

*Pistia stratiotes*  [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Arales	Araceae

**Common name** Lechuguilla de agua (English), tropical duckweed (English), laitue d'eau (French), pistie (French), repollo de agua (Spanish), water lettuce (English), lechuguilla de agua (Spanish), salade d'eau (French, Burkina Faso)

## Synonym

**Similar species** *Eichhornia crassipes*

**Summary** *Pistia stratiotes* is a freshwater invasive weed that is found throughout the tropics and subtropics. It is a free-floating plant that is capable of forming dense mats on the surfaces of lakes, ponds, rivers and other bodies of water. *Pistia stratiotes* is a popular garden pond plant and is often spread by the dumping of aquarium or ornamental pond plants. Fragments, or whole plants, can be spread via boats or fishing equipment from an infested area to a clean body of water.



[view this species on IUCN Red List](#)

## Species Description

Glazier (1996) describes *P. stratiotes* as a free-floating perennial of quiet ponds. It is stoloniferous, forms colonies, and has rosettes up to 15cms across. It has long, feathery, hanging roots. Its leaves are obovate to spatulate-oblong, truncate to emarginate at the apex, and long-cuneate at the base. Leaves are light green and velvety-hairy with many prominent longitudinal veins. Inflorescences are inconspicuous and up to 1.5cms long. Flowers are few, unisexual, and enclosed in a leaflike spathe.

## Uses

According to Rivers (2002), *P. stratiotes* is a popular ornamental plant, used in ponds and aquariums.

## Habitat Description

Rivers (2002) notes that for *P. stratiotes* to survive, it requires a wet, temperate habitat. It is usually found in lakes and rivers, however, it can survive in mud. *P. stratiotes* can endure temperature extremes of 15° C (59° F) and 35° C (95°). The optimal growth temperature range for the plant is 22-30° C (72-86° F). *P. stratiotes* prefers slightly acidic waters (6.5 - 7.2 pH) and moderate hardness (5 - 20 KH).

## Reproduction

Rivers (2002) states that *P. stratiotes* reproduces vegetatively and by seed. Vegetative reproduction involves daughter vegetative offshoots of mother plants on short, brittle stolons. Rapid vegetative reproduction allows water lettuce to cover an entire lake, from shore to shore, with a dense mat of connected rosettes in a short period of time.

## General Impacts

According to Rivers (2002), *P. stratiotes* can inflict a severe impact on the environment and economy of infested areas. The dense mats created by connected rosettes of the plant lead to the majority of problems encountered with water lettuce. These mats can have a negative economic effect by blocking waterways, thus increasing the difficulty of navigation and hindering flood control efforts. Mats of *P. stratiotes* can also disrupt natural ecosystems. They can lead to a lower concentration of oxygen in covered waters and sediments by blocking air-water interface and root respiration. Extremely thick mats of *P. stratiotes* can prevent sunlight from reaching underlying water. The cumulative effect of these negative characteristics of the plant is a loss of biodiversity in invaded habitats. *P. stratiotes* mats can also serve as a breeding place for mosquitoes.

## Management Info

**Preventative measures:** [A Risk assessment of \*Pistia stratiotes\*](#) for Australia was prepared by Pacific Island Ecosystems at Risk (PIER) using the Australian risk assessment system (Pheloung, 1995). The result is a score of 18 and a recommendation of: reject the plant for import (Australia) or species likely to be a pest (Pacific).

**Physical:** The most common physical control method is raking or seining it (using a large fishing net) from the pond's surface. In the United States, raking is done by mechanical harvesters. The plant is then removed from waterways to the shore where it is cut up by chopping machines and disposed of by spraying across the water (Ramey, 2001).

**Chemical:** Chemical control methods that have been successful in treating *P. stratiotes* include the herbicide endothall, which can act quickly and kill all plant cells that it contacts.

**Biological:** According to Rivers (2002), water lettuce leaf weevil (*Neohydronomus affinis*) is a native species of South America and was first introduced into Australia in the early 1980's for biocontrol of *P. stratiotes*. Additional releases of this weevil for research are currently being conducted. These weevils have a very short life cycle (approximately 30 days), which allows for quick establishment of populations. Adult weevils feed on the leaf, while the larvae attack the inside of the leaf. The other effective method of controlling *P. stratiotes* is the introduction of the water lettuce leaf moth (*Spodoptera pectinicornis*). The moth is native to Thailand and was imported into Florida for the biological control of water lettuce. The moth has a very short life cycle (approximately 35 days), with the larval stage lasting 17-20 days. The adult moth does not feed on water lettuce, however, moth larvae are capable of inflicting significant damage to *P. stratiotes*. The larvae are fairly large, which means that fewer larvae can provide a greater effect.

