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Voice

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North Fork Mountain Old Growth

by Robert Stough

When we think of old-growth forests we often envision towering trees reaching far into the sky, their lofty crowns luminous in the sun and casting a deep yet clear shade on the mossy forest floor. From the tiny remnants that are left to us it is obvious that many areas of the Great Forest of the Appalachians would have been something like that. But there are other remnants of old forests that are quite different, those principally found in the vicinity of large rock outcroppings that were rugged enough to turn back even the greed of the robber barons. The great majority of these areas are quite small, generally a few acres or less, and thus are rather like biological museum pieces instead of viable old-growth forests. There are, however, a few rare exceptions to this rule, where the land was so rugged and wild that it could not be profitably exploited, and thus was able to maintain some semblance of its original ecological integrity. One of the most outstanding of these areas is found on the crest of North Fork Mountain, in particular the summit ridge from the Fire Tower Rd. (FR. 79) north to the Hopeville Gorge. North Fork, as many readers are aware, is one of the most unique and spectacular features of the West Virginia highlands, and indeed the entire Appalachian range. Long sections of its crest area crowned by magnificent outcroppings of 500 million-year-old tuscarora sandstone, many of which are great vaulting cliffs that offer some of the most sublime and expansive vistas in eastern North America. There views are often framed by ancient,

weathered pines and oaks, the main constituents of the old forest that grows in concert with the wild, rocky summit.

Whether or not one can refer to this forest as completely old-growth is problematical, as is typical of most old-growth fragments. Certainly there were extensive logging operations on North Fork that ravaged much of the original forest on the mountain. Most of the actual crest of the mountain, however, in the area in question shows virtually no evidence of serious disturbance. This is not surprising in view of the fact that most of the trees are small and stunted, and would never have been worth the trouble to log out. But regardless of how one might classify this forest in a scientific sense, it has retained its primeval wildness and a remarkable diversity of species, which are, it seems to me, the most salient parameters for determining the relative significance of a tract of forest. This is especially true in a 'dwarf' forest such as the North Fork summit, where tree sizes are much smaller and life spans shorter for most species due to the harsh environment of the rocky crest.

North Fork Mountain is located at a kind of geological and climatological crossroads in the Appalachian range; and, that, combined with the wide variety of habitats that the mountain's configuration encourages has resulted in and interweaving of species from practically the entire extent of the



original eastern Forest. There are, for example, eight different species of conifers growing on or near the crest. The dominants are the hard pines; pitch pines, virginia pines and mountain pines often gnarled and twisted by the canyon winds. Scattered among these are also some red pines and white pines, small groves of hemlocks mainly on the northerly exposures, and a few disjunct red cedars on the upper eastern face of the mountain, disjuncts from the extensive cedar groves on Cave Mountain. Hardwoods include a great variety of oaks,

with Chestnut, Black, and Bear Oaks predominating, along with many red and white oaks. Other hardwood species include sugar and red maples, tuliptrees, cherries, walnuts, yellow birch and even a few white birch which have managed to survive here since the last ice age. Understorey species are also quite diverse, including mountain laurel, rhododendron, dogwood, redbud, sourwood, azalea, witch hazel, and, even, a little further south (and higher) on the mountain a colony of beach-heath,

usually found on northern seacoasts. It is the glaciers that most likely played a major role towards encouraging the present diversity of North Fork. During the last ice age it was of course much colder than it is today and there was tundra on the high Alleghenies. The North Fork summit likewise would have been much colder then, but its lower elevation would have precluded permafrost conditions, thus allowing species extirpated from the Alleghenies to colonize there. (see page 5)

Kumbrabow - The Benefit and The Trial

The Trial - will finally be held on March 3rd in Judge King's Courtroom of the Judicial Annex of the Kanawha Circuit Court at 9 am. Come early and get your seat. This will be the big showdown between the WV Division of Forestry and the Friends of Kumbrabow. Several issues are on the table including the legality of selling a HALF MILLION DOLLARS of State property without public review, and the failing of the DOF to follow statute in their management of the State Forest.

The Benefit - featuring BARNEY and the BEDROCKERS, and

FRIED CHICKEN (that old timey band). The night before the trial (i.e. March 2nd), the Friends of Kumbrabow and the WVHC Kumbrabow Committee are holding a benefit to help defray legal and mailing expenses. Friends of Kumbrabow have already raised close to \$2000, which includes generous donations from WVHC and the Mountaineer Chapter of Trout Unlimited. Now its your chance to have fun and help out. The benefit will be held at the Empty Glass (near the corner of Elizabeth and Washington in Charleston, near the Capitol), from 5 to 9:30. Call Bill at 824 3571 or Norm or Kim at 346 5891 for more details.

WVHC Spring Review

The Spring Review will be held at the Elk River Touring Center in Northern Pocahontas County the weekend of April 21/23. Many of you will remember the excellent food and atmosphere at last year's Spring Review at the Touring Center. This year Mary and Gil Willis are opening their field to tent camping to expand the types of lodging available.

As usual the Review will include many recreational and educational activities. Traditionally Saturday night is reserved for presentations. This year, Andy Mahler, founder of Heartwood is coming to discuss and looking for support for HB 1164 (the Bryant Bill), which you may have read about in these pages. Andy has testified before Congress and around the campfire and is an inspiration to many working to save the forests.

We are also fortunate to have Curt Seltzer come and speak to us about the Thornwood Gas Pipeline featured in last month's VOICE. Curt is one of the main activists on this issue and is very familiar with the Laurel Fork Area that this pipeline and associated wells threaten. It appears likely that a road/field trip to the pipeline site will be offered for those of us not taking a canoeing, biking, hiking or caving trip during the day on Saturday. For reservations call Mary Willis at 572-3771

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---from the heart of the mountains---

by Cindy Rank

BEWARE THE IDES OF MARCH!

March is nearly upon us and work as well as weather have prevented me from being at the Legislature on a regular basis this year. ...I admit that fact with both sorrow and glee.

The distance does little to soothe a heavy heart when talking to friends who are there working hard or when reading press reports of statements by legislators and agency personnel that are rife with misinformation about "the environmental community". In fact, feelings of guilt for not being at the capital and at least adding one more body to our presence during that annual 60 day stormfront, is painful nearly to the point of chucking responsibilities and unmet reporting deadlines at work.

But in the secret recesses of a spirit weary of dealing with the legislative gamesmanship that shape our state laws and government, there is also a selfish sense of relief that I have valid reasons for avoiding the shin-splinting marble floors, mind boggling confusion and heart rending daily confrontations.

For readers of the VOICE, however, the Charleston experience is important not for how it affects me personally, but for what all this year's shady shenanigans might mean for the Conservancy and other similar minded conservation-environment-citizen groups.

