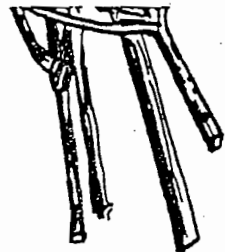




**KEY TO SOME IMPORTANT
AQUATIC PLANTS OF OREGON**

**OREGON STATE GAME COMMISSION
Miscellaneous Wildlife Publication No. 2**



KEY TO SOME IMPORTANT AQUATIC PLANTS OF OREGON

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OREGON STATE GAME COMMISSION
P. W. Schneider, Director
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Introduction

This plant identification key is designed primarily to aid those interested in waterfowl habitat and its management. Only the more important plants are considered here, including two of negative value. Elodea and Myriophyllum may be classed as troublesome weeds, although they are sometimes sold as waterfowl food plants. Najas, which resembles Elodea, is not generally considered to be an important food in Oregon; however, the two species found in the state are highly rated elsewhere. The other plants listed here are discussed in the recent publication "Planting Food for Waterfowl" which is available from the Game Commission. A separate key to the bulrushes (Scirpus) is included because of the number of important species, and the confusing nomenclature found in the literature. The appended list of references should be consulted if more detailed information is desired. The number of species and their ranges within the state can be found in Peck's "Manual of the Higher Plants of Oregon".

KEY TO SOME IMPORTANT AQUATIC PLANTS
OF OREGON

Free-floating

Entire tiny plant floating on surface of quiet, fresh water.

- A. Single root; each leaf-like part is less than $\frac{1}{2}$ in. long.

(2 sp.; widespread) Duckweed Lemna

- A. Several roots; leaf-like parts less than $\frac{1}{2}$ in. long.

(1 sp.; widespread) Greater duckweed Spirodela

(Avoid confusing with Azolla, an unrelated small, floating plant which is reddish.)

Submerged

Plants usually fast to bottom, sometimes detached masses floating. Leaves submerged or some floating; submerged leaves narrow.

- A. Algae - single cell between nodes. No flowers.

Mass of bright glassy-green threads, much branched; whorls of short branches at nodes. Often lime coated. Musky odor. Various depths and degrees of salinity.

(Many similar sp.; widespread)

Muskgrass Chara

- A. Flowering plants (may not flower in Oregon)

- B. Marine habitat

- C. Long ribbon-like lvs., $\frac{1}{4}$ to $\frac{1}{2}$ in. wide, to 6 ft. long. Usually 2-6 ft. water.

(1 sp.; Coast) Eelgrass Zostera

- C. Leaves thread-like, to 4 in. long. Water depth to several feet.

(1 sp.; Coast and interior)

Widgeon grass Ruppia

- B. Non-marine habitat (less than full sea salinity)

- C. Leaves in whorls (3 or more per node)

D. Plants sometimes emergent. Emerged leaves reduced; submerged leaves dissected, the slender divisions paired on opposite sides of the stalk.

(4 sp.; 3 of general range)

Fig. 3 Water milfoil Myriophyllum

D. Plants not emergent

E. Slender forked leaves with teeth along one edge only. Five or more lvs. per whorl. Olive green.

(1 sp.; general range)

Fig. 2 Coontail Ceratophyllum

E. Leaves not as above, but regular and with 1 nerve prominent. Generally 3 lvs. per whorl. Bright green.

(2 sp.; 1 of general range)

Fig. 1 Elodea (Anacharis) Elodea

C. Leaves opposite (smaller leaves in axils sometimes cause resemblance to whorls). Stems and leaves thread-like.

D. Leaves with bases enlarged, finely toothed; to 1 in. long. Stems any lg. to 6 ft. from fibrous roots. Fr. 1 per leaf axil.

(2 sp.; general range)

Fig. 5 Naias Najas

D. Leaves not enlarged, not toothed, stipules present, 1-4 in. long. Stems to 1.5 ft. from creeping rootstocks. Fr. several per leaf axil.

(1 sp.; general range)

Fig. 4 Horned pondweed Zannichellia

C. Leaves alternate

D. Stems and leaves thread-like. Usually less than 1/8 in. wide.

E. Leaf bases broad, sheathing; lvs. all same form. Rootstocks often zig-zag; usually 1 root per node.

(1 sp.; general range)

Fig. 6 Widgeon grass Ruppia

E. Lvs. without swollen bases, submerged, linear. Stipules present. Rootstocks mainly straight; usually 4 or more roots per node.

(20 sp.; general range; about half sp. key out here)
Fig. 7 Pondweeds Potamogeton

D. Stems and lvs. not all thread-like

E. Lvs. ribbon-like; about 3/8 in. wide, keeled. Fr. a globular bur or head. Fresh water.

(5 sp.; general range, 3 key here)
Fig. 8 Bur-reed Sparganium

E. Lvs. not ribbon-like; at least the floating lvs. broad. Fr. in spikes. Fresh, brackish or alkaline water.

Fig. 9 Pondweeds Potamogeton

Emergent

Basal portion of plant normally covered by water; part of tops erect above water. Some species may also be found at water margin in wet soil.

A. Lvs. submerged or floating, not emergent. Inflorescence at or above surface.

Pondweeds Potamogeton

A. Lvs. at least some emergent

B. Lvs. in whorls on sparingly branched, drooping stems of bottle-brush form. Submerged lvs. dissected; emerged lvs. entire. Dicot.

