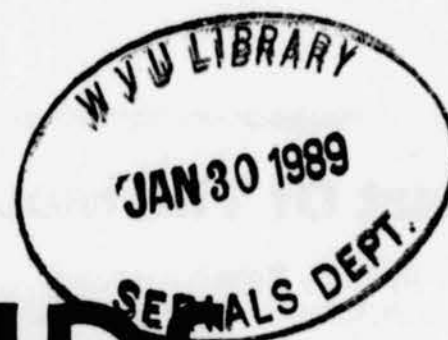




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Clean Coal King

WVU survey concludes West Virginians are willing to pay increased electric bills to combat acid rain. Funded by WVU Energy and Water Research Center, a telephone survey of West Virginia and New Jersey residents included questions to determine how knowledgeable the participants were about acid rain.

The Center for Clean Air Policy, a Washington based think tank, noted the survey results and made available its economic study of the problem at a press conference in Charleston, December 14, 1988.

"Acid rain damage to critical state rivers, including the Cranberry, Williams and other trout waters can finally be addressed," said John Purbaugh, Past President of WVHC. "Our focus on this issue is to look for a strategy which reduces SO₂ while avoiding massive fuel switching and the forced relocation of high sulfur coal miners." Purbaugh spoke for Conservancy President Cindy Rank who did not attend the conference.

"This plan is exciting because it indicates that controlling acid rain-causing SO₂ doesn't require that we rob Peter to pay Paul, sacrificing existing high sulfur jobs for new low sulfur jobs," Purbaugh concluded. The Center examined various options for controlling acid rain, concluding that a 'combined' approach using clean coal technology, selective use of scrubbers and limited fuel switching could deliver meaningful reductions within a theorized 5% electric bill increase without the coal miner job losses likely under other scenarios.

Other recent studies have claimed that WV coal miner jobs will dramatically increase under acid rain control laws which emphasize fuel switching, but northern WV high sulfur miners would be forced to relocate to southern WV to take advantage of predicted new jobs.

(continued on page 7)

Legislation Strategy

by Ronald A. Shipley

Making plans for the upcoming 1989 Legislative Session is difficult. In contrast to last year's session, the issues for the upcoming year are not predictable. Last year, the administration had an agenda and the out-of-state garbage issue was hot. This year the Department of Natural Resources is talking about what is needed, but the Director appears to be a lame duck and the new administration has not announced either the new director or its plans for the upcoming session. Out of state garbage is still a hot topic but last year's legislation appears to have controlled, if not eliminated, the problem.

Amid a pledge to reduce the cost of State government and consolidate various agen-

(continued on page 8)

Proposed SMCRA Revocation

by Skip Deegans

Between Christmas and New Years Eve when few Congressmen, members of the press, and environmentalists were in Washington, J. Steven Griles, Assistant Secretary for Lands and Minerals Management of the Department of the Interior, slipped out the door a proposed rule to the Surface Mining Control and Reclamation Act of 1977 (SMCRA). If adopted, this rule will allow coal mining activities in backyards, school playgrounds, family cemeteries, and our public parks and protected areas. Congressman Nick J. Rahall called this action "outrageous" and a "direct assault on the concept of good stewardship of our public resources."

When SMCRA was passed in 1977, Congress determined to protect valued areas of our country with the passage of Section 522 (e) of the Act. These protected areas include:

- * any lands within 300 feet of a home, school, church, community or institutional building;
- * any lands within the boundaries of units of National Parks, National Wildlife Refuges, National Trails, National Wilderness Areas, Wild and Scenic Rivers;
- * any lands within 300 feet of a public park;
- * any lands within 100 feet of a cemetery;
- * any lands within the boundaries of any National Forest, subject to limited exception;
- * any lands where mining will adversely affect any publicly owned park, such as buffer zones around national parks, state, local and municipal parks.
- * any places included in the National Register of Historic Places.

The Section 522 (e) prohibition is made "subject to valid existing rights." The initial definition of valid existing rights was that the owners of the coal had to have obtained all necessary mining permits on or before August 3, 1977, or could demonstrate that the coal for which the exemption was sought was both needed for, and immediately adjacent to, a mining operation in existence prior to August 3, 1977.

Following challenges by the coal industry in 1980, valid existing rights were redefined as a "good faith" attempt to have obtained all permits before August 3, 1977. Despite this redefinition, little of the land protected by Congress was jeopardized.

The new rule proposed on December 29, 1988, is one of a whole series of efforts by the Reagan administration to reform OSM regulations in favor of the coal industry. This new rule defines valid existing rights as simply the right to mine the coal. To mine in protected areas, a coal company would need only a deed, lease, contract or "other document" establishing a right to mine the coal. Using this definition, according to OSM, every operator would be able to demonstrate VER for mining.

Adoption of this new definition of VER opens mining rights to 4 million acres of federally protected land, 1 million acres of state and local parks and historic sites, and 45 million acres of land within 300 feet of homes, churches, schools, cemeteries, and public roads.

Federal lands underlain by coal in West Virginia include 61,620 acres in New River Gorge, 270,000 acres in the Monongahela National Forest, and 3,590 acres of the C & O Canal. Coal also underlies 55,900 acres of state and local parks and recreation areas and historic sites, and 2,247,000 acres of protected land near homes, churches, schools, cemeteries, and public roads.

The Department of the Interior argues that it really isn't eliminating protections of protected federal areas because it will condemn and purchase the coal where mining might occur. The Reagan administration had no interest in acquiring and protecting additional land, and no new effort to appropriate funds for these purposes seems evident.

The decision to provide protected areas near and beneath homes, churches, schools, cemeteries, historic sites, and state and local parks and recreation areas would be shifted to the states. If West Virginia regulatory agencies made efforts to protect these areas from mining, they would face legal challenges to compensate owners of the coal. West Virginia does not have the financial resources to pay for this protection.

The Department of the Interior also argues that it will protect nationally significant areas by interstate trading of coal under the Federal Land Policy and Management Act of 1976. Currently, however, interstate exchanges are prohibited. Moreover, the effort to "explore" land to determine the value of the coal for trading purposes can result in impressive environmental damage.

OSM has admitted that it withheld releasing the proposed rule until after the presidential election. Introducing it now saddles the Bush administration with what is appearing to become its first dance with environmentalists. It will undoubtedly be an issue at the confirmation hearing of Interior Secretary designee, Manuel Lujan.

(continued on page 2)

Bottled Error Distorts N₂O Estimates

In the dentist's office it goes by the name of "laughing gas," yet nitrous oxide (N₂O) is no laughing matter in the atmosphere, where it serves as a "greenhouse" gas and leads to the destruction of stratospheric ozone. As levels of this gas rise by some 0.2 to 0.3 percent annually, scientists are trying to determine how much each major source of it contributes to the atmospheric burden. Recent work has suggested that power plants — particularly those that burn coal — contribute as much as a third of the nitrous oxide in air. However, two chemists now report finding evidence that these studies vastly over-estimate the nitrous oxide coming from combustion of fossil fuels.

According to Lawrence Muzio of the Fossil Energy Research Corp. in Laguna Hills, Calif., and John Kramlich of the Energy and Environmental Research Corp. in Irvine, Calif., a measuring artifact may be creeping into most analyses of furnace exhaust. Because of this, a researcher analyzing exhaust could measure high levels of nitrous oxide even if the gas leaving the furnace contained little or none of it, they report in the November GEOPHYSICAL RESEARCH LETTERS.

"This looks like a major embarrassment in the sense that the research community thought the N₂O budget was balanced," says Ralph Cicerone, an atmospheric chemist at the National Center for Atmospheric Research in Boulder, Colo.

To analyze the nitrous oxide content of furnace exhaust, researchers have traditionally collected gas inside the furnace, stored the exhaust in a flask, then carried the flask back to the lab for testing. Muzio and Kramlich discovered, though, that while a gas sample sits in the flask, chemical reactions can create nitrous oxide from other components in the exhaust.

While sampling gas from a model furnace, the researchers found that in less than 2 hours, nitrous oxide levels in a stored sample could shoot from less than 5 parts per million to 300 parts per million, if the original exhaust contained nitric oxide (NO), water and sulfur dioxide, all common products of fossil-fuel combustion.

