

2013 Update: Aquatic Weeds in California

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Overview

- Active responses to: hydrilla, spongeplant, salvinia, alligatorweed, annual waterprimrose
- Status, history
- Other possible threats: lagarosiphon, *Trapa natans*, flowering rush, hygrophila

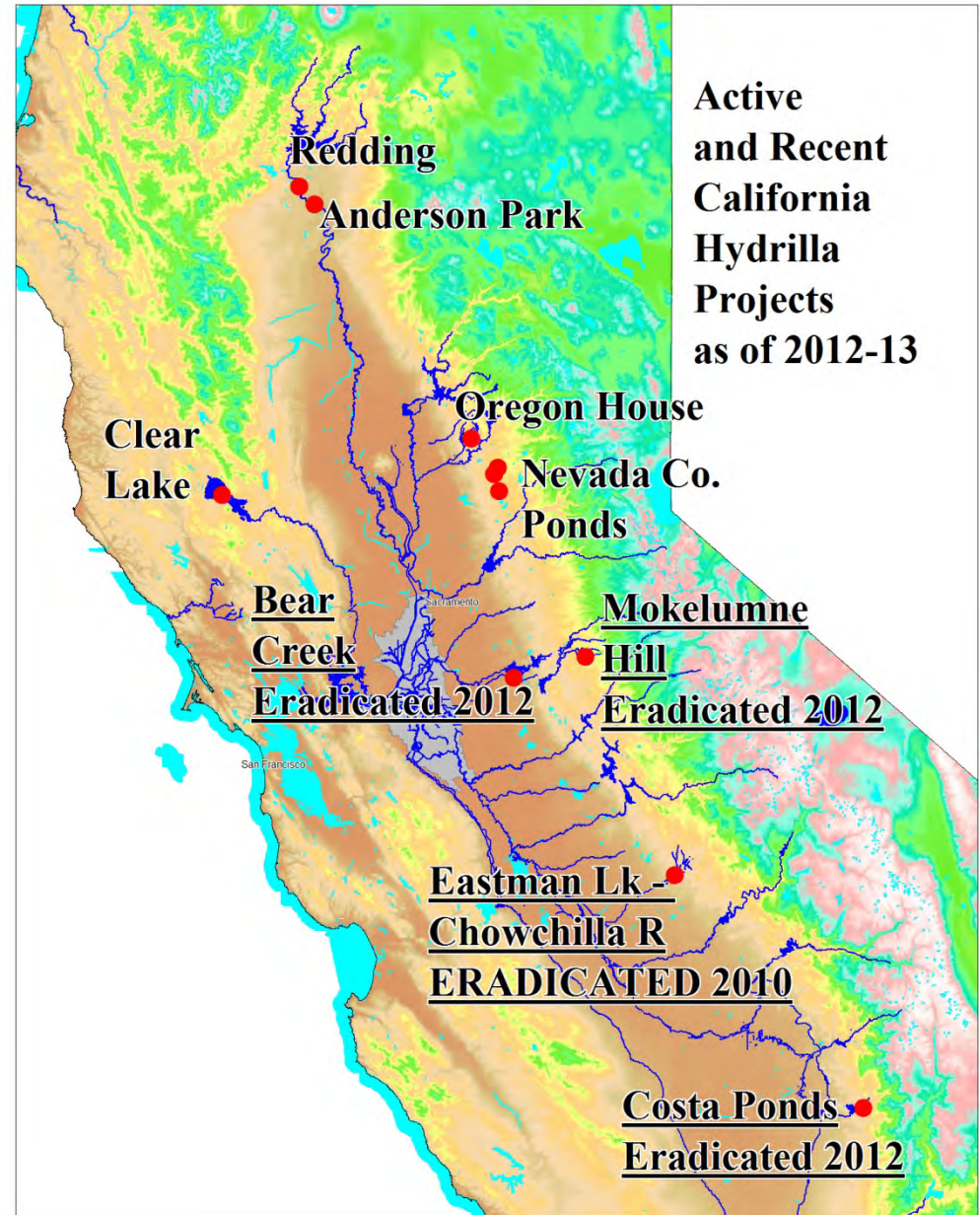
Hydrilla: Since 1976 approx. 26 of 32 infestations eradicated

