

**\*  
THE  
SHORT ALDRICH TRAIL  
SPRING EPHEMERAL PLANTS**



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\*Because this field guide has a focus on first flowering dates, the plant profile order is based upon phenological characteristics.

## INTRODUCTION

Nature's first green is gold,  
Her hardest hue to hold.  
Her early leaf's a flower;  
But only so an hour.  
Then leaf subsides to leaf.  
So Eden sank to grief,  
So dawn goes down to day.  
Nothing gold can stay.

– Robert Frost

Robert Frost wrote this small poem about, among other things, death and spring ephemeral plants three years after he moved to a farmhouse in Shaftesbury, Vermont. The house is scarcely five miles, as the crow flies, from the Short Aldrich Trail in North Bennington. The poem is one of the most famous in a collection that won the Pulitzer Prize. It is not hard to see why. It reflects a fixation – a common one, perhaps, because it is so caught up with our perceptions of beauty, of grief, of human life and loss – with the pathos of precious things that seem to fade too fast. Spring ephemerals represent perfectly the notion of the exquisite that cannot last.

Spring ephemerals flower early in spring, before summer's foliage shades the forest floor. Their colors are often more tender, their petals more delicate than those of the flowers that must weather the summer. Their pollinators are primarily queen bees – of the genus *Bombus* – that have passed the winter beneath the leaf litter. Ants disperse most spring ephemeral seeds, and so these seeds rarely travel far or quickly. Moreover, all the species (but one) in this field guide are relatively long-lived perennials, needing time to grow and establish. Many of these species are only found in primary-growth woodlands, and in those woodlands that have grown a relatively long time since a clearing. This makes them good indicators of land-use history, and of a forest stand's current state of succession and levels of native biodiversity.

It has recently been suggested that spring ephemerals may, in other ways, serve as indicator species. Scientists have found that many species of flower are blooming earlier now than they did in the past, seemingly a result of global climate change. Abraham Miller-Rushing and Richard Primack, using a data set begun by Henry David Thoreau in the 1850's, found that early-blooming species in particular are subject to climate-driven shifts in phenology, which are associated with rises in mean winter and spring temperatures. The consequences of such shifts are not yet well understood, but we have reason to fear that, by creating plant-pollinator

mismatches, they might lead to the decline of certain woodland species, to the increase of others – to changes, in short, in spring woodland flower communities that could end in extinction and a loss of biodiversity. They may end, if nothing else, in the loss of lovely things.

For this reason, observations on flowering spring ephemeral plants have become increasingly valuable. At the least, we can document loss and change; though we may hope to build a foundation for gaining further knowledge that would inform human behavior and management techniques. In summer, the spring ephemerals will fade, as they have always done. Yet it would make one just a little hopeless to think they might not return the next spring.

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## THE SHORT ALDRICH TRAIL

For the purposes of this field guide, the Short Aldrich Trail is divided into five sections – beginning with the map of the Park-McCullough trails at the trailhead off West St.. These sections will be referred to throughout the plant profiles, so that one reading this guide might, in future years, locate the species described.

**Section I:** This is the Mile-Around-Woods trail itself, and the narrow footpath that links the loop with the field to the south. As, in walking the Short Aldrich Trail, one can take either the east or the west fork, this section includes both. The whole area is reasonably homogeneous. It is mostly level, so aspect does not create significant variation. The canopy is in a fairly late stage of succession, and is dominated by beautiful *Fagus grandifolia* (American beech) and *Acer saccharum* (sugar maple). Late in the spring, a carpet of *Galium aparine* emerges, and some invasives, including *Lonicera morrowii* (bush honeysuckle), *Berberis thunbergii* (Japanese barberry), and *Alliaria petiolata* (garlic mustard) can be found along the wood edges. Nevertheless, the understory here is home to a diverse community of native spring ephemeral plants. The large clusters of *Dicentra canadensis*, and the vast patches of *Trillium grandiflorum* are particularly pleasing.

**Section II:** One reaches this section after crossing the open field to the south of the Mile-Around-Woods and turning left at the sign for the Short Aldrich Trail. Upon ducking under a hedge of honeysuckle, one begins to climb a west-facing slope. Two thirds of the way up lies a beautiful moss-covered stone wall; there is another stone wall on the east-facing side of the hill. Along the hill's crest – between the two walls – certain species, like *Caulophyllum thalictroides* (blue cohosh), are notably more plentiful than they are outside the walled-in area. This may be because the terrain here is quite steep, and a small patch of the canopy is still, remarkably, primary growth. This area is dominated by large *Acer saccharum* (sugar maples). The understory is open and airy, not overgrown either with invasives or with large native species – though late in the season it becomes a rolling green sea of jewelweed. Nevertheless, many of the most lovely and delicate early-spring ephemerals can be found here (either first or exclusively) particularly in the sunshine of the southeast-facing slope. These include: *Sanguinaria canadensis*, *Claytonia*

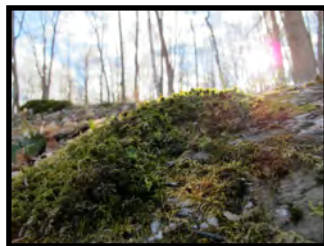
*caroliniana*, *Erythronium americanum*, the exquisite *Anemone acutiloba*, and many species in the genus *Viola*.

Exiting Section II, one must walk on the road for a time before crossing 67A and Paran Creek and descending again onto the Short Aldrich Trail.

**Section III:** This section of the trail skirts an old millpond and some marshy areas. It is relatively wet and shaded – the canopy being dominated by evergreens – primarily young *Pinus strobus* (white pine). In addition, one finds large shrubs (mostly honeysuckle), though native shrubs, like wild raspberries (*Rubus* spp.), grow here as well. Except for these shrubs, and a number of weedy grasses and dandelions, the understory is a carpet of coppery needles. A few extraordinarily large and majestic white pines are the area's main appeal.

