

Keys to the Cyperaceae (Sedge Family) of Newfoundland and Labrador

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About 12% of the flora of Newfoundland and Labrador belong to the Cyperaceae, including 115 species of sedges (*Carex*). Since the genus *Carex* is very large, taxonomists have grouped similar species into Sections, a taxonomic rank between genus and species (represented by the symbol §). Most *Carex* species of NL are included in either Key 2 or 3 below but, to facilitate comparison between similar species, separate keys are presented for *Carex* Sections with 5 or more species.

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Key 1. Key to Cyperaceae genera of Newfoundland and Labrador

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- 1a. Flowers unisexual, with pistillate (female) and staminate (male) flowers arranged in unisexual or bisexual spikes. Pistillate flowers (consisting of a single-carpellate pistil) surrounded by a perigynium (modified bract) and subtended by a thin papery bract; the perigynium partially fused along one side or completely fused except for a small orifice at the apex of the perigynium through which a 2- or 3-branched style emerges, beakless or with a beak; staminate flowers, consisting of 1–3 stamens subtended by a bract; perianth parts (sepals and petals) absent. Plants usually monoecious, with unisexual staminate and pistillate spikes, or bisexual spikes (gynecandrous – with staminate flowers situated at the base of the spike, beneath the pistillate flowers, or androgynous – with staminate flowers situated at the apex of the spike, above the pistillate flowers), or staminate and pistillate flowers mixed within a spike; or plants dioecious, with unisexual staminate or pistillate spikes on separate plants (Subfamily *Caricoideae*). **Carex** (see Keys 2 & 3, pgs. 5, 19)
- 1b. Flowers bisexual, with pistillate (female) flowers consisting of a single-carpellate pistil subtended by a bract; staminate (male) flowers, consisting of 1–3 stamens subtended by a bract; perianth parts modified into bristles, hairs, and/or scales, which may or may not persist at the top of the achene (Subfamily *Cyperoideae*). **2**
- 2a. Inflorescence of 1 terminal spike, lacking involucre bracts. **3**
- 2b. Inflorescence of 1 terminal spike, appearing lateral, with a single erect involucre bract extending above the spike; or the inflorescence of 2 to many spikelets (terminal or terminal and axillary), arranged in sessile or pedicellate clusters, subtended by 1–several involucre bracts. **5**
- 3a. Spikes to 2.5 cm long; achenes bearing a small to large tubercle at the apex, the achene surface smooth, rugulose, or variously sculpted with ridges, pits, or lines; perianth bristles 0 or 1–7, smooth or retrorsely barbed, shorter or up to 2 times longer than the achene, but not extending beyond the subtending scale. **Eleocharis** (see Key 4, pg. 37)
- 3b. Spikes to 2 cm long; achenes lacking an apical tubercle, the achene surface smooth; perianth bristles 6–25, smooth, shorter or often much longer than the achene, then extending well beyond the subtending scale. **4**
- 4a. Culms to 4.5 dm tall; cauline leaves usually absent, if present, with blades less than 5 mm long; spikes with 3–20 flowers, 3–8 mm long, perianth bristles 6, white, 3–30 mm long, equal in length or much longer than the obovoid achene. **Trichophorum** (see Key 9, pg. 46)
- 4b. Culms to 7 dm tall, cauline leaves lacking or present; spikes with 20–100+ flowers, subtended by up to 15 empty scales, spikes 8–20 mm long in flower, 15–50 mm

long in fruit (including bristles); perianth bristles 8–25, bright white, creamy white, or rusty-brown, 10–40 mm long, much longer than the 0.4–3.5 mm long achenes. ...
 ***Eriophorum*** (*in part*, see Key 5, pg. 40)

- 5a. Spikelets alternately arranged in 2 vertical rows (2-ranked); perianth bristles present, shorter than the floral scales. **6**
- 5b. Spikelets arranged in terminal and lateral clusters (usually spirally arranged, not 2-ranked); perianth bristles absent or present, then shorter or longer than the floral scales. **7**
- 6a. Plants 2–10 dm tall; culms terete in cross-section, with hollow internodes; lower bladeless sheaths 2–14, upper 3–15 leaves with blades, strongly 3-ranked (clearly visible when viewed from above); inflorescences 5–20, axillary, each 6–30 cm long; the 3–10 narrow lanceolate spikelets 1.5–3 cm long by 1.2–2.5 mm wide, with 4–8 flowers; perianth bristles 6–9, retrorsely barbed, persistent, longer than the achene, but not extending beyond the scales; achene narrowly ellipsoid, biconvex, 2–4 mm long, with a long beak.
 ***Dulichium arundinaceum*** var. ***arundinaceum*** (threeway sedge)
- 6b. Plants 1–4.5 dm tall; culms terete and solid, the 1–3 leaves 2-ranked; inflorescence solitary, terminal, 1–2 cm long; the 5–8 lanceoloid spikelets 3–6 mm long by 3–4.5 mm wide, with 2–5 flowers; perianth bristles 3–6, antrorsely barbed, shorter than and separating from the mature achene; achenes ellipsoid, biconvex, 4–5 mm long, with a short beak. ***Blysmopsis rufa*** (red bulrush)
- 7a. Plants tall, usually 1–4 m; leaves all basal; inflorescence terminal, appearing lateral due to the single erect involucrel bract extending above the inflorescence; spikelets 1–several; plants emergent or submergent, growing in water to 1.5 m deep.
 ***Schoenoplectus*** (see Key 7, pg. 44)
- 7b. Plants short or tall, to 1.8 m; leaves basal and/or cauline; main inflorescence terminal, with 1–several involucrel bracts subtending the inflorescence; spikelets 2–100+; plants of bogs, fens, tundra, wet meadows, and freshwater or brackish shorelines. **8**
- 8a. Inflorescence terminal, with 2–30 spikelets, sessile or peduncled, each with 20–100+ flowers; subtended by 1–5 leaflike involucrel bracts; spikelets 6–20 mm long in flower, 10–50 mm long in fruit (including bristles); perianth bristles 10–25, smooth, bright white, creamy white, or rusty-brown, 10–30 mm long, much longer than the 1.5–5 mm long achenes. ***Eriophorum*** (*in part*, see Key 5, pg. 40)
- 8b. Inflorescences terminal and often axillary, with 2–100+ spikelets, sessile or peduncled, each with 1–50 flowers; subtended by 1–several scalelike or leaflike inflorescence bracts; spikelets 2–40 mm long; perianth absent, or perianth of 3–11 smooth or barbed bristles, long or short; achenes 0.6–4 mm long. **9**

- 9a. Plants 1–18 dm tall; cauline leaves 3–20 mm wide; inflorescence a compound cyme; spikelets with 10–50 flowers; perianth bristles 3–6, extending well beyond the tip of the scales in some species. **10**
- 9b. Plants 1–10 dm tall; cauline leaves 0.5–3.5 mm wide; inflorescence cymose, the lateral spikelets sessile or pedicellate; spikelets with 1–5 flowers; perianth absent or of 5–11 bristles, not extending beyond the tip of the scales. **11**
- 10a. Culms obtusely 3-angled to nearly terete, the sides convex; inflorescence an open compound cyme, often with axillary inflorescences originating from the upper cauline leaves; spikelets clustered at the end of primary branches (rays), arranged in groups (glomerules) of 2–110 spikelets, with secondary or tertiary rays terminating in smaller clusters (cymules) of 1–7+ spikelets; perianth bristles 4–6, smooth or barbed; achenes elliptic or obovoid, obtusely trigonous or plano-convex, 0.6–1.7 mm long. ***Scirpus*** (see Key 8, pg. 45)
- 10b. Culms sharply 3-angled, the sides slightly concave; the main inflorescence terminal, capitate, with 2–40 sessile ovate spikelets, often with 1–4 axillary inflorescences of 2–10 spikelets, terminating stiff divergent rays to 8 cm long and originating from below the main inflorescence; spikelets 0.7–4 cm long by 0.7–1 cm wide; perianth bristles 3–6, very finely barbed, not persistent on the mature fruit; achenes obovoid, usually biconvex, about 2.3–4 mm long.
..... ***Bolboschoenus maritimus*** subsp. ***paludosus*** (saltmarsh bulrush)
- 11a. Plants 1–7.5 dm tall; inflorescence of 1–3 terminal and axillary white to reddish-brown cymes, turbinate, with 2–10 narrowly ellipsoid spikelets arranged in clusters of 1–3; lateral spikelets sessile or pedicellate; flowers subtended by 5–12 bristles, finely retrorsely or antrorsely barbed, or smooth; achenes ellipsoid to obovoid, lenticular, 1–3 mm long by 0.8–1.2 mm wide, tapering at the base, the apex terminating in a narrow triangular tubercle, 0.5–1.7 mm long. ***Rhynchospora*** (see Key 6, pg. 43)
- 11b. Plants 3–10 dm tall; inflorescence of 1–5+ terminal and axillary reddish-brown cymes, capitate, with 3–15 ellipsoid to narrowly ovoid spikelets arranged in clusters of 2–5; lateral cymes on pedicels of various lengths; flowers lacking a perianth; achenes ovoid, nearly terete, 2.5–3 mm long by 1.5–1.7 mm wide, truncate and slightly lobed at the base, obtuse to acute at the apex, lacking a beak or tubercle.
..... ***Cladium mariscoides*** (smooth twig-rush)

Key 2. Key to *Carex* Sections (§) and species in Newfoundland and Labrador with 2 stigmas and 2-sided (flat, plano-convex, or lenticular) achenes

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- 1a. Plants with a single terminal spike. **2**
- 1b. Plants with 2 or more distinct spikes, or with a compound panicle-like inflorescence of several unisexual or bisexual spikes forming a dense terminal cluster, the individual spikes indistinct. **6**
- 2a. Inflorescence capitate, spikes androgynous or rarely unisexual. **3**
- 2b. Inflorescence ovate or narrowly cylindrical, spikes gynecandrous or unisexual. **5**
- 3a. Spikes usually androgynous (plants monoecious), or rarely unisexual (plants dioecious); perigynia lanceolate or narrowly elliptic, entirely dark reddish-brown; perigynia initially ascending, reflexed at maturity (§ *Physoglochin*). . ***Carex gynocrates*** (northern bog sedge)
- 3b. Spikes androgynous, dense, with a narrow pistillate portion at the apex of the spike; perigynia broadly ovate with a dark beak; ascending to spreading, the lower perigynia reflexed (§ *Capituligerae*). **4**
- 4a. Plants of alpine heathlands, with a single terminal ovoid to globose spike, 5–8 mm long, androgynous, with ascending perigynia, the basal perigynia becoming somewhat spreading at maturity; staminate portion forming a short point at the spike apex; perigynia broadly ovate to nearly circular, 2–2.5 mm long, lenticular in cross-section, tapering somewhat abruptly to a dark beak; pistillate scales broadly ovate to obovate, obtuse at the apex, with broad hyaline margins, scales nearly as long as the perigynia. ***Carex arctogena*** (eastern capitate sedge)
- 4b. Plants of boreal peatlands, with a single terminal ovoid to globose spike, 4–10 mm long, androgynous, with ascending perigynia, becoming spreading to reflexed near the base at maturity; staminate portion forming a short point at the spike apex; perigynia ovate to broadly ovate, 2–4 mm long, lenticular in cross-section, tapering somewhat gradually to a dark beak; pistillate scales ovate to obovate, obtuse to rounded at the apex, with narrow hyaline margins, scales shorter and narrower than the perigynia. ***Carex capitata*** (capitate sedge)
- 5b. Culms 2–10 cm tall; spike ovate to nearly globose, 0.4–1 cm long, gynecandrous, with 7–15 ovate perigynia, 1.5–2 mm long (§ *Glareosae*, *in part*, see Key 2.1, pg. 10). ***Carex ursina*** (bear sedge)
- 5a. Culms 12–80 cm tall; spike narrowly cylindrical, 0.6–4 cm long, gynecandrous, or plants dioecious with an entirely pistillate or staminate spike (§ *Stellulatae*, *in part*, see Key 2.4, pg. 18). ***Carex exilis*** (meager sedge)

- 6a. Spikes arranged in a narrowly branched compound inflorescence, forming a dense stiff terminal cluster of divergent spikes, the boundaries of individual spikes often difficult to determine; spikes androgynous; staminate flowers inconspicuous; perigynia plano-convex, with spongy tissue below the achene. **7**
- 6b. Spikes arranged in a simple, unbranched inflorescence; spikes distinct, arranged in short capitate terminal heads, or lateral star-like sessile clusters, or the upper spikes often close together and strongly overlapping; spikes unisexual, androgynous, or gynecandrous; perigynia flat, biconvex, plano-convex, or nearly terete in cross-section, with or without spongy tissue below the achene. **9**
- 7a. Culms weak, arching; leaves 1–3 mm wide; the hyaline portion of leaf sheaths smooth, with small dark reddish-brown dots, the summit convex; inflorescence 2–5 cm long; the setaceous bract less than 1 cm long; perigynia dark reddish-brown, 2–2.75 mm long, shiny; front of perigynia with an elliptic slightly raised middle region, bordered by 4–6 prominent veins, and narrowed towards the broader base (§ *Heleoglochin*). **Carex diandra** (lesser paniced sedge)
- 7b. Culms stiff, erect; leaves 2–10 mm wide; the hyaline portion of leaf sheaths puckered horizontally, with or without small reddish-brown dots, the summit convex; inflorescence 2–15 cm long; subtended by setaceous bracts to 5 cm long; perigynia green, maturing to golden brown, about 2–5 mm long, veinless, or with up to 15 slender brownish veins. **8**
- 8a. Stems 3-angled, firm, not spongy internally; leaves 2–6 mm wide, longer than the culms; hyaline portion of leaf sheaths puckered and horizontally ridged, with scattered reddish-brown dots; inflorescence 2–15 cm (usually 7–10 cm) long; perigynia ovate, about 2–3 mm long, veinless, or with 3 veins on the concave surface; the beak about $\frac{1}{2}$ to $\frac{3}{4}$ as long as the body of the perigynium; pistillate scales awned (§ *Multiflorae*). **Carex vulpinoidea** (fox sedge)
- 8b. Stems strongly 3-angled, winged on the edges, spongy internally, and easily compressed; leaves 4–10 mm wide, shorter than the culms; hyaline portion of leaf sheaths puckered and longitudinally ridged, lacking dark dots; inflorescence 3–10 cm long; perigynia lanceolate-ovate with a spongy base, 4–5 mm long, with 15 brownish veins on the concave surface, 7-veined below; the beak longer than the body of the perigynium; pistillate scales acuminate to short-awned (§ *Vulpinae*). **Carex stipata** (awlfruit sedge)
- 9a. Inflorescence a short terminal head, to 1.6 cm long, with 3–7 small androgynous spikes; the staminate flowers inconspicuous. **10**
- 9b. Inflorescence 0.5–2 cm long, with 2–15 spikes arranged along the culm, spikes unisexual, androgynous, or gynecandrous, 1–15 cm long; staminate flowers inconspicuous or in a terminal staminate spike; or, when several gynecandrous spikes are clustered into a dense head, the inflorescence then 1–4 cm long. **11**

