South American spongeplant, *Limnobium laevigatum*: The Threat, and What can we do?

Patrick Akers, Hydrilla Program
Calif. Dept. of Food & Agric.

Overview

- **Threat: like water hyacinth but,**
  - **Seems to spread even more easily**
  - **Comes right back after clearing an area**
- **Why? Biology: heavy seed production, long seed survival, many seedlings, very small. Seedlings are very uncommon for hyacinth.**
- **History: control and spread**
- **Identification**

Threat – like water hyacinth

- Stops boating, fishing, swimming; ruins views of water; destroys tourism
- Blocks birds' access to water
- Suffocates fish and other animals (seals water surface from air; dying plants steal oxygen in water)
- Threatens water supplies (blocks canals, pumps, dams)
- Hurts water quality with decaying plants
- Threatens electricity supplies (blocks dams, generators)
- Increases flooding (blocks canals, streams)
- Crowds out native plants
- More money, energy, pesticides to clean canals
- More mosquitoes, disease

Acts like water hyacinth, but mat is packed even tighter

Redding pond, before treatment, June 2005. Spongeplant choked out water primrose and parrotsfeather. Grass is beginning to grow on the mat. Treatments continue as of 2010.

Quadrat 0.5m on a side. Roughly 2000 to 2500 plants per square meter, many times higher than water hyacinth.

Grows fast, like WH:"Main" Canal, Stanislaus Co.

Photos from late September, 2010. Canal personnel report that they noticed no spongeplant in this area as late as late July.

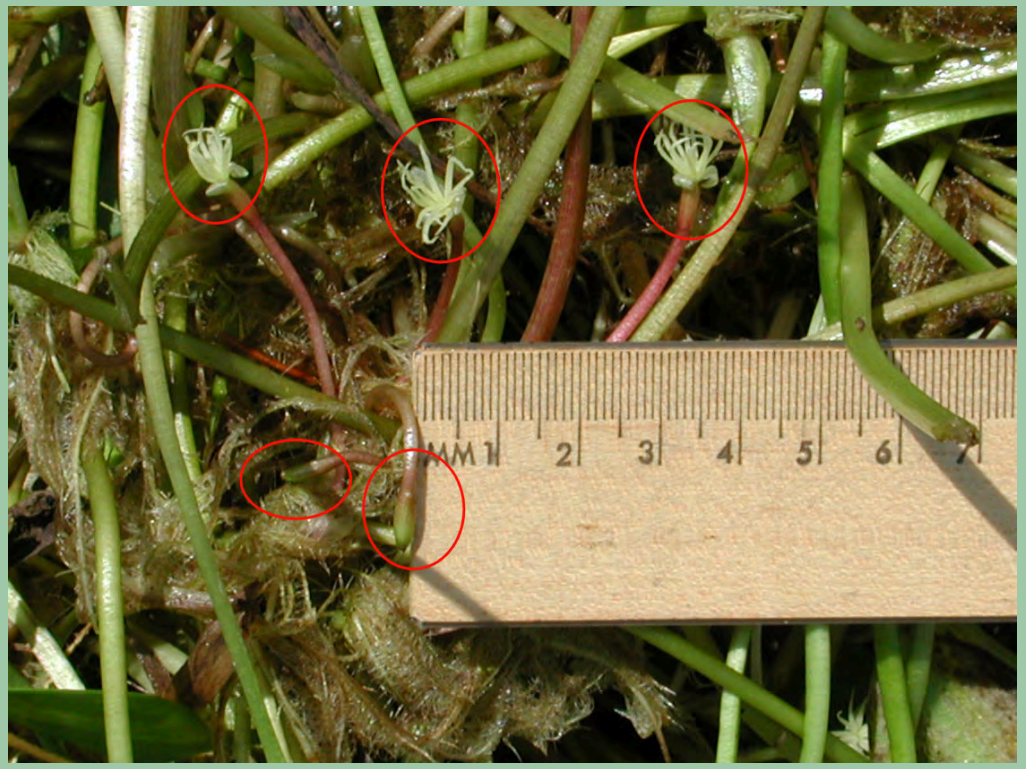
Cleaning Main Canal, Stanislaus Co.

That's all spongeplant. Water hyacinth is rare to uncommon in these canals.

Why would it be harder to manage than water hyacinth?

- Lots of seeds and seedlings
- Seeds survive at least 5 years
- Spongeplant returns rapidly due to sprouting of seeds
- Contrast: Seedlings often very uncommon for water hyacinth
- Small seeds, seedlings, and small plants can bypass water control structures and probably stick to birds. Young water hyacinth plants are larger and easier to exclude from areas.
- Result: continuing spread in San Joaquin Valley despite work by 7-person state crew and canal companies

Heavy seed production



Redding pond, late spring 2006. Above, female flowers and seed pods in red circles.