If you weren't shaken by the creation of the basic skeleton for DEP (the new Division of Environmental Protection) in the Fall of 1991, you should be at least a little concerned about the flesh that has been added to those bones. Where H.B.4065 gives care and attention to streamlining the permitting process and to easing administrative decision making, it offers only lipservice to increasing environmental protection and public involvement.

If you weren't concerned about the excessive amounts of discretionary authority given to the newly created position of the environmental czar without adequate checks and balances, you should be shaking in your boots to know that the person who currently holds that position cut a deal with supporters of the "wise use" movement by accepting a private property protection (i.e. "takings") provision into the DEP reorganization bill just to get the bill out of committee.

If you weren't upset about "friendly" legislators discrediting the environmental community in the press for "tactical" errors in gamesmanship in Charleston, you should be worried about the willingness of those legislators to accept "parity" (i.e. "no more stringent than Federal") language as a basis for future regulation changes.

Admittedly, the final language in each of these instances (reorganization, "takings" and "parity") is better than it might have been. But the mere fact that representatives of the environmental PROTECTION agency of the state, and normally sympathetic legislative leaders - whether by design or resignation - saw fit to accede to these short term fixes that have such lasting long term negative implications is frightening.

If there are messages to be heard or lessons to be learned from all of this, they are not new. Such actions and unholy alliances can be conceived and find support only in an atmosphere of shortsighted ignorance.

Historically humankind has prided itself as being the intelligent creature that can reason, think and make informed decisions. But, information is the key, and good information is necessary for good decision making. Unfortunately, like the brainchild computers of our technical genius, we too fall prey to gaps and glitches, errors and corruptions of our data banks. As the saying goes, "Garbage in, garbage out."

And today, as always, there are people willing and able to take advantage of any situation. In this age of massive amounts of information and speedy communications, is it any wonder that some of our fastest growing businesses are advertising agencies, public relations firms and corporate P.R. offices?

At face value, that isn't bad. Information IS key. Unfortunately, it seems that more and more of big money that was once spent in smoke filled back rooms is now being funneled into smoke-screens that emanate from front offices.

Appearances may have changed, but the game is the same. The power brokers of yesterday have merely retooled their skills to meet today's needs. The ability of moneyed interests to control information weighs as heavily on our efforts to act wisely today as did their ability to control the company stores of yesterday. (see page 4)

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ADMINISTRATIVE OFFICES

| | |
|---|---|
| Richard Wood: Membership Secretary P.O. Box 648 Lewisburg, WV 24901 647-4074 | Bill Ragette: Voice Editor 144 Trace Fork Rd Culloden, WV 25510 824-3571 |
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Public Lands Strip Show

Produced By: King Coal
Starring: The Wayne National Forest
A True Story By: Joe Hazelbaker

Although the Cold War may be over, the Coal War is just heating up. The battle lines are being drawn in the Wayne National Forest in Southern Ohio. At the center of the conflict are the rights of King Coal and the rights of citizens to protect public land. At stake is the integrity of the national regulatory law and 40 million acres of federal forests.

To understand the roots of the conflict we must go back to 1977 and the passage of the Surface Mining Control and Reclamation Act (SMCRA). After more than 6 years of citizen activism spurred by decades of citizen, community, and environmental exploitation at the hands of the coal industry, President Jimmy Carter signed the mining act into law. One of the major components was a ban on mining of federal lands, subject to Valid Existing Rights (VER). Unfortunately, the meaning of VER was left undefined and the task of defining it was left to the newly created Office of Surface Mining (OSM).

Several attempts by the Office of Surface Mining to define VER have been struck down by the court system in challenges by the coal

industry. The latest definition was the "good faith - all permits test", which meant that a mineral rights holder could only obtain VER, and hence the ability to mine public land, if the holder had all the required permits in place, or was making a good faith effort to obtain those permits, prior to passage of SMCRA on August 3, 1977. Considering the citizen activism and the political atmosphere at the time of SMCRA's passage a definition such as this, or a definition even more stringent, was clearly the intent of the law. The latest court decision that over rides this definition effects Ohio directly.

In 1989 Tom Belville, owner of Belville Mining Company in Ironton, Ohio, filed suit in federal district court after his 1988 VER determination to mine within the Wayne National Forest was reversed by the OSM. Mr. Belville filed suit even though he acknowledged it was his political connections that got him his original determination. A four year court battle ensued.

Significantly, the battle took place in the same courtroom that allowed the Meigs Massacre in which Southern Ohio Coal, a

subsidiary of Columbus Southern Power and American Electric Power, was allowed to pump over 1 billion gallons of toxic mine drainage that had flooded an underground mine. The discharge was permitted in local streams killing all life within 11 miles of waterways. Same court, different judge, same result; King Coal gets its way.

In 1991 Judge Carl Rubin found in favor of Belville and granted him the right to strip 8000 acres of Ohio's Wayne National Forest. The government (note 1) subsequently appealed, and on July 26, 1993 the 6th District Court of Appeals issued a divided decision granting Belville the right to strip-mine 1800 acres. Even though it was a divided decision and even though the judges raised avenues the government could use to prove no right-to-mine existed (2), the government chose not to appeal.

After the court's decision the Department of the Interior estimated that the court precedent could open 40 million acres of public land to strip mining. What the court decision does, in effect, is change federal law by barring the OSM from denying VER to mineral rights holders. Such a denial, in the courts eyes, would constitute a taking under the 5th amendment.

The government washed their

hands of the messy situation, meanwhile Belville pursued their permits from the State Division of Reclamation to begin mining. However, grassroots activists refused to give up.

A campaign was initiated by the Buckeye Forest Council in an effort to bring attention, scrutiny, and eventually an end to this travesty. With media attention sparse, agency cooperation negligible, and mining on the first 80 acres imminent, the council decided it was time for drastic measures. On January 24, 1994 thirty three activists representing eight organizations staged a sit-in at the OSM's regional support center in Pittsburgh, Pennsylvania. The director of that office, Carl Close, had made the original VER determination in Belville's favor in 1988 as a result of political pressure within the Bush administration. Demands were submitted to the OSM and the administrators were informed that the protest would not end until the demands were agreed to. Local police refused to make arrests and the government was forced to negotiate.

Twelve hours later a signed agreement was faxed from the OSM headquarters in Washington, DC to the protesters and the sit-in ended. As a result of the OSM's concessions, several avenues have been opened for

concerned citizens to challenge this mine and its precedent. Furthermore, the extensive media coverage that followed has informed people region-wide of the tremendous impact of this government incompetence, judicial error, and corporate greed in facilitating this mining.

