

Adirondack *Carex* species

This file provides a key to the superspecies and species of *Carex* known to exist in the Adirondacks. The key is based on Gleason & Cronquist's "Manual of Vascular Plants of Northeastern United States and Adjacent Canada, 2nd edition" (New York Botanical Garden, 1991) but has been modified to reflect current taxonomic thinking. In couplets where the species is not known to exist in the Adirondacks the couplet ends in "NA", i.e. not applicable. It should be appreciated, however, that the sedges are possibly the least known group of flowering plants in the region and that it should be expected that species in addition to those included here will be recognized in the future.

Terminology – Most of the terms you will need to use this key are described and illustrated in our book "Wetland Plants of the Adirondacks: Fern, Woody Plants, and Graminoids" (Meiyin Wu & Dennis Kalma, Trafford Publishing, 2011).

Note: A additional set of terms you may encounter when keying out some species is **phyllopodic** and **aphyllopodic**. Plants produce new structures from a tissue called meristem. In most plants the meristem is at the top of the plant: terminal meristem, and the plant grows upward by producing new shoots from the top of the plant. In some plants, as in grasses and sedges, the meristem is at the base of the plant: basal meristem. In this case new shoots are produced from the base of the plant. This is probably advantageous when the tops of the plants are continually being removed by grazing or fire. There are two ways the basal meristem can produce new shoots. First, if it is located in the center of the clump and produces new sprouts to the sides, the new stems will be in the center of the basal clump and the stems bases will grow straight up the center. This system is called **phyllopodic** and can be recognized by the central location of the new stems and their relatively straight bases. The other way the meristem can function is to be in a ring around the edge of the base so that new stems are at the edge of the basal clump and the stem bases will radiate out and up from the base. This system is called **aphyllopodic** and can be recognized by the peripheral location of the new stems and their curved (out then up) bases. In summary: phyllopodic = new stems central & straight bases; aphyllopodic = new stems lateral & curved bases).

Note: It is conventional to refer to the side of the perigynium facing the axis of the spike as the ventral side, i.e. it is adaxial. In leaves of grass it is conventional to refer to the side of the sheath opposite the blade as the ventral side.

- 1a spike 1 on each stem . . . **Group 1**
- 1b spike 2 or more (stunted plants may bear only a single spike . . . **2**
- 2a achenes lenticular or planoconvex; stigmas 2 . . . **Group 2**
- 2b achenes trigonous or nearly round in cross section; stigmas 3 . . . **3**
- 3a style persistent on achenes at maturity, becoming bony or cartilaginous . . . **Group 3**

- 3b style withering and usually deciduous as achene matures . . . 4
- 4a perigynium beaked, its teeth at orifice well developed, stiff, sharp, slender or stout (for convenience some spp with conspicuous teeth, though scarcely stiff or sharp, are included here as well as in the following leg of the key) . . . Group 4
- 4b perigynium beaked or beakless, its orifice entire or minutely toothed or with soft and blunt teeth (for convenience some spp with stiff and sharp but inconspicuous teeth are included here as well as in the preceding leg of the key . . . 5
- 5a bracts of the pistillate spikes (excluding the pistillate spikes arising from the base) bladeless, consisting of sheath only, or with small scale-like blade . . . Group 5
- 5b bracts of pistillate spikes (or at least the lowest non-basal spike) with well developed blade . . . 6
- 6a terminal spike bearing some perigynia . . . Group 6
- 6b terminal spike entirely staminate . . . 7
- 7a perigynia with hairs, at least around the base of the beak . . . Group 7
- 7b perigynia hairless . . . 8
- 8a bract of the lowest pistillate spike with well developed sheath . . . Group 8
- 8b bract of the lowest pistillate spike sheathless or nearly so . . . Group 9

Group 1: Key to Superspecies

- 1a achenes lenticular or planoconvex; stigmas 2 . . . 2
- 1b achenes trigonous or round in cross section; stigmas 3 . . . 4
- 2a plants loosely rhizomatous ... Dioicae #2
- 2b plants ± growing in clumps, without long rhizomes . . . 3
- 3a spike bisexual, androgynous; with central axis present . . . NA
- 3b spike unisexual, or bisexual with the female flowers above the male, central axis of spike lacking . . . Stellulatae #20
- 4a spikes bisexual . . . 5
- 4b spikes unisexual . . . 12
- 5a spikes with female flowers above the male . . . Squarrosae #54
- 5b spikes with male flowers above the female. . . 6
- 6a perigynia linear or subulate, spreading or reflexed . . . Orthocerates #3
- 6b perigynia elliptic or oblong to globose, ascending . . . 7
- 7a lowest pistillate scale leafy, much surpassing the strongly beaked perigynium . . . Phyllostachyae #25
- 7b lowest pistillate scales smaller and not leafy, varying from shorter to a little longer than the beaked or beakless perigynium 8
- 8a perigynia white; culm leaf solitary, undeveloped when plant flowers, becoming 2–5 cm wide . . . NA
- 8b perigynia green to brown; leaves numerous, up to 3 mm wide . . . 9
- 9a perigynia 5–6 mm; scarcely beaked, filled by the 4–5 mm achene . . . NA
- 9b perigynia 3.0–4.5 (5.0) mm, beaked or beakless . . . 10
- 10a achene filling the evidently short-beaked perigynium; axis of spike well developed . . . NA

- 10b achene far from filling the beakless perigynium; axis of spike lacking . . . **Polytrichoidae #7**
- 12a perigynia planoconvex, with ragged winged margins . . . **NA**
- 12b perigynia not wing-margined . . . **13**
- 13a spikes 20–40 mm . . . **NA**
- 13b spikes 4–12 mm . . . **Montanae #26**

