



Graminoids

- Sedges
- Grasses
- Rushes

Graminoid Poetry

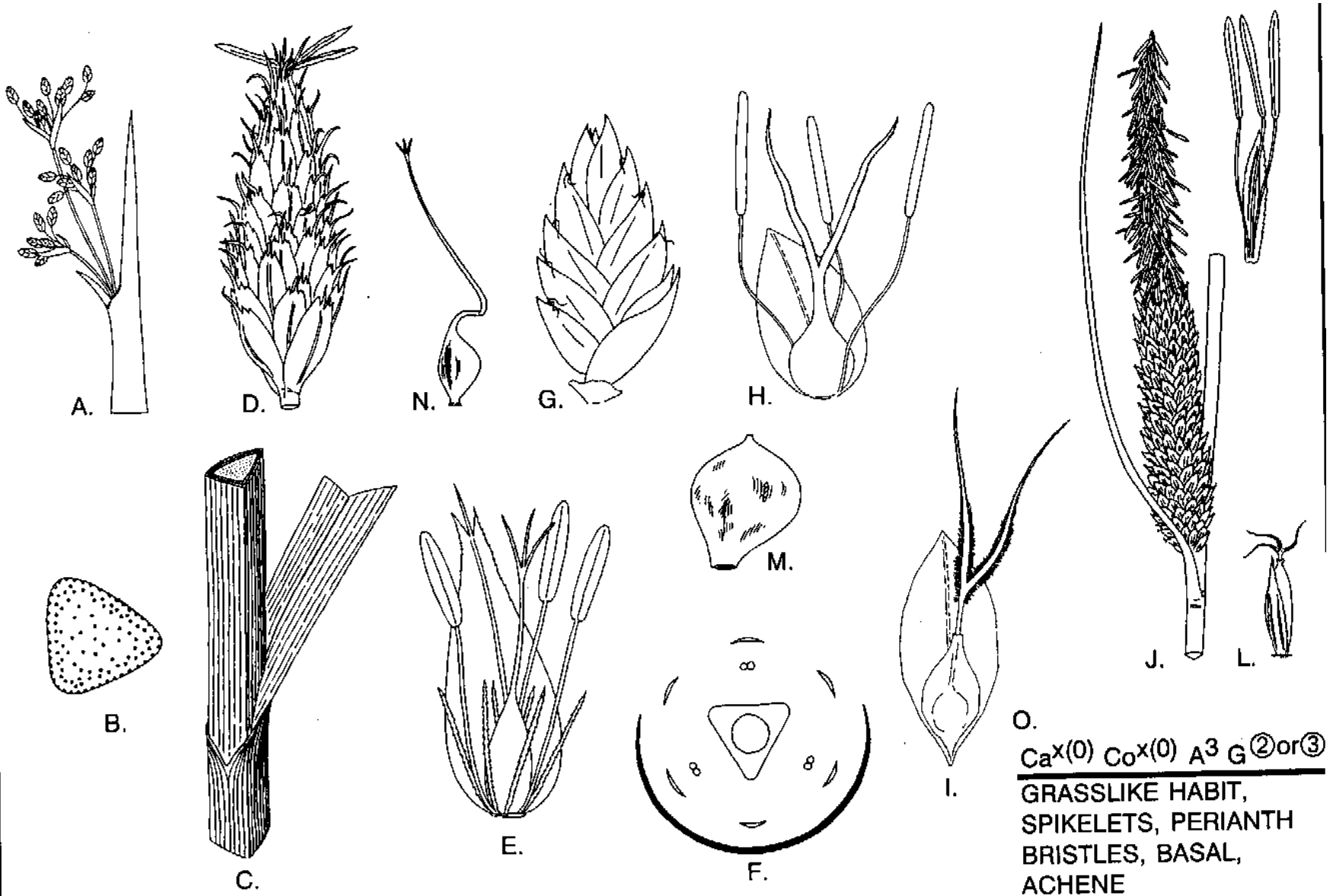
**“Sedges have edges,
Rushes are round, and
Grasses have nodes where leaves are found”**

**“Rushes are round,
Sedges have edges, and grasses are hollow
like glasses”**

...usually

Cyperaceae (Sedges)	Poaceae (Grasses)	Juncaceae (Rushes)
Stems usually 3-angled (or round, 4-angled, lenticular)	Stems round (terete)	Stems round (terete)
Stems usually with solid pith	Stems with solid nodes and hollow internodes	Stems with solid pith
Leaf sheaths closed	Leaf sheaths open	Leaf sheaths open
Leaves 3-ranked or spiral	Leaves 2-ranked	Leaves 2-ranked
Fruit an achene with bristles, bracts, may have tubercle	Fruit a grain with papery palea, lemma, and glumes	Fruit a capsule with tiny dust-like seeds

Sedges



Common Sedge Genera

- *Cyperus* - flat sedges
- *Rhynchospora* (*Dichromena*, *Psilocarya*) – beakrushes
- *Eleocharis* – spikerushes
- *Scirpus*
- *Schoenoplectus* – bulrushes
- *Fuirena*
- *Carex*
- *Cladium* (sawgrass), *Scleria* (nut rushes), *Fimbristylis*, *Bulbostylis*, *Websteria*

Cyperus

- 2-ranked floral scales on spikelets
- Basal leaves (articulatus, haspan, involucratus don't really have)
- Leafy bracts subtend inflorescence
- Key characters - # stigmas (2 or 3), shape of achene (lenticular or 3-sided) how achenes separate from spikelet



