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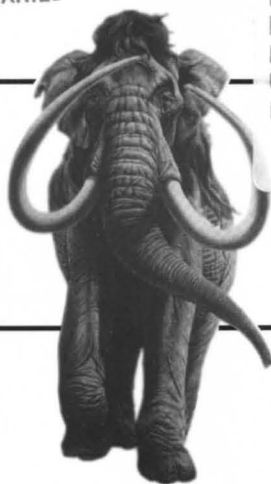
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*Notes*

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## AQUATIC PLANTS OF NEBRASKA

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More than 100 species of aquatic plants grow in Nebraska. Some are entirely submersed for their whole lives, others produce floating leaves and flowers, and still others stand upright, with only their lower stems in water. Examples of these are shown here in this publication.

Vigorous and diverse colonies of aquatic plants are usually a sign of healthy and stable aquatic environments. In fact, the plants themselves stabilize the shorelines, underwater soils, and water chemistry. Waters rich with aquatic plants are rich with aquatic animals and waterfowl, which find cover, breeding habitat, and abundant food. Non-alkaline waters have more aquatic plants than alkaline waters but, in the absence of pollution, both waters have stable communities. However, excessive nutrients from pollution by sewage and runoff from cropfields stimulate rampant growth by a few species that overwhelm the others, leading to decreases in aquatic plant and animal species. Most Sandhills waters are unpolluted and their aquatic floras are stable, but that is not the case for many streams and reservoirs elsewhere in the state.

### Arrowheads (*Sagittaria*)

Many people know the arrowhead-shaped leaves of these emergent plants, which are unlike those of any other of our aquatic plants. Arrowheads sometimes

form large colonies in shallow water and are important cover for waterbirds and other animals. Five Nebraska species of *Sagittaria* have such leaves, but two others do not. Some species produce fleshy, starch-filled, egg-sized tubers, called duck-potatoes, at the tips of underground stems in autumn. These are avidly eaten by aquatic mammals and waterfowl, and they are prized by human wild-food collectors.

The flower-stalks stand above the water and bear groups of three flowers. Each flower has three showy white petals and a yellow center, and each female flower bears hundreds of tiny, seedlike fruits that are readily eaten by birds.

Every part of the state has one or more species of *Sagittaria*, and sometimes two or three species together form mixed or adjacent colonies. The plants thrive on deep, nutrient-rich mud and spread quickly there. Our most common species having arrowhead-shaped leaves are *S. brevirostra*, *S. calycina*, *S. cuneata*, and *S. latifolia*, which can be distinguished from each other (with difficulty) by minor variations in their fruits and flowers.

### American lotus, Chinkapin (*Nelumbo lutea*)

American lotus is the most spectacular of Nebraska's aquatic plants. Its large, round, blue-green leaves are up to two feet in diameter, and they lack the deep cleft of water-lily leaves. The early leaves of the

season float, but later leaves are held above the water, attached at their center on prickly stalks. The leaves and solitary flowers arise from deeply buried stems that look like bananas attached end-to-end. The buried stems can spread 40 feet or more in a single growing season, and huge colonies are formed in the Missouri River bottoms and elsewhere in the eastern half of the state. The yellow, many-petaled flowers are sometimes as large as a dinnerplate. They are held well above the water and usually are higher than the leaves. The strange, inverted, cone-shaped, hard fruits are up to four inches in diameter and also stand above the water. They bear dark brown, acorn-like seeds on their flat face.

Although it is a nuisance and sometimes even a serious weed in eastern and southern states, lotus is uncommon and rather local in Nebraska, but it has spread westward from the Missouri Valley in recent years. It was reported near the Missouri River in present-day Nebraska as early as 1811, but it was used for food by Native Americans long before that.

#### **Sago pondweed (*Potamogeton pectinatus*)**

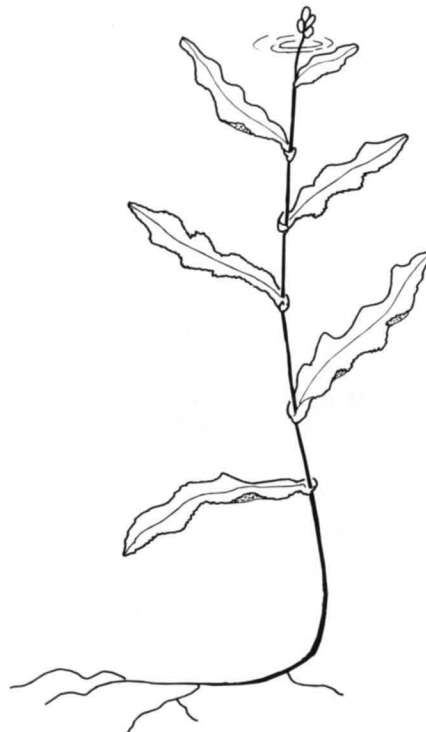
Sago-pondweed, a totally submersed plant with threadlike leaves, is common statewide, and its abundant fruits are often considered to be the most important waterfowl food of all. It is rooted on the bottom and can tolerate more turbidity and pollution than most pondweeds. In fact, it is often found in saline or alkaline waters, where few other plants can grow. Its fan-shaped clusters of long, slender leaves make it easy to recognize.