**Section IV:** This segment of the trail ascends the hill towards the main part of the Bennington College campus. It is the most vegetatively diverse segment of the eastern Short Aldrich Trail. The canopy is early-successional, and includes *Carya cordiformis*, (bitternut hickory), possessor of the most beautiful, yellow-velvet leaf buds in the forest; these can be found above the spring ephemerals, before the canopy leaves unfurl. Beside the bitternut hickory grows *Carpinus caroliniana* (muscle-wood or blue beech), with its graceful limbs. A number of small *Quercus* spp. (oaks), *Ostrya virginiana* (hop hornbeam), *Acer saccharinum* (silver maple), *Acer rubrum* (red maple), and even some small *Acer saccharum* (sugar maples) can be found here as well. Though this area did experience disturbance more recently than its western Short Aldrich counterparts, one does find certain spring ephemerals – most notably, a great many *Erythronium americanum* and *Arisaema triphyllum*. Many ferns also grow here: Christmas ferns (*Polystichum acrostichoides*), with their rounded, once-cut fronds; and evergreen wood ferns (*Dryopteris intermedia*), lacy, ethereal, thrice-cut, yet tough enough to last the winter through. In an open clearing just at the top of the hill one finds a large group of *Matteuccia struthiopteris*, the crowned and colony-forming ostrich fern, with its tall (100-170 cm), tapering plumes.

**Section V:** This final section begins in a *Pinus strobus* plantation, and here the understory vegetation is scarce – though some garlic mustard, certain wood ferns, and even a few *Arisaema triphyllum* can be found. Once one emerges from the *P. strobus* plantation the early-successional canopy and the thick cover of honeysuckle describes a highly and recently disturbed woodland. The canopy species include *Populus tremuloides* (trembling aspen) and *Acer rubrum* (red maple). A great golden *Betula alleghaniensis* (yellow birch) marks the trail's end, its roots, like metallic snakes, coiling across the path. Though the understory is dominated by garlic mustard, honeysuckle, and ferns, early in the season one does find a few spring beauty plants.



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***Claytonia caroliniana* Michaux, 1803**  
**Montiaceae**  
**Carolina Spring Beauty**



**Note on Taxonomy:** *Claytonia* is named for John Clayton (1694-1773), a Colonial plant collector in Virginia. According to many sources, including *Flora of North America* and *Flora Novae Angliae*, the genus *Claytonia* belongs to the family Portulacaceae (Purslane family). But currently taxonomists place it in the family Montiaceae.

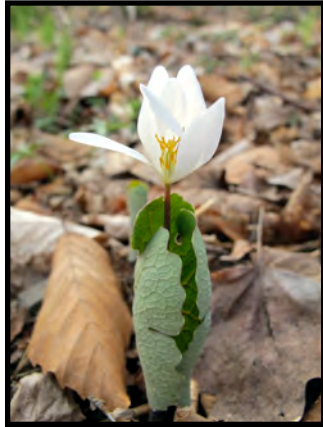
***Claytonia caroliniana*** is often the first ephemeral one sees in spring; it is also one of the longest lasting. Spring beauty blooms from March to June. In 2012, it was found in Section II on 22 March, and in Section I on 2 April. It could soon be seen along the length of the trail – though it remained far more rare on the east side. Spring beauty is myrmecochorous – ant dispersed – for, like the seeds of many spring ephemerals, the seeds of this species are attached to a fatty elaiosome that ants find delicious.

The flowers of ***C. caroliniana*** are 8-12 mm in diameter. They are white, pale pink, or – most often – candy-striped (pale with vivid pink nectar guides). Each blossom has 5 petals, 5 stamens, and 2 sepals. The stem is 6-25 cm in length; the leaves are dusty green and longer than they are wide (3-5 x 1-3 cm) with a short petiole (leafstalk) connecting them to the plant's base. *C. caroliniana* can be distinguished from its close relative, *C. virginica*, by the fact that the leaves of that species are *very* long and slender – appearing grass-like.

***C. caroliniana*** grows from a globose tuber that is said to have a potato-like texture and a pleasant, nutty flavor. *C. caroliniana* prefers loamy, well-drained soils. The flowers are visited by a wide range of insect pollinators – the species is obligately insect-pollinated. Relying upon insects can be chancy for flowers that bloom so early in the season, as pollinators are inactive if the weather is inclement. Obligately insect-pollinated species may be particularly vulnerable to suffering after climate-driven phenological shifts.

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***Sanguinaria canadensis*, Linnaeus, 1753**  
**Papaveraceae (Poppies)**  
**Bloodroot**



**Note on Taxonomy:** *Sanguinaria canadensis* is the only species in the genus *Sanguinaria* (which is named for its rhizome's red juices)

***S. canadensis*** flowers in earliest spring. In 2012, it was found in Section II on 22 March, and in Section I on 2 April. All *S. canadensis* flowers faded by late April, leaving their distinctive leaves – which seem to cradle the flower while it blooms – to open fully for photosynthesis. *Sanguinaria canadensis* remained absent in the other three sections. It is primarily myrmecochorous, though deer occasionally carry its seeds great distances.

The petals of ***S. canadensis*** are pure white and oblong to oblanceolate. Most plants have only one blossom. Each blossom has 2 sepals, 2 carpels, a short style, gold stamens, and 8-12 petals, 4 of which are relatively long and alternate with the short ones. *S. canadensis* is acaulescent (lacking a stem). Rather, the flower blooms upon a scape, at the base of which grows a single, large leaf. These leaves have long petioles and 3-9 palmate lobes, each one crenate to coarsely toothed. The leaf as a whole is "reniform" (kidney-shaped). The plant can grow just over 15 cm in height. Once the petals have fallen, the seeds show black to red-orange and numerous.

