HIGHLANDS BIOLOGICAL STATION

Gardens and Grounds Roadmap 2026–2030

A five-year guide to caring for, enhancing, and sharing the Highlands Botanical Gardens and the grounds of the Station, prepared by the Botanical Gardens and Grounds Planning and Advisory Committee.

Dated **September 26, 2025**

This Gardens and Grounds Roadmap was approved by the responsible administrator, Dr. James T. Costa, Executive Director of the Highlands Biological Station, on _____.

Contents

The 2026–2030 Roadmap carries forward the four-domain structure of the 2021 Roadmap. Action statements are coded by domain (C, G, H, P) so they can be referenced in committee reports and Board updates.

The Roadmap at a glance

One long-term goal, four domains, 13 action statements over five years. This page summarizes the whole Roadmap; the sections that follow give the background and the reasoning behind each action.

Long-term goal

"To ensure that HBS has beautiful, modern gardens and grounds that balance field station functionality in research and education with tourism and community engagement, with priority consideration given for the central research, education, and conservation mission of the biological station, making HBS a world-class destination for field biology research, academics, and public engagement."

Four domains

C

Plant Collections

Documenting the living collection and defining the conservation role of HBS.

2 actions

G

Grounds Management

Safe bridges, handrails, and trails; gardens that weather the storm water work ahead.

2 actions

H

Horticultural Management

Funding the work, tracking invasives, and keeping new plantings healthy and documented.

3 actions

P

Public Engagement

A new gateway garden, interpretation, volunteers, and the events that bring people into the gardens.

6 actions · includes a FY26–28 priority

All 13 action statements

Code	Action	Domain	Priority
C1	**Plant collection database** Continue working on an Excel database for plants in the HBS plant collection.	Plant Collections	
C2	**Conservation mission statement** Create a HBS conservation mission statement, such as a single statement, highlighting HBS priorities, current threats, and potential threat mitigation.	Plant Collections	
G1	**Bridges and handrails** Help HBS staff prioritize replacement of bridges and handrails to help ensure public safety. (See HBS Campus Appropriate Use Policy, November 2020.)	Grounds Management	
G2	**Storm water response** Assist HBS staff in prioritizing needed garden work in response to implementation of new storm water management projects.	Grounds Management	
H1	**Support and funding** Assist HBS leadership in identifying additional methods to obtain support for maintaining and enhancing the gardens.	Horticultural Management	
H2	**Invasive plant tracking** Assist HBS in identifying and tracking non-native invasive plants in the gardens and grounds.	Horticultural Management	
H3	**New and enhanced gardens** Review and advise on developing new gardens and enhancing existing gardens to ensure plant health and documentation of new plant additions to the gardens.	Horticultural Management	
P1	**South Gateway Garden** Provide advice on the creation of the “South Gateway Garden” next to the Clark Foreman Museum/Nature Center.	Public Engagement	**FY26–28**
P2	**Interpretive signage** Help create interpretation signage for the gardens.	Public Engagement	
P3	**Engaging visitors in science** Assist in generating innovative ways to better engage visitors in animal and plant sciences.	Public Engagement	
P4	**Volunteer recruitment** Assist in the recruitment of volunteers to work in the landscaped gardens.	Public Engagement	
P5	**Subcommittees for special events** Create new subcommittees/subgroups or means to help with special events over the next 5 years, with emphasis on the 100-year celebration of the Station and the biennial Native Plant Symposium.	Public Engagement	
P6	**Workshops, events, and the symposium** Continue to provide advice on workshops, events, and the biennial native plant symposium.	Public Engagement	

Priority actions are the focus for fiscal years 2026–27 and 2027–28. All other actions are ongoing across the Roadmap period.

Background and purpose

The 2026–2030 Highlands Biological Station (HBS) Gardens and Grounds Roadmap (HBS Roadmap) articulates the actions to be taken over the next five years by the HBS Botanical Gardens and Grounds Planning and Advisory Committee (Committee) and its partners to sustain and enhance the gardens and grounds of the HBS. It also represents an informed guide and, importantly, a call to action to implement effective, collaborative, and coordinated approaches to achieve the stated long-term goals.

The 2021 Roadmap was an important step in a series of collaborative efforts to ensure that there is focus on both the appropriate use of the HBS grounds and the living collection of flora and fauna. The prior Roadmap was recognized as a critical milestone in the HBS Strategic Priority Goals and Action Items, May 2020. The Roadmap proved to be a helpful tool to keep efforts focused on top priorities as well as record and celebrate the successes of the past five years (see HBS Gardens and Grounds Roadmap Successes, September 2025). Other key historical documents include the Botanical Garden Committee Roadmap (October 2018) that focused on the gardens of HBS and the Highlands Botanical Gardens Forum (May 2015) that offered important insights on the value of the gardens that can inform current actions and activities.