Stigma 2-parted
Lens-shaped achene



3-sided achene

Cyperus involucratus

Umbrella Plant

- Invasive exotic
- Formerly *C. alternifolius*
- Very large bracts subtending inflorescence
- No basal leaves



Cyperus articulatus *Schoenoplectus tabernaemontani*



- Cross partitions in stems



Cyperus articulatus
Photo by Matthew Merritt



Cyperus lecontei
Photo by Shirley Denton



Cyperus haspan
Photo by Shirley Denton



C. haspan

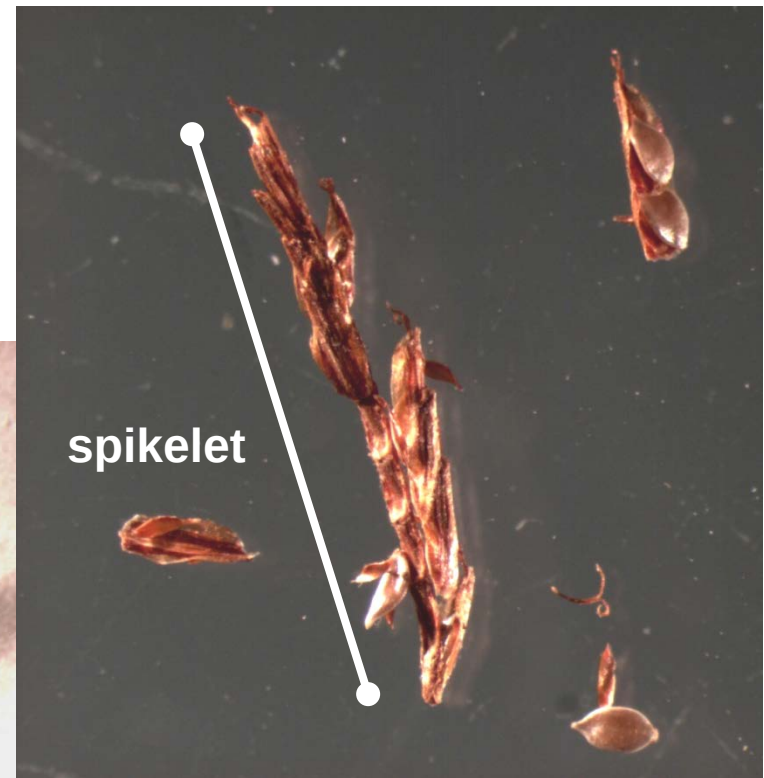
- soft triangular stem
- minor basal leaves
- fruits shed from the base of spikelet while tops still flowering



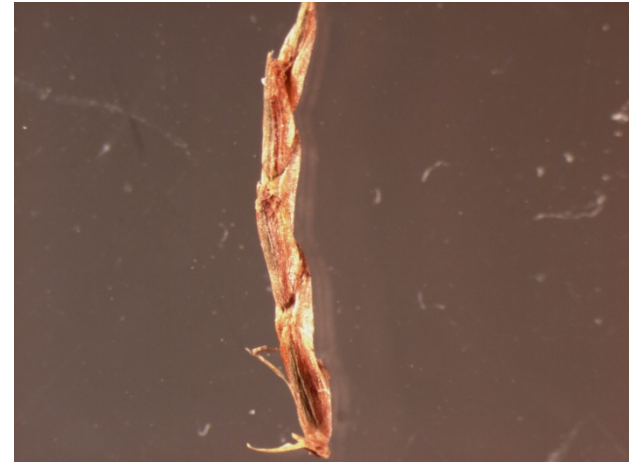
Cyperus haspan
Photo by Shirley Denton

Cyperus erythrorhizos

- Many spikelets on inflorescence axis
- 3-sided fruit
- Fruits fall off spikelet axis



Cyperus odoratus



Fruits disarticulate

Cyperus surinamensis



Cyperus surinamensis
Photo by Shirley Denton

Scirpus cubensis

Oxycarym cubense

Cyperus blepharoleptos



Scirpus cubensis
Photo by Shirley Denton

Cyperus blepharoleptos

- Leafy/invasive exotic
- Leaves dark green, shiny
- Red rhizomes, forms dense floating mats
- Inflorescence more likely branched in Peninsular Florida



Rhynchospora (Beaksedges)

- Tubercle on achene
- Plants leafy
- Key characters –
 - perianth bristles (length, barbs)
 - Tubercle (length, shape)
 - arrangement of spikelets (clusters or spreading)



