HIGHLANDS BIOLOGICAL STATION ~ OUR "CONTINUOUS PROJECT"

"To all the people, biologists and citizens,
male and female, young and old, living
and dead, who have participated in the
continuous project that is
The Highlands Biological Station"

~ Ralph M. Sargent, dedicating
Biology in the Blue Ridge (1977)

Ralph M. Sargent's celebration of the "continuous project that is the Highlands Biological Station" came at a momentous crossroads in the institution's history: *Biology in the Blue Ridge*, his 1977 memoir, marked the Station's 50th anniversary and the start of a new era as a University of North Carolina affiliate. Now nearly forty years later, with our 90th anniversary just a few short years away, our "continuous project" continues to thrive in ways that Ralph and other founders and benefactors of the Station would have delighted in. Each of its three facets — the research laboratory, the botanical garden, and the nature center — has come into its own, together serving a mission of research, education, and conservation for audiences from the local to the global. The components of such tripartite organizations as ours are sometimes seen as metaphorical legs of a stool, all three necessary in support of the functional whole. In our case I prefer to see them as metaphorical tripod legs underpinning a telescope: our functional whole is an instrument of discovery, insight, and wonder. Thus while the words of founding Director Edwin E. Reinke of Vanderbilt University are as true today as they were in 1930 when he noted that "with its natural wealth of vegetation and animal life the Highlands region will support indefinitely a varied program of research," equally true are the words of Ralph Sargent who declared that "from its inception, the Highlands Biological Station has had a wider scope and more general direction than research alone. It has sought to interest local residents, visitors, and the general public ... and to bring to them awareness of and care for the whole environment, physical, biological, and human of the southern mountains."

Ours is a mission of local focus with global significance, pursued through research and a rich educational program both formal and informal. But where is the Biological Station going, as it reaches its 90th year? This document offers a vision in answer to that question, but to understand what brought us to this point — the point of taking stock and looking to our future — it is important to understand our past. Why was a biological station founded in Highlands to begin with? To appreciate why, it is instructive to consider the big picture of our location and unique environment.

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Field stations are founded in environmentally interesting places, and when it comes to temperate-zone biodiversity our region is deeply interesting indeed. The renowned richness of the flora and fauna of the southern mountains stems from a happy confluence of factors, among them circumstances of geology, latitude, and weather and climate — the joint effect of these on adaptation, speciation, and the ebb and flow of species over time has resulted in a lush landscape where northern species meet southern and environmental gradients of elevation, slope aspect, soils, and rainfall provide a richly interwoven mosaic of myriad micro-environments and niches.

For millennia this region was the homeland of native peoples, who celebrated, studied and utilized the landscape here in many ways. Europeans, too, were beguiled by these mountains, which for a time were only seen as a distant wall on the horizon. In 1728 Colonel William Byrd of Virginia was part of a party surveying the Virginia-North Carolina border — the Dividing Line, as it was called — and from a hilltop he looked to the west and saw the Blue Ridge front looming in the distance. "*Our present circumstances*," he lamented, "*wou'd not permit us to advance the Line to that Place, which the Hand of Nature had made so very remarkable*." Byrd beheld what the Cherokee called the Blue Wall, the eastern front of the Blue Ridge running from Virginia to South Carolina seen as a steep escarpment rising from the Piedmont. This long sinuous front reaches its greatest height of nearly 5,000 feet in its southern stretch. Viewed from a distance, it appears as a continuous blue wall of mountains. And Highlands is perched atop it.

