



## PLANT SPECIES INFORMATION



Photo: Beth Kunkel

The following table lists plant species included in this guidebook. The table presents generally recognized scientific and common names for each species as well as the current accepted scientific name references and common name references derived from the *Annotated Checklist of the Flora of Minnesota* from the University of Minnesota herbarium (available on the herbarium's Web site at <http://biosci.cbs.umn.edu/herbarium/checklis2.htm>) and from the Integrated Taxonomic Information System (ITIS). The ITIS is a collaborative effort between taxonomists in the United States, Canada and Mexico. The goal of the ITIS is to determine and support the most current taxonomic standing for flora and fauna in North America. Data records have been confirmed online at <http://www.itis.usda.gov>. Note that several names were current as of January 2003.

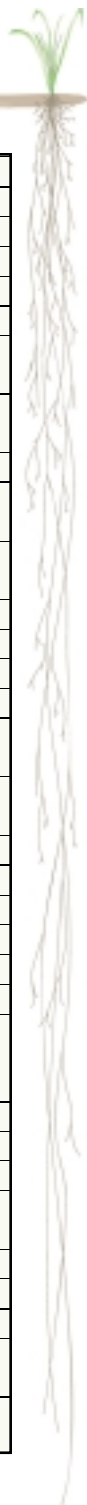
Also included in this section are two pages for each plant species.



<b>Plant Species Included in This Guidebook</b>		
<b>Currently Accepted Scientific Name</b>	<b>Accepted Common Name</b>	<b>Scientific Name Used in This Book</b>
<i>Acer saccharinum</i> L.	Silver maple	
<i>Acorus calamus</i> L.	Sweet flag	
<i>Agastache foeniculum</i> (Pursh) Kuntze	Giant hyssop	
<i>Alisma trivale</i> Pursh	Water plantain	
<i>Allium stellatum</i> Nutt. ex Ker-Gawl	Prairie wild onion	
<i>Alnus incana</i> ssp. <i>rugosa</i> (Du Roi) Clausen	Speckled alder	
<i>Amorpha fruticosa</i> L.	Indigo bush	
<i>Andropogon gerardii</i> Vitman	Big bluestem	
<i>Anemone canadensis</i> L.	Canada anemone	
<i>Angelica atropurpurea</i> L.	Angelica	
<i>Arisaema triphyllum</i> (L.) Schott	Jack-in-the-pulpit	
<i>Artemisia ludoviciana</i> Nutt.	Prairie sage	
<i>Asclepias incarnata</i> L.	Marsh milkweed	
<i>Asclepias tuberosa</i> L.	Butterfly milkweed	
<i>Aster macrophyllus</i> var. <i>macrophyllus</i> L.	Bigleaf aster	
<i>Aster pilosus</i> var. <i>pilosus</i> Willd.	Frost aster	
<i>Aster puniceus</i> var. <i>puniceus</i> L.	Red-stemmed aster	
<i>Athyrium filix-femina</i> ssp. <i>angustum</i> (Willd.) Clausen	Lady fern	
<i>Betula nigra</i> L.	River birch	
<i>Bidens cernua</i> L.	Beggarsticks	
<i>Boltonia asteroides</i> (L.) L'Hér.	Boltonia	
<i>Bromus ciliatus</i> L.	Fringed brome	
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	Canada blue-joint grass	
<i>Caltha palustris</i> L.	Marsh marigold	
<i>Carex aquatilis</i> Wahlenb.	Water sedge	
<i>Carex bebbii</i> Olney ex Fern.	Bebb's sedge	
<i>Carex comosa</i> Boott	Bottlebrush sedge	
<i>Carex crinita</i> Lam.	Caterpillar sedge	
<i>Carex hystericina</i> Muhl. ex Willd.	Porcupine sedge	
<i>Carex lacustris</i> Willd.	Lake sedge	
<i>Carex languinosa</i> Michx.	Wooly sedge	
<i>Carex lasiocarpa</i> Ehrh.	Wooly needle sedge	
<i>Carex retrorsa</i> Schwein.	Retorse sedge	
<i>Carex stipata</i> Muhl. ex Willd.	Awl-fruited sedge	

Currently Accepted Scientific Name	Accepted Common Name	Scientific Names Used in This Book
<i>Carex stricta</i> Lam.	Tussock sedge	
<i>Carex vulpinoidea</i> Michx.	Fox sedge	
<i>Celtis occidentalis</i> L.	Hackberry	
<i>Cephalanthus occidentalis</i> L.	Buttonbush	
<i>Chamerion angustifolium</i> ssp. <i>angustifolium</i> (L.) Holub	Fireweed	<i>Epilobium angustifolium</i> L.
<i>Chelone glabra</i> L.	Turtlehead	
<i>Comarum palustre</i> L.	Marsh cinquefoil	<i>Potentilla palustris</i> L. Scop.
<i>Cornus amomum</i> P. Mill	Silky dogwood	
<i>Cornus racemosa</i> Lam.	Gray dogwood	
<i>Cornus sericea</i> L.	Red-osier dogwood	
<i>Eleocharis obtusa</i> (Willd.) J. A. Schultes	Blunt spikerush	
<i>Elymus virginicus</i> L.	Virginia wild rye	
<i>Equisetum fluviatile</i> L.	Horsetail	
<i>Eryngium yuccifolium</i> Michx.	Rattlesnake master	
<i>Eupatorium maculatum</i> L.	Joe-pye-weed	
<i>Eupatorium perfoliatum</i> L.	Boneset	
<i>Euthamia graminifolia</i> var. <i>graminifolia</i> (L.) Nutt.	Grass-leaved goldenrod	
<i>Fraxinus nigra</i> Marsh.	Black ash	
<i>Fraxinus pennsylvanica</i> Marsh.	Green ash	
<i>Galium boreale</i> L.	Northern bedstraw	
<i>Gentiana andrewsii</i> Griseb.	Bottle gentian	
<i>Glyceria grandis</i> S. Wats.	Giant manna grass	
<i>Glyceria striata</i> (Lam.) A. S. Hitchc.	Fowl manna grass	
<i>Helenium autumnale</i> L.	Sneezeweed	
<i>Helianthus grosseserratus</i> Martens	Sawtooth sunflower	
<i>Heuchera richardsonii</i> R. Br.	Prairie alumroot	
<i>Ilex verticillata</i> (L.) Gray	Winterberry	
<i>Impatiens capensis</i> Meerb.	Jewelweed	
<i>Iris versicolor</i> L.	Blueflag	
<i>Juncus balticus</i> Willd.	Baltic rush	
<i>Juncus effusus</i> L.	Soft rush	
<i>Juncus torreyi</i> Coville	Torrey rush	
<i>Larix laricina</i> (Du Roi) K. Koch	Tamarack	
<i>Leersia oryzoides</i> (L.) Sw.	Rice-cut grass	
<i>Liatris ligulistylis</i> (A. Nels.) K. Schum.	Meadow blazingstar	

<i>Liatris pycnostachya</i> Michx	Prairie blazingstar	
<i>Lilium superbum</i> L.	Turk's-cap lily	<i>Lilium michiganse</i> L.
<i>Lobelia cardinalis</i> L.	Cardinal flower	
<i>Lobelia siphilitica</i> L.	Blue lobelia	
<i>Lysimachia thyrsoflora</i> L.	Tufted loosestrife	
<i>Lythrum salicaria</i> L.	Purple loosestrife	
<i>Maianthemum racemosum</i> ssp. <i>racemosum</i> (L.) Link	False Solomon's seal	<i>Smilacina racemosa</i> L.
<i>Matteuccia struthiopteris</i> (L.) <i>Todar</i>	Ostrich fern	
<i>Monarda fistulosa</i> L.	Wild bergamot	
<i>Oligoneuron riddellii</i> (Frank ex <i>Riddell</i> ) Rydb.	Riddell's goldenrod	<i>Solidago riddellii</i> Frank
<i>Oligoneuron rigidum</i> var. <i>rigidum</i> (L.) Small	Stiff goldenrod	<i>Solidago rigida</i> L.
<i>Onoclea sensibilis</i> L.	Sensitive fern	
<i>Osmunda regalis</i> L.	Royal fern	
<i>Panicum virgatum</i> L.	Switchgrass	
<i>Phalaris arundinacea</i> L.	Reed canary grass	
<i>Photinia melanocarpa</i> (Michx.) <i>Robertson &amp; Phipps</i>	Black chokeberry	
<i>Physocarpus opulifolius</i> (L.) <i>Maxim.</i>	Ninebark	
<i>Physostegia virginiana</i> (L.) <i>Benth.</i>	Obedient plant	
<i>Polygonum amphibium</i> L.	Water smartweed	
<i>Pontederia cordata</i> L.	Pickernelweed	
<i>Populus deltoides</i> Bartr. ex <i>Marsh.</i>	Eastern cottonwood	
<i>Populus tremuloides</i> Michx.	Quaking aspen	
<i>Pteridium aquilinum</i> (L.) <i>Kuhn</i>	Bracken fern	
<i>Pycnanthemum virginianum</i> (L.) <i>T. Dur. &amp; B. D. Jackson</i> ex <i>B. L. Robins. &amp; Fern.</i>	Mountain mint	
<i>Quercus bicolor</i> Willd.	Swamp white oak	
<i>Ratibida pinnata</i> (Vent.) <i>Barnh.</i>	Yellow coneflower	
<i>Rudbeckia subtomentosa</i> Pursh	Brown-eyed Susan	
<i>Sagittaria latifolia</i> Willd.	Broadleaved arrowhead	
<i>Salix discolor</i> Muhl.	Pussy willow	
<i>Salix exigua</i> Nutt.	Sandbar willow	
<i>Salix nigra</i> Marsh.	Black willow	
<i>Sambucus racemosa</i> var. <i>racemosa</i> L.	Red-berried elder	<i>Sambucus pubens</i> L.
<i>Schizachyrium scoparium</i> (Michx.) <i>Nash</i>	Little bluestem	



Currently Accepted Scientific Name	Accepted Common Name	Scientific Names Used in This Book
<i>Schoenoplectus acutus</i> var. <i>acutus</i> (Muhl. ex Bigelow) A. & D. Löve	Hardstem bulrush	<i>Scirpus acutus</i> Muhl.
<i>Schoenoplectus fluviatilis</i> (Torr.) M. T. Strong	River bulrush	<i>Scirpus fluviatilis</i> (Torrey) Gray
<i>Schoenoplectus pungens</i> var. <i>pungens</i> (Vahl) Palla	Three-square bulrush	<i>Scirpus pungens</i> Vahl.
<i>Schoenoplectus tabernaemontani</i> (K.C. Gmel.) Palla	Soft-stem bulrush	<i>Scirpus validus</i> Vahl.
<i>Scirpus atrovirens</i> Willd.	Green bulrush	<i>Scirpus atrovirens</i> Willd.
<i>Scirpus cyperinus</i> (L.) Kunth	Woolgrass	
<i>Scutellaria lateriflora</i> L.	Mad-dog skullcap	
<i>Silphium perfoliatum</i> L.	Cup plant	
<i>Solidago flexicaulis</i> L.	Zig-zag goldenrod	
<i>Sorghastrum nutans</i> (L.) Nash	Indian grass	
<i>Sparganium eurycarpum</i> Engelm. ex Gray	Giant burreed	
<i>Spartina pectinata</i> Bosc ex Link	Prairie cord grass	
<i>Spiraea alba</i> Du Roi	Meadowsweet	
<i>Symphotrichum laeve</i> var. <i>laeve</i> (L.) A. & D. Löve	Smooth aster	<i>Aster laevis</i> var. <i>laevis</i>
<i>Symphotrichum lanceolatus</i> var. <i>lanceolatum</i> (Willd.) Nesom	Panicle aster	<i>Aster lanceolatus</i> ( <i>simplex</i> ) willd.
<i>Symphotrichum novae-angliae</i> (L.) Nesom	New England aster	<i>Aster novae-angliae</i> L.
<i>Symphotrichum puniceum</i> var. <i>puniceum</i> (L.) A. & D. Löve	Swamp aster	<i>Aster lucidulus</i> (Gray)(Wieg.)
<i>Symplocarpus foetidus</i> (L.) Salisb. ex Nutt.	Skunk cabbage	
<i>Thalictrum dasycarpum</i> Fisch. & Avé-Lall.	Tall meadowrue	
<i>Tradescantia ohiensis</i> Raf.	Ohio spiderwort	
<i>Typha latifolia</i> L.	Broadleaved cattail	
<i>Typha x glauca</i> Godr. (pro sp.)	Hybrid cattail	
<i>Verbena hastata</i> L.	Blue vervain	
<i>Vernonia fasciculata</i> Michx.	Ironweed	
<i>Veronicastrum virginicum</i> (L.) Farw.	Culver's root	
<i>Viburnum lentago</i> L.	Nannyberry	
<i>Viburnum opulus</i> var. <i>americanus</i> Ait.	High bush cranberry	<i>Viburnum trilobum</i> L.
<i>Zizia aurea</i> (L.) W. D. J. Koch	Golden alexanders	

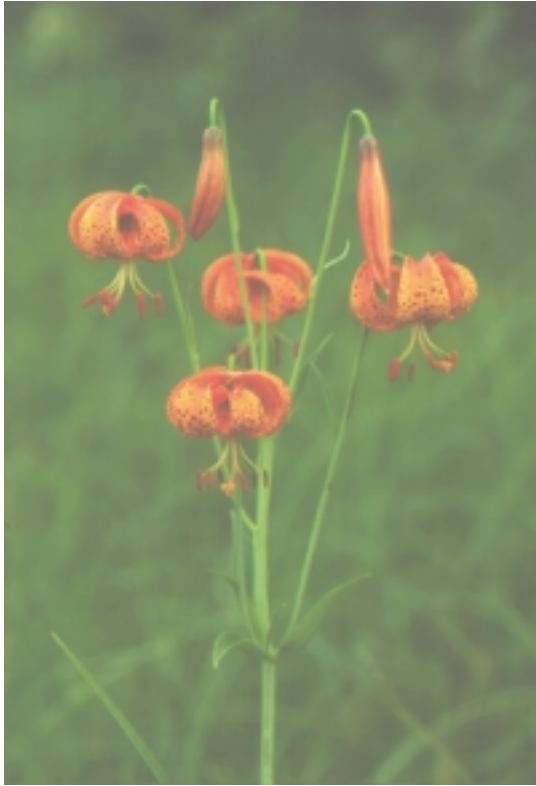
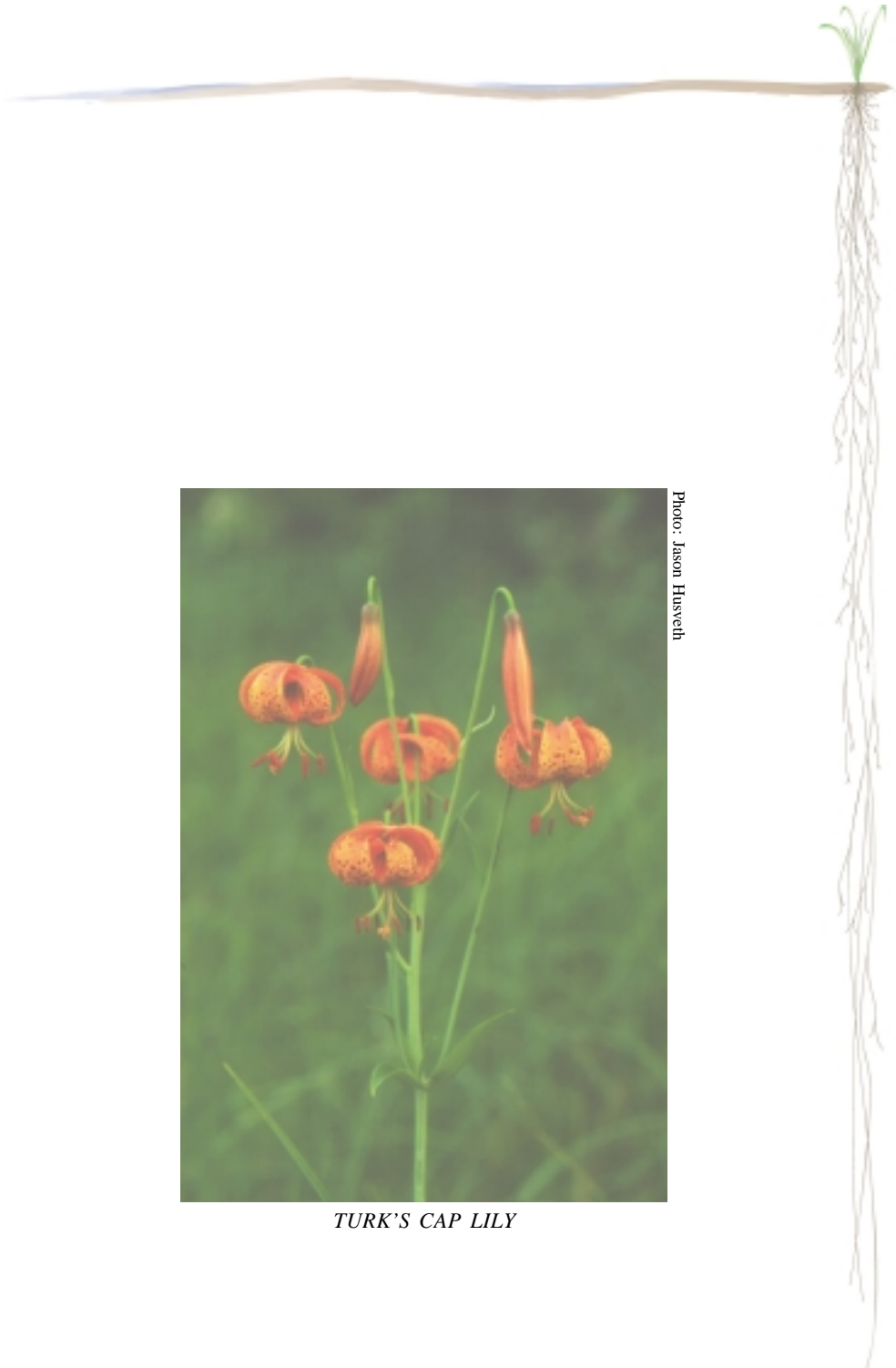


Photo: Jason Husveth

*TURK'S CAP LILY*



## Plant Matrix

This plant matrix summarizes information for plant species covered in the guidebook. Pages for individual species should be referred to for more detailed information. Within the matrix **Water Level** indicates the ideal moisture condition for the species. **Frequency** refers to the frequency of water fluctuation (frequency of inundation) that the species can handle without significant stress.

**Depth** refers to the depth of inundation that the species can handle for the time period listed under **Duration**.

**Design** refers to the type of BMP or other type of plating the species is suited to. The **Nursery** category provides information about the general availability of the plant species.

<sup>1</sup> **Water Level** is the water level of each plant as described in the Normal Water Level section: D = Dry soils, I = Inundation, M = Moist/mesic soils and S = Saturated soils.

<sup>2</sup> **Frequency** is the tolerance to frequency for each plant as described in the Fluctuation Tolerance section: H = High tolerance, L = Low tolerance and M = Moderate tolerance.

<sup>3</sup> **Depth** is the tolerance to depth in inches for each plant as described in the Fluctuation Tolerance section.

<sup>4</sup> **Duration** is the tolerance to duration for each plant as described in the Fluctuation Tolerance section followed by the number of days: H = High, ML = Medium Long, MS = Medium Short, S = Short.

<sup>5</sup> **Design Potentials** is the possibilities for this plant in designed landscapes as described in the Design Consideration section: A = Aromatic, BF = Butterfly/Nectar Source, CF = Cut/Dried Flowers, E = Erosion-control Plant, FC = Fall Color, GC = Ground Cover, GP = Garden Perennial, L = Landscape Design, NR = Use Not Recommended because this species is invasive, R = Restoration, RG = Rainwater Gardens, RO = Rock Garden, S = Shade, SW = Vegetated Swales, UB = Upland Buffer, W = Wave Buffer, WL = Wildlife.

<sup>6</sup> **Nursery** is the availability of the plant at nurseries with three categories of availability: L = Limited availability, NA = Not Available and

<sup>8</sup> W = Widely available.

Scientific Name	Common Name	Water Level <sup>1</sup> (in inches)	Frequency <sup>2</sup>	Depth <sup>3</sup> (in inches)	Duration <sup>4</sup>	Design Potentials <sup>5</sup>	Nursery <sup>6</sup>
<i>Acer saccharinum</i>	Silver maple	S	Mod	60	L 20	L, R, S	W
<i>Acorus calamus</i>	Sweet flag	S-I (6-20)	Low	12	MS 3	E, R, RG, SW, W, WL	W
<i>Agastache foeniculum</i>	Giant hyssop	M-D	Mod	12	S 2	A, CF, GP, RG, UB	W
<i>Alisma trivale</i>	Water plantain	M-I (6)	High	18	L 6	E, R, RP, SW, WL	W
<i>Allium stellatum</i>	Prairie wild onion	M-D	Mod	12	S 1	A, GP, RG, UB	W
<i>Alnus incana</i>	Speckled alder	M-S (6)	High	24	L 6	E, L, R, RP	L
<i>Amorpha fruticosa</i>	Indigo bush	M-D	High	18	MS 3	E, GP, L, R, RG	W
<i>Andropogon gerardii</i>	Big bluestem	M	Mod	12	S 2	E, FC, GP, L, R, UB	W
<i>Anemone canadensis</i>	Canada anemone	M-S	High	12	S 2	R, RG, RO, SW	W
<i>Angelica atropurpurea</i>	Angelica	S-I (3)	Mod-Low	18	MS 3	A, R	L
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	M-S	Mod	12	S 1	L, R, S	L
<i>Aronia melanocarpa</i>	Black chokeberry	M-S	Mod	12	S 2	FC, L, RG	W
<i>Artemisia ludoviciana</i>	Prairie sage	M-D	Mod	18	MS 3	A, GC, L, R, UB	W
<i>Asclepias incarnata</i>	Marsh milkweed	M-I (3)	Mod	18	MS 3	A, BF, L, R, RG, RP, SW, UB	W
<i>Asclepias tuberosa</i>	Butterfly milkweed	M-D	Low	12	S 1	BF, GP, L, R, RG, UB	W
<i>Aster laevis</i>	Smooth aster	M-D	High	12	S 1	BF, CF, R, RG, SW, UB	W
<i>Aster lanceolatus (simplex)</i>	Panicl aster	M-S	Mod	24	ML 4	BF, CF, R, RG, SW, UB	W
<i>Aster lucidulus</i>	Swamp aster	M-S	High	18	L 5	BF, CF, E, R, SW	L
<i>Aster macrophyllus</i>	Bigleaf aster	M-D	Low	12	S 1	GC, R, S, UB	L
<i>Aster novae-angliae</i>	New England aster	M-S	Mod	24	MS 3	BF, CF, GP, R, SW, UB	W
<i>Aster pilosus</i>	Frost aster	M-S	High	12	S 2	BF, CF, R, SW, UB	L
<i>Aster puniceus</i>	Red-stemmed aster	M-S	Mod	18	L 5	BF, R, RP	L
<i>Athyrium filix-femina</i>	Lady fern	M-S	Low	12	S 2	GC, GP, L, RG, S, UB	W
<i>Betula nigra</i>	River birch	M-S	High	60	L 5	E, L, RG, R, WL	W
<i>Bidens cernua</i>	Beggarsticks	M	High	24	ML 4	E, R, SW	L
<i>Boltonia asteroides</i>	Boltonia	M-S	Mod	18	MS 3	BF, CF, GP	L
<i>Bromus ciliatus</i>	Fringed brome	M-S	Mod	18	MS 3	CF, L, S	W
<i>Calamagrostis canadensis</i>	Canada blue-joint grass	M-I (6)	High	6	ML 4	E, L, R, SW, WL	W



Scientific Name	Common Name	Water Level <sup>1</sup> (in inches)	Frequency <sup>2</sup>	Depth <sup>3</sup> (in inches)	Duration <sup>4</sup>	Design Potentials <sup>5</sup>	Nursery <sup>6</sup>
<i>Caltha palustris</i>	Marsh marigold	S-I (6)	Mod	6	MS 3	R	W
<i>Carex aquatilis</i>	Water sedge	S-I (6)	High	12	MS 3	E, R, RG, S, SW	L
<i>Carex bebbii</i>	Bebb's sedge	M-S	High	12	MS 3	L, R, RG, RP	W
<i>Carex comosa</i>	Bottlebrush sedge	S-I (12)	High	36	MS 3	E, L, R, RG	W
<i>Carex crinita</i>	Caterpillar sedge	S-I (6)	High	12	MS 3	E, L, R, RG, S	L
<i>Carex hystericina</i>	Porcupine sedge	S-I (6)	High	36	MS 3	E, L, R, RG	L
<i>Carex lacustris</i>	Lake sedge	S-I (24)	Mod	24	L 8	R	W
<i>Carex languinosa</i>	Wooly sedge	M-I (3-6)	High	12	L 6	E, R, SW	L
<i>Carex lasiocarpa</i>	Wooly needle sedge	S-I (6)	Mod	12	MS 3	R	L
<i>Carex retrorsa</i>	Retorse sedge	S-I (6)	Mod	12	MS 3	R	L
<i>Carex stipata</i>	Awl-fruited sedge	M-I (6)	High	6	ML 4	E, R, S, SW	W
<i>Carex stricta</i>	Tussock sedge	S-I (6)	High	12	MS 3	L, R, RG, SW	W
<i>Carex vulpinoidea</i>	Fox sedge	S-I (6)	High	24	ML 4	E, L, R, RG, SW	W
<i>Celtis occidentalis</i>	Hackberry	M-D	Mod	60	L 5	E, L, R	W
<i>Cephalanthus occidentalis</i>	Buttonbush	S-I (36)	Mod	24	L 45+	E, L, R	W
<i>Chelone glabra</i>	Turtlehead	S-I (3)	Mod	9	S 2	BF, CD, L, R, RG	W
<i>Cornus amomum</i>	Silky dogwood	M-S	Low	36	L 30+	E, L, R, RG, WL	W
<i>Cornus racemosa</i>	Gray dogwood	D-S	Mod	6	S 2	E, R	W
<i>Cornus sericea</i>	Red-osier dogwood	M-S	Mod	36	L 30+	E, L, R, RG, WL	W
<i>Eleocharis obtusa</i>	Blunt spikerush	S-I (6)	High	18	L 30	E, R, SW	W
<i>Elymus virginicus</i>	Virginia wild rye	M-S	Mod	36	L 15	E, L, R, SW, WL	W
<i>Epilobium angustifolium</i>	Fireweed	M-S	Mod	12	S 2	E, WL	L
<i>Equisetum fluviatile</i>	Horsetail	S-I (36)	High	24	L 10	R, WL	L
<i>Eryngium yuccifolium</i>	Rattlesnake master	M-D	Mod	12	S 2	BF, CF, L, RG	W
<i>Eupatorium maculatum</i>	Joe-pye-weed	M-S	High	24	ML 3.5	BF, CF, E, GP, R, RG, SW	W
<i>Eupatorium perfoliatum</i>	Boneset	M-S	High	24	ML 3.5	E, GC, L, R, RG, SW	W

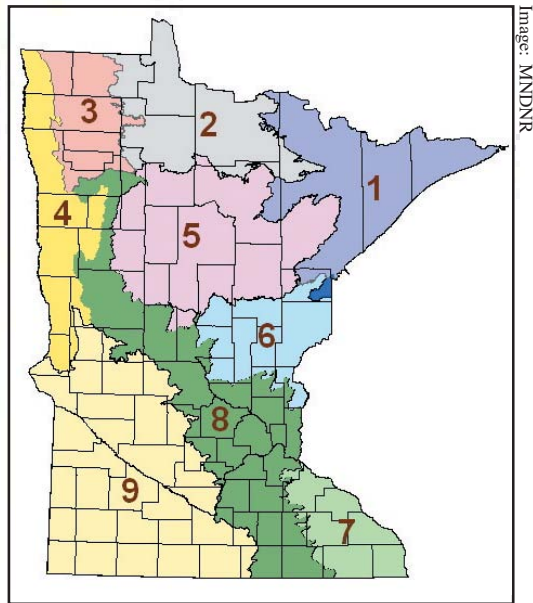
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	M-S	Mod	12	S 2	E, R, RG, SW	L
<i>Fraxinus nigra</i>	Black ash	M-S	High	60	L 5	R	W
<i>Fraxinus pennsylvanica</i>	Green ash	M-S	High	60/24	L 10/ML 4	E, R, S	W
<i>Galium boreale</i>	Northern bedstraw	M-S	Mod	12	S 1	CF, GC, L, RO	L
<i>Gentiana andrewsii</i>	Bottle gentian	M-S	Mod	12	S 1	CF, GP, L, R, RG, RO, SW	W
<i>Glyceria grandis</i>	Giant manna grass	S-I (12)	High	24	L 8	R, SW, WL	W
<i>Glyceria striata</i>	Fowl manna grass	M-I (6)	High	24	L 8	R, SW, WL	W
<i>Helenium autumnale</i>	Sneezeweed	M-S	Mod	18	MS 3	CF, E, L, R, SW	W
<i>Helianthus grosseserratus</i>	Sawtooth sunflower	M-S	High	18	MS 3	E, R, SW	W
<i>Heuchera richardsonii</i>	Prairie alumroot	M-D	High	6	S 1	RP, L, RG, RO	W
<i>Ilex verticillata</i>	Winterberry	M-S	Mod	18	MS 3	L, R, RG	W
<i>Impatiens capensis</i>	Jewelweed	S	High	18	L 30	R, WL	W
<i>Iris versicolor</i>	Blueflag iris	S-I (12)	Mod	12	ML 4	CF, E, L, R, RG, SW	W
<i>Juncus balticus</i>	Baltic rush	S-I (6)	High	24	L 10	E, R, SW, WL	L
<i>Juncus effusus</i>	Soft rush	S-I (12)	Mod	18	ML 4	L, R, RG, SW	W
<i>Juncus torreyi</i>	Torrey rush	M-I (3-6)	Mod	18	L 6	CF, E, L, R, SW	W
<i>Larix laricina</i>	Tamarack	M-S	Low	12	L 5	L, R, RG	W
<i>Leersia oryzoides</i>	Rice-cut grass	S-I (6)	High	30	L 6	E, R, SW, WL	W
<i>Liatris ligulistylis</i>	Meadow blazingstar	M-S	Low	12	S 1	BF, CF, GP, L, RG	W
<i>Liatris pycnostachya</i>	Prairie blazingstar	M-S	Low	18	MS 3	BF, CF, GP, L, R, RG	W
<i>Lilium superbum</i>	Turk's-cap lily	M-S	Low	12	S 2	BF, R	L
<i>Lobelia cardinalis</i>	Cardinal flower	M-S	High	18	L 5	CF, E, L, RG	W
<i>Lobelia siphilitica</i>	Blue lobelia	M-S	High	18	L 5	CF, GP, L, R, RG, WL	W
<i>Lysimachia thyrsoiflora</i>	Tufted loosestrife	I (3)	Mod	12	ML 4	R	L
<i>Lythrum salicaria</i>	Purple loosestrife	S-I (6)	High	36	L 10	NR	NA
<i>Matteuccia struthiopteris</i>	Ostrich fern	M-S	Mod	12	S 1	L, R, S	W
<i>Monarda fistulosa</i>	Wild bergamot	M-D	Mod	12	S 2	A, CF, E, L, R, UB, WL	W
<i>Onclea sensibilis</i>	Sensitive fern	S-I (3)	High	12	ML 4	CF, GC, L, R, RG, S	W

Scientific Name	Common Name	Water Level <sup>1</sup> (in inches)	Frequency <sup>2</sup>	Depth <sup>3</sup> (in inches)	Duration <sup>4</sup>	Design Potentials <sup>5</sup>	Nursery <sup>6</sup>
<i>Osmunda regalis</i>	Royal fern	S-I (3)	High	12	ML 4	GC, L, RG, S	W
<i>Panicum virgatum</i>	Switchgrass	M	High	18	MS 3	CF, E, L, WL	W
<i>Phalaris arundinacea</i>	Reed canary grass	S-I (12)	High	24	L 8	NR	L
<i>Physocarpus opulifolius</i>	Ninebark	D-S	Mod	18	MS 3	L, R	W
<i>Physostegia virginiana</i>	Obedient plant	S-I (3)	Mod	12	S 2	CF, GP, L, RG	W
<i>Polygonum amphibium</i>	Water smartweed	S-I (36)	High	12	S 2	E, R, W, WL	W
<i>Pontederia cordata</i>	Pickernelweed	I (12-18)	Mod	12	ML 4	L, R, RG, WL	W
<i>Populus deltoides</i>	Eastern cottonwood	M-S	High	60	L 30	L, R, S	W
<i>Populus tremuloides</i>	Quaking aspen	M-D	Low	18	MS 3	R, WL	W
<i>Potentilla palustris</i>	Marsh cinquefoil	S-I (6)	Low	12	S 2	R	NA
<i>Pteridium aquilinum</i>	Bracken fern	M-D	Mod	12	S 1	NR	NA
<i>Pycnanthemum virginianum</i>	Mountain mint	M-S	Mod	12	S 2	A, CF, E, GP, L, R, SW	W
<i>Quercus bicolor</i>	Swamp white oak	M-S	Mod	60	L 15	E, L, R, RG, UB	W
<i>Ratibida pinnata</i>	Yellow coneflower	M-D	Mod	12	S 1	CF, E, L, SW, UB	W
<i>Rudbeckia subtomentosa</i>	Brown-eyed-Susan	M	High	18	MS 3	BF, CF, L, R, RG, SW	W
<i>Sagittaria latifolia</i>	Broadleaved arrowhead	S-I (24)	Mod	18	MS 3	E, R, RP, W, WL	W
<i>Salix discolor</i>	Pussy willow	S-I (6)	Mod	24	L 6	CF, L, R	L
<i>Salix exigua</i>	Sandbar willow	S-I (6)	High	36	L 30+	E, R	W
<i>Salix nigra</i>	Black willow	S	High	60/24	L 10/ML 4	BF, E, R, SW	W
<i>Sambucus racemosa</i>	Red-berried elder	M	Mod	18	MS-3	E, R, S	W
<i>Schizachyrium scoparium</i>	Little bluestem	M-D	Low	12	S 1	E, FC, RG, UB, WL	W
<i>Scirpus acutus</i>	Hardstem bulrush	I (60)	High	24	ML 4	E, L, R, SW, W, WL	W
<i>Scirpus atrovirens</i>	Green bulrush	S-I (30)	High	30	MS 3	CF, E, R, SW	W
<i>Scirpus cyperinus</i>	Woolgrass	S-I (3)	High	18	L 5	E, L, R	W
<i>Scirpus fluviatilis</i>	River bulrush	S-I (30)	High	30	MS 3	E, R, SW, WL	W
<i>Scirpus pungens</i>	Three-square bulrush	S-I (30)	High	18	ML 4	E, R, SW, WL	W
<i>Scirpus validus</i>	Soft-stem bulrush	I (12-48)	High	24	L 42+	E, R, SW, W, WL	W

<i>Scutellaria lateriflora</i>	Mad-dog skullcap	S	Mod	24	MS 3.5	L, R, RG	L
<i>Silphium laciniatum</i>	Compass plant	M-S	Low	12	S 1	BF, E, R, RG	L
<i>Silphium perfoliatum</i>	Cup plant	M-S	Mod	18	MS 3	BF, E, R, RG, SW, UB, WL	W
<i>Smilacina racemosa</i>	False Solomon's seal	M	Low	12	S 1	CF, E, R, S, UB	W
<i>Solidago flexicaulis</i>	Zig-zag goldenrod	M-D	Low	12	S 1	R, RG, S, UB	W
<i>Solidago riddellii</i>	Riddell's goldenrod	M-S	Mod	12	S 2	BF, CF, L, R, WL	W
<i>Solidago rigida</i>	Stiff goldenrod	M-D	Low – Mod	12	S 2	BF, CF, E, R, RG, UB	W
<i>Sorghastrum nutans</i>	Indian grass	M-S	Mod	12	S 1	BF, E, L, R, RG, SW	W
<i>Sparganium eurycarpum</i>	Giant burreed	S-I (18)	High	12	S 2	E, R, W, WL	W
<i>Spartina pectinata</i>	Prairie cord grass	S-I (3)	High	24	ML 4	E, R, SW	W
<i>Spiraea alba</i>	Meadowsweet	S-I (3)	Mod	18	L 5	BF, L, R	W
<i>Symplocarpus foetidus</i>	Skunk cabbage	S	Mod	12	MS 3	R, S, WL	L
<i>Thalictrum dasycarpum</i>	Tall meadowrue	M-S	Mod	18	MS 3	L, R, S, UB	W
<i>Tradescantia ohiensis</i>	Ohio spiderwort	S-D	Low	12	S 2	BF, CF, E, GP, L, R, RG, UB	W
<i>Typha latifolia</i>	Broad-leaved cattail	S-I (18)	High	24	L 42	CF, E, WL	L
<i>Typha x glauca</i>	Hybrid cattail	S-I (24)	High	12	L 6	CF, E, WL	NA
<i>Verbena hastata</i>	Blue vervain	M-S	High	12	ML 4	BF, CF, E, RG, SW	W
<i>Veronica fasciculata</i>	Ironweed	M-S	Mod	18	ML 4	BF, CF, E, L, RG, W	W
<i>Veronicastrum virginicum</i>	Culver's root	M-S	Mod	18	MS 3	BF, CF, GP, L, R, RG, SW, UB	W
<i>Viburnum lentago</i>	Nannyberry	M-S	Mod	18	MS 3	E, L, R, UB, WL	W
<i>Viburnum trilobum</i>	High bush cranberry	M-S	High	18	MS 3	E, FC, L, R, UB, WL	W
<i>Zizia aurea</i>	Golden alexanders	M-S	High	12	S 1	BF, CF, E, L, R, SW	W

The following section provides detailed information for 131 plant species that are well suited to stormwater management practices (MPs). This information is intended to help designers narrow their species lists down to plants that are adapted to specific site conditions. Both wetland and upland species are included to cover a wide range of possible hydrologic conditions and to enhance the appearance and performance of upland areas adjacent to stormwater MPs. Information provided for each species includes:

- Habitat/Plant
- Community and Geographic Range
- Description
- Normal Water Level
- Flooding/Fluctuation Tolerance
- Sensitivities or Other Tolerances
- Design Considerations
- Wildlife Use
- Nursery/Plant Information
- Planting Techniques
- Additional Notes
- Indicator Status



*ECOLOGICAL CLASSIFICATION MAP*

The eco-region where each plant species is typically found in Minnesota is provided as part of the Geographic Range information. Eco-regions have been developed as part of the Minnesota Department of Natural Resources’ Ecological Classification System, or ECS (see at <http://www.dnr.state.mn.us>), by integrating climate, geological, hydrologic, topographic, soil and vegetation data for the state.

Flood tolerance charts are provided for each species. The charts were developed through a combination of available research, observations by the authors and review by professionals throughout the region. These

charts are intended to help designers select species that will be well adapted to the hydrologic conditions of their projects. The charts show the number of days the species can tolerate submersion at a specific water level in the middle of the growing season before experiencing “significant stress,” or the point where it begins to die. Water level is represented on the x-axis of the chart, and the y-axis represents the duration of inundation in one-half-day increments. The green line on the chart represents tolerances for adult plants, while the blue line represents the normal water level for the species. If the species is normally found in saturated-to-dry soils, no blue line is represented on the charts.

The native range of plants within the Twin Cities metropolitan area is 300 miles east and west and 200 miles north and south of the center of the Twin Cities metro area. This range also represents the area where the majority of plant information was collected for this guide.



Image: Jackie Newman



## **Botanical Name**

**Common Name** - a.k.a. – alternative names commonly recognized for this species

### **Habitat/Plant Community and Geographic Range**

The habitat/plant community and geographic range for each species is given in this section. Eco-Region numbers represent the Minnesota Department of Natural Resource ecological regions in Minnesota where the species is commonly found. Abbreviations used for compass directions are: c.-central; e.-east, eastern; n.-north, northern; nc.-north-central; ne.-northeast, northeastern; s.-south, southern; se.-southeast, southeastern; sw.-southwest, southwestern; w.-west, western.

Abbreviations used for geographic locations are: Ala.-Alabama, Alta.-Alberta, Amer.-America, Ariz.-Arizona, Ark.-Arkansas, B.C.-British Columbia, Calif.-California, Can.-Canada, Colo.-Colorado, Conn.-Connecticut, Del.-Delaware, Fla.-Florida, Ga.-Georgia, Ill.-Illinois, Ind.-Indiana, Kan.-Kansas, Ky.-Kentucky, La.-Louisiana, Labr.-Labrador, LP-Lower Peninsula, Man.-Manitoba, Mass.-Massachusetts, Md.-Maryland, Me.-Maine, Mex.-Mexico, Mich.-Michigan, Minn.-Minnesota, Miss.-Mississippi, Mo.-Missouri, Mont.-Montana, N.B.-New Brunswick, N.C.-North Carolina, N.D.-North Dakota, Neb.-Nebraska, New Engl.- New England, Nev.-Nevada, Nfld.-Newfoundland, N.H.-New Hampshire, N.J.-New Jersey, N.M.-New Mexico, N.S.-Nova Scotia, Nw. Terr.-Northwest Territories, N.Y.-New York, Okla.- Oklahoma, Ont.-Ontario, Ore.-Oregon, Pa.- Pennsylvania, P.E.I.-Prince Edward Island, Que.-Québec, R.I.-Rhode Island, Sask.-Saskatchewan, S.C.-South Carolina, S.D.-South Dakota, Tenn.-Tennessee, Tex.-Texas, UP-Upper Peninsula; USA-United States, Va.-Virginia, Vt.-Vermont, Wash.-Washington, Wis.-Wisconsin, W.Va.-West Virginia, Wyo.-Wyoming.

[#] – This symbol represents citation numbers in the Plant Pages Bibliography.

### **Description**

The species' physical features are broken down into eight categories for identification: general description, flower, leaf, stem or twig, bark, fruit, root and soil.

### **Normal Water Level**

This section describes where the species typically grows relative to soil moisture or normal level of inundation.

### **Flooding/Fluctuation Tolerances**

This section describes the tolerance to frequency, depth and duration of flooding. Special information about the species' sensitivity to water level fluctuation is given here also.

### **Sensitivities or Other Tolerances**

Other stresses and tolerances are described here. Stressors include salt, nutrient, siltation, insect tolerances as well as the species' preferred exposure. Tolerances are represented as high, medium or low. A high level indicates a high tolerance to the stress. "Unknown" indicates that the authors did not find information for that stress.

### **Design Considerations**

This section describes the optimal management practices appropriate for the species. Design concerns or considerations are presented here also.



**Exposure**



Full Sun



Partial Sun



Full Shade

**Indicator Status Categories:**

FAC (Facultative) — Equally likely to occur in wetlands or nonwetlands (estimated probability, or est. prob., 67-99%).

FACU (Facultative Upland) — Usually occurs in nonwetlands (est. prob. 67-99%), but is occasionally found in wetlands (est. prob. 1-33%).

FACW (Facultative Wetland) — Usually occurs in wetlands (est. prob. 67-99%), but is occasionally found in nonwetlands.

OBL (Obligate Wetland) — Under natural conditions, occurs almost always (est. prob. >99%) in wetlands.

UPL (Obligate Upland) — Occurs in wetlands in another region, but occurs almost always (est. prob. >99%) under natural conditions in nonwetlands in the region specified.

A positive (+) sign indicates that the species is more likely to be found in wetlands, and a negative (-) sign indicates that it is less likely to be found in wetlands. [38]

**Wildlife Use**

This section describes fauna species for which this plant species provides habitat and how the plant is used.

**Nursery/Plant Information**

This section provides information on the species' availability from nurseries and the types of plant material that are available.

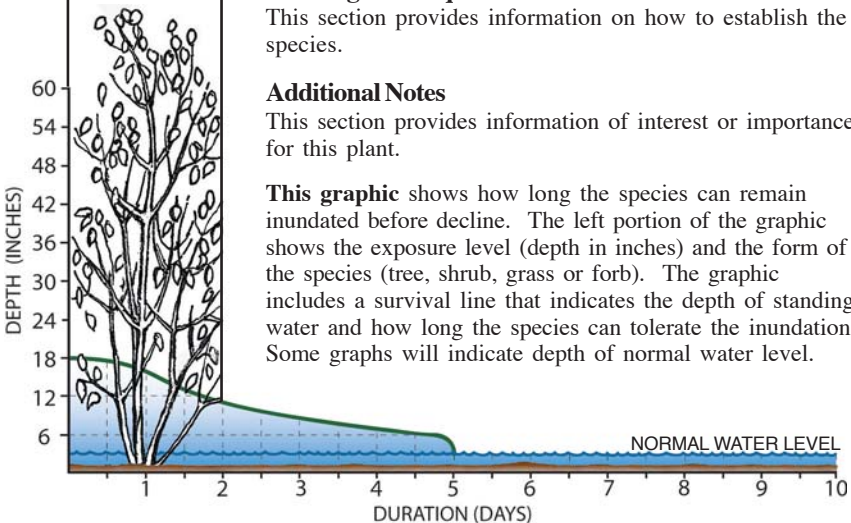
**Planting Techniques**

This section provides information on how to establish the species.

**Additional Notes**

This section provides information of interest or importance for this plant.

**This graphic** shows how long the species can remain inundated before decline. The left portion of the graphic shows the exposure level (depth in inches) and the form of the species (tree, shrub, grass or forb). The graphic includes a survival line that indicates the depth of standing water and how long the species can tolerate the inundation. Some graphs will indicate depth of normal water level.