- 10a. Culms to 2.5 dm tall, ascending, culms and leaves usually curved; leaves several per culm, rigid, strongly involute, 0.5–2 mm wide; inflorescence short cylindrical-ovoid to nearly globose, spikes 3–7; perigynia plano-convex to ovoid, medium to dark brown, unnerved; the beak often curved, 0.5–1 mm long (§ *Foetidae*).
 ***Carex maritima*** (seaside sedge)
- 10b. Culms 0.5–3.5 dm tall, ascending; leaves 1–2 per culm, flat, 1–3 mm wide; inflorescence ovoid, spikes 3–5; perigynia plano-convex to ovoid, plump, thickly convex on upper surface, greenish-brown to reddish-brown, prominently nerved with 12–28 darker nerves; beak short, straight, to 0.5 mm long (§ *Chordorrhizae*). ...
 ***Carex chordorrhiza*** (creeping sedge)
- 11a. Lateral spikes on short to long peduncles. **12**
- 11b. Lateral spikes sessile..... **17**
- 12a. Lateral spikes nodding to pendant, on flexuous peduncles to 7.5 cm long. **13**
- 12b. Lateral spikes erect to ascending or spreading, on short peduncles to 2 cm long. . **14**
- 13b. Culms to 14 dm long; inflorescence bracts sheathless; the terminal and upper 2–3 spikes staminate or gynecandrous, 2–6 cm long; lower 2–7 lateral spikes pistillate or androgynous, 1–11.5 cm long; perigynia biconvex (lenticular), ellipsoid, ovoid, to obovoid, 1.8–4.2 mm long, glabrous; pistillate scales 2–20 mm long, noticeably awned.
 **§ *Phacocystis*** (*in part*, see Key 2.3, pg. 16)
- 13a. Culms to 5 dm long; inflorescence bracts with a sheath 0.5–2.5 cm long; the terminal spike usually staminate or androgynous, 1–2.8 cm long; lateral 1–4 spikes pistillate or androgynous, 0.5–3 cm long, the lower on peduncles 2–3.5 cm long; perigynia usually of two types: either plano-convex, elliptic, 3.5–5.5 mm long, and very finely stiff-pubescent towards the apex or at least along the nerves or ellipsoid and 3-angled; pistillate scales 3–5.8 mm long, obtuse to short-awned (§ *Aulocystis*, *in part*).
 ***Carex petricosa* var. *misandroides*** (rock-dwelling sedge)
- 14a. Terminal 1–4 spikes staminate, the lower 2–7 lateral spikes pistillate, short- to long-cylindrical, to 10 cm long; perigynia biconvex to somewhat flattened in cross-section, ellipsoid, ovoid, or obovoid; glaucous green to pale brown at maturity, the short beak usually the same colour as the body of the perigynium (sometimes dark in *Carex bigelowii*). **§ *Phacocystis*** (*in part*, see Key 2.3, pg. 16)
- 14b. The solitary terminal spike is staminate or gynecandrous, 3–15 mm long by 1–2 mm wide; the 2–3 lateral spikes pistillate, short-cylindrical, to 2 cm long by 3–5 mm wide; perigynia oval to circular in cross-section, oblong-ellipsoid, obovoid to globose, plump, smooth to densely papillose; pale green, maturing to white or orange, beakless (§ *Bicolores*)..... **15**

- 15a. Terminal spike usually staminate; leaves 3–20 cm long by 1.4–3 mm wide; sheath of lowest inflorescence bract 2–4 mm long; perigynia initially pale green, turning golden-yellow or orange at maturity, smooth or minutely papillose; known from calcareous substrates in NL. *Carex aurea* (golden sedge)
- 15b. Terminal spike gynecandrous; leaves 2–15 cm long by 1–2.5 mm wide; sheath of lowest inflorescence bract to 10 mm long; perigynia pale green, turning whitish-green at maturity, densely papillose; rare in NL. **16**
- 16a. Plants 5–40 cm long; leaf blades 5–15 cm long; lowest inflorescence bract usually longer than the inflorescence, with a sheath to 10 mm long; terminal spike gynecandrous, with more than $\frac{1}{3}$ of the spike staminate; pistillate scales brown or hyaline with brownish margins; scale midrib green, sometimes extending beyond the blade of the scale in a cuspidate tip, especially in basal flowers of the spike; known in NL only from Porcupine Strand, eLabrador. *Carex garberi* (Garber's sedge)
- 16b. Plants to 20 cm long; leaf blades 2–6 cm long; lowest inflorescence bract equal to or shorter than the inflorescence, sheathless or with a sheath less than 5 mm long; terminal spike gynecandrous, with less than $\frac{1}{3}$ of the spike staminate; pistillate scales dark brown to black; scale midrib pale or green, not usually extending to or beyond the blade of the scale; known in NL only from limestone barrens of the Great Northern Peninsula. *Carex bicolor* (bicolour sedge)
- 17a. Inflorescence with 2–15 lateral gynecandrous spikes; with 3–30 perigynia arranged in ovoid to globose spikes; perigynia ascending to spreading, overlapping the bases of anterior perigynia. **18**
- 17b. Inflorescence with 2–8 lateral androgynous or gynecandrous spikes; with 1–32 perigynia arranged in small stellate clusters; perigynia divergent or reflexed. **19**
- 18a. Spikes 2–15 mm long; culms stiff and erect, or weak and arching; perigynia plano-convex to biconvex, often very plump, 1.5–4 mm long, margins rounded, the base often with spongy tissue below the achene; beak absent or at most 0.2–1.25 mm long. **§ Glareosae** (*in part*, see Key 2.1, pg. 10)
- 18b. Spikes 6–25 mm long; culm erect or nodding; perigynia plano-convex to flat, 2.5–6.8 mm long, usually with winged or ridged margins to 0.8 mm wide, the base without spongy tissue; beak straight, bidentate, 1–4 mm long. **§ Ovales** (see Key 2.2, pg. 13)
- 19a. Spikes all androgynous, with 1–2 staminate flowers (often inconspicuous) at the apex of each spike, or the lower spikes sometimes pistillate. **20**
- 19b. Spikes all gynecandrous (except terminal spike staminate in *Carex sterilis*), with up to 10 staminate flowers at the base of each spike, or the lower spikes sometimes pistillate. . **21**

- 20a. Lowest inflorescence bract to 5 cm long; spikes 4–8, with 3–8 perigynia per spike; perigynia 2.6–3.8 mm long, lanceolate, plano-convex, often reflexed; yellow-green to pale brown, spongy at the base, beak 0.4–1 mm (§ *Phaestoglochin*).
 ***Carex radiata*** (eastern star sedge)
- 20b. Lowest inflorescence bract 0.5–2 cm long; spikes 2–5, with 1–6 perigynia per spike; perigynia 2.2–3 mm long, oblong-ovoid, plump, biconvex, somewhat flat on the inner surface; yellow-green when immature to purplish-brown at maturity, not spongy at the base, very short-beaked (§ *Dispermae*).
 ***Carex disperma*** (two-seed sedge)
- 21a. Spikes usually 2–3 (rarely 1 in *Carex billingsii*), with 1–5 perigynia per spike; staminate flowers inconspicuous at the base of the spikes; perigynia ellipsoid to ovoid, biconvex, about 2.5–4 mm long, lacking spongy tissue at the base, short-beaked at the apex; the lower 2 spikes separated by an internode of 2–4 cm; lowest inflorescence bract bristle-like, 3–10 cm long, usually longer than the inflorescence.
 § ***Glareosae*** (*in part*, see Key 2.1, pg. 10)
- 21a. Spikes 2–8, with 2–32 perigynia per spike; staminate flowers 3–10 at the base of the terminal spike, fewer staminate flowers at the base of lateral spikes; perigynia lanceolate to broadly ovate, plano-convex, about 3–5 mm long, often spongy at the base, with flat serrulate-margined bidentate beak to 2 mm long; the lower 2 spikes not separated by long internodes; lowest inflorescence bract bristle-like, inconspicuous and much shorter than the inflorescence, or to 5 cm long. **22**
- 22a. Spikes 2–8, with 2–20 staminate flowers at the base of the terminal spike (or the terminal spike completely staminate in *Carex sterilis*) and 1–3 staminate flowers at the base of each lateral spike; perigynia 2–32 per spike, about 2–4 mm long, lanceolate to broadly ovate; pistillate scales ovate, about 1.5–3 mm long, with obtuse to acute apices; lowest inflorescence bract bristle-like, with a short inconspicuous blade. § ***Stellulatae*** (*in part*, see Key 2.4, pg. 18)
- 22b. Spikes 3–5, with 1–3 staminate flowers at the base of each spike, or the lower spikes sometimes completely pistillate; perigynia 3–12 per spike, about 3–5 mm long, lanceolate; pistillate scales ovate, 3–4.5 mm long, with an awn to 0.6 mm long; lowest inflorescence bract bristle-like, 1.5 to nearly 5 cm long (§ *Deweyanae*).
 ***Carex deweyana*** (Dewey's sedge)

**Key 2.1. Key to *Carex* Species of Section (§) *Glareosae*
in Newfoundland and Labrador**

- 1a. Plants with all or most spikes distinct and clearly separate, or at last the lower spikes not overlapping. **2**
- 1b. Plants with spikes clearly overlapping or clustered near the tip of the culm, usually forming a dense head; individual spikes not widely spaced. **7**
- 2a. Lowest bract of inflorescence bristlelike, about equal to or longer than the inflorescence; perigynia 1–5 per spike. **3**
- 2b. Lowest bract of inflorescence leaflike to bristlelike, distinctly shorter than the inflorescence; perigynia 5–20 per spike. **4**
- 3a. Leaves flat, nearly 1 to 2 mm wide, flat or channeled in cross-section; spikes 2–3, each with 2–5 perigynia; plants of shaded wetlands and wet woods.
..... ***Carex trisperma*** (three-seed sedge)
- 3b. Leaves bristle-like, 0.3–0.5 mm wide, involute, V-shaped in cross-section; spike 2–3, each with 1–2 perigynia, occasionally 3 in the uppermost spike; plants of open to partially shaded sites in bogs. ***Carex billingsii*** (Billings' sedge)
- 4a. Plants of coastal marine or estuarine marshes and wet brackish soils; plants stoloniferous; culms glabrous, to 40 cm long; spikes 3–6, lower spikes separate, usually 1.0–1.5 cm apart; perigynia usually obovate, widest above the middle; pistillate scales medium brown to darker brown at maturity.
..... ***Carex mackenziei*** (Mackenzie's sedge)
- 4b. Plants of terrestrial wetlands; plants rhizomatous; culms scabrous above, to 90 cm long; spikes 3–10, lower spikes 0.1–2.5 cm apart; perigynia elliptic, ovate, or obovate; pistillate scales hyaline or reddish-brown. **5**
- 5a. Culms to 35 cm tall; leaves to 15 cm long, ligules wider than long; inflorescence with 3–4 spikes, the lower spikes sometimes separate, but spikes are usually all crowded near the culm apex; perigynia elliptic to obovate, widest at or above the middle; pistillate scales reddish-brown, the midstripe paler, margins narrow and hyaline; plants known in NL only from western Labrador. ***Carex heleonastes*** (Hudson Bay sedge)
- 5b. Culms to 90 cm tall; leaves to 25 cm long, ligules as long as or slightly longer than wide; inflorescence with 4–10 spikes, the lower spikes often well separated, upper spikes close but not clustered; perigynia elliptic to ovate, widest at or below the middle; pistillate spikes hyaline to tinged with brown, the centre green and 3-veined; plants of Newfoundland and Labrador. **6**

- 6a. Leaves green to dark green, not glaucous, less than 2.5 mm wide; spikes 5–10, ellipsoid to nearly globose, 3–7 mm long, each with 5–10 perigynia; terminal spike clavate, with a distinct staminate portion; lower spikes 0.1–1 cm apart in subsp. *brunnescens*, or 1–2.5 cm apart in subsp. *sphaerostachya*; perigynia 2–2.7 mm long, greenish-brown, with a short serrulate beak and a noticeable suture line 0.4–0.8 mm long. ***Carex brunnescens*** (brownish sedge)
- 6b. Leaves greyish-green, somewhat glaucous, 2–4 mm wide; spikes 4–8, oblong to ovoid, 6–15 mm long, each with 10–30 perigynia; terminal spike with a short staminate portion; lower spikes 0.5–2.5 cm apart in subsp. *canescens*, or 2–4 cm apart in subsp. *disjuncta*; perigynia 1.8–3 mm long, white to silvery brown, the short beak slightly serrulate and a short inconspicuous suture line less than 0.4 mm long. ***Carex canescens*** (hoary sedge)
- 7a. Plants to 10 cm tall; leaves 1–5 cm long by 0.5–1.5 mm wide; spikes usually solitary; perigynia broadly ovate, 1.5–2 mm long; Arctic plants of sandy or gravelly shores. ***Carex ursina*** (bear sedge)
- 7b. Plants 10–80 cm tall; leaves 4–50 cm long by 0.5–4 mm wide; spikes 2–several, perigynia lanceolate, ovate, elliptic, or obovate, 1.5–3.5 mm long; boreal plants of bogs and wet forested habitats or salt marshes. **8**
- 8a. Plants 15–80 cm tall, upper portions of culms rough; leaves flat, 15–50 cm long by 2–4 mm wide; the lowest bract bristle-like, shorter or longer than the inflorescence; spikes 5–15, each with 10–20 ovate perigynia, 2–3 mm long, tapering gradually to a 2-toothed (bidentate) beak, 0.75 mm long, serrulate along the beak margins. ***Carex arcta*** (northern clustered sedge)
- 8c. Plants 10–50 cm tall; culms smooth; leaf blades flat, channeled, or involute, to 18 cm long by 0.5–2 mm wide; the lowest bract bristle-like or scale-like, shorter than the inflorescence; spikes 2–5, with 3–20 lanceolate, elliptic, or obovate perigynia, 3–3.5 mm long, beak absent or 0.2–0.5 mm long, entire. **9**
- 9a. Plants 10–25 cm tall, leaves 4–12 cm long, 1–2 mm wide; halophytic plants of coastal saltmarshes, brackish meadows, and gravel shores. ***Carex glareosa*** (gravel sedge)
- 9b. Plants 10–50 cm tall, leaves 5–18 cm long, 0.5–2 mm wide; plants of bogs and other freshwater wetlands, wet forests, and wet meadows. **10**
- 10a. Spikes with 3–15 oblong-elliptic perigynia, the surface papillose, bases convex to rounded, beak absent or nearly so, suture line small, inconspicuous; pistillate scales hyaline with a 3-veined midstripe. ***Carex tenuiflora*** (sparseflower sedge)
- 10b. Spikes with 5–20 elliptic to obovate perigynia, the surface punctate, bases tapering to stipitate, beak present, the upper surface with a conspicuous suture line

extending downward from the beak; pistillate scales pale to dark reddish-brown,
the centre paler but not 3-veined. **11**

