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From Campfires to the Capitol Dome

Like early man who first huddled around a campfire for light and warmth at the dawn of civilization, the idea of an environmental coalition was conceived around campfires at campgrounds all around West Virginia. Thoughts about forming a coalition often became the topic of discussion whenever environmentally sensitive people brainstormed ways to achieve positive environmental action. The Ripley conference of September, 1989, realized those dreams.

While the campsites aren't empty, many environmentalists are now around the Capitol dome. The West Virginia Environmental Council (WVEC) came to the Capitol equipped with plenty of fire and light.

Comprised of over 70 groups representing state chapters, regional organizations and local grassroots movements, the council became a political force during the 1989-90 legislative session.

Principal WVEC accomplishments include:

- A prioritized list of environmental issues known as "Blueprint for the Environment"

- Development and maintenance of networks between environmentalists

- Coordinated actions with sympathetic public interest groups like the League of Women Voters and WV-CAG

- Coordination of environmental lobbying activities for groundwater protection, landfill regulation, control of medical waste, air toxics standards, soil erosion guidelines and pesticide control.

A meeting of the Council is scheduled for noon on Sunday, May 13, 1990, following the WVHC Board Meeting. The focus will be on the structure of the Council.

EC Lobbyist Reviews Session

by Diane "Missy" Woolverton

As a first-time lobbyist for the West Virginia Environmental Council, it was my job to bring such important issues as groundwater protection, clean air, out-of-state garbage, and medical waste to the attention of our state senators. I hoped to advise them on the merits of protecting our beautiful state by passing good environmental legislation . . . copies of which I just happened to have in my bulging briefcase. Since our Senate is not universally known as a bastion of environmental consciousness, I knew I had my work cut out for me.

There were five lobbyists, including myself, with an environmental agenda, compared to over 60 lobbyists who were working overtime to see that we failed. We hammered away at the issues for two months. In January, we captured the legislators' attention for two months. In January, we captured the legislators' attention with E-Day, when more than 600 people from all over the state came to the Capitol for an environmental rally and to lobby their senators.

Later we had many articulate speakers at the groundwater public hearing. Throughout the session we helped focus attention on environmental issues in the newspapers and on television and radio. And, very importantly, throughout the session, citizens came from all over the state to let their own particular senators hear it straight from the "folks back home" just how important a clean, safe West Virginia is to them.

I had been told that the last two weeks of the session would be some of the most intense political maneuvering I would ever see or participate in. And it was a firestorm of wheeling and dealing. Those of us who had lobbied all session and had a

feel for the process were assisted by those many concerned environmentalists who joined us and lobbied day and night. Those who couldn't make the trip to the Capitol were called into action by phone trees, and the senators were barraged with calls and letters.

At the end of the session, we have for ALL our efforts—from Speaker Chuck Chambers to Senator Charlotte Pritt to Delegate David Grubb to the folks from Barbour County—a landfill bill, an air bill, a medical waste study group, a two-cent per ton increase in the Reclamation Fund, and a pesticide bill. What we don't have is a groundwater bill. But we had a part in defeating a weak groundwater bill. Next year we'll be back with a stronger bill, better organization and a recognition factor as a political force.

The Senate can no longer deny the existence of the environmental movement sweeping West Virginia. We are now players. We need to begin electing environmental candidates, and as Lois Gibbs so succinctly put it " . . . throw the dirtbags out." We must encourage our current environmentally sane legislators and work to re-elect them. And of course, we need to continue to build the grassroots environmental movement. The combination of all these vital elements will bring us a healthier, cleaner, less polluted West Virginia.

I feel privileged to have lobbied for the Environmental Council and hope to be working again in 1991. I am also thankful to Norm Steenstra, CAG environmental coordinator, who showed me the ropes and kept me laughing. Without his tireless organizing and lobbying efforts, our environmental agenda would not be so advanced.

Another Anniversary

PL91-190, the National Environmental Policy Act, better known as NEPA, became law on January 1, 1970. This twenty year anniversary coincides with the celebrated anniversary of Earth Day. Similar forces were at work in the genesis of Earth Day and NEPA.

Environmental Impact Statements (EIS) are to NEPA what teach-ins are to Earth Day. An idea as successful in delivering a message and raising consciousness as the teach-in often continues to evolve and be refined. The need responded to by the EIS has recognizable versions in private business and local governments.

The EIS mandated by NEPA is a requirement for federal agencies and projects. Any major federal activity that will significantly affect the quality of the environment must be evaluated by a five step guideline.

- (1) Establish environmental impact of the proposed action.

- (2) Identify any adverse environmental effects that are unavoidable if the proposal is implemented.

- (3) Provide alternatives to the proposed action.

- (4) Explain the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

- (5) Identify any irreversible and irretrievable commitments of resources that would be involved in the proposed action if it is implemented.

Conceptually, every EIS should be identical to every other EIS. Ideally, the unique circumstances of each distinct proposal should be reflected in that particular EIS.

The five guidelines suggest more than a statement of the obvious. Implicit in their direction is the ability of the evaluator to identify the appropriate level of life. Once having established the initial hierarchical point of entry, a logical reference point may be meaningfully established.

Methodical examinations around this logical initiator may be as simple as a physical site evaluation or as complex as material sampling. Requirements for a thorough evaluation are as diverse as the proposals. Effective examination will identify every component in the ecosystem being evaluated. Interactions of components within that ecosystem must also be determined. Once defined, this basic model of the ecosystem enables more accurate prediction of potential impacts.

Prediction is a risky undertaking given even the best data. Prediction for dynamic

Citizens and the Law

Earth Day celebrations for the Concerned Citizens of Alderson/GlenRay may have been bittersweet. This April marks the second year of their efforts to protect the ground water and the Greenbrier River. Whenever an essential resource is threatened there is cause for concern. When response by authorities is duplicitous and inadequate, there is an issue. The families of Glen Ray and an existing group known as the Friends of the Greenbrier River joined together when the issues became clear to them.

Initial warnings about the proposed wood treatment plant that would use carcinogenic and mutagenic chromated

copper arsenate (CCA) were in state-wide media reports when an employee of the WoodGuard Plant criticized faulty construction techniques. The plant construction as well as the site continued to be reported in local media and has had national attention too.

THE GREENBRIER RIVER

The Greenbrier River watershed covers about 1,656 square miles. The river has a history of significant floods documented as far back as 1812. Over half of the river corridor is subject to a 1% chance of flooding in any given year (100 year recurrence). Following the flood of record

in 1985—8-10 feet above predicted flood levels at the headwaters—the Army Corps of Engineers conducted extensive evaluations of the floodplain. (See *Voice*, March 1988.)

Studied as a potential component of the Wild and Scenic Rivers Act, an Environmental Impact Study was completed in 1987. More than half of the Greenbrier River Valley is privately owned. Projected development trends include continued use of the area as a complement to the tourist and river recreation enterprises. Wild and Scenic designation was not granted the Greenbrier, the

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ecosystem activity requires more variable examination than a weather report and with less historical data. Unexplored areas may require study just to determine accurate boundaries for a formal evaluation.

Changing pressures presented by outside forces, seasonal changes, internal dynamics, all contribute to the complex variability that every EIS should encompass.

Knowledge of the natural rhythms present in an ecosystem best facilitates recognition of acceptable alternatives. Unique circumstances present at one site may entertain a different potential range than identical factors at another site. Perception sensitive to the unique characteristics of an ecosystem can more accurately predict the effects of change.