Above: opened seed pod.

Produces many seedlings

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

Seedlings are small!

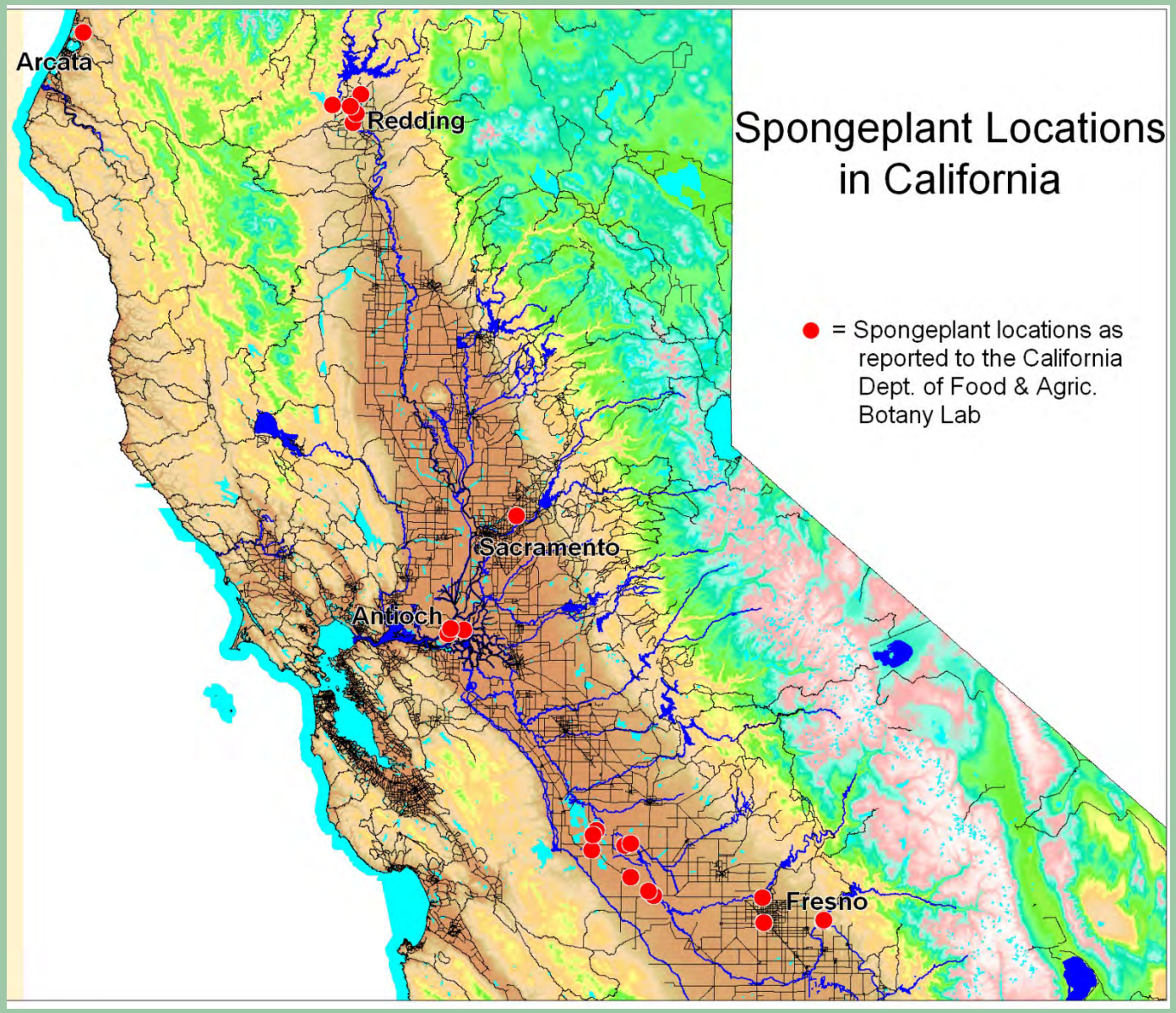
Result: plant spreads easily.

Seed survival time unknown, but at least 5 years.

