

Aton Forest Fellow's Annual Report and Prospectus

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The general focus of my research, both at Aton Forest and elsewhere, is documenting the host plants and natural history of understudied herbivorous insects. This year I completed and distributed all but the last six chapters of the third edition of my self-published serial e-book *Leafminers of North America*. I am in the process of compiling a similar guide to North American sawfly larvae, although I did not make substantial progress on it this year. I am continually updating both guides with information gleaned from newly published literature, photographs posted online (iNaturalist.org and BugGuide.net), and my own observations. When my own observations represent significant new information (e.g., new species or previously unknown host associations), I am documenting them thoroughly in peer-reviewed publications. In January, thanks to a generous gift from the Maxwell | Hanrahan Foundation, I was able to purchase two new microscopes and microscope cameras. These have allowed me to properly examine and image the tiny insects that I study, and as a result I have been able to begin describing new species on my own instead of relying entirely on collaboration with taxonomic specialists as I have in the past.

Research at Aton Forest

This year I visited Aton Forest six times. During each visit, I photographed leaf and stem mines, sawfly larvae, and miscellaneous other insects and signs thereof (e.g., galls and folded or tied leaves). Herbivorous insect larvae that I could not identify to species in the field were collected in an attempt to rear them to adults. The dates of each visit are listed below, along with the general area explored, a link to view photos from that day, my specific objectives/targets for the day (if any), and a list of some other highlights (new discoveries or mysteries to follow up on in the future).

May 12 – State Line Hill Rd.; stream near Aton Forest headquarters; Doolittle Lake Brook
https://www.inaturalist.org/observations?on=2025-05-12&user_id=ceiseman&verifiable=any

The main purpose of this visit was to dig up some bugleweed (*Lycopus uniflorus*) plants that I had marked in the fall, in an attempt to rear adults of an unknown moth (Opostegidae: *Pseudopostega* sp.) that mines leaves and stems of this plant, then overwinters in the roots. Although nothing ended up emerging from the plants I collected, I got one adult from a bugleweed plant I dug up near my house in Northfield, MA this spring, and one emerged this spring from a similarly mined wild mint (*Mentha arvensis*) plant that I dug up at Aton Forest last August. This coming spring I plan to send these specimens to a colleague in the Netherlands who will dissect and DNA barcode them to determine what species (singular or plural) they represent.

At this early date, no leaf mines of any kind were in evidence yet, and apart from the bugleweed plants, my only collection was of a single adult fly—one of many individuals (apparently all of the same species) that I noticed congregating on leaves of false hellebore (*Veratrum viride*). It proved to be *Minettia americanella* (Lauxaniidae), which is known mainly as a miner of dead tree leaves, but a few years ago I reared it from a mine made by another fly (Agromyzidae: *Calycomyza sonchi*) in a living leaf of rattlesnake root (*Nabalus altissimus*) that I

collected in Massachusetts. Interestingly, this spring a similar fly (not yet examined by a specialist) emerged from a false hellebore stem I had collected the previous summer in Massachusetts; in this case the larva fed in a stem inhabited by stem-boring larvae of a newly described species of lance fly (Lonchaeidae; see below under Peer-reviewed Articles Published in 2025).

June 17 – Stream near Aton Forest headquarters; Doolittle Lake Brook

https://www.inaturalist.org/observations?on=2025-06-17&user_id=ceiseman&verifiable=any

My targets for this visit were two unknown leaf-mining flies I had found at Aton Forest in previous years: a *Liriomyza* (Agromyzidae) on false hellebore (*Veratrum viride*), and a *Chirosia* (Anthomyiidae) on silvery spleenwort (*Deparia acrostichoides*). I found only a few empty mines of the former, and none of the latter. The abundance and phenology of these insects varies substantially from year to year, and I'll just have to keep trying! I did succeed in rearing a few adults from silvery spleenwort collected elsewhere in 2024, and they appear to belong to an undescribed species, but I will need to rear some more before it can be given a name.

The only specimen resulting from this visit was a larva of another leaf-mining fly on false hellebore (Scathophagidae: *Neochirosia atrifrons*), which I sent to a colleague in South Korea who had requested fresh material of scathophagid flies for DNA analysis.

