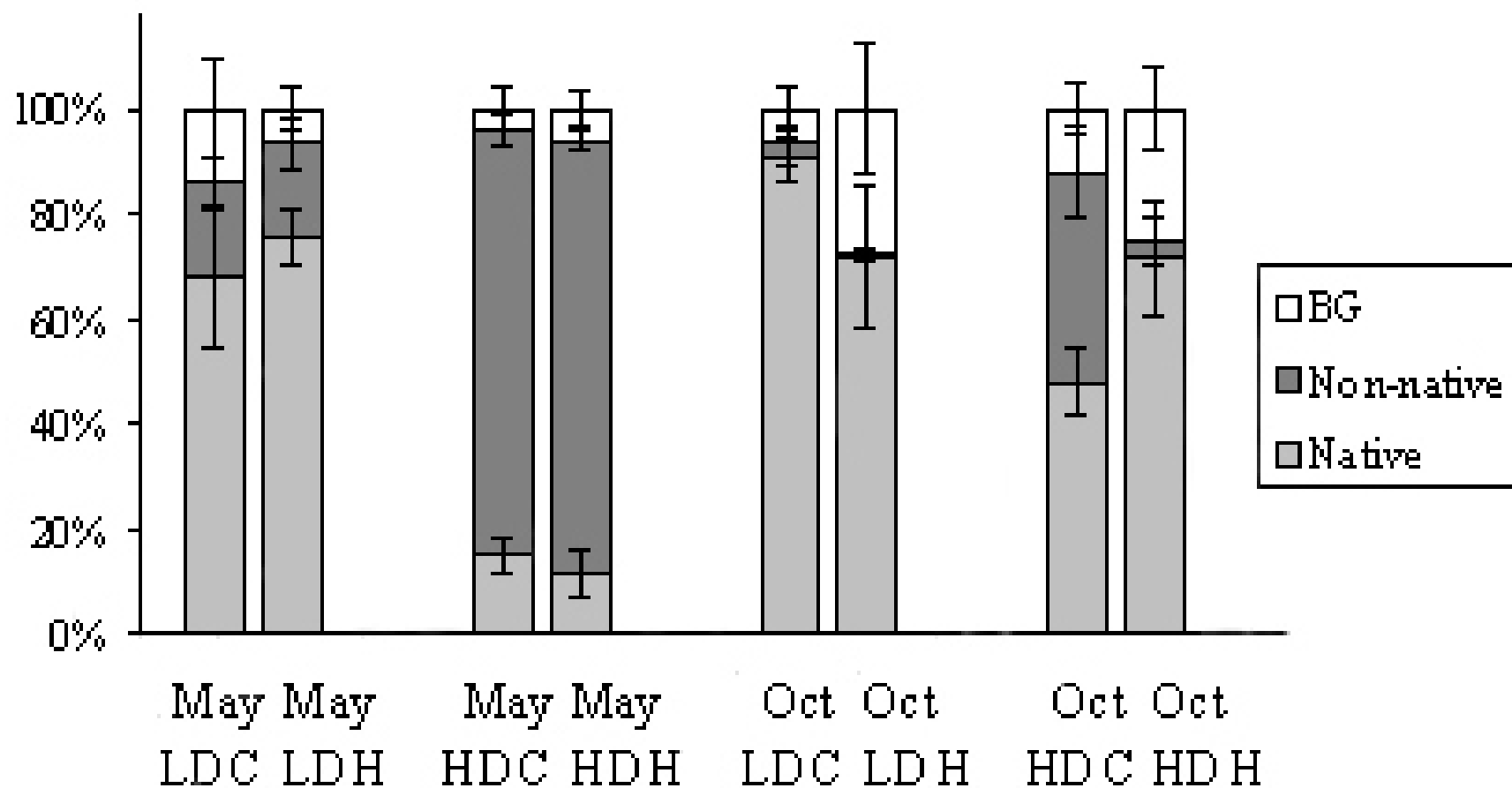
# Don Edwards



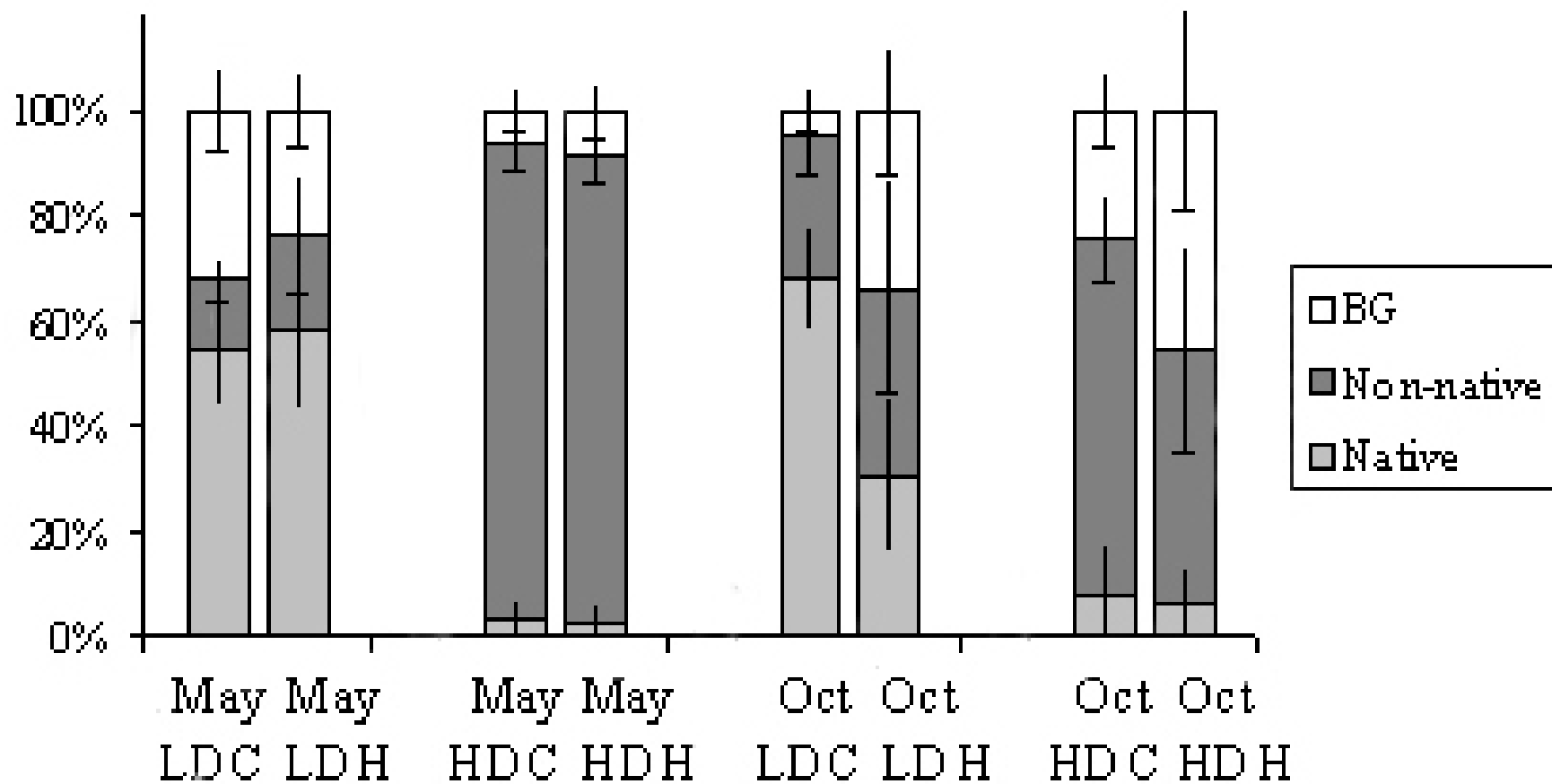
## Species composition (%) at Cosumnes River



## Species composition (%) at San Pablo



## Species composition (%) at Don Edwards



# Conclusions

- We defined herbicide efficacy according to two parameters: kill rate, and rebound potential
- In consideration of herbicide success, we valued a third factor, native recovery
- Herbicide was more effective at higher salinities



# Conclusions

- # non-native species had important implications for herbicide success
  - How was relative ratio of natives : non-natives is affected by treatment
- Summary of results from best to worst management scenarios:
  - San Pablo
  - Don Edwards
  - Cosumnes River
- Success at some sites requires more planning

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