One of the demands agreed to is that the OSM will investigate using "excusable neglect" to reopen the court case in order to present information relating to the issues the court case brought forth in the appeals decision. Another demand secures a public hearing in Columbus, Ohio on defining VER. If we are able to organize enough public input and win an appropriate definition of VER the 40 million acres that has been opened by the above case will be protected

Individuals and organizations are encouraged to contact their Congresspersons, particularly Representatives Ralph Regula and Ted Strickland and Senators Howard Metzenbaum and John Glenn, to ask them to push the OSM to explore all legal avenues, including "excusable neglect" to stop this illegal mine and work for the acquisition of the mineral rights, if the courts are not able to right this wrong.

The legacy of mining in Ohio has left its mark. Over one million acres of abandoned (see page 4)

The Green Computer

My name is Bill. I've been your editor now for a year. Maggie and I moved to West Virginia 19 years ago to live off the land. We still do, sort of. We cook and heat with wood. We plough and haul with our workhorse. We grow most of our own food and we get our electricity from the sun.

Well, you do too (at least the part that doesn't come from nuclear fission). Yours comes from the sun via ancient fern swamps, peabody coal, and appalachian power (or some variant). Ours comes through photo voltaic panels mounted on the roof of our three story log cabin. Compared to ours, yours is cheap, plentiful, and dirty. Not that solar panels and lead acid batteries are pure.

About eight years ago I bought an Apple IIc, because it drew only 25 watts and could be run directly from our storage batteries. My son, Oak, bought a laptop because it used about 30 watts. I have been using his computer for most of my tenure as editor. It would just about finish it up here at home and then go to Charleston and use WVCAG's computer and laser printer to finish it up and print it out - camera ready.

Oak had the gall to actually take his computer to college with him last fall, and I ended up trying to put the paper together during two all-nighters at CAG. It wasn't any fun -

proofing at 3 am is rough. I got exhausted and sick and refused to put out another paper till matters improved. WVHC had set aside money to purchase a computer last year, but I knew that I couldn't power a regular desktop computer during the dark winter months. For a few months each winter the family spends the evenings sitting together reading by one 30 watt fluorescent light. I tried to convince myself that the Conservancy could use a laptop. I considered buying/borrowing a gas powered generator to supplement in the winter. But the same philosophical reasons I got off the grid in the first place, restrained me from going that route now.

I called Steve Willey of Backwoods Cabin Solar Electric (from whom I'd bought panels and an inverter years ago) about a small, build-it-yerself generator he had designed (with a 5 horse power motor and a car alternator). In the conversation I asked about computers and he told me about the fellow that designed and built his - John Osborne of Air Castle Computers. John has been building low wattage computers for three years. He has tested the power draw of numerous monitors, printers, motherboards, chips, cards, power supplies...He has just recently been hired by a major manufacturer to design and test low power designs.

The first time I called John we talked for an hour. In the half dozen times I've called him I always get more information than I thought I wanted. He designed one that would run on 50 to 70 watts. I finally was sold and after consulting with the computer committee, I had John build us one. I like the fact that I can easily get ahold of the fellow that designed and built our computer. Since I've had it though, I've had no reason to call him (yet).

The Machine

For all you computer nerds (like me), here's what it has...an IBM 'green' motherboard (with power management capabilities like a laptop), a 486SLC 50 MHz, SLC coprocessor, 8 megs RAM, 255 meg hard drive, 2 floppies (send me your articles on 5 1/4 or 3 1/2), local bus VESA SVGA video with 1 meg video memory, 1024 by 768 b/w monitor. It makes working with Aldus Pagemaker a breeze.

Green Scam

While browsing in Walden-books last month I saw that WIRED (a techno, cyber punk rag) listed 'Green Computers' as the scam of the month. They were especially irate about IBM using the introduction of there (very expensive) 'green energy star' computer to appear environmentally friendly, while they are causing considerable pollution from the production of the com- (see page 4)



Apologies

to Norm Steenstra for the awkward title I gave his piece last month. You see a funny thing happened on the way to the word processor. Norm is beginning to enter the computer age and now writes his article on his computer at work and saves it on his one disk. He'll just leave it on his desk for me to pick up and use when I finally make it into CAG to finish the VOICE. As all his files for all the papers he writes for, are on this one disk (he has but one), he named his file VOICE ONE, realizing that even

I could figure out which one was for me that way. He used ONE to signify it was for the first issue of Volume 27. Anyway I missed it all and used the file name for the article title (it was way late at night). If any of you are aware of how conscientious Norm is, in trying to not be singled out as the 'voice of the environmentalists' and how he encourages others to speak out and think for themselves, you might understand how upset he was by my lousy choice for the title. Again, amigo, I apologize - bill r

Potomac Ranger District - Monongahela National Forest

Commercial Horse Trips; Search, Rescue and Survival Training in Dolly Sods Wilderness and other Special Biological Areas? Timbering and grazing on our forests? Is that what YOU want? Pay attention. Lots of folks want to use your National Forest. Find out what they want. To accompany Robert Stough's fine article on North Fork Mountain in the Potomac Ranger District, I thought I'd reprint some of the projects listed in their Quarterly Report for that district. What's wilderness for anyway? Enjoy.....

Red Creek Stables Outfitter Guide
Special use Permit
The owners of Red Creek Stables have approached the forest service for permission to rent horses and lead rides in the Dolly Sods area. This analysis will examine the effects of issuing such a permit. The decision of whether or not to issue Red Creek stables a permit and under what conditions, if any, will be based on the information learned in the analysis. Weirs Knob OA (#58.031), Red Creek (#56.102), Flat Rock-Roaring Plains (#56.203),

Dolly Sods North (#59.001), Decision date 3/94, Implementation 4/94, Contact Julie Foster.

Seneca Rocks Outfitter-Guide
Special Use
The district has four applications for outfitter-guide permits for climbing activities at Seneca Rocks. These applicants and many others currently use the rocks. The Forest Service plans to review the impacts of rock climbing and other uses on the rocks and adjacent environment, determine if there is a carrying capacity, and if so how to manage use to protect the affected environment. The decision... Seneca Rocks OA (#57.001), Decision date 6/94, Implementation 7/94, Contact Sara Schell

Frederick Community College Outfitter-Guide
Special Use Permit
Frederick Community College has approached the Forest Service for permission to conduct search, rescue and survival training in the Dolly Sods area. This analysis will examine the effects of issuing such a

permit. The decision... 5 OAs (the same five as the horse outfitters special use permit). Comments due 4/94, Decision Date 6/94, Implementation 7/94

Interstate Logging Road
Special Use Permit
Interstate logging company wishes to use and improve an existing road across FS land in order to remove timber from lands they own. This analysis will examine the effects of issuing such a permit, including the effects on threatened and endangered species on the private land. The decision to ... Osceola OA (#53.009), Pig's Ear (#36.112), Rich Mountain (#33.004) Decision Date 3/94, Implementation 4/94, Contact Richard Vanderhoot.

