



Salvinia minima Baker

Common Names: Common Salvinia, Water Spangles

Synonyms / Other Names: Water Fern, Floating Fern. *Salvinia rotundifolia* and *Salvinia auriculata* were both previously accepted as synonyms but are no longer accepted as such.

Taxonomic Status: Accepted (Plantae)

Taxonomy:

Kingdom Plantae

Subkingdom Viridiplantae

Infrakingdom Streptophyta

Superdivision Embryophyta

Division Tracheophyta

Subdivision Polypodiophytina

Class Polypodiopsida

Subclass Polypodiidae

Order Salviniiales

Family Salviniaceae

Genus *Salvinia*

Species *Salvinia minima* Baker

Noxious: *S. minima* is not listed as a noxious weed according to the USDA, Oregon, Washington, and Idaho. However, the similar species *Salvinia molesta* is listed as noxious by the USDA, Oregon, and Idaho, and *S. auriculata*, *S. biloba*, and *S. herzogii* are listed as noxious by the USDA. Additionally, Texas A&M's AgriLife Extension and the University of Florida's

Center for Aquatic and Invasive Plants both identify *S. minima* as a non-native invasive species and the US Fish and Wildlife Service identify it with high certainty as a high risk species.

Identification:

Stem/Rhizoids: Horizontal, branching rhizomes that float just under the surface of the water. Each node on the rhizomes produces two floating to emergent leaves and a third, submersed leaf that produces filaments. Leaves are essentially stemless due to their closeness to the main root structure.

Leaves: “Floating leaves are orbicular to oval in shape, with heart shaped bases and rounded to notched tips... Smaller, orbicular leaves lie flat on the water surface; larger leaves become elongated and fold upright on the midrib. Shade grown leaves remain broadly orbicular, and emerald green. Leaves grown in full sun become larger and elongated and often change from emerald green to rusty brown with maturity and [age]. The upper surfaces of floating leaves are uniformly covered with rows of white, bristly hairs. The stalks of each hair divide into four thin branches that are spreading and free at the tips. The branching hairs create a water repellent shield. Long chestnut colored hair coats the underside of floating leaves, the submersed filaments, buds, and the rhizome” (Morgan et al, 2021).

Look-a-likes: The leaf hairs on *S. minima* are unconnected and loose at the end, while the hairs on *S. molesta* are connected and shaped like eggbeaters.

Size: Leaves are 0.4 to 2.0 centimeters in length; entire plant is about 1.0 to 2.0 inches in height/depth; horizontal spread is indefinite depending on area.

Native Range: “Central and South America; common and wide-ranging from southern Mexico to northern Argentina and Brazil” (Morgan et al, 2021).

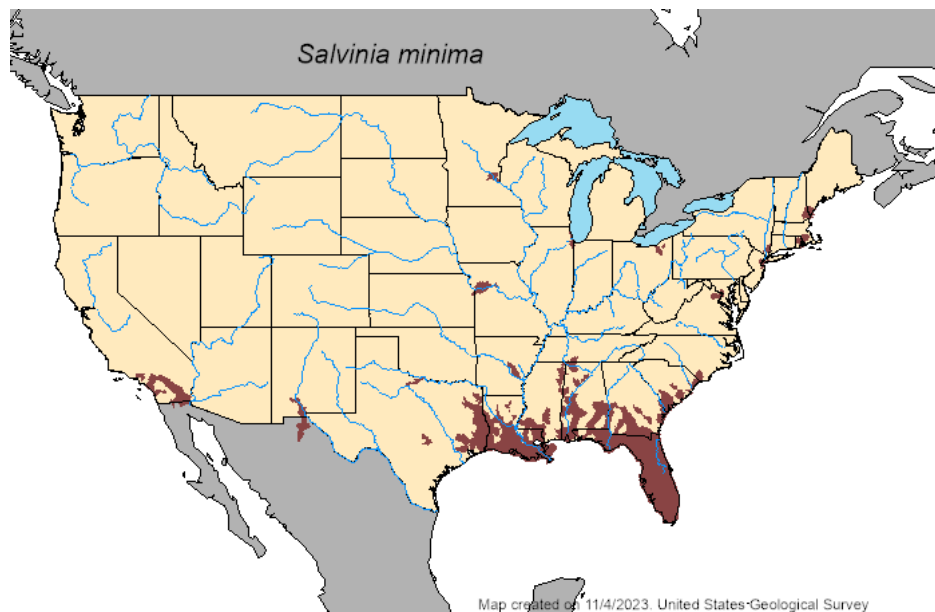


Figure 1. Map of the US showing (in red) areas where *S. minima* has been introduced outside of its native range.