Rhynchospora inundata and *corniculata*

Perianth bristles > achene body



Rhynchospora inundata

Photo by Betty Wargo

Rhynchospora inundata

Photo by Shirley Denton

Perianth bristles < achene body



Rhynchospora corniculata

Photo by Walter K. Taylor,

Rhynchospora corniculata

Photo by Shirley Denton

Rhynchospora tracyi

Rhynchospora tracyi
Photo by Shirley Denton



- Long tubercle, spikelets in clusters
- Leaves rolled



Rhynchospora microcephala



Rhynchospora (Psilocarya) nitens



Small black spikelets, jointed appearance

Rhynchospora



Look at stems, fruits

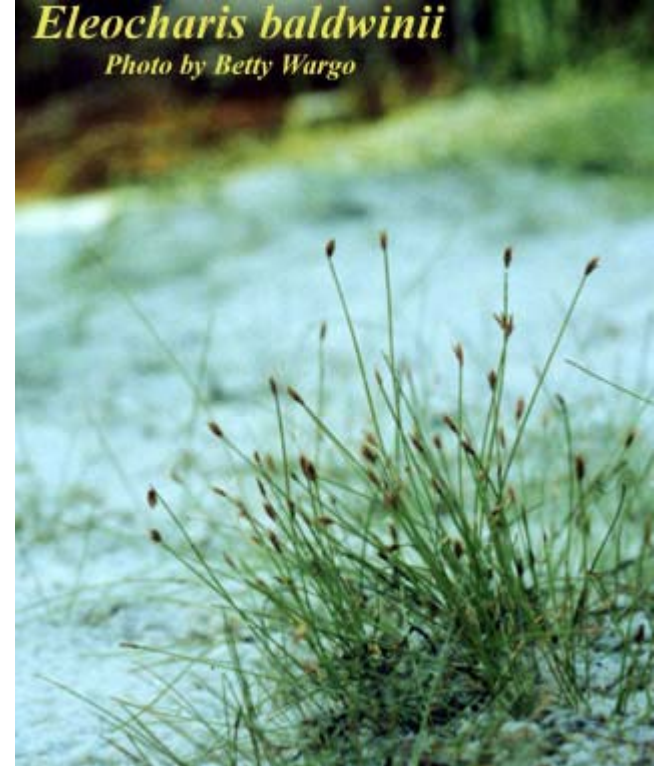
Juncus



Eleocharis spp.

Spikerushes

- Leafless stems in clumps
- Single terminal spike of fruits
- Sprout from stem tip
- Key characters –
 - Stem shape (flat, round, triangular, square)
 - Spikelet size and shape (wider than stem or not)
 - Perianth bristles
 - Tubercle
 - Achene surface ornamentation



Species with spike same width as stem:

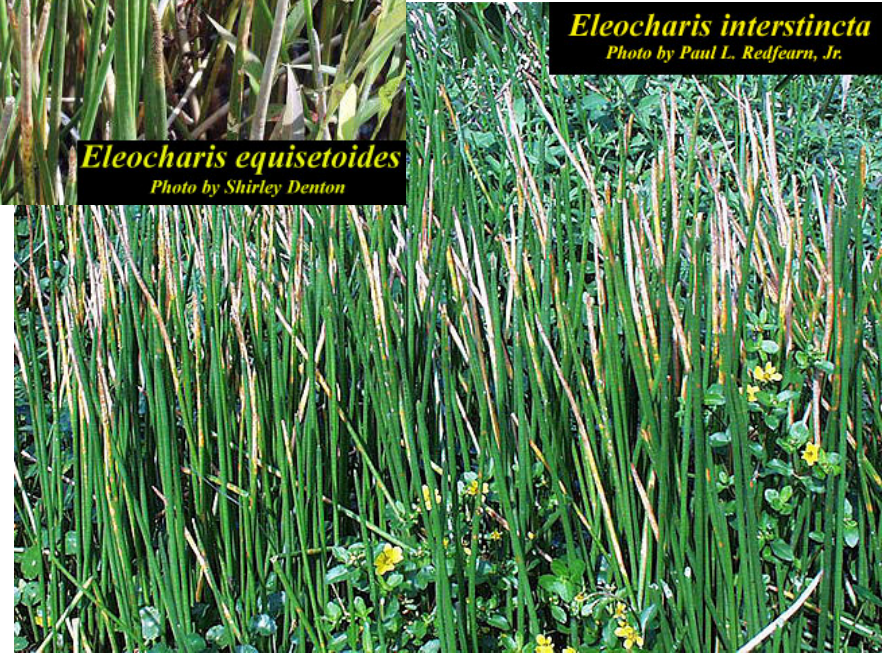
- *Partitions in Stem*
 - *E. montana* – partitions less than 8 mm apart
 - *E. interstincta* – partitions closer together near top, smooth stem
 - *E. equisitoides* – partitions equal distance apart, can feel partitions along stem
- *E. cellulosa* – no partitions, similar in size to above
- *E. robbinsii*
- *E. elongata*
- *E. quadrangulata* (not common)

E. cellulosa, equisetoides, interstincta

all are large species with the spike same width as stem



***E. equisetoides*
& *E. interstincta***
have nodose-septate stems



***Eleocharis*
equisitoides vs.
*interstincta***



Larger achene, shorter bristles



Smaller achene, longer bristles

E. equisitoides



Partitions crowded
near spike



E. interstincta



E. robbinsii and *E. elongata*

- *E. robbinsii*
 - Restricted to panhandle
 - Triangular stems
 - Spike same color as stem, very papery
 - Can have submersed hair-like sterile stems
- *E. elongata*
 - Very similar in growth form to *E. robbinsii*, but stems not triangular
 - Often no spikes present
 - Can have submersed hair-like sterile stems

Eleocharis robbinsii

- Triangular stem tips
- Fleshy stems, easy to crush
- Can grow in very deep water (2 m)
- Green above surface, orange below surface
- Fruiting tip not wider than stem





St. Marks NWR lake: *Rhynchospora tracyi*, *Eleocharis elongata*, *Fuirena scirpoidea*



Eleocharis elongata and *Nymphaea odorata*

Submersed non-fruiting

- Key to species in Ward and Hodges paper
- *E. elongata* has stolons, others caespitose
- *E. acicularis* not very abundant
- *E. vivipara* has red spots on sheaths
- *E. baldwinii* – no red spots

“Submersed Viviparous *Eleocharis*”



Schoenoplectus (bulrush)

- Tall leafless stems
- Bract extending beyond inflorescence, no leafy subtending bracts
- Round or triangular stems
- Fruit an achene without tubercle, with bristles



S. californicus

Schoenoplectus look alike



S. californicus

- Spikelets lance-ovoid, acute
- Perianth bristles plumose
- Grows to 3 m tall
- Stem typically firm