Water milfoil Myriophyllum

B. Lvs. not in whorls. Stems not of bottle-brush form. Monocots, except Polygonum.

C. Lvs. ribbon-like, alternate; fr. a globular bur or head.

(2 sp. key here)
Fig. 8 Bur-reed Sparganium

C. Lvs. not ribbon-like

D. Lvs. arrowhead shaped. Tuberous rootstocks.

(2 sp.; 1 general, 1 E. Ore.)

Fig. 10 Arrowhead Sagittaria

D. Lvs. not as above

E. Lvs. entire, stipules forming sheath.
Stem joints usually swollen. Fr. in spikes
at tips of branches.

(About 12 sp. on wet sites)

Fig. 11 Smartweed Polygonum

E. Lvs. not as above.

F. Lvs. without blades, represented by
sheaths at base of stem. Stems round,
square or rarely triangular. Single
spikelet terminating stem. Ht. usually
less than 3 ft.

(About a dozen sp. in Ore., mostly perennial)

Fig. 12 Spike-rush Eleocharis

F. Stems leafy or lvs. reduced to basal
sheaths. Stems round or triangular.
Spikelets usually several in a terminal
or lateral cluster. Hts. of most sp.
exceed 3 ft.

(About 17 sp. in Ore.)

Figs. 13-16 Bulrush Scirpus

Moist ground, often flooded seasonally

A. Lvs. clustered, all basal, half-round without definite blades,
fleshy, rushlike, from a short rootstock. Fr. in a long
spike-like inflorescence, without leaves; capsules split
into 3 or 6 parts when ripe. Brackish or alkaline sites.

(2 sp.; 1 Coast, 1 general)

Arrowgrass Triglochin

A. Lvs. 3-ranked, grass-like, closed sheaths. Solid triangular
stems, not distinctly jointed; often from creeping rootstocks.
Inflorescence of spikelets.

B. Fls. perfect. Inflorescence terminal, involucre leaves prominent. Spikelets flattened, scales 2-ranked.

(8 sp.) Cyperus, including Nutgrass
Cyperus

B. Fls. imperfect. Spikes sometimes also lateral. Spikelets not regularly flattened, scales in several ranks.

(Many sp.) Sedges Carex

A. Lvs. 2-ranked, open sheaths. Hollow, round stems, jointed. Inflorescence of spikelets. (Grasses)

B. Low, wiry, perennial (to 1 foot tall), with long tough rootstocks having sharp, hardened scale leaves. Hairy ligule. Saline or alkaline sites.

(2 sp.) Saltgrass Distichlis

B. Coarse, stout, weedy annual (to 3 feet or more tall). Ligule absent. Panicles of spike-like clusters; spikelets bristly; seed hardened, millet-like. Wet sites. Exotic.

(1 sp.) Barnyard grass Echinochloa

Scirpus

Eastern Oregon

Triangular stems

- A. Involucral leaf solitary; spikelets densely clustered, sessile. Leaves basal and usually inconspicuous.
- B. Stems very slender; ht. to 5 ft. Leaf blades 1-3 or up to 7 in. long. Involucral leaf extends from 1-6 in. beyond dense cluster of up to 6 spikelets; scales of spikelet conspicuously awn-tipped. Commonly on sandy soils. Fresh or moderately alkaline water, usually not over 18 in. deep. Widespread range.

Fig. 15

Three-square

S. americanus

- B. Stems stout, leafless or with few very short leaves. Ht. to 6 ft. or more. Involucral leaf 1-1 $\frac{1}{4}$ in. long, spikelets 5-12 or more in a cluster; scales without awn. Compared to americanus, this sp. has soft stems with deeply concave sides; spikelets smaller; involucral leaf shorter. Usually on rich soil. Fresh or mildly brackish water. Range southern half of eastern Oregon.

Fig. 13

Olney bulrush

S. olneyi

- A. Involucral leaves several; spikelets clustered or in umbel with unequal, mostly short rays. Stems leafy. Rootstocks sometimes enlarged at base of stem.
- B. Spikelets in a single dense head. Involucral lvs. (2 or 3) long, unequal, one especially long (to 12 in.) and erect resembles continuation of stem. Inflorescence is a dense cluster of 3-10 spikelets. Slender rootstocks and stems. Ht. to 3 ft. Lvs. may exceed stem. Bristles (1-3) much shorter than fruit, or absent. Swampy, alkaline sites, east of Cascades.

Alkali bulrush (S. campestris)

S. paludosus

- B. Spikelets in several clusters. Involucral lvs. long and unequal. Stems stout.
- C. Spikelets numerous in dense heads on unequal rays. Scales pale, with prominent awn. Bristles 6, about length of achene. Short rootstocks. Lvs. pale. Ht. 2-4 ft. Snake River and Eagle Creek, Baker Co.

Pale bulrush

S. pallidus

C. Spikelets solitary or few on long rays, except central ones may be sessile. Scales with prominent awn. Bristles 6, about as long as the achene. Involucral lvs. 3-5, up to 8 in. long. Ht. 3-6 ft., rank growth. Shallow, fresh water. Best on sites which dry late in season. Klamath River.

River bulrush

S. fluviatilis

Round stems

A. Ht. 9-18 in. Stems slender, clustered, leafy at base, may be slightly triangular. Lvs. 1/2-2/3 ht. of stems, erect. Spikelets (3 or 4) terminal in sessile cluster. Involucral leaf (1) short, 1/2 to 1-1/4 in. long. Moist alkali flats east of Cascades. Scarce in Harney-Malheur Lakes.

Nevada club rush

S. nevadensis

A. Hts. more than 3 ft. Stems leafless. Usually in water less than 3 ft. deep. Spikelets in compound, spreading umbel. Involucral leaf shorter than umbel. (The following group is difficult to separate, at least for field identification; inspection of fruits appears necessary.)