Group 2: Key to Superspecies

- 1a spikes all much alike, sessile, relatively short, seldom over 1.5 cm . . . **2**
- 1b spikes differentiated, the lowest and uppermost distinctly unlike; lateral spikes sessile or with stalks, if sessile then \pm elongate . . . **15**
- 2a stems arising singly or few together from \pm elongate rhizomes, stolons, or stems where the base lies on the ground . . . **3**
- 2b stems closely clustered, the rhizomes none or very short . . . **7**
- 3a stems bases lie on ground, tips send up new stems from old axils; plants of sphagnum bogs . . . **Chordorrhizae #14**
- 3b stems arising from elongate rhizomes; mostly not sphagnum bogs . . . **4**
- 4a spikes closely crowded into a dense inflorescence . . . **5**
- 4b spikes \pm separated from each other . . . **Bracteosae #15**
- 5a plants phyllopodic to somewhat aphyllpodic, the leaves all clustered at or near the base; perigynia usually nerveless or nearly so ventrally, often sharp-edged but not thin-margined . . . **NA**
- 5b plants strongly aphyllpodic, the leaves not forming a basal cluster; perigynia \pm evidently nerved ventrally; the body tending to be thin-margined distally . . . **6**
- 6a sheaths firm, ventrally partly greenish or greenish-striate; perigynia 2.3–4.0 mm . . . **NA**
- 6b sheaths distinctly thin and translucent ventrally; not greenish; perigynia 4.0–6.2 mm . . . **Arenariae #13**
- 7a plants androgynous, i.e. with staminate flowers at the top of some or all spikes . . . **8**
- 7b plants gynaecandrous, i.e. with staminate flowers produced at the base of some or all spikes . . . **12**
- 8a inflorescence simple, the spikes single at each node, seldom more than 10 spikes in inflorescence . . . **9**
- 8b inflorescence compound, at least the lowest node bearing 2 or more spikes . . . **10**
- 9a lateral spikes with a few staminate flowers at the tip; perigynia usually green or greenish, even at maturity . . . **Bracteosae #15**
- 9b lateral spikes wholly staminate or pistillate; perigynia usually brown at maturity . . . **Stellulatae # 20**
- 10a perigynia very firm and thick-walled, not spongy; \pm abruptly beaked, dark in color, ranging from medium or deep brown to deep olive-green or nearly black . . . **Paniculatae #18**
- 10b perigynia thin-walled, often \pm spongy-thickened toward the base, gradually or sometimes more abruptly beaked, pale in color, ranging from greenish or stramineous to light brown or golden-brown . . . **11**
- 11a pistillate scales with a definite awn 1–5 mm; perigynia rounded toward the base, which is only

- slightly or not at all spongy–thickened . . . **Multiflorae #16**
- 11b pistillate scales awnless, or if with a definite awn then the perigynium with broad, subtruncate, notably spongy–thick base . . . **Vulpinae #17**
- 12a perigynia plump, at most only sharp–edged, never thin–winged . . . **13**
- 12b perigynia with thin–winged margins, at least along the upper part of the body and the lower part of the beak, and often extending to the base and apex . . . **Ovales #22**
- 13a perigynium body nearly or quite filled by the achene; perigynium ± ascending, or merely ascending–spreading . . . **Heleonastes # 19**
- 13b perigynium body spongy at base, the achene occupying only the upper half or two–thirds . . . **14**
- 14a perigynia, or at least the lower ones in the spike, ± widely spreading (or even reflexed), often small and/or broader and/or shorter–beaked than in the next group . . . **Stellulatae #20**
- 14b perigynia apressed–ascending, relatively long (4.0–5.5 mm), narrow (3–5 times as long as wide) and long beaked (1–2 mm) . . . **Deweyanae #21**
- 15a lower pistillate spikes spreading or drooping on slender peduncles . . . **Cryptocarpae #48**
- 15b lower pistillate spikes erect or strongly ascending, sessile or short peduncled . . . **16**
- 16a perigynia swollen, obovoid, elliptic in cross section . . . **Bicolores #27**
- 16b perigynia flat to planoconvex or biconvex . . . **17**
- 17a achenes jointed with the style; perigynia not lustrous . . . **Acutae #49**
- 17b achenes continuous with the persistent style; perigynia lustrous . . . **NA**

Group 3: Key to Superspecies

- 1a perigynia slenderly subulate, 8–15 × 1.5–3.0 mm, gradually tapering into the beak . . . **2**
- 1b perigynia broader in shape and usually in measurement, the body lance–ovoid to broadly ovoid or ellipsoid or broadly obconic . . . **3**
- 2a perigynium teeth reflected . . . **NA**
- 2b perigynium teeth erect to merely spreading . . . **Folliculatae #51**
- 3a pistillate spikes (at least the lower ones) nodding or drooping on long, slender peduncles . . . **Pseudocypereae #52**
- 3b pistillate spikes ascending to erect, sessile or pedunculate . . . **4**
- 4a perigynia firm–walled, generally scarcely or not at all inflated . . . **Paludosae #53**
- 4b perigynia thin walled, ± inflated . . . **5**
- 5a body of the perigynium obconic or obconic–ovoid, very broadly rounded or ± truncate (or even indented) above and very abruptly beaked . . . **Squarrosae #54**
- 5b body of the perigynium ovoid to ellipsoid or globose; tapering or rounded above, not so abruptly beaked . . . **6**
- 6a bract of the lowest pistillate spike not or scarcely sheathing, or if definitely sheathing then the perigynia less than 10 mm . . . **Vesicariae #55**
- 6b bract of the lowest pistillate spike definitely sheathing at base, or if not sheathing then the perigynia greater than 10 mm; perigynia 10–20 mm . . . **Lupinulae #56**

Group 4: Key to Superspecies

- 1a perigynium planoconvex, with lacerate-winged margins . . . **NA**
- 1b perigynium not wing-margined . . . **2**
- 2a perigynia 10–20 mm . . . **Lupinulae #56**
- 2b perigynia not more than 8 mm . . . **3**
- 3a some of the pistillate spikes on nearly basal peduncles . . . **Montanae #26**
- 3b none of the pistillate spikes on nearly basal peduncles . . . **4**
- 4a pistillate spikes stout, erect, densely flowered; 6–15 mm thick, sessile or short-peduncle . . . **Hirtae #41**
- 4b pistillate spikes either loosely flowered, or slender and elongate, or spreading or drooping (or all of these) . . . **5**
- 5a pistillate scales with an evident awn tip; terminal spike pistillate for about upper third, staminate below . . . **Gracillimae #35**
- 5b pistillate scales no more than cuspidate; terminal spike wholly staminate, or occasionally with a few distal or basal perigynia . . . **6**
- 6a plants brownish at base; pistillate scales narrow, acute or acuminate, pale, largely translucent-chaffy, surpassing the body of the perigynium, beak 1.7–4.0 mm . . . **Longirostres #38**
- 6b plants purplish at base; pistillate scales otherwise; beak often shorter . . . **Sylvaticae #36**

Group 5: Key to Superspecies

- 1a staminate spike long-peduncled; leaf blades 2 mm wide or more . . . **2**
- 1b staminate spike sessile or nearly so; leaf blades various but often under 2 mm wide . . . **3**
- 2a leaf blades 2–4 mm wide . . . **Digitatae #28**
- 2b leaf blades 10–25 mm wide . . . **Laxiflorae #32**
- 3a perigynia 2.5–4.4 mm; prominently beaked . . . **4**
- 3b perigynia 1.5–2.0 mm; beakless . . . **NA**
- 4a plants densely tufted, without creeping rhizomes . . . **Montanae #26**
- 4b plants with long creeping rhizomes, not densely tufted . . . **NA**

Group 6: Key to Superspecies

- 1a perigynia of terminal spike born at its base . . . **2**
- 1b perigynia of terminal spike born at its summit or middle . . . **3**
- 2a perigynia subtended by long leaf-like scales . . . **Phyllostachyae #25**
- 2b perigynia little or not exceeded by scales . . . **NA**
- 3a perigynium distinctly beaked . . . **4**
- 3b perigynium beakless, or with a short, obscure, or poorly differentiated beak . . . **5**
- 4a lateral spikes elongate-cylindrical, spreading or drooping on slender peduncles . . . **Sylvaticae #36**
- 4b lateral spikes short-cylindrical, erect, most or all of them sessile or nearly so . . . **Extensae #39**
- 5a pistillate spikes slender, spreading or drooping, 2–6 cm, loosely flowered with perigynia in few rows (often exposing the axis); perigynia often over 4 mm . . . **Gracillimae #35**

