

Strategic Plan VERMONT CENTER FOR ECOSTUDIES



Uniting People and Science for Conservation



"People depend on healthy ecosystems. And increasingly, healthy ecosystems depend on people who have the knowledge and motivation to manage them wisely. At VCE, we excel in science that guides and inspires conservation. Our work gathers strength from volunteers who monitor wildlife in the Northeast and from a network of professional partners that extends from Canada to South America. This approach is successful because conservation is as much about people as it is about ecology."

Chris Rimmer, Executive Director, Vermont Center for Ecostudies



Our Mission Vermont Center for **Ecostudies advances** conservation of wildlife across the Americas through research, monitoring, and





VERMONT CENTER FOR ECOSTUDIES THE PATH AHEAD

As mounting human activity transforms ecosystems around the world, many wild animals face an uncertain future. The problem is complex and international in scope, but the Vermont Center for Ecostudies (VCE) has developed an effective strategy to conserve biodiversity. We deliver the science people need to make good decisions for wildlife. We then join with partners to implement and evaluate conservation actions. This plan describes our approach, which has been refined over the last twenty-five years, and outlines the priorities that will guide our work through 2016.

Our programs will capitalize on VCE's core strengths to advance three complementary goals: to sustain the health of northeastern ecosystems, to protect vital Caribbean habitats, and to map biodiversity for conservation. Each program will monitor for warning signs, identify threats to wildlife, and promote science-based actions before populations become imperiled. Involving citizen scientists in this work will create advocates for sound conservation policy. Collaborations with government agencies and other non-profits will put good policy into practice. In this way, we will translate robust conservation science into measurable benefits for wildlife.

As we expand VCE's programs, we will reinforce their foundation in organizational strength. To this end, we will ensure that the board and senior staff are equipped to lead effectively. We will bolster outreach to mobilize positive change at local and international levels. And we will Our programs will capitalize on VCE's core strengths to advance three complementary goals: to sustain the health of northeastern ecosystems, to protect vital Caribbean habitats, and to map biodiversity for conservation.

enhance the effectiveness of operations and development in order to realize the full value of our resources. Strengthening leadership, outreach, and operations will maximize the impact of our work.

The path to conservation success can be rough, but we relish the challenge. The route is sometimes obscure, but experience is a sure guide. We choose this path because we are curious about the world around us and optimistic about what lies ahead.

citizen engagement.

UNITING PEOPLE AND SCIENCE FOR CONSERVATION

The Vermont Center for Ecostudies will focus on key projects that promote our mission and deliver tangible conservation outcomes.

Effective wildlife conservation requires detecting and heeding early warning signs before species become endangered. At VCE, we monitor wildlife populations to assess their conservation status and to investigate potential threats. We then identify sources of observed decline before populations reach critically low levels. If warranted, we take actions to address the needs of wildlife that are seriously at risk.

We excel in recruiting, training, and coordinating citizen volunteers to conduct rigorous wildlife studies in a highly cost-effective manner. We also specialize in convening conservation professionals to implement science-based initiatives that benefit threatened wildlife populations and their habitats throughout the Americas.

We have the expertise and the broad community of partners to achieve our goals

- 1. To sustain the health of northeastern ecosystems
- 2. To protect vital Caribbean habitats
- 3. To map biodiversity for conservation
- 4. To strengthen organizational leadership, outreach, and operations



We use innovative methods to understand

- Studies in population and landscape ecology, wildlife behavior, genetics, and ecotoxicology
- Advanced geospatial and statistical analysis
- Engagement of skilled citizen scientists
- Collection of bird observations through eBird
- Collaboration with diverse stakeholders

We use effective tools to communicate and conserve

- Peer-reviewed and popular publications
- Internet forums, social networks, web logs and videos
- Habitat and population models
- Breeding bird, butterfly, and vernal pool atlases
- Wildlife monitoring protocols
- Management and policy recommendations
- Conservation action plans
- Nest site monitoring and management

We produce results

- Common I
- Average r
- New York
- Amphibic
- Butterfly s
- Individua
- Miles trav
- Volunteer



oon pairs breeding in Vermont in 1987, when loons were placed on the state endangered species l	ist 12
mber of breeding loon pairs since 2005, when the population recovery goal was met	65
orest acres delineated by a VCE habitat model for designation as a state Bird Conservation Area	72,700
breeding pools mapped during first three years of the Vermont Vernal Pool Mapping Project	4,869
ecies discovered in Vermont for the first time during the Vermont Butterfly Survey	12
birds documented and mapped by volunteers each year through Vermont eBird 1 to 1	.5 million
ed by a male Bobolink tracked by geolocator on a single day of spring migration	1,181
who participate in VCE citizen science projects in a typical year	700-750



TO SUSTAIN THE HEALTH OF NORTHEASTERN ECOSYSTEMS

VCE biologists have worked to understand and improve conditions for wildlife across the northeastern landscape since the 1980s. In order to build on past achievements and address emerging challenges, we'll focus future efforts on mountains, forests, grasslands, and lakes. These places harbor some of our region's most treasured and vulnerable wildlife. They are also woven into the fabric of our cultural identity.