- 11a. Leaves flat; spikes 2–5, each with 10–20 elliptic to obovate perigynia; plants of Arctic-
alpine meadows, snowbeds, peatlands, and streambanks in western Nfld. and much of
Labrador. ***Carex lachenalii*** (Lachenal's sedge)
- 11b. Leaves flat to involute; spikes 3–4, each with 5–10 elliptic perigynia; known in NL only
from western Labrador. ***Carex heleonastes*** (Hudson Bay sedge)

**Key 2.2. Key to *Carex* Species of Section (§) *Ovales*
in Newfoundland and Labrador**

- 1a. Inflorescence nodding; spikes distinct or only slightly overlapping, with the lowest internode 5–25 mm long, the second lowest internode 3–19 mm long. **2**
- 1b. Inflorescence erect; spikes dense, clustered near the apex and partially to strongly overlapping, with the lowest internode 1–16 mm long, the second lowest internode 1–13 mm long. **6**
- 2a. Leaf blades 3–7 mm wide, leaf sheaths somewhat winged on the angles; spikes 8–15, globose, perigynia spreading; lanceolate in shape. ***Carex projecta*** (necklace sedge)
- 2b. Leaf blades 1–5 mm long, leaf sheaths not winged; spikes 4–10, ellipsoid, oblong or obovoid, perigynia appressed to slightly spreading; and lanceolate, broadly elliptic, ovate, or obovate in shape. **3**
- 3a. Base of spikes rounded, sessile; perigynia ovate to obovate, widest above the middle; perigynia conspicuous veined with at least 5 veins on both surfaces; plants of moist to wet coastal areas in Nfld., never inland. ***Carex hormathodes*** (marsh straw sedge)
- 3b. Base of spikes tapered to clavate, appearing stalked; perigynia lanceolate, broadly elliptic, ovate or obovate, widest at or below the middle; perigynia conspicuously veined with at least 4–11 veins on the lower (abaxial) surface; plants of various habitats. **4**
- 4a. Plants usually glaucous, base of leaf blades bearing a pair of small rounded auricles; perigynia broadly elliptic to ovate, 3.5–5 mm long by 2–3.2 mm wide, the base convex to rounded; perigynia margins broadly winged, wings 0.5–0.8 mm wide, hyaline; perigynia lower (abaxial) surface with 6–12 conspicuous veins; upper (adaxial) surface conspicuously 3–5 veined; plants of coastal beaches, flats, and dunes in Nfld.; never occurring far from the coast. ***Carex silicea*** (seabeach sedge)
- 4b. Plants green, not glaucous, base of leaf blades lacking auricles; perigynia lanceolate, broadly elliptic, ovate, or obovate, 3.3–6 mm long by 1.5–2.5 mm wide, the base tapering to convex; perigynia margins narrowly winged, wings 0.2–0.4 mm wide, not conspicuously hyaline; perigynia lower (abaxial) surface with 4–11 conspicuous veins; upper (adaxial) surface with 0–4 veins; plants of various open habitats, but not of coastal beaches or dunes. **5**
- 5a. Plants 2–12 dm tall; leaf blades 2–4 mm wide; inflorescence often nodding from above the lowest spike, internode between the 2 lowest spikes 5–25 mm long; perigynia ascending, broadly elliptic to ovate, 3.3–5 mm long x 1.7–2.5 mm wide, about 2 times as long as wide; lower (abaxial) surface of perigynia with 4–9 conspicuous veins; upper

- (adaxial) surface lacking veins, or with 4–8 veins of unequal length; plants of acid sands, gravels, open woodlands, and open disturbed sites in Nfld. and the southern half of Labrador. ***Carex foenea*** (bronze sedge)
- 5b. Plants 3–7 dm tall; leaf blades 1–3.5 mm wide; inflorescence nodding from the below the lowest spike; internode between the 2 lowest spikes 4–14 mm long; perigynia ascending to spreading, lanceolate, 4.5–6 mm long x 1.2–2 mm wide, about 3 times as long as wide; lower (abaxial) surface of perigynia with 4–11 conspicuous veins; upper (adaxial) surface veinless or with 1–4 conspicuous veins; plants of open woods and meadow habitats, but its reported presence in swNfld. may be based on a misidentified specimen (the species is included here to facilitate identification of the similar species, *Carex foenea*).
..... ***Carex praticola*** (northern meadow sedge)
- 6a. First inflorescence internode 1–3.7 mm long, second internode 1–3.4 mm long. **7**
- 6b. First inflorescence internode 2–15 mm long, second internode 2–13 mm long. **9**
- 7a. Perigynia lanceolate, 0.9–1.3 mm wide, marginal wings 0.1–0.2 mm wide.
..... ***Carex crawfordii*** (Crawford's sedge)
- 7b. Perigynia elliptic to ovate, 1.2–2 mm wide, marginal wings 0.2–0.5 mm wide. **8**
- 8a. Inflorescence 1.1–3 cm long; perigynia 2.5–3.8 mm long; the lower (abaxial) surface with 3 conspicuous veins; ligule of upper leaves 1.5–6 mm long; spongy tissue absent not present in the perigynia; native in Nfld. and southeastern Labrador.
..... ***Carex bebbii*** (Bebb's sedge)
- 8b. Inflorescence very dense, 0.9–2.1 cm long; perigynia 3.5–4.5 mm long; the lower (abaxial) surface with 0–11 conspicuous veins; ligule of upper leaves 0.5–3 mm long; spongy tissue usually present in lower portion of perigynia below the achene; native in Labrador, but absent from Nfld. ***Carex macloviana*** (Falkland Island sedge)
- 9a. Pistillate scales lanceolate, 3.4–4 mm long, shorter and narrower than the perigynia; perigynia lanceolate, 4.2–6.8 mm long x 1.2–2 mm wide, tapering or cuneate at the base.
..... ***Carex scoparia*** (pointed broom sedge)
- 9b. Pistillate scales ovate, 3.5–5.5 mm long, about equal in length and width to the perigynia; perigynia lanceolate to broadly ovate, 3.4–5 mm long x 1.3–2.5 mm wide, rounded at the base. **10**
- 10a. Lowest inflorescence bract much longer than the inflorescence and usually leaflike to bristlelike; second lowest internode (between spikes) of inflorescence 4–10 mm long; lower (abaxial) surface of perigynia with 7–11 conspicuous veins; lower (adaxial) surface with 0 to 2 conspicuous veins; dry to moist wooded to open habitats, native in Nfld. ***Carex adusta*** (lesser brown sedge)

- 10b. Lowest inflorescence bract shorter than the inflorescence, bristlelike or scalelike; second lowest internode (between spikes) of inflorescence 3–6 mm long; lower (abaxial) surface of perigynia with 3–9 conspicuous veins; lower (adaxial) surface with 2–5 conspicuous veins; wet open habitats, introduced in insular Nfld.
..... ***Carex ovalis*** (oval sedge)

**Key 2.3. Key to *Carex* Species of Section (§) *Phacocystis*
in Newfoundland and Labrador**

- 1a. Plants with nodding spikes on slender flexuous peduncles; pistillate scales 3–20 mm long, including the long scabrous awns. **2**
- 1b. Plants with erect spikes, sessile or on stiff peduncles; pistillate scales with or without scabrous awns. **3**
- 2a. Plants of coastal brackish or saline marshes and shores; staminate spikes usually 2–3, terminal; lower 2–7 spikes pistillate or androgynous, each to 6.5 cm long; pistillate scales to 20 mm long, the awn longer than the blade of the scale. ***Carex paleacea*** (chaffy sedge)
- 2b. Plants of freshwater wetlands and moist to wet habitats; staminate spikes 1–3, terminal; lower 2–5 spikes pistillate or androgynous, each to 10.4 cm long; pistillate scales about 3–8 mm long (including the awn); the awn about equal to or longer than the blade of the scale. ***Carex gynandra*** (nodding sedge)
- 3a. Plants of brackish and saline marshes..... **4**
- 3b. Plants of freshwater moist to wet habitats with acute to blunt apices. **7**
- 4a. Pistillate scales to 8 mm long, with distinct awns. **5**
- 4b. Pistillate scales to 5.5 mm long, with acute to acuminate apices. **6**
- 5a. Culms 1–3 dm tall, obtusely 3-angled; leaf blades 2–3 mm wide; spikes erect, pistillate spikes about 1–3 cm long; pistillate scales brown, 2.5–8 mm long, wider than the elliptic perigynia, veinless or with 1–3 veins near the base. ***Carex salina*** (saltmarsh sedge)
- 5b. Culms 1.5–6 dm tall, acutely 3-angled; leaf blades 2.8–4 mm wide; spikes mostly erect, the lowest spikes sometimes pendant; pistillate spikes about 3–5.5 cm long; pistillate scales dark purplish-brown, 2.5–5.5 mm long, narrower than the broadly-ellipsoid to obovoid perigynia, with 2–5 prominent veins on each side. ***Carex vacillans*** (swaying sedge)
- 6a. Plants to 9 dm tall; terminal 1–3 spikes staminate; lower 3–5 spikes pistillate, to 1.4 cm long, with numerous perigynia; perigynia ellipsoid to obovoid; pistillate scales 2.8–5.5 mm long, narrower than the perigynium; the scale apex obtuse to acuminate or aristate. ***Carex recta*** (estuary sedge)
- 6b. Plants to 1.5 dm; staminate spike 1, terminal; lower 1–3 spikes pistillate, 3–5.5 cm long, with 5–15 perigynia; perigynia narrowly ellipsoid; pistillate scales 2–3.6 mm long, wider than the perigynia, the scale apex acuminate, mucronate, or aristate. ... ***Carex subspathacea*** (Hoppner's sedge)

- 7a. Plants stoloniferous, culms to 15 dm tall; leaves very glaucous; leaf blades 2–8 mm wide; lowest inflorescence bract 2–8 mm wide; the terminal 2–4 spikes staminate, the uppermost on a peduncle 2–5 cm long; lower spikes 2–7, pistillate, 2–10 cm long.
..... ***Carex aquatilis*** (water sedge)
- 7b. Plants stoloniferous or cespitose; culms to 11 dm tall; leaves light green to dark green but not obviously glaucous; leaf blades 1–4.5 mm wide; lowest inflorescence bract 0.5–4 mm wide; terminal spike staminate (occasionally with a smaller staminate spike near the base of the terminal one), sessile or short-peduncled; lower spikes 1–7, pistillate or androgynous, with a few staminate flowers at the apex; pistillate spikes 1–6 cm long. **8**
- 8a. Plants to 5 dm tall; basal sheaths red; culms bearing 8–15 leaves; lowest inflorescence bract 0.5–3 mm wide and shorter than inflorescence; terminal staminate spike to 1.5 cm long; plants of exposed dry to moist maritime or alpine barrens, or Arctic tundra..... ***Carex bigelowii*** (Bigelow's sedge)
- 8b. Plants to 11 dm tall; basal sheaths brown; culms bearing 4–9 leaves; lowest inflorescence bract to 4 mm wide and about equal to or longer than the inflorescence; terminal staminate spike 1–4 cm long; plants of freshwater wetlands, pools, and shores. **9**
- 9a. Plants stoloniferous, not forming dense clumps; culms to 11 dm tall; leaves mostly shorter than the culms; pistillate spikes to 4.2 cm long; pistillate scales dark purplish-brown to black, with hyaline margins and a slender green midrib.
..... ***Carex nigra*** (smooth black sedge)
- 9b. Plants cespitose, often forming dense tussocks; culms to 6 dm tall; leaves usually much taller than the culms; pistillate spikes to 6 cm long; pistillate scales pale brown or reddish-brown, with hyaline margins and a 3-nerved green midrib.
..... ***Carex lenticularis*** (lenticular sedge)

**Key 2.4. Key to *Carex* Species of Section (§) *Stellulatae*
in Newfoundland and Labrador**

- 1a. Plants with 1 terminal gynecandrous spike, 0.6–4 cm long, with the staminate basal portion of the spike narrow, 1–3 mm wide, or plants occasionally unisexual and dioecious (with male and female spikes on different plants); leaves wiry and rigid, 0.5–1.5 mm wide, with involute margins. ***Carex exilis*** (meager sedge)
- 1b. Plants with 2–8 lateral and terminal spikes; lateral spikes gynecandrous, primarily pistillate, but with some staminate flowers at the base, or spikes unisexual; leaves M-shaped in cross-section or flat, 1–5 mm wide. **2**
- 2a. Spikes usually unisexual, the terminal spike with all staminate flowers, or the terminal spike with both staminate and pistillate flowers, with the staminate portion less than 1 mm long and the spike not clavate; occasionally, some plants may have both completely staminate or pistillate spikes on the same culm; pistillate spikes with 5–26 perigynia; plants of basic (calcareous) moist to wet habitats.
..... ***Carex sterilis*** (sterile sedge)
- 2b. Spikes gynecandrous or androgynous, with pistillate and staminate flowers in the same spike; the terminal spike clavate, with the staminate portion 1–8 mm long; lateral spikes with few staminate flowers at the base; plants mainly of acidic habitats (except for *Carex interior*). **3**
- 3a. Leaves 1.7–5 mm wide; terminal spikes androgynous, about 6–14.5 mm long, with a basal staminate portion 2–8.6 mm long; lateral spikes gynecandrous, with mostly pistillate flowers and a few staminate flowers at the base; lateral spikes with 5–21 perigynia.
..... ***Carex wiegandii*** (Wiegand's sedge)
- 3b. Leaves 0.6–2.7 mm wide; terminal spikes gynecandrous, about 5 to 24 mm long with a basal staminate portion to 16.5 mm long; lateral spikes gynecandrous, with mostly pistillate flowers and a few staminate flowers at the base. **4**
- 4a. Perigynium 3–3.6 mm long; beak 1 to 2 mm long, about $\frac{1}{2}$ to $\frac{3}{4}$ the length of the perigynia body; lateral spikes with 3–32 narrowly ovate perigynia; pistillate scales about 2–3 mm long; plants of acidic wetlands.
..... ***Carex echinata*** subsp. ***echinata*** (star sedge)
- 4b. Perigynium about 2–3 mm long; beak less than 1 mm long, about $\frac{1}{5}$ to less than $\frac{1}{2}$ the length of the perigynium body; lateral spikes with 3–18 ellipsoid perigynia; pistillate scales about 1–2 mm long; plants of basic (calcareous) sites.
..... ***Carex interior*** (inland sedge)

Key 3. *Carex* Sections (§) and Species in Newfoundland and Labrador with 3 stigmas and 3-sided (trigonus) achenes

