



Carex gracillima,
HYMENOCHLAENAE



Carex gynandra,
PHACOCYSTIS



Carex leptoneura,
LAXIFLORAE



Carex lurida,
VESICARIAE



Carex radiata,
PHAESTOGLOCHIN



Carex scoparia,
OVALES



Carex swannii,
POROCYSTIS



Carex stipata,
VULPINAЕ



Carex vulpinoidea,
MULTIFLORAE



Scirpus atrovirens group

SEDGE LESSON 2: THE GENERALISTS AND THEIR GROUPS

Jerry Jenkins ♦ THE NORTHERN FOREST ATLAS PROJECT ♦ July 2020

INTRODUCTION

THIS IS THE SECOND of eight sedge lessons I am preparing for the on-line class, June-August 2020. They are intended to introduce you to sedges and sedge ecology by looking at the commonest woodland and wetland sedges and using them as exemplars of species groups.

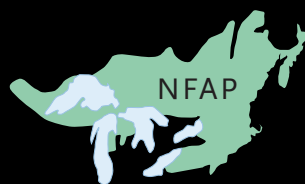
Lesson 2 introduces seventeen generalists: nine *Carex* from eight sections, and two *Scirpus*. These are among our commonest sedges, especially in the rural countryside. You will meet them in second-growth woods, pastures, meadows, roadsides, hedgerows, along wood roads and trails, on pond and stream shores, and in ditches and all sorts of wetlands. I have many of them within a few hundred meters of my house. You may too.

They are also old friends. I learned my sedges fifty years ago, in a more open and more pastoral Northeast, by going out the door and identifying everything I found. These are some of the first plants I met. The landscape has changed, but generalists are good at change and they remain common today. It pleases me that they are some of the first sedges you will meet too.

Because they are common, you will see them often and can get to know them well. They can be landmarks, familiar plants when you are in strange places. They can also be vantage points from which you survey groups of related species, and base camps from which you venture into steep and dangerous terrain.

Getting to know them well means knowing the whole plant, leaves, flowers and fruits, to bottom. Also knowing the group to which it belongs and the key characters that will identify the species and the group. Also, most important, knowing its life and seasons: spring foliage, flowers, fruits, late season growth, and overwintering leaves.

None of which is difficult. All it takes is curiosity and love. And a plant by the door to start with.



The Northern Forest Atlas Project
www.northernforestatlasproject.org



ABOVE, second-growth woods on the hill northwest of my house, 27 April, 017. Below, the White Creek and its floodplain east of my house, 14 January, 018. Much of the hill and floodplain was open pasture when I came here. At least 30 sedges live between the creek and the top of the hill.



RECALL LESSON 1: the big groups of spring woodland sedges are *Acrocystis*, *Phaestoglochin*, and the *Laxiflorae* and *Careyanae*. They flower and fruit quickly; in most of the species, the fruits are gone by late June. *Acrocystis* and the *Careyanae* are habitat specialists that don't fall in this lesson. *Phaestoglochin* and the *Laxiflorae* have some generalist species. I discuss two here. Starting in *Phaestoglochin*, *Carex radiata* grows in dense clumps and has fairly long slender leaves and slender, wide-spreading perigynia in small clusters along wiry stems. There is no red at the base of the plant. It is part of a 3-species group, the *Rosea* group, with slender leaves and small, well-separated perigynia. Within that group it is recognized, sometimes with difficulty, by the slender styles that are not tightly coiled.



RADIATA is **SLENDER**, grows in dense clumps, and has widely spreading lanceolate perigynia. In the woods the clumps are separated and easy to see. In meadows, as in the picture, you look for it amid other things. Once you have found a candidate, you make sure there is no red at the base of the plants and (just in case) that there are small bud-like clusters of scales without perigynia (where the male flowers were) at the tips of the spikelets. Then you look at the tips of the perigynia for slender styles whose ends aren't coiled, and you have it. Or probably have it, because the species lines in the *rosea*-group can be blurry. Here it is in tall grass by a barn with dandelion and jewelweed. Grass is everywhere, and looking for sedges within grass is a good skill to have.

EARLY SEASON GENERALISTS: *CAREX RADIATA* (Section *PHAESTOGLOCHIN*)



CHARACTERS OF *PHAESTOGLOCHIN* AND *RADIATA*: Section *Phaestoglochin* is Group 1 (compressed perigynia, 2 styles) and has the males at the tops of the spikes and unbranched clusters with the spikelets attached singly. Compare the *Ovales* (page 24) with males at the base of the spikelets, and the *Multiflorae* and *Vulpinae* (pages 35, 37) with branched clusters. *Radiata* has slender leaves and stems and well-spaced spikelets with widely spreading perigynia and slender styles that are not tightly coiled at their tips. Unless, of course, they feel like it.

CAREX Section *PHAESTOGLOCHIN*



rosea,
fertile woods



appalachica,
woods



muehlenbergii,
sandy fields, barrens



cephalophora,
dry woods, openings

ROSEA GROUP



radiata,
woods and moist open
places; generalist



cephaloidea,
moist fertile woods



sparganioides,
moist fertile woods

NORTHERN FOREST SPECIES OF *PHAESTOGLOCHIN*. All have flattened perigynia with sharp edges, males at the top of the spikes, and unbranched flower clusters (spikelets attached individually to the stem). The *Rosea* group have small, separated spikelets; the others have aggregated ones. *Radiata* is a very common generalist that you will see in all kinds of moist places. The others are habitat specialists, often locally common but rarely abundant. This is a must-know section. You will meet it every day in ordinary woods and thickets.



THE *LAXIFLORAE* bloom and fruit early but are vegetatively conspicuous the year around. Several species, particularly *leptoneura*, are generalists that turn up in all sorts of moist, partially shaded places. Here it is in mixed mid-elevation woods by the trail to Bourne Pond in the southern Green Mountains. The look and feel—relatively broad, smooth, shiny, m-pleated leaves; slender flowering stems with leafy bracts and spikelets more-or-less hidden in the axils of the bracts; bases of the shoots white or brownish—is pure *Laxiflorae*. Figuring out which one, especially vegetatively, is hard. Learn the group first. You will see it in almost every sort of moist woods. Get to know the color and texture, look at the new and old leaves, search for the remnants of the flowering stems. Knowing the common sedges year-around is an essential ecological skill. It also makes finding the rare ones a lot easier. Start early, practice daily, and you will get it.