Schoenoplectus californicus

Photo by Shirley Denton



Schoenoplectus californicus

Photo by Shirley Denton



S. tabernaemontani

- Spikelets ovoid, obtuse
- Perianth bristles retrorsely barbed
- Grows to 3 m tall
- Stem typically spongy



S. tabernaemontani photos from Katie Williams, DEP
Achene drawings from Godfrey & Wooten keys

Schoenoplectus (triangular stems)

- Triangular stems – *S. americanus*, *S. pungens*, *S. robustus* (marine)



Scirpus cyperinus

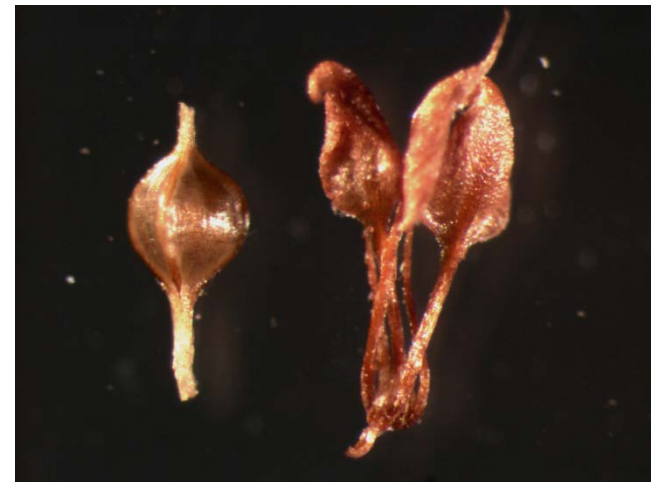
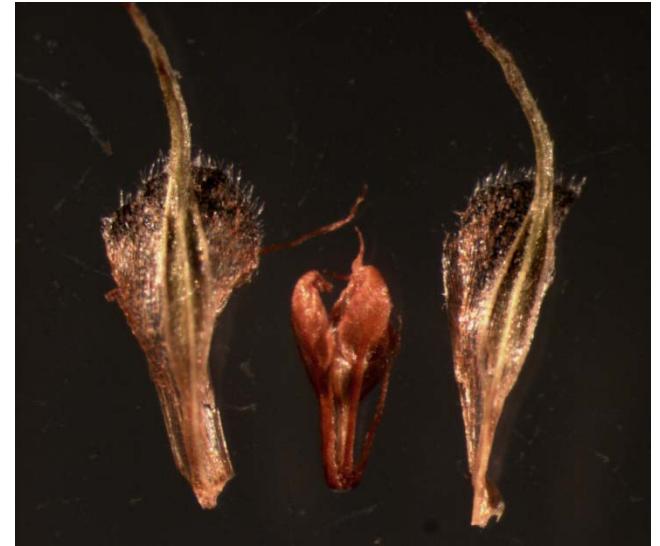
- *Round stem*
- *Leaves along stem*
- *Woolly inflorescence*



Fuirena (umbrella sedges)

Mostly small plants, 20-50 cm tall

F. squarrosa, *breviseta*, and *pumila* look alike



Fuirena scirpoidea

rush fuirena

- Round stems without leaves
- 1-3 (usually) seed heads
- Distinct triangular leaf sheaths at nodes along stem
- Height to 1 m in standing water
- Dark green above water surface, light green below



Fuirena scirpoidea



Carex

- Huge genus, generally not aquatic
- Male and female inflorescences often separate on same stem
- Fruit enclosed in a sac



Carex lupulina



- Streamsides
- Note sacs

Carex *albolutescens*

- Looks a little like *Fuirena*
- *Carex* fruit in sac, *Fuirena* fruit surrounded by papery bracts