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- 1a. Plants short, to 3.5 dm tall; perigynia open along one side nearly to the base; the inflorescence bisexual, consisting of a several small spikes, called *spikelets*, composed of a single scale subtending 1–2 flowers; spikelets unisexual, with either 1 staminate (male) or 1 pistillate (female) flower, or spikelets bisexual, with 1 staminate flower above a single pistillate flower. Spikelets arranged in either a simple spike, 1–3 cm long (with several staminate spikelets above several pistillate or bisexual spikelets) or a compound panicle, 1–3.5 cm long, with 3–10 spikelets (upper spikelets usually staminate or bisexual, lower spikelets pistillate or bisexual); calciphiles of exposed Arctic-alpine barrens (§ *Kobresia*).
..... 2
- 1b. Plants short to tall; perigynia fused entirely, except for a small opening through with the stigma extends during flowering; spikes unisexual, completely staminate (male) or pistillate (female) or bisexual, either *androgynous* (with staminate flowers at the apex of the spike, above the pistillate flowers), or *gynecandrous* (with staminate flowers at the base of the spike, below the pistillate flowers); plants of a variety of habitats throughout the Province. 3
- 2a. Leaf blades 1 mm wide or less; inflorescence simple, a solitary spike, 1–3 cm long by 2–3 mm wide; the terminal portion of the spike with several staminate spikelets, the lower 10–20 spikelets usually 2-flowered and androgynous, with an upper male flower and a lower female flower. *Carex myosuroides* (mousetail kobresia)
- 2b. Leaf blades 1–4 mm wide; inflorescence compound, with 3–10 spikelets forming a compact panicle-like head, 1–4 cm long by 3–8 mm wide at the base; the terminal and upper spikelets each with 1 staminate flower, the lower spikelets 2-flowered and androgynous, or 1-flowered and pistillate.
..... *Carex simpliciuscula* (simple kobresia)
- 3a. Plants with a single terminal spike. 4
- 3b. Plants with 2 or more distinct spikes; the spikes separated by short to long internodes, spikes sessile or stalked, with short or long peduncles. 9
- 4a. Plants dioecious, with unisexual staminate and pistillate spikes on separate plants; spikes narrowly cylindrical, 1.4–4 cm long by 2.5–5 mm wide; perigynia very pubescent, obovoid, 2.5–3.5 mm long (§ *Scirpinae*).
..... *Carex scirpoidea* (singlespike sedge)
- 4b. Plants monoecious, the bisexual spikes androgynous, with staminate flowers situated above the pistillate flowers; spikes narrow or broad, 0.4–2.3 cm long;

- perigynia glabrous, ovoid, narrowly ellipsoid to oblanceoloid, or obovoid, 2.5–8 mm long. 5
- 5a. Flowering stems (culms) usually shorter than the leaves; plants often with many persistent basal leaf sheaths present at the base; leaves 1–2 per culm, very narrow and wiry, blades 1–10 cm long by 0.2–0.3 mm wide; spikes ovoid to nearly globose, 0.4–1.2 cm long by 3–6 mm wide (§ *Nardinae*). ***Carex nardina*** (nard sedge)
- 5b. Flowering stems (culms) taller than the leaves; plants without persistent basal leaf sheaths at the base; leaves 1–12 per culm, with blades 0.4–3 mm wide; spikes narrow, 0.4–2 cm long by 1.5–3 mm wide. 6
- 6a. Perigynia narrowly lanceoloid, 3.5–8 mm long by about 1 mm wide, usually reflexed at maturity; leaves 0.5–1.5 mm wide (§ *Leucoglochin*). 7
- 6b. Perigynia oblanceoloid, or ovoid to obovoid, 2.5–5 mm long by 1–1.5 mm wide, erect to ascending at maturity; leaves 0.5–3 mm wide. 8
- 7a. Culms with 1–2 cauline leaves, blades 1–1.6 mm wide, upper cauline leaf with a longer blade than the blade of the lower cauline leaf; basal leaves with sheaths, but lacking blades; culms slightly scabrous below the spike and more sharply 3-angled; the terminal spike often androgynous, usually 3–10 mm long, with 1–6 perigynia, reflexed at maturity; the narrowly lanceoloid (subulate) perigynia, about 6–8 mm long, with an exerted style, but lacking a visible rachilla; plants of acidic peatlands.
..... ***Carex pauciflora*** (fewflower sedge)
- 7b. Culms with basal leaves only, blades less than 1 mm wide; culms are smooth below the spike and more obtusely 3-angled; the terminal spike often androgynous, usually 6–14 mm long, with 3–12 perigynia, reflexed at maturity; the narrowly lanceoloid (subulate) perigynia about 4–5 mm long, with a well-developed rachilla, 0.5 to nearly 3 mm long, exerted from the beak of the perigynium; plants of turfy limestone barrens and tundra.
..... ***Carex microglochin*** (bristle sedge)
- 8a. Plants cespitose, with short dark rhizomes; culms to 7 dm tall, with 1–2 leaves per culm; leaf blades to 25 cm long by 0.5–1.3 mm wide; culms much taller than the leaves; spikes 0.4–1.6 cm long by 2–3 mm wide, the number of staminate flowers per spike varies from few to several; perigynia 1–10 per spike, green, oblanceoloid, 2.5–5 mm long, beakless but slightly indented (emarginate) at the apex, finely lined with 16–28 slender nerves between the 2 prominent marginal veins; north-temperate to boreal plants of moist to wet forested habitats or wetlands (§ *Leptocephalae*). ***Carex leptalea*** (bristlestalk sedge)
- 8b. Plants loosely cespitose, with creeping dark brownish-black rhizomes; culms to 2 dm tall, with basal tufts of 8–12 leaves; leaf blades to 12 cm long by 1.5–3 mm wide; culms slightly taller than most leaves; spikes 1–2 cm long by 1.5–3 mm wide, mainly

- staminate with a few pistillate flowers at the base; perigynia 3–8 per spike, greenish-brown, ovoid to obovoid, 2.5–4 mm long, ending in a short dark beak, to 0.5 mm long, 3-angled with 2 prominent veins; Arctic-alpine plants of exposed barrens, tundra, and rocky slopes (§ *Rupestres*). ***Carex rupestris*** (rock sedge)
- 9a. Perigynia pubescent, often finely so or hairy only towards the apex (view with a handlens). **10**
- 9b. Perigynia glabrous, surfaces smooth or lined with few to several prominent veins. **18**
- 10a. Plants dioecious, spikes unisexual, pistillate spikes erect, narrowly cylindrical, 1.4–4 cm long by 2.5–5 mm wide; perigynia obovoid, 2.5–3.5 mm long; staminate spikes on separate plants (§ *Scirpinae*). ***Carex scirpoidea*** (single-spike sedge)
- 10b. Plants monoecious, spikes unisexual or bisexual, with spikes either androgynous (staminate flowers at the apex, above the pistillate flowers) or gynecandrous (staminate flowers at the base of the spike, below the pistillate flowers); perigynia of various shapes and sizes. **11**
- 11a. Terminal 1–2 spikes staminate, or if androgynous, mostly staminate, often with a few pistillate flowers at the base, spikes 1–2.8 cm long, narrowly lanceolate to elliptic; the 1–4 lateral spikes pistillate or androgynous, narrowly ellipsoid; spikes nodding or pendant; stigmas 2, 0.5–3 cm long, on peduncles to 8 cm long that emerge from the 5–25 mm long sheath of the lowest inflorescence bract; perigynia body finely stiff-pubescent in the upper half, with 3–9 veins, perigynia ellipsoid to narrowly obovate and either plano-convex or 3-angled; plants of limestone barrens in wNfld. (§ *Aulocystis*, *in part*). ***Carex petricosa*** subsp. ***misandroides*** (rock-dwelling sedge)
- 11b. Terminal 1–3 spikes staminate; lateral 1–5 spikes pistillate or androgynous; spikes erect to nodding, sessile or on peduncles to 3.5 cm long; sheaths of inflorescence bracts absent or less than 7 mm long; perigynia body evenly pubescent or with short, stiff, appressed hairs towards the apex; perigynia ellipsoid, ovoid, oblanceoloid, or obovoid, rounded or somewhat 3-angled in cross-section; plants not restricted to limestone barrens. **12**
- 12a. Leaves glaucous, inflorescence bracts sheathless; perigynia ellipsoid, sessile, with short, appressed hairs near the apex (§ *Thuringiaca*). ***Carex flacca*** (blue sedge)
- 12b. Leaves usually not glaucous (sometimes glaucous in *C. pedunculata*), sheath of inflorescence bract absent or less than 7 mm long; perigynia ovoid, oblanceoloid, or obovoid, sessile or stalked (stipitate), evenly pubescent. **13**
- 13a. Plants 1–12 dm tall, culm bases reddish-purple, sheath bases ladder-fibrillose; leaves to 70 cm long by 1–8.5 mm wide, somewhat septate-nodulose, narrow and involute, or M-shaped in cross-section with 2 marginal veins more prominent than the midrib; staminate spikes 1–3, sometimes with a smaller gynecandrous spike at the base; lateral spikes 1–3,

- usually pistillate, or androgynous in some species; pistillate spikes 5–45 cm long, perigynia 15–75 per spike, ovoid, to 6.5 mm long, gradually tapering to rounded at the base; perigynium body with several parallel veins, hidden in some species by the dense pubescence (§ *Paludosae*, *in part*). **14**
- 13b. Plants 1–6 dm tall, usually less than 3 dm, culm bases reddish-purple, sheath bases not ladder-fibrillose; leaves to 35 cm long by 1–7 mm wide, not septate-nodulose, V-shaped in cross section; staminate spikes 1–2; lateral spikes 1–5, usually pistillate, to 1 cm long, sometimes androgynous; perigynia 2–20 per spike (usually fewer than 12); obovoid, 2–5 mm long, tapering to stipitate at the base; perigynium body with 2 prominent veins along the sides of the perigynia. **16**
- 14a. Plants of dry open sandy or gravelly soils, sand dunes and blowout; perigynia sparsely pubescent, the nerves of the perigynium visible beneath the hairs.
..... ***Carex houghtoniana*** (Houghton's sedge)
- 14b. Plants of shallow water, wetlands, and wet shorelines; perigynia densely pubescent, with the nerves barely visible. **15**
- 15a. Leaf blades to 2 mm wide, U-shaped in cross-section, ligules 1–2.5 mm long; pistillate spikes 0.5–3 cm (seldom to 5 cm) long; perigynia 3–4.5 mm long, the beak to 1.1 mm long; pistillate scales acute to cuspidate.
..... ***Carex lasiocarpa*** subsp. ***americana*** (woollyfruit sedge)
- 15b. Leaf blades 1.5–5 mm wide, flat to M-shaped in cross-section, ligules 2–12 mm long; pistillate spikes 1.5–5 cm long; perigynia 2.5–5.2 mm long, the beak to 1.6 mm long; pistillate scales acute to acuminate or awned. ***Carex pellita*** (woolly sedge)
- 16a. Bracts subtending the inflorescence filiform or scale-like, lacking a sheath; perigynia somewhat obovoid, globose towards the middle, tapering abruptly to a stipitate base and a straight to bent beak, 0.3–2.5 mm long.
..... **§ *Acrocystis*** (*in part*, see Key 3.1, pg. 31)
- 16b. Bracts subtending the inflorescence with a tubular sheath to 7 mm long, often tinged with reddish-purple, the blade lacking or less than 2 mm long; perigynia oblanceoloid to obovoid, tapering gradually to the base, and with a short outward-facing beak, less than 0.5 mm long (§ *Clandestinae*). **17**
- 17a. Culms much taller than leaves; inflorescence bracts bladeless; spikes 3–4, clustered into a terminal head; terminal spike staminate, 3–6 mm long, peduncle about 1–3 mm long; pistillate spikes 2–3, close to the staminate spike; perigynia green, ellipsoid to obovoid, noticeably pubescent, ending in a short straight beak; pistillate scales broadly ovate, reddish-brown with a hyaline margin and rounded finely ciliate apex.
..... ***Carex concinna*** (northern elegant sedge)

- 17b. Culms of various heights; inflorescence bracts bladeless, the upper with long sheaths; spikes 2–6, separate and well-spaced along the culm; terminal spike androgynous, 7.5–nearly 10 mm long, often with 2–5 perigynia at base of spike; pistillate spikes 2–5, mostly from basal nodes of the culm, sometimes androgynous, with a 1–2 staminate flowers at the spike apex; spikes from basal nodes on long nodding peduncles; spikes from upper cauline nodes erect, on short peduncles; perigynia oblanceoloid, slightly pubescent, ending in a short bent beak; pistillate scales oblanceolate to obovoid, obtuse to rounded at the apex, hyaline to dark reddish-brown, with a green 3-veined centre ending in a cuspidate or short-awned tip. ***Carex pedunculata*** (longstalk sedge)
- 18a. Spikes pendant, on slender peduncles 1–8 cm long. **19**
- 18b. Spikes erect to arching, sessile or short-peduncled. **30**
- 19a. Pistillate spikes ellipsoid, 0.5–2.5 mm long, with 10–30 perigynia, dark brown to black, at least towards the apex; scales dark reddish-brown to purplish-black. **20**
- 19b. Pistillate spikes ellipsoid, short-cylindrical to long and narrowly cylindrical, to 7 cm long, with 3–45 green perigynia; scales hyaline with a green midrib or chestnut brown to nearly black. **22**
- 20a. Culms 2–7 dm tall; lowest inflorescence bract leaf-like, sheathless, dark at the base; terminal spike gynecandrous, club-shaped (clavate) and staminate only at the base; pistillate spikes 2–5, nodding, perigynia ellipsoid to obovoid, biconvex to somewhat flattened (§ *Racemosae*, in part, Key 3.2, pg. 32). ***Carex atratiformis*** (scabrous black sedge)
- 20b. Culms 1–3 dm tall; lowest inflorescence bract leaf-like, with a tubular sheath to about 3 cm long, purplish-tinged at the base; terminal spike gynecandrous and club-shaped (clavate), 8–10 mm long, (seldom staminate); pistillate spikes 2–3, spikes nodding or drooping; perigynia lanceolate or ovate, biconvex to 3-sided (trigonus) in cross-section, nerveless or nearly so; plants of Arctic-alpine tundra or sedge meadows in Labrador. (§ *Aulocystis*, in part). **21**
- 21a. Leaves short, less than 1 dm long, somewhat glaucous, flat with revolute margins, 2–4 mm wide; pistillate spikes ovoid to obovoid; perigynia ovate, 3–4.8 mm long, tapering abruptly to a short-beak. ***Carex atrofusca*** (darkbrown sedge)
- 21b. Leaves slightly longer, to 1.5 dm, yellowish-green, flat with involute margins, 1.5–3 mm wide; pistillate spikes ellipsoid to oblanceoloid; perigynia lanceolate to oblanceolate, 3.3–5.5 mm long, tapering gradually to serrulate-margined dark beak. ***Carex fuliginosa*** (shortleaf sedge)
- 22a. Leaves 2.5–9 mm wide, M-shaped in cross-section, usually glabrous (pubescent in *Carex castanea*); terminal spike usually staminate; pistillate spikes ellipsoid to long