| COUNTY* | YEAR** | WATER BODY | SIZE |
|----------------|--------|--------------|------------|
| LOS ANGELES | 1980 | Eight ponds | 2 acres |
| | 1983 | One pond | <1 acre |
| | 1985 | One pond | <1 acre |
| MONTEREY | 1978 | Private pond | 0.01 acre |
| RIVERSIDE | 1977 | One pond | <1 acre |
| | 1984 | One pond | <1 acre |
| | 1985 | Three ponds | <1 acre |
| SAN BERNARDINO | 1988 | One pond | <.01 acre |
| SAN DIEGO | 1977 | Lake Murray | 160 acres |
| | 1977 | One pond | <1 acre |
| SAN FRANCISCO | 1988 | One pond | 2 acres |
| SANTA BARBARA | 1977 | One pond | 0.12 acre |
| | 1993 | One pond | <.01 acre |
| SHASTA* | 1985 | Seven ponds | 133 acres |
| | 1986 | Four ponds | 23.5 acres |
| SONOMA | 1984 | Spring Lake | 72 acres |
| SUTTER | 1985 | One pond | <.01 acre |
| TULARE* | 1993 | Three ponds | 0.6 acre |
| YUBA* | 1976 | Lake Ellis | 30.8 acres |
| | 1990 | One pond | 6.0 acres |

Hydrilla

- No new infestations since 2005
- 4 projects reach eradication 2010-2012
- 4 other projects with zero plants for 6 seasons

Four projects
reach
eradication in
last 2 years



Projects where hydrilla plants found in 2012

- Imperial County (last find 2011)
- Lake County: Clear Lake
- Yuba County: Oregon House canal and ponds; Shakey's pond
- One Nevada Co. pond

ID: 5 leaves per whorl (variable)



South American spongeplant

- Habit very much like water hyacinth...often confused
- Easy to eradicate NEW infestations
- HARD TO ERADICATE once SEED BANK established ... **5+ years**
- Abundant seed
- Very small seedlings -> easy dispersal
- Currently under ±good suppression in most places, but continues to spread

Impacts in California



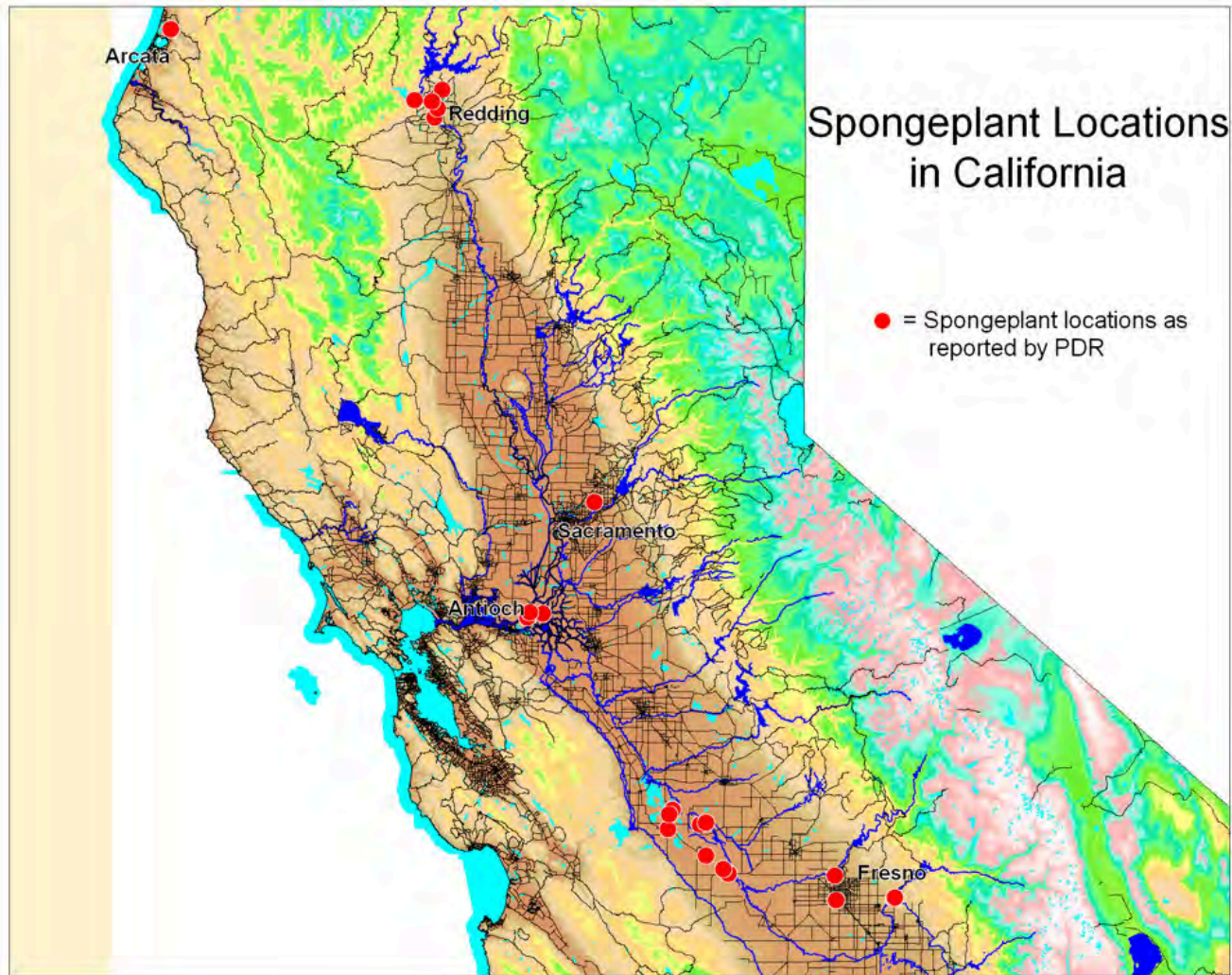
Main Canal, Central California Irrigation District, October, 2010.

