# Prenanthes

*'A Newsletter on Alpine Areas of the Northeastern United States"*

The Green Mountain Club

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## Learning from the Past Looking to the Future

*1994 Alpine Stewardship Gathering*

- by Dave Hooke

**O**n April 11 and 12,1992, The Green Mountain Club in Waterbury Center, Vermont hosted a very productive Alpine Managers Gathering. Something, however, needed to be added to the format in order to best facilitate the goals of the conference. The participants felt the next conference, called to continue the dialogue among managers and stewards of arctic-alpine areas, should be located in an area that would allow for field study of an arctic-alpine site as central to the discussions. Late in 1993, Dartmouth Outd6or Programs director Earl Jette offered the Moosilauke Ravine Lodge of Warren, New Hampshire as a location to meet this need. Consequently, the Mount Moosilauke summit be-came the center of focus for the Alpine Stewardship Gathering held June 24-26, 1994.

The program began Friday night, June 24 with a welcome to the 30 participants and a panel exploring the issues of winter use in the fragile arctic-alpine areas. Bob Proudman, the Trail Management Coordinator for the Appalachian Trail Confrrence (ATC), moderated; Rick Paradis, manager of the University of Vermont (UVM) Natural Areas Program, Buzz Caverly, the Baxter State Park Superintendent, and Ken Kimball, the Research Director of the Appalachian Mountain Club (AMC) presented the situations on Mount Mansfield, Mount Katahdin and the Presidential Range of the White Mountains, respectively. A contrast in management approaches emerged, from the strong regulations and direct education by rangers at Baxter State Park in Maine resulting from the "conservation before recreation philosophy, to a relatively low-key cooperative approach in the more accessible White Mountains of New Hampshire. In the White Mountains, the current policy allows camping only where there are two or more feet of snow. This policy represents an evolved effort to "get the users on the side of the managers" by structuring camping policy around managerial needs such as conservation and protection. On Mount Mansfield in Vermont, home of the oldest summit stewardship program, the elevated usage level of the summit area has spurred discussion of extending stewardship to the winter months, and resulted in a desire for more data on the environmental effects of winter use.

The panel participants agreed that there has been substantial in-crease in winter use. Discussion during the panel revealed that at almost all sites, visitation during fall and spring mud seasons had a deleterious effect on the partially frozen soils. Indeed, at most sites, there is now an effort to close trails during those times. This effort is having a positive impact.

Only in the White Mountains has there been an attempt to study the effects of use in winter. There, the net effect on the ecosystem of this usage increase has been surprisingly light, except in a few well-known heavy-use areas. This unexpected data led Dr. Kimball to conclude that, though there is undoubtedly a carrying capacity for the ecosystem, it is likely that our own perception about the declining quality of the experience will be the first trigger to additional regulation of the mountains in winter. This is a notable turning point in the many years of protection in this field, and this observation resonated through the rest of the weekend.

The second day of the conference consisted of four field trips. Each trip was assigned a guide familiar with Mount Moosilauke and the participants were asked to discuss a particular topic unique to their group. The findings and conclusions of the different groups were presented later in the day. The group topics were:

1. Recreational use and the control of use: What are the objectives; what works?
2. Rehabilitation: What works; what should be done?
3. Trails management strategies ("tools"): What works?
4. Ecology education, specific species protection, and inventory of alpine area types: What works; what needs to be considered?

In order to provide a broad range of perspectives for the discussions, participants were assigned to a particular field trip with a deliberate attempt to provide a mix of talents and interests. To prepare the participants, Dr. Charlie Cogbill, a freelance forest ecologist from Vermont, lectured on Mount Moosilauke's history, touching on use patterns, floristics, soils, current regulations, and problem areas.

The groups then proceeded to the summit by a variety of routes. It was a standard wet and foggy New Hampshire day, but this didn't slow things down. A lively set of investigations had groups all over the summit on old and new trails, rock-hopping the while. Dr. Cogbill and I floated from group to group, asking questions and providing information. Groups returned to the Lodge and then met over dinner to formulate their analysis. After dinner, a presenter from each group summarized the findings and recommendations for the whole. Lars Botzojorns, Director of Field Programs for The Green Mountain Club (GMC), moderated the substantial discussion which followed.

All groups observed that given the summit's heavy use, damage to the ecosystem has been surprisingly minimal except in a few areas. Previously disturbed areas - notably now-closed trails - also exhibited a remarkable ability to heal themselves. The most important element of the ecosystem stability is the great depth and drainage of the summit soils. The resulting conclusion is that even if use patterns were to continue as they are, which include hikers wandering all over the summit meadows, the damage would be minimal.

It was felt that this good fortune should not be exploited. Because hiker behavior in other alpine areas would be devastating, the participants felt it unwise to differentiate the alpine areas based on their soils and plant communities. It would be far better to present a uniform face and a simple message. Some additional observations included:

- Scree wall width should be wide enough to allow two hikers to pass or walk side by side.
- Trail crews should take time during their work to observe hiker behavior in and around newly constructed and about4o-be constructed trail work to improve the efficacy of trail improvements.
- Footpaths should be hardened as much as possible now. Don't wait for further erosion.
- Usage thresholds should be established to determine recreational/social/ecological carrying capacity.
- The possibility of implementing a group use fee and permitting process that would enable the Dartmouth Outing Club to help educate large groups on guidelines for using Mount Moosilauke should be explored.
- A high-quality video on regional alpine ecology, education, and stewardship should be developed.
- Any time there's a new trail created or an old trail abandoned, it should be used as a research opportunity.

The Sunday morning session attempted to draw ecological, political and organizational lessons from the histories of three stewardship programs now in place. Dr. Tom Wessels, of the Sandwich Range Conservation Association (SRCA) presented the history of the SRCA efforts to protect alpine communities on Mounts Welsh and Dickey in the south central White Mountains. There an ambitious volunteer simply and effectively walled off a number of isolated bogs, to the consternation of various parties who claimed they did not look natural. SRCA's response is that the use of scree walls also does not look natural. As a result, the already blurry distinction between "natural" and "artificial" became a bit more obscured, to the extent that a permit will now be required to remove the rock walls.

Next, Jim DiMaio, the current United States Forest Service District Ranger for both the Pemmigewasset and Ammanoosic Districts of the White Mountain National Forest, reported on the efforts to bring harmony to what had been a fractious situation on Franconia Ridge in New Hampshire. Several different groups, with varying opinions, have jurisdiction in the management of the heavily used area. One of their efforts was a study to analyze the effectiveness of the various protection strategies that had been tried, from scree walls to sedge transplants.

