

EPA JOURNAL

A black and white photograph of a dry, cracked earth surface in the foreground, with a body of water and hills in the background. The cracked earth is composed of large, irregular polygons, some of which are covered with small, light-colored patches of vegetation or debris. A single, dried, leafless branch lies across the cracks in the lower center. In the background, a calm body of water stretches across the middle ground, with a range of hills or mountains visible on the horizon under a clear sky.

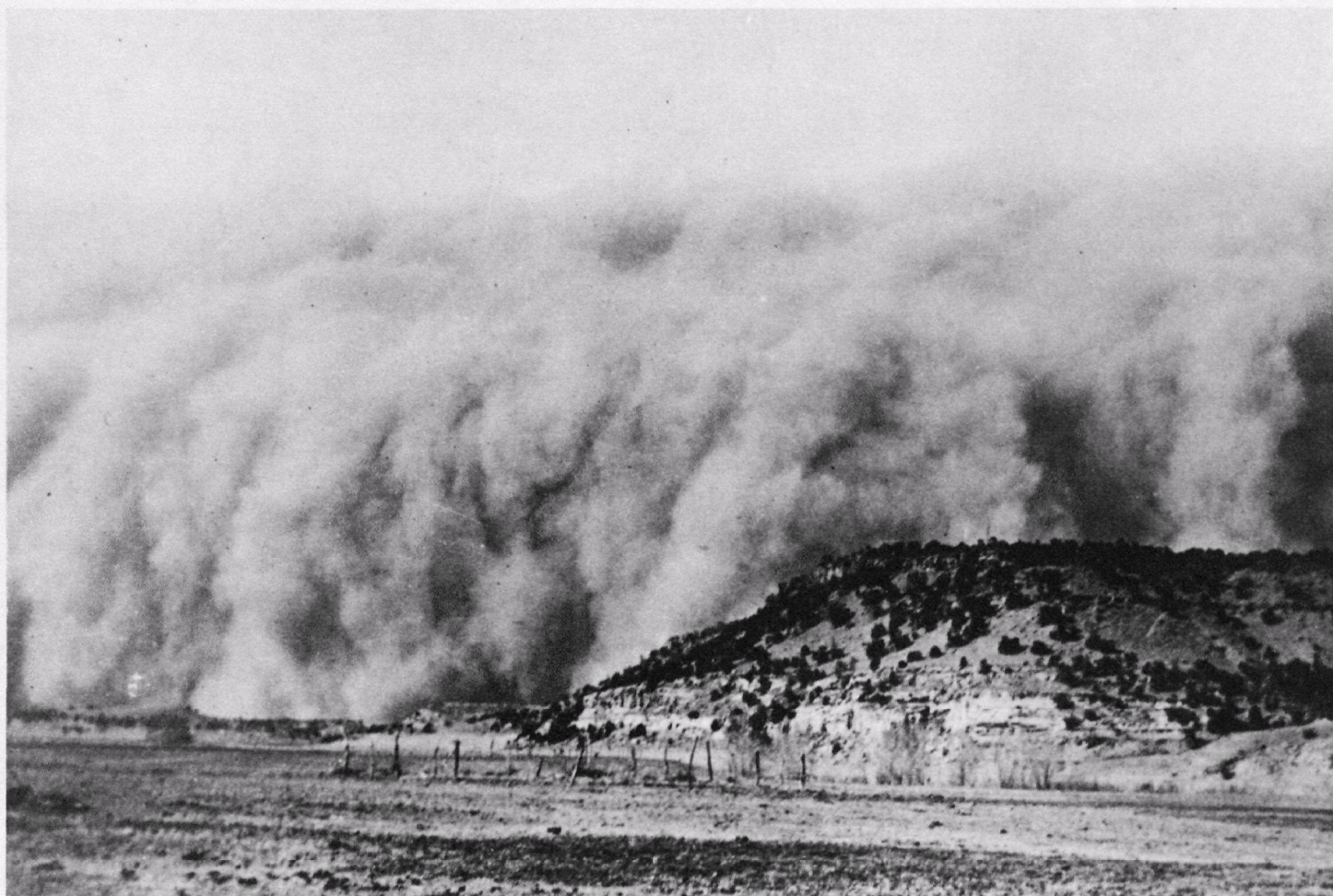
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SOIL AND POLLUTION

U.S. ENVIRONMENTAL
PROTECTION AGENCY

SOIL



An example of the damage that has been caused by mistreatment of the land is this huge dust storm photographed on the Colorado plains in 1934.

The Earth is the mother of us all. Everything our bodies need except air and water comes from the Earth.

As Administrator Douglas M. Costle points out in an interview with the Journal "we survive in a very fragile system. The first few feet of the Earth, the water on the surface of the Earth, and a few miles of atmosphere represent a narrow band containing the requisites for our very survival."

Yet human beings often continue to treat our environment and the land harshly. This issue of the Journal examines some of the consequences of our actions on land and what can be done about it.

One thing we can do very little about is the drought which has gripped the West. An article examines the effect of this drought on air and water pollution problems.

Eckardt C. Beck, Deputy Assistant Administrator for Water Planning and Standards, dis-

cusses erosion and what EPA is doing to help deal with this and other sources of non-point pollution.

Other articles involving the soil give an overall description of the non-point pollution problem, review the no-till farming technique, describe the problems of potato farms in Maine, report on what is being done to reduce pollution from dredging, and provide information about a loan program designed to reduce farm pollution.

John R. Quarles Jr., former Deputy and Acting Administrator, has given the Journal some of his thoughts about where the environmental movement has been and where it is heading.

A new development in the pesticide field is reported in our back cover story. Researchers of the Interior Department's Fish and Wildlife Service report that a chemical has been found that will protect cherry orchards from hungry birds while harming neither the fruit nor the birds. ■

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ENVIRONMENTAL
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AGENCY

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Cover: The bones of a fish are left behind
as the water recedes from the dry and
cracked floor of a reservoir in Marin
County, Calif. Photo by Black Star.

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ARTICLES

NEW DIRECTIONS FOR EPA PAGE 2

An interview with Douglas M. Costle, the Agency's
new Administrator.

DROUGHT AGGRAVATES POLLUTION PROBLEMS PAGE 4

A survey of air and water problems caused by the
drought in the West.

SOIL AND POLLUTION PAGE 6

An interview with Eckardt C. Beck, Deputy
Assistant Administrator for Water Planning and
Standards.

NON-POINT POLLUTION PAGE 8

Guidance for curbing erosion at construction sites.

NO-TILL FARMING PAGE 10

A new technique helps protect the land.

HELPING POTATO FARMS PAGE 12

Plans are being developed to reduce the erosion from
potato growing in Maine.

DREDGING PAGE 14

An effort is being made to reduce pollution from
dredging wastes.

LOANS TO REDUCE FARM POLLUTION PAGE 15

Farmers are now eligible for loans to control water
pollution.

THE ETHICS OF WASTE AND THE ETHICS OF CARE PAGE 22

Reflections by John R. Quarles Jr. on the future of
the environmental movement.

PROTECTING THE CHERRIES BACK COVER

DEPARTMENTS

ALMANAC PAGE 17

NATION PAGE 18

PEOPLE PAGE 20

UPDATE PAGE 21

NEWS BRIEFS PAGE 25

NEW DIRECTIONS FOR EPA

An interview with Douglas M. Costle, the Agency's new Administrator.



Q: What is the future of EPA?

A: I think, on balance, the future is quite good. We have problems, to be sure, but the American public's perception of environmental problems has matured. There has been growing, not diminishing, concern about the impact of the environment on our daily lives and the fragile nature of the environment which sustains us. There is also growing, not diminishing, concern about the human health problems associated with involuntary exposure to environmental contamination.

EPA is still a very young Agency by anybody's standards. We have only begun to solve some of the environmental problems and there are many others that we're only now becoming aware of. So I would expect EPA to be around for quite a while and I think we're about to move into a period which will present an enormous opportunity for the agency.

First, our knowledge base is expanding very rapidly. We now understand a great deal more than we did six years ago when this agency first started. On the one hand, that makes the problems look more complex and difficult to solve than they did when the Agency was established six years ago. On the other hand, we have a better knowledge base from which to address those problems.

Second, certain major legislation that we administer is up for renewal this year—the Federal Insecticide, Fungicide and Rodenticide Act, the Federal Water Pollution Control Act, and the Clean Air Act. There are major Congressional oversight reviews going on right now. So there is an opportunity for midcourse correction. I think an Agency as young as this one and dealing with as complex a set of problems as this one does need to make adjustments and evolve as it goes.

Finally, we don't want to be in a position of not seeing the forest

for the trees. We have gotten deeply enmeshed into the enormously complex details of carrying out our job, but the reason for our coming into being six years ago hasn't changed. We still recognize the limitations on man's ability to alter his environment without incurring intolerable damage.

Q: What priorities are you going to set for this Agency?

A: I think the critical nature of the problems we are trying to deal with determines the priorities of this Agency. And as our knowledge of environmental problems improves, our priorities will probably change.

In any event, we alone do not set those priorities. Congress has a major role to play in establishing priorities. As we go through this year of consultation with Congress, as they look at our major legislative acts and as we begin to implement the new Toxic Substances Act we will be resetting priorities.

Q: Is the environmental movement fading?

A: It may seem so to people in Washington, but I think that's only because they feel the pressure of organized groups who in turn are beginning to feel the direct impact of EPA's actions. When you get outside of Washington and talk to people, you find their concern has not diminished.

In Arizona, for example, the State Legislature gave serious consideration to withdrawing the auto inspection and maintenance system, but the voters decided in a referendum to leave it in place.

A poll was taken recently in Denver by one of Colorado's senators on what problem bothered people most, and the response was: air pollution. As I travel around, it seems clear to me that people's interest in environmental protection hasn't abated one bit. I think there is more concern about the impact of our actions in attempting to deal with these problems, but the average people outside of Washington have not lost sight of the fact that the government must take action. This is fortunate because I think broad-based public support for EPA's actions is absolutely essential. And that places a special burden on us to make clear to the public what we are doing and why we are doing it.

Environmental issues tend to have very immediate local impact. The average citizen can see them. They are not something remote and off somewhere in Washington. Power plant siting, industrial siting, urban development questions—these are issues that people are concerned with and that they want to get involved in helping to solve.

Q: Will EPA become part of a new or existing Federal Department?

A: As you may know, when the Ash Council deliberated on setting up EPA, I was the principal staff advocate for a separate independent agency. I have not changed my position on that.

President Carter has said that he is going to look at the entire Federal Government to determine whether reorganization would improve the way in which the government does its work.

I have been categorically assured, however, that the issue has not been prejudged. I think there are good reasons why EPA was set up as an independent agency. Its policies and in particular its standard-setting function intersect with the activities of a wide variety of departments. At the time the Ash Council made its decision, it was clear that you could argue that EPA could be placed in any of a number of Cabinet departments. For example, because of the health effects of pollution, HEW might have been a



Costle notes that photographs like this one of earth taken from outer space "drove home the fact that we must live within the limits of our own life support system . . ."

logical place to put it.

Because we are concerned about air and water as natural resources, an argument could be made for putting it with the Interior Department. Some would argue that, because pollution impacts so heavily on cities and large urban areas, the Department of Housing and Urban Development would be a logical place to put EPA.

In fact, virtually every existing cabinet department, perhaps with the exception of the Treasury and Justice, could argue that there is a reasonable relationship between what they do and what EPA does.

It was that very fact which led the Ash Council to decide that EPA indeed ought to be independent. They judged at the time that the EPA standard-setting responsibility was the critical function that EPA would perform—that is, setting the rules of the road.

But that standard-setting function had to be performed in the most objective way possible, and a variety of perspectives were relevant: The health perspective, the urban perspective, the economic perspective, the national resource perspective. So the Council determined that that standard-setting judgment should not be biased by any one of these perspectives to the disadvantage of others, and in order to insure that, they concluded that EPA should be an independent regulatory agency.

And they were concerned that putting EPA into a cabinet department might result in tilting that standard-setting judgment in the direction of whatever perspective represented the dominant theme or mission of that department.

Frankly, I have seen nothing in the past five years that would change my mind that that original judgment was sound. In fact, I think the evidence today tends to vindicate that judgment.

Q: What do you think of the record made so far by EPA in its first six years?

A: I think it is a commendable record. Given the size and complexity of the task and the crisis atmosphere that surrounded the creation of EPA—the Agency's record and progress today is exceptional.