Another important implication present in the five guidelines is absence of a evaluative judgment. While legal, sociological, economic and historical implications should be identified, judgment about these components or any natural component should not be part of the evaluation.

The general guidelines for an EIS are incredibly broad. The high standards mandated by NEPA for the EIS provides a realistic goal to anchor environmentally informed federal decisions.

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Bluestone River, the Gauley River and redrawn boundaries on the New River became designated Wild and Scenic in 1988.

Lacking an official designation for the river, the Friends of the Greenbrier and Concerned Citizens, persist in a colloquial image of the river as a regional treasure. On the map, Alderson appears to be about half way between Lewisburg and Hinton. At Hinton the Greenbrier joins the New River. The valley has recognized historic significance with twenty-nine sites on the register of Historic Places. Caving, although underdeveloped when compared to Kentucky, is also an area attraction. Within the counties of Pocahontas, Greenbrier and Monroe, there are approximately 1300 caves.

SPRINGS AND AQUIFERS

This section of West Virginia has long been recognized for its springs. In Greenbrier County, about 80 springs are identified. Along with location, data on the geologic and chemical constituents for most of the springs is available from the US Geological Survey. The White Sulphur Spring associated with the Greenbrier Hotel enjoys world-wide recognition. In Monroe County, about 50 springs have been documented by the US Geological Survey. Historically, springs have been associated with health, relaxation and curative powers. The threat of pollution and degradation represented by the wood treatment plant would be a tragic irony.

The counties are similar in geologic formation. Red shales and limestones from the Mauch-Chunk of Upper Mississippian age extend from Hinton to Alderson and the Greenbrier Group of Middle Mississippian age predominates in Greenbrier County.

Surface water run-off of the river averages 10-25 inches a year. Seasonal variations are extreme. The rate of ground water movement is rapid due to the

nature of shale, limestone and clay. Obtaining a completely accurate measurement of the rate of discharge of any of these aquifers takes several seasons. Every aquifer—a rock layer through which water is capable of circulating that will yield a useable amount to springs or wells—is unique in the amount of water present in any season.

CONCERNED CITIZENS

A background summary for the plant siting quickly confronts inadequate scientific data or lack of data. So did Concerned Citizens. Their first formal steps at determining the best course to prevent operation began at the County Commission. The Monroe County Commission is being asked to appeal the building permit issued after the plant's construction and in direct contradiction to the floodplain ordinances now in place.

Concerned Citizens' efforts did not succumb to the negative attitudes, insensitive layers of bureaucracy and callous lawlessness they encountered. Concerned Citizens frequently found the Small Business Administration (SBA), DNR, Federal Emergency Management Agency (FEMA) to lack a spirit of accountability but to possess a capacity for deceit.

The reasonableness of the plant's siting became overlooked in the funding process too. Concerned Citizens discovered violation after violation in the SBA processing of a loan for the plant. Stephen and Deborah Bailey are homeowners with a well near the site. They have been active in efforts to protect the area. After two long years of attempts to prevent the plant from operating, they express their resolve and experiences.

"Many of us naively assumed that agencies like the SBA, DNR, Corps of Engineers, County Commissions, and the Federal Emergency Management Agency had the citizen's best interests at heart. They might make a mistake now and then but usually they did a good job of looking out for us. We were fools. What we have learned as a result of our struggle to protect our drinking water and river, is that the employees of these agencies frequently operate above and beyond the law, Executive Orders, their own regulations, ordinances and other written and seemingly clear directives. Incompetence and deceit to cover up that incompetence is normal operating procedure, especially for the SBA . . . When we requested, through the Freedom of Information Act, information regarding the plant loan which was only procedural in nature our request was denied. It was only through the intervention of Representative Harley O. Staggers, Jr., and his threat to hold public hearings to obtain answers, did SBA provide his office limited, incorrect and very revealing information . . . Another clear example of our government acting in total disregard of the law is the conduct of the Monroe County Commission. The county's floodplain ordinance contains the following unconditioned requirement. 'No materials that are buoyant, flammable, explosive, or in times of flooding could be injurious to human, animal or plant life, shall be stored below Base Flood Elevation.' Besides the plant's CCA tanks located in a sunken pit, the plant site, which is itself below the 100 year flood elevation, contains a buried fuel

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MISTIX for MNF Campground Reservations

Reservations through a toll-free telephone reservation system, MISTIX, will be available for three campgrounds in the Monongahela National Forest.

All sites, 38 family, 3 group, 40 walk-in, at Seneca Shadows Campground near Seneca Rocks, three (3) sites at the Horseshoe Campground north of Parsons and 36 sites at the Meadow Creek Campground loop at Lake Sherwood north of White Sulphur Springs. Unreserved campsites are available on a first-come, first-serve basis.

Reservations for Lake Sherwood will be accepted May 15 through September 4, at Horseshoe from April 15 through October 9 and at Seneca Shadows from May 15 through September 15. Group sites can be reserved up to 360 days in advance. Single family sites can be reserved up to 120 days in advance. Call MISTIX, toll-free, at 1-800-283-CAMP.

Peatlands As Source Of Acid Rain

Evergreens and glaciers lend southeast Alaska a pristine appeal. That's why geographer Lee F. Klinger was puzzled when he measured extremely acidic rainwater in this region. While normal rainwater has a pH about 5.6, Klinger measured values as low as 3.6 during the summers and falls of 1986 and 1987.

Other researchers have discovered acidic rainwater in remote sites and traced the acids back to sulfur compounds emitted by oceanic organisms. Klinger, who works at the National Center for Atmospheric Research in Boulder, Colo., says the oceans may offer a partial explanation of the acids, but they don't tell the whole story. Analysis of the rainwater shows that, in addition to sulfuric acid, it contains certain organic acids that can only come from land sources, he reports.

Where, then, do those acids originate? Klinger suggests peatlands as an answer. Atmospheric patterns in the area indicate that the regions with the worst acid rain lie downwind from peatlands. Klinger tested the gases emitted by peatlands and found high levels of terpenes, isoprenes and other chemicals that could serve as sources of the organic acids.

Last year, Klinger reported that acid-loving mosses hasten the death of trees, in part by acidifying their immediate environment (SN: 4/30/88, p.285). The work in southeast Alaska suggests that peatlands—abundant in mosses—kill forests over a large area by creating acid rain. This process, he says, promotes the spread of mosses and develops more peatland.

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AIPM Spring

Spring activities in the Appalachian Integrated Pest Management (AIPM) demonstration project include treatment to reduce gypsy moth populations. Proposed spraying for the spring by the Forest Service is scheduled for several areas near Horseshoe Run and Silver Lake in Preston County, a small woodlot in Canaan Valley, several blocks between Jordan Run Road and Dolly Sods, an area near the Petersburg Fish Hatchery in Grant County, and on Cave Mountain in Pendleton County. The West Virginia Department of Agriculture will treat between 100,000 and 200,000 acres outside of MNF but within the AIPM project area.

The 38 county area includes public and private lands in West Virginia and Virginia. Two factors are notable and focus concern for the area: the high density of oak and a climate more favorable than the northeast. The range of the moth has been steadily expanding south and westward along the Appalachian mountains.

The AIPM program is administered by the Forest Service. Field surveys and monitoring are designed as a first step evaluation to determine location and size of gypsy moth populations. Evaluation of population data influences the alternative treatment methods. If eradication methods are determined to be beneficial in controlling population, one of three methods will be chosen.

