Aquatic Weed Identification and Biology

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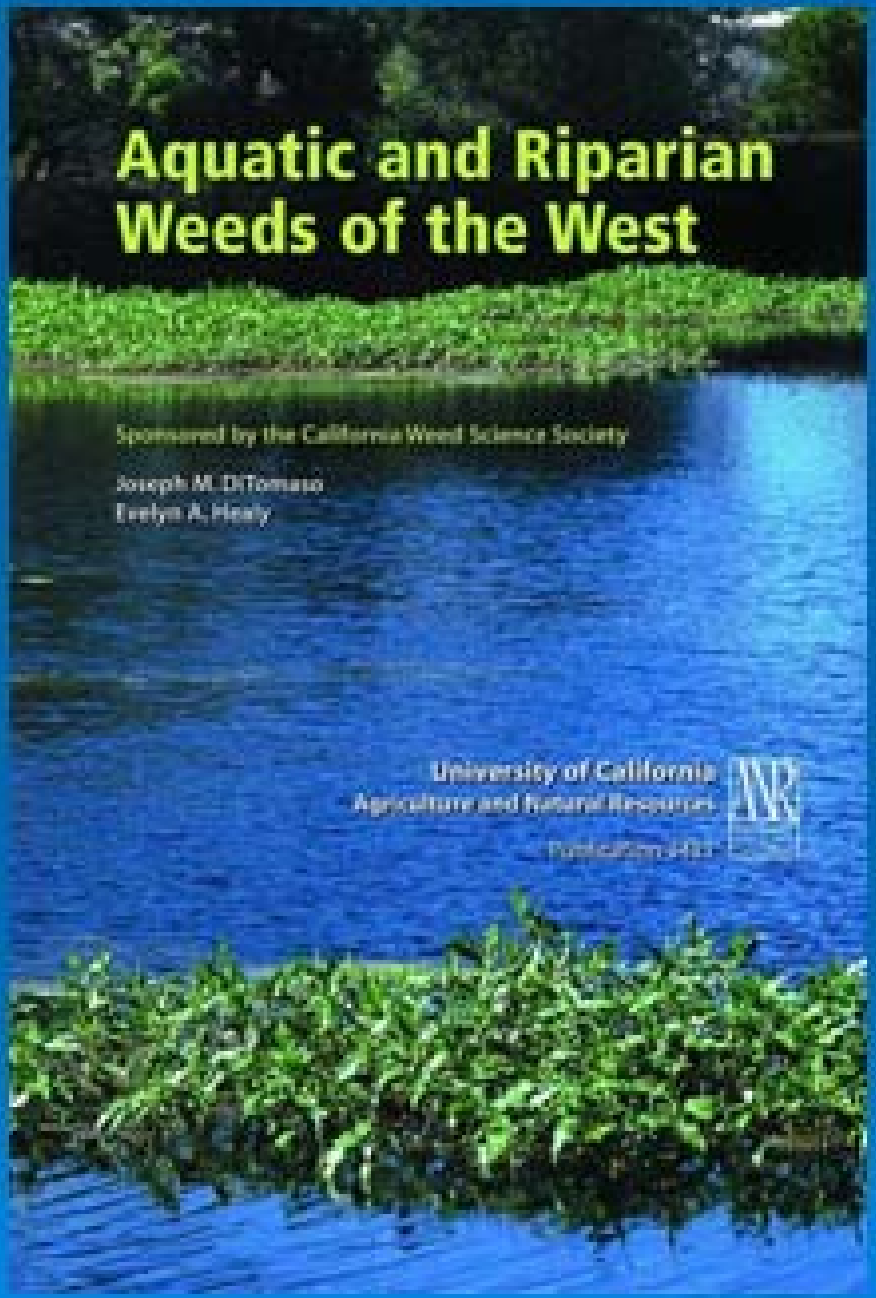
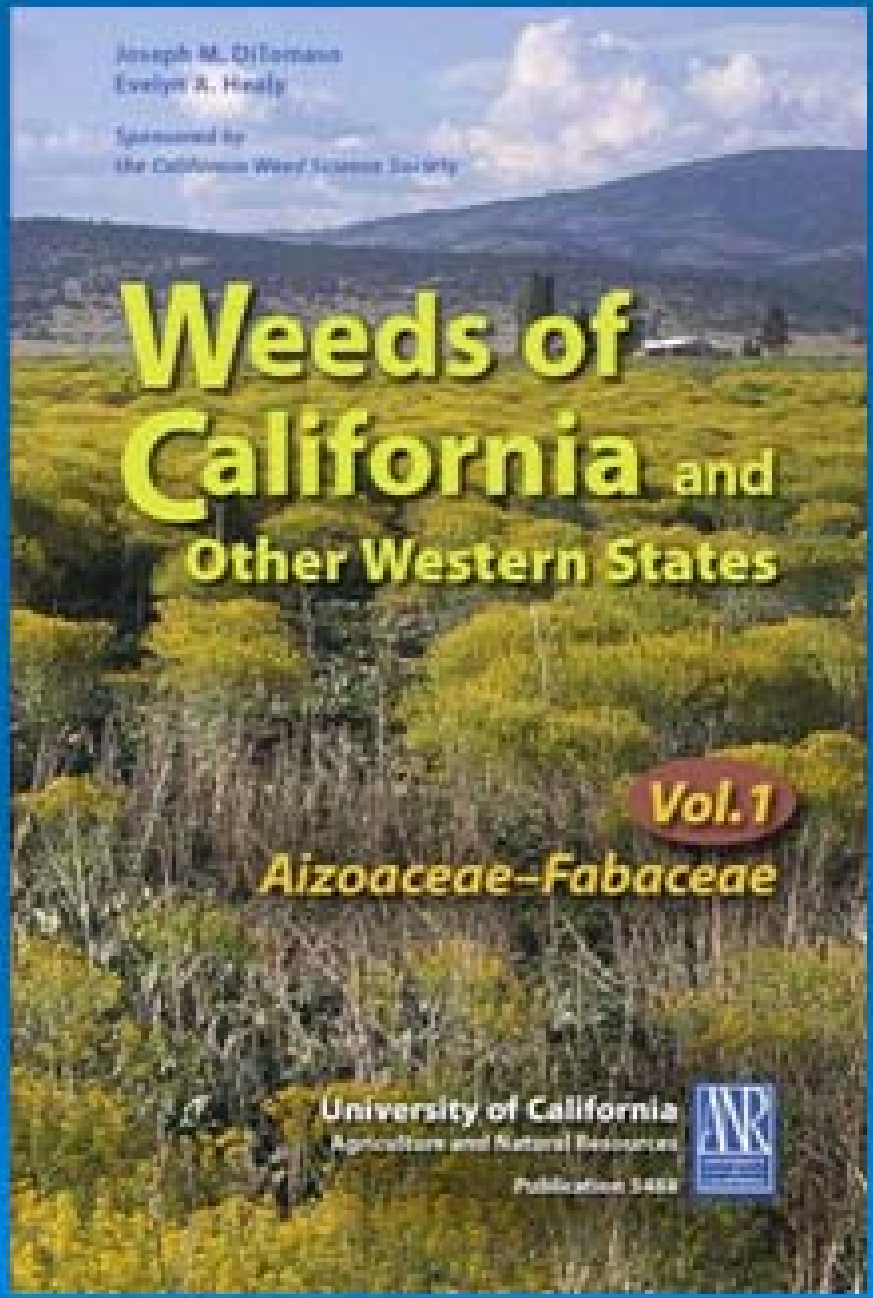

Aquatic and Riparian Weeds of the West
Sponsored by the California Weed Science Society
Joseph M. DiTomaso
Evelyn A. Healy
University of California
Agriculture and Natural Resources


Joseph M. DiTomaso
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Algae

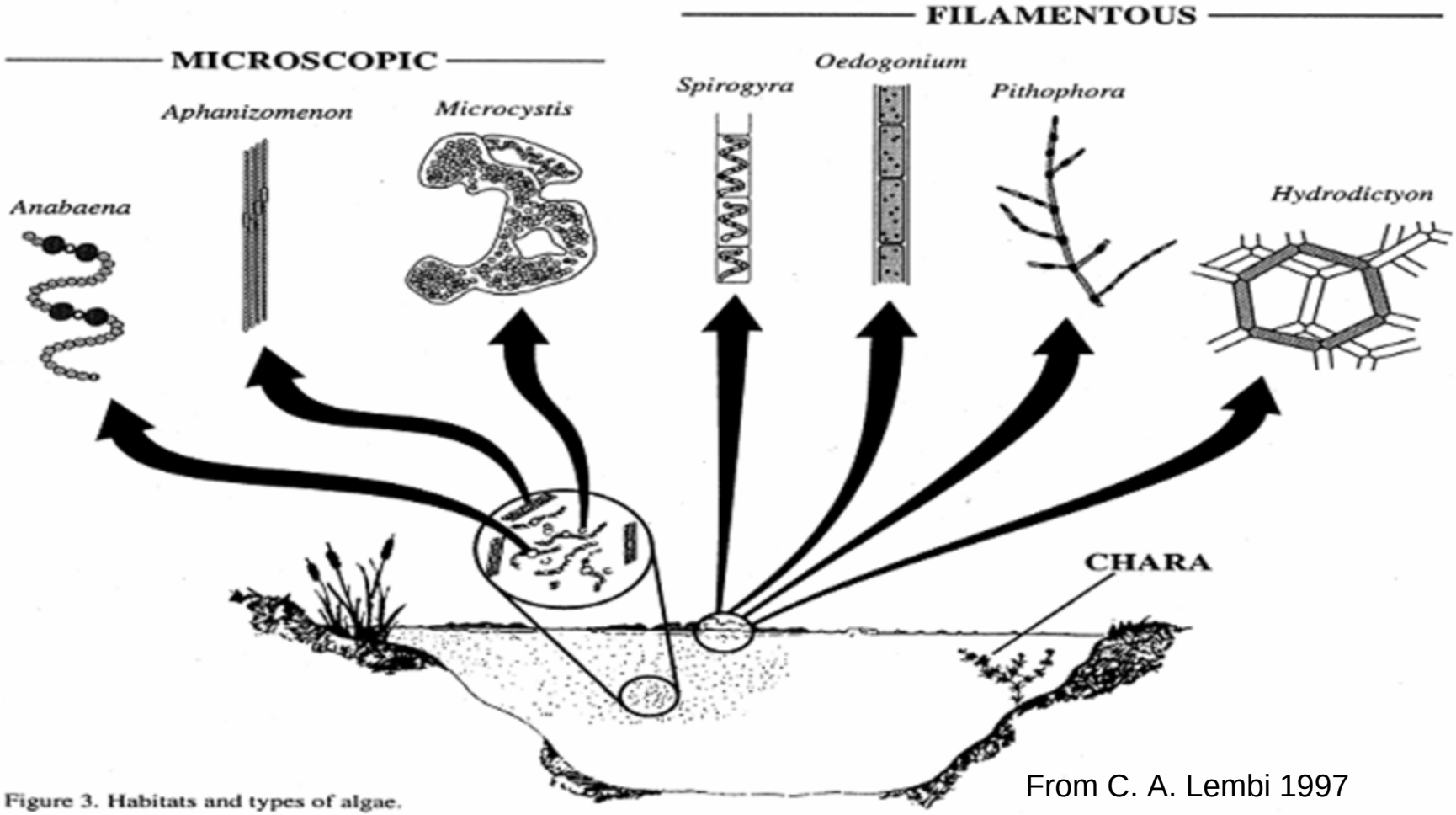


Figure 3. Habitats and types of algae.