Long-term goal

With this background, HBS has stated a lofty but achievable long-term goal:

> “To ensure that HBS has beautiful, modern gardens and grounds that balance field station functionality in research and education with tourism and community engagement, with priority consideration given for the central research, education, and conservation mission of the biological station, making HBS a world-class destination for field biology research, academics, and public engagement.”

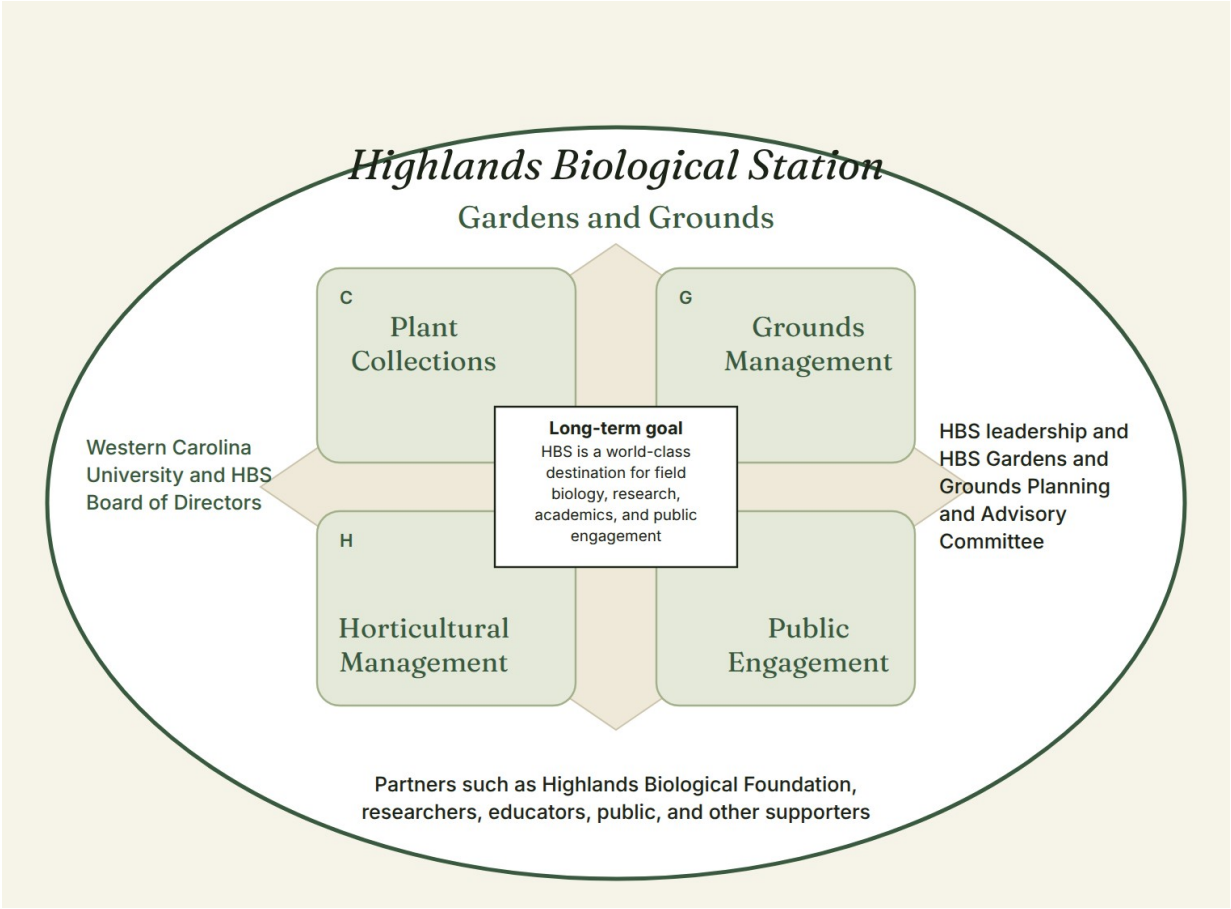
Key principles

Five principles frame how the Roadmap was written and how it will be used.