B. Fr. (achene) 3 angled. Stem slender; each spikelet usually isolated on separate ray of the umbel. Ht. 3-7 ft. Swamp, shallow water and shores. Particularly Klamath Co. in Oregon, eastward to Idaho.

Slender bulrush

S. heterochaetus

B. Fr. (achene) 2 angled. Stem stout; spikelets usually in clusters on rays. Stout rootstocks. Hts. 3-9 ft. or more. Range widespread in U. S. and Oregon. (The literature is not in agreement on the species which would key out here: S. acutus, validus and occidentalis. It appears that acutus and validus are good species, however, intermediates sometimes occur. S. occidentalis apparently is a synonym of acutus).

C. Umbels in dense cluster or of few, short, unequal rays. Large spikelets, up to 1/2 in. long with grayish brown scales. Achene 1/4 to 1/3 shorter than scale. Stem less than 1/2 in. thick at base, dark olive-green, firm in texture. Roots swollen and spongy. Commonly in hard water; emergent or on wet land. Often pioneer on hard bottom lakes, acting as buffer against wind or wave. Large stands; common; most important round-stem for waterfowl.

Fig. 14

Hardstem bulrush.
Common tule

S. acutus

C. Umbels mostly long-rayed (lax panicle). Small spikelets about 1/4 in. long, usually bright rusty-brown scales. Achene nearly equalling scale. Stem 1/4-1 in. thick at base; light green; soft, lax, spongy texture. Roots fibrous. Usually fresh water and rich soil. Sometimes in patches with acutus. Soft stems less able to withstand wind and wave action than acutus. Apparently less abundant than acutus.

Softstem bulrush S. validus
Great bulrush

GLOSSARY

Pertaining to leaves (lv.), stems or roots

- Alternate - leaves, one to a node.
- Axil - the upper angle formed where a leaf joins a stem.
- Blade - leaf; the flat, expanded part.
- Ligule - membranous or hairy appendage at the junction of the blade and sheath in the grass leaf.
- Nerve - leaf vein.
- Node - stem, a joint or place where leaves attach to stem.
- Opposite - leaves, two at a node.
- Petiole - leaf stalk.
- Rootstock - underground stem; may be long, slender, jointed and bearing scale-leaves and roots, or may be bulbous or tuberous.
- Sessile - without a stalk.
- Sheathing - wrapping around the stem.
- Stipule - an appendage of the base of a petiole.
- Whorled - leaves, three or more at a node.

Pertaining to flowers or fruits (fr.)

- Achene - fruit; small, dry, hard, not splitting open at maturity.
- Awn - bristle-like appendage.
- Bract - reduced leaf, often scale-like, usually associated with a flower-cluster.
- Bristle - in Scirpus, appendages attached to base of achene.
- Inflorescence - a flower cluster.
- Involucre - a cluster of bracts just below an inflorescence.
- Panicle - inflorescence; a loose, open, branching type.
- Perfect - stamens and pistil in same flower.
- Ray - the branches or pedicels bearing flowers in an umbel (as Scirpus).
- Scale - the dry bracts of a spikelet.
- Spike - inflorescence; flowers sessile, usually crowded, on a single stem.
- Spikelet - a spike-like unit of an inflorescence.
- Umbel - inflorescence; pedicels or rays all originating from one point.