EARLY SEASON GENERALISTS: CAREX LEPTONERVIA (Section LAXIFLORAE)



slender, stalked
spikelets in axils
of leafy bracts



broad stems; bracts with
sheaths 4 mm long or
more



ovaries with 3 styles; perigynia
rounded triangular, tapered to their
bases; with short beaks that are
often bent



leptoneura has 1 main nerve and a
few other indistinct nerves on each
of the three sides of the perigynia

THE LAXIFLORAE are medium sized and broad leaved and, except for *ormostachya*, have pale or light brown bases. Their diagnostic characters are the sharp-angled stems, conspicuous leafy bracts which originate from distinct sheaths, and rounded-triangular perigynia with tapered bases and short beaks. Compare the *Griseae*, larger and rarer, which tend, not uniformly, to have rough-awned scales and perigynia that are larger and more rounded at the base and have the nerves in grooves.

Within the *Laxiflorae*, *leptoneura* is best identified by the relatively few nerves of the perigynia. They are not easy to see or photograph on living plants; as a work-around I look for minute down-pointing teeth or hairs (scabrosity) on the edges of the blade just above the sheath. This is a secret I learned from Tad Dammon; please don't tell anyone.

THE LAXIFLORAE LOOK I: TOPS AND BOTTOMS



LEFT, *CAREX ALBURSINA* in a fertile ravine on Coon Mountain, eastern Adirondacks: very broad basal leaves; relatively broad stems with sharp or winged angles; broad leaf bracts that hide the spikelets. You don't have to get any closer than this to know what it is. Right, basal parts of *Carex laxiflora*: m-plated leaves; pale green or brown basal sheaths without blades. All our *Laxiflorae* except *ormostachya* have similar bases. The *Hymenochlaenae* and *Vesicariae*, common and somewhat similar, usually have red on their bases.

THE LAXIFLORAE LOOK II: MOPS OF LOW, BROAD LEAVES



LAXIFLORAE IN THE FIELD, showing pleated basal leaves; slender, often arching flowering stems; and long leafy bracts. Left column, *Carex laxiflora* and *albursina*. Right column, *Carex leptoneura*.



LAXIFLORAE IN THE YARD: a fine plant of *Carex albursina*, growing with *Carex radiata* and *gracillima* by my shop door. The broad leaves and broad bracts that hide the flower clusters are characteristic. The other *Laxiflorae*, while not true generalists, have a bit of a weedy streak, and will follow you home if you give them a chance.

SECTION LAXIFLORA, COMMON SPECIES



albursina,
fertile woods



blanda,
somewhat weedy
generalist, fertile
woods, roadsides,
thickets



laxiflora,
fertile woods



leptonervia,
average woods, gener-
alist in moist shade

THE WIDESPREAD NORTHERN FOREST SPECIES OF LAXIFLORAE. The species are generally similar, and mostly found in fertile woods. The broad leaves and bracts of *albursina*, the shorter spikelets of *blanda*, and the few nerves of *leptonervia* are the best characters. *Laxiflora* is more or less everything with straight beaks that doesn't fit the others. *Leptonervia* is the least fertility dependent, and the one most apt to be found in ordinary second growth.



CAREX GYNANDRA is an easy species in a hard group. It is a big tall clumped plant with broad m-pleated leaves with rough edges. The female spikelets are long and dangle. The scales have long rough points; the perigynia are compressed and the achenes have two styles. The stalked spikelets and compressed perigynia with two styles place it in Group 2: the long-cylindrical spikelets and two styles place it in Section *Phacocystis*. Within *Phacocystis*, it is close to *Carex crinita*, from which it differs in the rough sheaths and tapering bodies of the females scales. It grows in wet meadowy or marshy places in sun or shaded: woods, ditches, logging roads, sedge meadows, pond and river shores, drained beaver ponds, and mowings. These plants were at the edge of a driveway on an old farm. *Gynandra* is the common species at middle elevations; *crinita* replaces it in the valleys.



male tips on
female spikes

dangling spikes, some
all male or female,
some mixed



female scales with long rough
points; perigynia much shorter than
the scales



perigynia compressed, styles 2,
body (the blade part) of the female
scales tapering to the midrib



GYNANDRA is recognized as a member of the (large) Section *Phacocystis* by the combination of some all-female and all-male spikelets and compressed perigynia with two styles. When the styles are gone, the compressed achenes will do. Three other species of *Phacocystis* dangle, and two of them have long scales. See page 17 for a comparison. The tapering bodies (= blades) of the scales separate it from *crinita*. *Phacocystis* is hard, especially western North American; separating these two was one of many trouble spots. Lisa Standley, whom some of you have met through her moss course posts, was the one who finally sorted them out.



GYNANDRA along the edge of a wood road IN Ray Book, New York, early July, 2016. Trails and old roads in woods are essentially linear gaps, brighter, wetter, and a bit more open than the forest as a whole. Animals use them, and many sedges, which are animal dispersed, follow the animals. Walking logging or powerline road is a great way to meet the common sedges in your area. Walking pond shores is another. Many sedge perigynia float, and their achenes germinate on shores as the water levels drop. I have seen whole drift lines of *gynandra* perigynia on the shores of mountain ponds.

Shores and roads are often described as “disturbed” habitats, and sedges like *gynandra* are said to like disturbance. This not really accurate. *Gynandra* likes to be in or near wet openings, and it tolerates late-season mowing well. But it actually has a massive investment in roots and rhizomes, and doesn’t like soil disturbance at all. It colonizes logging roads after disturbance, perhaps from a seed bank, and persists; but it doesn’t grow where there is annual disturbance.



dangling spikes, some
all male or female,
some mixed



female scales with long rough
points; perigynia much shorter than
the scales



scale bodies end
in lobes



perigynia compressed, styles 2,
body (the blade part) of the female
with lobes where it joins the midrib

CAREX CRINITA is a sister species to *gynandra*. It is found at lower elevation is and more fertile settings, and is a bit more of a wetland specialist. It is separated from *Gynandra* by the lobed scale bodies and smooth sheaths. The characters are pretty good, but not perfect. Use them, but with care.

