P r e n a n t h e S

'A Journal on Alpine Areas of the Northeastern United States"

SUMMER 1996 VOLUME II, NUMBER 1

PRENANTHES SPORTING A NEW LOOK

Just when you thought it was safe to develop a search image for your favorite alpine newsletter among the various mailbox clutter, we've done and gone changed the graphic format and size of *Prenanthes.* Our limited resources dictated that we choose between either spending more time trying to raise the revenue needed to publish as is or scale back our ambitions and get you something in hand in a timely fashion. We felt it was more important to get the newsletter out on a regular basis in an effort to continue to communicate regionally on issues and news of alpine stewardship and research. So here you have it. It may not be much to rave about graphically, but we hope you'll find the reading interesting and informative.

Our revolving editorship of *Prenanthes* will need to move along again soon. If needed, I'm willing to handle another issue, but would like to work with whomever is willing to take on the next volume. Each annual volume consists of two issues. It's not all that much work (where have you heard that before?) and can provide you with a sense of power not unlike ruling a small medieval monarchy. Do I seea show of hands? Kindly contact me here at the University if you are interested. As always, thanks to all who continue to support our effort with their contributions of dollars and writing.

Rick Paradis
Current Issue Editor
University of Vermont

RESEARCH TO IDENTIFY GENETIC EXCHANGE AMONG REGIONAL ALPINE SUMMITS

It was a hot July 1995 in the Adirondacks, even in the High Peaks. There was little comfort in knowing that the temperature inside the large box lashed to my packframe was a chilly -110 degrees Fahrenheit. Passing hikers stared at my unusual load and asked what in the world I was bringing into the backcountry. "You must have everything in there, even the kitchen sink!" Before moving on I would reply, "Actually I don't have the sink, just the freezer." How do you explain a huge insulated box and 50 pounds of dry ice on a hiking trip?

We were two in number, Tamara Enz and myself. Our job was to take small leaf samples from alpine plants on the summits of the Adirondacks' highest peaks. To ensure thatthe samples reached the lab in good condition they had to be chilled while still in the field, and the colder the better. That simple

requirement had turned me into a sweating beast 6f burden laboring just inches from a tiny oasis of arctic cold. I'm a little embarrassed to admit this, but I hadn't even the presence of mind to toss in a few pints of Ben & Jerry's before leaving the trailhead. I would come to regret that one.

The alpine summits of New England's high peaks have always been a special place for me. During my Vermont years I spent many summer evenings on the summit of Camel's Hump. The low evening sun would

make the tundra glow, reminding me of many similar evenings in arctic Canada. The simple fact that I could make a visit to "The Arctic" barely ten miles from my front door never failed to amaze me. When the time came to choose a topic for my dissertation at the University of Massachusetts, I was drawn back to the little arctic islands that are the alpine summits of the Northeast.

Many plant species growing on the alpine summits are ice-age leftovers. Others of their kind have long since migrated north in the wake of receding glaciers. Only on the tops of the highest, coolest, most windswept summits do we find the beautiful cushion plant diapensia or the cheerful white blossoms of mountain sandwort. Here also we find grasslike tufts of Bigelow's sedge, tiny bushes of bog bilberry and dense clumps of "deer's hair", a member of the bulrush family.

Tundra species are found on just two summits in the Green Mountains: Camel's Hump and Mount Mansfield. In the Adirondacks, perhaps twenty summits and satellite peaks support assemblages of alpine plants. The White Mountains are the undisputed tundra leaders of the Northeast with the Presidential range alone boasting more than seven square miles of tundra in one unbroken swath. This varied distribution of tundra is an important factor in my research.

One of the questions that I hope to answer is this: Do the alpine plants growing on Adirondack summits have any gene flow with others of their species on nearby summits? Another way of stating this question is: Are populations of alpine plants fighting extinction collectively or individually, summit by summit?