"This fundamentally revises our thinking," says atmospheric chemist Joel Levine from NASA Langley Research Center in Hampton, Va. "If the emission factor in the chimney is reduced by a factor of 100, then coal burning, on a global scheme, does not become a major source of N₂O."

If fossil-fuel combustion does not account for much of the nitrous oxide in the atmosphere, then some other source must be much more prodigious than previously supposed. Scientists say one possible process making

(continued on page 2)

From The Heart Of The Mountains

by Cindy Rank

As 1989 begins there is a new President in the White House, a new Governor in Charleston . . . and a new President of the Conservancy. While I'm not at all ready to venture any predictions about changes on either the Federal or State levels, I should at least introduce myself to those of you who don't know me and perhaps give you some general impressions of where the Conservancy is headed these next two years.

I live in what is close to the geographic center of the State, in a place called Canaan. . . . Not the Canaan (ka-NANE) of Tucker County fame with its unique wetlands, tourism, ski slopes and burgeoning development, but the Canaan (KAY-nin) of Southern Upshur County with its quiet beauty sometimes reminiscent of the "promised land" Canaan of Biblical fame. (In fact, the communities of Eden and Goshen are just down the road a piece.)

My husband, Paul, and I moved here from Pittsburgh, PA in the early '70's through a series of curious coincidences which will always amuse and amaze me, but which are of little import or interest to anyone reading the VOICE. Suffice it to say that we bought property in December of 1971 and, with the help of several equally unexperienced friends, built the first part of our present home, and moved to the hills in May of 1973.

We left behind a life of chaos and convenience to explore a world we hoped would be more simple, though a bit more rugged, one that might keep us in touch with some of the more essential values of our own lives and the life of the earth and those around us.

The relatively rugged and labor intensive aspects of our chosen lifestyle remain, and do tend to keep us centered on some of our basic loves and joys, but the chaos has returned with a vengeance.

The chaos in part comes from the stark realization that the demands and challenges of society are no less imposing in the hills than they were in the city. They're just different. The thoughtlessness and greed that threaten to destroy human dignity and the earth we live in are not the private property of the concrete portions of our society.

This realization began only a few short years after we arrived in Canaan . . . Feeling our house shake as core drill trucks rumbled by and as seismographic survey trucks set off charges in search of coal, oil and gas reserves; hearing the thunder of a power company helicopter as it invaded our air space totally unannounced to spray noxious smelling chemicals on our newly cut power line; watching local gas drilling companies tear apart our roads in the winter and poorly construct access roads and pits which spill mud and other wastes onto our roads and streams each time it rains; tasting the awful salt and metal laden water at a neighbor's home which is located below a Department of Highways garage and salt storage pile, have made us painfully aware that in order to enjoy the life and land we love (and certainly in order to preserve it for future generations) we must also be actively involved in watchdogging the activities which directly effect our own property and the world around us. To believe otherwise is folly.

. . . Our first public response to these activities centered on coal developments that threatened the water quality and quantity of the streams and wells in "our own backyard" of the Headwaters of the Little Kanawha River. Fortunately, plans for these mines were put on hold in 1982. However, the water problem goes on elsewhere. The same acid mine drainage continues to plague the Buckhannon-Tygart River Watershed to the North of us and now threatens to expand into the Holly River to the South of us.

From our local group F.O.L.K. (Friends of the Little Kanawha) to the statewide sports and conservation groups like the Conservancy that helped us in 1979 the message is clear: We who love and enjoy the beauty and wonders of West Virginia have to actively work for and encourage the appreciation, preservation and wise use of the State's natural resources.

The Conservancy has been doing its part since 1967. Our efforts don't always involve areas as breathtaking or unique as Canaan Valley or the New River Gorge or the Greenbrier, but most of them do seem to go on forever, even as new concerns are put on the agenda.

As we head into 1989, in addition to our ongoing involvement in areas like the ones just mentioned, we've joined with others to help address the need to protect our ground water by developing appropriate and strong State regulations; we've begun to address the ever-present trash-litter-garbage problem that plagues our roads, inadequate landfills that pollutes nearby surface and ground water supplies, and, with 14 other conservation and sports groups have filed suit against the WV Department of Energy for failure to enforce the Federal and State Surface Mine Laws.

. . . The question on my mind since I agreed to be nominated as President of the Conservancy is "Am I up to it?" . . . I still don't know the answer to that question, but I'm determined to make a go of it these next two years. My personal focus and passion will always remain very local and I'll be relying on others among you to help me with the specifics of many of the broader issues which we're involved in. But with your help, and with the help of like minded groups throughout the State, we can and will effectively address at least some of the multitude of issues that promise to confront us as we move into the 1990's.

Bottled Error

(continued from page 1)

up the difference might be biomass burning — which includes tropical rain forests, grasslands and agricultural stubble. When vegetation burns, the combustion process creates nitrous oxide and other gases.

According to Levine, new work suggests that past studies have underestimated the amount of land burned each year. Moreover, his group and others around the world have recently discovered that burning creates nitrous oxide not only through straight combustion but also by stimulating soil microbes, which produce this gas for months after a fire (SN: 4/9/88, p. 231).

— R. Monastersky

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Proposed SMCRA (continued from page 1)

What You Can Do. Because of the impact this rule could have on West Virginia, it is important for WVHC members to comment on it. Comments do not have to be technical or detailed. Congressmen, especially, will be reviewing the comments to see which way the scales are tipped because this rule is so controversial. Written comments may be made to OSM until March 7, 1989, by writing:

Office of Surface Mining Reclamation and Enforcement, Administrative Record Room 5131L, U.S. Department of the Interior, 1100 L Street, NW, Washington, DC 20240.

Also, it is important that you send copies of your comments to the West Virginia Congressional delegation.

To obtain copies of the proposed rule (30 CFR Part 761: Areas Unsuitable for Mining; Areas Designated by Act of Congress; Applicability of the Prohibitions of the Surface Mining Act to the Surface Impacts of Underground Coal Mining) and draft Environmental Impact Statement contact:

Dr. Annetta Cheek, Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior, 1951 Constitution Avenue, NW, Washington, DC 20240, (202) 343-4006 or your Congressman.

Environmental Literacy Test

Public opinion poll data indicate that Americans are, generally speaking, highly concerned about environmental problems, and certainly public opinion plays a key role in the process of determining environmental priorities and policies. Clearly, then, it is important for the public to be adequately informed on environmental issues.

Reprinted from EPA Journal. Answers are given on page 7.

(Questions and answers prepared by Arthur Koines, Regulatory Integration Division, in EPA's Office of Policy, Planning, and Evaluation.)

1. Which of the following phenomena is believed to be associated with the greenhouse effect?
 - a. global warming
 - b. melting of the polar icecaps
 - c. sea level rise
 - d. all of the above
2. Which of the following gases is believed to cause the greenhouse effect?
 - a. oxygen
 - b. carbon monoxide
 - c. carbon dioxide
 - d. all of the above
3. Today, 18 years after the passage of the Clean Air Act, nearly all major cities in the United States are in compliance with national air quality standards.

True False
4. Which of the following environmental problems has EPA found to be the most threatening to public health?
 - a. hazardous waste sites
 - b. radon in homes
 - c. toxic chemicals in drinking water
 - d. leaking underground storage tanks
5. Which of the following environmental problems is the American public most concerned about?
 - a. hazardous waste sites
 - b. radon in homes
 - c. contaminants in drinking water
 - d. leaking underground storage tanks
6. Which of these is a major source of air pollution in homes?
 - a. building materials and furnishings
 - b. electrical heating and cooking appliances
 - c. tobacco smoke
 - d. none of the above

7. Ozone is beneficial to our environment at high altitudes, yet harmful at low altitudes.

True False
8. If dioxin is such a serious public health threat, why doesn't EPA just ban it?
 - a. It is a key material in the production of vital consumer products.
 - b. Industries that use dioxin are able to exert a powerful political influence on Congress.
 - c. EPA is unable to ban dioxin because it is an unwanted by-product of many industrial activities.
 - d. None of the above.
9. The federal government provides the majority of funding for implementing environmental programs.

