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ALASKA -- Wildlife for Tomorrow

The American Nature Study Society

President's Message:

ANSS AND YOU

CRAIG C. CHASE

Your society (ANSS) is undertaking a program of communciation. Each officer and director, for the past three years, has been asked to establish a local communications network to tell people what the American Nature Study Society is doing. If you have not been contacted—do drop a postcard to your nearest society director or officer—just write—I WANT TO KNOW. Be sure to supply your name and address. We're trying!

Some of the things that have been happening—

- testimony for preserving the New Jersey pine barrens was provided by Director Ruth Yarrow at the N.J. Senate Committee hearings.
- our magazine editor—(NATURE STUDY—A Journal of Interpretation and Environmental Education) is looking for quality articles for the next issue. *You* might tell a friend in the field.
- ANSS was well represented at the last Alliance for Environmental Education meeting in Washington. I counted three past presidents of ANSS.
- Doug Wade has retired from his position at Northern Illinois University.
- Esther Railton has been on sabbatical leave from her teaching post.
- Marty Sykes has recently said, "I do."

The foregoing are of interest to many of us. But there are some "heavy fisticuffs" shaping up that need you to exhibit your leadership and express your beliefs.

(1) *Preservation versus wise use.* There are many arenas for this controversy. Old buildings, forests, streams, oceans, even habitat for the Kirtland's Warbler. You should communicate your feelings to the general public. In many cases, you are the best informed!

(2) *Land Use*—if America is to continue to feed its people in the style of past years, we must devise a nation-wide program to preserve operating farmlands. Many plans have been forwarded for public consideration. You might be interested in the article *Vanishing Croplands* by Lester Brown in *Environment* magazine, December, 1978.

(3) *The ENERGY question.* Probably you were brought up utilizing fossil fuels. For the future—what do you recommend? One of the alternative energy sources—wind, water, solar, geothermal? Would you testify in the world series of this controversy—nuclear *vs* other? Have you strong feelings based on reason—we as a nation need to hear from you! I moved my family 400 miles to get further away from a new power plant nine years ago. I have not shared the figures and facts of my reasons for moving with the public. Won't you do a better job than I have?

(4) *Bottle bills will be coming up in your area.* So far, Oregon, Maine, Vermont, Michigan, Iowa, Connecticut and Delaware have enacted deposit laws which take a variety of forms but usually require a deposit on beverage containers which is refunded when the container is returned to a vendor. Hopefully, you have strong feelings on this issue—join forces with others and air the issue so that the public is informed, not propagandized, at voting time.

Most important—realizing that none of us is perfect—*do* set an example with your lifestyle, for those coming in contact with *your* circle of society.

ALASKA (PART II)

A Proposal To Protect 92 Million Alaska Acres For The Future

The National Wildlife Refuges . . .

Alaska is huge—twice the size of Texas. Yet this size is deceptive, as Alaska is a surprisingly fragile giant.

While her surrounding seas, in a pristine state, are among the most productive in the world, an average inland acre of Alaskan land/water is about five times less productive than the average acre in Michigan. On a year-round basis Alaska's vast acreage supports only a relatively few hardy species of wildlife and even these may be required to migrate up to 1,000 miles to satisfy their basic annual needs.

During brief, highly productive summers Alaska seemingly teems with life. But here again, only selected areas possess that combination of favorable habitat factors that allows them to support large numbers of nesting birds, calving caribou or spawning fish. Between them, these special areas support the nurseries of such nationally and internationally significant Alaskan-born resources as 100-200 million shore and waterbirds; 13 million waterfowl; 100+ million migratory perching birds; 100+ million seabirds; and undetermined numbers of marine mammals, large land mammals, furbearers, salmon and other fish (and one frog).

These special areas for fish and wildlife are the focus of the Department of Interior's proposals for new or additions to existing National Wildlife Refuges in Alaska.

ARCTIC NATIONAL WILDLIFE REFUGE (8.85 million acres)—Arching its back against the Arctic Ocean this refuge is one of the great wilderness expanses of the Nation. Stretching from the plains of the North Slope through the jumbled majesty of the Brooks Range to the northern reaches of Alaska's forest land, the Arctic Refuge is home to such hard species as grizzly, black and polar bears, dall sheep, wolves, wolverines, foxes, seals, musk oxen, 16 species of fish and a wide array of birds.

Arctic's wildlife inhabitants do not recognize man-made boundaries. The 120,000 member Porcupine caribou herd spends summer and fall months in the Arctic Refuge raising young, then retires to Canada's Yukon Territory for the winter. Wave after wave of waterfowl moving to and from Canadian nesting grounds and wintering areas along the California Coast or the Aleutian Islands National Wildlife Refuge pass through the refuge to rest and feed. Such movements may number up to 200,000 snow geese, 500,000 old-squaw or 1,000,000 eiders.

Not all of the Porcupine caribou always winter in Canada; some occasionally move into the proposed Arctic additions or uplands of the adjoining **YUKON FLATS NATIONAL WILDLIFE REFUGE** (8.45 million acres). Here the Yukon River floods across a vast basin, recharging some 40,000 lakes, oxbows and potholes. Long Arctic summer days and the insulating effect of surrounding mountains create conditions in these wetlands resulting in the most productive per acre waterfowl habitat in Alaska.

This basin contributes an annual flight of 2,100,000 ducks and 16,500 geese as well as 11,000 sandhill cranes, 15,000 loons and 100,000 grebes to Flyways touching all parts of the Lower 48, Canada and Mexico. Major populations of wolves, black and grizzly bears, moose, furbearers and production of over a quarter of a million salmon also contribute to the fish and wildlife values of the Yukon Flats.

Solar basins—those river-riddled, pond-dotted valleys rung by high hills and drenched by long summer sunlight characterize a number of other refuge proposals along the Yukon River, its tributaries, and other major rivers in Interior Alaska. Although superficially similar, each of these basins has different mixtures of plant communities and wetlands attracting birds and mammals of different species, densities—and winter destinations.

Moose, North America's largest member of the deer family, found in abundance in Alaska's wildlife refuges and parks.

(Photo by D. L. HANSELMAN)

Part I published Vol. 31, No. 3, pp. 1-4.

TETLIN NATIONAL WILDLIFE REFUGE (765,000 acres). Enter Alaska on the Alcan Highway and you are in the Tetlin Refuge—the northernmost terminus of many migratory birds such as redheads and ring-necked ducks and blue-winged teals, seldom seen in other parts of Alaska.

Aside from its regular nesters Tetlin, like the Yukon Flats proposal, becomes increasingly important in years like the present one when waterfowl normally nesting in Canada overfly drought-striken pothole areas seeking stable water conditions in Alaska. This year, waterfowl nesting densities in Tetlin increased 50 percent with signifcant increases in nesting canvasbacks (up 82 percent) and redheads (up 700 percent).

Across the Trans-Alaska Pipeline from Yukon Flats is a small basin enclosing the **KANUTI NATIONAL WILDLIFE REFUGE** (1.20 million acres). Contributing at least 75,000 waterfowl to many parts of the continent and Mexico, Kanuti is particularly noted for providing high density nesting habitat for white-fronted geese that spend their winter along the Gulf of Mexico.

The refuge also supports large populations of furbearers and moose and is a traditional wintering area for a second major caribou population, the Arctic caribou herd.

NOWITNA NATIONAL WILDLIFE REFUGE (1.45 million acres) is another key nesting area for white-fronted geese as well as several other species of waterfowl, that together send nearly a quarter of a million birds down the Central Flyway of Canada and the Lower 48 to coastal Texas and Louisiana.

The southern portion of the proposed refuge is home to caribou and grizzly bear, while moose concentrate in large numbers in northern willow thickets along the Yukon River in winter. The Yukon River also is important to migrating salmon, the Nowitna River (Wild River proposal) being a valuable spawning ground for the sheefish, an Arctic species often dubbed the "freshwater tarpon."