Finally, Dr. Ed Ketchledge of the Adirondack 46'ers presented a series of observations from his twenty-two years of work in summit stewardship in the Adirondacks, where wet and poorly drained soils have been heavily damaged by indiscriminate traffic. In his opinion, the twin tactics of educating people and artificially stabilizing these bogs had to be equally and vigorously pursued.

The gathering concluded with the announcement of The Green Mountain Club's creation of this newsletter. Several members of the Adirondack trail community expressed interest in hosting the next gathering in two years. Evaluation of the gathering revealed that the case study format provides for enhanced discussion on research and experimentation in the arctic-alpine zones. We had excellent support planning for the conference from Carl Gebhardt, the Developed Recreation Coordinator for the White Mountain National Forest; Jim Di Maio; Lars Botzojorns; and Charlie Cogbill; and also at various times from Kathy Regan, Director of Stewardship with the Adirondack Chapter of The Nature Conservancy; Kevin Peterson, the New England Regional representative for the ATC; Tom Burack, of the Dartmouth Outing Club; Brian T. Fitzgerald, representing both the GMC and the ATC; and Bob Proudman. The White Mountain National Forest, The Appalachian Trail Conference, The Adirondack Nature Conservancy and The Dartmouth Environmental Network all provided generous financial or material contributions. •

*Dave Hooke is the Facilities Manager of the Dartmouth Outing Club where he is involved in the supervision of Mount Moosilauke lands, trails, and facilities. Copies of ihe minutes from the Alpine Managers Gathering may be obtained from Dave at P.O Box 9, Hanover, New Hampshire*

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# The Next Step

*A Commitment to Communication*

*by Lors Botzojorns*

**W**elcome to the first issue of *Prenanthes.* After two years in the conceptual stage, it is finally here. The publication of *Prenanthes* is a response to the desire for continuous dialogue on issues surrounding arctic-alpine areas in the Northeast. The Alpine Stewardship Conference held in 1994 galvanized our collective commitment to stay in touch. This can be done through events such as biennial regional gatherings and smaller scale meetings in the field. The question is whether this newsletter is necessary to enhance cooperation. *Prenanthes* is an experiment; we need your feedback to determine whether it is worth the effort to produce.

As evidenced by the title *Prenanthes,* the communities of interest are the arctic-alpine areas of northeastern New England and New York. *Prenanthes boottii* is symbolic in that it is a species found only in our region. The debate over the taxonomic status of the *P. boottii* is symbolic in itself of the tough questions that we must ask of our relationship to these special landscapes. Bob Popp's review of P. *boottii* in the Feature Species section of this newsletter gives a strong factual background on the species.

*Prenanthes* is proposed to be a semiannual newsletter. The contents of *Prenanthes* will include: articles on featured species, people, and places; a select bibliography; a calendar of events; and other pertinent information from state and federal agencies, nonprofit organizations, universities, and other concerned parties. Such information should enhance the coordination of research projects. The newsletter is also a place to highlight new findings and proposed projects.

The major goals of the newsletter are:

- Enhancement of management, education, and research activities in arctic-alpine areas in northern New York and New England;
- The exchange of information among the scientific, management, educational, and recreational communities; and
- Increased interest in the arctic-alpine zone on the part of universities with programs in ecology. It is up to the readership of *Prenanthes* to expand on this goal.
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A desirable spin-off will be the broader application of ideas and techniques developed for the management of the arctic-alpine zone to other areas hosting rare and sensitive natural communities.

The cover story of this inaugural issue speaks well to our mission. Everyone from the weekend hiker to those trying to reestablish unique alpine plant species can have a long-term impact on the future of alpine areas. You, as a reader of this newsletter and as an individual concerned with alpine areas preservation, are a very important component of the efforts to understand and protect arctic-alpine ecosystems. We hope that with the establishment and continuation of this newsletter, many of the individual efforts that have been completed in the past will become the group efforts of the future.

The contents of this first issue represent a cross section of activities throughout the region. Topics range from administration of the Summit Steward Program in New York to issues surrounding a rare species of butterfly found on Mount Katahdin in Maine. *Prenanthes* also features research activities on Mount Mansfield in Vermont, a detailed look at Mount Moosilauke in New Hampshire, and a host of educational opportunities offered by the Appalachian Mountain Club (AMC) in the White Mountains. Included as well are some region-wide efforts, such as the development of a flora survey for the arctic-alpine zone in the Northeast.

I would like to express my appreciation to Mark Haberle who served as an intern over the last few months and pulled this newsletter together. This project would still be in the conceptual stage without Mark's tireless effort and intense interest. Mark will continue to be involved this summer through a monitoring project he is spearheading for the University of Vermont Natural Areas Program on Mount Mansfield. (See page 13 for further information.) We must also acknowledge our first official subscriber, Dr. Ed Ketchledge, who has expressed a great amount of enthusiasm for this project. It is encouraging to have the backing of one of the great motivators in arctic-alpine

protection. The first issue devotes its interview Section to Ketch.

There are several requests of the readership. First, production costs are not great, but they are a harsh reality. Please consider supporting *Prenanthes* both financially and with information and resources. For these purposes, please detach and complete the subscription form located on page 15. Finally, please use this and subsequent issues as a teaching and communications tool. Thank you and enjoy.

*Lars Botzojorns is the Director of Field Programs for The Green Mountain Club. He has also worked in Acadia National Park, the Appalachian Mountain Club hut system, and the Adirondack Chapter of The Nature Conservancy.*

A Lifelong Dedication to Preservation:

# "Ketch"

*Dr. E.H. Ketchledge*

*by Chris Morse*

Since 1949, Dr. E.H. Ketchledge, better known as "Ketch," has maintained a lifelong interest in arctic-alpine area management and rehabilitation. Beginning with his graduate studies in botany in the Adirondack Mountains high country, this interest continued through his 30-year tenure at the State University of New York (SUNY) College of Environmental Science and Forestry at Syracuse, from which he retired in 1985. His early scientific studies shifted from pure botanical exploration to an ecological exploration of methods for preservation and restoration of the deteriorating alpine landscape.

Upon retirement from SUNY, Ketch was instrumental in bringing together the three main organizations now administering to the Summit Stewardship Program in the Adirondacks of New York. (For related information, see Kathy Regan's article on page 10.)