The Black-throated Blue Warbler, like many other species monitored by VCE, is a high conservation priority in the Northeast.



MOUNTAINS



Mountains are a rugged and ancient feature of the northeastern landscape, yet mountain ecosystems are among the most sensitive indicators of environmental change. High-elevation habitats are often more susceptible than lowlands to the effects of climate change, atmospheric pollution, and adverse land use practices. Since they are simultaneously durable and fragile, mountains constitute a symbol of our strength and a gauge of our vulnerability.

The small size and isolation of mountaintops impose constraints on organisms with limited mobility, including biologists. VCE has long overcome the practical difficulties of high-elevation field research with the help of collaborators, volunteers, and our own determination to unravel the mysteries of mountain ecology.

Objectives

- Convene a science and policy summit on the state of mountain ecosystems in the Northeast.
- Produce and disseminate a science-based strategy to protect the integrity of mountain ecosystems.
- Expand the scope of high-elevation research and monitoring to investigate how landscape-level stressors affect populations of birds and other mountain wildlife.

VCE's studies of mountain bird ecology began in 1992. Since then, our findings have been applied throughout the Northeast in the management of state and national forests, alpine ski areas, upper-elevation timberlands, and ridgeline wind-energy projects.



FORESTS

Forest is the dominant vegetation cover in the Northeast, blanketing nearly 50 million acres from New York to Maine. Embedded within this area are a rich variety of upland and wetland habitats that support much of the region's biodiversity. Forests sustain people, as well, with jobs, timber products, fresh air, clean water, and countless recreational opportunities.

However, this iconic landscape is threatened by fragmentation, development, climate change, and a growing array of introduced pests, pathogens, and invasive species. To understand the impacts of these and other stressors, VCE gathers baseline information and monitors ecological change over time.

Objectives

- Develop and pilot a regional program to monitor vernal pools with citizen scientists.
- Map vernal pool locations in relation to current and predicted road networks in order to identify areas where amphibians may be at risk from habitat loss and road-crossing mortality.
- Produce and disseminate a peer-reviewed paper and complementary report on the status and conservation requirements of northeastern forest birds.
- Monitor forest birds on managed parcels to evaluate the effectiveness of management actions.



VCE has monitored birds in Vermont forests since 1989 and in northeastern national parks since 2006. Our groundbreaking study of salamander behavior led to an ongoing effort to map vernal pools throughout the state.



VCE has pioneered the use of geolocators to track the movements of migratory grassland birds. Results will spur conservation of critical breeding areas, stopover sites, and wintering grounds.



VCE works with the Vermont Fish and Wildlife Department and other partners to protect nesting loons. Our recovery efforts have spurred a ten-fold increase in numbers of nesting loon pairs between 1983 and 2010.

- Develop a regional protocol to monitor grassland birds and evaluate management practices.
- Identify critical grassland habitat in the Connecticut River Valley and help key landowners take advantage of Farm Bill programs that provide economic incentives for grassland bird conservation.



GRASSLANDS

People are instinctively drawn to grasslands, which satisfy a human impulse for open spaces. Despite our attraction to these areas, grassland ecosystems are gravely imperiled throughout the world. As grasslands disappear from our region, grassland birds are declining faster than any other avian group.

The fate of our society is linked to that of grasslands, which can be managed to provide food, sequester carbon, and even supply energy in the form of biomass and wind power. In the conservation of grasslands, we have an opportunity to maintain a resource on which we depend, and whose inhabitants will not survive without our careful stewardship.

Objectives

• Lead a cooperative effort to expand habitat for grassland birds in the Northeast.

 Investigate factors that may limit grassland bird populations during migration and winter.

LAKES



Lakes and ponds are scattered across the northeastern landscape, providing water for drinking, industry, hydropower, and irrigation. These water bodies support complex food webs, many recreational uses, and a long tradition of seasonal cabins and youth camps. Their continued vitality is essential to maintaining the region's ecological and economic health, as well as a cherished way of life.

Efforts to conserve inland waters must address a host of threats, from pollution and shoreline development to the spread of introduced species. VCE biologists have confronted such threats for decades, while leading the successful restoration of Vermont's once-endangered loon population. We champion a collaborative approach to lake conservation that integrates science, management, and public outreach.

Objectives

- Empower Vermont Loon Recovery Project volunteers with more responsibility for monitoring and managing the state's loon population, providing oversight and coordination as needed.
- Create and apply a tool to measure lake health so that conservation resources can be allocated according to need.
- Produce a model that will predict regional loon populations under different ecological scenarios to evaluate potential threats.





VCE programs span
temperate and tropical
ecosystems to address
a variety of threats to
biodiversity. Through
research, monitoring,
and citizen engagement,
we promote land use
decisions that benefit
native wildlife. Our work
helps conserve habitat
for species that reside
in the Northeast and
for those that range
across continents.



