QUICK LOOK KEYS

NORTHWEST WASHINGTON CAREX

Whatcom, Skagit, and Snohomish Counties
West of the Cascade Crest

By Al Hanners
& Vikki Jackson

March 2003

"UPLAND" SEDGES - MID MONTANE

Carex to examine for Feb. 13, 2013

Group	Taxon
1	C. leptalea
1	C. scirpoidea ssp. scirpoidea
1	C. scirpoidea ssp. stenochlaena
2	C. saxatillis
3	C. luzulina
3	C. rossii
4	C. limosa
4	C. magellanica ssp. irrigua = C. paupercula
4	C. mertensii
4	C. pluriflora
4	C. scopulorum
4	C. spectabilis
4	C. stylosa
4	C. viridula ssp. viridula = C. oderi (looks like C. flava)
5	C. aperta
6	C. disperma
6	C. hoodii
6	C. neurophora
7	C. brunnescens
7	C. canescens
7	C. echinata ssp. echinata = C. muricata (misapplied?) usually not coastal
7	C. echinata ssp. phyllomanica = C. phyllomanica coastal, wet bogs, etc.
7	C. illota
7	C. interior
8	C. microptera (looks like C. pachystachya)
8	C PRAMICOLA

Olympus SZ51

The breakdown of the wetland Carexes

Group	spike type	peri characters	stigma	achene	species
Group 1	spike solitary, terminal	peri w rachilla vestige			*C. Pauciflora*
Group 2	spikes 2-many	style continuous w/ achene not withering	stigs 3	trig	*C. comosa*, *C exsiccata* *C. utriculata*
Group 3	spikes 2-many,	style deciduous, peri pubescent	stigs 3	trig	*C. lasiocarpa*= *C. langulosa*
Group 4	spikes 2-many,	style deciduous, peri glabrous	stigs 3	trig	*C.macrocephala* *C. hendersonii*
Group 5	spikes 2-many,	style deciduous	stigs 2	lent	*C.aurea*, *C. obnupta*, *C. lyngbeyi*, *C. lenticularis*, *C. aquatilis*
Group 6	spikes 2-many, short - (< 1.5 cm long), sessile spikes with males above, or heads unisexual	peri with a dorsal suture,	stigs 2	lent	*C. ~~fumicola~~* *C. Densa* *C. vulpinoidea* *C. stipata*
Group 7	spikes 2-many, short - (< 1.5 cm long), sessile spikes with females above, or lateral all female	peri planoconvex not thin edged	stigs 2	lent	*C. arcta* *C. laeviculmis* *C. deweyana*
Group 8	spikes 2-many, short - (< 1.5 cm long), sessile spikes with females above, or lateral all female	peri planoconvex thin edged or wing-margined	stigs 2	lent	*C.athrostachya* *C.pachystachya* *C. leporina*

Frederick C. Weinmann

carexgrp (6/20/97) fcw

Carex Groups per Hitchcock and Cronquist

Group I: These are the "single spiked" sedges. This can lead to some superficial confusion with the genera Eleocharis or Scirpus cespitosus, but these genera do not have the achene in a perigynium subtended by a scale.

Typical Species: *geyeri, leptalea, pauciflora, nigricans, scirpoidea.*

Groups II, III, IV and V all have elongate spikes rather than the cone-shaped or egg-shaped tufts typical of the lbb's. Groups II, III and IV all have three stigmas (trigonous achenes); group V has elongate spikes and two stigmas (lenticular achenes). (For best results in determiningg number of stigmas directly, use newly flowering material; in mature material the stigmas have been shed and the number often must be determined by the shape of the achene).

Group II: Spikes elongate. Three stigmas, the ~~stigmas~~ styles of the same bony structure as the achene and not deciduous. *C. utriculata* (keys to rostrata in Hictchcock) **is very common and offers a good chance to see the bony structured stigmas.** Also *vesicaria, comosa, retrorsa, saxatilis,*

Group III: Peri pubescent; stigmas 3; spikes elongate; Examples are *pensylvanica, rossii, luzulina, lasiocarpa, lanuginosa, conncinoides.*

Group IV: Stigmas 3; spikes elongate; glabrous gonads; examples are *macrocephala, amplifolia, oederi, limosa, paupercula, raynoldsii, spectabilis, buxbaumii, mertensii, (luzulina), hendersonii, livida.*

Group V: Spikes elongate; stigmas 2; glabrous gonads; examples are *aurea, obnupta, lyngbyei, lenticularis, nebrascensis, aperta, interrupta, scopulorum, aquatilis.*