Ketch's concern for the arctic-alpine areas began in 1964 following an early spring hike to Wright Peak in New York. The well traveled trail resembled a drainage ditch more than anything else. This trip inspired him to seek the aid of Raymond Leonard of the United States Forest Service in attaining a grant for the study of alpine ecosystem degradation in the Adirondack high country.

Ketch received a grant and phase one of the ecological work began in 1967 with an inventory of New York's 46 highest summits, most of which support one or more alpine plant species. Only the highest 20 peaks display a characteristic tundra community. The open windswept summits all showed varying amounts of trampling impact. Following that survey, Dix Mountain was chosen as a representative for the other peaks, and restoration experiments began.

The first tests consisted of various revegetation regimes involving native and non-native species and fertilizer treatments. In 1971, Ketch and his colleagues, including Raymond Leonard, Dr. N.A. Richards, Dr. P.F. Craul, and Dr. A. R. Eschner, moved their studies to Mount Golden. (For a full reference to this study refer to the bibliography on page 15.) On Mount Golden, the team tested other boreal grass species and different fertilizer combinations, and settled on a basic treatment unit. The units consisted of: a pound and one-half of localized grass species seed Blue Grass and Fescue); five pounds of standard 10-20-10 lawn fertilizer; and five pounds of ground dolomitic limestone.

On Memorial Day weekend, 1971, the second or "volunteer" phase began. Because of his involvement with the Adirondack Mountain Club (ADK) and the Adirondack 46'ers, Ketch was able to mobilize a force of 50 volunteers to initiate the restoration program. That weekend, the summits of Algonquin and Wright peaks received 80 of the previously described units.

Twenty-five years and 900 work-days later, the volunteers continue to preserve the ecological integrity of the Adirondack arctic-alpine landscape. The Adirondack 46'ers have officially adopted the restoration program and, in recent years, provided all the resources necessary to field several weekend work crews each season.

Could the restoration methods be used to replace the soil mantle lost in the Adirondacks and perhaps elsewhere? Ketch explained that the unusual summit soil cannot be recreated and that reclamation via replacement is not a viable solution to the loss of the soil mantle. Rather, soil preservation is the chief concern and can be achieved by appropriate trail maintenance techniques and responsible use by the recreating public.

Phase three, addressing the impacts of hikers, began in 1989. That year, Ketch and Brian T. Fitzgerald, now involved with the Appalachian Tail Conference and The Green Mountain Club, conducted an updated inventory of the alpine flora in the Adirondacks for the New York Natural Heritage Program. In their travels over the summer, they learned that upwards of 300 visitors per season to Mount Marcy and Algonquin Peak were wandering off the trails and thereby trampling the arctic-alpine tundra. The New York State Department of Environmental Conservation (NYDEC) employs about five temporary summer rangers to patrol the trail system in the High Peaks area. Unfortunately they have had little time to spend on the summits to stem this trampling. There had been no state

funds available for specifically positioning anyone on a high summit.

In December 1989, Ketch called a meeting of several citizen groups at the ADK's Adirondack Lodge at Heart Lake in New York to explore new initiatives addressing the summit impacts. It was during this meeting that the Summit Steward Program was first realized. The Adirondack Nature Conservancy (ANC), the ADK, and the 46'ers all sent representatives, and several concerned individuals also participated. Through great collaboration and cooperation the Summit Stewardship Program details were finalized.

NYDEC officials eventually approved sharing administration of the Summit Stewardship Program with the ADK and ANC. NYDEC agreed to hire and pay the stewards with funds raised by the ANC. With encouragement from Timothy Barnett, Executive Director of the ANC, Ketch (an ANC trustee himself) proposed that $10,000 be allocated for three summit stewards for the 1990 summer season. The ANC board concurred and the third dimension of Ketch's summit preservation effort was implemented.

The Summit Steward Program has been a great success. Stewards, identified by both ADK and ANC patches, are sought out by visitors who recognize them as historians, educators, and caretakers.

The Adirondack summits host over 15,000 hikers annually. Such a situation can easily create serious trampling problems. Most summit visitors simply do not realize either the uniqueness of the alpine vegetation or the fragility of the rare ecosystem itself. As Ketch stated in *Adirondac* (September/October 1992): "The stress of the environment is shown by the irregularity of the scene: bonsai4ike trees filling in the shallow ravines leading to the summit; windswept and vulnerable populations of arctic relics surviving on difficult terrain where the life zone is but two feet deep, the distance between the impenetrable bedrock below and the killing winds tearing over the surface of the ground above. This is no place for humans to lower the odds further by trampling both rare plants and fragile environment.

Ketch's working perspective is best summarized by his rationale for spending three decades on arctic-alpine rehabilitation. That rationale is described as species protection of rare and endangered plants via protection of their collective habitats, that is, landscape preservation. Most of the summit species are common plants in the taiga and sub-arctic latitude northward in Canada and Alaska, and are not threatened with genetic impoverishment. However, within our region they are rare because we happen to be at the southern limits of their continental ranges. Less than one hundred acres of open, windswept arctic-alpine vegetation are the living relics of a late glacial time when such vegetation covered most of the Adirondack Mountains and the Northeast. They thereby constitute a living vignette of our natural heritage, rare survivors of what was once common and is now exceedingly rare in New York and New England.

The ancient vegetation we now inadvertently trample on the highest summits are museums connecting earlier times with the present, and must be preserved, just as we honor and preserve our cultural heritage in human-made museums.

In conclusion, Ketch's dedication to the preservation of arctic-alpine zones is matched by his eloquence in defining the human role in that preservation. With a sincere bluntness that offers both insight and vision, Ketch has commented:

"What a shame to damage them in our insensitive search for momentary vistas. Let us instead visit them both for their grand scenery and for the insights they provide us into our own natural heritage, then depart gently and leave the alpine landscape intact for our grandchildren in their time to enjoy and to learn.

The real challenge is for each of us to transfer our private sense of environmental responsibility to those whom this hour we briefly share a part of God's creation." •

*~Chris Morse is a former intern and seasonal caretaker with The Green Mountain Club. He conducted the interview in 1993.*

# Contradancing in a Mine Field

*Managing the Mount Mansfield Natural Area, Vermont*

*by Rick Paradis*

Arctic-alpine natural areas offer wonderful opportunities to either truly succeed or miserably fail in our

efforts to minimize the impacts of human activities in sensitive natural areas. For nearly a decade, my responsibilities at the University of Vermont have included managing the ridgeline of Mount Mansfield, Vermont's largest alpine community. The University owns and manages over four hundred acres on the mountain as a natural area. Our mandate is pretty specific: Ensure the protection of the mountain, while allowing for certain compatible uses. Although the mandate sounds specific, implementation is another matter. In a given year, five times as many people (approximately 40,000) visit the summit of Mount Mansfield as tour Vermont's State Capitol. They arrive as lone hikers or as school and camp groups of 100 plus. Scientists have identified the mountain as an important research site for long-term ecosystem monitoring and they frequent the area measuring all sorts of phenomena. An expanding ski resort flanks one side of the mountain; a toll road accommodating over 10,000 autos a year winds up to tree line; and four major telecommunications facilities with multiplying tenants are scattered along the summit ridge. Mount Mansfield is indeed in demand!