North of the Yukon the Koyukuk River floods a forested basin dotted with many lakes. This **KOYUKUK NATIONAL WILDLIFE REFUGE** (3.33 million acres) is the producer of that elusive target of midnight forays—the snipe—as well as numerous other shore and water birds. Waterfowl production from the unit contributes 75,000 Canada and white-fronted geese and over 300,000 ducks, largely pintails, wigeons, scaup and scoters. The area also boasts the northwesternmost nesting trumpeter swans (150) on the continent.

Moose, black bear and wolves are abundant; members of the Arctic caribou herd winter over the entire unit; and the area provides excellent habitat for such furbearers as beaver, muskrat, mink and martin.

Chinook and chum salmon and whitefish are important fishery resources; northern pike abound in lowland lakes and Arctic grayling in colder headwater streams.

The occurrence of the attractive Nogahabara sand dunes in the northern part of the proposal adds a unique geological dimension to the ecology of the refuge.

The **INNOKO NATIONAL WILDLIFE REFUGE** (2.84 million acres) south of Koyukuk has a unique boundary. Step into the refuge and you disappear into a sponge of wetland. This is a land that truly belongs to the beaver, the moose, the goose and the black bear.

In this transition area between the tundra of western Alaska and the boreal forest of the interior valleys is a major waterfowl nesting area whose ducks (380,000) migrate primarily to Washington and California, although the scaup reach the Atlantic Coast. Geese (totaling 65,000) split, with white-fronts migrating through the central U.S. to Mexico and the Canada geese orienting to the Pacific Coast. Along with more snipe, other notable bird species of the area include sandhill cranes by the thousands, bald eagles, osprey and peregrine falcons.

Moose are of primary importance among large mammals with major wintering concentrations along the Kaiyuh River. Black bears and beaver are abundant as are many other species of furbearers.

As the Yukon joins the Kuskokwim River there is created one of the wettest spots in this Nation. The **YUKON DELTA NATIONAL WILDLIFE REFUGE** (10.59 million acres) is a vast, water-dotted tundra. Probably no area of similar size is so critical to so many species. Fish and wildlife resources include at least 100 million shorebirds of several species; 3 million ducks, 50 thousand swans (80 percent of the Pacific Flyway flight) and 720 thousand geese (including 80 percent of the world's emperor geese, all of its cackling Canada geese, and half the continental population of black brant); and a large fishery resource (chinook, chum, coho, sockeye and pink salmon, northern pike, blackfish, sheefish, several species of whitefish, grayling and Arctic char) which is the mainstay of the 42 Native villages encompassed by the refuge.

Add to these a mammal resource including foxes, otters, mink, hares, lemmings, bears, lynx, wolves, beaver, wolverine, moose, harbor seals and walrus; another 100 nesting bird species scattering to six continents and a wood frog and the Yukon Delta becomes a remarkable wildlife wildland.

Also attracting birds from many continents is the **SELAWIK NATIONAL WILDLIFE REFUGE** (2.15 million acres), northwesternmost of the great wetland basins. Here at the crossroads of Asiatic and North American Flyways, can be found blue-throats and yellow wagtails from Asia; bartailed godwits from Australia and New Zealand; Arctic terns from Antarctica; upland and pectoral sandpipers from South America and wheatears from Africa.

Waterbirds nesting in Selawik also disperse to all parts of the Lower 48; greater scaup to the Atlantic Coast; lesser scaup to Louisiana; white-fronted geese to coastal Texas national wildlife refuges and numerous species such as pintails, mallards and green-winged teal to refuges of California, Oregon and Washington.

Selawik is also migration and wintering area for such diverse wildlife as the sheefish and caribou and the year around home to many moose, bears and wolves.

South of the Yukon-Kuskokwim Delta the low wetland tundra gives way to the mountainous peninsula encompassed by the **TOGIAK NATIONAL FISH AND WILDLIFE REFUGE** (3.84 million acres). Three major river drainages, the Kanektok, Goodnews and Togiak Rivers, provide critical freshwater contributions to the rich Bristol and Kuskokwim Bays. In so doing the area helps support some 10 species of whales, harbor seals, sea lions, salmon during marine life stages and literally millions of migrating shorebirds and waterfowl using near shorewater.

Fish—1.7 million salmon strong, live in rivers and streams of the proposal during summer and fall months. Numerous other fish can also be found such as steelhead, rainbow and lake trout, Arctic grayling, Dolly Varden and Arctic char.

Other summer residents of Togiak include 1 to 2 million seabirds, waterfowl, eagles, gyrfalcons and peregrine falcons. This refuge would encompass one of the most diverse mammal assemblages in Alaska with over 32 species of land mammals ranging from tiny shrews to brown-grizzly bears. Some of these mammal populations are currently at low levels but would be expected to increase under refuge management and protection.

South across Cook Inlet from Anchorage is the **KENAI NATIONAL MOOSE REFUGE** to which additions of 234,000 acres are proposed. This area of mountain lakes, wetlands and rivers support a wide diversity of fish and wildlife resources including the Kenai moose for which the area was originally established, one of the greatest loon populations in North America, six percent of the world's nesting trumpeter swans and one-third of the salmon caught in Cook Inlet.

The more than 1200 lakes and 160 miles of streams are home to such animals as mink, muskrat, weasels, otter and beaver. Dall sheep, mountain goats and a variety of smaller mammals and birds inhabit mountain areas, with caribou, bears (black and grizzly), lynx, wolves and coyotes in lower transitional zones.

The variety of habitats for fish and wildlife, the scenic beauty of the refuge and its nearness to Anchorage lend ample opportunity for quality environmental awareness and wildlife-oriented recreation programs.

Jutting into the Pacific Ocean from the southwest corner of Alaska is the Alaska Peninsula. Near its northern end the **BECHAROF NATIONAL WILDLIFE REFUGE** (1.03 million acres) is one of the major brown bear habitats in Alaska. The giant peninsula brown bears are free-ranging, feeding in salmon streams and coastal marshes over a wide area and hibernating in mountain dens. Some 232 dens have been located in mountain sides and on islands of the Becharof area.

Caribou and large members of moose range through the refuge proposal; streams abound with salmon, rainbow trout and Arctic graylings; and rocky seacliffs host tens of thousands of seabirds of several species.

Most of the remainder of the Peninsula from Becharof south to the existing Izembek National Wildlife Range at its southern tip is proposed as an **ALASKA PENINSULA SPECIAL STUDY AREA.** Currently an area of complex land ownership, the Peninsula is to be studied by the Department of Interior, the State of Alaska and several Native Corporation landowners to determine how best to reorder the land ownership and land use patterns to insure orderly use of the Peninsula's resources and the long-range maintenance of today's high quality fish and wildlife habitats.

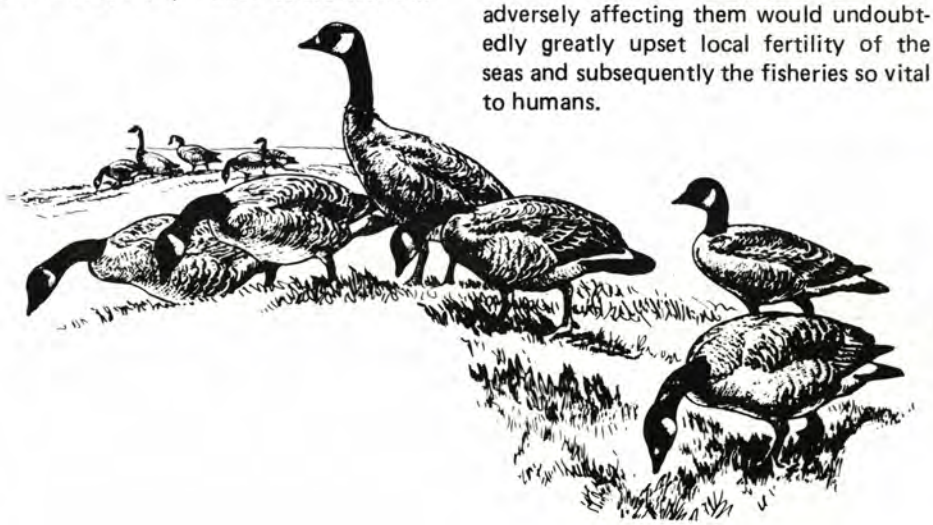
With an eye toward the nationally significant populations of brown bears, caribou, moose, salmon, trout, marine birds, waterfowl and migratory shorebirds of the area, review of other natural resources and the land management desires of the various landowners, this study will make recommendations to Congress and the Alaska Legislature by June of 1983, or sooner, for a more orderly, resource-oriented balance of Native, State and refuge lands.