Descriptions provided by the Elkins AIPM office list gypchek, dimilin and Bt. The following three descriptions are taken from the AIPM Elkins Office News Release of March 26, 1990.

1. "Gypchek is a naturally occurring virus which affects only gypsy moth caterpillars. It is applied aerially twice in the spring. The Gypchek is mixed with a molasses 'sticker' which allows it to stick to the surface of tree leaves, where the caterpillars eat it along with the leaves. Gypchek has no carryover effects in the foodchain, so is considered safe to use in sensitive areas, such as near caves containing endangered bat species. Availability of supplies of the virus permit only limited application of Gypchek this year."

2. "Dimilin is the trade name for diflubenzuron, a chemical which affects only those organisms which contain a substance called chitin. Gypsy moth caterpil-

lars contain chitin, as do other caterpillars, crustaceans and aquatic insects. Mammals, birds and reptiles are unaffected by dimilin, which is applied aerially with a sticker. It is eaten by the caterpillars and prevents them from growing normally to maturity. Care is taken during application to avoid streams and lakes to prevent accidental harm to aquatic insects and crustaceans.

3. "The third possible means of treatment being used this spring is the aerial application of *Bacillus Thuringiensis* (Bt). This is a naturally occurring bacteria that affects only caterpillars. It is also applied with a sticker."

On the spraying days, AIPM employees will be along roadsides in the area to be sprayed to explain activities. Helium balloons will be used to mark the boundaries of the spraying blocks for the plot and may be visible to visitors in the area.

For further information on the spraying planned within the MNF, call Karl Buermeyer at 304-636-3803 or write AIPM Office, P. O. Box 2208, Elkins, West Virginia 26241.

Monongahela Guide

Edition 5 of the WVHC **Monongahela National Forest Hiking Guide** is now available. This edition is bigger and better than ever, with 320 pages, 60 maps, 39 photographs, descriptions of 164 trails totalling 780 miles, a new section on skitouring, and a full-color cover. The authors are Allen de Hart and Bruce Sundquist. Allen has hiked all the trails of the Monongahela N.F. over the past few years. Bruce edited Editions 1-4. The hiking community and the U.S. Forest Service provided the authors with trail reports and photographs.

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 **Monongahela National Forest Hiking Guide**, send \$9.95 plus 6% sales tax for WV residents, plus \$1.25 postage (book rate) to West Virginia Highlands Conservancy, P. O. Box 306, Charleston, WV 25321.

Lime For Your Drink? Here's A New Twist

Janet Raloff reports from Hilton Head Island, S.C., at a National Acid Precipitation Assessment Program conference.

More than 60 years ago, managers of Norwegian salmon hatcheries conducted the first reported "liming," or chemical neutralization, of waters acidified by industrial air pollutants. This treatment, named for the limestone commonly used in the procedure today, typically involves applying mineral powders or pellets directly to affected lakes or streams. Though it yields an almost immediate and potentially revitalizing increase in pH, its benefits vanish as the water containing the buffering agent flushes out of the system and is replaced by untreated water. In lakes, the replacement typically occurs after a year or two, notes Harvey Olem, a Washington, D.C.-based consultant. And that's why researchers are beginning to focus their attention on watershed liming—an alternative buffering strategy that's expected to provide at least five to 10 years of benefits per treatment, says Olem, who conducted a peer-reviewed survey of liming science and technology for the federally funded National Acid Precipitation Assessment Program.

Rather than liming the acidified waters themselves, this treatment limes the land draining into them. According to Olem, watershed liming can yield a host of additional benefits unattainable with conventional liming. For instance, by parceling out its alkaline therapy more slowly and uniformly, watershed liming should prevent the potentially toxic over-buffering that has resulted from some poorly controlled direct-lake treatments, in which pH levels sometimes rose as high as 9, Olem says. Moreover, by neutralizing water before it enters lakes or streams, the new approach would prevent potentially large pulses of acidic snowmelt or rain drainage from entering a waterway and creating large, undiluted pockets of highly acidic water. Many sensitive aquatic species can die from chronic exposure to a pH of 6 or from acute exposures to more acidic levels. Aquatic biologist Patricia T. Bradt at Lehigh University in Bethlehem, Pa., notes that rain with a pH of 4.2 to 4.8 is fairly common in Pennsylvania.

Researchers in the United States and Europe are currently testing the alternative strategy. One experiment initiated last October used helicopters to shower 1,000 metric tons of limestone pellets onto the forested slopes above two streams feeding Woods Lake in New York's Adirondack mountains. "This is the first watershed liming in the United States, and the first anywhere to involve lots of careful measurements," says project manager Donald Porcella, of the Electric Power Research Institute in Palo Alto, Calif. During the next two years, researchers from five collaborating universities will assist the institute in monitoring water-acidity changes and other effects of the experimental liming on aquatic and terrestrial ecology.

The EPA's National Surface Water Survey has identified 2,500 lakes and 36,000 kilometers of streams as having pH levels of 6 or lower. Though this total may include some naturally acidic waters—existing in that state for perhaps millennia—a large fraction are believed to have suffered significant acidification due to industrial air pollutants.

Olem says researchers have estimated that half the U.S. surface waters acidified by air pollutants will eventually recover under the emissions-control strategies most likely to emerge from strengthened Clean Air Act regulations. "The other half will remain acidic," he observes. And for them, "liming may be an option—a tool—for restoring their fisheries."

Harald Sverdrup, a chemical engineer and liming expert from the Lund (Sweden) Institute of Technology, cautions that "liming doesn't solve all [ecosystem] problems—just a suite of the worst." Nonetheless, he says, it is the fastest remedy for surface-water acidification. And, short of stiff emissions controls, liming is also the "most effective" method known, concludes Olem in his survey report.

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Guidelines For Articles & Letters To The Editor

The **Voice** welcomes any well-researched article or editorial on areas of concern, for example, river conservation, public land management, mining, recycling. General articles on outdoor activities — canoeing, hiking, caving, climbing — or on unusual places or special outdoor events are also needed. All submissions are subject to editing. To assure accuracy in the printing of these articles, the following guidelines have been established:

1. Whenever possible, articles should be typed, double spaced on 8½ by 11 inch paper, with at least one-inch margins on each side. If the submission is not typed, the author should use lined paper and write legibly on every other line.

2. Each article should be accompanied by the author's name, address, and telephone number. (Addresses and telephone numbers will not be printed with the article, but are needed so that the editor may contact the author for additional information, if necessary.) If the article is more than one page, the author's last name should be placed under the page number on each page.

3. Photographs related to the article are greatly appreciated. Black and white photographs reproduce best, but color photos can be used. Photographs will be returned, if the author requests them.

4. The deadline for each issue of the **Voice** is the last Friday of each month.

The **Voice** also welcomes letters to the editor expressing views on any of the topics covered in previous issues or on other environmental concerns. Letters to the editor should follow the guidelines for articles.

Drink to Springs

Jack and Jill went up the hill to fetch a pail of water . . . Updating this nursery rhyme might require an environmental evaluation or water samples, depending on the audience. What has not changed is the essential role of water as a resource for everyone. No matter the source, source Pierrier, your kitchen faucet or an available bucket to gather rain water, water is essential to almost everything we do.