Reasons for spread: Small, abundant seedlings

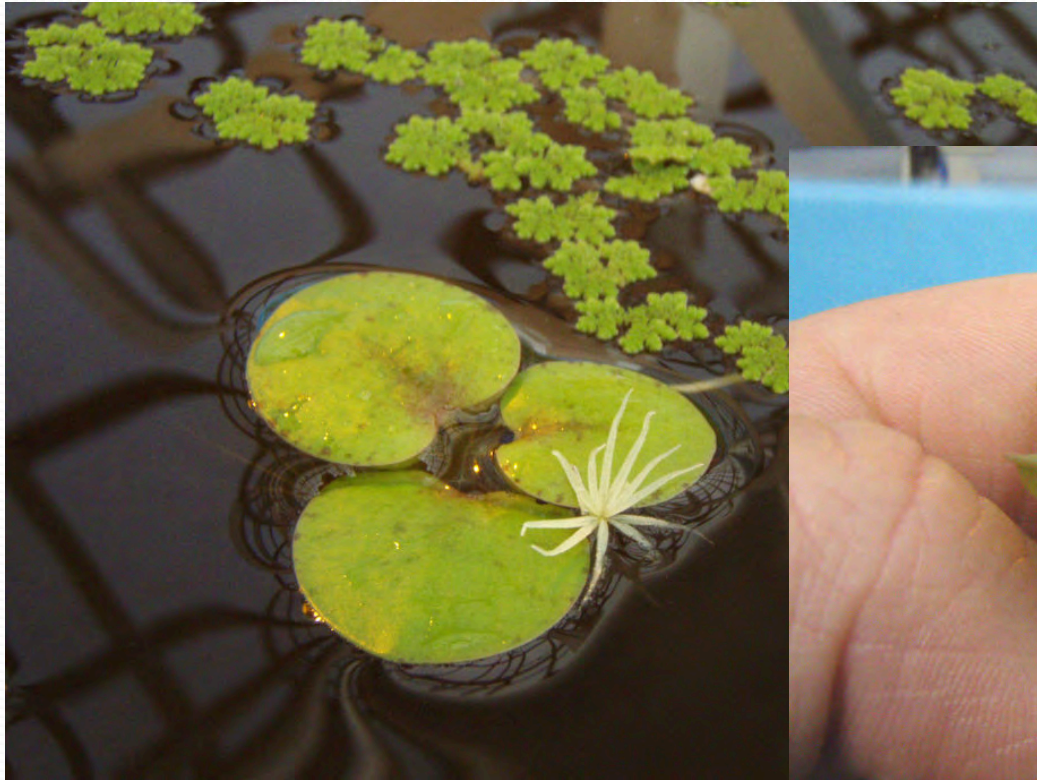


Seedlings in red ellipses. The other small plants are duckweed.