Principle	What it means for the Roadmap
Sixty-three years of shared work	The leadership of the HBS recognizes that considerable work has been undertaken by HBS staff and a variety of partners over the past 63 years to enhance the gardens and grounds.
HBS Strategic Priority Action Plan (May 2020)	Developed with the HBS Board of Directors, the plan continues to inform the development of the HBS Roadmap action statements and is a key reference document.
HBS Living Collections Policy (March 2020)	A keystone document that will guide the development of HBS policies, programs, and projects with respect to gardens and grounds.
HBS Campus Appropriate Use Policy (November 2020)	The policy and its related map provide guidance on HBS policies, programs, and projects with respect to gardens and grounds.
A living document	HBS recognizes that the HBS Roadmap is a “living document” focused on the next five years.

Organizing framework

The model below places the long-term goal at the center, the four domains around it, and the keystone organizations and partners at the corners.



The white box at the center of the model includes a summary statement of the long-term goal: "HBS is a world-class destination for field biology, research, academics, and public engagement."

The four shaded boxes surrounding the long-term goal display the four key domains of the HBS Roadmap: Plant Collections, Grounds Management, Horticultural Management, and Public Engagement. Though it is recognized that many of the action statements are interrelated, it is important to note that each of the HBS Roadmap action statements fits into one of these domains.

Underlying these domains, shown at the corners of the background diamond, are the keystone leadership organizations, groups, and partners. These critical collaborations will help turn the HBS Roadmap action statements into a series of feasible short-term and long-term projects aimed at achieving the long-term goal.

Action statements

The following action statements, grouped by the four domains, articulate the actions that the HBS will undertake over the next five years (2026–2030) to support its long-term goal.

Action statements marked PRIORITY are priority actions for FY 26–27 and 27–28.

Plant Collections (C)

Goal. *The Highlands Botanical Gardens features native plants presented in natural habitat gardens as a resource for research studies and public education. These gardens also serve as ecological preserves of native flora of the Highlands Plateau and the southern Appalachian Mountains. The Highlands Botanical Gardens features numerous native plant demonstration gardens for the education and pleasure of visitors.*

C1 Continue working on an Excel database for plants in the HBS plant collection.

The HBS Living Collections Policy was approved by the Highlands Biological Station and Board of Directors in March 2020. Work is needed to enter plant records in the database. This work will help inform how to increase the collection of rare/endemic plants needed in the gardens. The ultimate goal is to share plant collections with the public without revealing sensitive and rare plants in the gardens. Examples of ways to share the collection include checklists of categories of plants, plants blooming in different seasons, etc.

Several checklists were developed during the 2021–25 Roadmap period, namely "HBS Trees in the Gardens" and an updated "HBS Bartram Walk" (formerly "Bartram Trail," a self-guided tour).

C2 Create a HBS conservation mission statement, such as a single statement, highlighting HBS priorities, current threats, and potential threat mitigation.

The Highlands Botanical Gardens includes over 30 rare plants. A conservation mission statement will articulate the desired plant conservation role of the HBS.

Grounds Management (G)

Goal. *Maintain and enhance the grounds.*

G1 Help HBS staff prioritize replacement of bridges and handrails to help ensure public safety. (See HBS Campus Appropriate Use Policy, November 2020.)

Evaluate bridges and handrails and any needs to replace or enhance them. The HBS Strategic Priority Action Plan (May 2020) includes: "Continue to enhance trails and signage in the Botanical Garden."

G2 Assist HBS staff in prioritizing needed garden work in response to implementation of new storm water management projects.

The HBS has implemented a number of mitigation steps to redirect storm water that is negatively impacting buildings, walkways, and demonstration gardens. A storm water management plan has been proposed and will be carried out by HBS over time. Preparing for the careful removal, short- or longer-term protection, and replanting of plants will be important as the storm management plans are implemented. This will help prevent the loss of plants and ensure their return to the same garden or to new appropriate locations.

Horticultural Management (H)

Goal. *Maintain and enhance the gardens.*

H1 Assist HBS leadership in identifying additional methods to obtain support for maintaining and enhancing the gardens.

Several HBS Roadmap priority actions require significant funding. The feasibility of achieving these HBS Roadmap priority actions will be enhanced by identifying a broader portfolio of potential fundraisers. This could include the implementation of the HBS Donation Guidelines drafted by the Committee and adopted by the Station in 2023 (e.g., list resource needs and costs on the HBS webpage).

H2 Assist HBS in identifying and tracking non-native invasive plants in the gardens and grounds.

An Invasive Plant Management Plan was developed by a garden intern in the summer of 2019. The current horticulturalist kept a journal to record eradication efforts in the gardens. These could be combined to assist the HBS staff and horticulturalist to know what has been done and what are new problem areas (e.g., bladderworts in the lake) and potential means to address them (e.g., introduction of fish with appropriate controls).