For groups I-V it is relatively straight-forward to get into the correct group (elongate spikes, hairy peri's in group III, bony styles in group II, single spikes in group I etc.) Getting to the right group for VI, VII and VIII is more challenging—they are the lbb's of the sedge world. To use the Hitchcock and Cronquist (and HCOT) keys **requires interpretation of androgynous (or in some cases unisexual spikes) vs gynaecandrous.**

Problems arise. Mature achenes are necessary for much of the key; however in mature specimens it can be very difficult to determine the presence or absence and location of male flowers. The anthers and filaments are gone. We are advised to look for "empty" flowers subtended by scales as evidence of male flowers. These sometimes look no different than very mature flowers which have shed their achenes, while in other cases several male flowers clustered together lead to an obvious conclusion. To be honest, the situation is often not very clear and one must follow two tracks to find the best "fit".

Don't give up! These groups include ~~only~~ only 61 species (only about half the total carices for the Pacific Northwest); thus, for half the species, getting them in the right group is reasonably straightforward. For Groups VI, VII and VIII, we have a couple places to hang our hat. **Spikes are sessile, not elongate and have two stigmas (i.e. achenes lenticular) for all of these groups.**

Group VI: Androgynous or sometimes unisexual (e.g. *C. douglasii)*; examples are *disperma, pansa, douglasii, tumulicola, hoodii, vulpinoidea, diandra, stipata, neurophora, cusickii.*

Group VII: Spikes gynaecandrous or some lateral ones only female; peri planoconvex, often with raised margins, but not thin-edged; examples are *arcta, laeviculmis, canescens, deweyana, interior, muricata (echinata), interior.* ~~lenta~~

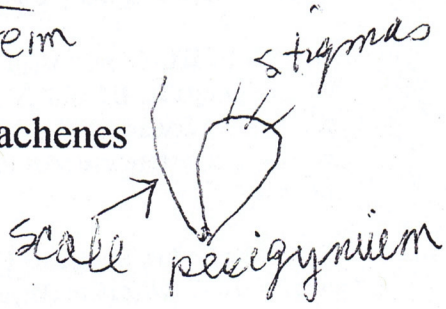
Group VIII: Spikes gynaecandrous or some lateral ones only female; peri planoconvex **or flattened, evidently thin-edged or wing-margined;** examples are *athrostachya, phaeocephala, illota, petasata, leporina, praticola, crawfordii, pachystachya, ~~praticola.~~*

M. Hellman

The 8 Essentials of Carex

1. Is there a single spike or more than one spike per culm?
inflorescence
stem

2. Are the stigmas 2 (achenes lenticular) or stigmas 3 (achenes trigonous)?
when stigmas gone look at achene



3. Is the style continuous with the achene and not deciduous?

4. Is the perigynium pubescent or is it glabrous?
♀

5. Are the spikes sessile and short or pedunculate and elongate?

6. Are the spikes androgynous or are the spikes gynaecandrous?
group VI
♀ at top
♀ at bottom
group VII + VIII

7. Does the perigynium have thin edges or winged margins?
sac that holds achene
group VIII
group VII

8. Are you a patient person?

most are monoecious ♀ + ♂ on ea. plant

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Preface

The purpose of this key to common species of the Carex Genera in Northwest Washington is conservation, and conservation begins at home. Wetlands and environs are highly productive of wildlife, but, unfortunately, the wetlands that remain are disappearing at an alarming rate. Wetlands and the native plants and wildlife that live on them will be saved only in proportion to the degree that the public cares about them, because, as Robert Pyle, the butterfly expert, said so succinctly, "It's hard to bulldoze a friend".

Carex species are important elements of our wetland ecosystems, but how can we see them as our friends if we don't know their names and walk past them with scarcely a second look?

Because Carex flowers and fruit are small, identification is considered difficult, and as a result, identification is almost exclusively taught at a detailed technical level to few people.

On-the-other-hand, people who understand Carex identify common species at a glance, or at least narrow down the possibilities to a few common look-alikes. Their knowledge is largely self-taught, or is passed on by word of mouth. This key is an effort to systemize some of that knowledge in partial fulfillment of a request by Tom Corrigan to facilitate recognition of common Carex in our area.

What is and is not a Carex

Three somewhat look-alike plant families are especially important in wetlands without permanent standing water: Grass, Rush, & Sedge. The aphorism, "sedges have edges", refers to triangular stems; however, indiscriminate use of the common name "sedge" to mean either the Carex Genus or the Sedge Family has led to some confusion. In fact, Carex usually have distinctly triangular stems; some other members of the Sedge Family also do, but other members have distinctly round stems.

