

Supplemental Written finding

Common Name: Grass-leaved Arrowhead,
Slender Arrowhead

Scientific Name: *Sagittaria graminea* Michx.

Family: Alismataceae (water plantain)

Native Range: *Sagittaria graminea* is a large, widely distributed species found throughout the eastern half of the North America as far west as Wyoming and from Labrador to Cuba in the East.

Depending on the taxonomic treatment one reads, members of a group of eight or nine related taxa have, at one time or other, been considered varieties within *S. graminea*. *S. graminea* or varieties of this species are listed as a threatened species in parts of its native range. It is also listed at some web sites as a weedy species.



Introduced Range: A native of eastern North America, *Sagittaria graminea* has been introduced to many countries as an ornamental aquatic plant. It was first recorded at a field site in New Zealand (on Auckland's North Shore) in 1988. It also found in Australia. It is growing in Lake Roesiger, Snohomish County, Washington. The plant identification was confirmed by Dr. Hayned at the University of Alabama in May 1995. The USGS survey of Lake Roesiger in 1972 identified a "water plantain" and the environmental consultant KCM identified "water plantain – *Alisma spp.*" in 1988. It is likely that both the USGS and KCM misidentified *Sagittaria graminea* as water plantain.

Known from Washington: There is a densely growing population *Sagittaria graminea* in Lake Roesiger in Snohomish County. There is smaller population in Mason Lake in Mason County that was discovered in 1998. *Sagittaria graminea* is offered for sale over the Internet.

Biology: *Sagittaria graminea* is an emergent or submersed perennial aquatic monocot. It grows best in shallow water up to two m deep (Lake Roesiger) in static or slow moving freshwater such as lakes, streams, and pond margins. *Sagittaria graminea* has both emergent and underwater leaves. Plants growing in deeper water (greater than 0.5 m) form only submersed leaves. The emergent leaves are linear to ovate, tapering abruptly to a point and can be as large as 10 to 25cm long and 2 to 8cm wide or as small as 1 cm to 5 cm long. The stems holding the emergent leaves are up to 55cm long, triangular in cross section, and are winged towards the base. The submersed leaves are strap-shaped, up to 50cm long and 2.5cm broad. The white or sometimes pink flowers are 3cm in diameter and are found in 2 to 12 groups of three-flowered whorls at the end of the flower stem. The flower stem is an emergent stalk to 1.2 m tall. The flowers are always below leaf height and produce clusters of fruitlets that contain oblong seeds, each 1.5 to 3mm long. The seeds germinate in the spring and grow slowly to produce profusely flowering stems in summer (July and August). Flowering continues until autumn with seed slowly maturing through autumn and winter.

Most seeds fall close to the colony but some may be eaten by ducks and remain viable when excreted. Fleshy rhizomes are the major means of spread. They begin growing when the seedlings are about one month old and continue to grow slowly, producing tubers throughout the growing season. Tubers and rhizomes remain dormant through winter, producing buds in spring. Sometimes *Sagittaria graminea* forms floating mats of vegetation that break up and take root elsewhere in the waterway. It is considered hardy from USDA Plant Growing Zones 4-10. The plant increases density and spreads locally by its creeping root system. It spreads to other areas through seed carried by water, machinery, and wildlife as well as rhizome fragments being transported. It also can be planted by aquatic plant enthusiasts who do not understand the ramifications of introducing non-native species to our natural ecosystems.

Threats: *Sagittaria graminea* is native to much of eastern North America, however, where it has been introduced outside of its native range, it has become a serious pest plant. It is a declared plant (noxious weed) in **Western Australia** and cannot be imported into the state or kept there. *Sagittaria graminea* blocks irrigation channels and drainage ditches in north central **Victoria** and **New South Wales** (pictured to the right). It has become a nuisance in rice fields in the Murrumbidgee Irrigation Area of New South Wales. *Sagittaria graminea* is a Class B noxious plant in **New Zealand** and the aim is to eradicate the plant from all known sites within five years. It forms extensive infestations in shallow waterways, seriously restricting water flow and increasing sedimentation, thus aggravating flooding.



Key Identifying Traits

- *Sagittaria graminea* can grow up to two meters above the water level.
- When growing in deeper water, *Sagittaria graminea* only forms submersed leaves.
- The leaves that grow below the water surface are long, thin and strap-like.
- The stems are erect and bear from 2 to 12 whorls of flowers during summer.
- The leaves growing above the surface are large, dark green, and spear-shaped. They have conspicuous radiating veins and are carried on upright spongy stalks. Our native *Sagittaria spp.* have arrow-shaped leaves.
- The flowers are about three cm in diameter with three white petals and a bright yellow center. The flowers have many stamens on hair-covered filaments.
- A fruit composed of numerous beaked seeds, about two cm in diameter is produced. The fruits are arranged in a ball-shaped cluster.



- *Sagittaria graminea* has a short brown and fleshy rootstock from which brown, branching fibrous roots grow. Attached to the rootstock are fleshy rhizomes and tubers.
- Members of this family (Alismataceae) often have similar leaf shapes. The flowers are required for identification to species.

Rationale for Prohibiting:

Sagittaria graminea has established in two western Washington lakes. It is growing densely and inhibiting the growth of native aquatic species. Its occurrence in two widely separated lakes indicates that people are deliberately planting this species in Washington. *Sagittaria graminea* is a noxious weed in both New Zealand and Australia causing serious problems in shallow waterways. It appears that this species is seriously weedy when introduced outside of its native range. Jenifer Parsons has also seen *Sagittaria rigida* here in Washington in Crocker Lake in Jefferson County. However, *Sagittaria ridida* does not appear to be nearly as weedy as *S. graminea*.

References:

<http://www.agric.wa.gov.au/agency/pubns/infonote/infonotes/AO2693.html>

www.loyno.edu/~hauber/Sagres.html

Miscellaneous web sites