Cladium jamaicense



- 1-3 meters tall
- Grayish-green color
- Scabrid leaf margins and midrib

Websteria confervoides

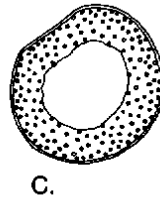
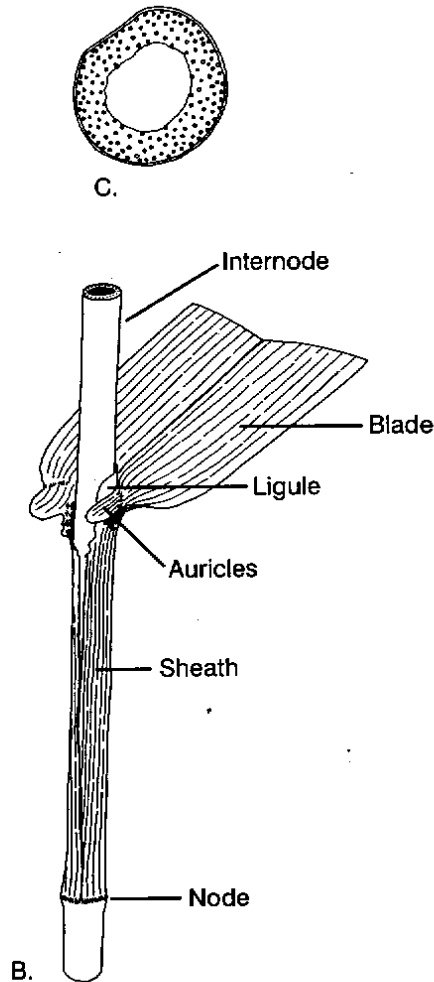
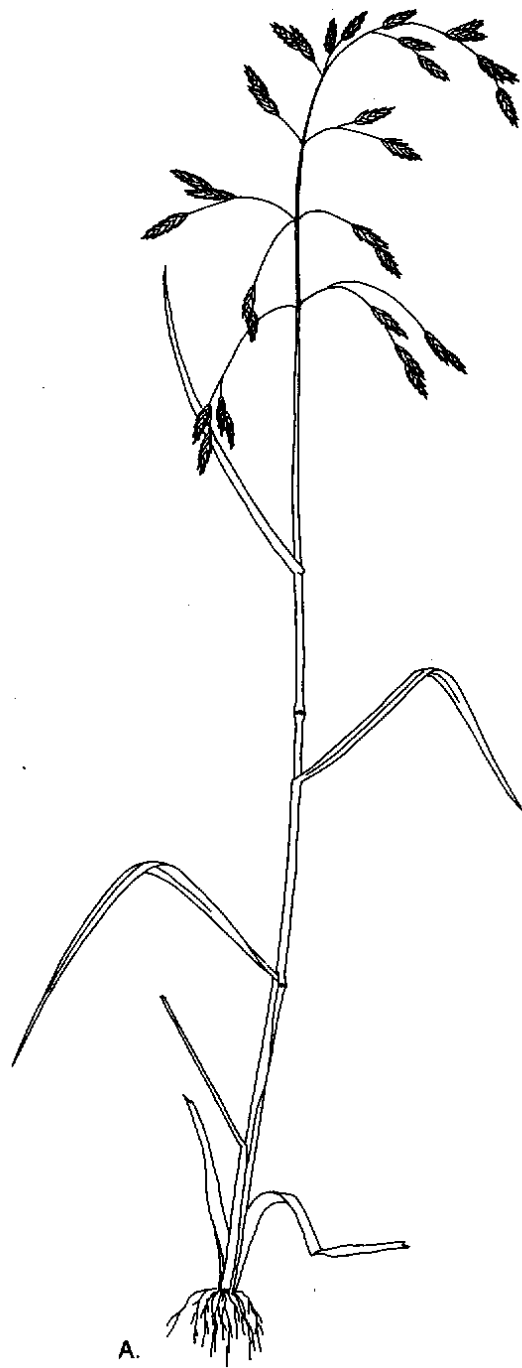


- Submersed
- Becomes locally abundant late summer
- Puffball appearance
- Terminal bud yields whorl of 3-12 branches
- Long stem between bunches of branches (distinguishes from submersed vivip *Eleocharis*)

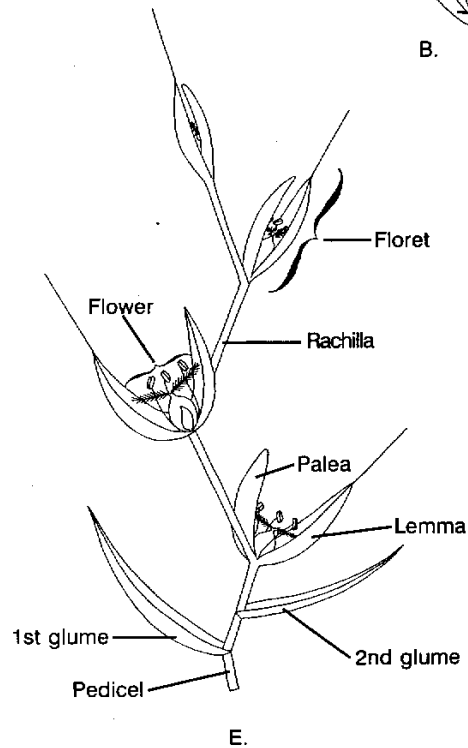
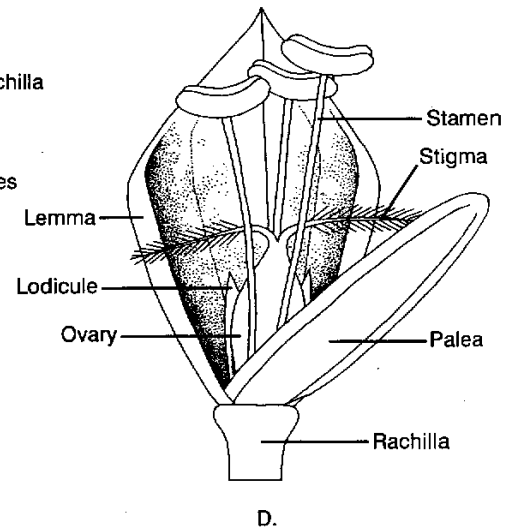
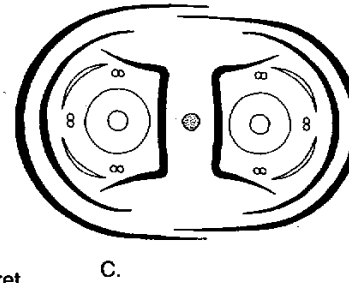
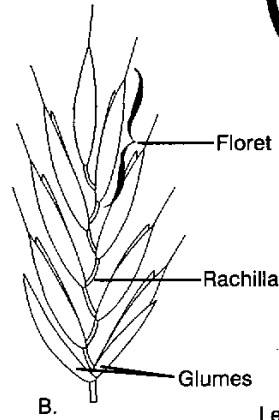
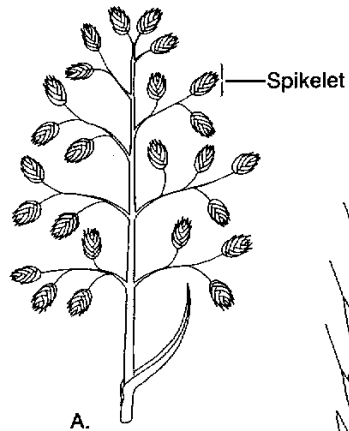
Websteria confervoides