The most far flung, remote and colorful wildlife refuge proposal is the **ALASKA MARINE RESOURCES NATIONAL WILDLIFE REFUGE** (430,000 acres of additions to 11 existing refuges). Rocks, islands, spires, reefs and headland cliffs dot the marine waters of Alaska from the Chukchi Sea to the Aleutian Island chain to the Southeast panhandle.

In sharp contrast to the million acres required for nesting shorebirds and waterfowl inland, many million of seabirds utilize every suitable foot of the proposed refuge. Marine bird resources of Alaskan waters probably amount to over a hundred million birds of at least 55 species. To date, over 135 nesting locations have been described outside the Aleutian Islands, of which 26 contain over a million.

In addition, all units are important to one or more species of mammals—including sea lions, harbor and hair seals, walrus, sea otters and polar bears. Sixteen species of whales, many endangered, also use waters lying immediately off the shore of these areas.

The value of these marine resources is often underrated. Estimates place food consumption by these birds at 0.6 to 1.2 million tons with a return of 120,000 to 240,000 tons of nutrients to these seas each year. Marine bird and mammal numbers are awesome today, yet any factors adversely affecting them would undoubtedly greatly upset local fertility of the seas and subsequently the fisheries so vital to humans.



EARLY USE OF SOLAR ENERGY

Ralph W. Dexter
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One of the critical environmental problems of today is the conservation of energy. One possible solution of great promise is the development of solar energy. In both scientific journals and the public press we read frequent issues of news, reports, and predictions concerning solar energy. With little doubt most readers will consider suggestions, proposals, and plans for solar energy to be of current origin. Such, however, is not the case. For example, nearly 100 years ago Prof. Edward S. Morse explained at a meeting of the Essex Institute at Salem, Massachusetts, (Bull. Essex Institute 13: 73-74. 1881.) a new invention "of his own contrivance, and for which a patent has been applied for—using the sun's rays as a means of heating and ventilation." This device was installed at the Museum of the Peabody Academy of Science at Salem (now the Peabody Museum of Salem). It was reported that, "—the air as it entered the room, by the utilization of the sun's rays, was from 15 to 30 degrees F. warmer than when it entered the apparatus from the outside." Morse exhibited a model of his invention and made diagrams on a blackboard to explain its operation.

B. L. M. LAND REVIEW

Debbie Sease
Wilderness Affairs Specialist
The Wilderness Society

The Bureau of Land Management is undertaking a wilderness review of their 470 million acres of public land as mandated by Federal Land Policy and Management Act of 1976 (Organic Act). This is a project of immense dimensions; the completion of which will have far-reaching effects on our public lands and the policies governing them. Most of the public land has never before had its wilderness values considered. This review will be the first opportunity to recommend qualifying areas for wilderness designation that would protect fragile ecosystems, wildlife habitats and recreational opportunities.

Unfortunately, the program is beginning at a time when the efforts of many conservationists are focused on the successful resolution of the Alaska Lands Bill and the RARE II program; the BLM land review is a newcomer lost in the press of other issues. But conservationists cannot afford to ignore this program until other issues are resolved. Although the BLM has the example of the Forest Service RARE II program, the Park Service Wilderness Review and the fourteen years of Congressional history since the passage of the Wilderness Act, the BLM is itself not experienced in dealing with the wilderness concept, and is evaluating a different type of land than most forest and park wilderness. The public lands are generally semi-arid rangelands and deserts. The BLM is carefully examining the historic concept of wilderness and determining an appropriate application of wilderness characteractics to the public lands.

Conservationists have several responsibilities to this program that cannot be put off. We must provide the BLM with guidance at all stages of the review process, effectively educate the public about the issue and their role in it and in doing so, build an active constituency that will work with the BLM to insure an adequate and representative wilderness system for the public lands.

It is imperative that conservationists, and conservation organizations, begin now to actively participate in the BLM wilderness review to insure the broadest possible public involvement throughout the program. Our commitment is needed now to mold a sound future for our public lands.

Appalachian Trail Bill Re-affirms the Role of Volunteers and Saves the Trail

The passage of the Appalachian Trail Legislation signed by President Carter on March 21, 1978 extends that which for over fifty years has been an experiment in participatory democracy—the working together of Government, landowners, and unpaid volunteers toward managing and maintaining a national resource.

Spearheaded by the Appalachian Trail Conference, this piece of legislation represents a major victory for the Appalachian Mountains as well as the thousands of volunteers who have devoted countless hours to the protection of four million people who hike on the Trail each year.

Proposed in 1977, the legislation first passed the House in October and then was enlarged in scope by the Senate Bill, which passed in February by acclamation. (The House accepted the amendments and passed the Bill, also by acclamation, early in March.)

The 1968 legislation, the first for trails, provided for two National Scenic Trails, the Appalachian in the eastern United States, and the Pacific Crest in the west. It also designated the National Park Service as government overseer for the Appalachian Trail and made provision for eminent domain.

In the ten years since 1968, it became obvious that the existing legislation was insufficient to save the Trail from oblivion.

The new Bill provides $90 million to purchase easements or acquire the property necessary to protect the Trail. If ultimately necessary, the condemnation authority can be exercised up to an average of 125 acres per mile. In addition, the Appalachian National Scenic Trail Advisory Council has been made statutory. It remains an advisory body on Appalachian Trail matters to the Secretary of the Interior.

The Appalachian Trail Conference was founded in 1925. It numbers over 63 clubs and 80,000 members, who share the responsibility of maintaining the Trail and its environment in its natural state. It is a private, nonprofit conservation corporation located at Harpers Ferry, West Virginia.

The Conference coordinates the volunteer efforts of clubs and individual members in protecting the Trail environment and maintaining the 2,000 mile long Trail. It is the longest facility of its type in the world, stretching from Maine to Georgia.

The Conference welcomes inquiries and interest on the part of the public and will answer mail addressed to The Appalachian Trail Conference, Harpers Ferry, West Virginia 25425.

THE MITIGATION SYMPOSIUM

A National Workshop on Mitigating Losses of Fish and Wildlife Habitats, (The Mitigation Symposium), is to be held at Fort Collins, Colorado, July 16-20, 1979. The event is sponsored by The American Fisheries Society, The American Society of Civil Engineers, the Wildlife Management Institute, and The Wildlife Society. Several federal conservation agencies and private sources are supporting the Symposium financially. Proceedings will be published promptly after the meeting. They should become an important influence on public policy, and a permanent technical reference.

The losses of fish and wildlife habitat which occur as a result of development projects of many kinds, and land use changes, constitute a major national environmental problem. President Carter's recent water policy referred to it. An amendment to the Fish and Wildlife Coordination Act has been introduced in Congress. The purposes of the Symposium are to assess the magnitude of the problem, and develop strategies and recommendations for achieving better mitigation, in the public interest. Sessions will deal with the problem in coastal as well as terrestrial and fresh water environments, and with all regions of the country.

For more information write Dr. Gustav A. Swanson, Program Director, The Mitigation Symposium, Fishery and Wildlife Biology, Colorado State University, Fort Collins, Colorado 80523.

The Seven Sleepers

Paul M. Kelsey

Winter is always the most difficult season for wildlife. Snow and ice bury much of the food, leaving only a limited supply where it can be reached. Wind and cold increase the requirement for protective cover. Just because a rabbit has a nice fur coat doesn't mean that it can stand those nights when the temperature drops down below zero. A little while out to feed on those crisp nights is all right, but if they don't have a woodchuck hole or some other cover insulated from the cold, they die of exposure. Deep snow not only hides more of the food, but makes travel searching for it more difficult.