Incredibly, these activities are to be accommodated in an area that possesses the greatest concentration of rare, threatened and endangered species and natural communities in Vermont. Mount Mansfield's Stature and importance as a significant site is apparent as it is recognized as a State Natural Area and Fragile Area, a National Natural Landmark, and a core area in an International Biosphere Reserve. It is also a landscape mosaic of public and private ownership controlled and managed by various cooperating and, at times, conflicting entities.

How might one ever hope to ensure the long-term protection of this significant alpine landscape? How might one do this while recognizing the demands, needs, and proclaimed rights of a divergent group of "stake-holders"? What can be gleaned from the Mount Mansfield saga that may help in managing alpine areas elsewhere?

An important effort has been to develop and nurture partnerships. The Mount Mansfield Collocation Association is legally incorporated to address the problem of the proliferation of telecommunications facilities on the mountain. The Collocation Association is al$_{50}$ responsible for identifying and limiting the electronic and environmental effects of these facilities. It has been through this entity that we have been able to raise concerns regarding the construction of new facilities and installation of new equipment. We have also been successful at getting Collocation Association members to correct past problems, such as replacing old fuel storage tanks and removing piles of debris from the mountain.

Another example of a partnership is the Mount Mansfield Area Cooperative Agreement. This group of partners oversees the funding and management of the Caretaker Program, one of the region's most successful efforts at protecting alpine areas through public information and education. The partners,
although with different agendas and responsibilities on the mountain, share the belief that a staffed, on-site program is the most effective way of reaching and communicating with the many visitors on the ridgeline.

A commitment to a partnership requires a commitment to honest and timely communications. In every example that I know where a proposed project or development has gotten bogged down in the intricacies of various regulatory procedures, poor communication among those involved has exacerbated the situation. On the other hand, I have witnessed such efforts as the Summit Caretaker Program or such projects as the new Mount Mansfield Visitor Center succeed because of open and effective communication among those involved.

Managing the affairs and activities of people is tricky business. Managing these affairs and activities in alpine areas is akin to calling a contradance in a mine field. One false step due to miscommunication and, well, you can imagine the rest. We have the responsibility as managers of these landscapes to do our very best to ensure for their long-term protection. Anything less and we may be pulling shrapnel out of our lug soles for some time to come.

For further information, contact Rick Paradis at the University of Vermont Natural Areas Program,
The Bittersweet, 153 South Prospect St., Burlington, Vermont 05401.

*Rick Paradis is responsible for the administration and management of the University of Vermont Natural Areas Program. He is also on the faculty of the University 5 Environmental Program where he instructs courses in natural areas protection and management, natural history, and ecological restoration*

## A Botanist's Look at Our Common Thread

### *Prenanthes boottii*

*byBob Popp*

**P***renanthes boottii* or Boott's rattlesnakeroot is endemic to alpine areas in three northern New England states and New York. This dwarf member of the aster family is named after John Wright Boott who first collected it in the

White Mountains of New Hampshire in 1829. *P. boottii* is legally protected in the four states where it occurs (Vermont, New Hampshire, Maine, and New York), and is also being considered for addition to ihe federal endangered and threatened species list.

*P. boottii* is thought to be monocarpic; that is, it flowers only once and then dies, although plants may live for several years in a vegetative state before flowering. It can also reproduce vegetatively by root off-shoots which eventually break off from the parent root to produce new plants. Boott's rattlesnakeroot is one of about seven species of rattlesnakeroot that occur in New England. Interestingly, five of the other six species have extensive ranges, extending well beyond our boundaries. The other exception is *P. nana,* the low rattlesnakeroot, which is restricted to alpine areas from New York to Newfoundland.

The two alpine rattlesnakeroots can easily be confused, but they can be separated by using a combination of the number of flowers per head and the shape of the basal leaves. P. Boottii has from ten to eighteen flowers per head, with heart-shaped basal leaves that are never lobed. P. nana has heads with nine to twelve flowers and basal leaves that are generally cleft into lobes, but reportedly can be heart-shaped.

New Hampshire has the largest population scattered in small sub-populations throughout two mountain ranges. Estimates range from 1,000 up to 10,000 plants, but there is concern that some of these plants may actually be *P. nana. P. boottii* is known from three populations in Maine totaling over 1,000 plants. In New York there are two populations, one consisting of about 150 plants, and one historic population.

In Vermont, *P. boottii* occurs mostly above tree line on cliffs, ledges, outcrops, or alpine sedge meadows at two locations in the state - Mount Mansfield and Camel's Hump. On Mount Mansfield, four separate sub-populations are known, while Camel's Hump hosts two. Although two locations for the entire state may seem a rather tenuous population, historically *P. boottii* has not been any more widespread. All herbarium records for Vermont are either from Camel's Hump or Mount Mansfield, where it was first collected in 1876 and 1877, respectively.

The largest threats to *P. boottii* in the Northeast are from the heavy hiker traffic on alpine summits and the less obvious, but perhaps more insidious, threat of global climate change. An additional concern is the sparse seedset exhibited by the species. It is typical to see dozens of plants with basal leaves and few, if any, with flowering stalks.

The hiker impact to the rattlesnakeroot is a primary concern on Camel's Hump where the bulk of the larger subpopulation occurs immediately adjacent to hiking trails. Even under this level of disturbance, *P. boottii* has managed to hold on and even thrive, exhibiting 50% and 30% increases in cover in two permanent plots from 1991 to 1994. This may be a tribute either to *P. boottii's* resilience or to the efforts of the Summit Caretakers to keep hikers on the trails. Most likely it is the combination of the two. •

*Bob Popp is the Botanist for the Vermont Non-game and Natural Heritage Program. His duties include tracking rare and endangered plants within the state, focusing on their status and distribution.*

# A Historical Look at the 1994 Alpine Stewardship Gathering Host Site

*Mount Moosilauke, NewHampshire*
*by Charhe Coghill*

**Site**: Mount Moosilauke Location: **44A** 02'N ***77A*** 50'W, town of Benton (Grafton County), New Hampshire, southwest corner of the White Mountains. It is a relatively isolated massif (18 km from nearest alpine species reservoir at Cannon Mountain).