More than packaging and more than delivery methods distinguish waters. Properties and mineral contents determine water to be suitable for drinking or fit only for industrial or other purposes. Almost all water in nature participates in the hydrologic cycle. Driven by the sun, the hydrologic cycle describes changes in water circulation between the land, water bodies and the atmosphere.

Through scientific analysis, the origins of water may be identified. Ancient sea water remains trapped in rock formations (*connate water*). Water travelling to the surface from the Earth's interior (*juvenile water*) originates from magma. Ground water lies below the surface in depths from 10,000 feet to 50,000 feet, depending on the geologic environment. (6550 foot depth is considered to be the practical limit of accessibility.)

The minerals found in naturally occurring water include: silica, aluminum, iron, manganese, calcium, magnesium, barium, sodium, potassium, lithium, copper, zinc, boron, ammonia, nitrogen, bicarbonate, carbonate sulfate, phosphate. In various proportions and conditions nature's formulas produce the sweetest to the most foul tasting water.

Over time, geologic changes created features that hold water in one or another phase of the cycle. The properties of rock must be favorable to contain ground water. The topography of the land must be favorable to contain surface water. Springs are places where the ground water meets the land surface and flows naturally from rock or soil onto the surface. Man learned to artificially intercept ground water by digging wells. Artificial springs, or wells, are the drinking water source for many West Virginians.

Sadly, some springs in West Virginia are now cross-referenced on hazardous waste sites or known to be polluted. Publicized by the "I live on a dot" campaign at the E-Day rally this past January, identification is a very important first step in the political cycle. Current wisdom holds that the present point in the "political cycle" favors environmentally focused actions. That's something to drink to.

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tank and pump. The County Commission issued the building permit anyway.

Faced with such arrogance for the law by those we entrust to act by and enforce it we do occasionally question if the fight is worth the effort. Just how much pure well water and pristine river can we afford to defend? Fortunately, our community group is large enough and varied enough in emotional strength and motivation that we support each other. Some of us continue the struggle while others of us rest for awhile. Although we remain quite confident that we will prevail in defending our precious water and beautiful river, we are conscious of the sacrifices in time, effort and money that have been made and will continue to be required of us."

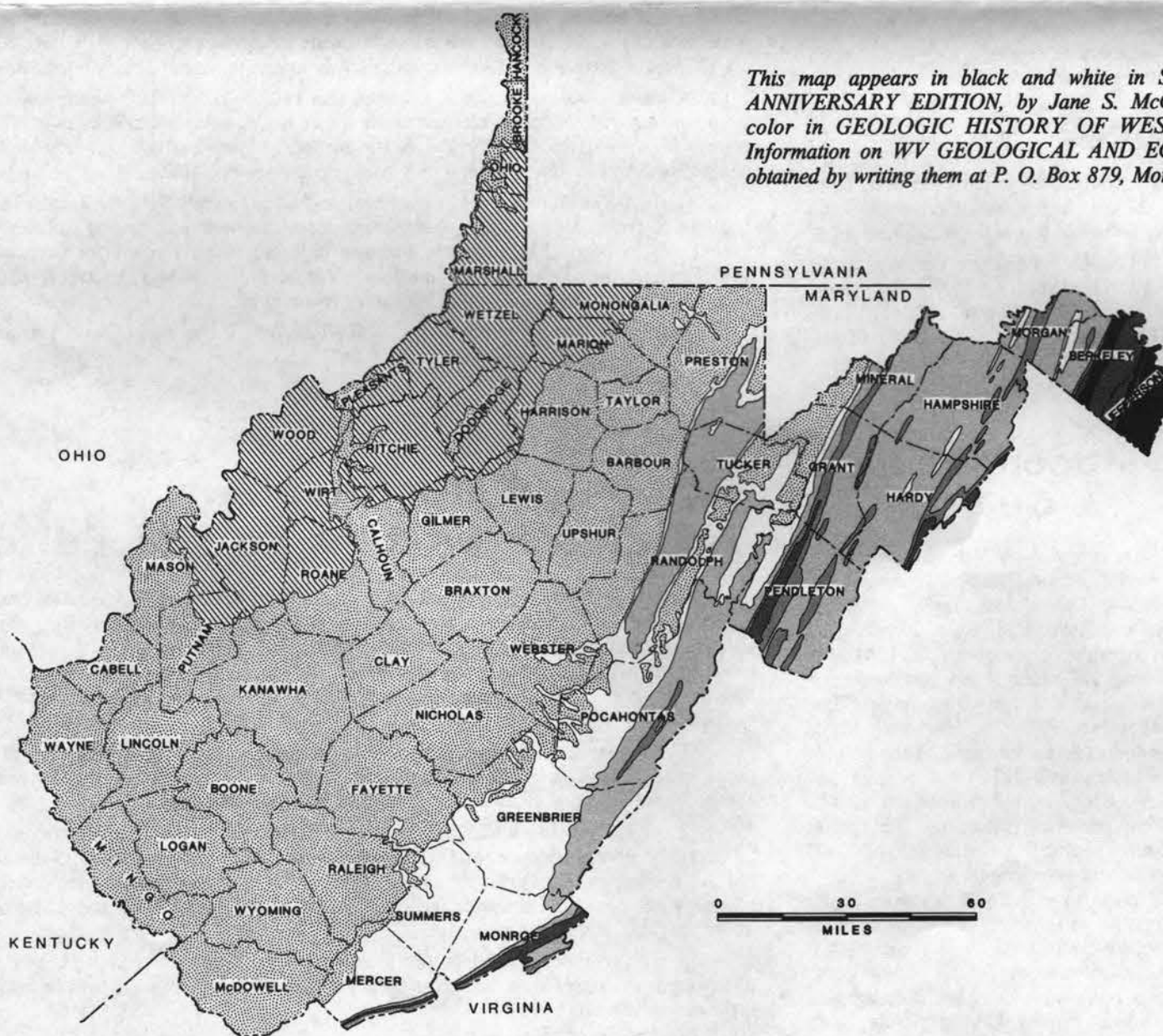
More recently, in an appeal to the DNR through the Water Resources Board, examination of a National Pollution Discharge Elimination System (NPDES) permit has met with frustration. The three hearings held to date on the basis of citizen protest is unprecedented. Delays over certified records extended the hearings. Mark Blumenstein, a Concerned Citizen, has also been with the group for its two year existence.

"It was interesting to see the lawyers in action at the Water Board Hearing. It was at least four to one. But we've got a great one. Bob Shostak, an environmentalist attorney, he is of the first order. He can bob and weave with the best of them. He stood his ground under fire. He was prepared. The schucking and jivin' of the Water Board's and DNR's attorneys didn't squash him. We know he'll be back for the title bout, after a few more minor skirmishes."

Delays, uncooperative bureaus, lack of scientific information, all contribute to the growing costs faced by Concerned Citizens.



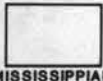
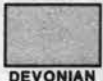
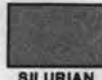
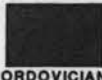
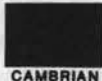

Science and the technological power often associated with its applications; and, law and the authority it represents are as precious to the Concerned Citizens as the water they drink. Through science and by law we know the composition of healthy drinking water. As responsible citizens supported by scientific and legal expertise, Concerned Citizens can determine the composition of a healthy river valley community.

For more information or to send donations write to Concerned Citizens of Alderson/GlenRay, HC 73 Box 11, Alderson, West Virginia 24910.