Through evolutionary changes, each species has developed its own way of meeting these winter hardships. Some, like deer, move into special types of cover where the snow isn't quite as deep, and the cold not as fierce. Some have special adaptations, like the snowshoes of the varying hare and ruffed grouse, and the hollow hair of deer. Some make special preparations by storing food near their den, like the beaver and squirrels. Then there are more mobile ones that just fly south where conditions are not as rigorous.

Common skunk.

There is one little elite group, known as the "seven sleepers" that just curl up and sleep the winter away. They are an odd assortment, the bats, bears, chipmunks, coons, jumping mice, skunks and woodchucks. Of these, only the bats, jumping mice and woodchucks are true hibernators. The others actually are just very deep sleepers. Not all bats are hibernators, some migrate to warmer areas where their insect food is still active. Others migrate short distances to good caves for hibernating.

True hibernators have marked reduction in body temperature, rate of breathing, heart rate and are very slow to wake up, for they literally have to thaw out. The breathing rate of a woodchuck, for example, drops from a normal of 260 times an hour to about 14 times an hour. The deep sleepers, on the other hand, show relatively little change from normal rates and can arouse themselves very quickly when disturbed.

Since the hibernating animals' body temperature drops to about the same temperature as the surrounding air, which would be fatal if it should go down to freezing, Mother Nature has built in a safety mechanism which wakes them up as their body temperature approaches the critical point.

American black bear.

The deep sleepers, who don't have the advantage of markedly lowered metabolic rates that accompany low body temperatures, must make some provision for fuel to keep their systems in operation. The bear and the raccoon are notorious for becoming very fat. The skunk has other claims to notoriety, but it also gets fat. The exception is the little chipmunk, which is as lithe as ever when it turns in for the winter. The chipmunk, however, has been storing away food in his den just as busily as the others have been gorging themselves. When the hunger pangs overtake him, he just rolls over in bed and reaches out for one of his tasty acorns.

Woodchuck.

Tradition brings the woodchuck above ground on February 2 to look for the sun. Tradition notwithstanding, what brings the woodchuck up during February and March is the romantic urge to find a mate. For this he wallows around in the cold wet snow, leaving his muddy trail.

The deep sleepers are apt to be up and around any warm night during winter, but again, romance makes the skunk a widely traveled animal during late winter. I was once startled on a warm March afternoon to suddenly see a chipmunk's head come up through a foot of snow in the woods ahead of me. It is during this deep sleep period of the winter that the bears give birth to their young. Their maternity ward can be a cave in a rockslide, a hollow log, or just a snug shelter under the low-hanging branches of a dense spruce.

Long-eared bat.

GOOD READING *for Environmental Education and Interpretation*

BOOKS BY HELEN ROSS RUSSELL

CITY CRITTERS, Paperback. $4.00 plus $.50 postage. $3.00 for orders of ten or more plus postage. Proceeds go entirely to the educational program of the American Nature Study Society. Order from John Gustafson, R. 1, Homer, NY 13077.

This book deals with 7 vertebrates and 12 invertebrates including things like the courtship, housekeeping, flirtations, and family life of house sparrows; the trail of pigeons in and out of world history; singing and working mice; insects and other small animals that set up housekeeping with the cave people and have been travelling around with humans ever since; creatures tough enough to flourish in our most highly populated cities and adaptable enough to feel at home in a tiny farm community. Knowing them guarantees that you will have an acquaintance—and maybe a friend—wherever you go.

EARTH, THE GREAT RECYCLER, publisher Elsevier-Nelson, 2 Park Ave., New York, N.Y. 10016. $6.95.

Ecology for the non-scientist. The story of Earth's wonderful interwoven patterns and our responsibility for maintaining them. Illustrated with drawings and photographs.

SOIL, WINTER, AND SMALL WORLDS, Field Trip Guides, each $4.95. Published by Little Brown, 32 Beacon St., Boston, Mass. 02106.

Three picture books for the six to eight year old set designed to help youngsters explore the world around them in terms of (1) soil formation, (2) plants, animals and the natural forces of winter and (3) common micro-habitats and microclimates. Photographs by Arline Strong.

FORAGING FOR DINNER, Identifying, Collecting, Cooking and Eating Wild Foods. Published by Elsevier-Nelson, 2 Park Ave., New York, N.Y. 10016 $5.95.

The forty-five plants selected are easy to identify, abundant, and flavorful. Drawings and smoke prints aid in identification. Kitchen and dining room tested recipes use standard measurements.

TEN MINUTE FIELD TRIPS, Using The School Grounds for Environmental Studies. Paperback. Can be ordered through bookstores. $6.95, or on school stationery from J. G. Fergusen, 118 E. Wacker Dr., Chicago, Ill. 60601 for $4.95.

This guide developed for teachers can be equally useful for camp counselors, nature centers and parents. Each chapter contains background material, indoor activities and field trip explorations and studies that can be carried out just beyond the four walls of any building. Black and white drawings and diagrams help with identification.

WINTER SEARCH PARTY. Order from Helen Ross Russell, 44 College Dr., Jersey City, N.J. 07305. $3.00 plus $.50 postage.

What happens to insects, spiders, earthworms and the host of tiny animals that are so abundant in summer? An amazing number can be found by an alert observer. Others, more secluded, can make enjoyable reading on a blustery day. Illustrated with 210 marginal black and white drawings.

Land Use: Tough Choices in Today's World

Over the last decade the debate over land use issues has taken many forms at all levels of government. Programs have been adopted and tried at the state, county, and municipal levels, and the federal government, while not enacting any of the specific national land use planning proposals, has initiated programs that regulate the use of land. *Land Use: Tough Choices in Today's World* is a comprehensive review of land use planning problems, implementation experiences, and the courts' reactions to those programs. The 53 papers in the book were presented at the Soil Conservation Society of America's 1977 symposium, which attracted 500 professionals and laymen to discuss the progress of land use planning.

Presented by planners; natural resource specialists; attorneys; federal, state, and local governmental officials; landowners; and laymen, the papers deal with facing the tough land use choices, the competition for land; preserving land for food and fiber; providing land for living space; setting aside land for natural space; federal and state involvement in land use planning; and a special section on the role of citizens, landowners, planners, elected officials, developers, attorneys, and the courts in the land use planning process.

SCSA, 7515 NE Ankeny Rd.,
Ankeny, Iowa 50021
454 pages, 6 x 9 in., softbound, $7.00

PLANNING FOR WILDLIFE IN CITIES AND SUBURBS

A new publication that describes how to create and maintain better environments for both wildlife and people in urban and suburban areas was announced today by the Interior Department's U.S. Fish and Wildlife Service and the Urban Wildlife Research Center, Ellicott City, Maryland.

The publication, "Planning for Wildlife in Cities and Suburbs," is a 64-page manual which focuses on regional and on-site planning for wildlife, particularly in undeveloped areas. Urban core and other developed areas are also considered. Many of the same general approaches discussed in the booklet can be applied in the backyards of private homes.

Historically, urban planners and developers have given little attention to wildlife considerations. Yet, these individuals often unwittingly are wildlife managers in that they set the stage for habitat preservation, improvement, or deterioration in their planning and design activities.

The booklet emphasizes that providing for wildlife has been shown to improve the environmental quality of a residential development, as well as increase the value. It explains how, with little change in the planning and design process—and usually with little cost—conditions for fish and wildlife in both cities and suburbs can be improved.

The manual will be useful to planners, developers, administrators, and decision-makers who may have little knowledge of wildlife requirements or little understanding of wildlife values. Additional sources of expert information and assistance are given including regional listings of selected plants ranked according to their value to wildlife.

The booklet was prepared by the Urban Wildlife Research Center for the Fish and Wildlife Service's Office of Biological Services, and was co-sponsored by the American Society of Planning Officials, Chicago, Ill.