True False
10. In what way can people be exposed to lead in the environment?
 - a. in their drinking water
 - b. in dust from lead paint in their homes
 - c. in lead-contaminated soils
 - d. all of the above
11. What adverse health effects have been associated with human exposure to lead?
 - a. anemia
 - b. learning disabilities in children
 - c. hypertension in adult males
 - d. all of the above
12. Nationally, which of the following is the biggest polluter of our air?
 - a. the chemical industry
 - b. automobiles
 - c. hazardous waste incinerators
 - d. none are big polluters
13. Which of the following is the source of radon in homes?
 - a. ultraviolet radiation
 - b. defective home heating systems
 - c. uranium in naturally occurring rock formations

- d. none of the above
14. Which of these answers comes close to the amount of garbage created annually by the average American?
 - a. 10 pounds
 - b. 100 pounds
 - c. 1,000 pounds
 - d. none of the above
15. What do we do with all the garbage we create?
 - a. dispose of it in landfills
 - b. burn it in incinerators
 - c. recycle it
 - d. all of the above
16. A ground-water aquifer is most like:
 - a. an underground lake
 - b. an underground river
 - c. an underground sponge
 - d. none of the above
17. Which of the following best describes an estuary?
 - a. a large inland water body
 - b. an ancient river bed
 - c. the confluence of fresh water and salt water bodies
18. Estuaries are important because they:
 - a. are major sources of drinking water
 - b. are vital marine habitats
 - c. normally occur near large population centers
 - d. all of the above
19. Although the pollutants causing acid rain are generated mainly in the Midwest, what region of the United States has experienced the worst effects from acid rain?
 - a. the Northwest
 - b. the Northeast
 - c. the Southeast
 - d. the Southwest
20. In the past, which of these groups has enjoyed cost savings from inadequate pollution controls?
 - a. industry
 - b. the American consumer
 - c. federal, state, and local governments
 - d. all of the above

EPA Journal, July/August 1988

Monongahela National Forest Hiking Guide Now Out

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 ski-touring, and a full-color cover. The authors are Allen de Hart and Bruce Sundquist. Allen has hiked all the trails of the Monogahela 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.

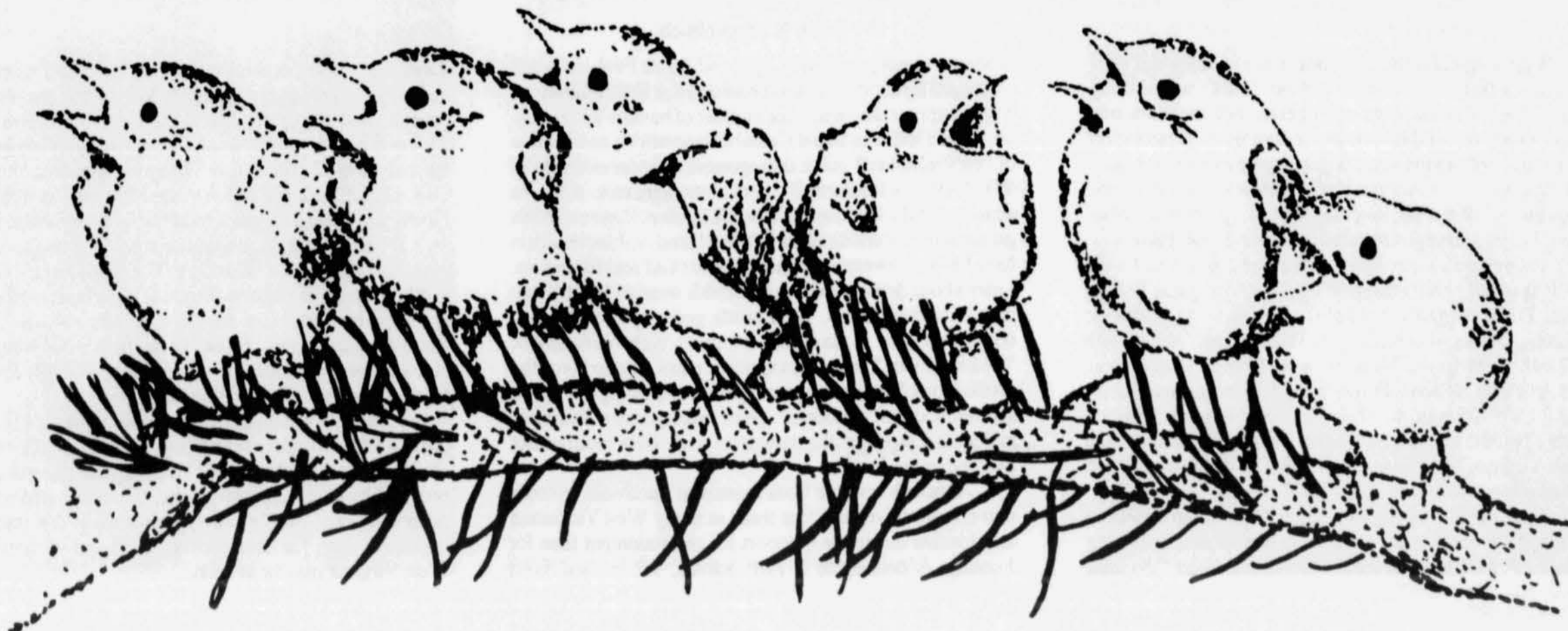
In the U.S. Forest Service's planning process that led to

the 1986 Land and Resource Management Plan, over 35,000 comments were received from the public. The gist of these comments is that the Monongahela is a "Special Place." And indeed it is. The hiking and backpacking 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, Flat-rock Plains, Roaring Plains, Blackwater Canyon, Spruce Knob, North Fork Mountain, Shaver's Mountain, Laurel Fork Wilderness, Cranberry Back Country, Cranberry Wilderness, among others. This guide will help you get to know

these and other special places in the forest.

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, Suite 201, 1206 Virginia Street E., Charleston, WV 25301.



Saga Of Greenbottom: Wetlands In Danger

Brian E. Hagenbuch and Janet K. Fletcher,
HTSAS President
Photography by
Marilyn S. Aikman and Brian Hagenbuch

The Greenbottom Swamp (GS), located along the Ohio River about 16 miles north of Huntington, has become a focal point of environmental, historical, and ecological concern for many West Virginians. This 838 acre tract is the mitigation site for land disturbed by the Army Corps of Engineers for enlargement of the Gallipolis Locks and Dam Project. The GS is known to the Corps as "Glenwood Bend" and the West Virginia Department of Natural Resources (DNR) as "Lesage Wildlife Management Area." The GS is not only known for its unique natural history and ecological importance, but also includes the historically significant General Albert Gallatin Jenkins home, (built around 1835) on the National Register of Historic Places, and the Clover Site, an important archaeological dig of a Fort Ancient Indian Village.

Approximately 110 acres of the GS are considered wetlands or marshes, making this the third largest wetlands in West Virginia, and the only major wetlands in the southwestern portion of the state. The area was once the site of a 4400 acre plantation and approximately 65% of the land is still used for agricultural production. The GS is famous for its river bottom forest and abundance of non-game wildlife, waterfowl and rare plants. The biodiversity that presently exists at Greenbottom is probably a direct result of its unique, yet interconnected, mosaic of natural habitat.

Historical Perspective and Prospectus

The GS has had a long and illustrious history. In 1976, Thomas Hannon created the first white settlement in present day Cabell County, and the first between the Kanawha and Big Sandy Rivers, on this land. Today, he lies buried at the northwest corner of the tract.

The DNR plans to convert the two-story General Jenkins home into administrative offices and home for a DNR game warden. Because of the historical significance of the General Jenkins home, its prominence on the National Register of Historic Places, and the surrounding plantation, we feel the site would be best utilized as a museum and center for civil war and Ohio River history. The home should be restored, preserved, maintained, and operated by a full-time curator and be opened to the public. Preservation of the site has been advocated by the West Virginia Society of Architects, Huntington Chamber of Commerce, Sons of



The General Albert Gallatin Jenkins home, built in 1835, and on the National Register of Historic Places.

West Virginia is the only state in the country that does not have a National Wildlife Refuge. Unlike neighboring states, West Virginia does not operate nor maintain one nature preserve, wildlife refuge, or ecological preservation site (outside of the manicured state park system). In a state well known for its scenic beauty, natural wonders, and bountiful wildlife, no state-maintained, protected, year-round habitats exist for research, education, and tourism.