- 5b pistillate spikes short-cylindric, 1–2 (4) cm; perigynia densely and compactly arranged, 1.8–4.0 mm . . . 6
- 6a sheaths or lower leaf surfaces (or both) pubescent . . . *Virescentes* #40
- 6b sheaths and blades glabrous . . . 7
- 7a perigynia nearly or quite as wide as long, firm, diverging at nearly right angles . . . NA
- 7b perigynia obviously longer than wide, thin, ascending . . . 8
- 8a scales conspicuously surpassing the perigynia; spikes spreading or drooping on slender peduncles . . . NA
- 8b scales shorter than perigynia or spikes sessile . . . 9
- 9a terminal spike about half pistillate . . . *Atratae* #47
- 9b terminal spike with 1 or very few perigynia . . . *Paniceae* #31

Group 7: Key to Superspecies

- 1a perigynia with 20+ sharp fine nerves extending nearly or quite to tip . . . *Laxiflorae* #32
- 1b perigynia with fewer nerves or nerveless . . . 2
- 2a perigynium beakless or minutely apiculate . . . NA
- 2b perigynium beaked, the body obovoid in general outline . . . 3
- 3a perigynium 2-ribbed, the intermediate nerves absent or very obscure or developed only at the base . . . 4
- 3b perigynium 2-ribbed, intermediate nerves conspicuous . . . 6
- 4a stems and leaves glabrous . . . 5
- 4b stem and leaves pubescent . . . NA
- 5a beak of the perigynium 0.5 mm or greater; style-base not expanded . . . *Montanae* #26
- 5b beak of the perigynium shorter, conic; style-base expanded into a ring 0.5 mm in diameter . . . NA
- 6a pistillate spikes slender, peduncled, spreading or drooping . . . 7
- 6b pistillate spikes short-cylindric, sessile or nearly so, erect . . . N
- 7a perigynium lanceolate or narrowly ovoid, 4.7–8.0 mm; plants tufted . . . *Sylvaticae* #36
- 7b perigynium obovoid, 3.2–4.4 mm; plants rhizomatous . . . *Anomalae* #42

Group 8: Key to Superspecies

- 1a perigynium 2-ribbed; otherwise nerveless or with usually less than 10 faint or obscure nerves . . . 2
- 1b perigynium 2-ribbed and also conspicuously nerved; the nerves are numerous, usually more than 10, extending the length of the perigynium . . . 7
- 2a perigynium beakless, the orifice entire . . . *Paniceae* #31
- 2b perigynium beaked . . . 3
- 3a pistillate spikes erect or nearly so; perigynium abruptly narrowed to the beak . . . 4
- 3b pistillate spikes spreading or drooping, mostly on slender peduncles; perigynia various . . . 5
- 4a rhizomatous; perigynia 4.3–6.7 mm, including the often well developed beak . . . *Paniceae* #31
- 4b tufted; perigynia 2.4–4.1 mm, the beak very short . . . *Laxiflorae* #32

- 5a pistillate spikes 1.5–6.0 cm, or if only 1.0 cm, then the perigynia 3.5–5.8 mm . . . 6
- 5b pistillate spikes 0.5–1.5 cm, perigynia 2.4–3.2 mm . . . **Capillares #37**
- 6a teeth of the perigynium beak minute, not soft and scarious . . . **Sylvaticae #36**
- 6b teeth of the perigynium beak distinct under a hand lens,
soft and scarious (thin, dry, chaffy) . . . **Longirostres #38**
- 7a pistillate spikes sessile or nearly so, short-cylindric to subglobose, very densely flowered;
perigynia spreading or recurved, conspicuously beaked; bracts of the pistillate spikes
with short or no sheaths . . . **Extensae #39**
- 7b pistillate spikes short-cylindric to elongate, at least the lower peduncled, densely or loosely
flowered, the perigynia mostly ascending, never recurved or reflexed; bracts of the
pistillate spikes with well developed sheath . . . 8
- 8a perigynia obovoid to fusiform or lanceolate, distinctly narrowed to the base . . . 9
- 8b perigynia ovoid or ellipsoid or rarely obovoid, rounded at base . . . 11
- 9a pistillate spikes short-cylindric, usually erect (in a few species drooping, these have sharply
trigonus perigynia) . . . 10
- 9b pistillate spikes elongate, at least the lower widely spreading or drooping; perigynia not
sharply trigonus . . . **Sylvaticae #36**
- 10a perigynia with finely elevated nerves, awns of pistillate scales smooth
or lacking . . . **Laxiflorae #32**
- 10b perigynia with very numerous impressed nerves giving the appearance of a longitudinally
wrinkled surface; awns of pistillate scales rough . . . **Oligocarpae #34**
- 11a perigynium beakless . . . 12
- 11b perigynium with short but distinct beak . . . 13
- 12a pistillate spikes short-cylindric, 1–2 (4) cm, erect or nearly so on
short peduncles . . . **Oligocarpae #34**
- 12b pistillate spikes very slender, 3–6 cm, widely spreading or drooping on
slender peduncles . . . **NA**
- 13a leaf blades flat; plants of nonsaline habitats . . . **Granulares #33**
- 13b leaf blades involute; plants of saline or brackish habitats . . . **NA**

Group 9: Key to Superspecies

- 1a perigynium beakless or minutely apiculate . . . 2
- 1b perigynium with short or long, but distinct, beak . . . 6
- 2a pistillate spikes short-cylindric to ovate or cylindrical, at least the lower spreading
or drooping on slender peduncles . . . 3
- 2b pistillate spikes short-cylindric; erect or nearly so, sessile or short-peduncled . . . 5
- 3a pistillate spikes rarely as much as twice as long as thick; perigynia flattened . . . **Limosae #46**
- 3b pistillate spikes 3–several times as long as thick; perigynia from nearly circular to
obscurely trigonus in cross section . . . 4
- 4a pistillate scales white or pale green with green center . . . **Gracillimae #35**
- 4b pistillate scales with brown or purple sides and paler center . . . **NA**
- 5a foliage covered with waxy white powder; perigynia fusiform, 3–5 mm . . . **Paniceae #31**