From C. A. Lembi 1997

Microscopic or Planktonic Algae

Microscopic or Planktonic Algae

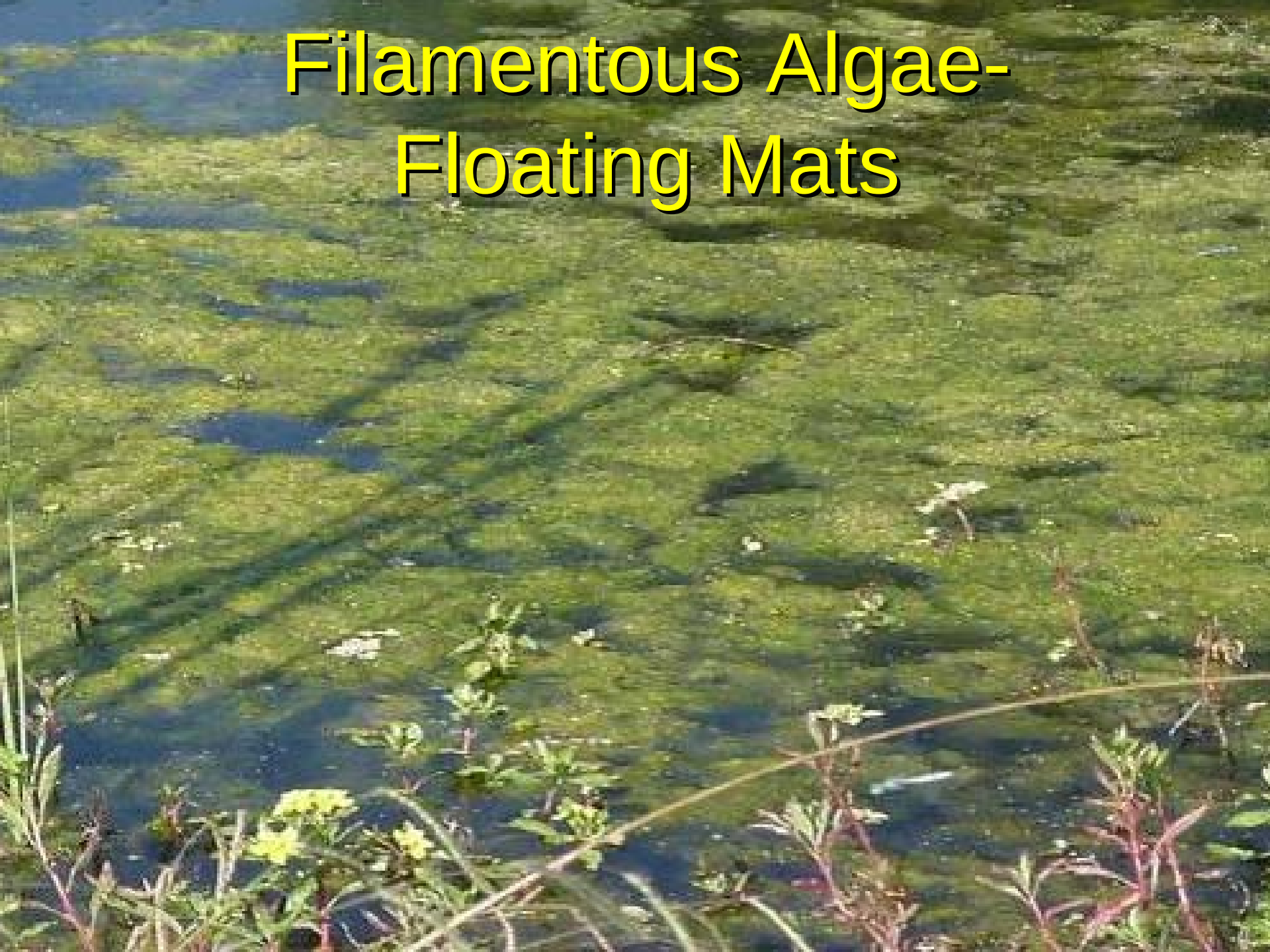
- Not really algae, actually bacteria.
- Microscopic algae: *Anabaen, Aphanizomenon, and Microcystis*
- AKA ‘Annie, Fanny and Mike.’
- Produce toxins, but poisonings rare.


Algae Bloom

Algae Bloom

- Bloom caused by warm water and nutrient introduction
- ‘Fish Kills’ occur during respiration or when algae die- oxygen depletion.

Filamentous Algae- Floating Mats

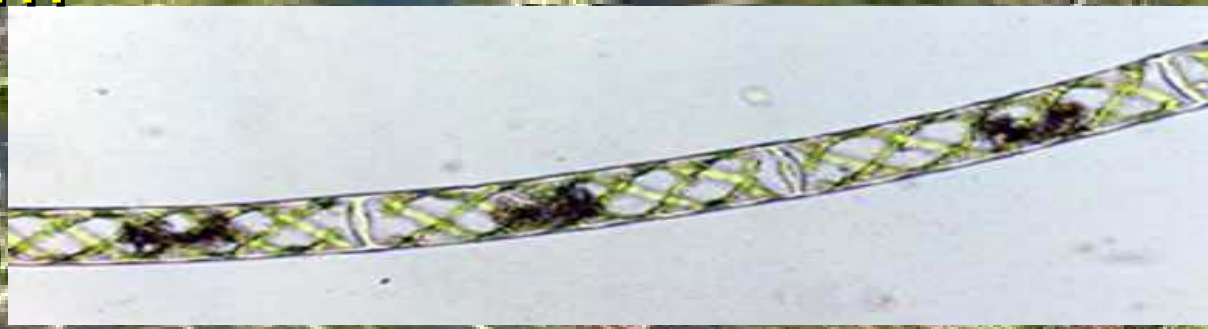


Filamentous Algae- Floating Mats

- Often incorrectly called ‘moss’
- Growth usually starts on edges and bottoms of pond in spring

Filamentous Algae- Floating Mats

- Often incorrectly called ‘moss’
- Growth usually starts on edges and bottoms of pond in spring
- Segments are single cells.
- Common Species: Cladophora, Rhizoclonium



Submersed Algae

Chara-stonewort

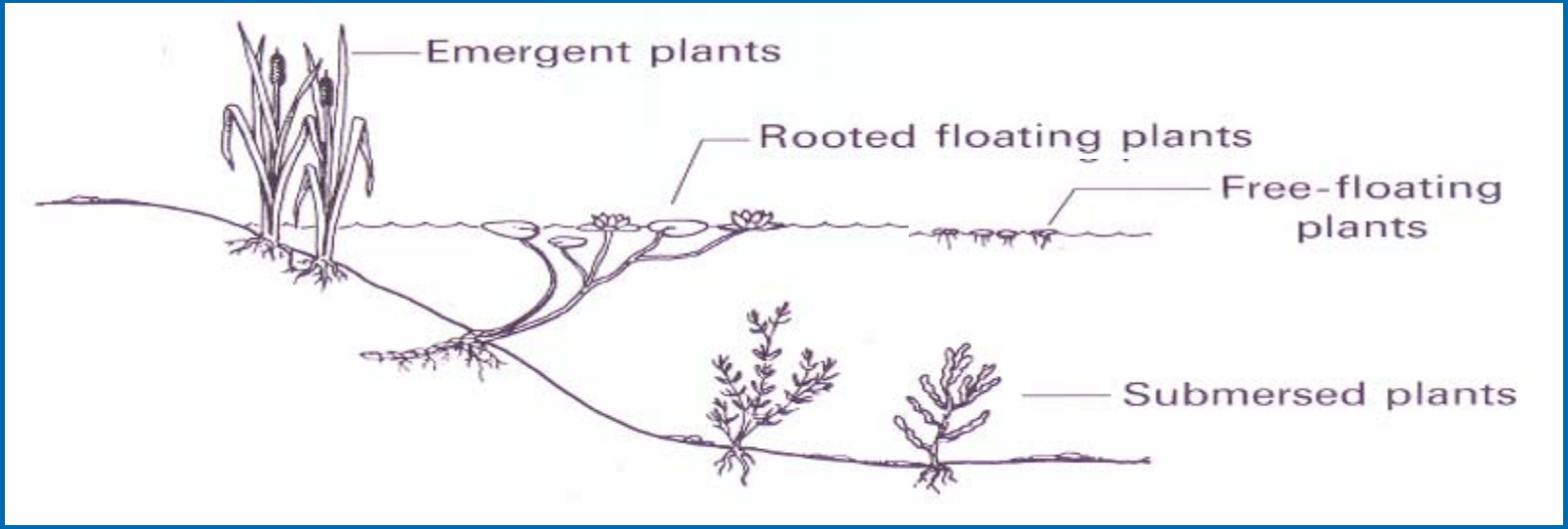
Chara-stonewort

- Usually grows in very hard water
- Often confused with flowering plant
- Rough feel and distinctive musky smell
- Where it is low growing it is voluble habitat for fish

Nitella

- Native- very similar to Chara
- No rough feel

Types of Aquatic Plants



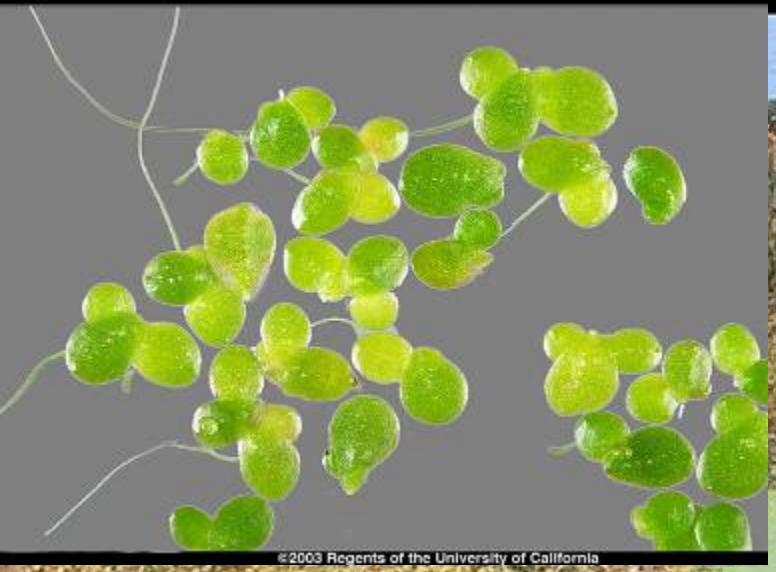
Free-floating plants

Each of the four types of aquatic plants favors a certain water depth. Typically the growth areas are not sharply divided. Expect to see overlap in growth--submerged plants interspersed among floating-leaf varieties.


Pacific mosquitofern
Azolla filiculoides

Pacific mosquitofern
Azolla filiculoides

- Fern- reproduces by spores and stem fragments
- Desirable native species in natural habitat
- Often grow in eutrophic water-
- Still sold in aquarium trade- careless disposal of water may introduce into new areas.

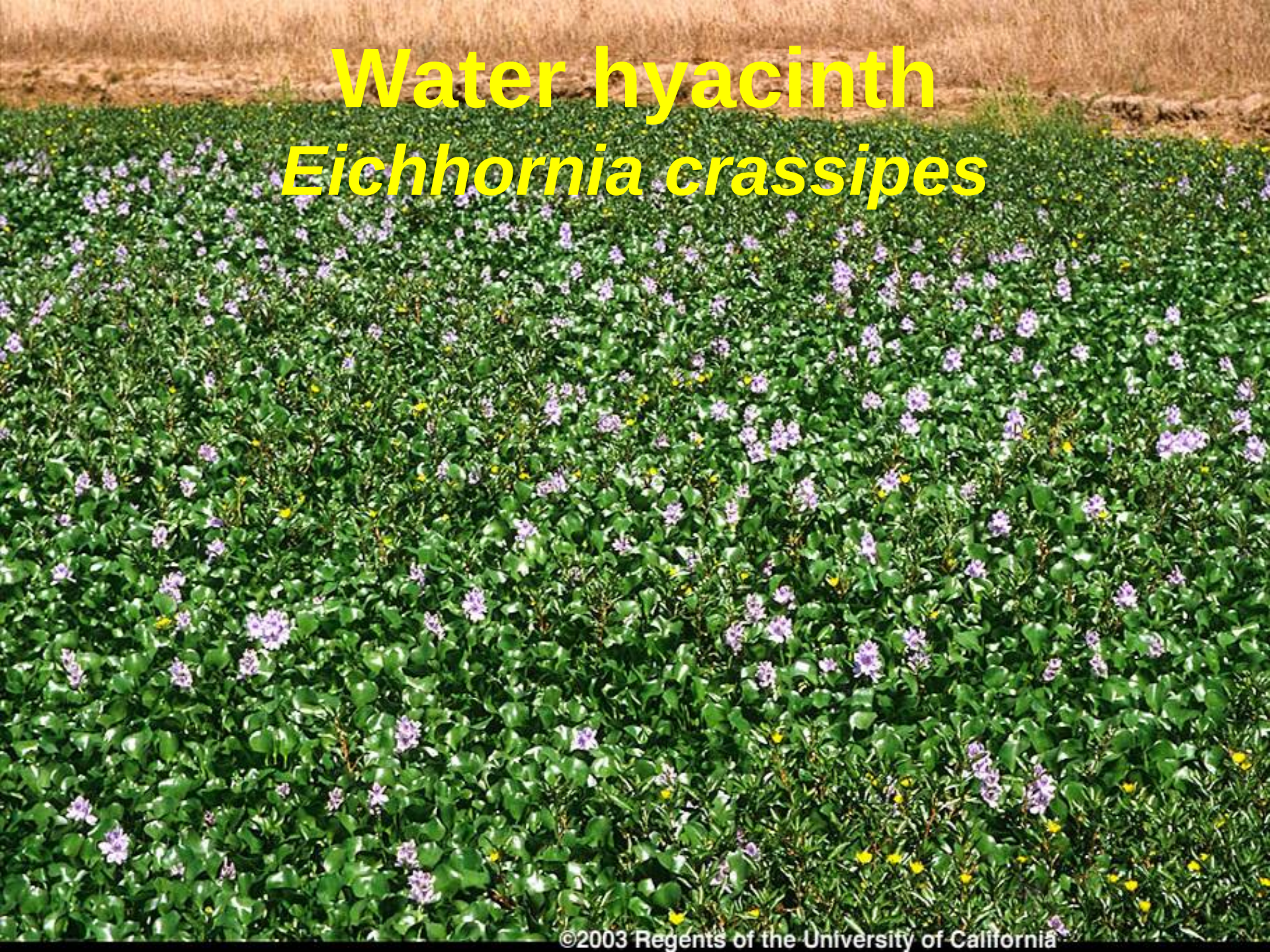


Common duckweed

Lemna minor

Common duckweed

- Very small floating perennial native
- In high fertility site can double in number every 3 days
- Reproduces by budding (daughter plant)
- One root per frond


Water hyacinth
Eichhornia crassipes
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airbladder
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Water hyacinth
Eichhornia crassipes

- Noxious floating perennial introduced from Brazil
- Floating mats clog water ways
- Heavy infestations can alter water oxygen content, temperature, pH, and displace native plants and wildlife.