Grasses



- Ligule
- Pith
- Sheath
- Fruits



F. $\text{Ca}^0 \text{Co}^0 \text{A}^3 \text{G}^2$
SPIKELETS w/ GLUMES,
LEMMAS and PALEAS,
LODICULE, CARYOPSES

Common Grasses in lake or fringe

- Submersed/Floating
 - *Luziola fluitans*
- Emergent – Low
 - *Leersia hexandra*
 - *Panicum repens*
 - *Paspalum repens*
- Emergent - Mid
 - *Panicum hemitomon*
 - *Sacciolepis striata*
 - *Urochloa (Brachiaria) mutica*
 - *Hymenachne amplexicaulis*
 - *Paspalidium geminatum*
- Emergent – High
 - *Echinochloa* spp.
 - *Saccharum (Erianthus) giganteus*
 - *Phragmites australis*
 - *Zizania aquatica*
 - *Zizaniopsis*

***Luziola fluitans* – Water Grass**

- Slender grass growing in shallow water
- Leaves float



Paspalum repens

- Fruits on “leaves” (winged rachis)
- Sprawling and floating
- Purple spots on sheaths
- Stems spongy, roots dark



Paspalum repens

C 1999



Water paspalum
Photo by Ann Murray
C 1999 University of Florida

Paspalum repens

Photo by Shirley Denton

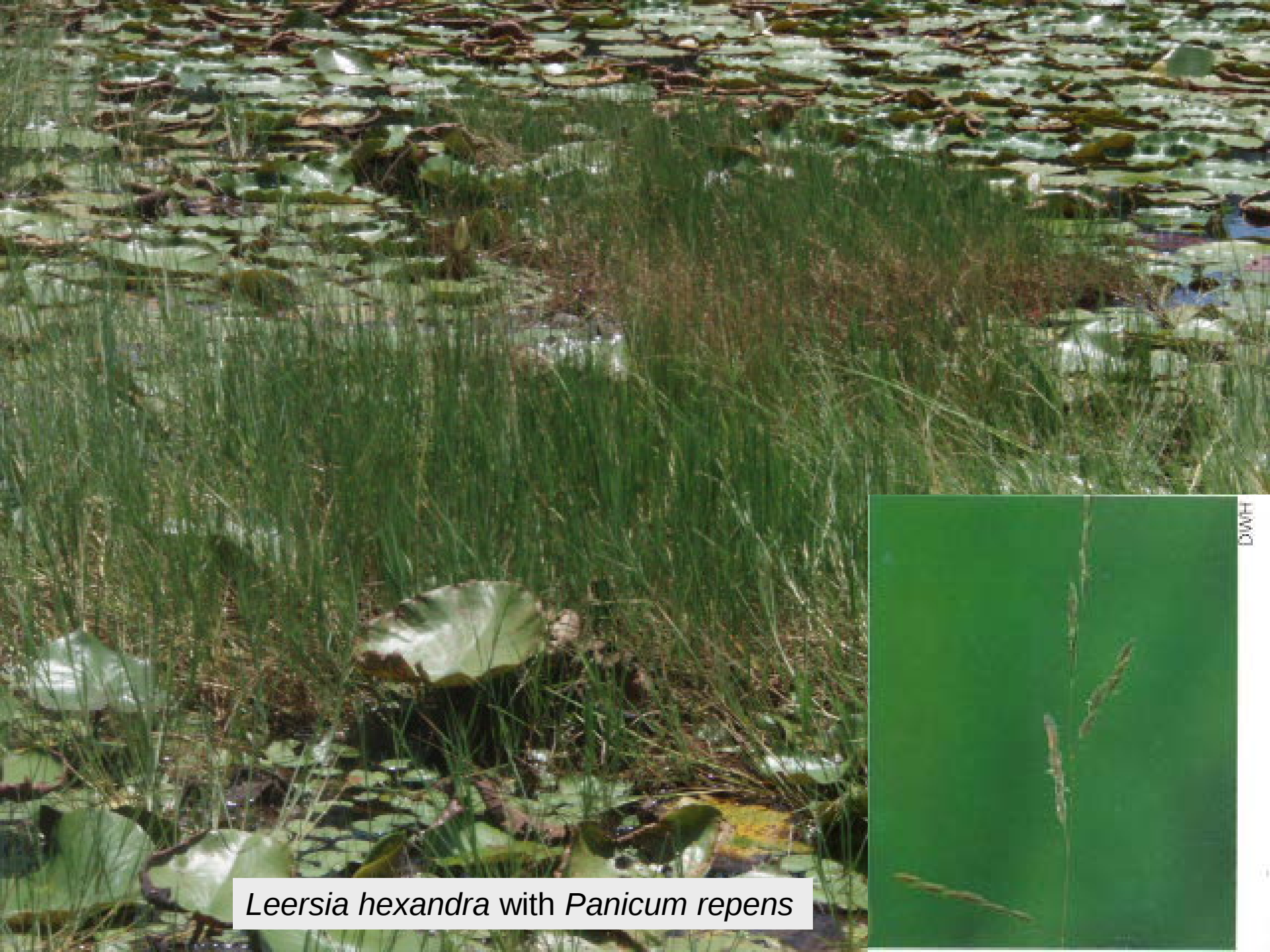


Leersia hexandra

Southern Cut Grass

- Forms mats on water surface
- Even leaf heights, “hair cut” grass
- “stiffly ascending leaves < 9 mm wide”
- Leaf blades scabrous
- Fruits flattened, peach-colored (good photo in FL Wetland book)
- Ring of white hairs at nodes