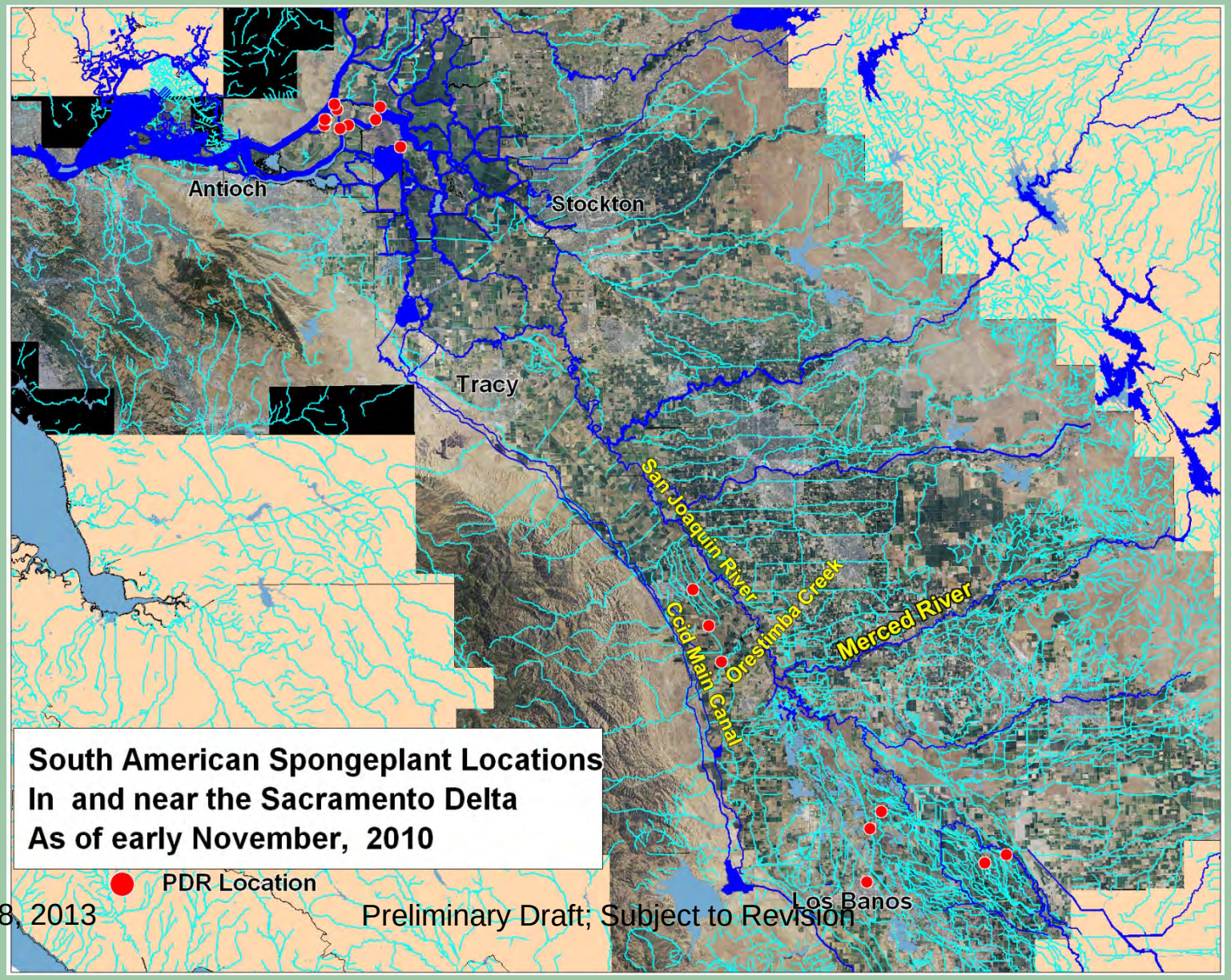
Result: immediate re-infestation of cleaned areas.

Seedlings emerging in the source pond in the Kings River canals infestation. Photos taken Oct. 2010. This pond has been kept clean of mature plants since early spring 2008. Pond was heavily infested when found.

History: Steady spread in California 2007-2012, but slowing? Due to generally good suppression