It works like this; if the many summit populations of mountain sandwort are occasionally exchanging a bit of pollen or a few seeds (courtesy of wandering bees and birds), then they are all effectively one big population with all genetic resources of a big population. By contrast, if the plants on each summit are truly isolated from each other, then any population that goes through some hard times and loses a portion of its genetic variation has no way to regain it. Such a genetically limited population is thought to be much less able to cope with any sort of stress or environmental change.

I will attempt to answer this question using a variation on DNA fingerprinting. Lab tests will characterize the similarities and differences in the same dozen proteins for each population. What will emerge is a "protein fingerprint" for each summit's population of each species. If the summits have been regularly exchanging genes, then their protein fingerprints will be very similar. If each summit is genetically isolated from its neighbors, then each summit will have a muchless similar fingerprint.

One control for this experiment is the Presidential Range. During the summer of 1996, I will sample plants from ten small areas in the alpine zone of the Presidential Range and compare them to plants from the ten summits in the Adirondacks. In the Presidential Range, the alpine summits are not separated from each other by forest. Each summit sticks up from a ridge which is all tundra. Gene flow is unrestricted. If the pattern of genetic variation in the Adirondacks is similar to that of the Presidential Range then there is probably gene flow between the Adirondack summits.

The second control is Camel's Hump in Vermont. Since this mountain has no close alpine neighbors, it is clearly "going it alone" in maintaining its genetic variation. If each Adirondack summit has only as much genetic variation as Camel's Hump, they are probably just as isolated.

I'm also interested in the long-term effects of habitat fragmentation, a process that we see all around us. Forests are reduced to scattered woodlots by development, the few surviving patches of native prairie are a tiny remnant of a once vast inland sea of grass, and miles of rainforest have become many sparse islands of trees. I can shed some light on the long-term genetic consequences of habitat fragmentation by comparing the amount of genetic variation present in plants on Adirondack and Green Mountain summits (thefragmented habitat) with the amount present in the Presidential Range plants (the unfragmented habitat).

Alpine tundra is oneof the few habitats which allows such long-term study since it began fragmentation at the end of the last ice age. Most studies of habitat fragmentation have used sites fragmented in the last few centuries. While these studies are important, they are limited in what they can

tell us about the long-term effects of fragmentation on plants which may live for a century or more. In that context, the comparison of genetic variation in the Adirondacks with genetic variation in the Presidential Range is an excellent experiment in habitat fragmentation that has been running for thousands of years. It's time to record the results.

Working in the alpine zone is a spectacular alternative to test tubes and beakers at the lab bench. Last summer Tamara and I were hard pressed at times to remember that our pursuit was science and not adventure. After all, mountaintops force you to work on their terms, regardless of what you may have planned. When the howling wind blew the tape measure straight out 100 meters on the summit of Iroquois, we knew we would need to modify our "experimental protocols" at least for that day. The drought of 1995 broke during our return from the summit of Gothics. Rain pelted down in sheets, and lightning flashed and boomed over our heads as we dashedacross John's Brook, seeking shelter from the storm. The swirling microburst windstorm of July tried to uproot tents, samples and ourselves from our camp below the MacIntyre Range. But good fortune smiled on us as well. July was as bug-free as any July could ever be!

This summer will see us back on the summits. This time it's the Green Mountains and the White M6untains that will provide the wind, rain and lightning. I hope they provide some answers too. And oh, by the way, this time I won't forget the Ben and Jerry's.

Bruce Lindwall University of Massachusetts

TRAMPLING EFFECTS ON MOUNTAIN VEGETATION

The Appalachian Mountain Club Research Department conducted studies on the effects of trampling on mountain vegetation in the White Mountains, one of fourmountain sites located across the country. A report was published by the US Forest Service (David Cole, 1993, *Trampling Effects on Mountain Vegetation in Washington, Colorado, New Hampshire, and North Carolina.* **USFS** Intermountain Research Paper *INT-464).* The study sites in the White Mountains were on the Presidential Range at 450, 1050 and 1600 meters elevation -- varying from northern hardwood, to spruce fir to alpine habitats Changes in vegetation cover, vegetation height, species richness and species composition were evaluated before and after controlled hiker trampling.