The Blue Wall was forbidding to some, but beckoned others. The lush southern Appalachian Mountains seemed to inspire a sense of mystery and primeval power to all who ventured to explore them. When Philadelphia naturalist William Bartram penetrated deep within what was then Cherokee country of western North Carolina in May 1775, he was staggered at his first elevated view of the region. As he wrote in his famous *Travels*, "I beheld with rapture and astonishment, a sublimely awful scene of power and magnificence, a world of mountains piled upon mountains." He was among the earliest naturalists to celebrate the botany of the region too, reveling in its "charming circle of mountain beauties." Between the 17th and 20th centuries our region was a veritable botanical Shangri La, crisscrossed by a Who's Who of early naturalists besides Bartram: André and Francois Michaux, John Fraser, Thomas Nuttall, John Lyon, Samuel Buckley, Asa Gray, John Torrey, Moses Ashley Curtis, among others.

Modern travelers are no less astonished; the vast Blue Ridge Physiographic Province, anchored by the Great Smoky Mountains at their heart, boasts highly complex geology with the highest peaks in all of eastern North America and rainfall and biological diversity worthy of tropical rainforests. Seven major river gorges dissect the southern escarpment alone, creating a wild watery landscape where creeks and rivers rush past lush slopes wreathed in the mists that put the "blue" in the Blue Ridge and the "smoky" in Great Smoky Mountains.

This is where we are. And in part, *why* we are here.

In the Air

In addition to its salutary climate and natural beauty, Highlands residents have celebrated the natural history of the area since the town's founding. New England writer Bradford Torrey, visiting Highlands in the 1890s, was struck by this: "Botany and Latin names might almost be said to be in the air at Highlands," he wrote. "The truth is that the region is most exceptionally rich in its flora, and the people, to their honor be it recorded, are equally exceptional in that they appreciate the fact." There should be little wonder then, that some local residents had the visionary idea of founding a biological research station in Highlands a few decades after Torrey penned those words. Indeed, the wonder may lie more in why it took so long. It was in 1927 that Clark Howell Foreman (1902-1977) — scion of the founders and publishers of the *Atlanta Constitution*, future Assistant Secretary for the Interior in the Roosevelt Administration, civil rights advocate,

and conservationist — invited a group of Highlands residents to a meeting to consider the idea of founding a museum in Highlands: "It is with the idea of preserving as much as possible of the old intellectual spirit of Highlands that a few people have manifested an interest in a Highlands Museum. . . ." A museum, he urged, "could grow into all the fields of natural history and be a constant source of pride, entertainment, and education to the people of Highlands." The idea was embraced with enthusiasm, and the Highlands Museum Association soon formed, and the Highlands Museum (initially occupying a one-room addition to the local library) was opened on July 4, 1928. The Museum's first Trustees included, besides Foreman, botanist and educator Thomas Grant Harbison, William M. Cleaveland, Albertina Staub, Charlotte Elliott, and Marguerite Ravenel — local residents all. Soon afterward Robert L. Foreman, Edith Eskrigge and Sam Evins joined the group.

That same year Foreman invited noted UNC Chapel Hill botanist William Chambers Coker and Vanderbilt University zoologist Edwin E. Reinke to consider working in Highlands. Both accepted the invitation, establishing a long and fruitful relationship between these distinguished scientists and the nascent Biological Station, with Reinke eventually becoming the first Director and Coker the second. Pursuing an idea put forth by Clifford Pope of the American Museum of Natural History in New York that the Highlands Museum "undertake a program of active biological research," Foreman consulted with biologists throughout the eastern US on the idea of establishing a research laboratory in Highlands. Reinke was asked to undertake a feasibility study, and his resulting "Report on the Necessity of a Mountain Biological Research Station in the South," released in 1930, proved galvanizing. Foreman and other officers of the Museum soon convened a conference of distinguished biologists from a diversity of southeastern universities as well as the American Museum, Princeton University, and the US Biological Survey in Washington. At its conclusion the group voted unanimously to recommend the formation of a new Corporation, and on July 5, 1930, the Highlands Museum and Biological Laboratory, Inc. was born.