***S. canadensis*** grows from a thick rhizome that leaks bright red sap when cut (hence the names: *Sanguinaria*, bloodroot). Native Americans used *S. canadensis* to treat sores, ulcers, burns, cramps, tapeworms, fever, diarrhea, irregular periods, to stop vomiting, in cough syrups, as a spring emetic, as a blood purifier, and as a love charm. It is still an ingredient in certain compound cough remedies, though it contains the poisonous alkaloid sanguinarine. It can be highly destructive to skin tissue and toxic if swallowed.

***Sanguinaria canadensis*** is "facultatively xenogamous." This means that, unlike spring beauty, it does not rely upon insect pollinators, though it does make use of them. Bloodroot will self-pollinate if it has not been cross-pollinated within three days of flowering.



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***Anemone acutiloba*, de Candolle, 1884**  
**Ranunculaceae (Buttercups)**  
**Sharplobe Hepatica**



**Note on Taxonomy:** This species was originally named *Hepatica acutiloba* in 1824. (*Hepatica* comes from the Latin, and is based on the leaves' liver-like shape and mottled coloring.) Both *A. acutiloba* and its close relative, *A. americana* (blunt-lobed hepatica), have since been placed in the genus *Anemone*. Both are closely allied with the Eurasian *Anemone hepatica* [Linnaeus]. According to *Flora of North America*: "Further research, including a comparative study of breeding systems, is needed to clarify the relationship between *Anemone hepatica*, *A. acutiloba*, and *A. americana*." Though some intermediates – or perhaps hybrids – of the two North American species do occur, the fact that the two species are highly sympatric, and still maintain obvious morphological differences, implies that they are indeed separate.

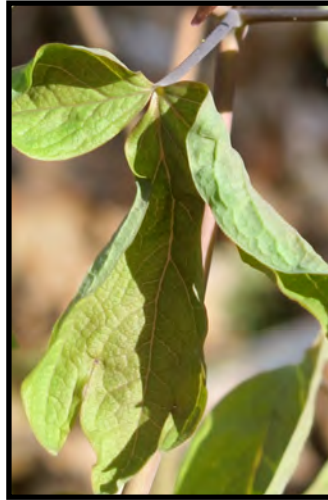
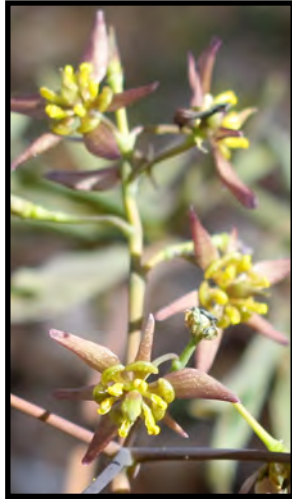
***A. acutiloba*** blooms briefly in earliest spring. In 2012, it was first found blooming, lightly scattered, in Section I on 22 March, and in Section II on 2 April. No *A. acutiloba* was found on the east side of the Short Aldrich trail. The species is mostly myrmecochorous.

The blossoms of ***A. acutiloba*** are white, pale pink or an exquisite, warm blue. Each flower has 5-12 colored sepals, ovate in shape and glabrous (smooth). The flowers lack petals. 10-30 white-tipped stamens cluster beautifully at each blossom's center. The involucral bracts behind the sepals are pilose (covered in soft hairs), and each stem bears only one flower. The leaves are deep greenish-purple, with petioles arising from the plant base. Each leaf is deeply divided into 3, with leaf bases cordate (heart-shaped). Leaf margins are entire with apex acutely pointed (these acute leaf tips distinguish *A. acutiloba* from *A. americana*, with its blunt-tipped leaves). The leaf surface is villous (softly hairy) to glabrescent (bare). The heads of the achenes, visible late in the season, are spheric, the bodies narrowly ovoid, hispid, gradually tapering, with beaks indistinct. *A. acutiloba* is rhizomatous and associated with calcareous soils. It is pollinated by many species of insect.



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***Caulophyllum thalictroides*, (Linnaeus) Michaux, 1803**  
**Berberidaceae (Barberries)**  
**Blue Cohosh, Papoose Root**



**Note on Taxonomy:** *Caulophyllum* comes from the Greek, and is based on the plant's compound leaves.

***C. thalictroides*** blooms generally in April and May. In 2012, however, it was found blooming in Section II on 31 March. It is notably plentiful between the two stone walls, along the ridge of the hill. The seeds are large, globose, and enclosed in a blue membranous (berry-like) covering; they are eaten and dispersed by deer, birds, and certain invertebrates.

Each flower of ***C. thalictroides*** has 3-6 sepals, each of these subtended by 3 or 4 bractlets with six petals above. The petals are much smaller than the sepals (one is found at each sepal's base). Each flower cluster has a central stem bearing a terminal flower – a formation called a cyme. The sepals are colored a distinctive yellowish green, greenish purple, or greenish blue. Plants have 2 alternate leaves, the first large and triternate (in 3 parts), but simulating 3 long-petioled biternate leaves. The second leaf is smaller, biternate, lobed, oblong and subtending the inflorescence. The stem is blue and glaucous, at least when the plant is young.

***C. thalictroides*** grows from thick, knotted rhizomes and prefers rich woods. Native Americans used various preparations of Blue Cohosh root medicinally – including as a treatment for fever, fits and hysterics.

Though the flowers of ***C. thalictroides*** are capable of self-fertilization, they are often pollinated by flies and bees.

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***Dicentra cucullaria*, (Linnaeus) Bernhardt, 1833**  
**Fumariaceae (Fumitory)**  
**Dutchman's Breeches**



**Note on Taxonomy:** *Dicentra* is from the Greek, meaning two-spurred. Flavonoid components indicate that *D. cucullaria* and *Dicentra canadensis* are more closely related to one another than they are to other species in the genus. Nevertheless, it is believed that species purported to be hybrids between them are in fact just unusual specimens; there is high variability in the floral morphology of *D. cucullaria*. Western populations of *D. cucullaria* (which appear to have been separated from eastern populations for one thousand years at least) appear quite different – "coarser," supposedly – and were once designated as a separate species. It is now thought that their varied appearance is a phenotypic response to environment, representing only an "ecotype."