Grasses are distinguished by solid nodes on the stems, and often but not always, by their frilly inflorescence. Rushes have round stems without solid nodes; and each flower has 6 tepals, both male and female organs, and a single capsule containing many small seeds at maturity. In contrast, the fruit of members of the Sedge Family is an achene, solid, hard fruit without a tough covering like grass seeds. The Sedge Family has one achene per flower.

The Genus Carex

Individual Carex flowers are either male or female; they do not have organs of both sexes. Flowers are borne on spikes on an unbranched inflorescence. Each individual spike either has all male flowers or all female flowers; or either male above and female below, or visa versa. Male and female flowers are not indiscriminately distributed.

The achene is enclosed in a unique sack called a perigynium (plural perigynia). Usually the achene does not fill the sack, the upper end being empty except for most of the style. Placement of male and female flowers on spikes, the number of stigmas per flower, 2 or 3, and accordingly, a 2 or 3 sided achene, and the characteristics of the perigynia, are important to identification of species.

In contrast, each flower of other genera of the Sedge Family has both male and female organs, and instead of a perigynium (or tepals like a rush) it usually has bristles surrounding the achene.

Distinguishing male from female flowers.

Both male and female flowers commonly are more or less covered by scales, small bract-like organs. Carex anthers are oblong to linear organs that produce pollen, and they protrude outside the scales when in bloom. Only female flowers have perigynia, and stigmas, female organs that occur at the ends of perigynia when in bloom and collect pollen. Perigynia distend the female scales, thus female spikes are thicker than male spikes of the same species.

Anthers soon fall off. Hence, where there are only a few male flowers above many female flowers on the same spike (androgynous), or only a few male flowers below many female flowers on the same spike (gynaecandrous), male flowers usually are not readily visible. However, filaments still attached but hidden by male scales commonly remain. Look for filaments by using a fine needle to turn back the scales.

Filaments are smooth, usually white, and are reminiscent of fine, monofilament fishing line. A single unattached stigma, or a tangle of them unconnected to a perigynium, may also be present. They are rough and often brownish.

Counting Stigmas

Female Carex flowers have either 2 or 3 stigmas per flower. One or more stigmas often are early deciduous, and they are easily broken off when collected. Hence, count stigmas carefully when the plant is fresh in the field.

Carex with 2 stigmas have two-sided, biconvex achenes. Carex with 3 stigmas have three-sided achenes. Hence, if the stigmas have fallen, the number of stigmas can be determined by examining the achenes.

Place the perigynium on a cardboard and use a single-edged razor blade. First, slice off one side of the upper part of the perigynium, then slice off the opposite side. Open the remaining base with a needle and examine the achene.

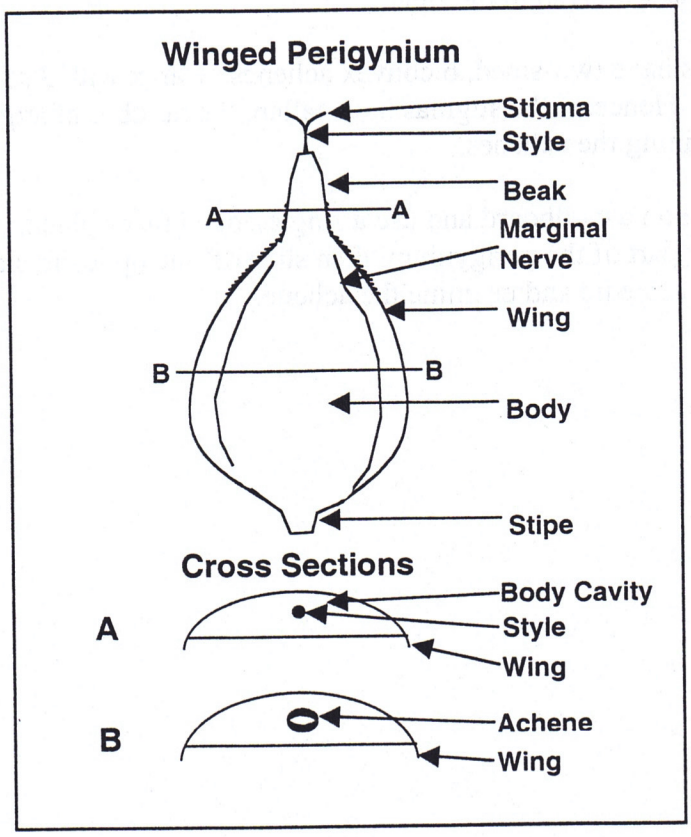
Species with Winged Perigynia

Carex species with winged perigynia have several characteristics in common and deserve special attention. First, all winged species of our area of interest have serrulate margins. If we except Carex macrocephala, which normally has male and female flowers on separate plants, and flowers with three stigmas, these are the common characteristics:

- All species have 2 stigmas per female flower.
- All species have spikes with female flowers above and male flowers below.
- Perigynia of all species are more or less dorsally convex and more or less flat on the other side.
- All but two species have a more or less compact head.