Smooth frogbit or
West Indian spongeplant
(*Limnobium laevigatum*)
© 2008 California Department of Food and Agriculture

Smooth frogbit or West Indian spongeplant (*Limnobium laevigatum*)

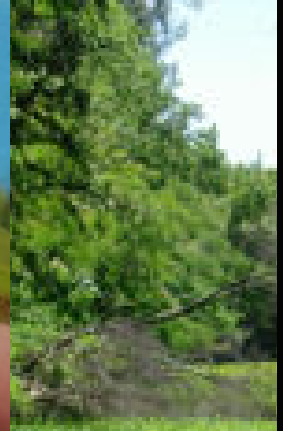
- Hydrocharitaceae-Same family as Hydrilla
- Native to Central and South America
- First infestation in Redding (2002). Found in 2007 in scattered patches along 10-15 miles of the San Joaquin River in Fresno.
- Later it appeared in the Sacramento Delta and
- near the Kings River southeast of Fresno.

Smooth frogbit or West Indian spongeplant (*Limnobium laevigatum*)

Floating to rooted stoloniferous perennial.

Very different from hydrilla and Brazilian egeria - resembles a smaller version of water hyacinth

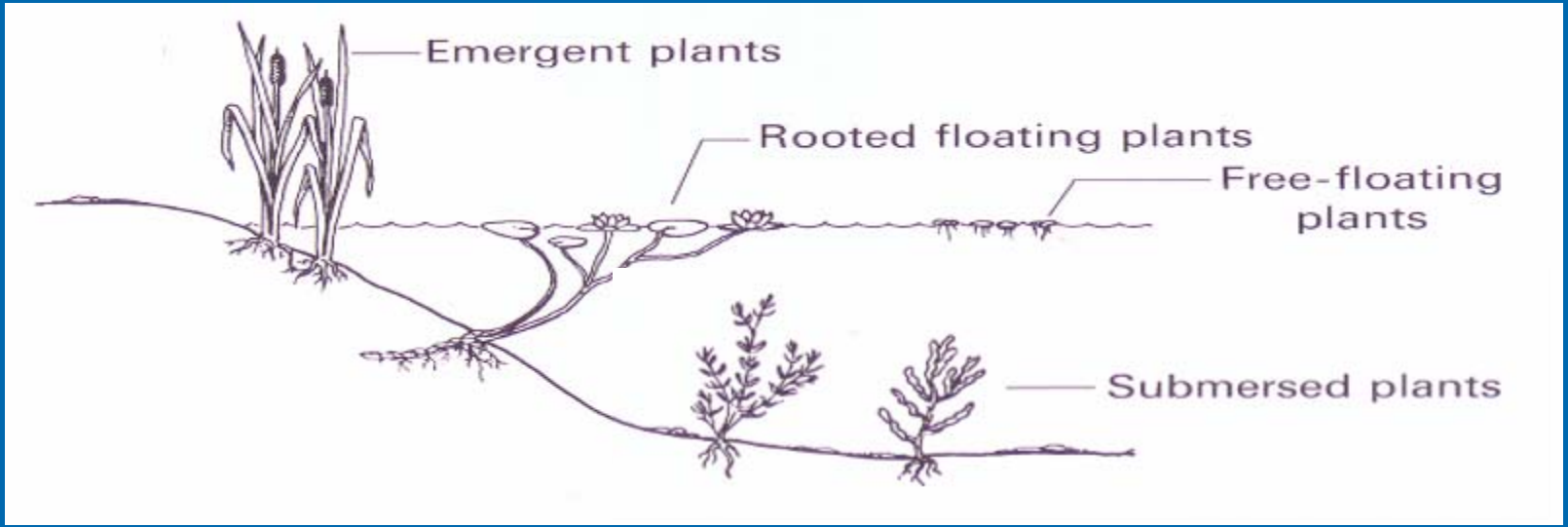
. The bottom of its leaves have a diagnostic honeycomb-like spongy tissue.



Placed on CDFA Noxious Weed Q-list

Juvenile form of partly submersed rosettes with thick floating leaves develop into much larger mature clumps

Types of Aquatic Plants



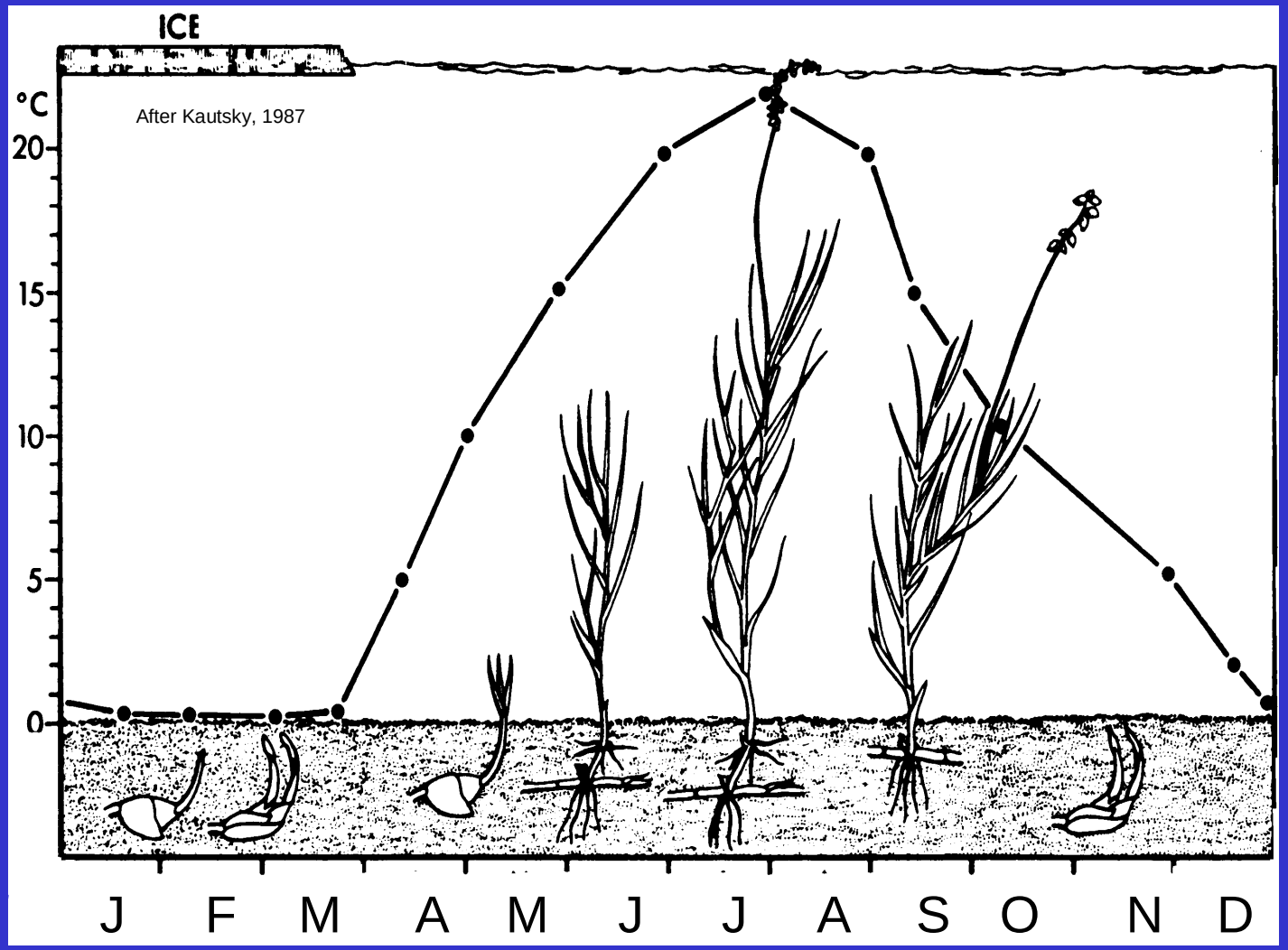
Submersed plants

Pondweeds

- All Potamogeton and Stuckenia species are native to the Western US, except Potamogeton crispus-curlyleaf pondweed (Eurasia)
- Important components of wildland aquatic habitats-
- Perennials-most with rhizomes
- Curlyleaf produces turions and Sago produces tubers