***D. cucullaria*** blooms in April and May. In 2012, it was first found blooming in Section I on 2 April. It could soon be found growing plentifully throughout Sections I and II. It was never found in the other three sections. *D. cucullaria* is myrmecochorous.

The flowers and inflorescences of ***D. cucullaria*** resemble those of its famous Eurasian cousin, the bleeding heart (formerly *Dicentra spectabilis*). They more closely resemble those of *D. canadensis*, though *D. cucullaria* can be distinguished by its basally pointed – rather than rounded – outer petal spurs, by its lack of fragrance, by its slightly earlier flowering dates, and by its faint yellow, rather than faint pink, coloring. The petals are white, sometimes suffused pink, and yellow to yellow-orange at their lower tips. *Flora of North America* describes their complex structure: "filaments of each bundle connate from base to shortly below anthers; nectariferous tissue forming 1-3(-4.5) mm spur diverging at angle from base of bundle; style 2-4 mm; stigma 2-horned with 2 lateral papillae." *D. cucullaria's* common name, perhaps, describes them best: they resemble an upside-down pair of "dutchman's breeches" – the legs pointing skyward.

***D. cucullaria*** grows from a short rootstock which bears pink to white, teardrop-shaped bulblets. After fruit set, the bulblets remain dormant until fall, when stored starch is converted to sugar, and flower buds and leaf primordia are produced below ground. These remain dormant until the following spring. *D. cucullaria* prefers rich woods, and pollination of the species can only be accomplished by queen bumblebees and other long-tongued insects.

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***Cardamine* spp., Linnaeus, 1754  
Brassicaceae (Mustards)**

**Cutleaf Toothwort/Broadleaf Toothwort, Crinkleroot, Pepper Root**



*Cardamine concatenata*



*Cardamine diphylla*

**Note on Taxonomy:** *Cardamine* comes from the Ancient Greek name for cress. The leaves of these species have a bitter cress flavor – like those of many mustards. Both were once in the genus *Dentaria*, the toothworts.

***C. concatenata*** and ***C. diphylla*** are rhizomatous and prefer rich, moist woods. Both are pollinated by long-tongued bees and other insects, and can be food plants for butterflies. The foliage may be eaten by humans as well, and has a peppery taste. The flowers and the foliage of these two *Cardamine* species are alike in many ways – and are similar to those of certain famous cousins, like *Eruca sativa* (arugula). The stems of both are erect and unbranched, with ascending pedicels hanging from all sides. Differences in leaf-shape distinguish them. Though both species have 3-foliate rhizomal and cauline (stem beginning above ground) leaves, the leaf proportions are notably different.

***C. concatenata*** blooms in April and May. In 2012, it was first found blooming in Section II on 4 April. It could soon be found in Sections I and IV as well. The species was quite plentiful. Though the species does sometimes reproduce by seed, it is most often found growing in clusters that have spread from a single rhizome.

The flowers of ***C. concatenata*** have 4, white to pale pink oblanceolate petals, surrounded by oblong, green sepals. The stem can be slightly pubescent. The plant is 10-20 cm in height. The leaves are deeply 3-foliate, with margins coarsely dentate to incised. Thin, almost stringy leaf sections distinguishes this species from *C. diphylla*.

***C. diphylla*** blooms from April to June. In 2012, it was first found blooming in Sections I and II on 18 April, in scattered clusters.

The blossoms of ***C. diphylla*** are white or pale pink to purple. Each has four oblong sepals and four petals; each petal is obovate to oblanceolate, closed and appearing funnel-like at first and spreading or curling backwards with age. The anthers are linear and a vivid lime green, while the filaments are white and frail. The leaves are so deeply 3-foliate as to appear almost compound, though each leaf section is much wider than those of *C. concatenata* – with bases cuneate (wedge-shaped) to obtuse and margins coarsely crenate or dentate.

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***Erythronium americanum* Ker Gawler, 1808**  
**Liliaceae (Lilies)**  
**Trout Lily**



**Note on Taxonomy:** *Erythronium* comes from the Greek name for a purple European species. The common name, "trout lily," is inspired by the leaves' mottled coloring; they are said to resemble brook trout. A trout lily bulb will often sprout just one leaf and no flowers – yet, because of the leaves' distinctive appearance, even these can be easily identified.

The **trout lily** is an emblem of New England spring ephemeral species. It is beautiful, distinctive, and widespread. It blooms in April and May. In 2012, it began blooming in all five sections close to 14 April. Everywhere it was extremely plentiful. The fact that this species is myrmecochorous does not seem to have limited its spread – even into certain recently disturbed woodlands.

The flowers of ***Erythronium americanum*** are lily-like, with yellow tepals, sometimes almost purple-red on their backs, their faces tinged with reddish dots. The petals are strongly reflexed at anthesis (when they are fully open), lanceolate in shape, and 20-33 mm. Each flower is solitary, terminal, and nodding. The stamens are pronounced – 9-15 mm with yellow filaments and anthers that may be yellow, chestnut brown, or lavender. The pollen is plentiful, yellow or brown, while the style is greenish yellow. The leaves of *Erythronium americanum* are 8-30 cm, roughly ovate in shape, irregularly mottled, dusty green and purple, smooth and thick, with margins entire. The scape is 10-18 cm.

***E. americanum*** often propagates by offshoots, and produces sterile (one leaf, no flowers) and fertile (two leaves, several-flowered) plants. The flowers are visited by all sorts of hymenopteran pollinators – among them long-tongued *Bombus* species, small golden halictidae, nomadini and shining blue cuckoo bees.