Spread in California 2003-2010



ID: when young, small round disks
flat on water; “keeled” leaf



Alligatorweed

- In Tulare & Kings Co's by 1966, Los Angeles basin by 1968 (Rio Hondo, San Gabriel R). Not much spread since.
- Still not eradicated there in spite of large early effort, long and persistent follow-up, esp. in LA
- Extremely hard to kill: sacrifice to protect nodes, roots; very deep root system; very flexible life history...even in pastures, lawns
- Eradicated from some small infestations, e.g., San Diego

Tulare Co. 1966



Challenges: deep roots



Challenges: flexible lifestyle



ID: white
flower cluster



ID: opposite leaves



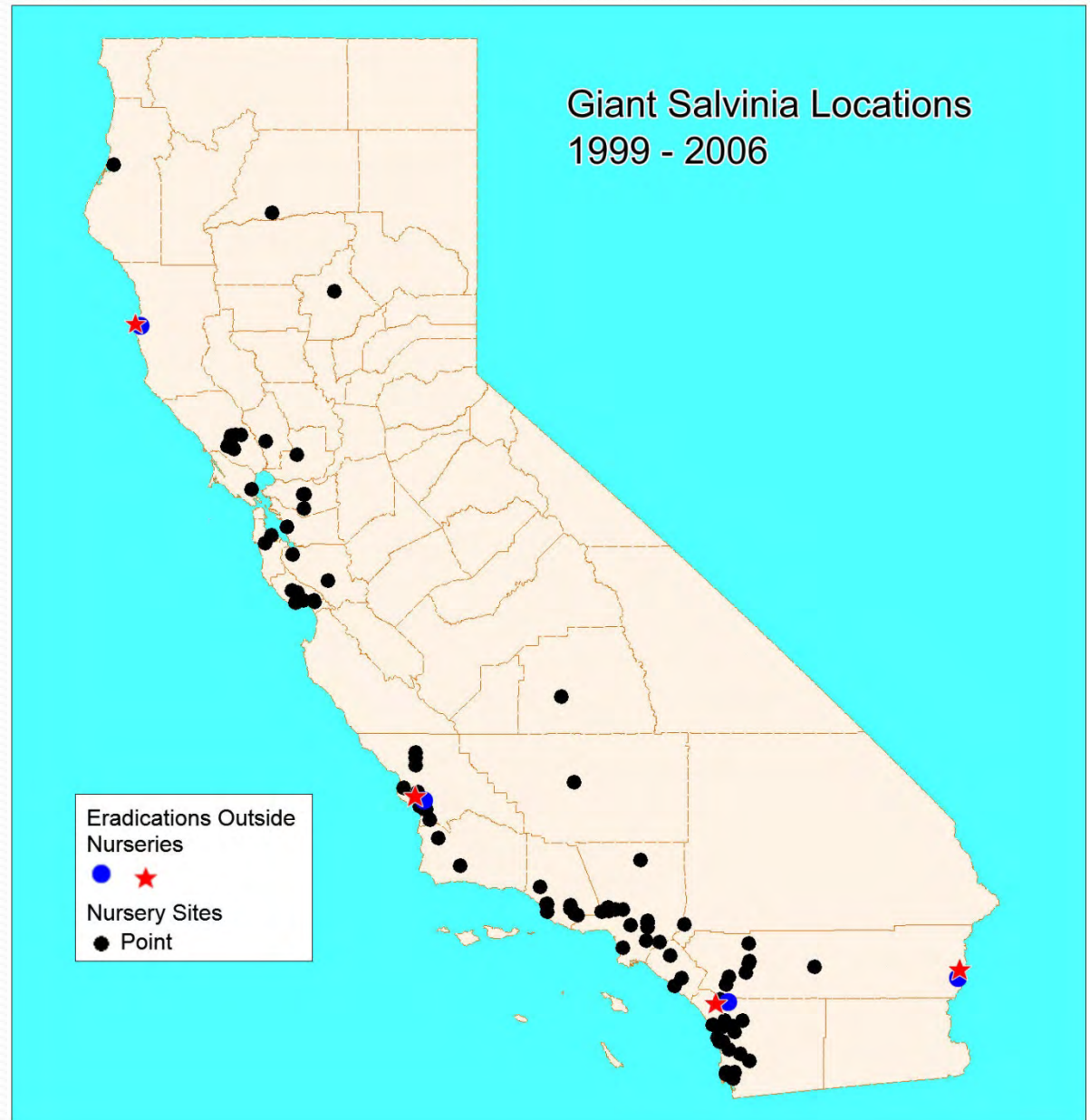
Giant Salvinia

- An aquatic floating fern, spreads easily by currents
- Exceptionally prolific: 3-6 inch plants -> mats 2-3 ft thick
- In CA, found widely in nurseries 1999, but in only ~5 locations outside
- All eradicated by ~2006 except along Colo. River
- No new finds outside nurseries since ~2002