**Water Plantain (*Alisma plantago-aquatica*).** Lancaster County.  
Photo by Robert Kaul.

#### **Bur-reed (*Sparganium eurycarpum*)**

The bur-reed is similar to cattails but does not grow as tall, and its erect, rather stiff leaves have a ridge down the back, which cattails lack. The plants form colonies by underground stems, and at flowering time each plant produces an erect, zig-zag stem up to three feet tall. That stem has male and female flowers in separate clusters, the white male clusters uppermost and the green female clusters farther down. The female clusters mature into spiny burs of tightly packed, rock-hard, pyramidal fruits. The plants are locally common on shores and marshes across the state, including the Sandhills, and they can survive, but stunted, in somewhat saline soils.



#### **Curly-leaved pondweed (*Potamogeton crispus*)**

This plant is easily identified because it is our only species of pondweed to have teeth on the margins of the leaves. It is a Eurasian species that, in some parts of North America, has become a serious weed because its vigorous growth overwhelms native aquatic plants. In Nebraska, however, it is not yet troublesome.

#### **Water-lily, lily pads (*Nymphaea odorata*)**

The large, round, floating leaves and solitary, long-stalked flowers arise from a small underground stem. Each leaf has a single deep cleft and is attached at its center to a slender stalk. The many-petaled white flowers are up to six inches in diameter, and they have

a yellow center that sometimes emits a sweet odor. Each flower floats at or just above the surface, and it opens in the morning and closes in late afternoon for several consecutive days. The developing fruits mature just beneath the surface. The plants grow in quiet, clear ponds, lakes, backwaters, and oxbows where they often form dense, long-lived colonies. They are much less common now than in the past because of siltation, pollution, and grazing by cattle.



#### **Cattails** (*Typha*)

Growing on every continent except Antarctica and in every Nebraska county, cattails can be recognized by just about everyone in the world. The narrow, crowded, erect leaves can reach eight feet tall, and they arise from thick underground stems that spread rapidly in shallow water and on mud. The solitary, cylindrical, brown heads are unlike anything found in other plants and, when they shatter in late autumn and winter, they release thousands of microscopic seeds, each provided with white hairs that make it airborne. Nebraska has two common species: the broad-leaved cattail (*T. latifolia*), with bluish-green leaves up to an inch wide, and the brown female head abutting the tan male head above it; and the narrow-leaved cattail (*T. angustifolia*), with narrower, darker green leaves, and the male and female parts of the head separated by a slender stalk. However, the two species hybridize and produce intermediate plants, and the hybrids are more common than the parents in some places. Generally, the narrow-leaved cattail occupies deeper, more turbulent, and more alkaline waters than does the broad-leaved cattail. While the plants form cover and breeding habitat for wildlife, their rampant growth can overwhelm other aquatic vegetation and so reduce the diversity of plants and animals.

#### **Duckweeds** (*Lemna*, *Spirodela*) and **Watermeal** (*Wolffia*)

Everyone has seen these tiny plants that form floating green mats on the surface of quiet waters. They are sometimes mistaken for algae or scum, but they are indicators of healthy waters and are also important foods and habitats for aquatic animals. In the duckweeds, each plant consists of a group of flat, leaflike fronds, each frond bearing one or more roots that hang into the water. The greater duckweed (*Spirodela polyrrhiza*) is the largest of this group, each frond one-fourth of an inch wide, usually red underneath, and with a red spot above, and bearing several roots. The other duckweeds (several species of *Lemna*) have a single root per frond. The watermeals (*Wolffia*), of which Nebraska has two species, are even smaller—pinhead-sized, the world's smallest flowering plants—and have no roots; they resemble floating grains of green meal. All these plants sometimes grow together. Their flowers are unbelievably small and most people have never seen them. In autumn, the duckweeds sink to the bottom, and they rise in spring to begin growth anew.