Please refer to the diagram of a typical winged perigynium. The top figure is a view of the dorsal side, the side next to the scale. The bottom two figures are cross sections. One marginal nerve occurs on each side of the body cavity. They often are visible and may be green. Wings are paper-thin projections beyond the marginal nerve.

Note that the dorsal side of the perigynium typically is convex, and the opposite, ventral side, is more or less flat. It is helpful to examine the ventral side of a perigynium and look for a projection that could be a wing. At the same time, note whether there is a distinct angle at the junction of the dorsal and ventral surfaces, or the junction is rounded. The same view of the ventral surface provides a good opportunity to determine whether the perigynium margins are serrulate.



The Handlens

Effective use of a handlens is essential to look for serrulation; nerves, and wings on perigynia; and hence, to identify with confidence more than a very few Carex species. Moreover, at least a little skill opens a whole world of beauty and knowledge. Here area few suggestions.

A handlens with 10x magnification and a reasonable broad field of view has the most utility. A 10x Tecnar magnifier, and a Bauch & Lomb Coddington magnifier, are examples meeting those requirements. They cost about $15 and $30 respectively. Aside from general applications, note that some experts define the presence or absence of serrulation and nerves according to whether or not they are visible with a 10x handlens.

Most 10x handlenses have a focal length of one inch or less; hence, the lens must be held close to the eye for a sharp image. The distance between the eye and the lens, and between the lens and the subject, must be kept constant to avoid annoying, wavering, and fuzzy images. There are two good common methods to keep those distances steady. Most people are right-eyed, and for them, (1) hold the lens in the left hand and hold it steady by bridging across the nose. (2) Alternatively, hold the lens in the right hand and press the right hand against the right cheek. In either method, hold the specimen in the other hand, touch fingers of both hands, and focus on the specimen by flexing the fingers. In both methods, the handlens is stationary, and the specimen is moved to obtain the optimum view and lighting. Thus, for right-handed people, method #1 uses the right hand for the more delicate work.

Light intensity and direction is best controlled in the field if spikes are distinct and it is ethical to pick one. When broken in two parts, one end reveals the ventral side of perigynia, the side where serrulation and wings often are best seen. The other end provides a clear view of the scales, and if a scale is pushed back, the dorsal side of a perigynium where critical nerves usually occur also can be seen. Some nerves form slight ridges and occasionally are best seen when backlighted. Sometimes serrulation and hairs are best revealed as a silhouette against the sky.

Other Tools

Some novice botanists will want to go beyond using only a handlens and strictly quick-look techniques. Some skilled botanists do amazing things with fingernails; novices would find a few simple tools more practical. A dissecting pin generally is the most useful tool, but those commonly available are too coarse. To make a much better one, cut a slender bamboo stake to a convenient length, fill the hole on one end with quick-setting epoxy cement, insert the head of a fine sewing needle, and hold it in place for a few moments until the epoxy begins to harden.

Tweezers also tend to be too coarse; medical type forceps with cross-corrugated tips are better. Single-edge razor blades, sold in hardware stores, are effective and cheap.

To often while attempting to dissect a perigynium, it flies away never to be seen again. Dissecting one is best done at home. Try using cardboard as a cutting board and placing the perigynium in an indentation made with a coin or a screwdriver.

COMMON CAREX OF MOUNTAIN MEADOWS
QUICK-LOOK KEY

1a. Inflorescence a single compact head.

2a. Heads with pointed tops and not reddish.

3a. Inflorescence dark, a single spike commonly staminate above and pistillate below; however, heads all pistillate also are common. All heads pointed above except when staminate flowers are in bloom, pistillate spikes less pointed than those with staminate flowers above and in fruit. Stigmas 3.

Carex nigricans

3b. Inflorescence of more than one spike. Stigmas 2.

4a. Heads usually greenish when young, brown toward maturity; small, less than 10 mm high, the perigynia often greenish, neither winged nor serrulate. Most individual spikes are not usually readily distinguishable by the naked eye except one widely spreading spike, the perigynia at the tip radiating like spokes of a wheel and revealing their flat ventral sides. Common but often casually dismissed as C. nigricans.

Carex illota

4b. Heads larger, usually greenish to maturity, midribs of scales greenish, sides dark, perigynia winged and serrulate.