This map appears in black and white in *SPRINGS OF WEST VIRGINIA, 50TH ANNIVERSARY EDITION*, by Jane S. McColloch, Environmental Geologist; and, in color in *GEOLOGIC HISTORY OF WEST VIRGINIA*, by Dudley H. Cardwell. Information on *WV GEOLOGICAL AND ECONOMIC SURVEY* publications may be obtained by writing them at P. O. Box 879, Morgantown, WV 26507089.

LEGEND

-  **PERMIAN OR PENNSYLVANIAN**
(230+ mil. yrs. ago). Cyclic sequences of sandstone, red beds, shale, limestone, coal.
-  **PENNSYLVANIAN**
(280-310 mil. yrs. ago). Cyclic sequences of sandstone, shale, clay, coal, limestone.
-  **MISSISSIPPIAN**
(310-345 mil. yrs. ago). Limestone, red beds, shale, sandstone.
-  **DEVONIAN**
(345-405 mil. yrs. ago). Red beds, shale, sandstone, limestone, chert.
-  **SILURIAN**
(405-425 mil. yrs. ago). Sandstone, shale, limestone, rock salt, ferruginous beds.
-  **ORDOVICIAN**
(425-500 mil. yrs. ago). Limestone, dolomite, sandstone, shale, metabentonites.
-  **CAMBRIAN**
(600-600 mil. yrs. ago). Limestone, dolomite; some sandstone, shale.
-  **PRECAMBRIAN**
(More than 600 mil. yrs. ago). Greenstone.

Acid Rain Report Unleashes A Torrent of Criticism

By Philip Shabecoff

Washington—A comprehensive Federal report that was supposed to resolve the issue of how much damage is caused to forests by acid rain has come under criticism from some distinguished scientists who are reviewing it.

The critics said that the report gave an incorrect impression that air pollution was not causing any large-scale problems for forest ecosystems. They also said that the report, still in draft form, ignored a number of studies suggesting serious air pollution problems.

But other experts contend that the general conclusion of the report is essentially right. The report concluded that with the exception of damage to red spruce at high elevations in the East, forests in the United States are not suffering serious damage from acid rain. (continued on page 6)

City temperature highest in U.S.

NEW YORK (UPI)—The high temperature reported Wednesday by the National Weather Service, excluding Alaska and Hawaii, was 89 degrees at Charleston, W.Va. The low was 4 degrees below zero at Flagstaff, Ariz. [Gazette 3-15-90]

*the sky a silver
dissonance by the correct
fingers of April
resolved into a
clutter of trite jewels
now like a moth with stumbling
wings flutters and flaps along the
grass collides with trees and
houses and finally,
butts into the river*

from TULIPS & CHIMNEYS
E. E. CUMMINGS

Let the Sunshine In

"Let us think then of the atmosphere as the skin of the earth, the outer membrane of the biosphere. Let us think of the primeval earth when this thin film rose from the oceans, the exhalations of plants and animals, oxygen and carbon dioxide, which with water vapor, passed the life-giving light, but excluded the destroying rays. This bubble expands, rising from the sea to encompass the land and all the earth. This membrane is evolving, as truly as are the skins of creatures, elaborating to sustain more and more complex life. Now it covers us, our outer membrane, the breaths of ancient lives, protecting and sustaining us, warming, shading, washing with rain, reverberating with thunderstorms charging the earth, modulating the light through days and changing seasons, source of climate and of weather, making the distant stars twinkle—this atmosphere which permates us." DESIGN WITH NATURE, Ian L. McHarg

effectiveness of ecological management guidelines and the effectiveness of their application takes into account processes that form the foundation of a region. The ecological vision strives for an accounting of dynamic interdependencies as well as static analyses.

Several articles of faith underlie McHarg's explorations.

"... the economist's view of nature as a generally uniform commodity—appraised in terms of acres per unit of population. Nature, of course, is not uniform but varies as a function of historical geology, climate, physiography, soils, plants, animals and—consequently—intrinsic resources and land uses. Lakes, rivers, oceans and mountains are not where the economist might want them to be, but are where they are for clear and comprehensible reasons. Nature is intrinsically variable."

And again giving perspective to the limits of ecological planning:

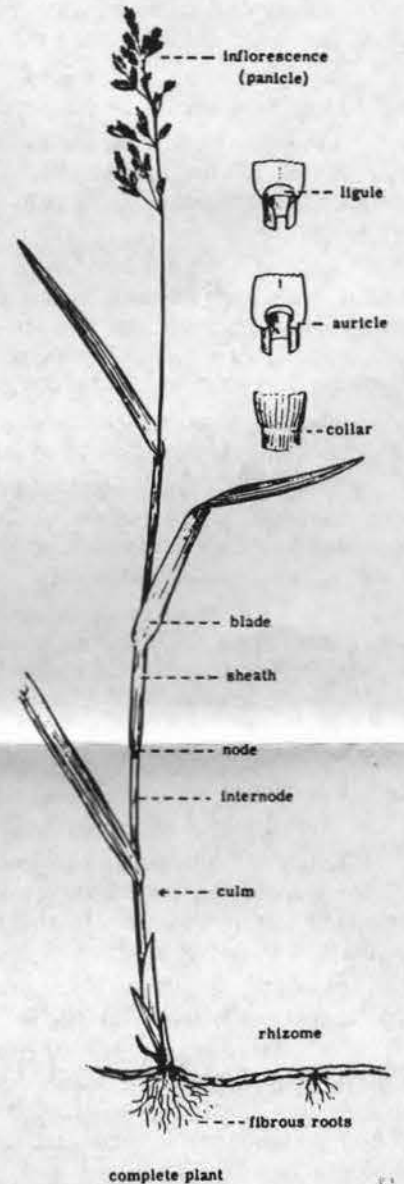
"We cannot follow the path of every drop of water, but we can select certain identifiable aspects—precipitation and runoff, surface water in streams and rivers, marshes and floodplains, groundwater resources in aquifers and the most critical phase of these—aquifer recharge. We can now formulate some simple propositions. Simple they are indeed—almost to the point of idiocy—but they are novel-

ties of high sophistication to the planning process and the bulk of local government agencies."

Today it is increasingly difficult to distinguish the natural process from a process affected by man's action. This additional complication should not be perceived as an alteration of man's role as steward or his role as perceiver of Nature's symbioses.

The ecologist believes in an achievable harmony. Most often it is the effects of man's actions on one resource presented for our consideration: water pollution, holes in the ozone, toxic dumps, smog, species extinction. Too infrequently does consideration of such travesties evolve into solutions. Ambitious suggestions to envision every day as Earth Day point towards solutions. The best solutions rely on plans developed from ecologically sound evaluations.

Recall basic components. Air, water, soil, producers, consumers, solar radiation, noise and groundwater may be considered as a complete list. Familiar measures characterize our experience of these components: temperature, size, texture, acidity. The stuff of this experience and our characterizations of it equips every individual similarly. Fashioning experience into an ecological vision can make even the most uneventful sun rise and sun set an exquisite variation on a theme that is around us.



DESIGN WITH NATURE, by Ian L. McHarg, was written in 1967 under a grant from the Conservation Foundation. Some colleges use it today as a textbook for landscape architecture and urban planning courses. McHarg is one of many names mentioned in Earth Day history litanties. His insights continue to provide substantive evaluations of man's role as earth's caretaker.