I don't think anybody here at EPA that I have talked to has any

doubts about the magnitude of what remains to be done. While the progress has been exceptional, it's clear that we have really only begun the task.

As EPA has sought to enforce the law and apply the law, it is causing change. And society resists change. So there have been times in the last six years when it seemed as if everybody was out gunning for EPA.

EPA has come through that remarkably well. I would attribute that primarily to the fact that it has tried to do its homework and it has always conducted itself in a professional manner. I think all of this Agency's success or failure will turn on the professionalism of the staff.

Only by doing our homework and being thoroughly professional can we cut through a lot of the rhetoric of reaction. Our credibility must be unassailable if we are to win public support for the very hard decisions that are required in solving environmental problems.

Q: Are you concerned about morale at EPA?

A: Ultimately the morale of the Agency depends on not losing sight of why we're here, on having a sense of pride that we're doing the very best job we can, and, finally, on the satisfaction of knowing that we do our homework better than anyone else, and that what we do counts.

Q: Do you plan to reorganize the major program elements in the Agency?

A: Any institution has to evolve as it grows, and its own conception of the job changes. Reorganizations are always difficult and should only be undertaken when a clear and compelling case for them can be made. I do not expect to be making precipitant changes, and any changes that are made will be made only after I'm satisfied that the benefits clearly outweigh the inevitable turmoil that reorganizations cause. I am particularly mindful of the fact that EPA has been through several internal reorganizations and that at some point things have to stabilize a bit so people aren't always having to look around to get fresh compass bearings.

Continued on page 16

DROUGHT AGGRAVATES POLLUTION PROBLEMS

Lingering drought in the West is aggravating both air and water pollution problems.

One result is that some States are considering attempting to modify their pollution standards to permit waivers for violations during the drought, a survey of EPA Regional Offices disclosed.

Severe dust storms in Oklahoma and other parched areas have raised fears of the possibility of the recurrence of another Dust Bowl. Many small streams have dried up, and some rivers are at century-low levels. The critically important mountain snow packs which provide the melt-off that would ordinarily fill streams and replenish reservoirs are far below normal levels.

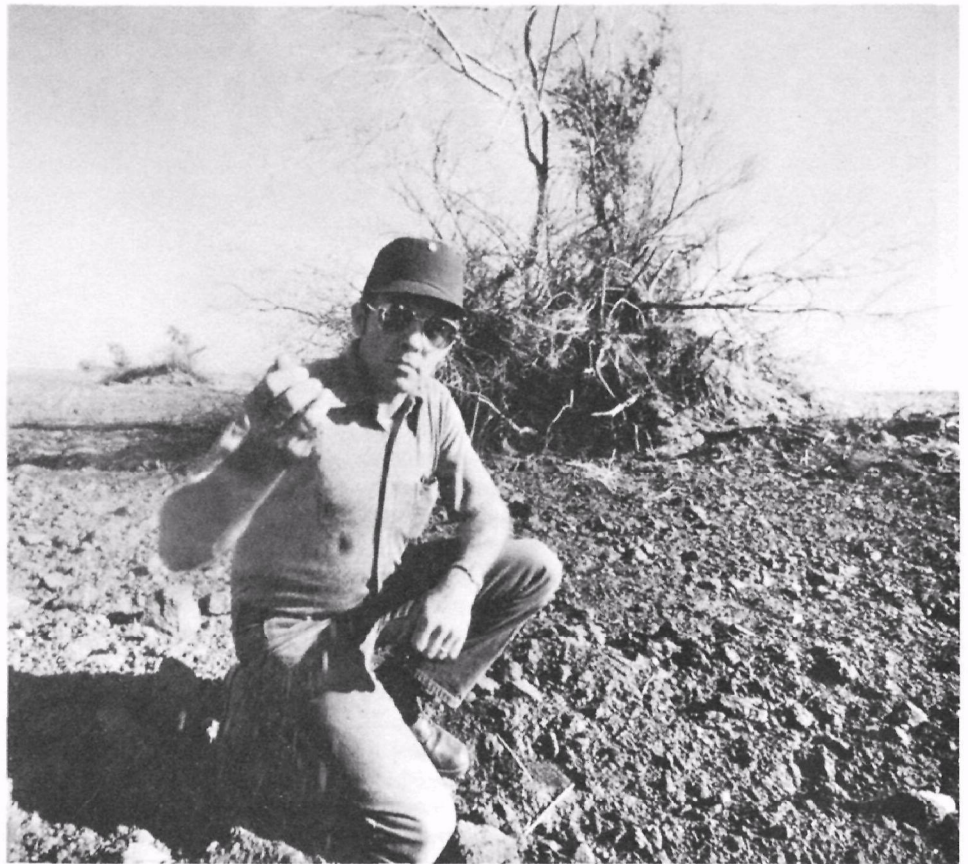
Much of the concern in the arid regions of the West is over the conditions that may develop this summer if the dry weather continues, rather than over what has already happened.

Nevertheless, highways in several Western States have been temporarily closed because the blowing grit has made car travel so risky. In eastern Oregon and eastern Washington drivers have had to turn their headlights on in the middle of the day as they groped through the dust-filled air.

In western Kansas some farmers have hesitated to go outside at times because the air was so black with dust, and some farms in Colorado have lost several tons of precious topsoil off each acre of their land during severe storms. Blowing dust has contributed to a rash of traffic accidents in parts of California's San Joaquin Valley where interstate highways slice through parched farmland.

In Nebraska, drought for the third straight year has disrupted efforts to cleanse the air. In an article headlined "Drought Gums Up Efforts to Cleanse Nebraska Air," the Omaha World-Herald reported that most of the State's air sampling stations showed more particulate pollution (dust and other fine materials) on the average in 1976 than in 1975 even though the State's industries are continuing to reduce their air pollution load.

California has suffered its driest winter in history and many counties are already ration-



ing water or asking for voluntary curtailment.

As the flow of fresh water from the Sacramento and San Joaquin Rivers into California's rich agricultural Delta lands lessens, salt water from San Francisco Bay pushes in.

Two-thirds of California's population gets at least some water from the flow through the Delta. The importance of this source is underscored by the statement by a California Department of Water Resources official that "If you were to take California's water pulse, you'd put your finger on the Sacramento-San Joaquin Delta."

A Region IX official reports new problems are developing because the restricted water use is lessening the flow into water treatment plants while at the same time waste concentrations are higher.

A biologist shows how parched topsoil is easily gone with the wind.

Other possible drought impacts being closely monitored by Region IX are:

Whether the 40 to 60 percent cutbacks in crop plantings in the San Joaquin and Sacramento Valleys will leave more land with no cover and therefore a contributor to dust pollution or will a reduction in plowing ease the air particulate problem?

Whether the substantial reduction in the planting of rice will have a significant impact on the amount of particulates from the fall burning of rice stubble in the fields?

Whether shutdowns by some industries because of the shortage of good water will have an appreciable effect on the Region's air pollution problems?



Will the low levels of water in reservoirs reduce their use for swimming, boating and other water recreation activities and therefore the pollution from automobiles traveling to these sites?

How much of an increase in the air particulate problem will be caused by more forest fires in the parched forest lands?

In the Pacific Northwest, Region X reports that if the winter wheat crop doesn't sprout, there will be increased soil erosion washing into the Region's waterways.

The Willamette River has reached a 100-year low and water quality violations are expected this summer. The Oregon legislature is considering whether to modify its pollution standards to provide for drought violation waivers.

Region X has established a task force to review options for possible assistance it can

provide to the States in this Region.

In the Middle West, Region VII reports that approximately half of the air quality areas in the region show violations of the particulate standard caused by wind-blown dust.

In many areas shelter belts of trees planted between fields in the 1930's have died or been removed. As a result, these lands are much more exposed to wind erosion.

Some of these shelter trees were ripped out so more crops could be planted and others were removed to make room for the long arm of an irrigation machine which travels in a circular path around a center pivot.

From Denver, Region VIII reports that the dry soil conditions are stimulating more interest in a new farming technique called "No-till." Under this system, the ground is disturbed as little as possible. Violations of

Windbreaks like these on a North Dakota farm were widely planted after the 1930's Dust Bowl days. Now fields may be blown away again because some farmers have cut down the shelter trees to increase their crop acreage.

particulate standards because of dust are also reported in this region.

Some EPA regions express concern that the severe financial losses from the drought may cause State revenue declines, which could in turn impair funding for pollution control, particularly in the smaller States.

One positive impact of the drought seen by EPA regional officials is that it should lead to better water quality management systems in the West. ■

SOIL AND POLLUTION

Interview with Eckardt C. Beck, Deputy Assistant Administrator for Water Planning and Standards.

Q: Why is erosion so harmful?

A: When the soil erodes, it not only reduces the productivity of the land necessary to feed and clothe our Nation, it results in water pollution. Sediment from soil erosion is a pollutant itself and carries with it pesticides, nutrients, pathogens, and other pollutants. As we do a better job of regulating point sources of discharge from municipalities and industries, nonpoint sources of pollutants, such as erosion, will become relatively more important. In fact, unless we can do a much better job of controlling sediment and other pollutants that are being washed into our streams and lakes, there is little likelihood that we can reach the clean water goals which all of us want.

Q: How much erosion is there in the United States?

A: About 4 billion tons of sediment reach our streams each year. About 30% may be from natural causes such as geologic erosion, 50% from agricultural land, another 10% from range and forest land and the remaining 10% from disturbed areas like roadbanks, construction, and surface mining. The single greatest cause of pollution remaining after our municipal and industrial sources are cleaned up, will be this sediment.

Q: What role should soil and water conservation districts play in the increased efforts to stop pollution?

A: They should be, and in most cases are, actively involved in developing a portion of an areawide plan under Section 208 of the Federal Water Pollution Control Act to help prevent soil and other nonpoint source pollution. One way of viewing the 208 program is to consider it a funding mechanism to allow organizations with particular expertise to participate in water quality management. In fact, the soil and water conservation agencies in 32 States have specific responsibilities for this effort. In 14 States local conservation districts have agreements with areawide planning agencies. With their 40 years of experience in soil and water conservation, we think they are uniquely qualified. Most important, districts are managed by local people who understand local problems better than anyone else. Since districts are also responsible for helping landowners establish nonpoint source control measures, we believe their role will continue to be important.

Q: Are land use controls a feasible method of controlling erosion?

A: Yes. Land use controls are already in effect in many areas through State, county, and municipal laws. Every coal-producing State has regulations on how mined land will be reclaimed. In 16 States land use controls have also been established for construction activities. Many communities and States are considering programs to control sediment and other pollution in their 208 programs.

Q: Are Federal regulations needed to control soil and nonpoint source pollution?

A: Yes, in some instances. For example, the solid waste legislation passed last fall will require that States take action to close down open dumps. The proposed strip mine reclamation act would have a strong regulatory program. However, in many situations, local or State regulation will be the most effective means of controlling nonpoint source pollution. The idea in 208 water quality management is to look at all of the means that exist at the Federal, State, and local levels of government and to put together the most effective package of programs required to get the job done.

Q: What level of government is in the best position to control soil and nonpoint pollution generally? Federal? States? counties? special districts?

A: As I indicated previously, the real answer lies in using the best mix of government required in a particular circumstance. In certain States where the "Home Rule" concept is strong, local governments may carry more of the implementation role. In other situations where State government has historically exercised a greater responsibility the State will play the lead role. The public lands, such as the national forests and national parks will of course require action at the Federal level. In many cases, the job will be a cooperative one in which the State will share its responsibilities with local government. For example, in Iowa local soil conservation districts have the major role in implementing the State sediment control law. However, when an action is required against a landowner who violates the law, the State has the enforcement responsibility.

Q: Do you think that current soil and water conservation practices result in significant water quality improvements?

A: Yes. Much has been accomplished by the application of soil and water conservation measures. The planting of grass on over two million acres along waterways; construction of 1.5 million miles of terraces; building of 100,000 disposal lagoons and debris basins; and a host of farming practices have resulted in improving our water quality. Much work remains to be done. We believe these land management and conservation control measures need to be improved to control, not only sediment but also other pollutants such as nutrients and pesticides. Much of our research activity is concerned with these problems.

Q: Are local government controls now in effect dealing adequately with erosion problems from construction?

A: Not in all cases. Maryland is an example of a State where local governments are doing a good job. The program in Montgomery County, Maryland, is one that is being used as a model in many other areas. However, we still have a big task of education in many areas of the country where the pollution problems resulting from construction are as severe as in Maryland but State and local governments are not ready to deal with the issue.

