



## *September 2020- August 2021 Service Year* POSITION DESCRIPTION

### Position Title

VCE Mountain Ecology Field Technician

### Sponsoring Organization

Vermont Center for Ecostudies  
Norwich, VT

### Sponsoring Organization's Mission

The Vermont Center for Ecostudies advances wildlife conservation across the Americas through research, monitoring, and citizen engagement. With a reach extending from Canada and northern New England through the Caribbean and South America, our work unites people and science for conservation.

### Overview

There is strong scientific evidence that montane ecosystems are warming at 2-5 times the rate of lower elevation zones due to global climate change. (e.g., <https://www.nature.com/articles/srep19219> and [https://www.geo.umass.edu/climate/papers2/MRI\\_NatureCC\\_2015.pdf](https://www.geo.umass.edu/climate/papers2/MRI_NatureCC_2015.pdf)) Globally, many hundreds of research papers have documented that plant and animal species are responding to these changes by moving upslope and towards the poles as they seek out areas with their preferred suite of environmental conditions. We can reasonably expect these changes to occur sooner and faster for species whose core populations already exist at relatively high elevations and latitudes. Indeed, our colleagues have used sophisticated models to predict that global climate change will lead to substantial ranges shifts for montane species in the northeastern U.S. For example, we can expect to lose 50% of our sub-alpine spruce-fir forests over the next 200 years to the upslope movement of hardwood forest communities, and we may entirely lose Blackpoll Warblers from New England as their populations shift further into Canada. (<https://link.springer.com/article/10.1007/s10980-016-0429-z> and <https://link.springer.com/article/10.1007/s10980-016-0429-z>) We created Mountain Birdwatch in 2000 to address these challenges, with the goal to monitor the distribution and abundance of montane birds across northern New England and New York. The inaccessibility of this largely roadless ecosystem poses a barrier to monitoring the unique assemblage of bird species that breeds in these spruce-fir forests.

### Montane earthworm collection:

Earthworms are an invasive group of species now widespread in the Northern Forest, with at least 26 species - none North American in origin - documented to occur in the region. Earthworms have profound effects on the health of forested ecosystems that they have invaded, altering fundamental

ecosystem processes, hindering forest regeneration, promoting the spread of other invasive species, and diminishing biodiversity. Indeed, the spread of earthworms may be the primary driver of change in the Northern Forest over the medium-term. Despite their influence on ecosystem health, our understanding of the factors shaping the distribution of earthworms in the Northern Forest remains coarse, poorly refined and limited to areas below the spruce-fir montane zone. This information gap poses a significant problem for forest management because the most efficient approach to management and control is to keep earthworms out of currently worm-free areas; once established, eradication or control of earthworms is exceedingly difficult. Understanding correlates of earthworm presence and abundance can help predict the location of worm-free areas, identify areas at greatest risk of invasion, and, most importantly, identify activities that contribute to the spread of earthworms and that should be tightly regulated when carried out in worm-free areas.

Montane bird communities of disturbance zones within the spruce-fir zone:

Recent analyses of Mountain Birdwatch data have revealed that some montane bird species are most abundant along disturbed areas (e.g., ski slopes) that mimic that natural disturbances throughout the spruce-fir forest biome. Understanding the relationship between disturbance and montane bird occupancy is critically important, because climate change will likely result in the loss of 50% of our spruce-fir forests in northern New England over the next 200 years (<https://link.springer.com/article/10.1007/s10980-016-0429-z>). Combined with species climate modeling from Audubon (<https://www.audubon.org/climate/survivalbydegrees>) we can reasonably expect numerous high-elevation species to entirely disappear from New England by 2100, including Blackpoll Warbler, Ruby-crowned Kinglet, and Red-breasted Nuthatch. Bicknell's Thrush may face global extinction due to these changes. However, there are few silvicultural management options to enhance spruce-fir habitat for montane birds in our region. This project aims to understand the relationship between montane birds, bats and disturbances, with the ultimately goal of identifying management options that may counteract the negative effects of climate change.

The ECO AmeriCorps member will have the opportunity to advance each of these important projects, providing a critical position as a junior field technician, supporting the efforts of summer interns and volunteers and gathering field data for the pilot years of the latter two projects.

#### Goals for the ECO AmeriCorps Position

In advancing the Mountain Birdwatch citizen science project and two new projects that will enhance our understanding of montane ecosystem dynamics, the AmeriCorps member will pursue the following activities. In conducting this service, the member will frequently interface with citizen scientists, interns, and professional scientists within VCE and at other organizations.

Establish 6-10 new Mountain Birdwatch routes in New York and northern New England. Create interactive web applications to showcase the depth and value of Mountain Birdwatch data. Coordinate the collection of earthworm data at locations across NY and northern New England. Improve our understanding of the distribution of invasive earthworms in the spruce-fir forest biome of the northeastern United States. Develop identification materials and help citizen scientists learn to identify common invasive earthworm species. Deploy acoustic monitoring devices across Mountain Birdwatch study areas. Document which species of bats forage at disturbances within the spruce-fir forest and relate those occurrences to features of the disturbances. Elucidate which species of montane birds are most abundant along disturbances, and determine how disturbance size influences those relationships.

### Essential Functions. Functions that the applicant must be able to perform

- Be able to hear and visually and aurally identify all 11 species that are monitored by Mountain Birdwatch (listed here: <https://vtecostudies.org/projects/mountains/mountain-birdwatch/volunteer-materials>). (These can readily be learned by someone with the desire, commitment, and hearing capabilities using training materials at the website provided.)
- Hike 5 miles on back-to-back days in rugged, mountainous terrain. Be comfortable serving alone and with others in the backcountry.