# *Acer saccharinum*

Silver Maple - a.k.a. Soft Maple, White Maple

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Silver maple is a dominant tree in floodplain forests. It is also found in swamps, on stream banks, shores, and low areas of wet to mesic soils. It does well in upland plantings and is common in Midwest windbreak and farmstead plantings. [7, 11, 22, 32, 36] **Range:** Minn. (Eco-Regions 1, 2, 4-9), especially se., uncommon in far nw. Wis., especially s. LP of Mich.; N.B. and Que. to Minn. and e. S.D., s. to Ga., w. Fla., La. and Okla. [7, 21]

## Description

**General:** Large, deciduous tree with short, stout trunk, spreading open, irregular crown of curving branches that may grow to a height of 90'. This tree is the fastest growing native maple. **Flower:** February to March, usually ¼" long; clusters; male and female are separate. **Leaf:** Opposite 4-6" long, broadly ovate, deeply 5-lobed, green above and silvery white below. **Twigs:** light green to reddish, hairless with slightly unpleasant odor when crushed. **Bark:** Gray and smooth in young trees, becoming furrowed into long, scaly, shaggy ridges. **Fruit:** A winged samara. **Roots:** Shallow, very wide spreading, fibrous. **Soils:** Tolerates wide variety of soils, but reaches largest size in moist soils. [7, 11, 22, 36]

## Normal Water Level

This species prefers wet/saturated conditions. [21, 37]

## Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 5'. **Duration:** Long – 20 days (decreasing 6"/day for 8 days, leveling out at 18" for until the 20th day) during the growing season, although it tolerates weeks of inundation in the spring and is very resistant to drought/heat. [1, 22, 37]

## Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Moderately high for spray and moderately low for soil. **Nutrient:** Manganese chlorosis in calcareous or high-pH soils. **Siltation:** N/A. **Insect:** Frequent – ocellate leaf gall, cottony maple scale, borers, other scale. **Other:** Resistant to SO<sub>2</sub>, HCl, Cl, mine spoils and soil compaction. Sensitive to O<sub>3</sub> and alkaline soils, though intermediate to HFl. [1, 2, 10, 22, 24, 37]

## Design Considerations

Silver maple is frequently used in landscaping as a shade tree because of its rapid growth and toleration of a wide variety of soil types. A good tree for wetland use, restorations, stream edges and floodplains. **Concerns:** The branches are very weak and damage easily. Other issues are that it does not tolerate dense shade, fruit produces litter, and roots may grow at the surface and become exposed, creating tripping hazards. [11, 36]

## Indicator Status: FACW

### Wildlife Use

This species provides seeds and nesting cover for gamebirds, songbirds (especially bobwhite quail, cardinals, orioles, goldfinch and grosbeaks), waterbirds and waterfowl. Silver maple also provides food and cover for porcupine, raccoon, squirrel, chipmunk, mice, beaver, deer and moose.

[21, 22, 32, 37]

### Nursery/Plant Information

**Available:** Widely (though watch out for different varieties). **Types:** Balled-and-burlapped, potted and bareroot stock.

### Planting Techniques

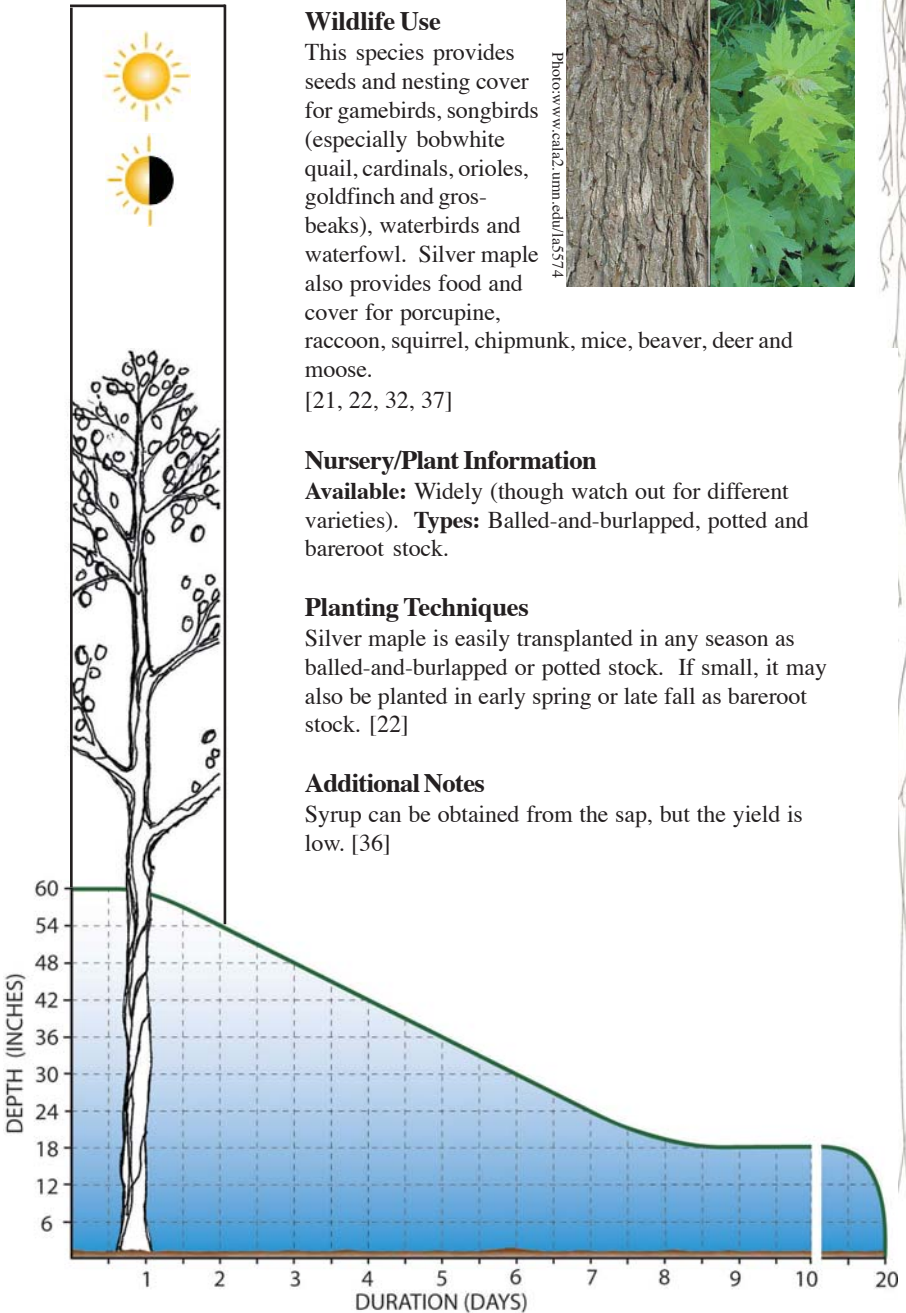
Silver maple is easily transplanted in any season as balled-and-burlapped or potted stock. If small, it may also be planted in early spring or late fall as bareroot stock. [22]

### Additional Notes

Syrup can be obtained from the sap, but the yield is low. [36]



Photo: www.cala2.umn.edu/hs574





# *Acorus calamus*

Sweet Flag - a.k.a. *Acorus americanus*

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Bogs, streambanks, marshes (often with cattails), swamps, shallow water, peatlands and sometimes in seasonally inundated wet meadows. Usually forming beautiful clumps. [4, 7, 16, 35] **Range:** Minn. (Eco-Regions: All), scattered throughout Wis., Mich. Native, though widely naturalized in N. Amer. from N.S. and Que. to Alta., s. to Fla., Tex., Colo., n. Idaho and Wash.; Asia. [7, 21]

## Description

**General:** Perennial, aromatic, emergent herb, growing in clumps or dense beds with tall, sword-like leaves. Mature height is 2-6'. **Flower:** Small, in a dense cluster (spadix) near the top of the flattened, leaflike stem. Color is green/brown from May 25 to June 30. **Leaf:** Its erect, swordlike leaves are much like those of blue flag, except they are yellowish-green and give off a sweet odor when bruised. **Stem:** The spathe is the tapering upper part of the stem with a 2-edged stalk. **Fruit:** Brown and persistent into late fall. **Root:** Stout, aromatic rhizomes. **Soil:** pH range 5.9-8.8; tolerates most wet soils in inundated conditions. [4, 7, 16, 35, 44]

## Normal Water Level

This species prefers shallow water of 20" of inundation or less to wet/saturated conditions, though it prefers depths of 6-20". [21, 37, 44]

## Flooding/Fluctuation Tolerances

**Frequency:** Low. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing 4"/day). Prefers stable water levels and will decrease in abundance with flood depth increases, although will tolerate dry periods. [1, 6, 29, 37, 44]

## Sensitivities or Other Tolerances

**Exposure:** Partial to full sun. **Salt:** Low to moderate. **Nutrient:** Low. **Siltation:** Low. **Insect:** N/A. **Other:** Tolerates acidic conditions and moderately tolerates general disturbance and stress. [1, 6, 37, 44]

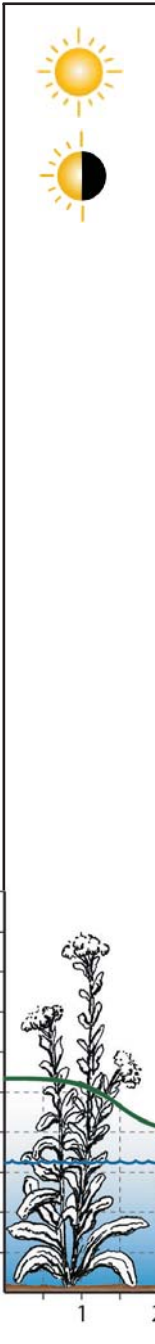
## Design Considerations

Sweet flag is used in soil stabilization of lower shoreline zones and vegetated swales. Rhizomes and roots form a mat in upper 4-8" of soil, which prevents erosion, stabilizes sediment, and mitigates buffering wave action. Good for wetland restoration (wet meadow/wet woods) due to its aggressive behavior and rhizomatous growth – though it is moderate in spread rate. Good for rainwater and water gardens. Uses may also include wildlife cover and a food source. **Concerns:** This species is considered aggressive, although this may be beneficial to some sites. [16, 21, 44]

## Wildlife Use

Sweet flag provides food (seed) and cover for waterfowl (especially wood ducks). Muskrats will eat the rhizomes. Sweet flag is also considered an excellent feeding cover

**Indicator Status:** OBL



for woodcock, snipe and rodents. This perennial grows in clumps that provide nesting spots for waterfowl and shorebirds. [4, 21, 37, 44]

### **Nursery/Plant Information**

**Available:** Widely.

**Types:** Transplants, rhizomes and seeds.

### **Planting Techniques**

Rhizomes and transplants are generally more successful than seeds. Expose freshly harvested seed to cold, moist stratification for 60-90 days or soak seed in a bucket of water outside all winter, let freeze. Seed can be stored 9 months to 2 years. Fall sowing provides better germination than spring sowing by providing this cold treatment naturally. Sow in saturated soils. Avoid flooding of newly established plants. Transplants can tolerate some bounce in water levels. This species requires drawdown until plants are established. Seeding rate is .006-0.25 lb/acre or spacing of 1-3' centers at minimum of 1,000/acre. 12,000 seeds/lb. Plant in muddy soils to 1' of water. [4, 16, 44]

### **Additional Notes**

Recently, some plant taxonomy authorities have recognized two species of *Acorus* in Minnesota, *A. calamus* and *A. americanus*. Most nurseries and design professionals have not recognized two species of *Acorus*. *A. calamus* is recognized as a naturalized species, possibly from Europe. Gleason and Cronquist (1991) and Chadde (1998) consider *A. americanus* a synonym, as does this book.



Photo: Jason Husveit



## *Agastache foeniculum*

**Giant Hyssop** - a.k.a. Wonder Honey Plant; **Fragrant, Fragrant Giant, Giant Blue or Anise Hyssop**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Mesic to dry prairies and open or semishady woodlands (savanna), often along roads. [16, 17, 35, 41] **Range:** Minn. (Eco-Region: 1-6, 8, 9), Wis. Wis. to n. Iowa and Man., s. to Colo. and Alta., and occasionally e. to Que. **Endangered in Iowa.** [17, 21]

### **Description**

**General:** One of the more ornamental and larger of our native mints. Giant hyssop is a perennial, commonly 2-4' tall. **Flower:** A thick spike with dense, often interrupted, whorls of bright blue flowers ¼" long, June to October. **Leaf:** Sharply pointed, lance-shaped, toothed, opposite, glossy, dark green with fine hairs underneath and 2-3" long. Leaves have an anise or licorice odor when crushed; can be used for tea. **Stem:** Square. **Fruit:** Light to dark brown. **Roots:** Fibrous, shallow. **Soil:** Medium (mesic) to dry loam soil. [17, 35, 41, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to dry conditions. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day).

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Moderate; low to 2,4-D. **Nutrient:** Unknown. **Siltation:** Unknown. **Insect:** Infrequent. **Other:** Giant hyssop has a moderate tolerance to general disturbance and stress. [1, 47]

### **Design Considerations**

Giant hyssop is an ornamental perennial that grows well in gardens and produces excellent cutflowers. This plant has use as an aromatic and as a herb for teas. Will work well in shallow rain gardens and upland buffers. **Concerns:** Giant hyssop self-seeds readily and may spread in gardens. It survives poorly in northern Minnesota. [41]

### **Wildlife Use**

Flowers are very attractive to bees and butterflies throughout the summer. [21, 41]

### **Nursery/Plant Information**

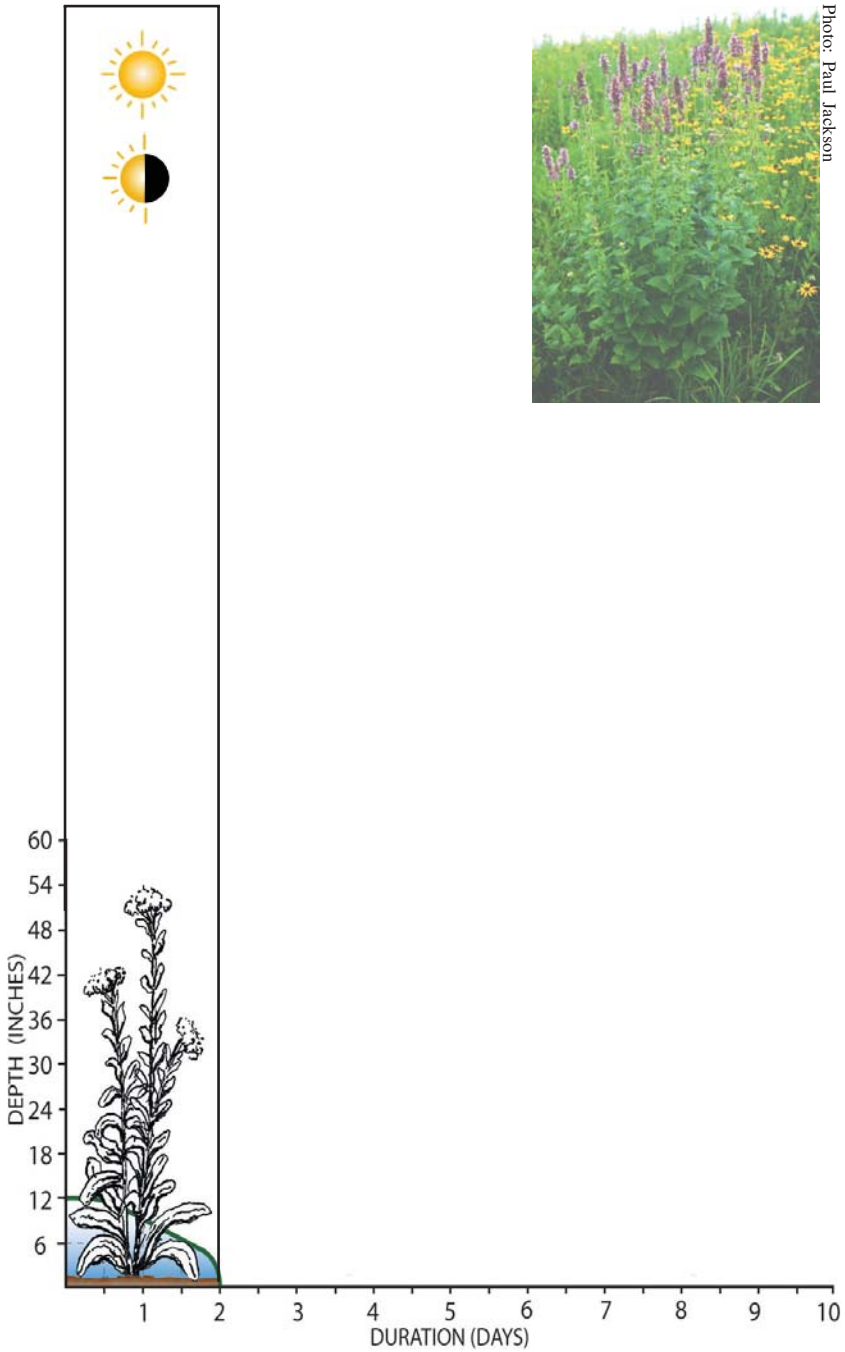
**Available:** Widely. **Types:** Plants and seed.

### **Planting Techniques**

Spreads by producing hundreds of tiny, black seeds. Seeds need no treatment, but moist, cold stratification may help. 1,040,000 seeds/lb. [16, 21, 41]

**Indicator Status: UPL**

Photo: Paul Jackson







## *Alisma trivale*

**Water Plantain - a.k.a. Common Water Plantain or Mud Plantain**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Shallow water and in saturated soils, marshes, shrub swamps, wooded swamps, shores of lakes and streams, and ditches. It rapidly invades exposed mud flats and is common in farmed wetlands. [4, 7, 11, 16, 21]

**Range:** Minn. (Eco-Region: All), n. Wis., Mich. N.S. to s. B.C., s. to Pa., Mo. and Calif. [4, 7, 21]

### **Description**

**General:** A decorative, perennial herb, usually emergent with a mature height of 3-4'.

**Flower:** Inflorescence is highly branched with perfect flowers of 3 sepals and 3 white or pinkish petals from May to September. Pistils are in a single whorl on a small, flat receptacle. **Leaf:** Broad, flat blades that may be rounded or tapered at the base; however, submerged forms with only ribbon-like leaves are also produced. The leaves are olive-green in color. **Fruit:** A group of minute, flat-sided achenes borne in a whorl. Achenes are not quite 1/8" long. **Root:** Submerged bulb. **Soil:** The pH range is 7.0-8.8. Tolerates saturated to inundated conditions on many soil types. [4, 7, 11, 16, 44, 47]

### **Normal Water Level**

This species prefers shallow water, 6" or less, to wet/saturated conditions of 36" of inundation or less, though it prefers 0-6" of water depth. [11, 21, 37, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 18". **Duration:** Long – 6 days (decreasing 6"/day). This species tolerates periodic inundation of short durations during the early part of the growing season. It will increase in abundance with increases in flood depth. Tolerant of late-season drawdowns. [1, 21, 16, 37, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Moderate. **Nutrient:** Moderate. **Siltation:** High. **Insect:** Infrequent. **Other:** It has a moderate-to-high tolerance of general disturbance and stress. [1, 44, 47]

### **Design Considerations**

Water plantain is well adapted for use in upper and lower shoreline zones, for streambank stabilization, and in vegetated swales. It is also well suited for restorations of wetlands, low spots in wet prairies and wet meadows. Seed is common in seedbanks of hydric soils. Well adapted for habitat as wildlife cover and food.

**Concerns:** This long-lived species can be invasive. [16, 44]

### **Wildlife Use**

Waterfowl (mallard, pintail, scaup, blue-winged and green-winged teal), songbirds, pheasants and rodents eat the achenes and tubers. Plants provide shade for fish.

Rabbits and deer sometimes eat the leaves. The leaves also provide an excellent

Indicator Status: OBL



feeding cover for frogs. The sturdy stalk may become a perch for songbirds. [4, 21, 44]

### Nursery/Plant Information

**Available:** Widely.

**Types:** Achenes, transplants and rootstocks.

### Planting Techniques

Achene production is high, about 144,000/plant.

Achenes require scarification to break dormancy, which

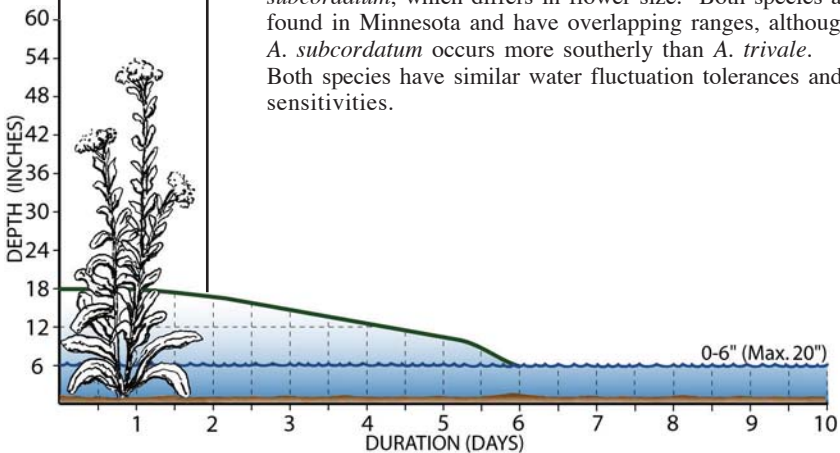
can be done with sandpaper and moist, cold stratification for 30 days. Fall sowing provides better germination on wet mudflats. Alternating temperatures in moist (underwater) conditions and/or light for germination. Achenes retain viability when stored in water under cold temperatures for 6 months and are found in seedbanks in many hydric soils. Avoid flooding of newly established plants. Common water plantain germinates quickly and favors drawdown until plants are established. Seeding rate is .06-0.5 lb/acre or plant rootstock or plants 2-5" in damp soils to 12" of water. 1,122,800 seeds/lb. [4, 16, 37, 39, 42, 44]

### Additional Notes

Another species that is very similar to *A. trivale* is *A. subcordatum*, which differs in flower size. Both species are found in Minnesota and have overlapping ranges, although *A. subcordatum* occurs more southerly than *A. trivale*. Both species have similar water fluctuation tolerances and sensitivities.



Photo: Dan Shaw







## *Allium stellatum*

**Prairie Wild Onion - a.k.a. Prairie Onion, Cliff Onion**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Prairies, meadows and rocky soils. [16, 17, 35, 41]

**Range:** Most common in s. and w. Minn. (Eco-Region: All), Wis. (except for n. ¼), Mich. W. Ont. to Ill., w. to Sask., Wyo. and Okla. [17, 21]

### **Description**

**General:** A native perennial herb that grows to 1-2'. The entire plant has a strong onion fragrance. **Flower:** A round cluster, 1-2" wide, that stands atop a single, erect umbel at the end of the stem; pink to rose with yellow centers, summer to fall.

**Leaf:** Slender and solid in a basal clump of thin grass-like leaves. **Stem:** Slender, solid stem. **Root:** A small, papery-scaled bulb. **Soil:** Moist to dry, sometimes rocky soils. [16, 17, 35, 41, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to dry conditions, which sometimes are rocky. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 1 day (decreasing 12" in 1 day). This plant does not tolerate long periods of saturation.

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun. **Salt:** Moderate. **Nutrient:** Low. **Siltation:** Low.

**Insect:** Infrequent. **Other:** N/A. It is tolerant to general disturbance and stressors. [47]

### **Design Considerations**

Prairie onion can be used for the edges of rainwater gardens and upland buffers. Plant in groups for more visibility. **Concerns:** Prairie wild onion does not compete well with aggressive native grasses. Even though this plant can be used for food, please do not pick or dig up this plant from natural conditions. [16, 21]

### **Wildlife Use**

This species attracts butterflies and bees and is edible to humans. [16, 21]

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Plants and seed.

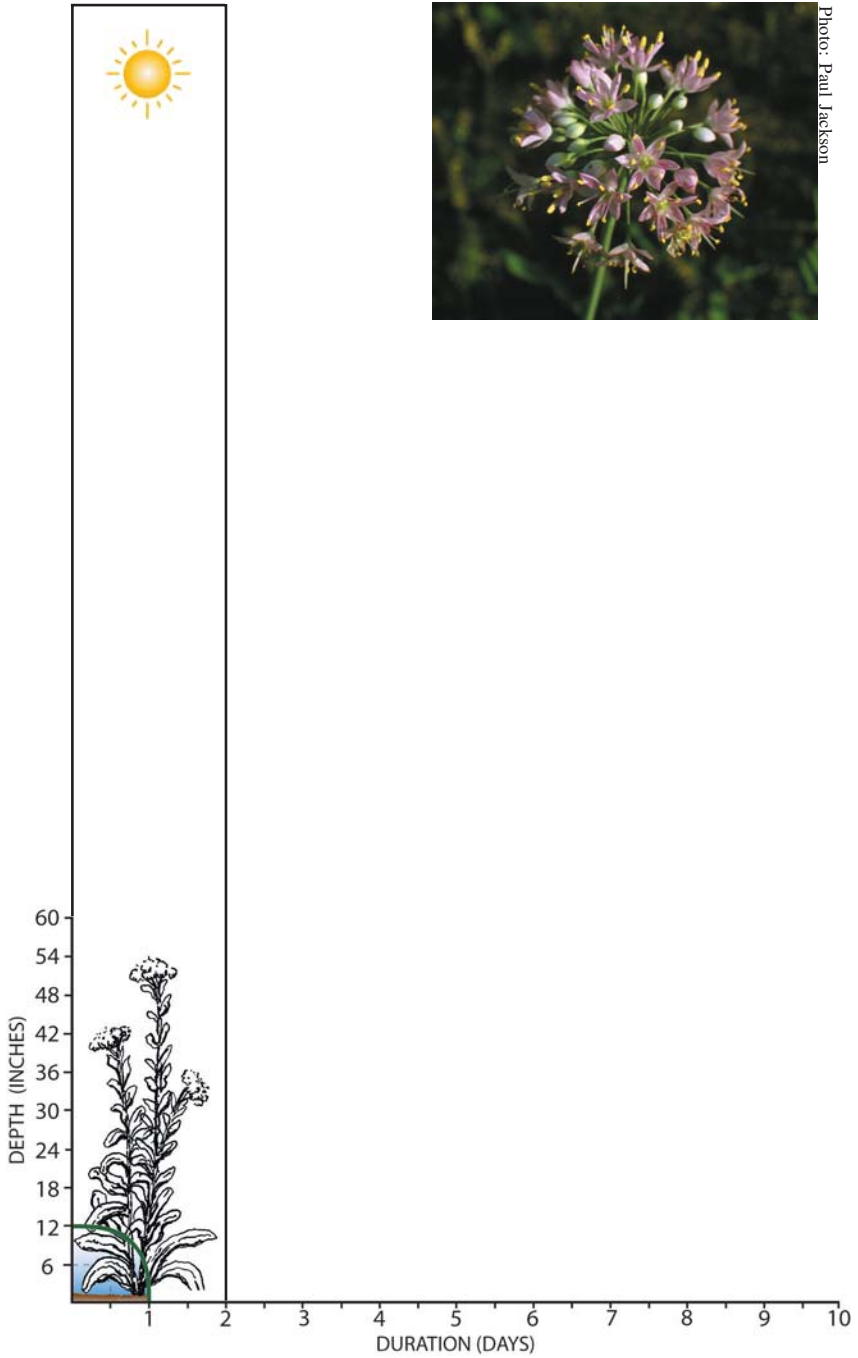
### **Planting Techniques**

Seeds need to be moist, cold stratified. Fall planting is ideal. 162,000 seeds/lb. Seeds self sow. [16]

### **Additional Notes**

The flower always grows on erect stalks, which distinguishes it from the nodding onion (*A. cernuum*), whose flowers always hang downward. [41]

**Indicator Status: UPL**





## *Alnus incana*

Speckled Alder - a.k.a. *Alnus rugosa* – Hazel, Tag or Gray Alder

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Speckled alder is found in swamps, thickets (especially alder thickets), bog margins, shores, moist meadows and is common on stream banks and floodplains. This species is also found in lowland wet areas such as openings in low, wet woods and low alluvial flats. It may also be present in bogs and coniferous swamps on neutral to acidic soils. [7, 11, 22, 36] **Range:** All but sw. Minn. (Eco-Region: 1-8), but local in sw. Wis., and se. Mich. Widespread across Can. from Nfld. to Alaska, s. to Md., Ohio, n. Ind., Minn., N.D., N.M., Ariz. and Calif.; Eurasia. This is the dominant species in alder thickets of Minn. and Wis. [7, 21]

**Endangered in Illinois.**

### Description

**General:** A deciduous, thicket-forming shrub or small tree sometimes growing to 16' tall. **Flower:** Tiny; in early spring before leaves. Male in drooping catkins 1½-3" long. Female in cones ¼" long. **Cones:** ½-5/8" long; elliptical, blackish, hard, short-stalked. **Leaf:** Leaves are dull, dark green with network of sunken veins and often hairy above; whitish-green with hairy veins beneath. Leaves are alternate, simple and elliptical or ovate. **Bark:** Gray, smooth. **Stem:** 4" maximum diameter. **Twigs:** Gray-brown, slender, slightly hairy when young. **Fruit:** Purple-black fruit persisting into winter. **Root:** Roots are very shallow and narrow spreading. **Soil:** Prefers deep loams to loamy sands that are wet to moist. [7, 11, 22, 36]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions and is able to tolerate inundation to 6" or less. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 2'. **Duration:** Long – 6 days (decrease of 1' in first 2 days and a steady 6½ days thereafter). This species is very tolerant of flooding, somewhat tolerant to flood duration, and moderately tolerant to increases in flood depth. [1, 2, 22, 25]

### Sensitivities or Other Tolerances

**Exposure:** Full to partial sun. Very intolerant to shade. **Salt:** Moderate. **Nutrient:** Low to moderate. **Siltation:** Moderate. **Insect:** frequent – several borers, alder bark beetle, tent caterpillar. **Other:** Sensitive to drought/heat. Sensitive to mine spoils, though tolerant to soil compaction. Sensitive to O<sub>3</sub>. The root system gives little wind support, especially in wet, spongy soils; weak wooded. It has a moderate tolerance for general disturbance and stress. [1, 22]

### Design Considerations

This species has been planted as an ornamental at water edges. Its root mass prevents erosion on stream banks and enriches soil by making nitrogen available to other plants. Use this plant in restorations (see community section above), pond edges and acidic soil conditions. **Concerns:** Weak-wooded, shade-intolerant, insect-damage-

**Indicator Status: OBL**

prone and sensitive to drought and heat. [21, 36]

### **Wildlife Use**

Wildlife value is high for songbirds (especially the seeds for redpoles,

siskins, and goldfinches), gamebirds, waterbirds, small mammals (rabbits, muskrats, beavers) and hoofed browsers (deer and moose). The thickets provide excellent cover from predators and weather for many animals, especially ruffed and sharp-tailed grouse. [11, 21, 22, 32, 36]

### **Nursery/Plant Information**

**Available:** Limited. **Types:** Bareroot and potted plants.

### **Planting Techniques**

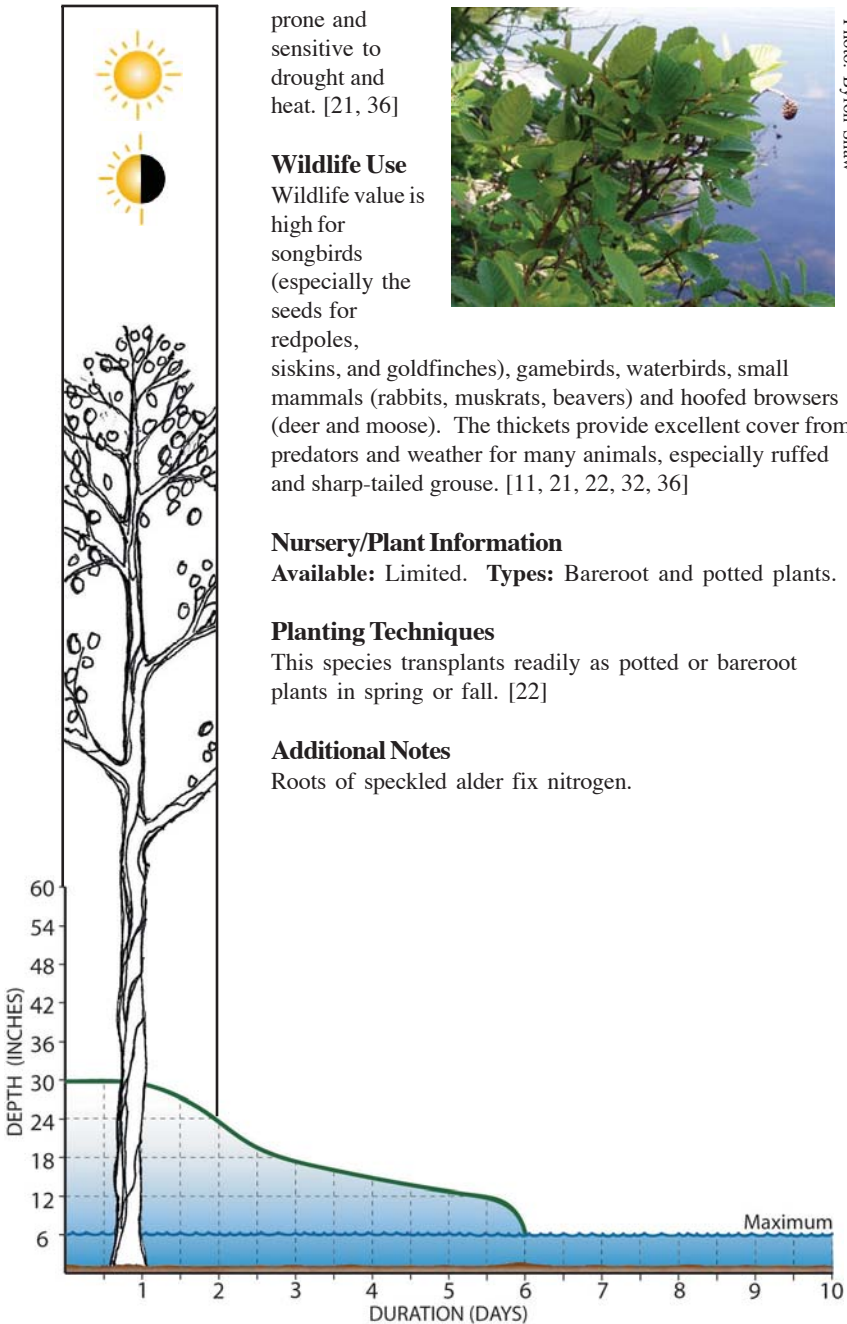
This species transplants readily as potted or bareroot plants in spring or fall. [22]

### **Additional Notes**

Roots of speckled alder fix nitrogen.



Photo: Byron Shaw





# *Amorpha fruticosa*

**Indigo Bush - a.k.a. False Indigo, Indigo Bush Amorpha, Bastard Indigo**

## **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Wet meadow, stream banks, shores and ditches. This species may also be found in bogs, swamps, dunes in lowland wet to wet-mesic conditions of flood plain depressions, hummocks, wet clearings and lakeshores. Grows well in river bottoms and floodplains. [7, 16, 22] **Range:** Nw., c. and s. Minn. (Eco-Region: 3-9); wc. and sw. and along St. Croix and Mississippi rivers of Wis., local in s. LP of Mich. Pa. to Sask., s. to Ala. and n. Mex. [7, 21]

## **Description**

**General:** A multiple-branched shrub that can grow 12" tall. **Flower:** Attractive, purple flower spikes blooming from June to August, turning to a seedpod. **Leaf:** Pinnately compound leaves. **Stem:** Many branches. **Fruit:** Interesting brown seed pods in autumn. **Root:** This species has fibrous, shallow lateral roots, somewhat suckering. **Soil:** Prefers sandy loams that are wet to dry. [7, 17, 22]

## **Normal Water Level**

This species prefers upland moist/mesic to dry conditions, though the soil may be saturated in spring. [21, 37]

## **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing 6"/day). Indigo bush is very tolerant to floods, especially in the spring, though can handle short periods of inundation during the growing season. [22, 37]

## **Sensitivities or Other Tolerances**

**Exposure:** Full to partial sun; intolerant to shade. **Salt:** Salinity resistant. **Nutrient:** Unknown. **Siltation:** Unknown. **Insect:** Occasional – inflorescence galls; generally free of insect problems. **Other:** Sensitive to 2,4-D and resistant to mine spoils, drought and heat. It has a moderate tolerance to general disturbance. [1, 22, 37]

## **Design Considerations**

Indigo bush is a good ornamental landscaping plant and is suited well for wetland or floodplain restorations. This plant works well in erosion control and rain gardens. **Concerns:** Weak-wooded plant that is easily broken. [16, 21]

## **Wildlife Use**

This species provides food and cover for waterfowl, marshbirds, shorebirds and small mammals. Its fruits are poisonous to humans. [21, 22, 37]

## **Nursery/Plant Information**

**Available:** Widely. **Types:** Plants only.

**Indicator Status: FACW+**

### Planting Techniques

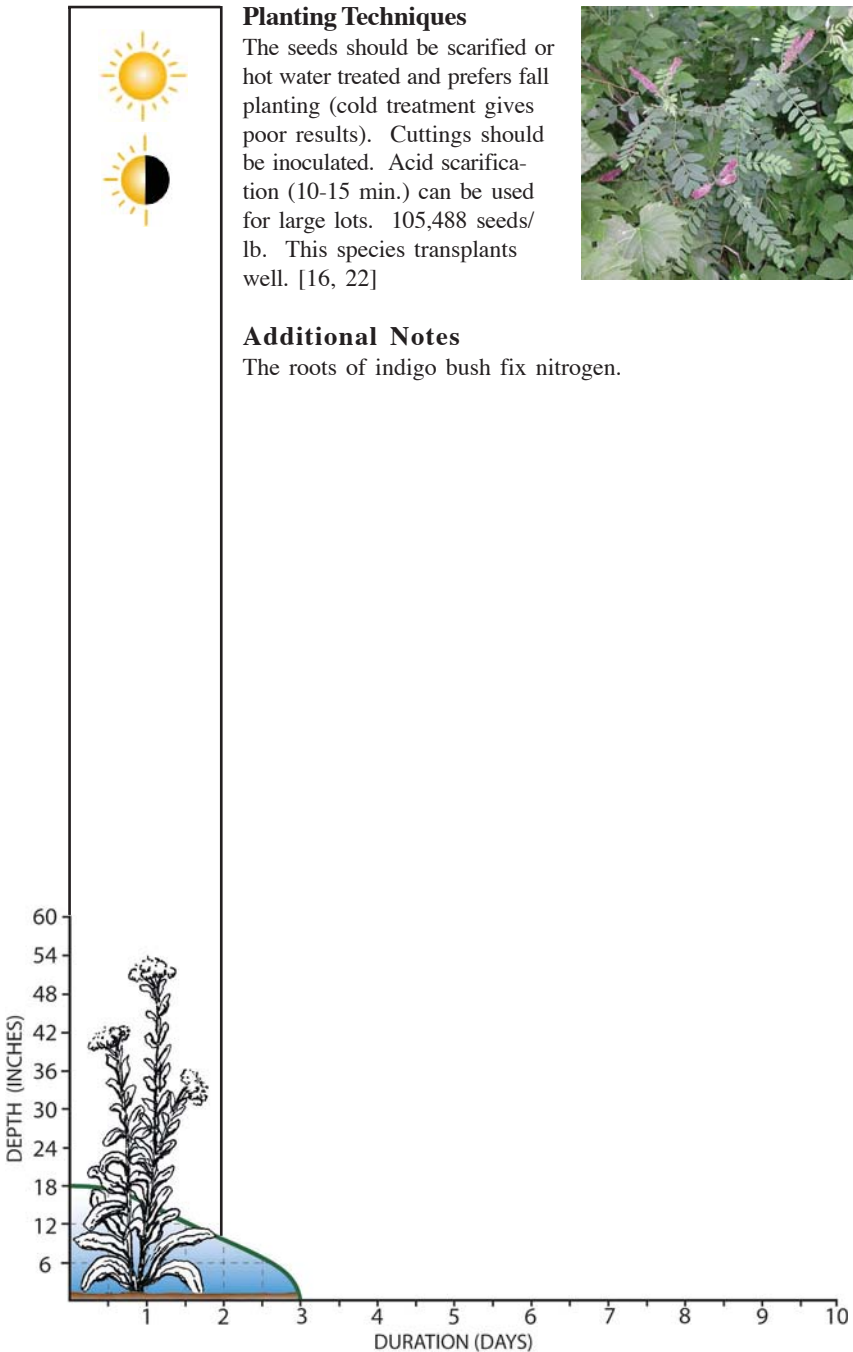
The seeds should be scarified or hot water treated and prefers fall planting (cold treatment gives poor results). Cuttings should be inoculated. Acid scarification (10-15 min.) can be used for large lots. 105,488 seeds/lb. This species transplants well. [16, 22]



Photo: Rusty Schmidt

### Additional Notes

The roots of indigo bush fix nitrogen.





# *Andropogon gerardii*

**Big Bluestem** - a.k.a. *A. furcatus*, Turkey Foot

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Big bluestem is one of the more dominant of the tallgrass prairie grasses in mesic prairies, savannas and woodlands. It often occurs in wet to wet-mesic prairies and may occur in calcareous fens and the other extreme of dry sand plains and bluffs. This species seems to be limited only by shade and excessive soil moisture. [11, 16, 17] **Range:** Minn. (Eco-Region: All), Wis., Mich. Me., s. Can. to Sask., s. to N.M., Tex., n. Fla. [17, 21]

## Description

**General:** A perennial, clump-forming, warm-season grass that grows 3-9'.

**Flower:** Flowers are arranged in fingerlike spikes that resemble turkey feet. Flower color is bronze turning to steely gray-blue as autumn advances. Blooms in July.

**Leaf/Stem:** The foliage is purplish on stout stems. The leaves and stems turn bright yellow, red, orange or purple in the fall. **Fruit:** The inflorescence contains 2-10 finger-like racemes with 2 types of spikelets: perfect, stalkless spikelets and staminate, stalked spikelets. **Root:** Fibrous; can extend over 10' deep. **Soil:** Wet-dry loam/clay soils with a wide pH range. This species will tolerate a variety of soil conditions. [8, 11, 16, 17, 44, 47]

## Normal Water Level

This species prefers upland moist/mesic conditions. [21, 44]

## Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 2 days (decreasing by 6"/day). Big bluestem is not tolerant of flooding, but it is tolerant of saturated soils for short periods and is drought tolerant. [1, 8, 44]

## Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low. **Siltation:** Low.