Q: Is erosion from such construction as road building, new housing developments, and fac-

tory building a serious problem?

A: Yes. Some of the most glaring examples of serious erosion can be seen where new construction is under way. While the construction industry is doing a better job of pollution control, a lot more must be done. We know how to control erosion. Industry must recognize that erosion control is as much a cost of doing business as any other phase of their operation. We have made a lot of progress in certain areas, such as the examples I have used in describing the Maryland program. Another area where we have improved a lot in recent years is the Federal sponsored highway program. We are happy with the progress being made. And we are also working hard to see that progress continues and in fact, improves.

Q: Will steps proposed by EPA require expenditures that will drive small farmers from agriculture?

A: Farmers are applying many control measures at the present time. We expect State and areawide agencies to develop programs which are practical and do not require a heavy investment.

Q: What part does economics play in developing best management practices for croplands and open range land?

A: A very important part. Farmers can apply sediment control measures and adopt management techniques only when they are within their economic means. In some situations, financial assistance is available to help landowners to install these needed measures. This assistance has been a part of USDA's program for many years. We believe it can be a useful tool in helping to get better water quality control measures installed on farm lands.

Q: Will we require practices controlling erosion on Federal lands that are leased by the U.S. Government for grazing of cattle and logging?

A: Yes. Control measures that are required must be applied whether the land is under public or private ownership. We have been especially pleased with the willingness of the Forest Service to cooperate not only with EPA, but also with State and local governments in carrying out the water quality goals set forth in the Federal Water Pollution Control Act.

Q: We have had conservation efforts by the Department of Agriculture since the 1930's. Why haven't these efforts been sufficient to protect water quality?

A: Early conservation efforts have helped to protect water quality. However, many of the early efforts in sediment control centered on protecting the land's productive capability. Now we need to concentrate on those measures which will not only prevent erosion but will also control other pollutants.

Q: Which States have regulations controlling erosion in order to protect water?

A: Most States have regulations or ordinances that attempt to control erosion from some types of land use. Most States are trying to control erosion from surface mining operations and certain types of construction activities. The States leading the way are Maryland, Iowa, and Pennsylvania. Pennsylvania law provides for control of sediment from all types of land use, including agriculture. Beginning in July 1977 farmers in that State will develop conservation plans for their farmlands as required under that State's Clean Streams Law. Of course our interest is in how well the laws are implemented. Unfortunately in some States the good intentions of new legislation have not been fulfilled. Programs are not being implemented. That is why we are putting so much emphasis on the management part of the Section 208 program.

Q: In terms of cleaning up the Nation's waste,

EPA placed its first emphasis on controlling pollution from cities and industries. Why was this?

A: The Act set a very tight deadline on municipal and industrial point sources of pollution. We responded to meet that deadline and have been quite successful. In the nonpoint source area Congress recognized that the problem was more complex and some time must be spent to get a better idea of the size of the problem and to come up with new ideas on how to tackle nonpoint source pollution. This is being done through the Section 208 water quality management programs currently under way. State and local governments have the major responsibility for carrying out a nonpoint source program. I think States are especially pivotal in this program and we will do all we can to assure their success.

Q: What general program is EPA pursuing to deal with soil and other nonpoint source pollution?

A: We are working with the States and local governments to help them determine these controls for themselves. They are to develop the best management practices appropriate for their situation and decide how they can best get these applied. We are working with the existing organizations and agencies to use delivery systems that are already in operation as much as possible. We will continue to provide management assistance to the States and 208 agencies and grant funds where they are needed to get the job completed. Another important task that we have is to coordinate activities of other Federal agencies who can also help us to get the job done.

Q: How serious is the water pollution stemming from range and croplands?

A: Sediment and the related pollutants that come from range and cropland are very significant. The majority of these pollutants come from cropland planted to row crops such as cotton, corn and soybeans. As I stated earlier, our estimate is that as much as 50% of the 4 billion tons of sediment reaching our streams each year come from agricultural land. Since the average amount of cropland in the U.S. is expected to increase in the future, the water quality problems from sediment and erosion will become greater unless we take pollution control measures now.

Q: What steps will EPA be fostering to achieve control of agricultural pollution?

A: EPA will be supporting an agricultural pollution control program with several elements. First is the need to have broad farm community support. A strong information and education program will be needed. We also have to continue to support management assistance that farmers are now receiving, such as through their local soil and water conservation districts. The biggest task is to assure that State and local agencies developing 208 programs come up with practical programs we can quickly implement. Where needed, we will encourage State and local agencies to acquire the needed regulatory programs to assure that the needed control measures are established.

Q: With the increased pressure to grow more food crops isn't there a danger that land with the most erodible soil will now be farmed? What can be done about this?

A: Definitely. This has already happened. In the early 1970's, when demand and price of farm products went up, a lot of land that was in grass and trees was planted to corn or wheat or soybeans; land that was very erodible. What can be done about this? We don't want to restrict the farmer's freedom to respond to the market demands. We do want the States and areawide 208 agencies to identify the best management practices that are needed and develop a program to assure that appropriate control measures are established. ■

NON-POINT POLLUTION

Most of EPA's actions to control water pollution have dealt with reducing pollutants at the points where they are discharged: sewer outfalls and factory waste-pipes.

But waterways are also degraded by pollution from spread-out, diffuse areas that have no discrete points of discharge. Rainwater falls on land and drains downward to the nearest stream, picking up silt and dissolved material as it goes.

Much of such pollution is natural and inescapable. It has been going on for millions of years, eroding mountains, creating fertile bottom land, and salting the sea. When man interferes with the natural plant cover on the land, however, the amount of silt washed into the rivers increases and new hazardous pollutants are added to the runoff: pesticides and nutrients from farmland and residential areas, poisonous heavy metal compounds from city streets, oily wastes and chemicals from industries.

EPA officials estimate that 50 percent of all water pollution comes generally from such "non-point" sources. It is harder to control than that from point sources. We cannot—and don't want to—stop the rain from falling. But we can take steps to reduce the damage from rainwater runoff (and wind-blown dust) whenever we try to alter the land.

The first of five guidance documents for non-point source pollution control was published in December by the Office of Water Planning and Standards. The 117-page illustrated book, compiled by Robert E. Thronson, Project Officer, concentrates on construction activities: controlling pollution from highway and bridge building, real estate developments, industrial parks, airports, etc.

Similar documents will be published soon on nonpoint source pollution control for forestry, agriculture, mining, and stream alteration.

These guidance documents are not EPA regulations, Thronson said, but aids to State and local environmental agencies—especially the areawide water quality planning bodies that operate under Section 208 of the Federal Water Pollution Control Act—in identifying

and solving their local problems with non-point source pollution.

There are now 176 regional agencies in 52 States and territories that are engaged in the 208 planning program, using \$217 million in EPA grants.

Construction activities are a major cause of runaway runoff, Thronson said, affecting about 1.6 million acres of land each year. If no erosion control measures are taken, from 35 to 1,000 tons of soil can wash off in a year from an acre of land cleared for building purposes. Sediment from construction sites contributes an estimated 7 percent of the annual silt load in American rivers.

The downstream damage from such sediment includes the filling up of reservoirs, harm to aquatic life, clogging of navigation channels, flooding, and increased costs for treating river water used for drinking.

Other pollutants beside sediment can be carried by runoff from construction sites: petroleum compounds improperly stored, pesticides, and fertilizers used for cover plantings, and a variety of industrial chemicals associated with construction machinery.

The best control lies in preventive planning that is tailored to each site, its geography and contours. Such methods try to: (1) limit the time that ground is laid bare to rainfall; (2) cover and hold soil in place by mulches, mats, or fast growing grasses; (3) construct drains at shallow angles to slow down runoff; and (4) create barriers, embankments, catch basins, and other devices to hold sediment on the site.

All these methods are good engineering practices, long known to builders but not always used to best advantage.

The EPA report summarizes these practices and illustrates most of them with photos or drawings. Many different Federal agencies and private civil engineering groups have contributed to their development. The Department of Agriculture's Soil Conservation Service has developed ways to predict soil loss for different types of soil, land grades, and rainfall conditions. The National Weather Service provides data on the rain or snow that may be expected in any area, and,

of particular interest, the maximum storms that can occur. Ground water information is available from the U.S. Geological Survey. Other pertinent information is culled from publications of the Federal Highway Service and various engineering bodies.

The guidance document is not itself a technical manual, but for all the pollution control methods it lists, detailed references are given where planners can obtain more specific information.

Good housekeeping and common sense are the keys to keeping pollution to a minimum at construction sites, Thronson said.

Oils, chemicals, fertilizers, once they get dissolved in runoff water or attached to fine-grained sediments, will pass through all sediment control barriers and reach the downstream waterway. Proper storage and careful use of these pollutants by the builders is essential to reduce their potential for environmental damage.

Keeping silt and sediment on the site to the greatest extent possible is simply good engineering. No road builder wants his embankments and supports washed downstream. No real estate developer wants to lose all his topsoil.

Only a builder who was very short-sighted would regard saving the soil as a burdensome cost, said Thronson. Sediment control costs vary widely according to the type of land involved, the kind of construction, and natural erosion rates. Recent data from developers and contractors in Maryland and California indicate that the average cost at residential sites is \$1,125 per acre. Control actions included here are sediment collection basins, diversion barriers, sodded ditches, seeding, and straw mulch. For industrial and commercial development the cost would tend to be higher, Thronson said.

But the value can be immense. More than \$125 million is spent each year to dredge sediment from harbors and waterways. An unknown but substantial portion of this dredging could be prevented. Sediment in reservoirs accounts for about \$100 million worth of lost capacity each year for hydro-power, water supply, flood control, and recreation.



Tractor and equipment partly covered by drifting soil during the Dust Bowl days in Oklahoma.

Erosion and flood waters ruin a new highway near Morrison, Colo.



And at the local community level, sediment deposited on streets from construction project runoff costs about \$8 per cubic yard to remove, and 8 to 10 times that much for sediment removal from sewer pipes and basements.

Sixteen States have sediment control laws that apply to construction. Most of them require prior approval of a control plan for the work. The guidance document follows the general format of these State laws.

The document, "Non-point Source Pollution Control Guidance—Construction Activities," may be obtained from the Office of Water Planning and Standards, Non-point Sources Branch, WH-554, EPA, Washington, D.C. 20460. ■

NO-TILL FARMING

A relatively new farming technique that reduces the amount of plowing of fields is saving money for farmers and is helping to conserve America's soil and reduce water pollution.

EPA is encouraging use of this approach in water quality management plans being developed by State agencies under Section 208 of the Federal Water Pollution Control Act. The Agency offers technical assistance to State and local 208 planners, and grants funds for the development of plans that will cut pollution.

"Minimum or no-till farming methods will certainly be one of the best management practices adopted at the local level in many Section 208 water quality programs," said Joe Krivak, Chief of EPA's Nonpoint Sources Branch.

To succeed, this method requires a special planter. The advantages of reduced tillage can include up to a 95 percent reduction in soil lost through erosion, according to Leon Kimberlin, chief agronomist with the Soil Conservation Service (SCS). "Reduced tillage also offers great benefits in reduction of energy use," he said. "No-till farming can save over 50 percent of the fuel used by a farmer's tractor."

Krivak indicated that many progressive farmers have been using some form of minimum tillage for a number of years, and there is ample evidence that the practice has resulted in less erosion and sediment.

Reduced tillage is being used in an Idaho project that is credited by SCS officials with cutting erosion by 75 to 90 percent. EPA has granted \$95,000 to the project, through the State of Idaho, to monitor the effectiveness of the management practices being used. The project stems, in part, from a sediment control institute sponsored by EPA. From 1972 to 1974 such institutes were held in 40 States under Water Planning Division grants to the National Association of Conservation Districts.

A farmer who practices no-till farming doesn't plow the fields in the traditional manner. Instead of plowing, harrowing, planting, and cultivating, the no-till farmer



uses a machine that plants through existing plant cover and previous crop residues. The planter opens a narrow slot, deposits the seed, and closes the opening in the same operation. The residue of the previous crop or cover crop form a protective mulch to hold the soil in place.

In another variation, called strip tillage, the farmer uses a machine that tills only the narrow strips in the rows that are planted, leaving the areas between the row strips covered with mulch. Less bare earth is exposed to the ravages of wind and rain, so erosion is cut by a considerable amount. Reduced tillage, whether no-till or strip till, uses fewer man and machine hours to produce a crop. It also preserves the soil structure against compaction that can result from many trips of heavy machinery traveling over the fields.