- and narrowly cylindrical, 0.8–8 cm long; pistillate scales hyaline or light brown, with a green central midrib (§ *Hymenochlaenae*). **23**
- 22b. Leaves less than 4 mm wide, V-shaped in cross-section, glabrous; terminal spike staminate, gynecandrous, or androgynous; pistillate spikes short-cylindrical, 0.4–2.2 cm long; pistillate scales pale brown to black. **26**
- 23a. Pistillate spikes 2–4, nodding, oblong to cylindrical, 8–15 mm long by 4–5 mm wide, borne on slender peduncles, 10–30 mm long; leaves hairy (pilose) on both surfaces; sheaths of inflorescence bracts less than 3 mm long; the perigynia are ellipsoid to ovoid, 2.5–5 mm long, with 5–7 smaller veins between the 2 prominent ribs; perigynia tapering to a beak, 1.5 mm long; pistillate scales ovate, translucent chestnut brown with a green midrib and an acuminate apex or awn to 3 mm long. ***Carex castanea*** (chestnut sedge)
- 23b. Pistillate spikes 2–5, nodding, linear, to 80 mm long by 2–4 mm wide, borne on slender peduncles to 50 mm long; leaves glabrous on both surfaces; sheaths of inflorescence bracts to 30 mm long; the perigynia are ellipsoid to oblanceoloid, 2–6.2 mm long, with 8–20 smaller veins between the 2 prominent ribs; perigynia with or without a beak; pistillate scales elliptic to ovate, white-hyaline, with a green midrib, apices blunt to awned. **24**
- 24a. Perigynia ellipsoid to oblanceoloid, 2–3.7 mm long, with 8–12 veins between the 2 prominent ribs, tapering at the base, the apex is blunt (obtuse) to rounded and beakless. ***Carex gracillima*** (graceful sedge)
- 24b. Perigynia narrowly ellipsoid or fusiform, 5–6.2 mm long, with 10–20 veins between the 2 prominent ribs, tapering at both ends and beaked at the apex. **25**
- 25a. Sheath of inflorescence bract to 3 cm long, pistillate spikes borne on peduncles to 3 cm long; spikes with 15–45 perigynia, each separated by 1–2 mm; perigynia 3–5 mm long by 1–2 mm wide; pistillate scales lanceolate, the apex is acuminate to awned, the awn to 1.5 mm long. ***Carex arctata*** (drooping woodland sedge)
- 25b. Sheath of inflorescence bract to 7 cm long, pistillate spikes borne on peduncles to 5 cm long; spikes with 10–25 perigynia, each separated by 2–9 mm; perigynia 5–6.2 mm long by about 1–2 mm wide; pistillate scales oblong-elliptic, the apex is acute to short cuspidate, then with a cusp to 0.2 mm long. ***Carex debilis*** var. ***rudgei*** (Rudge's sedge)
- 26a. Plants rhizomatous; rhizomes densely pubescent with a felty covering of yellow or yellowish-brown root hair (often obscured by mud until cleaned); pistillate spikes 2–8 mm wide; perigynia ellipsoid to obovoid, compressed, 2.5–4.5 mm long, glaucous green and papillose, beakless; pistillate scales chestnut brown, dark brown, to nearly black, the apex acute to acuminate or cuspidate; plants of acid peatlands (§ *Limosae*). **27**
- 26b. Plants cespitose; rhizomes short and glabrous; pistillate spikes 2–4 mm wide; perigynia lanceoloid to ovoid, 2.3–3.5 mm long, greenish-brown to reddish-brown,

- tapering gradually to a short beak; pistillate scales pale to medium brown, the apex blunt (obtuse) to acute; plants of moist to wet rich sites, especially fens or wetlands over limestone bedrock (§ *Chlorostachyae*). 29
- 27a. Plants to 3.5 dm tall; lateral spikes 1–2, pistillate, with 2–10 perigynia, spikes erect to nodding, pistillate scales broadly ovate, 3 to nearly 5 mm long, dark reddish-brown to blackish, with a paler midrib and hyaline margin, the apex obtuse to mucronate; scales about as long and wide as the perigynia. ***Carex rariflora*** (looseflower alpine sedge)
- 27b. Plants to 8 dm tall; lateral spikes 1–4, pistillate, with 5–30 perigynia per spike, or androgynous, with 1–3 staminate flowers at the base, spikes on slender nodding peduncles; pistillate scales lanceolate to broadly ovate, about 3–7 mm long; chestnut brown, with a green centre or a prominent acuminate apex, scales about as wide and long, or narrower and much longer than the perigynia. 28
- 28a. Leaves glaucous, 1–3 per fertile culm; terminal spike 1–3.5 cm long, staminate; lateral spikes 1–3, pistillate, with 8–30 perigynia per spike, or androgynous, with a few staminate flowers at the spike apex; pistillate scales persistent on mature spikes; scales broadly ovate, 3–5.5 mm long, apex obtuse to mucronate, about as wide and long as the perigynia. ***Carex limosa*** (mud sedge)
- 28b. Leaves dark green, not glaucous, 3–12 per fertile culm; terminal spike 1–2 cm long, staminate or gynecandrous, with 1–8 pistillate flowers at the base; lateral spikes 1–4, pistillate, with 5–20 perigynia per spike, or gynecandrous, usually with 1–3 staminate flowers at the base; pistillate scales deciduous before the achenes mature; scales lanceolate, about 3–7 mm long, apex acuminate, narrower and longer than the perigynia. ***Carex magellanica*** subsp. ***irrigua*** (boreal bog sedge)
- 29a. Plants to 6 dm tall, leaves 1–4 mm wide (in Arctic regions, usually to 1.5 dm with leaves 1–2 mm wide); terminal spike staminate; lateral spikes pistillate, 2–4, each 5–20 mm long by 3–4 mm wide, the lower pistillate spikes nodding to pendant on slender peduncles. ***Carex capillaris*** subsp. ***capillaris*** (hairlike sedge)
- 29b. Plants to 3 dm tall, leaves 0.25–1 mm wide; terminal spike staminate or androgynous, gynecandrous, 2–8 mm long; lateral 2–5 spikes pistillate, ascending, each 4–10 mm long by 2–3 mm wide, the lower pistillate spikes ascending or nodding, pistillate spikes with 3–9 lanceoloid-ellipsoid perigynia, faintly 2–10 nerved between the 2 prominent marginal veins. ***Carex williamsii*** (Williams' sedge)
- 30a. Pistillate spikes with large or inflated perigynia, lustrous, 3.4–16.5 mm long. 31
- 30b. Pistillate spikes with smaller and slightly or uninflated perigynia, smooth to somewhat shiny, papillose, or finely resin-dotted, 1.5–7.8 mm long. 34

- 31a. Plants with 1–4 staminate spikes and 1–6 pistillate spikes, usually cylindrical and 20–150 flowered (except in *C. oligosperma*, which has ovoid to short-cylindrical pistillate spikes with 3–15 flowers); perigynia prominently veined with 6–22 veins.
 § *Vesicariae* (in part, see Key 3.3, pg. 34)
- 31b. Plants with 1 terminal staminate spike and 1–5 pistillate or androgynous spikes (with a few staminate flowers at the tip); spikes broadly ovoid to globose, 1–12 flowered; perigynia prominently veined, with 13–26 veins. **32**
- 32a. Basal sheaths reddish-purple; lowest inflorescence bract sheathless; leaves to 8 mm wide, leaves V-shaped in cross section; pistillate spikes 1–4, situated close to one another, on peduncles 3–15 mm long; perigynia ovoid, 10–16.5 mm long by 2.6–6.5 mm wide, strongly inflated, tapering to a 2-toothed (bidentate) apex, with teeth less than 1 mm long (§ *Lupulinae*). *Carex intumescens* (bladder sedge)
- 32b. Basal sheaths yellow or brown; lowest inflorescence bract with a sheath about 4–30 mm long; leaves to 18 mm wide, leaves M-shaped in cross section; pistillate spikes 2–5, close to or separate from one another; nearly sessile to long-peduncled; perigynia narrowly lanceoloid, 8–15.6 mm long by 1.3–3.3 mm wide, barely inflated, very gradually tapering to a narrow 2-toothed (bidentate) apex, with teeth about 1 mm long (§ *Rostrales*). **33**
- 33a. Leaves green, 6–18 mm wide; culms 4–17.5 dm long; sheath of the lowest inflorescence bract hyaline and concave at the summit; the inflorescence 15–85 cm long; staminate spike 1, terminal, sessile or short-peduncled, 1.2–2.5 cm long; the 3–5 lateral spikes pistillate, long-peduncled; perigynia ascending-spreading, lanceoloid, 1.0–1.5 cm long by 1.8–3.3 mm wide, slightly inflated, tapering gradually to the 2-toothed (bidentate) apex; pistillate scales lanceolate-ovate, tapering to a long awn; scales about $\frac{3}{4}$ as long as or longer than the perigynia. *Carex folliculata* (northern long sedge)
- 33b. Leaves yellow-green, usually 1.5–3.5 mm wide (occasionally to 5.5 mm in NL); culms 1.5–7 dm long; sheath of the lowest inflorescence bract hyaline and prolonged at the summit; inflorescence 1.8–18 cm long; staminate spike 1, terminal, small, 0.6–1.5 cm long, often hidden within the uppermost pistillate spike; the 2–4 lateral spikes usually pistillate; perigynia ascending-spreading to divergent, narrowly lanceoloid, 0.8–1.2 cm long by 1.3–2.1 mm wide, scarcely or not inflated, tapering gradually to the 2-toothed (bidentate) apex; pistillate scales ovate, short-acuminate; scales about $\frac{1}{2}$ as long as the perigynia.
 *Carex michauxiana* (Michaux's sedge sedge)
- 34a. Leaves with soft-pubescent (pilose) sheaths and lower blades (§ *Porocystis*).
 *Carex pallescens* (pale sedge)
- 34b. Leaves with glabrous blades and sheaths. **35**

- 35a. Plants short, less than 2 dm tall, pistillate spikes 0.2–1 cm long. 36
- 35b. Plants taller, 2–13 dm tall; pistillate spikes 0.5–15 cm long. 37
- 36a. Leaf blades 2–4 cm long by 1.5 mm wide; culms 4–15 cm long, much taller than the leaves; the inflorescence easily mistaken for a single terminal spike, but composed of a small terminal staminate spike and 1–3 pistillate spikes, 2–5 mm long and 1–5 flowered; the perigynia ovoid, dark reddish brown, 1.5–2.5 mm long, with a short beak less than 0.5 mm long; plants of rocky Arctic-alpine barrens and often limestone barrens (§ *Lamprochlaenae*). ***Carex glacialis*** (glacier sedge)
- 36b. Leaf blades 5–15 cm long by 2–4.5 mm wide, seldom less than 2 mm wide; culms 4–16 cm long, shorter than the leaves; pistillate spikes 6–10 mm long by 4.5–6 mm wide, with 1–3 long-peduncled spikes and 2–3 short basal spikes nearly concealed by the leaf bases; perigynia 3–10 or more per spike, ovoid, light green to pale brown, 3.1–4.7 mm long, with a long beak 1.75–2 mm long; plants of open, dry, sandy acidic sites (§ *Acrocystis*, *in part*, see Key 3.1, pg. 31).
..... ***Carex tonsa* var. *tonsa*** (darkgreen sedge)
- 37a. Lowest bract subtending the inflorescence lacking a sheath or with a sheath less than 4 mm long. 38
- 37b. Lowest bract subtending the inflorescence with a sheath to 3.5 cm long. 40
- 38a. Terminal spike gynecandrous and club-shaped, or staminate, rarely androgynous; pistillate spikes 1–3; perigynia with 2 prominent marginal veins (2-keeled), papillose, pale green or glaucous-green, maturing to white, golden-brown, or medium brown, often with a dark beak; pistillate scales dark purplish-black, often with a green pale brown 3-nerved midrib, extending to the apex or exceeding it to form a narrow awn. § ***Racemosae*** (*in part*, see Key 3.2, pg. 32)
- 38b. Terminal spike and 1–4 upper lateral spikes staminate; pistillate spikes 1–4; perigynia with several to many prominent or faint veins; often shiny, not papillose, yellow green to nearly black, the short beak the same colour as the perigynia; pistillate scales medium brown to black, the apex blunt or awned. 39
- 39a. Plants 1–8 dm tall; leaves medium to dark green, 1–6.3 mm wide, V-shaped in cross-section or involute and circular in cross-section; terminal and upper 1–2 lateral spikes staminate, short-peduncled; lower 1–3 lateral spikes pistillate, 0.5–3 cm long, with 20–100 perigynia per spike; perigynia oblong-ellipsoid to obovoid, 2.2–5.5 mm long, initially green to greenish-brown, maturing to purplish-brown or purplish-black, faintly veined, tapering abruptly to a short straight beak 0.2–0.8 mm long; pistillate scales black, blunt to acute at the apex. § ***Vesicariae*** (*in part*, see Key 3.3, pg. 34)
- 39b. Plants 5–13.5 dm tall; leaves glaucous green, 8.5–21 mm wide, M-shaped in cross-section, with 2 prominent lateral nerves; terminal and upper 2–4 lateral spikes staminate, long-