**Insect:** Unknown. **Other:** This species will tolerate a variety of soil conditions and is moderately tolerant to general disturbance and stress. [1, 44]

## Design Considerations

This species is used to stabilize soil and slow surface runoff, especially in upland buffer zones. Big bluestem is a major grass component in any prairie restoration and a successional species. Provides wonderful fall color throughout the winter, making a nice touch for landscaping in areas where its height is not a problem, and is becoming more common as an ornamental grass in gardens. A good clump former. Will perform well in well drained rain garden situations. **Concerns:** Big bluestem can be moderately aggressive. [16, 21, 44]

## Wildlife Use

Big bluestem provides food for Delaware skipper and forage for antelope, bison, deer and livestock. Also provides cover and some food for upland gamebirds and songbirds



**Indicator Status:** FAC-

(especially tree and field sparrows, finches and juncos). [16, 32, 37]

Photo: Paul Jackson



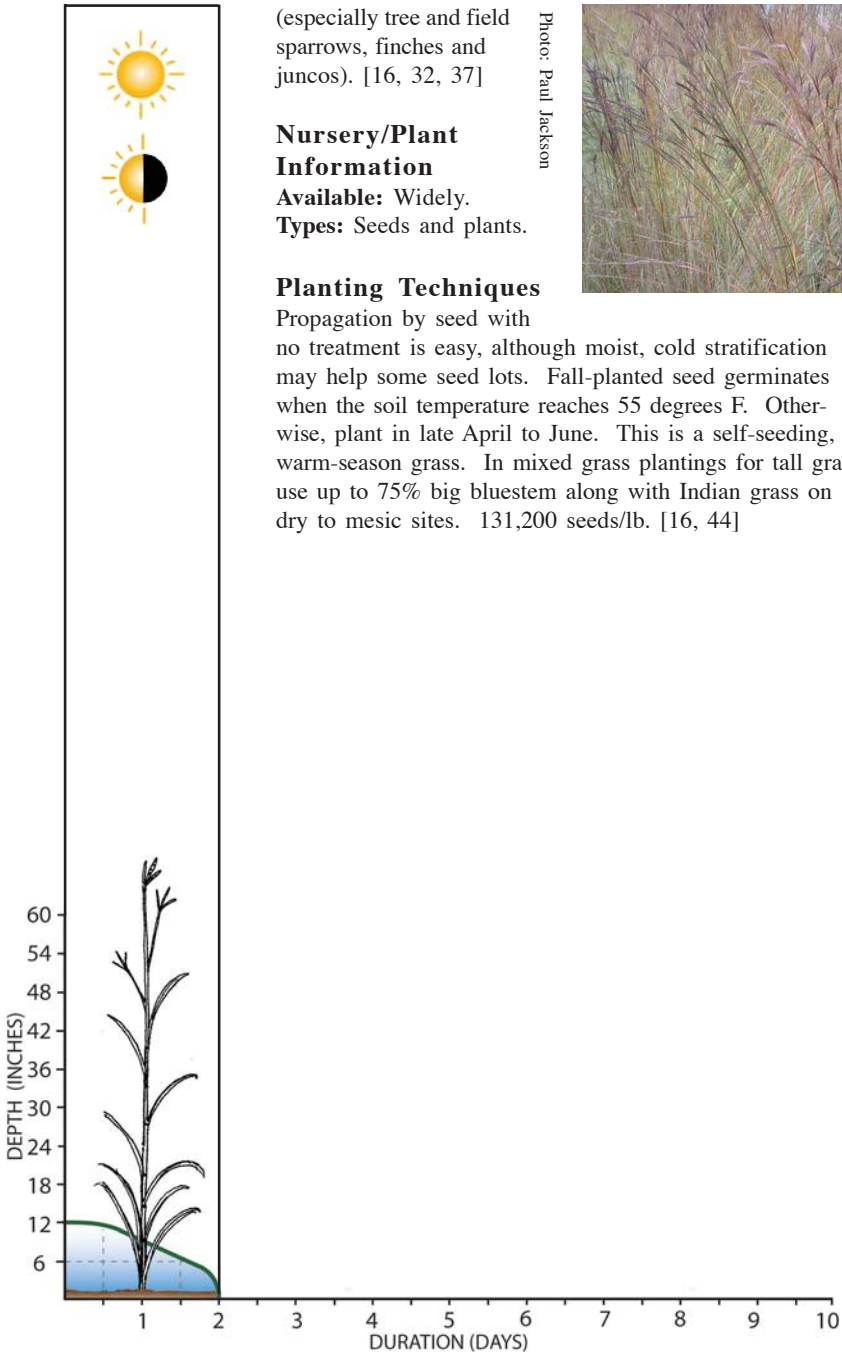
### **Nursery/Plant Information**

**Available:** Widely.

**Types:** Seeds and plants.

### **Planting Techniques**

Propagation by seed with no treatment is easy, although moist, cold stratification may help some seed lots. Fall-planted seed germinates when the soil temperature reaches 55 degrees F. Otherwise, plant in late April to June. This is a self-seeding, warm-season grass. In mixed grass plantings for tall grass, use up to 75% big bluestem along with Indian grass on dry to mesic sites. 131,200 seeds/lb. [16, 44]







## *Anemone canadensis*

Canada Anemone - a.k.a. Canada Windflower, Round-leaved or Meadow Anemone

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Moist-to-wet openings, stream banks, thickets, wet meadows, low prairies (mesic prairies and savannas), ditches, roadsides and railways; usually growing in patches. [7, 16, 21, 35, 41] **Range:** Minn. (Eco-Region: 1-8), Wis., Mich. E. from Que. to Alta., s. to Md., W.Va., Mo., Kan. and N.M. [7, 21]

### Description

**General:** A native, perennial herb that grows 1-2' tall from slender rhizomes that usually form large patches. **Flower:** White, arising from a long stem, blooming May to August. The flowers are 1-1½" across, have 5 petal-like sepals and a yellow center. **Leaf:** This species has deeply lobed and basal leaves with a long stem with whorled leaves forming the flower cluster. Leaves appear hairy, especially on the lower surface. **Stem:** Flowers and leaves arise from a long, hairy stalk. **Fruit:** Light to dark brown late in fall. **Root:** Rhizomatous. **Soil:** Medium soil from mesic to wet (hydric). [7, 35, 41, 47]

### Normal Water Level

This species does well in moist to wet (saturated) soils, spreading as a good groundcover. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). This species is somewhat tolerant to flood duration. [1]

### Sensitivities or Other Tolerances

**Exposure:** Partial to full sun. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Unknown. **Insect:** Infrequent. **Other:** It has a moderate tolerance to general disturbance and stress. [1, 47]

### Design Considerations

A good plant for restorations (wet meadow, low prairies and woodland openings) and revegetation sites such as roadsides and vegetated swales. This species has a use in rock gardens and rainwater gardens in shallow inundation conditions. **Concerns:** This species is an aggressive underground spreader for gardens and other formal landscaping areas, though this may be desirable in restorations. [16]

### Wildlife Use

This plant is sometimes used by waterfowl, muskrats and small rodents. [21]

### Nursery/Plant Information

**Available:** Widely. **Types:** Seeds and plants.

### Planting Techniques

The seed should be stored dry for about 180 days. Approximately 97,600 seeds/lb. [16]

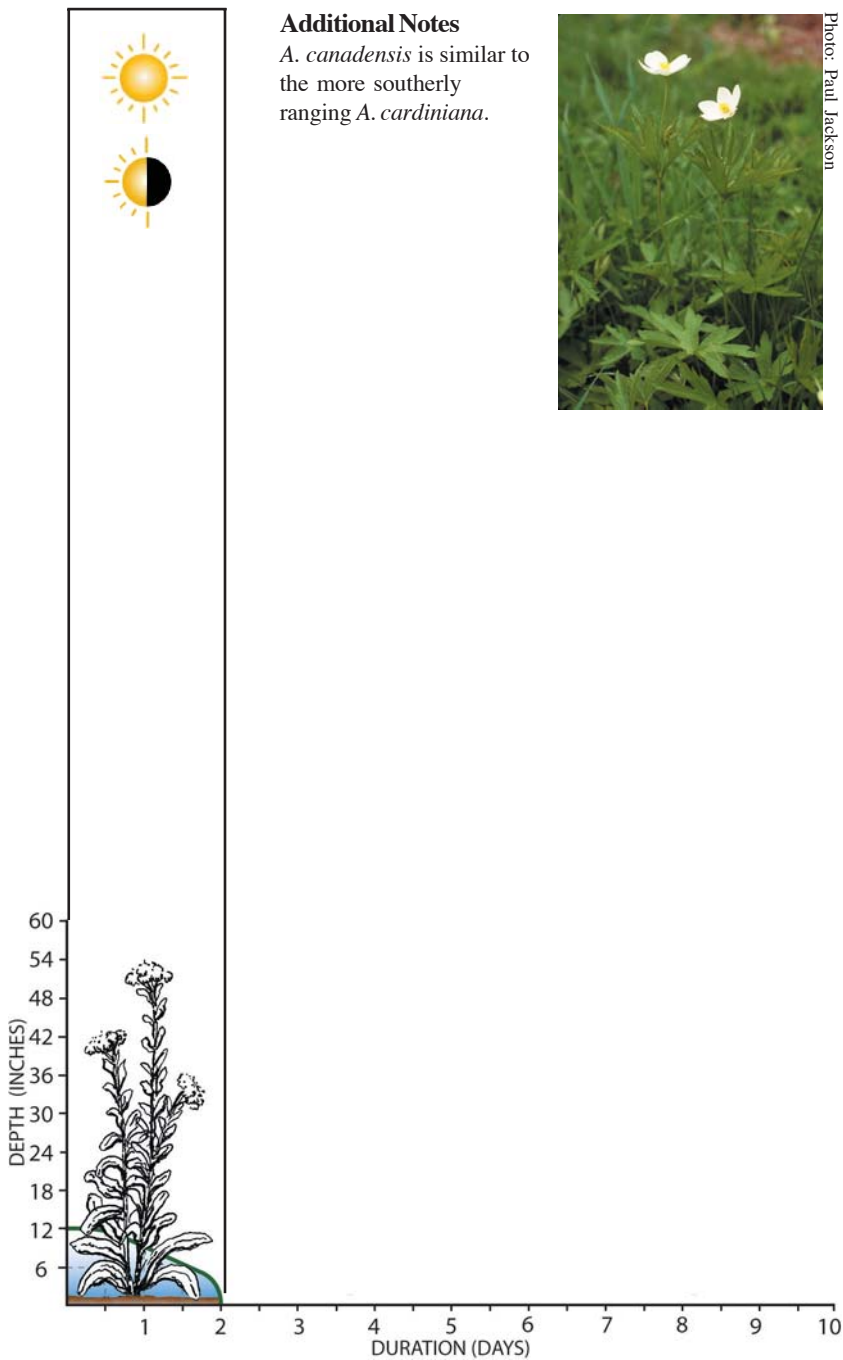
Indicator Status: FACW

**Additional Notes**

*A. canadensis* is similar to the more southerly ranging *A. caroliniana*.



Photo: Paul Jackson





## *Angelica atropurpurea*

*Angelica* - a.k.a. Alexanders; Purplestem, Great or Great High Angelica

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Springs, seeps, calcareous fens, stream banks, shores, marshes, sedge meadows, wet depressions in forests in calcium-rich soils. [7, 11, 16] **Range:** E. though local in ne. Minn. (Eco-Region: 1,6-8), ec. and s. Wis., mostly s. LP of Mich.

This species is generally in the n. from Lbdr. to Minn. and s. to Del., W.Va. and Ill. [7, 21]

**Endangered in Iowa.**

### Description

**General:** A native perennial herb that can grow to 8" tall, this species is a member of the carrot family. **Flower:** The inflorescence is a large 4" in diameter, compound umbel. Flowers are white or greenish-white and bloom around the first week in June.

**Leaf:** Basal leaves are pinnately more than once divided, and upper leaves are progressively reduced, with broadly sheathing leaf stalks and serrate, pointed leaflets.

**Stem:** The stout, round stems are purplish, aromatic and hollow. **Fruit:** Thin, flat lateral wings occur on the hairless fruit, which fall by midsummer. **Root:** Fibrous, shallow. **Soil:** This species prefers calcareous-rich soils. [7, 11, 16]

### Normal Water Level

This species prefers shallow water of 3" of inundation or less to wet/saturated conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate to low. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing in water depth 6"/day). Can survive early-summer flooding while dormant.

### Sensitivities or Other Tolerances

**Exposure:** Full to partial sun. **Salt:** Low to moderate. **Nutrient:** Unknown.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 47]

### Design Considerations

This is a good species for wetland restorations (especially in calcareous situations, seeps and springs). It is underutilized for landscaping. **Concerns:** This species can be aggressive in some soils, though this may be desirable. [16]

### Wildlife Use

*Angelica* provides good habitat for upland gamebirds and songbirds. It is also a bee and butterfly attractant. [16, 21]

### Nursery/Plant Information

**Available:** Limited. **Types:** Only seed is widely available.

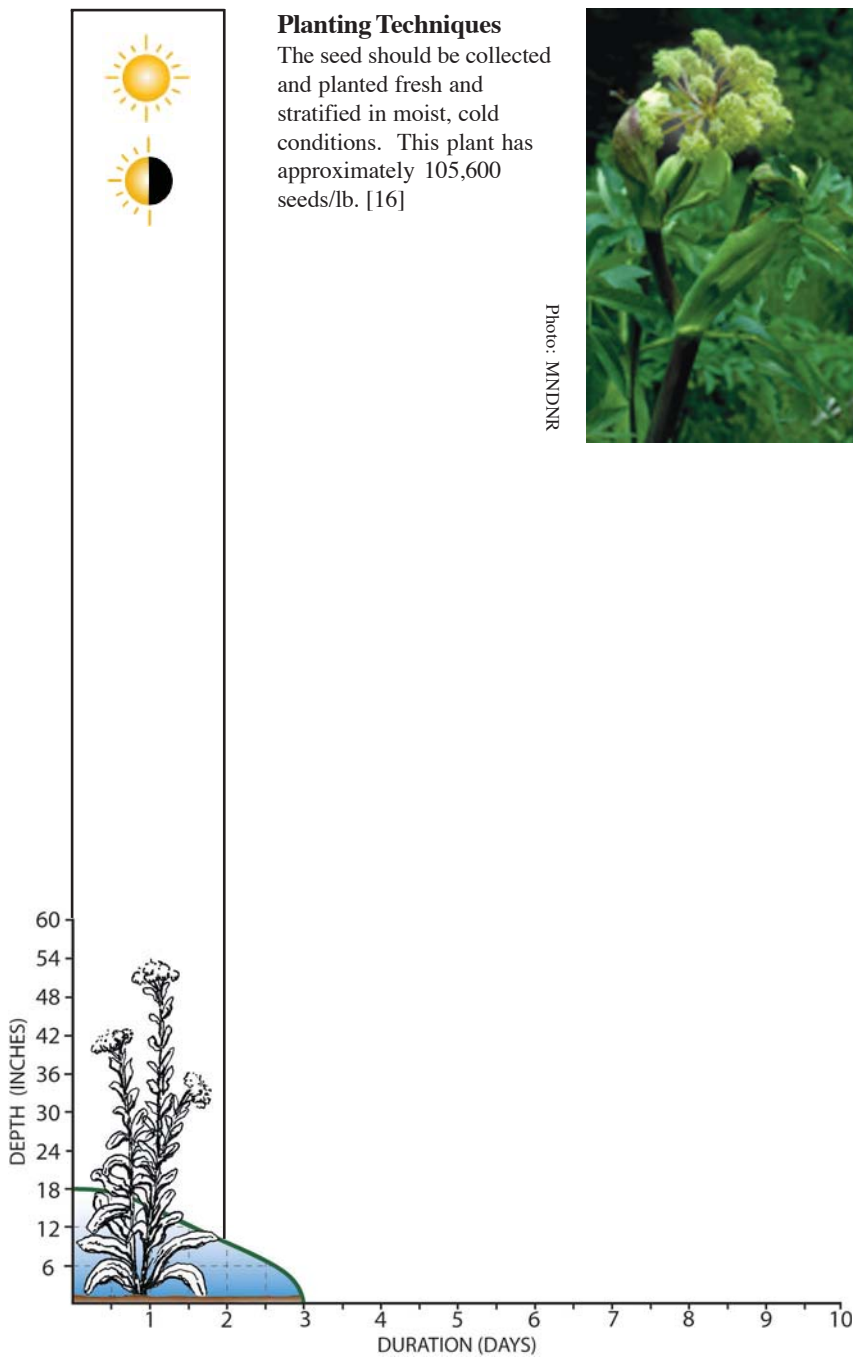
Indicator Status: OBL

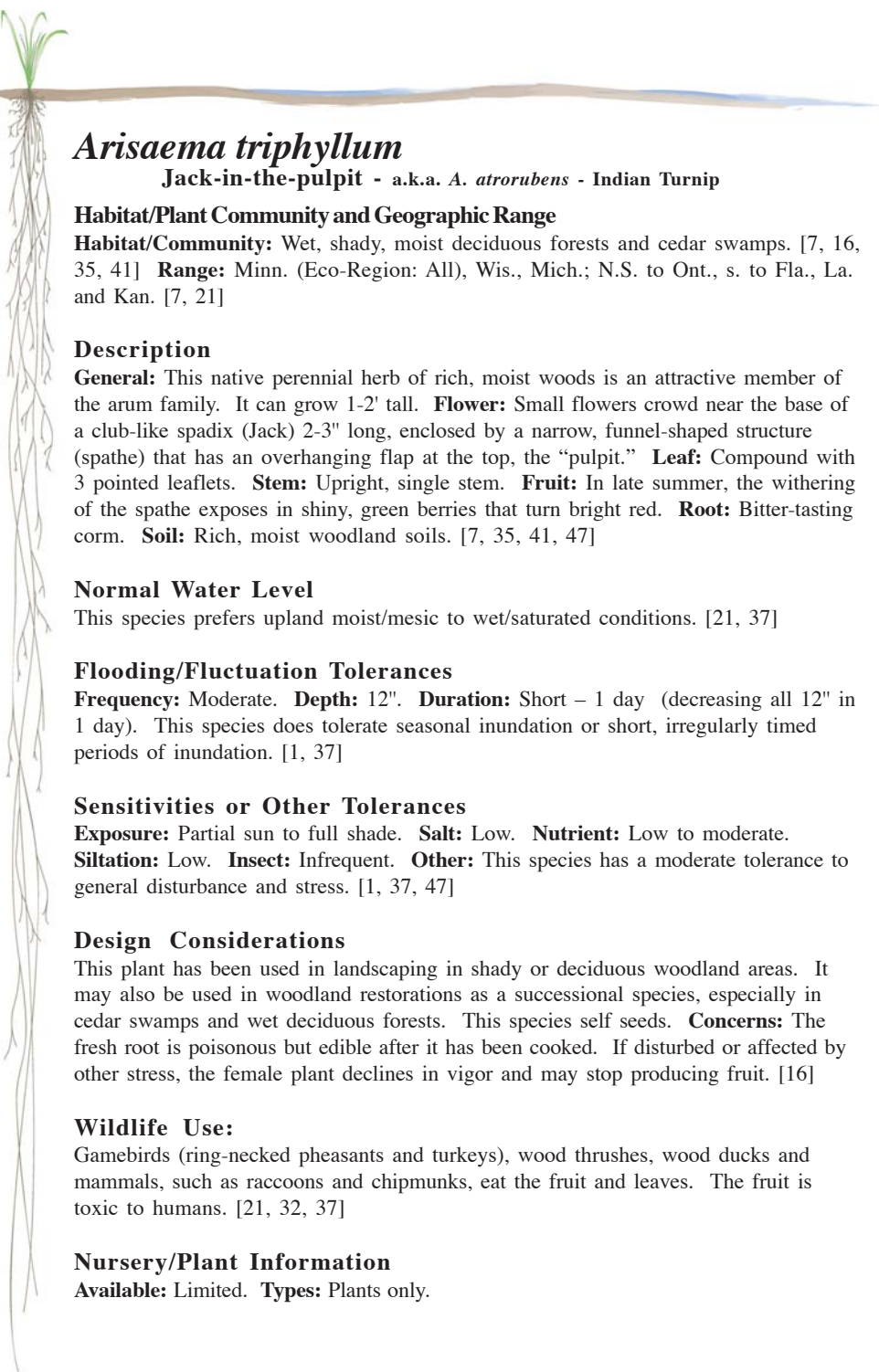
### Planting Techniques

The seed should be collected and planted fresh and stratified in moist, cold conditions. This plant has approximately 105,600 seeds/lb. [16]



Photo: MNDNR





## *Arisaema triphyllum*

Jack-in-the-pulpit - a.k.a. *A. atropubens* - Indian Turnip

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet, shady, moist deciduous forests and cedar swamps. [7, 16, 35, 41] **Range:** Minn. (Eco-Region: All), Wis., Mich.; N.S. to Ont., s. to Fla., La. and Kan. [7, 21]

### Description

**General:** This native perennial herb of rich, moist woods is an attractive member of the arum family. It can grow 1-2' tall. **Flower:** Small flowers crowd near the base of a club-like spadix (Jack) 2-3" long, enclosed by a narrow, funnel-shaped structure (spathe) that has an overhanging flap at the top, the "pulpit." **Leaf:** Compound with 3 pointed leaflets. **Stem:** Upright, single stem. **Fruit:** In late summer, the withering of the spathe exposes in shiny, green berries that turn bright red. **Root:** Bitter-tasting corm. **Soil:** Rich, moist woodland soils. [7, 35, 41, 47]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21, 37]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 1 day (decreasing all 12" in 1 day). This species does tolerate seasonal inundation or short, irregularly timed periods of inundation. [1, 37]

### Sensitivities or Other Tolerances

**Exposure:** Partial sun to full shade. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Low. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 37, 47]

### Design Considerations

This plant has been used in landscaping in shady or deciduous woodland areas. It may also be used in woodland restorations as a successional species, especially in cedar swamps and wet deciduous forests. This species self seeds. **Concerns:** The fresh root is poisonous but edible after it has been cooked. If disturbed or affected by other stress, the female plant declines in vigor and may stop producing fruit. [16]

### Wildlife Use:

Gamebirds (ring-necked pheasants and turkeys), wood thrushes, wood ducks and mammals, such as raccoons and chipmunks, eat the fruit and leaves. The fruit is toxic to humans. [21, 32, 37]

### Nursery/Plant Information

**Available:** Limited. **Types:** Plants only.

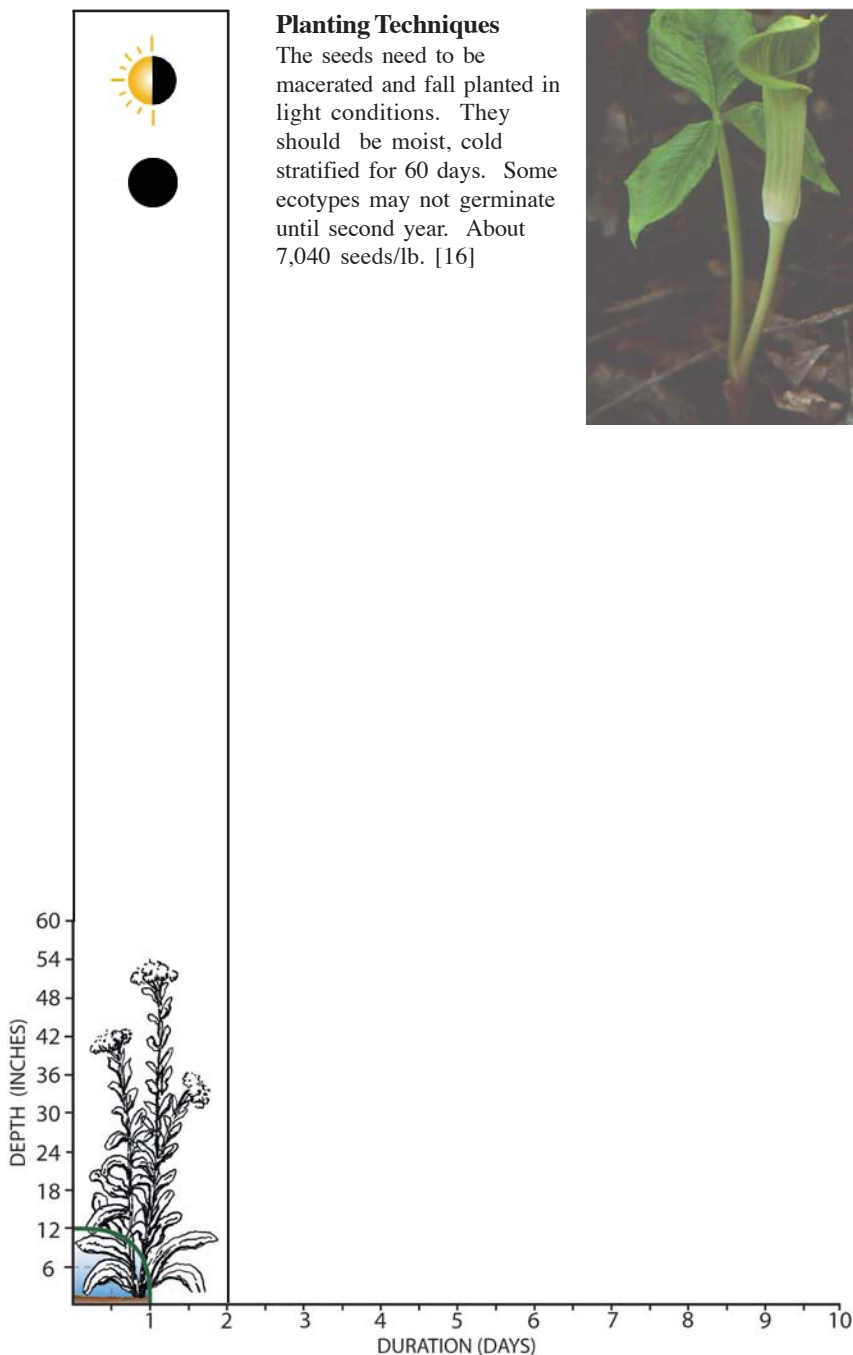
**Indicator Status:** FACW-

### Planting Techniques

The seeds need to be macerated and fall planted in light conditions. They should be moist, cold stratified for 60 days. Some ecotypes may not germinate until second year. About 7,040 seeds/lb. [16]



Photo: Jeff Shaw





## *Aronia melanocarpa*

**Black Chokeberry** - a.k.a. Glossy Black Chokeberry or Indigo Bush

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Tamarack swamps, open bogs, wet thickets, marshes, springs, prairies, dunes, old fields, creek banks, and shores. [7, 16, 22] **Range:** Nc., ne. and ec. Minn. (Eco-Regions: 1-3, 5, 6), Wis., Mich. Nfld. and Labr. to Minn., Iowa and se. Mo., s. to n. Ga. and Ala. [7, 21] **Endangered in Iowa.**

### **Description**

**General:** Black chokeberry is a very attractive, spreading shrub of the rose family that grows 3-6' tall. **Flower:** Nice clusters of white flowers in May. **Leaf:** Excellent, deep red fall foliage. **Stem:** Suckering, upright habit. **Fruit:** Black to blue-black berries. **Root:** Shallow fibrous, fine textured, suckers profusely. **Soil:** Wet-to-dry soils, although it prefers sandy wet or boggy. [7, 22]

### **Normal Water Level**

This species prefers upland moist/mesic to wet/saturated conditions and tolerates dry conditions and salty soil and water. [6, 21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). Black chokeberry is very tolerant to floods early in the season and somewhat tolerant to flood duration. [1, 22]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Moderate (Tolerates salty soil and water). **Nutrient:** Low to moderate. **Siltation:** Moderate. **Insect:** Infrequent – round-headed apple borer; rarely serious. **Other:** Resistant to drought/heat, compacted soils, mine spoils and infrequently damaged by ice and wind. It has a moderate tolerance to general disturbance and stress. [1, 6, 22]

### **Design Considerations**

This species is excellent for wet, lake edge plantings. Black chokeberry is also used as an ornamental for its showy white flowers, black fruit and fall color. Good in massing, borders and backgrounds in landscaping. This species does well in rain gardens with well drained conditions. **Concerns:** Black chokeberry Spreads aggressively under favorable conditions. [16]

### **Wildlife Use**

The fruit are of some importance, as they persist through the winter. The fruit is consumed by upland gamebirds (sharp-tailed and ruffed grouse), songbirds (cedar waxwings, chickadees, and meadowlarks), large and small mammals (bear and white-footed mice), hoofed browsers eat twigs, leaves, fruits edible to humans. [21, 22]

**Indicator Status:** FACW-

**Nursery/Plant Information**

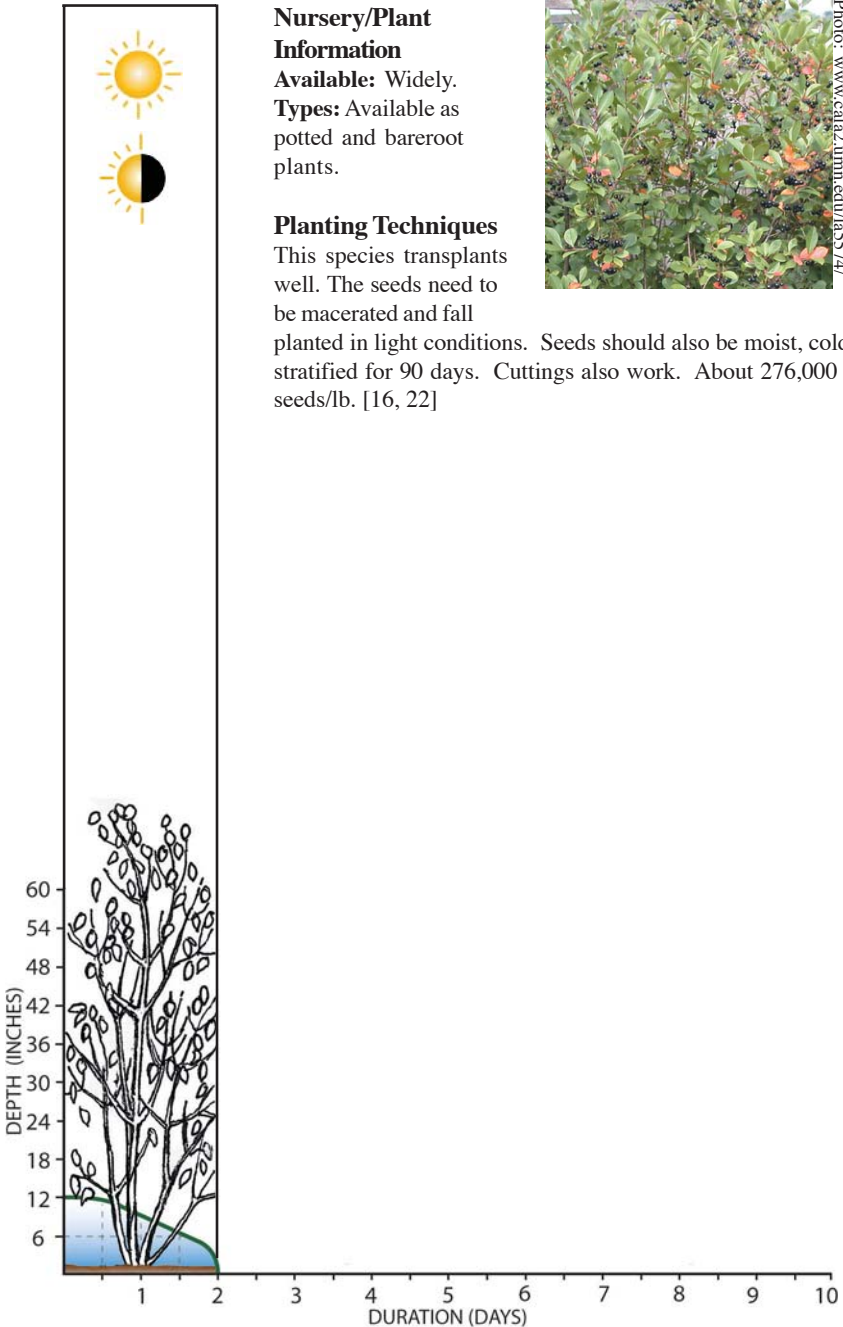
**Available:** Widely.  
**Types:** Available as potted and bareroot plants.

**Planting Techniques**

This species transplants well. The seeds need to be macerated and fall planted in light conditions. Seeds should also be moist, cold stratified for 90 days. Cuttings also work. About 276,000 seeds/lb. [16, 22]



Photo: [www.caia2.uminn.edu/ia5574/](http://www.caia2.uminn.edu/ia5574/)







## *Artemisia ludoviciana*

Prairie Sage - a.k.a. White Sage or Dark-leaved Mugwort

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Prairie sage often grows in patches in sand and dry prairies, primarily near major rivers, pastures and savannas. [16, 17, 35] **Range:** Especially s. and w. Minn. (Eco-Region: All), Wis.; Man. to Ala., s. to Mont., N.M., n. Tex., Ark., n. to w. Ind., s. Wis. and Minn. [17, 21]

### Description

**General:** Prairie sage is a native perennial that is grown for its silvery gray foliage. **Flower:** The inconspicuous flowers are arranged in an elongated, pyramidal inflorescence. **Leaf:** Leaves of this plant are oblong and up to 3" in length. They appear white because they are covered with soft, white hairs on both sides. The leaves have an aromatic, sagebrush odor when crushed. **Stem:** Spreading. **Fruit:** Light brown achene at the end of fall. **Root:** Aggressive, rhizomatous roots. **Soil:** Medium (mesic) to dry (xeric) soils. [17, 35, 47]

### Normal Water Level

This species prefers upland moist/mesic to dry conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing 6"/day).

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Unknown. **Siltation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 47]

### Design Considerations

Prairie sage is a good groundcover for sunny, dry slopes because of its aggressive habit. This species is also good for restorations, as a contrast plant in landscapes and for aromatic use. **Concerns:** Spreads quickly in gardens. [21]

### Wildlife Use

Provides habitat and cover in prairies for small birds and mammals. [21, 32]

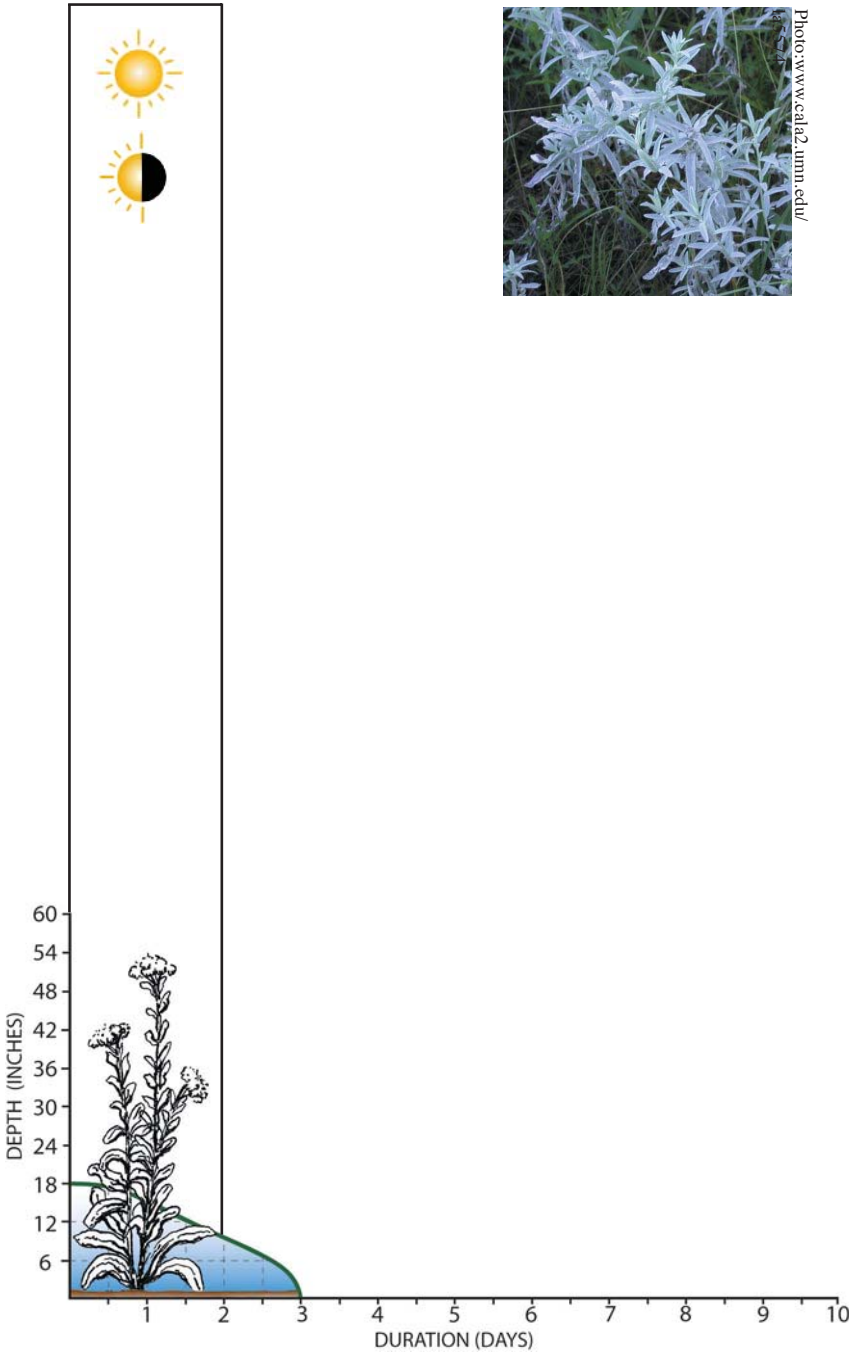
### Nursery/Plant Information

**Available:** Widely. **Types:** Plants only.

### Planting Techniques

The seed needs no treatment other than light. [16]

Indicator Status: UPL





## *Asclepias incarnata*

Marsh Milkweed - a.k.a. Swamp or Red Milkweed

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Marsh milkweed is a common wetland and lakeshore milkweed found in openings in conifer swamps, sedge meadows, shallow marshes, stream banks, ditches, open bogs, open fens, often in shallow water and will tolerate moist prairie conditions. [7, 11, 16, 35, 41] **Range:** Minn. (Eco-Region: All), Wis., Mich. N.S. to Sask., s. to Fla., Tex. and N.M. [7, 21]

### Description

**General:** A common, native, erect, perennial herb usually 3-4' tall that has milky juice when the stem or leaf is cut. Often the entire plant is reddish. **Flower:** Clusters of pink to rose-purple flowers from June to August. The inflorescence is comprised of several flat umbels, the individual flowers have 5 downward-curving petals and 5 upward petals, resembling a crown. **Leaf:** Opposite, lance-shaped to linear to oblong on short leaf stalks. **Stem:** Usually 1 long stem that branches near the top, and is erect decorative deep red-brown. **Fruit:** Pointed 3" seedpods, which open up in late summer with downy, airborne seeds. **Root:** Thick rhizomes. **Soil:** Prefers wet to moist wetland or loamy soils. [7, 11, 35, 41]

### Normal Water Level

This species prefers shallow water of 3" of inundation or less to wet/saturated to upland moist conditions. [21, 37]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing 3"/day). Tolerant of spring flooding when dormant. This species prefers wet meadows and tolerates seasonal inundation or short periods of inundation during the growing season. [1, 37]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Moderate. **Nutrient:** Low to moderate. **Siltation:** Moderate. **Insect:** Infrequent. **Other:** This species has a moderate to low tolerance to general disturbance and stress. [1, 37, 47]

### Design Considerations

A good plant for butterfly gardens and landscaping due to its aromatic and decorative qualities. This species also is used well in restorations of wetlands, wet woods, marshes and wet prairies. Also recommended for rain gardens, pond edges and vegetated swales. **Concerns:** This species can be short lived. [16, 21, 41]

### Wildlife Use

This species is a host and nectar plant for monarch butterflies. Many birds use the fibers from old stems to build nests. Many insects use this plant; it is particularly attractive to bees and butterflies. Flowers often conceal crab spiders lying in wait for pollinators. [11, 37, 41]

Indicator Status: OBL

**Nursery/Plant Information**

**Available:**

Widely.

**Types:** Seeds and plants.

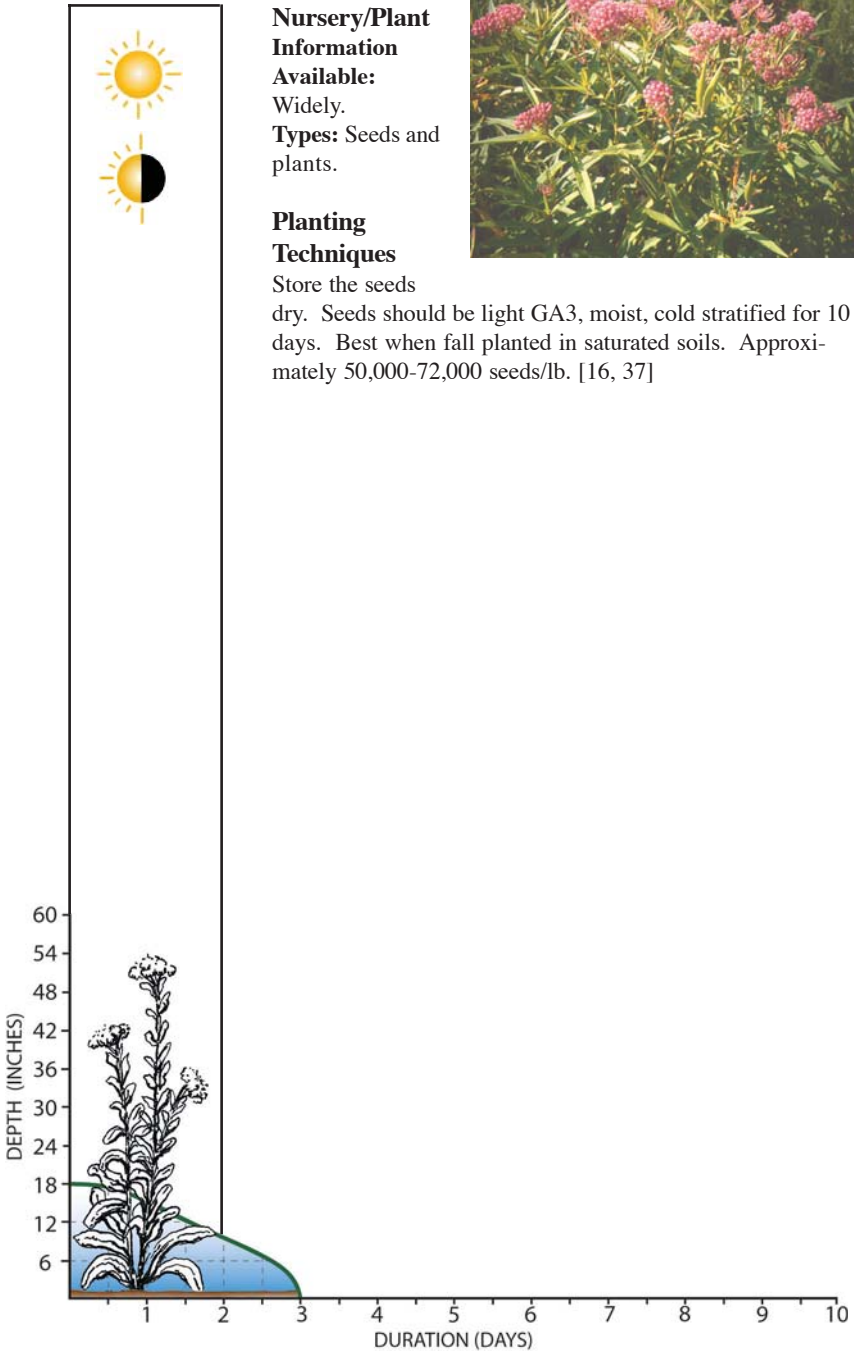


Photo: Dan Shaw

**Planting Techniques**

Store the seeds

dry. Seeds should be light GA3, moist, cold stratified for 10 days. Best when fall planted in saturated soils. Approximately 50,000-72,000 seeds/lb. [16, 37]





## *Asclepias tuberosa*

**Butterfly Milkweed** - a.k.a. Butterflyweed, Pleurisy Root or Chigger-flower

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Dry, sunny prairies and savannas, prefers sandy soils. Found along railroad beds and roadsides high on the outside berm, growing in clumps in open places, often on sand. [16, 17, 35, 41] **Range:** Mostly s. and e. Minn. (Eco-Region: 3-9), mostly s. and w. Wis.; Me. to Minn., s. to Ariz., Fla. [17, 21]

### **Description**

**General:** One of the brightest and most conspicuous native perennials, growing usually 1-2' tall. This plant, unlike other milkweeds, has no milky juice, instead, its stem and leaves bleed clear sap. **Flower:** Spreading clusters of flowers ranging from bright yellow to blazing orange. Flowers are arranged in a large, flat-topped umbel 2-3" wide, blooming from late June to September. **Leaf:** Hairy, toothless, narrow, alternate leaves 2-6" long, widen at tip. **Stem:** Often clumped with a single stem that branches only near the top. **Fruit:** Erect small cluster of narrow pods, 6" long, covered in fine hairs; pods contain large, brown seeds with silken "parachutes." **Root:** A large taproot. **Soil:** Sand/loam soils, will tolerate dry, sandy soils. [17, 35, 41]

### **Normal Water Level**

This species prefers upland moist/mesic to dry conditions. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Low. **Depth:** 12". **Duration:** Short – 1 day (Inundation is acceptable if in sandy soils that infiltrates quickly in less than 1 day). This species is somewhat tolerant to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun, not tolerating a lot of shade. **Salt:** Low to 2,4-D; moderate to soil salt and high to spray. **Nutrient:** Low to moderate. **Siltation:** Low. **Insect:** Infrequent. This species has moderate tolerance to general disturbance and stress. [1, 47]

### **Design Considerations**

Butterflyweed is a wonderful landscaping garden perennial though it can be short lived. As the name indicates, it is a good butterfly garden plant and is used in prairie and upland restorations. This plant can be used in rain gardens on the edge or areas that are not inundated frequently, dry quickly and do not exceed depths greater than 3". **Concerns:** Many cultivars exist, some of which do not have disease resistance. [16, 35]

### **Wildlife Use**

A host plant for gray hairstreak and monarch butterfly caterpillars. This species is an excellent nectar source for all butterflies, often attracting hords of butterflies. [21, 41]

Indicator Status: UPL

### Nursery/Plant Information

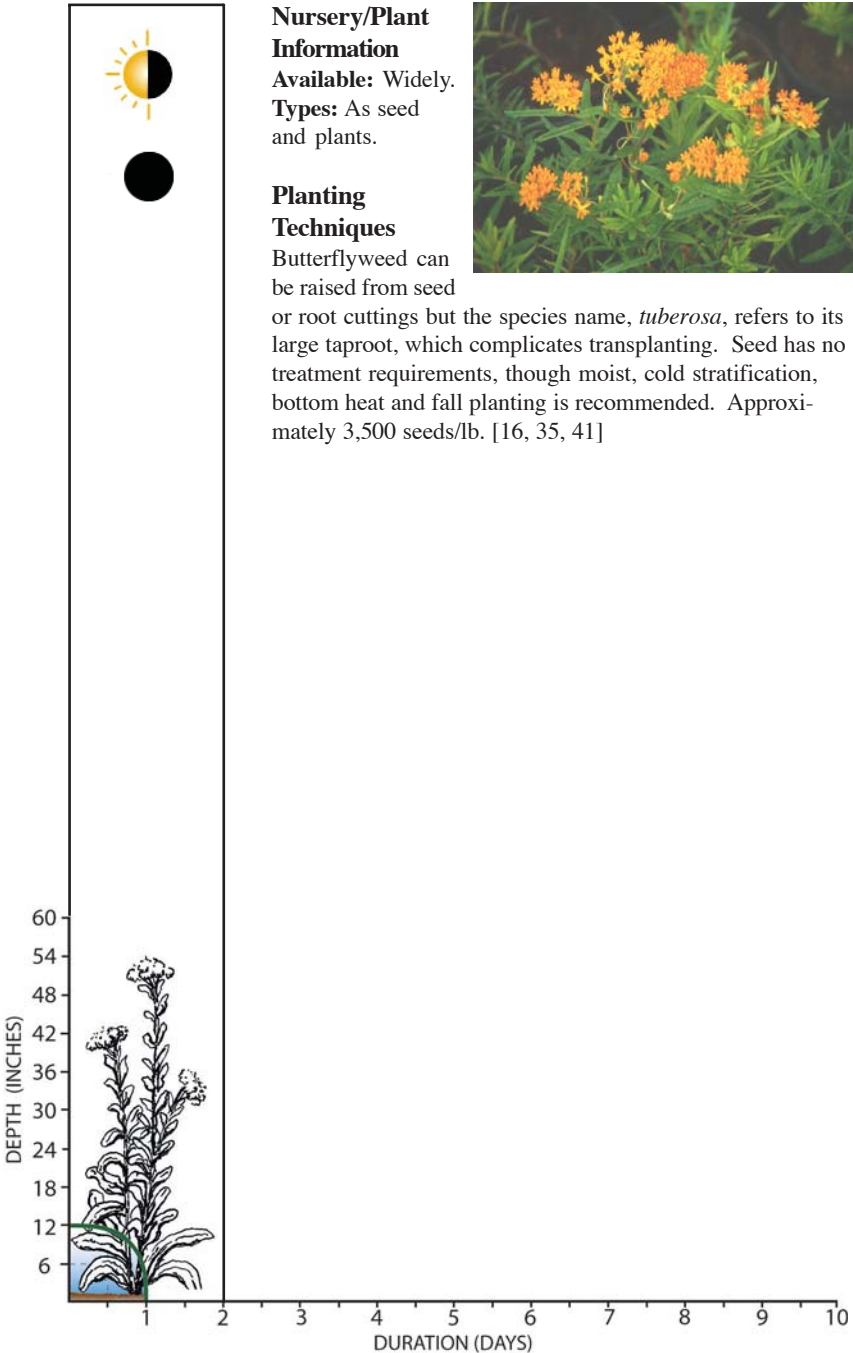
**Available:** Widely.  
**Types:** As seed and plants.