To support scientific research it was necessary to supplement the museum with a laboratory; a benefactor, Samuel T. Weyman, soon stepped forward and underwrote the construction of the building that now bears his name, situated on five lakeside acres purchased by the corporation. Designed by the noted architect Oscar Stonerov of Philadelphia and completed in 1930, the Sam T. Weyman Memorial Laboratory was acclaimed for its innovative, modern design. (The building was converted to a dining hall when the adjacent William Chambers Coker Laboratory was built in the late 1950s, with then-state-of-the-art research space, but the Weyman building served the Station well as a bustling research lab for some thirty years.) Research activity at HBS snowballed through the 1940s and 1950s; the rich diversity of the region attracted researchers working on many different groups of organisms and ecological systems, which in turn led to growing financial support from the State of North Carolina and the National Science Foundation (NSF). During the tenure of the third Director, zoologist Thelma “Doc” Howell of Wesleyan College, additional research infrastructure was built in the 1950s and 1960s with the inauguration of a series of intensive field studies of the escarpment river gorges. It was in that period that the main lab at the Station, the W. C. Coker Laboratory, was completed, along with the first residences at the Station (later named Howell, Wright, and Deacon Cottages). The Illges family of Columbus, Georgia,

donated a house for use by students and faculty in this period, dubbed the Illges Cottage, and an aquatics research laboratory and attached maintenance shop were built.

In this period, too, a program of academic summer field courses was initiated, and a Grant-in-Aid program supporting graduate research was launched with NSF support. Later taken over by the Highlands Biological Foundation, this program has now operated continuously for over 50 years, supporting hundreds of research projects and scores of graduate theses and dissertations. Research conducted at HBS encompassed biological systems fittingly diverse: plants, insects, fungi, mammals, birds, fish, salamanders, fungi, terrestrial and aquatic ecology have been the primary areas of interest, with studies ranging from taxonomy, systematics, ecology and evolution to conservation biology, ecophysiology and ecosystem and community ecology. Because the southern Appalachian region is a temperate zone hotspot for salamanders, research on this group has been a major research focus over the decades.

Other Facets of the Diamond: Museum and Botanical Garden

By 1941 the Biological Laboratory was joined by a new museum building, a WPA-built structure of native stone and beamed and paneled with chestnut salvaged from the surrounding Nantahala National Forest. The museum and associated amphitheater was a natural counterpart to the research laboratory, embodying the joint research and educational mission of HBS. Officially named for visionary HBS founder Clark Foreman, today the Museum is known informally as the Highlands Nature Center. Among its many public programs, the Nature Center is an important venue for scientists working at the Station to share their research and knowledge with the community at large. The Museum was built as a seasonal facility, with a program of nature-oriented summer programs and a Thursday evening lecture series that continues to this day. Its programming capabilities changed dramatically in the early 2000s under the tenure of Robert Wyatt; funds were raised to make the building suitable for year-round use, and affiliation with the state-supported Grassroots Science Museums Collaborative provided grants in support of operations, a full time supervisor for the Nature Center, and summer interns. Nature and science programming for the public and school groups increased by an order of magnitude, with daily and weekly programs, special events, summer camps, and evening lectures (now named the Zahner Lectures in Conservation Biology in honor of Bob and Glenda Zahner) in season, and a continuous offering of school programs in Macon and surrounding counties during the school year.

Ralph M. Sargent, Professor of Renaissance Literature at Haverford College, Pennsylvania, became a Trustee in 1939 and served as Secretary of the Corporation from 1941-1944 and then President from 1944-1947. In 1945 Ralph first articulated the need for a native plant botanical garden in Highlands. He called for an arboretum, a "living display of southern mountain plants" as he put it. He and Henry Wright and others made good use of the grounds around the Museum and Laboratory, planting a great diversity of native trees and shrubs, but within a few years the area was deemed inadequate for the planned arboretum. The Trustees then appointed a committee consisting of Ralph, Henry, Tom Harbison (son of botanist T. G. Harbison) and NC State Univeristy botanist H. R. Totten to find a suitable location for a Botanical Garden. It was slow going, but the botanical enthusiasts labored away. By the late 1940s they identified a triangular tract owned by the Town adjacent to the museum as a wonderful site for a garden, but