Copies are available from the Information Transfer Coordinator, Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C. 20240. Copies may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, at $2.40 each by referring to Stock Number 024-010-00471-1.

How to Find Insects Weathering the Winter

Jane Brody

Where have all the flies gone? Or, for that matter, the mosquitoes, spiders, ants, bees and butterflies? With the cool days of fall, these and other cold-blooded creatures that are our constant summer companions disappear. Only a few, like the monarch butterfly, migrate south. The rest spend the winter in some cold-hardy form of suspended animation as eggs, larvae, pupae, immature or fully grown adults.

Blue bottle fly.

Although no longer apparent or bothersome, most insects and their arthropod relatives remain in or near their summer homes, and a search for their overwintering forms can turn an otherwise dreary winter day into a fascinating adventure. In her book, "Winter Search Party," Helen Ross Russell, a New Jersey science teacher, tells how and where to find insects and other invertebrates in winter and, for those with even greater curiosity, how to collect samples to watch Nature unfurl again in spring. Although "Winter Search Party" is out of print, copies can be purchased by sending $3.00 to Mrs. Russell at 44 College Drive, Jersey City, N.J. 07305.

Many insects overwinter as adults in a hibernation-like state. As Alice Gray, an insect specialist at the American Museum of Natural History, explained, ants crawl beneath the level where the ground freezes and pack themselves tightly into their tunnels, sometimes as much as six feet under. Ladybird beetles hibernate in congregations and can sometimes be found by the cupful in tree stumps or between railroad ties, Miss Gray reports.

Crickets often huddle in their wingless immature stage in beetle burrows in old logs. These burrows are also winter homes for fertile young hornet queens, each of which will start a new nest in spring. All the workers and the old queens die off when the weather turns cold.

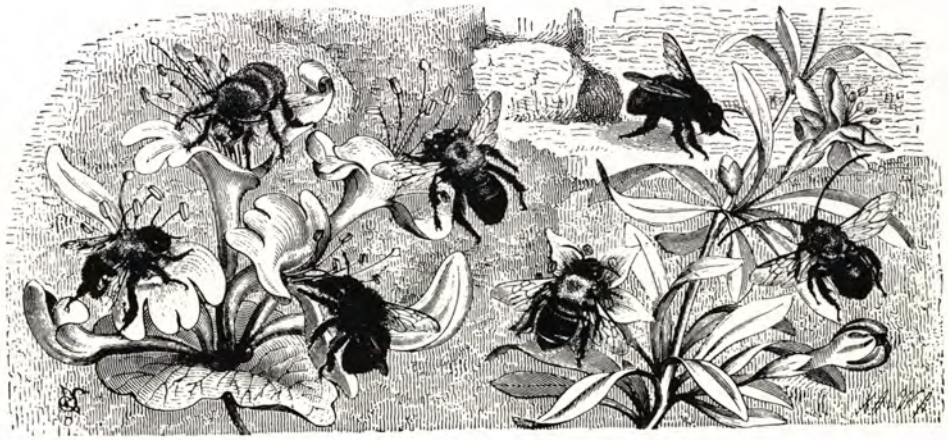
Honey bee males die in fall, but the workers and queens live through the winter, conserving body heat by clustering in a ball. The ball keeps stirring so that the bees on the outside can move into the middle for more warmth. But on warm winter days, Miss Gray says, the bees fly about because they can only defecate on the wing and will be poisoned by their own wastes if they don't fly now and again.

Other insects weather the winter as eggs. Mosquito eggs, which can withstand drying, can be found near water or where water is likely to collect next spring. Praying mantids lay their eggs on the stems of trees and bushes in a walnut-sized froth that dries like merinque. The egg cluster should not be brought indoors in winter because the insects are carnivorous and will have nothing to eat if they hatch permaturely. Garden spider eggs hatch before winter but the baby spiders stay in their silken sack until spring. If the weather warms up and they get hungry, they will eat each other.

Most butterflies and moths spend the winter as pupae in a naked shell called a chrysalis or in a spun cocoon. In spring, the insects go through a metamorphosis and the fully grown adults emerge. But the angle wing butterflies, among them the mourning cloak, red admiral and painted lady, overwinter as adults and may even be seen flying about on a warm winter day.

Hanging hornet's nest.

As for house flies, Mrs. Russell says that most of the ones that will bother us next summer spend the winter as adults in cool places in buildings, including homes. Each female that survives the winter can produce 400 to 650 eggs next spring. So, she adds, the best way to help reduce next year's house fly population explosion is to kill as many as possible during the winter.



Flower bees.

NEWS and NOTES *for Environmental Education . . .*

PROSPECTS FOR ONSITE SOLAR ENERGY

By the mid-1980's, energy supplied by small-scale solar equipment located at the point of use could **meet a variety of residential, commercial and industrial needs.** Such "onsite" solar systems are technically capable today of providing energy for domestic hot water, space heating and cooling, industrial process heat, and mechanical and electric power.

With few exceptions, solar energy now costs more than energy from conventional sources. However, if expected reductions in the cost of some kinds of solar equipment (particularly solar electric equipment) and expected increases in gas, oil, and electricity prices occur, solar equipment **could be competitive** on a life-cycle cost basis **in a variety of markets within 10 years.** Solar hot water and heating systems are already competitive in some circumstances.

Onsite solar systems which rely on storage for backup can be designed to provide all of a building's energy needs, but generally are more expensive than systems relying on electric or gas backup. Systems relying on electric backup can be designed which would not adversely affect utility rates. Systems using oil and gas as a backup may be more attractive in some circumstances. Small **electric-generating** solar systems may find it preferable to sell electricity to a utility (if permitted to do so), even at reduced rates, than to store electricity.

Small solar systems offer a number of **technical and economic benefits.** They do not require long-range planning and large investments **in single plants.** Most solar components, except storage, are modular and thus do not offer economies of scale. Solar energy could create new jobs, particularly in the construction trades; reduce world competition for fossil fuels; and improve U.S. balance of trade. In most cases, solar equipment can deliver energy with **minimal harm to the environment.**

Markets for small-scale solar equipment will develop without Government assistance. However, **without Government help, solar energy is unlikely to make a significant contribution to U.S. energy supplies before the year 2000.** Existing Federal programs controlling fuel prices and subsidizing nonsolar energy sources have created a situation where, without compensating subsidies, solar energy is uniquely disadvantaged. A program to accelerate the widespread use of solar energy could include: 1) allowing energy prices to rise to marginal replacement cost; 2) establishing tax credits, loan subsidies, or other incentives for both consumers and manufacturers of solar devices; 3) supporting a balanced program of research, development, and demonstrations on a wide variety of solar concepts; 4) resolving legal and regulatory barriers, particularly utility law and "sun rights," 5) encouraging international cooperation in solar research and demonstrations, especially in areas where solar energy may be commercially attractive before it enters U.S. markets; and 6) ensuring that adequate standards are established.

The report, "Application of Solar Technology to Today's Energy Needs," is available from the U.S. Government Printing Office. The GPO stock number is 052-003-00539-5; the price is $7.00. Copies **for congressional use** are available by calling 202/224-8996.

TARGETING PESTICIDE SPRAYS ON PLANTS, NOT THE WHOLE FIELD

Why spray pesticides over an entire field if only the plants need to be protected?

Within the U.S. Department of Agriculture, researchers now report initial success in targeting pesticide sprays strictly on crops.

They are using a new pesticide sprayer that turns on automatically as it passes over the plant, and then shuts off. No continuous spraying is done.

Chemical usage, in a season-long field experiment, was cut back 31 percent, they reported.

Agricultural engineers of USDA's Science and Education Administration have developed the sprayer for use on fruit and vegetable row crops, where the on-off system is practical.

On-off spraying is activated by wire "feelers" of spring steel on an air-operated model of the sprayer, while a second version uses an electric eye system.