Nonindigenous Occurrences:

State	First Observed	Last Observed	Total HUCs with observations†	HUCs with observations†
AL	1982	2022	14	Escatawpa; Lower Alabama; Lower Black Warrior; Lower Tallapoosa; Middle Alabama; Middle Chattahoochee-Walter F; Middle Tombigbee-Chickasaw; Middle Tombigbee-Lubbub; Mobile Bay; Mobile-Tensaw; Mulberry; Pea; Perdido; Upper Conecuh
AR	1998	1999	2	Bayou Meto; Lower Arkansas
CA	2008	2021	7	Aliso-San Onofre; Los Angeles; Newport Bay; Salton Sea; San Luis Rey-Esccondido; Santa Ana; Whitewater River
DC	2022	2022	1	Middle Potomac-Anacostia-Occoquan
FL	1917	2023	50	Alafia; Alapaha; Apalachee Bay-St. Marks; Apalachicola; Apalachicola Bay; Aucilla; Big Cypress Swamp; Caloosahatchee; Cape Canaveral; Charlotte Harbor; Chipola; Crystal-Pithlachascotee; Daytona-St. Augustine; Econfinia-Steinhatchee; Escambia; Everglades; Florida Southeast Coast; Hillsborough; Kissimmee; Lake Okeechobee; Little Manatee; Lower Chattahoochee; Lower Choctawhatchee; Lower Ochlockonee; Lower St. Johns; Lower Suwannee; Manatee; Myakka; Nassau; New; Northern Okeechobee Inflow; Oklawaha; Peace; Pensacola Bay; Perdido; Santa Fe; Sarasota Bay; South Atlantic-Gulf Region; Southern Florida; St. Andrew-St. Joseph Bays; St. Marys; Tampa Bay; Upper St. Johns; Upper Suwannee; Vero Beach; Waccasassa; Western Okeechobee Inflow; Withlacoochee; Withlacoochee; Yellow
GA	1936	2022	12	Alapaha; Little; Little Ocmulgee; Little Satilla; Lower Chattahoochee; Lower Flint; Lower Savannah; Middle Chattahoochee-Walter F; Middle Flint; Ogeechee Coastal; Suwannee; Withlacoochee
ID	2004	2004	*	
IL	2020	2020	1	Chicago
LA	1980	2022	25	Amite; Atchafalaya; Bayou Teche; Bogue Chitto; East Central Louisiana Coastal; Eastern Louisiana Coastal; Lake Maurepas; Liberty Bayou-Tchefuncta; Lower Calcasieu; Lower Grand; Lower Mississippi-New Orleans; Lower Ouachita; Lower Pearl; Lower Red; Lower Red-Lake Iatt; Lower Sabine; Mermentau; Mermentau Headwaters; Saline Bayou; Tangipahoa; Toledo Bend Reservoir; Vermilion; West Central Louisiana Coastal; West Fork Calcasieu; Whisky Chitto
MA	1941	1941	1	Narragansett
MN	1890	1890	1	Twin Cities
MS	1999	2022	8	Escatawpa; Homochitto; Lower Mississippi-Natchez; Lower Pearl; Pascagoula; Tangipahoa; Upper Leaf; Upper Tombigbee
MO	2018	2018	1	Lower Missouri-Crooked
NH	1976	1976	1	Piscataqua-Salmon Falls
NM	1994	1994	1	El Paso-Las Cruces
NY	1893	2022	2	Lower Hudson; Sandy Hook-Staten Island
OH	2017	2017	1	Cuyahoga
OK	1989	1989	1	Arkansas-White-Red Region
PR	1955	2022	4	Cibuco-Guajataca; Culebrinas-Guanajibo; Eastern Puerto Rico; Southern Puerto Rico
SC	1997	2022	9	Broad-St. Helena; Calibogue Sound-Wright River; Carolina Coastal-Sampit; Cooper; Lake Marion; Lower Savannah;
TN	2009	2009	1	Pickwick Lake
TX	1992	2022	14	Austin-Travis Lakes; Buffalo-San Jacinto; Caddo Lake; East Fork San Jacinto; Lower Angelina; Lower Neches; Lower Sabine; Lower Trinity; Middle Sabine; Pine Island Bayou; Sabine Lake; Village; West Fork San Jacinto; Wichita

† Populations may not be currently present.

* HUCs are not listed for states where the observation(s) cannot be approximated to a HUC.