Impacts: infestations can be massive



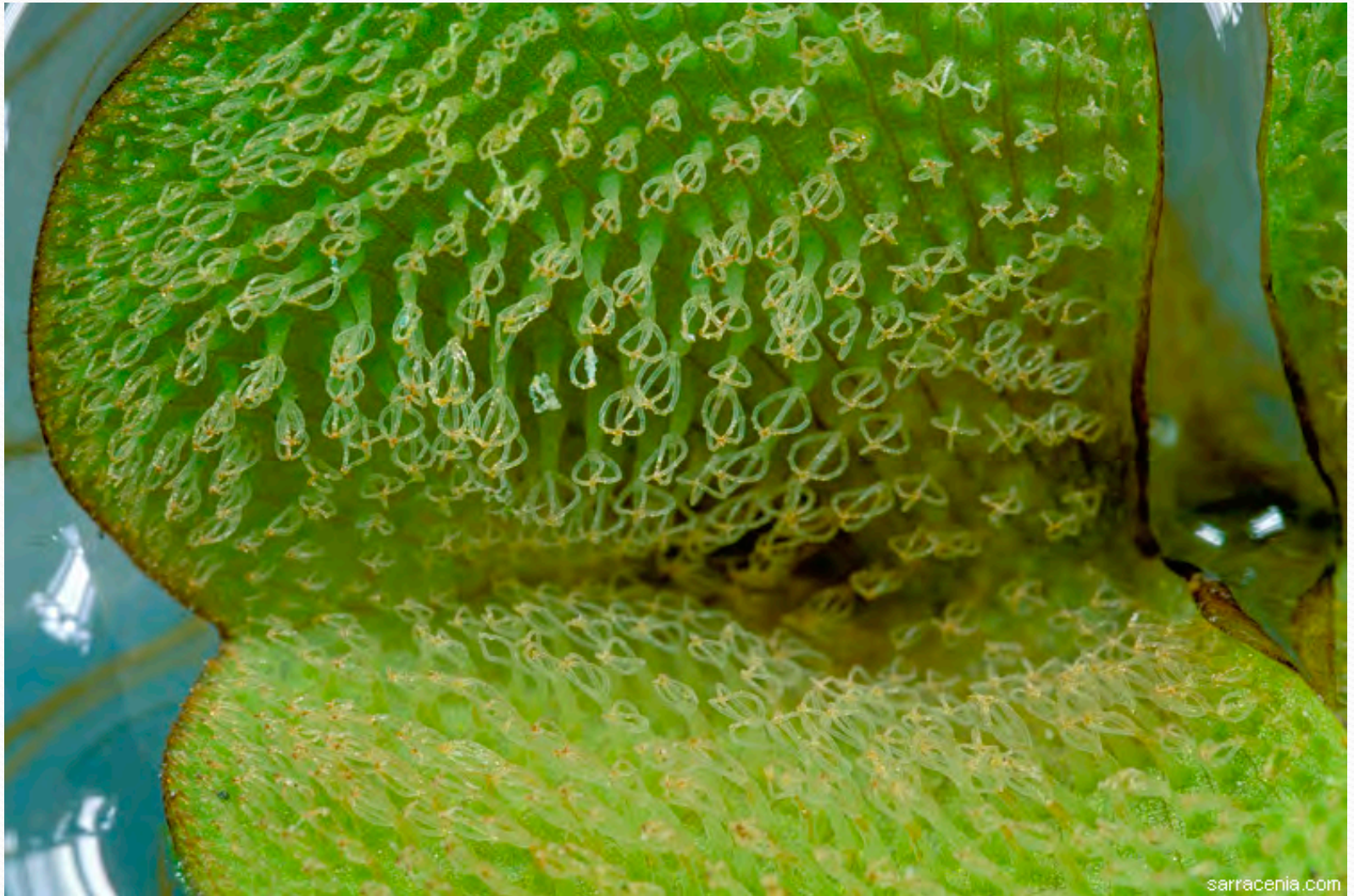
Most finds
in
nurseries;
only a few
outside;
Colorado
R. remains



ID: curved “book pages”