Grassy Mountain Project Area
Vegetation Management/ recreation/wildlife. **Timber Harvest and management**, recreation projects, fisheries and wildlife projects, and related support activities such as road and trail construction. Decision date 10/93, Implementation 1/94, Contact Larry

DeHaven
Osceola Project Area
Vegetation Management/ recreation/wildlife. **Timber Harvest and management**, recreation projects, fisheries and wildlife projects, and related support activities such as road and trail construction. Osceola OA (#53.009), Decision date 8/94, Implementation 10/94, Contact Sara Schell

Charlie Sites Allotment, Andy Champs, Dry Fork Range Allotments
Range management. The Forest Service will be preparing allotment management plans for these allotments. As part of the plans the effects of proposed management alternatives will be analyzed. Grant, Pendleton (Briggs Run OA (#56.106)) and Randolph Counties. Decision Date 4/94, Implementation 5/94
for more info call or write
Potomac Ranger District
257-4488
HC 59 Box 240
Petersburg, WV 26847



Glaze storms such as these are nature's way of creating openings

Public Lands Strip Show

(from page 3) reclaimed, and current strip-mines scar the state, while thousands of miles of streams run, degraded or lifeless, with the poisons of the mining trade. Public lands were created to restore the land and to offer refuge from devastating practices such as mining. We must work to see that this protection is not violated and that the rights of other species and of future generations are upheld over and defended from the imaginary right of an exploitative

entity and its puppets.
1.) In this case the 'government' includes the Department of Justice acting on behalf of the Office of Surface Mining and the US Forest Service.
2.) For instance, on the 80 acre Jenkins tract there is a reservation within the deed that prevents mining unless the mineral rights holder meets certain criteria. Belville Mining meets none of the criteria. ♦
You can contact Joe at

Buckeye Forest Council
5107 Olentangy River Rd
Columbus 45157
Maybe I should apologize for including a story about the National Forest in Ohio. On the other hand, citizens in Ohio are getting active in protecting their Forest and I don't have any news of WV Forest Activists doing anything for the Monongahela, of course if you are doing something. I certainly apologize, why don't you send me an article about it. ♦

from the heart of the mountains

(from page 2)
If spin doctors can make issues like "takings" and "parity" appear innocuous or attractive to legislators and any significant portion of the population, I cringe to think what disasters IRR (Initiative, Referendum and Recall) might bring. Even an idea that sounds like a wonderful world of good government, true democracy and people power, is subject to the whims of those in control of determining how much and what kind of information will be available to the public at large, in a

climate where money still rules the day, this could well be the next level of duping and duplicity.
So, beware the IDES OF MARCH!
If you thought things were on the upswing, that somehow a new consciousness had swept over the land, you had better take off those rose colored glasses and return to the tedium of microscopic examination of all that is laid before you. Discerning fact from fiction and truth from tall tales may be a more demanding task today than it ever has been before. ♦

Green (from page 3)

puters and chips. It is true that if we replaced the incandescent light bulbs in our homes with fluorescents, we'd save ten times as much power as if we bought green computers. And we'd save ten times more still if we switched to the most fuel efficient cars or stopped heating and cooking with electric.
But the truth is, that around here watts are very precious. I just can't run a desktop and monitor with a usual power draw of 100 to 200 watts. Actually on this planet, watts are very precious. And the unconsidered and considerable use of power is causing acid rain, acid mine drainage, strip mines and general ugliness.
The Hydro Plant
Actually even with a green computer, I still don't have enough power in winter to run it for the 20 to 30 hours it takes to put the VOICE together. So far this winter I've hauled batteries the mile to our

neighbor's to charge them up more than once (and it hasn't been easy with the foot of snow). Actually as I was writing this article the first time (without saving periodically), the battery got low enough so that the inverter (changes 12 volt dc to 120 volt ac) kicked off and I lost the whole article. I hooked up another battery and jumped back in, enabling the feature of Microsoft Word that automatically saves your work for you every 5 minutes.
So I bought a hydro plant from Steve Willey. Just as soon as I can get the horse out to haul up the 500 foot of PLASTIC pipe, I'll hook it up and have plenty of power as long as it rains. Now back to saving the earth.....
One month later, I didn't need this article for the last issue, actually receiving 5 articles on disks!!! This month I'll type it all and write a good bit of it so I have room for this. We just got the hydro plant running and I am using it now. ♦

North Fork Mountain

(from page 1) As the climate warmed and the great glaciers receded the composition of the forest naturally underwent considerable changes, and some species, black spruce and jack pine, for example, were extirpated from the range and replaced by more southerly species. Some northern species, however, having established niches in the forest ecosystems going back uncounted millennia were probably able to survive in viable numbers until virtually the entire forest was destroyed by the logging madness of the late 19th and early 20th centuries. One must say probably because the species diversity of the original forest of the West Virginia highlands is at best poorly known.

What is clear, though, from the remnants of old-growth that have survived is that the Monongahela Forest must have been an even more diverse ecosystem than it is today. The presence of red pine and white birch on North Fork Mountain offers compelling evidence for such speculation, as do the ghosts of wolves, cougars and golden eagles - top predators, who by most accounts were relatively abundant in the highlands before their habitats were destroyed or they were shot as vermin. It is true that eagles and cougars are still occasionally seen in the mountains, but these are clearly at present no more than a remnant population. Some hint of the original numbers of the eagle may be gleaned by remembering Maurice Brooks, in his book 'The Appalachians', saying that he had once seen seven golden eagles in the air over North Fork, and on his many trips to the mountain had seldom failed to record eagle sightings.

The current ecological state of North Fork is, then, like virtually all other ecosystems in the Appalachians, in a state of flux. One may

argue (and those who exploit wild places frequently do so) that such a condition is perfectly natural. This contention, however, ignores the fact that natural changes in biodiversity within any given area almost always occur in time frames that must be measured in centuries and millennia. Any more rapid changes than this, by whatever agents, are nearly certain to have a diminishing effect upon species diversity. This effect may be temporarily masked by an influx of weed species and exotics in the early successional stages following a major disturbance such as clearcutting, but there is an ultimate impoverishment of many species endemic to climax forests that apparently persists for at least several hundred years, or in other words, until the forest regains its full symbiotic balance.

