

IDENTIFICATION AND MANAGEMENT OF WATER LILY-LIKE SPECIES

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INTRODUCTION

Several water lily species—or similar “lily-like” species—are native to Texas and can be found in lakes, ponds, pools, ditches, and slow streams. Most of these species are commonly confused with one another, even though they are distinguishable with a few key characteristics.

Water lilies and similar species are perennial plants, meaning they are expected to live for more than 2 years. During colder months, the visible portions of the plant will disintegrate, but the roots will remain viable as long as they do not freeze. These species are known for their floating, thick, and waxy leaves, which can be completely smooth or deeply notched, and their large, showy flowers that bloom throughout the spring and summer.

Contrary to popular belief, all water lily and lotus species are classified as emergent aquatic plants, rather than floating aquatic plants. True floating aquatic plants are completely free-floating, but the floating leaves of a water lily have stems attached centrally (petioles). The petioles connect to roots that are anchored to the pond bottom. These stems are adapted to handle fluctuating water levels and will shoot new growth to reach the water’s surface throughout the growing season.

Species may be hybridized to get a desired flower color, making them likely to be used as an ornamental plant.

Quick Fact: These roots, referred to as rhizomes, can send root runners up to 20 feet from the parent plant and can contain enough carbohydrates to survive for more than 5 years without sprouting any leaves. This can influence the selection of chemicals for effective treatment.



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Identification of hybridized lilies and sub-species requires higher magnification and greater expertise. Therefore, they are not discussed in this publication.

AMERICAN WHITE WATER LILY

American white water lily (*Nymphaea odorata*) has fragrant, white flowers up to 8 inches wide (Fig. 1). This large flower sits on the water’s surface, consist of 25 or more sword-shaped petals, and blooms from March to October.



Figure 1. American white water lily

Its leaves have smooth margins and are oval-shaped, with pointed lobes caused by the petiole’s deep slit. Leaves range from 5.8 to 11.8 inches wide and are bright green on top with a red to purple underside.

AMERICAN LOTUS

American lotus (*Nelumbo lutea*) has circular, slightly wavy leaves that are up to 2.75 feet wide and lack slits or lobes. Its flower is pale yellow, large, and up to 10 inches wide with 20 or more rounded petals (Fig. 2). These flowers bloom from May to July and have large, nut-like seeds (Fig. 3).



Figures 2 and 3. American lotus

DOTLEAF WATERLILY

Dotleaf waterlily (*Nymphaea ampla*) is a species not commonly seen and is limited to Texas' border regions. It may be confused with the American white water lily, but its white flower (with 12 to 21 petals) sits 4 to 5 inches above the water's surface and blooms throughout the year. Additionally, its green leaves are speckled with purple coloration and can be either serrated or wavy, compared to smooth.

Quick Fact: American lotus leaves may lie flat on the water's surface or grow cup-like 1 to 3 feet above the water's surface.



YELLOW WATER LILY

Yellow water lily (*Nymphaea Mexicana*) is very similar to the American white water lily—in that it has a deep slit in the petiole and oval-shaped leaves up to 9 inches wide (Fig. 4). Its leaves are bright green on top and sometimes mottled brown, with red to purple coloring underneath. The yellow water lily, also known as the Mexican water lily, gets its name from the large, bright yellow flowers that bloom from March to August. The colorful flowers range from 2.3 to 3.9 inches wide, with roughly 25 sword-shaped petals (Fig. 5). The warty appearance of its roots can also make identifying yellow water lilies easier when it is not in bloom.



Figures 4 and 5. Yellow water lily

SPATTERDOCK

Spatterdock (*Nuphar lutea*) has large, heart-shaped leaves, arranged spirally, growing up to 15 inches long and 10 inches wide (Figs. 6 and 7). Leaves can deviate from being strictly floating and may become submersed, making their appearance transparent and thin. Spatterdock (also known as cow lily) has relatively small, sphere-shaped flowers that bloom from March to October—although they never look to be in “full bloom.” Its flowers are as tall as they are wide (1 inch), with six thick, green sepals and many small, yellow petals.



Figures 6 and 7. Spatterdock

BLUE WATER LILY

Blue water lily (*Nymphaea elegans*) has large, blue, or pale purple flowers raised above the water's surface and bloom from April to July (Fig. 8). They are 2.4 to 5.2 inches wide, with 8 to 27 petals. Blue water lily, also known as elegant water lily, has oval shaped leaves that grow up to 11.8 inches long. The leaf edges can lay flat on the water's surface like other species, but they are typically observed as being slightly wavy.

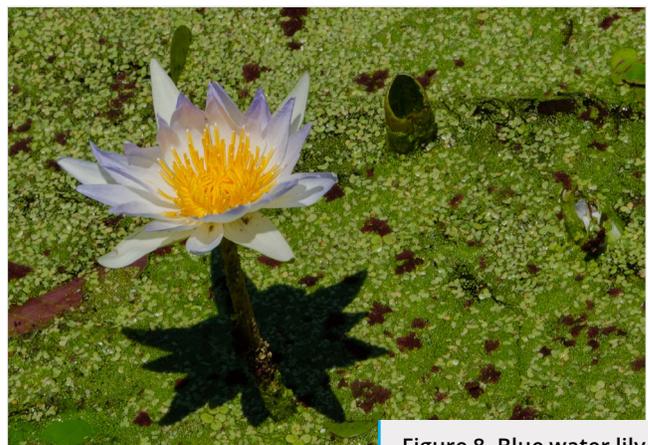


Figure 8. Blue water lily

Quick Fact: *Banana lily* (left) and *Water shield* (right) may be confused with species discussed in this publication, but have much smaller leaves (0.8 to 5.9 inches) and flowers (0.4 to 0.6 inches). Management options differ among these species and should be identified properly to avoid ineffective management or a waste of resources. Both species are considered aggressive invaders and should not be intentionally introduced.