- 5b foliage green; perigynia ellipsoid, 2.1–2.8 mm . . . **Viriscentes #40**
- 6a leaf blades less than 2 mm wide, bracts shorter than the spikes . . . **NA**
- 6b leaf blades in most species at least 2 mm wide, but if not so, then at least the lowest bract longer than its spike . . . **7**
- 7a perigynia obovoid to stoutly rhomboid–fusiform, broadest at or above middle, abruptly narrowed to the beak . . . **8**
- 7b perigynia ovoid or lance–ovoid, broadest below the middle and tapering gradually into the beak . . . **10**
- 8a pistillate spikes cylindrical, 2–5 cm; pistillate scales with rough awns . . . **NA**
- 8b pistillate spikes short–cylindric to subglobose, up to 2 cm; pistillate scales blunt to sharp tipped . . . **9**
- 9a beak of perigynium a third to as fully as long as the body; perigynia spreading or reflexed . . . **Extensae #39**
- 9b beak of perigynium minute but distinct, usually about one–eighth as long as the body; perigynia all ascending . . . **NA**
- 10a pistillate spikes spreading or drooping on slender peduncles . . . **11**
- 10b pistillate spikes erect or strongly ascending, sessile or short peduncled . . . **NA**
- 11a pistillate spikes 1–2 cm x 6–8 mm . . . **Sylvaticae #36**
- 11b pistillate spikes 2–5 cm, very slender, about 5 mm thick . . . **Gracillimae #35**

Dioicae #2

one species in area . . . *C. dioica*

Orthocerates #3

one species in are . . . *C. pauciflora*

Polytrichoidae #7

one species in area . . . *C. leptalea*

Arenaria #13 – one species in area

1a spikes 4–12; scales shorter than the perigynia . . . *C. siccatta*

1b spikes numerous; scales equaling or mostly surpassing the perigynia . . . **NA**

Chordorrhizae #14

one species in area . . . *C. chordorrhizae*

Bracteosae #15 – seven species in area

1a sheaths loose, septate–nodose and usually mottled or striped green and white on the dorsal side . . . **NA**

1b sheaths tight, not septate–nodose on the dorsal surface; not mottled or striped . . . **3**

3a inflorescence an ovoid head, the densely aggregated spikes hardly distinguishable

- except by the projecting setaceous bracts . . . 4
- 3b inflorescence composed of spikes, the spikes plainly distinguishable and often separated by an exposed internode of the axis . . . 5
- 4a perigynia two-fifths to three-fifths as wide as long, widest just below the middle, rounded or broadly wedge-shaped at base . . . *C. cephalophora*
- 4b perigynia three-fifths to three-fourths as wide as long, widest near the broadly rounded or truncate base . . . NA
- 5a pistillate scales strongly tinged with brownish or reddish-purple . . . NA
- 5b pistillate scales greenish or greenish-translucent, or becoming straw-colored or pale brown when dried . . . 9
- 9a perigynia densely white-dotted; plants loosely rhizomatous . . . *C. disperma*
- 9b perigynia not white-dotted; plants growing in tufts . . . 10
- 10a perigynium conspicuously spongy-thickened at base, nerveless or finely striate or nerved on the spongy base only . . . 11
- 10b perigynium not spongy-thickened, prominently nerved dorsally . . . *C. muhlenbergii*
- 11a beak of the perigynium smooth margined; scales pointed, deciduous early . . . *C. retroflexa*
- 11b beak of the perigynium serrulate-margined; scales obtuse, persistent . . . 12
- 12a plants colonial by well developed creeping rhizomes; perigynia mostly 4–5 times as long as wide . . . NA
- 12b plants densely tufted, not rhizomatous; perigynia 2–3 times as long as wide . . . 13
- 13a stigmas straight or only slightly twisted; achene occupying only the upper half of the basally subtruncate perigynium; perigynia reflexed when ripe . . . *C. radiata*
- 13b stigmas mostly once or twice coiled, or if occasionally not so, then the plants otherwise not as above . . . 14
- 14a broadest leaves 0.9–1.5 mm wide; base of fertile stems 0.7–1.3 mm thick . . . *C. appalachica*
- 14b broadest leaves 1.8–2.6 mm wide; base of fertile stems 1.5–2.2 mm thick . . . *C. rosea*

Multiflorae #16 – two species in area

- 1'a perigynia yellow-green to pale brown, flowering stems shorter than leaves, perigynia elliptic, moist habitats . . . *C. vulpinoidea*
- 1'b perigynia golden-brown or yellow-brown, flowering stems longer than leaves, perigynia ovate to suborbicular, dry to moist soils . . . *C. annectens*

Vulpinae #17 – three species in area

- 1a perigynia lanceolate to lance-ovate, broadest near the truncate or notched base, the beak often equaling or longer than the body . . . 2
- 1b perigynia distinctly ovate, rounded at base, the beak no longer than the body . . . 4
- 2a perigynium with the spongy base continuous with the body . . . 3
- 2b perigynium dilated at base into a disk-shaped spongy structure notably wider than the

- short subconic body . . . NA
- 3a sheaths prolonged beyond the base of the blade, ventrally thin, fragile, and cross-corrugated . . . *C. stipata*
- 3b sheaths with thick-margined, concave mouth, not prolonged, not corrugated . . . *C. laevivaginata*
- 4a sheaths ventrally cross-corrugated; perigynia green or becoming ± straw-colored, strongly few-nerved dorsally . . . *C. conjuncta*
- 4b sheaths not (or scarcely) corrugated; perigynia becoming largely or wholly golden brown, inconspicuously few-nerved dorsally . . . NA

Paniculatae #18 – two species in area

- 1a perigynia obovoid; sheaths concave at mouth, not prolonged . . . NA
- 1b perigynia lance-ovoid to ovoid; sheaths distinctly prolonged beyond the base of the blade . . . 2
- 2a dorsal surface of the perigynium with a median thin, often depressed and pale stripe bordered by a pair of veins and extending to the base; sheaths ventrally pale and red dotted . . . *C. diandra*
- 2b dorsal surface of the perigynium without such a strip, the principal veins divergent well above the base; sheaths strongly coppery toward the mouth ventrally . . . *C. prairea*

Heleonastes #19 – five species in area

- 1a spikes 2–4, closely aggregated and overlapping in a short, ovoid or oblong head . . . 2
- 1b spikes (1) 2–9, at least the lower ones generally separate and not overlapping . . . 4
- 2a pistillate scales white-translucent, except the greenish midrib; perigynia beakless . . . *C. tenuiflora*
- 2b pistillate scales strongly brown tinged; perigynia distinctly short-beak . . . NA
- 4a scales reddish-brown, equaling and ± concealing the perigynia; maritime . . . NA
- 4b scales paler, mostly shorter than the distally exposed perigynia, not maritime . . . 5
- 5a spikes 1–3, usually 2; perigynia 1–5 each spike, 2.5–4.0 mm . . . 5*
- 5b spikes 4–9, perigynia 5–30 each spike, 1.7–2.5 mm . . . 6
- 5*a perigynia 2–5 per spike, leaf blade 1.0–2.0 mm wide . . . *Carex trisperma*
- 5*b perigynia 1–2 per spike, leaf blade 0.5–1.0 mm wide . . . *Carex billingsii*
- 6a perigynia mostly 5–10 (15) per spike; ventrally nerveless or obscurely nerved; loosely somewhat spreading; sharp tips of beaks interrupting the outline of the spike . . . *C. brunnescens*
- 6b perigynia (10) 15–30 per spike; distinctly nerved ventrally; sharp tips of beaks not interrupting the outline of the spike . . . *C. canescens*

