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We collaborate within

Western Carolina University,

as well as with Highlands

Biological Station and

other regional institutions,

in education, research,

and outreach focused

on the ecology and biotic

diversity of the Southern

Appalachian region.



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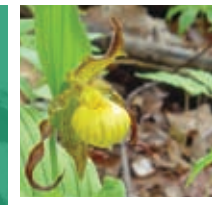
ECOSYSTEM
NATU
CONSERV

SABEC

Southern Appalachian Biodiversity & Ecology Center

MISSION

to serve as a regional resource
for education, research, and
service focused on biodiversity
and ecology of mountain ecosystems
of western North Carolina and
surrounding areas.



WESTERN
CAROLINA UNIVERSITY
A University of North Carolina campus

SABEC | Dept. of Biology
132 Natural Science
Cullowhee, NC 28734

WESTERN CAROLINA UNIVERSITY

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PHOTOS L TO R: Larval Hellbender; Josephine Falcone (graduate, biology) sampling eastern hemlock canopy arthropods; Ellen Bolas (UNC CEP) sampling high elevation rock outcrop vegetation; Sweet wakerobin, *Trillium vaseyi*; Greg Adkison (SABEC faculty) shows Teresa Tait (undergraduate, chemistry) traditional Cherokee plants; Jill Bourdon (graduate, biology) studies fairy wand (*Chamaelirium luteum*); Preparing a flying squirrel (*Glaucomys*) for radio-collaring; Odonata: *Cordulegaster* Twin-spotted Spiketail (larva).

STUDENT INVOLVEMENT

Our students take classes and conduct research to explore biodiversity of the western North Carolina region over scales from microscopic to the landscape. Recent research, highlighted below, includes diversity inventories; the ecology of threatened species; the interactions of exotic species and pathogens with native ecosystems; and the effects of changing land use on biodiversity.

Diversity Inventories

These studies include bacterial and archaeal diversity in Great Smoky Mountains National Park, microbial diversity in the root zone of hemlock trees, and the Odonata of Panthertown Valley, which contains the largest remaining southern Appalachian Bog.

Endangered Species

Research includes pollinator diversity and pollination patterns in the endemic rock outcrop plant *Houstonia montana*; distribution limits and shoot plasticity of Appalachian violet, a species of concern in USFS region 8; and the foraging habitat of a disjunct population of the endangered northern flying squirrel.

Exotic Species

Studies include mycorrhizal fungi effects on the exotic invasive plant oriental bittersweet (*Celastrus orbiculatus*); the effect of roads on the distribution of the exotic grass *Microstegium vimineum*; changes in red oak (*Quercus rubra*) population genetic diversity associated with different management regimes and following the loss of chestnut (*Castanea dentata*); and effects of control for hemlock woolly adelgid on arthropod and bird communities.

Land Use

Studies include golf course effects on connectivity across the increasingly fragmented western NC landscape; stream meiofauna and macro-invertebrate response to sedimentation; location and potential harvest effects on population structure of the medicinal plant fairy wand (*Chamaelirium luteum*); comparative studies of native and hatchery-derived populations of brook trout; factors influencing fish communities in restored and unrestored reaches of a formerly polluted river; and habitat fragmentation effects on fishes in Southern Appalachian streams.

FACULTY INVOLVEMENT

WCU faculty and staff members from Biology, Natural Resource Conservation and Management (NRCM), the Center for Service Learning (CSL), the Center for Mathematics and Science Education (CMSE), the Revitalization of Traditional Cherokee Artisan Resources (RTCAR) program, and Highlands Biological Station (HBS) contribute to SABEC research, education, and outreach. SABEC faculty members have worked with K-12 teachers in the NC Public School Math and Science Program; mentored students in the Carolina Environmental Program in residence at Highlands Biological Station; and are actively engaged in biodiversity and ecological research.

SABEC members and their areas of interest include Greg Adkison (Biology) plant ecology, evolution, and conservation; Peter Bates (NRCM) forestry and soil science; Glenn Bowen (CSL); Joni Bugden-Storie (NRCM) environmental studies and remote sensing; Beverly Collins (Biology) plant community ecology; disturbance ecology; James T. Costa (Biology and HBS) evolutionary genetics and behavior of social insects; David Cozzo (RTCAR) Cherokee ethnobotany, human ecology; Ron Davis (NRCM) wildlife ecology, GIS and remote sensing; Laura E. DeWald (Biology and NRCM) ecological genetics, restoration ecology, and conservation biology; Elaine Franklin (CMSE); Jeremy Hyman (Biology) behavioral ecology and ornithology;

Thomas H. Martin (Biology) population and community ecology of aquatic organisms; Kathy Gould Mathews (Biology) plant systematics; Seán P. O'Connell (Biology) microbial ecology; diversity of bacteria and archaea in soil and water; Joseph Pechmann (Biology) population and community ecology, herpetology, and wetlands ecology; Malcolm R. (Mack) Powell (Biology) host-pathogen interactions; Lori Seischab (Biology) molecular pathology and biophysics. Adjunct faculty members Karen Kandl (ecological genetics, conservation biology, and evolution), Paul Super (National Parks and avian parasite ecology), and Gary Wein (landscape analysis, wetland ecology, and land conservation) also contribute to SABEC projects.

COOPERATORS

SABEC students and faculty collaborate with regional land groups, private citizens, and state and federal agencies to study the effects of land use on ecosystems and biodiversity of the Southern Appalachian region and help provide a scientific basis for land management. Our cooperators include the Bent Creek Experimental Forest; Highlands-Cashiers Land Trust; National Forests of North Carolina; National Park Service, Appalachian Highlands Science Learning Center; and North Carolina Wildlife Resources Commission.