Close pairs like *crinita-gynandra* are common in sedges, and the character combinations are often more stable than you might expect. At least some of the time the mechanism is genetic. The sedges and rushes have diffuse centromeres, meaning that the spindle is broadly attached to the chromosome in meiosis. This results in lots of chromosome breakage and changes in chromosome length and numbers. Some of the changes are trivial, some deleterious. Some, at least in theory, can create barriers to gene exchange and stabilize small character differences.

THE NORTHERN FOREST SPECIES OF SECTION *PHACOCYSTIS*



aquatilis,
fens



bigelowii,
alpine tundra



crinita,
low-elevation generalist



gynandra,
mid-elevation generalist



haydenii,
marshes, fens



lenticularis,
river shores



nigra,
open peaty wetlands



paleacea,
brackish wetlands near
coast

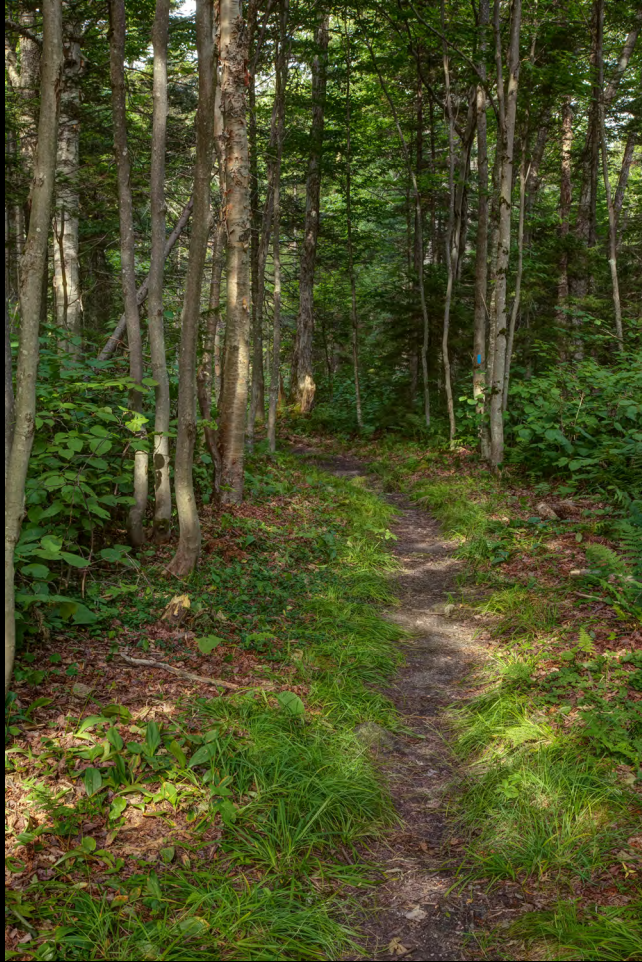


stricta,
marshes, swamps,
shores



torta,
rocky river shores

THE WIDESPREAD NORTHERN FOREST SPECIES OF *PHACOCYSTIS*. I lack good close-ups of *emoryi*, a mid-western species of river shores. The group is moderately hard, and you need to smart about how you study them. My preferred way is to divide the group into subgroups by habitat and then divide it again by conspicuous characters, like arching spikelets of *torta* and the long scale tips of *paleacea*. Then cross-classify: make a table with habitats one way and diagnostic characters the other. The intersection points are species. Thus a species with long scales in a brackish marsh should be *paleacea*; one with black scales in an open peatland should be *nigra*. open peatlands. You use the table to get a plausible guess, and then use the diagnostic characters for that species to confirm. Your putative *nigra* is a creeper, has amphistomous leaves that are whitened above, and lacks bladeless sheaths at the base. *Nigra* is confirmed. This technique—cross-classify, guess, confirm—outperforms every other identification technique we have tried.



lower sheaths red



separate male spikelet

spikelets slender, arching or dangling



perigynia slender, tapering to the base

MOST DECIDUOUS AND MIXED WOODS have one or more species of tall sedges with slender arching or dangling spikelets. The bases of the plants are often red. The perigynia are slender and, unlike *crinita* and *gynandra*, have three styles and are not compressed. The plants are in Section *Hymenochlaenae*, pronounced anyway you can manage. Or just woodland dangles. We have eight species. Three—*arctata*, *debilis*, and *gracillima*—are generalists. They are among the first tall sedges you will see in woodlands in June. Once you know them, you will find one or more in almost every moist shaded place.

The pictures show *debilis*: leafy clumps with slender culms, mostly bent over, lining a trail in mid-elevation woods; with red bases and arching spikelets; perigynia slender, elongate pointed at both ends. The group as a whole is heterogeneous; all dangle and have elongate perigynia, but not all have red bases or long spikelets. *Debilis* is a forest generalist; deciduous and mixed woods, thickets, and openings, low to medium fertility, dry to moist, valleys to mountains. In ordinary, low-fertility, mixed northern hardwoods it is one of the commonest sedges.



DEBILIS, *ARCTATA*, AND *GRACILLIMA* are the three common generalist danglers. *Arctata* looks much like *debilis*; its largest leaves are often 5 mm wide, and the perigynia wider and more rounded below. The perigynia have a distinct stalk, but those of *debilis* have a sort of stalk and the difference is not great.* *Arcta* is commonest in fertile woods at low elevations, while *debilis* is most abundant in acid woods at mid elevations. But the two often grow together.

Gracillima is a low elevation species of moderate fertility and a very general generalist: woods, meadows, thickets, flood plains, lawns, roadsides, barnyards. Look and you will find. Broad leaves like *arctata*, but the perigynia oblong with rounded tips, and the terminal spikelet with perigynia. *Aestivalis*, p. 23, sporadic in mid-elevation deciduous woods, has similar perigynia but furry leaf sheaths.

*If you like dissecting, you can open a perigynium of *debilis* up and see that the achene is raised on a stalk within the perigynium.



A NICE *ARCTATA*, in beech woods in spring, the flowers just starting to bloom. At this stage the wide m-pleated leaves look like something from the *Laxiflorae* but the flowers are wrong and there is usually some red at the base. *Debilis* usually has narrower leaves, but wide *debilis* can overlap narrow *arctata*.



A CLUMP OF ARCTATA, in flood-plain thickets near my house, late spring. Shiny, m-pleated leaves, like *leptonervia* but taller, and with some red on the bases.