Sago pondweed
Stuckenia pectinatus

Seasonal Development of Sago Pondweed

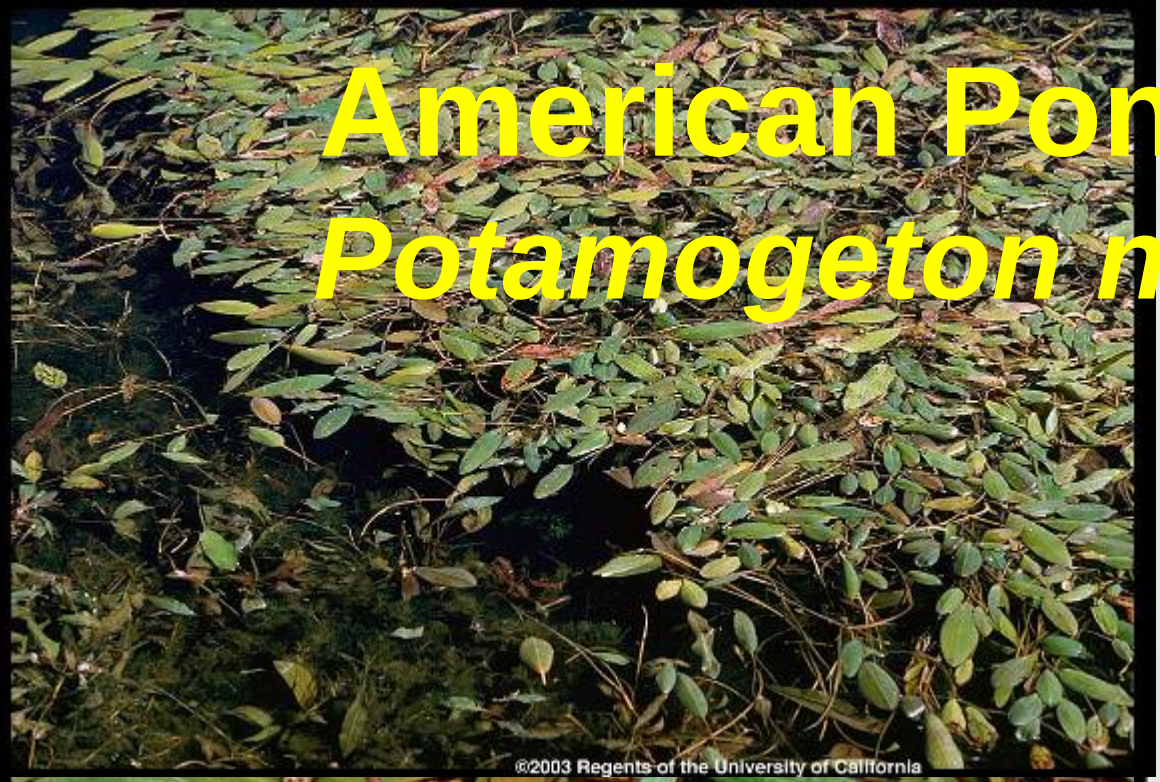


Curlyleaf pondweed
Potamogeton crispus

Leafy pondweed
Potamogeton foliosus

Floatleaf pondweed
Potamogeton natans

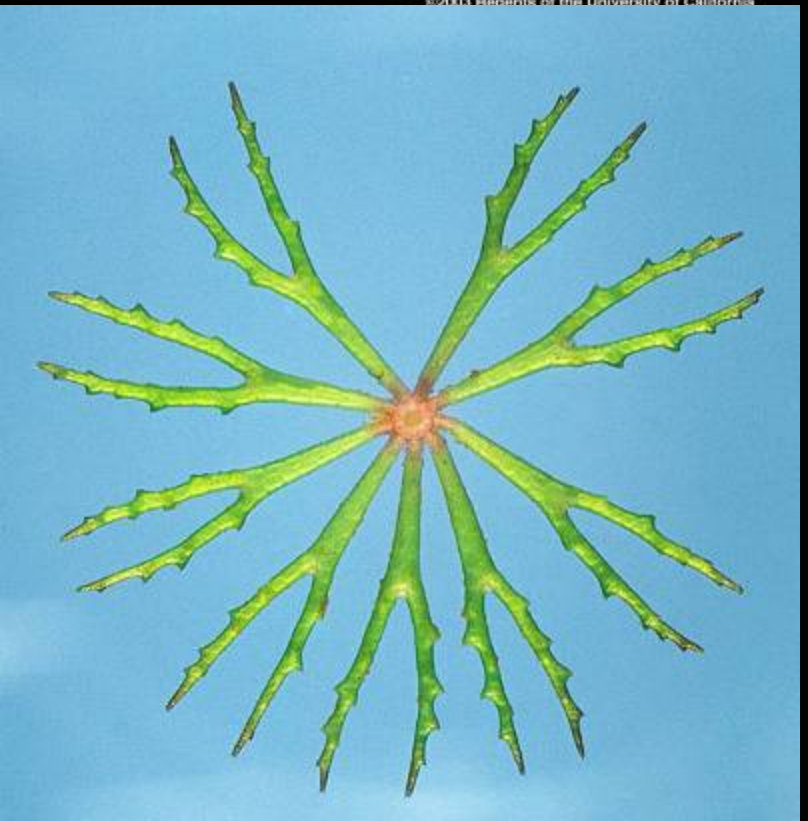
American Pondweed
Potamogeton nodosus



Coontail, Parrotfeather and Milfoils

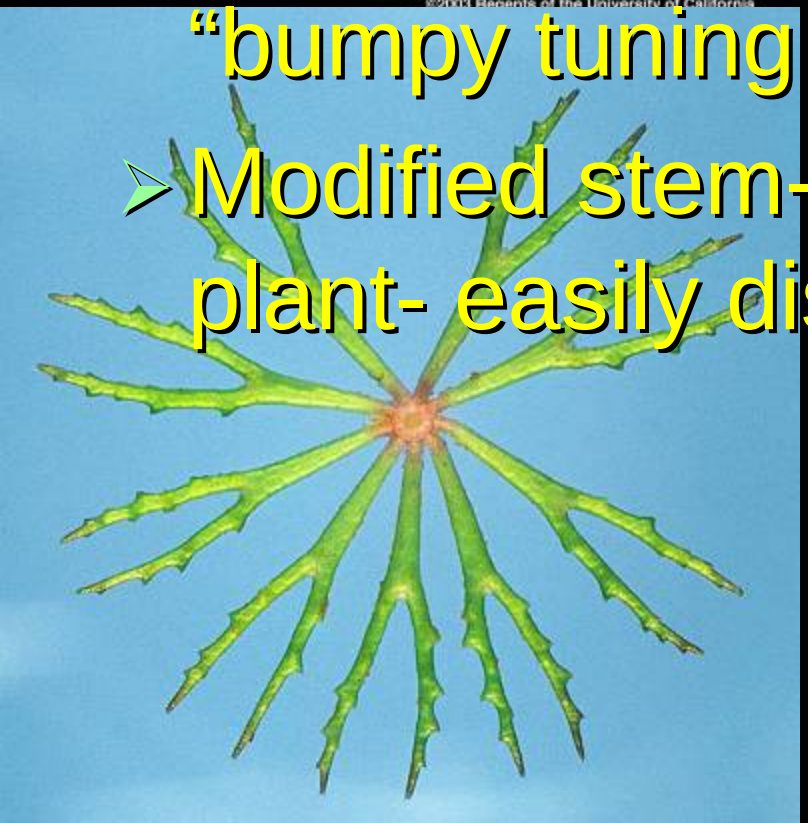
Coontail

Ceratophyllum demersum



Coontail
Ceratophyllum demersum

- Native-annual to perennial
- Cross section- leaves look like "bumpy tuning fork"
- Modified stem-not roots lightly hold plant- easily dislodged



Parrotfeather
Myriophyllum aquaticum

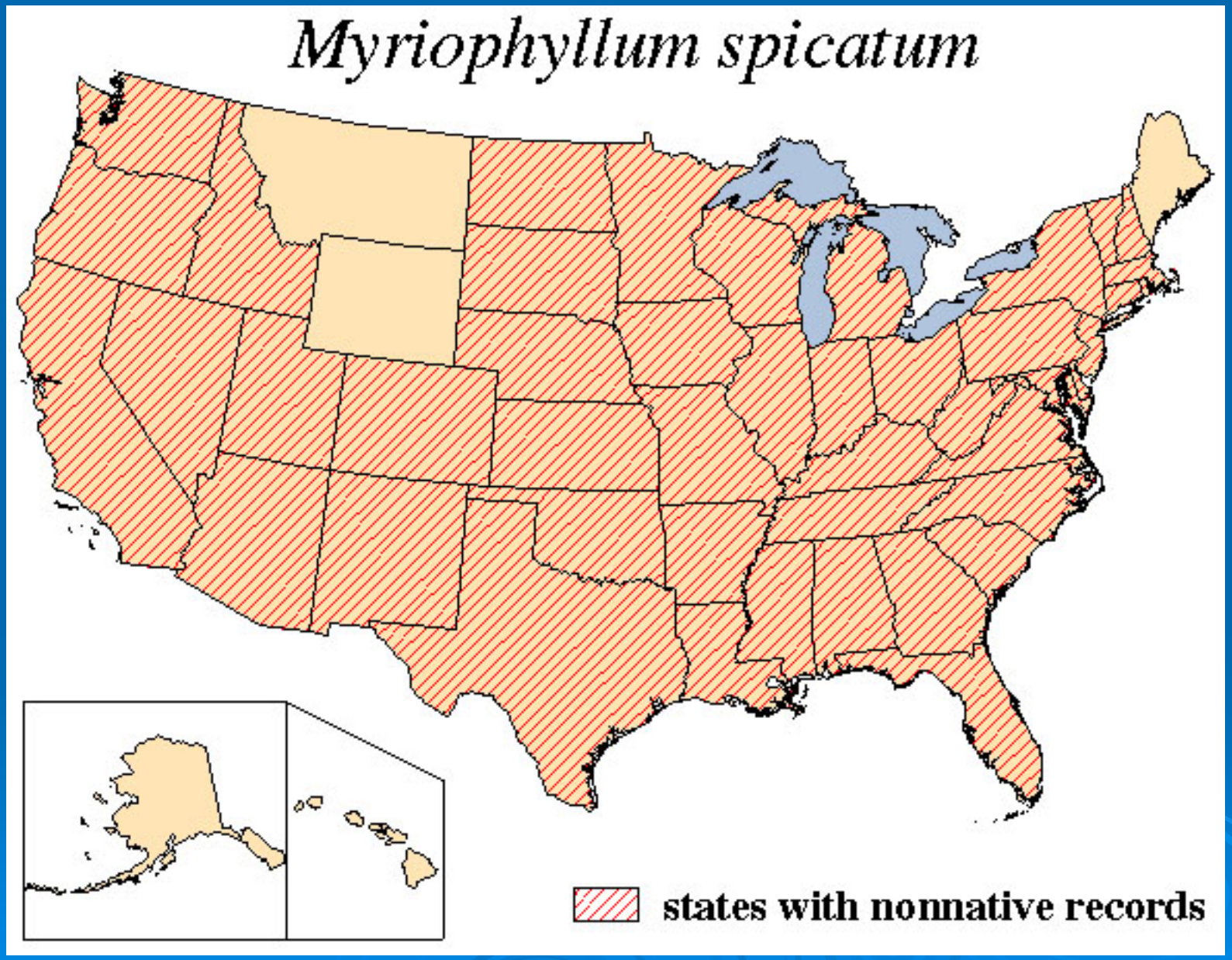
Parrotfeather
Myriophyllum aquaticum

- Noxious perennial introduced from South America in late 1800's
- Emersed plant, can become semi-terrestrial
- Reproduces vegetatively only- by rhizome and stem fragments

Western watermilfoil *Myriophyllum hippuroides*

- An uncommon native species
- not considered weedy
- Unlike other milfoil's emerges from water

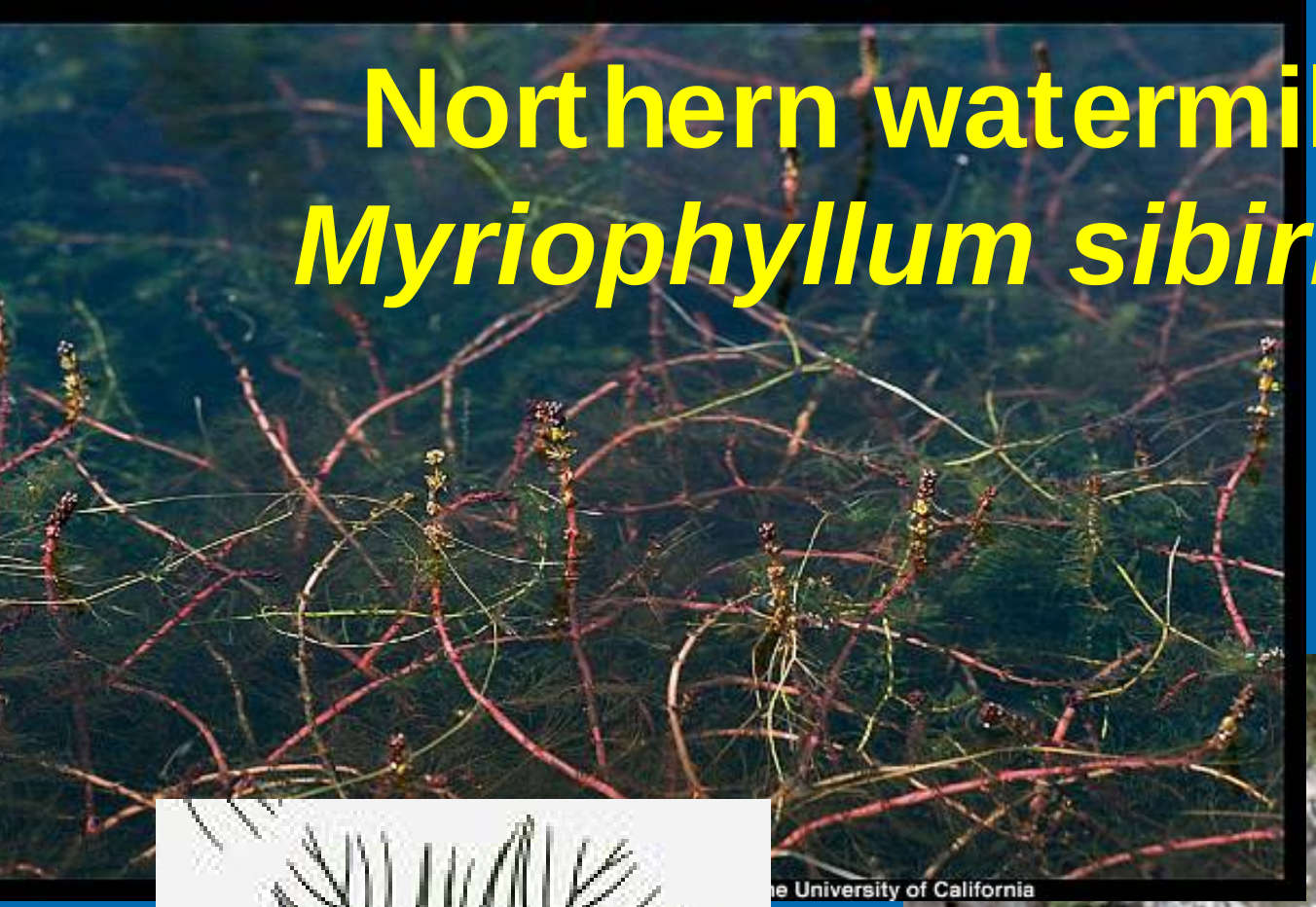
Eurasian watermilfoil
Myriophyllum spicatum