One section of the book showcases a 1965 study done by University of Pennsylvania students. The summary study of the Potomac River Basin generated over 500 maps. The physiographic provinces of the Blue Ridge, Valley and Ridge, Allegheny Front (Plateau), Piedmont and Coastal Plain were identified by historic geologic features and periods. Eight natural features (surface waters, floodplains, marshes, aquifer recharge areas, aquifers, steepness of slopes, forests and woodlands, unforested land) were evaluated to determine a relative priority of value for each area.

As the first ecological planning study in the United States, it has become a paradigm for ecological evaluations. Conducted at a scale of 1:250,000, general characteristics were emphasized to establish a general overview. The study focused on representing each area by its unique composition and inherent merits.

Representation showing all of an area's merits requires a realistic vision and an objective translation. No single use will be perceived as dominant if an ecologically balanced plan is applied in a context of guidelines developed for optimum land use. Advocating balance does not exclude the development of any single resource. The eloquence and reasonableness of ecological management guidelines and the

Components	Attributes
AIR	temperature relative humidity potential evaporation trace metal content
WATER	temperature dissolved oxygen pH conductivity
SOIL	temperature water content moisture content depth texture
PRODUCERS (plant)	biomass density diversity relative abundance
CONSUMERS (animal)	population age structure relative abundance biomass density food habits
SOLAR RADIATION	intensity
NOISE	level
GROUNDWATER	depth sodium content sulfate content acidity mineral content

Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and the carnage is forgotten. Streets abandoned by traffic become grass grown like rural lanes, and are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal . . . Unobtrusive and patient, it has immortal vigor and aggression. Banished from the thoroughfares and the field, it bides its time to return, and when vigilance is relaxed, or the dynasty has perished, silently resumes the throne from which it never abdicates. It bears no blazonry or bloom to charm the senses with the fragrance of splendor, but its homely hue is more enchanting than the Lily or the Rose. It yields no fruit in earth or air, and yet should its harvest fail for a single year, famine would depopulate the earth.

From the LaFayette Home Nursery, Inc. catalog.

(continued from page 5)

The document on forest damage is one part of the final draft of a Federal assessment of current scientific knowledge about the effects of acid rain on lakes and streams, forests, health, atmospheric visibility and materials. After it is reviewed, the assessment will be the basis of a separate report, to be issued in September, on strategies for dealing with acid rain.

Dr. James R. Mahoney, director of the National Acid Precipitation Assessment Program, or Napap, which coordinated the Federal research effort, said that he agreed with some of the reviewer comments about the forest problem and that the final report would probably be changed to reflect them. He said that there had been comments in "both directions," with some reviewers saying, "We don't have evidence of damage and we shouldn't try to find something that isn't there." Napap was created 10 years ago by Congress.

Diane Smiraldo, a spokeswoman for the Edison Electric Institute, which represents the private electric utility industry, said the Napap report "lends credence to our argument that the industry should be given flexibility in dealing with acid rain." She said the study "shows that rain is causing damage but must less than anticipated."

Several senators have referred to the draft report in questioning whether the high cost of an acid-rain control program was proportionate to the seriousness of the problem.

The report now being reviewed is the final draft, completed at a cost of nearly \$500 million. It examines the effects of other pollutants, like ozone, as well as acid deposits, and it concludes that air pollution causes far less environmental damage than has been feared.

An interim report issued by the study group in 1987, before Dr. Mahoney became director, was sharply criticized by many scientists. They contended that it tailored research findings into conclusions that matched the political goals of the Reagan Administration, which opposed new controls on air pollution. No such criticism has been leveled at the 28-volume final draft, which has been generally praised as a sound scientific document.

There is, however, some unhappiness among scientists with the volume dealing with forest health and productivity in the United States and Canada.

Dr. Cowling, highly regarded by colleagues as a conservative, solid scientist, wrote a memorandum to the authors of the forest health volume. He offered a series of suggestions for changing the wording of conclusions in ways that he said would reflect the state of science more accurately.

The first of those would change a finding that stated, "The vast majority of forests in the United States and Canada are not affected by decline." To be more consistent with the data, Dr. Cowling said, the conclusion should read: "Most forests in the United States do not show unusual visible symptoms of stress, marked decreases in the rate of growth or significant increases in mortality."

Dr. Hertel and Dr. Jay S. Jacobson, a plant physiologist with the Boyce Thompson Institute at Cornell University, both said the report did not deal adequately with the issue of how acid deposition might be affecting nutrients in the soil.

Sulfur and nitrogen carried in acidified water or dry particles are building up to high levels in the soil, Dr. Jacobson said. He added that other nutrients required by trees, particularly phosphorus, calcium and magnesium, appear to be replaced in the soil or leached from foliage by acid rain.

While the seriousness of this problem is still uncertain, Dr. Jacobson said, it could create nutrient imbalances that over the long run could lead to serious forest declines.

Dr. Mahoney said that all comments received after the Hilton Head meetings would be considered by the authors of the various volumes of the report and that the reports would be changed or modified where appropriate. The revised report would then be peer reviewed by scientists and by Government agencies before it is released in September, he explained.

NYT, March 20, 1990

Monongalia Residents Sue Over Acid Mine Drainage

By Paul Nyden, Investigative Reporter

Angry at watching their creeks run orange, 20 Monongalia County residents Tuesday sued Omega Mining Co. and the Division of Energy. They charged that toxic pollution coming from an underground mine is killing all life in Booths Creek and Owls Creek, a few miles south of Morgantown.

"From the smallest microorganisms . . . to the insects, fish and birds that are part of a healthy stream life population—all are killed by toxic acid mine drainage of the type spewing from the Omega mine," the suit stated.

Morgantown lawyer Tom Rodd wants Omega Mining to post a \$1 million bond to guarantee treatment of acid waters he believes will be released for at least 100 years. Rodd also asked for \$10 million in punitive damages.

Joan Sims, president of the 4-H Road Community Association, and other residents protested the Omega mining permit before the Department of Natural Resources approved it in 1983.

At the time, Omega Mining Co. officials promised there would be no long-term pollution problems. Syd Peng, chairman of West Virginia University's mining engineering department, testified the predictions made by Sims and others were wrong.

"Those comforting assurances have proved to be bogus, hollow promises," according to the suit filed Tuesday.

Sims and her neighbors also named Energy Commissioner George E. Dials and the WVU Foundation as defendants. The suit charged Dials "is not performing his mandatory duty to take all necessary steps to ensure that no further toxic mine drainage is created."

In August 1989, the federal Office of Surface Mining issued a cessation order against Omega Mining. Federal inspectors thought DOE officials were not acting quickly enough to stop the release of mine acid, which was turning creek waters a bright orange and threatening Morgantown's water supply.

The suit also stated, "in the past, [DOE] entered into agreements, which have improperly allowed mining companies to escape the full cost of long-term treatment, much to the [public] detriment."

Former Energy Commissioner Kenneth R. Faerber signed one such agreement with DLM Coal Corp. in August 1985. It forgave DLM all future liabilities in exchange for \$850,000. The state now pays \$250,000 a year to treat acid drainage for the old DLM mine.

The West Virginia University Foundation is named because it has leased coal to Omega and other mines since 1986, when Consolidation Coal donated coal lands to the foundation. Most of the royalties from the coal go to the College of Mineral and Engineering Resources, the suit stated.

Rodd believes the Omega suit is the first of its kind. "We are not only seeking damages for past pollution. We want companies to set aside enough money for future treatment when they mine acid seams of coal."

"Clearly, the DOE has not been requiring coal operators to provide enough money to treat their pollution," Rodd said. "We are trying to save the taxpayers the millions of dollars it will cost to treat this problem."