SCIRPUS

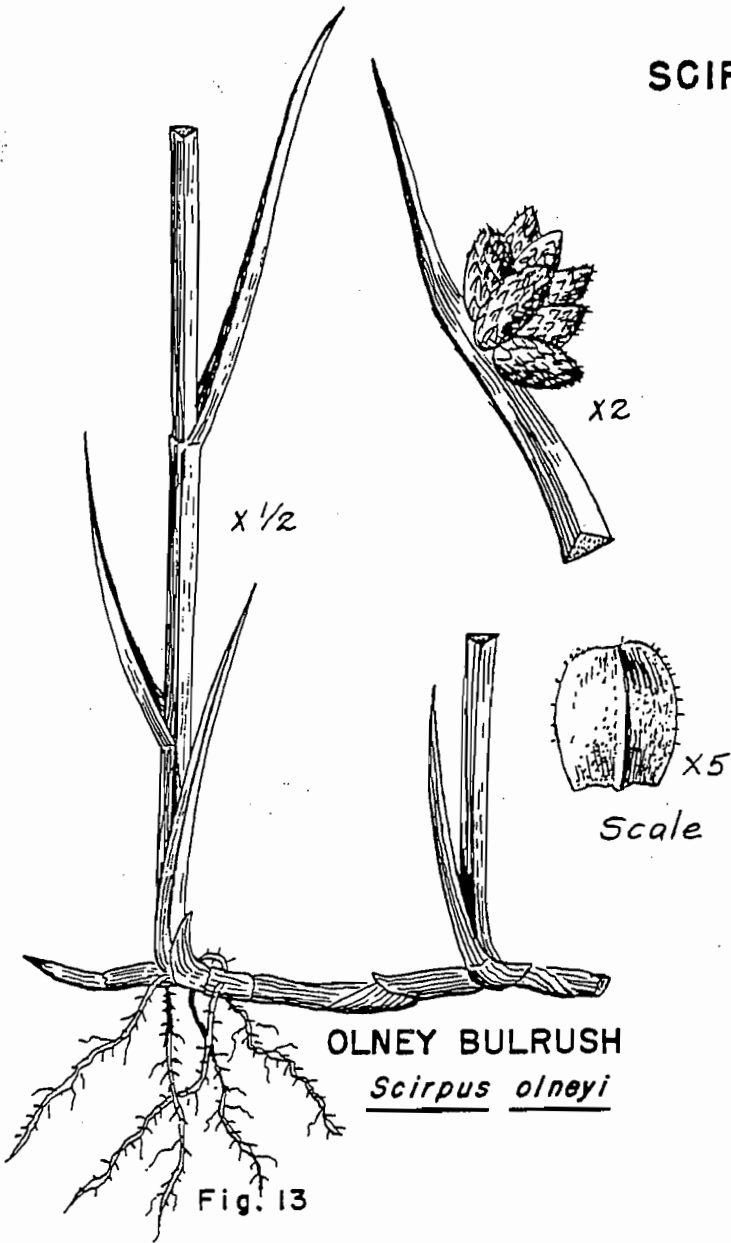


Fig. 13

HARDSTEM BULRUSH
Scirpus acutus

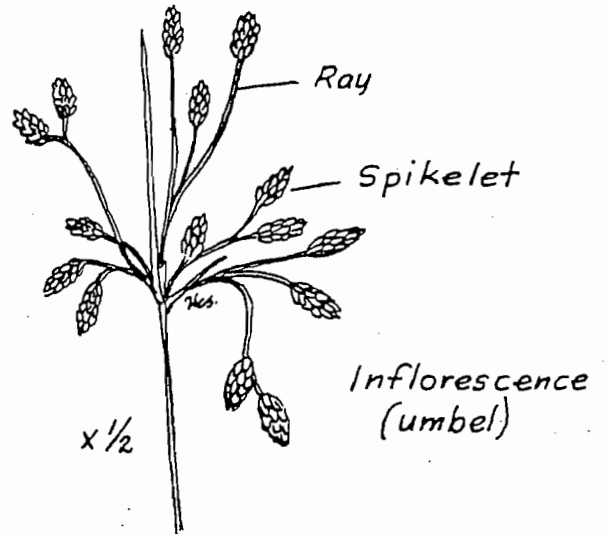


Fig. 14

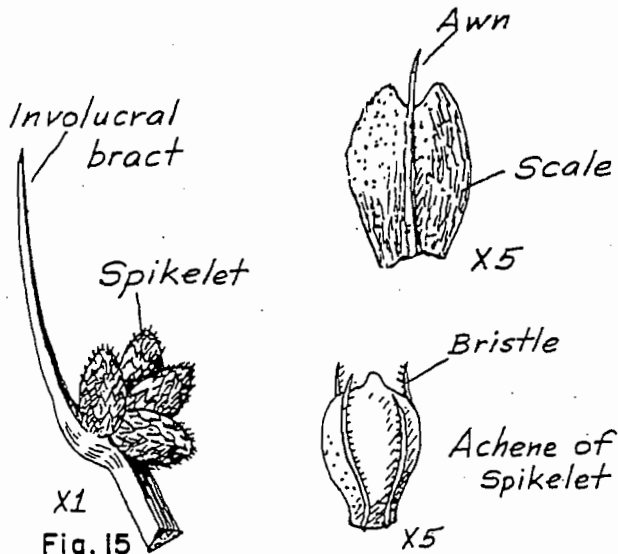


Fig. 15

THREE-SQUARE
Scirpus americanus

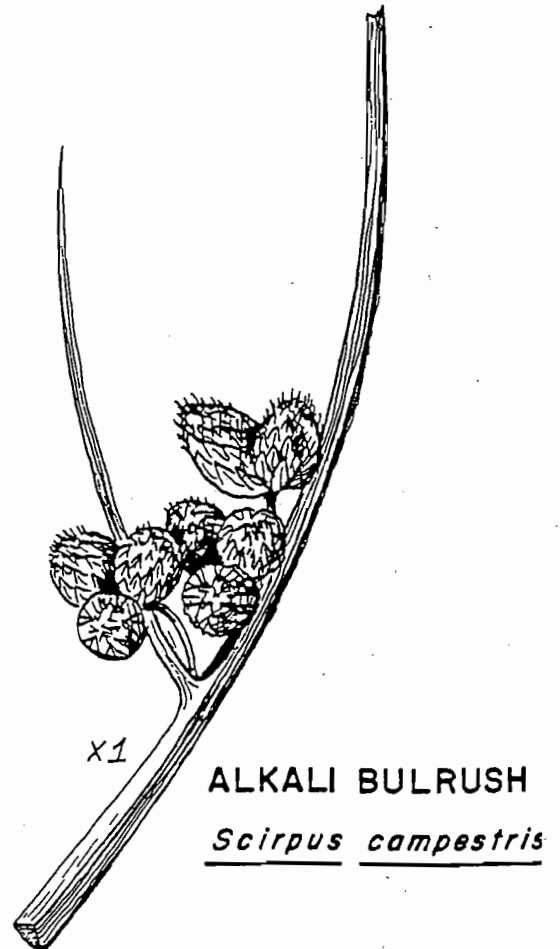
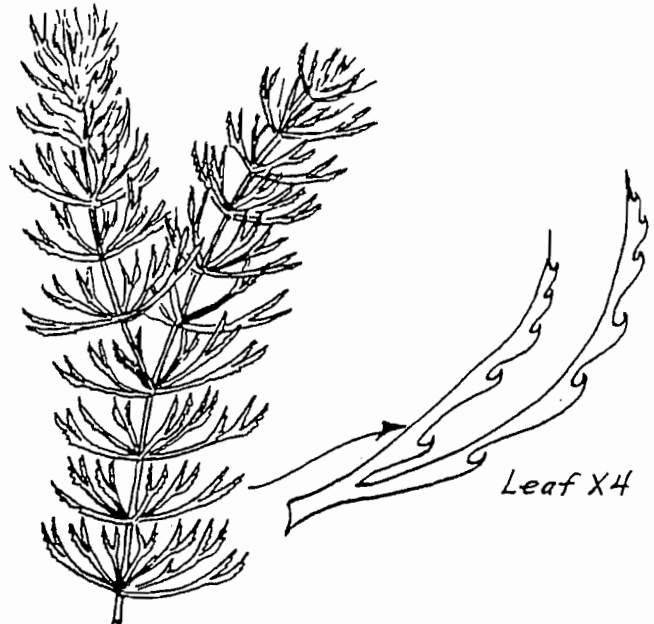