GRACILLIMA IN A BARNYARD, with grasses, strawberries, and clover, in late spring. Broad, shiny, light-colored leaves with red or brown at their bases. Sprigs of *Carex swannii* above the clover in the center and *Carex radiata* mixed with it.

NORTHERN FOREST SPECIES OF SECTION *HYMENOCHLAENAE*



aetivalis,
mid-elevation
woods



gracillima,
generalist



castanea,
calcareous meadows,
swamps, rich forests



sprenglii,
dry fertile rocky
woods



formosa,
wet limy thickets



arctata,
generalist



debilis,
generalist



prasina,
swampy fertile
woods

SEVEN WIDESPREAD NORTHERN FOREST SPECIES OF *HYMENOCHLAENAE*. All arch or dangle, and have relatively slender, elongated spikelets. The shapes of the perigynia vary a lot. The group as a whole is closely related to, and perhaps not sharply separable from Section *Porocystis* (p. 30). *Sprenglii* and *prasina* are outliers, and look it. They likely belong somewhere else, but no one knows where.



Carex scoparia



oval spikelets, with
males at base



flattened perigynia,
winged mostly above the
middle, three or more
times as long as wide

THE OVALES, WITH 19 NORTHERN-FOREST SPECIES, are our largest section of *Carex*, and, in fairness, probably the hardest. They are also, to a large extent, generalists and gypsies: they love burns, gaps, trails, roads, shores, marshes, mounds, mowings, scrapes, and ditches. They arrive after disturbance, persist while the habitat persists, sometimes for decades, and then up stakes and move somewhere else when it changes. They have some habitat fidelity—*bebbii* and *cristatella* are wetland plants, *foenea* and *argyrantha* dry soil ones—but also a good deal of gregariousness. It is rare to find just one in a habitat and not hard to find five or more.

I have treated the *Ovales* in a lot of detail elsewhere*, and don't want to overwhelm you in Lesson 2. This lesson introduces three species that are very common in woods and dooryards on fertile soils in Vermont. You will certainly see others (and if you are in the acid north in Maine or New Hampshire you will likely only see others). But these are a good start, and a place to work from. We will have an *Ovales* lesson eventually, perhaps next year after I have been able to get back to Maine.

Carex scoparia is one of our commonest species, found in marshes, and wet thickets and meadows, both on sterile or fertile soils. The flattened, winged perigynia and oval spikelets with the males at the base make it an *Ovales*; the long perigynia, often slightly asymmetrical, with the wing widest above the middle, make it *scoparia*.

* See the photo guide and digital atlas for detailed treatments, and also my *Notes on the Ovales*, 2013, posted with these lessons.



CAREX SCOPARIA with jewelweed and grasses in a moist barnyard, Grafton, New York. The narrow-oval clusters, like paintbrushes, in compact heads, are distinctive. Proud downeasters will, of course, check to see if they have an Orono or Dawnland sedge, *oronense* or *waponahkikensis*.



Carex normalis

compact, stiff flower clusters, rounded spikelets with widely spreading perigynia; perigynia oval, a narrow wing extending nearly to the base, at least on good perigynia on good days.

Carex projecta

arching flower clusters with at least the lower spikelets separated; spikelets with conical bases and often with ascending perigynia; perigynia narrower, the wing mostly above the middle.

Projecta and *normalis* are two of our commonest *Ovales* of moist, open, fertile soil, typically found in meadows and thickets. Both have relatively broad leaves (largest leaves over 4 mm wide) with sheaths that are somewhat loose at the summit. The flower clusters of *normalis* are often compact and don't nod; the perigynia are oval, closer to 2x as long as wide than 3x as long as wide and, when dry, usually with a narrow wing to near the base. *Projecta* has more open, nodding clusters, except when you mow it, and relatively narrower perigynia, closer to 3x as long as wide, with the wing mostly in the upper half. Intermediates occur; we work with what we have. If your plant has *normalis* perigynia but narrow leaves, try *tenera* or *bebbii*. If it has *projecta* perigynia but the stiff spikes and big spikelets of *normalis*, try *tribuloides* or *cristatella*. Nomenclator says there are a lot of names and we might as well use them.



CAREX PROJECTA in moist thickets in a floodplain, White Creek, New York. Stems tall, arching at their tips; largest leaves over 4 mm wide; lower spikelets in cluster separated; perigynia slender, angled upwards, giving the spikelets a conical base. *Projecta* often forms big loose clumps with lots of sterile shoots. The fruiting stems may be within or above the clump. *Tenera* is similar and grows in the same sort of places but has narrower leaves and broader perigynia.



CAREX NORMALIS often has tall fruiting stems that arch high above the leaves. The upper stem may arch a bit but doesn't nod; spikelets may be aggregated or separated; the perigynia are broader than those of *projecta* and *tenera* and spread more widely. *Tribuloides* has narrower perigynia.

NORTHERN FOREST SPECIES OF SECTION OVALES

GROUP 1: bodies of perigynia nearly as wide or wider than long



BREVIOR



MERRITT-FERNALDII



CUMULATA



SILICEA



MOLESTA

GROUP 2: perigynia oval, broadened above middle; scales with long awns, or hiding perigynia bodies and beaks



FOENEA



ARGYRANTHA



HORMATHODES



ADUSTA

GROUP 3: perigynia oval, less than 2.5:1, the wings sometimes extending to base



TINCTA



NORMALIS



TENERA



BEBBII

GROUP 4: perigynia narrow oval, more than 2.5:1, the wings often stopping above the base