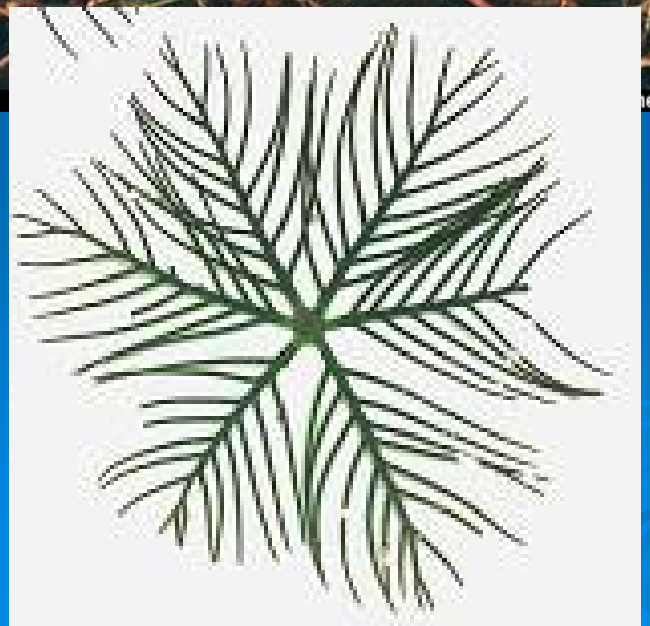

Myriophyllum spicatum
states with nonnative records

Eurasian watermilfoil *Myriophyllum spicatum*

- Noxious perennial propagated by rhizomes, axillary buds and seeds.
- Seeds can survive dormant for 7 years under dry conditions and are eaten and spread by birds.
- Introduced from Eurasia, probably late 1940's in aquarium trade.

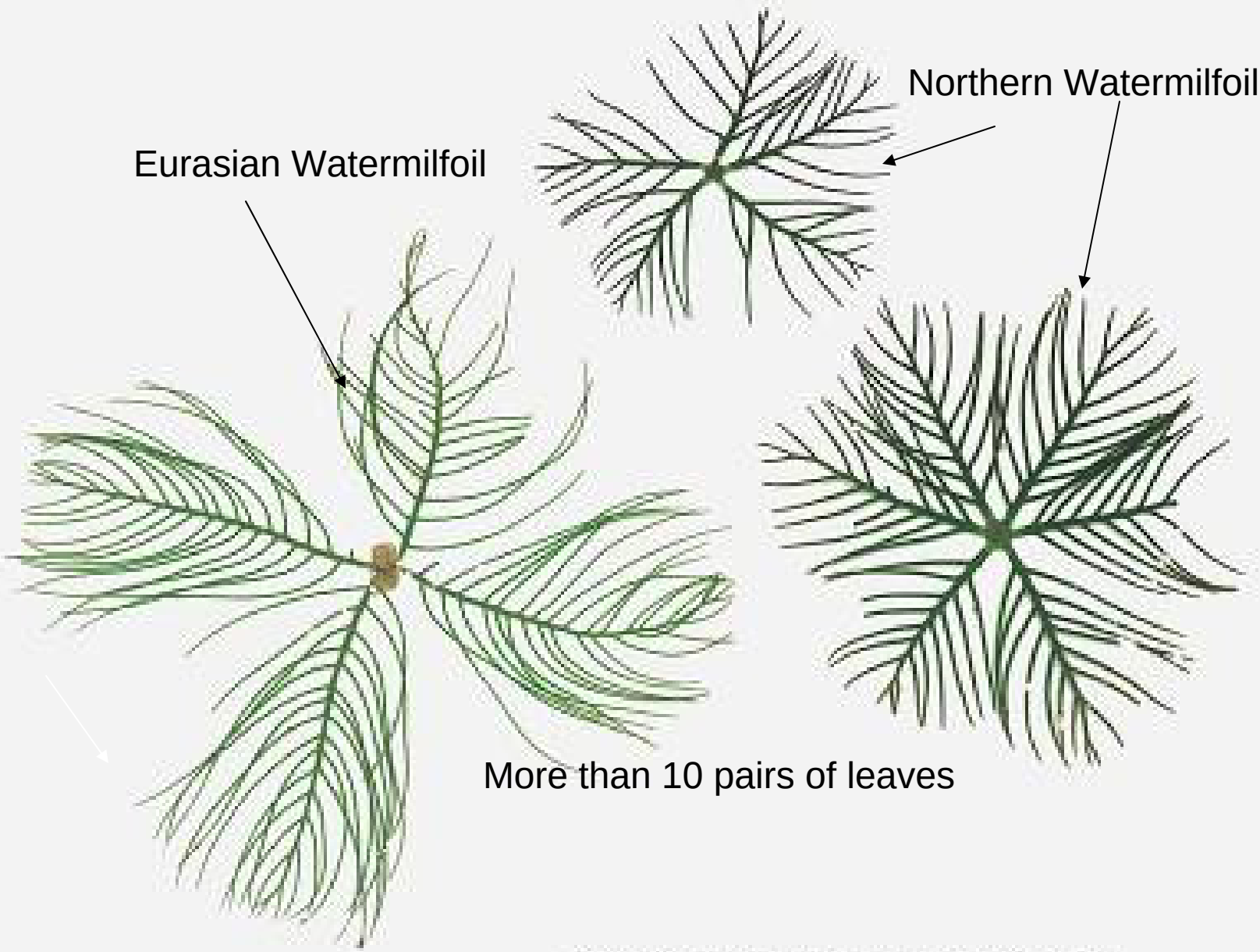
Northern watermilfoil
Myriophyllum sibiricum





Northern watermilfoil
Myriophyllum sibiricum

- Widespread native
- Produces turions-EWM does not
- Looks very similar to EWM- leaf lobes different-


Northern Watermilfoil
Eurasian Watermilfoil
More than 10 pairs of leaves

Elodea, Egeria, Hydrilla

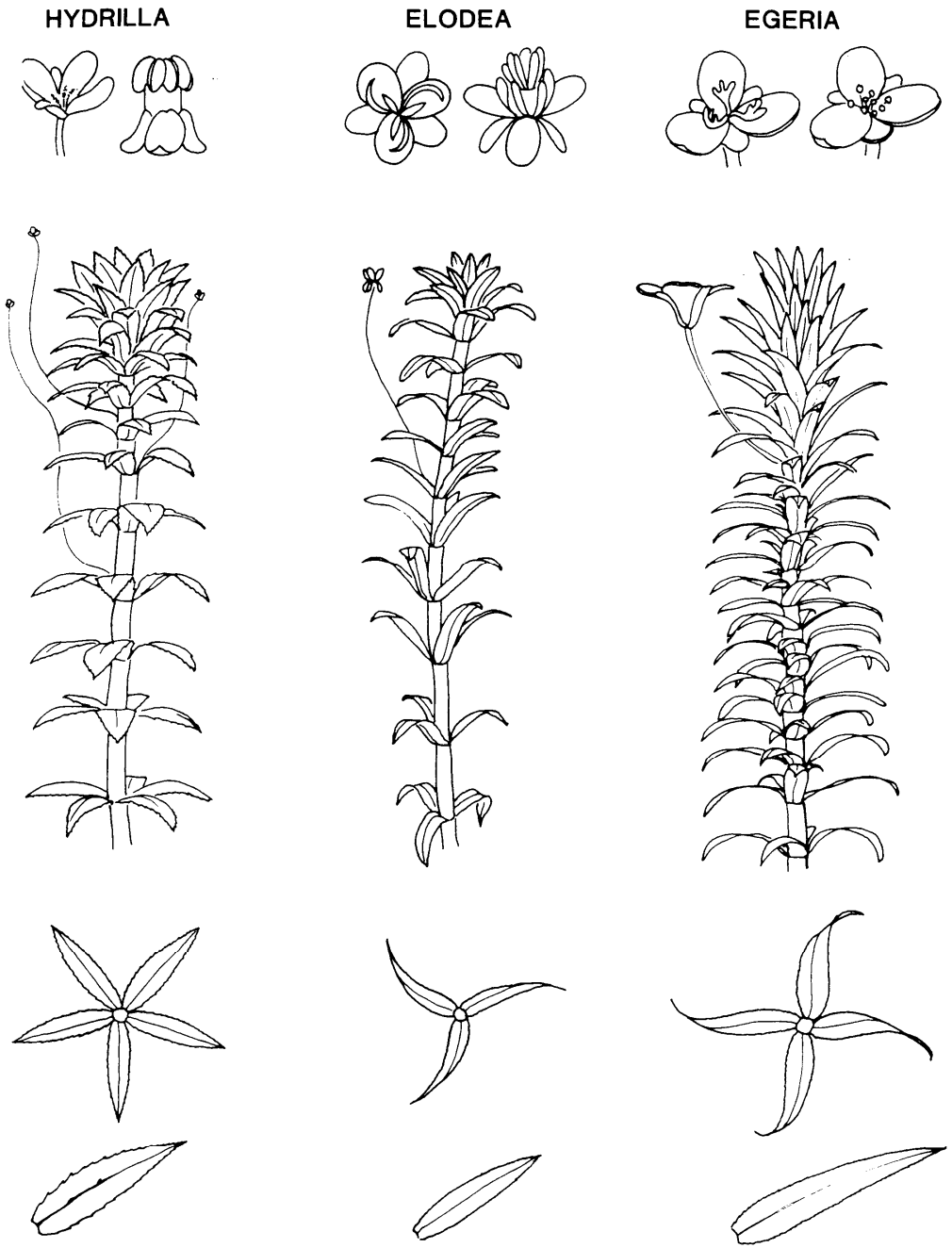
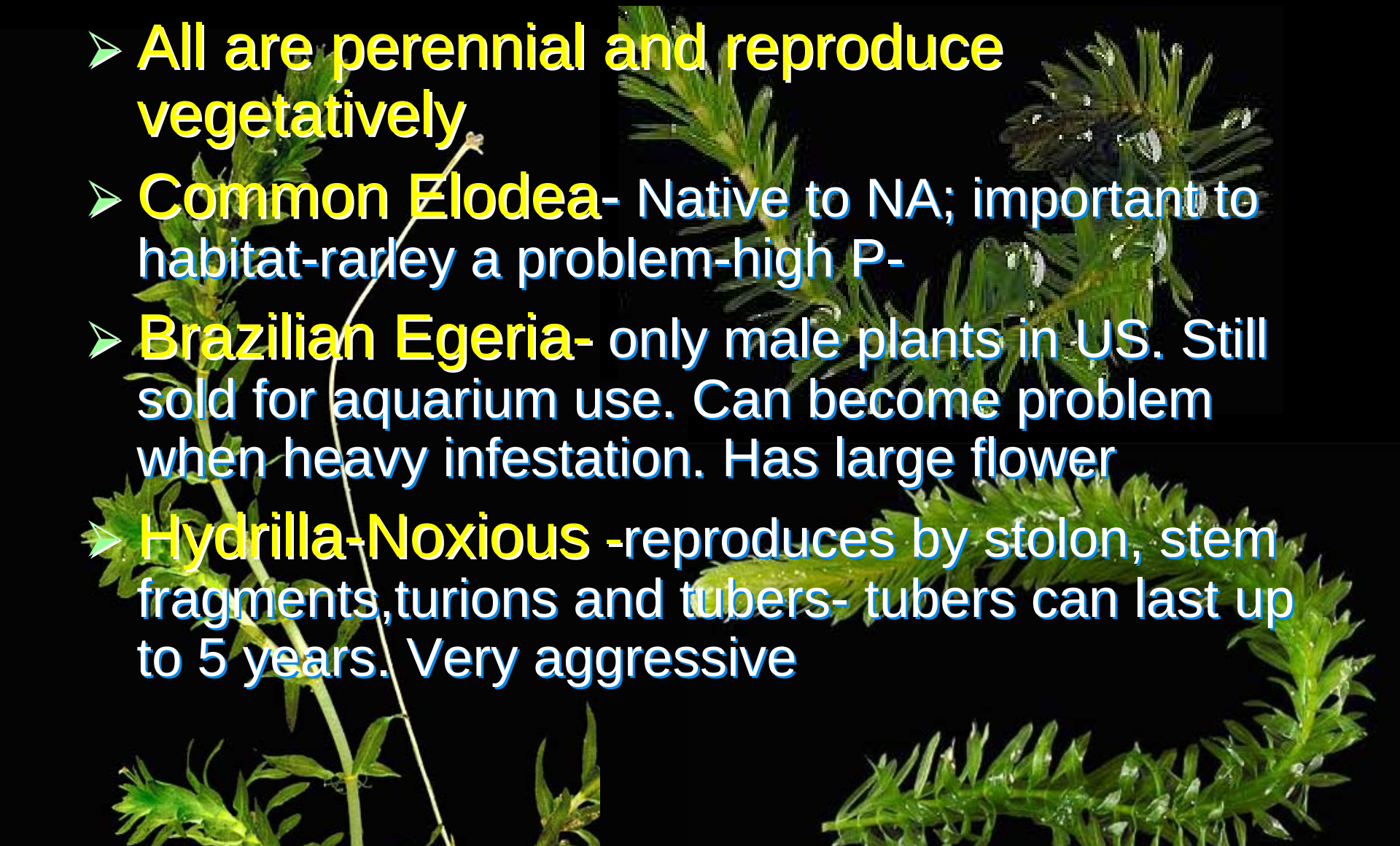