TO PROTECT VITAL CARIBBEAN HABITATS



Migratory birds represent a living link that connects northern breeding habitats with southern wintering grounds. Conserving them requires an understanding of ecological events that occur across the hemisphere and throughout the year.

Some 120 species of birds that breed in North America migrate annually to the Caribbean, an ecoregion that is exceptionally important for global biodiversity. Caribbean islands also provide refuge to a diverse resident avifauna, including 148 species that exist nowhere else on earth. Yet, growing human populations and habitat loss threaten the region's unique bird life.

The most threatened terrestrial habitat in the Caribbean is mountain forest, winter home to the globally vulnerable Bicknell's Thrush. This songbird, which breeds in mountain forests of the Northeast, has been a focus of VCE conservation initiatives for two decades.



Over time, our work has expanded to include a suite of at-risk wildlife in the Greater Antilles.

> VCE first convened the International Bicknell's Thrush Conservation Group in 2007 to coordinate research and monitoring, build local capacity, acquire and restore habitat, and carry out education initiatives. Its growing numbers include over seventy-five conservation professionals representing more than forty government and non-government institutions in the United States, Canada, the United Kingdom, and the Greater Antilles.



Objectives

- Produce and disseminate a scientific paper and complementary report on the state of Hispaniola mountain forests in order to galvanize conservation of this critical habitat.
- Develop and implement Bicknell's Thrush conservation action plans for Hispaniola, Jamaica, Puerto Rico, and Cuba.
- Build a robust avian monitoring program in mountain forests of Hispaniola.
- Analyze and publish existing data sets to guide Caribbean conservation activity.

TO MAP BIODIVERSITY FOR CONSERVATION





Many ecosystems are undergoing unprecedented change as a result of human activity. Habitat conversion, climate change, and the replacement of native species by exotics all threaten to redraw the map of life.

In this rapidly changing world, biodiversity conservation often requires knowledge of plant and animal distributions across vast landscapes and over long periods of time. Legions of field biologists can be needed to illuminate patterns and trends that reveal pressing environmental problems.

VCE has a longstanding tradition of training and supporting volunteer naturalists. This tradition generates affordable and reliable data, while fostering connections between people and the natural world.

With the mapping and modeling power of geographic information systems (GIS), we will convert traditional field observations into strategic conservation solutions for the twenty-first century.

> VCE biologists use state-of-the-art technology to gather and display aeoreferenced field observations. Integration and analysis of data in GIS helps to identify areas of high conservation significance



Objectives

- Identify biodiversity hotspots in Vermont and prioritize conservation actions to safeguard vulnerable native flora and fauna.
- Create an open-access online Vermont biodiversity database for scientists, land managers, and the general public.
- Identify and assess vulnerability of biodiversity hotspots in mountain habitats of the Greater Antilles in order to guide conservation actions.
- Launch a five-year Vermont bumblebee survey as a statewide citizen science project for this ecologically and economically vital group of pollinators.



TO STRENGTHEN ORGANIZATIONAL LEADERSHIP, OUTREACH, AND OPERATIONS

Disciplined attention to organizational growth and development is vital to VCE's overall success. In order to increase the impact of our work, we will strive for excellence in three areas.

Leadership

We will strengthen governance of the organization and the effective management of our resources as we build our programs, expand our geographic influence, and grow our staff. Special attention will be given to cultivating leadership on the board and senior staff.

Outreach

We will provide decision makers and the general public with information that guides on-the-ground conservation, connects issues from local to global scales, mobilizes people to action, and communicates VCE's distinct niche. An institutional communication strategy will be developed to help convey our messages to natural resource managers, volunteers, and VCE supporters.

Operations

We will maximize the effectiveness of operations, development, and communications at board and staff levels. In particular, we will build capacity in the administration of human resources, finances, and conservation science projects.

More detailed objectives related to this goal are available from VCE upon request.











STRENGTH IN NUMBERS

People have been altering habitats and putting species at risk for thousands of years. It's an age-old problem that has resulted in countless extinctions. Now, twenty-first century tools give us the chance to transform our relationship with wildlife and sustain the vitality of ecosystems. In the coming years, VCE will use these tools every day to accomplish the goals of this plan.

We will employ innovative field and laboratory methods to amass volumes of data from northeastern and tropical landscapes. We will apply cutting-edge computing and mapping technology to illuminate patterns and interactions that point to conservation solutions. And we will use the power of traditional and Internet communications to activate our network of citizen scientists and conservation partners.

As conservation biologists, we adhere to a fundamental tenet of our field: there is strength in numbers. So count on us to deliver more science to more people in order to conserve more wildlife.

Please join us in this important work.



UNITING PEOPLE & SCIENCE FOR CONSERVATION

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Vermont Center for Ecostudies advances conservation of wildlife across the Americas through research, monitoring, and citizen engagement. We deliver the science people need to make good decisions for wildlife.