**Owner/Manager**: 17 hectares (ha) of the summit have been owned since 1920 by Dartmouth College, but five ha on South Peak are within the White Mountain National Forest. A conservation easement is held by the Forest Service and management authority is held jointly among The Dartmouth Outing Club, The United States Forest Service, and The Appalachian Trail Conference.

**Alpine area:** Moosilauke supports 22 ha above continuous krummholz, two-tenths ha on the rocky outcrops of South Peak, and three isolated islands on East Peak.

**Elevation:** Summit 1,466 meters (m) (4,802'); tree line 1,425 m (4,689'), as low as 1,375 m (4,510') on the west side of South Peak.

**Trail History:** Supposed first ascent occurred in 1774 by Chase Whitcher of Warren, Vermont. The summit is accessible from four directions: Glencliff Trail (a trail from 1840, upgraded in 1859 to a bridle path and in 1870 to a carriage road), Benton bridle path (from 1859, later to become a trail), Little's Path (from 1882 and later the Beaver Brook Trail), and the Gorge Brook Trail (a 1943 trail from Ravine Lodge replaced by East Peak Trail in 1990). The Appalachian Trail traverses the summit with a reroute on the north side having occurred in 1993.

**Summit Occupation:** The summit (Prospect, Tip Top) House was built in 1860 and operated as a hotel/hostel

(additions in 1881 and 1901) until it burned in 1942. The site of the Tip Top House no longer hosts any structures. Other summit buildings include a barn and two winter refuge cabins (1926-1957, 1957-1979).

**Scientific Exploration:** In 1817, Alden Partridge made the first scientific ascent of Mount Moosilauke. He erroneously observed "the summit of the north peak was burned over a few years ago, and is now entirely bald." A couple of comprehensive floristic studies have been undertaken on the mountain by W.W. Eggleston in 1898 and A. Nelson in 1963. Vegetation sampling has been conducted by A. Tait in 1986 and C. Cogbill in 1993.

**Environment:** The topography of Moosilauke exhibits a rounded dome with very gentle slopes and few outcrops (a classic bald pate). The bedrock is composed of granulites and the surface is moderately stony with some polygons. The surface is also subject to frost activity. In general, the area is covered with a thick organic horizon and a relatively deep parent material. This is one of the largest extents of glacial till supporting alpine vegetation in the region. The chemistry of the area shows moderate nutrient content (6-20 ppm Ca) and an acidity of pH 3.7-5.0 common to alpine soils.

**Flora:** 63 vascular species have been documented from above tree-line consisting of 38(60%) characteristic from nearby fir forests, 10 (16%) introduced weeds, and only 15 (24%) primarily open alpine species. Some interesting species are *Calamagrostis pickeringii,* and historically, *Betula minor.* Other significant alpine species not on the summit have been found in Deer
Lake Bog and the nearby headwall of Jobildunc Ravine (such as *Arnka mollis* and *Lycopodium selago,* last seen in 1898).

**Fauna:** Prominent vertebrates include raven, junco, water pipit, white-throated sparrow, and the varying hare.

**Alpine Cosnmunities:** The most prevalent community is the heath meadow dominated by Ju*ncus trifidus* and *Vaccinium vitis-idaea,* with abundant Carex *bigelowii* and *Vaccinium uliginosum.* Other significant communities are heath snowbanks at krummholz edges, including *Empetrum nigrum* arid *Viburnum edule,* and one of the largest herbaceous snowbanks in the White Mountains dominated by *Deschampsia flexuosa, Solzd~go macrophylla,* and *Vaccinium cespitosum.* Rocky ridges and East Peak are dominated by *Vaccinium vitis-ulsea.*

**Management:** A limited use policy has been in effect since 1972 and some scree walls have been maintained since 1992 by the Dartmouth Outing Club. The vegetation of the summit seems relatively intact except along trails and directly around old summit buildings. Several old trails, however, are revegetating well. Several alien species are well-established, but are minor components except in disturbed areas near an old barnyard. Management problems still remain however. One example is the widening of the heavily used and snaking path (around cairns!) of the Appalachian Trail north of the summit. •

*Charlie Cogbill is a freelance forest ecologist who is currently living in Plainfleld, Vermont. He also serves as adjunct faculty' at both Sterling College and Communitv College of Vermont (CCV). His major research interests are spruce dynamics, spruce historv, and ecology with an associated interest in remnant old growth stands in the Northeast. Alpine ecosystems also have been a focus of his interest.*

# When Protection is a Priority, Management is a Necessity

*The Nature Conservancy's Management Role*

by Kathy Regan

**T**he Nature Conservancy, an international conservation organization, works at pro tecting plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. One very important ecological area identified by the Adirondack Chapter of The Nature Conservancy ~NC) is the high-elevation (above 2,500') boreal habitat of the Adirondack High Peaks. This region contains 29 species and four natural communities tracked by the New York Natural Heritage Program(NYNHP'). Three of these species have not been seen in recent times and may no longer occur in New York.

In the Adirondacks, this habitat and these species are already protected from development through the State Constitution as Forest Preserve, or "Forever Wild" lands. However, State ownership has not been enough to guarantee the health of this sensitive ecosystem.

The Nature Conservancy began its involvement with the management of these natural areas in the late 1980's. The NNNHP had recently inventoried the High Peaks region and written several Element Stewardship Abstracts for these natural communities. Once aware of how ecologically important this area is within New York, the TNC invited itself to become involved with developing management strategies for the alpine ecosystem.

In December, 1989 several individuals, organizations, and agencies met at the Adirondack Mountain Club facility at Heart Lake to discuss management issues of the arctic-alpine habitats of the High Peaks region. As a result of this and subsequent meetings, the Summit Stewardship Program was designed. The program was modeled after the successful Green Mountain Club Ranger-Naturalist Program in Vermont, with references made to the Ridge-Runner Program started the previous decade in New York.

It was decided that the Summit Steward Program would work best as a cooperative program. The three main participants became The Nature Conservancy, The Adirondack Mountain Club (ADK), and the New York Department of Environmental Conservation (NYDEC). A Memorandum of Understanding was written by TNC which listed each organizations interests in participating, as well as the logistics for running the program.