Achieving such a balance is critically dependent upon having trees in all stages of both growth and decay. For instance, it has become widely recognized in recent years that the long-term health of Forest ecosystems is inextricably linked to the presence of substantial amounts of standing dead trees and fallen dead wood, the 'over-mature decadence' of foresters' jargon. Thus any disturbance that interferes with the transformation processes of these vital forest components must result in the impoverishment of the local ecosystem. Indeed, perhaps the single most important element of forest regeneration, soil-building, is seriously retarded by modern exploitative practices that not only remove most of the trees needed for future soils but usually also disturb the existing soils sufficiently to destroy the micro-communities necessary for healthy forest recovery. And montane ecosystems such as North Fork Mountain are the most severely impacted of all owing to the steep and usually rocky slopes and

generally harsher environment, which factors greatly exacerbate soil erosion following disturbances.

I know that most of the information in the preceding paragraph will not be news to readers of the VOICE, but it apparently needs to be said again and again, because extensive clearcut logging operations have and will be taking place on the eastern face of North Fork as part of the Forest Service's multiple-use master plan. **One such clearcut, done in 1987 only a few hundred feet below the crest of the mountain on a very steep slope has had predictable results: there has been obviously substantial soil erosion and very poor forest regeneration consisting almost entirely of stunted heaths and stump-suckers.** The Forest Service response has been to plant seedlings protected by tubes and continue clearcutting farther along the mountain. Thus the Forest Service is slowly but surely degrading the ecological integrity of the entire mountain, including the spectacular summit ridge, and tangentially threatening its ancient but fragile forest community, which is one of the most unique temperate forest associations in the world. What is at stake here is more than just the acreage of trees to be cut, for we already know that old forest communities surrounded by exploited land become island habitats whose biodiversity is inexorably diminished by pressures from generalized 'weed' species.

That logging is taking place at all on the dry rocky slopes of North Fork is indicative of the usual myopic multiple-use practices that the Forest Service continues to cling to regardless of the ultimate effect of such practices on the wild ecosystems under their control. The Forest Service contends that it goes to great

lengths to account for all contingencies as a result of their timber extraction. We are told of benefits to local economies (subsidized clearcuts), benefits to local governments (more tax dollars for them to waste), benefits to recreation (more ORV routes and 'wildlife' openings), benefits to the forest itself (greater numbers of individual species, i.e. weeds in clearcuts) but somehow we are never told what is happening to whole ecosystems, which is that they are being slowly weakened piece by piece, which unravels and will ultimately destroy the finely-woven tapestry of thousands of years of Forest evolution. As with so many other areas in the Appalachian range, the only appropriate management plan for North Fork Mountain is to leave it alone.

The last, and to my mind most important, reason for the preservation of North Fork cannot be caged up and quantified by its value to homo sapiens, and yet is something that we will surely perish for the lack of. It is the ineffable and yet indispensable qualities of primeval wildness that places such as the North Fork encourage and nurture. It is in the wings of the peregrine falcon swooping past in the evening twilight, ravens playing with each other, their crazy croaking echoing off the forbidding cliffs, the narrowed eyes of the rattlesnakes dreaming in the morning sun, moonlight glinting off the black bear's fur, dawn wind keening in the branches of the ancient pines....

That at least a few places such as the North Fork summit exist at all is reason enough for hope these days, but it ought to be obvious that we can't continue biting chunks out of the mountain and expect it to retain its special qualities. Although multiple-users have long denied it, the truth is that a wild mountain cannot be all things to all species. The resilience of the Appalachian forests is legendary but what is often forgotten is that they do not reproduce themselves as they were before exploitation. The forest of today is very different from the original old-growth, which is now gone forever, except for the few tiny jewels that escaped the maw of the industrial revolution. Whether even these survive much longer is now dependent primarily on the state of our human culture, that is, have we grown enough as a species to respect and cherish the lives of other beings who have no economic value to us, or, conversely, have a great deal of value that we choose to forego extracting because to do so would mean the degradation of a wild ecosystem.

What is clear is that we cannot have it both ways. Our own quality of life will be determined by the level of our concern for the quality of other species' lives. The North Fork summit is obviously not a large area, nor is its destruction or preservation

critical to our species or even the species that now live there. But it is of the utmost importance to those individual beings that call the mountain home. It is our concern for such individuals that will ultimately determine our own fate. The era of management by numbers, of what the Forest Service condescendingly refers to as 'opportunity areas' must come to an end. It is not that the taking of other lives, both plant and animal, for the survival of humans is wrong, but what is terribly wrong is our perverted attitude that we have the right to use the earth however we choose, with little or no regard for the lives we are ending. This has already resulted in a widespread breakdown of spiritual and moral values, which is clearly in large measure because of our exploitive treatment of mother Gaia. And that is why the full protection of such wild places as North Fork Mountain is vital to our own future, that we are finally able to make friends with the land, and so with ourselves. ❖

Graphics Credits

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- Vince Packard

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- Robert Leverett

Ivory Billed (from page 8)

closely related Imperial woodpecker at 22 inches length was the largest of all. A denizen of the mature mountain forests of the Sierra Madre, it became extinct at almost the same time as the Ivory Billed.

Even though by 1900 it was even more rare than the California Condor, the Ivory Billed was the most studied of all rare birds. Over 400 specimens remain in museums. Their strength and endurance are legend among students of the bird.

An Alexander Wilson wrote about one he wounded and kept in his hotel room. "In less than an hour I returned, and, on opening my door he set up a distressing shout, which appeared to proceed from grief that he had been discovered in his attempts to escape. He had mounted along the side of the window, nearly as high as the ceiling, a little below which he began to break through. The bed was covered with large pieces of plaster, the lathe was exposed for at least 15 square inches and a whole, large enough to admit the fist, opened to the weather boards, so that in less than another hour he certainly would have succeeded in making his way through." ❖



The Work of the US Forest Service not far from the crest of North Fork Mountain

Liriodendron tulipifera

by Robert Leverett

52 Fairchild Ave.
Holyoke, MA 01040

This piece is from the most recent issue of WILD EARTH. Some of you may recognize the author's name from two other articles I've included in the VOICE by him

Many of us hold fond memories of favorite trees we climbed, swung from, or sat beneath in our youth. These memories become magnified through the lens of childhood imagination. But there is one tree that needs no boost from youthful reveries. I speak of Liriodendron tulipifera, Lord of the Appalachian Coves.

Physical properties

Liriodendron tulipifera is no ordinary tree. As reported by Harriet Keeler in her artful 1900 publication, Our Native Trees, the tuliptree is a genus of a single species. Keeler explained that "In the Cretaceous age the genus was represented by several species, and was widely distributed over North America and Europe. Its remains are found in tertiary rock. One species alone survived the glacial ice, and this is found only in eastern North America and western China." Liriodendron tulipifera's only close living relative was discovered in China in 1875.

