Water Gardening: Pathway to Paradise or Plant Invasion?
The Popularity of Water Gardening is Steadily Increasing

• The number of U.S. households engaged in water gardening has jumped from 4 to 16 million in the last 5 yrs.

• Water gardening retail sales reached $1.56 billion in 2003
Water Gardens Are Versatile

- inside or outside
- large or small
- formal or informal
Aquatic Plants are Beneficial and Beautiful
Response to Market Demands

Aquatic plants and/or water garden supplies now widely available through:

- nurseries and garden centers
- hardware/home center chains
- mail order catalogues
- internet sites
12 Popular Water Garden Plants of Concern

- Cabomba caroliniana (fanwort)
- Egeria densa (Brazilian waterweed)
- Eichhornia crassipes (water hyacinth)
- Hydrilla verticillata (hydrilla)
- Iris pseudacorus (yellow flag iris)
- Lythrum salicaria (purple loosestrife)
- Myriophyllum aquaticum (parrot-feather)
- Myriophyllum spicatum (Eurasian watermilfoil)
- Nymphoides peltata (yellow floating heart)
- Pistia statiotes (water lettuce)
- Salvinia molesta (giant salvinia)
- Trapa natans (water chestnut)
**Cabomba caroliniana** *(fanwort)*

- sold for aquariums and ornamental ponds
- native to southeastern U.S.
- spreads by stem fragments, seeds and roots
Egeria densa (Brazilian waterweed)

- native to eastern South America
- sold for aquariums and ornamental ponds
- earliest record in U.S. from NY in 1893
- has been in Delta for several decades
Eichhornia crassipes (water hyacinth)

- native to tropical South America (Brazil)
- known to exist in CA since 1904
- frequently sold for ornamental ponds
- dubbed world’s worst aquatic weed
Hydrilla verticillata (hydrilla)

- native to warm regions of Asia
- introduced to FL in 1958 as an aquarium plant
- has spread to all continents except Antarctica
- came to CA as contaminant in aquatic nursery stock
Iris pseudacorus (yellow flag iris)

- native to Europe
- grown as an ornamental – escaped cultivation
- reproduces by seed and creeping rhizomes
Lythrum salicaria (purple loosestrife)

- native to Eurasia
- grown as an ornamental – escaped cultivation
- 2 million viable seeds per large plant
- spread to nearly all states in U.S. and Canada
Myriophyllum aquaticum (parrot-feather)

- native to South America
- earliest specimen collected from NJ in 1890
- can survive freezing conditions
Myriophyllum spicatum (Eurasian watermilfoil)

- native to Europe and Asia
- sold for aquariums and ornamental ponds
- has spread to at least 45 states and Canada
Nymphoides peltata (yellow floating heart)

- native to Europe
- grown as an ornamental since at least 1882
- spread by seed, rhizomes and fragments
Pistia stratiotes (water lettuce)

- native to tropical South America
- sold for ornamental ponds and aquariums
- free-floating; spreads by offsets and seeds
Salvinia molesta (giant salvinia)

• aquatic fern native to tropical South America
• plants can double biomass in 2-3 days
• sold as an aquatic ornamental
• spreads through stem fragmentation
**Trapa natans** (water chestnut)

- native to Europe, Asia and Africa
- introduced in late 1800s as a pond ornamental
- has woody, nut-like seeds with barbed spines
Hyacinth and Egeria Control in the Delta

- DBW program implemented in 1987 (hyacinth) and 2001 (egeria)
- over $45 million spent on control - management continues annually
CDFA Aquatic Plant Control

The California Dept. of Food and Agriculture has spent over $35 million on aquatic weed control since the 1970s -- mostly on hydrilla eradication.
Movement of Aquatic Plants Through the Horticultural Trade

• in s. New England 76% of non-native aquatic plants are escapes from cultivation (Les and Mehrhoff, 1999)

• in NZ 75% of aquatic invasive plants are of horticultural origin (Champion and Clayton, 2000)

• the 1st monoecious hydrilla in CA was traced to a contaminated lily shipment
Findings of Maki and Galatowitsch, 2003

- 92% - Fed. Noxious Weeds acquired
- 93% - plant/animal not requested
- 18% - misidentified plants
- 43% - unordered seeds
- plants received but not ordered: purple loosestrife, hydrilla, giant salvinia, curly-leaf PW
- aquatic inverts found in 30 of 40 plant orders; fish found in two orders
Invasive Aquatic Plants Available on the Internet

- water lettuce – 85%
- parrot feather – 80%
- water hyacinth – 70%
- egeria – 65%
- fanwort/YF Iris – 55%
- yellow floating heart – 50%
- salvinia – 35%
- milfoil – 25%
- purple loosestrife – 5%
- hydrilla/chestnut – 0%
Education, Education, Education

There is a correlation between familiarity w/ issue and a preference NOT to buy invasive plants (Reichard and White 2001).

- work with media & publishers
- reach bigger and broader audiences
  - Botanical Gardens
  - Master Gardeners
  - Garden Clubs
What Can Water Gardeners Do to Help?

• **DO NOT RELEASE** plants near or into a water body
• Build your water garden away from natural waterways
• Site your pond away from areas that flood
• Learn which plants are likely to be invasive
• Request non-invasive plants from your nursery
• Inspect your plant purchases for hitchhikers
Role of a Responsive Nursery

• Know which species are regionally/federally regulated
• Abide by all laws governing plant importation, sale, etc.
• Verify the scientific name of what you purchase
• Inspect shipments to make sure they are not contaminated
• Educate staff/customers – promote *Don’t Release* message
• Provide a selection of non-invasive plants for consumers
A New National Campaign

Habitattitude:

The message is...

DON’T RELEASE

www.habitattitude.net
RI DNI S Project
Reducing the Introduction and Distribution of Non-native Aquatic Invasive Species Through Outreach and Education

• develop Best Practice Guidelines with industry
• produce outreach materials in Spanish & Chinese
• publish articles in trade magazines
• partner with others

http://www.ridnis.ucdavis.edu
Thank you!