Sea Grant
Pennsylvania
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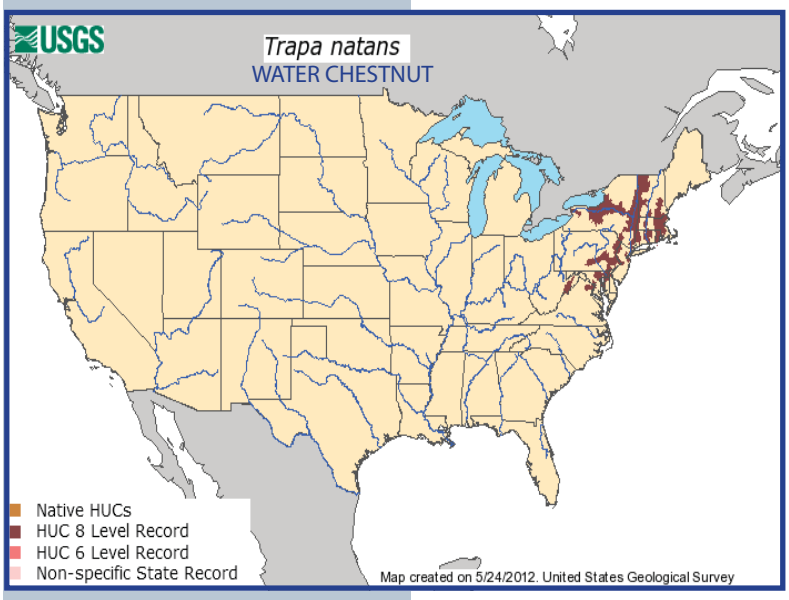
Water Chestnut
Trapa natans

***Trapa natans*, which is different from the water chestnut you find in Chinese take-out, is a rooted aquatic plant that can dominate ponds, shallow lakes, and rivers. It grows in thick colonies that displace native vegetation and limit recreation and navigation.**



Species Description

Water chestnut is a rooted annual aquatic plant consisting of submerged leaves and a buoyant rosette of floating leaves. The floating leaves are green, glossy, and triangular with toothed edges. The submerged leaves are feathery and whorled around a cord-like stem that can reach 12-15 ft (4-5 m) in length. Flowers are small and white and form at the center of the stem. The fruit is a nut that has four short, sharp spines.

Native & Introduced Ranges

The water chestnut's native range includes Europe, Asia, and Africa. It was first observed in North America near Concord, Massachusetts in 1859. Since then, the dense mats have invaded waters in New England and Mid-Atlantic states including Maryland, Massachusetts, New York, and Pennsylvania. In Pennsylvania, water chestnut is established in Dauphin, Pike, and Bucks counties, including lakes Nockamixon and Towhee in Bucks County.

Photo courtesy of
Leslie Mehrhoff, IPANE.

Biology & Spread

Water chestnut was brought to the United States by water gardeners in the 1800s and quickly became established. Water chestnut has a high reproductive rate; each plant can produce up to 15 nuts per season—each containing a single seed. It can also spread vegetatively. As the "rosettes" of floating leaves break apart, fragments can attach to boats and trailers, or float to new locations. The sharp spines of the nut can also get caught on other objects, birds, and animals. Canada geese have been observed with the nuts clinging to their feathers.

Habitat

Water chestnut begins to flower in mid- to late-July in Pennsylvania. The nuts ripen approximately one month later and seed production continues into the fall until frost kills the floating rosettes. Each nut that sinks to the bottom produces new plants and seeds may remain viable for up to 12 years, although most will germinate within the first two years. Water chestnut can grow in any freshwater setting; however, it prefers nutrient rich waters less than 16 ft (5 m) deep in ponds, lakes, slow moving streams, and rivers.

Photo courtesy of Pennsylvania Sea Grant.

WATER CHESTNUT

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Photo courtesy of Vermont Department of Environmental Conservation.

Impacts

Threat to Biodiversity

Dense floating mats of water chestnut can choke a water body and limit light and oxygen. These colonies can alter habitat and outcompete native organisms for nutrients and space. While other organisms may feed on water chestnut, it offers little nutritional value compared with beneficial native plants. In a short time, water chestnut can completely dominate an aquatic ecosystem.

Economic Costs

Water chestnut infestations can clog waterways and make fishing, boating, and swimming nearly impossible. The sharp nuts, which are capable of tearing through a shoe, can cause painful puncture wounds if stepped on. It is also difficult and expensive to control, with the primary economic costs associated with chemical and mechanical control efforts. For example, the state of Vermont spent nearly $500,000 in 2000 to remove water chestnut using mechanical harvesters and hand removal.

Prevention & Control

Since water chestnut is an annual plant, control requires preventing plants from blooming and setting seed. A combination of manual, mechanical, and chemical techniques is often the most effective. However, eradication requires several years of monitoring because seeds can remain viable for up to12 years. Larger infestations require the use of mechanical harvesters or the application of aquatic herbicides. Infected waters may need to be monitored for 5-12 years to eliminate the invader, and some infestations are so severe that total eradication may never be achieved.

The key to water chestnut control is early detection. It is important to spot small populations while they are easy to remove by hand. If you see water chestnut, pull it out and dispose of it far away from the water. Any plant you destroy will prevent up to 120 new plants from growing the next year!

Photo courtesy of Steve Hurst at USDA-NRCS PLANTS Database.

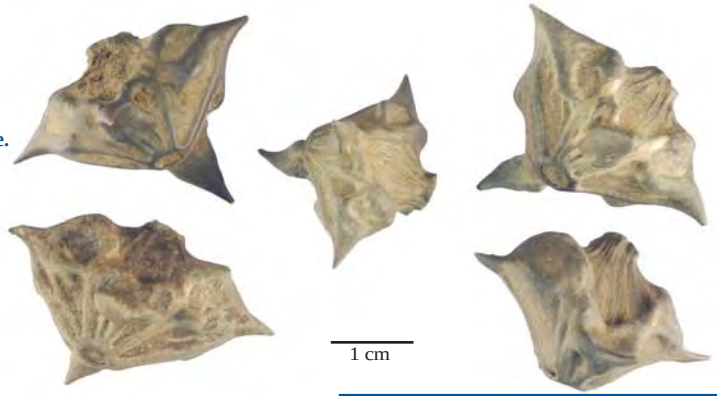

Photo courtesy of Leslie Mehrhoff, IPANE.

References:

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