A working model of the air-operated sprayer used 31 percent less insecticide than a continuous sprayer in trial runs last summer on a cabbage crop, according to Donald L. Reichard, agricultural engineer stationed in Wooster, Ohio. He built the sprayer from easily-obtainable parts, designed to be operated over millions of cycles at very fast response times.

Reichard's air-operated sprayer produced a double payoff: the pesticide volume was reduced and the insect damage was controlled "just as well" as in continuous spraying, according to an entomologist's analysis of the feeding damage of cabbage loopers and imported cabbage worms.

Reichard also built and tested an electrically-operated on-off sprayer, but while it used 42 percent less chemical it also fell short of the air-operated model in controlling pests.

"If we assume eight weekly applications, per acre savings in pesticide costs would be about $10.50 and would soon offset the cost of an intermittent sprayer," the engineer said.

"Contamination of the environment," he said, "would be reduced in proportion to the amount of pesticide saved."

As to the potential of the electric-eye system, its designer, Peter A. Boving, said laboratory studies have been promising. Field testing was started this summer (1978).

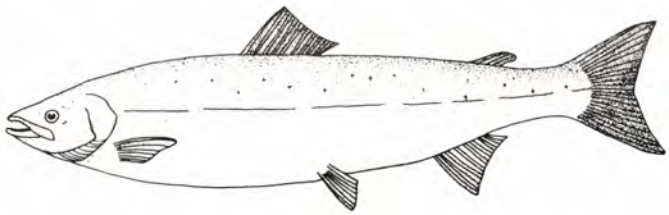
An agriclutural engineer based at Yakima, Wash., Boving has explored the use of the electric-eye system for treating sugarbeets. They are attacked by insects from the time young plants emerge, and treating the seedlings can help to maintain yields and hold down production costs.

"Using broadcast techniques to treat seedling with pesticides is very inefficient when the ground coverage of the crop may be only 10 percent," Boving said.

His sprayer, using the electric eye, is activated only when a plant interrupts a modulated infrared light beam. Modulation is used to prevent sunlight's infrared radiation from interfering with the sensor reception.

As the two agricultural engineers view it, the increasing costs of chemicals will focus new attention on reducing the amount of chemicals applied and, in turn, make it practical to use row-type, on-off sprayers.

ATLANTIC SALMON AGAIN RUN THE CONNECTICUT RIVER



For the first time in over 100 years significant numbers of Atlantic salmon have returned to the Connecticut River system—a result of one of the most successful fish restoration efforts ever. The river system, once barren of the species due to dams which acted as physical barriers, is being used again by salmon, reared at Federal and State hatcheries. In the last 3 weeks more than 50 adult Atlantic salmon have been captured in fish lifts and traps—a tenfold increase over 1977—and are being held in the Berkshire National Fish Hatchery in Hartsville, Massachusetts.

This is a heartening conservation story. It's what we've been waiting for—fish that home in on the Connecticut River and that might eventually become established as a Connecticut River strain for the first time since George Washington's era. It clearly illustrates that almost impossible feats can be accomplished when Federal and State agencies work together.

Most of the fish appear to be in good health, weigh between 11 and 13 pounds, and are between 30 to 32 inches in length. While most have no markings or tags, all of the 4-year-old fish were stocked as 6 to 8 inch smolts in the lower Connecticut River system in 1976.

The fish will be kept at the hatchery until the fall when artificial spawning will be performed. Then the offspring will be raised in hatcheries until they reach smolt size (the size at which they are ready to enter the ocean). In the spring of 1981, they'll be released in the lower Connecticut River. Usually, the salmon will spend the next 2 years at sea until they mature and return to the river system to spawn. Each female salmon produces between 8,000 and 10,000 eggs, but commonly less than 1 percent of the offspring which make it to smolt size survive until spawning stage.

The salmon were caught beginning May 24 at the fish ladder at Rainbow Dam on the Farmington River at Windsor Locks, Connecticut, and at the Holyoke Fish Lift on the Connecticut River in Massachusetts, about 80 miles from the mouth. More salmon are expected to be caught, and many more are thought to be in the river below the fish lifts.

This cooperative restoration effort was begun in 1967 by the U.S. Fish and Wildlife Service, the Commerce Department's National Marine Fisheries Service, and the States of Massachusetts, Connecticut, New Hampshire, and Vermont through the formation of a Policy Committee for Fisheries Management of the Connecticut River Basin. As a result of the work of these and other agencies, pollution of the river system continues to subside, and fish passage facilities have been or will be constructed to pass the salmon over major obstructions.

NEW AUDUBON SOCIETY SCHOOL

The National Audubon Society has established a special environmental education program which can serve as an accredited portion of any college, high school or graduate school student's curriculum. The program provides potent learning experiences by making it possible for participating students to live in and study varying natural communities and cultural settings. Audubon semesters and summers explore the ecology of America with the assistance of over 100 experts, specialists and resource people.

Full information is available by writing the Audubon Expedition Institute at 950 3rd Ave., N.Y., N.Y. 10022. Admission is open to all regardless of race, creed or nationality. The Institute is partially funded by a grant from the National Endowment for the Humanities.

GOOD READING

Can garden pests be controlled by a) spinach, b) a pin-wheel, c) a yellow-billed cuckoo?

Is a fly-swatter a pesticide?

Can trees control noise? Provide air-conditioning?

Can riprap help save our streams?

The answer to all these questions is "yes," and a new booklet published by Concern, Inc., tells you how to use planting and other natural aids to save a stream, preserve a sand dune or cut household energy needs.

"The Concerned Gardener" is designed as a guide for neighborhood and civic groups, as well as individuals who care, who want to control or correct environmental problems.

How to mow your lawn and how to water it, how to plant the wetlands, flower the secondary sand dunes, what pesticides are safe—these are a few of the subjects covered. You will also find out where to go for additional information about plants and trees suitable for your part of the country.

There are trees more likely than others to withstand urban stresses, primarily air pollution caused by auto emissions. Mangroves preserve wetlands. Grasses and reeds—the start of the food chain—protect sand dunes from dangerous erosion.

For your gardening friends and neighbors "The Concerned Gardener" will make an ideal gift at any time. At Christmas it can serve as a card for someone who deserves more than just a card.

"The Concerned Gardener" may be ordered, at $2.00 a postpaid copy, from Concern, Inc., 2233 Wisconsin Avenue, NW, Washington, D.C. 20007. For first class mail send $2.50 per copy.

Major Study of American Attitudes Toward Wildlife and Natural Areas Begun

The most comprehensive study yet done of the American public's attitudes toward wildlife and natural areas is being conducted by Yale University under a recently awarded grant by the Interior Department's U.S. Fish and Wildlife Service.

"This is a bold new step for the Fish and Wildlife Service," Director Lynn A. Greenwalt said. "Never before have we undertaken such a large-scale effort to determine the human dimension that affects wildlife management. The results of this investigation will help us to promote greater citizen participation in the decision-making process and in our future plans to manage wildlife for the benefit of all Americans."

Dr. Stephen Kellert, a senior research associate at Yale's School of Forestry and Environmental Studies, will serve as principal investigator of the 3-year study. He is one of the Nation's foremost authorities on public attitudes toward wildlife. His research is generally regarded as the most definitive work to date on the factors that influence how people perceive and are likely to behave toward wildlife.

"Most conservationists are already aware that for many species and for many areas of the country, we can no longer simply 'leave it to nature' to assure that wildlife will survive and do well in this country," Greenwalt said. "Man has already intervened with his cities, agriculture, pollution, recreation, and a host of other activities. And he must continue to intervene to ensure that those species and natural areas will be preserved for generations to come. This is a basic tenet of sound wildlife management.

"Knowledge of human attitudes and perceptions about wildlife and their habitat can be just as valuable to wildlife management practices as is the latest waterfowl population census or the number of acres of wetlands drained each year."

Preliminary results of the study are expected by June 1979. The study will focus on the results of data collected from personal interviews with 3,000 randomly selected Americans—2,700 over age 18 and 300 under age 18.

Major areas of investigation include:

—Trends and significant changes in American attitudes toward wildlife at the national and regional levels and the implications for species not hunted or fished.