illustration provided by:
IFAS, Center for Aquatic Plants
University of Florida, Gainesville, 1990

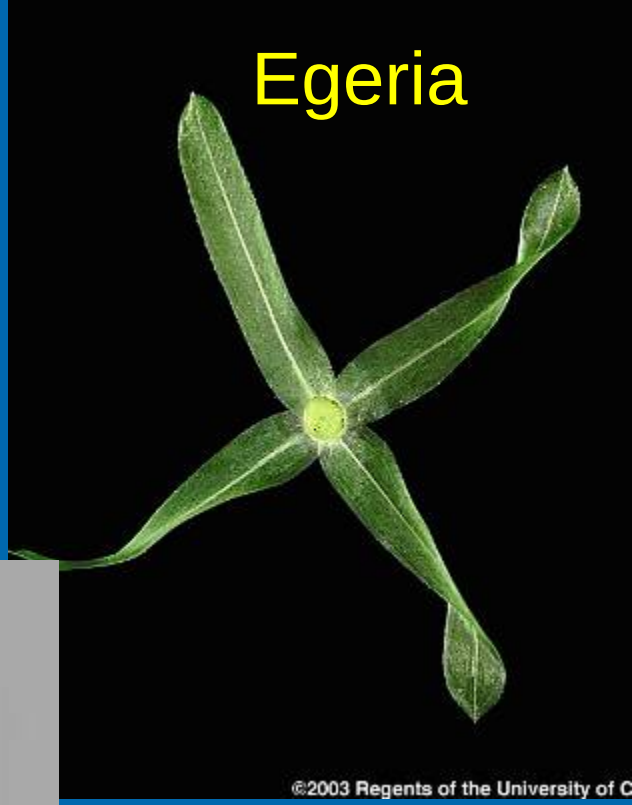
Elodea, Egeria, Hydrilla



- All are perennial and reproduce vegetatively
- Common Elodea- Native to NA; important to habitat-rarley a problem-high P-
- Brazilian Egeria- only male plants in US. Still sold for aquarium use. Can become problem when heavy infestation. Has large flower
- Hydrilla-Noxious -reproduces by stolon, stem fragments,turions and tubers- tubers can last up to 5 years. Very aggressive

Hydrilla

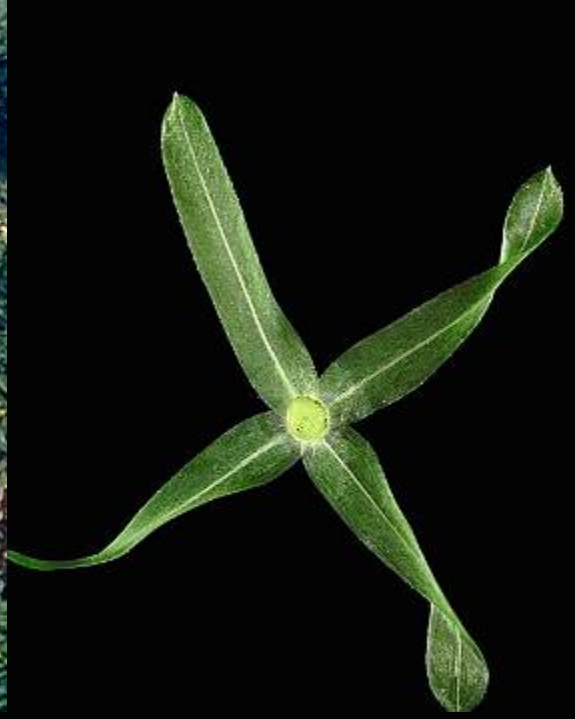
Egeria



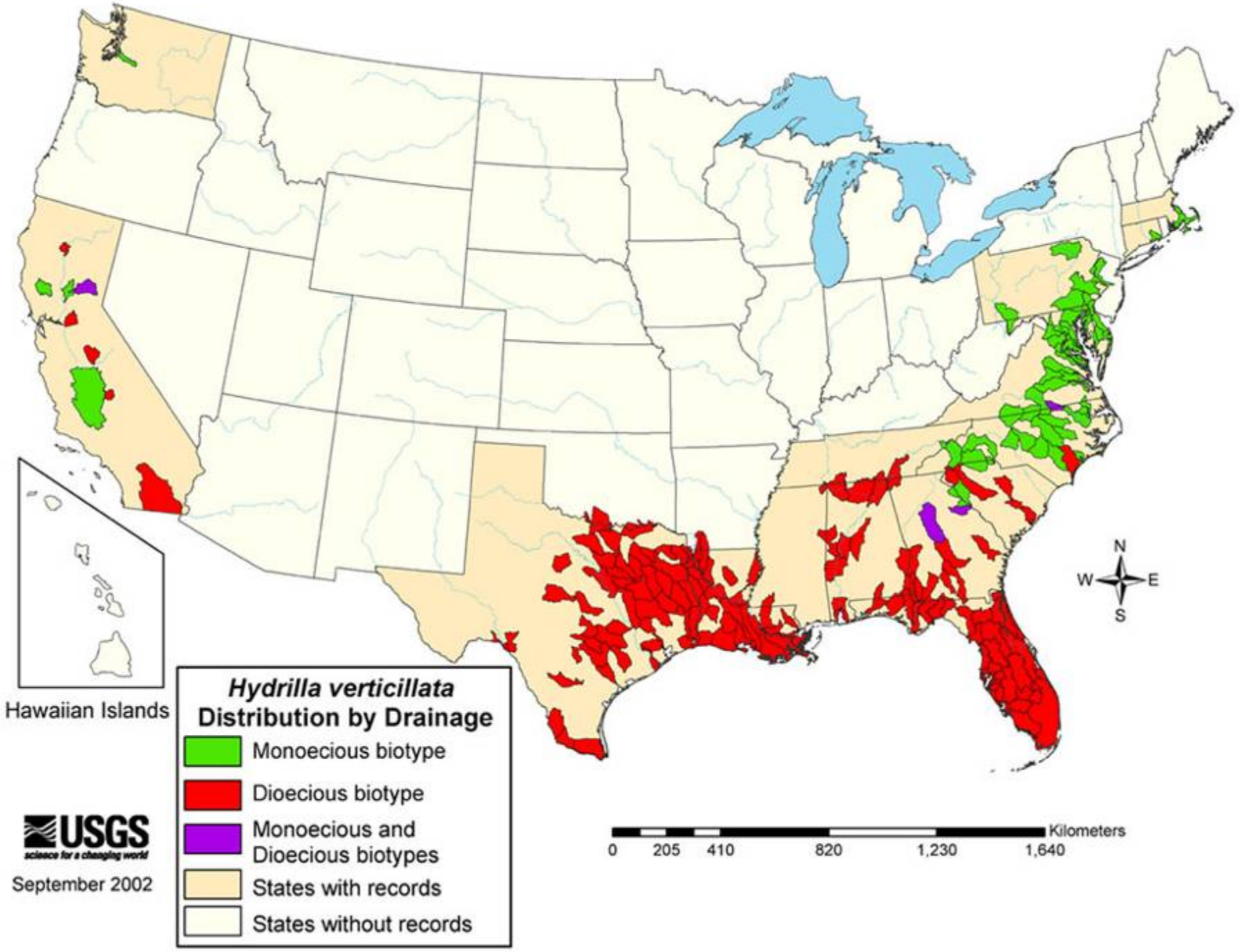
Elodea

Common Elodea
Elodea canadensis

Brazilian Egeria
Egeria densa



Hydrilla-*Hydrilla verticillata*


Hawaiian Islands
Hydrilla verticillata
Distribution by Drainage
Monoecious biotype
Dioecious biotype
Monoecious and
Dioecious biotypes
States with records
States without records
USGS
science for a changing world
September 2002
N
W
E
S
0
205
410
820
1,230
1,640
Kilometers

Hydrilla at Wakulla Springs, Florida
Hydrilla verticillata
Photo by Vic Ramey


Hydrilla
Hydrilla verticillata
Photo by Ann Murray
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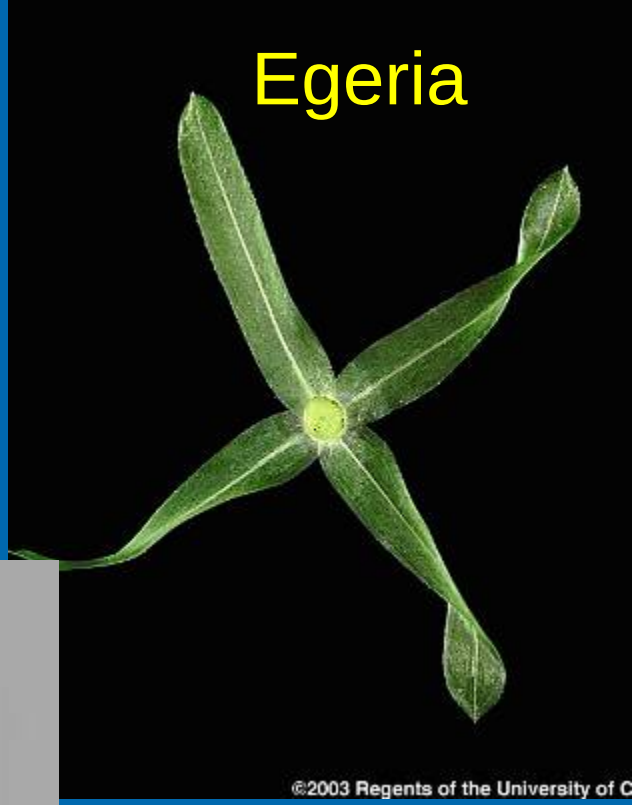
Hydrilla