Result: Steady approach toward Delta

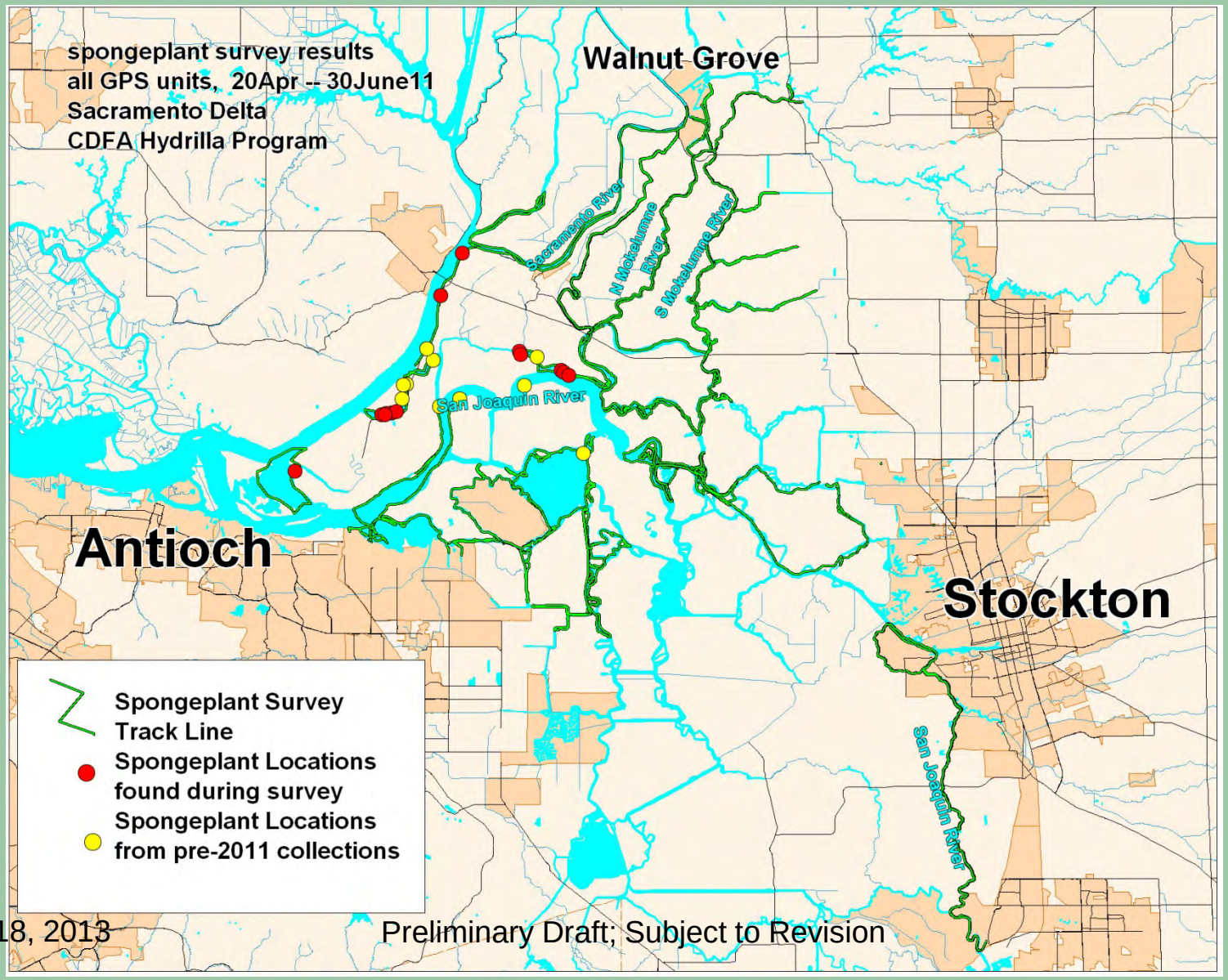


It's moving into the Delta

Above: Sacramento-San Joaquin Delta. Left, spreading patch; right, more mature mat. Note how it is crowding tules and cattails.

In the Sacramento-San Joaquin Delta.

Item of hope: slow spread in Delta



Item of hope: infestations can be eradicated if caught early, before seed bank established

A canal in western Fresno county, before, during, and after treatment, 2008. Plants did not come back at this location, end of 2012.

In locations where the plants have had time to set a lot of seed, they quickly reappear.

Treatment Methods

- **Physical removal – effective for limited infestations**
  - **Hand removal for scattered plants, small patches**
  - **Heavy equipment for well-developed patches**
  - **Booms to limit spread**
- **Herbicides (aquatic formulations)**
  - **Diquat most effective so far, ¼ to ½ label rate**
  - **Glyphosate: can be good but sometimes variable. Use aquatic surfactant.**
  - **2,4-D with careful application**
  - **Others show promise**

Identification: young, uncrowded spongeplant

Note white female flower and daughter plant on stolon (runner) coming off larger plant

Uncrowded spongeplant has leaves that lie flat on the water, the leaves are thick near the stem and curve and taper towards the tip (keeled shape), and the leaf stem is shorter than or about the same length as the leaf blade.