—The size, distribution, social characteristics, and attitudes of key wildlife interest groups such as birdwatchers, backpackers, trappers, and hunters.

—Public perceptions of crucial issues affecting wildlife and their natural habitat (e.g., concern about endangered species, preservation of wetlands and other fragile habitats, the impact on wildlife of energy exploration and development).

—The identification of critical stages in the development of young people's attitudes toward wildlife and the implications for environmental education.

—Aesthetic and symbolic values attached to wildlife.

—The extent to which factors, such as education, occupation, place of birth, and present residence (urban vs. rural), influence attitudes toward wildlife.

—The identification of appropriate ways to improve cooperation between hunters and non-hunters to protect wildlife and natural habitat.

Several of the key features of the study—non-game wildlife, endangered species, habitat preservation—were strongly emphasized in President Carter's Message to Congress on the Environment (May 23, 1977).

In addition to being extremely helpful to the Interior Department, the data from this study is expected to be useful to local park and planning commissions, State fish and wildlife agencies, educational institutions, and conservation organizations.

To ensure that the study results are valid and useful to wildlife professionals, the Service has established an informal advisory committee composed of leading conservationists and private citizens who have volunteered their time to assist in the development of the study. Among the organizations represented on the committee are the Environmental Defense Fund, International Council for Bird Preservation, National Association for the Advancement of Colored People, New York Zoological Society, AFL-CIO, International Association of Fish and Wildlife Agencies, Humane Society of the United States, National Wildlife Federation, and the League of Women Voters.

SEED EXTRACT "UGH" TO JAPANESE BEETLES

Japanese beetles stay clear of oilseed extracts from the neem tree of India and Africa. Could it be due to the seed's garlic-like odor?

U.S. scientists aren't sure why, but they do know, for the first time, that the neem seed works wonders as a biological control against foliage-eating Japanese beetles.

Neem seed extracts will so discourage the beetles that, in some cases, the metallic green and brown pests will starve before they will take a bite on extract-treated plants.

On being given only a feeding of sassafras, Dr. Thyril L. Ladd, a U.S. Department of Agriculture entomologist, reported, "some beetles died rather than consume the treated sassafras leaves." As an alternative to pesticides for Japanese beetles, the neem seed extract looks good so far. "Our studies show that extracts of neem seeds are uniquely effective as a deterrent to Japanese beetle feeding."

Dr. Ladd, research leader of the agency's Japanese Beetle Research Laboratory in Wooster, Ohio, said experiments were started in 1965 on sassafras to see whether the neem tree's reported medicinal and insecticidal powers in India and Africa could have a payoff in controlling the beetle.

USDA's researchers were not without clues. Over the years, the neem tree had become almost a mystical source of healing agents, and Hindus in India have looked upon it as a sacred tree. Its bark has been used, for example, to treat fever, nausea, and scorpion and snake bites while the leaves have been said to yield a remedy for ulcers.

What attracted the researchers were reports that the neem oil would repel insects, and that in India, where the tree is grown commercially, the seeds are mixed in stored grain to keep insects out.

NEVER DOES NATURE SAY ONE THING AND WISDOM ANOTHER

Grass - A Renewable Source of Protein

Grass, looked at and walked on in the U.S., may take on a new status worldwide as a source of protein, easily used to fortify foods.

"According to what we now know, the potential is there for developing countries to utilize grasses as renewable resources for food supplies," said Dr. John J. Evans, research chemist, U.S. Department of Agriculture's Science and Education Administration.

Dr. Evans said it is possible that localities in developing countries can process their own grass protein into powder and meal, based on research findings of a cooperative Pakistan-USDA project.

Pakistani scientists extracted protein from native grasses and processed it into a high protein supplement, called leaf protein concentrate (LPC). They found that LPC added 50 to 70 percent more protein, in some cases, to Pakistani foods.

Apart from the concentrate, the grass extract also yielded a bonus for the Pakistanis. Microbial foods such as yeast and mushrooms, they found, can be propagated in nutritionally-rich liquid that is left in the processing cycle.

Dr. Evans, cooperating USDA scientist for the project, said the Pakistani work has provided "needed information on the preparation, composition and use of leaf protein concentrates."

Whether grasses will become a new direct source of protein to fortify foods in the U.S. may depend on USDA scientists economically developing a white, edible concentrate.

According to Dr. Evans, food products containing LPC are green in color, and research in this country has indicated that color is not esthetically acceptable. "It may be only a matter of time and food needs," he said.

He said the color is no problem in the East where many food delicacies are grass and where, in Pakistan for example, farm families use green leaves for food after pounding them into an edible pulp. As part of the Pakistani studies, the scientists fortified native main dishes including bread, potatoes and vegetables.

As an example, seven grams of LPC were added to bread, for a sandwich of bread, boiled potatoes, butter, cumin seeds, salt, chilies and pepper. LPC increased the protein level 51.3 percent.

Adding 15 grams of LPC to 100 grams of Chutney resulted in a 70.2 percent protein increase. Chutney is a sauce made with mint, coriander, onions, pomegranate seeds and red chilies.

Pakistani scientists reported that LPC in the native dishes does not affect taste, texture or flavor.

Dr. Evans said the Pakistanis studied 20 species of grasses "of common interest to the U.S. and Pakistan," for yield, content and extractability of protein. One species, Napier millet hybrid, was highest in yield in both tons of leaf material per hectare a year and in kilograms of protein (LPC) per hectare a year.

Pakistani scientists reported that LPC can be used for food and feed, based on its content of protein, lipids, carbohydrates, minerals, vitamins and pro-vitamins. A residue from the extraction process was found suitable as a feed for cows and sheep; the residue contained protein, fiber, lipids, lipid soluble vitamins and carbohydrates.

Dr. Evans said the cooperative Pakistani studies, undertaken at the Pakistan Council of Scientific and Industrial Research Laboratories, Lahore, will be incorporated in USDA research on protein sources. Alfalfa juice is being investigated in Berkeley, Calif. and southern forages such as Coastal bermuda grass are being studied as poultry feeds in Athens, GA.

ENVIRONMENTAL IMPACTS ON COAL-FIRED POWER PLANTS STUDIED IN NEW REPORT

The ecological impacts of the current trend toward greater use of coal as an energy source for power production are discussed in a new 261-page report announced today by the Interior Department's U.S. Fish and Wildlife Service.

The technical report, "Impacts of Coal-Fired Power Plants on Fish, Wildlife, and their Habitats," covers the environmental impacts associated with the operation of a power facility from the time at which coal is delivered to the site through the final disposal of waste products.

The rapid rise in oil prices coupled with the national emphasis on future energy planning and development has made coal one of the cheapest and most abundant sources of energy for electric power production.

The Fish and Wildlife Service's National Power Plant Team contracted for the report because this increase in the use of coal can harm fish and wildlife through the discharge of waste materials from coal-fired power plants.

The report contains current information on the potential impacts on plant and animal communities and their habitats from the operation of coal-fired electric generating facilities and steps that can be taken to minimize these impacts. Also discussed are the impacts associated with oil- and gas-fired stations that have been converted to coal.

Included in the report is an outline and discussion of research needed to more effectively predict and minimize impacts along with extensive reference listings at the end of each major section of the report.

"Impacts of Coal-Fired Power Plants on Fish, Wildlife, and their Habitats" is the first of two major publications prepared by the Department of Energy's Argonne National Laboratory under an interagency agreement between the Fish and Wildlife Service and the Department of Energy. The second—a field manual entitled "A Biologist's Manual for the Evaluation of Impacts of Coal-Fired Power Plants on Fish, Wildlife, and their Habitats"—will be published this month.

The National Power Plant Team, headquartered in Ann Arbor, Michigan, is a part of the Fish and Wildlife Service's Biological Services Program. It provides the Program's scientific and technical expertise regarding the impacts of power plants and energy development on fish and wildlife resources and arranges for contract studies with States, universities, and consulting firms.