H3 Review and advise on developing new gardens and enhancing existing gardens to ensure plant health and documentation of new plant additions to the gardens.

Although efforts to select and establish plant species with few reported problems are a key element of a garden design, HBS can anticipate the need to replace specimens from time to time. Those chosen as replacements must be compatible with the site and will hopefully add to the diversity of the plant species on campus.

Public Engagement (P)

Goal. *Inspire understanding and appreciation of the rich natural heritage of the Highlands Plateau and southern Appalachian Mountains.*

P1 Provide advice on the creation of the "South Gateway Garden" next to the Clark Foreman Museum/Nature Center. PRIORITY FY26–28

Improve the visitor experience when entering the gardens at the Clark Foreman Museum (i.e., Nature Center). Design and install a "Discovery" or "Gateway Garden" in the space adjacent to the west side of the Museum to serve as an entry garden and orientation space that is universally accessible and introduces visitors to the HBS and the gardens. This "Exploratorium" could function as an outdoor extension of the Museum.

This space could be an accessible and multi-sensory garden with a sculptural focal point with a model of the Highlands escarpment and an education focal point with interpretive information regarding regional geology, ecology, and biodiversity. This project could also include reestablishing a primary walkway leading to the Woodland Way garden and core (historical) Botanical Gardens entrance.

Funding is needed for construction documents in anticipation of implementation of the plan. The HBS 2021 Roadmap identified this as a top priority near-term project to "enhance the entry corridor leading to the garden from the Nature Center."

P2 Help create interpretation signage for the gardens.

Enhance the educational value of the gardens for visitors. Develop creative ways to integrate education into the gardens. Develop interpretive content for key points throughout the gardens.

P3 Assist in generating innovative ways to better engage visitors in animal and plant sciences.

Consider a range of appropriate methods and technologies to reach a diverse audience. The expert panel of botanists who participated in the Highlands Botanical Gardens Forum agreed that "education is the highest and best use for the Highlands Botanical Gardens."

P4 Assist in the recruitment of volunteers to work in the landscaped gardens.

There is an ongoing, dedicated group of Botanical Garden Volunteers who help the HBS maintain and enhance the gardens. This program needs more volunteers and those who can do various physical tasks in the gardens.

P5 Create new subcommittees/subgroups or means to help with special events over the next 5 years, with emphasis on the 100-year celebration of the Station and the biennial Native Plant Symposium.

Subcommittees can be among the most important working forces of an organization. They serve as work units of the organization, taking work and breaking it into meaningful and manageable

chunks. It will be important to create empowered subcommittees, with specific and clear tasks and goals, moving beyond the Committee to the greater group of Friends of the Station, to realistically assist HBS in carrying out their plans for the 100-year celebration of the Station and the biennial Native Plant Symposiums.

P6 **Continue to provide advice on workshops, events, and the biennial native plant symposium.**

This will include ways to provide enhanced outreach to connect the public with the gardens and further realize their educational value.

Implementation and assessment

Effective implementation of the actions identified in this Roadmap can be achieved in the following means

1. HBS leadership will utilize HBS staff and traditional funding resources to develop and implement plans to achieve specific actions. HBS has initiated activities for several action statements.
2. HBS leadership will identify which actions they wish to address through working with the Gardens and Grounds Committee to establish subcommittees or task forces that can make recommendations on necessary next steps, projects, and possible funding avenues.
3. HBS leadership will work to develop and establish partnerships with like-minded supporters to help move forward or achieve select actions.

Tracking the progress of project plans and related outcomes can be achieved by

1. HBS leadership working with the Gardens and Grounds Committee to establish a system to track progress on project plans and related outcomes. Achievements will be documented and shared.
2. HBS leadership and the Gardens and Grounds Committee will review the HBS Roadmap priorities and accomplishments annually. Actions can be reprioritized, as necessary.
3. As HBS and their partners achieve priority actions, the Roadmap will be used to move forward and address other actions that have become more feasible and urgent.