Recent trends have shown that land acquired by the DNR is usually converted into Public Hunting and Fishing areas. DNR currently maintains approximately 40 Public Hunting Areas comprising 263,022 acres, along with 952,042 acres in the Monongahela, George Washington, and Jefferson National Forest Wildlife Management Areas, and 80,900 acres in the State Forests. Almost 1.3 million acres of public maintained lands are available for hunters in West Virginia. Not one acre is available as a state-sanctioned wildlife preserve.

Four public hunting and fishing areas are in operation within a 30-60 minute drive of Greenbottom, including Clinton F. McClintic Wildlife Station and Chief Cornstalk

Confederate Veterans and the United Daughters of the Confederacy, League of Women Voters and several other groups and individuals. Greenbottom is a page of history and should be resurrected as a tourist attraction for the education and enjoyment of others.

Archaeological Significance and Status

An archaeological dig by faculty and students of Marshall University has unearthed remnants of a Fort Ancient Indian Village, known as the "Clover site." Surveys by the Corps have unearthed nine more indian remnant locations of archaeological significance. We feel the Clover Site deserves status on the National Historical Register, and artifacts should be restored in a museum to complement the General Jenkins home. Continued excavation should be performed by Marshall University, thus giving students valuable field experience. Contrary to the attitude of one Corps employee, we feel archaeological sites of this scale and importance, especially in the Ohio River area, should not be dug up and removed.

Flora and Fauna of the GS

The GS has provided an outstanding field location for research and education activities led by faculty and students of Marshall University. Studies have been conducted over the past 12 years on many biotic aspects of the swamp and adjacent marshlands. The GS has also provided several other groups the opportunity to participate in non-consumptive activities such as hiking, photography, birdwatching, art and environmental education.

From a botanical perspective, the swamp contains four species of plants found nowhere else in West Virginia, including two kinds of watermeal, a large floating liverwort, and toothcup. Other plants found in the swamp that are rare elsewhere in the state include a species of sedge, water beadgrass, caric-sedge, duckweed and loosestrife. Botanical studies have concentrated on the floodplain vegetation and effects of hydrologic changes in vegetation of the swamp.

The GS is a mecca for birdwatchers in the Huntington, Tri-State area. Approximately 221 of the 302 extant bird species in West Virginia have been documented at the GS, including 84 nesting species (compared to 107 for Cabell County) and an additional 121 migratory species. Two species, the Cooper's Hawk and Northern Harrier are classified as undetermined status on the WV-DNR Special Animal List. Ospreys, classified as special interest status, were also recorded. Loggerhead Shrikes, a species of special concern, were documented in the 1970's.

Bald eagles, classified as endangered by the U.S. Department of Interior, have been documented, as have Northern Goshawk, which is classified as special interest status. The GS is also an important local wintering area for the Rough-legged Hawk, which is considered only a casual winter visitor in West Virginia.

In one published report, nine species of raptors were recorded during fall surveys and four species during winter surveys. These raptor sightings, along with the annual migra-

Hunting Versus Non-Game

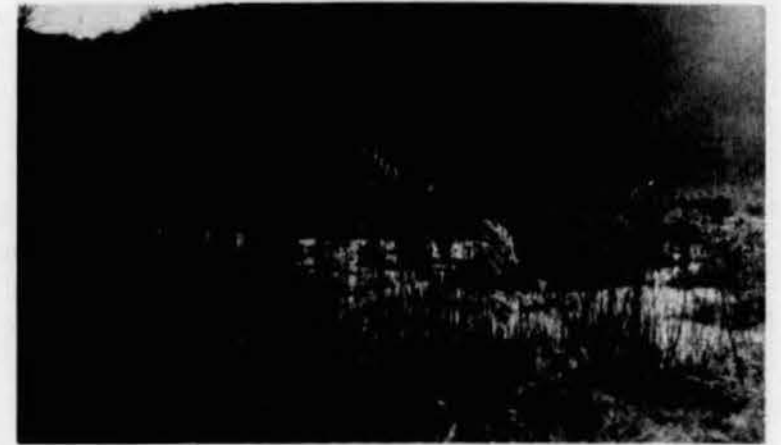
by Brian E. Hagenbuch

in Mason County and Mill Creek and Beech Fork in Cabell County. The addition of the small acreage at Greenbottom will not appreciate greatly the number of hunters in the area.

The DNR has stated Greenbottom will be an example of "old-fashioned" game management. For an example of WVDNR "old-fashioned" game management plans in action, visit the McClintic Wildlife Station. Vegetation has grown out of control and the blocks of land and field borders have become overrun with honeysuckle and multiflora rose. Litter abounds over the area and rivals most of West Virginia's backyard dumps. The Canada geese have become an obnoxious pest as have the Saturday night party-goers. "Old-fashioned" game management plans tend to favor the production of one or two game species, displacing non-game species. Current "modern" game management strategies include all facets of the ecosystem and stress biodiversity over game production.

Although revenue from sportsmen's activities exceeds non-consumptive uses, four times as many West Virginians and tourists utilize the outdoors for entertainment than for hunting. According to a 1985 survey, 1.2 million West

The wetlands in the late afternoon sun with the General Jenkins home in the background.



tion of waterfowl, will conflict with the proposed hunting season in fall and winter, thus endangering the welfare of these species. A bald eagle, Cooper's hawk, and rough-legged hawk were among the many species observed at the GS during the 1988 Audubon Christmas Bird Count conducted by the Ona Ornithological Society.

Two other species of concern are the prairie vole, whose easternmost known distribution is the GS area and the bronze copper butterfly, whose DNR status in West Virginia is special interest, and has only been recently recorded from the GS.

Proposed Glenwood Bend Management Plan

Under the proposed management plan, the Corps will lease GS land to the DNR, who in turn plan to convert the area into another Public Hunting and Fishing Area. Plans call for constructing dikes and levees to increase the size of the wetlands, control water flow at "optimum, man-made" levels, and create a suitable wildlife and waterfowl habitat for a "Canada goose farm" and public hunting.

Portions of the plantation will be partitioned with approximately \$225,000 worth of transplantings to create a habitat suited primarily to game species under the guise of "old-fashioned" game management. A portion of that money will also be spent attempting to maintain wetland plant communities. Three areas, primarily agricultural land, will be permanently flooded and "planted" with wood duck and Canada goose nesting sites.



Many conservationists feel this will be an all-to-common sight should DNR develop the area for hunting.

Virginians (79%) participated in non-consumptive activities annually, spending approximately \$78 million per year. The general fund of the State of West Virginia receives about \$1.2 million per year from non-game wildlife activities, yet the only contributions to the program are from the Non-Game Tax Check-off, which totaled \$22,000 for 1988. The DNR Non-Game Program receives no State funding.

DNR has maintained an admirable Non-Game Program despite the lack of funding. The Non-Game weekend, raptor projects, non-game mammal surveys, and other programs have contributed greatly to our knowledge of non-game wildlife. Despite the lack of funding, DNR would gain considerable support for the Non-Game Wildlife Program by creating a series of wildlife sanctuaries.

Although West Virginia continues to battle a financial crisis, a new Governor brings hope of a renewed interest in environmental appreciation. Perhaps a strong grass-roots program by environmental groups, educators, students, and other interested people can spur interest in this important legislative year. The future of the "Wild and Wonderful" in West Virginia may be at stake.



Creek flowing from an embayment in the river bottom forest.

Concerns Over Management Proposal

We are very concerned over several issues raised in the Corps proposal. Among these include:

1) The detrimental effects of construction and destruction on the fragile natural balance of the wetlands ecosystem.

The soil profile of the Greenbottom land is comprised primarily of silt loams in the Ashton Series, which is common along high flood plains. These soils are naturally fertile, with moderate permeability, and are well suited for agricultural use. Loams of these subsoils are restricted for use in dikes and not well suited for use in levee construction, unless mixed with high clay soils. Because no suitable soils with high clay content are in close proximity, bentonite clay will need to be transported in and mixed with the Ashton Series. The addition of clay soils will increase sedimentation and alter the efficiency for which the wetlands can remove and retain nutrients.