Leersia hexandra with *Panicum repens*



Panicum repens - Torpedograss

- Floating mats
- Bluish-green color
- Flowers purple and orange
- Rhizome tip pointed and white (torpedo-like)
- Sits fairly low to the water, but not regular like *Leersia*



Torpedo grass, *Panicum repens*





Panicum hemitomon **Maidencane**

- Flowers/fruits appressed to stem
- Stems and nodes sometimes hairy
- Can create large stands of varying thickness
- Plants grow deeper than *Sacciolepis striata*, and come higher out of the water than *P. repens*
- Ligule of long hairs, more obvious than in *Sacciolepis striata*





Sacciolepis striata

American cupscale

- Can form dense stands
- Conspicuous nerves on leaves
- Short hairs on sheath
- Short ligule
- Spikelets not close against central axis of inflorescence
- Stems decumbent, roots at nodes



Urochloa (Brachiaria) mutica

Pará grass

- Sprawling, medium-height, mat-forming grass
- Swollen nodes with *dense* hairs
- Sheaths loose, overlapping
- Inflorescence and open panicle, 8-20 alternate branches
- Spikelets purplish



A photograph showing a dense field of Urochloa mutica grass in the foreground. The grass is green and appears to be a mix of seedlings and young plants. In the background, there is a line of trees, including several tall, thin trees with Spanish moss hanging from their branches. The sky is blue with some white clouds.

Urochloa mutica
Photo by Shirley Denton

Panicum repens

Torpedograss

- Perennial, rhizomatous
- Stems rigid, decumbent at base, roots at lower nodes
- Nodes, internodes, sheaths glabrous or hairy
- Panicles open
- Leaves to 30 cm long and **8 mm** wide
- Leaves flat to folded, tips sharp, linear, **grayish**
- Ligules membranous, ciliate, 1 mm long

Panicum hemitomon

Maidencane

- Perennial, rhizomatous
- Stems erect, may roots at nodes in water, but **not decumbent**
- Nodes, internodes, sheaths glabrous or hairy
- Panicles elongated and tight (not open)
- Leaves to 35 cm long and 15 mm wide
- Leaf margins scabrous
- **Ligules membranous, ciliate, to 1 mm long**

Sacciolepis striata

American cupscale

- Perennial, stoloniferous
- Stems **decumbent**, roots at nodes
- Nodes, internodes, sheaths glabrous or hairy
- Sheaths often purplish
- Flowers in dense appressed spikes
- Leaves to 23 cm long and 20 mm wide
- **Ligule hairs 2-3 mm long**

Urochloa mutica

Paragrass

- Not native, Perennial, stoloniferous
- Stems erect or decumbent, roots at nodes
- **Nodes densely haired**, internodes glabrous
- Lower leaf sheaths densely hairy, may be purplish
- Flowers in terminal open branches
- Leaves to 35 cm long and 20 mm wide
- Ligule membranous with hairs, to 2 mm long

Amphicarpum
muhlenbergianum
Blue Maidencane

- Leaves bluish-green, **evenly spaced on stem**
- Leaf margins with **white hyaline margin**
- Flowers in panicle



Hymenachne amplexicaulis

West Indian Marsh Grass

- 1-2.5 m high
- Perennial, stoloniferous
- Leaf blades up to 4 cm wide, cordate at the base
- Stems glabrous, white pith
- Panicles narrow, pressed against axis, July on



West Indian marsh grass
Hymenachne amplexicaulis
Photo by A. Murray
Copyright 2000 Univ. Florida



West Indian marsh grass
Hymenachne amplexicaulis
Photo by A. Murray
Copyright 2000 Univ. Florida

Paspalidium geminatum

- Sheaths longer than internodes
- Leaf blades can be involute or folded
- Tufted stems, long leaves
- Seeds on one side of rachis
- Ligule a fringe of short hairs



Paspalidium geminatum

Photo by Shirley Denton



Paspalidium geminatum

Photo by Shirley Denton

Echinochloa

- 6 species in Florida
 - 3 non-native (*colona*, *crusgalli*, *cruspavonis*)
 - 3 native (*walteri*, *muricata*, *paludigena*)
- **No ligule**
- Awns are variable
 - Long awns (*walteri*)
 - No awns (*colona*)
 - Either *with or without* awns (*crusgalli*, *muricata*, *paludigena*)
- Leaf sheaths compressed

Echinochloa walteri



Echinochloa walteri
photo by John Kunzer

- No ligule
- Nodes hairy
- Leaf midveins white, margins scabrous
- 2 awns/spikelet, awns to 4 cm
- Bases and plant parts often purple



Echinochloa walteri



Echinochloa crusgalli

- No ligule
- Nodes not hairy
- 1 awn/spikelet, awns usually present and to 2 cm
- Edges of leaves scabrous, hairs on edges of sheath



Echinochloa crusgalli
Barnyard Grass

Saccharum giganteum

Sugarcane plumegrass

- Common grass, often in roadside ditches
- Large silky inflorescence
- Not very leafy
- Formerly *Erianthus giganteus*

Saccharum giganteum
Photo by Betty Wargo



Big Grasses



Flora of Florida

Erianthus giganteus (Walt.) Muhl.