- peduncled; lower 2–4 lateral spikes pistillate, 2.5–10 cm long, with 50–150 perigynia per spike; perigynia narrowly ovoid, 5–8 mm long, yellow-green, conspicuously veined with 14–28 prominent nerves, tapering gradually to a short beak; pistillate scales medium to dark brown, tapering somewhat abruptly to a scabrous awn to 3.5 mm long (§ *Paludosae*, *in part*). ***Carex lacustris*** (lake sedge)
- 40a. Leaves very narrow, involute, 0.5 mm wide (§ *Albae*). ***Carex eburnea*** (bristleleaf sedge)
- 40b. Leaves flat or folded (V- or M-shaped in cross-section), 0.8–10 mm wide. **41**
- 41a. Leaves V-shaped in cross-section, 0.8–5.4 mm wide; terminal spike usually staminate, occasionally androgynous; lateral spikes pistillate, rarely androgynous; pistillate spikes ovoid, globose, or short-cylindrical, 0.4–2.2 cm long by 3–12.7 mm wide; perigynia ascending, spreading, or reflexed, about 2–6 mm long, prominently veined, abruptly narrowed to a bidentate beak, up to 2.7 mm long (§ *Ceratocystis*). **42**
- 41b. Leaves M-shaped in cross-section, about 1.5–10 mm wide; terminal spike staminate; lateral spikes pistillate, short-cylindrical, 1–3 cm long by 3–7 mm wide; perigynia ascending, about 2–5 mm long, prominently veined or at least 2-keeled, beakless or with a short beak. **48**
- 42a. Perigynia all ascending, beak straight; bract subtending inflorescence to 9 cm long, staminate spike 1–3.3 cm long, on a peduncle 0.5–7 cm long. ***Carex hostiana*** (tawny sedge)
- 42b. Perigynia spreading or reflexed; bract subtending inflorescence to 20 cm long; staminate spike 0.5–2.5 cm long, on a peduncle to 2.8 cm long. **43**
- 43a. Perigynia somewhat to strongly reflexed, yellow to yellow-green, with 8–20 veins, gradually tapering to a reflexed beak about as long as the perigynium body; forming an angle of 13° to 72° between the beak and the body; peduncle of the staminate spike to 8 mm long. **44**
- 43b. Perigynia spreading, yellow-green to dark olive green, with 5–10 veins; abruptly tapering to a short beak, much shorter than the perigynium body; the beak straight or reflexed less than 20°; peduncle of the staminate spike to 2.8 cm long (*Carex viridula* subspecies). .. **45**
- 44a. Pistillate scales light brown to reddish brown with a central green stripe, 2.3–3.9 mm long, visible at the perigynium base; lower perigynia reflexed, the down-curved beak bent at an angle of 26° to 72°; staminate spike appearing sessile, but on a short peduncle 0.4–5 mm long; plants of calcareous substrates. ***Carex flava*** (yellow sedge)

- 44b. Pistillate scales yellowish green, 1.7–2.6 mm long, barely visible between the perigynia; most perigynia reflexed, the down-curved beak bent at an angle 13° to 48°; peduncle of staminate spike 0.5–8 mm long; plants of acidic substrates.
..... ***Carex cryptolepis*** (northeastern sedge)
- 45a. Culms 2–40 cm long; leaves to 40 cm long, lacking a ligule; pistillate spikes 1–8; plants found in habitats with acidic or calcareous substrates. **46**
- 45b. Culms 2–85 cm long; leaves to 19 cm long, often with a truncate to rounded ligule; pistillate spikes 1–3; plants of moist to wet calcareous fens, shorelines, and limestone barrens (varieties of *Carex viridula* subsp. *brachyrrhynca*). **47**
- 46a. Pistillate spikes 1–8, broadly elliptic to globose; perigynia yellow to greyish-green, 1.8–3.9 mm long; the apex narrowed abruptly to a short beak, 0.3–1.3 mm long, bent at an angle usually less than 15°; staminate spike with a peduncle to 20 mm long; plants of sandy to peaty shorelines, fens, and moist open acidic or calcareous habitats. ***Carex viridula*** subsp. ***viridula*** (greenish sedge)
- 46b. Pistillate spikes 2–5, elliptic; perigynia green to dark olive, 3.2–3.8 mm long, the apex narrowed gradually to short beak, 0.7–1.7 mm long, bent at an angle to 28°; staminate spike with a peduncle to 28 mm long; a calcifuge, plants restricted to acidic coastal flats and meadows; European, intro. in coastal NL.
..... ***Carex viridula*** subsp. ***oedocarpa*** (Oeder's sedge)
- 47a. Plants short to tall; culms 2–85 cm long; leaves membranaceous to firm, to 40 cm long x up to 5.4 mm wide, with truncate to rounded ligules; staminate spike 5–25.3 cm long, staminate peduncle to 25 mm long; pistillate spikes ellipsoid, 5.4–11 mm wide; perigynia 3.2–4.5 mm long; plants of moist to wet calcareous fens and limestone substrates.
..... ***Carex viridula*** subsp. ***brachyrrhynca*** var. ***elatior*** (long-stalked yellow sedge)
- 47b. Plants very short; culms 2–4.5 cm long; leaves thick and succulent to coriaceous, to 3 cm long x up to 3.5 mm wide, usually lacking ligules; staminate spike 5–6 mm long, staminate peduncle short, to 4 mm long; pistillate spikes broadly ellipsoid to nearly globose, 4–5.5 mm wide; perigynia 2.3–2.8 mm long; plants of calcareous maritime shores, restricted to a narrow coastal zone frequently exposed to salt spray.
..... ***Carex viridula*** subsp. ***brachyrrhynca*** var. ***saxilittoralis*** (rocky shore sedge)
- 48a. Plants densely cespitose; culms and rachis sharply 3-angled, finely scabrous along the edge; leaves 3–10 mm wide; green to dark green; inflorescence bract loose with the hyaline portion of the sheath prolonged at the summit; pistillate scales hyaline with a broad green midrib, the apex blunt or awned. **49**
- 48b. Plants rhizomatous, with long sympodial rhizomes; culms and rachis smooth; leaves about 1.5–4.7 mm wide, often glaucous; inflorescence bract tight to somewhat

- loose above, prolonged or not at the summit; pistillate scales light to dark brown with a light brown or green midrib, the apex blunt to short-awned. 50
- 49a. Leaves 3–4 mm wide; culms, rachis, and leaf margins antrorsely scabrous, with scabrous barbs oriented towards the apex of the leaf on main veins of the lower leaf surface and pistillate scales; perigynia oblong-ovoid, 2.8–4 mm long, beakless, with 17–28 impressed veins; pistillate scales ovate, tapering at the apex to a distinct awn (§ *Grisae*).
..... ***Carex conoidea*** (field sedge)
- 49b. Leaves 3–10 mm wide; culms and leaf margins retrorsely scabrous, with scabrous barbs oriented downward towards the base in the upper half of the leaf; in the lower fourth of the leaf, the margins are antrorsely scabrous; perigynia obovoid, 2.2–4 mm long, with a short outwardly-curved beak, to 1.1 mm long; prominently 2-ribbed with several fine veins; pistillate scales broadly ovate, the apex blunt or retuse and short-awned (§ *Laxiflorae*). ***Carex leptonevia*** (nerveless woodland sedge)
- 50a. Leaves to 10 cm long, light green to somewhat glaucous; inflorescence bract with the hyaline portion of the sheath prolonged and convex at the summit; perigynia 10–45 per spike; 2.2–3.5 mm long, with a short beak to 0.3 mm long; ovoid, plump; yellowish-green to pale brown, prominently nerved, with 12 or more veins, the surface often bearing minute resin dots (§ *Granulares*).
..... ***Carex crawei*** (Crawe's sedge)
- 50b. Leaves 4.5–40 cm long, green or somewhat to very glaucous; inflorescence bract with the hyaline portion of the sheath not prolonged above the concave summit; perigynia 3–25 per spike; 3–5 mm long, fusiform and beakless, or obovoid with a bent beak to 1.8 mm long; yellowish-green, or brown, strongly glaucous, 2-keeled, papillose (§ *Panicae*). 51
- 51a. Leaves green, seldom glaucous, 1.5–5 mm wide; lowest bract of inflorescence much shorter than ($\frac{1}{5}$ to $\frac{1}{2}$ as long as) the inflorescence, with a sheath 1–3.5 cm long; perigynia ovoid to obovoid, sparsely papillose, abruptly narrowing to a slender cylindrical beak, to 1.8 mm long, slightly bent. ***Carex vaginata*** (sheathed sedge)
- 51b. Leaves bluish-green, very glaucous; lowest bract of inflorescence to 11 cm long, with a short sheath to 1.2 cm long; perigynia fusiform, glaucous-green, beakless.
..... ***Carex livida*** (livid sedge)

**Key 3.1. Key to *Carex* Species of Section (§) *Acrocystis*
in Newfoundland and Labrador**

- 1a. Culms usually less than 1 dm tall (rarely to 1.6 dm), much shorter than leaves; leaves 5–25 cm long, yellowish-green to bright green, scabrous and stiff, 2.5–5 mm wide; perigynia glabrous or nearly so, 3.1–4.7 mm long, with a straight beak, 0.9–2 mm long; pistillate scales acute to long-acuminate. ***Carex tonsa* var. *tonsa*** (deepgreen sedge)
- 1b. Culms 0.3–6 dm tall, shorter or longer than leaves; leaves 0.5–30 cm long, pale green to dark green, membranaceous or firm, often scabrous, 0.9–3 mm wide; perigynia finely pubescent (visible with hand lens), 2–4 mm long, with a straight or bent beak 0.3–2.3 mm long; pistillate scales bunt to acuminate, cuspidate, or awned. **2**
- 2a. Culms of various sizes, usually 3–7.5 cm tall and often hidden by the leaves, or occasionally much longer than the leaves, reaching 4 dm tall; leaf blades 1.5–2.5 mm wide; plants of dry sandy, clay, or rocky soils, dry woodlands or fields.
..... ***Carex umbellata*** (umbellate sedge)
- 2b. Culms of about equal sizes per plant, 5–60 cm tall, shorter than or longer than the leaves; leaf blades 0.7–4 mm wide; plants of moist forested habitats. **3**
- 3a. Culms 2–6 dm tall, much longer than the leaves, leaf blades 1.8–5 mm wide (usually more than 3 mm wide); spikes distinct, not aggregated into a terminal cluster; perigynia 2.8–3.8 mm long, beak 0.5–2.3 mm long. ***Carex communis*** (fibrous-root sedge)
- 3b. Culms 0.5–4 dm tall, about equal in length (slightly longer or shorter) to the leaves; leaf blades 0.7–3 mm wide; spikes mostly aggregated into a terminal cluster; perigynia 2.2–3.1 mm long, beak less than 0.7 mm long. **4**
- 4a. Leaf blades less than 6 cm long by about 1–3 mm wide; flowering culms of different heights, some nearly basal; staminate spike 3–5.7 mm long, short-peduncled or nearly sessile, often hidden by the upper pistillate spikes; pistillate spikes 1–4, each with 4–15 perigynia, spikes usually aggregated in a terminal cluster; if separate, the lower 2 spikes separated by less than 7 mm; perigynium beak 0.7 mm long.
..... ***Carex deflexa* var. *deflexa*** (bent northern sedge)
- 4b. Leaf blades to 15 cm long by 0.7–1.5 mm wide; flowering culms all about as tall as the leaves; staminate spike 4–15 mm long, on a peduncle about 2–6 mm long; pistillate spikes 1–3, each with 3–10 perigynia, upper spikes aggregated in a terminal cluster, the lowest 2 spikes separated by more than 7 mm; perigynium beak 0.3–0.5 mm long. ***Carex novae-angliae*** (New England sedge)

**Key 3.2. Key to *Carex* Species of Section (§) *Racemosae*
in Newfoundland and Labrador**

- 1a. Spikes, at least the lower ones, nodding at the end of long flexuous peduncles.
..... *Carex atratiformis* (scabrous black sedge)
- 1b. Spikes erect or spreading, sessile or on stiff peduncles. **2**
- 2a. Basal sheaths strongly ladder-fibrillose; pistillate scales 3–10 mm long, long acuminate to awned, the prominent green or light brown midrib extending into an awn 0.5–3 mm long; perigynia ellipsoid, pale green, somewhat glaucous, 2.5–4 mm long. *Carex buxbaumii* (Buxbaum's sedge)
- 2b. Basal sheaths not ladder-fibrillose; pistillate scales less than 3.5 mm long, with an obtuse to acuminate or mucronate apex, the mucro less than 0.2 mm long; perigynia ellipsoid to obovate, whitish, green, to brown, not glaucous, 2–3.5 mm long. **3**
- 3a. Terminal spike usually staminate and erect above the adjacent pistillate spikes; lowest pistillate spike long peduncled; the pale green to golden or dark brown perigynia with a 0.2–0.3 mm dark beak, entire at the apex; often with the persistent style protruding from the beak, especially in upper perigynia of the spike. *Carex stylosa* (longstyle sedge)
- 3b. Terminal spike staminate and shorter than the adjacent pistillate spikes, or terminal spike gynacandrous; pistillate spikes sessile or short peduncled; the pale green to dark brown perigynia with a beak less than 0.2 mm long to 0.4 mm long; styles not protruding from the beak. **4**
- 4a. Terminal spike gynacandrous, clavate, pistillate above with a few staminate flowers at the base; pistillate spikes 1–3, densely clustered or distinctly separate; perigynia ellipsoid to oblanceoloid, 2–3.5 mm long, pale green, maturing to golden or dark brown; beak dark brown to black; styles 3; pistillate scales shorter than or equal in length to the perigynia, pistillate scales dark brown to black, with or without a paler midrib. **5**
- 4b. Terminal spike staminate short and usually hidden by the 2–3 pistillate spikes, each 8–15 mm long; perigynia obovoid, 2–2.5 mm long, pale green to pale whitish-brown, maturing to light purplish-brown, marked with dark brown at the rounded nearly beakless apex; styles 2, thick and short; pistillate scales about equal in length to the perigynia, pistillate scales solid dark purplish-brown to black, or often with a narrow pale midvein. Reports of this sedge from northernmost Labrador are considered questionable, as no verified reports have been documented; this species is included here to facilitate identification of future reports.
..... *Carex holostoma* (Arctic marsh sedge)

- 5a. Inflorescence with 2–3 lateral pistillate spikes, usually separate and short-peduncled; pistillate scales dark with a prominent pale midrib; perigynia ellipsoid, pale green, the apex rounded, ending in a short black beak less than 0.2 mm long. ***Carex adelostoma*** (circumpolar sedge)
- 5b. Inflorescence usually with 1–3 lateral pistillate spikes, sessile and clustered together in a dense head or the lower somewhat separate and short-peduncled; pistillate scales dark throughout, a pale midrib lacking or inconspicuous; perigynia ellipsoid to oblanceoloid, pale green, maturing to golden, reddish, or dark brown; the apex tapering abruptly to a dark beak 0.2–0.4 mm long. **6**
- 6a. Culms short, 5–35 cm long, leaf blades 1.5–3 mm wide; inflorescence with all spikes sessile and densely clustered; perigynia ellipsoid, 2–2.5 mm long, pale green initially, maturing to chestnut brown, dark brown, or purplish-black; the darker brown beak 0.2–0.3 mm long; pistillate scales entirely purplish-black or with a very narrow hyaline margin. ***Carex norvegica*** (Norway sedge)
- 6b. Culms taller, 15–60 cm long; leaf blades 2–4 mm wide; inflorescence with upper spikes clustered in a loose head, with the lower somewhat separate and short-peduncled; perigynia ellipsoid to oblanceoloid, 2.5–3.5 mm long, pale greenish-white, maturing to golden or medium brown, the darker brown beak 0.3–0.4 mm long; pistillate scales purplish-black, occasionally with a very narrow hyaline margin near the apex. ***Carex media*** (intermediate sedge)