Ecology:

Growth: *S. minima* has three separate stages of growth. During the primary stage, fern buds are introduced to a new environment and will lay flat on the surface of the water. During the secondary stage, the leaves begin to curl upwards as they grow and become more closely crowded against each other. During the tertiary stage, the leaves can become nearly vertical due to how dense the plant's matting form has become. Once established, the rhizomes continue to branch out and fragment, creating many offspring throughout its growing season. Fragments are covered in hairs to remain better attached to spreading vectors such as boats and animals and can also lay dormant during unfavorable conditions.

Habitat: "Prefers shallow backwaters of bayous, lakes and ponds, oxbows, ditches, slow flowing streams, cypress swamps, and marshes ... [and] is vulnerable to conditions of salinity" (Morgan et al, 2021).

Means of Introduction: First reported in Florida in 1930, likely due to contaminated ship ballasts from international ship traffic. Was already being cultivated in greenhouses and gardens in the US since the 1880s; likely then entered surrounding natural areas through flooding, runoff, or intentional release. Has been sold in nursery trade and is still readily available to order from online suppliers. Can easily hitchhike on boats, vehicles, clothing, and animals.

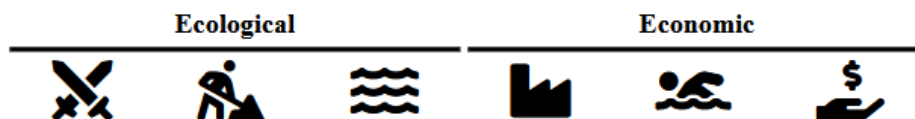
Status:

Established in: Alabama, Florida, Louisiana, Minnesota, New York, and Texas

Locally established in: Missouri, Mississippi

Collected in: Arkansas, Maine, Maryland, New Mexico, New York, and Oklahoma

Impact of Introduction:



[Competition](#) | [Habitat Alteration](#) | [Water Quality](#) | [Infrastructure](#) | [Recreation](#) | [Commerce](#)

Can compete for resources against native species, but not necessarily during all seasons. Due to its dense matting growth habit, it can outcompete other floating plant species and block sunlight from reaching submersed plant vegetation, which in turn can decrease oxygen concentration that is necessary for the survival of aquatic animal species. Can clog irrigation systems and water intakes, interfere with power production, and impede waterways. Its treatment can require the use of herbicides or water withdrawal which negatively impacts boating, recreational activities, and fishing.

Remarks: None

References:

från svenska, Laxskinn. "File:Salvina_minima.JPG." *Wikimedia Commons*. Wikimedia Foundation. 5 August 2010. https://commons.wikimedia.org/wiki/File:Salvina_minima.JPG.

Lower, E. (2021, June 10). *Salvinia minima Baker*. Great Lakes Aquatic Nonindigenous Species Information System. https://nas.er.usgs.gov/queries/greatlakes/FactSheet.aspx?Species_ID=297&Potential=Y&Type=2

Morgan, H., Anemaet, E., Lower, E. (2021, October 29). *Water Spangles (Salvinia minima) - Species Profile*. NAS - Nonindigenous Aquatic Species Database. <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=297/>

Texas A&M AgriLife Extension. (2020, December 3). *Common Salvinia*. AquaPlant. <https://aquaplant.tamu.edu/plant-identification/alphabetical-index/common-salvinia/>

University of Florida Institute for Food and Agriculture Sciences. (n.d.) *Salvinia minima*. Center for Aquatic and Invasive Plants. <https://plants.ifas.ufl.edu/plant-directory/salvinia-minima/>

US Department of Agriculture. (2023, February 16). *Plants for planting FAQ's*. Animal and Plant Health Inspection Service. <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/plants-and-plant-products-permits/plants-for-planting/plants-for-planting-faqs>

US Fish & Wildlife Service. (2019, August 19). *Ecological Risk Screening Summary - Water Spangles (Salvinia minima) - High Risk*. <https://www.fws.gov/media/ecological-risk-screening-summary-water-spangles-salvinia-minima-high-risk>

Ziarnek, Krzysztof. "File:Salvinia minima kz01.jpg." *Wikimedia Commons*. Wikimedia Foundation. 9 February 2020. https://commons.wikimedia.org/wiki/File:Salvinia_minima_kz01.jpg.

Ziarnek, Krzysztof. "File:Salvinia Minima Kz04.Jpg." *Wikimedia Commons*. Wikimedia Foundation. 28 December 2020. https://commons.wikimedia.org/wiki/File:Salvinia_minima_kz04.jpg.