The protective mulch can be cornstalks, soybean stubble, small grain residues or the existing sod of grasses and legumes. The mulch conserves moisture, and keeps the soil

Corn making rapid growth after being planted in wheat stubble. Competing weeds were killed with herbicides at planting time.

cool during the summer months. Mulch however, can be the source of some problems as well, as it can harbor insect pests.

Farmers who use reduced tillage must rely on increased amounts of pesticides and herbicides to kill insects and to reduce weed competition. This results in increased levels of chemicals in the drainage from these fields.

Krivak cautioned against considering the practice as a cure-all. "It is only one of many practices that can be used, and it does not work for all soils," he stated. The EPA official indicated that he also believes more information is needed on the total environ-



Soybeans being planted in field which has not been plowed.

mental effects of minimum tillage, since the effects of the additional pesticide application usually required have not been evaluated.

Kimberlin agrees that "we do need to learn more about the effects of reduced tillage on the environment, but it is a very promising practice, if we can work out some of the minor problems."

Who uses reduced tillage? The Cooperative Extension Service of the University of Maryland at College Park reports that many Maryland farmers find it beneficial for their soybean and corn crops. Extension Agronomist Joseph L. Newcomer cites these reasons as given most often by farmers using

the no-till practices. 1. Yields more income. 2. Makes farming easier. 3. After a heavy rain or thunderstorm, the streams run clear. 4. In hot, dry summers no-till corn does better than conventional corn with the same rainfall. 5. Fewer trips over the field and reduced fuel costs.

T.H. Secor, an SCS official working with the Metro-Washington Council of Governments, says that in the Washington area some 80-90 percent of the farmers are using reduced tillage because of the economic incentives it offers. "We like to think it's because our farmers are more progressive," he said. "But they also save time and fuel. It helps them to cope with the shortage of labor and the high price of land."

Kimberlin estimates that 40 million acres of farmland in the U.S. now benefit from reduced tillage. "No-till is applied in most States when soybeans, corn, cotton, small grains, and grain sorghums are grown." It is especially adapted to well-drained soils and sloping cropland where erosion presents the

greatest problem.

"There are over 200 million acres of this kind of land in the U.S.," he continued. "Some problems with reduced tillage have developed on wetter sites where poorly drained soil is slower to warm in spring. This delays planting. There have been problems with wheat crops in the Northwest, and corn on the colder wetter soils."

A windfall of the reduced tillage method is the energy savings it can produce. In addition to cutting a large part of farmers' fuel consumption by elimination of additional tractor runs across fields in plowing, this technique saves energy on fertilizer production.

Fertilizer accounts for 23 percent of farm-related energy consumption. It takes 33,000 cubic feet of natural gas to make one ton of ammonia for nitrogen fertilizer. Agronomists estimate that approximately 10 pounds of nitrogen are lost in every ton of soil that washes away from farmland. By cutting soil losses, farmers are also saving energy for other needs. ■

HELPING POTATO FARMS

by Al Heier

The highway sign, "Aroostook County," brings the early summer visitor to a gently rolling countryside alive with tiny white blooms on plants carefully placed in row upon row and acre after acre of roadside fields. In this far northern county of Maine, the visitor has come upon a "Potato Empire" of the East. Here, in a small river basin are produced approximately 90–95 percent of all potatoes grown in the State. Here too is found one of the most serious soil erosion problems in Maine. Some of this fertile potato-producing soil loses up to 85 tons of soil per acre per year.

The effects of heavy rill and sheet erosion are evidenced by the turbidity in the Aroostook River which flows through the "Garden of Maine." To help deal with this problem, the Governor has designated an area in East Central Aroostook County for a special water quality planning and management program. Funded by a U.S. Environmental Protection Agency grant, the Northern Maine Regional Planning Commission was selected in 1975 to carry out a comprehensive planning effort to find a solution to the erosion problem.

Called a "208 Area," so named after Section 208 of the Federal Water Pollution Control Act, the Aroostook County program is under "one of the most dynamic, aggressive and innovative 208 agencies in the country," said Don Smith, EPA's Region 1 project officer for this planning effort.

Located in the most densely populated portion of the county, the designated 208 area includes two cities, Caribou and Presque Isle, plus seven towns and farms in the 281,000 acre-study areas. Of these 103,000 acres are intensely farmed cropland, with most of the remainder in a natural wooded state. Seven potato processing plants provide industrial employment for a major part of the population. Total urban and rural population in the 1970 census was 34,842.

Heier is a Headquarters Public Affairs Officer.

The cropland runoff has numerous consequences: roads and roadside ditches have occasional maintenance problems from the eroded silt; the Aroostook River collects much of the sediment which destroys aquatic bottom habitats; the downstream drinking water supplies for the city of Caribou need additional water treatment facilities to clean up turbid waters; silt destroys the trout spawning beds and reduces the number of trout that thrive further up stream in less turbid waters.

The economy of the community is predominantly dependent upon potato production and processing. The average per acre production is approximately 240 one hundred pound bags of potatoes. A more competitive and fluctuating market together with rapidly increasing farm costs have forced more intensified farming in the basin.

Due to the short growing season, 115–120 days, the soil is left barren during the winter months, increasing the possibility of excessive erosion during heavy spring rains. Potatoes are a row crop, which is also conducive to erosion.

"Conservation practices of farming in this area are not widely implemented," said Karen Cathey, a planner working with the 208 Agency. "A large number of farmers are living hand to mouth," she continued, "making it very difficult in the short run for the farmer to adopt crop rotation practices which would solve some of the problems."

The number of farms within the 208 area have decreased from 1,900 farms in 1954 to 500 larger consolidated farms today. The introduction of bigger farm machinery requires planting in longer straight rows, not conducive to reducing runoff. "They try to get every ounce of production out of the land," remarked Cathey. Because of the immediate economics of potato growing, "farmers take a short view" of some of the effective conservation methods such as more rotation cropping, diversion ditches, and planting grass on waterway banks, she stated. Such practices often take land out of row crop production and this is regarded as being economically unfavorable. Approximately

two-thirds of the farmland is planted annually in row crops for raising potatoes as well as some sugarbeets.

The Northern Maine Regional Planning Commission has conducted a detailed soil loss study by making field surveys on each of the farms in the 208 area. Soil loss was determined by the slope, amount of rainfall, soil type, and methods of cultivation. This study showed an average annual soil loss of 7.56 tons per acre of cropland. Two percent of the land showed a loss of between 50 and 100 tons per acre; 1.6 percent is in the 25–50 ton category; 17.5 percent in the 10 to 25 ton range; 57.9 percent in the 3 to 10 ton figure; and approximately one fifth or 22.7 percent is in the more acceptable 0–3 ton category. "The real danger lies in allowing these conditions to persist, causing not only water degradation but also a reduction in the economic base for viable economic commodity," noted a report from the Commission.

The soil loss study will assist the 208 planning agency to make a determination of future land treatment necessary to reduce soil erosion.

Presently, the rates of eroded sediments entering into the two major waterways, the Aroostook River and the Prestile Stream have not been determined. A Commission study on the Libby Brook watersheds in the town of Fort Fairfield, located on the Eastern side of the 208 area bordering New Brunswick, showed that 17 percent of the soil loss entered the Brook. Much of the eroded soil ends up covering adjacent land or in nearby wooded areas. While the study on Libby Brook, a tributary of the Aroostook River, cannot be generalized for the entire 208 planning area, it is conservatively estimated that over 117,000 tons of soil annually reach the brooks, streams and River in Central Aroostook County.

Another study of the Commission substantiates the economic dangers of continued soil loss. Aerial photographs taken over a period of years show that bedrock outcrops in the tilled soils are enlarging. A significant part of a decrease in potato production in the area is due to loss of critical top soil. Since the '50's, Maine has ranked second to Idaho in total



potato production.

A land use study conducted by the Northern Maine Regional Planning Commission in 1975 showed an estimated 29,400 acres of farmland in the 208 area have become idle in the past seven to 10 years. The predominant reason for this land becoming idle is the lack of fertile soil for growing cultivated crops, particularly potatoes. Other reasons for abandonment include: small tracts of once productive soils are now uneconomical to manage with today's larger equipment; land held for speculation or sold to non-farmers; soils on steep slopes difficult to farm with the larger machinery; the shallow to bedrock conditions which are not suited to heavy farm equipment, and soils with poor drain-

age. It is estimated that 6,000 acres of this land could be brought back into production quite easily. Much of the remaining productive acreage would be difficult to bring back into cultivation with today's economic conditions and the farmer's reluctance to manage small tracts.

The two-year study of the Aroostook River 208 area began in late 1975. A continuous effort is being made to get farmers involved, and several farmers are included in all the 208 planning committees. Farm organizations, county, and State agricultural agencies are all engaged in selecting the Best Management Practices necessary for controlling the erosion.

Since the planning effort of the Commission

is not complete final proposals are not known. However, to maintain a viable agricultural economy and clean up the waters, the need for increased use of cultural and structural conservation practices is evident. One such practice, crop rotation, includes potato production for two years, a grain crop the third year, a hay or legume the fourth year, followed by potatoes. This program provides some winter and early spring mulch cover, replaces needed nutrients and adds fiber to alleviate some of the erosion. Control of erosion to a tolerable level in the Aroostook County 208 area will depend upon many factors including economic resources and incentives as well as possible soil loss restrictions. ■

DREDGING

Each year millions of tons of dredged and fill materials are disposed of in U.S. waters. These materials usually consist of sediment, clay, rock, and other earthen substances. When carelessly discharged they can destroy productive, natural systems like tidal salt marshes; block migratory paths of fish like salmon; suffocate small organisms which dwell on the soft sea bottom, or carry toxic substances into the surrounding waters.

To help deal with this problem, EPA and the Army Corps of Engineers have formed a joint committee—the Technical Committee on Criteria for Dredged and Fill Material—to develop improved methods for evaluating the environmental impact of the disposal of dredged materials.

Dr. Frank G. Wilkes, Chief of the Process and Effects Branch at EPA's Environmental Research Laboratory, Gulf Breeze, Fla., is its co-chairman, along with Dr. Robert M. Engler of the Corps' Waterways Experiment Station, Vicksburg, Miss.

Last month, the Technical Committee released its first annual report, documenting its work toward the development of an "Implementation Manual." The Manual will revise and update interim guidance promulgated by the Corps in May, 1976, entitled "Ecological Evaluation of Proposed Discharge of Dredged or Fill Materials into Navigable Waters." It will provide improved methods to the Corps' District Engineers for making environmentally sound decisions about the

disposal of dredged and fill material.

To bring the Implementation Manual into circulation as quickly as possible, sections of it will be released as completed, after appropriate EPA and Corps review. The first such release is expected to be in July.

The annual report designates the following sections of the Manual as the three highest priorities for immediate development:

1 A method for predicting the effect of dredged material on sea-bottom life. Animals that dwell on the sea bottom, called benthic organisms, often play a vital role in aquatic ecosystems. The Committee's annual report states, "perhaps the single largest unanswered concern about dredged material disposal is the effect over many months on animals living in or on the deposited materials." A variety of tests, called benthic organism bioassays, will be included in the final manual. Each test will be designed to estimate effects under various circumstances.

2 A method for analyzing dredged material for contaminants. Sediment may contain such contaminants as heavy metals, pesticides, and other harmful substances. Through dredging and dumping activities, these pollutants may be released into the water. Currently, there are no manuals with detailed procedures for analyzing dredged materials for contaminants. According to the annual report, the Committee is therefore developing such procedures to be incorporated in the final Manual.

3 A method for identifying the boundaries of wetlands. In order to learn the limits

of the Government's authority in regulating the disposal of dredged material, the Committee is attempting to determine the boundaries of all wetlands in the United States. Wetlands are often surrounded by geographical areas which, like wetlands, support distinctive plant life. Such areas are called transition zones. The report states that "these zones . . . are poorly defined and are likely to be the areas most contested as to their identity as wetlands or non-wetlands. Criteria are needed to describe and determine the extent of transition zones around each type of wetland."

Federal authority for regulating dredging activities is contained in the provisions of two Acts. Section 404 of the Federal Water Pollution Control Act establishes a permit system for the discharge of dredged or fill materials into navigable waters. The permits are issued by the Secretary of the Army, acting through the Chief of Engineers. The EPA Administrator is charged with the development of guidelines for specifying the disposal sites of such materials.