July 15 – Beaver pond on South Sandisfield Rd.; Haskell Pond; Bull Pasture

https://www.inaturalist.org/observations?on=2025-07-15&user_id=ceiseman&verifiable=any

My main objective for this visit was to explore Haskell Pond for the first time; I also met briefly with Bronwen Childs, the new trustee, at the gate to the cabin by the beaver pond on South Sandisfield Road. Some highlights:

- After meeting with Bronwen and driving to the next spot, I found a daisy fleabane (*Erigeron annuus*) plant stuck to the front of my car. When I removed it I noticed a stem mine of an unknown agromyzid fly (Agromyzidae: *Ophiomyia* sp.) that I have only found a couple of times before, and only in my own yard. Unfortunately this one was already empty, but now I have another species to watch for at Aton Forest.
- At the Sandisfield Road beaver pond, I found leaf mines of a fly (Agromyzidae: *Cerodontha* sp.) and a moth (Elachistidae: *Elachista* sp.) on tussock sedge (*Carex stricta*); this plant is not a known host for any species in either of these insect families.
- By Haskell Pond, I found a shadbush (*Amelanchier*) leafminer in the genus *Parornix* (Gracillariidae) that doesn't match any of the known species on that host. I succeeded in rearing the adult moth, but have not yet had a chance to try to identify it.
- Also by Haskell Pond, I collected some witch hazel (*Hamamelis virginiana*) leaf folds, because I am interested in determining whether *Episimus argutana* (Tortricidae) on witch hazel and sumac (*Rhus* spp.) is really a single species. I succeeded in rearing one adult moth from Aton Forest, and several others from near my house, but I only got parasitoids from my collections of sumac leaves this year, so I'll have to continue this investigation another year.
- In a paper published this year, I showed that DNA evidence suggests the species mining leaves of three-way sedge (*Dulichium arundinaceum*) is distinct from typical *Taphrocerus gracilis* (Buprestidae). More specimens are needed to determine whether there are consistent morphological differences that would support describing it as a

separate species. I found a few mines at Haskell Pond and succeeded in rearing one adult beetle.

- On a paper birch (*Betula papyrifera*) leaf at Bull Pasture, I found a leaf mine representing the first Connecticut record for the moth *Phylloporia bistrigella* (Incurvariidae).

September 4 – Headquarters; Bull Pasture and land to the east

https://www.inaturalist.org/observations?on=2025-09-04&user_id=ceiseman&verifiable=any

My main objective for this visit was to explore the land to the east of Bull Pasture for the first time. Some highlights:

- At headquarters I found leaf mines on alternate dogwood (*Cornus alternifolia*) made by a new moth species that I am in the process of describing (Heliozelidae: *Antispila* sp.). I hope to finish that paper this winter, but if it is delayed, perhaps an adult will emerge in time to be included as a paratype. In any case, this is the first Connecticut record, and it will be mentioned in the paper along with the parasitoid wasp that already emerged from one of the mines.
- I collected a number of other leafminers and leaf tiers on the north side of North Colebrook Road, but it is too early to say whether there was anything unusual among them, with the exception of a previously unknown *Cerodontha* mine on wood rush (*Luzula* sp.; unfortunately already empty).
- By the parking area just west of the Colebrook town line, I found leaf mines on phragmites representing the first Connecticut record of *Cosmopterix nitens* (Cosmopterigidae), a native moth that has no other known host plant.

September 30 – Doolittle Lake Brook; North Colebrook Road

https://www.inaturalist.org/observations?on=2025-09-30&user_id=ceiseman&verifiable=any

Apart from making some follow-up observations of an *Ophiomyia* species I found feeding in stems of cardinalflower (*Lobelia cardinalis*) last year, this visit was a general exploration. Highlights included:

- An occupied stem mine of an unknown *Ophiomyia* species on calico aster (*Symphyotrichum lateriflorum*), which I had just discovered in Massachusetts earlier that month.
- I found leaf mines of *Cremastobombycia solidaginis* (Gracillariidae) on panicked aster (*Symphyotrichum lanceolatum*), and succeeded in rearing an adult moth. Apart from my having found this species twice on heart-leaved aster (*S. cordifolium*) in Massachusetts, it is thought to be a specialist on goldenrods (*Solidago* spp.).
- A stem mine of a previously unknown agromyzid fly on tall meadow rue (*Thalictrum pubescens*); a puparium was present but unfortunately already empty.
- Leaf mines on blue flag (*Iris versicolor*) possibly made by *Cerodontha edithae* (Agromyzidae), a fly known from a single specimen I reared on Nantucket.
- First Connecticut record for *Ophiomyia mimuli* (Agromyzidae), a stem miner of monkeyflower (*Mimulus ringens*).
- Stem mines of a previously unknown *Ophiomyia* species on flat-topped aster (*Doellingeria umbellata*); unknown stem galls on the same plant.
- I reared an as yet undetermined *Phytomyza* species (Agromyzidae) from leaf mines on flat-topped aster, and found puparia of another *Phytomyza* species in fruits of

thimbleweed (*Anemone virginiana*); both of these will be first Connecticut records, whatever they turn out to be.