**Key 3.3. Key to *Carex* Species of Section (§) *Vesicariae*
in Newfoundland and Labrador**

- 1a. Plants with 1–3 erect pistillate spikes; perigynia broadly ellipsoid to nearly orbicular, slightly compressed, about 2–5 mm long, light reddish-brown to dark purplish-brown, short-beaked, barely inflated and obscurely veined; pistillate scales dark purplish black, about 2–4.5 mm long, with an obtuse to acute or acuminate apex. **2**
- 1b. Plants with 1–6 erect or nodding pistillate spikes; perigynia ellipsoid to ovoid, round in cross-section, green to straw-coloured (stramineous) or yellowish-brown (tawny), 3.6–10.8 mm long, short- or long-beaked, inflated, and prominently nerved; pistillate scales yellowish to purplish brown, 2.4–11.2 mm long, with an obtuse to long scabrous-awned apex. **4**
- 2a. Culms round in cross-section, glabrous below the inflorescence; leaf sheath bases brown, rarely tinged with red; leaf blades 1.3–3 mm wide; staminate and pistillate spikes 1–2; perigynia greenish-brown to dark purplish-brown.
..... ***Carex rotundata*** (roundfruit sedge)
- 2b. Culms 3-angled in cross-section, scabrous below the inflorescence; leaf sheath bases reddish-purple or brownish-purple, leaf blades 1–6.3 mm long mm wide; staminate and pistillate spikes 1–3; perigynia reddish-brown to dark purplish-brown. **3**
- 3a. Plants 1.5–4 dm tall, with 7–15 leaves per culm; leaf blades 2.5–5 mm wide; perigynium surface with nerves not extending into the beak; stigmas 3; pistillate scales obtuse to acuminate. ***Carex membranacea*** (fragile sedge)
- 3b. Plants 2–9 dm tall, with 3–7 leaves per culm; leaf blades about 1–6 mm wide; perigynium surface usually lacking nerves; stigmas 2; pistillate scales usually obtuse or acute.
..... ***Carex saxatilis*** (russet sedge)
- 4a. Leaves narrow (filiform) and wiry, 0.5–2.5 mm wide, with involute margins; staminate spike usually solitary (rarely 2); pistillate spikes usually 1–2, broadly ovoid to short-cylindrical, 0.7–2 cm long, with 3–15 flowers.
..... ***Carex oligosperma*** (fewseed sedge)
- 4b. Leaves wider, flat or M-shaped in cross-section, 2.5–16 mm wide, margins flat; staminate spikes 1–5, pistillate spikes 1–8, short- to long-cylindrical, 1–15 cm long, with 20–150 flowers. **5**
- 5a. A single terminal spike usually staminate, occasionally gynecandrous, with a few perigynia at the apex, or androgynous, with a few perigynia at the base; upper pistillate spikes erect, lower pistillate spikes nodding or pendant on flexuous peduncles; perigynia with

- several prominent nerves not extending past the base of the beak; pistillate scales 2.3–12 mm long, with long scabrous awns, the awn longer than the body of the scale. **6**
- 5b. The terminal 1–5 spikes staminate; pistillate spikes 1–6, erect to spreading, sessile or short-peduncled; perigynia with prominent nerves extending into the beak; pistillate scales less than 6 mm long, with obtuse to acuminate or short-cuspidate apices, lacking scabrous awns. **8**
- 6a. Basal leaf sheath pale brown; lateral spikes usually pistillate, sometimes androgynous, with a few staminate flowers at the apex; spikes on short to long flexuous peduncles; pistillate scales lance-acuminate, 2.5–8.6 mm long by 0.3–0.6 mm wide. ***Carex pseudocyperus*** (Cyperus sedge)
- 6b. Basal leaf sheaths tinged with reddish-purple; pistillate spikes appearing sessile or with long peduncles; pistillate scales lanceolate to narrowly oblong, 2.3–11.2 mm long by 0.5–1.1 mm wide. **7**
- 7a. Culms obtusely 3-angled, erect or ascending; leaves 4.5–11.5 mm wide; terminal spike staminate; lateral spikes pistillate, 1–3, on short stiff peduncles, spreading to nodding; perigynia 6.5–10.8 mm long by 2–3.5 mm wide, ovoid, with 7–12 prominent nerves; pistillate scales 3.4–11.2 mm long. ***Carex lurida*** (sallow sedge)
- 7b. Culms sharply 3-angled, erect to spreading, arching, or nodding; leaves 2.5–8.5 mm wide; terminal spike staminate or occasionally gynecandrous, with a few perigynia at the tip of the spike; lateral spikes 2–4, pistillate, 1–4 cm long, lower spikes often nodding to pendant on long peduncles; perigynia 4.5–7.3 mm long by 1.4–2.1 mm wide, ellipsoid, with 13–21 prominent nerves; pistillate scales 2.3–6.5 mm long. ***Carex hystericina*** (porcupine sedge)
- 8a. Pistillate spikes ascending, clustered near the top of the culm; terminal spike staminate or androgynous, with a few perigynia at the base of the spike; terminal spikes situated close to the pistillate spikes; perigynia spreading to reflexed at maturity, 6–10 mm long, with a beak about 2–4.5 mm long; summit of the leaf sheath flat (truncate) to convex. ***Carex retrorsa*** (retorse sedge)
- 8b. Pistillate spikes erect to arching, arranged along the culm, not clustered; staminate spikes situated well above the upper pistillate spike; perigynia ascending to arching at maturity, 3.6–8.6 mm long, with a beak to 2.2 mm long; summit of the leaf sheath flat (truncate) to concave. **9**
- 9a. Plants densely cespitose, culms weak and arching, sharply 3-angled; leaf blades sparsely septate-nodulose on upper surface; pistillate spikes erect to nodding, with ascending perigynia, pointing towards the apex of the spike. ***Carex vesicaria*** (inflated sedge)

- 9b. Plants colonial, spreading by long rhizomes and stolons; culms stiff and erect, obtusely 3-angled at the spongy base; leaf blades septate-nodulose on the upper surface; pistillate spikes erect, with spreading perigynia, pointing outward from the spike axis. **10**
- 10a. Leaf blade upper surface whitish-green to glaucous, 1.5–4.5 mm wide; U-shaped in cross-section with slightly involute margins; pistillate spikes 2–3 per culm, 1.5–7 cm long; perigynia 3.6–5.8 mm long. ***Carex rostrata*** (beaked sedge)
- 10b. Leaf blade upper surface pale to medium-green, 4.5–12 mm wide, V-shaped in cross-section; pistillate spikes 2–5 per culm, 2–15 cm long; perigynia 4–8.6 mm long. ***Carex utriculata*** (northern beaked sedge)

Key 4. Key to *Eleocharis* (spikerush) Species in Newfoundland and Labrador

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Please note that all spikerush (*Eleocharis*) species have leaf sheaths that surround the base of the flowering stems (culms) and lack leaf blades, and flowers are all contained within a single terminal spikelet. With so few traits to differentiate between species, mature fruits (achenes) are required for accurate identification of spikerush species. Perianth bristles are not often mentioned in this key since they are not consistently present in some species and the stamen filaments may be confused with perianth bristles.

- 1a. Achenes 3-sided (trigonus), with convex or straight sides; achenes bearing short tubercles (less than 0.2 mm long), depressed tubercles, or tubercles appearing as a conical continuation of the achene. **2**
- 1b. Achenes 2-sided (biconvex), with convex sided; achenes bearing larger (0.3–1.5 mm long) tubercles, attached to the achene by a short, narrow neck, or tubercles triangular, widest at the base, and about half as wide as the achene. **6**
 - 2a. Achenes oblanceoloid to obovoid; pearly white; 0.7–1.1 mm long by 0.3–0.6 mm wide; tubercle conical, short, less than 0.2 mm long, with a narrow neck; achene surface with 8–12 longitudinal ridges and numerous horizontal cross-ridges.
..... *Eleocharis acicularis* (needle spikerush)
 - 2b. Achenes obovoid to obpyriform (pear-shaped); yellow, orange, or brown; 0.6–1.8 mm long x 0.5–1.4 mm wide; tubercle depressed within an area surrounded by a short collar or flange; surface smooth or finely rough. **3**
- 3a. Basal leaf sheaths with or without an apical tooth; achenes are obscurely 3-angled, with convex sides, persisting after the floral scales have fallen; tubercles are very short, depressed, and encircled by a collar-like border. **4**
- 3b. Basal leaf sheaths lacking an apical tooth; achenes distinctly or obscurely 3-angled, with nearly straight to convex sides, and falling with the scales; achenes have conical tubercles that appear as extensions to the achene apex and lack collars or flanges at the top of the achene. **5**
 - 4a. Basal leaf sheaths most often bearing a short tooth, to 0.5 mm long, at the apex; spikelets 3–8 mm long; achenes 0.7–1.2 mm long x 0.6–0.9 mm wide; perianth bristles absent or rarely 1–3, about half as long as the achene; tubercle bordered by a slightly raised collar with a very short central point (0.1–0.25 mm tall); plants of calcareous or brackish wetland sites. *Eleocharis elliptica* (elliptic spikerush)
 - 4b. Basal leaf sheaths blunt and often reddish, lacking a tooth at the apex; spikelets 1–4 mm long; achenes 0.6–0.8 mm long x 0.5–0.6 mm wide; perianth bristles absent;

- tubercle bordered by a very short collar with a short conical point (to 0.15 mm tall); plants of acid peatlands or sandy sites. ***Eleocharis nitida*** (quill spikerush)
- 5a. Plants to 7 cm tall; rhizomes short, often terminating in recurved, J-shaped tubers, 2–2.5 mm long; spikelets 2–4 mm long, flattened, with 6–10 floral scales; achenes distinctly 3-angled (trigonous) in cross-section, with straight to slightly concave sides, about 1–1.2 mm long; perianth bristles 6, about equal to longer than the achene; tubercles to 0.2 mm long; plants of mainly coastal brackish or saline wetlands and shores.
..... ***Eleocharis parvula*** (dwarf spikerush)
- 5b. Plants usually to 15 cm tall in NL; rhizomes long, sometimes bearing ovoid, scaly, resting buds or bulbs, 3–6 mm long, round (terete) in cross-section; spikelets 3–8 mm long, with 3–10 floral scales; achenes obscurely 3-angled in cross-section, with convex sides, about 1.6–2.3 mm long; perianth bristles lacking, or 3–6 and of unequal lengths; tubercles 0.3–0.4 mm long; plants of fens, wet meadows, seepage areas and calcareous wetlands.
..... ***Eleocharis quinqueflora*** (fewflower spikerush)
- 6a. Spikelets ovoid, 2–8 mm long by 2–4 mm wide; spikelet axis (rachilla) with about 10 floral scales per mm; achene 0.75–1 mm long by 0.6–0.9 mm wide, light brown; tubercles triangular and flattened, widest at the base, 0.3–0.5 mm long and wide, neck absent. ***Eleocharis ovata*** (ovate spikerush)
- 6b. Spikelets ellipsoid to lanceoloid, 3–25 mm long by 2–7 mm wide; spikelet axis (rachilla) with about 1–8 floral scales per mm; achenes 0.9–1.8 mm long by 0.7–1.6 mm wide, various shades of yellow to dark brown; tubercles slender to broadly conical, attached to the top of the achene by a narrow neck, 0.3–0.8 mm long; or tubercles trapezoidal, constricted at the base, and 0.7–1.5 mm long. **7**
- 7a. Achenes with broad rectangular to trapezoidal tubercles, wider than long; 0.7–1.5 mm long, truncate at the apex and constricted at the usually slightly broader base; neck lacking or very short; rare plants of limestone barrens in northwestern Newfoundland and southeastern Labrador. ***Eleocharis kamtschatica*** (Kamchatka spikerush)
- 7b. Achenes with conical or lanceoloid tubercles, 0.3–0.8 mm long and longer than wide, pointed at the apex and attached to the achene by a short neck; plants common to occasional, not restricted to limestone barrens. **8**
- 8a. Plants of coastal saline or brackish marshes and shores; culms 1–6 dm tall by 0.2–1.5 mm wide, apex of sheath blunt, lacking an apical tooth; achenes 1.3–1.8 mm long by 1–1.4 mm wide; tubercle lanceoloid, 0.4–0.8 mm long.
..... ***Eleocharis uniglumis*** (single-glume spikerush)
- 8b. Plants of freshwater marshes, meadows, fens, and shores; culms to 11.5 dm tall by 0.3–3 mm wide; apex of sheath blunt (obtuse to broadly acute), usually lacking an

apical tooth; achenes about 1–2 mm long by 0.7–1.5 mm wide; tubercles conical,
0.3–0.7 mm long. 9

- 9a. Culms 0.8–8 dm tall by 0.3–1.4 mm wide; sheaths usually red towards the base, inflated near the entire blunt apex, tooth absent or sometimes present, then to 0.1 mm long; spikelets 3–18 mm long by 2–3 mm wide; the lowest scale of the spikelet clasping and nearly to completely encircling the spikelet base; floral scales 15–50, with 4–5 scales attached along each mm of the spikelet axis (rachilla); scales 2–3.5 mm long, ovate; anthers 1–1.8 mm long. ***Eleocharis erythropoda*** (redstem spikerush)
- 9b. Culms 3–11.5 dm tall x 1–3 mm wide; sheaths red to blackish towards the base, close, not inflated, often splitting at the blunt apex, tooth absent; spikelets 5–25 mm long by 3–7 mm wide, the lowest scale clasping two-thirds to three-fourths of the spikelet base; floral scales 30–100, with 4–8 scales attached along each mm of the spikelet axis (rachilla); scales lanceolate, 3–4 mm long; anthers 1.5–2.2 mm long.
..... ***Eleocharis palustris*** (common spikerush)

Key 5. Key to *Eriophorum* (cottongrass) Species in Newfoundland and Labrador

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- 1a. Inflorescence a single terminal spikelet, perianth bristles white to reddish-brown (cinnamon or rusty brown). **2**
- 1b. Inflorescence a terminal umbellate cluster of 2–30 spikelets, erect or nodding; bristles white, pale brown (tawny), or reddish-brown. **9**
- 2a. Bristles of the spikelet light to dark cinnamon-brown or rusty-brown. **3**
- 2b. Bristles of the spikelet bright white, creamy white, or slightly tinged with reddish-brown. **5**
- 3a. Plants densely caespitose and forming tussocks with 1–several flowering stems (culms); culms to 7 dm tall, 3-angled (trigonus) in cross-section; leaves 1–3; spikelet obovoid to nearly globose, 0.8–1.5 cm long by 2.5–5 cm long in fruit; bristles 10–15 per achene; occurs with the overlapping range of the parent species in NL.
..... ***Eriophorum xpylaieanum*** (Bachelot de la Pylaie's cottongrass)
(*E. russeolum* subsp. *russeolum* x *E. vaginatum* subsp. *spissum*)
- 3b. Plants rhizomatous, with a single flowering stem (culm) arising from each shoot; culms round (terete) in cross-section, to 5.5 dm tall; leaves 2–7; spikelet obovoid or hemispherical, 1.4–4 cm long by about 1–6 cm wide in fruit, bristles more than 30 per achene. **4**
- 4a. Spikelets obovoid; bristles cinnamon-brown to rusty brown, 25–32 mm long, 50–70 per achene; anthers 1.5–3.1 mm long; widespread in NL, but not reported from northernmost Lab. ... ***Eriophorum russeolum*** subsp. ***russeolum*** (russet cottongrass)
- 4b. Spikelets usually hemispherical, sometimes ovoid; bristles pale cinnamon-brown to pale rusty-brown, 15–20 mm, 30–50 per achene; anthers 0.8–1.5 mm; known from western and southeastern Labrador; not reported from insular Nfld.
..... ***Eriophorum xmedium*** subsp. ***medium*** (intermediate cottongrass)
(*E. russeolum* subsp. *russeolum* x *E. scheuchzeri* subsp. *scheuchzeri*)
- 5a. Plants rhizomatous, sterile scales of the spikelet 3–7. **6**
- 5b. Plants caespitose, sterile scales of the spikelet 10–15. **7**
- 6a. Spikelet broadly obovoid to hemispherical, 2–3 cm long by 1.4–4.5 cm broad in fruit, bristles bright white; sterile spikelet scales 5–6, broadly lanceolate to ovate, 5–12 mm long by 1.6–4.3 mm wide, lead-grey to blackish; flowering plants with anthers less than 1 mm long; known from throughout Labrador and the Strait of Belle Isle. ..
..... ***Eriophorum scheuchzeri*** subsp. ***scheuchzeri*** (Scheuchzer's cottongrass)