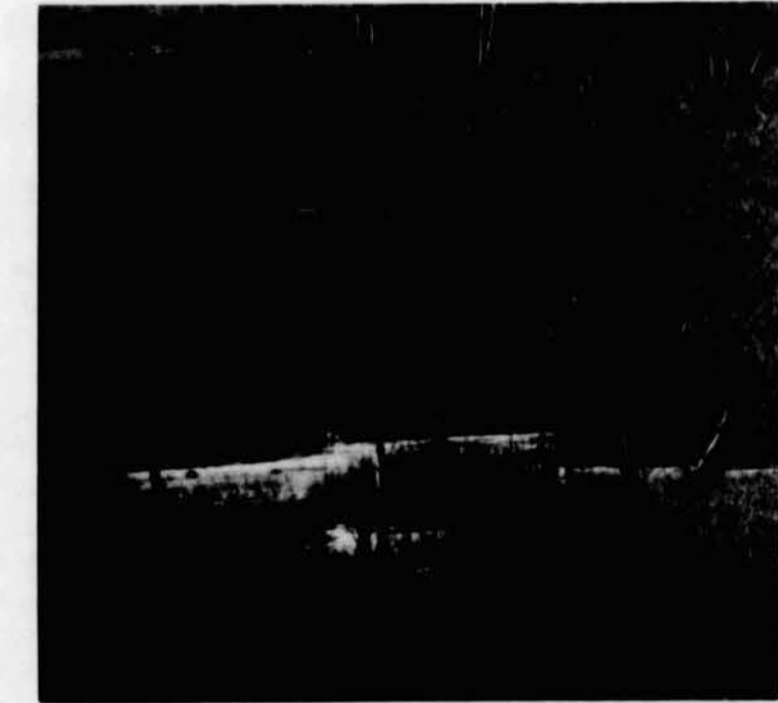
2) The effect on construction on the rare plants and animals have not been thoroughly addressed.

In order to construct the levees, heavy earth-moving machinery will be required. The effects of this disturbance will be detrimental to the rare species in the swamp and cause irreversible damage to the surrounding land.

3) The effect of constantly altering the water levels of the wetlands on the native plant and animal species.

4) The effect of fall hunting on raptors and migratory waterfowl that use the wetlands as a resting place.

5) The effect of hunting on the safety and welfare of the public. The GS is a narrow strip of land bordered by the Ohio River on the west and WV Route 2 on the east, the major thoroughfare between Huntington and Point Pleasant. CSX Railroad runs along the highway. Both highway and river traffic are often heavy and may be at risk from stray bullets.



The wetlands support beaver, birds and other wildlife.

Should the General Jenkins home be opened for tourism, we are also concerned about public safety. A proposed buffer zone around the home will not protect tourists who would like to stroll the area. The fall hunting season also conflicts with small mammal trapping studies and bird migration surveys. We cannot put the safety of students and educators in jeopardy.

6) The potential disposition of endemic non-game wildlife and birds from increasing the habitats and populations of game animals.

7) Land displaced by the Gallipolis Locks and Dam Project was not open as a public hunting and fishing area.

The attitudes of the DNR and Corps towards Greenbottom have been both arrogant and appalling. DNR has made it clear they will listen to and discuss all matters concerning the GS, but they will not change their plans for the hunting area.

Greenbottom Natural History Preserve

The Huntington Tri-State Audubon Society (HTSAS) has proposed the Greenbottom Natural History Preserve (GNHP) as a viable alternative to the proposed public hunting and fishing area. The Preserve would restore the General Jenkins home as a living museum for pre-civil war and Ohio River history, cooperate in further archaeological digs, and develop a wildlife sanctuary for non-consumption use to the benefit of educators, students, the general public, and non-game wildlife.

The GNHP should be managed as an area where no hunting is permitted. Construction of interpretive trails, boardwalks, an observation tower and nature center are highly desirable. A full-time naturalist should be employed to develop and implement educational programs. While additional wetlands may be beneficial, construction of new wetlands should not compromise the current integrity of the GS. Large open tracts should be maintained as an attraction for raptors and numerous other avian species.

The GNHP has been endorsed by the Huntington Chamber of Commerce, several civic and environmental groups, educators, legislators, government officials, historians, architects, archaeologists, students, and many other individuals who feel this unique area has more potential for education, research, and tourism than for hunting.

Greenbottom Update

On December 16, the Corps announced that it had agreed to lease the General Albert G. Jenkins home to the West Virginia Department of Culture and History instead of the Department of Culture said they plan to restore the 150 year old home to its pre-Civil War state and operate it as a museum. The land surrounding the home still belongs to the Corps and may yet become a public hunting area.

Close up view of the wetlands shoreline.

Swamp rose mallow is a common wetlands plant.



The wetlands are excellent birdwatching locations.



Under DNR plans, the agricultural fields will be partitioned into blocks and be transplanted to provide habitats for game species.

Epilogue

Wetland ecosystems are disappearing at an alarming rate and the preservation and study of such areas are critical to the future and wealth of our country's natural resources. The loss of land and wetlands along the Ohio River has been astounding. The Goodyear Plant, Aptus, the Gallipolis Locks, and numerous other private developments have swallowed thousands of acres of wetland and marshes, waterfowl and non-game wildlife habitat.

It is our opinion that the benefits of the GS, such as those already mentioned, plus the potential for tourism, far outweigh the net gains or losses incurred by creating a hunting and fishing area. The GNHP could provide the initiative for creating an outstanding nature preserve system across West Virginia and the GS would be a logical first step.



Earth Day Recollections: What It Was Like When The Movement Took Off

by John C. Whitaker

When President Nixon and his staff walked into the White House on January 20, 1969, we were totally unprepared for the tidal wave of public opinion in favor of cleaning the nation's environment that was about to engulf us. If Hubert Humphrey had become President, the result would have been the same.

During the 1968 presidential campaign, neither the Nixon nor Humphrey campaign gave more than lip service to environmental issues. Rather, their thoughts focused on such issues as Vietnam, prosperity, the rising crime rate, and inflation. Nixon made one radio speech on natural resources and the quality of the environment, which seemed adequate to cover an issue that stirred little interest among the electorate.

In the Humphrey camp, things were just as quiet. He dedicated a park in San Antonio, Texas, and the John Day Dam in Oregon, using both occasions to discuss the environment and conservation. Otherwise, Humphrey said nothing on the issue.

If the candidates showed little interest in the issue, so did the national press corps. In fact, Nixon staff members do not recall even one question put to him about the environment.

Yet only 17 months after the election, on April 22, 1970, the country celebrated Earth Day, with a national outpouring of concern for cleaning up the environment. Politicians of both parties jumped on the issue. So many politicians were on the stump on Earth Day that Congress was forced to close down. The oratory, one of the wire services observed, was "as thick as smog at rush hour."

Concern For Environment

A comparison of White House polls (done by Opinion Research of Princeton, New Jersey) taken in May 1969, and just two years later in May 1971, showed that concern for the environment had leaped to the forefront of our national psyche. In May 1971, fully a quarter of the public thought that protecting the environment was important, yet only 1 percent had thought so just two years earlier. In the Gallup polls, public concern over air and water pollution jumped from tenth place in the summer of 1969 to fifth place in the summer of 1970, and was perceived as more important than "race," "crime," and "teenage" problems, but not as important as the perennial poll leaders, "peace" and the "pocketbook" issues.

In the White House, we pondered this sudden surge of public concern about cleaning up America and providing more open spaces for parks, and a heightened awareness of the necessity to dedicate more land for wildlife habitat. Why, we asked, after it was so long delayed, was the environmentalist awakening so much more advanced in the United States than in other countries? What motivated millions to so much activity so long after publication of Rachel Carson's *Silent Spring* in 1962? Many factors seem to have been involved.

First, the environmental movement probably bloomed at the time it did mainly because of affluence. Americans have long been relatively much better off than people of other nations, but nothing in all history compares even remotely to the prosperity we have enjoyed since the end of World War II, and which became visibly evident by the mid-fifties. An affluent economy yields things like the 40-hour week, three-day weekends, the two-week paid vacation, plus every kind of labor-saving gadget imaginable to shorten the hours that used to be devoted to household chores. The combination of spare money and spare time created an ambiance for the growth of causes that absorb both money and time.