Stellulatae #20 – eight species in area

- 1a spike usually solitary; leaves involute; anthers large, 2.0–3.6 mm . . . *C. exilis*
- 1b spikes 2–many; leaves flat or with longitudinal folds; anthers

- smaller, 0.6–2.2 mm . . . 2
- 2a spikes 7–15, crowded into an elongate head, many-flowered with (20) 25–40 perigynia . . . *C. arcta*
- 2b spikes 2–8, often less crowded and/or with fewer flowers . . . 3
- 3a plants usually with sexes on separate plants; spikes unisexual or nearly so . . . *C. sterilis*
- 3b plants with both sexes on the same plant, at least the terminal spike with pistillate flowers above the staminate ones . . . 4
- 4a beak of perigynium smooth margined . . . *C. serosa*
- 4b beak sparsely to densely serrulate on the margins . . . 5
- 5a perigynia mostly 2–3 mm wide and 1.0–1.7 times as long as wide . . . *C. atlantica*
- 5b perigynia mostly 1–2 mm wide, often more than 1.7 times as long as wide . . . 6
- 6a leaves relatively broad, the widest ones 2.8–5.0 mm . . . 7
- 6b leaves narrower, the widest ones not over 2.7 mm wide . . . 8
- 7a inflorescences 1.5–3.0 cm; lowest 2 spikes only 1–10 mm apart . . . *C. wiegandii*
- 7b inflorescence 3.0–8.5 cm; lower spikes 1–4 cm apart . . . NA
- 8a perigynia relatively long, narrow, and long-beaked, mostly 2.8–3.5 (4.0) mm and 1.8–3.2 times as long as wide, the beak half as long to nearly as long as the body . . . *C. echinata*
- 8b perigynia shorter, or relatively wider, and with a shorter beak up to half as long as the body . . . 9
- 9a perigynia nerveless (seldom few nerved) ventrally, tending to be somewhat convexly tapering from widest point to beak, forming a shoulder; beak conspicuously toothed and with small bristles . . . *C. interior*
- 9b perigynia mostly several nerved ventrally, ± wedge-shaped or even concavely tapered from widest point to beak; beak more sparsely toothed . . . *C. atlantica*

Deweyanae #21 – one species in area

- 1a perigynia about 0.8–1.2 mm wide and 4–5 times as long as wide; strongly nerved on both sides, or only weakly so ventrally . . . *C. bromoides*
- 1b perigynia about 1.3–1.6 mm wide and 3–4 times as long as wide; faintly nerved or nerveless on both sides . . . NA

Ovales #22 – eleven species in area

- 1a bracts leaflike and many times longer than the inflorescence . . . *C. sychnocephala*
- 1b bracts much shorter and ± bristle-like, seldom as much as twice as long as the inflorescence . . . 2
- 2a scales nearly or fully as wide and long as the perigynia and ± concealing them . . . 3
- 2b scales obviously shorter and/or narrower than the perigynia, largely exposing at least the distal margins as well as the beaks of the perigynia . . . 9
- 3a perigynia evidently slender-beaked, at least the distal 0.5 mm of the beak somewhat rounded, marginless, and smooth or nearly so . . . NA

- 3b perigynia with a flattened, broadly margined and toothed, often ill-defined beak, this sometimes with a minute somewhat rounded tip less than 0.5 mm . . . 6
- 6a inflorescence \pm elongate and flexuous or constricted at intervals, not stiff . . . 7
- 6b inflorescence stiff and congested, the spikes \pm touching or close together . . . NA
- 7a ventral side of the perigynium nerveless or obscurely few-nerved . . . *C. foenea*
- 7b ventral side of the perigynium strongly 5–8 nerved . . . *C. argyrantha*
- 9a achenes narrow, mostly only 0.5–0.8 mm wide; perigynia often but not always more than 2.5 times as long as wide; body of the perigynium never obovate . . . 10
- 9b achenes broader, 0.9–1.5+ mm wide (if a little narrower, then the perigynium body obovate); perigynia up to about 2.5 times as long as wide . . . 17
- 10a perigynium 6.5–10.0 mm . . . NA
- 10b perigynium 2.4–5.5 mm . . . 11
- 11a perigynium 2.4–3.9 mm x 1.1–1.5 mm, up to three times as long as wide . . . 12
- 11b perigynium either at least 4 mm long, or more than three times as long as wide, or both . . . 13
- 12a perigynium with stiffly spreading to recurved beak, the body often not winged to the base . . . *C. cristatella*
- 12b perigynium with stiffly ascending beak, the body winged to the base . . . *C. bebbii*
- 13a principal leaves 1–3 mm wide . . . 14
- 13b principal leaves 3–7 mm wide . . . 16
- 14a perigynia 1.5–2.5 times as long as wide; sheaths ventrally green-veined almost to the summit, with only a very short translucent area . . . NA
- 14b perigynia 2.5–5.0 times as long as wide; sheaths ventrally translucent . . . 15
- 15a perigynia 4.0–5.5 mm x 1.5–2.0 mm; 2.5–3.0 times as long as wide, strongly flattened and much wider than the achene . . . *C. scoparia*
- 15b perigynia 3.3–5.0 mm x 0.8–1.0 mm; 3.5–5.0 times as long as wide, planoconvex and not much wider than the achene . . . NA
- 16a spikes 8–12 mm, overlapping and crowded; perigynia more than 30 . . . *C. tribuloides*
- 16b spikes 5–8 mm, separate (at least the lower) in an elongate inflorescence; perigynia 15–30 . . . *C. projecta*
- 17a perigynia less than 4 mm long and also less than 2 mm wide . . . 18
- 17b perigynia more than 4 mm long, or more than 2 mm wide, or both . . . 24
- 18a perigynium body obovate; achene not over 1 mm wide . . . NA
- 18b perigynium body ovate to oblong, elliptic, or orbicular; achene often over 1 mm wide . . . 20
- 20a perigynium body orbicular to broadly elliptic, abruptly rounded to the slender beak . . . NA
- 20b perigynium body ovate to elliptic or oblong, more gradually tapering into the often broader beak . . . 21
- 21a scales about as long as but distinctly narrower than the perigynia . . . 22
- 21b scales distinctly shorter (as well as usually narrower) than the perigynia . . . NA
- 22a ventral side of the perigynium nerveless or obscurely few-nerved . . . *C. foenea*