negotiations for its acquisition dragged on. The botanical garden idea got a push in 1952 at the 25th anniversary celebration of the Station, when D. Hiden Ramsey, publisher of the *Asheville Citizen*, spoke on the value of basic research and urged further efforts to establish a botanical garden in Highlands. "Big Arboretum for Mountain Flora Favored," the headline read. By this time Thelma "Doc" Howell had been Station director for just shy of ten years, and nearly another ten would pass before a breakthrough was achieved.

The year 1962 proved an *annus mirabilis* for the Station's botanical garden ambitions, with events altering its footprint dramatically: in that year the Town of Highlands agreed to lease the "Town Park" tract to the Station for ninety-nine years, the Foreman family donated the tract just below Lower Lake Road, and the Corporation managed to purchase an additional portion of the Foreman property along the southeastern shore of the lake. The donated tract was named "Effie Park," in honor of Effie Howell Foreman, mother of Clark Foreman. A new Botanical Garden Committee convened, consisting of Judge George Janvier of New Orleans, Martina Wadewitz (later Martina Wadewitz Haggard), Ralph Sargent, Henry Wright, and later, Chapel Hill biologist Lindsay Olive. This energetic group quickly moved to develop and implement a plan for the nascent botanical garden. From the beginning the philosophy was to showcase native plants in their natural habitat: the garden was to be a naturalistic garden, developed within and among the natural assets of the site. And what natural assets! From the old growth acid cove forest of the Coker Trail to lake edge, wetland, riparian areas, and upland woods, the 10+ acres of the garden site were teeming with native flora and fauna. Celebrating its 50th anniversary in 2012, the Highlands Botanical Garden has developed into a premier naturalistic native-plant garden prized by casual visitors and botany classes alike.

Onward and upward

"Doc" Howell retired in 1971 after a tenure of 26 years, an important crossroads for the Station as the decade-long river gorges research project came to an end. Duke University herpetologist Richard "Dick" Bruce assumed the directorship, and over the next 27 years worked to further solidify the institution's standing as a premier center of research. Salamanders were a special focus, and the Station hosted several international conferences and a veritable army of faculty and student researchers from across the country and around the world. Dick Bruce also played a key role with Al Radford (then President of the Corporation) in negotiating the momentous transition of the Station from private to State enterprise, when in 1976 it joined the University of North Carolina system as the university's mountain research station. Thus began the Station's fruitful relationship with the university system, and in particular with its new administrative home, Western Carolina University. At that time the founding non-profit corporation was reorganized into the modern Highlands Biological Foundation, Inc., its mission to support and advance the educational and scientific mission of the Biological Station.

In the 1980s the Station's footprint and capacity were once again enlarged, with the acquisition of the Valentine home and an adjacent 2-story outbuilding once used as a photography studio. The house became Valentine House dormitory and the outbuilding the Bruce Biodiversity Laboratory, named for Dick Bruce upon his retirement in 1999. (A decade later, with NSF support new teaching labs and classrooms were installed in the ground floor of the Bruce Biodiversity building, and State funding provided a state-of-the-art molecular genetics laboratory in the upper level.) The facilities expansion

permitted by the Valentine House purchase was of tremendous benefit to the Station, but incalculably more valuable was the impact of the acquisition on the Station's footprint: the property linked the Museum, Coker Laboratory, and older residential cottages, creating a core campus that was previously lacking.