Similarly, Section 103 of the Marine Protection, Research, and Sanctuaries Act establishes a Corps-administered permit system for ocean dumping of dredged and fill materials. The Secretary of the Army must determine that such dumping will not "unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." The EPA Administrator must concur in this conclusion.

"The Technical Committee was formed as it became evident that there was a need to coordinate the research being conducted by EPA and the Corps on the environmental impact of dredged material disposal," Dr. Wilkes said. "The Committee serves as a focal point for coordinating and disseminating such research required by Federal law."

Other personnel on the Technical Committee include Drs. Paul Lefcourt and Donald Phelps, Environmental Research Laboratory, Narragansett, R.I.; Dr. William Brungs, Environmental Research Laboratory, Duluth, Minn.; Dr. Michael D. Mullin, Large Lake Field Station, Grosse Ile, Mich.; Dr. Harold V. Kibby, Environmental Research Laboratory, Corvallis, Ore.; Dr. Mark Carter, Region V, and Mr. William S. Davis, headquarters.

Copies of the Technical Committee's first annual report can be obtained by writing Dr. Frank G. Wilkes, Environmental Research Laboratory, Gulf Breeze, Fla. 32561 ■

A dredge, clearing a channel to keep it navigable, sends sediment gushing from a pipeline onto a land disposal area.



LOANS TO REDUCE FARM POLLUTION

Farmers throughout the Nation are now eligible to receive water pollution control loans. These loans will help farmers to meet nonpoint pollution control requirements established by State water quality planning and management programs established under Section 208 of the Federal Water Pollution Control Act of 1972.

These requirements may be met by employing a variety of conservation measures, such as the planting of grass along waterways and construction of irrigation ditches and debris basins.

Non-point sources of pollution are caused by rainfall runoff from farms and forests and erosion at construction sites and mines. The six general types of non-point source pollution associated with farming are sediments, nutrients, pesticides, organic materials, salinity, and microorganisms.

Prior to June 4, 1976, when amendments to the Small Business Investment Act were passed by Congress, farmers could not obtain these loans. These amendments also permit water pollution facilities, such as lagoons and equipment necessary for no-till farming, to be financed through the issuance of industrial revenue bonds.

These bonds, which may be issued by a

State or other political subdivision, are exempt from Federal income tax. Furthermore, these loans may be guaranteed by the Small Business Administration.

The water pollution control loan program was established on August 16, 1974. This program, a joint venture of EPA and the Small Business Administration, allows for loans to be made to "any small business concern" which is "likely to suffer substantial economic injury" in meeting water pollution control requirements without Federal assistance. Loans may be made for "additions to or alterations of the equipment, facilities or methods of operation . . . necessary and adequate to comply" with the Act. Under the current provisions of the Act, farmers, including corporate and partnership farms, are eligible for loans if their gross annual sales do not exceed \$275,000. The loans, at 6 $\frac{3}{8}$ percent, may be paid back over a maximum of 30 years. Funds come from the Small Business Administration after EPA certifies the projects' environmental values.

Each EPA regional office distributes in-

Spring run-off on a plowed field on a Wisconsin farm.

formation on the loan program to permit applicants. Materials are also distributed by county agricultural agents. More than 65 trade, professional, and farm journals have featured material concerning the loan program. Speaking engagements have also been extensively used.

Sheldon Sacks, EPA coordinator of the program, tries to find those individuals specifically affected by pollution control requirements. Television programs, such as "Down to Earth," sponsored by the Department of Agriculture, and various radio spots also publicize the program.

Other Federal agencies also make loans to farmers to meet pollution abatement requirements. The Agricultural Stabilization and Conservation Service's cost sharing program provides funds to farmers for controlling animal waste pollution and for land conservation operations.

These practices utilize the engineering plans developed by the Soil Conservation Service. The Federal share of this program may vary from 50 to 75 percent of the cost, up to a limit of \$2,500 in a given year. Pollution abatement practices have to meet appropriate State pollution control requirements. ■



Continued from page 3

Q: What is your view on how EPA's enforcement program should be conducted?

A: I believe in vigorous but fair enforcement. I ran a very tough enforcement program in Connecticut, but we were never open to the charge that we had failed to do our homework or that we had been arbitrary or unfair. I think our credibility turns in large measure on the people whom we regulate knowing that we mean business. I think we will also increasingly see an equity issue. An increasing number of companies that are subject to our regulations have been making good faith efforts to comply with very tough standards. As the number of these companies grows, the unfair advantage which the recalcitrant few enjoy gets harder to justify under even ordinary principles of administrative justice.

I would hope that this Agency always will have the reputation of being tough but fair enforcers of the law, and of knowing what we're doing before we do it.

Q: Does EPA need more regulations?

A: I don't think that EPA's work ought to be measured in terms of the number of regulations we issue. Our organic legislation determines the number and kind of regulations we promulgate. Ultimately we're going to be judged on whether our regulations make any sense, and whether they deal fairly and effectively with the problems they're intended to address. We have an overriding responsibility to be clear, concise, and straightforward in our regulations. And we need to bear in mind that you cannot fashion a set of rules that will anticipate every situation that will arise, and that a "rule book" cannot be used as a ritual substitute for common sense judgment.

“... environmental protection is ...
a necessary precondition for energy
development.”

Q: Do you believe citizen involvement in EPA activity is desirable?

A: I believe citizen involvement is an enormous source of creative energy, which this Agency cannot afford to neglect. To gain citizen support I would like to see EPA have the reputation for being the most forthright and candid of Government agencies.

I'll go back to what I said before. If the average citizen of this country doesn't understand what we're doing, why we're doing it, we will not long have their consent to act in their behalf. Only by actively involving citizens in what we do can we hope to have the necessary public support.

Q: How do you perceive EPA's role in the President's energy program?

A: I believe that for too long environmental concern has been portrayed as an obstacle to energy development. This Administration, in contrast, believes that environmental protection is not an obstacle but merely a necessary precondition for energy development.

EPA has the responsibility to speak for the environmental side within the councils of government. At the same time, to the extent that we are perceived as always coming to the debate carrying a narrow advocacy brief, our advice will be discounted.

I will not hesitate to be an advocate, but I think the strength and persuasiveness of our advocacy rests on a broad perspective that is inherent in the environmental movement. The environmental movement cannot afford to be perceived as just another special interest group. Environmentalists have succeeded to date where

they have been able to show that the real nature of their concern is how everything is related to everything else. I think it's important that we keep that in mind.

Q: Will EPA be different under the Carter administration?

A: For the first time since this Agency was created, we now have a President who cares deeply about this issue. I think the White House will come to be perceived as the hill up which those who resist environmental considerations must, like Sisyphus, roll the rock.

I think the President understands very deeply, appreciates very deeply, the need to preserve and protect the environment. When you think about it, we survive in a very fragile system. The first few feet of the crust of the Earth, the water on the surface of the Earth and a few miles of atmosphere represent a narrow band containing the requisites for our very survival.

I think the first photographs that were taken from manned space flight showing the globe against the black void of space have left an indelible impression on everyone and will for future generations. Those photographs just drove home the fact that we must live within the limits of our own life support system, and that ecological foresight is imperative if we're to guarantee survival of our species.

Q: At present staffing and budget levels, will EPA be able to meet its responsibilities?

A: EPA has been working under severe resource constraints. President Carter recognized that and gave us some relief in the '78 budget. That relief included 600 new positions and authority to begin staffing in advance of the start of the fiscal year.

He also left the door open for us to come back if we are able to demonstrate that our needs are critical.

The burden of persuasion is clearly on us, but I feel the President will be a fair and sensitive judge of our needs. I might point out that we were given very generous relief, when measured against that given to other agencies, which also have real and legitimate needs.

Q: What new Federal legislation, if any, do you feel is needed to ensure proper environmental protection of our Nation?

A: I'm not in a position to say right now that we need new Federal legislation. I will not hesitate to ask for it if I perceive a need in the future, but I am impressed with the fact that we have an enormously wide-ranging legislative authority. I think that we have an urgent need to consolidate that authority, employ it, and seek refinements when experience suggests they're needed.

Q: What role should EPA play in the global pollution control effort now being made by the UN and other international organizations?

A: EPA has a vital role to play in the international arena. This country has stepped out ahead on environmental protection issues. Other industrialized nations are looking to us for guidance. They see us as an example and are eager to profit from our experience.

Pollution problems are not limited to national boundaries. We cannot effectively deal with the fluorocarbon issue, for example, without effective international agreements. I think we're obliged to seek those agreements.

Q: In addition to its statutory responsibilities, does EPA, in your judgment, have a broader responsibility to help give leadership to the environmental aspirations of our society?

A: I can't emphasize enough the importance of EPA's role in educating the public. Public support turns on our credibility, and our credibility in large measure turns on how effective we are at educating the public in language that they can understand. ■

ENVIRONMENTAL ALMANAC

A GLIMPSE OF THE NATURAL WORLD WE HELP PROTECT

APRIL

HOLDING THE EARTH TOGETHER

A golf ball rolls along the lush, clipped putting green and drops into the 18th hole at a Pebble Beach, Calif., country club as the winning tournament golfer turns to receive the cheers of thousands of spectators.

A nimble goat bounds up a rock and nibbles at the tuft of green growing in a crevice far above the timber line of the snowcapped Himalaya mountains.

A huge reaping machine moves ponderously through the seemingly endless Kansas wheat field stretching to the horizon in one windswept wave after another.

A python slithers down a giant bamboo tree in Southeast Asia and wraps itself around an unsuspecting fawn grazing below.

All these diverse settings have in common the most wildly distributed plant family in the world—the grasses. They occupy all parts of the earth and far exceed any other plant in the number of individuals.

While bamboo, the largest of the grasses, forms extensive forests and jungles, grasses are generally low and relatively inconspicuous such as the plants growing on the lawns of most houses.

The primary form of food is grass. Wheat, corn, oats, rye, barley, rice, and sugarcane are some of the food-producing grasses which make this plant family the most important to man. Grasses also provide the fodder for our livestock.

Yet often overlooked is the service grass provides by holding the

earth together with its tenacious root system. Strip the land of its grasses and erosion would choke all our rivers with silt.

The following assessment of the role of grass was made by the late Agnes Chase, custodian of grasses in the Smithsonian's National Museum and a famed authority in her field:

"Grass made it possible for the human race to abandon cave life and follow herds. Civilization was based on grass, everywhere in the world."

Grasses have achieved their success because of their ability to thrive under almost all conditions and to their usually abundant seed crop and its wide dispersal.

The flowers of most grasses are minute and borne on tiny branchlets. If insects were necessary to pollinate these flowers and produce fertile seeds, the grasses would require showy or fragrant blossoms to attract the bees and other pollinators. However, these grasses have no need for attractive flowers since they are pollinated by the blind wind.

Their seeds are also carried widely by the wind and have been

collected by planes thousands of feet in the sky as they are swept to new locations. Still other grass seeds have needlelike points which attach themselves to the clothing of man or the hair of animals. Man unknowingly has transported some grasses to new territories.

Bermuda-grass, for example, is one of the African grasses that were used for bedding for slaves or as feed for animals carried in the slave ships. Grasses have often spread along trade routes and sometimes enter new countries when their seed is inadvertently mixed with imported seeds of another plant.

One of the many valuable functions performed by grass is the converting of stretches of marshland into fertile farmland. Cordgrass has built meadowland on many mud flats and estuaries. Much of tidewater Virginia was built up by cordgrass.

Grasses also help to keep in place the sand dunes along the north Atlantic coast and the southern end of Lake Michigan.

If unchecked, the upper and driest sand on the windward side of the dune blows over the leeward side. As a result, the dune could be moved a few inches to a few feet in a year.

However, beach grasses can check the wind and catch the windborne sand before it travels farther.

When a man dies, his grave is covered by a blanket of grass. His remains then help nourish grass, man's primary form of food. So in the endless and circling tide of nature, all flesh is indeed grass.—C.D.P.



AROUND THE NATION



radioactive waste

Although there are no immediate hazards to health or the environment at a disused burial site for radioactive wastes in upstate New York, remedial action will be needed in the future to forestall such hazards.

This was the conclusion of recent studies by Region II officials and State authorities at the site near West Valley, about 30 miles south of Buffalo.

About 1.8 million cubic feet of waste material containing more than 300,000 curies of low-level radioactivity were buried at West Valley from 1963 to 1975. The privately owned facility was closed in 1975 by New York officials after it was found that some radioactive materials had seeped into a nearby stream.