Liriodendron tulipifera is known by a variety of common names spelled in different ways: Tuliptree, Tulip-tree, Tulip Poplar, and Yellow Poplar (as it is inappropriately called by the lumber industry) are the most common. Liriodendron is a member of the magnolia family, which prefers deep, rich soil, though it can be found growing in relatively infertile locations. The Tuliptree flowers in May and June. Yellow-green blossoms have orange markings within and are 1.5 to 2.5 inches across with 6 petals and 3 sepals. The blossoms resemble tulips and it has been reported that a mature tree can produce 7 to 8 pounds of nectar

per year from which bees produce up to 4 pounds of honey. The outline of the leaf also suggests a tulip. The Tuliptree fruits in September. Few seeds are fertile; less than 10 percent can reproduce. The leaves are 4 to 6 inches long and equally wide with 3 or 4 lobes. The leaves turn a brilliant, uniform yellow each fall. The vivid hue rivals the Plains Cottonwood and Quaking Aspen of the Rockies. The bark of old Tuliptrees is smooth and gray to gray-brown. Older trees develop rounded ridges and deep, perpendicular furrows. The outer bark of truly old trees drops off leaving a flat, smooth surface.

The Tuliptree can seed as early as 13 years of age, though more commonly it begins bearing seeds between age 15 and 20. Its wood is soft, straight-grained, and relatively light (25 lb/cubic foot). The wood has a higher strength to weight ratio than most other hardwoods - rivaling some of the important softwoods. The heartwood is light yellow to brown, Medullary rays are small and inconspicuous. The sapwood is creamy. In some stands the heartwood is also creamy, hence the common names White Poplar and Whitewood. The wood in these latter stands is inexplicably softer than that found in stands with darker heartwood; a mystery perhaps associated with soil or climate.

USES

The Tuliptree is well known in the lumber industry. The wood has been described as: straight-grained, resistant to splitting, warping, and shrinking; holding of nails well; taking of a good finish; and accepting glue, paint, and stain well. In the East, some say, Tuliptree wood is surpassed in these qualities only by White Pine. The wood is easily worked. As a result, it has found its way into everything from cabinets to postcards. Native Americans preferred it for making dugout canoes and cradles, and used the bark for a variety of medicinal purposes. According to Deborah A.

Boerneins's American Forests article, "Rediscovering the Yellow Poplar" (commercially, I might add), use of the Tuliptree reached an all-time peak in 1899 and experienced another peak in 1950. The Tuliptree has accounted for only 9% of hardwood production since 1960, but is now being heavily promoted by the US Forest Service and some state agencies.

Growth Characteristics

The Tuliptree is light-loving and can repopulate old fields in the southern part or its range like White Pine in the Northeast. It achieves and maintains dominance in the canopy by outgrowing its competitors. The first year it is likely to grow about half a foot. Thereafter it can grow up to 3 feet per year for a number of years. One 58 year old specimen in North Carolina was measured at 114 feet. Under competition with other species, the tuliptree tends to maintain a central leader and simply outgrows its competitors. As a youth, I observed a White Pine and Tuliptree growing side by side in a nearby field. These equally proud species were neck and neck throughout the 10 year period that I watched them locked in their race for dominance.

Although the Tuliptree likes sunshine, the species lives long and persists in the shaded coves of the Southern Appalachians. Estimates of the ages of the oldest Tuliptrees in the Great Smoky Mountains are on the order of 500 years. It is not clear how these estimates were derived, but solid data support a longevity of over 350 years for old trees.

Most books describe the Tuliptree as a large forest tree up to 6 feet in diameter and 150 feet in height. A few sources place its limits at 200 feet in height and 10 feet in diameter. Records confirm that Tuliptrees approached these dimensions in the pre-settlement forests of at least two areas; flood plains of Illinois and Indiana rivers (e.g. Wabash) and Southern Appalachian coves.

We are indebted to naturalist Robert Ridgeway for the work he did in the 1870s and 80s. He took meticulous measurements of the largest Tuliptrees he could find. A sample of 25 trees yielded an average diameter of 6.2 feet with a maximum of 11 feet. A sample of 18 Tuliptrees measured on the ground yielded an average height of 143.5 feet with a range from 110 to 168 feet. Ridgeway triangulated the crown of one giant, standing alone in a field, at 182 feet. He estimated some downed giants with broken crowns to have been near 200 feet when standing.

Similar data exist for cove trees of the Southern Appalachians. Great Smoky Mountain National Park has records of a giant Tuliptree that yielded 18,000 boardfeet in 4 logs. Its diameter approached 7 feet and its length was a solid 190 feet. A stupendous Tuliptree cut in North Carolina's Slickrock district in the early 1900 produced 20,165 boardfeet of lumber in 4 huge logs. This figure can be better appreciated when compared to the average of 33,000 boardfeet of lumber per acre calculated for the virgin Pisgah tract of southern New Hampshire. Today, a good White Pine forest in the Northeast can yield 25,000 boardfeet per acre. Oak forests often yield as little as 5000 boardfeet per acre. In 1859, a professor Buckley reported two Tuliptrees near the Pigeon River in Haywood County, NC: The first made 33 feet in circumference and the second 29. Other statistics could be cited to confirm that with the demise of the American Chestnut, the Tuliptree was left with few competitors for the title of monarch of the Eastern Hardwoods. If the tuliptree can be

equaled in height, it would likely be by the American Sycamores that once grew in the Ohio and Tennessee River valleys.

Prior to 1967, the national champion Tuliptree grew in Annapolis, Maryland. It measured 26 feet 6 inches in circumference, but was a mere 83 feet in height: a field spreader. In 1967 Paul Thompson, a famous big tree hunter from Michigan, crowned a new national champion tuliptree: girth 19 feet 3 inches, height 176 feet, spread 112 feet. The current national champion, the third largest tree in the East, grows near Bedford, VA. Its girth is 23 feet, height 146 feet, crown spread 125 feet.

Those looking for impressive tuliptrees need not travel far. Within its range, respectable specimens can be found in yards and city parks. Even in the extremes of its range, Liriodendron may exceed 100 feet in height and 3 feet in diameter, but the real giants are found in the areas of old growth possessing terrain favorable to the species.

For several years, I have been collecting data on sizes and ages reached in the past by Eastern in-forest trees of various species, with the intention of comparing them to those growing in today's environment. I search for the exceptional trees. Knowing the limits to which these woody towers grow may help us understand if our incessantly meddling activities are reducing the vitality of the forest and turning once majestic species into runts. I have been concentrating on the White Pine, Eastern Hemlock, Red Spruce, Sugar Maple, White Ash, and Tuliptree.