PROJECTA



CRISTATELLA



WAPONAHKIKENSIS



TRIBULOIDES



SCOPARIA

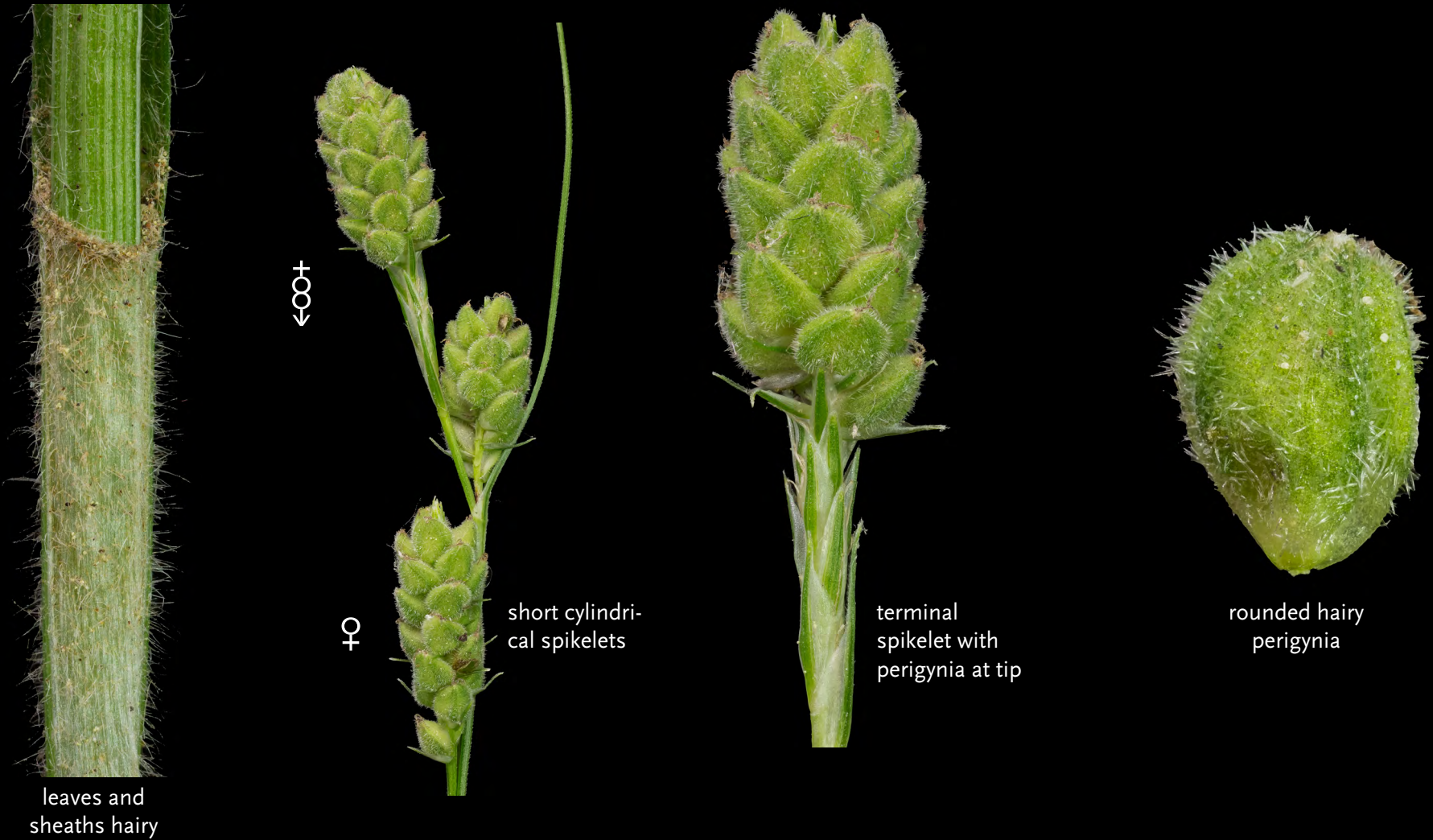


CRAWFORDII

THE PERIGYNIA OF EIGHTEEN NORTHERN FOREST SPECIES OF *OVALES*, sorted into groups by shape. The overall shape is a good guide; *brevior* never looks like *argyrantha*, or *crawfordii* like *normalis*. But there is a lot of variation, and neither the species nor the groups are clear cut. None the less, used in connection with leaf and inflorescence characters, the groups will get you close.



FIVE SECTIONS OF *CAREX* contain plants with furry leaves or sheaths. Most of them are uncommon or ecologically restricted or both. The exception is Section *Porocystis* which contains two common generalists. *Carex swanii* is the commonest; it is a leafy light-green plant with white furry perigynia that is common, though not particularly conspicuous in moist thickets, second-growth woods, and meadows. Look for the short, white-furry spikelets hidden among the leaves. The picture is of a mowed plant, growing with grasses and clover, in a barnyard in Grafton, New York. The grooved leaves with v-folds, common in sedges, absent in grasses, will help pick it out.



SECTION *POROCYSTIS* has furry leaves and sheaths and rounded or oblong perigynia that are furry or smooth. In three of our four species, the terminal spikelet has perigynia at the tip. Within the group, *swanii* is distinguished by the short spikelets and rounded furry perigynia.



OUR SECOND COMMON SPECIES, *Carex pallescens*, is found in meadows and open second-growth woods. Its marks are the slender furry leaves and glossy oblong perigynia. Pastures and meadows are getting scarce, and I see it less than I used to.

NORTHERN FOREST SPECIES OF SECTION *POROCYSTIS*



swanii
generalist, moist woods,
meadows, thickets



pallescens,
generalist, meadows,
open woods



virescens
moist or dry woods



hirsutella,
moist limy meadows,
shores

THE FOUR NORTHERN FOREST SPECIES OF *POROCYSTIS* are usually easy to identify. *Virescens* is close to *swanii* but more of a woodland obligate, differing in its longer spikelets and more oval perigynia. Young or small plants can be hard to place. *Hirsutella* is like *pallescens* but limited to open limy habitats; it has rounder perigynia and perigynia at the tip of the terminal spike. I used to see it frequently in the pastures and meadows around here; they are mostly gone now.



MOST Group I *CAREX* have the spikelets arranged singly on the stem. Three groups, the *Multiflorae*, *Vulpinae*, and *Heleoglochin*, have the spikelets on short side branches or, when the branches are shortened, have several spikelets that seem to be attached at a single point. *Heleoglochin* has limy-wetland specialists that we will get to in the lesson on fens; the *Multiflorae* and *Vulpinae* have generalist species that I treat here.

Both groups have a distinctive look. The *Multiflorae* have long pleated leaves and slender, wiry stems; the flower cluster has clear branches, the spikelets are cylindrical, and the beaks of the perigynia fairly short. *Vulpinoidea*, the common species, is found in wet meadows, marshes, ditches, and along streams.* It also grows in my lawn; a lot of things grow in my lawn. *Vulpinoidea* has long leaves and makes big mop-headed clumps, with the spikelike flower clusters sticking up in the middle.