Fig. 16

ALKALI BULRUSH
Scirpus campestris



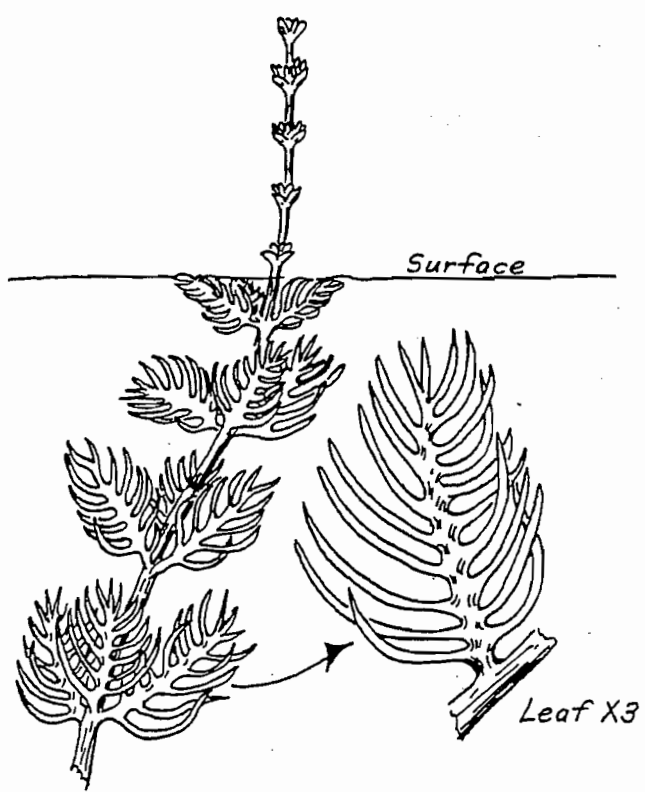
ELODEA - Waterweed
Anacharis densa



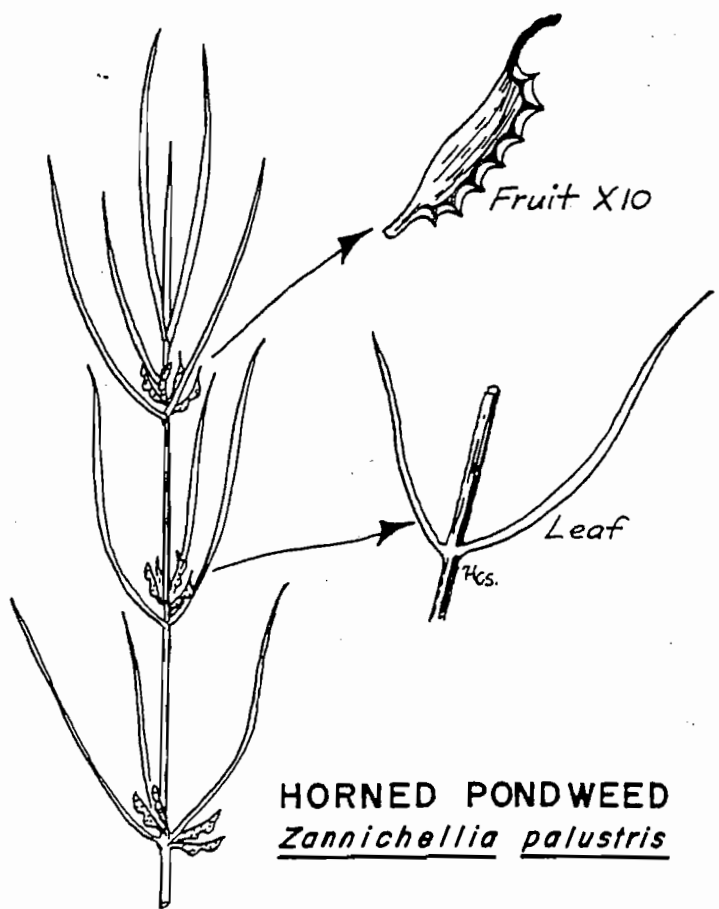
COONTAIL
Ceratophyllum demersum

Fig. 1

Fig. 2



WATER MILFOIL
Myriophyllum exalbescens



HORNED PONDWEED
Zannichellia palustris

Fig. 4

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Aquatic Vegetation Control

Questions are frequently asked of the Department of Fish and Wildlife about chemicals and other methods for control of vegetation in ponds and water courses. The Department is not funded for vegetation control and becomes involved only on its own lands and in other unusual circumstances. Department employees have little experience with the large variety of registered herbicides and their appropriate use.