In summary, alpine vegetation, at least the types included in this study, was more resistant to trampling than many vegetation types found at lower elevations. The best predictors of resistance were 1) whether the vegetation was dominated by shrubs, forbs or graminoids, and 2) whether the vegetation was erect or not. The least resistant plants were erect forbs and ferns. The most resistant were tuft and mat forming graminoids (grasses, sedges and rushes). The best predictor of resilience was whether the vegetation was dominated by chamaephytes (plants that regenerate from above ground tissue or buds like shrubs). Chamaephytes were substantially less resilient than hemicryptophytes plants with growing points at the soil surface) and cryptophytes plants with growing points at or below the soil surface). *Carex bigelowii* was quite resistant (ability to resist change) and moderately resilient (ability to recover) to the effects of trampling.

Ken Kimball AMC Research Department

TELECOMMUNICATIONS AND THE VERMONT MOUNTAIN SCENE

"I will lift up mine eyes unto the hills..."[9], but soon instead of receiving assurance and inspiration as did the Psalmist, we will be largely receiving the visual assault of transmission towers. Expansion of radio stations and massive growth in the telecommunications industry is resulting in a major assault on the mountains and prominent hills in Vermont. Summit restaurants and telescopes with their access roads or lifts add to the increasing amount of human disfigurement of the natural skyline of the Green Mountain State.

Considered one at a time, in scattered locations from a statewide perspective, many legislators and regulators do not see a large problem. There is, however, a need for a consideration of the cumulative impact of what has taken place before and what looms in the future, when considering the next application for a permit. Within the past two years alone there have been controversies at Okemo, Stratton, Rockingham, Athens, Mount Ellen, and Pease Mountain. Our mountaintops are too precious to allow this haphazard approach, driven by an increasingly feisty and powerful telecommunications industry. Moreover, there are unanswered health concerns about electromagnetic fields from transmission towers such as the increasingly notorious WIZN tower on Pease Mountain in Charlotte, Vermont. denied Despite this, public concerns are being access to the process in recent actions in Montpelier, Vermont. Siting of telecommunications towers on public land is being removed from the purview of the Agency of Natural Resources. And the State Senate has voted to remove radio frequency emissions from Act 250 review. Whether they really wanted to hand over control to the telecommunications industry or were primarily intent on whittling down Act 250, is a moot point. And on the federal scene, the Telecommunications Act of 1996 permits industry to install antennae and other equipment on federal lands which includes National Forests. This bodes ill for the Green Mountains or other mountains in the Northeast.

People living close to the land used to regard mountaintops as places of power from a spiritual sense. Most cultures and religions have their sacred mountains and holy hills. If we are not careful the only power we will be getting from our mountains will be microwaves and cellular phone conversation. Citizens of Vermont and neighboring states should press for comprehensive and rational policies with respect to tower siting. This must include the effects of towers and associated structures and roads on the flora and fauna of the site area.

Lawrence S. Hamilton
Commission on National
Parks and Protected Areas
World Conservation Union
(IUCN)

RECOVERY EFFORTS FOR *POTENHLLA ROBBINSIANA* MOVE FORWARD IN 1996

In early June, 1996, staff from the Appalachian Mountain Club Research Department, New England Wildflower Society, US Fish and Wildlife Service and White Mountain National Forest, plus several volunteers, moved lots of dirt, water and some 74 adult *Potentilla robbinsiana* plants to an undisclosed alpine site, where they were transplanted. *Potentilla robbinsiana* is a federally listed endangered alpine plant endemic to the White Mountains of New Hampshire. This transplant effort continues earlier work to build up several "satellite populations" that are intended to supplement the main population (located in a col between Mount Washington and Mount Monroe --known as the Monroe Flats population). The 74 plants join earlier transplants at this site which- have already shown the ability to successfully generate progeny. An additional 16 plants were also transplanted in the Monroe Flats habitat at a location adjacent to the old treadway of the Crawford Path (part of the Appalachian Trail).The Crawford Path was relocated out of this species habitat in the 1980's. Transplants are grown by the New England Wildflower Society from seeds collected from the Monroe Flats population by the AMC. They are grown to adult size from seed within 1112 years in the greenhouse, held in a freezer over the winter, then pulled from the freezer and transplanted within 2448 hours, before they break winter dormancy. The species takes upwards to a dozen years to reach adult size in the wild.

