

# MY COMMUNITY, OUR EARTH

## MIAMI

## Investigating the Impact of Lionfish on Water Lettuce on South Florida

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Nymphaeaceae bloom amongst water lettuce

### **Problem Statement:**

**What effect does Water Lettuce have on the freshwater ecosystems of South Florida?**

### **Background**

The introduction and spread of invasive species around the world is a major threat to ecosystems and native species within those ecosystems. Historically, South Florida has become home to several nonnatives that have changed the local flora and fauna. Although some deliberately introduced species have proved beneficial, many can cause ecological and economic harm. Whether deliberately or accidentally introduced, nonnative populations are able to grow exponentially. This is due to the fact that there may be no natural predators, competitors, or parasites that would usually control

their populations in their native homes. As their populations increase, invasive species can crowd out populations of many native species, trigger ecological disruptions, cause human health problems, and lead to economic losses (Miller and Spoolman, 2012). Identifying invasive species, evaluating their impact, and attempting to limit their expansion is key to protecting ecosystems around the world.

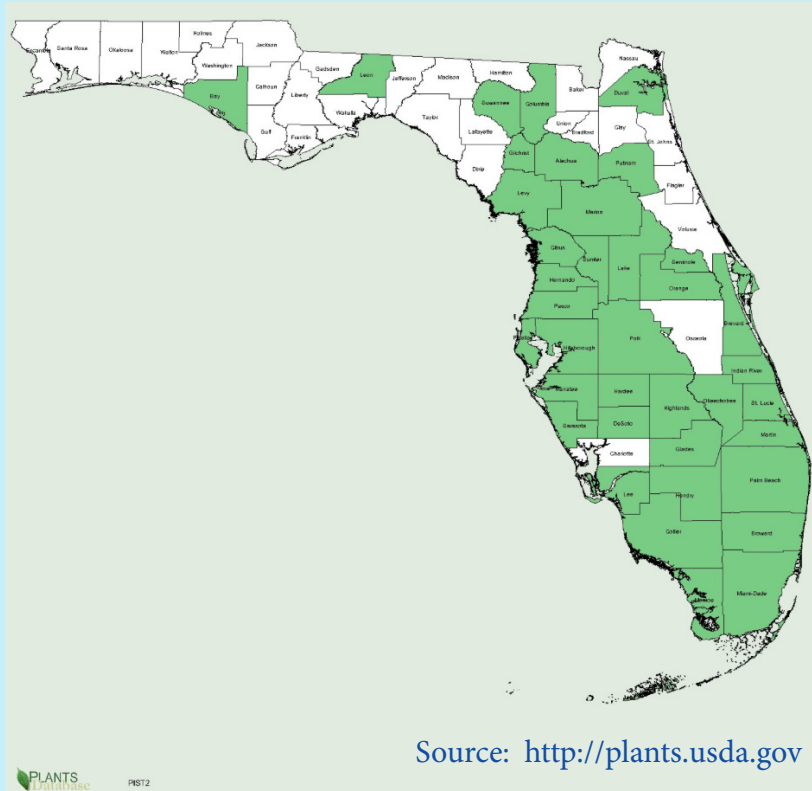
A visit to any of the freshwater ecosystems in South Florida will inevitably reveal the presence of *Pistia stratiotes*, more commonly known as water lettuce. This perennial plant floats on the surface of water, absorbing nutrients directly into its roots. Although the species has been found in the United States for centuries, it is currently considered a South Florida invasive. Water lettuce can reproduce quickly, forming large mats. Reproduction occurs sexually or vegetatively, with new daughter plants



forming on stolons that grow from the mother plant (Penfound and Earle 1948). The ability to form these large masses is the reason that this invasive can cause such devastation.

Clumps of water lettuce can block the exchange of gases between the air and water. In addition, light will be blocked from reaching underwater aquatic plants. Important native underwater plant species may be lost due to their lack of photosynthesis. Animals that depend on these underwater plants as a food source or for nesting will also see population reductions. Both of these situations will ultimately lead to a reduction of dissolved oxygen (from loss of exchange surface or from bacteria breaking down dead aquatic plants). A reduction in the levels of dissolved oxygen will lead to further loss of biodiversity, because oxygen-dependent organisms cannot tolerate the hypoxic conditions.

## Distribution of Water Lettuce in Florida



Other problems can also result from the presence of water lettuce. Since the water lettuce can multiply quickly, impenetrable mats can form within a few weeks. The increased transpiration through the plants stomata can cause a reduction in water levels, further affecting the animals that share the habitat and rely on the freshwater resources. Mats of water lettuce can clog waterways, hindering boating, fishing, swimming, and other water activities. This can also reduce water flow, leading to flooding along rivers and canals. Finally, the mats can be used by pest insects, particularly mosquitoes, for breeding. With the growing number of pathogens that are spread by mosquitoes, this becomes a human health concern.

## Implications and Conclusions

Fortunately, intensive statewide management efforts have been able to maintain low-population densities of water lettuce. There impacts have been greatly reduced through continuous diligent monitoring of the watersheds that are affected by the plant. Typical treatment to reduce water lettuce populations includes the application of aquatic herbicides. Since the plants float, they can also be removed by hand and spread out to dry.

Nymphaeaceae bloom amongst water lettuce

US distribution of Water Lettuce