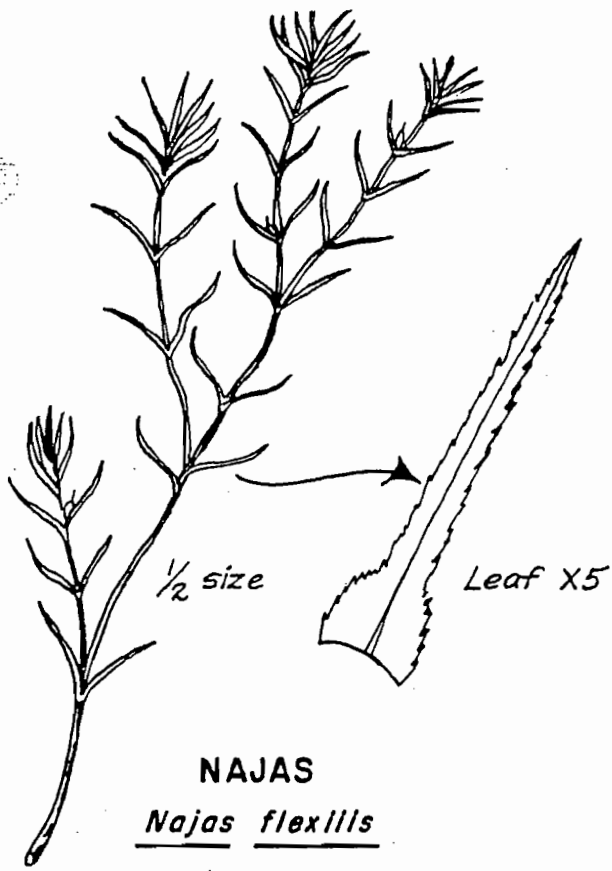
Much better sources of information are available from the public agencies who specialize in such work. The Oregon State University Cooperative Extension Service has considerable research and practical experience in aquatic vegetation control which is readily available through its local extension agents. Some counties have weed control districts whose supervisors may also be able to advise on pond problems. The USDA Soil Conservation Service can advise on design features of new ponds to discourage vegetation.

The SCS has numerous county offices in Oregon.

March 1983

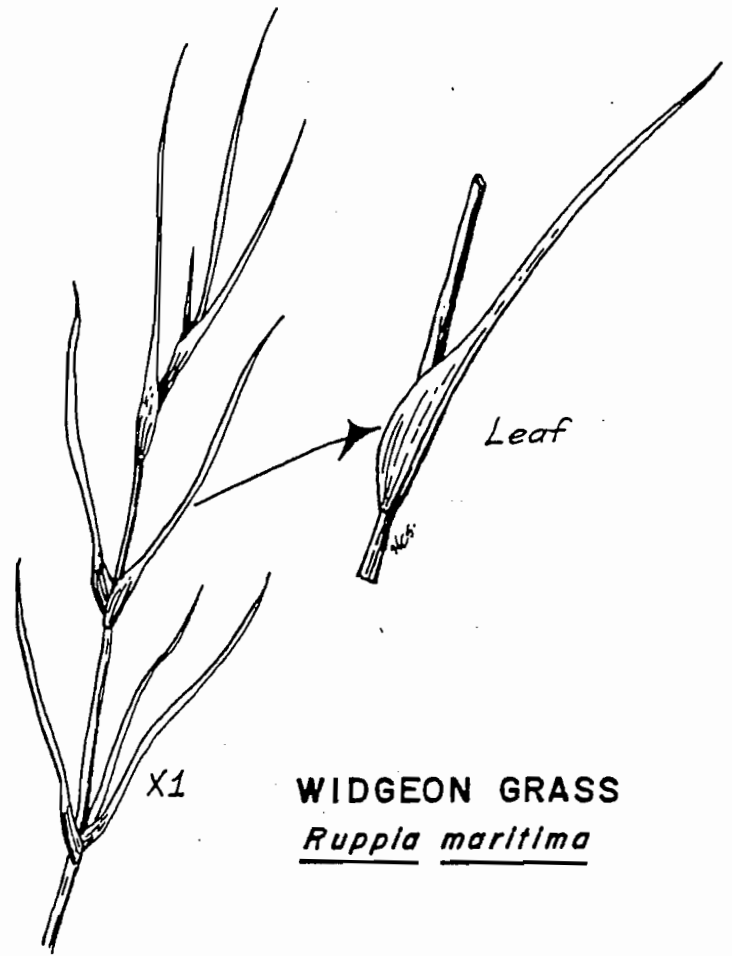
Oregon Department of Fish and Wildlife
P.O. Box ~~3503~~ 59
Portland, OR 97208 97207

*There are no methods other than chemical
for algae control. Remove fish prior to
chemical treatment.*