- 6b. Spikelet ellipsoid to obovoid, 2–4 cm long by 1.5–3.5 cm broad in fruit, bristles dull or creamy white, occasionally tinged with pale reddish-brown; sterile spikelet scales 4–6, oblong-lanceolate, 7–16 mm long by 3–5.3 mm wide, olive-green to blackish; flowering plants with anthers 1.5–3.1 mm long; reported in NL only from Battle Harbour, southeastern Labrador.
 ***Eriophorum russeolum*** subsp. ***albidum*** (white-bristled russet cottongrass)
- 7a. Plants to 2 dm tall; cauline leaves 0–1, confined to below the middle of the culm; the sheath somewhat inflated and often bearing a short blade; culms circular or oval in cross-section near the spikelet; achenes each bearing 30–50 typically bright white (or rarely pale reddish-brown) bristles; anthers 0.6–1.2 mm long; an Arctic species, known from Labrador and the Strait of Belle Isle. ***Eriophorum callitrix*** (beautiful cottongrass)
- 7b. Plants to 7 dm tall; cauline leaves 1–3, extending to above the middle of the culm; with bladeless sheaths barely to conspicuously inflated, and the sheath summits dark or blackish; culms 3-angled near the spikelet; achenes each bearing 8–15 bright white, creamy white, dull white, or pale brownish bristles; anthers up to 2 mm long. **8**
- 8a. Plants densely cespitose; uppermost cauline leaf extending to above the middle of the culm; sheath of the uppermost cauline leaf conspicuously inflated; spikelet obovoid to subglobose, 0.8–1.5 cm long by 2.5–5 cm broad in fruit; bristles bright white, 15–25 mm long; spikelet scales lead-grey to blackish with hyaline margins, lanceolate-ovate; sterile scales at the spikelet base spreading to reflexed; plants of acidic bogs and peaty barrens; well distributed throughout the Province.
 ***Eriophorum vaginatum*** subsp. ***spissum*** (hare's tail)
- 8b. Plants loosely cespitose; cauline leaves evenly distributed along the culm, with the uppermost extending to near the top of the culm; sheath of the uppermost cauline leaves not or only barely inflated; spikelets obovoid to globose, to 1 cm long in flower, more globose in fruit and 2–3.5 cm broad; bristles creamy or dull whitish to pale brown, 10–20 mm long; spikelet scales, including the margins, lead-grey to blackish, lanceolate; sterile scales at the spikelet base appressed or ascending; plants of calcareous peatlands and tundra, known mainly from wLabrador and the Strait of Belle Isle. ***Eriophorum brachyantherum*** (closed-sheath cottongrass)
- 9a. Spikelets arranged in a dense tufted cluster of cymes, with the central spikelet of each cluster sessile, peduncles of lateral spikelets up to 1 cm long, bristles white to tawny or reddish-brown; involucre bracts 2–5, leaf-like, spreading and longer than the inflorescence. ***Eriophorum virginicum*** (tawny cottongrass)
- 9b. Spikelets arranged in open, nodding or pendant clusters; spikelets all borne on peduncles to 6 cm long, bristles white or creamy white; involucre bracts 1–5, at least the lowest bract erect. **10**

- 10a. Spikelets 2–7, appearing lateral, 1.5–3 cm long, on peduncles to 3 cm long, subtended by a single erect involucre bract; bristles white or creamy white..... **11**
- 10b. Spikelets 2–30, on peduncles to 6 cm long, subtended by 1–4 spreading to pendant leaf-like involucre bracts; bristles white or creamy white. **12**
- 11a. Upper cauline leaf blade shorter than the sheath, with the blade 1–4 cm long, the sheath, 2.5–5.5 cm long; spikelets 2–5, borne on peduncles 0.5–3 cm long; involucre bract to 2 cm long, grey or black at the base; known from w/c Lab. and w/c Nfld.
..... ***Eriophorum gracile*** (slender cottongrass)
- 11b. Upper cauline leaf blade longer than the sheath, with the blade 3–25 cm long, the sheath 2.5–9 cm long; spikelets 2–7, borne on peduncles 0.5–2 cm long; involucre bract to 6 cm long, brown at the base; known from w/c Lab. and throughout insular Nfld.
..... ***Eriophorum tenellum*** (rough cottongrass)
- 12a. Plants rhizomatous, spikelets 2–10, 2–5 cm long in fruit; scales to 10 mm long, brown to grey, darker at the base, the prominent midrib not extending to the paler apex; involucre bracts 1–3, the lowermost bract dark reddish-brown to black, to 12 cm long; achenes black, 2–5 mm long; anthers 2–5 mm long; widespread throughout NL.
..... ***Eriophorum angustifolium*** subsp. ***angustifolium*** (narrowleaf cottongrass)
- 12b. Plants caespitose, spikelets 3–30, 1.5–3 cm long in fruit; scales 4–6 mm long, dark green to grey, paler at the base, the prominent midrib extending to or exceeding the apex; involucre bracts 2–4, the lowermost bract brown at the base, to 7 cm long; achenes dark brown, 2.5–3.5 mm long; anthers to 2 mm long; known from w/c Lab. and throughout insular Nfld.
..... ***Eriophorum viridicarinatum*** (green-keeled cottongrass)

Key 6. Key to *Rhynchospora* (beakrush) Species in Newfoundland and Labrador

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- 1a. Plants 1–8 cm tall, densely cespitose, not stoloniferous; leaves flat, blades 0.5–2 mm wide; spikelets lanceoloid, milky white, 3.5–5.5 mm long; inflorescence broad to hemispherical, of several clusters (fascicles) of 1–3 spikelets; perianth bristles 10–12; plants of acidic peatlands and wet sands. ***Rhynchospora alba*** (white beakrush)
- 1b. Plants 1–5 dm tall, loosely cespitose and stoloniferous; leaves involute, to 2 mm wide; spikelets lanceoloid, reddish-brown to dark brown, 4.5–7 mm long; inflorescence of narrow, ascending clusters (fascicles) of 1–10 spikelets; perianth bristles 5–6, plants of calcareous or acidic habitats. **2**
- 2a. Spikelets light reddish brown to medium brown, with 1-5 flowers, perianth bristles 6, with downward-pointing (retorse) barbs, achenes stalked (stipitate), 1-4 per spikelet, with a narrow tapering triangular tubercle to 1.7 mm long; plants of calcareous fens and wet basic substrates.
 ***Rhynchospora capillacea*** (slender beakrush)
- 2b. Spikelets reddish brown to dark brown, with 2-3 flowers, perianth bristles 5-6, with upward-pointing (antrorse) barbs, achenes sessile, about 2 per spikelet, with an abruptly tapering tubercle to 1.3 mm long; plants of acidic peatlands and string fens..... ***Rhynchospora fusca*** (brown beakrush)

Key 7. Key to *Schoenoplectus* (bulrush) Species in Newfoundland and Labrador

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- 1a. Plants with 3–20+ submergent leaves, the tips often floating on the surface of water; blades filiform to narrow and flat, weak (flaccid), to 1 mm wide (leaves of emergent forms with few, erect, firm, short blades); spikelet solitary, 0.5–1.5 cm long; flowers with 6 brownish-white, bristle-like perianth parts, half to about equal in length to the achene; the bristles with minute downward-pointing (retorse) barbs, barely noticeable with a handlens. *Schoenoplectus subterminalis* (water bulrush)
- 1b. Plants with 2–6 emergent leaves, blades flat and linear, 1–9 mm wide; spikelets 1–200, often in clusters of 2–8 spikelets, each 0.3–2.3 cm long; flowers with 4–8 brownish-white bristle-like perianth parts much shorter to nearly as long as the achene; the bristles with downward-pointing (retorse) barbs in at least the upper two-thirds, clearly noticeable with a handlens. **2**
- 2a. Culms sharply 3-angled (trigonous) in cross-section; upper leaf blades 2–5 times longer than the sheath, blades 5–75 cm long; spikelets 1–5, in a sessile cluster at the base of the erect, involucre bract; perianth bristles 4–8, floral scales with entire margins. *Schoenoplectus pungens* (three-square bulrush)
- 2b. Culms round (terete) in cross-section; leaf blades typically shorter than the sheath, blades 0.2–20 cm long; spikelets 3–200, sessile or in stalked clusters (glomerules) at the base of the erect, involucre bract; perianth bristles usually 6, floral scales with ciliate or fimbriate margins. **3**
- 3a. Culms hard and firm, not easily compressed when pressed between the fingers, air spaces in upper portions of the culm about 0.5 mm wide (seen in cross-section); spikelets 1–2 cm long, usually in glomerules of 2–8, some often borne singly on stiff, ascending pedicels; scales ovate to elliptic, 3–4 mm long by 2–3 mm wide, dotted in the upper half with reddish-brown viscid spots, scales notched at the apex, terminating in a usually crooked (often broken) awn 0.5–2 mm long. *Schoenoplectus acutus* (hardstem bulrush)
- 3b. Culms relatively soft and spongy, easily compressed, air spaces in upper portions of the culm 1–2.5 mm wide (seen in cross-section); spikelets 0.3–1.7 cm long, usually borne singly or in glomerules of 2–4 on slender pedicels; scales ovate, 2–3.5 mm long × up to 2 mm wide, notched at the apex, terminating in a usually straight awn 0.2–0.8 mm long. *Schoenoplectus tabernaemontani* (softstem bulrush)

Key 8. Key to *Scirpus* (bulrush) Species in Newfoundland and Labrador

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- 1a. Inflorescence branches (rays) stiff and spreading; all spikelets of each cluster (cyme) sessile at the end of each inflorescence branch (ray); perianth bristles 4–6, retrorsely barbed, shorter or less than 2 times as long as the achene, not extending beyond the spikelet scales. **2**
- 1b. Inflorescence branches (rays) strongly nodding, central spikelet of each cluster (cyme) sessile at the end of each inflorescence branch (ray), most or all other spikelets pedicelled; perianth bristles 6, smooth, much longer than the achene, extending beyond the spikelet scales and often very curly, giving the spikelets a woolly appearance. **4**
- 2a. Leaves 4–11 per culm, blades 4–15 mm wide; base of leaf sheaths dark red; involucre bracts 3, the lowest about as long as or longer than the inflorescence; spikelets 2–8 mm long, in clusters of 3–18 spikelets, perianth bristles 4, retrorsely barbed almost to the base; present in Nfld. and Labrador.
..... *Scirpus microcarpus* (red-tinged bulrush)
- 2b. Leaves 3–9 per culm, blades 5–20 mm wide, slightly barbed; base of leaf sheaths green; involucre bracts 4, 2 long and 2 short; spikelets 2–5 mm long, in clusters of 4–100+, perianth bristles 5–6, retrorsely barbed above the middle. **3**
- 3a. Leaf blades 5–9 mm wide; leafy bulblets borne at the end of inflorescence rays; spikelets 2–3.5 mm long, perianth bristles 5–6, retrorsely barbed in the upper 0.2–0.4 mm, shorter than the achenes, which measure 0.7–1.1 mm long; present in Nfld. and Labrador.
..... *Scirpus hattorianus* (mosquito bulrush)
- 3b. Leaf blades 7–20 mm wide; leafy bulblets lacking; spikelets 2–5 mm long, perianth bristles 6, retrorsely barbed in the upper 0.3–0.6 mm, about equal to slightly longer than the achenes, which measure 1–1.3 mm long; present only in insular Nfld.
..... *Scirpus atrovirens* (darkgreen bulrush)
- 4a. Leaves 5–10 per culm, 3–10 mm wide; inflorescence branches strongly nodding; bases of involucre bracts drab greenish-brown to dark brown, not black; spikelets other than the central spikelet either sessile or pedicelled, spikelets 3–6 mm long, cinnamon brown at maturity; present only in insular Nfld.
..... *Scirpus cyperinus* (woolgrass)
- 4b. Leaves 4–8 per culm, 5–9 mm wide; inflorescence branches slightly nodding; base of involucre bracts black, dark green, or brown; spikelets other than the central spikelet all or mostly pedicelled, spikelets 2.5–9 mm long, pale brown to greenish-black; present in Nfld. and Labrador. **5**

- 5a. Leaves 4–7 per culm, 3–6 mm wide; sheathing portion of involucre bracts black throughout; spikelets 2.5–6 mm long, greenish-black; present in Nfld. and Labrador.
 ***Scirpus atrocinctus*** (black-girdled bulrush)
- 5b. Leaves usually 8 per culm; margins of involucre bracts green, longitudinally striped or suffused with red; spikelets 3–9 mm long, buff to pale brown often reddish-brown towards the base; present only in insular Nfld. ***Scirpus pedicellatus*** (stalked bulrush)

Key 9. Key to *Trichophorum* (clubrush) Species in Newfoundland and Labrador

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- 1a. Plants cespitose, growing in crowded tussocks, rhizomes lacking; spikelets lanceoloid to ovoid, 3.3–7 mm long; flowers 3–9 per spikelet; perianth bristles 6, pale brown, filiform, inconspicuous in fruit, about 3 mm long; plants of acidic bogs, tundra, and shores.
 ***Trichophorum cespitosum*** (deergass)
- 1b. Plants forming loose colonies or small tufts from creeping rhizomes; spikelets lanceoloid, 4–8 mm long; flowers 15–20 per spikelet; perianth bristles 6, white, flat, elongating to 1–3 cm in fruit; plants of calcareous peatlands, borders of marl ponds, and on calcareous substrates. ***Trichophorum alpinum*** (alpine clubrush)