5a. Spikes often distinct, spikes and perigynia ascending or appressed, scales partly hiding the perigynia.

Carex preslii

5b. Similar to 5a except individual spikes less distinct and usually one or more are short and widely spreading, the perigynia at the tip spreading like spokes of a wheel and showing the ventral sides.

Carex bebbii

2b. Common single-headed rushes for comparison. Inflorescence with capsules and long, narrow tepals, not perigynia.

6a. Heads compact, black, wider than high, rounded at top, leaves round. Wet areas.

Juncus mertensianus

6b. Heads less compact, reddish, higher than wide. Often on well-drained ground.

Juncus drummondii

Habitat and in bloom.

All pistillate, in bloom.
Mag. = 5X

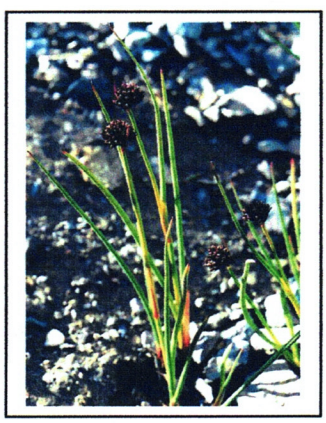
Staminate above pistillate.
Mag.= 2.5 X

Carex nigricans

Carex illota
Mag= 4 X

Carex preslii
Mag.= 3.4 X

Carex bebbii
Mag.= 3.6X



Juncus mertensianus

Juncus drummondii

1b. Not a single compact head, inflorescence more elongate. All spikes erect, or lowest spike on long peduncle and usually nodding.

7a. Terminal spike staminate and erect.

8a. Pistillate spikes slender, greenish, perigynia crowded. Stigmas 2.

9a. Single terminal spike entirely staminate, or with a few perigynia at it's base. All spikes more or less erect. Perigynia ellipsoidal, or lance-like and wider below the middle; nerves visible under 10x magnification when mature. Shorelines, forms monocultures on flat floodplains.

Carex lenticularis var. lipocarpa

9b. Staminate spikes (1-3) commonly more than one, and terminal. Perigynia obovoid, wider above the middle, nerves none, may have red mottling. Wet areas.

10a. All pistillate spikes more or less erect, often entirely pistillate. More common in mountain meadows than 10b.

Carex aquatilis var. aquatilis

10b. Lowest spike pistillate and nodding on a long peduncle. Other pistillate spikes erect or spreading and may have a few staminate flowers at the tips.

Carex aquatilis var. dives

8b. Pistillate spikes thicker, often dark and/or partly reddish. Lowest spike pistillate, on long peduncle, and usually nodding. Stigmas 3. Staminate spike single and solitary. Wet areas.

Carex spectabilis

7b. Spikes up to 4 cms long and 7 mm wide, usually tan to reddish brown, and all nodding on long peduncles. Terminal spike staminate at the base or nearly all staminate, other spikes mostly pistillate. Stigmas 3. Common along roads and other disturbed ground.

Carex mertensii.

Carex lenticularis var. lipocarpa

Carex aquatilis var. dives

Carex spectabilis

Carex mertensii

COMMON LOWLAND CAREX
QUICK-LOOK KEY

1a. Spikes either pistillate above and staminate below, or visa versa. No terminal staminate spikes.

2a. Inflorescence a single head with no remote spikes. Head more or less compact, or if elongate, usually conspicuously tapering upward.

3a. Perigynia margins serrulate but not winged. Spikes staminate above but not conspicuously so, and pistillate at base. Heads much taller than wide and usually tapering upward. Perigynia nerved, spreading, beaks long and serrulate, and prickly appearance. Stigmas 2. Leaf sheaths cross-corrugated. Wet areas, a common pioneer species on damp to wet disturbed ground.

Carex stipata

3b. Perigynia winged and serrulate. Heads more compact, spikes pistillate above and staminate below. Stigmas 2.

4a. Heads greenish, scale centers green. All spikes and perigynia ascending or erect. Wet areas. Formerly included in Carex pachystacha.

Carex preslii

4b. Much like Carex preslei except heads brownish and scales brownish or reddish throughout, and commonly found where drainage is better. Not illustrated.

Carex pachystachya

2b. Inflorescence usually much longer than wide, spikes more or less clustered above; and below, one or more spikes either more distinct, or somewhat to distinctly remote.

5a. Perigynia bodies ovoid, transition to beaks gradual, the beaks either very short, or medium length and stout. Scales scarious, center green.