MANAGEMENT

Propagation

Water lilies and similar species gained their popularity from their aesthetic value and are usually sought after by pond owners. These species can be easily introduced and produced through plant division—otherwise known as propagation.

New plants can be produced quickly by sectioning the rhizomes into sections (no more than 2 to 3 inches long) of parent plants. These sections can then be placed in wide, shallow containers that are roughly two-thirds full of a damp soil mixture and submerged so the water depth is 2 to 4 inches before reaching the soil. The rhizome section should be gently submerged into the soil until little to no portions of the rhizome can be seen. Propagation success will be evident as leaves begin to form.

Although the species covered in detail within this publication are native to Texas, some species—such as the American lotus—have a rapid growth rate (over 1 foot per year), can easily become invasive, and are generally not recommended for planting. Spatterdock and American white water lily have slower growth rates (less than 0.2 feet per year) and are more likely to be recommended for planting. Both of these species are known for

Quick Fact: *American lotus* seeds can stay viable for many years and can be germinated in room temperature, non-chlorinated water after the seed coating is gently removed.

tolerating partial shade as well as full sun. Spatterdock has a higher tolerance for salinity and water fluctuations.

Control

If water lily and lotus populations become a nuisance, control can be challenging and expensive. Due to their unique structure as an emergent plant, with thick, submerged root systems and floating leaves, water lily and lotus species are not constricted in terms of water depth and can easily take over a whole body of water. Due to their well-developed root systems, dense populations can hinder recreational activities like boating, fishing, swimming, and may be hard to reach. Additionally, an overabundance of these plants can limit light availability in the water column. Limited light availability can reduce beneficial phytoplankton and native submerged plant species, lower photosynthesis rates, and disrupt oxygen transfer from submerged plants and the atmosphere. The effects from overpopulation ultimately lowers dissolved oxygen levels and can potentially cause fish die-offs. Although these lily and lotus species can be distinguished from one another, propagation and control options are relatively the same.

Physical Control

Physical control includes hand pulling, raking, and using cutter boats on water lily and lotus plants. For anything other than a small population, physical control can be labor intensive and any missed material can re-establish quickly from seeds and rhizomes, making this type of control ineffective.

Biological Control

Biological control is the method of introducing other organisms to eliminate or decrease the presence of pests. While roots may be eaten by small mammals—such as beavers, muskrats, porcupines, and deer, which may also eat the leaves or flowers—there are no biological controls for the species mentioned in this publication.

Chemical Control

Before discussing the chemical controls that work best for lily species, the regulation of herbicides and pesticides must be addressed. Each state has its own agency or agencies that regulate the purchase, use, and application of pesticides and herbicides. **Please consult with the appropriate state agency before attempting to purchase or apply aquatic herbicides or algaecides.**

When choosing herbicides, they can be split into two classifications: contact and systemic, which can dictate the treatment application. Contact herbicides cause

immediate cell death at the point of contact. They are fast-acting and cause above-ground tissue death. When contact herbicides are applied to a dense population of aquatic vegetation, they can cause oxygen depletions due to large amounts of decomposing material. The decomposition process consumes oxygen and lowers the dissolved oxygen levels within the water body. Therefore, contact herbicides need to be applied over sections of no more than 25 to 30 percent of the pond area at a time. There should be a wait-period of 7 to 10 days before treating the next section. Endothall is the only effective contact herbicide option for water lily-like plants.

Quick Fact: *When using foliar sprays, such as products with the active ingredient glyphosate, herbicides should be applied multiple times, at the lowest label rate. This application method ensures the herbicide has time to penetrate into the root system and does not just kill the foliage above ground.*

Systemic herbicides are translocated throughout the plant. They are slow-acting and cause total plant mortality. Due to plants dying slowly over a long period, systemic herbicides do not typically need to be applied in small sections like contact herbicides. Triclopyr (2, 4-D, glyphosate, imazamox, fluridone, penoxsulam) are systemic herbicide options for water lily-like plants.

Repeated treatments may be necessary and an aquatically labeled surfactant may be recommended with treatment to increase effectiveness (check the label).

Chemical control options provided here are for private waters only. Treatment of flowing or publicly owned waters requires permits obtained from the state or federal regulatory agency tasked with managing the specific body of water. For Texas, these permits can be obtained from the Texas Parks and Wildlife Department by calling: 512-389-4444. Some waters in Texas are managed by the United States Army Corps of Engineers (USACoE). The USACoE Fort Worth District Regulatory and Permitting Office can be reached at: 817-886-1731; and the USACoE Galveston District Regulatory and Permitting Office at: 409-766-3982.

Other Resources: More information on aquatic vegetation identification and management, along with other publications can be found on:

<https://aquaplant.tamu.edu/>; and at:
<https://fisheries.tamu.edu/>.

Photos by: Betty Saenz, Peggy Romfh, Wanda Rauscher, and Todd Sink.