* I asked my friend Nomenclator why *vulpinoidea* was not in the *Vulpinae*. He quoted Samuel Clemons, “In the first place, God made idiots. This was for practice...” and then added something coarse about the rules of nomenclature that I can’t repeat here.

NORTHERN FOREST SPECIES OF SECTION MULTIFLORAE



conspicuous
spikelet
bracts



fronts of
leaf sheaths
wrinkled



perigynia oval,
compressed,
with narrow
beak



flower clusters
branched



male flowers very
inconspicuous, at
tops of spikelets

flower clusters
branched

vulpinoidea, generalist, moist soil

conspicuous
spikelet
bracts



perigynia oval,
compressed,
with broader
beak

annectens, dry limy meadows

AS A GROUP, our *Multiflorae* have long narrow v-folded leaves with the fronts of the sheaths wrinkled; branched flower clusters with conspicuous needle like bracts; oval, compressed perigynia with beaks; and a few male flowers at the top of the spikelets. *Vulpinoidea*, the common species, has the flower clusters down among the leaves and perigynia with narrow beaks that stay greenish or turn brown as they mature. *Annectens*, much less common, has leaves shorter than the flowering stems and perigynia with broader beaks that turn yellow or brown as they mature.



THE *VULPINAE* resemble the *Multiflorae* in their branched flower clusters, and, in the case of *stipata*, cross-wrinkled sheaths. They differ in their broader stems with sharp angles, in lacking the conspicuous spikelet bracts, and in the wedge-shaped (lanceolate) perigynia with long beaks and spongy bases. The general plan of the two groups is similar; the details are quite different, and they can usually be separated at a glance.

Stipata is the commonest species and the one with the widest ecological range. It is best separated by the combination of delicate leaf sheaths and wedge-shaped perigynia. *Laevivaginata*, which looks similar in the field, has sheaths with a thickened edge and slightly longer perigynia.

NORTHERN FOREST SPECIES OF SECTION *VULPINAE*



stipata,
generalist, moist soil



short spikelet
bracts

laevivaginatus,
shaded streams, wet
places in forests



alopecoidea,
fertile alluvial thickets, wet
limy meadows

THE THREE NORTHERN FOREST SPECIES OF *VULPINAE*. All have branched inflorescences, though you may have to work to convince yourself of this. *Stipata* and *laevivaginatus* are similar; the best distinction is the thickened band at the top front of the sheath in *laevivaginatus*. *Alopecoidea* has more rounded perigynia with shorted beaks. If you miss the branched flower clusters or thick stems and wind up in the *Ovales* or *Multiflorae*, you won't be the first.



THE *CAREX* WITH INFLATED PERIGYNIA are in four sections: the *Rostrales* with slender perigynia, the *Lupulinae* with huge ones, the *Squarrosae* with males at the base of the spikelets, and the *Vesicariae* with all the rest. Most of the species are woodland or wetland specialists. Only the *Vesicariae* have generalists. *Carex lurida* is the most widespread. The picture shows in a wet meadow with several common pasture grasses. It also grows in open wetlands, ponds and stream shores, along wood roads, and in ditches. Ditches, by the way, are a kind of universal sedge habitat. If you can name a sedge, there is probably a ditch somewhere that has it. Note the broad, m-pleated leaves, single male spikes, thick female spikes, and inflated perigynia with long beaks.



spikelets with
leafy bracts,
down among
leaves



spikelets over 15
mm wide.



perigynia strongly inflated,
with 10 or fewer veins, con-
tracted into a long slender
beak.

scales with small
bodies and long
needle tips, their
bodies hidden by the
perigynia



broad, shiny m-
pleated leaves;
bases of stems
often red

THE *VESICARIAE* as whole have cylindrical spikelets with inflated perigynia that are mostly less than 1 cm long. Within the *Vesicariae*, *lurida* is distinguished by the combination of thick spikes, needle-tipped scales whose bodies are hidden by the perigynia, and large, strongly inflated perigynia with 10 or fewer veins.



SPIKELETS OF *LURIDA*, with grasses in a wet meadow. Note the shiny leaves, single male spikes, inflated perigynia with long beaks. *Lurid*, in botanical Latin, means sal- low or yellow brown, not ghastly or garish.

GENERALIST RELATIVES OF *CAREX LURIDA*: *CAREX BAILEYI* AND *HYSTERICINA* (SECTION *VESICARIAE*)



baileyi

moist, sterile or acid soils, often sandy; like *lurida* but smaller: spikelets under 15 mm wide, beaks of perigynia often longer than bodies



lurida

meadows, moist woods, shores, open wetlands, ditches, swamps: perigynia with fewer than 13 nerves, their bodies top shaped, the nerves extending up into the beak



hystericina

open limy wetlands, shores, thickets, ditches: perigynia with 15 or more nerves, their bodies oval, the nerves fading out below the beak

CAREX LURIDA has two generalist relatives, *Carex baileyi* and *hystericina*. Both are locally common but not as widely so as *lurida*. *Baileyi* is a three-quarter size *lurida* found on open wet acid soils in the Appalachians. It is very common around ponds and along logging roads, especially on wet sandy soils, in parts of the Adirondacks and on the Green Mountain and Berkshire plateaus. *Hystericina* is a calciphile that looks like a *lurida* with less-inflated, more densely packed perigynia. It is found throughout the Northern Forest Region, and is especially common in the limy valleys of Vermont and western Massachusetts.

NORTHERN FOREST SPECIES OF SECTION VESICARIAE

GROUP 1: scales with tiny bodies and needle tips; the bodies are hidden by the perigynia and only the tips stick out.



baileyi



lurida



hystericina



comosa



pseudocyperus



schweinitzii

GROUP 2: scales without needle tips, their bodies are visible between the perigynia.



retrorsa



tuckermanii



oligosperma



vesicaria



utriculata



rostrata

THE TWELVE NORTHERN FOREST SPECIES OF *VESICARIAE*. The group is large, and hence variable; all have cylindrical spikelets and beaked perigynia that are at least slightly inflated. Molecular studies show that it is largely a natural group, but suggest some of the other inflated-perigynia groups may be mixed with it.