6a. Spikes (4-8) usually not more than 6, beaks very short. Perigynia serrulate to the middle. The upper spike often clavate, the upper part pistillate and wide, the lower part staminate and narrow. Wet places from lowlands to the timberline.

Carex canescens

6b. Spikes (7-15) more numerous, clustered above, less so below but no spikes remote. Beaks medium length, stout, serrulate. Shorelines and wet places. Not illustrated.

Carex arcta

Habitat

Close-up of Sheath

Detail of Head
Mag. = 3.5X

Carex stipata

Carex preslii
Mag. = 3.5X

Carex canescens
Mag. = 4X

5b. Beaks longer, more narrow, more conspicuous, and the transition from body to beak more abrupt.

7a. Inflorescence often brownish. Perigynium distinctive, the body almost globular, evident nerves converge at the base, and the body abruptly constricted to a long, serrulate beak. Spikes staminate above and pistillate at the base. Stigmas 2. Leaf sheaths red-dotted. Common on low terraces at water's edge of lakeshores, and edges of pools in fens; sometimes found in standing in water.

Carex cusickii

7b. Inflorescence more greenish, perigynia bodies more or less ovoid. Spikes pistillate above, staminate at base.

8a. Stems erect or ascending and often zig-zag at individual spikes. Beaks only slightly serrulate, and at least a few beaks are ex-curved (bent outward). Perigynia with a few nerves. Shorelines and wet places.

Carex laeviculmis

8b. Stems sprawling. Perigynia ascending, long, distinctly serrulate beaks and prominent marginal nerves. Common along trails and other openings in second growth lowland forests.

Carex deweyana

1b. Staminate spikes terminal and erect.

9a. Staminate spikes usually more than one. Lower spikes brownish or reddish, some all pistillate, others with staminate tips. Stigmas 2. Achenes white to translucent, oblong, and both sides somewhat constricted in the middle.

10a. Staminate spikes 1-3. Base of pistillate spikes erect to ascending, but the spikes themselves bent outward and spreading. Wet areas. Marshes near the coast but usually not those grading to tidewater. A tall, coarse plant, it competes with Juncus balticus and Phalaris arundinacea. Somewhat shade tolerant, it also is in forested wetlands.

Carex obnupta

10b. Staminate spikes 2-3. Very similar to Carex obnupta but less coarse and with pistillate spikes nodding on long peduncles. Maritime. Edges of marshes and wet areas grading to tidewater in protected bays and channels. Hybridizes with Carex aquatilis var. dives.

Carex lyngbyei

Typical Habitat

Perigynium
Mag. = 4X

Carex cusickii

Carex laeviculmis
Mag. 4X

Carex deweyana
Mag. = 3.5X

Carex obnupta

Carex lyngbei

9b. Staminate spikes one or more. Pistillate spikes slender, greenish, or somewhat brownish with age; perigynia crowded.

11a. Perigynia more or less ovoid or obovoid. Stigmas 2. Achenes dark, biconvex, lenticular.

12a. Single terminal spike entirely staminate, or with a few perigynia at it's base. All spikes more or less erect. Perigynia ellipsoidal, or lance-like and wider below the middle; nerves visible under 10x magnification at least at maturity. Wet ground at low to high elevations, and on floating logs between elevations from 1500 to 2000 feet.

Carex lenticularis var. lipocarpa
(Carex kellogii)

12b. Staminate spikes (1-3) commonly more than one and terminal. Perigynia commonly obovoid, wider above the middle, some red mottling, nerves none. Wet areas.

13a. All pistillate spikes more or less erect, often entirely pistillate.

Carex aquatilis var. aquatilis

13b. Lowest spike pistillate and nodding on long peduncle. Other pistillate spikes erect to ascending, and commonly some with a few staminate flowers at the tips. Hybridizes with Carex lyngbyei.

Carex aquatilis var. dives
(Carex sitchensis)

11b. Perigynia long, slender, nerved and sloping to both ends, beak poorly defined. Stigmas 3, achene longer than wide and 3-sided, trigonous. Stems to 9 dm often sprawling, lowest spike pistillate and up to 3 dm remote. Normally the terminal spike is staminate; however, plants that have only pistillate spikes and no staminate spikes were found in Sharpe Park. Along trails in moist but not wet second growth forests up to about the 3000 foot elevation. Not illustrated.

Carex hendersonii

Carex lenticularis var. lipocarpa

Carex aquatilis var. dives
(Carex sitchensis)

CAREX SPECIES NOT IN QUICK-LOOK KEYS

The "Flora" by Hitchcock et. al. includes about 140 Carex species believed to have been valid when it was published. This present study considers that about 50 species occur in our smaller area of interest: Whatcom, Skagit, and Snohomish Counties west of the Cascade Crest. The Quick-Look Keys include 13 "lowland" species and varieties, and 9 "mountain meadow" species and varieties including three in both keys. The total is 19.