Photo: Jeff Shaw

### Planting Techniques

Butterflyweed can be raised from seed or root cuttings but the species name, *tuberosa*, refers to its large taproot, which complicates transplanting. Seed has no treatment requirements, though moist, cold stratification, bottom heat and fall planting is recommended. Approximately 3,500 seeds/lb. [16, 35, 41]





## *Aster laevis*

**Smooth Aster - a.k.a Smooth Blue Aster**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** A beautiful aster of mesic open or brushy places such as prairies, savannas, woodlands, swales and roadsides. [16, 17, 35] **Range:** All but ne. Minn. (Eco-Region: All), Wis., Mich. Mass., N.Y., s. Ont., s. Man. to Alaska, s. to N.D., S.D., Iowa, Mo., Tenn.; n. to Ohio, Pa., R.I. [7, 21]

### **Description**

**General:** A showy, vibrant blue-flowered perennial herb that has a mature height of 2-4'. **Flower:** Color is lavender-blue, blooms from August to October. The flowers are 1" across with 15 to 25 rays. **Leaf:** Blue-green, thick leaves that clasp the stem throughout the plant. **Stem:** Upright, single stem. **Fruit:** Light brown achene at the end of autumn. **Root:** Fibrous, shallow. **Soil:** The pH range is 5.0 to 6.5, dry to mesic soil. [17, 35, 44, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to dry conditions. [21, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 12". **Duration:** Short – 1 day (decreases 6" every 12 hours). Smooth aster can tolerate wet conditions for short durations and seasonal inundation. [1, 44]

### **Sensitivities or Other Tolerances:**

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Low to moderate. **Insect:** Infrequent. [1, 44, 47]

### **Design Considerations**

Smooth blue aster is well suited for upland slope buffer stabilization, vegetated swales, rainwater gardens and stormwater runoff situations that drain well. It is also good in landscaping situations for butterflies, cut flowers and birds. **Concerns:** The plant is aggressive, which is favorable for some restorations. Several cultivated varieties exist. [16, 35, 44]

### **Wildlife Use**

This aster attracts the orange sulphur butterfly. [21, 32, 44]

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Seeds and plants. Several cultivars exist.

### **Planting Techniques**

Smooth aster is easily propagated from seed. No germination treatments are needed. Seed should be stored dry and cool. Cuttings can be rooted, and this species self sows well. Seeding rate is 0.02-0.125 lb/acre and approximately 768,000 seeds/lb. [16, 44]



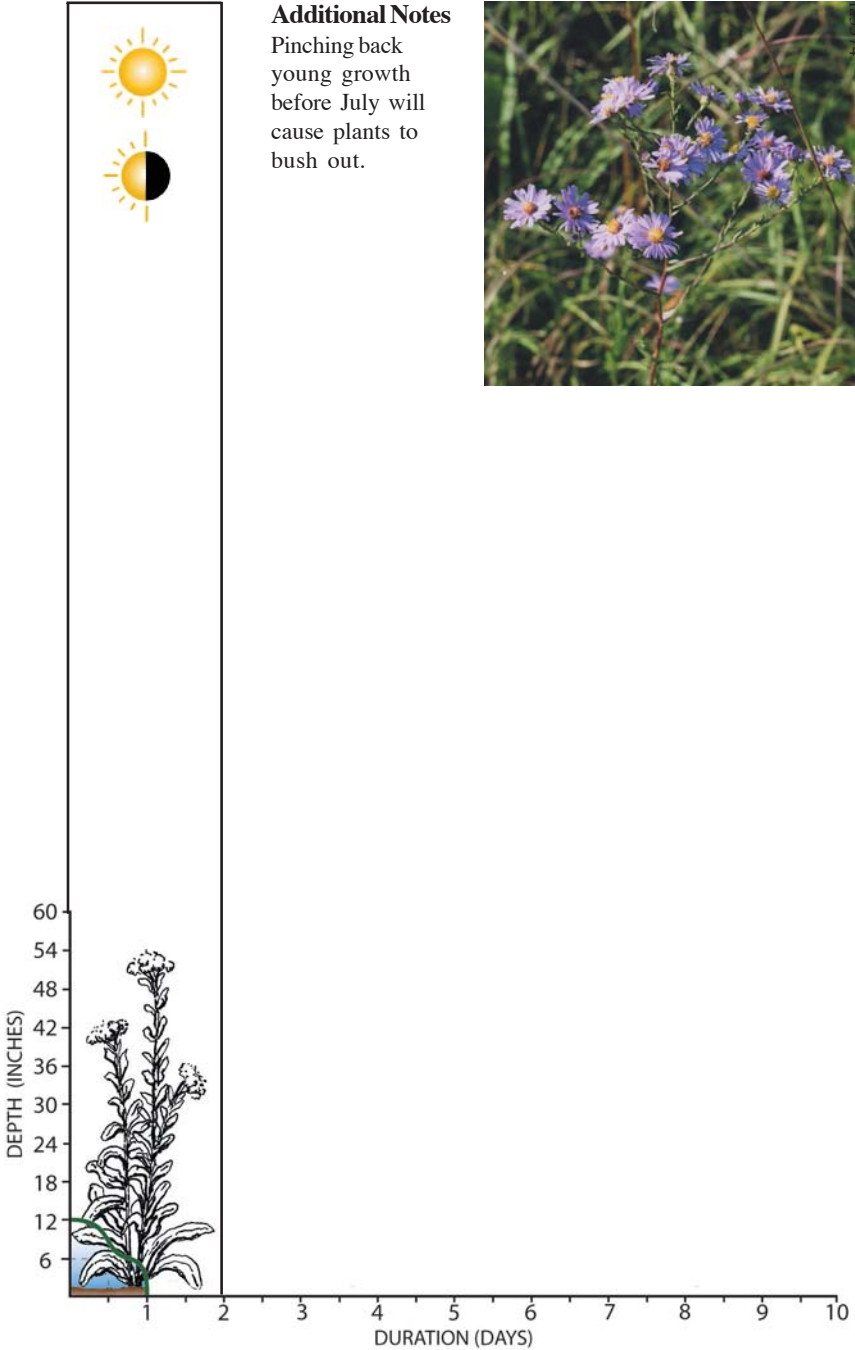
Indicator Status: UPL

**Additional Notes**

Pinching back young growth before July will cause plants to bush out.



Photo: www.calia2.uinn.edu/





## *Aster lanceolatus (simplex)*

Panicle Aster - a.k.a. *Aster simplex* – White Panicle, Marsh or Eastern Lined Aster

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Panicled aster is one of our more common asters found in drier, open marshes, wet meadows, sedge meadows, fens, swamp openings, low prairies, old fields, stream banks and shores. [7, 11, 16, 35] **Range:** Minn. (Eco-Region: All), Wis., Mich. N.S. to N.D., s. to Va. and Tex. [7, 21]

### Description

**General:** This large, stout, perennial herb has a mature height of 2-4" and may form dense colonies. **Flower:** Flowers are about  $\frac{3}{4}$ " wide with 20 or more white rays, usually blooming from August to October. The inflorescence is leafy and forms a panicle. Although similar to the redstem and swamp asters (*A. puniceus* and *A. lucidulus*) the ray flowers of white panicle aster are always white and smaller. **Leaf:** Stem leaves are sessile or slightly clasping. Leaf undersides are smooth with the exception of occasional small hairs along the margins. Leaves are mostly serrate, longer than wide. **Stem:** Large, stout plant producing multiple branches toward the top. **Fruit:** Light brown achene maturing at the end of fall. **Root:** Forming colonies from long rhizomes. **Soil:** Prefers moist to saturated soils. [7, 11, 35, 44, 47]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21, 44]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 24". **Duration:** Medium long – 4 days (decreasing 6" daily). Panicled aster seedlings are killed by 2 days of inundation, though mature plants tolerate shallow flooding for short periods. This aster has a better tolerance to inundation than New England aster and is moderately to somewhat tolerant to flood duration. [1, 44]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low to moderate. **Nutrient:** Low to moderate. **Siltation:** High. **Insect:** Infrequent. **Other:** This species is moderately tolerant to general disturbance and stress. [1, 44, 47]

### Design Considerations

Panicled aster is used well in the upper shoreline zone and for slope buffer stabilization. It also does well in vegetated swales and restorations. It is used for cutflowers and attracts butterflies. This species will work well in infiltration basins and rain gardens. **Concerns:** Can be very weedy and aggressive, though this may be a benefit against other invaders in restorations. [16, 44]

### Wildlife Use

This aster provides waterfowl cover and will attract butterflies and bees. [21, 32, 44]

Indicator Status: FACW

### Nursery/Plant Information

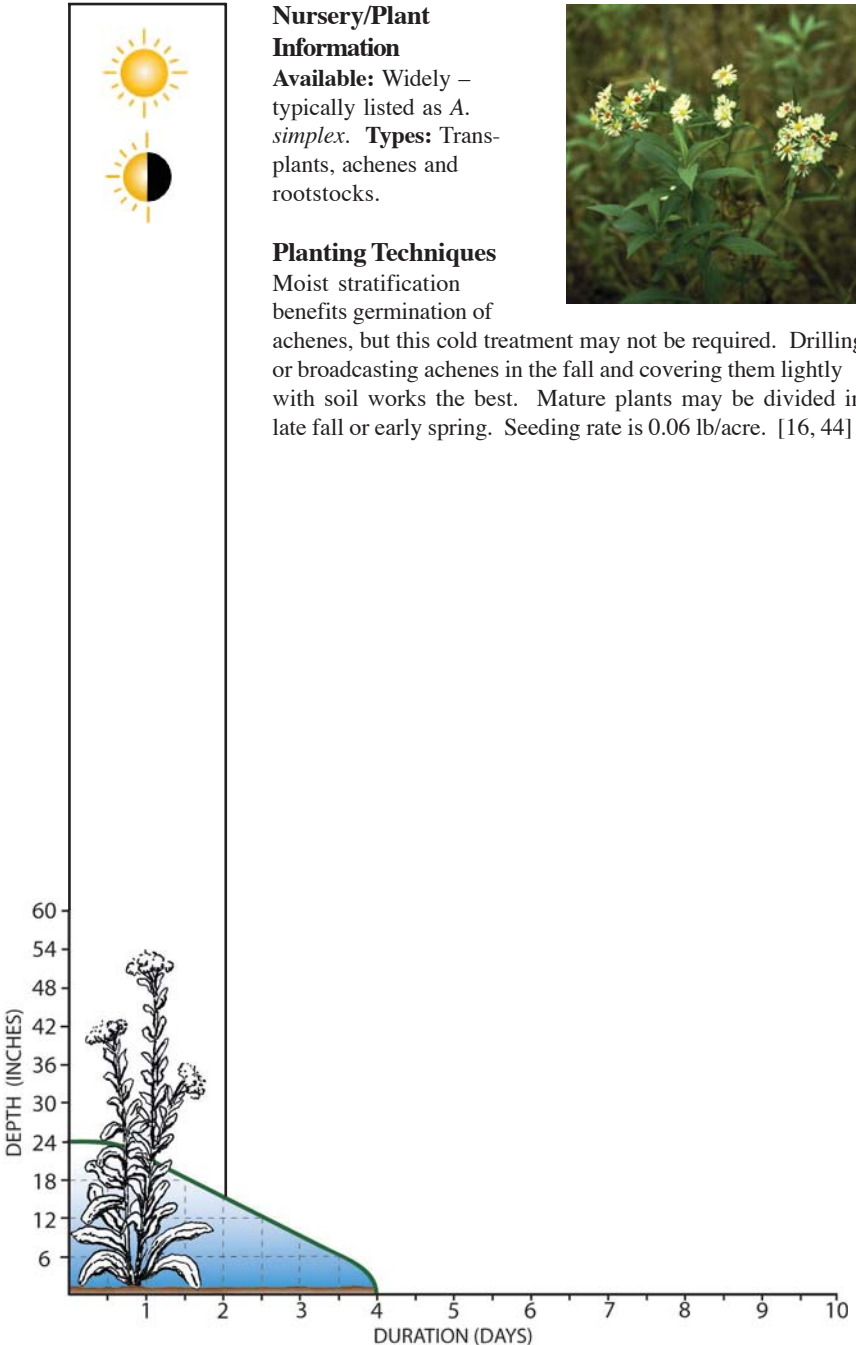
**Available:** Widely – typically listed as *A. simplex*. **Types:** Transplants, achenes and rootstocks.

### Planting Techniques

Moist stratification benefits germination of achenes, but this cold treatment may not be required. Drilling or broadcasting achenes in the fall and covering them lightly with soil works the best. Mature plants may be divided in late fall or early spring. Seeding rate is 0.06 lb/acre. [16, 44]



Photo: MNDNR





## *Aster lucidulus*

Swamp Aster - a.k.a. Shining Aster

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** One of the more common wetland asters, found in swamps, stream banks, shores, sedge meadows, calcareous fens, marshes, thickets, roadsides and ditches. This aster sometimes forms large colonies and seems to respond to disturbances, such as grazing and drainage by increasing or spreading. [7, 11]

**Range:** Minn. (Eco-Region: All), Wis., Mich., w. N.Y. to Minn. and S.D., s. to W.Va. and s. Mo. [7]

### **Description**

**General:** Swamp aster is a colonial, perennial herb, which may grow 15"-8' tall.

**Flower:** The inflorescence may be hairy or smooth, but does not have glands. Ray flowers are usually pale blue to lavender and bloom from August to October.

**Leaf:** Stem leaves are lobed at the base and clasp the stem. They are conspicuously crowded, especially toward the inflorescence. **Stem:** Green stems with mahogany marks at the nodes, or streaked. The stems are smooth to sparingly covered with stiff, straight hair. **Fruit:** Hairy achenes. **Root:** Long, creeping rhizomes.

**Soil:** Prefers moist-to-saturated soil. [7, 11, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to wet/saturated conditions.

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 18". **Duration:** Long – 5 days (decreasing 6" the first day and 12" over the next 4 days).

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun to part shade. **Salt:** Low. **Nutrient:** Unknown.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** Swamp aster has low tolerance to general disturbance and stress. [46]

### **Design Considerations**

Swamp aster is useful in the wet meadow zone and for slope buffer stabilization. It does well in vegetated swales and restorations and infiltration basins.

**Concerns:** Swamp aster can be aggressive and form monocultures in grazing- and drainage-disturbed areas.

### **Wildlife Use**

This aster provides waterfowl cover and will attract butterflies and bees. [32]

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Seed only.

Indicator Status: FACW+

### Planting Techniques

Swamp aster is easily propagated from seed. No germination treatments are needed. Seed should be stored dry and cool.

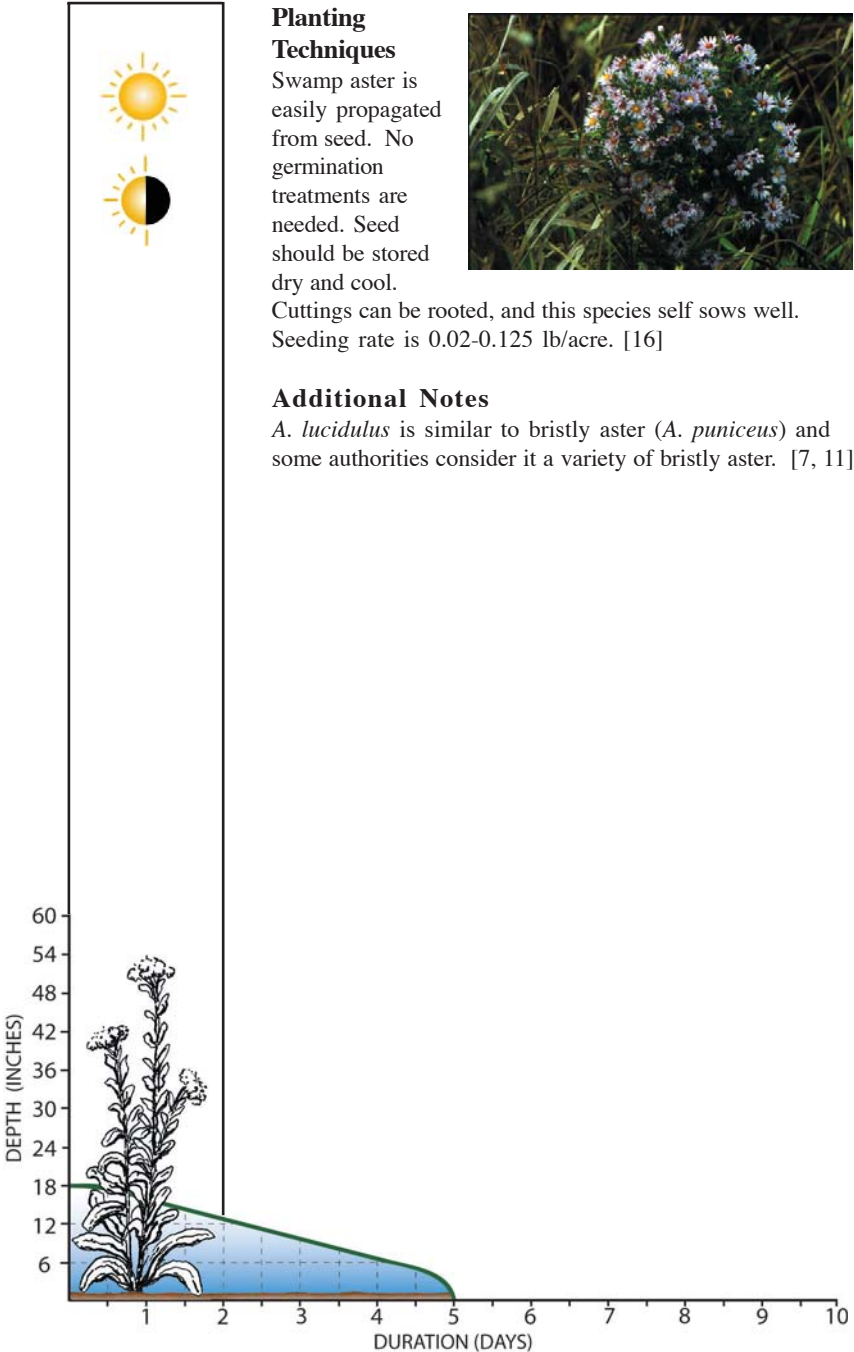
Cuttings can be rooted, and this species self sows well. Seeding rate is 0.02-0.125 lb/acre. [16]



Photo: Paul Jackson

### Additional Notes

*A. lucidulus* is similar to bristly aster (*A. puniceus*) and some authorities consider it a variety of bristly aster. [7, 11]





## *Aster macrophyllus*

**Bigleaf Aster - a.k.a Large Leaf Aster**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** One of the more common asters found in northern forests, a common groundcover in dry, shady savannas, woodlands and forests. May form a ground cover. [17, 35, 41] **Range:** Throughout northern upland forests of Minn. (Eco-Region: 1, 2, 5-8), Wis., Mich. N.S., N.B. and Que. to Wis., Minn. and se. Man., s. to Pa. and Ky., and in the mountains of Ga. [17, 21]

### **Description**

**General:** Native perennial, with a height of 8-18". Only a few plants send up flower stalks each year. **Flower:** Inflouescence is a loose cluster of lilac-to-purple flowers with yellow anthers that turn red with age. Blooms from Aug. to Oct. **Leaf:** Basal leaves are broad heart-shaped; coarsely toothed and rough to the touch, 4-8" long, that are deeply notched where they attach to the stalk. **Stem:** Long flowering stems, 1-2' tall, which are sticky to the touch because of miniature glands. **Fruit:** Light brown achene at the end of the growing season. **Root:** Rhizomes. **Soil:** All soil types. [17, 35, 41, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to dry conditions and is usually an indicator of the upland side of wetland boundaries. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Low. **Depth:** 12". **Duration:** Short – 1 day (decreasing all 12" in 1 day). This species is somewhat tolerant to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun to shade. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Low. **Insect:** Infrequent. [1, 47]

### **Design Considerations**

Bigleaf aster is a great groundcover for shaded slopes or dry, shaded edges of rainwater gardens, forested wetlands or upland buffers. **Concerns:** This species can be aggressive and form monocultures within the groundcover of the forest floor. [21]

### **Wildlife Use**

This aster provides cover and nesting habitat for songbirds of the forest floor. [21, 32]

### **Nursery/Plant Information**

**Available:** Limited. **Types:** Only as plants.

### **Planting Techniques**

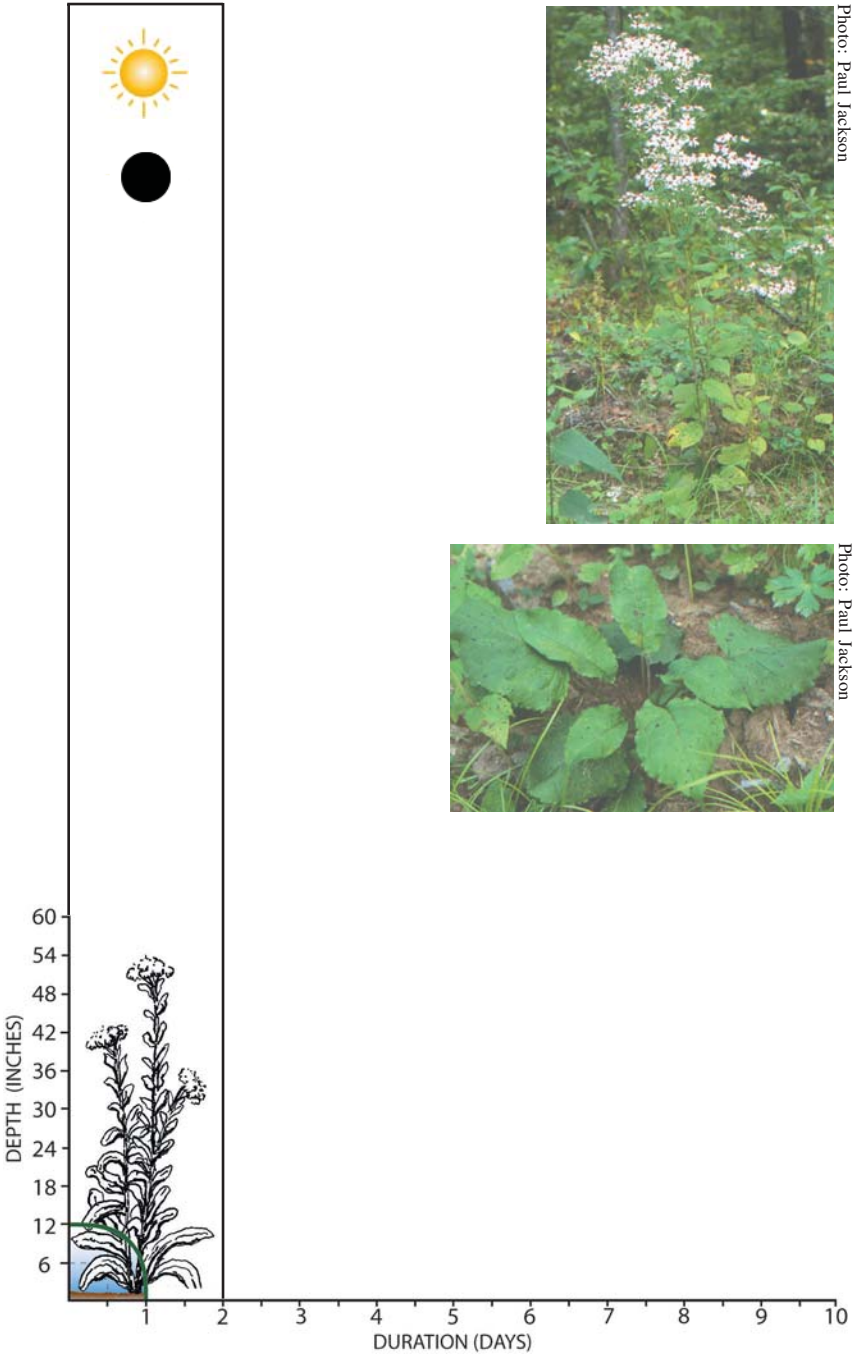
Plant containerized plants in spring or fall.

**Indicator Status: UPL**

Photo: Paul Jackson



Photo: Paul Jackson







# *Aster novae-angliae*

New England Aster - a.k.a. False Indigo

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet meadow, low prairie, shores, thickets, calcareous fens, and roadsides, usually in moist or wet, open areas. This species is a common aster of wet to wet-mesic prairies. [7, 11, 16, 35, 41] **Range:** Mostly w. and s. Minn. (Eco-Region: 3-9); Wis., especially s. LP of Mich.; Mass. to N.D. and Wyo., s. to Ala., Okla. and N.M. [7, 21]

## Description

**General:** A native, perennial herb with clustered stems reaching 1-6½', which is easily grown and makes a robust, colorful garden plant. **Flower:** Individual flowers, flower stalks and modified leaves subtending the flowers have hairy glands. The ray flower is very variable in color, from amethyst to rosy, rarely blue or white. The distinctive disc flower is yellow. The flower heads are 1-2" wide and bloom from late summer until frost. **Leaf:** Bases of the oblong (lance-shaped) stem leaves are clasping and entire, while the lower leaves tend to be deciduous. **Stem:** Usually clumped and much branched and often covered with glandular hairs (use a 10-15X lens). **Fruit:** The achenes are densely covered with stiff hairs. **Root:** A short rhizome or crown. **Soil:** Moist to wet habitats with a pH range of 5.5-7.0. [7, 11, 35, 41, 44]

## Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21, 37]

## Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 24". **Duration:** Moderate short – 3 days (decreasing 1' in the first day and 6" the following 2 days). Germinating seedlings are killed within 2 days of inundation. Mature plants appear to be more tolerant of short periods of shallow flooding in natural areas but not in reconstructed wet areas. [1, 37, 44]

## Sensitivities or Other Tolerances

**Exposure:** Full to partial sun. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** High. **Insect:** Infrequent. **Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1, 37, 44, 45, 47]

## Design Considerations

New England aster is a good soil stabilizer for prairies, shorelines and upland buffer areas. It is often a garden perennial of cultivated varieties. It provides good cut flowers and is very good for lakeside plantings. It is also a good butterfly plant. Slight disturbances often benefit this aster. **Concerns:** This species can be aggressive and form monocultures. It spreads by seed. Many cultivars exist. [16, 21, 35, 41, 44]

## Wildlife Use

This aster provides waterfowl cover. A great nectar source because of its long bloom time in autumn, during which it is heavily visited by migrating monarch butterflies. [21, 32, 41, 44]

Indicator Status: FACW

### Nursery/Plant Information

**Available:** Widely; often a garden perennial with a white variety.

**Types:** Transplants, seed and rootstocks.

### Planting Techniques

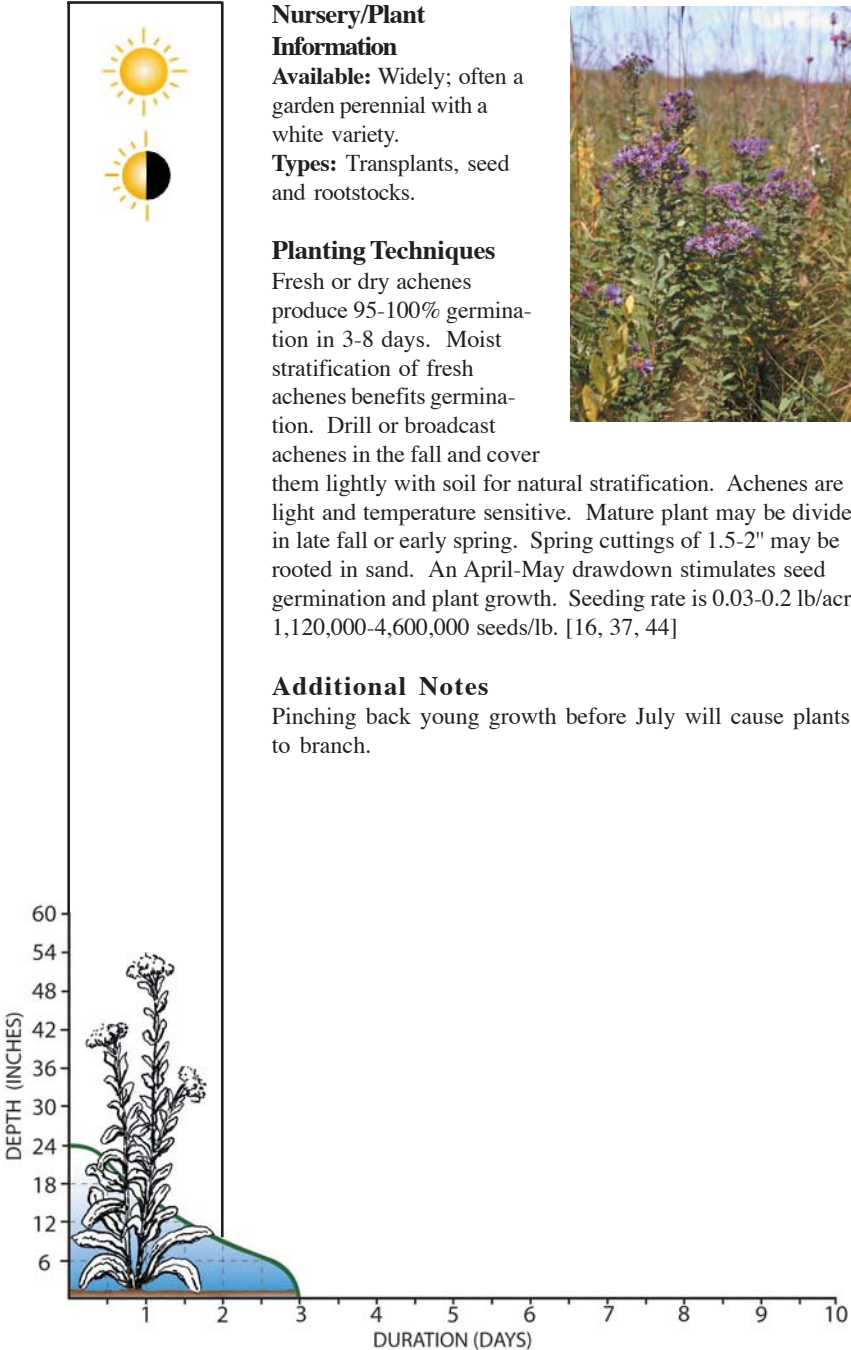
Fresh or dry achenes produce 95-100% germination in 3-8 days. Moist stratification of fresh achenes benefits germination. Drill or broadcast achenes in the fall and cover them lightly with soil for natural stratification. Achenes are light and temperature sensitive. Mature plant may be divided in late fall or early spring. Spring cuttings of 1.5-2" may be rooted in sand. An April-May drawdown stimulates seed germination and plant growth. Seeding rate is 0.03-0.2 lb/acre. 1,120,000-4,600,000 seeds/lb. [16, 37, 44]

### Additional Notes

Pinching back young growth before July will cause plants to branch.



Photo: Paul Jackson





## *Aster pilosus*

Frost Aster - a.k.a. Hairy Aster, White Oldfield Aster

### Habitat/Plant Community & Geographic Range

**Habitat/Community:** Sandy and gravelly shores, interdunal swales, wet meadows, widely adapted to prairie habitats and moist-to-wet marshes. This species is often in calcium-rich soil, and may become weedy in disturbed fields and roadsides. [7, 16]

**Range:** Se. Minn. (Eco-Region: 7-8), Wis., Mich.; N.S. to s. Minn. and Neb., s. to n. Fla., La. and Kan. [7]

### General Description

**General:** Frost aster is a spreading perennial herb, from a large crown that grows between 16-24". **Flower:** This species has green-tipped, white ray flowers and yellow disc flowers that bloom from August to November. **Leaf:** Alternate, basal and lower leaves oblong lance-shaped, with stalks that soon are deciduous. The upper leaves are smaller, linear, stalkless. Leaf margins are entire or slightly toothed and the petioles are fringed with hairs. **Stem:** Sometimes smooth or stems and leaves with spreading hairs. **Fruit:** An achene; pappus white. **Root:** Fibrous, shallow. **Soil:** Widely adapted to moist-to-wet soils. [7, 16, 17, 47]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions.

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). This species is somewhat tolerant to flood duration. [1]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Low to moderate.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1, 47]

### Design Considerations

Frost aster makes wonderful cutflowers and is a good nectar source with strong tolerance to sandy and gravel soil types. **Concerns:** Aggressively self-seeds. May become weedy in disturbed sites though it may be used beneficially in restorations to defend against invasive plants. [16]

### Wildlife Use

This aster provides waterfowl cover and will attract butterflies and bees. [7, 32]

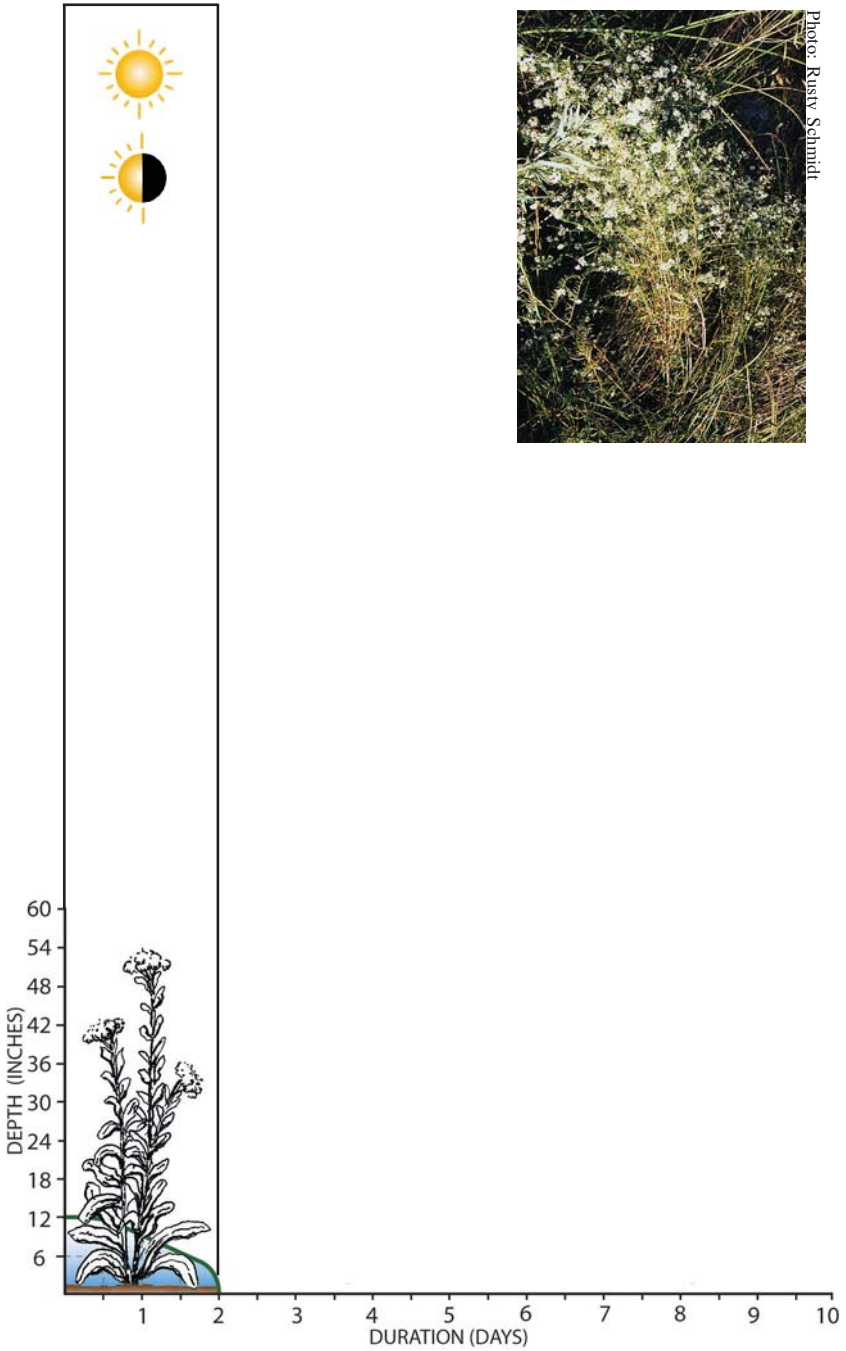
### Nursery/Plant Information

**Available:** Limited. **Types:** Plants only.

### Planting Techniques

Achenes should be kept in dry storage before planting. [16]

**Indicator Status: FACU+**





## *Aster puniceus*

**Red-stemmed Aster** - a.k.a. Purplestem, Red-stalked, Bristly or

Swamp Aster

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** A stout aster of open and brushy swamps, sedge meadows, shrub-carrs, alder thickets, calcareous fens, stream banks, shores and springs. [7, 11, 35] **Range:** Minn. (Eco-Region: 1–8), Wis., Mich.; Nfld. to N.D., s. to Ga., Ala., Ill. and Neb. [7, 21]

### **Description**

**General:** Large, perennial herb commonly 1-5' tall. **Flower:** The flower heads have pale blue to deep lavender or violet ray flowers and yellow disc flowers. This species blooms from August to October. The inflorescence is hairy or smooth, but does not have glands. **Leaf:** Stem leaves are lobed, clasping the stem, and usually toothed. The leaves are not conspicuously crowded. **Stem:** The stem is often reddish, with scattered coarse, stiff, white hairs. **Fruit:** Achenes are smooth. **Root:** Short rhizomes or crowns and sometimes has short stolons. **Soil:** Hardy and tolerant of wet soils. [7, 11, 35]

### **Normal Water Level**

This species prefers moist/mesic to wet/saturated conditions. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 18". **Duration:** Long – 5 days (decrease of 6" in the first day and then 12" in the next 4 days). This species has a moderate tolerance to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Low to moderate.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1]

### **Design Considerations**

Red-stemmed aster is used in wetland restorations as well as in restorations of shores and streams. Also consider this plant for stormwater detention areas. This species is a wonderful source of nectar. **Concerns:** Can be very weedy and aggressive, though this may be a benefit against other invaders for restorations. [16, 21]

### **Wildlife Use**

This aster provides waterfowl cover and will attract butterflies and bees. [21, 32]

### **Nursery/Plant Information**

**Available:** Limited. **Types:** Seed and plants.

**Indicator Status: OBL**

**Planting Techniques**

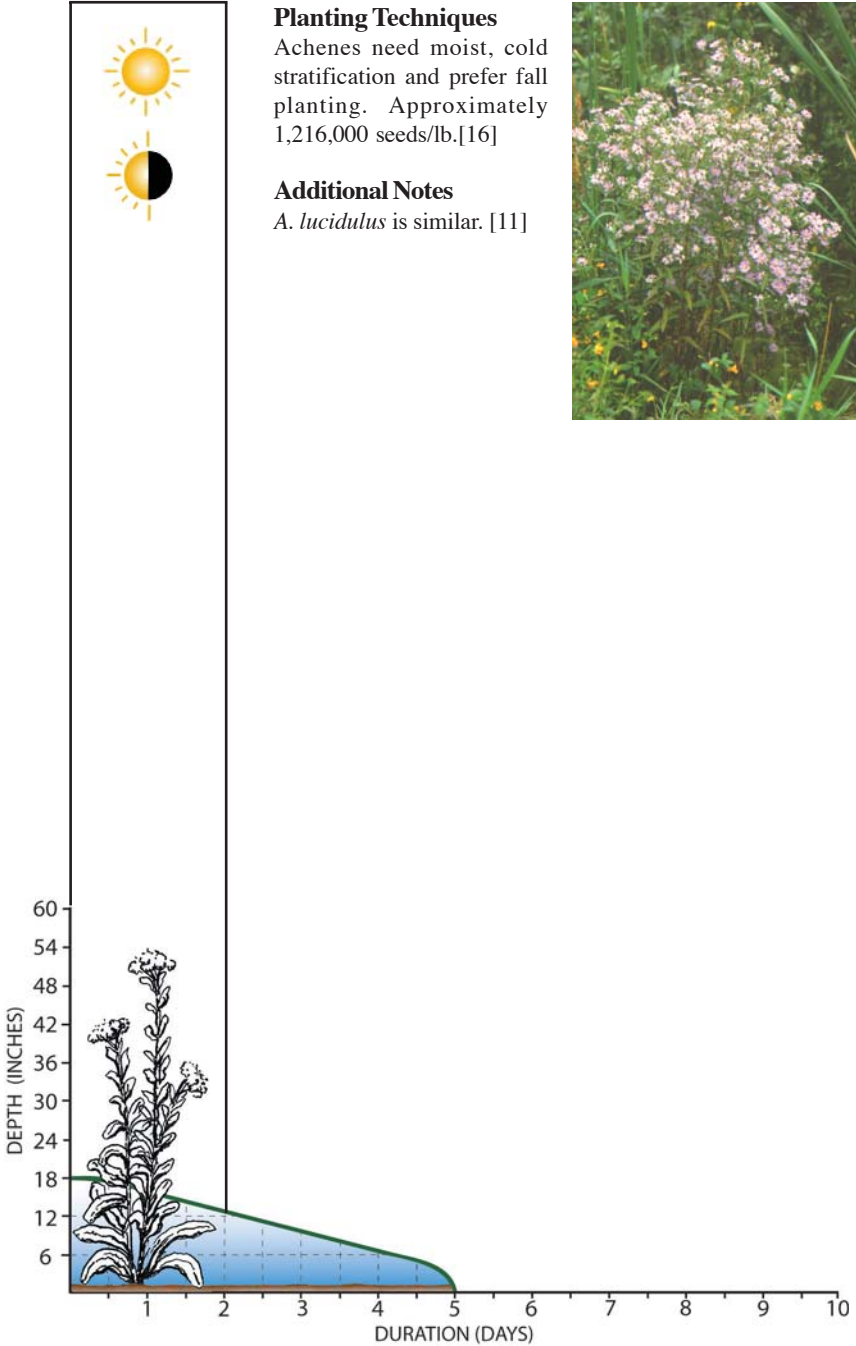
Achenes need moist, cold stratification and prefer fall planting. Approximately 1,216,000 seeds/lb.[16]

**Additional Notes**

*A. lucidulus* is similar. [11]



Photo: Paul Jackson





# *Athyrium felix-femina*

Lady Fern - a.k.a. *Athyrium angustum*

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Moist, rich soils of forests, wooded swamps and a dominant fern in midwestern woodlands. [17] **Range:** Minn. (Eco-Region: All), Wis., Mich.; N.S. and N.B. to Ont., Minn.; s. to Ga., La. and Okla. [17, 21]

## Description

**General:** A perennial, native fern that may grow to 36". **Leaf:** Lady fern is a vigorous, semi-spreading fern with lime-green, lacy, cut fronds. **Fruit:** Light brown spore in August. **Root:** Rhizome, short-creeping to suberect. **Soil:** Moist, rich soils of forests. [17, 21, 47]

## Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21]

## Flooding/Fluctuation Tolerances

**Frequency:** Low. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). This species is moderately tolerant to flood duration. [1]

## Sensitivities or Other Tolerances

**Exposure:** Part sun to full shade. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Low. **Insect:** Infrequent. **Other:** Sensitive to wind. This species has a moderate tolerance to general disturbance and stress. [1]

## Design Considerations

Lady Fern makes a very useful groundcover for shady restorations, gardens, rain water gardens and replacement for hostas to deter deer. This species is also a good indicator for wetland boundaries in northern woodlands. **Concerns:** Ferns are susceptible to excess wind and sun exposure. [21]

## Wildlife Use

Ferns are widespread, especially in moist woodlands. Yet as a wildlife food source, they are used only to a minor extent. Their leaves are eaten by deer, hares and grouse when other green plants are scarce. Ferns are a good cover plant for small mammals and songbirds. [21]

## Nursery/Plant Information

**Available:** Widely. **Types:** Available as plants or rhizomes.

## Planting Techniques

Plants or rhizomes should be planted in the spring or fall and adequately watered. Ripened spores can also be spread on top of exposed soil, but this technique is most successful under greenhouse conditions.



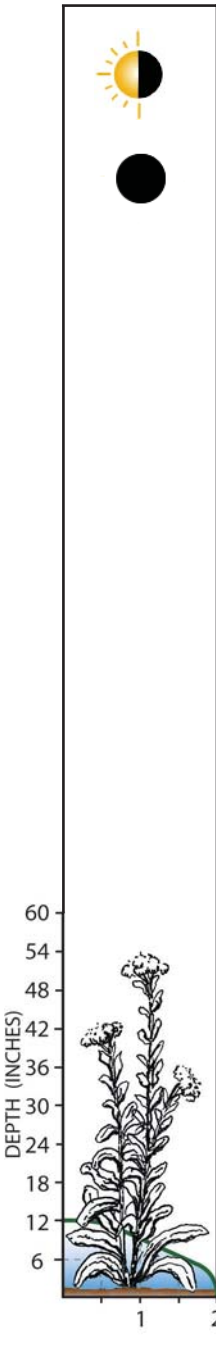
Indicator Status: FAC

**Additional Notes**

Lady fern is highly variable in its form.