## Pathway

*P. stratiotes* can spread from broken-off pieces or whole plants being moved on boats or fishing equipment from an infested to a clean body of water (Rivers, 2002). According to Ramey (2001), *P. Stratiotes* continues to be sold through aquarium supply dealers and through the internet. Rivers (2002) cites that dumping of aquarium or ornamental pond plants is often the means of spread for *P. stratiotes*.

**Principal source:** [Water Lettuce \(\*Pistia stratiotes\*\) \(Rivers, 2002\)](#)

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

**Review:** Dr John Clayton NIWA, National Institute of Water and Atmospheric Research. Hamilton, New Zealand

**Publication date:** 2005-12-30

## ALIEN RANGE

[1] AUSTRALIA

[1] BURKINA FASO

[1] CHINA

[1] BERMUDA

[1] CAMBODIA

[1] COOK ISLANDS

[1] FRENCH POLYNESIA	[2] GUADELOUPE
[1] GUAM	[1] INDONESIA
[1] MALAYSIA	[1] MARTINIQUE
[1] NEW CALEDONIA	[1] NEW GUINEA
[1] NEW ZEALAND	[1] NORTHERN MARIANA ISLANDS
[1] PAPUA NEW GUINEA	[1] PHILIPPINES
[1] PUERTO RICO	[1] REUNION
[1] SAINT LUCIA	[1] SEYCHELLES
[1] SOLOMON ISLANDS	[1] SWAZILAND
[1] THAILAND	[15] UNITED STATES
[1] VANUATU	[1] VIET NAM
[1] VIRGIN ISLANDS, U.S.	

**Red List assessed species 2: CR = 1; NT = 1;**

[Oxyura maccoa](#) NT

[Terpsiphone corvina](#) CR

## BIBLIOGRAPHY

21 references found for *Pistia stratiotes*

### Management information

[Champion, P. Clayton, J. and Rowe, D. 2002. Alien Invaders Lake Managers Handbook. Ministry for the Environment.](#)

**Summary:** Available from: <http://www.mfe.govt.nz/publications/water/lm-alien-invaders-jun02.pdf> [Accessed 3 February 2005]  
Gee II, David E., pers. comm. 2006. Wildlife Biologist, Guam Division of Aquatic & Wildlife Resources and Guam team member of the Pacific Invasives Learning Network (PILN).

[Hilhorst, M. Water lettuce.](#)

**Summary:** A report on how *P. stratiotes* was eradicated from the two sites where it was deliberately planted.

Available at [www.biodiv.org](http://www.biodiv.org) [Accessed 24 September 2003]

[Mack, R. N and W. M. Lonsdale., 2002. Eradicating invasive plants: Hard-won lessons for islands. In \*Turning the tide: the eradication of invasive species\*: 311-318. Veitch, C.R. and Clout, M.N.\(eds\). IUCN SSC Invasive Species Specialist Group. IUCN. Gland. Switzerland and Cambridge. UK.](#)

**Summary:** Uses *Clidemia hirta* in Hawaii as an eradication case study. *Clidemia* is in the Melastomataceae and somewhat similar ecologically to miconia.

Eradication case study in *Turning the tide: the eradication of invasive species*.

[National Pest Plant Accord, 2001. Biosecurity New Zealand.](#)

**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]

[PIER \(Pacific Island Ecosystems at Risk\), 2003. Pistia stratiotes](#)

**Summary:** Ecology, synonyms, common names, distributions (Pacific as well as global), management and impact information..

Available from: [http://www.hear.org/pier/species/pistia\\_stratiotes.htm](http://www.hear.org/pier/species/pistia_stratiotes.htm) [Accessed 15 July 2003]

[Rivers, L. 2002. Water Lettuce \(Pistia stratiotes\). University of Florida and Sea Grant.](#)

**Summary:** A detailed report on *P. stratiotes*, including information on biology, ecology, distribution and management methods.

Available from: <http://www.iisgcp.org/EXOTICSP/waterlettuce.htm> [Accessed 16 July 2003].

[Royal New Zealand Institute of Horticulture \(RNZIH\), 2005. Water lettuce Pistia stratiotes](#)

**Summary:** Available from: [http://www.rnzih.org.nz/pages/nppa\\_090.pdf](http://www.rnzih.org.nz/pages/nppa_090.pdf) [Accessed 1 October 2005]

Swaziland s Alien Plants Database., Undated. *Pistia stratiotes*

**Summary:** A database of Swaziland s alien plant species.

[Varnham, K. 2006. Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.](#)

**Summary:** This database compiles information on alien species from British Overseas Territories.

Available from: <http://www.jncc.gov.uk/page-3660> [Accessed 10 November 2009]

### General information

[CONABIO. 2008. Sistema de información sobre especies invasoras en México. Especies invasoras - Plantas. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. Fecha de acceso.](#)

**Summary:** English:

The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), under the section Novedades for information on updates.