Here are four more species less likely to be seen. All are tall, robust; all have a prickly appearance because of spreading perigynia with long beaks, and all usually have three stigmas. Moreover, all have the terminal spike staminate except Carex macrocephala, which usually is diocious.

Carex amplifolia

Robust, terminal spike staminate and solitary. Leaves usually wide (6-20 mm) and scabrous on the margins. Edge of roadside ditch east of Alger near the "Alger Alps" trailhead, and one locality on private land. Other species with wide leaves and similar in a vegetative state are Carex hendersonii and Scirpus microcarpus. However, their leaves are scabrous on the midribs distally in addition to scabrous margins.

Carex comosa

Robust, terminal spike staminate and solitary. Stigmas usually 3. Long beaks with long, widely spreading teeth are diagnostic. On State of Washington Sensitive List. Tennant Lake Whatcom County Park.

Carex macrocephala

Normally diocious, staminate and pistillate flowers on separate plants. The inflorescence is a single compact head. Pistillate heads 3.5-8 cms long and 2.5-5 cms thick, the largest of any Carex. Moreover, it is our only winged species with 3 stigmas. Maritime sandy soils. Common on the banks of the Swinomish Channel, Skagit County, but seldom seen because of restricted access.

Carex utriculata (formerly C. rostata)

Robust; terminal staminate spikes 2-4. Perigynia nerved, abruptly narrowed to a bidentate beaks, teeth 0.2-.08 mm. Nooksack North Fork Fen, Whatcom County.

TABLE 1

CAREX MORPHOLOGY

Carex Species	A Terminal Spike Staminate	B Gynaecandrous	C Androgynous	D Diocious	E Stigmas 2 Achene lenticular	F Stigmas 3 Achene trigonous	G Key Bract Sheathed
aenea		•			•		
amplifolia	•					•	
aquatilis	•				•		
var. aquatilis							
var. dives (sitchensis)							
arcta		•			•		
arthrostachya		•			•		
aurea	•				•		•
bebbii		•			•		
brevicaulis	•					•	
brunnescens		•			•		
buxbaumii		•				•	
canescens (curta)		•			•		
comosa	T					3 (2)	±
cusickii			•		•		
deweyana		•			•		
diandra			•		•		
echinata (muricata)		•			•		
ssp echinata							
ssp phyllomanica							
hendersonii	•					•	•
hoodii			•		•		
illota		•			•		
inops (pensylvanica)	T					•	
interior		•			•		
laeviculmis		•			•		
lanuginosa	•					•	±
lasiocarpa	•					•	
lenticularis	•				•		
var. limnophila (hindsii)							
var. lipocarpa (kelloggii)							
leptalea			•			•	
limosa	T					•	±
livida	•					•	•
luzulina	T					•	•
lyngbei	•				•		
macrocephala				T		•	
macrochaeta	•					•	±
mertensii		T				•	
microptera		•			•		
nardina			•		2, 3		
nigricans			*	*		•	

TABLE 1

CAREX MORPHOLOGY

	A	B	C	D	E	F	G
Carex Species	Terminal Spike Staminate	Gynaecandrous	Androgynous	Diocious	Stigmas 2 Achene lenticular	Stigmas 3 Achene trigonous	Key Bract Sheathed
obnupta	•				•		
ovalis (leporina, tracyi)		•			•		
pachystachya (macloviana) formerly included C. preslii		•			•		
pauciflora	•					•	
pluriflora	•					•	
preslii		•			•		
pyrenaica			•			•	
rossi (deflexa)	•					•	
saxatilis	•				•		
spectabilis	•					•	
stipata			•		•		
stylosa	T					•	
tumulicola			•		•		
unilateralis		•			•		
utriculata (rostata)	•					•	
vesicaria	•					•	
viridula (oederi)	•				•	•	
vulpinoidea			•		•		

REMARKS

T Usually, see key for exceptions.
± Sheathed or sheathless.
Key bract: The bract below the lowest spike.