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***Ranunculus abortivus*, Linnaeus, 1753**

**Ranunculaceae (Buttercups)**

**Early Woodbuttercup, Kidney-leaf Buttercup, Littleleaf Buttercup, Smallflower Buttercup, Smallflower Crowfoot**



**Note on Taxonomy:** The genus *Ranunculus* (from the Latin name for frog) is well-represented in the New England forests – though many species, like *R. abortivus*, do not have a showy appearance.

***R. abortivus*** blooms in May and June. In 2012, however, it was first found blooming in Sections I and II on 15 April; it could soon be found in the other sections as well. The species spreads by reseeding itself, and it will grow in meadows, fallow fields and clearings as well as woodlands.

The fact that ***R. abortivus*** shares more life-history traits with weedy species than it does with spring ephemerals is reflected in its appearance. Its flowers are not particularly distinctive or beautiful – though their greenish yellow against the plant's vivid green foliage does give them a verdant, summery look. Each flower has 5 tiny, pale green petals that surround the bright yellow anthers. The stem is erect or nearly so, 10-60 cm and glabrous; each plant bears 3-50 flowers. The basal leaves are persistent, with blades reniform (kidney-shaped). These can be either undivided or innermost 3-foliate. The cauline (stem) leaves have bases shallowly to deeply cordate (heart-shaped), and margins that are crenulate, while the apex is rounded.

The roots of ***R. abortivus*** are filiform – sometimes enlarged basally – and, unlike the other species in this field guide, *R. abortivus* is a biennial or a short-lived perennial. It is pollinated mostly by small insects – ladybird beetles, small bees and syrphid flies – though ants and larger flies suck nectar from the blossoms and some feed on the pollen. Certain bees collect the pollen for their larvae. Eastern chipmunks and meadow voles are known to eat the seeds of *R. abortivus*, while the foliage can be food for wood ducks, wild turkeys, and cottontail rabbits.

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***Trillium erectum*, Linnaeus, 1753**  
**Melanthiaceae**

**Wake Robin, Red Trillium, Stinking Benjamin, Stinking Willie, Birthwort**



**Note on Taxonomy:** The name *Trillium* is based on the flower parts (all in threes). There are two varieties of *T. erectum*: the typical deep red var. *erectum* and the pale var. *album*. According to *Flora of North America*, however, since they do vary only in petal color: "Variety *album* ... should be reduced to the rank of forma. Many other colors occur sporadically in otherwise typically maroon to purple populations, most frequently a soft pale yellow, but also white with a pink overlay, or paler forms of reddish maroon. Only some of these other forms seem to have been named. This is probably to the good, since some are forms in the true sense but others may represent interspecific hybrids (F. W. Case and G. L. Burrows 1962)."

***T. erectum*** blooms from April to June. In 2012, it was first found blooming in Sections I and II on 13 April. It was never found in the other sections. Though trillium is mostly myrmecochorous, it is occasionally dispersed by chipmunks, large insects, and even deer.

The flowers of ***T. erectum*** are most often deep red or nearly purple – though many color morphs are possible – with smooth, rich petals. Between each red petal is a leafy green – or green and maroon streaked – sepal, equal to the petals in length (5-20 mm) but only half each petals' width. The flowers can be erect, ascending, or proximal, and the petals are spreading – either in the same plane as the sepals or slightly before them. Quite distinctively, major veins appear almost "engraved" upon each petal's smooth surface. The stamens are highly visible, erect to recurved; the filaments are white to pink or deep purple, and thin, while the erect anthers are dark maroon, grey-maroon, or yellowish – and vividly yellow when the pollen is exposed. The ovaries of *T. erectum* are dark purple to maroon (even in white-flowered forms), and the stigmas are dark purple. The fruits are dark maroon, carrying a vague fruity fragrance. The leaves (which also come in threes) are bright green – lacking dark pigmentation. The major leaf veins are prominent. The leaves are 5-20 x 5-20 cm, widest near the middle, then tapering to an attenuate base and an acuminate apex. The scape is robust and glabrous (smooth). The rhizome is short and thick.

***Trillium erectum*** flowers have a fetid "raw meat" scent. This attracts their fly pollinators. Despite the flowers' rotten smell, poultices of the roots and other parts of the plant have astringent and antiseptic properties, and were used by Native Americans in many medical applications – among them, to stop bleeding in childbirth. Hence the common name – birthwort.

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***Viola* spp.**  
**Violaceae (Violets)**

**Note on Taxonomy:** *Viola* is a vast and widespread genus. The name is classical; violets play a part in the myths of the Greeks and Romans. Artemis transformed one of her chaste nymphs into a violet – to shield her from Apollo's unrelenting pursuit.

***Viola*** flowers have 5 uneven petals; the 2 lateral petals are often bearded – insects cling to the fragile hairs, which also prevent rain or dew drops from entering and diluting the nectar. The lower petal may be bearded as well, and spurred or staccate at its base. Each flower hangs on a one-flowered peduncle, with two small bracts (leaflets) near its middle. The stamens have orange appendages and are closely connivent around the ovary. Most *Viola* species produce petaliferous flowers in the the spring – they are visited by pollinators of all kinds – and cleistogamous (non-opening – i.e. self-pollinating) flowers later in the season. The leaves have crenate or crenate-serrate margins, and are round or cordate in shape. They may be used in salads or as a potherb; they are high in vitamin C. *Viola* species are myrmecochorous.

**Species with basal leaves only**



*Viola rotundifolia*



*Viola sororia*

***Viola rotundifolia*** (Round-Leafed Yellow Violet): The flowers of *V. rotundifolia* are an easily identifiable vivid yellow, striped with dark brown nectar guides. The leaves are round to cordate, deep green and veined – almost rippled – with margins bluntly toothed. *Viola rotundifolia* blooms in April and May. It was first found in Section I on 13 April. It could soon be found blooming in all five sections.