Another product of affluence has been the emergence of an "activist" upper middle class — college-educated, affluent, concerned, and youthful for its financial circumstances. The nation has never had anything like this "mass elite" before. Sophisticated, resourceful, politically potent, and dedicated to change, to "involvement," it formed the backbone of the environmentalist movement in the United States.

Other factors included the rise of television and the opportunities it provides for advocacy journalism.

Also, science contributed another dimension to the national agitation. To the obvious signs of pollution that people could see, feel, and smell, science added a panoply of invisible threats: radiation, heavy metal poisons, chlorinated hydrocarbons in the water, acidic radicals in the atmosphere, all potentially more insidious, more pervasive, and more dangerous than the familiar nuisances. This could happen only in a country able to support a large, advanced scientific community with an immense laboratory infrastructure, marvelously sensitive instruments, intensive funding, computers, data banks, and vast interchanges of information able to isolate and trace the progress through the ecosystem of elements and compounds at concentrations measured in parts per billion, and to establish their effects upon living organisms in the biosphere.

The press served the pollinating function of a honey bee, transporting the latest scientific findings to the public, which reacted with fear and misgivings. These in turn were relayed by the press back to the scientific community, which was stimulated by public concern to intensify its investigations, leading to more discoveries of new perils, and so on. This in itself provided a climate in which support for environmentally related causes could be elicited.

New Ethic

The feverish pitch of Earth Day 1970 passed, but the environmental movement did not go away. Instead, the drive for a cleaner environment became part of our national ethic. Now it is taken for granted, the best possible testimonial that progress is being made. Our nation's thinking has changed. Endorsing growth without regard to the quality of that growth seems forever behind us. The failure of the economy to take into full account the social costs of environmental pollution is being rectified. Not only are environmental considerations now factored into federal government decision-making but over and over again Americans pay for low-polluting or pollution-free products like low-sulfur heating oil, unleaded gasoline, and coal from fully reclaimed strip mines, for automobile emission controls, for electricity from cleaner fuels, and for more parklands and wildlife refuges. More fundamentally, we are beginning to understand that the environment is an independent whole of which man is only a part.

But in the early 1970s it was clear that the executive branch could not respond to public demand to clean up the environment without first creating an organization to do the job. Better coordination of federal environmental programs was needed. There were 44 agencies in nine separate departments with responsibilities in the field of what was then loosely described as "the environment and natural resources." No department had enough expertise to take charge.

At cabinet meetings, HEW Secretary Bob Finch, responsible for air pollution controls, and Transportation Secretary John Volpe, argued over which department should take the lead in developing a research program for unconventional low-polluting automobiles. On pesticides, Walter Hickel at Interior and Finch argued for tighter pesticide controls, while Agriculture Secretary Clifford Hardin emphasized the increased crop productivity resulting from the application of pesticides. And Secretary of State Bill Rogers weighed in expressing concern on whether a ban on DDT in this country might restrict the supply of DDT to the developing countries. Hickel, who at the time handled water pollution control over at Interior, wanted more money for sewage treatment control; Bob Mayo, director of the Bureau of Budget would have none of it. Maurice Stans at Commerce was wary of tighter pollution controls and what effect this might have on corporate profits. Paul McCracken, Chairman of the President's Council of Economic Advisors, worried that we would be uncompetitive in international markets if our product prices reflected the costs of pollution abatement standards that were more stringent than those of other countries. There was hardly a Cabinet officer who did not have a stake in the environment issue. Even the Postmaster General joined the debate, offering to use postal cars to test an experimental fleet of low-pollution cars.

The cabinet meeting left President Nixon dissatisfied. There was no overall strategy, too many unanswered questions. Should enforcement be done by regulation, or by user fees, or a combination of both? What were the overall costs to industry and the consumer in terms of both the increased price products for various pollution abatement schedules under varying standards and regulations? Finally, what would the various clean-up scenarios do to the federal budget? Nixon clearly needed a "pollution czar" and one agency to look to for the answers.

First, Nixon discarded the option of a Department of Environment and Natural Resources as well as several other reorganization plans. In July 1970 he submitted to Congress the Environmental Protection Agency plan; the new agency came into being on December 2, 1970. Meanwhile, I had interviewed a number of candidates to run the new agency and recommended Bill Ruckelshaus to the President. I've missed the mark on lots of things in my life, but Ruckelshaus was a "bull's eye."

Now, years later, the accomplishments of the Nixon years are plain to see. New clean air, water, solid waste, and pesticide laws, coastal zone management planning seed money, new national parks in New York City and San Francisco harbors. In addition, Nixon ordered federal agencies to shed spare federal acreage that would be converted into parks and recreation areas, especially in urban areas. More than 82,000 acres in all 50 states were converted into 642 parks, the majority of them in or very close to cities, really bringing parks to the people.

More money was dedicated to buying wildlife habitat; Congress passed Nixon's controversial proposal to protect endangered species. Nixon's executive orders restricted ocean dumping and tightened environmental standards for off-shore oil drilling. To quell the insatiable development instincts of the Army Corps of Engineers he cancelled construction of the Cross-Florida Barge Canal.

What Nixon — and subsequent presidents — couldn't accomplish is to address in a rational way the cost of pollution abatement control: how fast should the nation clean up and at what cost? In the early 1970s our polls clearly showed the public demanded a cleaner environment, but data on the public's willingness to pay was ambivalent. Our initial Opinion Research polls showed that about three-fourths of the public supported more government spending for air and water pollution abatement programs, that support existed in all population groups, and that it was particularly high among the young. But this did not mean that taxpayers had committed themselves to spending their own money. Opinion Research reported that in

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 an 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: Suite 201, 1206 Virginia St., E., Charleston, WV 25301

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 _____

Earth Day Recollections: What It Was Like When The Movement Took Off (continued)

May 1971, three-fourths of the public would pay small price increases for pollution control, but six out of 10 opposed large price increases for that purposes.

A Harris poll in October 1971 indicated that 78 percent of the public would be willing to pay (how much was not specified) to have air and water pollution cleaned up, and 48 percent would accept a 10-percent reduction in jobs for a cleaner environment. Poll editor Hazel Erskine indicated that individuals were not "personally anxious" to foot the bill for correcting pollution damage, although willingness to pay for pollution control was growing.

Americans Willing To Pay

Congress received even stronger messages. Twenty-two congressmen, in a survey of 300,000 Americans in varying kinds of congressional districts, asked constituents if they were willing to pay more for pollution control. Respondents in all but three districts answered affirmatively. Representative Gerald Ford asked his Michigan constituents, "Should the federal government expand efforts to control air and water pollution even if it costs you more in taxes and prices?" The answer: 68.3 percent yes, 27.5 percent no. Subsequently, Ford voted to override President Nixon's veto of the Federal Water Pollution Control Act Amendments of 1972. (Nixon vetoed it largely because of the very heavy federal expenditures, particularly for sewage treatment plants.) Not surprisingly, because the perspective almost always changes inside the oval office, President Ford later tried unsuccessfully to hold down sewage treatment expenditures, as has every president since then.

Nixon knew he would pay a political price by not proposing the "toughest" and costliest pollution control standards, but after looking at the federal budget and the macro-economic impact, he chose a more moderate course. As it turned out, Congress, fanned by the political hurricane of the environmental movement, enacted deadlines that could never be met, like the 1977 deadline for secondary treatment of municipal waste, and an \$18 billion appropriation over the three-year life of the law, which couldn't even be dispensed under the law's cumbersome grant system. Similarly, Congress legislated technology that didn't exist by setting emission standards for automobiles that couldn't be met and later had to be postponed. The missed 1987 year-end ozone deadlines is another glaring example of Congress' tendency to legislate non-existent technology.

Early in the process we recognized that Congress and the executive branch mistrusted each other's cost impact figures for various pollution reduction strategies. Even in executive branch meetings, the EPA staff repeatedly seemed to minimize pollution costs while other agencies weighed in with high costs to meet the identical pollution standard. Often, we halved the difference, relaxing the standard more than EPA wanted, but keeping it much tighter than Commerce, for example, found acceptable.

