

# AIS

## Aquatic Invasive Species

### CURLYLEAF PONDWEED



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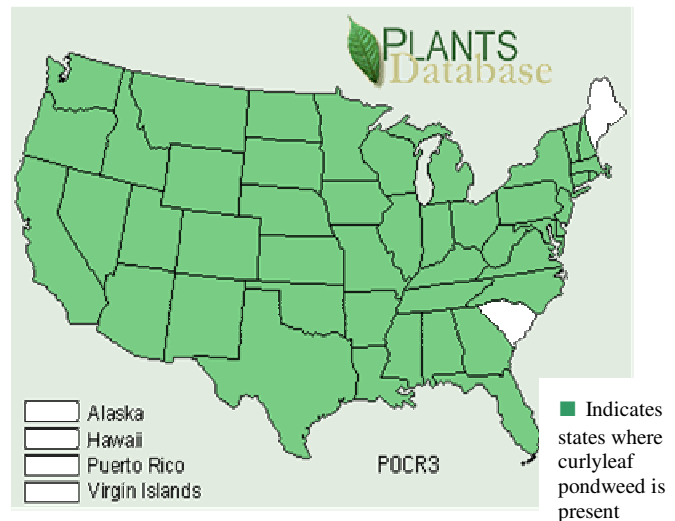
**COMMON NAMES:** Curlyleaf Pondweed

**SCIENTIFIC NAME:** *Potamogeton crispus* L.

**DISTRIBUTION:** Curlyleaf pondweed is native to Eurasia, Africa, and Australia. This aquatic invasive species is now reported in all of the continental United States except for Maine and South Carolina.

**DESCRIPTION:** This submersed aquatic plant has oblong blue-green leaves that attach to its spaghetti-like stems in an alternate pattern. The margins of the leaves are wavy and fine-toothed. Leaves can be up to 3 inches long and a half inch wide. Curlyleaf pondweed produces small flowers that are arranged on dense

terminal spikes that rise a few inches above the surface of the water. In the spring, the plant produces dormant vegetative propagules known as turions. Turions look like small greenish-brown pinecones.



**LIFE CYCLE BIOLOGY:** Curlyleaf pondweed is considered a deep-water plant, but it will colonize in shallow water as well. With a strong rhizome anchoring system, curlyleaf can grow in a variety of different locales and sediment types. This plant can tolerate extreme conditions including low light and cold water temperatures and has even been found growing under 20 inches of snow covered ice.

Curlyleaf pondweed actively grows during the winter months when most plants are dormant. Curlyleaf reaches its maximum density in late spring and dies back in mid-summer when most plants are at their peak of seasonal growth. Although this plant can reproduce by seeds, its main reproductive means is through the production of dormant vegetative propagules called turions. Hundreds of turions can be produced by each plant, and they can be dispersed by water currents. Turions are produced in the late spring, just before the plants begin to die.

Turions remain dormant in the sediment through the summer until cooling water temperature triggers their germination in the fall. The germination rate of turions is very high, some estimates indicate between 60-80%. Turions can also remain viable in the sediment for a number of years. Plants will also grow from the rhizomes of past plants.



**Curlyleaf turions** – Photo by Marilyn Peterson, Portage Lake Association (<http://www.lakeorono.org/CurlyleafID.pdf>)

**PATHWAYS/HISTORY:** A popular aquarium plant, curlyleaf pondweed was accidentally introduced to U.S. waters by hobbyists in the mid 1800's. The species first became established in the northeastern United States. By the 1930s it was established in the Midwest and is now readily present in nearly all of the lower 48 states.

**DISPERSAL/SPREAD:** The most likely mode of introduction of curlyleaf pondweed into a body of water is through the transport of plant fragments on aquatic equipment such as boats and trailers. These fragments can root and create a new infestation. Once the plant is established in a body of water it can spread quickly. Each plant can yield hundreds of turions. Water currents and wave action can transport turions throughout a waterway.

**RISKS/IMPACTS:** Although curlyleaf can provide habitat for aquatic life during the winter when few other plants are present, the negative consequences of this plant far outweigh this one positive aspect. The mid-summer decay of curlyleaf pondweed can cause low oxygen conditions in areas where a considerable amount of decomposition is occurring. The die-off will also cause nutrients to be released from the plants which can trigger algal blooms. Dense beds of curlyleaf can reduce recreational opportunities such as boating, fishing, and swimming. Property values may decrease around lakes heavily

infested with curlyleaf. To reduce recreational impacts and maintain property values, expensive control programs must be implemented.

**MANAGEMENT/PREVENTION:** While preventing a curlyleaf pondweed infestation is the most efficient line of attack, in many cases it is too late as the species is already present. Once the species becomes established there are a couple of control options. For a control option to be most effective, the key is to remove the plant before turion production takes place. Control efforts should take place for a number or consecutive years since some turions lay dormant for a few growing seasons. Early timing (before new turions are produced) and a multiple year control program can effectively reduce the “turion bank” of curlyleaf.

Early season mechanical removal using weed harvesters, hand cutting, or raking are possible methods of control. Plants should be removed as close to the sediment surface as possible to reduce turion production. All fragments must be removed from the body of water for this to be effective. To dispose of the remnants, composting, burning, burying, or trash disposal are all acceptable methods.

Early spring treatments using contact herbicides with active ingredients of diquat or endothall have shown positive effects in reducing curlyleaf pondweed shoot and root biomass as well as suppressing turion production. Research has shown that a chemical application of diquat or endothall should occur when the water temperature is around 50 to 55 degrees to greatly reduce turion production. Fluridone applied early in the spring has inhibited turion production. Fluridone should only be used for large scale or whole lake treatments, whereas diquat or endothall may be used over isolated beds of curlyleaf or large scale treatments. To determine the most effective herbicide to control curlyleaf pondweed in your particular body of water, you should contact an aquatic herbicide applicator. Only herbicides labeled for aquatic use may be used to treat aquatic plants. An Aquatic Vegetation Control Permit is required for weed control efforts on Indiana’s public waters.

To help stop the spread of aquatic invasive plants including curlyleaf pondweed, here are some simple steps you can follow.

- ✓ Rinse any mud and/or debris from equipment and wading gear and drain all water from your boat before leaving the access area.
- ✓ Remove all plant fragments from the boat, propeller, and boat trailer. The transportation of plant material on boats, trailers, and in livewells is the main introduction route to new lakes and rivers.
- ✓ Allow all equipment to thoroughly dry for at least five days before transporting it into a new body of water
- ✓ Do not release aquarium or water garden plants into the wild, rather seal them in a plastic bag and dispose in the trash.

## REFERENCES:

*Potamogeton crispus*. Global Invasive Species Database. 31 March 2006.  
[www.issg.org/database/species/ecology.asp?si=447&fr=1&sts](http://www.issg.org/database/species/ecology.asp?si=447&fr=1&sts)

Poovey, A.G., J.G. Skogerboe, and C.S. Owens. "Spring Treatments of Diquat and Endothall for Curlyleaf Pondweed Control." *Journal of Aquatic Plant Management* 40: 63-67, 2002.

Plants profile: *Potamogeton crispus*. U.S. Department of Agriculture, Natural Resource Conservation Service.

<http://plants.usda.gov/java/nameSearch?keywordquery=Potamogeton+crispus&mode=sciname>

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