MOST OF THE NON-CAREX SEDGES are wetland specialists. A few species in the late-flowering genera like *Bulbostylis capillaris* or *Cyperus esculentus* are weedy. These aside, the most impressive non-*Carex* generalists are the bulrushes in the *Scirpus atrovirens* group. They are tall plants with broad shiny leaves, very common in moist places: meadows, seasonal wetlands, shores, wet places in the woods, roadsides and ditches. The photo shows them in the median of a shaded wood road in Ray Brook, New York. The small dark heads of spikelets on spreading branches from the top of the stem are good mark.

BULRUSH GENERALISTS: *SCIRPUS ATROVIRENS* GROUP



clusters of spikelets
on straight branches,
forming an umbel

a circle of bracts at the top
of the stem



spikelets small, in round
clusters



new plants may arise from
within spikelets

ALL OUR *SCIRPUS* have similar architecture; a leafy stem with whorl of leafy bracts at the top of the stem; spikelets in a simple or compound umbel above the bracts; achenes surrounded by bristles. They differ in the shape of the spikelets, whether they are stalked, whether there is red on the bracts, and how long the bristles are. The *atrovirens* group is distinguished by brown or black sheaths and bracts, straight branches in the flower cluster, and short bristles hidden behind the scales.



A *SCIRPUS* OF THE *ATROVIRENS* GROUP, in flower in a meadow in late June. The white curved things are the styles, the yellow-white things that stick farther out the anthers. Each one of the ball-shaped things is a head of spikelets. A crab spider is hiding under a head, and there is webbing between some of the other heads. Despite being wind pollinated, sedges are loaded with small webs, suggesting that insect visitors are common. Some may come casually, some deliberately. There are a lot of small insects in the world and they have to go somewhere. Either way, sedge inflorescences are busy places.

NORTHERN FOREST SPECIES OF *SCIRPUS*



ancistrochaetus,
wooded pools,
drained beaver
flows



atrovirens group,
generalist, moist
soils



expansus,
wet stream banks,
ditches



microcarpus,
wetland generalist



cyperinus,
wetland generalist



atrocinctus,
wetland generalist



pendulus,
wet limy meadows,
disturbed limy soil



polyphyllus,
wet woods, stream
banks

SEVEN WIDESPREAD NORTHERN FOREST SPECIES OF *SCIRPUS*. All have terminal umbels, with the branches radiating from the top of the stem. *Cyperinus* and *atrocinctus* have long woolly bristles; *pendulus* and *ancistrochaetus* have arching or dangling branches; *expansus* and *microcarpus* have red leaf sheaths; *polyphyllus* has ten or more stem leaves; and the *atrovirens* group is what is left. Several of these species, particularly *atrocinctus*, *cyperinus*, and *microcarpus*, occur in a wide variety of wetlands and may be described as wetland generalists. There are other important wetland generalists, and we will get to them in later lessons. All of them are restricted to wetlands; unlike, say *Carex scoparia* or *Scirpus atrovirens*, they won't occur in second growth woods or in your lawn.



SCIRPUS MICROCARPUS on an old beaver dam, with alders, bur-reeds, and other sedges. *Microcarpus* is a large creeping sedge that occurs in all sorts of wetlands: swamps, pond and river shores, sedge meadows, marshes, wet thickets, ditches. It a wetland generalist; its ecological range is wide, but not as wide, say as *Carex lurida* or *scoparia*, which occur in both wetland and upland sites.

1 THE MAJORITY OF OUR SEDGES have strong habitat associations. *Carex pedunculata* is a woodland species associated with mineral-rich seepage. *Eriophorum vaginatum* is a species of open, acid peatlands; *Eriophorum viridi-carinatum* a species of rich fens.

2 When learning habitat specialists, combining habitat clues and morphology is very powerful. If you are on a river or lake shore, the only species of *Phacocystis* that grows in clumps, has whitened upper leaf surfaces, and lacks bladeless sheaths at the base is *lenticularis*.

3 I call this approach cross-classifying by habitat and morphology, or just habitat × morphology. It is the way the pros do it and the way that you should learn it.

4 Before you can learn the sedges that are in particular places, you need to learn the sedges that can be anywhere. There are a dozen or so generalist sedges that turn up in many different habitats. *Carex lurida* can be in marshes, meadows, wet woods, or on shores. *Carex radiata* grows in woods, successional thickets, barnyards, and, it turns out, my lawn.

5 One reason to learn the generalists first is that you are going to see them everywhere and don't want to have to identify them from scratch each time. Once you know them, you can go into a habitat, check them off, and focus on the species that are restricted to that habitat.

6 Another reason to learn them is that they are starting points from which to learn other species. Each has related species, and each is in a distinctive genus or distinctive section. If you learn the genera and sections, you will recognize the related species when you meet them. If you learn the related species, you will have a good start on the common sedges.

7 Put another way. Our sedges are related by systematics and ecology. Call the set of all their relationships *sedgeland*. Your job is to make two maps of it, one taxonomic and one ecological, and keep both in your head. The generalists in this lesson will teach you about morphology and the big divisions of the taxonomic map. The specialists in future lessons will teach you about habitat preferences and show you how to construct the ecological map.

8 This lesson treats 17 species in two genera and 8 sections:

Carex Section *Laxiflorae*: *Carex leptoneura*

Carex Section *Phaetoglochin*: *Carex radiata*

Carex Section *Hymenochlaenae*: *Carex arctata*, *debilis*, *gracillima*

Carex Section *Ovales*: *Carex normalis*, *projecta*, *scoparia*

Carex Section *Porocystis*: *Carex pallescens*, *swanii*

Carex Section *Multiflorae*: *Carex vulpinoidea*

Carex Section *Vulpinae*: *Carex stipata*

Carex Section *Vesicariae*: *Carex baileyi*, *hystericina*, *lurida*

Scirpus: *Scirpus atrovirens* group, *microcarpus*.

If you learn these generalists and the genera and sections they are in, you will know two of our four largest sedge genera and have a good starting point for learning an additional 58 related species. Really not bad for the second lesson.