We might have missed a chance in those early days to help resolve the debate. Russ Train, chairman of the Council on Environmental Quality, and I proposed setting up a national body with think tank funds plus matching federal funds to study cost-benefit analysis for pollution controls. We hoped that if a body removed from Congress and the executive branch did the number crunching, then perhaps the results would be more acceptable to all parties inside the beltway. The idea never reached the President, largely because Chuck Colson opposed our candidate to head this study groups, and Colson beat me out in the White House staff warfare that goes on in any Administration.

Today Americans spend \$77 billion annually for environmental improvements and that cost could easily reach \$100 billion by the end of the century. Rather than ask where the next billion dollars can be spent, we must pause and again ask how clean and how fast? Today we have infinitely more scientific capability and sophisticated cost-benefit analysis to steer a course toward a cleaner environment. The question is, will our elected officials and executive branch regulators be willing to lean into the political winds, as we did, and act on the basis of objective information?

(John C. Whitaker was President Nixon's Cabinet Secretary (1969); associate director of the White House Domestic Council for environment, energy, and natural resources policy (1962-1972); and Undersecretary of the Department of the Interior (1973-1975). He is now Vice President, Public Affairs, for Union Camp Corporation. From EPA Journal July/August 1988.)

Book Review

The Old Farmer's Almanac Book Of Weather Lore, by Edward F. Dolan. Edited by Sandra Taylor. Designed by Jill Shaffer. Illustrated by Carl Kirkpatrick; Yankee Books, a division of Yankee Publishing Incorporated which also publishes Yankee Magazine and The Old Farmer's Almanac; Dublin, New Hampshire; \$15.95.

No matter your requirement for preferred reading, the **Book of Weather Lore** is entertaining as a casual browse or a cover-to-cover read. As the author observes, almanacs have been best sellers in many cultures and in many ages. Crisp black and white graphics enhance scientific explanations as well as please for their own sake. Several hundred excerpts from proverbs, mythology and literature have been collected and grouped. A prefatory distinction between climate and weather determines the selections offered and underscores the author's desire to encourage readers to verify the patterns of weather described.

Past cultures are revealed by their interactions with the environment; and the rhymes and descriptions that preserve their "shrewd, everyday observations" about the world. The conclusions and success of past predictions are only slightly less successful than the present approach. The basis for the activity being universal to all times and cultures: predict the future and increase control of it. Examples from our speech today show the influence of many early superstitions. Mod-

Clean Coal King

(continued from page 1)

By contrast, the new economic study released today predicts that under a 'combined' approach WV can meet its SO₂ reduction targets while protecting high sulfur mining jobs where they exist in northern WV, and still have modest employment gains in low sulfur mining in southern WV.

Secretary of State Ken Hechler summarized: "These studies kill once and for all the bogus claims made for years by the high sulfur coal and utility industries that acid rain legislation spells economic disaster for WV. The truth is: acid rain control will mean new mining jobs for hundreds of laid-off miners from Randolph County to Mingo County, from Richwood to Logan. Coal mining employment in the southern half of the state has fallen by nearly 50% since 1981, dropping from 39,008 miners to 20,916, the hardest hit part of the state. We need to let these miners back to work and acid rain legislation can help," he said.

The Center study is available for \$20.00. Contact Nicole Werner, Center for Clean

ern lore is included too; "you always get rained on when you don't have an umbrella."

The insight provided goes further than a factual examination of superstitions and further than the scientific explanations of meteorological phenomenon. The humanistic values guiding the choices of the author underscores his recommendation for applying the earlier methodology. Early peoples: "looked at the behavior exhibited by the sky, the ground underfoot, the surrounding plants and trees, our animals, and even our own aches and pains."

Evaluations of predictions and why they do not withstand scientific proof are given when the evidence is indisputable:

"the pot of gold at rainbow's end can never be reached because the rainbow itself (with a rare exception or two) can never be reached. The arch recedes at our approach and remains, beckoning, in the distance. This is because its distance from us is always exactly that of the nearest and farthest raindrop responsible for its presence. Any step toward a rainbow adjusts our angle to it and the sun, causing the reflection to 'move' farther back."

Many of the selections are unusual as the author has carefully avoided overworked cliches. The majority of literary sources are from Western cultural traditions. Several important sources used are listed in the bibliography.

Air Policy, 444 N. Capitol Street, Suite 526, Washington, D.C. 20001, 202/624-8191.

... waste is a spoil and destruction of the estate, either in houses, woods or lands; by demolishing not the temporary profits only, but the very substance of the thing; thereby rendering it wild and desolate; which the common law expresses very significantly by the word vastum: and that this vastum, or waste, is either voluntary or permissive; the one by an actual and designed demolition of the lands, woods and houses; the other arising from mere negligence, and want of sufficient care in reparations, fences and the like. So that my only business is at present to show to whom this waste is an injury; and of course who is entitled to any, and what, remedy by action.

*Private Wrongs
Public Wrongs
Ehrlich's Blackstone*

Answers to Environmental Literacy Test

- The answer is d. These phenomena are believed to be causally related. The greenhouse effect causes global warming. Gradually rising temperatures may be expected to cause some melting of the polar ice caps, which, in turn, causes sea level rise.
- The answer is c. Of the choices given, only carbon dioxide is a greenhouse gas.
- This statement is false. In fact, just the opposite is true: today, most major cities are not in compliance with national air quality standards.
- The answer is b. In the study "Unfinished Business: A Comparative Assessment of Environmental Problems," EPA staff and managers identified radon in homes as the most threatening public health problem of the choices given for this question.
- The answer is a. According to a recent Roper Poll, 65 percent of the American public felt that active hazardous waste sites were a "very serious" environmental problem. None of the other choices for this question was rated as very serious by as large a percentage. Radon in homes was rated very serious by only 21 percent.
- The answer is c. Tobacco smoke is acknowledged to be a major source of air pollution in homes where at least one smoker lives and smokes.
- The statement is true. At high altitudes ozone acts as a shield against harmful ultraviolet radiation from the sun. At ground level,

ozone can cause respiratory ailments in people and adverse effects on plant life.

- The answer is c. Dioxin is an unwanted by-product of industrial activities. The best known examples are its chemical formation in paper manufacturing and in the incineration of municipal waste.
- This statement is false. Federal funds now account for less than half of most state environmental program budgets. The federal share is decreasing as state programs grow while federal grants to state governments remain constant or are reduced.
- The answer is d. All of the choices are known routes of human exposure to lead.
- The answer is d. All of the choices represent adverse human health effects that have been associated with lead exposure through epidemiological studies.
- The answer is b. Nationally, of the choices given, automobiles are acknowledged to be the biggest polluter of our air.
- The answer is c. Radon is formed by the radioactive decay of uranium in naturally occurring rock formations.
- The answer is c. The United States has a population of about 240 million people and generates about 140 million tons of garbage annually. The average is 1,167 pounds (or roughly 1,000 pounds) per person.
- The answer is d. While landfilling is still by far the most

common waste management practice, both incineration and recycling are used by some communities.

- The answer is c. An aquifer is a soil formation capable of absorbing and storing water. It therefore functions like a sponge.
- The answer is c. An estuary is the confluence of a river and a salt water body. Some well-known examples of estuaries are the Chesapeake Bay, the Puget Sound, and San Francisco Bay.
- The answer is b. Estuaries result when a river discharges into a salt water body. The river supplies nutrients from the land to marine life. The estuary thus creates a vital habitat for marine animals in need of those nutrients.
- The answer is b. The most serious effects of acid rain have thus far been observed in the Northeast United States.
- The answer is d. In a narrow sense, all have enjoyed cost savings from inadequate pollution controls. Industry has saved as a consequence of lower production costs; some of these savings have been passed on to consumers in the production of public goods and services, such as municipal garbage and sewage disposal. In a broader sense, however, all of these cost savings came at the expense of a clean environment — a cost that our society as a whole must now bear.

NEWS BRIEFS

Noise Is Called A Threat To Sea Life

by Malcolm W. Browne

Noise generated by human activity is seriously endangering fish and such oceanic mammals as seals and whales, according to Arthur A. Myrberg Jr., a marine biologist at the University of Miami.

Marine animals have extremely sensitive hearing that is easily damaged by the noise of underwater blasting and drilling, and the impact of icebreaker hulls on pack ice.

Dr. Myrberg, an expert on acoustic communication between fish, reports that Beluga whales emit alarm calls when an icebreaker is 50 miles away, and that they flee when such vessels approach within 25 miles.

