

Warren Wilson College

Land Innovation Program

Background

Warren Wilson College is an educational community defined by its close ties to the land, a deeply held sustainability ethos, and an unflagging commitment, at every pivotal moment in its history, to address the most pressing issues of the day. Our 1,050 acre campus—a riverine and upland system with managed gardens, farm, forest and landscaping—provides us with unparalleled opportunity for research, action and leadership. In 2018, we launched a “Land Innovation Program,” hired a Dean of Land Resources and dedicated our 1,050 acre campus as a living laboratory for the education of our students and for the development, modeling and teaching of innovative, profitable and resilient land management practices in a changing climate.

Our Land Innovation Program is grounded in the following realities:

- Our curriculum approach to engaged learning already supports the use of our land as a living laboratory.
- The College’s farm, garden, landscaped core-campus lands, recycling and composting operations, and forest are sustainably managed by student work crews and have proven to be remarkable sites for research on adaptive practices and entrepreneurial endeavors.
- Warren Wilson students are eager to serve as change agents.
- North Carolina has one of the highest rates of farmland loss in the US. In our region, in the midst of their struggle to make operations profitable, the farmer’s situation is severely exacerbated now by climate change impacts and their effect upon previously successful practices. This region needs successful models and information.
- The Southeast’s climate is changing dramatically and is forecast, according to the most recent climate assessment report, to be one of the most effected regions in the US.
- Our legacy of educational outreach to the region already establishes us as a valued contributor.

We have affirmed the goals of the Land Innovation Program in our new Strategic Plan:

- Strategic Imperative 4: Land and Environmental Sustainability
Warren Wilson College will be a living laboratory for innovative land management and practices for moving toward carbon neutrality and zero waste production. Our campus provides an immersive context for application and development of professional skills and community leadership in sustainability, integrated throughout the educational programs.
- Strategic Imperative 4a Land Stewardship
Warren Wilson College Lands will become a regional model for integrative land stewardship based on innovation, conservation and outreach by providing our students with a systems-based approach to land management. We will collaborate to exchange sustainable management practices, building an example of a resilient and productive working landscape.

Land Innovation Program Description

The goals for our Land Innovation Program are as follows:

- Living Laboratory for Student Learning
- Research and Modeling...A Hub of Innovation
- Educational Outreach to the Region and Beyond

- Partnership Development for Innovation and Leadership

Living Laboratory for Student Learning

We are committed to realizing the potential of our lands to offer an unparalleled educational experience for our students. The following strategies expand student learning opportunities and help us to achieve our mission-driven goal to educate students capable of building “a just and sustainable world” by having them do just that, on our land.

- Majors and Concentrations:
 - To expand student opportunities for using the campus as a living laboratory, and in response to student interest, the College has added Conservation Biology as a stand-alone science major. Majors in Chemistry, Biochemistry and Biology as well as Environmental Studies concentrations in Sustainable Agriculture, Ecological Forestry, Conservation and Society, Environmental Education, Environmental Policy and Justice and Water and Earth Resources continue to use the campus as a living laboratory for research and an outdoor classroom.
 - Warren Wilson has relaunched its Business major with an interdisciplinary lens to integrate sustainability and social responsibility throughout a traditional, liberal arts-based business curriculum. The land provides ample opportunity for Business majors to experiment with sustainable business ventures. As an example, we are installing a commercial kitchen to process campus-grown products like tinctures, salves, syrups and fabric dyes to sell to the public.
- Grant-Funded Student Research: We are expanding student research opportunities on Warren Wilson lands by seeking grant funds for inquiry into pressing land-based issues. Recently, we received funding for long-term soil carbon monitoring at the College Farm. Regenerative agriculture, a system the College has used for its farming for some time, increases biodiversity, enriches soils, improves watersheds, and enhances ecosystem services while maintaining economic sustainability. Capturing and storing soil carbon is one of the priorities of regenerative agriculture —an invaluable technique for reducing greenhouse gas emissions. This research will allow us to create a baseline inventory of current carbon contained in our agricultural fields that can be used to assess the effects of future management innovations with an eye towards carbon capture. The monitoring system will provide applied learning opportunities for our agriculture students and results will be shared with private and public stakeholders throughout the region.
- Capstone Student Research Projects (a requirement for Warren Wilson students): These continue to reflect our students’ keen interest in adaptive innovations. Student capstone projects focused on best ecological and market-based practices, and conducted on Warren Wilson lands in the 2018-2019 year, include the following:
 - *No-Till Barley Within A Pasture-Based Crop Rotation: A Feasibility Study*
 - *Warren Wilson Rice Production: A Regional Feasibility Study*
 - *Occultation Vs. Solarization On Weed Seed Bank Suppression*
 - *Effects of Elaeagnus Umbellata On Available Light and Soil Chemistry in The Warren Wilson College Forest*
 - *“Cleaning Up” The Hungarian Hot Wax Pepper: An On-Farm Variety Trial For WNC*
 - *Pre-Mitigation Baseline Study of Warren Wilson College Stream Networks*
- Student/Faculty Research Collaborations: These continue to assert the College into the national conversation about climate change. As a recent example, Warren Wilson College established the Phenology Stewardship Program to contribute phenological observations and research to the USA National Phenology Network. We established several phenology garden plots and a phenological monitoring trail on campus to serve as long-term research locations. Students and faculty observe and track seasonal changes