The report recommends that methods be devised to keep water out of the burial trenches and to prevent the migration of radioactive wastes by leaching or erosion. State officials are now studying the best methods of doing this. "If the goal of low-level nuclear waste disposal is 100 percent retention of the waste for the duration of its hazardous lifetime—300 to 1,000 years—then in 14 years West Valley has failed . . ." said Gerald M. Hansler, Regional Administrator.



smoke crackdown

Region I has started enforcement actions against the Boston Edison Co. for air pollution violations at three of its generating plants in the metropolitan area: the Mystic Station in Everett, and the New Boston and L Street Stations in South Boston.

An administrative order concerning two generating units of the Mystic Station, which has a long history of visible smoke violations, listed three options Boston Edison might take to achieve compliance. Further violations could lead to Federal court action, a Regional Office spokesman said.

The Region has also directed the company to upgrade or replace smoke monitoring devices at all three stations. The three sources emit more than 4,000 tons of particulates per year and are among the largest sources of particulate pollution in Metropolitan Boston.



grants management

Region III and the State of Maryland have agreed "in principle" to a program under which some of the administrative responsibilities of the construction grants program will be turned over to the State.

Daniel J. Snyder III, Regional Administrator, said the move would eliminate some duplication and improve operating efficiency. The State would charge municipalities fees for processing grant applications. The State would also review facility plans, construction contracts payment requests, user charges, and engineering subagreements and conduct inspections of construction.

These authorities will not be finally delegated until EPA has determined the State's capability to carry out the specific responsibilities.

\$70,000 water fine

The Elk Refining Co., Falling Rock, W. Va., a division of Pennzoil Company, has been fined \$70,000 for violating the Federal Water Pollution Control Act.

Judge John T. Copenhaver Jr., of the Southern District of West Virginia, levied the penalty after the company pleaded guilty to 16 to 17 criminal counts brought against it in Federal Court. The firm was accused of discharging wastewater without a permit into the Elk River and Falling Rock Creek from five outfalls on Feb. 24 and 25, 1975. It was also charged with failing to notify EPA of permit violations and to submit progress reports.



penalty in question

A \$321,000 water pollution penalty, imposed by the Georgia Department of Natural Resources last year, was appealed by the chemical manufacturer involved, and a departmental appeals committee has recommended lifting the fine.

Spokesmen for EPA Region IV, Atlanta, have protested the committee's move and said the Agency may look into the possibility of removing the State's discharge permit authority. Environmentalist groups have also protested the lifting of the fine.

The fine was levied against the American Cyanamid Co. at Savannah. A State hearing officer in March 1976 found that the company had been dumping chemical wastes, including sulfuric acid, into the Savannah River over a three-year period. The plant manufactures titanium dioxide, a pigment used in paints.

The company appealed the fine, contending that there was no technology available to control the pollution. The three-member appeals committee held that the Georgia department could not fine industrial polluters.



power plant ok'd

Region V has given preliminary approval to the Wisconsin Public Service Corp. to build

a new generating unit at its Weston Station in Marathon County, Wisc. Regional officials said air pollution from the station's two existing units will be reduced before the new unit starts production in 1980. The new unit will generate 321 megawatts, more than double the existing capacity.

rail line defended

EPA strongly opposes a plan to abandon the South Shore Railroad, a commuter line serving Chicago and nearby counties in Illinois and Indiana. Regional Counsel Thomas F. Harrison said closing passenger service on the railroad would jeopardize Federal, State, and local plans to control air pollution in the Chicago metropolitan area. The area's already severe problems with air pollution from automobiles would be increased if the commuter line is abandoned, Harrison told a recent hearing held by the Interstate Commerce Commission. Two counties in Illinois and six in Indiana are exceeding EPA limits for photochemical oxidants in the ambient air, and six Illinois counties are exceeding the limit for carbon monoxide, he said. "Even the level of improvement now expected by 1980 assumes both continued operation of the South Shore Railroad and greater control of auto emissions than can probably be achieved," Harrison told the hearing. "Failure of State and local governments to assure continued operation of the railroad could jeopardize certification of State implementation plans (for air pollution control) and lead to questioning of consistencies in transportation planning by the Federal Highway Administration."



involvement day

More than 11,000 persons attended the Citizen Involvement Day program in Houston Feb. 12 sponsored by the Jacques Cousteau Society and the Houston Citizens' Environmental Coalition.

Cousteau himself, the undersea explorer, filmmaker, and conservationist, was the host for a question period in the morning, intended primarily for children. Other speakers included U.S. Rep. Bob Eckhardt, State Sen. A.R. Schwartz, and Edward H. Harte, chairman of the board of the National Audubon Society. Kyle Rote was master of ceremonies.

Citizen Involvement Days were held last

year in California, Florida, and Wisconsin, and two more are planned this year: Boston in May and Seattle in October.

The days are non-profit events, designed to bring concerned citizens together to learn about the environment, discuss major issues, and see educational exhibits. The Houston meeting had an EPA exhibit, "Environmental Health Effects of Air Pollution," supplied by the Agency's laboratories at Research Triangle Park, N.C.



foreign visitors

Delegates from several western European countries will visit St. Louis May 16 to learn about the industrial waste exchange operated by the St. Louis Regional Commerce and Growth Association. The group will include scientists and engineers participating in a pilot study of hazardous waste management for the North Atlantic Treaty Organization's Committee on the Challenges of Modern Society. Waste transfer schemes for industrial wastes have been operating for several years in Europe, and the visitors are interested in seeing how the St. Louis Waste Exchange, started last year, is doing. The Exchange links buyers and sellers of waste materials for which no regular market exists by publishing lists of available and wanted waste and surplus material.



bike commuting

Enhancing the role of the bicycle as a commuting alternative is the goal of a statewide conference scheduled for April 4 and 5 in Denver, Colo.

Under contract with the Region VIII Office, the Mountain Bicyclists Corp. will stage the conference for decision makers concerned with identifying and removing hindrances to bicycle commuting in Colorado.

The EPA "seed money" has helped attract additional funding and in-kind services from a variety of groups and from local and State government agencies.

Mountain Bicyclists is a non-profit umbrella

group. President Tom O'Hara said, "A major thrust of the conference will be to get all these people into one room and figure out how we can all work together to achieve the energy, exercise, and clean-air benefits cycling can provide."



bay improving

San Francisco Bay water has improved in quality from five- to 16-fold since 1973, according to a recent bacteriological survey made by the Bay Area Regional Water Quality Control Board. Except in some shallow areas, all parts of the Bay meet bacteria standards for water-contact sports, even during the summer months, the report found. Coliform counts were said to be below State Health Department standards. The improvement was attributed to "the universal practice of sewage disinfection" now required by the board and to improved reliability of disinfection practices.



minority workers

The hiring of minority workers under Federal "affirmative action" requirements, even when this conflicts with union contracts, was upheld in Federal Court in Region X recently.

The U.S. District Court judge enjoined Local 701 of the Operating Engineers Union in Portland, Ore., from stopping work on two sewer construction projects in Washington and Oregon. The union pulled its workers off the jobs when the contractors—unable to obtain black workers through the union hiring hall—employed non-union blacks as operating engineers. The court ruled that the Presidential Executive Order requiring affirmative action on federally funded construction jobs superseded any conflicting provisions of collective bargaining agreements. The action was filed by the Justice Department on a referral by the Region X Office of Civil Rights and Urban Affairs.

PEOPLE



Dr. Thomas D. Bath, Staff Director of the Science Advisory Board, Office of Research and Development, has left EPA to start a private consultancy primarily to aid universities and other research institutions in finding financial support. Dr. Bath joined EPA in 1972. In December, 1974, he became Staff Director of the Science Advisory Board, which he helped develop into its present form. The Board's mission is to bring to Agency programs useful advice from eminent scientists outside of the EPA. Dr. Bath is trained in chemical engineering and received his B.S. from the University of Kansas, and his M.S. and Ph.D. from the University of Michigan. Lloyd T. Taylor is serving as Acting Staff Director.

Leonard Mangiaracina has been appointed the first Director of EPA's Chesapeake Bay Program by Region III Administrator Daniel J. Snyder III. The program, announced last May, coordinates a number of Federal, State, and local projects aimed at maintaining and improving water quality in the Chesapeake.

Mangiaracina, who came to EPA in 1971 after 10 years of experience as a chemical engineer with private industries, has been Chief of the Industrial Permits Branch, Federal Regional Council liaison officer, and administrative assistant to the Regional Administrator. He holds bachelor's and master's degrees in chemical engineering from the Polytechnic Institute of Brooklyn and New York University, respectively. He and his wife, the former Katherine Strykowski of Merrick, N.Y., have three children.

Charles H. Sutfin has been appointed Director of the Water Division, Region V, Chicago, succeeding Henry Longest, who was transferred last fall to the headquarters staff. Sutfin joined EPA in 1971 in Washington, D.C., as a design engineer in the Municipal Wastewater Systems Division and later became a branch chief and deputy director in the Municipal Construction Division. In 1975 he was awarded EPA's Bronze Medal for commendable service. He is a civil engineering graduate of Purdue University, Lafayette, Ind., and earned an M.S. in sanitary engineering from the University of California at Berkeley. He is a registered professional engineer in California and a member of the Water Pollution Control Federation and the Pennsylvania Water Pollution Control Association.

Max J. Wilcomb Jr., former Chief of Program Support, Pesticides Branch, Region VII, Kansas City, has been named Toxic Substances Coordinator

for that Region.

Dr. Wilcomb has a B.A. in zoology from Montana State University, Missoula; an M.S. in wildlife management from Oregon State University, Eugene; and a master's degree in public health and a Ph.D. in animal ecology from the University of Oklahoma, Norman.



George B. Morgan has been named Director of EPA's environmental Monitoring and Support Laboratory in Las Vegas, Nevada. Morgan has been director of the Laboratory's Monitoring Systems Research and Development Division since March, 1973. He has held research positions with EPA and its predecessors since June, 1965. He is a member of the U.S. Delegation to the United Nations Environmental Program Working Group, and of a joint US/USSR working group on cooperation in air pollution monitoring methodology. He holds a B.S. in Chemistry from Valdosta State College (Georgia), and a M.S. in bio-analytical chemistry from the University of Florida.

Donald P. Mausshardt has been selected as Deputy Director of the Office of Regional and Inter-

governmental Operations. He has been Chief of the Implementation Branch, Hazardous Waste Management Division, Office of Solid Waste, since 1975. Mausshardt has worked with EPA and its predecessor agencies since 1964. He directed technical investigations of pollution problems in the Southwest, and served as Pacific Islands Director developing pollution control plans for Guam, American Samoa, and the Pacific Trust Territories. Named in 1973 as a Presidential Executive Interchange from EPA to Bechtel Corporation, he remained with Bechtel until 1975 serving as Group Manager for the Industrial Development of Saudi Arabia, and was responsible for developing a pollution control plan there. Mausshardt holds a B.S. in Civil Engineering and a M.S. in Sanitary Hydraulics from Oregon State University, and is a registered professional engineer.

Stanley Laskowski has been named Chief of the Industrial Permits Branch, Region III, Philadelphia. Laskowski has served in the Regional Office since 1972, as an engineer in the Water Planning Section and later in the Municipal Permits Branch, where he was Pennsylvania Section Chief. A native of Philadelphia, he earned a B.S. in civil engineering and a master's degree in business administration from Drexel University, Philadelphia, and has taken graduate courses in civil engineering at Villanova University, Villanova, Pa. He was a field engineer for the U.S. Geological Survey at Trenton, N.J., before joining EPA. He and his wife, the former Patricia Kelly of Springfield, Pa., and one child live in Collegeville, Pa.

UPDATE

A listing of recent Agency publications, and other items of use to people interested in the environment.

GENERAL PUBLICATIONS

Single copies available from the Public Information Center (PM 215), US EPA, Washington, D.C. 20460

Buying a Car Overseas (Revised March 1977) A six-panel leaflet informing motorists buying cars outside of the United States about emissions standards the cars must meet before they can come into this country. It discusses certification labels, U.S. Customs procedures, rules for catalyst-equipped vehicles, penalties, and further sources of information.

Smog, Health, and You (February 1977) An eight-panel leaflet that explains how smog is formed and what effects it has on human health. It discusses ways to cut hydrocarbon production in both urban and rural areas.