- 22b ventral side of the perigynium strongly 5–8 nerved . . . *C. argyrantha*
- 24a sheaths with an elongate translucent ventral area; perigynia in most species \pm ovate or broadly ovate in outline, widest at one–fourth to two–fifths of length from the base to the summit . . . 25
- 24b sheaths ventrally green–veined almost to the summit, with only a short translucent area; perigynium in most species widest at two–fifths to one–half of the length from the base to the summit and at or beyond the middle of the orbicular to obovate body . . . 29
- 25a perigynia planoconvex, not over 4.4 mm . . . NA
- 25b perigynia flat, often but not always over 4.4 mm . . . 27
- 27a perigynium very thin, \pm translucent, evidently nerved on both sides, 4.2–7.0 mm . . . NA
- 27b perigynium thicker and firmer, opaque, often nerveless ventrally; pistillate scales merely acute . . . 28
- 28a perigynium 3.2–4.8 mm x 2.2–3.4 mm, the body no wider than long . . . 28*
- 28b perigynium 4.5–5.7 mm x 3.3–4.5 mm, the body wider than long . . . NA
- 28*a leaf sheaths with fine raised bumps (at 30–40 x magnification), especially near base . . . *C. merritt–fernaldii*
- 28*b leaf sheaths smooth . . . *C. brevior*
- 29a pistillate scales acuminate into a narrow or awn–like tip . . . 30
- 29b pistillate scales inconspicuous, obtuse or merely with pointed ends . . . NA
- 30a spikes separate in an elongate inflorescence, the lateral ones conspicuously tapering to the base . . . NA
- 30b spikes crowded and overlapping, the lateral ones obtuse to short club–shaped at the base . . . *C. alata*

Phyllostachyae #25 – one species in area

- 1a pistillate scales with translucent margins . . . NA
- 1b pistillate scales wholly green . . . *C. beckii*

Montanae #26 – five species in area

- 1a spikes usually are borne \pm close together above middle of the stem, the terminal one staminate, the lateral ones pistillate, only rarely any of the spikes near the base . . . 2
- 1b some of the pistillate spikes borne singly on short to \pm elongate peduncles that originate near the base of the stem, well removed from the over spikes . . . 8
- 2a perigynium body (beak and contracted base excluded) ellipsoid to obovoid, distinctly longer than wide, usually wider than thick, obscurely trigonous at maturity . . . 3
- 2b perigynium body subglobose, nearly or quite as wide and thick as long . . . 6
- 3a lowest pistillate spike short–pedunculate, \pm remote from and not overlapping the spike next above it, though still borne above the middle of the stem . . . NA
- 3b lowest pistillate spike sessile (like the others) and usually overlapping the spike

next above . . . 4

- 4a pistillate scales somewhat circular, distal end somewhat obtuse to tipped with a short sharp slender point; about half as long as the body of the perigynium . . . *C. peckii*
- 4b pistillate scales ovate to lance-ovate, with sharp end or ending in a short slender point; nearly equaling or surpassing the body of the perigynium . . . NA
- 6a plants in clumps, without long rhizomes; leaves relatively short and broad, at least the larger ones 3–7 mm wide . . . *C. communis*
- 6b plants producing long rhizomes; leaves longer and more slender, mostly 1–3 mm wide . . . 7
- 7a beak 0.2–1.0 mm, one-eighth to one-half as long as the rest of the perigynium . . . *C. pensylvanica*
- 7b beak 1.0–2.0 mm, one-half to fully as long as the rest of the perigynium . . . *C. lucorum*
- 8a terminal staminate spike closely associated with one or more pistillate spikes, the lowest of these subtended by a foliaceous bract mostly surpassing the staminate spike . . . NA
- 8b terminal staminate spike alone or associated with a pistillate spike, in the latter case the subtending bract-scale not surpassing the staminate spike . . . *C. umbellata*

Bicolores #27 – two species in area

- 1*a perigynia 12–20 ribbed, white-papillate when young becoming golden to yellow-brown and fleshy and obscurely papillate at maturity . . . *C. aurea*
- 1*b perigynia obscurely ribbed, remaining dry and white and papillate at maturity . . . *C. garberi*

Digitatae #28 – one species in area

- 1a pistillate scales conspicuously abrupt and notched . . . *C. pendunculata*
- 1b pistillate scales rounded to obtuse or acute . . . NA

Paniceae #31 – three species in area

- 1a perigynia beakless, or with minute beak less than 0.5 mm . . . 2
- 1b perigynia with distinct beak 0.7–2.2 mm . . . 6
- 2a achenes ovoid- or ellipsoid-trigonous, broadest near the middle, rounded at base . . . 3
- 2b achenes obovoid-trigonous, broadest well above the middle, tapering to base . . . 4
- 3a leaf blades distinctly channeled or rolled inward lengthwise, wet places . . . *C. livida*
- 3b leaf blades flat except at base, dry fields and meadows . . . NA
- 4a pistillate spikes 5–7 mm thick, with about 6 rows of perigynia 2.0–2.5 mm wide . . . NA
- 4b pistillate spikes 3–4 mm thick with mostly 2–3 rows of perigynia 1.5–2.0 mm wide . . . 5
- 5a phyllopodic, only seldom red-purple at base; rhizomes

- deep-seated, slender . . . *C. tetanica*
- 5a strongly aphyllopodic, red-purple at base; rhizomes shallow, stout . . . NA
- 6a phyllopodic, the basal leaves with well developed blade; perigynia all or mostly in 2 rows . . . *C. vaginata*
- 6b aphyllopodic, the basal leaves reduced to bladeless sheaths; perigynia all in 3 or more rows . . . NA

Laxiflorae #32 – seven species in area

- 1a perigynia rounded trigonous, with convex faces, especially below; none of the spikes basal . . . 2
- 1b perigynia sharply trigonous, with plane or only slightly convex faces; lowest pistillate spike usually basal . . . 10
- 2a perigynia 2-ribbed, otherwise nerveless or only very obscurely nerved . . . *C. leptonervia*
- 2b perigynia with numerous evident nerves, sometimes also 2-ribbed . . . 3
- 3a perigynia tapering into a straight or somewhat curved, often \pm elongate beak . . . NA
- 3b perigynia with short, abruptly bent beak . . . 8
- 8a leaves of sterile shoots 1–10 mm wide; pistillate scales prominently sharp pointed or short-awned . . . 9
- 8b leaves of sterile shoots 10–50 mm wide; pistillate scales broadly obtuse or subtruncate and only minutely sharp toothed on end . . . *C. albursina*
- 9a plants purple at base . . . 9*
- 9b plants brownish at base, not purple . . . NA
- 9*a angles on basal sheaths with small hairy teeth . . . *C. gracilescens*
- 9*b angles on basal sheaths merely bumpy . . . *C. ormostachya*
- 10a plants purple at base . . . 11
- 10b plants brown or whitish at base, not purple . . . 12
- 11a sheaths of stem leaves and bracts much reduced or no blade; perigynia 3.7–5.0 mm . . . *C. plantaginea*
- 11b sheaths of stem leaves and bracts with well developed blade; perigynia 5.0–6.5 mm . . . NA
- 12a leaves of fertile and sterile shoots very different, the sterile shoots mostly 10–25 mm wide, the fertile shoots rarely over 6 mm wide . . . *C. platyphylla*
- 12b leaves of fertile and sterile shoots similar, seldom any of them over 10 mm wide . . . 13
- 13a basal scales of the pistillate spikelets, like the others, subtending the pistillate flowers . . . 14
- 13b basal 1–3 scales of the pistillate spikes empty or subtending staminate flowers . . . NA
- 14a staminate spike sessile or nearly so, often hidden by the bracts and pistillate spikes . . . NA
- 14b staminate spike on an evident peduncle 0.5–8.5 cm . . . *C. digitalis*