This species' natural population has shown a tremendous recovery since it was listed endangered. The species Recovery Plan has been carried out by the AMC, in cooperation with the US FWS and WMNF. The US FWS is considering downlisting *Potentilla robbinsiana* from endangered to threatened. However, the process has been stalled by the Congressional moratorium on listing *and* delisting of *endangered species,* which was recently just lifted. The US FWS Regional Office is still without funds now to undergo the formal review process for examining the downlisting option.

Ken Kimball AMC Research Department

VACCINIUM BOREALE DISCOVERED IN ACADIA NATIONAL PARK

Vaccinium boreale, **a rare alpine** blueberry, was documented last year on two summits in Acadia National Park. A possible third occurrence has been found this season. Despite intensive botanizing in Acadia over the past one hundred years, there had been no known documentation of its presence in the park. Following a tip from Dr. Sam P. Vander Kloet of Acadia University, Nova Scotia, that he had observed *V. boreale* on Cadillac Mountain in the late 1970's, Arthur Haines of the University of Maine found *V. boreale* growing in granite crevices near the summit of the mountain. At the time of the Cadillac discovery, Haines suggested to Thomas Vining, also of the University of Maine, that Sargent Mountain, Acadia's second highest peak, might also be home for the diminutive blueberry. Vining hiked up Sargent and found *V. boreale* in small patches near the summit. Linda Gregory, Acadia National Park Botanist, visited both Cadillac and Sargent with Haines and Vining to corroborate their findings. Photographic documentation of both occurrences is now housed in the University of Maine Herbarium. In addition to these two discoveries, Gregory and Vining believe they have found *V. boreale* on Champlain Mountain this year.

Vaccinium boreale is currently listed as endangered in Maine. Besides the Acadia locations, it is known to occur only in Baxter State Park (see Prenanthes Spring 1995) and on Saddleback Mountain in Franklin County. An historical record from 1915 exists for Bigelow Mountain in Somerset County.

Vaccinium boreale is easily overlooked or mistaken for *V. angustifolium,* common lowbush blueberry, especially since both species often grow close to each other. *Vaccinium boreale* has very small, narrow leaves and a smaller corolla and fruit than *V angusttfolium.* It also flowers earlier, with fruits expanding while *V angusnfolium* is still in flower. A detailed description of *Vaccinium boreale* and recent discoveries in Maine by Arthur Haines has been submitted for publication in "The Maine Naturalist".

- **Linda Gregory Acadia National Park**

VERMONT INSTITUTE OF NATURAL SCIENCE HIGH ELEVATION AVIAN RESEARCH

The following abstracts report on ongoing research conducted by the Vermont Institute of Natural Science on Bicknell's Thrush and other high elevation birds. For more information or copies of the full reports contact Chris Rimmer or Kent McFarland at VINS, RR2, Box *532,* Woodstock, Vermont 05091, (802) *457-2779.*

POPULATION DENSITY AND DEMOGRAPHIC STUDIES OF BICKNELL'S THRUSH ON MOUNT MANSFIELD, VERMONT AND OTHER NORTHEASTERN UNITED STATES PEAKS

Abstract: Research on the population ecology of Bicknell's Thrush *(Catharus bicknelh)* was expanded on Mount Mansfield and 11 other northeastern U.S. peaks in *1995.* On Mount Mansfield, spot mapping of territorial males on an 8.8 ha ridgeline study plot yielded a density estimate of 45-53 pairs/40 ha, while estimates of 20-20.5 and 4-9 pairs/40 ha were obtained from two plots at lower elevations. Efforts to capture and band thrushes on ten study plots resulted in a total of 147 birds (75 males, 34 females, 38 juveniles) being uniquely color-banded in 1992-95, 103 of these on Mount Mansfield. Band returns ofadults indicated high survivorship and site fidelity. None of the juveniles banded on Mount Mansfield in 1992-94 were recaptured in a subsequent year. Of 11 active nests located in 1992-95, only 3 (27%) were successful in fledging any young. Most nests failed due to predation, apparently by red squirrels *(Tamiasciurus huasonicus).* Analysis of vegetation data at nest sites (n= 13) and non-use sites (n= 13) failed to detect expected differences in stem densities, but did reveal significantly higher ground and fern cover on non-use sites.