Botanist Robert Wyatt became the fifth Station director upon retirement of Dick Bruce. Among other important initiatives, Wyatt added residential capacity with the construction of the Duplex adjacent to Valentine House (a joint effort of the Highlands Biological Foundation, Cannon Foundation, and NSF), and introduced a new and exciting research and educational dimension to the Station in 2001 by partnering with the Institute for the Environment (formerly Carolina Environmental Program) at UNC-Chapel Hill. HBS became a founding "field site" of the Institute, providing an annual fall semester-in-residence program for undergraduate environmental science, biology and geography majors with a focus on regional biogeography, biodiversity, conservation biology, and cultural history. The program's academic courses, individual research internships, and group capstone research project immerse students in a study of place, and the many historical and ecological factors that shape so bio-rich a place as ours. They also tackle local environmental problems or scientific questions with their research projects, many of which have been published in the scientific literature.

Janus in Highlands

I am the sixth HBS director, standing on the shoulders of giants. Upon my arrival in 2006 I was asked by the Board of Directors and UNC General Administration to take stock of the Station and begin to chart its future course. An 'in-house' Master Planning process ensued. The record of accomplishment as the Station neared its 80th anniversary in 2007 was clear: scores of graduate theses over the years, hundreds of scientific publications, thousands of students and researchers coming through the Station to study and learn, tens of thousands visiting the Nature Center and Botanical Garden for instruction and enjoyment. But the facilities and program assessment also made it clear that that the story of the growth of HBS through the decades, and the accomplishments and productivity of the legion researchers, faculty, students, and community members who have been a part of our "continuous project," had not been a story of unalloyed progress. The institution also suffered long periods of neglect, both from the university system and the community. Staffing limitations had long been a problem, and many of the facilities that served the Station so well began to show signs of deterioration. Some, like the Illges Cottage, had to be closed down permanently; disrepair and physical location prohibited making the building fully accessible and up to code.

In time for the 80th anniversary celebration in 2007, a new era began to take shape. Plans were drawn up for campus-wide improvements from physical infrastructure to staffing to programming, a roadmap to not only getting the institution back on track but setting the course for future decades. The past half dozen years have seen steady improvements beginning with funding from the state of North Carolina for a sewer system, a key infrastructure improvement that made subsequent building overhauls possible. State and NSF funding permitted a complete and dramatic renovation of both the Coker Laboratory and Howell Administration Building in 2012-2013. Following on the heels of the 2009-2010 NSF-sponsored renovation of the Bruce Biodiversity Laboratory, the research and teaching capacity of HBS increased dramatically and made

a quantum leap into the 21st century. A "green HBS" initiative was launched, resulting to date in the installation of solar thermal systems at Valentine House and the Duplex. An outdoor classroom was built in 2011 for expansion of outreach programming. Internet connectivity was overhauled campus-wide. A rejuvenated and energized Highlands Biological Foundation hired its first dedicated and talented Director, Sonya Carpenter who, together with a new Program Assistant position ably filled by Michelle Ruigrok, has put HBF program planning, communications, fundraising, and membership on a new and unprecedented plane. Exciting collaborations and funding partners permitted development of new kinds of offerings, such as the Backyard Naturalists after-school program.

Looking both backward and to the future, Janus-like, we see a past of tremendous progress and productivity despite setbacks and uncertainties, and a future of continued achievement and service to our mission — but of course also likely with challenges we cannot currently conceive of. The last half-dozen years of key infrastructure, facilities, programming, and staffing improvements has brought us now to a time for revisiting the informal master plan of 2006-2007. We recently undertook a more formalized, and inclusive, planning process, the fruits of which you hold in your hands. The year-long process involved workshops, interviews, surveys, long and passionate discussions about virtually every facet of the institution. The vision for the Highlands Biological Station that emerges is exciting: true to our mission, but identifying and strategically solving key challenges such as student and researcher housing, new venues for community engagement, a commons for informal learning, and more. Not everything in the new plan will be realized in precisely the form envisioned here, and certainly not all at once, but this first truly comprehensive Master Plan is our blueprint for achieving the next level of excellence of our "continuous project" that is Highlands Biological Station.

Jim Costa
HBS Executive Director
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