Omega's owners, Mark Boyle and William Boyle, own other coal companies, including Ambrec Corp. and Viking Coal Co.

"It is all too easy for these companies to take bankruptcy, go to Florida and leave the taxpayers with the bill," Rodd said.

The Charleston Gazette, Friday, March 30, 1990

Reasons To Join WVHC

The West Virginia Highlands Conservancy is a private, non-profit environmental organization started in 1967. Its objectives are "to promote, encourage, and work for the conservation—including both preservation and wise use—and appreciation of the scenic, historic, open space, wilderness, and outdoor recreation resources of and related to West Virginia, and especially the Highlands Region . . ."

Members include people and organizations diverse in their personal interests and professions but united by a common interest. Most WVHC members are West Virginians but many live outside the state.

The Highlands Voice, a monthly 8-page

newspaper, is sent to all Conservancy members. It is filled with environmental news on topics of interest and concern to members as well as articles about trips and outings.

The Conservancy sponsors two special weekends each year. These are usually at some scenic spot in the highlands and feature speakers, outings and board meetings.

Your contribution to WVHC is tax deductible and joining is as simple as filling out this form and returning it to the office in Charleston.

Join today and become part of an active organization dedicated to preserving West Virginia's natural resources.

WVHC Membership Categories (Circle One)			
Category	Individual	Family	Organization
	\$	\$	\$
Senior/Student	12	—	—
Regular	15	25	50
Associate	30	50	100
Sustaining	50	100	200
Patron	100	200	400
Mountaineer	200	300	600

Name _____ Phone: _____

Address: _____

City/State/Zip _____

Make checks payable to: West Virginia Highlands Conservancy
Mail to: P. O. Box 306, Charleston, WV 25321

Membership Benefits

- 1-year subscription to **The Highlands Voice**
- Special meetings with workshops and speakers
- Representation through WVHC's efforts to monitor legislative activity.

The West Virginia Highlands Conservancy is a non-profit organization. Your contribution is tax-deductible. Please keep this for your records.

Date _____

Amount _____

Check number _____

May 10-13, 1990 29th Annual West Virginia Wildflower Pilgrimage

WV Wildflower Pilgrimage, May 10-13, 1990 will be held at Blackwater Falls State Park, Davis, West Virginia. Sponsored by the West Virginia Garden Club, Inc. and DNR with assistance from the Parks and Recreation Division of the WV Department of Commerce. Attendance at Blackwater Falls State Park averages 300 professional and amateur botanists, bird watchers and nature lovers.

Tours are scheduled for Friday, May 11 and Saturday, May 12. Specialists from WVU, DNR, Department of Commerce, Garden Club and other colleges will be available to answer questions and identify particular plants. Speakers, programs, exhibits and entertainment will be featured throughout the evenings.

Write to

Catherine Knapp, Wildflower Pilgrimage Coordinator
1203 20th Street
Parkersburg, West Virginia 26101 (304) 428-0607

or

Maxine Scarbro, Wildflower Pilgrimage Arrangements Coordinator
West Virginia Department of Natural Resources
Charleston, West Virginia 25305 (304) 348-3370

May 12, 1990 and June 2, 1990 SOS

by Karen Firehock, Save Our Streams Coordinator

The Izaak Walton League of America is a national nonprofit conservation organization with more than 1,000 members in West Virginia. In cooperation with the Department of Natural Resources, the Save Our Streams (SOS) program began in West Virginia in the fall of 1989. It is designed to teach interested citizens, public officials, educators, children and conservationists how to monitor and protect a favorite river from pollution. West Virginia's 28,000 miles of rivers is now monitored by 29 permanent stations maintained by the DNR. That's about one water quality monitoring station for every 1,000 miles of rivers.

Save Our Streams, originally founded in 1969, now coordinates hundreds of active river protection projects around the country. Participants complete regular stream surveys which include monitoring aquatic life and stream conditions. Free day-long workshops held around West Virginia teach citizens how to recognize pollution problems, monitor water quality and solve problems they discover.

Data generated by stream monitors will be used by the DNR to assist the state in gauging water quality, especially in areas where runoff pollution from the land is a problem. The data also will be sent to the Izaak Walton League for use when generating reports for the DNR and other interested state agencies.

Workshops are scheduled for Saturday, May 12, 1990, at Woodlawn Elementary, Charleston, WV and Saturday, June 2, 1990, at the State 4-H Conference Center, Weston, WV.

Anyone interested in attending or learning more about the program should contact Karen Firehock at the League's national office (703) 528-1818, or Paul Brant of the League's West Virginia Division (304) 574-3036. This program is made possible by a grant from the Virginia Environmental Endowment.

May 25-27, 1990 5th Annual National Forest Reform Conference

by Mary Kelly and CJ Wilson, PowWow Coordinators

The Western North Carolina Alliance, a grassroots activist organization and participant in the Forest Reform Network (FRN), will host a working conference at Camp Green Cove, North Carolina May 25-27, 1990. This is the first time the Pow Wow has been held in the eastern United States.

Randal O'Toole, author of "Reforming the Forest Service," will be a speaker. Ned Fritz founder of FRN and author of "Clearcutting: A Crime Against Nature" will also speak.

Panel discussions will focus on biological diversity in National Forests, current reform proposals, forest management practices, the "new" or ecological forestry movement and spiritual ecology. Outings before and after the event include hikes, traditional music and dancing, story telling, slide shows and evening campfires.

The theme of the conference is "National Forest Reform - - - The Time Is Now." For more information on how to attend or co-sponsor the event, contact WNC Alliance, P. O. Box 18087, Asheville, North Carolina or call (704) 258-8737.

April—May—June—July Monongahela National Forest Trial Project

The Mon Trail Project began in response to damage caused during the flood of 1985. That first year, 90 people put in over 1,800 hours as volunteers working on 85 miles of trail. Special recognition by the Chief of the U.S. Forest Service recognized the special effort of the Sierra Chapter. The project has continued to help meet trail maintenance needs in MNF.

No prior experience is required. "We all share a strong love of the Forest environment, and we enjoy the exercise and the fun, as well as the service aspects of the activity," says Mary Wimmer of Morgantown who first organized the project with former Bluefield resident Paul Turner.

Five outings are planned from April through July for this year. Under the cooperative agreement the Forest Service provides tools, hard hats, technical advice, and identification of individual projects. The Sierra Club organizes the work schedule and volunteer work crews and provides trained leaders for each outing. Outings usually last all day Saturday and half day Sunday; volunteers usually stay in a comfortable cabin on Saturday night.

Work crews will be put together using sign-up sheets that are mailed to interested persons in the early spring and which describe the year's projects. "The ideal crew size varies with the type of work," says volunteer Linda Scandale, who is organizing the 1990 crews. "We like to have at least six (6) workers per outing to accomplish as much as possible through the team effort that people enjoy," she said.

To become a 1990 Mon Trail Project volunteer contact the WV Sierra Club, P. O. Box 4142, Morgantown, West Virginia 26504. If you have any questions, call Linda Scandale at 291-3273 or Greg Good at 296-6850.

Plants Under Pressure: The Touch That Stunts

Plants feel—a fact recognized in the 1970s when scientists showed that many forms of touch affect plant growth. Now, researchers have isolated specific plant genes that "turn on" in response to pressure cues such as wind, rain and human touch.