in select plants growing on these plots and trails. They are encouraging community members to get involved, take the training, and become “citizen scientists” who contribute to global climate change research.

Research and Modeling...A Hub for Innovation

The Land Innovation Program helps to keep the campus focused on creative, resourceful and ecologically sound, place-based solutions.

Warren Wilson College Models Best Practices

For years, the College has modeled best land management practices for the region and beyond for which we have received numerous awards and recognitions regionally and nationally. Our Land Innovation Program will help us to communicate our learnings more effectively to the region and beyond. Our recent implementation of a stream mitigation project demonstrates this commitment. Warren Wilson has undertaken an extensive restoration project for the Farm’s riparian borders along the Swannanoa River. The project models and teaches several important features: tax credits from a regional road project have been used to pay for this restorative work; native plant propagation and use is an essential feature of the restoration; and, the remeandered riparian buffers have been placed under conservation easement —a vital mechanism to sustain best practices. The Land Innovation Program’s Conservation Exchange has held a public seminar about the project and posted instructional signage along the road.

Student Work Crews Lead Innovation

Warren Wilson students’ Farm, Forestry, Garden, Landscaping, Blacksmithing and Fiber Arts Crews, with oversight from staff and faculty mentors, manage all aspects of the College’s lands and creative enterprises and their work is infused with liberal arts learning about best practices. Not only do students manage the daily operations, they are instrumental in implementing innovative and entrepreneurial practices whose outcomes are of value to regional farmers and craftspeople. Students are learning how to develop and test enterprises that fit the unique ecology of the region and bring economic benefit that leads to the conservation of the region’s natural resources. Some examples follow:

- Recent experiments in seed propagation protocols by the Forestry Crew in our 3,000 square foot research shade house determine effective propagation techniques for wild medicinal plants that have been overharvested nearly to extinction including ginseng, wild ginger, goldenseal, black cohosh and ramps. In Spring 2019, students became interested in the marketing and promotion of this work to nurseries and landowners. They investigated trademark law and developed a branded product: *Warren Wilson College “Guaranteed from Seed - Never Wild Harvested” Forest Medicinal Plants*. As a direct result of their work we are selling “Guaranteed from Seed” seedlings to the public and distributing them to landowners.
- A Forestry Crew student was interested in tapping black walnut trees (native to our region) and making black walnut syrup. Through testing a variety of methods and materials, with the support of his mentors, he ultimately created an economically viable black walnut syrup operation. This student is an Environmental Studies major with a concentration in Ecological Forestry and conducts the necessary academic research on the process of tapping the trees within the scope of his academic major. However, his work to tap the trees, to reverse osmosis to create the syrup, create labels, market the product, and ultimately generate sales occurs through his work on the Forestry Crew.
- Warren Wilson College’s river cane is a native bamboo species that grows along rivers and streams throughout western North Carolina and the southeast. River cane provides habitat for wildlife, improves water quality and is a culturally significant resource for Native Americans, especially the Cherokee. Once dominating floodplains and lowlands through the region, the species now occupies a small fraction of its

historical range. Working with Restoration Systems—the environmental firm assisting with our stream mitigation project—we have distributed this river cane for restoration projects to the Eastern Band of Cherokees, Asheville Greenworks, Riverlink, The Nature Conservancy, Conserving Carolina, Veterans Healing Veterans, the Healing Farm and Rockingham Community College. We have also transferred a portion of the river cane population to a large propagation field which will provide planting stock for future restoration efforts throughout western North Carolina.