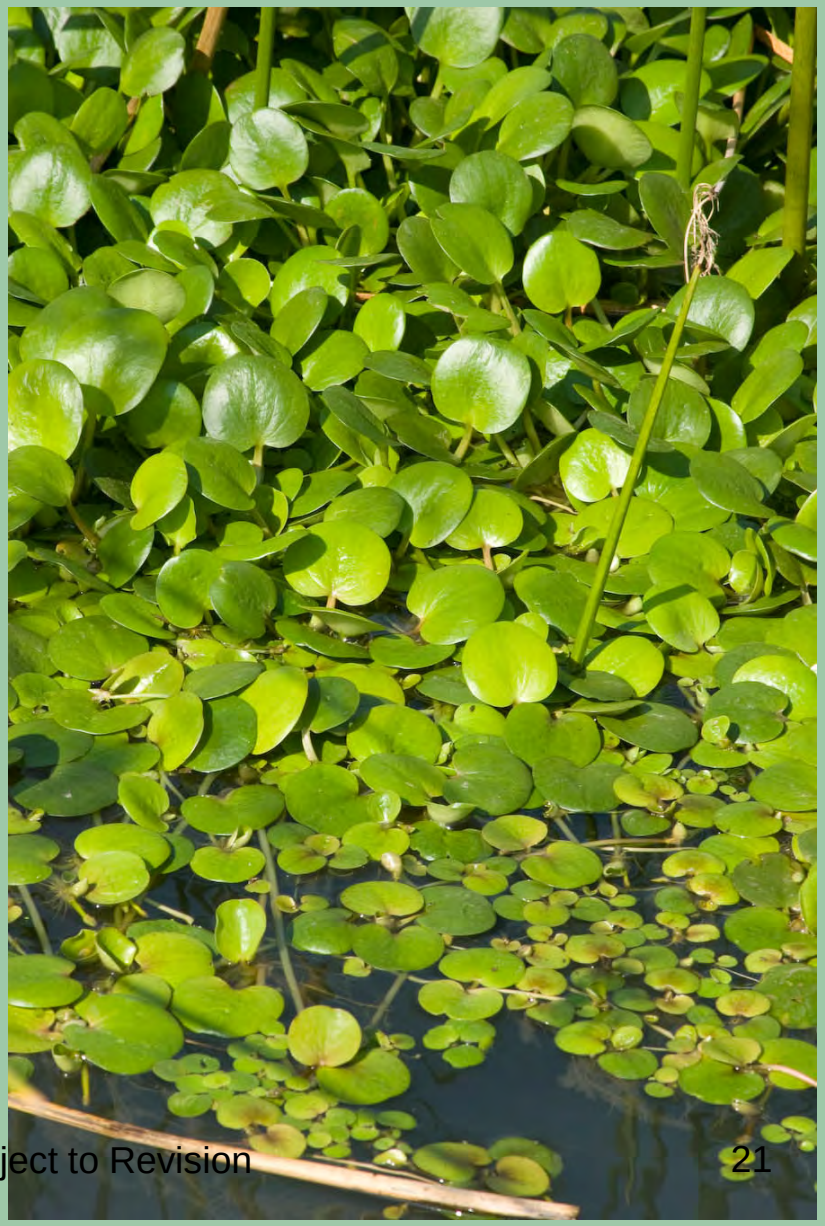
ID: young, uncrowded spongeplant

Leaf folded in half

Note seed pod on right

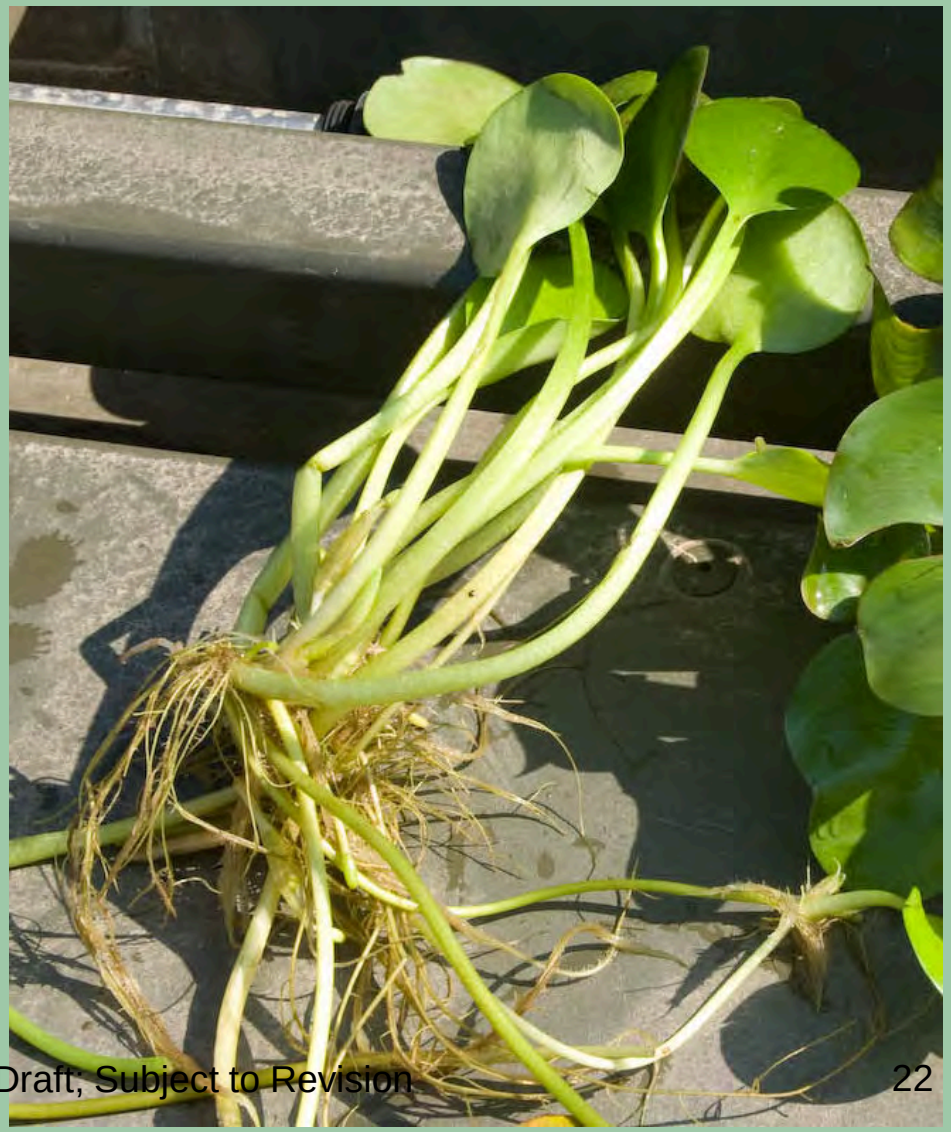
ID: young, uncrowded spongeplant

ID: crowded, upright spongeplant