Plants respond to changes in the environment, but unlike people, they can't run for shelter. Instead, they must adapt by changing their own development. For example, coastal trees buffeted by powerful winds and heavy rains assume a bentover posture as they grow, which leaves them shorter and sturdier than more protected inland trees. In the laboratory, touching a plant's leaves can elicit the same growth changes as wind and rain.

In indoor experiments measuring the effects of environmental stimuli on the growth of *Arabidopsis*, a member of the mustard family, researchers at Stanford University found that pressure stimuli activated five genes. Moreover, plants touched twice daily by the researchers did not grow as tall as untouched plants, says Ronald Davis, who reports the work with Janet Braam in the Feb. 9 *Cell*.

Plants seem to sense touch and translate that information into increased gene expression, which ultimately alters their development, Davis says.

The researchers detected gene expression by measuring the amounts of messenger RNA (mRNA) in plant cells. Thirty minutes after spraying plants with water, they found that mRNA levels had increased 10 to 100 percent over those in unsprayed plants.

But the gene activation did not stem from any special property of water, the team found. The same genes switched on just as readily when the researchers touched leaves, cut them with a scissors or simulated blowing wind with a hair dryer. Plants receiving no direct stimulation showed no increase in mRNA, Davis says. Nor did genes turn on in plants exposed only to music, increased humidity or a change of location.

To determine whether three weeks of human touch would affect growth patterns, the researchers measured the lengths of the stems and stalks of untouched plants and compared them with plants touched twice daily. They calibrated their measurements from photographs of the plants to avoid inadvertently turning on the touch-activated genes. They found that the stalks of untouched plants reached an average length of 41 centimeters, compared with 18 cm in touched plants.

Although scientists have yet to demonstrate a mechanism by which touch alters plant growth, the Stanford group suggests one, based on its discovery that three of the touch activated genes code for calmodulin or related proteins. Scientists know that calmodulin, a receptor within cells, responds to environmental signals by binding calcium—a key cellular communicator. When a plant responds to direct stimulation, calcium levels increase inside cells. And when enzymes act on calcium-saturated calmodulin receptors, a cascade of cellular events ensues. One such event might be the activation and regulation of the touch-activated genes, the Stanford researchers propose. In effect, calmodulin may turn on the very genes that encode it, Davis hypothesizes.

Calmodulin receptors also exist in human brains, where they are important in responding to sensory stimuli. Davis speculates that plants and people may detect environmental changes through similar sensory pathways. "It may be a very ancient conserved mechanism that evolved before animals and plants diverged during evolution," he suggests.

He also speculates that calmodulin plays a role in rearranging plant-cell structure. The rearrangement may be required for expanding cell diameter and inhibiting cell elongation, resulting in shorter plants, Davis says.—C. Decker

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Camp Rimrock on Beautiful Cacapon River, Hampshire County


This Spring's WVHC Review and board meeting will be held at Camp Rimrock, near High View on the Cacapon River, May 11, 12 and 13. This is one weekend later than originally planned, due to some of our members' involvement in the May 8 West Virginia primary elections—both as candidates for public office and as campaigners for those who are friends of the environment.

Camp Rimrock is located on the banks of Cacapon River, between Capon Bridge and Yellow Springs, Hampshire County, on Route 14. Camp Rimrock is a girl's summer camp site owned by Jim Matheson, Chairman of the Cacapon River Committee, a citizens' action group dedicated to preservation of the Cacapon River Valley.

Facilities at Camp Rimrock include four to eight double bunk beds per lighted but otherwise rustic and unheated cabin. The cost of \$30.00 per person for the weekend includes two nights of lodging and three meals—breakfast and supper on Saturday, and breakfast on Sunday. The cooking comes highly recommended. Bring your own linens for single width bunk beds, or a sleeping bag. Separate hot showers are available for men and women a very short distance from the cabins.

For those who feel the rustic cabin setting is not to their fancy, Lost River State Park, about thirty minutes away, has fully equipped cabins available. You may make your own reservations at Lost River by calling 1-800-CALL WVA (1-800-225-5982). Tell them that you are with WVHC and get a ten percent discount.

For Kids:



NATURE SKOOL

A comprehensive program of hands-on nature/wildlife education and fun for children, ages 3-10.

Saturday - MAY 12
9 a.m. - 5 p.m.

\$20

To register, call:
296-0565
by May 3
Enrollment limited

DON'T MISS IT!

- mini-hikes
- field collecting
- hand lens explorations
- scavenger hunt
- natural food snacks

WVHC Spring Review May 11-12-13, 1990

Name: _____ Number Attending: _____

Address: _____ Registration Fee: \$3.00/person

City: _____ X \$3.00 _____ X \$30.00*

State: _____ Zip: _____ Total: _____

() Check here for canoe rental (price determined by size of group)
Call 346-5891 during working hours for additional information.
*Children under 12 half price. Meals only: adults \$15, children \$7.50.

Make checks payable to
WVHC Spring Review

With the state park cabins, meals are on your own. But we highly recommend the Camp Rimrock facilities for both economy and the scenic splendor.

Friday evening will be set aside for a social gathering at the covered and screened pavilion. The exact time is indefinite due to varied driving distances for our members. We are trying to get together some informal musical entertainment for Friday evening—perhaps bluegrass and/or folk/environmental performers.

Saturday activities will include a five-hour canoe trip on the Cacapon River, one of the few significant rivers in West Virginia unspoiled by industrial pollution, a trip to the proposed Lost River dam site, and possibly other as yet undecided activities. In addition, the West Virginia Environmental Council will also be meeting at Camp Rimrock this weekend. There will be ample opportunity for updates on other environmental issues.

If you plan to attend, please send a check in the amount of \$30.00 for each person for the weekend's lodging and meals to WVHC, P. O. Box 30b, Charleston, WV 25321. Make checks payable to: WVHC Spring Review.

Lab Founder To Lead WVHC Canoe Expedition

Dr. George Constantz, Founder and Director of Pine Cabin Run Ecological Laboratory, will be giving an illustrated talk and slide presentation dealing with the ecology of the Cacapon River. Following the presentation he will lead a canoe expedition. The trip will last about five (5) hours, depending on the water level. Dr. Constantz holds a Ph.D. in ecology from Arizona State University. In addition to his activities in numerous ecological issues he is a member of the Board of Trustees of the WV Nature Conservancy.

Spring Review Agenda

Friday, May 11, 1990

- 6:00 to 11:00 p.m.—Registration
- Music Making (tentative)
- Social Hours:
- Official Cursing of Coal Companies
- Tirades Against Trash Tycoons, etc.

Saturday, May 12, 1990

- 7:00 a.m.—Birdwalk
- 8:00 a.m.—Breakfast
- 9:00 a.m.—Lecture/Slides
- 10:00 a.m.—Outings:
- Canoe Trip
- Tour of proposed Lost River Dam Site
- 5:00 p.m.—Supper
- 6:00 p.m.—Speaker:
- Mario Palumbo
- 7:30 p.m.—Speaker:
- Sally Shepherd
- 9:00 p.m.—Social Hour

Sunday, May 13, 1990

- 7:00 a.m.—Birdwalk
- 8:00 a.m.—Breakfast
- 8:30 a.m.—WVHC
- Board Meeting
- 11:30 a.m.—Lunch
- 12:00 noon—WV Environmental Council Meeting



Dr. George Constantz showing his daughter, Leah, the eggs in a red-eyed vireo nest.