Measuring the girth and basal area of a tree is relatively simple, but it is extremely difficult to accurately measure the height and crown spread of in-forest trees, particularly in mountainous terrain. Tall trees are the most difficult to measure. They require longer baselines to discern the highest points of their crowns.

After the old-growth conference last August in North Carolina, naturalist Ted Watt, my daughter Celeste Poulin (contributing artist to Wild Earth), and I measured a number of impressive Tuliptrees in the Cosby section of the Great Smoky Mountains National Park. A stand of trees on the Gabes Mountain Trail produced measurements up to 163 feet. At 94 feet, the baseline for this tallest tree was too short. The measurement thus carries a high probability of error. However, a younger tree on the Henwallow Falls trail, near the Cosby campground, yielded a height of 146 feet on a respectable baseline of 160 feet. The Porter Creek trail produced measurements on the 150 foot range on equally long baselines. Unfortunately, I could not get measurements of the most promising trees, including a hemlock that may rewrite the records. Much work remains to be done in Porter Creek drainage to adequately document the exceptional qualities of its forest. Obtaining unobstructed views of the tree crowns in this cathedral forest will require they be measure when bare of leaves. We hope to put to rest the question of whether 200 foot Tuliptrees can still be found in the Southern Appalachians.

Tuliptree as Symbol

No account of trees would be complete without discussing their psychological impact on humans. The Tuliptree ranks high in its capacity to inspire properly attuned mortals. In his book The Best Loved Trees of America, Robert Lemmon writes "The United States is fortunate in the number and variety of its large trees, but within the area where it naturally grows you would look far to find one more



Natural Disturbance Regimes

With all of the Forest Service talk about using ecological management to imitate the natural processes occurring in the forest I thought I'd do a little research on what the natural processes are like in the forests around West Virginia. It seems very little has been studied about natural disturbance regimes in West Virginia. I did come across research that monitored change in virgin forests in Indiana, the Smokies and Pennsylvania. Most of the information for this article comes from a chapter by James R. Runkle in "The Ecology of Natural Disturbance and Patch Dynamics", edited by S.T.A. Pickett and P.S. White. - Bill R

One way to characterize a forest type is by the mortality pattern of the canopy trees. This pattern of canopy tree death is referred to as the community's disturbance regime. The lay of the land, the soil and geology, species occupancy, and climate all effect the regime. Disturbance regimes are characterized by their scale, rate, and severity of occurrence.

The disturbance rate effects species composition and the structure of the forest. High disturbance rates tend to select species that are fast growing and/or short lived. When rates become too high trees disappear and shrubs and grasses take over.

The minimum disturbance rate is related to the maximum age and size limits of the dominant species. As trees grow, they become less efficient at moving water, nutrients and photosynthates. The roots and photosynthetic processes have to support proportionately more

biomass and non-photosynthetic tissue. For all these reasons, as well the large crown, the trees are susceptible to more common and smaller disturbances. Often there is a seamless intersection between external (wind and weather, fires, predation) and internal (a trees increased susceptibility) causes of canopy openings.

The average range of forest ages throughout the world is 100 to 1000 years. In our temperate region canopy trees in deciduous forests can average 300 years before death, with some individuals reaching 500 years. Several students of eastern temperate forests have found an average annual disturbance rate of .5 to 2 % per year. This held true no matter what the actual disturbance was (fire, large or small scale wind-throw). From this we get a natural return rate (how often the canopy is cleared in any one particular area) of 50 to 200 years. Runkle explained the difference between this and the 300 years a tree normally lives, as the time a tree would spend in the understory. He found that the trees that finally make it into the canopy spend an average of 91 years waiting for the 'big break'. He also found that they averaged about 10" in diameter at that time. The giants that live 300 to 500 years have been favored by location and chance.

Natural Disturbance Patch Sizes

The number of individual trees involved in a disturbance event ranges from one to over a million. When the size is small, the occurrences are many and usually spread out evenly

in time. When the sizes are larger, they occur less frequently. The size of this patch (open space in the canopy) effects the nature of the vegetative response. The term 'gap' has come to mean a place where one or a few trees are removed from the canopy and where active recruitment occurs.

Physical Environment of Gaps

The physical environment under the canopy and in large and small gaps is quite different. Table 1 is a compilation of data from several researchers. I was surprised at the increase of soil moisture in openings. Some researchers credit the increase in soil moisture to the decrease in roots absorbing soil moisture.

A useful term in understanding gap size is the D/H ratio. This is the ratio of the diameter of the clearing to the height of the trees surrounding it. Most of the above factors increase or decrease until the D/H ratio is 2, that is the clearing is twice as wide as it is deep. The shape and orientation of the opening can have effects on the physical environment.

Species Composition

Many USFS studies have shown that selective cutting favors shade tolerant trees (beech, maple, hemlock). Once the size of the canopy opening reaches 400 m2 other trees, such as tulip poplar, ash and yellow birch can

survive.

Severity of disturbances

The magnitude of a disturbance is reflected in the damage it does to the vegetation and other ecosystem properties. The greater the damage the slower the re-growth. Size and severity and not necessarily related. The type of succession (by saplings, seedlings, buried or new-to-the-site seeds) is determined by the severity. With single-tree-throw, suppressed saplings will fill in. More severe wind damage favors seedlings and intense fire favors buried and blown-in seeds. Certain types of disturbance with great extent in time and space (farming) will usually result in a totally alien succession.

The specific type of disturbances will have unique effects. Large wind throws will create a pit and mound topography. The pits will have more litter and water while the mounds will have less. Herb species differ in the part of the pit/mound they will colonize. Decomposing logs favor yellow birch and hemlock. Long after the log has finally rotted away you can see yellow birches standing on their legs. The large debris pile of the tree's crown creates browse and its own habitat. Researchers at Island Royale National Park would seek out this downed (see page 8)



According to the Senator Don McNaughton Explanation, trees on the borders of openings (and along power lines) grow asymmetrically, with greatest growth towards the opening (or powerline). Heavy snow and ice loads will tip these trees over and increase opening size naturally. Note formation of mound and pit topography at root base.

impressive than the tuliptree at its best."

Harriet Keller's poetic description of the tuliptree reflects its impact: "The trunk rises like a Corinthian column, tall and slender, the branches come out symmetrically, and the whole contour of the tree, though somewhat formal, possesses a certain stately elegance." Keeler's sentiment is echoed by others who point to the tree's symmetry. Yet many who adore the species have not seen it at its best. Their praise would be effusive were they to walk among the real forest giants. But where can one see such trees?