The Nature Conservancy agreed to draft the Memorandum of Understandings and contracts; raise the funds necessary to hire the Stewards; and help recruit and train the Stewards. The ADK agreed to administer the Stewards' day4o-day activities and to provide additional training. The NYDEC agreed to provide the Stewards with equipment and backcountry support.

The program is reviewed on an annual basis by all the participants. Changes have been made over the years which have strengthened the program and better defined each group's role. Realizing that the program may someday become more than rare species management, the TNC has written a strategic plan addressing its goals and limits of involvement.

The Summit Stewardship Program is about to enter its sixth season. Many changes have been made, but the most notable change has been with hiker behavior and aware-ness of this fragile ecosystem. The largest challenge continues to be the development of long-term funding for this program and the overall stewardship of alpine ecosystems.

For further information contact: Kathy Regan, Director of Stewardship, The Nature Conservancy, Adirondack Chapter, P0 Box 65, Keene Valley, New York 12943, (518) 576-2084 ext. 21. •

*Kathy Began serves (he Adirondack High Peaks of New York stale in several ways. She is currently the Director of Stewaraship for the Adirondack Chapter of The Nature Conservancy. Duties include overseeing the Summit Steward Program as well as monitoring the rare species in the arctic-alpine areas. She is also involved in conservation and strategic planning for the Adirondacks as a whole.*

# The Flora and Vegetation of Eastern Alpine Areas

*A Continuing Inventory Effort*

Charlie Cogbill, a freelance ecologist of Plainfield, Vermont; Peter Zika, of Salix Associates in Corvallis, Oregon; and Dan Sperduto, of The New Hampshire Natural Heritage Inventory in Concord, New Hampshire are currently in the process of conducting a survey of arctic-alpine plant species. The field work for *Flora and Vegetation of Eastern A pine Areas* is nearing completion, but ongoing input from the community is appreciated. The areas covered by this work range from the Adirondacks of New York state to the Gaspe' Peninsula of Quebec. ~

- For further information contact Charlie Coghill, RD Z Box 650, Plainfied, Vermont 05667; Peter Zika, Salix Associates, 4320 NW Clubhouse #1, Corvallis, Oregon 97330; or *Dan Sperduto, New Hampshire Natural Heritage Jnvento~, P0 Box 856, Concord, NewHampshire 03302.*

## Field Guide to the New England Alpine Summits

*A new publicalion*

**N**ancy Slack and Alison Bell are the coauthors of *Field Guide to the New England Alpine Summits* published by The Appalachian Mountain Club. The new guide features information on the lower elevation ecological zones through the upper elevation arctic-alpine summits. Information on the biological and physical factors that create these unique environments, quick reference notes on the alpine flowers in bloom, and a selection of *fully* annotated photographs of the flora, fauna, and landscapes are also included. The format is similar to *85 Acres: A Field Guide to the Adirondack Alpine Summits* also coauthored by Slack and Bell and published by The Adirondack Mountain Club. On June 17,1995 the authors will be at the Appalachian Mountain Club Pinkham Notch facility in New Hampshire for a book signing and discussion. ~

*-For further information contact Appalachian Mountain Club Books, 5 Joy Street, Boston, Massachusetts 02108; (617) 523-0636.*

## The Society for Ecological Restoration Takes a Broader View

*Tackling the Issues of Alpine Restoration*

**On** September 14-16,1995 in Seattle, Washington the Society for Ecological Restoration will host their annual meeting. The conference theme will be: "Taking a Broader View," touching on issues specific to the Pacific Northwest. The conference is open to all interested peoples of any profession. Although the conference is directed to the Pacific Northwest, many topics will be relevant to the Northeast. The announcement of the conference comes with a call for abstracts for 22 different general sessions. One such session will be Alpine Restoration." The deadline for the submission of abstracts has passed but information is available. The meeting will consist of oral presentations, poster presentations, field trips, exhibits, and more. •

*-For further information, contact either Barbara Ritchie or Gea Roachefort at Engineering ProfessionalPrograms Universitv of Washington, 3201 Fremont Avenue North, Seattle, Washington 98103; (206)543-5539.*

## Wildflower Seed Banking in the Katahdin Region

*Searching for the True Vaccinium boreale*

*by Jean Hoekivater*

Bill Brumback, Conservation ~ Director of New England [1~]Wildflower Society ~EWFS), visited Maine's Katahdin region in late July, 1994 to find the true *Vaccinium boreale.* His proposal for plant survey work and limited seed collection was reviewed and approved by the Baxter State Park Scientific Research Review Committee in April 1994. He was accompanied by BSP advisory member Don Hudson, Executive Director of the Chewonki Foundation. Don has spent many hours botanizing on Mount Katahdin and has been a great asset in assisting the Park's conservation efforts. Bill was interested in collecting seed from several species for the NEWFS seed banking project. Bill and Don were also interested in trying to reconfirm the occurrence of several species in the North Basin and around Hamlin Peak. Viable populations of most species in question were found with little or no habitat degradation noted and new sites were discovered for several species. One species of interest to Bill is *Vaccinium boreale.* There seems to be some disagreement regarding the identification of this species. The leaves of plants Bill and Don found at Blueberry Knoll, the historic site for the collection of this plant, were too large. Some smaller-leaved plants located above tree line may turn Out to be *Vaccinium horeale.* Bill is hoping to grow plants from collected fruit of the plants at the NEWFS lab, so he can check the chromosome number for positive identification. •

*Jean Hoekwater has been the Resident Naturalist at Baxter State Park for six years. She first began working at the park gate in 1980. Three years later she moved into an apprenticeship with the former Park Naturalist. After a stint with The Appalachian Mountain Club in Pinkham Notch, she returned to Baxter in 1988 as the Resident Naturalist.*

## Manager, Researcher, Botanist or Enforcer?

*Poaching Endangered*
*Butterflies in Baxter Stale Park*

**The** tableland of Katahdin is home to the Katahdin Arctic butterfly, *Oeneis polixenes katahdin.* In general, Baxter State Park does not allow collection of this species because of its rarity and vulnerability to extirpation. A recent investigation by the United States Fish and Wildlife Service turned up 37 Katahdin Arctic specimens that were in the hands of three collectors involved the illegal trade and sale of rare and protected butterflies from all over the United States. Recent updates from federal officials indicate the trio of butterfly poachers were sentenced on April 26, 1995. Law enforcement agents have assured the Park that all confiscated specimens will be turned over to the agencies and landowners concerned.