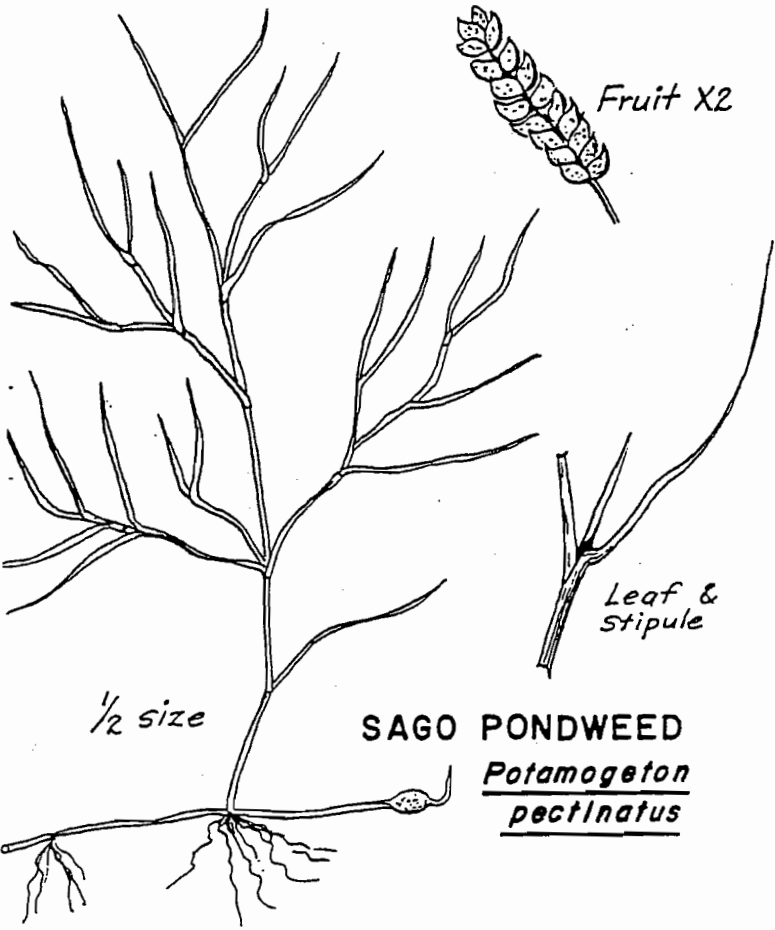
NAJAS
Najas flexilis

Fig.5

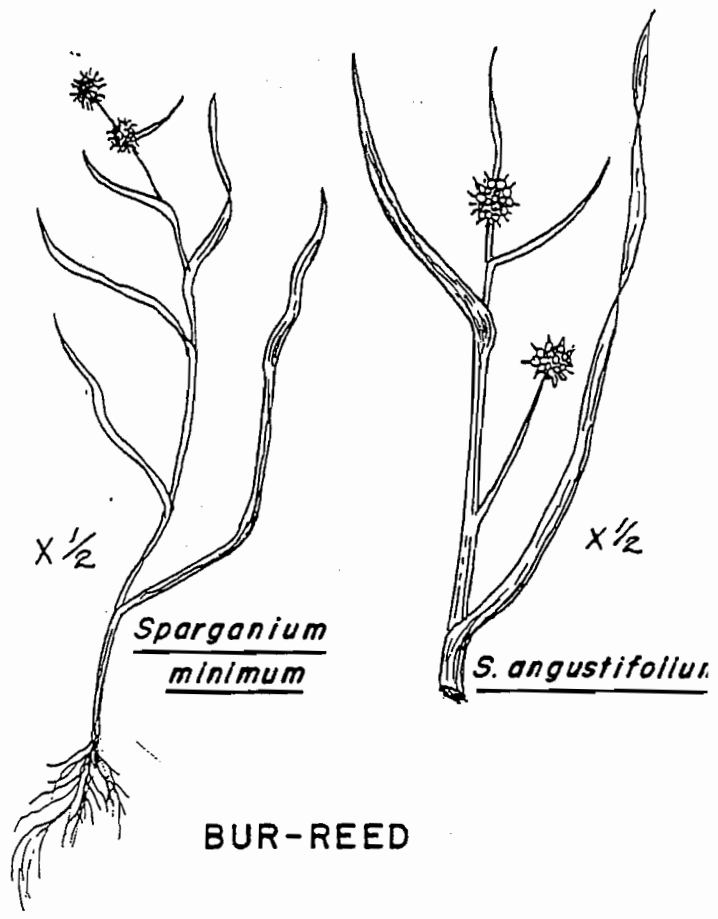


WIDGEON GRASS
Ruppia maritima

Fig.6



SAGO PONDWEED
Potamogeton pectinatus

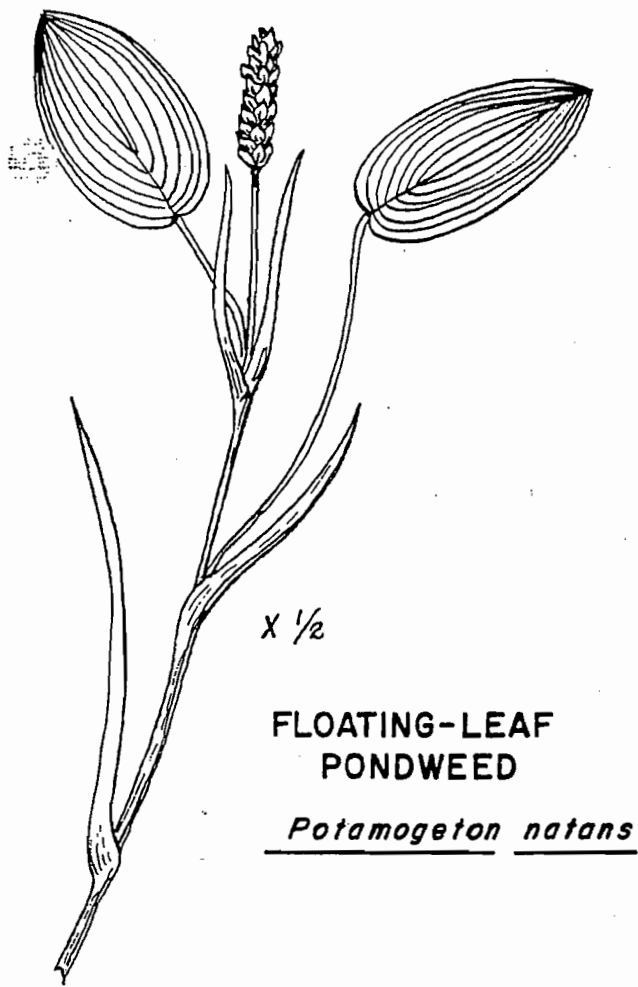


Sparganium minimum

S. angustifolium

BUR-REED

Fig.8

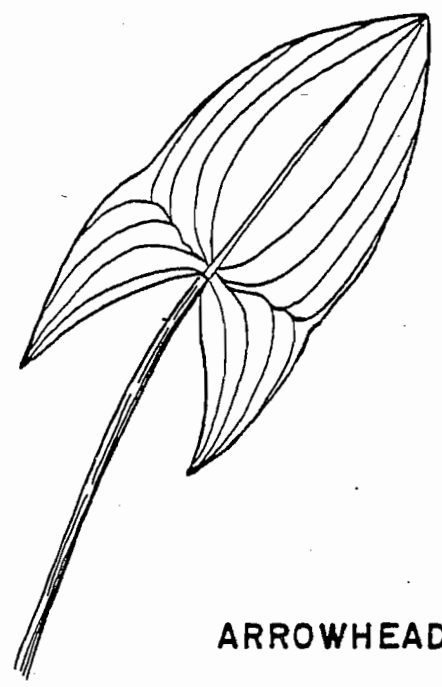