Granulare #33 – two species in area

- 1a staminate peduncle none or shorter than uppermost pistillate spike . . . *C. granularis*
- 1b staminate peduncle elongate, overtopping uppermost pistillate spike . . . *C. crawei*

Oligocarpae #34 – one species in area

- 1a leaf sheaths covered with small firm hairs; perigynia broadest well above middle . . . *C. hitchcockiana*
- 1b leaf sheaths hairless; perigynia broadest near the middle . . . NA

Gracillimae #35 – one species in area

- 1a perigynia strongly angled at the lateral ribs, otherwise nerveless; plants brownish or greenish at base . . . *C. prasina*
- 1b perigynia obscurely triginous, the lateral ribs not at the angles; plants purplish at base . . . NA

Sylvaticae #36 – two species in area

- 1a achene sessile in the base of the perigynium . . . 2
- 1b achenes elevated above the perigynium base on a slender stipe 0.5–1.5 mm . . . NA
- 2a perigynia covered with hairs, texture leathery . . . NA
- 2b perigynia hairless . . . 3
- 3a spikes short-cylindric, 1.0–2.0 (2.5) cm, closely flowered; leaves soft hairy . . . *C. castanea*
- 3b spikes linear, slender, (2.0) 2.5–7.0 cm, loosely flowered; leaves hairless or nearly so . . . 4
- 4a perigynium on slender stalk, its beak much shorter than the body . . . *C. arctata*
- 4b perigynium sessile, its beak about as long as the body . . . NA

Capillares #37

one species in area . . . *C. capillaris*

Longirostes #38

one species in area . . . *C. spregelii*

Extensae #39 – three species in area

- 1a perigynia mostly spreading or reflexed; sheaths white ventrally; widespread, not maritime . . . 2
- 1b perigynia ascending; sheaths red-dotted ventrally; coastal . . . NA
- 2a perigynia 2.2–3.3 mm, straight or nearly so; achene nearly filling the perigynium . . . *C. viridula*
- 2b perigynia 3.5–6.2 mm (or as little as 3.2 mm in *C. cryptolepis*), many or most of them strongly recurved-hooked; achene in the lower half of the perigynium . . . 3
- 3a pistillate scales conspicuous, coppery-brown; perigynium beak rough margined . . . 4

- 3b pistillate scales inconspicuous, about the same color as the perigynia;
beak smooth . . . *C. cryptolepis*
- 4a staminate spike short-peduncled or sessile; perigynium gradually
tapering to the beak . . . *C. flava*
- 4b staminate spike on a peduncle surpassing the uppermost pistillate spike;
perigynium abruptly contracted to the beak . . . NA

Viriscentes #40 – three species in area

- 1a terminal spike completely staminate . . . 2
- 1b terminal spike pistillate at top, staminate below . . . 3
- 2a perigynia faintly and finely nerved, ellipsoid, beakless . . . *C. pallescens*
- 2b perigynia conspicuously nerved, obovoid, with a beak 0.2–0.5 mm . . . NA
- 3a perigynia densely hairy . . . 4
- 3b perigynia hairless . . . 5
- 4a pistillate spikes 2–4 cm, loosely flowered at base; anthers 1.5–2.5 mm . . . *C. virescens*
- 4b pistillate spikes 1–2 cm, closely flowered throughout; anthers 0.7–1.5 mm . . . NA
- 5a perigynia pressed to axis-ascending, much wider than thick, blunt,
obscurely nerved . . . *C. hirsutella*
- 5b perigynia spreading, nearly or quite as thick as wide, short-pointed,
conspicuously nerved . . . NA

Hirtae #41 – three species in area

- 1a leaf sheaths and pistillate scales hairy; teeth of perigynium 1.0–1.5 mm . . . NA
- 1b leaf sheaths and pistillate scales hairless; teeth mostly under 1.0 mm . . . 2
- 2a perigynia hairless or inconspicuously hairy, nerves impressed . . . NA
- 2b perigynia hairy, ribbed (but ribs often obscured by the hairs . . . 3
- 3a beak of the perigynium distinctly two-toothed, teeth stiff . . . 4
- 3b beak of the perigynium soft and hyaline and only obscurely bidentate at tip . . . NA
- 4a perigynia 4–7 mm, conspicuously ribbed, short-hirtellous;
dry habitats . . . *C. houghtoniana*
- 4b perigynia 2.8–5.0 mm, the ribs mostly hidden by the dense pubescence; mostly
in wet habitats . . . 5
- 5a leaves flat or nearly so, mostly 2–5 mm wide . . . *C. pellita*
- 5b leaves folded along the midrib, only 1.0–1.5 (2) mm wide
when folded . . . *C. lasiocarpa*

Anomalae #42

One species in area . . . *C. scabrata*

Limosae #46 – two species in area

- 1a pistillate scales ovate or elliptic, mostly about as wide and long as perigynia . . . 2
- 1b pistillate scales lanceolate, narrower and longer than the perigynia . . . *C. magellanica*

- 2a stems obtusely 3-angled, very smooth; scales enclosing the perigynium base . . . NA
- 2b stems sharply 3-angled, usually rough above; scales not enclosing the perigynium base . . . *C. limosa*

Atratae #47 – two species in area

- 1a pistillate spikes mostly sessile or nearly so . . . 2
- 1b pistillate spikes on slender stalks 1–4 cm . . . *C. atratiformis*
- 2a stems of season strongly aphyllopodic; not surrounded by dried sheaths of previous years; perigynia densely and conspicuously covered with small bumps . . . *C. buxbaumii*
- 2b stems of season phyllopodic, or somewhat aphyllopodic, surrounded by the dried sheaths of previous years; perigynia not notably covered with small bumps . . . NA

Cryptocarpae #48 – three species in area

- 1a pistillate scales awnless, the sides blackish or deep purple-brown . . . *C. torta*
- 1b scales awned, the sides merely brown . . . 2
- 2a densely tufted plants, without long rhizomes, not of salt-marshes . . . 3
- 2b salt marsh plants with elongate rhizomes . . . NA
- 3a sheaths hairless, perigynia somewhat inflated, obovoid, rounded above to an abrupt beak . . . *C. crinita*
- 3b sheaths rough margined; perigynia flattened, elliptic, tapering from near to below the middle . . . 4
- 4a perigynia smooth to slightly papillate distally . . . *C. gynandra*
- 4b perigynia densely granular-papillate throughout . . . NA