TABLE II

CAREX ECOLOGY

Coastal	Low	Moderate	High	Carex Species	Brackish	Bogs & Fens	Swamps & Marshes	Shorelines	Meadows & Misc. Wet	Forested Wetlands	Woods, Moist Upland	Dry Areas	Indicator	Remarks
	•	•		aenea					•					
	•	•		amplifolia				•	•		•		FACW+	
				aquatilis									OBL	
	•	•	•	var. aquatilis			•	•	•					
	•	•	•	var. dives (sitchensis)			•	•	•					
	•	•	•	arcta				•	•				FACW+	
	•	•		arthrostachya					•				FACW	
	•	•		aurea		•		•	•				FACW+	
	•	•		bebbii				•	•					
•				brevicaulis								•		
			•	brunnescens		•			•	•			OBL	
	•	•		buxbaumii			•		•				OBL	
	•	•	•	canescens (curta)		•	•		•				FACW+	
	•			comosa			•		•				OBL	
	•	•		cusickii		•	•	•	•				OBL	
	•	•		deweyana				•						
	•	•		diandra		•	•		•		•		FAC+	
				echinata (muricata)									OBL	
	•	•		ssp echinata		•								
•				ssp phyllomanica	•	•		•						
	•	•		hendersonii							•			
	•	•	•	hoodii					•		•	•		
			•	illota		•			•				FAC	
	•	•		inops (pensylvanica)							•	•		
	•	•		interior		•		•	•				FACW-	
	•	•	•	laeviculmis		•		•		•			FACW	
	•	•		lanuginosa					•				FACW	
	•			lasiocarpa		•							OBL	
				lenticularis										
•				var. limnophila (hindsii)					•				OBL	seashore
	•	•	•	var. lipocarpa (kelloggii)				•	•				FACW+	

TABLE II

CAREX ECOLOGY

Coastal	Low	Moderate	High	Carex Species	Brackish	Bogs & Fens	Swamps & Marshes	Shorelines	Meadows & Misc. Wet	Forested Wetlands	Woods, Moist Upland	Dry Areas	Indicator	Remarks
	•	•		leptalea		•			•				OBL	
	•	•	•	limosa		•			•				OBL	
	•			livida		•	•			•			OBL	
		•	•	luzulina		•			•				OBL	
•				lyngbei	•		•	•					OBL	
•				macrocephala									FAC-	marine area sands
•				macrochaeta				•	•				FACW-	scarce
		•	•	mertensii					•				FACW	
		•	•	microptera					•			•	FACW	
			•	nardina								•	FACW	
			•	nigricans					•				FACW	
•	•			obnupta			•	•		•			OBL	
	•	•		ovalis (leporina, tracyi)			•		•				FAC	
	•	•	•	pachystachya (macloviana)					•			•	FAC	
	•	•		pauciflora		•							OBL	
	•	•		pluriflora		•	•	•					OBL	
	•	•	•	preslii					•			•	FACU	
			•	pyrenaica					•				FAC	
	•	•	•	rossi (deflexa)					•			•		
		•	•	saxatilis				•	•				FACW+	
		•	•	spectabilis					•				FACW+	
	•	•		stipata					•				OBL	disturbed areas
•				stylosa			•	•					FACW+	
		•		tumulicola					•				FACU+	
	•	•		unilateralis					•		•		FACW	
	•	•		utriculata (rostata)		•	•	•					OBL	
	•	•		vesicaria		•	•	•					OBL	
	•	•		viridula (oederi)		•	•	•	•				FACW+	
	•	•		vulpinoidea			•		•				OBL	

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REMARKS

The names of Carex species as defined in the Jepson Manual were used in this key for all that range into our area.

APPENDIX

Hybrids: Carex lyngbyei x aquatilis var. dives

Most hybrids have some characteristics of both parent species. For example, a mule has long ears and slender legs of a donkey, but the body of a horse. That relation could be written symbolically as donkey > < horse, but more commonly as donkey x horse.

Moreover, hybrids have different characteristics according to which parent is male and which is female. For example, a hybrid of a male donkey and a female horse is a mule; but a hybrid of a male horse and a female donkey is a hinny.

There is convincing evidence of Carex lyngbyei x aquatilis var. dives near the boat launch at Silver Lake. Circumstantial evidence suggests that C. lyngbyei, a species usually growing in wetlands on marine shorelines, arrived by boat.

Much work on these hybrids remains to be done; however, tentatively there appear to be two or more taxa:

- **Sterile achene, ~~long~~ short scale taxon**
  The achene is brownish like that of C. aquatilis. It is much longer than wide like C. lyngbyei, but without constriction at the middle. It appears to be a collapsed tube, and hence, sterile.

- **Spindle-shaped achene, ~~short~~ long scale taxon**
  The achene is brown like that of C. aquatilis, but it tapers to points at both ends unlike that of either parent.

Hybridization of these two species is mentioned but not elucidated in the Jepson Manual. It is not mentioned in any of the standard botanical references commonly used for our area. Hence, evidence of hybridization of these species indicates that keys and description of these species are incomplete and not entirely accurate.