**Trapa natans**

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Phylum</th>
<th>Class</th>
<th>Order</th>
<th>Family</th>
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</thead>
<tbody>
<tr>
<td>Plantae</td>
<td>Magnoliophyta</td>
<td>Magnoliopsida</td>
<td>Myrtales</td>
<td>Trapaceae</td>
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</tbody>
</table>

**Common name**
European water chestnut (English), bull nut (English), water chestnut (English), water nut (English)

**Synonym**
Trapa bispinosa

**Similar species**
Trapa natans

**Summary**
Trapa natans, commonly known as water chestnut, is an annual plant introduced from Asia and has become abundant in the northeastern United States where it creates a nuisance in lakes, ponds, canals and other slow-moving water. Trapa natans grows best in shallow, nutrient-rich lakes and rivers and is generally found in waters with a pH range of 6.7 to 8.2 and alkalinity of 12 to 128 mg/L of calcium carbonate. Trapa natans out-competes native plants for sunlight and spreads either by the rosettes detaching from their stems and floating to another area, or more often by the nuts being swept by currents or waves to other parts of the lake or river.

**Lifecycle Stages**
VDEC (2002) states that as a true annual, *T. natans* reproduces by overwintering seeds. Ungerminated seeds may remain viable for up to 12 years. However, most seeds probably germinate in the first two years.

**Uses**
*Trapa natans* produces a nut-like fruit that can be cooked, eaten out of hand, or used in other foods (Magness et al. 1971).

[view this species on IUCN Red List]
Habitat Description

*Trapa natans* can be found in lakes, ponds, canals, and slow water. *T. natans* grows best in shallow, nutrient-rich lakes and rivers and is generally found in waters with a pH range of 6.7 to 8.2 and alkalinity of 12 to 128 mg/L of calcium carbonate (Methe et al. 1993, in CBP 2002).

Reproduction

According to Haber (1999), flowers are produced singly on stalks arising from the center of the floating rosette of leaves. Each flower is bisexual, bearing a two-chambered ovary, four stamens and four white petals. Four triangular sepals surround the flower and develop into barbed spines in the mature fruit. Once the ovules of the insect pollinated flowers are fertilized, the flower stalks curve downward with the result that the fruit develops under water. The fruit matures into a nut-like, barbed spiny fruit. VDEC (2002) states that the single-seeded woody fruits produced from the previous year germinate in early spring. A single seed may give rise to 10 to 15 plant rosettes. Each rosette can produce up to 15 to 20 seeds.

General Impacts

According to VDEC (2002), *T. natans* is a fierce competitor in shallow waters with soft, muddy bottoms. Uncontrolled, it creates nearly impenetrable mats across wide areas of water. In Vermont, USA, many previously fished bays of southern Lake Champlain are now inaccessible, and floating mats of *T. natans* can create a hazard for boaters. It is also a human nuisance because mature *T. natans* nuts drift to shore where their sharp spines may hurt bare feet (Haber, 1999). VDEC (2002) states that this noxious plant also severely limits the passage of light into the water, a critical element of a well-functioning aquatic ecosystem. It reduces oxygen levels, which may increase the potential for fish kills. *T. natans* outcompetes native vegetation and is of little value to wildfowl.

Management Info

**Physical**: According to CBP (2002), hand removal is an effective means for eradication of smaller populations; *T. natans* roots are easily uplifted. Their removal is imperative because floating uplifted plants can further spread seeds downstream. The potential of *T. natans* seeds to lay dormant for up to 12 years makes total eradication difficult. Hand harvesting from canoes and raking have been effective and are a means to promote community involvement.

**Chemical**: For large-scale control of *T. natans* populations, which can form dense, thick mats capable of covering miles, herbicides and mechanical harvesting can both be effective. Aquatic plant harvesting boats are often employed in instances where waterways are blocked and herbicide (2,4-D) has been tested and deemed safe for use by federal and state agencies.

Principal source: Invasive Species in the Chesapeake Watershed: Water Chestnut (CBP, 2002)

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Anon
Publication date: 2005-09-28

ALIEN RANGE
[1] SWEDEN [8] UNITED STATES

BIBLIOGRAPHY
15 references found for Trapa natans

Management information
CBP (Chesapeake Bay Program), 2002. Invasive Species in the Chesapeake Watershed: Water Chestnut. Maryland Sea Grant.

Summary: This report is the first stage in a three-stage development of a Border Control Programme for aquatic plants that have the potential to become ecological weeds in New Zealand. Available from: http://www.doc.govt.nz/upload/documents/science-and-technical/sfc141.pdf [Accessed 13 June 2007]

Summary: This report is the second stage in the development of a Border Control Programme for aquatic plants that have the potential to become ecological weeds in New Zealand. Importers and traders in aquatic plants were surveyed to identify the plant species known or likely to be present in New Zealand. The Aquatic Plant Weed Risk Assessment Model was used to help assess the level of risk posed by these species. The report presents evidence of the various entry pathways and considers the impact that new invasive aquatic weed species may have on vulnerable native aquatic species and communities. Available from: http://www.doc.govt.nz/upload/documents/science-and-technical/SFC185.pdf [Accessed 13 June 2007]

Summary: The National Pest Plant Accord is a cooperative agreement between regional councils and government departments with biosecurity responsibilities. Under the accord, regional councils will undertake surveillance to prevent the commercial sale and/or distribution of an agreed list of pest plants. Available from: http://www.biosecurity.govt.nz/pests-diseases/plants/accord.htm [Accessed 11 August 2005]


General information

ITIS (Integrated Taxonomic Information System), 2005. Online Database Trapa natans
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals. Available from: http://www.itisacticsa/taxastep?king=every&p_action=containing&taxa=Trapa+natans&p_format=&p_ifx=plgif&p_lang=[Accessed March 2005]
FULL ACCOUNT FOR: **Trapa natans**


USDA-ARS (United States Department of Agriculture, Agricultural Research Service). UNDATED. Taxon: *Trapa natans* L.
National Genetic Resources Program. Germplasm Resources Information Network (GRIN). [Online Database] National Germplasm Resources Laboratory, Beltsville, Maryland.

**Summary:** Information on common names, synonyms, and distribution.


**Summary:** A report on aquatic nuisance species, specifically the Water chestnut. It contains information on the ecology and biology of *Trapa natans*.


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