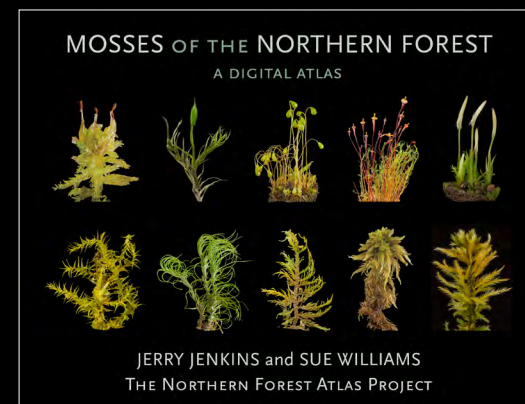
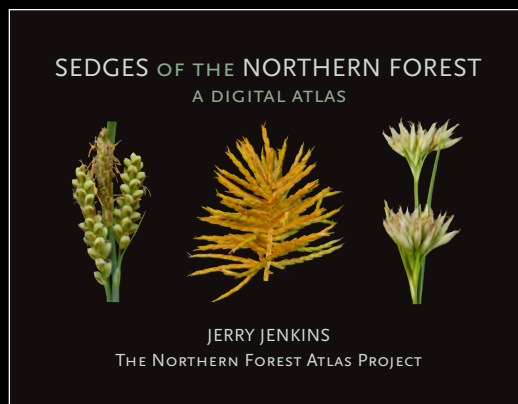
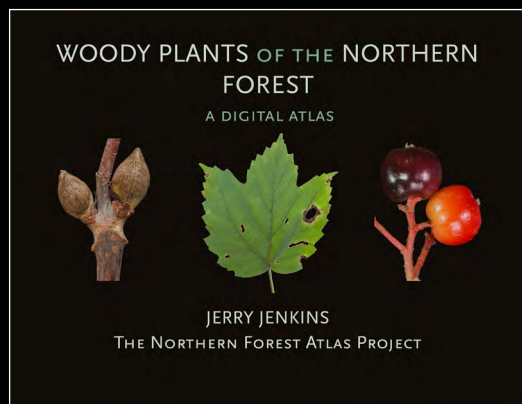
9 Section *Ovales* deserves special note. It is the largest northern-forest section of *Carex*, with 19 species. It is also the hardest. You will need to learn it and will enjoy it once you do. But you should approach it carefully, and, if possible, get someone to help you when you do.

10 The reasons that the *Ovales* are hard are interesting. The first is morphological: the spikelets and the perigynia, while quite varied, form a continuous series. There are clear differences between related species, say *normalis* and *tribuloides*, but it is hard to tell where the perigynia of one end and those of the other begin. This means that you need to get your eyes off the top of the plant and look at growth form and leaves and sheaths. This is never a bad idea with any sedge; with the *Ovales* is crucial.

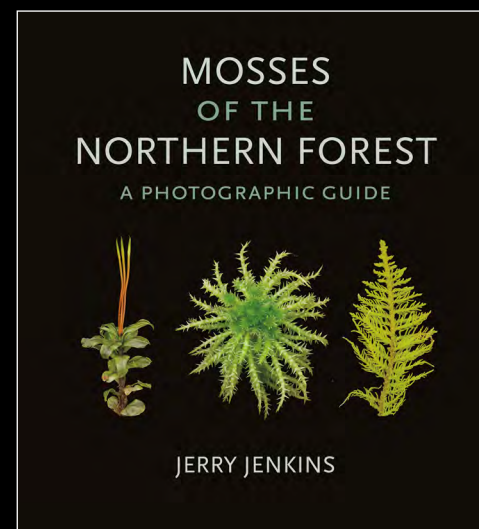
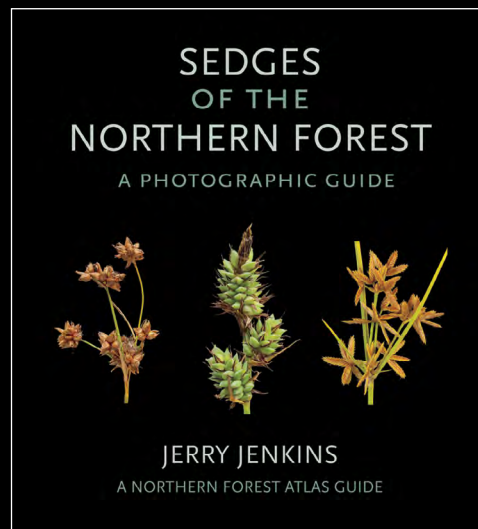
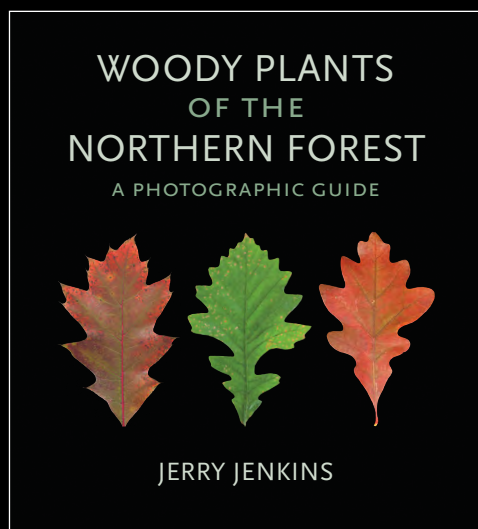
11 The other reason that the *Ovales* are hard is ecological. About 13 of the 19 northern forest species are generalists. You can find them in many different places and in many combinations. This makes them different from other hard groups. *Phacocystis* is certainly hard, but there are rarely more than two or three species in a habitat, which helps a lot. In the *Ovales* there can be five or eight species in a habitat, and you can't predict which they will be. In *Phacocystis*, habitat × morphology works superbly. In the *Ovales*, habit often passes and you have to know the morphology cold.

PUBLICATIONS OF THE NORTHERN FOREST ATLAS PROJECT

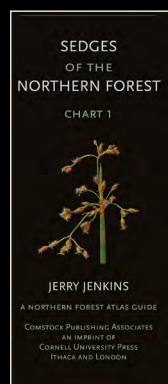
DIGITAL ATLASES



PHOTOGRAPHIC GUIDES



WATERPROOF FOLDING CHARTS



As of Spring, 2020, the Atlas Project has produced digital atlases, paper photographic guides, and folding charts to woody plants, sedges, and mosses. The digital atlases are available for download from our website, northernforestatlas.org; the photographic guides and charts from Cornell University Press, cornellpress.cornell.edu. Photographic guides to grasses, a digital atlas of grasses, and a book-length field guide to woody plants will be published in 2022.