X 1/2

**FLOATING-LEAF
PONDWEED**

Potamogeton natans

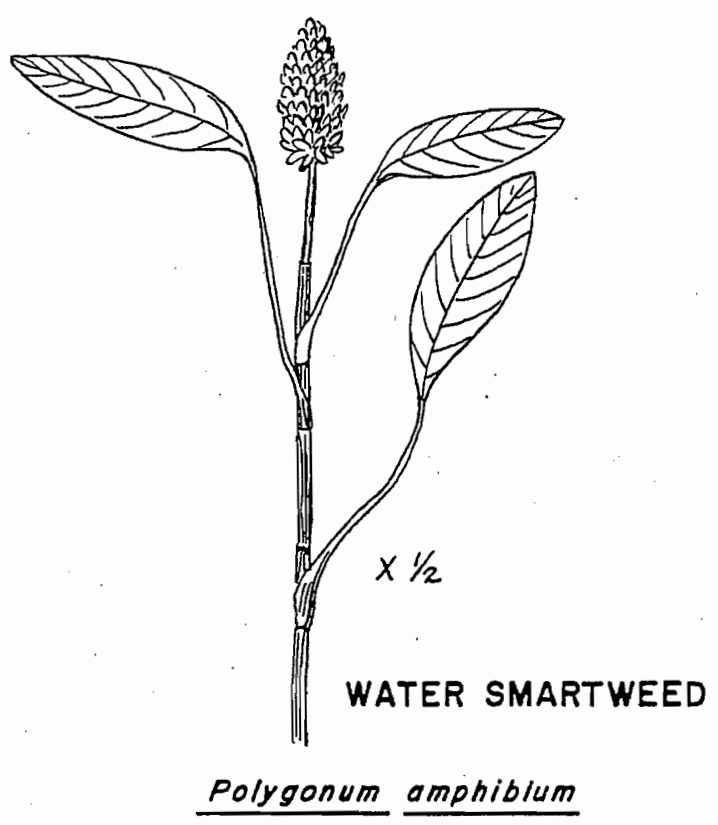
Fig. 9



ARROWHEAD

Sagittaria latifolia

Fig. 10

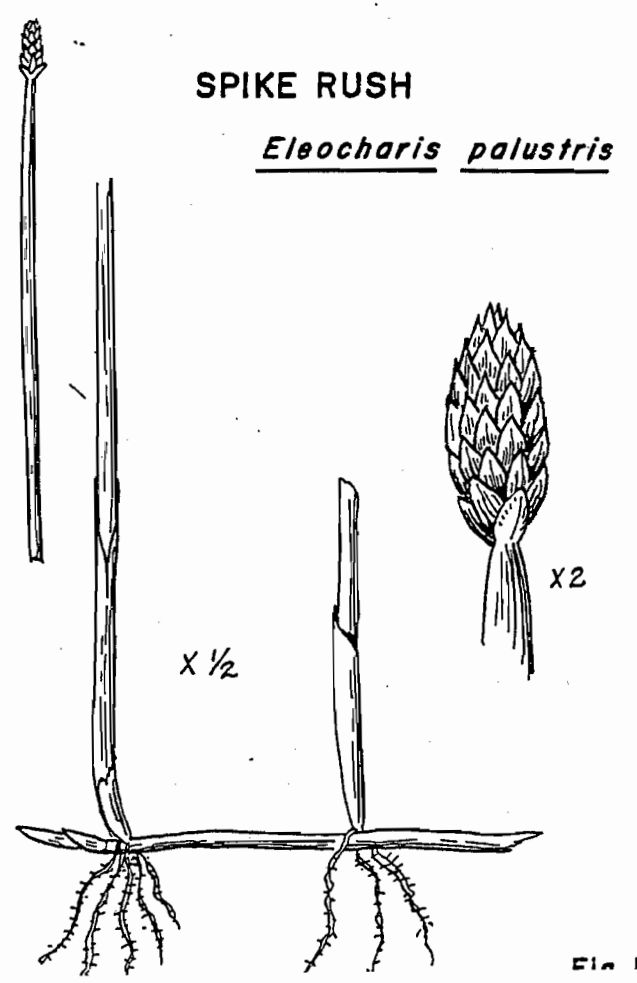


X 1/2

WATER SMARTWEED

Polygonum amphibium

Fig. 11



SPIKE RUSH

Eleocharis palustris

X 1/2

X 2

Fig. 12