



Turning a New Leaf Conference
Shepherdstown, West Virginia
November 16, 2013

Track C: Flora and Fauna: Applying Ecology to Design

Session C.1 Water Gardening and Aquatic Invasive Species. Diane Oleson, Penn State Extension, York County, Pennsylvania

Topics Covered:

- What not to plant and why not?
 - Aquatic Invasive Species (AIS)
 - Prevention is the best weapon
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- What is an Invasive Species?
 - Examples: Zebra mussels—clog boats, water systems, remove plankton and algae
 - A species outside of its native range—(regional, local)
 - Ex. mosquito fish
 - Brought in by artificial means
 - Economic/ecological/human/plant/animal harm
 - Usually more than one harm
 - Why are they so troublesome?
 - Come in all forms
 - Tolerate a wide range of conditions—spring up in disturbed areas
 - Produce a lot of offspring
 - Move-in without predators and pathogens
 - Seed banks can last 5-12 years
 - 40% of US pests are invasive
 - Cost billions of dollars of ecological damage
 - “rule of 10”—out of every 100 species, 10 will naturalize , only 1 will become a problem
 - Most of our food species are non-native
 - Modes of transport:
 - Hitchhiking
 - Packaging
 - intentional,
 - pets/trade,
 - ballast water,
 - Many countries must do a white-list approach before they will let species in (ex. NZ)
 - KNOW YOUR ENEMY:
 - They can be microscopic—clean and change water, etc. so that you can protect against unwelcome invaders from packaging etc.—dispose of water down the sewer (NOT STORMDRAIN)
 - Giant Hogweed—DANGEROUS—looks like Queen Anne’s Lace on Steroids—20 ft tall—brought in for horticulture—sap can cause blindness, chemical burns, activated by sunlight—blisters can come back up to 2 years later
 - Asian Tiger Mosquito



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- In Water Garden: outdoor aquaria, small, self-contained, nutrient controlled, often stocked with organisms
 - Animals:
 - Use carp and koi with great care—they grub in sediment for any plants—very picky and will not eat the things you want them to eat
 - Goldfish—root up vegetation
 - Chinese mystery snail-easily moved by birds, intermediate hosts for parasites
 - Plants
 - Water hyacinth—reproduce quickly, weedy
 - Water lettuce—cuts off oxygen, breeds mosquitoes, double like crazy
 - Stagnant water between plants—causes mosquito breeding
 - Watermilfoils—forms mats
 - Brazilian waterweed
 - Water chestnut (caltrop)—seeds have nasty spines, restrict light and oxygen, displace other plants, bad for recreation
 - Around the water (these species halt natural succession and provide poor habitat):
 - Yellow flag iris
 - Daylily
 - Purple loosestrife

➤ **BMPs**

- Maintain
- Pay attention to local waterways/ storm drains—make sure things won't wash out of your gardens into these
- Do your homework when selecting plants—noxious weeds, climate appropriate
- Get plants from a reputable source—use Latin name when searching
- Clean and inspect before installing—tap water rinses, quarantine fish for 2 weeks, dispose of plants and rinse water
- Avoid non-native snails
- Go native!

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➤ **Q&A**

- Hardiness zones don't matter much
- Native shiners make good replacements for koi
- Kids don't care about colorful fish
- Dunks are a good mosquito control that are generally safe for everything but mosquitoes
- Look for chinks in invasive armor
- It is sometimes easier to leave fish out of a water garden



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References:

- Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed
- National Invasive Species Council Whitepaper, Pathways of Invasion
- USDA Plants Database—good for showing plants' native ranges
- web-resources on handout (of concern in PA)
- For PA (but could also maybe be used for other regional states): Google DCNR Invasive Plants—searchable database, management suggestions, native alternatives
- Invasive.org—pictures, species profiles, images
- Early Detection, Rapid Response Whitepaper
- PA Field Guides
- Penn State Water Resources under Pond Management
- Habitattitude
- Protectyourwaters.net
- Chicago Botanical Gardens—restoration of lakeshores
- Master Gardener Penn State Water Resources: under “Ponds” —places you can buy fish

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