October 9 – Wetlands and pond between State Line Hill Rd. and South Sandisfield Rd.

https://www.inaturalist.org/observations?on=2025-10-09&user_id=ceiseman&verifiable=any

This was another general exploration, although I hoped to find more of the stem mines on tall meadow rue, and I succeeded in collecting several viable-looking puparia. Other highlights:

- More possible *Cerodontha edithae* mines; I collected enough that I should have a reasonable chance of rearing some adults.
- Stem mine of an undetermined *Ophiomyia* species on Indian tobacco (*Lobelia inflata*), which I first found in Massachusetts a few weeks earlier.
- First Connecticut record of *Phytomyza sehgalii*, a leafminer of thimbleweed—just in time to be included in my paper on Agromyzidae that is now in press.
- Powdery mildews (Erysiphaceae), which are host-specific parasitic fungi found on plant leaves, are all the rage on iNaturalist right now, so I photographed every one I found during this visit. Seven different species were identifiable, with others remaining to be determined.
- I hadn't been aware of the trail along the southwest side of the pond until now! I walked it quickly at the end of the day, stopping to collect undetermined sawfly larvae from a pussy willow (*Salix discolor*), which also provided two new leafminers for the Aton Forest list. I will have to spend some more time on this trail earlier in the season.

Field Research at Other Sites

As always, I conducted investigations of herbivorous insects in my own yard (Northfield, MA) and surrounding areas throughout the growing season. Explorations farther afield included:

- May 1 to 4 (3 days total) – I conducted a rare plant survey in Easthampton, MA for Pascommuck Land Trust.
- June 3 to 12 – I collected leafminers while on a road trip through New York and Ohio.
- June 16 – I conducted an ecological inventory in Egremont, MA for Egremont Land Trust.
- June 28 – I participated in a bioblitz in Marlboro, VT; the species I documented can be viewed here: https://www.inaturalist.org/observations?on=2025-06-28&user_id=ceiseman&verifiable=any
- August 1 to 3 – I joined the Cambridge Entomological Club on a trip to the White Mountains in New Hampshire; the species I documented can be viewed here: https://www.inaturalist.org/observations?d1=2025-08-01&d2=2025-08-03&user_id=ceiseman&verifiable=any
- August 6 to 9 – As I did in September 2022 and July 2024, I assisted Bill Buck with his all taxa biodiversity inventory of Kent (Carmel), NY, documenting numerous species of leafminers and gall inducers. The species I found can be viewed here: https://www.inaturalist.org/observations?d1=2025-08-06&d2=2025-08-09&place_id=48&user_id=ceiseman&verifiable=any
- August 28 and September 9 – I began conducting an ecological inventory in Ashfield, MA for Franklin Land Trust, which will be completed in spring of 2026.

Other Activities

Throughout the year I worked on several different papers, as well as on updates to the leafminer guide, and I served as a peer reviewer for several manuscripts about leaf-mining insects. I sent numerous insect specimens to collaborators in Canada, Belgium, Germany, Scotland, South Korea, and the USA, and received specimens from other collaborators throughout the USA.

- I served my first year as a Member-at-large of the Executive Council of the Lepidopterists' Society.
- June 14 – I led an insect tracking walk at Distant Hill Gardens and Nature Trail, Walpole, NH.
- June 28 – I led an insect walk at the Pool Nature Center Bioblitz, Vermont Museum of Natural History, Marlboro, VT.
- August 1 – I gave a leafminer talk at AMC's Highland Center, Crawford Notch, NH.
- August 17 – I led a leafminer walk at Caterpillooza, Quonquont Farm, Whately, MA.
- August 23 – I led a plant/insect walk at Wachusett Bioblitz, Princeton, MA.
- September 20 – I led a nature walk at RiverFest, Cummington, MA.
- September 22 – I gave a leafminer talk (via Zoom) for Scarabs: The Bug Society, Seattle, WA.
- Throughout the year, I served as a consultant for the Greentree Foundation's survey of moths on their property in Manhasset, NY, continuing the work we began in 2022.
- Throughout the year, as part of my leafminer and sawfly research, I have reviewed and identified photos of these insects submitted to iNaturalist (including those added to the "Leafminers of North America" project I created). According to the website's calculations as of midday on December 31 (<https://www.inaturalist.org/stats/2025/ceiseman>), in 2025 I have helped 2,515 people with 21,733 identifications.