***Viola sororia*** (Sister Violet, Woolly Blue Violet): The petals of *V. sororia* are deep to pale purple, white, or some mixture of the three – either speckled, or shading from pale at the edges to deep violet in the flower center. The three lower petals have vivid and delicate honey guides – which are highly visible to the ultraviolet-sensing eyes of bees – and are always bearded. The leaves are like those of *V. rotundifolia*. It blooms from April to June. In 2012, was first found blooming in all five sections near 13 April.



## Caulescent Violets (species with stem leaves)



*Viola canadensis*



*Viola rostrata*



*Viola conspersa*

***Viola canadensis*** (Canada Violet): The petals of *V. canadensis* are white – vivid yellow at the center, with dark brown to purple honey guides. Their backs are tinted purple. The yellow petal bases and the purple tint distinguish *V. canadensis* from other white violets. The leaves of this species are cordate to sharply acuminate and toothed – though not as jaggedly as those of certain other *Viola* species. They are also a paler green – more muted and less glossy – and the veining, though visible, is less distinct. *V. canadensis* blooms from May to July. It was found blooming in all five sections near 19 April.

***Viola conspersa*** (Dog Violet): The blossoms of *V. conspersa* are similar to those of *V. sororia* – though their purple contains less pink and more blue. They, too, have bearded lateral petals. But the lower petal's long, delicate, hooked nectar spur, in which only long-tongued bees can feed, is enough to distinguish them. The leaves are also more slender and the leaf tips more pointed than those of *V. sororia*. *V. conspersa* blooms from April to June. It was found blooming plentifully in all five sections near 20 April, and continued to bloom well after most other understory flowers had faded.

***Viola rostrata*** (Long-Spurred Violet): The flowers of *V. rostrata* are like those of *V. conspersa* – though the petal tips are more pointed, the lateral petals lack hairs, and the spur is far longer – nearly twice as long as the rest of the flower. The color of *V. rostrata* is a uniform light purple. The leaves are nearly rounded. *V. rostrata* blooms from April to June. It was found blooming in all five sections near 18 April.

Species in the genus ***Viola*** have many interesting faunal associations. In addition to providing nectar for bees of all sorts, (including *Andrena violae*, a specialist pollinator of violets), moths, including *Elaphria grata* (the Grateful Midget), *Eubaphe mendica* (The Beggar), and *Apantesis nais* (the Nais Tiger Moth) feed on the foliage. Animals like white-tailed deer, rabbits, mourning doves, grouse, wild turkeys and even wood turtles feed on violet foliage as well.

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***Dicentra canadensis*, (Goldie) Walpers, 1842**  
**Fumariaceae (Fumitory)**  
**Squirrel Corn**



**Note on Taxonomy:** *D. canadensis* is closely related to *D. cucullaria* (see *D. cucullaria* profile for details). *Dicentra* comes from the Greek, meaning two-spurred.

***Dicentra canadensis*** blooms in April and May. In 2012, it was found blooming in Sections I and II on 19 April. It was never found in sections III, IV, or V. *D. canadensis* is myrmecochorous.

The flowers of ***D. canadensis*** are beautifully fragrant. They have a truly exquisite quality that lends them the appearance of garden specimens – they seem to lack a woodland wildflower's hardiness. More strongly than the flowers of *D. cucullaria*, those of *D. canadensis* resemble bleeding hearts. The petals are white, and each flower is distinctly heart-shaped, with the claw linear-elliptic and the crest prominent – exceeding the apex (which, rather confusingly, hangs at the flower's lowest point, as the pedicels are pendent) by 2 mm. Each inflorescence is racemose, 3-12 flowered, and most often exceeding the leaves in height. Each leaf blade has 4 orders of leaflets or lobes; the leaf-backs are glaucous (smooth). The ultimate lobes are linear in shape, with tips minutely apiculate. Each *D. canadensis* scape rises from a rootstock that bears yellow, globose bulblets.

***Dicentra canadensis***, with its hidden nectaries, must rely upon queen bumble bees for pollination.

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***Trillium grandiflorum*, (Michaux) Salisbury, 1805**  
**Melanthiaceae**  
**White Trillium, White Wake-robin, Snow trillium**



**Note on Taxonomy:** This species is highly variable in appearance, making identification sometimes difficult. *Flora of North America* explains: "Most variants of *Trillium grandiflorum* have green stripes or markings on the petals, many with numerous (4–30+) extra petals and/or bracts, and, often, much-deformed, monstrous characteristics. G. R. Hooper et al. (1971) showed that mycoplasmic organisms were present in all such forms examined, and were absent from normal plants. Most such forms should not be named taxonomically but, unfortunately, many have been."

***Trillium grandiflorum*** blooms from May-June in rich, moist woods. In 2012, it was found blooming in Sections I and II on 19 April. It could soon be found growing in vast clusters in the little dells and indentations along the south side of the Mile-Around-Woods Trail. It was never found in the other three sections. *T. grandiflorum* is myrmecochorous, though its seeds may be dispersed by larger animals.

The petals and sepals of ***T. grandiflorum*** come in threes, and are out-facing, erect, and odorless. Structurally, *T. grandiflorum* flowers resemble those of *T. erectum* (see *T. erectum* profile for details). The petals are white or rarely pale pink, with no markings. The major adaxial veins are visible – like those of *T. erectum* – but do not quite appear "engraved." The stamens are straight, 9-27 mm, with white filaments and pale yellow anthers (a lack of red or purple anthers can distinguish this species from white *T. erectum* morphs). The fruits of *T. grandiflorum* are pale green, odorless, mealy and moist. The leaves are dark green with maroon overtones, roughly ovate in shape with apex acuminate (pointed).

***Trillium grandiflorum*** grows from a short, thick rhizome. The species is pollinated by bumblebees. For a long time, it was thought to rely upon self-pollination, because pollinators were so rarely observed visiting the plant. Studies have shown, however, that the species is nearly incapable of self-fertilization, suggesting that plant fitness may suffer significantly if something impedes pollinator visitation in a given season. This may also be the reason that one often finds great clusters of close-growing *T. grandiflorum* – to ease the process of cross-pollination.