Photo: Rusty Schmidt





## *Betula nigra*

River Birch - a.k.a. Red Birch, Black Birch

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Flood plain forest, river banks, swamps, lowland wet and wet mesic forests, ox-bows, lakes, swampy bottomlands and low, open sites of recent disturbance along streamsides. Its preferred germination sites are sandbars exposed after spring floods have receded or silty loam bottomlands. [7, 11, 22, 32, 36] **Range:** Se. along Mississippi River in Minn. (Eco-Region: 7), c. and s. Wis., Mich.; N.H. to Ohio and s. Minn., s. to Fla. and Tex. [7, 21]

### Description

**General:** Medium-sized tree that may grow to a mature height of 50–75' and width of 35–40'. Can grow 20–30' in 10 years. Often slightly leaning and forked tree with irregular, rounded, spreading crown. **Flower:** Male yellowish, with 3 stamens, many in long, drooping catkins near tip of twigs. Female greenish, in short, upright catkins back of tip of same twig during April and May. **Leaf:** Alternate, simple, deltoid-to-wedge-shaped that is doubly serrated. Shiny, dark-green above, whitish and usually hairy beneath; turning dull yellow in autumn. **Bark:** Cinnamon-to-reddish, papery, horizontal exfoliation, blocky scales at base; adult trunks, red-brown to black, becoming thick, fissured and shaggy. **Twigs:** Cherry-like, with conspicuous, horizontal striped lenticels. **Bud:** Stalked, woolly through summer, small, just a bit over ½", light chestnut brown. **Fruit:** Oblong elliptic strobiles, erect, medium green becoming tan-brown at maturity. Cones are 1-½" long; cylindrical, brownish, upright, short-stalked, with many hairy scales and hairy, 2-winged nutlets; maturing in late spring or early summer. **Root:** Shallow, fibrous, wide-spreading roots. **Soil:** Tolerates most soils, including fine, heavy clays that are poor to moderately well drained; prefers wet-to-average moisture, acid soils, pH 6.5 or lower. [7, 8, 11, 22, 36]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [8, 21, 36, 37]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 60". **Duration:** Long – 5 days (prefers a rapid water decrease of 12"/day). This species can survive dry summer/fall seasons and can tolerate seasonal or irregularly inundated-to-saturated conditions. Seedlings somewhat tolerate flood duration and flood depth increases, while adults have a moderate tolerance. [1, 8, 22, 37]

### Sensitivities or Other Tolerances

**Exposure:** Full sun to part shade. **Salt:** Low. **Nutrient:** Moderate.

**Siltation:** Moderate. **Insect:** Infrequent: unlike other birch species not susceptible to bronze birch borer. **Other:** Sensitive to 2,4-D and to lighting. Resistant to drought/heat. Resistant to mine spoils and soil compaction. This species has a moderate tolerance to oil/grease and metals. It has a moderate tolerance for general disturbance, from which seedlings decrease in abundance. [1, 8, 22, 37, 47]

### Design Considerations

River birch is well suited for bank stabilization, shoreland and floodplain restorations on mesic-to-wet soils. Its ability to thrive on moist sites makes it useful for erosion control and rain gardens. This species is long lived and fairly disease resistant. It is used in yards and landscape designs.

## Indicator Status: FACW

**Concerns:** This tree can be messy in manicured gardens because of its many drooping branches and because its weak wood is easily damaged by wind and ice. [6, 36]

### Wildlife Use

Wildlife that benefit are songbirds (especially cavity nesters, redpolls and siskins) and waterfowl. This species provides seeds for upland gamebirds (sharp-tailed, ruffed and spruce grouse) and songbirds. Moose and white-tailed deer eat the twigs and foliage, and beavers, hares and porcupines eat various other parts. [6, 21, 22, 37]

### Nursery/Plant Information

**Available:** Widely. **Types:** Balled-and-burlapped, bareroot and potted stock.

### Planting Techniques

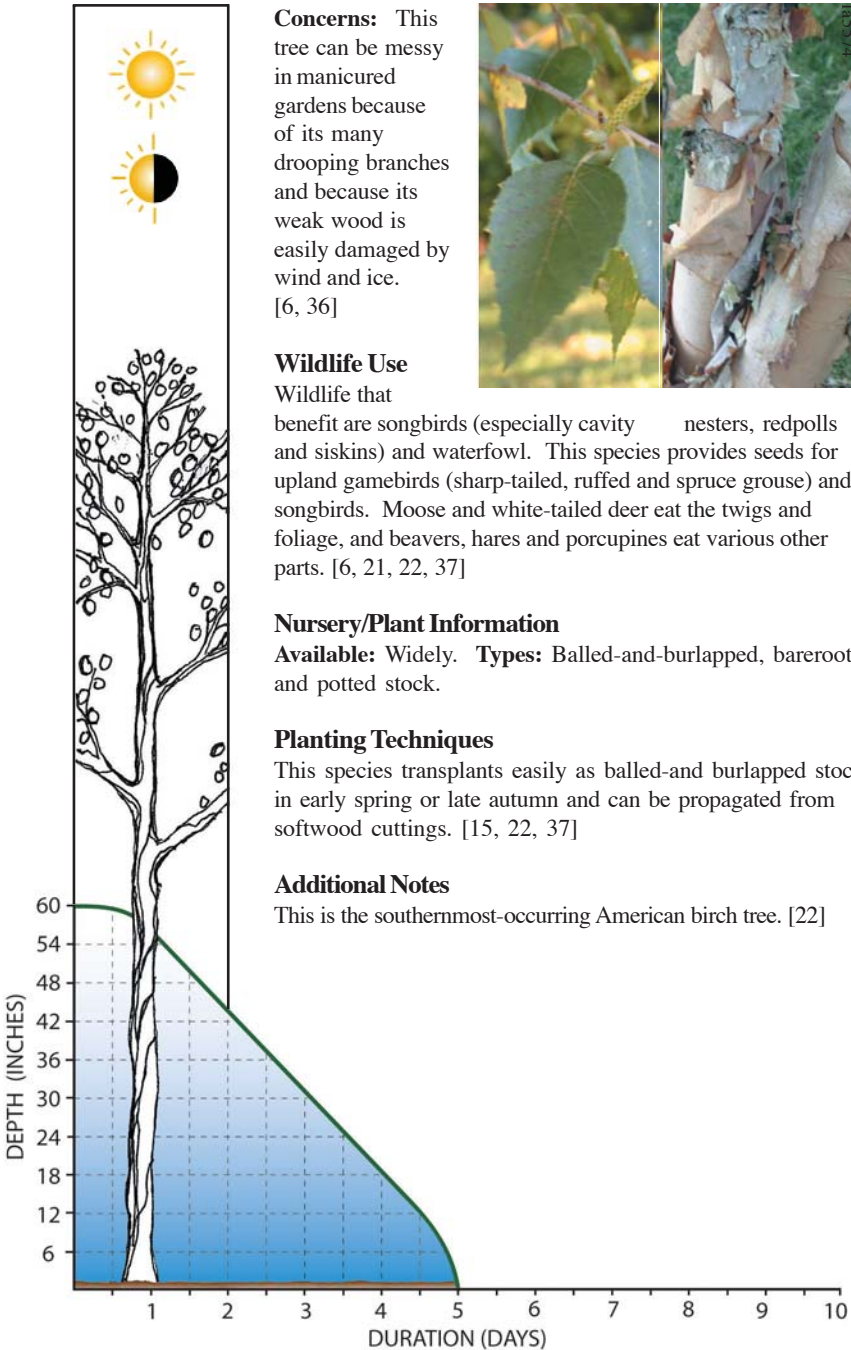
This species transplants easily as balled-and burlapped stock in early spring or late autumn and can be propagated from softwood cuttings. [15, 22, 37]

### Additional Notes

This is the southernmost-occurring American birch tree. [22]



Photos: www.cala2.umn.edu/





## *Bidens cernua*

**Beggarsticks** – *a.k.a.* **Nodding Beggarsticks, Bur Marigold, Stick-tight, Nodding Bur-Marigold**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Exposed, sandy or muddy shores, streambanks, marshes, forest depressions, wet meadows, ditches, pond margins and other wet places. [7, 11, 32, 35]

**Range:** Minn. (Eco-Range: all), Wis., Mich. N.B. to B.C., s. to N.C., Okla., N.M. and Calif.; Eurasia. [7].

### **General Description**

**General:** Annual species. Mature height is 4" to 3.3'. **Flower:** Small, yellow, sunflowerlike heads from August to October. **Fruit:** The elongate achenes end in 2-4 barbed awns which stick tightly to clothing and fur. The flower heads nod as seeds ripen. **Leaf:** Bases of the opposite simple, sessile, leaves are often joined. **Soils:** Wet soils of a variety of textures. [7, 11, 35, 44]

### **Normal Water Level**

This species prefers moist/mesic conditions. [44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 24". **Duration:** Medium-long – 4 days (decreasing 6"/day). Species tolerates seasonally flooded conditions for short duration and decreases in abundance as flood depth increases or decreases. Do not submerge young plants for more than 2 or 3 days in 1-2" of water. Mature plants have a tolerance for water level fluctuation, flood duration, and this species thrives in conditions similar to *Aster lanceolatus*. [1, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun. **Salt:** Low to moderate. **Nutrient:** Moderate, though *B. cernua* is intolerant to P levels decreasing. **Siltation:** Moderate to high. **Insect:** Infrequent.

**Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1, 44, 47]

### **Design Considerations**

Beggarsticks is used in upper shoreline zones and in vegetated swales. A good pioneer species. Well suited for restorations of all wet, disturbed areas and urban conditions. This species may be in the seed bank and respond well to drawdowns. **Concerns:** This genus is considered a nuisance for walkers when the seeds are ripe. It is short-lived. [26, 42, 44]

### **Wildlife Use**

Provides wildlife cover. Waterfowl (especially wood duck), shorebirds, songbirds, and small mammals consume achenes. [32, 44]

### **Nursery/Plant Information**

**Available:** Limited. **Types:** Plants and achenes.

**Indicator Status:** OBL (*B.cernua*)

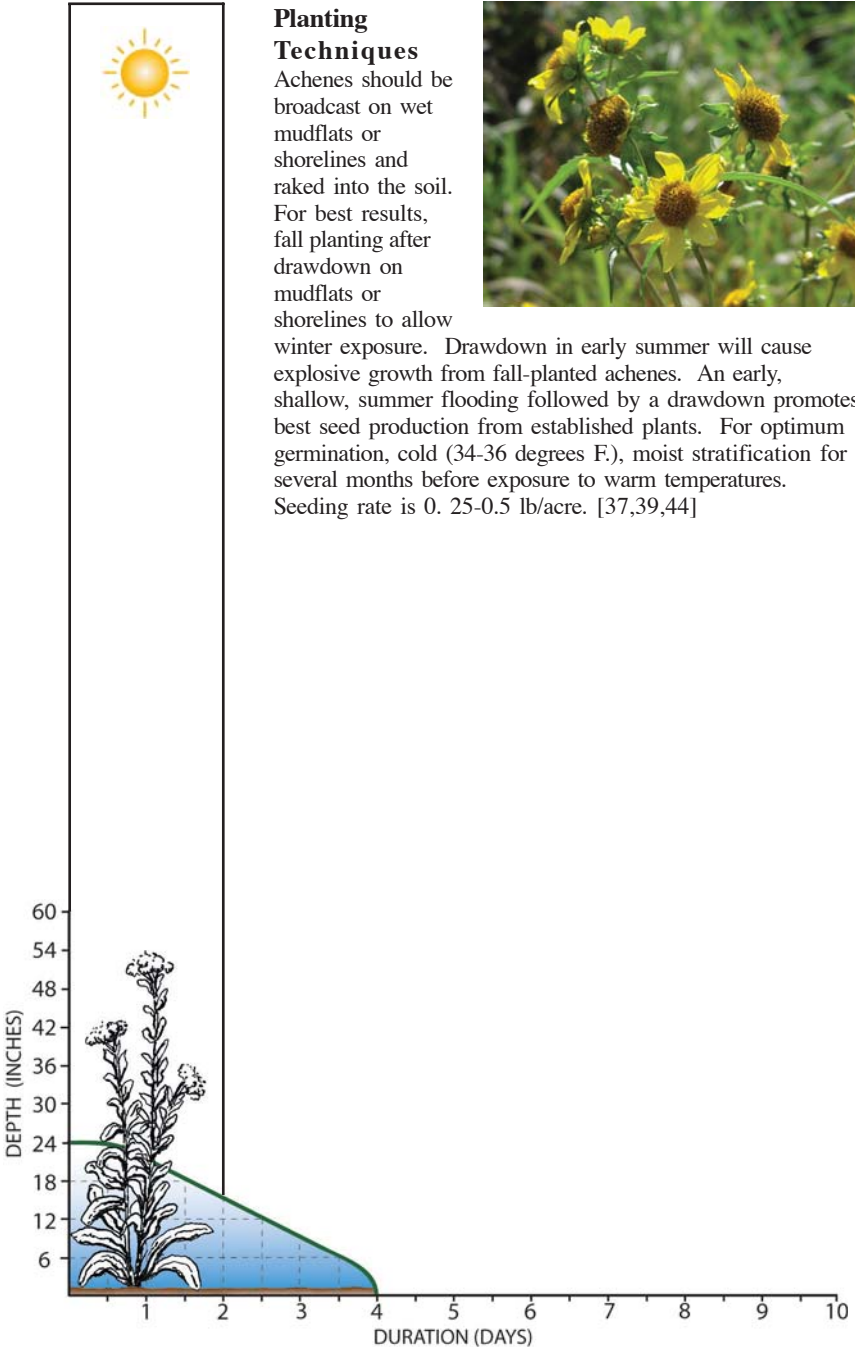
### Planting Techniques

Achenes should be broadcast on wet mudflats or shorelines and raked into the soil. For best results, fall planting after drawdown on mudflats or shorelines to allow

winter exposure. Drawdown in early summer will cause explosive growth from fall-planted achenes. An early, shallow, summer flooding followed by a drawdown promotes best seed production from established plants. For optimum germination, cold (34-36 degrees F.), moist stratification for several months before exposure to warm temperatures. Seeding rate is 0.25-0.5 lb/acre. [37,39,44]



Photo: Tony Randazzo





## *Boltonia asteroides*

**Boltonia** - a.k.a. White or Star Boltonia, White False Aster, False Aster

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Seasonally flooded, muddy shores, wet meadows, marshes, swamps, low or damp prairies, swales and edges of streams. [7, 35] **Range:** C. and s. Minn. (Eco-Range: 4, 7-9), s. Wis., extreme s. LP of Mich.; N.J. to s. Man., s. to Fla. and Tex.; introduced in nw. USA. [7, 21]

### Description

**General:** A robust, asterlike, perennial herb, which has branched stems, often in clumps and grows 3-5' tall. **Flower:** The heads are about 1" across, have yellow, hemispherical centers and narrow, usually white rays in the fall (August to October). **Leaf:** Broadly linear-to-lanceolate leaves that reduce towards the top. **Fruit:** Achenes differ from those of the asters and fleabanes by having no tuft of hairs at the end. **Root:** Fibrous-rooted, sometimes with shallow rhizomes. **Soil:** Moist-to-wet soils. [7, 35]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing 6"/day).

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Moderate. **Nutrient:** Unknown. **Siltation:** Unknown. **Insect:** Unknown. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 47]

### Design Considerations

*Boltonia* makes a great cutflower and attracts butterflies, which makes it a good plant for perennial gardens. It may do well in semi-shaded areas. **Concerns:** This plant grows tall and should be planted with other robust species. [35]

### Wildlife Use

This species is a bee and butterfly magnet. [21]

### Nursery/Plant Information

**Available:** Limited. **Types:** Plants primarily, although achenes are available.

### Planting Techniques

The species establishes readily from achenes. [21]



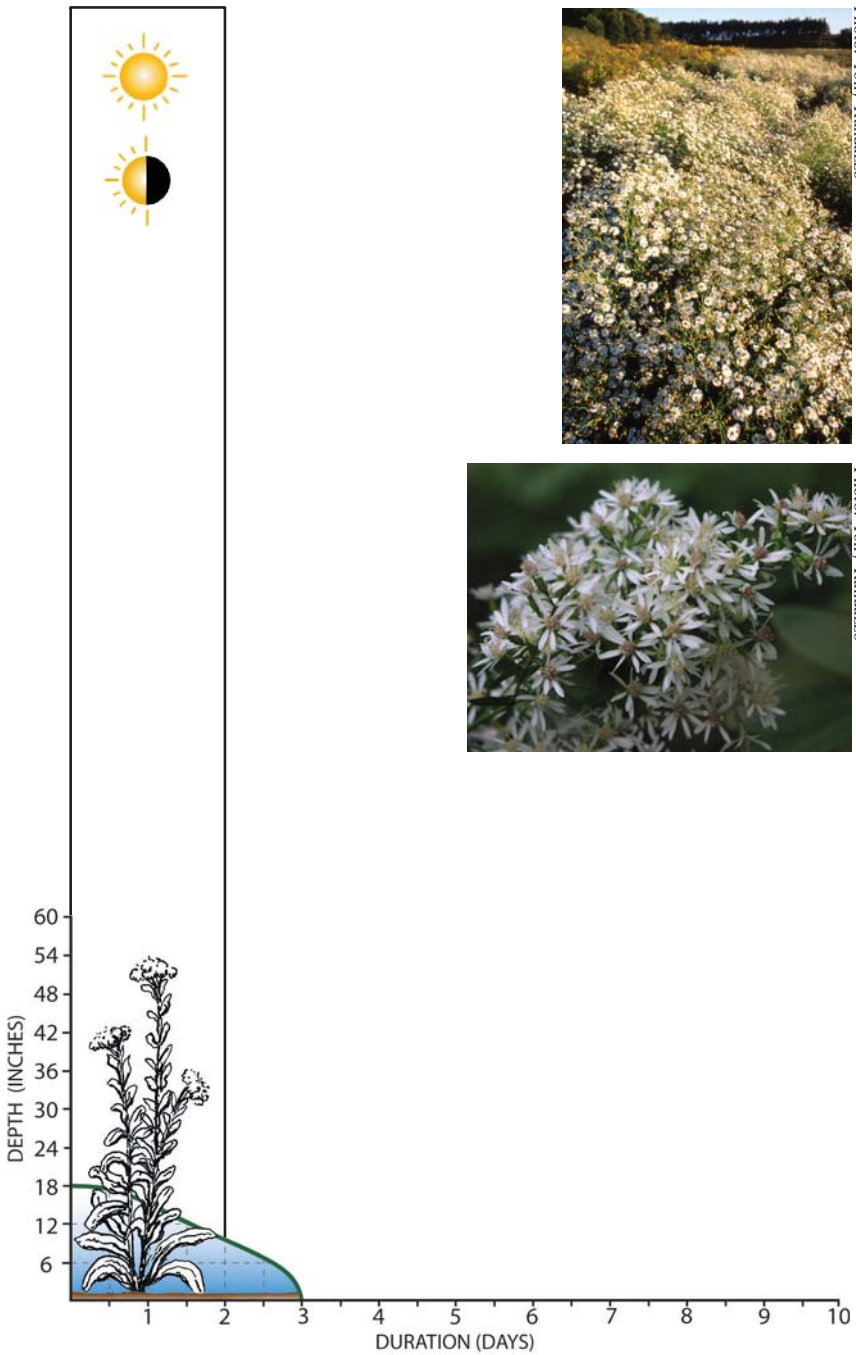
**Indicator Status: FACW**



Photo: Tony Randazzo



Photo: Tony Randazzo







## *Bromus ciliatus*

**Fringed Brome** a.k.a. *Bromus kalmii* - Fringed Brome-grass, Prairie Brome, Kalm's Brome, Wood Chess, Cheat

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Stream banks, shores, thickets, sedge meadows, fens, marshes, wet meadows and moist woods and thickets. This species is widely adapted to habitats from saturated wetland soils to mesic upland forests and roadsides. [7, 16, 21]

**Range:** All but sw. Minn. (Eco-Range: 1-6, 8), Wis., Mich.; Nfld. to Wash., s. to N.J., Tenn., Iowa, Tex. and Calif. [7, 21]

### **Description**

**General:** Cool-season, perennial grass that reaches 2-4' in height. It is a bunching, short-lived species. **Leaf:** Green, turning tan in autumn. **Flower:** Blooms June to July, often flowering first year. The inflorescences resemble those of wheat.

**Fruit:** Delicate, gracefully nodding caryopsis. **Root:** Fibrous. **Soil:** Saturated wetland soils to mesic upland forests and roadsides. [7, 16, 17, 47]

### **Normal Water Level**

This species prefers upland moist/mesic to wet/saturated conditions, although it is drought tolerant. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 18". **Duration:** Medium short – 3 days (decreasing 6"/day). This species is somewhat tolerant to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun to shade. **Salt:** Unknown. **Nutrient:** Low to moderate.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** Drought tolerant and moderate-to-low tolerance to general disturbance and stress. [1, 47]

### **Design Considerations**

A good restoration plant for shady sites as well as mesic-to-wet conditions. The seed head has dried flower uses. This species can be grown as a specimen or in small groups. **Concerns:** This species is not competitive with taller grasses.

### **Wildlife Use**

The good-sized seeds are eaten by a number of birds (grouse, partridges, lark sparrows, savannah sparrows and brown towhees) and rodents (chipmunks, gophers, ground squirrels, mice and prairie dogs). Hoofed browsers and geese consume the leaves or other parts of the plant, especially when young. [32]

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Seed.

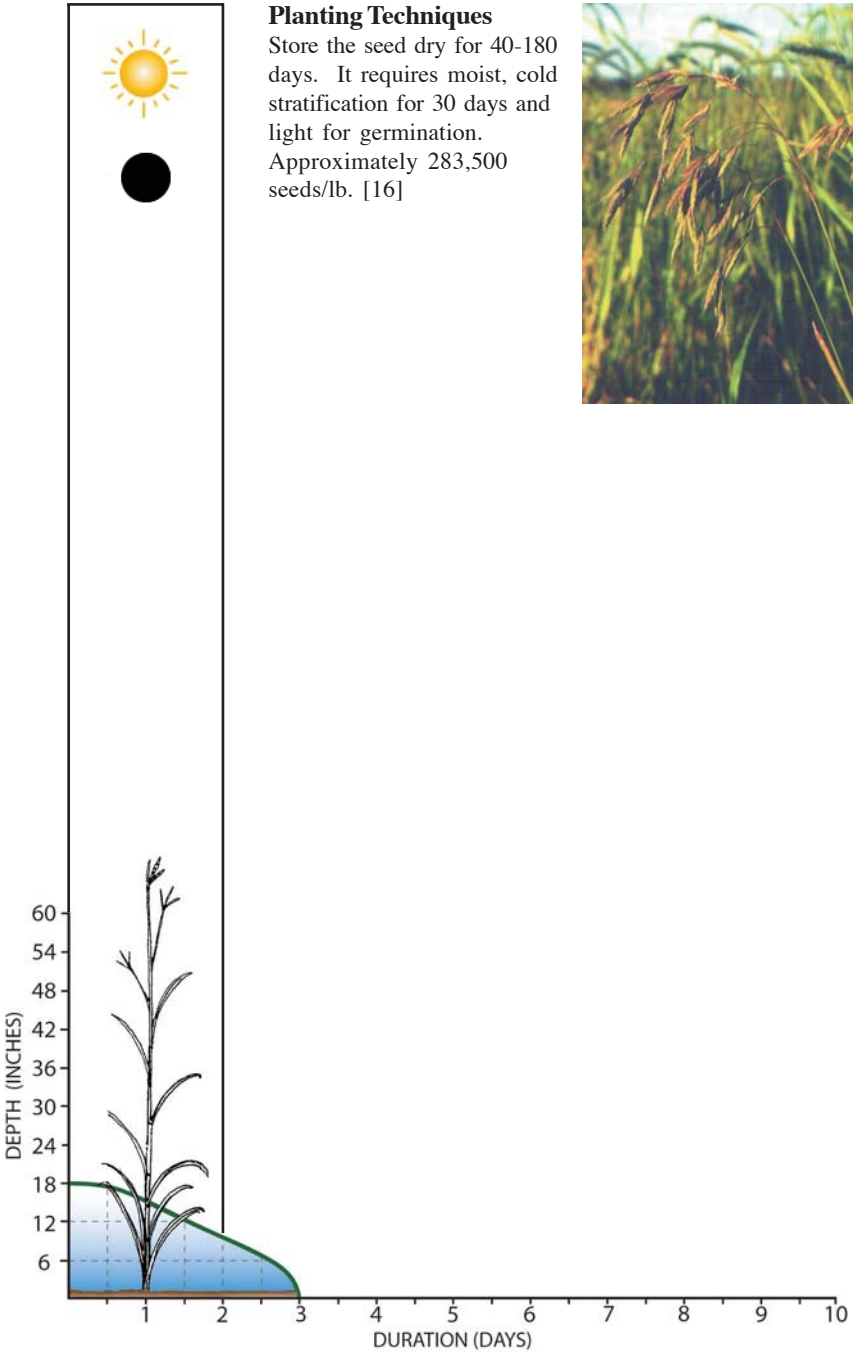
**Indicator Status: FACW**

**Planting Techniques**

Store the seed dry for 40-180 days. It requires moist, cold stratification for 30 days and light for germination. Approximately 283,500 seeds/lb. [16]



Photo: Paul Jackson





## *Calamagrostis canadensis*

Canada Blue-joint Grass *a.k.a.* Blue Joint Grass, Canada Blue-joint Grass, Bluejoint, Blue-joint Reedgrass, Reedgrass

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet meadow, wet-mesic prairies, shallow-water marshes, calcareous fens, stream banks, shrub-carrs and thickets. This species usually occurs as a subdominant in sedge meadows, and is the most frequent grass associate of the sedges. [7, 11, 16] **Range:** Common to abundant; Minn. (Eco-Range: All), Wis., Mich. Greenland to Alaska, s. to N.J., W.Va., N.C., Mo., Kan., N.M. and Calif. [7, 21]

### Description

**General:** Cool-season, perennial grass with a mature height of 2-4' has many very slender stems that arise from small rhizomes. **Flower:** A pretty, open inflorescence of tiny flowering spikelets on bluish stems that is a brown color from May to August. **Leaf:** The sheaths are usually hairless. The slender leaves tend to be flat. A distinct, thin, dry, papery structure extends beyond the summit of the sheath (the ligule). **Stem:** Nodes often are blue to reddish purple. **Fruit:** A caryopsis. **Root:** Creeping rhizomes. **Soil:** The pH range is 5.0-8.0. [7, 11, 44]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions, though will tolerate 3 to 6" of inundation. [21, 37, 44]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 6". **Duration:** Medium long – 4 days (decreasing 3" every 2 days). Canada blue-joint grass can tolerate regularly or seasonally inundated condition to 6", but not permanently flooded conditions, but will moderately tolerate flood duration. This species is more abundant in wetlands with minimal water level fluctuations and will increase in abundance with decreases in flood depth. [1, 23, 37, 44]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low. **Siltation:** Moderate. **Insect:** Infrequent. **Other:** This species has a moderate-to-low tolerance to general disturbance and stress. [1, 44, 47]

### Design Considerations

Canada blue-joint grass is used in upper shoreline zones and in vegetated swales. This species also does well in landscaping, restorations especially wetland, wet meadow and wet prairie, and mitigation sites. It provides good wildlife habitat for songbirds. **Concerns:** Can spread aggressively by rhizome under optimal conditions, though this is desirable in restorations threatened by invasive species. This species may decrease with heavy grazing. [14, 16, 21, 37, 44]

Indicator Status: OBL

### Wildlife Use

Songbirds and waterfowl eat the seeds. Geese, moose, deer, small mammals and muskrats graze on the entire plant, especially the young shoots. This grass stands up well in winter, making it a good source of food and cover for wildlife, especially songbirds. [11, 14, 37, 44]



Photo: Paul Jackson

### Nursery/Plant

#### Information

**Available:** Widely.

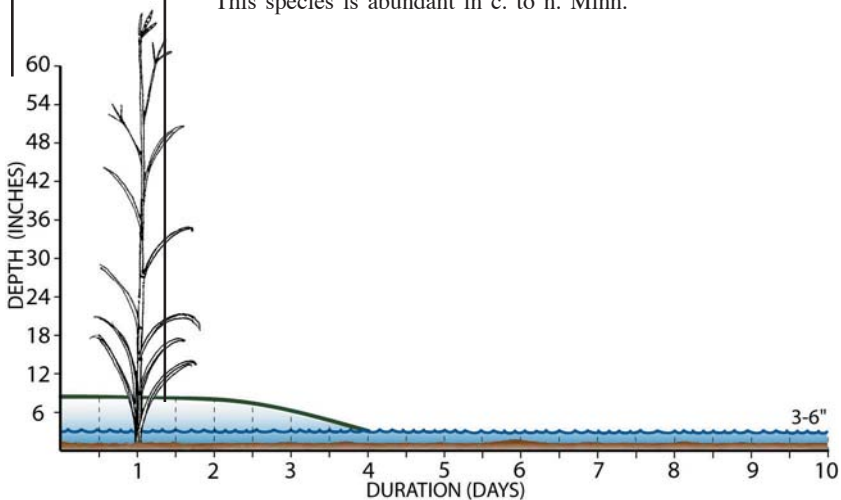
**Types:** Plants and seed, although not in large quantities due to low seed production and low viability.

#### Planting Techniques

Planting plugs has been most successful. Planting should be on 1/2' centers because the rhizomes spread slowly. Can be grown from seed, but is slow to establish. Soil should be moist to saturated, but not inundated during planting. Seed should be fresh, moist, cold stratified and divided. Light is important in germination. Seeding rate is 0.03-0.06 lb/acre, approximately 1,512,000 seeds/lb. Established stands may be mowed in alternate years for maintenance. [16, 44]

#### Additional Notes

This species is abundant in c. to n. Minn.





## *Caltha palustris*

**Marsh Marigold** - a.k.a. Cowslip, Common Marsh-marigold, King-cup

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Shallow water, swamp, hardwood swamps, wet woods, shrub swamps, thickets, especially stream banks, sedge meadows, fresh (wet) meadows, calcareous fens, marshes and springs. This species is usually associated with peaty ground and some flowing water. [7, 11, 16, 35, 41] **Range:** Common; Minn. (Eco-Range: All), throughout Wis., Mich. Circumboreal; s. to N.C., W.Va., Tenn., Ind., Ill., Iowa and Neb. [7, 21]

### **Description**

**General:** With its early bloom, marsh marigold is a harbinger of spring. It is a native perennial herb, that reaches a height of 1-2'. **Flower:** Many round, green-and-yellow buds open to become a flower with 5-9 bright yellow petals sepals, 1-1½" wide and 4 or more pistils surrounded by many stamens; blooms during April and May.

**Leaf:** The basal leaves are broadly heart-shaped or rounded, 2-7" wide, and usually coarsely toothed. **Stem:** Hollow, 8-24" long. **Fruit:** A follicle 3/8-5/8" long with a pronounced beak. **Root:** Fibrous, deep. **Soil:** Grows in saturated soil and prefers peat. [7, 11, 35, 41, 47]

### **Normal Water Level**

This species prefers shallow water of 3" of inundation or less to wet/saturated conditions. [21, 37]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 6". **Duration:** Medium short – 3 days (decreasing 3" the first 2 days then 3" more the last day). Marsh marigold will tolerate seasonal to regular inundation with a moderate tolerance to duration. [1, 37]

### **Sensitivities or Other Tolerances**

**Exposure:** Part sun to shade. **Salt:** Low. **Nutrient:** Low. **Siltation:** Unknown.

**Insect:** Infrequent. **Other:** This species spreads slowly. It has a moderate tolerance to general disturbance and stress, and moderate tolerance to iron concentrations. [1, 37, 47]

### **Design Considerations**

The main use for this plant is in wetland/stream restorations or rehabilitation, especially in wet meadows, marsh/bog areas or areas associated with peaty ground and some flowing water. This species can be successfully planted on any wet ground, although it prefers swamp and peatlands. **Concerns:** Marsh marigold may not do well in nutrient-poor soils. [16]

### **Wildlife Use**

Upland game birds eat the seeds and moose eat it as food. It is used by frogs and insects as well. However, cattle and deer avoid eating this plant, which may be toxic to livestock. [21, 35, 37]

Indicator Status: OBL

**Nursery/Plant Information**

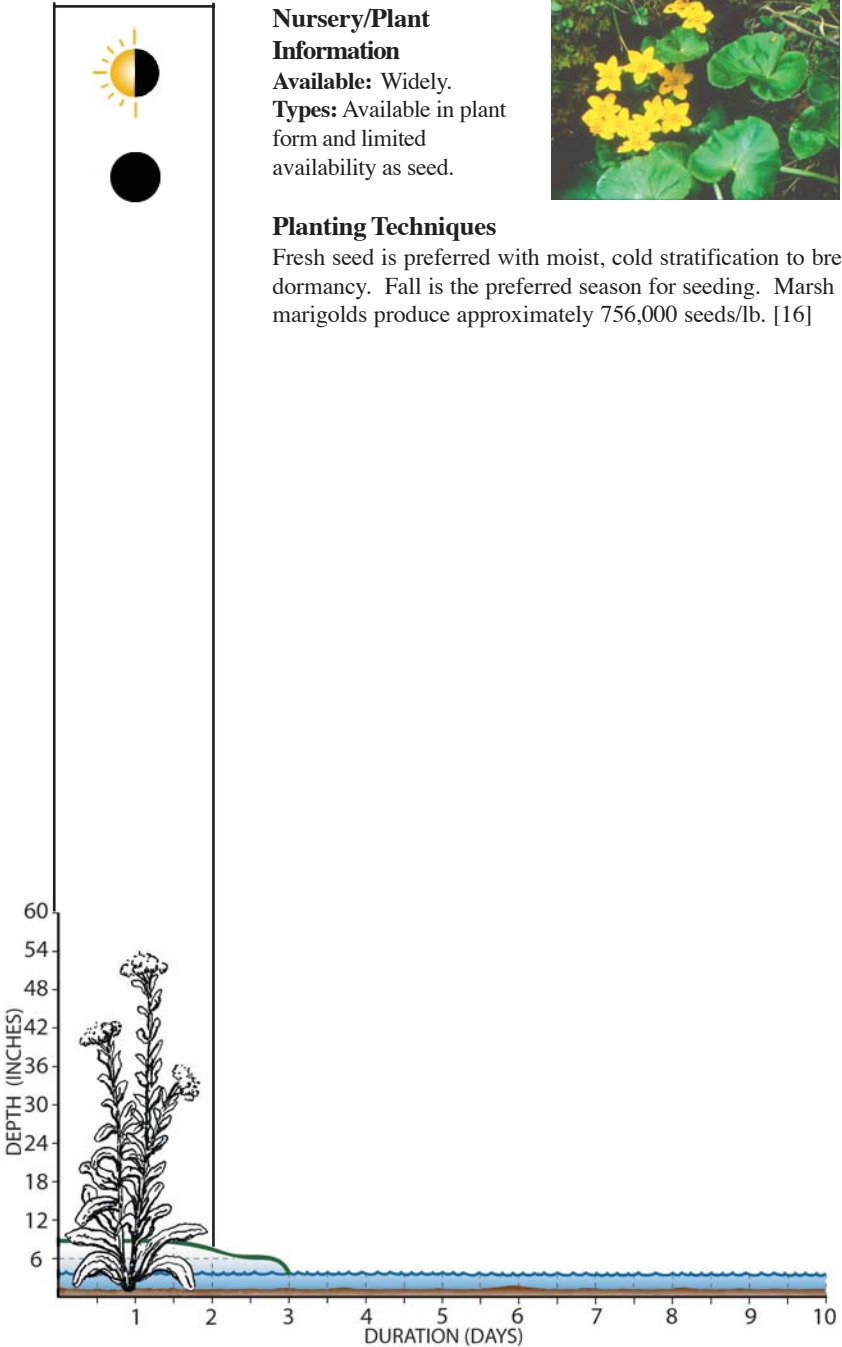
**Available:** Widely.  
**Types:** Available in plant form and limited availability as seed.



Photo: Dan Shaw

**Planting Techniques**

Fresh seed is preferred with moist, cold stratification to break dormancy. Fall is the preferred season for seeding. Marsh marigolds produce approximately 756,000 seeds/lb. [16]





# *Carex aquatilis*

## Water Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet meadows, marshes, shores, stream banks, kettle lakes, ditches and fens. [7] **Range:** N., c. and infrequently s. Minn. (Eco-Region: 1-6, 8, 9), e. and n. Wis., local in w. UP of Mich. Circumboreal, s. to N.J., Ind., Iowa, Kan., N.M. and Calif. [7, 21]

### Description

**General:** This native perennial forms clumps or tufts. One of the lake sedges, *Carex aquatilis* is very similar to tussock sedge (*Carex stricta*). It may grow to a mature height of 2-3'. **Flower:** Pistillate scales reddish-brown or tawny to often purplish-black, usually with a paler midrib, which is generally narrower and often shorter than the perigynia. **Leaf:** Lowest leaves have blades; mature leaves tend to be blue-green. **Stem:** The flowering stems arise centrally; lack basal sheaths with 2 rows of fibers on each side of a central fiber. **Root:** Spreading by many slender rhizomes. **Soil:** Wet soils. [7, 11]

### Normal Water Level

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions, sometimes in salt marshes. [21, 37]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing in depth 6" in day 1 and 6" more in days 2 and 3). This species can tolerate seasonal-to-regular inundation, with a moderate tolerance to flood duration. It usually increases in abundance with flood depth increases. Found in sites with stable water levels. [1, 29, 37]

### Sensitivities or Other Tolerances

**Exposure:** Partial shade. **Salt:** Unknown. **Nutrient:** Unknown.

**Siltation:** Unknown. **Insect:** Infrequent. **Other:** Water sedge has a moderate rate of spread and a moderate-to-low tolerance to general disturbance and stress. [1, 37]

### Design Considerations

In addition to being a good stream bank stabilizer, this species works well in many restoration efforts. Restorations or reestablishment may include wet meadows, shores, stream banks, kettle lakes, fens and ditches. This is a good plant for partially sunny to shady conditions within rain garden designs. [37]

### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed chicks), marsh birds, shorebirds, seed-eating songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beavers, deer and muskrats. Stands of *Carex* in shallow water can provide valuable spawning habitat. In addition to providing food, sedges also provide



**Indicator Status:** OBL

valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

**Nursery/Plant Information**

**Available:** Limited.

**Types:** Limited plant and seed availability.



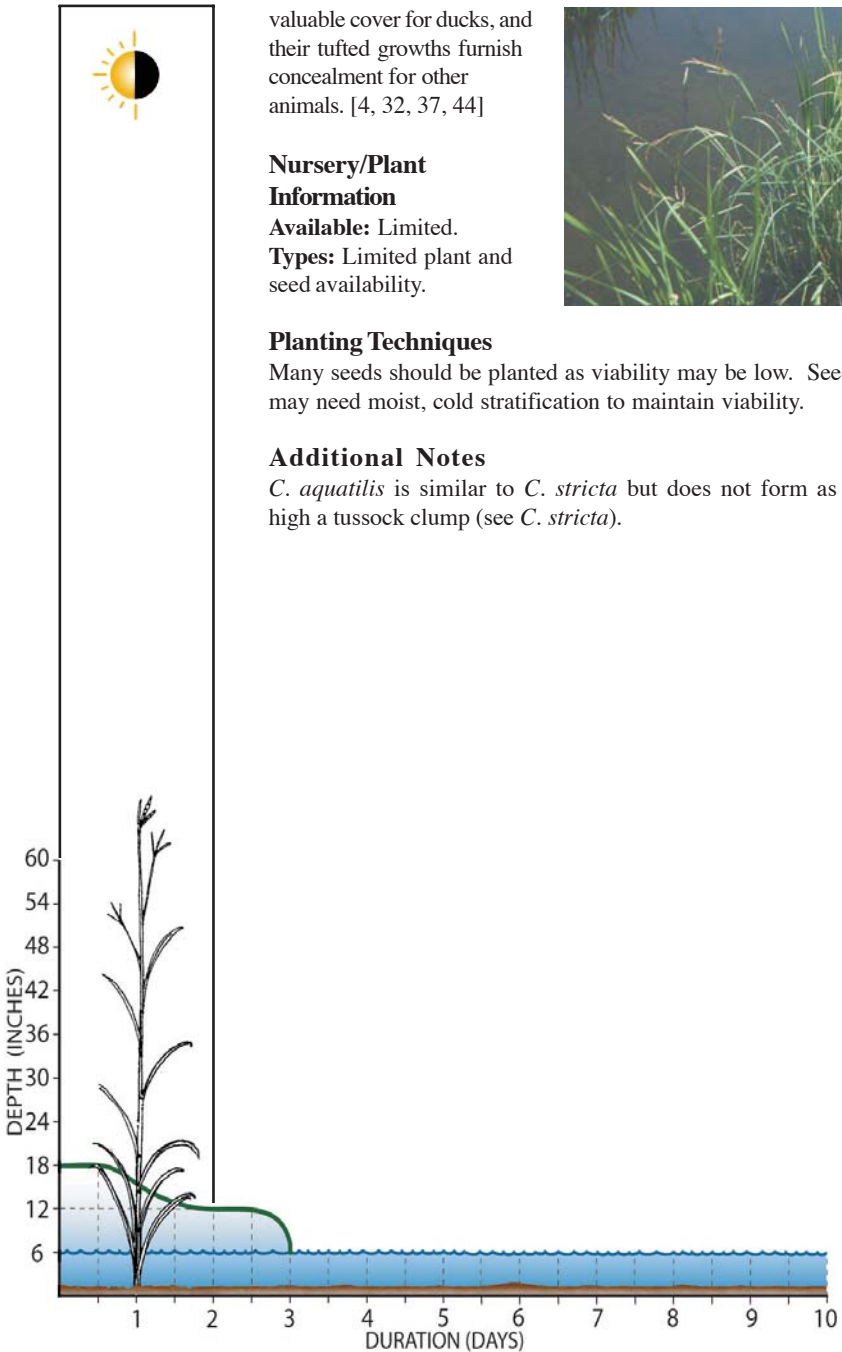
Photo: Paul Jackson

**Planting Techniques**

Many seeds should be planted as viability may be low. Seeds may need moist, cold stratification to maintain viability.

**Additional Notes**

*C. aquatilis* is similar to *C. stricta* but does not form as high a tussock clump (see *C. stricta*).





## *Carex bebbii*

Bebb's Sedge - a.k.a. Bebb's Oval Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet-to-moist meadows, marshes, lake edges, stream banks, ditches and calcareous fens. It forms dense clumps on moist-to-saturated soil. [7, 16]  
**Range:** Common northward; all but s.w. Minn. (Eco-Range: All), Wis., Mich. Nfld. to B.C., s. to N.J., Ohio, Ill., Neb. and Colo. [7, 21] **Threatened in Indiana.**

### Description

**General:** This native, cool-season, perennial, grass-like herb forms dense clumps with heights of 24-36". **Flower:** Green in May to June with 4-12 spikes, 3/16-3/8" long, sessile in a compact, crowded spike or head ½ to 1-3/16". Bracts inconspicuous, even the lowest one shorter than the inflorescence. Pistillate scales shorter and narrower than the perigynia. Perigynia crowded, stiffly ascending (the beaks often standing out from the body of the spike), ovate, 2-3 times as long as wide.  
**Leaf:** Elongate, mostly 1/16-3/16" wide; sheaths ventrally hyaline. **Fruit:** Achene lenticular. **Soil:** Moist-to-saturated soil, especially in calcareous situations. [7, 17]

### Normal Water Level

This species prefers upland moist/mesic to wet/saturated conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 12". **Duration:** Medium short – 3 days (6" the first day then 6" the following 2 days).

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Unknown.  
**Sitation:** Unknown. **Insect:** Unknown. **Other:** This species has a moderate tolerance to general disturbance and stress. [1]

### Design Considerations

A good species for wetland restorations and other saturated areas, such as stream banks and lake shores. It does exceptionally well in calcareous situations and wet meadows. This bunching herb will stay controlled for landscaping situations, rain gardens and moist pond areas. **Concerns:** *C. bebbii* may decline with competition from robust grasses and forbs. [16]

### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed chicks), marsh birds, shorebirds, seed-eating songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beavers, deer and muskrats. Stands of *Carex* in shallow water can provide valuable spawning habitat. In addition to providing food, sedges provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

Indicator Status: OBL

### Nursery/Plant Information

**Available:** Fairly widely.

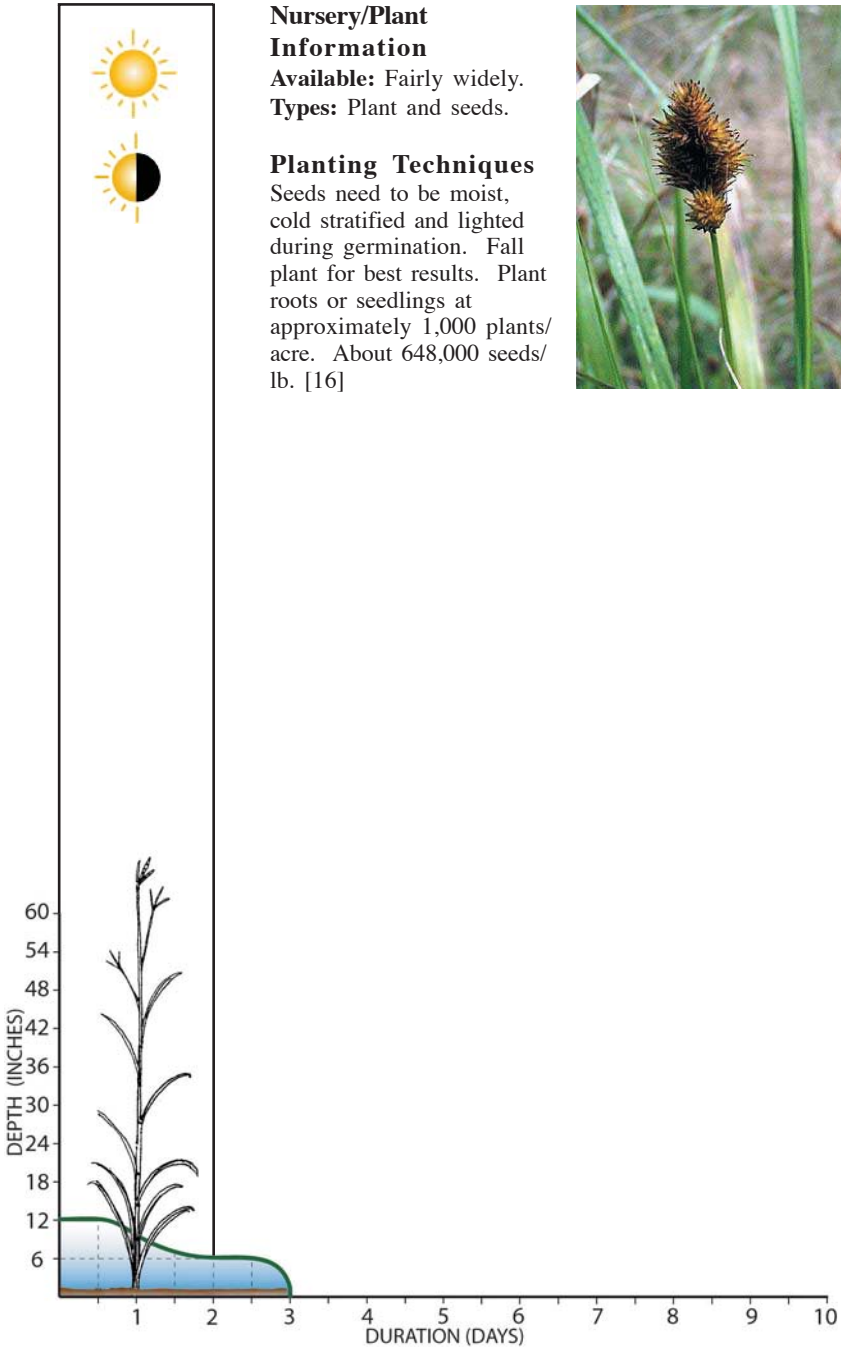
**Types:** Plant and seeds.