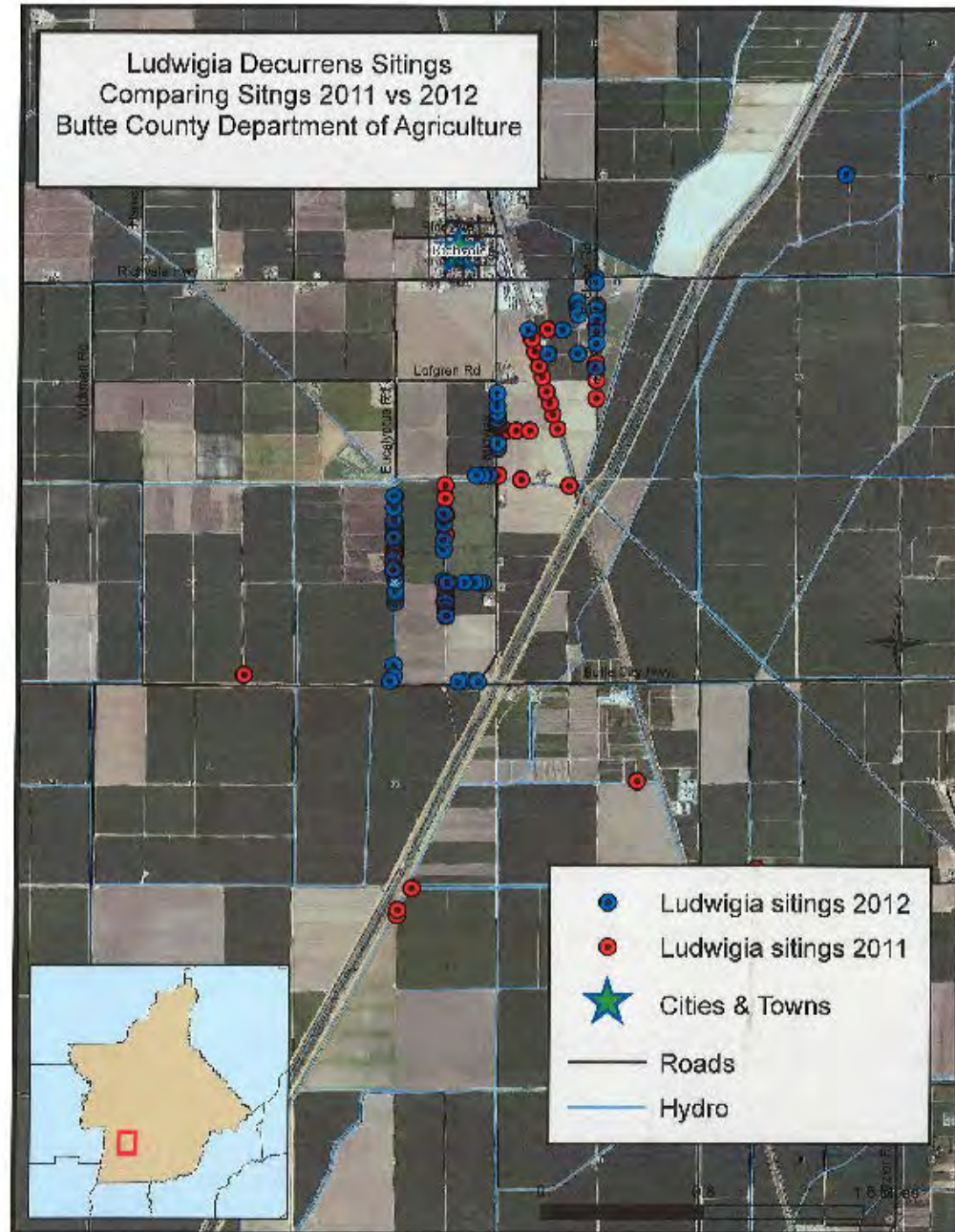
ID: “eggbeater” hairs



Annual or willow waterprimrose, *Ludwigia decurrens*

- **Butte County, 2011**
- **Spread over several square miles**, most along borders and irrigation canals. One field infested throughout.
- Plant produces thousands of seeds; float
- Also by fragments, eg, tillage, harvesting
- Fragments root in day or two in water
- Control adequate with herbicides but must treat early before seeds form
- Vigorous response by Butte Ag office, growers, irrigation companies, Co-op Extension

Infestation sites (~20 mi north of Sutter Buttes)