The case has had some positive benefits both nationwide and close to home. The techniques the poachers used to collect specimens and evade land managers are being used as examples in the training programs for National Park personnel throughout the country. Many of the specimen federal agents confiscated were collected from Canadian National and Provincial Parks, but had to be returned to the poachers because Canada does not have any official protection in place for invertebrates. The case has prompted a movement to officially list and protect invertebrates on a federal level in Canada.

At Baxter State Park, we now have a much greater awareness of the potential for unauthorized collecting. We are grateful to the federal agents for their hard work on behalf of the nation's rare and endangered species and grateful to Park users for demonstrating an increased willingness to help us protect all the wild and growing inhabitants of this special place. The Katahdin Arctic butterfly has been nominated for inclusion on Maine's state endangered list.

## Alpine Vegetation Study on Mount Mansfield

*Perpetua/Progress is the Key to Arctic-Alpine Understanding*

*ByBill Howland*

The alpine tundra is a special world and it stands apart from the rest of our habitat, in stark contrast to the lower lands. Good stewardship of the Mount Mansfield summit ridge requires information about what sorts of ecosystem changes are taking place in response to changing climate and new patterns of human activity in the area. In meeting this requirement, we have a serious

problem: despite the long period of botanical collections (now prohibited) on the mountain, the plant communities of the alpine ecosystem have not been well studied. Consequently, at a time when it would be most useful in the course of careful stewardship, historical vegetation data for the summit is unavailable. While we can see evidence that tundra plant communities are changing, we don't know how quickly or in what directions.

Fortunately, several studies are now underway to characterize life in the University of Vermont Mount Mansfield Natural Area. Networked by The Vermont Monitoring Cooperative, these studies will contribute to the long4erm research and monitoring of biota and natural conditions on the mountain. One study, documenting the alpine vegetation of the summit area, is described below. Conducted over the summer seasons of 1992, 1993, and 1994 by Bill Howland of Green Mountain Audubon, assisted by Sandy Tarburton and Ben Kimball, both Middlebury College students, this study is nearing completion.

**Sampling in the Alpine Zone**

Four long-term research sites are located in the summit area adjacent to existing trails but off the beaten track, so that the impact of hikers is minimal. Field sampling of the tundra vegetation follows two plans. First, within the four 20 x 30 meter long-term sites, floristic data (frequency and cover for all species) have been gathered from a random array of 40 fixed quadrants. Observations of soil properties, local geomorphology, elevation, and slope angle and aspect are collected where vegetation is sampled. Secondly, a number of other observations of vegetation in the higher elevations have been made, especially concerning several endangered species, in order to broaden the information base spatially.

Because the long-term plan calls for periodic revisits through the years to reveal changes in vegetation, a rigorous method of location control is essential so that the sample quadrats within each site may be accurately relocated. A laser theodolite survey of each 20 x 30 meter site, and of the ten fixed one-meter quadrats within each, provides the sample location data that will be required by researchers who replicate the study in the future. Similarly, laser theodolite angles and distances link the long4erm sites to several benchmarks and monuments that are found in the summit area from previous cadastral surveys. The four long-term study sites include one near the summit of the Chin, one on the highest part of the West Chin, and two between the West Chin and Thunderbolt Gap.

The field time required to evaluate the vegetation of a quadrat often amounted to several hours, depending upon the degree of researcher familiarity with the more difficult lichens and mosses. The moss and lichen flora were included in the survey because it has been shown in several arctic tundra studies that these plants are often profoundly affected by direct human impact and other environmental changes. Moreover, while the more familiar, higher vascular alpine flora is limited to a few species, the mosses and lichens comprise many species, adding an important element of diversity and stability to the tundra ecosystem. Many lichen and moss collections were required so identifications could be made later in a laboratory. Reliance on photographic vouchers for vascular plants is standard in the alpine zone because plants in this area are legally protected and collections are not appropriate.

**Next Steps**

The field studies for this research were completed in the fall. While some moss and lichen identifications are still underway, this part of the study will be completed during the spring. The focus of the study, the characterization of tundra plant communities in each of the long-term sites, will be possible within the next month. The final report on the project should be completed before summer.

The term "Final Report" conveys the wrong message entirely. This is an avenue of research that must be revisited regularly every few years - forever - to document the dynamic changes that characterize the living alpine ecosystem. The completion of this research is only the end of a beginning, an important step in the long journey of stewardship of Mount Mansfield's alpine tundra. •

Bill Howland is the Executive Director of The Green Mountain Audubon Nature Center in Huntington. Vermont. Bill has spent many years conducting arctic-alpine research in such places as the Mackinzee River Delta in *Canada. His curret plans are to continue his research work on Mount Mansfieid furthering his studies of cryptogamic and higher vascular species.*

## How Can We Measure Impact?

### *Researching a Monitoring Protocol*

*By Mark Haberle*

Recent discussion concerning the management of Mount Mansfield's ridgeline have highlighted the need for a comprehensive database to access the impacts of visitation on the Long Trail corridor and associated natural communities. In meeting this need, a monitoring protocol must be developed that will provide accurate and quantifiable data on trail treadway growth and regression as well as associated floral response.

Current research indicates photographic monitoring can meet these protocol requirements. In order to test this methodology, a research project is being designed with two goals in mind. The first goal is the establishment of a photographic monitoring program for the *Long* Trail corridor and other visitor staging areas along the ridge. The second goal is the subsequent

refining of the monitoring program with emphasis on ease of application and data management.

Completion of these two goals will offer the University of Vermont Natural Areas Program a workable monitoring protocol for the collection of data to aid in future management decisions as well as ecological assessments.

Photomonitoring will be conducted along approximately two miles of the Long Trail located on the ridge of Mount Mansfield in the arctic-alpine zone. A very brief overview of the protocol designed for this project is as follows: 1) transects will be established along the trail with bias towards areas of special concern (such as dog trails, bogs, or staging areas); 2) these transects will be broken down into three separate photographic points that will overlap (for 3-D stereographic viewing capability) and cover an area approximately three to four feet on either side of the treadway; 3) pictures will be taken using a quadropod with a graduated quadrat affixed to the legs to serve as real-world coordinates for comparison of images indicating change/ time; 4) images will be utilized to provide quantifiable data for analysis of such parameters as treadway growth, regression, and floral community response according to cover, density, and frequency.

As a program designed to meet the needs of both the ecologist and the manager, it is essential that input comes from both. Information on sampling methods, assessment methods, database structure, and any other needs is welcome. •

*- For further information please contact Mark Haberle, 37RussellSt., Burlington, Vermont 05401, (802) 658-4905 Phone/Fax, <mhaberle@moose.uvm.edu> E-Mail.*

# Facilitating Communication is a Tool for Sucess

*An OngoingEffort*

*Prenanthes* should serve as a tool for facilitating the communication of arctic-alpine issues among all involved parties.