### Planting Techniques

Seeds need to be moist, cold stratified and lighted during germination. Fall plant for best results. Plant roots or seedlings at approximately 1,000 plants/acre. About 648,000 seeds/lb. [16]



Photo: Rusky Schmidt





## *Carex comosa*

**Bottlebrush Sedge** - a.k.a. Bristly Sedge

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Shallow marshes, wetland margins, floating mats, bogs, shores of ponds, lakes, streams and ditches. [4, 7, 11, 16] **Range:** Nc. and e. Minn (Eco-Regions: 1, 5-9), Wis., Mich. Que. to Minn. and S.D., s. to Fla. and Tex.; also Wash. and n. Idaho to Calif. [7, 21]

### **Description**

**General:** One of the region's more common aquatic sedges. It is a large, native, perennial herb, often forming large clumps that may grow to a height of 1½-4'.

**Flower:** Green from May to July. The more slender male spike is on a short stalk just above the female spikes. It is the female spikes that are nodding and have the bottle brush appearance. The sac-like structures around the ovaries called "perigynia" have a long beak with two slender teeth that curve away from each other. When these perigynia are all clustered together in a spike, the teeth create a "bristly" appearance. The perigynium are approximately ¼" long and strongly ribbed. **Leaf:** Leaves are ¼-½" wide, M-shaped, septate and rough-margined. **Stem:** Sharply triangular. **Fruit:** Tan achenes from July to August. **Root:** Rhizome in a dense cluster. **Soil:** Grows in very shallow water or moist soil. [4, 7, 11, 16, 44, 47]

### **Normal Water Level**

This species prefers shallow inundation of 12" or less to wet/saturated soils. [4, 21, 37, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 36". **Duration:** Medium short – 3 days (12"/day). This species tolerates regular and seasonal inundation. [37, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low. **Siltation:** Not tolerant.

**Insect:** Infrequent. **Other:** Bottlebrush sedge spreads slowly and is moderately tolerant to general disturbance and stress. [1, 44, 47]

### **Design Considerations**

Bottlebrush sedge, a good clump former, is used in upper shoreline zones. This species does well in restorations, especially in wetlands, shores of lakes, ponds and stream banks. A beautiful plant that is excellent in water gardens or other landscape situations. Spikes persist into the winter. The dense growth form makes this sedge a valuable shoreline stabilizer. It is a successional species that starts in very shallow water and moves to deeper areas that are normally arrowhead and pickerel weed habitat.

**Concerns:** While it is difficult to establish from seed, this species is important in many plant communities and can be established by plants or plugs. [4, 16, 44]

### **Wildlife Use**

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed chicks,

**Indicator Status: OBL**

Photo: Paul Jackson



Photo: Paul Jackson



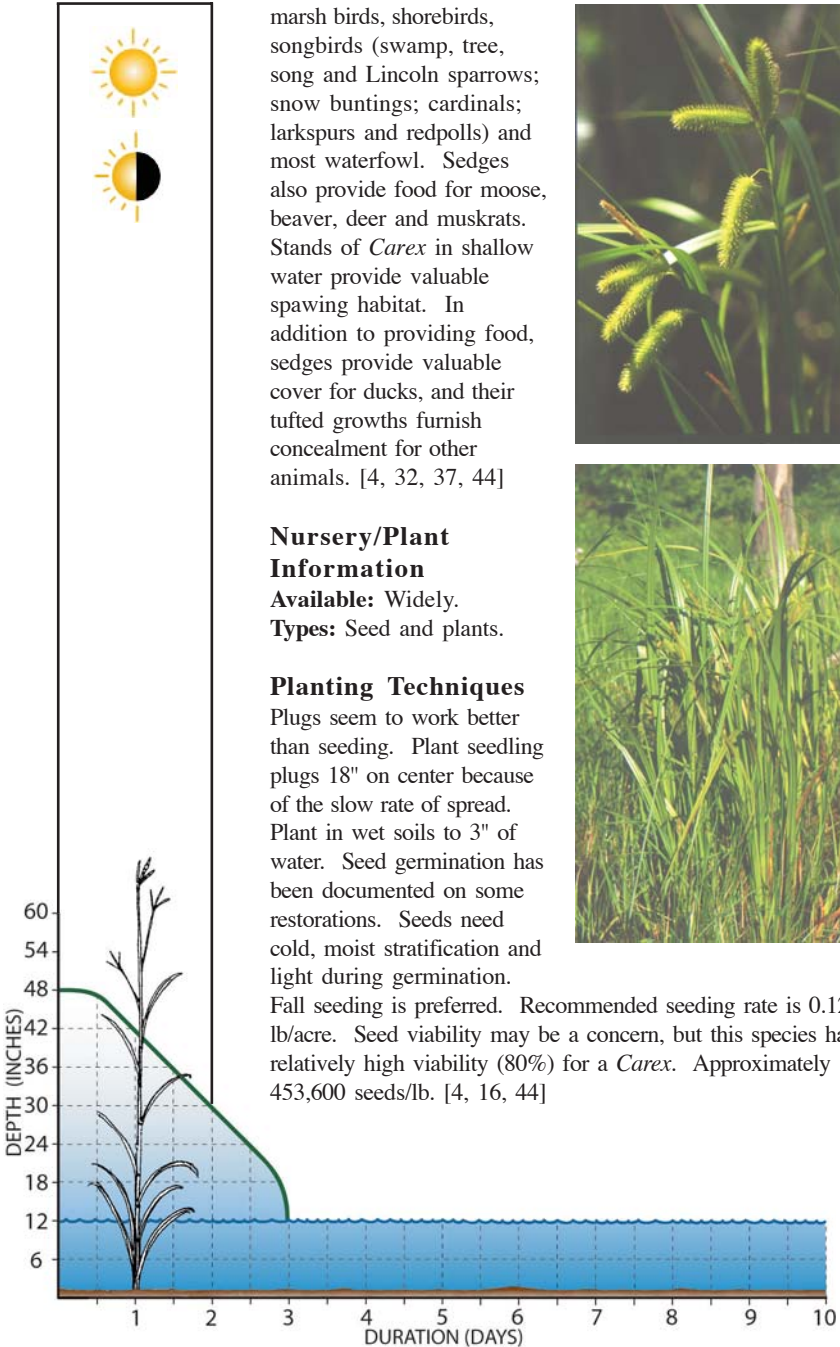
marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrats. Stands of *Carex* in shallow water provide valuable spawning habitat. In addition to providing food, sedges provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

**Nursery/Plant Information**

**Available:** Widely.  
**Types:** Seed and plants.

**Planting Techniques**

Plugs seem to work better than seeding. Plant seedling plugs 18" on center because of the slow rate of spread. Plant in wet soils to 3" of water. Seed germination has been documented on some restorations. Seeds need cold, moist stratification and light during germination. Fall seeding is preferred. Recommended seeding rate is 0.125 lb/acre. Seed viability may be a concern, but this species has relatively high viability (80%) for a *Carex*. Approximately 453,600 seeds/lb. [4, 16, 44]





## *Carex crinita*

**Caterpillar Sedge** - a.k.a. Fringed Sedge, Sickle-grass

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Swamps, alder thickets, wet openings and mesic savannas, ditches, lake edges and potholes. [7, 16] **Range:** Ne. and ec. Minn. (Eco-Range: 1, 5, 6), n. and c. Wis., Mich. Nfld. and Que. to Minn., s. to Ga. and Tex.

**Threatened in Iowa.** [7, 21]

### **Description**

**General:** Large, densely clumped perennial that may grow 2-5' as a cool-season, native herb. **Flower:** Attractive, 4", nodding spikes that resemble a caterpillar from May to June. The flower heads are deep brown, with perigynia silk-green, 2-ribbed, otherwise nerveless, smooth, somewhat inflated, nearly circular in x-section, rounded to an abrupt, minute beak. **Leaf:** The leaves are flat, 1- to 3-ribbed, and brownish tinged. Main leaves are ¼-½" wide, the sheaths glabrous, bracts leaf-like, sheathless or nearly so, the lowest one 8-22". **Stem:** 3- sided, surpassing the leaves.

**Fruit:** Achene lenticular, constricted on 1 side or edge, with a bent style.

**Soil:** Wet-to-moist soils. [7, 16]

### **Normal Water Level**

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing 6" the first day and a total of 6" the following 2 days). This species has a moderate tolerance to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Low. **Siltation:** Unknown.

**Insect:** Infrequent. **Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1]

### **Design Considerations**

This species is well suited for a wetland restoration especially in semi-shaded conditions, such as shrub-carrs or shrub wetlands. It will also do well in water gardens in many situations. Due to its bunching habit, this species will look good in all landscape scenarios and serves as a good plant for stabilization areas. [16]

### **Wildlife Use**

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed chicks) marsh birds, shorebirds, seed-eating songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrats. Stands of *Carex* in shallow water can provide valuable spawning habitat. In addition to providing food, sedges also provide valuable

**Indicator Status:** FACW+

cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

**Nursery/Plant Information**

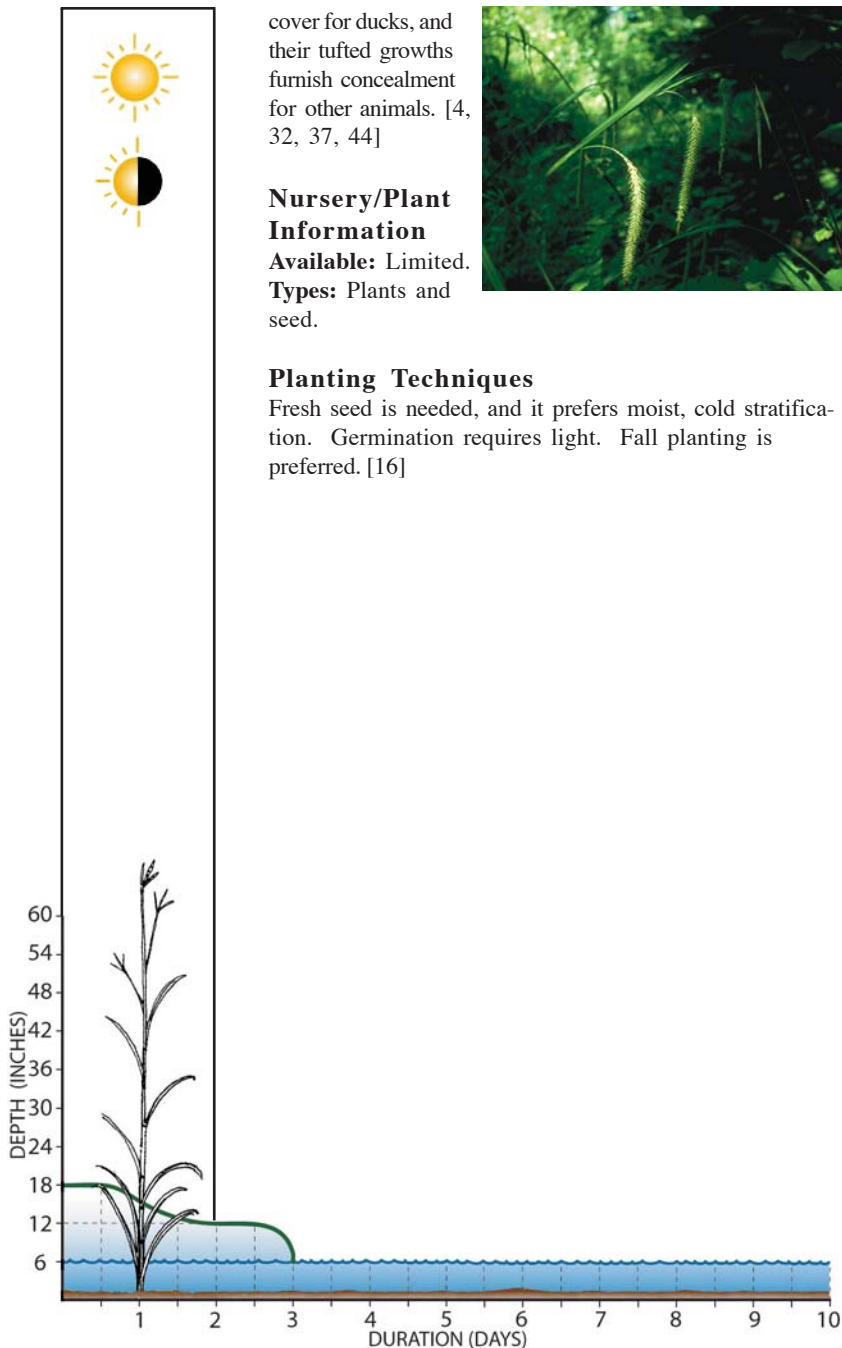
**Available:** Limited.  
**Types:** Plants and seed.



Photo: MINDNR

**Planting Techniques**

Fresh seed is needed, and it prefers moist, cold stratification. Germination requires light. Fall planting is preferred. [16]







## *Carex hystericina*

Porcupine Sedge - a.k.a. Bottlebrush Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Swamps, marshes, alder thickets, wet meadows, lake edges, ditches (agricultural) and calcareous fens. [7, 11, 16] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich. N.B. to Wash., s. to Va., Ky., Ark., Tex., N.M. and Calif. [7]

### General Description

**General:** A slender, native perennial, which often forms large clumps about 2-3 1/2' tall.

**Flower:** Bracts of the lowest pistillate spike are generally longer than the inflorescence, which blooms from May to June. The lower spikelets are usually drooping on slender stalks. The numerous perigynia are 15-20 nerved, and densely clustered. The slender beak of the perigynium is conspicuous and has short, straight teeth.

**Leaf:** Leaves are 1/8- 3/8" wide, M-shaped and not septate. **Stem:** Triangular.

**Fruit:** Achene is trigonous, with a bony style, which becomes flexuous or contorted as the achene matures. **Root:** Clustered on short, stout rhizomes. **Soil:** Wet-to-moist soils at water's edge and calcareous situations. [7, 11, 16]

### Normal Water Level

This species prefers shallow water to wet/saturated conditions of 6" of inundation or less. [37]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 36". **Duration:** Medium short – 3 days (12"/day). Porcupine sedge will tolerate seasonal to regular inundation to 6" of water with a moderate tolerance to duration. [1, 37]

### Sensitivities or Other Tolerances

**Shade:** Full sun to part shade. **Salt:** Moderate. **Nutrient:** Moderate.

**Siltation:** Unknown. **Insect:** Unknown. **Other:** Bottlebrush sedge has a moderate rate of spread and a moderate tolerance to general disturbance and stress. [1, 37, 47]

### Design Considerations

This species is a very attractive plant for shoreland restoration and water gardens. It may be a good soil stabilizer because of its bunching characteristic. It prefers calcareous soils, although it tolerates many soil types and fluctuating water levels. [16]

### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. Many birds, including rails (sora, yellow), grouse (especially ruffed chicks), marsh birds, shorebirds, seed-eating songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl, eat the achenes. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water can also provide valuable spawning habitat. In addition to providing food, sedges provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

Indicator Status: OBL

### Nursery/Plant Information

**Available:** Limited.

**Types:** Seeds and plants.

### Planting Techniques

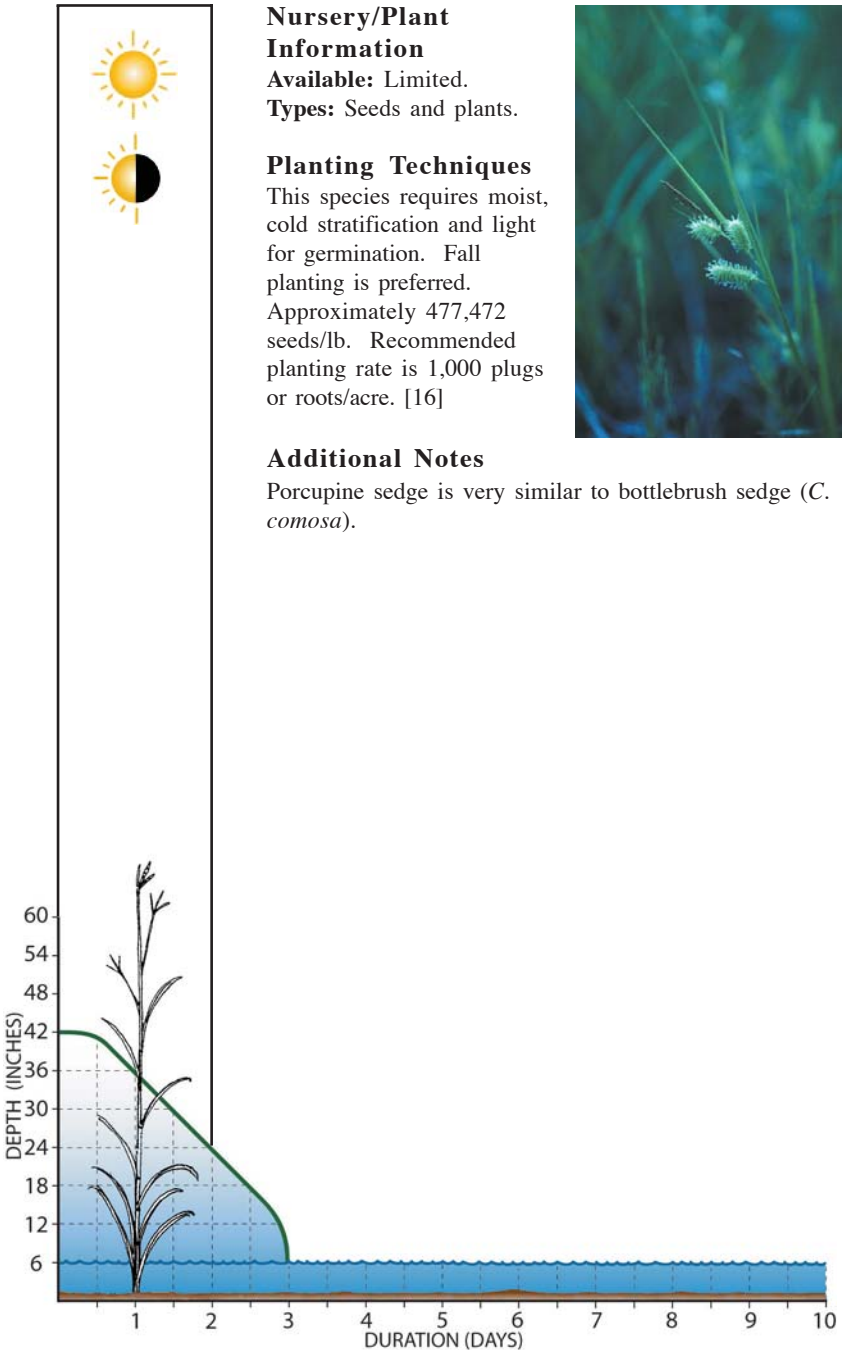
This species requires moist, cold stratification and light for germination. Fall planting is preferred. Approximately 477,472 seeds/lb. Recommended planting rate is 1,000 plugs or roots/acre. [16]

### Additional Notes

Porcupine sedge is very similar to bottlebrush sedge (*C. comosa*).



Photo: Jason Husveit





# *Carex lacustris*

Lake Sedge - a.k.a. Common Lakeshore or Lake-bank Sedge, Rip Gut

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Swamps, shallow marshes, shrub-carrs, alder thickets, wooded swamps, sedge meadows, borders of lakes and streams, kettle wetlands, wetland margins (usually in shallow water), low areas in tamarack swamps) and sometimes seasonally inundated wet meadows. [7, 11, 16] **Range:** Common; all but sw. and se. Minn. (Eco-Range: 1-8), Wis., Mich. Que. to Sask., s. to Fla. and Tex. [7, 21]

## Description

**General:** Lake sedge produces large, persistent scattered beds of clones. A cool-season, native perennial that can reach a height of 2-3'. **Flower:** Pistillate spikelets numbering 2-4 that are  $\frac{3}{4}$ -4" long, and are sessile or on short stalks. Staminate spikelets number 2-4. The perigynium is  $\frac{1}{4}$ -5/16" long, without hairs, distinctly ribbed and gradually tapers into a beak, which blooms from May to June.

**Leaf:** Coarse leaves that are M-shaped, bluish-green, 3' or more long, and 5/16-9/16" wide. It has reddened basal sheaths and open, feather-like (pinnate) fibers.

**Stem:** Triangular stems. **Fruit:** The achene is 3-angled. **Root:** Scaly rhizomes. **Soil:** Saturated soils. [7, 11, 16]

## Normal Water Level

This species prefers shallow water of 2' of inundation or less to wet/saturated conditions. [21, 37]

## Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 24". **Duration:** Long – 8 days (decreasing 3"/day). Will tolerate seasonal-to-regular inundation to 2', though more abundant in wetlands with minimal water level fluctuations. It will tolerate a moderate flood duration. [1, 23, 37]

## Sensitivities or Other Tolerances

**Exposure:** Full to partial sun. **Salt:** Moderate. **Nutrient:** Moderate.

**Siltation:** Moderate. **Insect:** Infrequent. **Other:** Lake sedge has a rapid rate of spread and a moderate tolerance to general disturbance and stress. [1, 37, 46]

## Design Considerations

Lake sedge is another sedge well-adapted for restorations of shallow marshes, and any wooded swamps, thickets or shrub-carrs. It does well in borders of ponds, lakes and streams. **Concerns:** Lake sedge is aggressive, so it would probably not be ideal for landscape conditions or rain gardens, although the aggressiveness may be preferred for some restoration areas to outcompete invasive species.

## Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed chicks),

Indicator Status: OBL



marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]



Photo: Dan Shaw



Photo: Dan Shaw

### Nursery/Plant Information

**Available:** Widely.

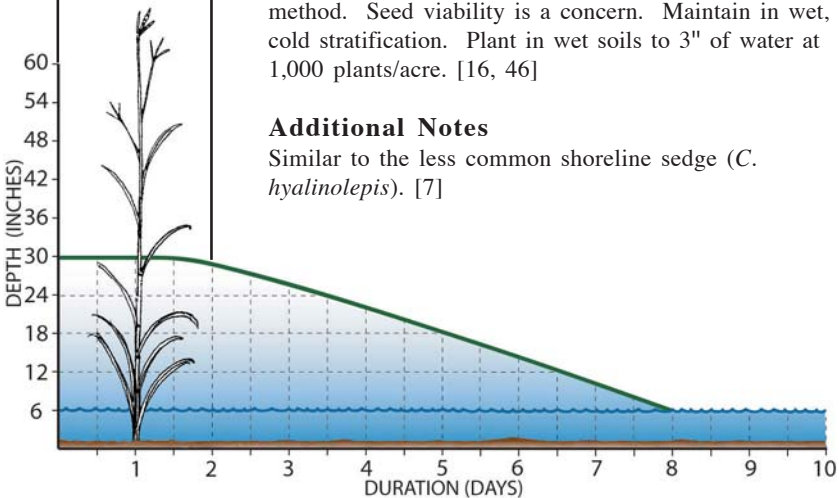
**Types:** Plants and seed.

### Planting Techniques

Lake sedge needs fresh seed and light for best germination. Dividing plants is also a successful propagation method. Seed viability is a concern. Maintain in wet, cold stratification. Plant in wet soils to 3" of water at 1,000 plants/acre. [16, 46]

### Additional Notes

Similar to the less common shoreline sedge (*C. hyalinolepis*). [7]





## *Carex languinosa*

Woolly Sedge - a.k.a. *Carex lasiocarpa* var. *latifolia*, *C. pellita* -  
Slender Sedge, Wiregrass Sedge, Hairy-fruited Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Wet-to-moist meadows and swales, marshes, sandy or marly shores and flats, stream banks (often wet places), and characteristic of floating bog-mats and minerotrophic sedge-mats. [7, 11] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich. N.B. and Que. to B.C., s. to Va., Tenn., Ark., Tex. and Calif. [7, 21]

### Description

**General:** Colony-forming, native perennial that forms mats with stems 1-3' tall. **Flower:** Green from April to July. Perigynia have bidentate teeth up to 0.5 (0.7) mm long and less than half of the body length. Pistillate are usually narrower than the perigynia and acute or shortly awn-tipped, with scales partly or wholly brownish or purplish. **Leaf:** Glabrous folded along the midrib, blades have revolute margins and are 1/16-3/16" wide. **Stem:** Triangular. **Fruit:** Concavely trigonous achene. **Root:** From scaly rhizomes. **Soil:** Bogs and minerotrophic sedge-mats. [7, 11, 44]

### Normal Water Level

This species prefers moist soil although it will tolerate shallow water to 3-6" of inundation or less. [21, 37, 44]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 12". **Duration:** Long – 6 days (decreasing 4"). Woolly sedge will tolerate seasonal or irregular inundation to a depth of 6". [37, 44]

### Sensitivities or Other Tolerances

**Exposure:** Full sun. **Salt:** Low. **Nutrient:** Moderate to high. **Siltation:** Moderate. **Insect:** Infrequent. **Other:** Tolerates moderate disturbance and stress. [1]

### Design Considerations

This species is used in upper shoreline zones and in vegetated swales. It will do well in some wetland restoration sites and along streams. **Concerns:** The species decreases with moderate grazing. [14, 37, 44]

### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks) marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

Indicator Status: OBL



### Nursery/Plant Information

**Available:** Limited.

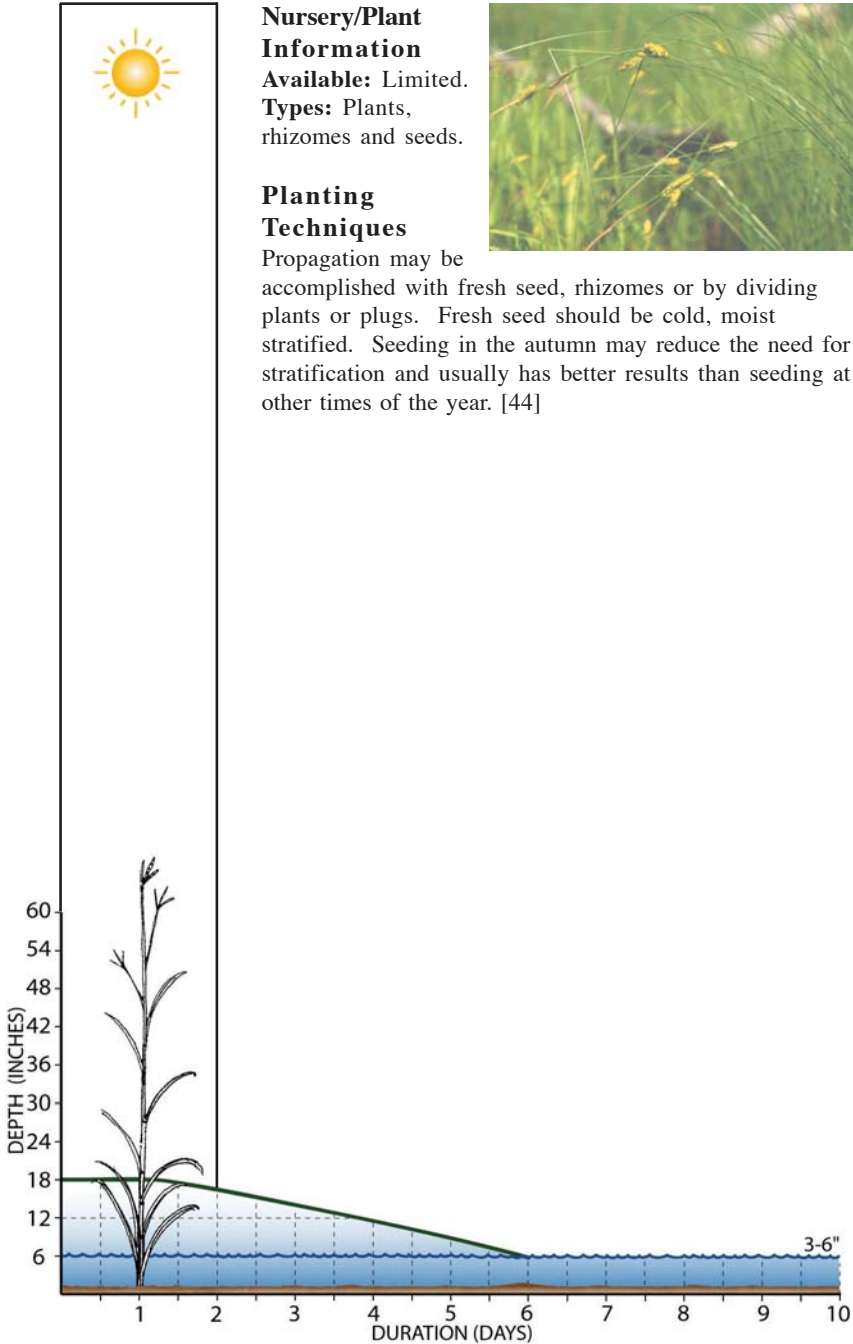
**Types:** Plants, rhizomes and seeds.



Photo: Paul Jackson

### Planting Techniques

Propagation may be accomplished with fresh seed, rhizomes or by dividing plants or plugs. Fresh seed should be cold, moist stratified. Seeding in the autumn may reduce the need for stratification and usually has better results than seeding at other times of the year. [44]







## *Carex lasiocarpa*

Wooly Needle Sedge -a.k.a. Slender, Wiregrass or Hairy-fruited Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Peatlands, wet peat soils, open bogs, calcareous fens, shrub-carrs, sedge meadows, shallow marshes; frequently in shallow water and on pond margins. The well developed, air-filled root and rhizome system makes this sedge one of the floating, mat-forming species that create the first stage in bog succession. Persists in wetlands with relatively unaltered watersheds, land use and hydrology. [7, 11]

**Range:** Common; especially along the hollows in Red Lake peatlands of Minn. (Eco-Range: 1-9), Wis., Mich. Circumboreal, Nfld. to Alaska, s. to N.J., Ohio, Iowa, N.D., Mont., Idaho and Wash. [7, 21]

### Description

**General:** A colony-forming, native perennial reaching over 3' tall. **Flower:** The 1-3 pistillate spikelets are 3/8 to 1-1/8" long and sessile, while the 1-3 staminate spikelets are 3/4 to 2-3/8" long. The perigynia are densely fuzzy with an oblong-oval shape and sharp teeth. **Leaf:** Wiry leaves (not over 2 mm wide) are characteristically C-shaped in cross section or inrolled, tapering to very slender tips. **Stem:** Triangular. **Fruit:** Achene concavely trigonous. **Root:** Air-filled root and long, scaly rhizomes. **Soil:** Prefers peat soils. [7, 11]

### Normal Water Level

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing 6" the first day and a total of 6" the next 2). This species has a moderate tolerance to flood duration. [1, 23]

### Sensitivities or Other Tolerances

**Exposure:** Partial sun. **Salt:** Unknown. **Nutrient:** Low. **Siltation:** Unknown. **Insect:** Unknown. **Other:** This species has a moderately low tolerance to general disturbance and stress. [1, 46]

### Design Considerations:

Wooly needle sedge will do well in some wetland restoration sites especially peatlands and peat soils or in bog conditions. This species create the first stage in bog succession. Persist in wetlands with relatively unaltered watersheds land use and hydrology.

**Concerns:** This species decreases with moderate grazing. [14]

### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks), marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water



**Indicator Status:** OBL

provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

**Nursery/Plant Information**

**Available:** Limited.

**Types:** Seed and roots.

**Planting Techniques**

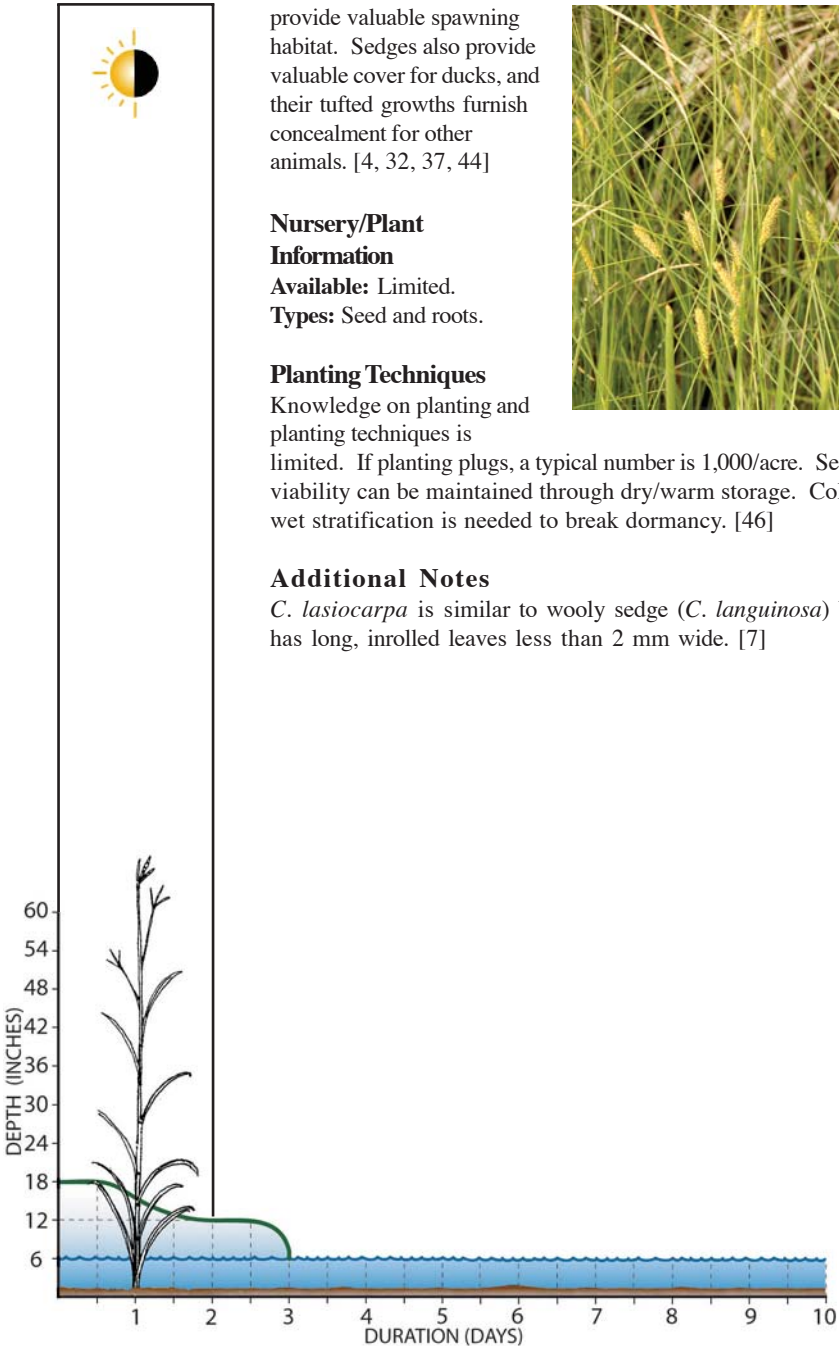
Knowledge on planting and planting techniques is limited. If planting plugs, a typical number is 1,000/acre. Seed viability can be maintained through dry/warm storage. Cold, wet stratification is needed to break dormancy. [46]

**Additional Notes**

*C. lasiocarpa* is similar to woolly sedge (*C. languinosa*) but has long, inrolled leaves less than 2 mm wide. [7]



Photo: Mark Genes





# *Carex retrorsa*

**Retorse Sedge** - a.k.a. **Deflexed Bottlebrush Sedge, Beaked Sedge**

## **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Flood plain forest, swamps, thickets and marshes. [7, 16]

**Range:** Common in n., occasional in s. Minn. (Eco-Range: All), Wis., Mich. Que. to B.C., s. to Md., Ind., Iowa and Ore. **Endangered in Ind.** [7, 21]

## **Description**

**General:** Densely clustered perennial reaching 2-4' tall. **Flower:** Spikes sheathless, at least the lowest one generally several times as long as the inflorescence. Several crowded spikes are sessile. Lower spikes are pistillate and upper spikes are staminate. Pistillate scales conspicuous, shorter and narrower than the perigynia. Perigynia numerous, densely crowded in 8 or more rows, widely spreading or the lowest ones retrorse, glabrous, shining, firm-walled but somewhat inflated, ellipsoid and often somewhat oblique, narrowed to a prominent, slender, smooth beak 1/16" long with short teeth. **Leaf:** Septate (especially the sheaths), mostly 1/8-3/8" wide with the leaves subtending the pistillate. **Stem:** Triangular. **Fruit:** Achenes dark brownish, narrowly trigonous, 1/16" long; the persistent, bony style becoming contorted with maturity. **Root:** Densely clustered on a very short rhizome. **Soil:** Wet to mesic soils of sandy to mucky conditions. [7, 17]

## **Normal Water Level**

This species prefers shallow water to wet/saturated conditions of 6" of inundation or less, although it will tolerate mesic conditions. [21, 37]

## **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing 6" the first day and a total of 6" the following 2 days). Retorse sedge will tolerate regular, seasonal or irregular inundated periods of 6" or less and is somewhat tolerant to flood duration. [1, 37]

## **Sensitivities or Other Tolerances**

**Exposure:** Full sun. **Salt:** Unknown. **Nutrient:** Moderate. **Siltation:** Unknown. **Insect:** Unknown. **Other:** This species has a moderately low tolerance to general disturbance and stress. [1, 37]

## **Design Considerations**

Retorse sedge is used well in wetland restorations of flood plains, thickets and marsh conditions. **Concerns:** This species spreads slowly.

## **Wildlife Use**

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks) marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and

**Indicator Status: OBL**

their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

**Nursery/Plant Information**

**Available:**

Limited.

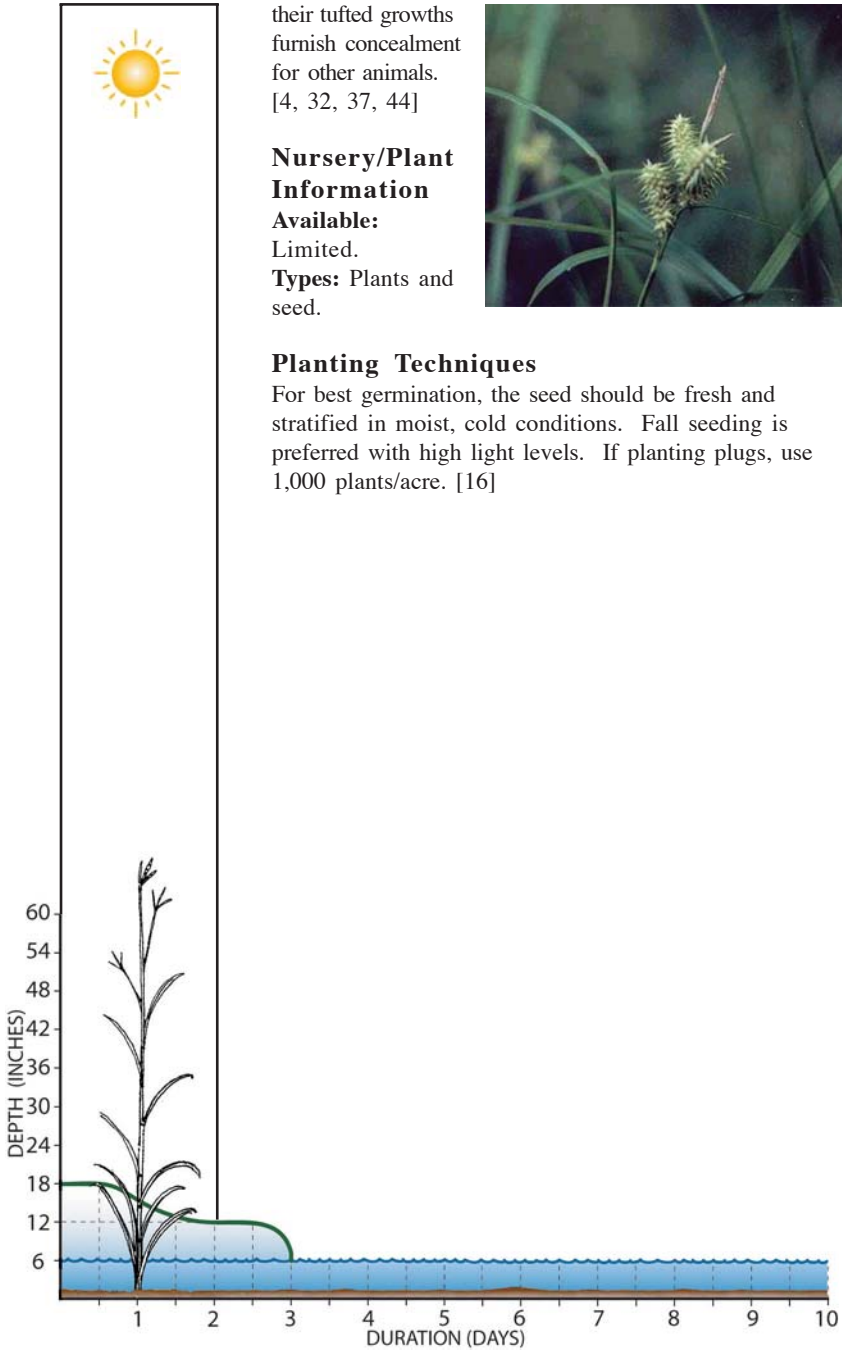
**Types:** Plants and seed.



Photo: Ray Frances Wis. State Herbarium

**Planting Techniques**

For best germination, the seed should be fresh and stratified in moist, cold conditions. Fall seeding is preferred with high light levels. If planting plugs, use 1,000 plants/acre. [16]





## *Carex stipata*

Awl-fruited Sedge - a.k.a. Common Fox, Stalk-grain or Soft Sedge

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Flood plain forest, swamps, thickets, wet meadow, wetland margins, wet basins, marshes and ditches (usually not in sphagnum bogs). [7, 11, 16] **Range:** Common; Minn. (Eco-Range: All), Wis., Mich. Nfld. to s. Alaska, s. to Fla., Tex. and Calif. [7, 21]

### Description

**General:** Awl-fruited sedge is a somewhat stout, clump-forming sedge that may reach 3'. It is a cool-season, native, perennial herb that is similar to *C. vulpinoidea*, but slightly more robust with flaccid stems. **Flower:** Green flower color from May to July. Perigynia are 1/8-1/4" long, lance-triangular shaped, sessile and densely aggregated. The perigynia has a conspicuous beak that is less than twice as long as the body, but gives the large pyramid-shaped inflorescence a prickly appearance. **Leaf:** M-shaped, coarse, green leaves that are usually shorter than the stem. Thin sheaths extend beyond the leaf base and are conspicuously cross-wrinkled and whitish. **Stem:** Clustered, sharply triangular. **Fruit:** Achene lenticular. **Soil:** Prefers wet-to-moist soils of peat, muck, bogs (but not sphagnum) and loams. [7, 11, 44]

### Normal Water Level

This species prefers moist soil although will tolerate shallow water to wet/saturated conditions of 12" of inundation or less. [21, 37, 44]

### Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 6". **Duration:** Medium long – 4 days (decreasing 3" every 2 days). This species will tolerate some seasonal and irregular water fluctuations and is somewhat tolerant to flood duration. It is tolerant, however, to flood depth and frequency increases. [1, 37, 44]

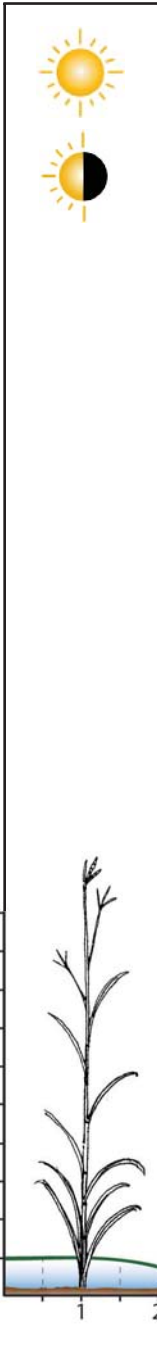
### Sensitivities or Other Tolerances

**Exposure:** Full to part sun, although it usually occurs in shaded to partially shaded areas. **Salt:** Low to moderate. **Nutrient:** High. **Siltation:** Moderate – although it decreases in abundance with high water levels. **Insect:** Infrequent. **Other:** Has a slow rate of spread. Increased sediment has been shown to decrease biomass of *C. stipata*, and it has a moderately high tolerance to general disturbance and stress. [1, 12, 37, 44]

### Design Considerations

Although awl-fruited sedge is well adapted for partially sunny to shaded wet basins and marshes, it is used in upper shoreline zones, other open, wet habitats and vegetated swales. This species is well suited to calcareous areas and its bunching character provides soil stabilization. It is a fast grower for shoreland habitats, restorations and revegetation zones in a variety of light conditions. [16, 44]

**Indicator Status: OBL**



### **Wildlife Use**

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks) marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs, and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrats. Stands of *Carex* in shallow water provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]



Photo: MINDNR

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Plants and seed.