DISTRIBUTIONAL SURVEY OF BICKNELL'S THRUSH IN COASTAL MAINE, 1993-95

Abstract: Field surveys to determine the presence of Bicknell's Thrushes on coastal spruce-fir forests of Maine were conducted in June and July of 1993-95, using tape recorded playbacks. A total of 50 areas were surveyed between Mount Desert Island, Maine and Grand Manan Island, New Brunswick. In 1993, Bicknells' Thrushes were reported at five sites in coastal Maine and one site in New Brunswick. More intensive surveys in 1994 and 1995, using volunteer birders and a full-time experienced observer, and including multiple visits to each of the reported 1993 sites of encounter, failed to locate any Bicknell's Thrushes. We suspect that some of the birds reported in 1993 may have been misidentified or transient, non-breeding individuals.

DISTRIBUTION AND ECOLOGY OF BICKNELL'S THRUSH IN THE

DOMINICAN REPUBLIC

Abstract: Field investigation of Bicknell's Thrush in the Dominican Republic were expanded during November and December of *1995.* Presence/absence surveys were conducted at 16 sites, and three long-term study sites were established in Parque Nacional Sierra de Bahoruco. Bicknell's Thrushes were found at eight of the 16 sites visited and at five of the eight surveyed sites known to have been historically occupied by the species. All birds were encountered in the dense understory of moist, broad-leaved forests or mixed pine-broad-leaved forests at high elevations (>700m). On an 11.8 ha study plot at Pueblo Vieho, spot mapping yielded very high density estimates of 71.2-78.0 Bicknell's Thrush territories/40 ha. A single 3.2 km line transect in more patchy habitat at Loma del Toro yielded an estimated density of 20 Bicknell's Thrush territories/40 ha. We captured 13 Bicknell's Thrushes in Parque

Nacional Sierra de Bahoruco in 858 net hours. Eleven of these were new bandings, one was a return from 1994 at the Pueblo Viejo site, and one was a recaptured male at Pueblo Viejo that we banded on Mount Mansfield in June of 1995. Plans for 1996/97 include expanding distributional surveys throughout Hispaniola, continuing demographic studies in Parque Nacional Sierra de Bahoruco, initiating radio telemetry monitoring on our long term plots, and implementing a locally-based monitoring program for Bicknell's Thrush and other high elevation birds in the Dominican Republic.

POPULATION MONITORING AND DEMOGRAPHIC STUDIES OF SUBALPINE SPRUCE-FIR AVIAN COMMUNITIES IN THE NORTHEASTERN UNITED STATES

Abstract: Research on Bicknell's Thrush was expanded to encompass the entire subalpine breeding bird community in 1995. Several field protocols (e.g., point counts, MAPS, BBIRD) were combined on study sites across the Northeast. Eleven point count series were conducted on ten peaks, and six new sites were selected and marked for censuses planned to begin in 1996. Point count data indicated that relative abundance of breeding birds tended to be higher on large peaks with extensive spruce-fir habitat than on smaller, more isolated peaks. Mist-netting on five MAPS plots produced 607 total captures in 2,626 combined net hours (0.23 captures/net hours), and this protocol will likely be scaled down in 1996. Nest monitoring on four BBIRD plots yielded a total of 53 nests. Of the 49 nests whose outcome was known, 23 (47%) were successful in fledging at least one young. The most accessible and intensively monitored plot, Ranch Brook, accounted for 30 (57%) of the nests located. Plans in 1996 include assigning individual teams to single BBIRD plots and concentrating nest monitoring efforts on three species (Bicknell's Thrush, Swainson's Thrush, and Blackpoll Warbler).