The format for future *Prenanthes* will be similar to this issue. Future issues will consist of 12-16 pages devoted to the general categories of education, research, and management.

To that end, we are interested in any and all information on current and past undergraduate, graduate, and professional research projects being conducted within the arctic-alpine zone. Information on potential research ideas is also welcome. *Prenanthes* can help cultivate research ideas by introducing them to a specific audience.

The communication of these projects to other interested parties will prevent duplicate research projects, offer researchers with similar objectives the chance to pool their resources, and disseminate research information to a wider audience.

For research-related projects, send information in the form of a brief abstract (one-half to one page typed) that may be included in the newsletter. Abstracts should include principle researchers, dates of research, location, lists of all involved parties, hypotheses, a broad methodology (if completed), general findings, and contacts for obtaining further information on the project.

Information on courses, seminars, and events related to arctic-alpine areas are also requested. *Prenanthes* will offer a calendar of events (see page 16) as well as a sampling of an ever-increasing bibliography (see page 15). Any compiled bibliographies, new books, or events listings will improve our base of information.

Finally, we are looking for any items that relate to the arctic-alpine zones of the northeastern United States. Jean Hoekwater's article on the poaching of rare butterflies from the Mount Katahdin arctic-alpine zone (see page 13) is a perfect example. Contributions like these are critical to the success of future issues.

The number of issues surrounding the use, protection, management, and preservation of the arctic/alpine zones has grown immensely over the past few years. The Green Mountain Club, through the creation of the *Prenanthes* can gather, organize and disseminate information on these issues. We ask the readership to support this important new forum. Please refer to the reply form on page 15 for further mailing information. •

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## CALENDAR of EVENTS

### The Adirondack Fortysixers

May 27-28 *Sprin~ Meetin~ Weekend Projects* This weekend will consist of several different trail maintenance activities including a Summit Seeding foray to Wright or Whiteface.

June 10-11 *Dix Summit Seeding* This trip will consist of some touch up seeding work as well as some other trail maintenance.

July 15-16 *Rescue Mission to Marcy* This trip will be an attempt to mitigate some erosion problems that are threatening some very rare flora.

*For further information contact Chris Behr, 125 Staniford Road, Burlington, Vermont. 05401.*

### The Appalachian Mountain Club

June 9, 11, 16, 18 *Alpine Garden Tour Day Trip* A highly recommended trip both for the amateur botanist as well as the professional researcher. These trips are scheduled during the time when the flora is flowering for easier identification and a chance to glimpse the fragile beauty of a host of rare species.

June 9-11 *Alpine Flower Walk I* This excursion will provide a chance to explore the famed Bigelow Lawn and Alpine Garden when they are in full bloom.

June 16-19 *Alpine Flower Walk II* This excursion will tour another area of the Presidentials (along the Crawford path) and allow for the exploration of the alpine flora in bloom.

June 28-30 *Franconia's Wildflowers* A tour through one of the premier alpine zones of the Northeast will offer a chance to view

the wide spectrum of wildflowers tenacious enough to bloom in such a harsh environment.

July 18-19 *Retween Timberline and Treeline* Explore the transition zone that connects the arctic-alpine communities to the timberline communities. The exploration of this ecotone will provide a greater understanding of the challenges facing the vascular species of the arctic-alpine zones.

August 30-31 *A Taste of Tundra* Inclusive of geologic studies and sunsets this trip will focus on the unique ecology of the alpine zone surrounding Madison hut.

*For further information contact Rob Burbank, Public Information Coordinator, Appalachian Mountain Club, P0 Box 298, Gorham, New Hampshire 03581; (603) 466-2721.*

The Green Mountain Club

May 25 *GMC Summit Caretaker Orientation/Field walk on Mount Marnfzeld* Contact Lars Botzojorns, The Green Mountain Club, Route 100, RR 1 Box 650, Waterbury Center, Vermont 05677 (802) 24~7037.

The Adirondack Mountain Club

June 1~12 ADK Summit Steward Orientation/Field Walk on Mount Marcy, Contact Kathy Regan, The Nature Conservancy-Adirondack Chapter, Box 65, Keene Valley, New York 12943 (518) 576-2082.

The White Creek School

The White Creek school offers several forays on various topics into the arctic-alpine zones of the northeast. Contact Jerry Jenkins, The White Creek School, Craftsbury, Vermont 05826 (802) 586-7767.

The West End Trail Tenders

The West End Trail Tenders run a schedule of work trips that include visits to arctic-alpine areas including Franconia Ridge and other areas in the White Mountains. Contact Laura and Guy Waterman, East Corinth,

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Lars Botzojorns - Director of Field Programs
Mark Haberle - Green Mountain Club Intern



*Prenanthes*
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*Prenanthes* is published by The Green Mountain Club on a semiannual basis and is dependent on readership contributions. Contributions of research abstracts, photographs, event information, resource contacts, educational opportunities, management issues, and any other information pertaining to the arctic-alpine areas of northern New England and New York are welcome. The copy deadline for the fall issue is September 10, and for the spring issue February 10. All contributions should be sent to *Prenanthes,* The Green Mountain Club, Route 100, KR 1 Box 650, Waterbury Center, Vermont 05677.

advertisements.

Subscription costs serve to meet the administration needs of the newsletter and its network of public regional arctic-alpine information. We welcome any contributions that will help maintain this network.

Send address changes to *Prenanthes,* The Green Mountain Club, Route 100, RR1 Box 650, Waterbury Center, Vermont 05677.



*-Mission -*

The mission of Prenanthes is to promote the preservation of arctic alpine areas in the northeastern United States. The major goals of the newsletter are 1) to enhance management, education, and research activities in the arctic-alpine areas of the northeastern United States; 2) to disseminate information to the scientific, education, recreation, and management communities.

*The Green Mountain Club is a nonprofit organization founded in 1910. In a 1971 Joint resolution, the Vermont Legislature designated The Green Mountain Club the founder, sponsor, defender and protector of the Long Trail System...,, The Club has 6,000 members at present and some 400 volunteers who contribute time and expertise annually to the work and mission of ihe Club. The GMC's efforts are directed toward promoting respect for the wilderness and hackcountiy areas of Vermont and maintaining a primitive experience for hikers on the Long Trail System.*