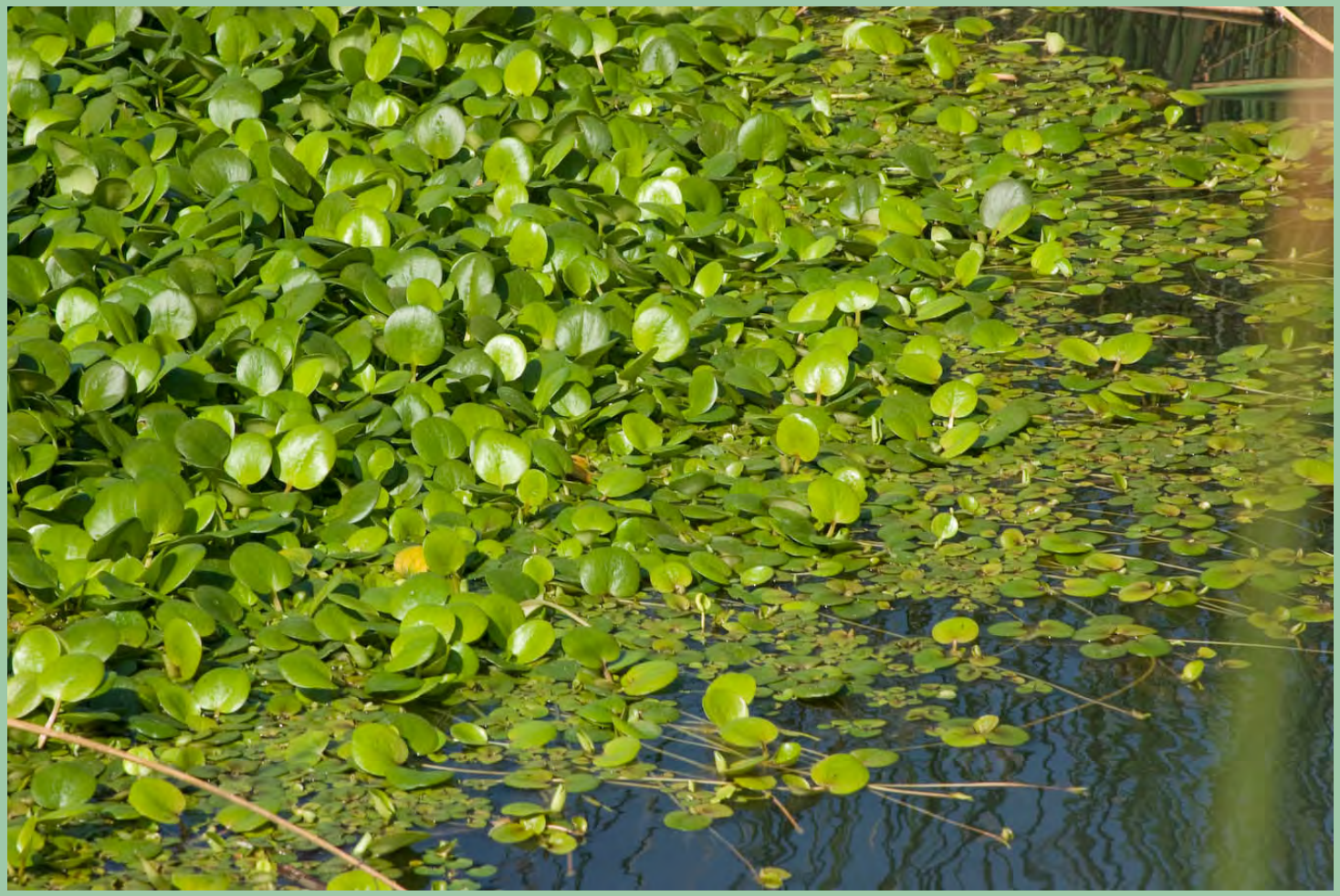


Crowded spongeplant has leaves that are held upright, the leaves are not heavily keeled, and the leaf stem is distinctly longer than the leaf blade, sometimes as much as five times longer. In this condition spongeplant looks