Think hierarchically and follow dichotomous keys (for the purpose of identifying species).

- Organize, plan, and manage the flow of the project, in collaboration with the Project Leader.
- Follow directions and take advice and then serve independently to implement the project, checking in regularly for progress reports with supervisor, seeking input or feedback as needed.
- Collaborate with partners and project leader to develop database for citizen scientist-gathered data. Be able to teach others how to access and use the database and perform quality assurance/quality control on volunteer-submitted data.
- Be able to organize and train novice members of the public to serve as citizen scientists for projects. Plan, carry out, and follow up the training sessions with support for the citizen scientists in implementing it.
- Be familiar with reading maps and be able to navigate through unfamiliar terrain to access field sites.
- Be sufficiently detail oriented to manage project data.
- Communicate clearly with multiple stakeholders throughout the process: scientific advisors, citizen scientists in recruiting, training, and managing their work, VCE colleagues in functioning as a full member of the organization's staff team, the public in presenting the project in outreach programs.
- Contribute to a collegial, positive work environment.
- Be willing and able to transport oneself to field sites, and flexible enough to conduct field service and volunteer training and support at odd hours and in all kinds of weather.

### Marginal Functions. These are secondary to Essential Functions, may be negotiable, and can be completed as time allows.

- Write engaging and educational blogs and other articles to be used in VCE's outreach materials
- Participate in a variety of VCE projects not directly related to assigned service, for the benefit of professional growth and breadth of experience of the AmeriCorps member and to be a fully participating member of the VCE team.

### Projects May Include

The ECO member will have an opportunity to engage in three major initiatives that will advance understanding of mountain ecosystems and the processes that are changing them.

One of these projects is a long-standing citizen science project, Mountain Birdwatch, in which the ECO member will have the opportunity to interface with >100 citizen scientists, offering training, support, and education to these volunteers, and gain leadership skills by co-supervising two summer interns on that project.

The ECO member's service on two other projects will gather critical baseline data for two new studies examining drivers of change in mountain systems: invasive earthworms and "fir waves." On these projects, the ECO member will network with researchers across the Northeastern US to refine protocols, learn identification skills for the species in question (earthworms, birds, bats, and plants), develop training materials for and provide training and support of citizen scientists involved in these projects, collect data in the field, learn to use technologies such as extracting data from audio recording devices

and ArcGIS online mapping tools, explore interesting and remote mountainous landscapes in NY, VT, NH, and ME, and develop writing skills to effectively communicate science to lay audiences.

#### Desired Qualifications

- Interest in conservation science, field service, and learning relevant new skills
- Interest in and commitment to VCE's mission
- Experience co-supervising interns or technicians
- Experience hiking, camping and navigating in the backcountry
- Solid public speaking and writing skills
- Exposure to some sampling theory and statistical analysis (proficiency is not needed)
- Data collection for scientific research projects
- Strong naturalist skills and beginner-to-intermediate bird identification skills
- Ability to learn new software programs for creating data summaries
- Experience editing web pages

#### Networking Opportunities

VCE has extensive partnerships with colleagues in academia, state and federal agencies, and NGOs, and we encourage networking opportunities among mentees. The member will be coordinating and collaborating with several conservation partners with overlapping objectives as appropriate. Partners in past years include the USDA Natural Resources Conservation Service, USDA Forest Service, Vermont Department of Fish and Wildlife, Vermont Department of Environmental Conservation, University of Vermont Extension, Vermont Coverts, The Trust for Public Land, Upper Valley Land Trust, and Audubon Vermont. In addition, service members will be encouraged to participate in other VCE field projects as time allows in order to fully experience the depth and breadth of our programs.

The Mountain Birdwatch citizen scientists include state biologists (from New York, Vermont, New Hampshire, and Maine), federal biologists (from the White and Green Mountain National Forests, USGS, and the US Fish and Wildlife Service) and representatives from numerous private conservation organizations and universities (e.g., SUNY ESF, Antioch and Plymouth State). In addition, there will be substantial coordination other biologists in New England who study earthworms and disturbances (e.g., fir waves) in the spruce-fir montane forest zone.

#### Service Conditions

Service will be a mix of office and outdoors. The outdoor service will require navigating unpaved and sometimes unmarked roads, overnight camping and pre-dawn service (up to 3 days per week) in the mountains of the northeastern US.

The member will be based out of our Norwich, VT office and will need to reside within an easy commute of the office.

#### Minimum Qualifications:

- Be a US citizen, a national, or legal permanent resident alien of the U.S.;
- Be at least 18 years of age upon entering the Pre-Service Orientation (there is no upper age limit);
- Be a high school graduate or have a GED certificate, or be willing to work towards their GED as part of their service-year successful completion requirement. A member cannot have dropped out of high school to join AmeriCorps. If a member has a documented medical

reason/professional opinion why they cannot finish high school, they might be eligible; call in this case;

- Has not been convicted of murder or sexual assault and is willing to undergo a National Service Criminal History Check;
- Must submit to Agency of Human Services checks, i.e. Adult Abuse and Child Abuse Prevention;
- Be committed to the ECO AmeriCorps program, and its ethic of service and personal and professional development of its participants;
- Have the ability and enthusiasm to drive to, attend, and participate in required trainings and events, and be prepared to drive up to 2-3 hours each way.