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***Tiarella cordifolia*, Linnaeus, 1753**  
**Saxifragaceae (Saxifrages)**

**Heartleaf Foamflower, Allegheny Foamflower, False Miterwort, Coolwort**



**Notes on Taxonomy:** The name *Tiarella* is based on the shape of the pistil, and *cordifolia* on the shape of the leaf. There are three official varieties of this species: var. *austrina*, var. *collina*, and var. *cordifolia*. In New England, one is most likely to see var. *cordifolia*, though one might possibly see the non-stoloniferous var. *collina* (var. *cordifolia* has long stolons).

***T. cordifolia*** flowers from May-June – it is, notably, one of the last woodlands flowers that remains late in the season. In 2012, it was first seen blooming, rarely, in Sections I and II on 3 May. It increased in abundance till the middle of the month. *T. cordifolia* var. *cordifolia* can reproduce by seed or by stolon, much like a strawberry plant.

Each flowering stem of ***Tiarella cordifolia*** is 15-40 cm – an erect raceme – and carries 15-50 delicate blossoms. Each blossom is creamy white and radially symmetric, with sepals spreading at anthesis (when the flower is fully open). It has five slender, "clawed" petals. The stamens are long, slender, and equal – expanding like frail fireworks from each blossom's center – and the anthers are oval. The ovary is superior. The leaves are long petioled, emerging at the base of the stem, and broadly cordate-ovate (heart-shaped to egg-shaped), 3-5 lobed, with margins crenate or serrate.

***Tiarella cordifolia*** is rhizomatous; it prefers shady and damp deciduous woods. It is visited by a wide range of insect pollinators – butterflies, bees and flies. Interestingly, *T. cordifolia* is semi-evergreen. Its leaves: "... develop during deciduous forest canopy leaf-out and senesce after snow melt the following spring (Rothstein and Zak 2001a). Compared to spring ephemerals, which have very high rates of photosynthesis and biomass accumulation before canopy leaf-out in the spring, *T. cordifolia*'s capacity to utilize available sunlight varies within a relatively narrow range through the growing season." This allows it to bloom late in May, even after the understory is cast in deep shade.



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***Arisaema triphyllum*, (Linnaeus) Schott, 1832**  
**Araceae (Arums)**  
**Jack-in-the-pulpit, Indian Turnip**



**Note on Taxonomy:** *Arisaema* comes from the Greek name for an arum with spotted leaves; *triphyllum* is "three-leaved." The species was first named *Arum triphyllum* by Linnaeus in 1753. The name changed many times over the years, and subspecies have often been recognized. Though at this time none are recognized officially, most New England field guides still describe them: subsp. *triphyllum*, subsp. *stewardsónii*, and subsp. *pusillum*.

***Arisaema triphyllum*** blooms from May-July. In 2012, var. *triphyllum* was first found blooming in Section II on 19 April, and in Sections IV and V on 20 April. *Arisaema triphyllum* can reproduce clonally or by seed. After flowering, each plant produces a cluster of red berries – each berry containing 1-3 seeds. These are eaten and distributed by many animal species.

The flowers of ***Arisaema triphyllum*** have a distinctive arum-like appearance. The scape is elongate, with the spathe enclosing the spadix, tubular and convolute below, with an arched limb above. The spathe is purple or green, and the flowers cluster at the basal part of the spadix; the terminal part is sterile. The leaves are long-petioled and obscurely corrugated in subsp. *triphyllum* – though deeply corrugated in subsp. *stewardsónii*. The corms of *Arisaema triphyllum* – like those of its relative, taro – may be eaten (though it must be roasted or sliced thin and then dried for 6 months beforehand). The fresh corms are an acrid blue, and full of oxalis crystals.

The life history of ***A. triphyllum*** is peculiar. Young plants will not produce flowers for several years after beginning growth (the exact period of time depends on the habitat, but it is generally not less than three growing seasons) and the first flowers produced are male – staminate. After several years, the plant begins to produce carpellate, or female flowers as well, undergoing an intermediate, or "bisexual" stage of development. At any given time, however, each plant reproduces only through the male or the female function. Older and larger plants produce female flowers alone. Interestingly, studies have shown that this cycle can be altered by shifts in resource availability, a plant's physiological state, or environmental changes (i.e. when resources are scarce, flowers are male; when resources are plentiful, flowers are female).

***A. triphyllum*** relies primarily upon fungus gnats and thrips for pollination. Insects enter the male inflorescence – drawn by the odor – fall into the spathe, and then exit through a small opening at the spathe's base. The female inflorescence does not possess a basal exit, and many insects die of exhaustion within its confines.

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***Mitella diphylla*, Linnaeus, 1753**  
**Saxifragaceae (Saxifrages)**  
**Bishop's Cap, Miterwort**



**Note on Taxonomy:** *Mitella* comes from the shape of the immature fruit; *diphylla* is two-leaved.

***Mitella diphylla*** blooms from May-June. In 2012, it was first found blooming in Section I on 20 April. It was soon found blooming Section II as well. *M. diphylla* is myrmecochorous.

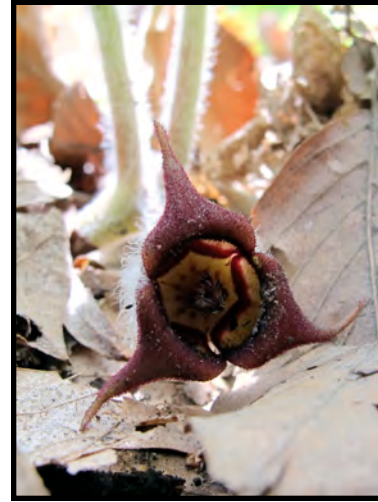
The flowers of this species are lovely and peculiar. The sepals are spreading, greenish white or yellowish green. The petals are a creamy white and appear to form a small cup, which is a vivid greeny-yellow inside. Around the rim of the cup are five feathery protrusions – appearing like tiny, frail conifer branches – which give this flower the look of a strange sea animal. The filaments are white and the anthers pale yellow. The leaves have long petioles and are 3- or 5-lobed, crenate to dentate with an acute terminal lobe. Each plant has 1-5 inflorescences; each inflorescence has 5-22 flowers.