### **Planting Techniques**

Seeding works well, and the plants spread quickly. Store seeds in dry, cold conditions (14% moisture) and sow the following spring, or fall seed with fresh seed. Awlfruited sedge is a clump-forming species. Plugs should be planted 15-18" on center. Recommended seeding rate is 0.125lb/acre. Approximately 567,000 seeds/lb. [16, 44]



# *Carex stricta*

**Tussock Sedge** - a.k.a. **Common Tussock, Hummock, or Meadow Sedge**

## **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Sedge meadow, marshes, shrub-carrs, calcareous fens, peatlands, shores, stream banks and ditches. This is the characteristic sedge of Minnesota and Wisconsin sedge meadows. The hummocks may persist for decades, even when pastured. [7, 11, 16] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich.; N.J. to Man., s. to Fla., Tex. and Colo. [7, 21]

## **Description**

**General:** Densely clumped, colonial perennial forming large, raised hummocks to 30" tall. **Flower:** Flowering stems arise laterally. Perigynia are beakless, flat, widest below the middle section of the body, and taper to the tip. Blooms from April to June. **Leaf:** Slender and green mature leaves, like the stems, are extremely rough on the edges. The flower stem has been reduced to bladeless sheaths on the lowest leaves. The reddish-brown basal sheaths disintegrate into 2 rows of fibers on each side of a central fiber (pinnate). Pincushion-like young shoots erupt in late summer, persist through winter, and grow quickly in early spring into a tuft of bright blue-green leaves. **Stem:** Mostly triangular stems about 15-40" tall which usually exceed the leaves. **Fruit:** Lenticular achenes. **Root:** Long, scaly rhizomes. **Soil:** Prefers wet-to-saturated peat and calcareous soils. [7, 11, 17]

## **Normal Water Level**

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions. [16, 21, 37]

## **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 12". **Duration:** Medium short – 3 days (decreasing 6" the first day and a total of 6" the following 2 days). It will tolerate regular or seasonal water fluctuations, is moderately tolerant to flood duration and will increase in abundance as flood depth increases. [1, 23, 37]

## **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Moderate. **Siltation:** Moderate, 0-8 cm/year. **Insect:** Infrequent. **Other:** This species is acid tolerant and has a moderate rate of spread. It has moderate tolerance to general disturbance and stress. [1, 37]

## **Design Considerations**

Tussock sedge is used in wetland restorations, and should be used in calcareous, sedge meadow, shrub-carr and peat situations. It may be used in shoreland restorations of lakes, ponds and streams, and has survived ditches. Persists in wetlands with relatively unaltered watershed land use and hydrology and the hummocks may persist for decades, even when grazed. It is attractive in landscape and water garden plantings due to its bunching form. **Concerns:** At times, this species has been overspecified in restorations due to its availability. [16]



Indicator Status: OBL



### Wildlife Use

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks) marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings; cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrats. Stands of *Carex* in shallow water provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

### Nursery/Plant Information

**Available:** Widely. **Types:** Plants, roots and seeds.

### Planting Techniques

Tussock sedge germinates well when fresh seed is fall planted. If storing over winter, the seed should be moist, cold stratified and germinated with plenty of light. About 3,000,000 seeds/lb. Plant seedlings or plants in wet soils to 3" of water at a density of about 1,000 plants/acre. [16]

### Additional Notes

Water sedge (*C. aquatilis*) is very similar to tussock sedge. *C. aquatilis* lacks basal sheaths with 2 rows of fibers on each side of a central fiber; the flowering stems arise centrally; lowest leaves have blades; mature leaves tend to be blue-green; and stems do not form pincushion-like young shoots that persist through winter [11].



Photo: Paul Jackson



Photo: Paul Jackson





# *Carex vulpinoidea*

**Fox Sedge - a.k.a. Brown Fox Sedge**

## **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Wet and moist meadows, marshes, lake shores, stream banks, roadsides and ditches (a pioneer species). [7, 11, 16] **Range:** Common; Minn. (Eco-Range: All), Wis., Mich. Nfld. to B.C., s. to Fla., Tex., Colo., Ariz. and Ore. [7, 21]

## **Description**

**General:** Densely clumped, cool-season, perennial sedge that may reach 3' in height. **Flower:** Green, brown flower color resembling a fox's tail, blooms from May to July. Perigynia are lance-ovate and taper into a beak. **Leaf:** Generally longer than the stem, although the lowest stem leaves are reduced to scales (aphyllopodic). **Stem:** Slender, firm stems about 12-40" tall that have whitish, thin sheaths that are conspicuously cross-wrinkled. **Fruit:** Achene lenticular. **Root:** Short rootstocks. **Soil:** Wet soils of all types. [7, 8, 11, 44]

## **Normal Water Level**

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions. [21, 37, 44]

## **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 24". **Duration:** Medium long – 4 days (decreasing 6" the first day, 12" the second day, and a total of 6" the last 2 days). Fox sedge tolerates regular and seasonal inundation although it is not tolerant of extended periods of flooding. [1, 8, 37, 44]

## **Sensitivities or Other Tolerances**

**Exposure:** Partial to full sun. **Salt:** Low to moderate. **Nutrient:** Moderate to high. **Siltation:** Moderate, 0-8 cm/year. **Insect:** Infrequent. **Other:** Fox sedge has a slow rate of spread and a moderate-to-high tolerance to general disturbance and stress. [1, 8, 37, 44]

## **Design Considerations**

Fox sedge is used in upper shoreline zones, streambank stabilization and vegetated swales. It is an excellent colonizer for wetland mitigation sites since it is a pioneer species that tends to revegetate wet, open sites soon after disturbance. It will do well in landscapes and rain gardens due to its clump form, tolerance to water fluctuation and slow rate of spread. The seedhead looks similar to a fox's tail. **Concerns:** Fox sedge may not be long lived if it is in areas of dense competition. [11, 16, 44]

## **Wildlife Use**

*Carex* species are an essential food source for a wide variety of wildlife. The achenes are eaten by many birds, including rails (sora, yellow), grouse (especially ruffed grouse chicks) marsh birds, shorebirds, songbirds (swamp, tree, song and Lincoln sparrows; snow buntings, cardinals; larkspurs and redpolls) and most waterfowl. Sedges also provide food for moose, beaver, deer and muskrat. Stands of *Carex* in shallow water

Indicator Status: OBL

provide valuable spawning habitat. Sedges also provide valuable cover for ducks, and their tufted growths furnish concealment for other animals. [4, 32, 37, 44]

### Nursery/Plant Information

**Available:** Widely.

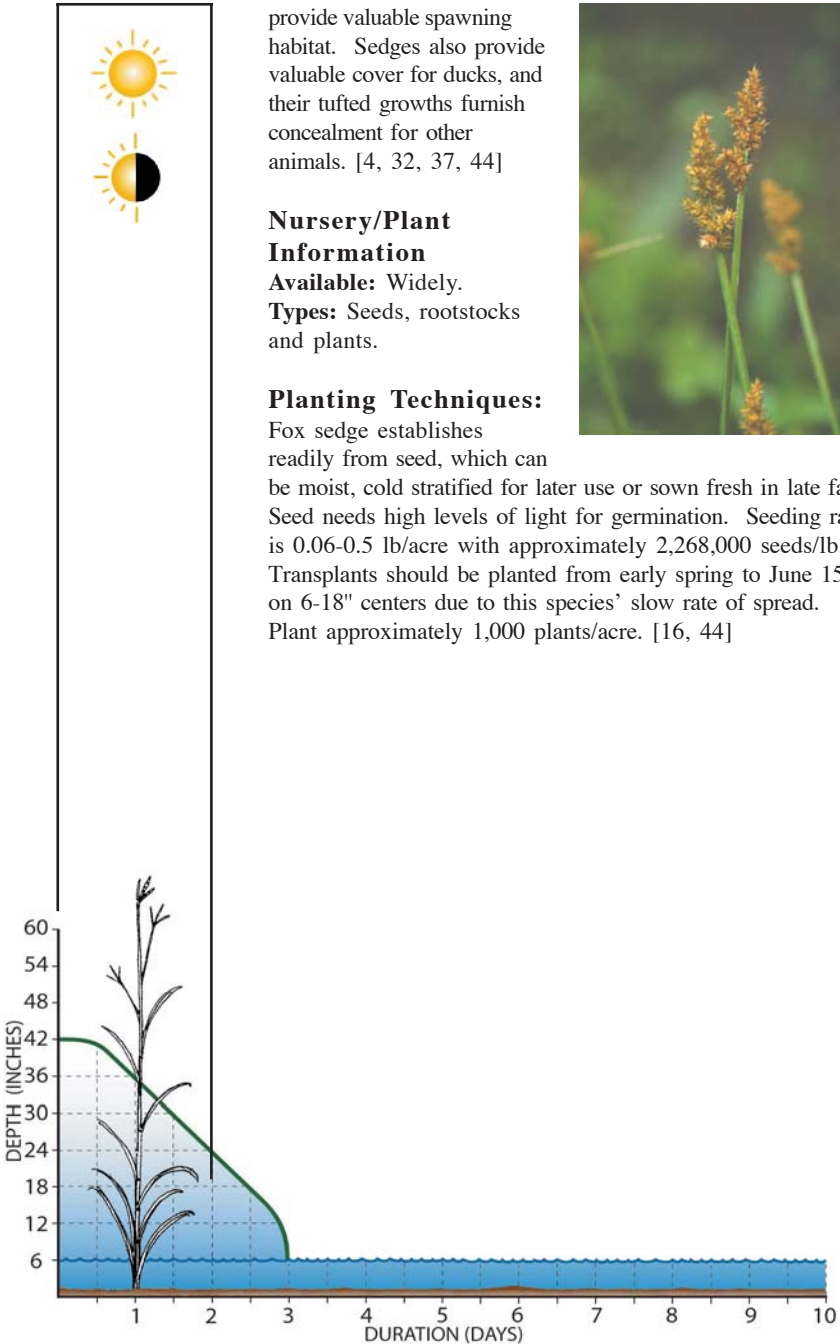
**Types:** Seeds, rootstocks and plants.

### Planting Techniques:

Fox sedge establishes readily from seed, which can be moist, cold stratified for later use or sown fresh in late fall. Seed needs high levels of light for germination. Seeding rate is 0.06-0.5 lb/acre with approximately 2,268,000 seeds/lb. Transplants should be planted from early spring to June 15 on 6-18" centers due to this species' slow rate of spread. Plant approximately 1,000 plants/acre. [16, 44]



Photo: Paul Jackson





## *Celtis occidentalis*

**Hackberry** - a.k.a. Sugarberry, Nettle tree, Common Hackberry

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Flood plain and river valley (first terrace) forest species; lowland wet-to-mesic and upland mesic-dry drainage basins, wooded slopes and on high, rocky, limestone bluffs bordering streams and windbreaks. [17, 22, 36, 44]

**Range:** Minn. (Eco-Region: 4-9), Wis., Mich. Extreme s. Ont., e. to N. England., s. to n. Ga., w. to nw. Okla., n. to N.D.; local in s. Que. and s. Man. [17, 21]

### **Description**

**General:** A deciduous tree reaching heights of 50-75', widths of 50-75' and trunk diameters of 1½-3'. It usually has a rounded crown of spreading or slightly drooping branches, often deformed by bushy growths on the ends of the branches called "witches' brooms." **Flower:** Greenish yellow flowers from April to May, with both male and female flowers at base of young leaves in early spring. **Leaf:** Ovate, long, pointed leaves in 2 rows, usually sharply toothed, unequal-sided with a rounded base and 3 main veins. Shiny green and smooth above, often hairy on veins and paler beneath, turning yellow in autumn. **Bark:** Gray or light brown; smooth with conspicuous corky warts or ridges, becoming scaly. **Twigs:** Light brown, slender, mostly hairy, slightly zigzag. **Fruit:** Persistent small (¼-3/8"), orange-red to purplish berries that are 1-seeded drupes; dry and sweet; slender-stalked at leaf bases; maturing in autumn. **Root:** Deep, coarse, wide-spreading lateral roots. **Soil:** Sandy loam to silty clays with a pH range of 6.6-8.0. [17, 22, 36, 44]

### **Normal Water Level**

Upland moist-to-dry soils and can tolerate limestone bluffs. [21, 37]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 60". **Duration:** Long – 5 days (decreasing 12"/day). Seedlings cannot tolerate submergence, yet mature trees can survive irregular or spring floods. A permanent high water table will stress the plant. Seedlings are somewhat tolerant, saplings are moderately tolerant and trees are tolerant to flood duration and flood depth increases. [1, 22, 37, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Moderate to high. **Nutrient:** Low to moderate. **Siltation:** Low to moderate. **Insect:** Frequent – hackberry nipple gall, morning cloak butterfly, scales. **Other:** Hackberry is susceptible to witches' broom, powdery mildew and leaf spots. It is resistant to drought, heat, salt, alkaline soils and mine spoils. It can be impacted occasionally by soil compaction and wind and ice damage. A good tree for dry, polluted conditions, it is moderately tolerant to general disturbance and stress. [1, 22, 25, 32, 37, 44]

### **Design Considerations**

Hackberry is used in upper shoreline zones, stream bank stabilization, upland slope buffers and shelterbelts. It has been used well in polluted urban conditions and as a street tree. Hackberry is a hardy tree that can withstand many stresses.

**Indicator Status:** FAC-

**Concerns:**

Deformed branches may affect form. [44]

**Wildlife Use**

During the winter, this species' fruit is popular with many birds, especially cedar waxwings, yellow-bellied sapsuckers, mockingbirds and robins. It is also an exclusive food source of the hackberry and snout butterflies. Small mammals and deer use the tree as a source of food and shelter. [21, 22, 32, 36, 37, 44]



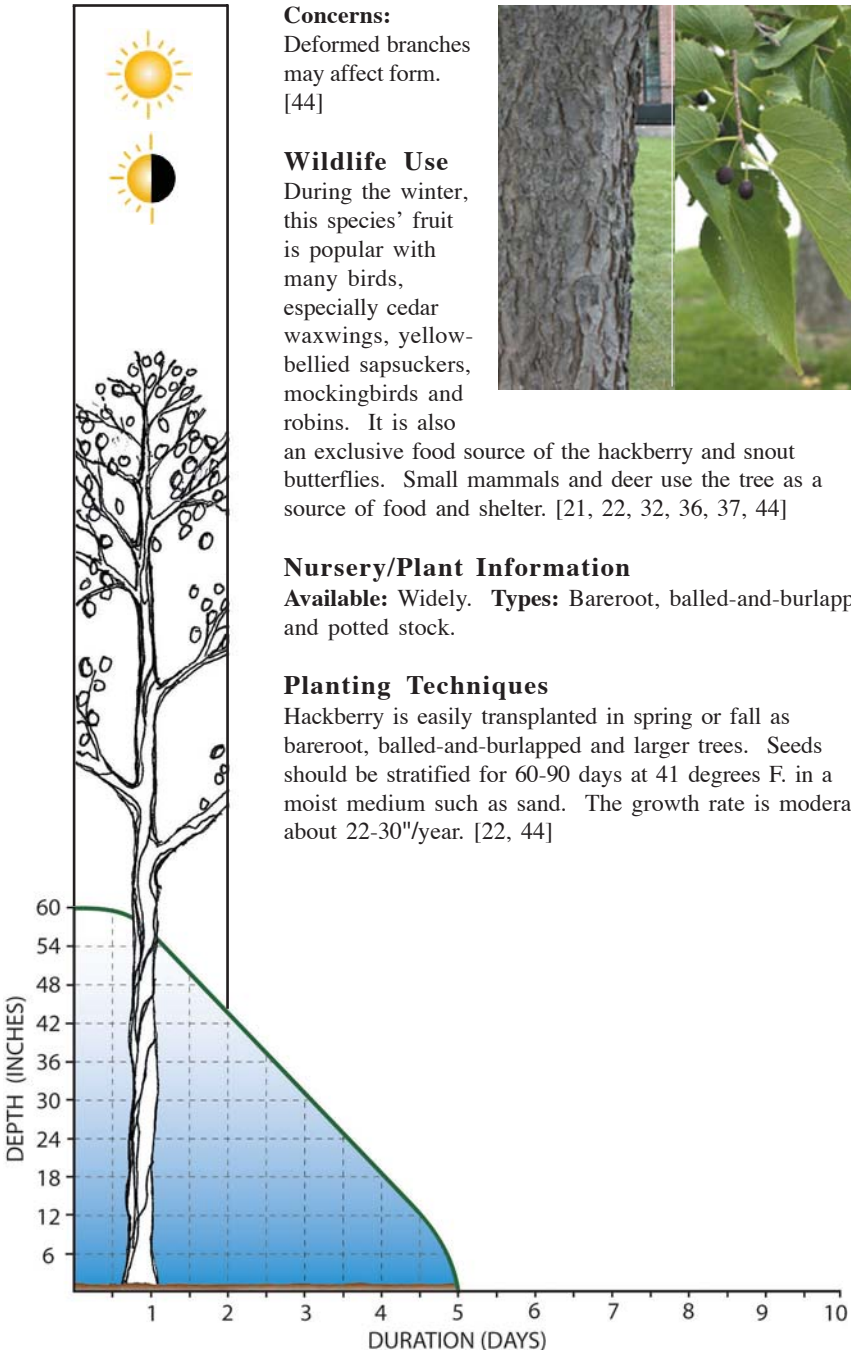
Photo: www.calla2.unm.edu/

**Nursery/Plant Information**

**Available:** Widely. **Types:** Bareroot, balled-and-burlapped and potted stock.

**Planting Techniques**

Hackberry is easily transplanted in spring or fall as bareroot, balled-and-burlapped and larger trees. Seeds should be stratified for 60-90 days at 41 degrees F. in a moist medium such as sand. The growth rate is moderate, about 22-30"/year. [22, 44]





# *Cephalanthus occidentalis*

**Buttonbush** - a.k.a. Common Buttonbush, Honey-balls, Globe-flowers

## **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Hardwood swamp, low alluvial woods, flood plain forest, thickets, stream banks, marshes, meadows, prairie sloughs and open bogs (often in standing water or muck). [7, 16, 22, 36] **Range:** Se. Minn. (Eco-Region: 6-8), wc. and s. Wis., LP of Mich. N.S., N.B. and Que. to s. Minn, s. to W. Indies and Mex. [7, 21]

## **Description**

**General:** A spreading, aquatic shrub or sometimes small tree with many branches (often crooked and leaning) and an irregular crown. This shrub can form dense thickets 3-12' tall. **Flower:** White, tubular flowers collectively forming globose balls from June to August. **Leaf:** Opposite or 3 at a node (whorled), ovate, pointed at the tip, rounded at the base; without teeth. Paler and sometimes hairy beneath and shiny green above. **Bark:** Gray or brown; becoming deeply furrowed into rough, scaly ridges. **Twigs:** Mostly in 3s; reddish-brown, stout, sometimes hairy, with rings at nodes. **Fruit:** Button-like balls of fruit  $\frac{3}{4}$ -1" in diameter, each 2-seeded and maturing in autumn. **Root:** Fibrous, shallow, lateral roots. **Soil:** The pH range is 6.0-8.5. Tolerates most soils although it prefers lowland wet, wet-mesic, moist peat, and low alluvial woodland types. [7, 22, 36, 44]

## **Normal Water Level**

Although it will grow in drier areas, this species prefers shallow water of 2-3' of inundation or less to wet/saturated conditions. [6, 21, 37, 44]

## **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 24". **Duration:** Long – 45+ days (12" in 3 days and 12" for possibly 45 more days). Seedlings that are 10" tall or less can survive complete submergence for up to 45 days in 18" or less of water. This species will tolerate regular, irregular and seasonal flooding of up to 3' and will tolerate increases in flood depth. [1, 13, 22, 37, 44]

## **Sensitivities or Other Tolerances**

**Exposure:** Partial to full sun. Will tolerate full shade but may decline.

**Salt:** Moderate to high (will tolerate salty soil and water). **Nutrient:** Moderate, although low for seedlings. **Siltation:** Moderate. **Insect:** Infrequent – San Jose scale can be troublesome. **Other:** Buttonbush is damaged infrequently by wind and ice. It is sensitive to drought and heat, though resistant to alkaline soils and soil compaction. It has a moderate-to-low tolerance to general disturbance and stress. [1, 6, 13, 22, 25, 37, 44]

## **Design Considerations**

Buttonbush has been used in stream bank stabilization and in upper and lower shoreline zones. It is a nice landscape plant if allowed to be aggressive and soil moisture is maintained. A good plant for wetland restorations, especially in flood plain forests, meadows, thickets and stream banks. **Concerns:** This species can be very

**Indicator Status: OBL**



aggressive and may form monocultures, this may be a desirable trait if invasive species are a threat. [16, 44]



Photo: Dan Shaw

### **Wildlife Use**

**Buttonbush**

provides a good nectar source and

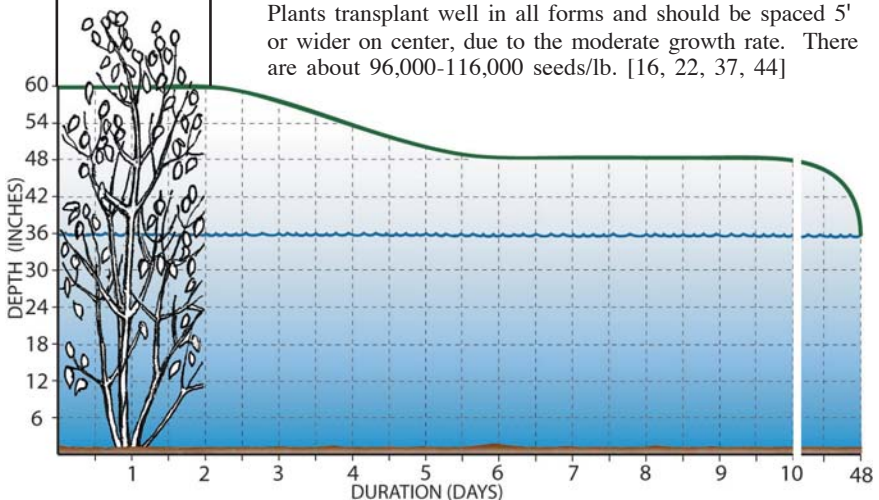
habitat for insects and hummingbirds. Waterfowl (mallard, widgeon, shoveller, wood duck, teals) are the principal users of its seeds, although they may be eaten also by insects, beaver and muskrats. Deer, muskrats and beaver browse it. It provides habitat for birds and reptiles. The leaves are poisonous to humans and unpalatable to livestock. [6, 22, 32, 36, 37, 44]

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Seed and bareroot and potted stock.

### **Planting Techniques**

Seeds are best germinated in plenty of light on wet mudflats and shorelines. Seeds can be collected August to September and stored in fresh water at 34 degrees F. if they are not planted immediately. This species sprouts easily from cuttings and should be rooted prior to flooding. Plants transplant well in all forms and should be spaced 5' or wider on center, due to the moderate growth rate. There are about 96,000-116,000 seeds/lb. [16, 22, 37, 44]







## *Chelone glabra*

Turtlehead - a.k.a. White Turtlehead, Snake-head

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Swamp openings, thickets, stream banks, shores, wet meadows, marshes, peatlands and calcareous fens. [7, 16, 35, 41] **Range:** Nc. and e. Minn. (Eco-Region: 1-3, 5-9), Wis., Mich. Nfld. to Minn., s. to Ga. and Ala. [7, 21]

### Description

**General:** Robust perennial herb that is 1-3" tall, and often grows as a single stem topped with a cluster of large, white flowers. **Flower:** It has spikes of white (sometimes lavender) flowers that are 2-lipped and 1-1½" long. The shape of the flower suggests the head of a turtle. Blooms from July to October. **Leaf:** Narrow, opposite, elongate (½-1" wide and 3-6" long), glossy, dark green and coarsely toothed. **Stem:** Bluntly angled stems are often clumped. **Fruit:** Seeds flat, suborbicular, with a broad wing. **Root:** Fibrous, deep. **Soil:** Wet-to-moist soils of many types, although it prefers calcareous soils and peat. [7, 35, 41]

### Normal Water Level

This species prefers shallow water of 3" of inundation or less to wet/saturated conditions. [21]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 9". **Duration:** Short – 2 days (decreasing 6" the first day and 3" the second). This species has a moderate tolerance to flood duration. [1]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Unknown. **Nutrient:** Low. **Siltation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate-to-low tolerance to general disturbance and stress. [1,47]

### Design Considerations:

Turtlehead is widely known as a landscape plant for mesic to wet gardens. It is also well suited for wetland restorations, rain gardens, and lake-edge restorations, especially in calcareous and peaty conditions. It is suited for cutflowers and is a butterfly host. **Concerns:** Loss of habitat has made turtlehead less common. Many cultivars have been produced that may be mistakenly used in wetland restorations. [16, 41]

### Wildlife Use

This species is a host plant for the very rare Baltimore butterfly as well as other butterfly larvae and insects. It attracts hummingbirds. With the decline of turtlehead habitat, the baltimore butterfly is losing its host. [21, 41]



Indicator Status: OBL

### Nursery/Plant Information

**Available:** Widely.

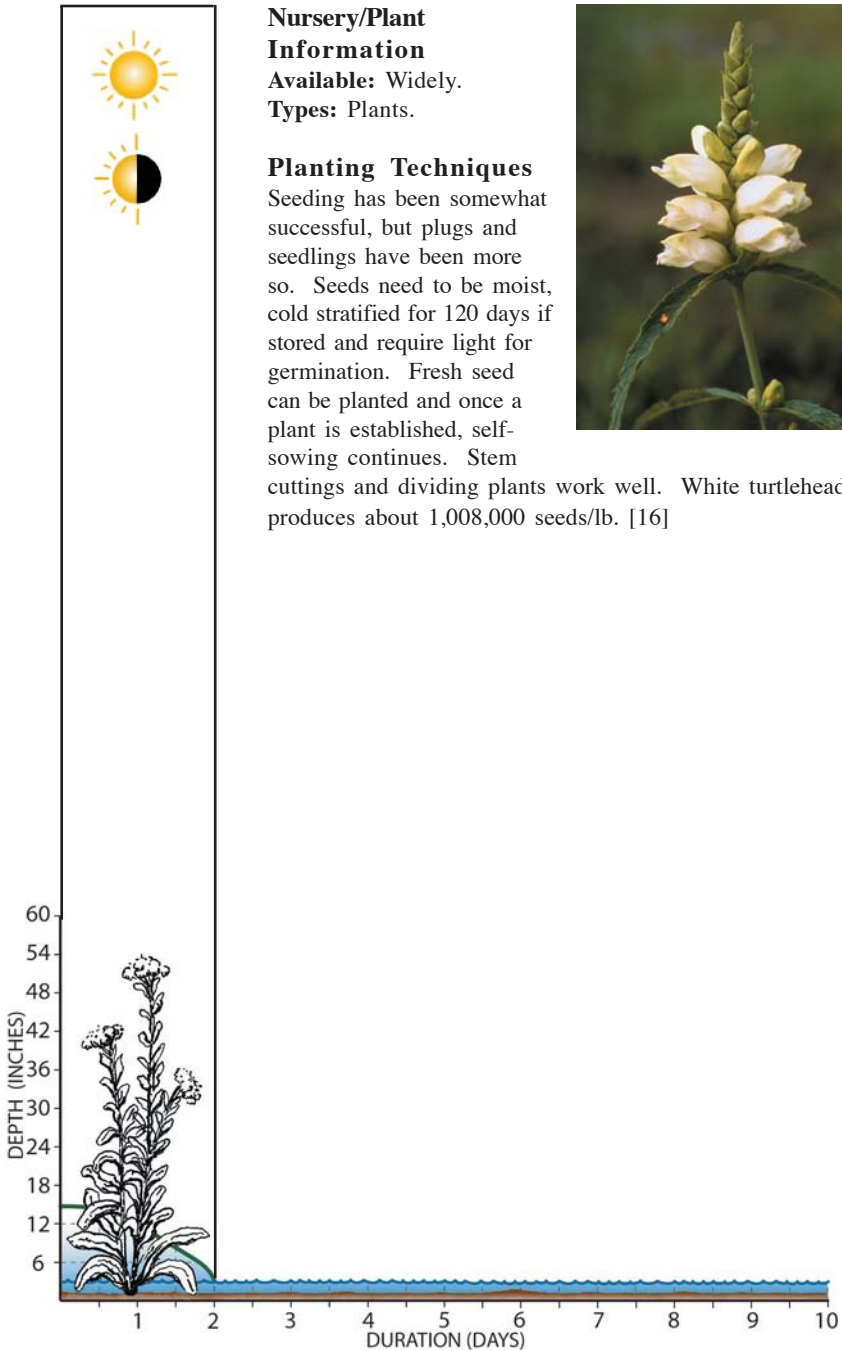
**Types:** Plants.

### Planting Techniques

Seeding has been somewhat successful, but plugs and seedlings have been more so. Seeds need to be moist, cold stratified for 120 days if stored and require light for germination. Fresh seed can be planted and once a plant is established, self-sowing continues. Stem cuttings and dividing plants work well. White turtlehead produces about 1,008,000 seeds/lb. [16]



Photo: Paul Jackson





## *Cornus amomum*

Silky Dogwood – a.k.a. *C. obliqua*

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Conifer swamps, floodplain depressions, ox-bows, low alluvial woods, wet thickets, marshes, springs, meadows, open bogs, calcareous fens, lake shores, stream banks and wet dunes. Silky dogwood is not as common as red-osier dogwood (*C. sericea*) in shrub-carrs. [7, 11, 22] **Range:** Common; se. Minn. (Eco-Region: 5-9), c. and s. Wis., LP of Mich. (occasional in s. UP). Me. and Que. to Minn., s. to Ga., Ala., Ark. and Okla. [7, 21]

### Description

**General:** An erect, deciduous shrub that forms a dense cluster of stems usually 6-12' high and wide. **Flower:** Our latest-flowering dogwood. The inflorescence is an open cyme with white flowers that bloom from May to July. **Leaf:** Opposite, ovate-to-elliptic, and 2-3/8 to 4¾" long with 4 to 6 pairs of lateral veins. The leaves are dark green on top and silky underneath. **Stem:** Brownish stems and reddish-purple bark. **Twigs:** Magenta with fine hairs and brown pith. **Fruit:** Mature berry is dark blue; the immature fruit may be white to bluish white. **Root:** Fibrous, shallow lateral roots. **Soil:** Tolerates most soils. [7, 11, 22]

### Normal Water Level

This species prefers moist-to-wet/saturated conditions although it is tolerant of more upland conditions. [21, 37]

### Flooding/Fluctuation Tolerances

**Frequency:** Low. **Depth:** 36". **Duration:** Long – 30+ days (decreasing 24" in 4 days and then 12" in the next 30 days). This species can tolerate seasonal and irregular flooding and is moderately to somewhat tolerant to flood duration. [1, 8, 22, 37]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low. **Siltation:** Unknown. **Insect:** Infrequent – borers, scales, dogwood club-gall and leaf miner can be minor problems. **Other:** Infrequent damage from ice and wind, though sensitive to 2,4-D, lighting, drought and heat. Silky dogwood is resistant to soil compaction. It has a moderate-to-high tolerance to general disturbance and stress. [1, 8, 22, 37]

### Design Considerations

Silky dogwood has been used often for wildlife cover and in restorations. It is well suited for stream bank stabilization and for shrubby thickets adjacent to wooded swamps. Other restorations that it would be well suited for are calcareous fens, lake shores, marshes and wet dunes. This species should be considered in landscaping situations and for rain gardens with low-salt conditions. **Concerns:** Stressed by drought conditions. [11]

**Indicator Status: FACW+**

### Wildlife Use

This is one of the better species for habitat and beauty. The fruit and buds are used by wood ducks, marsh birds, shorebirds, songbirds (cardinals, catbirds, evening and pine grosbeaks, kingbirds, robins, hermit and wood thrushes, common flickers, downy woodpeckers and cedar waxwings) and gamebirds (ruffed grouse, wild turkeys). Other major users are large and small mammals (deer, moose, rabbits and chipmunks). This dogwood is not edible to humans. [11, 21, 22, 32]



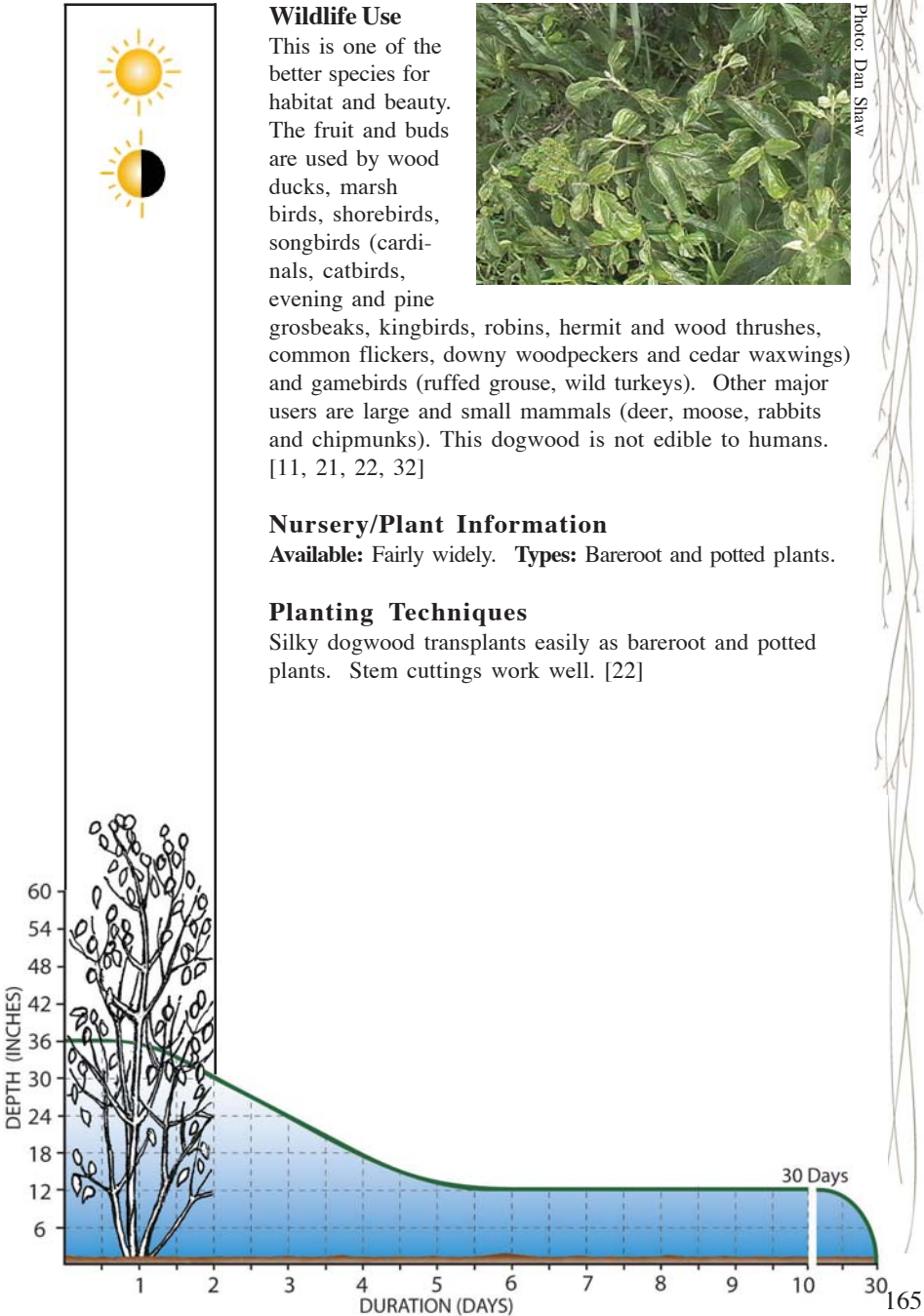
Photo: Dan Shaw

### Nursery/Plant Information

**Available:** Fairly widely. **Types:** Bareroot and potted plants.

### Planting Techniques

Silky dogwood transplants easily as bareroot and potted plants. Stem cuttings work well. [22]





## *Cornus racemosa*

Gray Dogwood - a.k.a. *C. foemina*, *C. paniculata*, *C. foemina racemosa*

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Lake shores, stream banks, swamps, thickets, marshes, low prairies, savannas and moist woods (open alluvial woods, rocky wooded hilltops, wood's edge, fence row, rocky ledges, limestone outcrops, glades, oak woods). [7, 16, 22] **Range:** Common; all but far ne. Minn (Eco-Range: 1, 3-9), local in nc. Wis., LP and occasional in c. and e. UP of Mich. Me. and s. Que. to s. Man., s. to Va., s. Ill. and Mo. [7, 21]

### Description

**General:** Gray dogwood is a widely adapted, multistemmed shrub that forms large, upright, branching stands that may reach heights of 12'. **Flower:** Showy white flower clusters in May to July. **Leaf:** Lanceolate-to-elliptic leaves that are 1½ to 3-1/8", abruptly acuminate, often whitened beneath, with 3-4 lateral veins to a side. Good purple-red fall color. **Bark:** Old bark mostly smooth and gray, pith white or tan. **Twigs:** Glabrous, at first green, soon becoming tan and eventually gray-brown. **Fruit:** Excellent production of berries that are white, August to September. **Root:** Fibrous, shallow lateral roots; suckers profusely, forming large colonies. **Soil:** Wet-mesic, mesic-dry, dry soil gradient with a pH range of 5.5-8.5, will tolerate most soils. [7, 22, 44]

### Normal Water Level

This species prefers moist/saturated-to-dry conditions, although it persists on unfavorable sites. [21, 37, 44]

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 6". **Duration:** Short – 2 days (decreasing 3"/day). This species will tolerate seasonal and irregular inundation of 2-4" of short duration and will decrease in abundance with flood depth decreases. [1, 22, 37, 44]

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Moderate to high. **Siltation:** Moderate to high. **Insect:** Infrequent; none serious. **Other:** Gray dogwood is sensitive to 2,4-D, salt and lighting. It has some resistance to O<sub>3</sub>, wind/ice damage and soil compaction. Gray dogwood is resistant to drought, heat, alkaline soils and mine spoils. It has a high tolerance to general disturbance and stress. [1, 2, 10, 16, 22, 25, 37, 44]

### Design Considerations

Gray dogwood is commonly used in restorations or revegetation sites and is often allowed to form thickets. It has been used in slopes, buffers, fence rows, stream bank stabilization, lake edges, and upper shoreline zones. It will increase and become denser with disturbance. **Concerns:** This species suckers and forms thickets that will invade surrounding area and become aggressive. This may be a strategy to inhibit other species that invade, such as buckthorn and honeysuckle. [16, 44]

**Indicator Status:** FACW-



### **Wildlife Use**

This is one of the better species for habitat and beauty. The flowers attract the common blue butterfly. The fruit and buds are particularly used by wood ducks, marsh birds, shorebirds, songbirds (cardinals, catbirds, evening and pine grosbeaks, kingbirds, robins, hermit and wood thrushes, common flickers, downy woodpeckers and cedar waxwings), and game birds (ruffed grouse, pheasants and wild turkeys). Other major users are large and small mammals (deer, moose, rabbits, beavers, woodchucks, raccoons, squirrels and chipmunks). This dogwood is not edible to humans. [21, 22, 32, 37, 44]



Photo: Paul Jackson



Photo: Paul Jackson

### **Nursery/Plant Information**

**Available:** Widely. **Types:** Bareroot and potted stock.

### **Planting Techniques**

The seeds germinate readily if they are scarified. The roots sucker well and will spread quickly. Cuttings also root easily and grow rapidly. About 12,100 seeds/lb. [16, 22, 44]



## *Cornus sericea*

**Red-osier Dogwood** - a.k.a. *C. stolonifera* - **Red Osier, Redosier or Red-twigged Dogwood; Kinnikinnik**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Swamps, marshes, shores, stream banks, flood plain forests, sedge meadows, wet to wet-mesic prairies, calcareous fens, shrub thickets and sand dunes. It is a characteristic shrub of shrub-carrs. It may form dense thickets and may invade nonwooded areas in response to water level changes. [7, 11, 16, 22, 36]

**Range:** Common; Minn. (Eco-Region: All), Wis., Mich. Nfld. to Alaska, s. to Pa., Ill., Neb. and n. Mex. [7, 21]

### **Description**

**General:** Many-stemmed, erect, deciduous shrub, 6-12' tall, forming thickets.

**Flower:** Flat-topped clusters of small, creamy white flowers from May to August.

**Leaf:** Lanceolate to ovate, without teeth, 1½-3½" long with 5-7 pairs of lateral veins. The leaves are dull green above, whitish green and covered with fine hairs beneath, and turn reddish in autumn. **Bark:** Gray or brown, smooth or slightly furrowed into flat plates. **Twigs:** Reddish to bright red, hairy when young, then lack hairs with rings at nodes. **Fruit:** A cluster of white, juicy, berry-like drupes with 2 seeds; April to November. **Root:** Fibrous shallow lateral roots, stoloniferous. **Soil:** Lowland wet water gradient with a pH range of 5.5-8.5. Will tolerate many soil types, including calcareous and peat. [7, 8, 11, 22, 36, 44]

### **Normal Water Level**

This species prefers mesic to wet/saturated conditions. [21, 37, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 36". **Duration:** Long – 30+ days (12" every 2 days until the last 12", which may last up to 30 days). It tolerates constant inundation during early spring better than during the growing season, although it will tolerate seasonal and irregular fluctuations. [1, 8, 11, 22, 37, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Moderate to high.

**Siltation:** Moderate to high. **Insect:** Occasional – scale, bagworms, other insects.

**Other:** Red-osier dogwood spreads slowly by stolons. It is tolerant to drought, heat, alkaline soils and soil compaction, although it is intolerant to 2,4-D, O<sub>3</sub> and lighting. It is also tolerant of oil/grease and metals. It may handle SO<sub>2</sub>, wind and ice damage. It has a moderate tolerance to general disturbance and stress. [1, 2, 8, 10, 22, 25, 37, 44]

### **Design Considerations**

Red-osier dogwood is specified in many plans for restorations, buffers, screens, erosion control, stream bank stabilization and landscaping. It will work well in rain gardens and other water-fluctuation situations. It provides habitat for wildlife and beauty to landscapes. Overall a good plant in many designs. **Concerns:** There are many cultivars and varieties. It may invade sedge meadows, prairies and calcareous



## Indicator Status: FACW

fens as water levels change. When deer numbers are high, this species is reduced in size and abundance. [16, 36, 44]



Photo: MINDNR

### Wildlife Use

This is one of the better species for habitat and beauty. The flowers attract common blue butterflies. The fruit and buds are used particularly by wood ducks, marsh birds, shorebirds, songbirds (cardinals, catbirds, evening and pine grosbeaks, kingbirds, robins, hermit and wood thrushes, common flickers, downy woodpeckers and cedar waxwings), and gamebirds (ruffed grouse, pheasants and wild turkeys). Other major users are large and small mammals (deer, moose, rabbits, beavers, woodchucks, raccoons, squirrels and chipmunks). It provides excellent warbler and American goldfinch habitat. Its fruit is not edible to humans. [7, 11, 21, 22, 32, 37, 44]

### Nursery/Plant Information

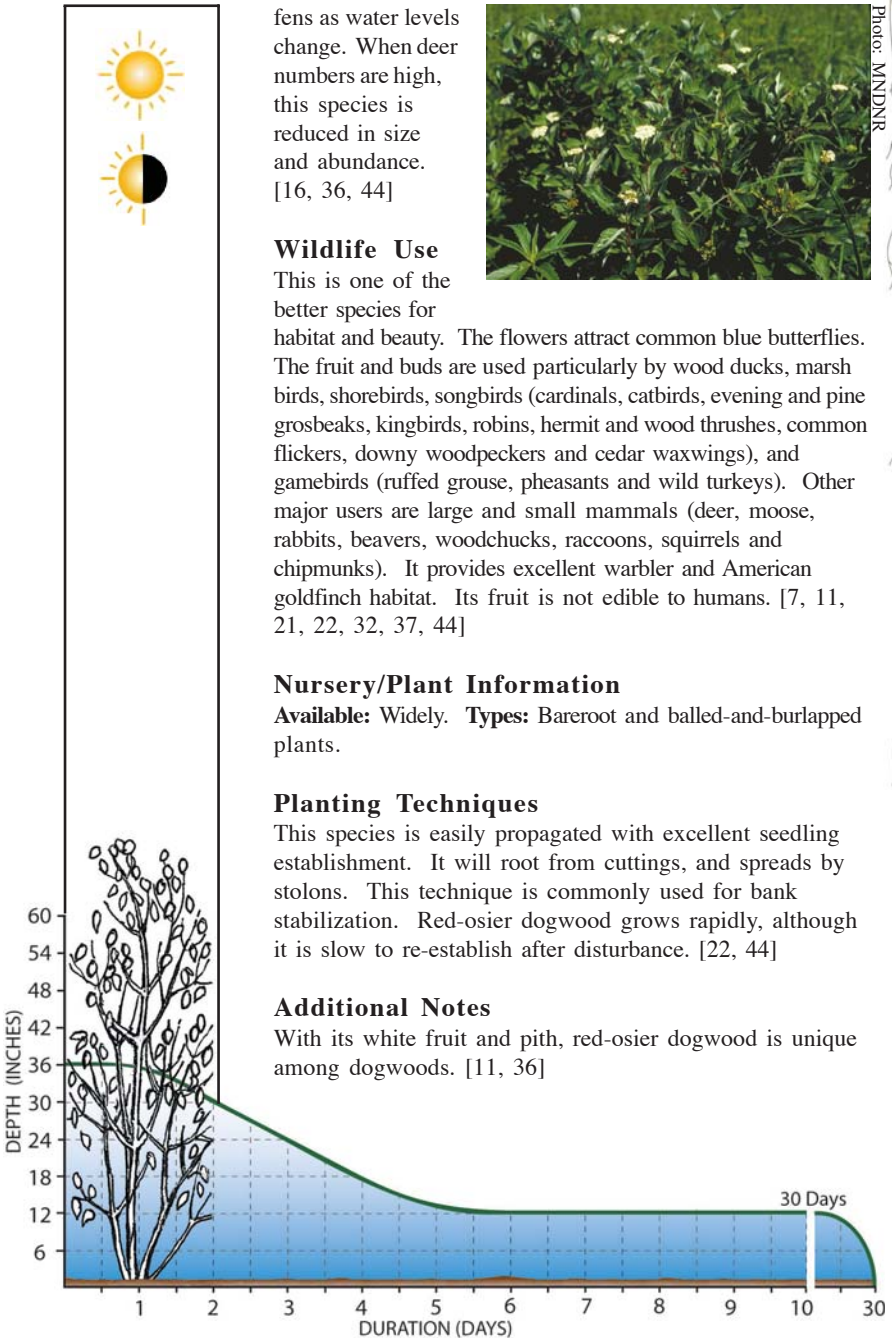
**Available:** Widely. **Types:** Bareroot and balled-and-burlapped plants.