Acutae #49 – six species in area

- 1a longest bract will overtopping the spikes . . . 2
- 1b longest bract shorter than or merely equaling the spikes . . . 4
- 2a with long rhizomes, salt-marsh plants . . . NA
- 2b densely tufted plants, without rhizomes, mostly not of salt marshes . . . 3
- 3a perigynia essentially nerveless on both faces . . . *C. aquatilis*
- 3b perigynia with a few sharp, elevated nerves on each face . . . *C. lenticularis*
- 4a lower sheaths rough textured, red-brown, splitting to form a pinnate network . . . *C. stricta*
- 4b lower sheaths smooth, not filamentose . . . 5
- 5a scales black; perigynia distally purple-brown . . . 6
- 5b scales brown or red-brown; perigynia not purplish-brown . . . 7
- 6a perigynia essentially nerveless on both faces . . . *C. bigelowii*
- 6b perigynia with a few sharp, elevated nerves on each face . . . NA
- 7a perigynia red-dotted, each face nerveless or faintly 1–3 nerved . . . *C. haydenii*
- 7b perigynia not dotted, each face evidently several-nerved . . . *C. emoryi*

Folliculatae #51 – one species in area

- 1a main leaves 1.5–4.0 mm wide; bract sheaths concave at mouth . . . *C. michauxiana*
- 1b main leaves 4–16 mm wide; bract sheaths prolonged at the mouth . . . NA

Pseudocyperae #52 – three species in area

- 1a mature perigynia spreading or ascending, rather thin textured, nearly round in cross-section, rather abruptly narrowed to the beak, scarcely stalked . . . *C. hystericina*
- 1b mature perigynia ± reflexed, rigidly leathery, obtusely trigonous, very gradually tapering to the beak, slender-stalked . . . 2
- 2a teeth of the perigynium beak curved-divergent, 1.2–2.3 mm . . . *C. comosa*
- 2b teeth of the perigynium beak nearly straight and parallel, 0.5–1.0 mm . . . *C. pseudocyperus*

Paludosae #53 – two species in area

- 1a perigynia hairless . . . 2
- 1b perigynia hairy . . . *C. trichocarpa*
- 2a teeth of perigynium beak 1 mm or less . . . 3
- 2b teeth 1–3 mm, perigynia 5.5–10.0 mm . . . NA
- 3a leaves narrow, mostly 2–4 mm wide; pistillate spikes 1.5–3.0 (4.0) cm; perigynium 3.5–5.5 mm, with impressed nerves . . . NA
- 3b leaves wider, mostly 5–15 mm wide; pistillate spikes 3–11 cm; perigynium with ± raised nerves . . . 4
- 4a perigynium 2.5–4.5 mm; leaves mostly 5–8 mm wide . . . NA
- 4b perigynium 4.7–8.0 mm; leaves mostly 8–15 mm wide . . . 5
- 5a stems aphyllopodic, lateral; ligules much longer than wide . . . *C. lacustris*
- 5b stems phyllopodic, central; ligules scarcely if at all longer than wide . . . NA

Squarrosae #54 – two species in area

- 1a terminal spike generally staminate; pistillate scales with an awn equaling or surpassing the perigynium . . . NA
- 1b terminal spike mainly pistillate with staminate flowers at the base, pistillate scales awnless or with an awn surpassed by the perigynium beak . . . 2
- 2a achene a little less than half as wide as long; style much curved near base . . . *C. squarrosa*
- 2b achene half to three-fifths as wide as long; style straight or nearly so . . . *C. typhina*

Vesicariae #55 – eight species in area

- 1a perigynium beak merely emarginated; leaves narrow, mostly 1–4 mm wide . . . 2
- 1b perigynium beak with 2 slender sharp teeth; leaves often wider . . . 3
- 2a achene trigonous; stigmas 3; faces of perigynia evidently nerved . . . *C. oligosperma*

- 2b achene lenticular; stigmas 2; faces of perigynia nearly or completely nerveless . . . NA
- 3a pistillate scales acute to acuminate or notched . . . 4
- 3b pistillate scales with a slender awn equaling or longer than the body . . . 10
- 4a perigynia ascending at maturity, \pm arranged into 6 (8) vertical rows . . . 5
- 4b perigynia spreading or reflexed at maturity, \pm arranged into (6) 8–12 vertical rows . . . 7
- 5a achene symmetrical; perigynia up to ~ 3 mm thick . . . 6
- 5b achene deeply indented in the middle of one angle; perigynia (4.0) 4.5–7.0 mm thick . . . *C. tuckermanii*
- 6a perigynium beak 0.5–1.0 mm, its teeth ~ 0.25 mm; leaves mostly 2–3 mm wide . . . NA
- 6b perigynium beak 1–2 mm, its teeth (0.3) 0.5–1.2 mm; leaves mostly 3–8 mm wide . . . *C. vesicaria*
- 7a bract of the lowest pistillate spike 1–2 times as long as the inflorescence; plants with long rhizomes . . . 8
- 7b bract of the lowest pistillate spike 2–several times as long as the inflorescence; plants tufted, without long rhizomes . . . *C. retrorsa*
- 8a perigynium 4–7 mm, with smooth beak . . . 9
- 8b perigynium 6–9 mm, its beak rough on the margins . . . NA
- 9a leaves flat, yellow–green, without white waxy deposits, the larger ones 5–12 mm . . . *C. utriculata*
- 9b leaves \pm folded upward longitudinally, bumpy white waxy deposits above, 1.5–4.0 mm . . . NA
- 10a staminate scales with an evident rough awn, no long rhizomes . . . 11
- 10b staminate scales merely sharp pointed; plants with long rhizomes . . . *C. schweinitzii*
- 11a pistillate spikes 14–20 mm thick; perigynium beak shorter than the body . . . *C. lurida*
- 11b pistillate spikes 8–13 mm thick; perigynium beak longer than the body . . . *C. baileyi*

Lupulinae #56 – 4 species in area

- 1a sheath of uppermost non-bracteal leaf wanting or less than 1.5 cm; perigynium beak 1.5–4.2 mm; no rhizomes . . . 2
- 1b sheaths of uppermost non-bracteal leaf usually more than 1.5 cm; perigynium beak 4.5–10.0 mm; plants usually with long rhizomes . . . 3
- 2a perigynia dull, wedge shaped at the base, mostly 8–35 per spike, radiating in all directions . . . *C. grayi*
- 2b perigynia lustrous, convexly rounded at the base, 1–12 per spike, ascending or spreading . . . *C. intumescens*
- 3a achene longer than wide, or about as long as wide, widest near the middle; perigynia usually ascending . . . 4
- 3b achene distinctly wider than long, widest above the middle; perigynia usually spreading . . . NA
- 4a staminate peduncle usually much surpassing the uppermost pistillate spike . . . NA
- 4b staminate peduncle surpassed by or merely equaling uppermost pistillate spike . . . 5

- 5a angles of the achene smoothly curved; faces flat to slightly concave . . . *C. lupulina*
- 5b angles of the achene pointed; faces strongly concave . . . *C. lupuliformis*