Invasive species - Plants is available from: [http://www.conabio.gob.mx/invasoras/index.php/Especies\\_invasoras\\_-\\_Plantas](http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas) [Accessed 30 July 2008]

**Spanish:**

La lista de especies del Sistema de información sobre especies invasoras de México cuenta actualmente con información acerca de nombre científico, familia, grupo y nombre común, así como como hábitat, estado de la invasión en México, rutas de introducción y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la página de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualización, por favor consulte la portada (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), en la sección novedades, para conocer los cambios.

Especies invasoras - Plantas is available from: [http://www.conabio.gob.mx/invasoras/index.php/Especies\\_invasoras\\_-\\_Plantas](http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas) [Accessed 30 July 2008]

[Conservatoire Botanique National De Mascarin \(BOULLET V. coord.\) 2007. - Pistia stratiotes Index de la flore vasculaire de la Réunion \(Trachophytes\) : statuts, menaces et protections. - Version 2007.1 \(mise à jour 12 juin 2007\).](#)

**Summary:** Base de données sur la flore de la Réunion. De nombreuses informations très utiles.

Available from: <http://flore.cbnm.org/index2.php?page=taxon&num=3d3d286a8d153a4a58156d0e02d8570c> [Accessed 9 April 2008]

[Fenner, B. UNDATED. Water Lettuce, Pistia stratiotes. Wet Web Media.](#)

**Summary:** A report that provides information on the history of *P. stratiotes*.

Available from: <http://www.wetwebmedia.com/PlantedTksSubWebIndex/pistia.htm> [Accessed 16 July 2003]

[Florence J., Chevillotte H., Ollier C. & Meyer J.-Y. 2007. Pistia stratiotes Base de données botaniques Nadeaud de l'Herbier de la Polynésie française \(PAP\).](#)

**Summary:** Available from: [http://www.herbier-tahiti.pf/Selection\\_Taxonomie.php?id\\_tax=4614](http://www.herbier-tahiti.pf/Selection_Taxonomie.php?id_tax=4614) [Accessed 10 April 2008]

[Glazier, K. 1996. Pistia stratiotes L. Ecology and Evolutionary Biology Conservatory.](#)

**Summary:** A brief description of *P. stratiotes*.

Available from: [http://florawww.eeb.uconn.edu/acc\\_num/199600001.html](http://florawww.eeb.uconn.edu/acc_num/199600001.html) [Accessed 15 July 2003]

[ITIS \(Integrated Taxonomic Information System\), 2005. Online Database Pistia stratiotes](#)

**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.cbif.gc.ca/pls/itasca/taxastep?king=every&p\\_action=containing&taxa=Pistia+stratiotes&p\\_format=&p\\_ifx=plgt&p\\_lang=](http://www.cbif.gc.ca/pls/itasca/taxastep?king=every&p_action=containing&taxa=Pistia+stratiotes&p_format=&p_ifx=plgt&p_lang=) [Accessed March 2005]

[Langeland, K.A. and Burks, K. C \(Eds\) 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. University of Florida. Pistia stratiotes](#)

**Summary:** Information on plants that pose threats to natural resource areas in Florida.

Available from: [http://www.fleppc.org/ID\\_book/Pistia%20stratiotes.pdf](http://www.fleppc.org/ID_book/Pistia%20stratiotes.pdf) [Accessed 30 December 2004]

Le Bourgeois & Lebreton, 2006

**Summary:** Le Bourgeois, T., Lebreton G. 2006. Expertise sur la gestion des plantes aquatiques envahissantes *Eichhornia crassipes* (Jacinthe d'eau) et *Pistia stratiotes* (Laitue d'eau) dans les étendues d'eau douce littorales de la Réunion. Cirad, Saint Pierre, Réunion.)

Lompo-Ouedraogo, Z., pers.comm., 2005. From: Especies Exóticas Invahissantes: Etat Des Lieux Au Burkina Faso, a report to the Group of Experts on Invasive Alien Species meeting in Palma de Majorca (Spain), 9-11 June 2005.

[Ramey, V. 2001. Pistia stratiotes. University of Florida.](#)

**Summary:** A fact sheet on *P. stratiotes*.

Available from: <http://aquat1.ifas.ufl.edu/seagrant/pisstr2.html> [Accessed 15 July 2003]

[WQH \(Water Quality Home\). 2003. Water Hyacinth Washington State Department of Ecology.](#)

**Summary:** A report on water hyacinth, and its similarity to *P. stratiotes*.

Available from: <http://www.ecy.wa.gov/programs/wq/plants/weeds/hyacinth.html> [Accessed 17 July 2003].