### Planting Techniques

This species is easily propagated with excellent seedling establishment. It will root from cuttings, and spreads by stolons. This technique is commonly used for bank stabilization. Red-osier dogwood grows rapidly, although it is slow to re-establish after disturbance. [22, 44]

### Additional Notes

With its white fruit and pith, red-osier dogwood is unique among dogwoods. [11, 36]







## *Eleocharis obtusa*

**Blunt Spikerush** - a.k.a. *Eleocharis ovata* – **Blunt Spike Rush**

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Wet, sandy or muddy shores, marshes, ditches, mud flats, disturbed artificial wetlands and temporary ponds. Commonly found in disturbed, saturated soils, such as those of farmed wetlands and wetland creation or restoration sites. [7, 11, 16, 44] **Range:** Mostly ne. and ec. Minn (Eco-Region: 5-9), n. Wis., local in w. UP and far n. LP of Mich. Widespread over much of N. Amer. and Eurasia. [7, 21]

### **Description**

**General:** A densely tufted, herbaceous annual that is hardy and reaches 12-20".  
**Flower:** Brown, from June to October in ovoid spikelets. **Stem:** The soft stems have sheaths that are oblique at the apex. **Fruit:** Lens-shaped achene with a triangular cap (the tubercle) that is a different color and texture than the body of the achene. Bristles subtending the achene usually number 6-7 and are as long or longer than the achene.  
**Root:** Fibrous. **Soil:** Wet sandy or muddy soils. [7, 11, 24, 44]

### **Normal Water Level**

This species prefers shallow water of 6" of inundation or less to wet/saturated conditions. [21, 37, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 18". **Duration:** Long – 30 days (decreasing 6"/day for 2 days, then the last 6" over 28 days). Blunt spikerush will tolerate regular flooding to 6" of water. Continuous flooding of 15" or more or increases in flood depth can kill it. It has a moderate tolerance to flood duration. [1, 24, 26, 37, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Prefers full sun. **Salt:** Low to moderate. **Nutrient:** Moderate to high and unaffected by P increases. **Siltation:** Low. **Insect:** Infrequent. **Other:** Spikerush has a high metal uptake and a moderate tolerance to general disturbance and stress. [1, 6, 24, 37, 44]

### **Design Considerations**

Blunt spikerush is commonly found in disturbed, saturated soils, such as farmed or created wetlands and restoration sites. It is used in stream bank stabilization, mud flat revegetation, vegetated swales and in calcareous situations. A good plant to add to many restorations, and may come from the seedbank. **Concerns:** May decline with increased competition. [16, 26, 44]

### **Wildlife Use**

Waterfowl (coots, black ducks, mallards, pintails, ring-necked ducks and teal; blue, snow and Canada geese; and swans) eat the rhizomes and achenes of this plant. The achenes are also eaten by sora and Virginia rails. Prairie voles, muskrats and rabbits eat the plant and achenes. [24, 32, 37, 44]

Indicator Status: OBL

### Nursery/Plant Information

**Available:** Widely.

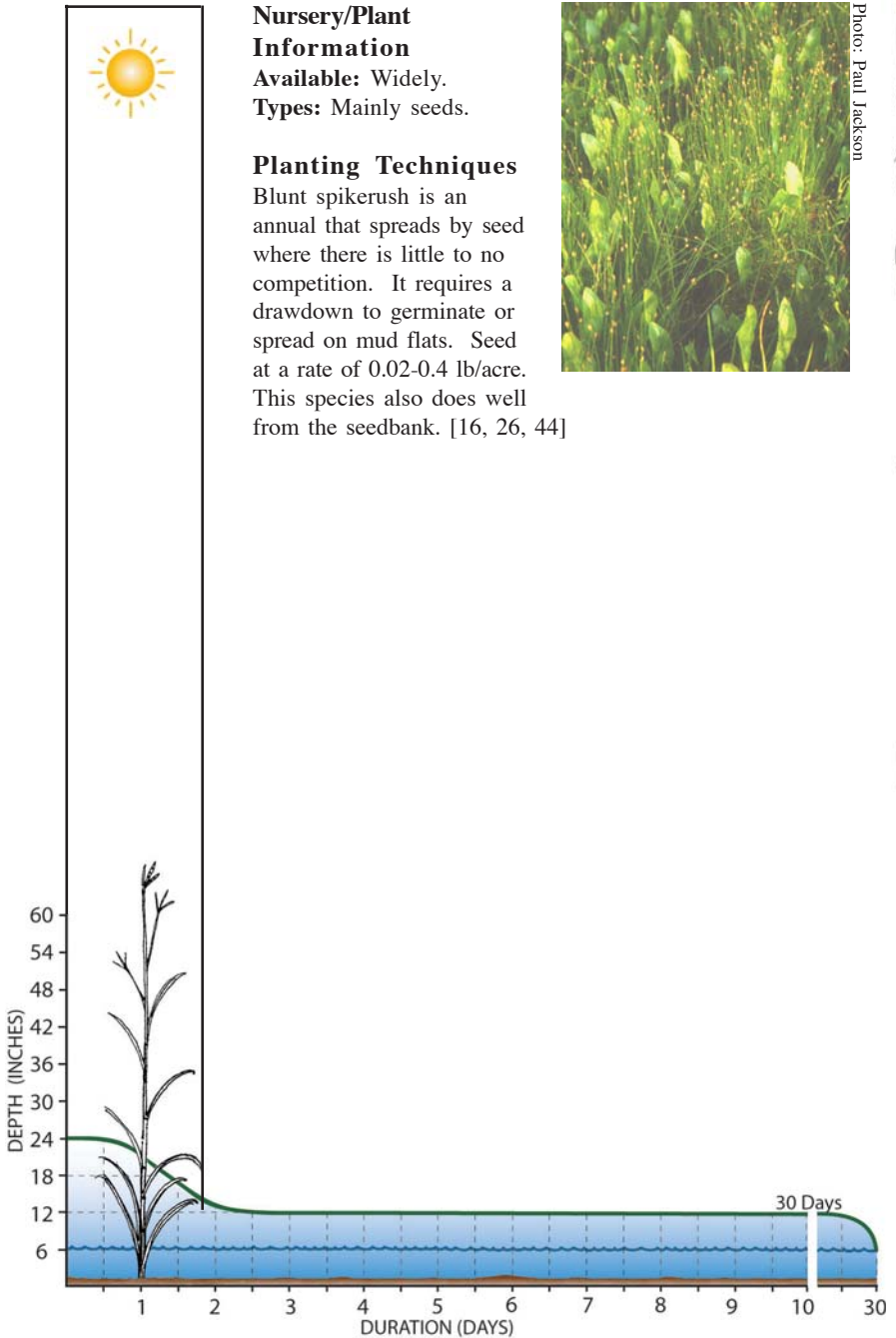
**Types:** Mainly seeds.

### Planting Techniques

Blunt spikerush is an annual that spreads by seed where there is little to no competition. It requires a drawdown to germinate or spread on mud flats. Seed at a rate of 0.02-0.4 lb/acre. This species also does well from the seedbank. [16, 26, 44]



Photo: Paul Jackson





## *Elymus virginicus*

Virginia Wild Rye - a.k.a. Virginia Wildrye, Terrell-grass

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Flood plain forests, wet savannas, mesic woodlands, thickets and stream banks. [7, 16] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich. Nfld. to Alta., s. to Fla. and Ariz. [7, 21]

### **Description**

**General:** A short-lived, cool-season perennial grass that clumps and reaches heights up to 3'. **Flower:** Tan color from June to October. The awn is less than 3 cm long. **Leaf:** Flat, 3/8-9/16" wide, rough to the touch on both sides, with smooth sheaths. **Stem:** 24-48" long. **Fruit:** A caryopsis. **Root:** Rhizomes. **Soil:** Moist soil in many types. [7, 17, 44]

### **Normal Water Level**

This species prefers upland moist to wet/saturated conditions. [21, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Moderate. **Depth:** 36". **Duration:** Long – 15 days (decreasing 12"/day for first 2 days, then 6" on day 3 and last 6" over 15 days). It will tolerate dry soils as well. [44]

### **Sensitivities or Other Tolerances**

**Exposure:** Partial to full sun. **Salt:** Moderate. **Nutrient:** Moderate. **Siltation:** Moderate. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 44, 47]

### **Design Considerations**

Virginia wild rye is used mostly as a forage and haying species. It is also used along stream banks for stabilization, slope buffers, vegetated swales and in floodplain forest or savanna areas. It is a good landscape plant and dries well for arrangements. Consider it for many types of wetland restorations. **Concerns:** This species can become aggressive if it is seeded too heavily. [16, 44]

### **Wildlife Use**

Virginia wild rye is grazed and is palatable for many browsers as well as blackbirds and quail. [32, 44]

### **Nursery/Plant Information**

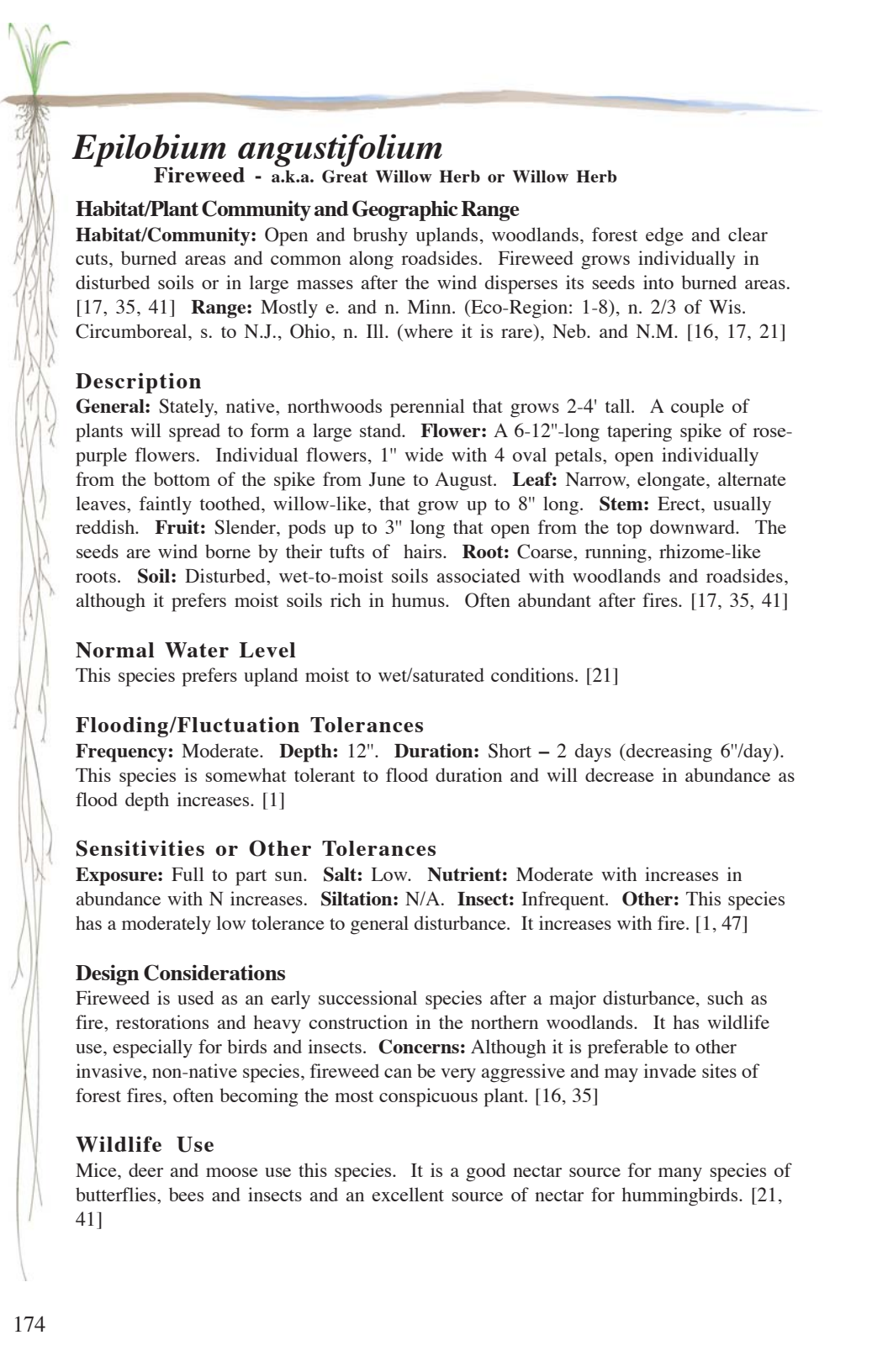
**Available:** Widely. **Types:** Plants and seed.

### **Planting Techniques:**

Seeding is best done in spring or fall. Recommended rates are 0.06-1.0 lb/acre. Over seeding can be a problem. Approximately 73,000 seeds/lb. [16, 44]

Indicator Status: FACW-





# *Epilobium angustifolium*

Fireweed - a.k.a. Great Willow Herb or Willow Herb

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Open and brushy uplands, woodlands, forest edge and clear cuts, burned areas and common along roadsides. Fireweed grows individually in disturbed soils or in large masses after the wind disperses its seeds into burned areas. [17, 35, 41] **Range:** Mostly e. and n. Minn. (Eco-Region: 1-8), n. 2/3 of Wis. Circumboreal, s. to N.J., Ohio, n. Ill. (where it is rare), Neb. and N.M. [16, 17, 21]

## Description

**General:** Stately, native, northwoods perennial that grows 2-4' tall. A couple of plants will spread to form a large stand. **Flower:** A 6-12"-long tapering spike of rose-purple flowers. Individual flowers, 1" wide with 4 oval petals, open individually from the bottom of the spike from June to August. **Leaf:** Narrow, elongate, alternate leaves, faintly toothed, willow-like, that grow up to 8" long. **Stem:** Erect, usually reddish. **Fruit:** Slender, pods up to 3" long that open from the top downward. The seeds are wind borne by their tufts of hairs. **Root:** Coarse, running, rhizome-like roots. **Soil:** Disturbed, wet-to-moist soils associated with woodlands and roadsides, although it prefers moist soils rich in humus. Often abundant after fires. [17, 35, 41]

## Normal Water Level

This species prefers upland moist to wet/saturated conditions. [21]

## Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). This species is somewhat tolerant to flood duration and will decrease in abundance as flood depth increases. [1]

## Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Moderate with increases in abundance with N increases. **Siltation:** N/A. **Insect:** Infrequent. **Other:** This species has a moderately low tolerance to general disturbance. It increases with fire. [1, 47]

## Design Considerations

Fireweed is used as an early successional species after a major disturbance, such as fire, restorations and heavy construction in the northern woodlands. It has wildlife use, especially for birds and insects. **Concerns:** Although it is preferable to other invasive, non-native species, fireweed can be very aggressive and may invade sites of forest fires, often becoming the most conspicuous plant. [16, 35]

## Wildlife Use

Mice, deer and moose use this species. It is a good nectar source for many species of butterflies, bees and insects and an excellent source of nectar for hummingbirds. [21, 41]

Indicator Status: FAC

### Nursery/Plant Information

**Available:** Fairly.

**Types:** Plants commercially.

### Planting Techniques

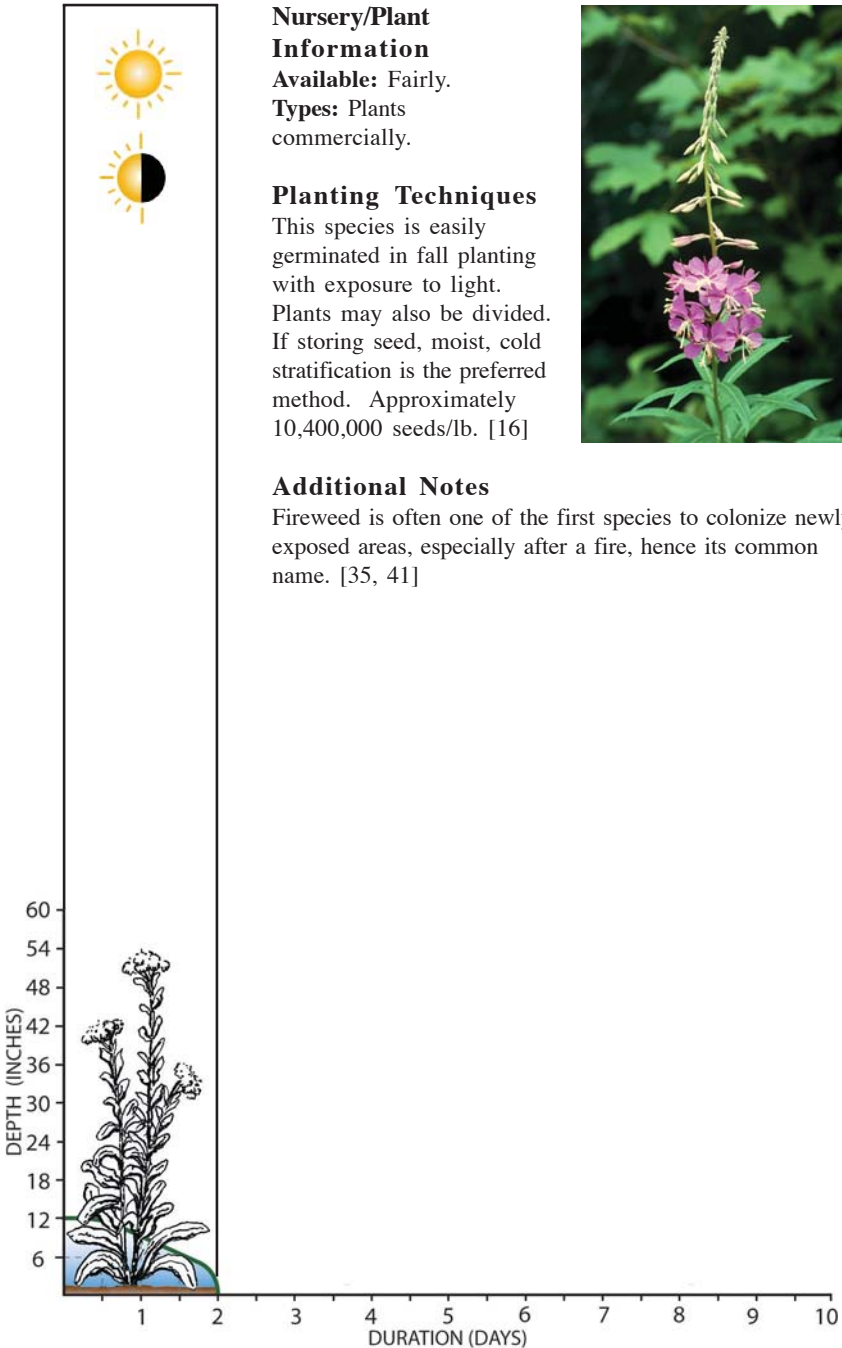
This species is easily germinated in fall planting with exposure to light. Plants may also be divided. If storing seed, moist, cold stratification is the preferred method. Approximately 10,400,000 seeds/lb. [16]

### Additional Notes

Fireweed is often one of the first species to colonize newly exposed areas, especially after a fire, hence its common name. [35, 41]



Photo: MINDNR





## *Equisetum fluviatile*

**Horsetail** - a.k.a. Water-horsetail, Swamp Horsetail, Pewterwort, Joint Rush

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** In standing water of marshes, muddy shores, bogs, lake edges, ponds, peatlands, ditches and swales. [4, 7, 17] **Range:** All but sw. Minn. (Eco-Region: 1-8), common in Wis., Mich. Circumboreal, s. to Pa., W.V., Ohio, n. Ill., Iowa, Nebr., nw. Mont. and Ore. [7, 21]

### **Description**

**General:** A rhizomatous perennial with annual stems which, like other horsetails, grows in large beds. A dark-green, leafless plant, growing to 3'. Sterile and fertile stems look alike, except fertile stems produce a terminal cone. **Leaf:** Leaves reduced to a toothed membrane that encircles the stem at each node. The 15-20 pointed teeth are dark brown to black with a pale margin. **Stem:** Hollow, jointed stems that may branch and are ridged and stiff, with a high silica content. A central cavity takes up about 80% of the stem's diameter. Each stem is jointed and can be pulled apart, making a snapping sound, like popping bubble wrap. Depending on growing conditions, branching may occur at the nodes. **Fruit:** Oval cone that produces spores which will germinate on moist soil. **Root:** Emerges from a buried rhizome. **Soil:** Muddy to peaty soils preferred in standing water. [4, 7, 17]

### **Normal Water Level**

This species prefers deep water of 3' of inundation or less to wet/saturated conditions. [4, 7, 21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 12". **Duration:** Long – 10 days (decreasing 2.5"/day). This species has a moderate tolerance to flood event duration, although it is very tolerant to depth increases. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun to part shade. **Salt:** Low to moderate. **Nutrient:** Low. **Sitation:** Unknown. **Insect:** Infrequent. **Other:** This species has a moderate-to-low tolerance to general disturbance and stress. [1, 47]

### **Design Considerations**

Even though common horsetail regrows from the rhizomes each year, it will work well in restorations in peat soils, muddy shores, ponds and mud flats. It provides good habitat for fish and other animals. **Concerns:** May produce large, monotypic beds. [4]

### **Wildlife Use**

Common horsetail provides good fish cover and habitat, food for geese and is grazed by ruffed grouse and moose. Research in Alaska has shown that it is a primary food source for trumpeter swans, dominating the diet of both adult and young swans. [4, 21, 32]



**Indicator Status: OBL**

**Nursery/Plant Information**

**Available:** Limited.

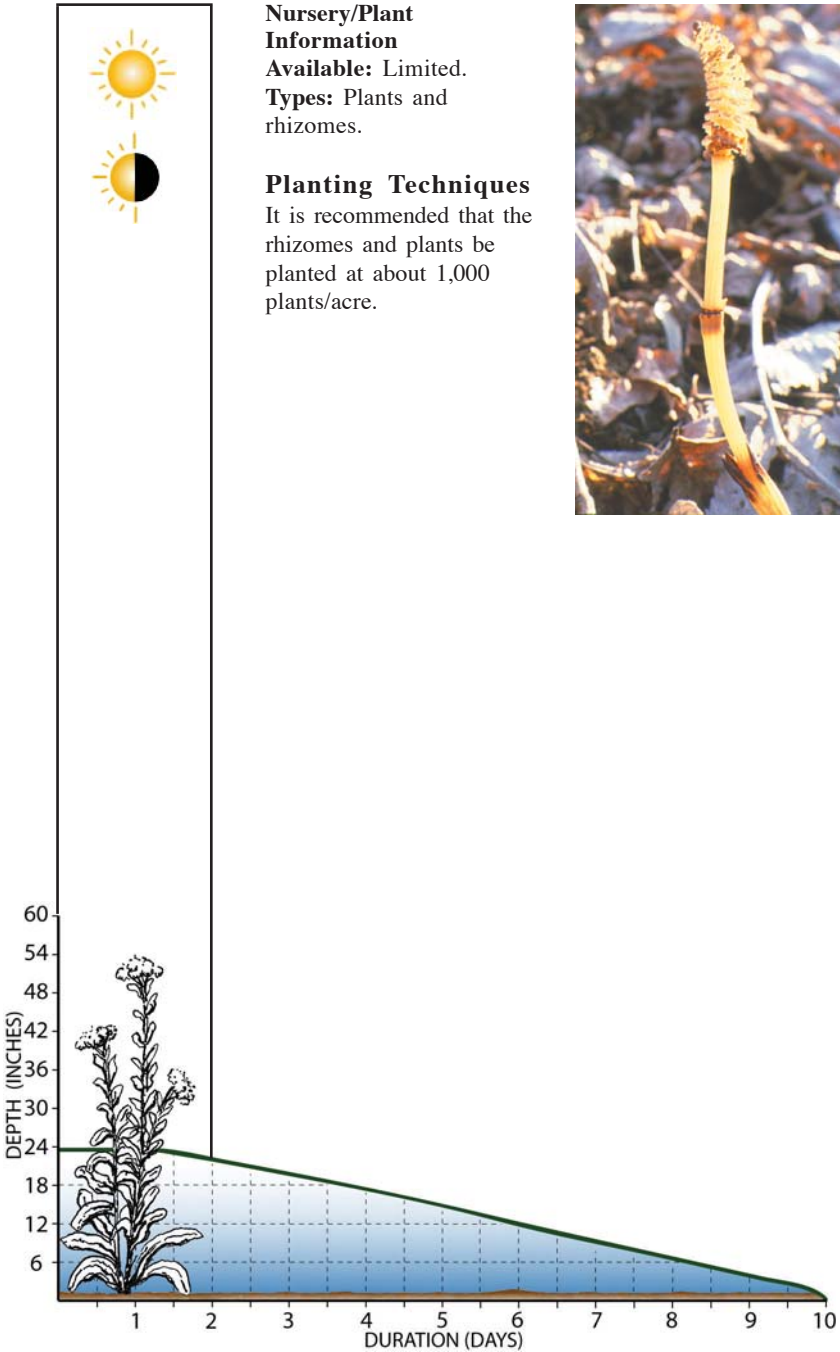
**Types:** Plants and rhizomes.

**Planting Techniques**

It is recommended that the rhizomes and plants be planted at about 1,000 plants/acre.



Photo: Paul Jackson





## *Eryngium yuccifolium*

Rattlesnake Master - a.k.a. Rattlesnake-master, Button Snakeroot

### Habitat/Plant Community and Geographic Range

**Habitat/Community:** Mesic and dry, sandy soils of open woods, prairies and savannas. [16, 17] **Range:** Nw., c. and s. Minn. (Eco-Region: 3-5, 7-9), Wis. and Mich. S. USA, n. to Va., Ind., Minn. and Kan., and occasionally farther north. **Special concern species in Minn., endangered in Mich.** [17]

### Description

**General:** Rattlesnake master's appearance is reminiscent of the Southwest's yucca. This coarse, spiny, erect perennial stands 28-42" tall. **Flower:** Composed of dense heads, each head subtended by a bract, each flower by a bractlet. Heads round-ovoid; white-to-lilac blooms from July to September. **Leaf:** Linear, very elongate, parallel-veined leaves that are whitish with bristly outer edges. The upper leaves gradually reduce. **Stem:** Usually simple to the inflorescence. **Fruit:** Round, scaly and about 1" in diameter. **Root:** Fascicled roots. **Soil:** Prefers wet-to-dry sandy soil in uplands. [17]

### Normal Water Level

This species prefers mesic to dry upland conditions.

### Flooding/Fluctuation Tolerances

**Frequency:** Moderate. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). It will tolerate drought and heat.

### Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Moderate. **Nutrient:** Low. **Siltation:** Low. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 47]

### Design Considerations

A beautiful, distinctive plant that is ideal for landscapes as a contrast or background plant. The flowers may be dried for arrangements. It is a butterfly magnet and is a tough fast grower for restorations, rain garden edges, and upland buffers. It is an early successional species. **Concerns:** Rattlesnake master is an endangered or special concern species in Minnesota and Michigan. Cultivars are starting to be produced. [16]

### Wildlife Use

It is a butterfly host plant and a bee and butterfly magnet.

### Nursery/Plant Information

**Available:** Widely. **Types:** Plants and seed.

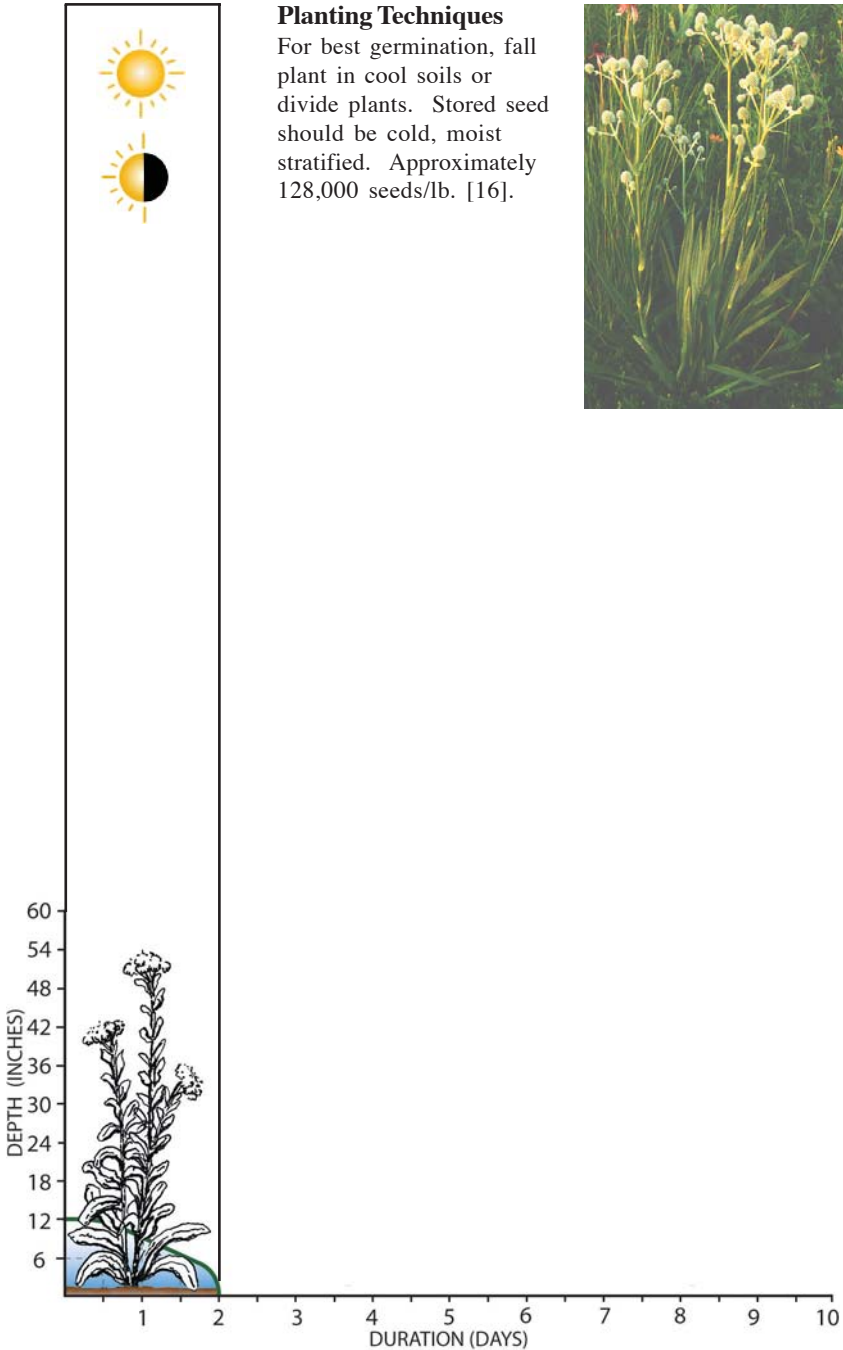
**Indicator Status: FAC+**

**Planting Techniques**

For best germination, fall plant in cool soils or divide plants. Stored seed should be cold, moist stratified. Approximately 128,000 seeds/lb. [16].



Photo: Dan Shaw





## *Eupatorium maculatum*

**Joe-pye-weed** - a.k.a. *Eupatoriadelphus m.* - Joe-pye Weed, Spotted Joe Pye Weed, Purple Boneset

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Wet meadows, sedge meadows, shrub-carrs, marshes, low prairie, shores, stream banks, ditches, cedar swamps, calcareous fens and open bogs. [7, 11, 16, 35, 41, 44] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich. Nfld. to B.C., s. to Md., Ohio, Ill., N.M. and Utah. [7, 21]

### **Description**

**General:** Robust, native perennial herb, usually 3-5' tall with 1 to several stems. **Flower:** Deep-rose to light-pink, flat inflorescence that lacks ray flowers and appears fuzzy or shaggy, 9-22 disc flowers occur in each head from July through September. Hundreds of individual flowers, ¼" wide, make up each inflorescence. **Leaf:** Toothed, lance-shaped leaves generally are in whorls of 4 or 5 and are 3-9" long. **Stem:** Often spotted with purple. **Fruit:** Achenes prismatic, mostly 5-angled and nerved. **Root:** Fibrous, shallow. **Soil:** Moist soils, especially calcareous wet or rich loam soils. [7, 11, 35, 41, 44, 47]

### **Normal Water Level**

This species prefers moist soil to wet/saturated conditions. [21, 44]

### **Flooding/Fluctuation Tolerances**

**Frequency:** High. **Depth:** 24". **Duration:** Medium long – 3.5 days (6" the first half day and then 6"/day). This species has a moderate tolerance to flood duration and will decrease in abundance as flood depth increases. [1, 44]

### **Sensitivities or Other Tolerances**

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low. **Siltation:** Low. **Insect:** Infrequent. **Other:** This species has a moderate tolerance to general disturbance and stress. [1, 44]

### **Design Considerations**

Joe-pye-weed is used in restorations, vegetated swales, shorelines, lake edges, wet prairies and gardens. It is an attractive plant, well suited for the perennial garden, rainwater garden and landscape where height is allowed. It provides good cutflowers, bird habitat and butterfly food. Joe-pye-weed prefers calcareous and heavy soils and is usually a good addition to a prairie garden. **Concerns:** This species may become aggressive, which may be preferable in some situations. Also, many cultivars or varieties are available, which may work in a landscape design but are not well suited to restorations. [16, 44, 47]

### **Wildlife Use:**

This species provides habitat for many species. It attracts butterflies, bees and many other insects. It provides cover for small mammals, amphibians and reptiles. Swamp sparrows and turkeys eat the seeds. [21, 32, 41, 44]

**Indicator Status: OBL**

**Nursery/Plant Information**

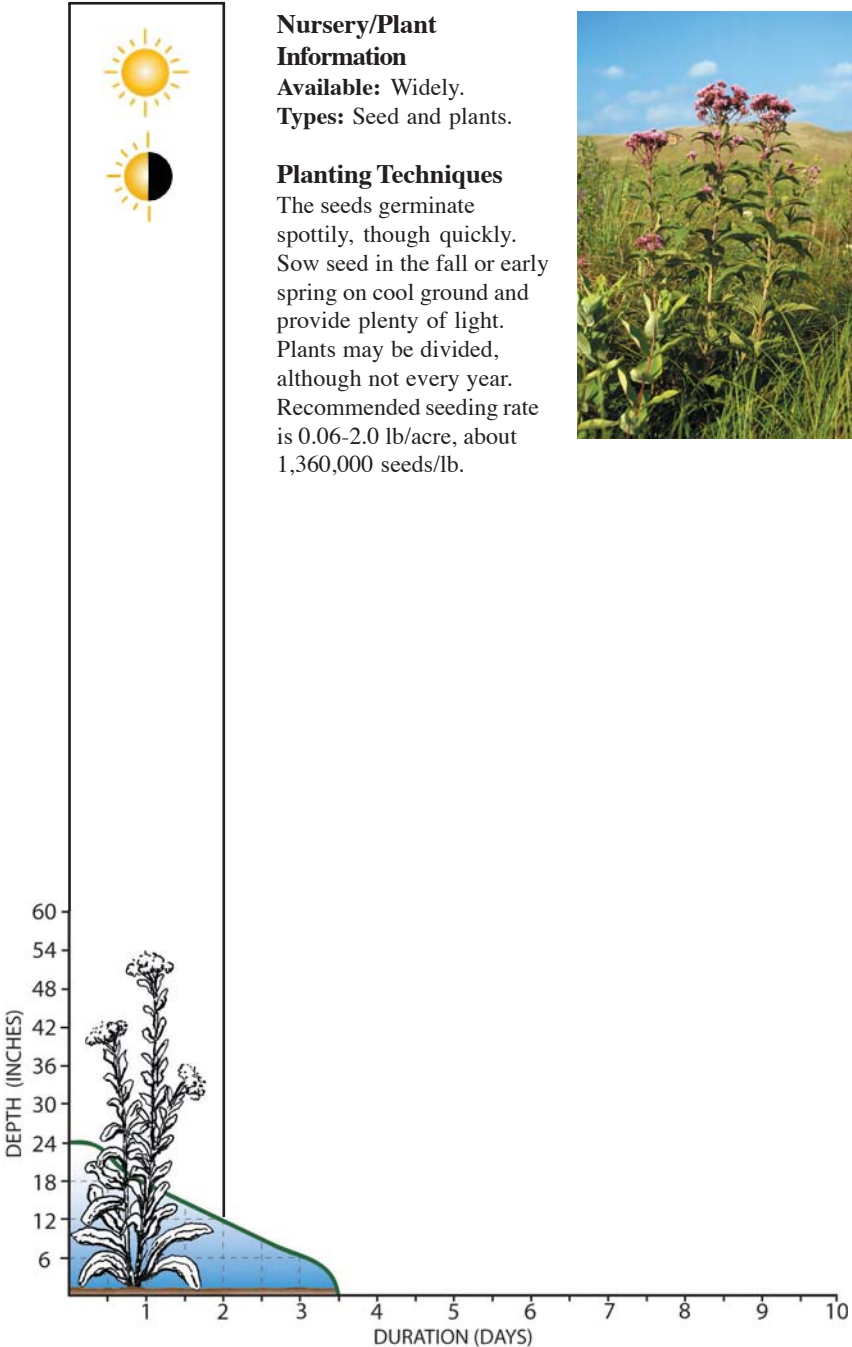
**Available:** Widely.  
**Types:** Seed and plants.

**Planting Techniques**

The seeds germinate spottily, though quickly. Sow seed in the fall or early spring on cool ground and provide plenty of light. Plants may be divided, although not every year. Recommended seeding rate is 0.06-2.0 lb/acre, about 1,360,000 seeds/lb.



Photo: Paul Jackson





# *Eupatorium perfoliatum*

Boneset - a.k.a. Common Boneset, Indian Sage

## Habitat/Plant Community and Geographic Range

**Habitat/Community:** Marshes, wet meadows, sedge meadows, low prairies, prairie swales, shores, stream banks, ditches, cedar swamps, thickets and calcareous fens. Often occurring with Joe-pye-weed (*E. maculatum*). It is often associated with groundwater seepages and tends to be a pioneer species. [7, 11, 16, 35, 41, 44]

**Range:** Common; Minn. (Eco-Region: All), Wis., Mich. N.S. and Que. to se. Man., s. to Fla. and Tex. [7, 21]

## Description

**General:** Coarse, hairy, native, perennial herb that may reach heights of 2-3'.

**Flower:** Conspicuous, flattish cluster of small, flowerheads that lack ray flowers. 9-23 white disc flowers occur in each head; individual flowers are ¼" in diameter and give a fuzzy appearance. **Leaf:** Opposite, elongate, wrinkly, leaves 4-8" long, join at the base (perfoliate) so that the stem appears to grow through the leaves. Leaves are covered in fine, whitish hair. **Stem:** Stems are coarsely hairy. **Fruit:** Achenes prismatic, mostly 5-angled and nerved. **Root:** Fibrous. **Soil:** Prefers moist or wet low grounds of rich loam or calcareous soils. [7, 11, 35, 41, 44]

## Normal Water Level

This species prefers wet/saturated-to-moist conditions. [21, 44]

## Flooding/Fluctuation Tolerances

**Frequency:** High. **Depth:** 24". **Duration:** Medium long – 3.5 days (decreasing 6" the first half day and then 6"/day after that). This species has a moderate tolerance to flood duration and is unaffected by increases in flood depth. [1, 44]

## Sensitivities or Other Tolerances

**Exposure:** Full to part sun. **Salt:** Low. **Nutrient:** Low to moderate. **Siltation:** Low to moderate. **Insect:** Infrequent. **Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1, 44, 47]

## Design Considerations

Similar to Joe-pye-weed, boneset is used in restorations, vegetated swales, shorelines, and is used to bind soil with its fibrous root system to resist erosion. It is a good habitat provider and groundcover. Flower color is not brilliant in gardens but the 2-3' plant has an interesting texture. Consideration should be given for this plant in rain gardens, lake edges and other landscape designs. **Concerns:** Leaves are often eaten by insects. [16, 44]

## Wildlife Use

Boneset is an excellent nectar provider for bronze copper, monarch, crescent and fritillary butterflies. Turkeys, swamp sparrows and some waterfowl eat the achenes. Mallards and ruffed grouse eat the leaves. It also provides cover for small mammals, reptiles and amphibians. [21, 32, 41, 44]

**Indicator Status:** FACW+

**Nursery/Plant Information**

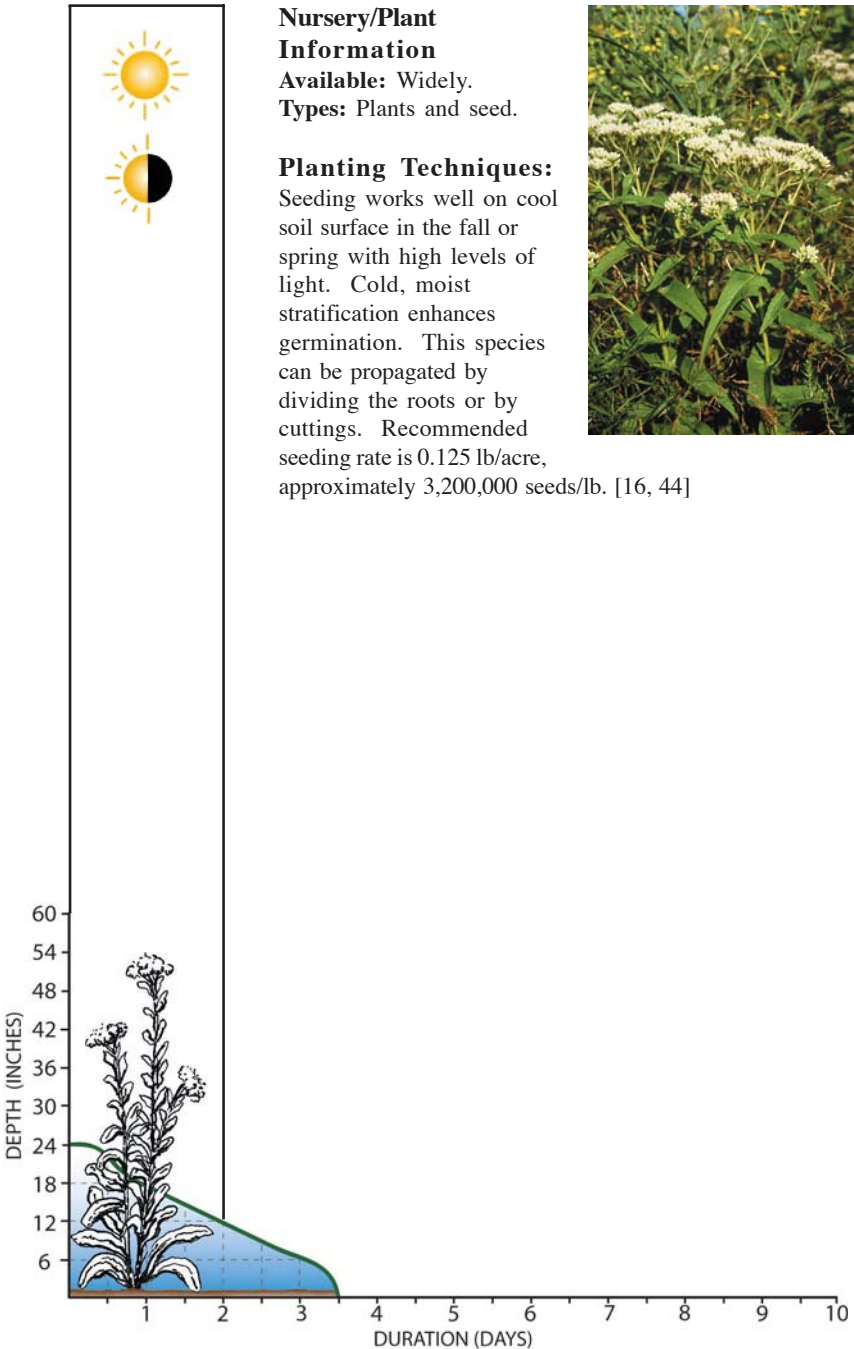
**Available:** Widely.  
**Types:** Plants and seed.

**Planting Techniques:**

Seeding works well on cool soil surface in the fall or spring with high levels of light. Cold, moist stratification enhances germination. This species can be propagated by dividing the roots or by cuttings. Recommended seeding rate is 0.125 lb/acre, approximately 3,200,000 seeds/lb. [16, 44]



Photo: Paul Jackson







## *Euthamia graminifolia*

**Grass-leaved Goldenrod** - a.k.a. *Solidago graminifolia* - Bushy, Fragrant, Common Flat-topped, or Flat-topped Goldenrod

### **Habitat/Plant Community and Geographic Range**

**Habitat/Community:** Shrub, wet meadows, low prairies, springs, fens, swamps, interdunal wetlands, and stream banks (often where sandy or gravelly; also weedy in abandoned fields). [7, 17] **Range:** Common; Minn. (Eco-Region: All), Wis., Mich. Nfld. and Que. to B.C., s. to Va., Ala., Tex. and N.M. [7, 21]

### **Description**

**General:** An erect, native, perennial herb that grows 1-3' high. **Flower:** Yellow disk and ray flowers from July to October. It looks more like an aster than a typical goldenrod. **Leaf:** Alternate, linear-to-narrow, lance-shaped leaves usually 1-6" long with 3 veins. **Stem:** Erect stem that has many small, lance-like leaves, usually branched at head. **Fruit:** A finely haired achene. **Root:** Spreading by rhizomes. **Soil:** Prefers wet/saturated to moist gravelly or sandy soils. [7, 17]

### **Normal Water Level**

This species prefers wet/saturated to moist/upland conditions. [21]

### **Flooding/Fluctuation Tolerances**

**Frequency:** Medium. **Depth:** 12". **Duration:** Short – 2 days (decreasing 6"/day). This species has a moderate-to-low tolerance to flood duration. [1]

### **Sensitivities or Other Tolerances**

**Exposure:** Full sun. **Salt:** Moderate. **Nutrient:** Low. **Siltation:** Low, from 0-8 cm/year. **Insect:** Infrequent. **Other:** This species has a moderate-to-high tolerance to general disturbance and stress. [1, 46]

### **Design Considerations**

A good restoration plant for old fields and meadows, wet prairies, fens and stream banks. Its root system helps resist erosion. A good plant for rain gardens due to its ability to withstand flooding and dry soils. **Concerns:** This species can spread quickly from rhizomes and become weedy.

### **Wildlife Use**

This species provides food and habitat for mice, rabbits, deer, grouse, bees and other insects. [21]

### **Nursery/Plant Information**

**Available:** Limited. **Types:** Plants and seed.

### **Planting Techniques**

This species should be planted with other aggressive species such as native grasses. There are 350,000 seeds/oz.

Indicator Status: FACW-

Photo: Paul Jackson