Peer-reviewed Articles Published in 2025

Among the 15 articles published this year are three including observations and specimens from Aton Forest. One of the paratypes of the new species *Earomyia veratri* (Lonchaeidae), a stem borer of false hellebore, came from a stem collected along Doolittle Lake Brook, which is where I first noticed evidence of the larvae of this species. There are also brief mentions of Aton Forest in the papers on gall midges (Cecidomyiidae) and leaf-mining jewel beetles (Buprestidae).

Eiseman, Charles S., Steven D. Brewer, Erik J. van Nieuwerkerken, Jen Bayer, and Hilary Bayer. 2025. New records of Palearctic *Stigmella* species (Lepidoptera: Nepticulidae) on elms (Ulmaceae: *Ulmus* spp.) in North America, including new hosts for *S. multispicata* Rocienè and Stonis and the first continental record for *S. ulmivora* (Fologne).

Proceedings of the Entomological Society of Washington 127(4): 774–780.

Eiseman, Charles S. 2025. The second instance of a lauxaniid fly (Diptera: Lauxaniidae) being reared from a leaf mine of another insect. Proceedings of the Entomological Society of Washington 127(4): 771–773.

Eiseman, Charles S., David Jeffrey Ringer, and Tracy S. Feldman. 2025. New records of *Telamoptilia* Kumata and Kuroko (Lepidoptera: Gracillariidae: Acrocercopinae) from the

- USA, with the description of a new species. *Proceedings of the Entomological Society of Washington* 127(4): 699–707.
- Sawada, Masayasu, Kazunori Yoshizawa, Charles S. Eiseman, Neung-Ho Ahn, Wanggyu Kim, and Issei Ohshima. 2025. Host-shifting pattern common in relatives: phylogenetic study of Sapindaceae-associated *Cameraria* (Lepidoptera: Gracillariidae), with a description and population genetics of *Cameraria serena* sp. nov. *Biological Journal of the Linnean Society* 146 (4): blaf082.
- Eiseman, Charles S., Tracy S. Feldman, Henry A. Hespenheide, Ted C. MacRae, Michael W. Palmer, Norman E. Woodley, and Mathew Zappa. 2025. New larval host records and DNA barcoding data for North American leaf-mining jewel beetles (Coleoptera: Buprestidae). *Zootaxa* 5719(4): 489–534.
- Eiseman, Charles S., Matthew A. Bertone, Tracy S. Feldman, and Nathan E. Harms. 2025. A review of the species of *Eugaurax* Malloch (Diptera: Chloropidae) occurring in North America, with the description of a new species mining leaves of floating marshpennywort (Araliaceae: *Hydrocotyle ranunculoides* L.f.). *Insecta Mundi* 1152: 1–26.
- Charney, Noah D., Charles S. Eiseman, Ethan B. Plunkett, Sydne Record, and Paige S. Warren. 2025. The reach of road salt into vernal pools and the response of amphibians. *PLoS One* 20(10): e0329680.
- Eiseman, Charles S., John Klymko, and Jeff Ward. 2025. Two species of Prodoxidae (Lepidoptera: Adeloidea) newly documented as leafminers on Saxifragaceae. *Proceedings of the Entomological Society of Washington* 127(2): 174–181.
- Eiseman, Charles S. and Iain MacGowan. 2025. A new species of *Earomyia* Zetterstedt (Diptera: Lonchaeidae) and its associates in stems of false hellebore (Melanthiaceae: *Veratrum viride* Aiton) in southern New England, USA. *Proceedings of the Entomological Society of Washington* 127(2): 162–173.
- Eiseman, Charles S., David Jeffrey Ringer, Thomas Irvine, and Tracy S. Feldman. 2025. A new species of *Urodeta* Stainton (Lepidoptera: Elachistidae) mining leaves of button mangrove (Combretaceae: *Conocarpus erectus* L.) in Florida and the Caribbean. *Zootaxa* 5683(4): 530–542.
- Eiseman, Charles S., Stéphane V. Perreault, Swarnalatha Moparthy, and Matthew A. Bertone. 2025. Two leaf-mining insects newly associated with big bluestem (Poaceae: *Andropogon gerardi* Vitman) (Diptera: Agromyzidae; Lepidoptera: Elachistidae). *Proceedings of the Entomological Society of Washington* 127(1): 21–29.
- Eiseman, Charles S., Tracy S. Feldman, and Mark A. Metz. 2025. First account of the larval biology of *Coleotechnites nigra* (Busck) (Lepidoptera: Gelechiidae), with new host and distribution records. *Proceedings of the Entomological Society of Washington* 127(1): 9–20.
- Chen, Xiaona, Xiaohua Dai, Qingyun Guo, and Charles S. Eiseman. 2025. Convergence of plant-leafminer associations on two continents. *Global Ecology and Conservation* 61: e03656.
- Eiseman, Charles S. 2025. Miscellaneous records of Cecidomyiidae (Diptera) from the USA. *Proceedings of the Entomological Society of Washington* 126(4) [2024]: 454–473.
- Eiseman, Charles S., Owen Lonsdale, Gaye L. Williams, and Thomas Irvine. 2024. First records of *Phytomyza hellebori* (Kaltenbach) (Diptera: Agromyzidae), a Palearctic leafminer of *Helleborus* spp. (Ranunculaceae), in North America. *Proceedings of the Entomological Society of Washington* 126(3): 382–389. [This paper was published at the very end of 2024, after I had completed that year's Prospectus.]