County: S. Florida

Latitude: 0° 0' 0" Longitude: 0° 0' 0"

Specimen

Saccharum (Erianthus) giganteus
Sugarcane Plumegrass



Andropogon glomeratus
Bushy Broom Grass



Echinochloa wateri
Coast Cockspur-grass

Phragmites australis

Common reed

- Large grass of fresh and brackish water
- Large silky inflorescence
- Leaves alternate along stem
- Fringe-like ligule of short bristles



Zizania aquatica

Wild rice

- Large clumping grass, often in flowing waters
- Basal leaves
- Male and female separate on inflorescence
- Stem of inflorescence round and spongy



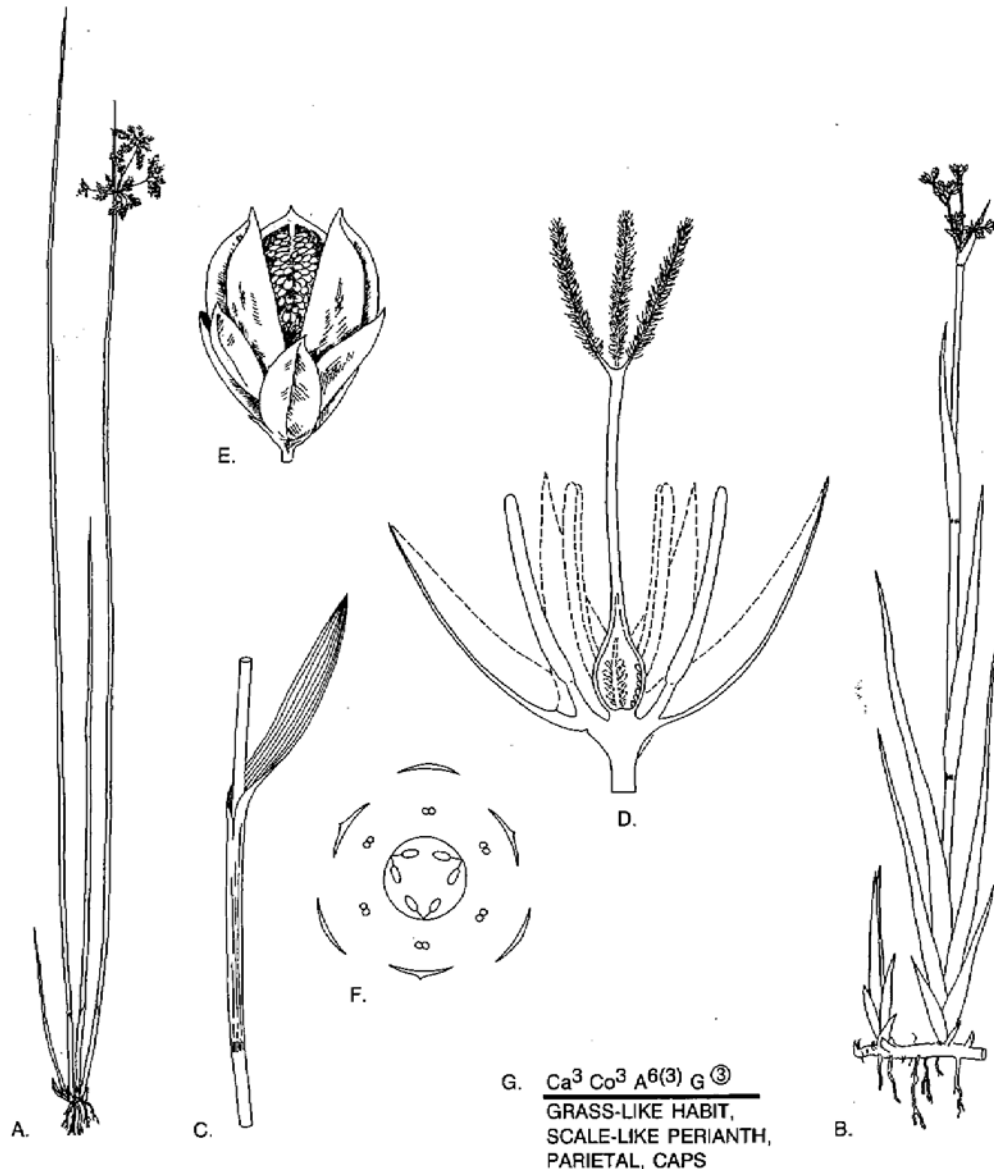
Zizaniopsis miliacea

Giant cutgrass

- Large clumping grass, usually in quiet waters
- Basal leaves
- Leaves smooth on surfaces, sharp margins
- Large inflorescence, all drooping
- Base of inflorescence stem flat



Juncus spp. (Rushes)



- Stems round, with or without leaves
- Fruit a capsule full of tiny seeds

Key characters-

- Capsule shape, size
- Long or short bract subtending inflorescence
- Flowers/fruits single or in clusters
- Presence or absence of cross-partitions in stems (see or feel)
- Leaf blades flat or round

Juncus roemerianus

- Estuarine or tidal habitats
- Bract goes past inflorescence
- Stems up to 1.5 m tall, grayish-green



Juncus effusus

- Large common freshwater species
- Clumping
- Large bract that looks like continuation of stem

Juncus effusus subsp. solutus
Photo by Shirley Denton



Juncus effusus subsp. solutus
Photo by Shirley Denton



Juncus repens

- equitant flattened leaves
- sprouting new individuals from stem ends
- submersed or stranded



Juncus repens



Juncus marginatus

Photo by Shirley Denton



- Fruits arranged in loose clusters
- Stems somewhat flattened
- Plant to 1 m tall
- Fruits rounded with blunt tips



Juncus megacephalus

- Cross-partitions
- Rounded leaf blades
- Capsule long and pointed with purplish tip





Thank you
Questions?