Noise and Its Measurement (February 1977) An eight-panel leaflet that discusses the sound levels of noises we hear every day. It explains how noise is measured and what effect different sound levels have on the people exposed to them.

Noise at Work (February 1977) An eight-panel leaflet that looks at industrial noise. It discusses the impact of noise on workers and communities, and tells what steps can be taken to prevent hearing injuries.

Noise on Wheels (February 1977) A 12-page booklet covering the noise caused by transportation vehicles and the steps EPA is taking to diminish these sound levels.

Keep Poison Baits Out of Children's Reach (February 1977) A six-panel leaflet alerting people to the dangers of household rodent, ant, and roach baits. It suggests locations for bait placement and storage, and gives emergency instructions.

A Drop to Drink (Reprinted March 1977) A 10-page booklet that looks at the quality of our drinking water. It describes water-supply research, current treatment processes, and legislation to protect public health.

Is Your Drinking Water Safe? (March 1977) A 16-page booklet that explains the Safe Drinking Water Act and tells how the Act provides for the protection of drinking water sources.

How to Obtain Federal Grants to Build Municipal Wastewater Treatment Works (Reprinted February 1977) A 34-page handbook that outlines the steps required for a community to apply for construction grants funds under the Federal Water Pollution Control Act.

Research on the Plains (March 1977) A five-page reprint from EPA Journal that looks at Agency studies of the environmental impact of coal burning power plants on wildlife and vegetation.

Application of Sewage Sludge to Croplands MCD 33 (February 1977) An appraisal of the potential hazards of heavy metal to plants and animals.

LEGISLATIVE REPRINTS

Single copies available from the Public Information Center (PM 215), US EPA, Washington, D.C. 20460

The Safe Drinking Water Act. Public Law 93-523

The Federal Water Pollution Control Act. Public Law 92-500.

FEDERAL REGISTER NOTICES

For copies of Federal Register notices, write Office of the Federal Register, National Archives and Records Service, Washington, D.C. 20408

Polychlorinated Biphenyls. EPA adopts toxic pollutant effluent standards. Wednesday, February 2.

Resource Conservation and Recovery Act. Intent to develop rule-making. List of contact persons. Thursday, February 17.

Pesticides Containing Lindane. EPA notice of rebuttable presumption against registration and continued registration. Thursday, February 17.

Pesticide Products Containing Nitrosamines. EPA announces public hearings on pesticide products containing nitrosamines. Thursday, February 24.

COMING EVENTS

More information about these events and EPA participation in them is available from Sue Sladek (202) 426-4188.

Conference on Federal Regulation of Environmental Carcinogens. Washington, D.C. April 12, 13.
EPA National Conference on 208 Planning and Implementation. Denver, Colorado, April 19, 21; St. Louis, Missouri, May 24, 26.
International Symposium on Remote Sensing of the Environment. University of Michigan, Ann Arbor, Michigan, April 25, 29.

MOVIES

(For more information contact Chris Perham (A-107), EPA, Washington, D.C. 20460. Phone 202 755-2840).
Battle of the Bugs. EPA is making this 10 minute full-color filmstrip available (in limited quantity) to schools across the country through State departments of environmental education. The film which has an accompanying cassette soundtrack and information leaflets, tells elementary school children about pesticides in general, and about pesticide safety in particular

THE ETHICS OF WASTE AND THE ETHICS OF CARE

Reflections by John R. Quarles Jr. on the future of the environmental movement.

The City of Washington is a city of monuments. From the majesty of the Lincoln and Jefferson Memorials to the statues that dot the centers of bustling traffic circles and line the halls of Congress to the rows of simple white markers spreading across the hills of Arlington Cemetery, the Capitol city is filled with reminders of men who have served their country with a devotion never forgotten. These monuments are part of our heritage, symbolizing the spirit and the glory of our great country. They stand as both a challenge and an invitation to each of us. They call out to us to pick up that spirit and carry it forward as we face the trials of each succeeding generation.

It was the late afternoon of a summer day when I pulled into the parking lot to visit one of the finest of these memorials, Theodore Roosevelt Island. A troop of Girl Scouts were leaving the island as I arrived, their young faces bright and cheerful as they ran and skipped and laughed and shouted to clamber aboard the large orange bus waiting for them. Their voices faded quickly into the background roar of rush hour traffic along the George Washington Parkway, and I headed out across the narrow footpath leading over to the island. A lone young man stood on the bank casting a fishing line across toward the shore, the warm sun pouring a golden glow over his bare shoulders. I paused for a moment to watch his line settle on the muddy brown water and then moved on. When I reached the island I passed three adults and two children intently watching a wild rabbit nibbling the grass. Then I entered the woods, and I was alone. The foliage closed out the sounds of traffic, which were replaced almost magically by the chirping and singing of birds. High above me the tree tops created a canopy of green foliage, and in the shade around me the air was refreshingly cool. The ground, covered with ivy, was soft and lovely. I walked along slowly, savoring each footstep. After a few minutes the pathway branched. The main path seemed to go to the right, but I turned to the left toward a clearing I could see through the woods. I guessed it to be the memorial.

The opening was like a large circular outdoor room, a few hundred feet across, ringed by a moat filled with water and bordered by the luxuriant growth of the surrounding forest. At the center on the far side, immediately catching my attention, stood the huge dark bronze statue of Theodore Roosevelt, his figure stepping forward with commanding force, its outline bold against the light gray tones of the thirty-foot granite shaft behind him. His right arm was raised upward in a gesture that captured the character and the spirit that Theodore Roosevelt has stood for—hope, strength, courage, and vision. I walked quietly between the sparkling fountains and stood at the foot of the towering figure, a great person speaking to us still down the corridors of time.

Spaced out under the trees behind the statue were four tall granite

Quarles, author of "Cleaning Up America," made this article available to EPA Journal as he left the Agency after nearly seven years of service as Assistant Administrator for Enforcement, Deputy Administrator and Acting Administrator.

tablets. I had been there once several years before, and by some subconscious impulse I went to the left hand tablet to find the inscription I was seeking. The shadows fell softly on the solid gray stone, and as I looked upward my eyes had to adjust before I could read the letters. At the top of the tablet was the single word, "Nature." With a quick expectancy I scanned the lines and found the inscription I was looking for:

"The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value."

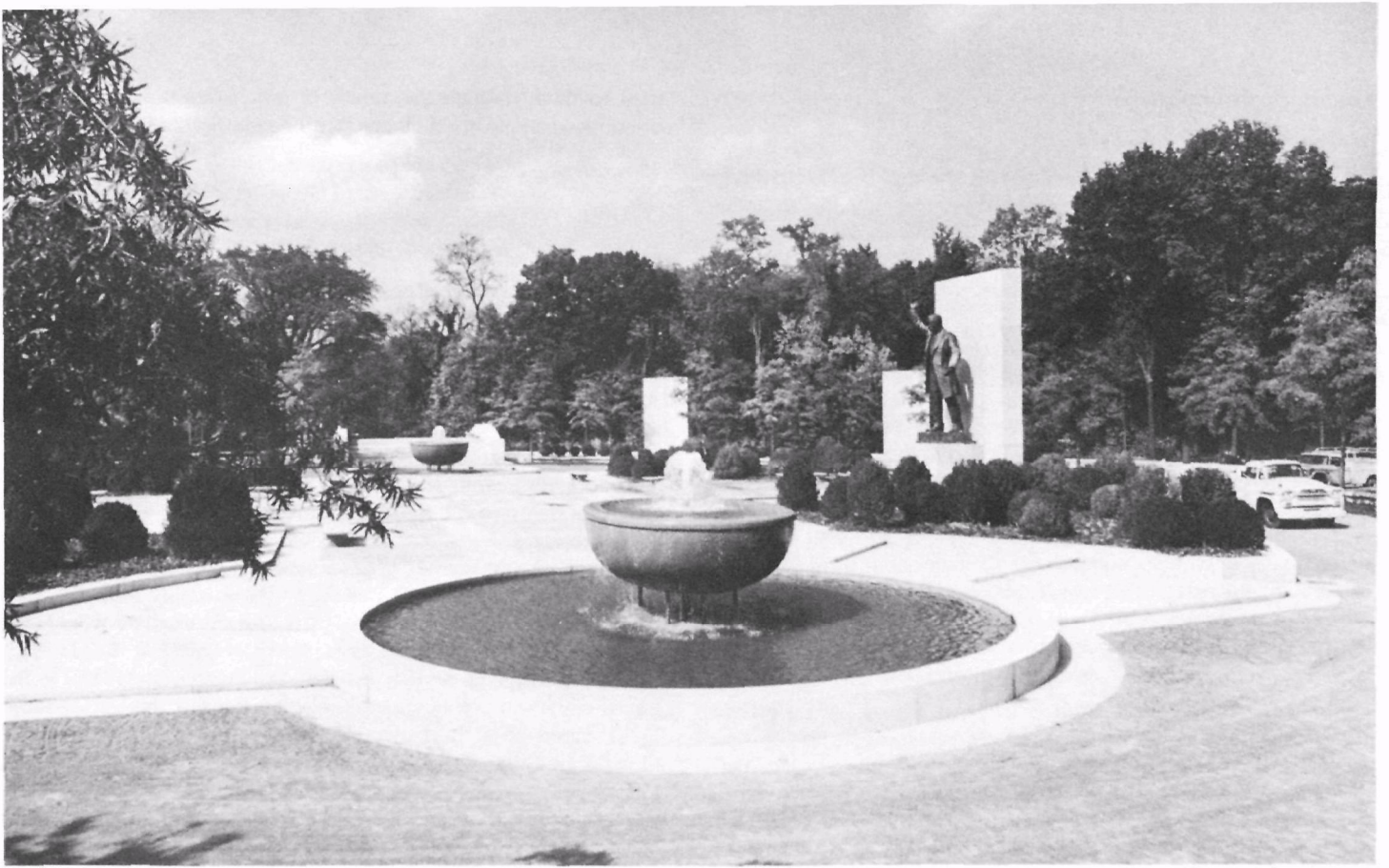
Yes, Roosevelt had understood the importance of natural resources. He had battled to save them for succeeding generations. I lingered over the meaning of his words and then read on. I was struck by the inscription that followed:

"Conservation means development as much as it does protection."

Slowly considering the meaning of those words, I wandered over to one of the fountains. Streams of water glistened brilliantly, catching the sunlight and reflecting it with splendor. At the base of the fountain was the seal of the American eagle. I stared at it in solitude and thought of all it stood for—all the people who had struggled to build our democracy, all their hardships and their sacrifices, and all the ideals and principles that they had worked and fought for.

After several years in the government I found its democracy meant more to me than ever before. Through the environmental movement I had seen democracy in action. From the very outset the environmental movement had been entirely a force of citizens. Its whole strength had grown out of their spontaneous efforts at the grass roots level of political protest. Those grass roots efforts had caused a groundswell of pressure that shook the halls of Congress. It forced the adoption of strong new laws, and it had caused profound changes in industrial practices, in government programs, and in individual patterns of behavior. I had had a ringside seat for the show. I had seen the forces of public opinion produce impressive results, and in the process I had learned that political leaders and government programs actually are responsive to public opinion. In a fundamental sense that is what democracy is all about. Through my own eyes I had seen that our democracy works.

I turned away from the fountain and walked back to the tall granite tablet on Nature. I pondered the problem of our natural resources. Certainly it was not a new problem. Seventy years ago Theodore Roosevelt had seen the problem of protecting our natural resources, and he had faced it squarely. He established the U.S. Forest Service and called the first White House Conference ever



Roosevelt Island

held to emphasize the need for conservation. But those early efforts had only dealt with some of the needs. Thirty years later another Roosevelt had also confronted this problem. The disaster of the Dustbowl had shown the damage of resource abuse, and the Civilian Conservation Corps embarked on a nationwide program of conservation efforts. Yet those efforts had also been insufficient, and in the 1960's the Nation had rediscovered the price we pay for our abuse of nature. We had launched a high-powered attack on the problems of pollution, and we were correcting many of those problems. Once again, however, the movement of reform had fallen short of addressing all of our needs. Several pollution problems were still far from solution. The need to control the use and development of land also had been clearly spotted during the environmental crisis, but the steam had gone out of the movement before that need had been met. Most serious of all, we had developed no systems to guide our patterns of economic growth, to protect and preserve an essential care of natural resources. Never before had we been so close to the prospect that those resources actually might run out.