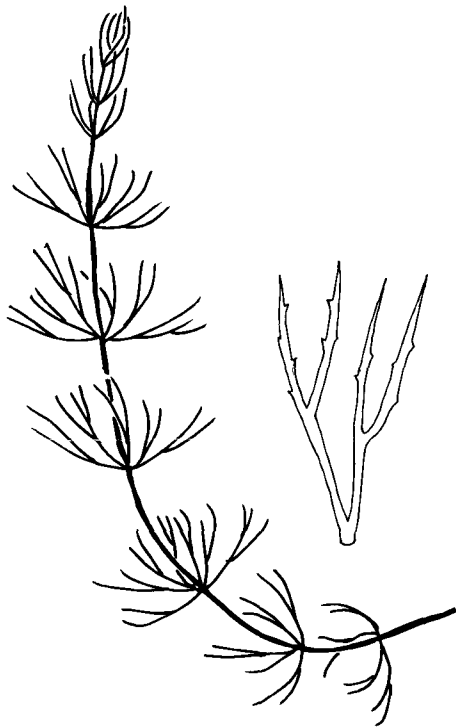
#### **Yellow pond-lily, spatterdock** (*Nuphar variegata*)

Smaller, yellow flowers and oval floating leaves that are large and thick distinguish this from the white water-lily. The leaves and the solitary, long-stalked flowers arise from a long, thick, yellow, underground stem buried deeply in mud. The globe-shaped yellow flowers, about two inches diameter, are held just above the surface and emit an alcoholic odor. The fruit is flask-shaped, and when it ruptures it releases its seeds in packets that float away, eventually to sink and germinate. Yellow water-lily was once more widespread in the state, but most of the colonies have been eliminated by grazing cattle and siltation. Today, it grows only in a few Sandhills ponds that cattle do not reach, but it is a common plant across much of the Northern Hemisphere.

#### **Floating pondweed** (*Potamogeton nodosus*)

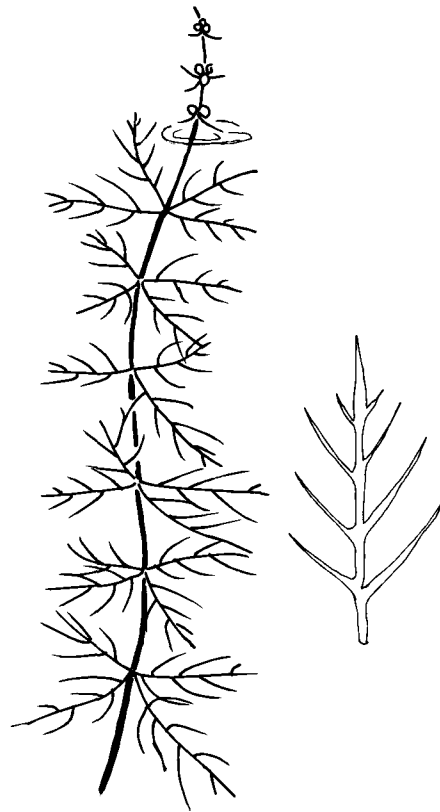
This is our most common and widespread pondweed that produces floating leaves. The submersed leaves are narrow and soon rot away, but the floating leaves are oblong and sometimes form crowded mats on the water surface. Short, erect spikes of flowers appear abundantly in late summer, and the fruits produced are a major source of food for waterfowl. Chains of slender winter-buds are produced on the buried stems and are avidly eaten by aquatic animals. A similar plant, *P. natans*, is found in the Sandhills.

There are 16 species of *Potamogeton* in Nebraska's waters, some abundant but others very restricted. The plants form important breeding habitat for fish and aquatic invertebrates. Luxuriant stands of pondweeds are indicators of healthy aquatic environments, but a few species show explosive growth in waters that are excessively enriched by runoff from cropfields. Most species cannot tolerate muddy waters, and many have disappeared from the turbid, polluted waters outside the Sandhills. Some species absorb lime directly from the water, and their leaves and stems become brittle and encrusted with it.



**Coontail (*Ceratophyllum*)**

The name coontail comes from the crowded upper leaves, which make the stems appear bushy, like the tail of a raccoon. Several brittle leaves are attached at each node, and each leaf, which has no central axis, forks evenly several times, giving the plant its brushlike texture. The tiny flowers are produced and pollinated underwater and are rarely observed without painstaking efforts. These common, brittle, rootless plants are usually entangled on the bottom in shallow waters, but often they float just beneath the surface and can become entangled in fishing gear and motors. Coontail is more tolerant of murky and polluted waters than most submersed aquatics, and it is used in aquaria and ornamental pools where it thrives in bright light. Coontail is often among the dominant aquatics in newly constructed ponds and reservoirs that have water rich in dissolved nutrients and organic matter.



**Water-milfoil (*Myriophyllum*)**

The four species of water-milfoil in Nebraska are very difficult to distinguish from each other, but only one, *M. sibiricum*, is abundant and widespread. A submersed plant that is rooted on the bottom, it could be confused with coontail because of its slender-lobed leaves that are in groups at the nodes. However, the leaves of the water-milfoils have a central axis from which lateral lobes project, giving them a feather-like appearance. *Myriophyllum sibiricum* is often found in hard waters, where it accumulates lime and becomes encrusted and brittle. Its tiny flowers are held just above the surface. Another species, *M. spicatum*, the dreaded Eurasian water-milfoil, has been found at a few places in Nebraska but has not yet become a nuisance. In other states it has become a serious problem because its rampant growth clogs waters and crowds out native species.



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