- Additional Work Crew projects include the following: testing the viability of the Black perigord truffle for regional markets; cultivating American ginseng under pre-commercial white pine to realize market values for stands not yet ready for timber harvest; developing perennial polyculture systems to provide examples of mixed management applications and market products availability throughout all seasons; establishing a pawpaw/ramp orchard for the development of value-added enterprises for regionally/culturally important crops; producing charcoal from the College's sawmill waste for use in the blacksmith shop as an alternative to the ghg-amped coke

Educational Outreach to the Region and Beyond

The main vehicle for the Land Innovation Program's outreach is the Conservation Exchange at Warren Wilson College. Established in 2018, it serves as a hub for dialogue about land management practices, economic innovations and stewardship strategies in a changing climate for a regional, national, and international audience. Activities also include assisting regional landowners in the development of management plans for their lands. Through its speaker series, workshops and quarterly newsletter, the Conservation Exchange has grown into a 1,370 member conservation community committed to "share ideas, passion and resources for innovative land stewardship." In addition to its quarterly newsletter, here are examples of expert-led workshops and seminars to date: Creating Pollinator Habitat, Bat Conservation, Freshwater Mussel Conservation, Apiary Management, Southern Appalachian Dendrology, Shitake Mushroom Cultivation, Plant Phenology And Climate Change, Archeology And History Of Native Peoples Of The Swannanoa Valley, Portable Sawmill Operation, Stream Mitigation And Conservation Easements and Natural History and Land Management In The Southern Appalachian Mountains.

Examples follow of management plans developed by Warren Wilson faculty, in collaboration with their students, for regional landowners and conservation organizations:

- Conserving Carolina/Florence Nature Preserve: Plan for community access and biodiversity protection
- Christmount Property: Plan for non-timber forest product development, wildlife management, community trail system, timber management
- Imladris Berry Farm: Timber management plan integrated with commercial berry operation
- Old Coggins Farm: Plan for non-timber forest product development, land conservation, educational facility
- Sedmak Property: Plan for wildlife management, non-timber forest products, equestrian operations, biodiversity identification/cataloging

Partnership Development for Innovation and Leadership

Partnerships are central to innovation and to the proliferation of new practices that define stewardship in these changing times. We're developing local, national, and international partnerships that provide an exchange of ideas and best practices for integrated land management that are ecosystem-friendly, economically viable and adaptive to a rapidly changing climate. Examples of these partnerships follow:

- RiverBend Malt House, Asheville—"Connecting the farm to the fermenter since 2010. We work tirelessly to forge a connection between the land and the craft beverage industry. The results bring new varieties, flavors, and value to the consumer." The partnership goal for Warren Wilson is to test whether specialty varieties of grains are well-suited for production in the region. Our student Farm Crew is experimenting to identify grain varieties that can be successfully grown in this region and meet the specific nutrient requirements for malting and incorporating in commercial spirits.
- Green Lights Farm—a regional farming operation interested in hemp production. The partnership goals follow: Warren Wilson is testing the viability of late planting hemp (July) while also testing whether growing from seed or start is better at that time of year; establishing a larger crop field in 2020 to further examine growth potential; exploring the potential of a business partnership where Warren Wilson grows the hemp and shares in the profit and Green Lights Farm provides internships for Chemistry and Business students.
- Abundant Labs—a \$12M CBD oil processing facility that has recently relocated to Canton, NC (near Warren Wilson). The partnership goals follow: the College's student Garden Crew will test a late season direct seeding method against a late season greenhouse start method of RN-13 hemp variety for CBD oil; research and development for products derived from spent hemp material that has been through the CBD extraction process; Warren Wilson's chemistry majors may work as interns and/or full-time lab technicians at Abundant Labs.
- National Wiper Alliance—located in Swannanoa, a leader in converting and manufacturing nonwoven dry wipes. The partnership goal is for Warren Wilson to test the anti-microbial properties and compostability of a newly developed compostable commercial wipe. College work crews are participating in this project.
- Fonta Flora—a crafts brewery, based in Morganton, NC. The partnership goal is for Warren Wilson to grow lemongrass and other products for the production of Fonta Flora beers.