Egeria



Elodea

Najas guadalupensis

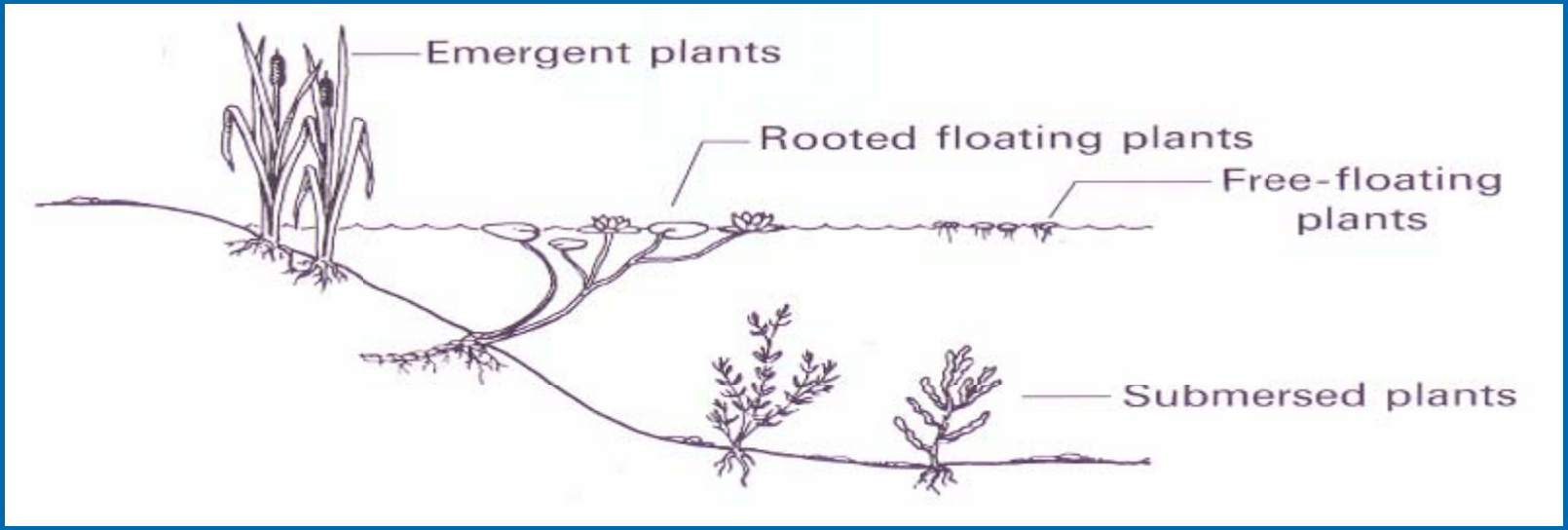
Southern Naiad

Photo by Brian Nelson
Copyright 1998 Florida Department of Environmental Protect

Southern Naiad

- Same Family as Hydrilla, Egaria, and Elodia
- Annual- Spreads primarily by seed
- Seeds and foliage important food source for Birds
- Not usually considered a weed in natural habitat
- Will tolerate polluted water

Types of Aquatic Plants



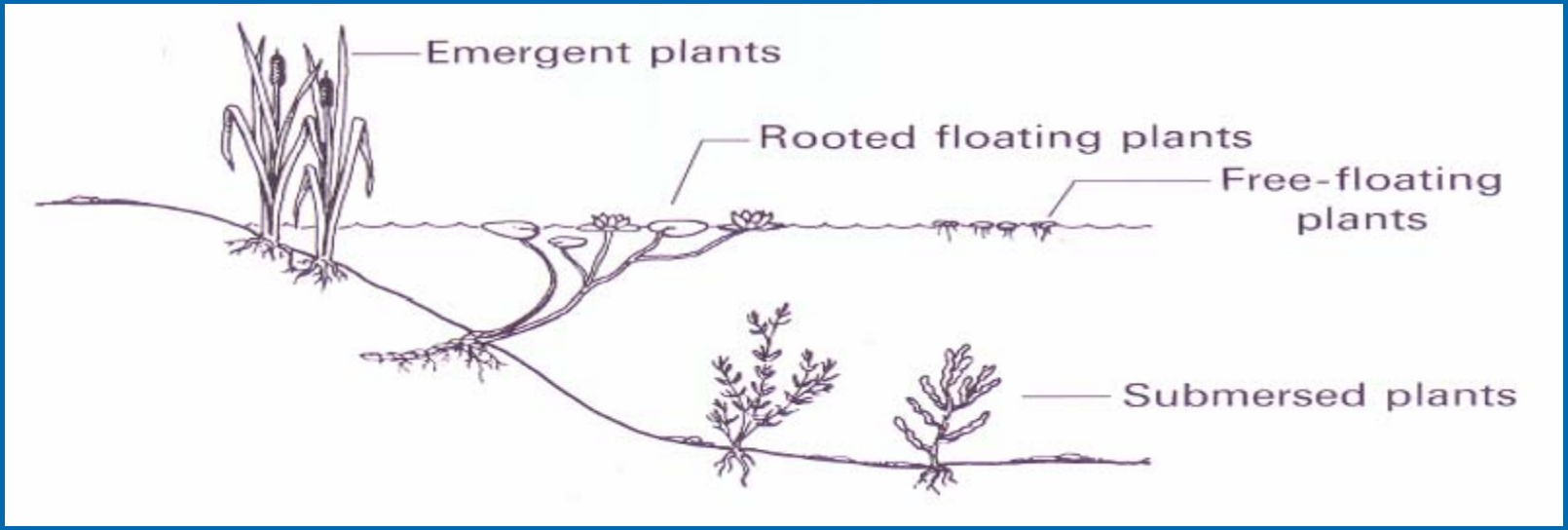
Rooted floating plants

Creeping waterprimrose
Ludwigia peploides

Creeping waterprimrose
Ludwigia peploides

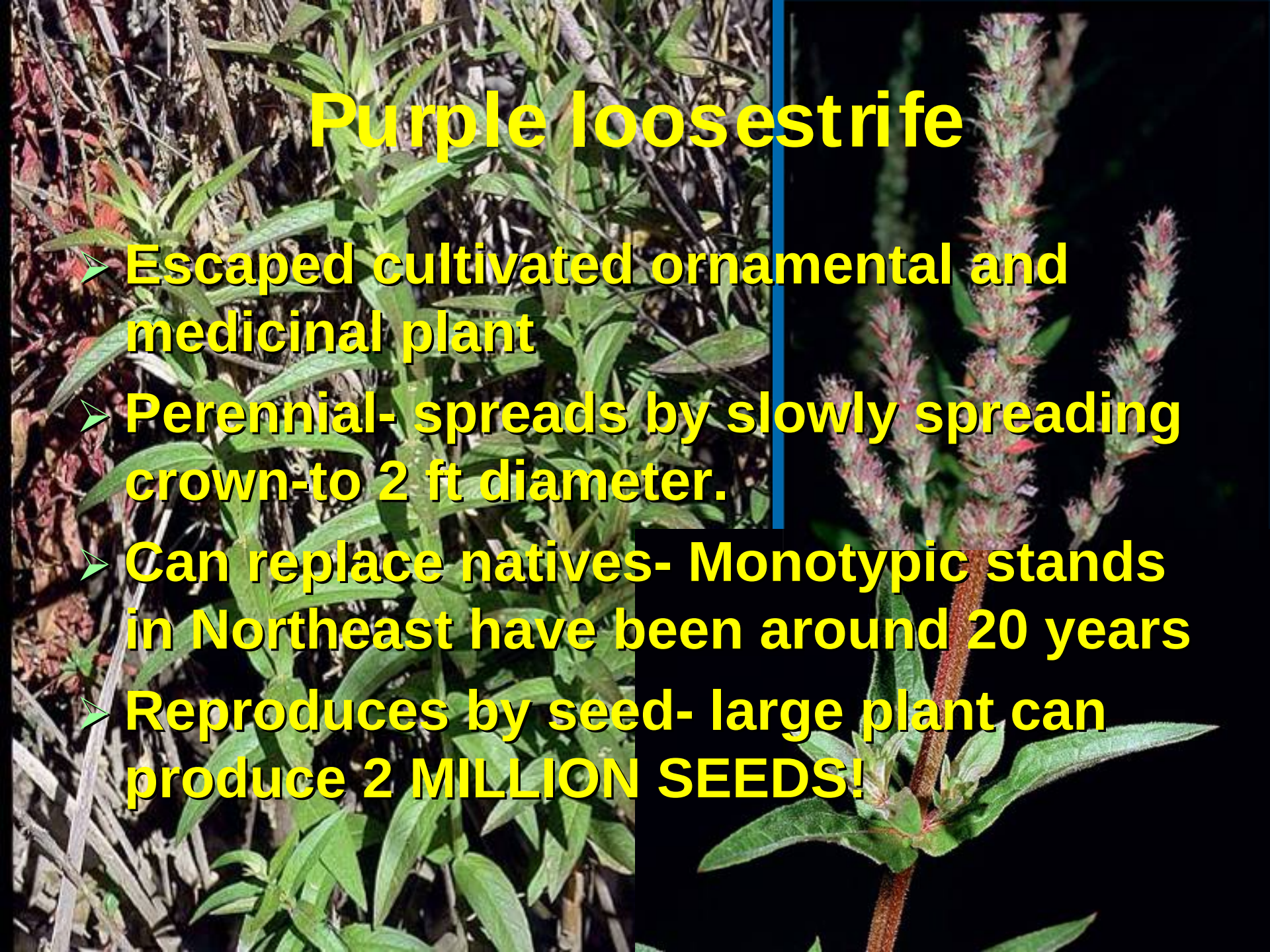
- 3 species- one native to California
- Can develop thick mats that interfere with water flow
- Rooted in side of pond or canal
- Reproduces by seed, creeping stems and stem fragments

Types of Aquatic Plants



Emergent plants

Purple loosestrife
Lythrum salicaria



Purple loosestrife

- Escaped cultivated ornamental and medicinal plant
- Perennial- spreads by slowly spreading crown-to 2 ft diameter.
- Can replace natives- Monotypic stands in Northeast have been around 20 years
- Reproduces by seed- large plant can produce 2 MILLION SEEDS!

Giant horsetail

Equisetum telmateia ssp. *braunii*

Scouringrush

Equisetum hyemale ssp. *affine*

Giant horsetail
Scouringrush

- Both desirable riparian native-
- Spread by rhizome
- Contain alkaloids- can be toxic- especially to horses
- Problem if stands become excessively dense

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Giant reed
Arundo donax

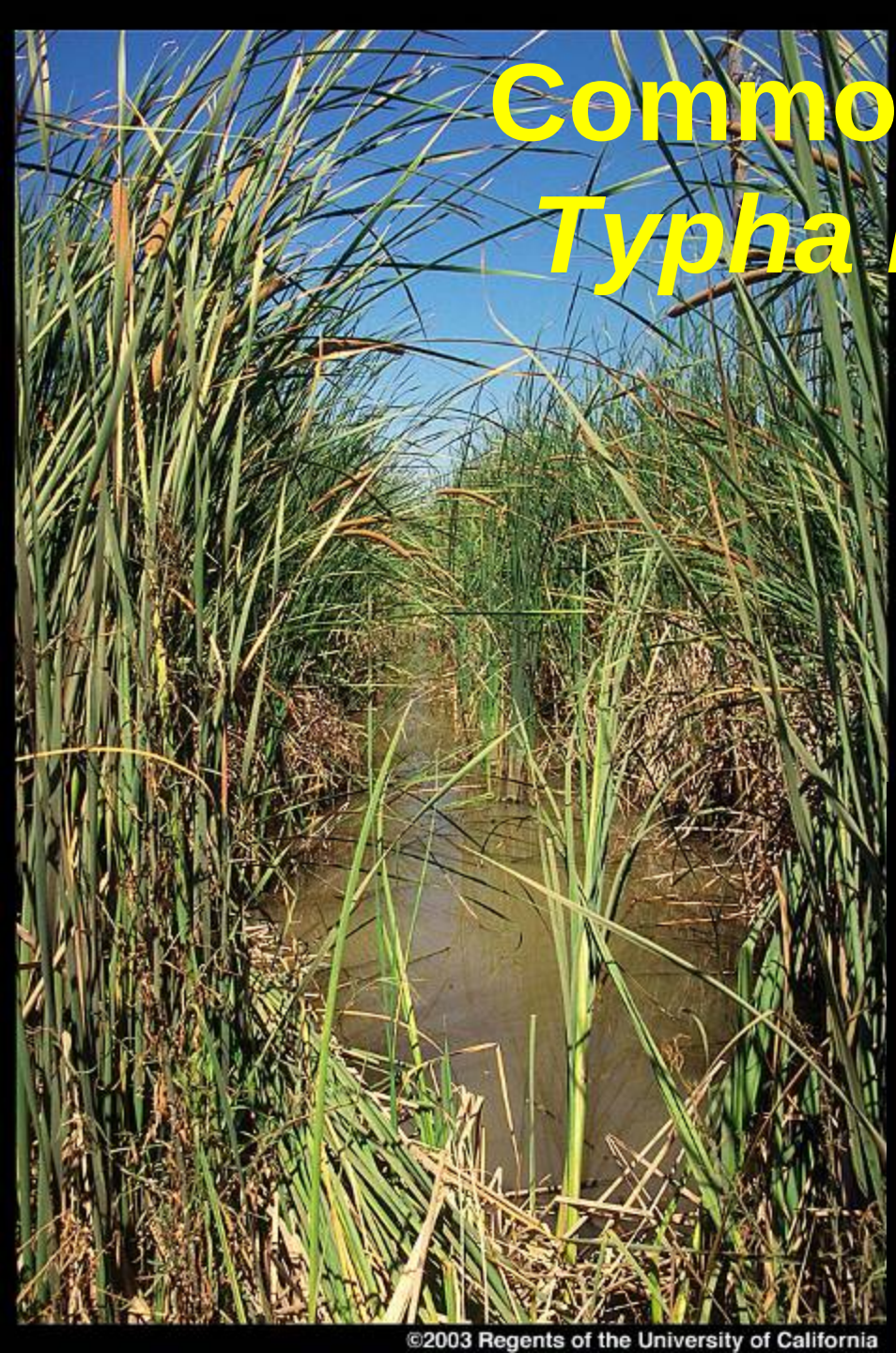
Seedhead

Sprouts from fallen branch

Giant reed
Arundo donax

- Robust perennial grass- grows 6-30 feet high-spreads by rhizome- no viable seeds
- Brought to Los Angeles in 1820's used for roofing and fodder material
- Used for erosion control- now causes floods
- Displaces native plants and wildlife because of the large stands and monopolization of soil moisture-