very much like water hyacinth, except that it typically gets only 8 to 14 inches tall.

ID: crowded, upright spongeplant



ID: crowded vs uncrowded



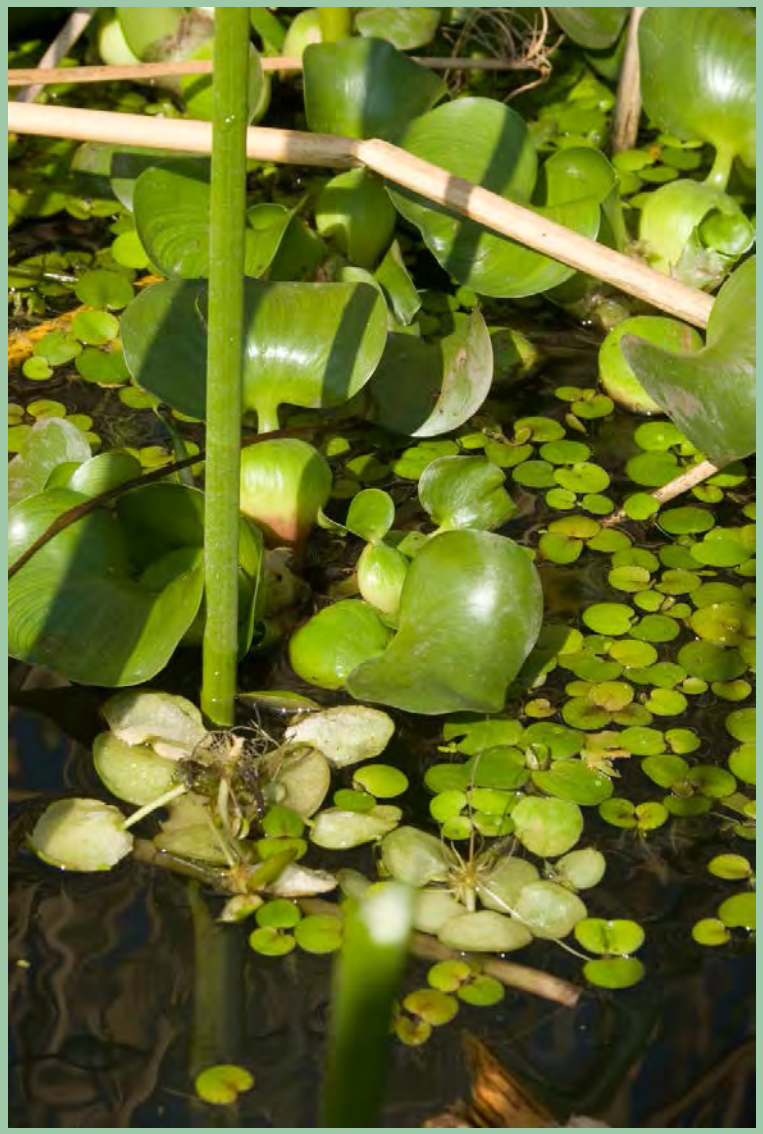
Grading from crowded on left to uncrowded on right