Other 2025 Publications and Reports

- Eiseman, Charley. 2025. BugTracks. <https://bugtracks.wordpress.com/>—9 blog posts in 2025, including three focusing on observations at Aton Forest:
<https://bugtracks.wordpress.com/2025/03/22/caterpillar-craftsmanship/>
<https://bugtracks.wordpress.com/2025/03/30/reawakenings/>
<https://bugtracks.wordpress.com/2025/10/22/false-hellebore-fauna/>]
- Eiseman, Charley. 2024. *Leafminers of North America, Third Edition*. Privately published e-book, clxxviii+1948 pp. Available from: <http://charleyeiseman.com/leafminers/>

Plans for 2026

This coming year, in addition to continuing to update the *Leafminers of North America* guide, my projects include attempting to complete papers I have started involving taxonomy of moths in the families Gelechiidae, Gracillariidae, Heliozelidae, Tischeriidae, and Tortricidae, as well as papers on my long-term surveys of Nantucket Lepidoptera (leaf-mining moths) and Hymenoptera (sawflies and gall wasps). When my collaborators and I find the time, I also have new findings to report involving flies in the families Agromyzidae, Anthomyiidae, Chironomidae, Lauxaniidae, Scathophagidae, and Sciaridae; beetles in the families Chrysomelidae and Curculionidae; moths in the families Bucculatricidae, Cosmopterigidae, Elachistidae, Eriocraniidae, and Nepticulidae; and sawflies and wasps in the families Argidae, Braconidae, Figitidae, Ichneumonidae, Pamphiliidae, Roproniidae, and Tenthredinidae. Following a year-long hiatus, I will also resume completing reports on my botanical / natural community surveys for Green Berkshires.

During the field season, in addition to continuing to add to the overall list of herbivorous insects documented at Aton Forest, I will have a list of specific targets in mind each time I visit, with the goal of collecting larvae and rearing them to adults so that the species in question can be identified (and described, if they turn out to be new). Some of these are species that I have already succeeded in rearing, but more specimens are needed.

They include:

- Spring: mystery feeding channels on interrupted and sensitive fern; leaf-mining moth on *Spiraea tomentosa*
- Throughout the season, beginning in June: collect mines of *Phytomyza agromyzina/notopleuralis* on dogwoods, with the hope of rearing enough adults to determine whether these species are synonymous; collect *Cameraria*, *Cremastobombycia*, and *Parornix* mines and leaf folds on various hosts
- Mid- to late June: *Liriomyza* on false hellebore; *Chirosia* on silvery spleenwort; *Agromyza* on avens and *Glyceria grandis*; Phytomyzinae on grass-leaved goldenrod; *Cerodontha* and *Elachista* on tussock sedge; *Ophiomyia* on daisy fleabane; purported *Polypedilum braseniae* on *Brasenia* and *Nymphaea*; leaf spot gall midge on sweetgale; leaf curl gall midge on highbush blueberry
- Mid- to late summer: *Cerodontha* on *Iris* and *Luzula*; stem-mining *Ophiomyia* on bedstraws; *Taphrocerus* and possibly *Cosmopterix* on *Dulichium arundinaceum*; stem-mining agromyzid on tall meadow rue
- Autumn: maleberry *Brachys* and *Caliroa*; stem-mining *Ophiomyia* spp. on calico aster, flat-topped aster, and Indian tobacco; stem galls on flat-topped aster

I look forward to exploring Aton Forest's new acquisitions and attending some of the 100th anniversary events. Other fieldwork will include a summer trip to Kent, NY; botanical consulting work in western Massachusetts and central Connecticut; and possibly further surveys sponsored by Green Berkshires in the vicinity of Mount Washington, MA.