The lush, rain drenched coves of the Great Smoky Mountains and the nearby Joyce Kilmer-Slick Rock Wilderness harbor Tu-

liptrees that demonstrate the awesome power locked in the genetics of this remarkable species. Gargantuan trunks rise like Atlantean pillars through the mist to connect earth and sky, continuing an unbroken reign of centuries of dominance. The visitor is humbled in the presence of these Ice Age survivors. They seem timeless, linking present and past. No measurements need be taken nor statistics cited to bolster respect. The massive in-forest tuliptrees stand in sharp contrast to the slender crowded second-growth tuliptrees a few thousand yards down the ridges. Like young athletes who must slowly develop into seasoned professional, "young field poplars" only hint at the inherent power of the species. ♦

Monongahela National Forest Hiking Guide Now Out

Edition 6 of Monongahela National Forest Hiking Guide is now available. This edition is bigger and better than ever, with 368 pages, 96 pages of maps, 49 photographs, 177 trails totalling 812 miles, and a new full color cover. West Virginia Highlands Conservancy is the publisher. Authors are Allen de Hart and Bruce Sundquist (same as edition 5). Allen has hiked all the trails of the Monongahela N.F. over the past few years. Bruce was the editor for the first four editions. The hiking community and the U.S. Forest Service provided trail reports and photographs. Edition 6, like edition 5, also provides information for ski-touring and backpacking.

The growing throngs of visitors and the public at large regard the Monongahela National Forest as a 'Special Place'. And indeed it is. The hiking, backpacking, and ski-touring opportunities it provides are among the best in the eastern U.S. The more outstanding areas are becoming known far and wide - Otter Creek Wilderness, Dolly Sods Wilderness, Flatrock Plains, Roaring Plains, Blackwater Canyon, Spruce Knob, North Fork Mountain, Shaver's Mountain, Laurel Fork Wilderness, Cranberry Back Country, Cranberry Wilderness, among others.

Profits from the sale of these guides support a wide variety of worthy environmental projects in the West Virginia Highlands Conservancy.

To order your copy of Edition 6 of Monongahela National Forest Hiking Guide, send \$11.45 (this includes \$1.50 shipping and handling) to

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Natural Disturbance Regimes

(from page 7) browse to help locate moose. The smaller the gap the more likely that lateral growth of surrounding trees, rather than sapling growth, will fill in. Studies of tree growth rings show multiple cycles of fast and slow growth, implying several cycles of gap formation and closure. It seems unlikely that even 'shade tolerant' trees make it to the canopy without at least a few gaps aiding them. One study found that it took beech trees 12 and hemlock trees 29 years on the average to reach 4 ft. under a closed canopy. What shade tolerant really means is not that the trees can grow in shade, but rather that they persist and are quick to take advantage of any gaps that occur.

The Cove Forests of the Smokies

Extensive natural forests are non-existent in WV. Studies have been done in the Smoky Mountain National Park and in forests in Pennsylvania and Minnesota. Runkle studied the cove forests in the Smokies, as they are the largest block of undisturbed forest remaining in the East.

Fires seem to be extremely rare in cove forests, occurring if ever on low south facing ridges. In contrast, in the pine forests of Northern Minnesota fire is the main cause of canopy disturbance. In the cove forests the major loss of canopy trees is caused by glaze storms, occasional tornadoes, lightning and windthrow. Several investigators have found canopy disturbances to occupy .25 - 1 % of the land area. Most of the disturbance was caused by single tree loss. The maximum disturbed area of 15,000 sq. ft. was caused by a multiple throw. Negative effects of the damage are minimized because surrounding vegetation absorbs nutrients and holds soil. The high number of suppressed saplings fill in the canopy rapidly.

This type of disturbance favors the 'shade tolerant' species, like maple, buckeye, beech and hemlock. These are the trees that dominate in the coves. Shade intolerant trees like the tulip poplar, occur only occasionally, most likely in an area that experienced a multiple tree gap. The densities of tulip trees correlates

well with the densities of the larger gaps.

The Alleghenies

The gap dynamics of the forests of the Alleghenies in northwest Pennsylvania are intermediate between the northern pine forests and the cove forests, exhibiting in different locales both large and small scale disturbances. Runkle reviewed the literature of the two types of natural forests in this area. One type existed on sandy or otherwise well drained soil, growing pine, chestnut, red maple and northern red oak. The moister upland forests were mostly beech/hemlock with some sugar maple, black cherry and yellow birch. Can you guess which disturbance regime dominated in each of these forests?

The pine forests were associated with fires and larger windthrows. Pine seems to prefer lots of sun and exposed mineral soil. One pine site studied in the Allegheny Plateau (Heart's Content) revealed 41 fires between 1727 and 1927. The nearby Beech/Hemlock forest showed no signs of fire.

In a few cases on the moister uplands, large tracts of red maple, black cherry and black birch were caused by the hurricanes of 1808 and 1870. But few and single tree disturbances are the rule for the beech/hemlock forests.

Human caused disturbance

All the above forests are natural, virgin forests. When humans enter the scene, a whole new dimension is added to disturbance regimes. The widespread harvesting of conifers and the death of the American chestnut allow oaks to dominate the drier sites. The selective cutting of hemlock (originally for its tannin rich bark) and the increased browsing by a growing deer population tend to eliminate it and favor beech. The 'harvesting' of the large stems decrease the rate of gap formation. The flush of second growth does not favor saplings in the understory. The success of any harvesting regime depends on a healthy sapling crop, especially because of intense deer browsing

Table 1

| | humidity | light | soil moisture | wind | temperature |
|--------------|----------|--------|---------------|---------|---------------|
| under canopy | highest | lowest | average | lowest | most constant |
| small gaps | medium | medium | higher | | larger fluct. |
| larger gaps | lowest | high | greatest | highest | most fluct. |

Extinct Species of the Month



Campephilus principalis

This month's lesson is the Ivory Billed Woodpecker. My good friend and neighbor, Liz Plazo, after months of being bugged by me for some more artwork, gave me this drawing and the ones of the grouse feathers. The feathers are from real life, the Woodpecker is from a book called Vanished Species by David Day. This book is beautifully illustrated and terribly depressing, all the majestic species gone forever.

The woodpeckers needed extremely

mature and extensive hardwoods to survive. Two thousand acres was a typical territory for a breeding pair. The birds were never common but were widespread throughout the Southeast, inhabiting virtually all mature river bottom timberland before 1880. Their bills were highly prized by the Indians, but the destruction of their habitat was the primary reason for their demise. Undoubtedly such beautiful birds have also lost considerable numbers to collectors.

At twenty inches they were among the largest of woodpeckers. The (see page 5)

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