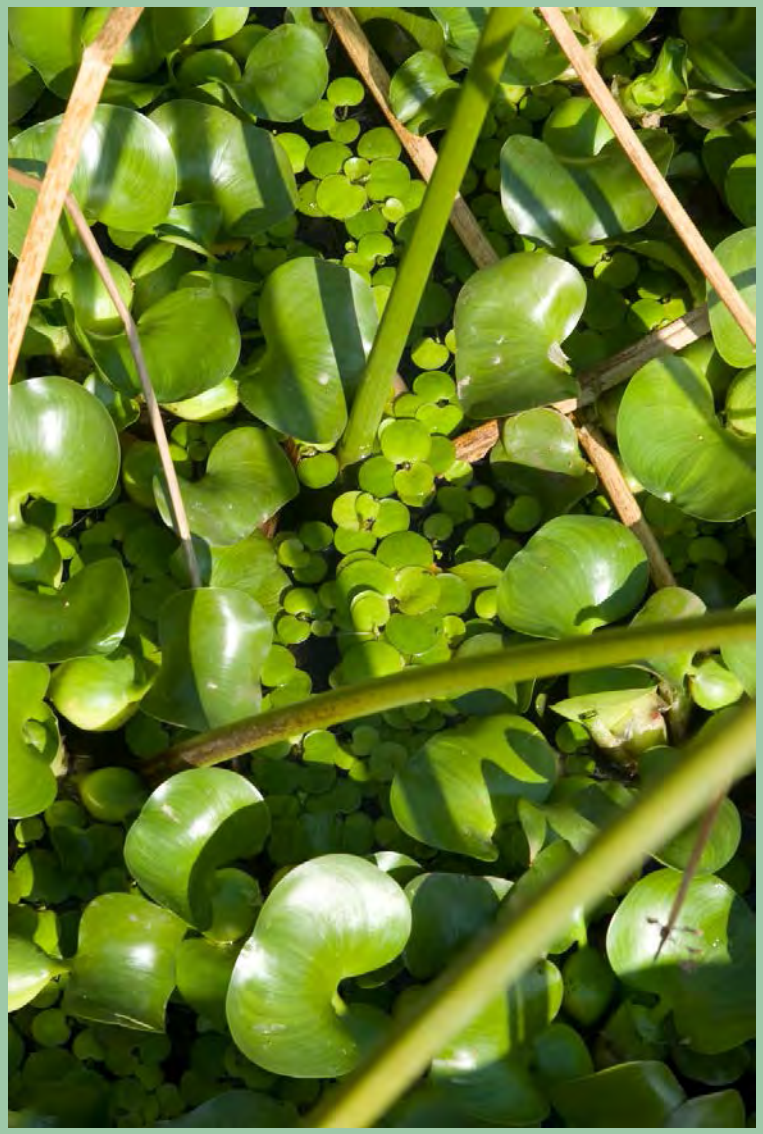
ID: spongeplant vs water hyacinth

Crowded spongeplant, lower, vs crowded hyacinth, upper

Crowded spongeplant, left, vs uncrowded hyacinth, right

ID: spongeplant vs water hyacinth





Uncrowded spongeplant mixed with uncrowded hyacinth

Summary

- **Spongeplant may become a more widespread, persistent problem than hyacinth**
- **Eradication successful if attack is early**
- **Physical and chemical methods effective**
- **Early plants very distinctive with keeled shape**

What you can do

- **Strongly urge you to:**
  - **Survey for it**
  - **Don't let it get established**
  - **Hit it hard, fast when it's found**
- **Report sightings (good location info is important): Patrick Akers, patrick.akers@cdfa.ca.gov**
- **Express support for work on this invader to California Department of Food and Agriculture, other state agencies, and the Legislature**
- **Don't grow it! Don't buy it for your aquarium, water feature, or pond.**
- **Tell your friends**

More Resources

- More info, pictures at:
  - http://www.cdfa.ca.gov/phpps/ipc/hydrilla/hydrilla_hp.htm
  - Or to get to same page, go to CDFA Website main page (www.cdfa.ca.gov) and search for "hydrilla"

pakers@cdfa.ca.gov

History: Control and Spread

- **2003: Infestations in Arcata (on coast) and in Redding 2004: Regulations to eradicate it where it threatens major waterways**
- **2005: Begin treating ~4 sites in Redding; 3 eradicated, one continues.**
- **Summer 2007: One small spot reported in SJ Valley west side (Salt Slough), eradicated. Also reported along SJ River in Fresno. Fresno Hydrilla crew begins survey, suppression (6 seasonals, 1 perm).**
- **Dec 2007: patch in west Delta; disappears after storm**
- **Feb 2008: small canal off Kings River, east of Fresno. Heavily suppressed.**

Control and Spread

- **Summer 2008: Found in CCID canals in western Fresno Co. Survey, suppression locally effective but plants widely, unpredictably scattered.**
- **2009: Suppression in Fresno continues, slight spread northward in western canals.**
- **Summer 2009: found again in Delta. Hydrilla Program has no resources for a response.**
- **2010: Suppression in Fresno continues, but now populations have spread in canal systems to north of Los Banos. Mostly very light, very scattered.**

Winter Effects – Delta, Feb 2011

CDFA Response

- **2011: Expanded survey to define size of problem**
- **2011: Test treatments in Delta to determine if eradication is possible**
- **2011: Expand CDFA eradication authority to include Delta – by normal regulations process, not emergency**
- **Late 2011: Results to stakeholders; determine whether to start large-scale eradication effort**
- **After 2011: ??**