4-petalled flowers like all
waterprimroses



ID: distinctive
upright
growth



ID: winged stems



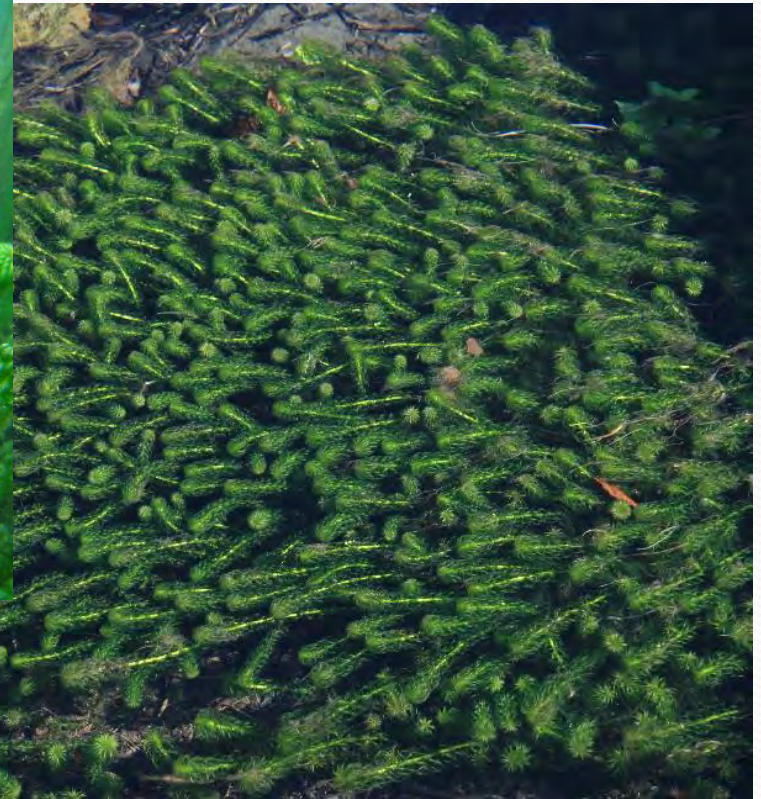
Potential Threats

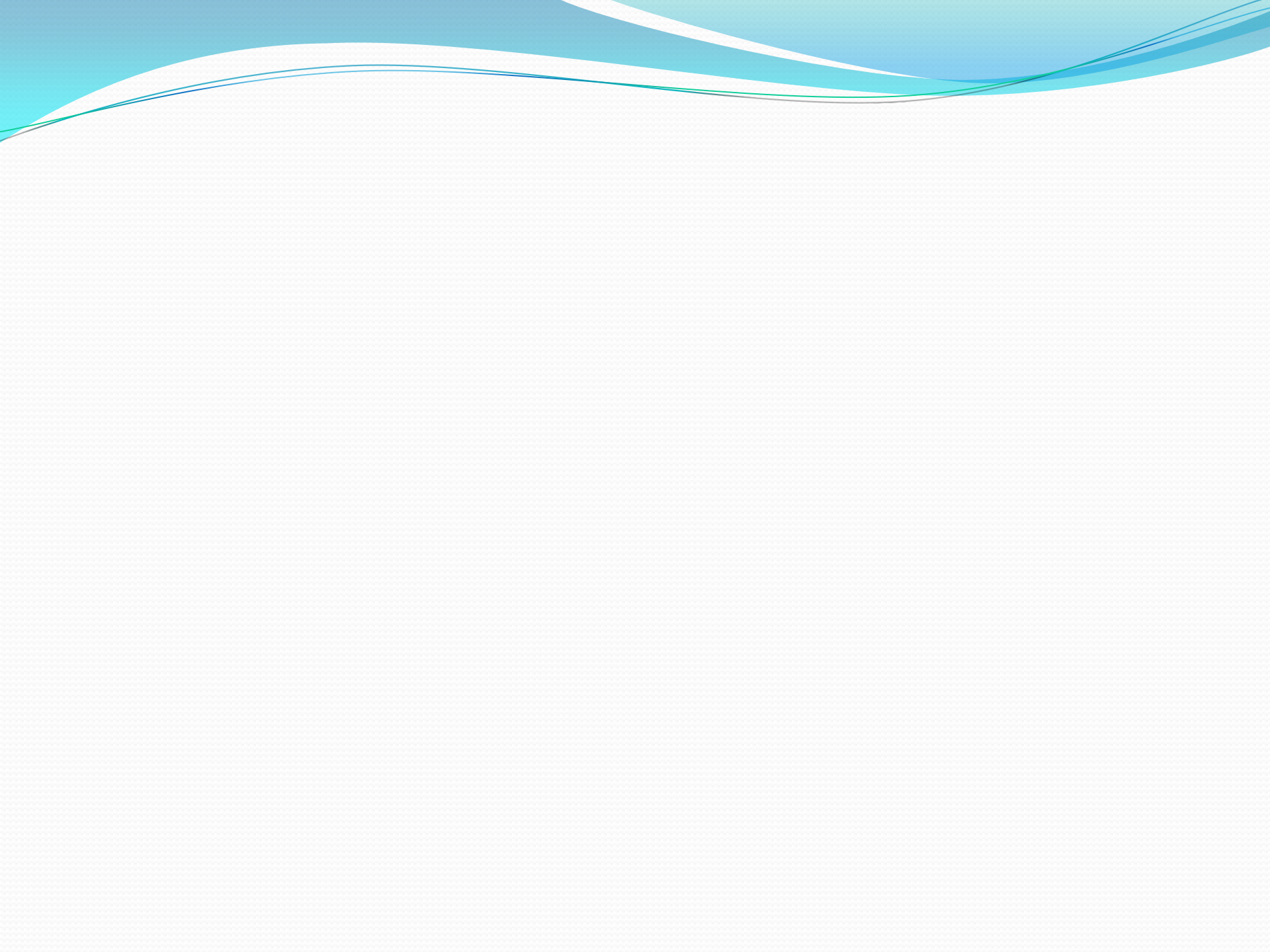
- *Lagarosiphon major* (lagarosiphon, African elodea, oxygenweed)
- *Hygrophila polysperma* (swampweed)
- *Trapa natans* (waterchestnut—not the canned kind)
- *Butomus umbellatus* (flowering rush)