"Impacts of Coal-Fired Power Plants on Fish, Wildlife, and their Habitats" can be purchased for $4.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, stock number 024-010-00458-4.

Along the Paint Pot Hill Trail

Richard F. Fleck

We had to break away from the crowds of tourists at Yellowstone National Park and seek our own wilderness. The Paint Pot Hill Trail seemed to be the right place for that, for here we would observe Yellowstone's more remote thermal features affording us our own intimate discovery.

Stopping by a marshy meadow with little patches of June snow, we took our binoculars and camera and started to cut across the lush meadowlands. Two Canada geese flew overhead while one bull with his harem of ten cow elk placidly browsed on sweet grass stalks several hundred yards away. Thousands of Western Spotted frogs croaked in the marshes below the lodgepole pine forests sounding like the Okefenokee Swamp of Georgia. The woods, so lush with melting snow and rain water, were bordered by rocky cliffs literally draped with bright green mosses, lichens and liverworts. Clumps of delicate red shooting stars and maroon pine drops sprouted through layers of dead pine needles. As we trekked along the winding path through aisles of pine trees, I could have thought we were back in the Tetons or even Rocky Mountain National Park, Colorado. Entering an upland meadow about a mile back in, we saw steam clouds rising a half mile away, but these could have been clouds of mist as well; we were not sure. Yellow golden banner swayed in the open green meadow below towering red-brown cliffs of rhyolite. At the far end of the meadow below some pine branches, the trail passed a miniature paint pot no larger than a kitchen pot. Violent bubbles of mud rose to the surface emitting steam. No other sign of thermal activity could be found, yet this tiny area of violence churned as if it stood next to Old Faithful or the Fountain Paint Pots. The first man, red or white, to have seen such a sight must have either been frightened to death or mystified the rest of his life.

After another five minutes of ambling along the trail we reached an unstable area with warnings to keep on the wooden boardwalk crossing over steaming red earth having a sandy texture and smelling quite sulphurous, like a Mud Volcano. At trail's end we reached a series of gurgling paint pots curiously surrounded with thick clumps of blue chiming bells. One of the pots spouted puffs of steam sounding like a locomotive in a freight yard. We soon realized that we had come to an entire basin of bubbling pots at the foot of a naked rhyolite cliff. Coming into such an area, without being trailed by dozens of other people, gives one the sense of having a closer and more primitive rapport with the essence of the Yellowstone wilderness. One can better understand the early experience of John Colter and other mountain men who made solo treks into this unique country. To have been alone and to have discovered bubbling springs and geysers of the Yellowstone plateau must have been for Colter as deeply spiritual as Indian medicine men seeing visions on the prairie. We had a small taste of Colter's experience here on the Paint Pot Hill Trail. Such areas as these help us regain what we have lost through centuries of encroaching civilization.

EXHIBIT INFORMATION WANTED

Dr. James Fazio is in the process of compiling information for a service project being conducted at the University of Idaho. He would like very much to hear from you if you could supply information relative to exhibit constructors and suppliers. Specifically, he would like to compile a list of sales outlets for a) indoor message repeaters, b) listening devices, and c) firms or individuals who can produce finished portable exhibits (complete with recommended AV equipment and shipping containers), from scale drawings.

If interested or if you have knowledge of a satisfactory source(s) of these services or materials, please send listing to: Dr. James R. Fazio, Wildland Recreation Management Program, College of Forestry, University of Idaho, Moscow, Idaho 83843.

MOSQUITOES NEED ONLY A WHIFF OF YOU — ZAP!

What attracts mosquitoes to the human body?

We know that mosquitoes are out for blood, literally. Yet that doesn't tell us why the pesky devils go after some people while others escape the stings.

An unlucky victim, it is now known, gives off odors that a mosquito likes.

That may not be the only reason, says the U.S. Department of Agriculture, but a new study has left little doubt that the body's odors are heady stuff for female mosquitoes on the prowl.

A whiff of skin odors attracted mosquitoes, in research that cooperating US DA and University of Florida scientists did. They used an instrument called an olfactometer to measure the mosquito's reaction to airborne odors.

One trap, in the olfactometer, had clean air, and a second trap the skin odors from a person's arm. Carbon dioxide and water were added to balance the airstream in each trap.

On releasing 100 female mosquitoes, researchers found that the odor-laden air trap bagged some 60 mosquitoes. And, the clean air trap failed to attract one mosquito.

As to other reasons why mosquitoes attack, one is that the body's warmth may have a special appeal. Another simply is that the body is there, as a human target.

According to the scientists, their research is aimed at identifying the "human-produced organic chemicals" that attract mosquitoes to humans. Thus, in the tests, other clues were removed, such as seeing the person and sensing the infrared emissions and warm air rising in convection currents from the body.

Other stimuli—including odors, moisture, carbon dioxide, and lactic acid coming from the skin—seem to overlap in the "mosquito attraction hierarchy," the scientists suggest as a result of their research.

"Will Power" Energy

The current furor over gasoline shortages and nuclear energy is not so much a matter of supply of oil power or electric power as it is a matter of will power. It's time for us—each one of us—to face up to the realities and act responsibly. It's not someone else's problem—it's ours. Very simply stated, we consume too much energy!

I use the word "consume" because we really don't "use" all of it—we waste about 40 percent of the energy we produce or import.

It is probably true that nuclear energy is a dead-end source—the malfunction at the Harrisburg plant underscores what common sense (and even some expert judgment) has been telling us all along:

—The magnitude of the effects of a nuclear failure are too great to be acceptable;

—There is no fail-safe system;

—Proliferation of nuclear material can only lead to its misuse.

—We don't know how to take care of the wastes;

—Long-range supply of reactor fuel is uncertain;

—The cost of nuclear-generated electricity is not competitive when the cost of safety and waste disposal are included. (Just the increase in insurance rates which will surely follow the Harrisburg affair are enough to boggle the mind.)

Even if the impending gasoline shortage is contrived by the oil companies, the fact still remains that we import half of what we consume, with a tremendous drain in dollars, making for enormous trade deficits, a weakened dollar, runaway inflation, and a shift of world power away from the U.S.

And it's all so unnecessary! If we would cut out needless waste and waste due to inefficient methods, we wouldn't *need* to build nuclear plants or to import huge quantities of oil. A well-designed and public-supported energy conservation program would not only alleviate these immediate problems, but would give us the lead time for developing alternative energy sources such as solar.

There's a special challenge to those of us in nature interpretation and environmental education in all of this. We've got to set the example, not just preach! The old saying, "I can't hear what you're saying 'cause your actions speak so loud" is so true! Our individual life-style, the way in which we run our programs and nature facilities, all must show that we are serious about the matter of energy and materials conservation. Lack of credibility is always a fatal blow to any social enterprise.

Fortunately, energy conservation is a matter that we citizens can do something about. We can cut back on gasoline consumption ten or fifteen per cent, and make those allocations last to the end of each month. We can reduce our demand for electrical energy, and thus build some moral ground on which to oppose plans to store nuclear wastes under our lovely hills. A little thought will quickly bring to mind many ways in which we can do with less energy:

—Automobiles: Avoid idling, speeding, poor tuning, extra trips due to poor planning, and big cars.

—Homes: Keep the heat at 55 to 65 degrees (F) in winter and 75 to 85 degrees in summer; insulate; triple-glaze windows; shut off unused rooms; fewer and shorter showers, shampoos and laundries; turn off TV, lights and appliances when not in use.

—Institutions and Businesses: Greatly reduce advertising signs and decorative lighting; cut back hours; watch heating and cooling levels.

—Individuals: Use manual and foot power in place of machines.

The time is over when we could blithely gobble up energy without thought for the consequences! We have entered the age when waste is wrong. Let's not act like little children and wait until someone coerces us to behave.

It can be done! At the college where I teach we cut back energy consumption by thirty per cent in 1975. Other institutions have done even better. In my own home we have reduced heating oil consumption in the past two years by 70%, by improvement of insulation and modest use of a wood stove.

It's time for all of us to get into the action!

J.A.G.

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