Appendix A

Contributors to the HBS Roadmap 2026

Committee Chair	Ken Conover
Highlands Biological Station	James Costa, PhD, Executive Director Jason Love, Associate Director Canty Worley, Horticultural Specialist
Western Carolina University	Katherine Mathews, PhD, Director of WCU Herbarium, Botanist
Community	Bryding Adams Lynda Anderson, PhD Ken Conover Paul Manos Glenda Zahner

Current Committee membership

Name	Position
Bryding Adams	
Lynda Anderson	
Ken Conover	Immediate Past Chair
Dr. James Costa	Highlands Biological Station Executive Director
Jason Love	Highlands Biological Station Associate Director
Leslie Manning	Highlands Biological Foundation Executive Director
Dr. Paul Manos	Chair
Kathy Mathews	
Marissa Nieddu	Highlands Biological Foundation Marketing & Communications Specialist
Liz Sargent	
Jeremy Schewe	
Dollie Swanson	
Sarah Vickery	Highlands Biological Station Business & Communications Manager
Canty Worley	Highlands Biological Station Horticultural Specialist
Glenda Zahner	

Appendix B

Accomplishments from the prior Botanical Garden Roadmap (2021–2025)

Plant Collections

- **A simpler collections database.** After several years of unsuccessful attempts to create a living collections database using the purchased BRAHMS software, the Committee agreed that a simpler and less expensive solution was needed. Tara Henderson created an Excel spreadsheet template including a garden location naming scheme. Tara and Paul Manos are working on populating the spreadsheet.
- **Two rare species expanded.** Some *Helonias bullata* have been moved by Station staff from the large population by the trail to the lakeside bog to a few other locations around the lake. Ken grew *Chelone cuthbertii* from seeds collected at the Station and planted them in the lakeside bog. Trimming of the woody plants along the boardwalk by Station staff has also allowed previously unknown *Chelone cuthbertii* to bloom. One *Lilium grayi* was identified along the boardwalk in 2025 and caged to protect it from deer browse.

Grounds Management

- **Bridges, steps, and trails assessed and improved.** A subcommittee (Bryding Adams, Jim Costa, Jason Love, and horticulturist) was established. In July 2021, Station staff, Lynda, and Ken assessed and documented with photographs the bridges, boardwalks, paths, steps, and handrails. Improvements were made in 2022 by Jim Chance and his volunteers, including removing obsolete steps on the steep slope of the Moss Garden, building new stone steps into the Moss Garden from the driveway, improving the bottom step going into the Historic Woodlands, adding stone steps at the end of Creekside Trail, replacing the steps that lead down to the creek just before the Woodland Loop, adding stone steps on the Foreman Trail, and rebuilding the stone cribbing on the edge of the creek. Repairs were made to the steep, narrow section of Creekside Trail where erosion was occurring.
- **National Register designation closed.** The NC State Historic Preservation Office advised that the building would not qualify due to the significant changes that have been made to the building since its construction. No further action.
- **Storm water proposals in hand.** Engineering consultants have developed proposals for mitigating storm water impacts. The HBS is pursuing partial implementation in 2026 with some available funds.
- **Water quality monitoring under way.** Water quality monitoring equipment has been installed in the lake and creek. Monitoring is in progress.

Horticultural Management

- **A broader base of support.** The Station has received funds for garden projects from the Foundation, the WCU 1889 Grant, Mountaintop Rotary Club, Mountain Findings, Laurel Garden Club, and the North Carolina Science Museums Grant Program. Friends of the Station have continued to donate via the WCU Development office. The Station generated additional funds for the gardens from workshops, garden symposiums, and other events.

- **Donation Guidelines adopted.** The Committee drafted a Donation Policy for the Station, which was adopted by the Station as Donation Guidelines. A link was added to the Station website to make it easier for donors to donate funds to the Station.
- **Invasive removal, ongoing.** Station staff and volunteers have continued removing non-native invasive plants from the campus. This is an ongoing process.
- **Management and maintenance guidelines written.** A subcommittee (Lynda Anderson and Ken Conover) created HBS Gardens and Grounds Management and Maintenance Guidelines in 2023. It is comprehensive in scope, including both sensitive garden areas and demonstration gardens.
- **More volunteers, tracked and recognized.** The Station has initiated several activities that have attracted additional volunteers. Volunteer hours are being tracked. Annual recognition events are held.

Public Engagement

- **South Gateway Entrance Garden concept.** Liz Sargent worked with Warren Byrd and Sue Nelson to create a wonderful conceptual design for the proposed South Gateway Entrance Garden. The HBS is raising the funds needed ($30,000) to hire a landscape architect to create schematic designs and construction drawings.
- **Interpretive content in progress.** Several Committee members are in the process of developing interpretive content for new and updated signs.
- **Names, wayfinding, and a new map.** Garden and trail names were updated. New wayfinding signs were installed in 2025. A new trail map was created in 2025.
- **Four signature events.** Station staff and members of the Committee organized and hosted a successful Native Plant Symposium in 2022 to celebrate the 60th anniversary of the Botanical Gardens, a special “Darwin and the Art of Botany” event in 2023, a Native Plant Symposium in 2024, and a special George Masa event in 2025.