I looked up at the colossal figure of Theodore Roosevelt and wondered how he would act if faced by our modern dilemma. "Conservation means development as much as it does protection"—I reflected on that phrase. Roosevelt had understood that natural resources must be used to meet the needs of people. It made me think of Wally Hickel, shouting, "You can't take man out of the environment. You can't just take all that oil and lock it up forever. There has to be a way—a way to use it and still protect the environment." Surely our development had brought us many blessings—housing, medical care, educational facilities, physical comforts, a massive rollback of poverty. No one could dispute that our economic growth had been good. That was not the question. The question was how to preserve a balance for the future. I concluded that Theodore Roosevelt would not leave that to chance or to the free economy alone. He had been a rugged individual. He had believed in competition and free enterprise. Yet even then, decades before the

New Deal, he had known that some controls had to be imposed. He had been the famed trust buster and had pushed successfully for other regulatory reforms, the Pure Food and Drug Act for example. "We have admitted the right of the individual to injure the future of the Republic for his present profit. The time has come for a change," he said. He also put it more bluntly: "I hate a man who would skin the land."

Overhead a large jet airplane flew across the island on its flight path after take-off from National Airport two miles down the Potomac. The roar of its engines drowned out the sounds of nature. I looked up to watch it pass, at first annoyed by the intrusion, but then as I watched it was a lovely sight to view. The long sleek silver body of the plane gleamed in the sun against the rich blue of the sky. I looked at it closely and wondered where it might be headed. That made me think of other big cities scattered around the country and all the airports I had walked through. I was glad to be on the ground, going nowhere, but the fast climbing plane reminded me that time was flying too. I looked at my watch and thought that I could not stay much longer.

That was the problem—time. It always seemed to be a problem, but now it had an urgency like never before. We were moving fast, consuming our resources, crowding our landscape, gathering people and things into cities that were growing totally out of control. We were confronting new problems, and their solutions might be years—or decades—away. As the stakes rise higher and higher and the speed of our growth keeps increasing, will we be able to afford that delay?

There is another vital dimension to our current situation. The questions of managing our threatened natural resources involve much more than merely calculations of how fast and how far we can keep our economic machine running. They also pose questions of what kind of a world we really want to live in. Throughout history our most basic national goal has been maximum economic growth to raise the standards of living for people. With the

Continued on page 24

fulfillment of affluence that basic goal is shifting. People have seen the danger that the trappings of progress are beginning to undermine the quality of human life. Indeed, the emotional wallop of the environmental movement came largely out of protest against the extent that economic goals and commercial values dominated life in modern America.

As people have crowded into cities and suburbs which increasingly become a world of concrete and glass and noise and neon lights, we have been losing something precious despite our economic progress. The quiet and the beauty of the countryside become more remote and more treasured, but we continue to squeeze the last vestige of nature out of our daily lives. We have shattered the primordial connection between man and mother earth. Overwhelmed by the outpourings of conveniences and contrivances of modern technology, we look about us at our rising crime rate, our rising divorce rate, and our rising use of drugs, and we must wonder where all our fast progress has brought us. For all its comforts and conveniences, there is something vital in life that is difficult to find in a world encased in plastic.

In our frenzied chase after material progress, we have somehow lost sight of the axiom that things should serve people, rather than people serving things. We have gone at life with haste, rather than with care. We have not taken the time to be certain what our true values are. Our lifestyles are dominated by compulsions to consume. In our hurry we have also failed to look ahead and safeguard our resources for the future. We have used modern technology with reckless abandon to exploit our finite resources. In the process we have developed the throwaway society. We have built a whole culture on the ethics of waste.

Our profligate use of resources no doubt can be traced, at least in part, to the abundance which our country has always enjoyed. Frugality, however, was one of the dominant values of our early national heritage. With rising prosperity that virtue gently slipped away. In our affluence since World War II it has almost disappeared. The gas-guzzling, luxury dream cars of the 1960's stand as symbols of our new national fashion of extravagance.

Conditions of the future may force a return to earlier values and attitudes. As scarcities show up in higher prices, people may be led back to prudence. The public may also recover its respect for nature as people discover how great our dependence on it really is and how sorely we have abused it. Just as the ethics of waste grew out of our abundance, future conditions of scarcity may breed a new ethic of care.

It is hard to believe that the challenge of protecting our environment can be solved in separation from these deeper concerns of national ethics. Government action is controlled by public thought. Individual cases are always handled in a broader policy framework. Beneath the complex technical or legal questions of any problem there is always the political question of what the public pressures are. And beneath those political questions there is always the question of ethics, of what our values really are.

National ethics become manifest in the formulations of public policy. If we are to have any hope of preserving the natural resources on which the future depends we are going to have to recover our respect for the larger natural order within which human beings, like all others, are subordinate creatures. We are going to have to return to the ethics of prudence and care.

Meditating uneasily on these questions of ethics and values, I looked up once again at the tall granite tablet standing before me. I

tried to think through the values of our heritage. I reread all the inscriptions and focused on one that I had passed over lightly before:

"There are no words that can tell
the hidden spirit of the wilderness,
that can reveal its mystery, its
melancholy, and its charm."

I knew that Theodore Roosevelt had loved nature, had revelled in the out-of-doors. Yes, I thought, conservation means development, but there has to be a balance. The first duty has to be to turn over the natural resources to the next generation not impaired in value. And those resources surely include the natural world of the wilderness.

I took a long, thoughtful look at the statue of the fighter, Theodore Roosevelt, and turned to leave. I walked slowly across the memorial, past the fountains and the boxwood and over one of the footbridges across the water-filled moat. I glanced back for a final look at the statue, hopeful and strong, and reentered the forest. Theodore Roosevelt was right. There simply were no words that could describe its hidden spirit. I thought of all he would have to say to our present generation. But it wasn't just Roosevelt. I thought of Thoreau, leaving Boston even back in the 1840's to live for two years in the wildness of Walden Pond. I thought of Ralph Waldo Emerson—"In the woods, we return to reason and faith." I thought of others—Longfellow, Whittier, Whitman, and Frost. How deeply rooted Nature was in the values of our heritage. How were we slipping so far away from it? What could we gain from more affluence that could compensate for its destruction? What in the world are we after?

I thought in sadness of the speed with which construction and development are driving the grace of nature out of our modern world. I wondered how long it would be before people rise up again in protest. That will not happen soon because public opinion is nowhere close to facing these problems squarely. Public opinion is still digesting the changes required to control basic pollution. It is still feeling the backlash from some of those costs and difficulties. The environmental movement is still caught in the crunch. It is not yet ready to tackle the more baffling problems of guiding future growth and protecting essential resources.

And yet, I thought, there is hope. Many people do see these needs. Many people are deeply concerned. It will take time for a full resurgence of the values of our heritage, but those values are so fundamental that that resurgence is bound to come. It will require basic shifts of attitude at the grassroots level of public opinion, which can only come through public education. It will require active citizen involvement—with all the hearings, the meetings, the telegrams, and the postcards—the same spontaneous efforts that brought the environmental movement its power to change government policy in the first place. Only then will it be possible for government to tackle these problems with any real hope of success. It would take a whole new generation of environmental activists, I thought to myself, to alert the public and rally broad support, but surely there are citizens ready to take up the struggle and fight for the cause until it prevails. And surely it will prevail. The only real question is how much we lose in the meantime.

When I reached the footpath leaving the island the lone fisherman was still there, having caught no fish but seemingly fully content. The roar of the traffic grew louder as I approached the parking lot. Rush-hour traffic was in full crush—two lanes of bumper-to-bumper cars moving impatiently along the George Washington Parkway. In the parking space next to my car a young family was just arriving. They had a small boy, perhaps three or four years old, and an infant they were placing in a stroller. I wondered what sort of a world our children and grandchildren would have to live in, and I thought of the awesome trust we all hold to protect and preserve it for them. ■



news briefs

RECALL ORDERED FOR 135,000 CADILLACS

EPA Administrator Douglas M. Costle has ordered the General Motors Corporation to recall and repair about 135,000 Cadillac automobiles that are emitting excessive amounts of carbon monoxide. Agency experts found that most 1975 model Cadillacs with 500 cubic-inch-displacement engines have defective carburetors that must be repaired if the cars are to meet emission standards.

WILDLIFE FEDERATION HONORS BARBARA BLUM

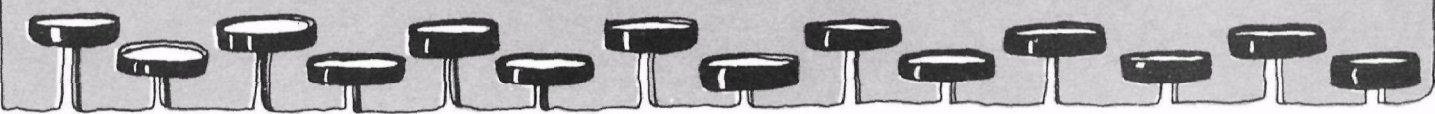
Deputy Administrator Barbara Blum recently received the National Wildlife Federation's 1976 Special Conservation Award for her "outstanding individual contribution to conservation, particularly in the effort to save the Chattahoochee River in Georgia." Nine other persons and two organizations also received awards from the federation.

WORKSHOP PLANNED ON RADIOACTIVE WASTE PROTECTION

EPA will hold its second workshop on environmental protection standards for radioactive wastes at Albuquerque, N.M., April 12-14. Dr. William D. Rowe, Deputy Assistant Administrator for Radiation Programs, said the meeting will discuss policy and techniques for the handling and disposal of all types of radioactive waste and the public acceptance of the associated risks. The first workshop session was held in Reston, Va., in February.

RESOURCE RECOVERY SEMINAR TO BE HELD APRIL 28-29

Methods of recovering materials and energy from solid waste will be reviewed by EPA specialists at a seminar in Washington, D.C., April 28 and 29. Attendance will be limited to 250 persons. Resource Recovery Division staffers will give the latest information on EPA-funded demonstration projects and other new recovery systems, covering both technical data and costs.





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PROTECTING THE CHERRIES

The U.S. Environmental Protection Agency is reviewing an application for the general use of a pesticide which the manufacturer claims will protect cherry orchards from hungry birds, while harming neither the fruit nor the fowl.

The new bird repellent is a chemical called methiocarb which researchers of the Interior Department's U.S. Fish and Wildlife Service helped field test. The Fish and Wildlife Service reported that the product allows cherry growers to raise their crop successfully and have birds in their orchards too by acting as a potent emetic. After eating only a few cherries, the birds soon learn to associate the taste with the effects, which are temporary. The birds then recover completely. In 10 years of field testing, according to the Fish and Wildlife Service, the repellent was not found to be responsible for the death of a single bird. Additionally, no chronic effects or cases of abnormal reproduction were observed. Methiocarb is also shortlived and breaks down quickly in sunlight.

Over \$70 million worth of sweet cherries are grown annually in the United States. The orchards are easy targets for birds, which can and do inflict considerable damage on the ripening fruit.

"An experimental permit was granted for testing methiocarb in California, Michigan and Washington," said Douglas D. Campt, Acting Director for Registration. "That permit will expire on April 13. Meanwhile, the manufacturer, Chemagro Corp. of Kansas City, Mo., has applied for a full registration as required under the Federal Insecticide, Fungicide, and Rodenticide Act.

"Methiocarb has been registered previously for control of insects on



Cherry trees in bloom in a western orchard.

peaches and cherries, as snail and slug bait on flowers and shrubs, and for other uses.

"The experimental use permit was issued to permit data to be collected on the effectiveness of this use. If the review of this data supports the pesticide use in the protection of cherries from birds, we will issue a registration for the use. All registrations require data to demonstrate the safety of the use to humans and the environment when the pesticide is used in accordance with the label directions," Mr. Campt said.

Damage in some cherry orchards is presently controlled by scaring the birds with gunfire, exploding devices, or broadcasts of the recorded distress

calls of the birds. Trapping may be used if starlings are causing damage. Such methods can be time consuming and therefore costly. Local residents sometimes complain about the noise.

In the most recent tests conducted by biologists from the Fish and Wildlife Service's Denver Wildlife Research Center, methiocarb was sprayed on sweet cherry orchards in California and Washington. In California, untreated orchards received 3.2 times the amount of damage to fruit as did treated orchards, and in Washington, this figure was 7.5 times as much, according to the Service biologists. House finches seemed to be the most common cherry nibbler in both States.

In the future, methiocarb may also be used as a bird repellent on blueberries, grapes, grain, sorghum, and sprouting rice, if approved by EPA. ■