Fire on the Mountain

by Nora Murdock

Mountain golden heather
Photo by E. LaVerne Smith/USFWS

In the spring of 1816, pioneering botanist Thomas Nuttall made an arduous 3,900-foot (1,190-meter) climb up to the rim of a deep gorge in North Carolina. From the rocky, windswept ridge, he could see for miles in all directions as the horizon stretched away into the misty mountains that would later be called the Blue Ridge.

The vegetation of the rocky ledges where he stood was sparse. In fact, the French botanist Andre Michaux had visited the same vicinity in 1794 and described it as "very barren." Among the few plants that braved the elements on this desolate summit was a tiny, golden-flowered shrub only 6 inches (15 centimeters) tall. Nuttall knew it was something he had never seen before. Two years later, he described the plant as a new species and named it *Hudsonia montana*. It came to be known by the common name "mountain golden heather."

A century and a half later, this amazing little plant still clung to existence in the same place where Nuttall found it. Despite intensive searches by many botanists, no other populations had been found. All of the plant's habitat was within a federally designated Wilderness Area in the Pisgah National Forest of North Carolina. Surely, under these circumstances, life would be secure for the golden heather.

However, the opposite appeared to be true. In fact, the numbers of plants dropped so low that, by the 1960s, the species was reported to be extinct. More intensive searches in the 1970s by The Nature Conservancy, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and others revealed a small number of survivors in colonies scattered along the gorge rim. We took immediate action to list the plant as threatened and designated Critical Habitat for the species. The North Carolina Department of Agriculture soon gave the plant state protection as well. Nevertheless, it continued to decline. One problem was that the wilderness area where the mountain golden heather grows is spectacularly beautiful and very popular, being within a short drive of several major cities. Visitation is extremely heavy, and the use of signs or artificial barriers is restricted under official wilderness regulations, a situation that makes it very difficult to control habitat destruction caused by human overuse. The fragile habitat occupied by mountain golden heather was in danger of being unknowingly trampled by a public that was loving the area to death.

In addition, biologists discovered that the Critical Habitat designation, including the required maps published in local newspapers, was actually contributing to the plant's decline. The local Forest Service office reported that numbers of people who had never before visited the gorge appeared the day after the newspaper publication with the published maps in their hands, inquiring about the best route to the remote site where the plants grew. Mountain golden heather had never been known as a target for collectors, and was not offered for sale in any native plant catalogues, but plants began to disappear from the wild.

Biologists found that the holes where plants had been dug were carefully refilled with soil and covered over again with leaf litter so that no one would be the wiser. If not for the fact that all the plants had been individually marked and mapped in permanent monitoring plots, the thefts would have gone undetected. The population at the type locality eventually declined to only two reproducing plants.

In addition, biologists studying the species suspected another factor in its decline: fire suppression. Although wildfires were probably never common in the mesic forests of the southern Appalachian Mountains, these forests do contain pockets of more fire-prone habitats, such as the rocky rims of steep gorges. The highly effective fire suppression efforts of the past half-century have virtually prevented catastrophic forest fires, but they have also eliminated smaller fires from open areas within the forest that once burned on a routine basis. Although these once-open sites have now been closed in by heavy tree and shrub growth, there are still indications that fire and other natural disturbances played a role in shaping the historic landscape of this region. Many of the plants growing alongside mountain golden heather, including pitch pine *(Pinus rigida)*, Table Mountain pine *(Pinus pungens)*, and sand myrtle *(Leiophyllum buxifolium)*, are known to be fire-adapted species in other parts of their range.

After the plant's listing, the North Carolina Department of Agriculture's Plant Conservation Program began intensive research into the life history of mountain golden heather with funding from the Service under the ESA's section 6 State Grant-in-Aid Program. By analyzing soil cores and tree rings, biologists discovered that, in the first half of the 20th century, lightning fires occurred in mountain golden heather habitat approximately once every 5 to 10 years. In the artificially induced absence of these regular fires, the entire plant community had changed, with more fire-intolerant species crowding out mountain golden heather and other species that were adapted to the open, sunlit ledges. In addition, the bare mineral soil required for germination by the golden heather was no longer available, since it was covered by leaf litter from the encroaching trees. Therefore, successful reproduction had become quite infrequent.

Armed with this information, the Service and the state approached the Forest Service with a proposal to conduct a small, experimental burn in

The fire-adapted mountain golden heather survives on this windswept ridge overlooking a deep gorge in the Blue Ridge Mountains.
Photo by Nora Murdock/USFWS

Carefully controlled prescribed burns help to restore a mountain golden heather site that had become overgrown due to fire suppression.
Photo by Nora Murdock/USFWS

mountain golden heather habitat. The local Forest Service office was agreeable, but the proposal was opposed by environmental groups. Setting fires on purpose in the Appalachian Mountains? Unthinkable. Nevertheless, in 1987 we gained final approvals for a prescribed burn in 10 small experimental plots. The results were excellent. Encroaching trees and shrubs were set back, and the mountain golden heather rebounded. We also discovered that a seedbank existed for mountain golden heather in the soil, where seeds had lain dormant for at least 5 years. Once fire was reintroduced, the dormant seeds germinated and grew on the newly revitalized habitat. By the time of the first prescribed burn, Heller's blazing star *(Liatris helleri)*, another declining species within the same habitat, had been listed as threatened. This plant also responded positively to the prescribed burns. Yet another species seemed to benefit from the reopening of the ledge habitats as well; the peregrine falcon *(Falco peregrinus)*, which nests on the sheer cliffs below the golden heather, began to hunt their prey in the open, shrubby habitats.

After the success of the initial experiments, biologists from the Fish and Wildlife Service, the Forest Service, and the state designed a 10-year management plan that included regular prescribed burns. The mountain golden heather has responded and is now making a slow but steady comeback, but it is not "out of the woods" yet. While fire does control encroaching vegetation, it also makes those newly-opened ledges much more attractive as camping sites for hikers. Tremendous mortality of golden heather has resulted from campers inadvertently setting their tents on the plants, moving rocks on top of them, and trampling the habitat. The Forest Service has erected interpretive displays at the border of the wilderness area, describing the problem to visitors and directing them to more appropriate campsites. With the tremendous use this area receives, however, effective control of all visitors is virtually impossible.

After the experimental burns, botanists collected seeds of mountain golden heather. The difficult germination techniques were eventually developed, and the first seedlings were transplanted back into the wild at the type locality in 1991. Survival of the transplants was good, with many starting to produce seeds in the second year following their planting. The population at the type locality has steadily increased to 56 plants, with 75 percent of these now reproducing. Biologists also have discovered a second population on Forest Service land. Fire at this site had long been suppressed and only about two dozen mountain golden heather plants survived. The Forest Service has taken vigorous action to manage this newly-discovered population, which is outside of the designated wilderness. Trails have been permanently re-routed to eliminate trampling of this site by hikers and campers, and it is now on a regular schedule for prescribed burns.

For a species once headed for extinction, recovery may now be in sight.

Nora Murdock is a Biologist in the Service's Asheville, North Carolina Office.