Common cattail
Typha latifolia



Common cattail
Typha latifolia

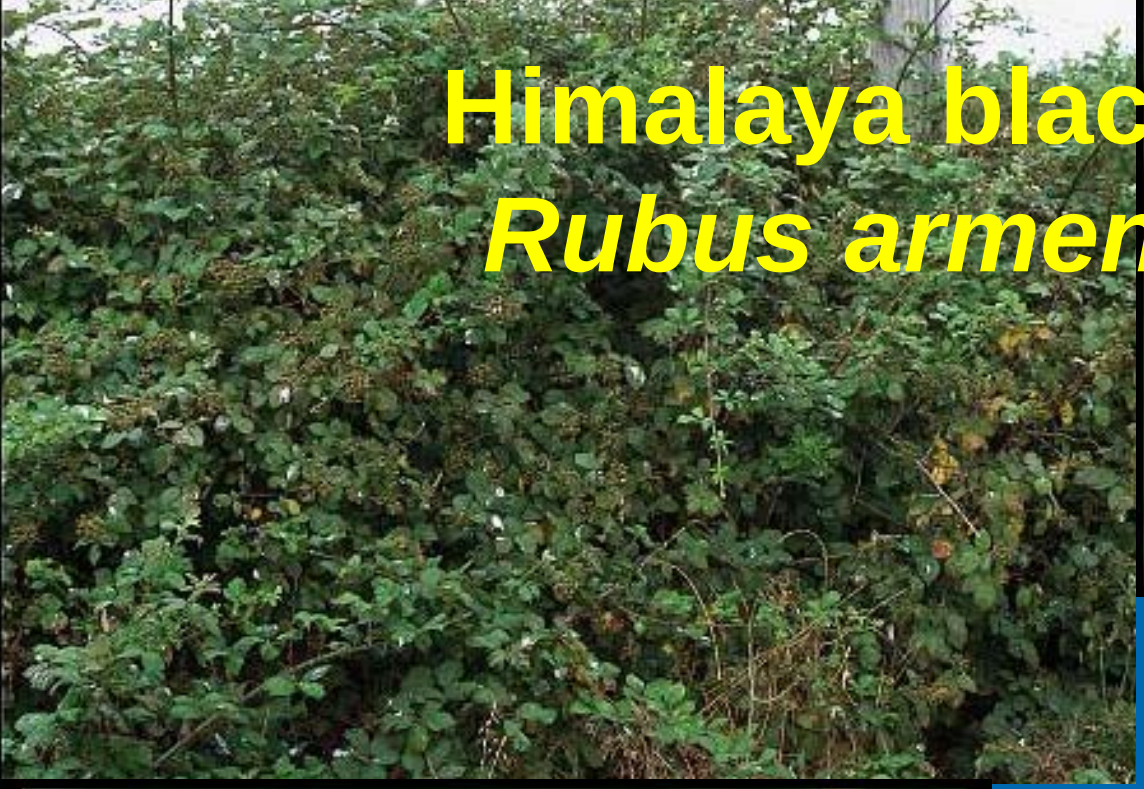
- Widespread desirable native – valuable source of food and shelter for wildlife- prevent shoreline erosion, and help remove excess nutrients from water.
- Spreads by seed and extensive rhizome system-
- "Everybody wants 2 feet of cattail- nobody wants 10 feet!"

Perennial pepperweed
Lepidium latifolium

Perennial pepperweed
Lepidium latifolium

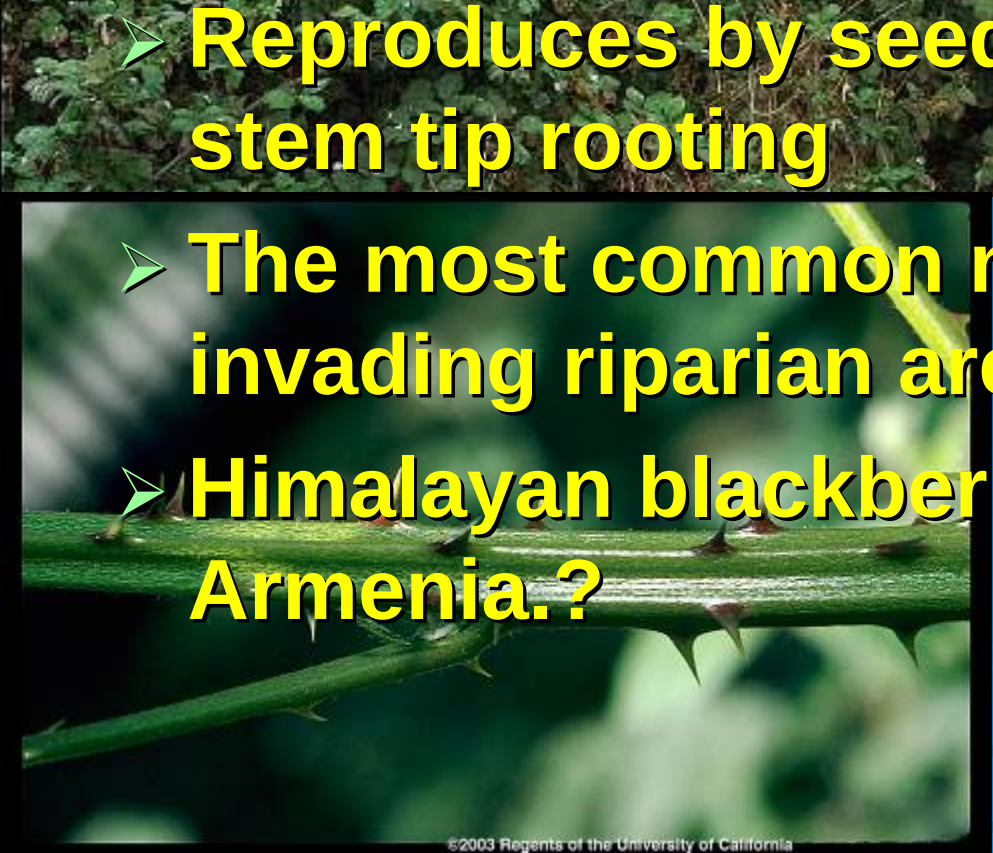
- Perennial spreads by root and seed
- Forms dense stands in brackish or alkaline wetlands- and other areas
- Introduced from Europe found in all counties in CA, except Del Norte, Humboldt and Imperial.

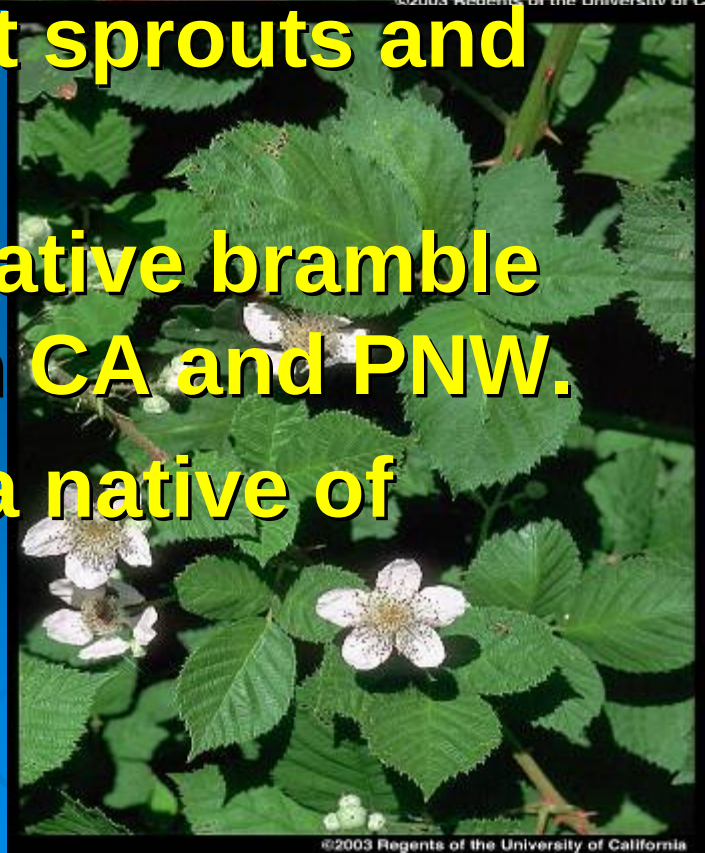
Himalaya blackberry
Rubus armeniacus



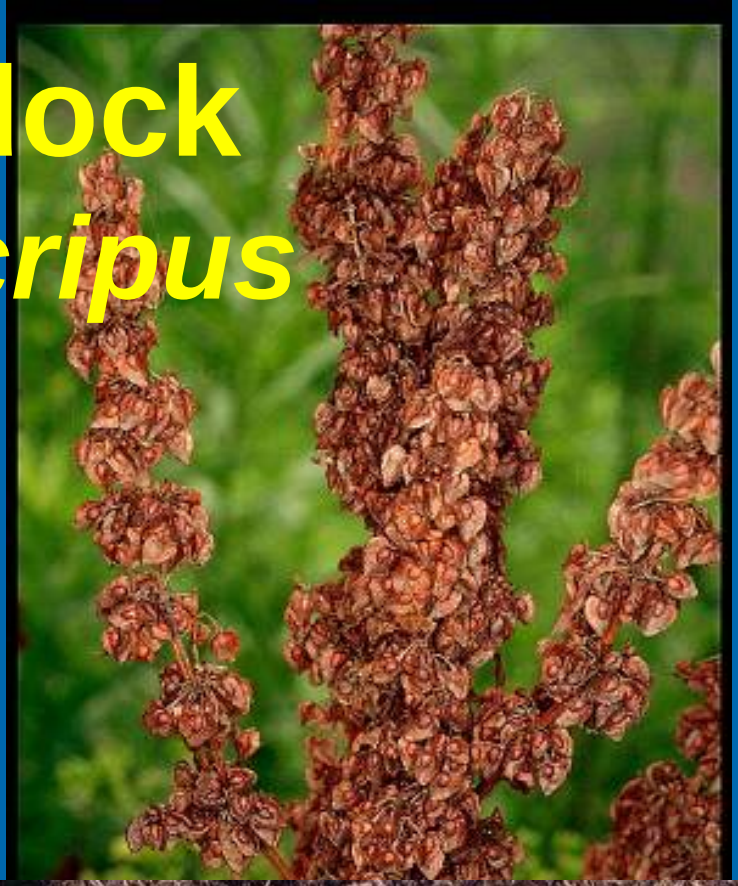
Himalaya blackberry
Rubus armeniacus

- Canes are typically biennial- roots are perennial
- Reproduces by seed, root sprouts and stem tip rooting
- The most common non-native bramble invading riparian areas in CA and PNW.
- Himalayan blackberry is a native of Armenia.?





Curly dock
Rumex cripus



Curly dock
Rumex cripus

- Perennial- can accumulate toxic level of oxalates and plants can (rarely) become poisonous to livestock when ingested in high quantity.
- Reproduces by seed- buried can survive 20 years or more.
- Seeds can survive ingestion by cattle and small birds- but not chickens-

Pale smartweed
Polygonum lapathifolium

Pale smartweed
Polygonum lapathifolium

- Desirable annual native that produces seeds that are an important food source for birds
- Can impede water movement when population becomes large and dense