Lagarosiphon, reasons for concern

- fast-growing, may totally fill shallow lake
- In New Zealand, has attained biomass of 88-225 tons/acre
- fills water conveyance channels
- heavy booms protecting hydro-electric plants "fail when a massive amount of weed is liberated after storms"
- major aquatic weed problem in England, "actively displacing" non-native *Elodea* species
- able to shade out and outcompete other submersed species
- Not yet in US
- in original Africa range, grows in high mountain streams and ponds

ID: strongly curved leaves





Hygrophila: reasons for concern

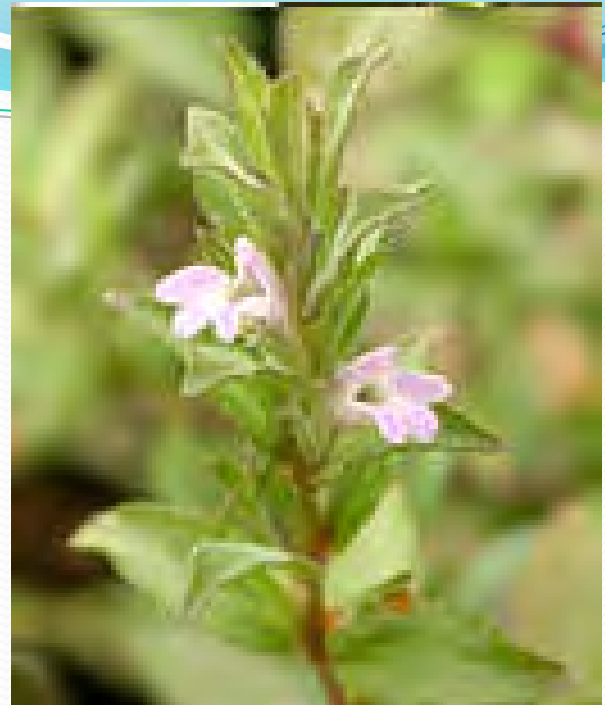
- Actually outcompeting hydrilla in some FL locations
- In FL and so-central TX since ~1950s: not spreading rapidly north, but min. temp. tolerance is 39⁰
- dense stands of stems in the water, later breaking loose to form large floating mats
- Hard to kill: no herbicides very effective, grass carp don't like it
- Spreads easily by fragments

ID: opposite leaves, like
alligatorweed; mostly submersed



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ID:
distinctive
2-lipped
flower



Trapa: reasons for concern

- In NE US, but apparently not spreading fast. First see in MA in late 1800's.
- Rooted, floating plant.
- Danger to swimmers because seeds drift to shore where sharp spines hurt feet
- Creates nearly impenetrable mats; in VT, many bays of Lake Champlain now inaccessible
- Strong competitor in shallow waters
- Floating mats a hazard for boaters
- severely limits the passage of light into the water
- It reduces oxygen levels, which can cause fish kills
- Outcompetes native vegetation and is of little value to wildfowl

Heavy infestation



ID: distinctive shape; large, barbed seeds



Flowering rush, reasons for concern

- Spreading steadily across northern tier states. Now moving from ID into Snake River and then Columbia
- Very difficult to control. No herbicide very effective.
- Forms dense stands that interfere with boats, swimming
- Dense stands impede native trout, provide cover for predator bass and pike

Impacts: blocks access by people, fish



ID: distinctive flower heads





Thank you and questions.