THE EFFECTS OF SKI AREA DEVELOPMENT ON SUBALPINE SPRUCE-FIR BIRD COMMUNITIES AND THEIR HABITAT ON MOUNT MANSFIELD, VERMONT: AN ANALYSIS OF PRE-TREATMENT DATA

Abstract: As part of an Act 250 assessment of the proposed Nose Dive Pod.ski area expansion we established a 20 ha study plot (NDPO) and a 20 ha control plot (RABR) on the east slopes of Mount Mansfield, Vermont to examine the effects of ski area development on Bicknell's Thrush and other birds of subalpine spruce-fir forests. Spot mapping of all breeding birds and analysis of vegetation were conducted on each plot. Twenty-eight species of birds (18 breeding) were recorded on NDPO and 32 (16 breeding) on RABR. Four species are dependent on spruce-fir forest during the breeding season. Eight Bicknell's Thrush territories (4.5 territories/20 ha) were found in or around the NDPO plot, while 10.75 territories/20 ha were recorded on RABR.Thrushes seemed to be concentrated along current ski trail edges in the NDPO. Differences in densities may have been caused by habitat differences. Examination of the flora showed NDPO to be a lower elevation, mesic site, while RABR was classified as a higher elevation subalpine forest. The conservation status of the Bicknell's Thrush, combined with the paucity of avian population data in subalpine forests and increasing development pressures, argue for careful, long-term impact assessment studies. Contingent upon Act 250 approval for ski expansion, we plan to monitor both sites for at least one more breeding season prior to construction and six years thereafter.

**FALL MIGRANT LANDBIRD STOPOVER
IN MOUNT MANSFIELD, VERMONT
SUBALPINE SPRUCE-FIR FORESTS**

Abstract: The stopover ecology of fall migrant landbirds on Mount Mansfield, Vermont was examined through standardized mist-netting and banding in 1995. We captured 948 individuals of 51 species during 11 weeks of banding. Peak waves of migrants occurred from late September through mid-October. Over 77% of captures were HY (hatching year) birds. Blackpoll Warbler was the only species not exhibiting a strong HY bias. Unexpectedly high numbers of immature Black-throated Blue Warblers, a species that breeds in northern hardwoods forests, were captured during August and September. Regular searches of areas below transmission towers on Mount Mansfield and Mount Ascutney yielded only three dead birds, a Myrtle Warbler and a Hairy Woodpecker on Mount Mansfield, and a Blackpoll Warbler on Mount Ascutney.

*** NOTICE * NOTICE * NOTICE * NOTICE * NOTICE ***

**The Northeast Alpine Stewardship Steering Committee
announces the third biennial**

Alpine Stewardship Gathering

Whiteface Chalet
Wilmington, New York

**"A
Holistic Approach to Alpine Management in the Adirondacks'[1]**

September 12-14, 1996

Por more information and registration materials contact:

Kathy Regan

Adirondack Nature Conservancy
Box *65*
Keene Valley, NY **12943**
(518) 576-2082

Prenanthes

Summer 1996
Volume 2 - Number I

Prenanthes
The Green Mountain Club
RR 1 Box *650*
Waterbury Center, Vermont 05677
(802) 244-7037

Mission

The mission of *Prenanthes* is to promote the preservation of arctic-alpine areas in the northeastern United States. To that end, this newsletter serves to: 1) enhance management, education, and research activities in and about arctic-alpine areas in the Northeast, and 2) facilitate the sharing of information about arctic-alpine areas among interested parties in the Northeast and other regions.

Prenanthes is published twice a year and is dependent on readership contributions. Contributions of research abstracts, photographs, artwork, event information, resource contacts, educational opportunities, management issues, and any other informationpertaining to arctic-alpine areas is welcome. All contributions of materials, other inquiries, subscription requests, or address changes should be sent to *Prenanthes* at the above address.