***Mitella diphylla*** prefers rich woods. It is pollinated by syrphid flies and small short-tongued bees. Long-tongued bees collect *M. diphylla* pollen for their larvae.

A decoction of the whole ***M. diphylla*** plant was used by the Iroquois as a good luck charm. The seeds were used by Menominee as sacred items in medicine dances.

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***Asarum canadense*, Linnaeus, 1753**  
**Aristolochiaceae (Birthworts)**  
**Wild Ginger**



**Note on Taxonomy:** *Asarum* comes from the ancient Greek. Though the roots of the *Asarum*, or wild gingers, look and smell like those of *Zingiber officinale* – the ginger we are accustomed to eating – the two are not in the same family. *Z. officinale* is a member of the Zingiberaceae.

***Asarum canadense*** blooms in April and May. Several small clusters of many *A. canadense* plants were found blooming in Section I – along the footpath that links the Mile-Around-Woods with the field to the south of it – on 25 April, 2012. *A. canadense* is myrmecochorous.

Each ***A. canadense*** plant has a solitary maroon, reddish-brown or purplish flower on a short, stout peduncle. The flowers are 3-parted, and each segment is acuminate – spreading and curling backwards to frame a cup-like base. The cup's interior is white or pale green and, in turn, frames the thick column of deep purple reproductive organs. The petal backs are puberulent (downy) with crisped purple or pale hairs. The flowers, however, often cannot be seen at all unless the distinctive leaves are lifted. All leaves are basal and reniform to orbiculate, with cordate bases and tips acuminate – they appear distinctly heart-shaped. They are a deep vivid green, and, like the flowers, covered in crisped hairs.

***A. canadense*** has a slender aromatic rhizome that can be dried and candied or powdered and made into a drink. The reddish-brown flowers, lying, as they do, low to the ground, are pollinated by flies and little beetles.



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***Polygonatum biflorum*, (Walter) Elliott, Sketch, 1817**  
**Asparagaceae (Asparagus)**  
**King Solomon's Seal, Smooth Solomon's seal**



**Note on Taxonomy:** *Polygonatum* is from the Greek, and refers to the knotty rhizome (while *biflorum* is, of course, two-flowered). Though varieties of *P. biflorum* are not officially recognized, certain sources, including *Flora of North America*, claim that even in New England alone the species is complex and highly variable, with tetraploids, recognized as var. *commutatum*, being larger and coarser than diploids, recognized as var. *biflorum*.

***P. biflorum*** flowers from May-July. In 2012, var. *biflorum* was seen blooming in Section II on 3 May. The seeds are dispersed by deer and other animals. They are contained within dark blue or violet spheroid berries.

The visible part of a ***P. biflorum*** flower – the "perianth" – is white to greenish yellow and tube-shaped, with distinct, gently spreading tips. The flowers themselves, however, are not *P. biflorum*'s most vivid feature. The stem is gracefully erect to arching, and the leaves are sessile to clasping, narrowly lanceolate and glabrous with a soft green surface and prominent veins – wave-like – running parallel along their lengths. Each inflorescence emerges from a leaf axil, and hangs gently down.

***P. biflorum*** has a deeply set rhizome. It prefers moist, rich woods. It is pollinated by all sorts of long-tongued bees – in particular bumblebees – though even hummingbirds may visit its flowers.

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## END NOTE

Because I only began observing spring ephemerals that grow near the Short Aldrich Trail this year – in 2012 – my first flowering dates are tentative. (I may not have found each species by the first day that it bloomed.) First flowering dates also vary from year to year. Studies have shown that the flowering phenology of many spring ephemerals seems most related to January, April and May temperatures. The winter and spring of 2012 were, on the whole, unusually warm. Despite the inevitable variation, however, I hope the information I have gathered here might be of use in future years. Ideally, someone might continue to note first flowering dates in this area, perhaps even creating a long-term data set comprehensive enough to aid future research.

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## SOURCES

Below is a list of sources that I used, and sources that would be helpful to those interested in learning more about the ecology, taxonomy, and life-histories of flowering New England spring ephemeral plants.

- For official and current taxonomic information: Integrated Taxonomic Information System (ITIS.gov).
- For detailed online plant descriptions: Flora of North America (efloras.org).
- Field Guides and Floras:
  - Magee, Dennis W. and Ahles, Harry E. *Flora of the Northeast*. Amherst: University of Massachusetts Press, 2007.
  - Haines, Arthur. *Flora Novae Angliae: A Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. New Haven: Yale University Press, 2011.
  - Newcomb, Lawrence. *Newcomb's Wildflower Guide*. New York: Little, Brown and Company, 1977.
- Additional helpful online sources:
  - USDA plants database (<http://plants.usda.gov/java/>)
  - Go Botany (<http://gobotany.newenglandwild.org/>)
  - Connecticut Botanical Society (<http://www.ct-botanical-society.org/galleries/galleryindex.html>).
  - Illinois Wildflowers (<http://www.illinoiswildflowers.info/>)
- For information on changes in flowering phenology:
  - Miller-Rushing, Abraham J. and Primack, Richard. Global warming and flowering times in Thoreau's Concord: A community perspective. *Ecology* (Feb. 2008), 89(2) 332-341.
  - Rafferty, Nicole E. and Ives, Anthony R.: Effects of experimental shifts in flowering phenology on plant-pollinator interactions. *Ecology Letters* (Jan. 2011). 14 (1): 69-74.
- Helpful Glossaries:
  - *Flora of the Northeast*; The Free Online Dictionary by Farlex (surprisingly good).