When drill ships work directly in the path of migrating bowhead whales in the Beaufort Sea, he said, the whales give the ships a wide berth.

Damage To Fish Eggs

From experiments and observation, Dr. Myrberg has concluded that the hair cells of the auditory organs of some fish are destroyed by high noise levels.

Underwater noise not only forces fish to flee the regions where it is generated; it also damages fish eggs and reduces the growth rate of fry, effects that ultimately reduce the catches of commercial fishermen.

The inner ears of Wedell seals inhabiting McMurdo Sound, Antarctica, have been damaged by underwater dynamite explosions, he said.

The deep-diving Wedells spend much of their time at depths where no light penetrates, and must communicate largely by the whistling sounds they emit. This channel of communication is destroyed by deafness.

Explosions in Antarctic waters are used in seismic studies of sedimentary layers as well as ice structures in the area.

Problem in Submarine Warfare

Where fish are raised for food, Dr. Myrberg said, aquaculturists try to assure the animals adequate space, food, light and dark cycles, and protection from disease and pests. But the problem of noise is too often overlooked, he believes.

Increasing noise in the world's oceans has also become a major problem in antisubmarine warfare.

The ballistic-missile submarines of the major navies are prime potential targets for their adversaries, which try to detect and track them by sound.

But builders are making ever quieter submarines, which are increasingly difficult to detect against the increasing background of oceanic noise.

Immediate Curbs Are Urged

Dr. Myrberg's concern is with the damage noise does to wildlife. The situation has become serious enough to require immediate curbs on oceanic noise, he believes.

"If we delay too long, problems that arise for these treasured animals will have no solutions and their loss will then be imminent."

The New York Times, 12-13-88

Ambiance Of Caves Intrigues Volunteer

CARLSBAD, N.M. (AP) — An Italian interior designer says the prospect of aiding science is what prompted her to volunteer to spend up to five months in a cave, out of the sunlight and away from the sound of another human voice with only 400 books to keep her company.

If she succeeds, Stefania Follini, 27, of Ancona, Italy, will set a women's duration record for isolation in a cave. But her interest is in the scientific value of the experiment that NASA officials will monitor to draw parallels with the isolation experienced in lengthy space flights.

The purpose of the cave marathon is to find out how a woman's body and psyche will react to the prolonged isolation. The only voice Follini will hear will be her own, and she will not have a clock or calendar.

Montalbini once spent seven months in a cave and other men have spent up to six months underground. But Follini, who is hoping to stay at least four and possibly five months, would be the woman's record holder if she succeeds. The cave-sitting record for a woman is one month.

Follini said she was fascinated by the news of Montalbini's seven-month underground stay and decided to volunteer when she heard that his Frontier Explorations and Researches Group wanted to send a woman into a cave.

Follini, who will not be paid for her role in the experiment, said she likes the ambiance of caves, the way she feels far away, yet secure.

Although she won't be able to see or hear another human, scientists will be able to monitor her via a video camera and microphones.

The Charleston Gazette, 1-1-89

L. L. Bean Executives Pitch In

Executives at L. L. Bean Inc. are working cash registers and stocking shelves at the company's warehouse sale in Freeport, Maine, causing longtime employees to remember the days when everybody pitched in, even L. L. Bean himself.

Before the mail order company became a multimillion-dollar business, it was not unusual for a shoemaker to stop work to wait on a customer in the retail store.

Bean, who died in 1967 at the age of 94, often waited on customers, who sought him out for advice on hunting and fishing gear.

Today the company employs 5,000 people and has 22 locations for general offices, distribution, manufacturing, phone orders and training.

The sale, the first the company has held in the holiday season, was called because construction at the only retail store has cut down on storage space.

The Charleston Gazette, 12-20-88

Wood Plant Critics On Attack At Hearing

ALDERSON — After nearly two hours of a heated public hearing on a permit for a wood treatment plant, Glen Ray plant opponents dropped a bombshell Wednesday night.

Attorney Paul Detch read from an affidavit from former Wood Guard plant foreman Claude Massie who said plant construction was unsafe, adding to residents' fears that toxic chemicals could escape the plant and contaminate ground water and the nearby Greenbrier River.

Plant owner Richard Moore spoke briefly after Detch and said Massie is lying. "Mr. Massie is no longer with us," he said. "I am sorry he took it so hard."

More than 200 people, most opposed to the plant, packed the cafeteria at Alderson Elementary School for the second public hearing the state Department of Natural Resources has held on the plant.

Reading from the affidavit, Detch quoted Massie as saying that several parts of a part of a pit built to contain leaks are flawed: concrete has cracked, steel supports are not welded properly and a plastic liner is useless because it is torn and has holes.

Detch also quoted Massie as saying that Moore knew of the flaws and that DNR inspectors did not detect them.

Eli McCoy, acting chief of the DNR's Water Resources Division, said the agency did not have the staff or the power to perform construction inspections. He said he was unsure how the agency would respond to Massie's allegations.

The plant, which is built but not operational, lies on a six-acre site on the Greenbrier River, a few hundred yards from the entrance from the federal women's prison at Alderson.

The Charleston Gazette, 1-5-89

Highland Roadway Status Upgraded

The Highland Scenic Highway in southeastern West Virginia has been designated as a National Forest Scenic Byway, Sen. Jay Rockefeller, D-W.Va., said Tuesday.

The highway, which lies entirely within the Monongahela National Forest, begins on W. Va. 39 at Richwood, travels through the North Fork of the Cherry River Valley, to the Cranberry Mountain Visitor Center, and then along Route 150 to the junction of U.S. 219 seven miles north of Marlinton.

The Charleston Gazette, 12-20-88

Legislation Strategy

(continued from page 1)

cies, environmental organizations are wondering whether the new Governor will see the need to reestablish the former Department of Natural Resources as a consolidated environmental agency or if he will continue the bifurcation begun under the Moore administration. Carl Beard's retirement from the Air Pollution Control Commission, removes a strong opponent to the creation of a completely consolidated environmental agency. Many people on all sides of the issues are talking about consolidation of the agencies.

Last year, predicting the hot topics was fairly easy. The administration had its agenda, including the Underground Storage Tank Act, DNR reorganization, repeal of the Community Right-to-Know Act, a Groundwater Regulation Act (which would allow pollution up to the standards promulgated by the Water Resources Board and some kind of solid waste legislation).

The Conservancy's effort led to defeating the repeal of the Community Right to Know Law, positive amendments to the DNR reorganization bill (which did not pass), oversight of the Underground Storage tank bill (which did pass), and strengthening of the Solid Waste Management Act, including the creation of fees to implement the law, the creation of an open dump cleanup fund (which DNR has not yet implemented), the retention of the Solid Waste Authority and other provisions. In addition our participation in the Groundwater Coalition resulted in a standoff between the environmental community's Groundwater Protection Act and the Department's Groundwater Regulation Act.

Last year's success was due to coordinated efforts with other environmental

organizations, particularly on the Solid Waste bill. Coordination takes time, and not only produces greater results but can allow the Conservancy more flexibility to cover issues it may be more interested in by having someone else cover hearings of mutual interest. This year, the Conservancy has fostered greater cooperation with other environmental groups and has been attending meetings by Speaker of the House, Chuck Chambers.

Out of these discussions emerged the idea that the environmental community should set its own agenda and begin work on it, rather trying to figure out what others may do and react to them. The Conservancy, therefore, is working with other environmental groups to develop a coordinated agenda for the upcoming session. Along with four other environmental organizations, the Conservancy has agreed to sponsor a meeting to set an agenda on the upcoming Session. It will be held on Friday January 13, 1989. Co-sponsors of the meeting are: West Virginians for A Clean Environment, the Groundwater Coalition, the League of Women Voters and the Sierra Club of West Virginia. At that meeting, a consensus will be developed on the top three or four environmental issues. Strong contenders are: a groundwater protection bill; mandatory recycling and source separation; a Statewide EPA and a citizens environmental protection rights bill.

Not only will the meeting develop an agenda, but we will hold a press conference after the meeting and follow it with a request to speak with the newly inaugurated Governor. The meeting, press conference and coordinated effort is long overdue in West Virginia.

Please give me any ideas you might have.