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## Monthly Planet, 1987, June

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# **MONTHLY PLANET**





*Corbin Piper*

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*Planet folks:* Amy Morrison, editor; Claire Cdebaca, Susan Dixon, Alice Panny, Scott Williams, staff; Rich Royston, contributor; N.S. Nokkentved, photographer and student adviser; Lynn Robbins, faculty adviser.



*Cover design and photographs by N.S. Nokkentved*



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# GRIZZLIES in the North Cascades

## Program helps grizzlies and campers share North Cascades

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"There is a need to reeducate the public in back-country etiquette."

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by Chris Stirling

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**T**he North Cascade mountains are home to a number of the endangered *Ursus arctos Horribilis*, better known as the grizzly bear. A five year research program, being conducted by the Department of Game, the Forest Service, and the Park Service, is attempting to find out more about the bears and is trying to educate the public about them.

In 1986 37 reports of grizzlies were documented. Of these, 18 were considered credible according to Jon Almack, a wildlife biologist who is currently studying the grizzlies in the North Cascades. Of the sightings considered credible, grizzly sows were seen with cubs, indicating a reproducing population.

Almack is working for the Washington State Department of Game in conjunction with both the Forest Service and the Park Service to find out the grizzlies' population in the North Cascades and to evaluate their habitat.

The research program obtains special funds from Congress under the Endangered Species Act of 1973, and includes other states which support grizzly populations such as Wyoming, Idaho, and Montana. Started in May 1986, the program is scheduled to run five years.



Due to a peculiar trait of grizzly social behavior, data has only trickled in. "Census is hard because grizzlies are single-roaming creatures" Almack explained. "Briefly the males and females come together to breed in the last two weeks of June"

Besides trying to get a census of grizzlies, the research program is studying habitat, especially the food sources within that habitat. 80-90 percent of the omnivorous grizzly diet consists of plants and roots, small mammals, insects, larvae, and fish. By better understanding the foods which grizzlies rely on, the better their habitat can be protected.

Almack is not only concerned about their continued existence, but the public's perception of them.

Although there have been no documented attacks of grizzlies on people in the North Cascades, the grizzlies are the target of many misconceptions. The notion that grizzlies are "man-eating" has been perpetuated by the media. Pictures of grizzlies on hind legs, nine-feet tall, poised to attack, are common in magazines and movies.

One theory as to why they stand on their hind legs more than Black bears is because they evolved on Siberian grasslands where their only defense was making themselves seem larger and more intimidating when predators threatened. Another theory points to their increased ability to see, hear, and smell when standing upright. In contrast, Black bears tend to climb trees when threatened, though they can and will stand on their hind legs.

Almack contends that "there is a need to reeducate the public in back-country etiquette." Campers need to respect the bears and to "bear-proof" their campsites. Part of Almack's program is educating the public to minimize dangerous situations for themselves.

Some precautionary steps include keeping campsites free from food particles and odorous materials, cooking at least 100 yards downwind from the campsite, not sleeping in the same clothes that were worn while cooking, stringing up food and other products that could interest scavaging bears, leaving dogs and other pets at home, and camping away from a known



MARILYN HOFF STEWART

feeding ground or food source. All of these precautionary measures are centered around not attracting bears, thus reducing a potentially dangerous situation.

Interestingly, grizzly bears are not always grizzly and Black bears are not always black. The common shades of brown, black, and cinnamon can be colors of both the Black and Brown bears. Size is dependent on the age and sex of the bear. The best way to distinguish a Black bear from a Brown bear (grizzly) is by the large muscular hump across the shoulder area of the grizzly. Also, a grizzly has long straight claws, unlike the "hooked" claws of a Black bear. The long straight claws of the grizzly, powered by the muscular shoulders, help to dig and forage for plants, roots, and other foodstuffs.

By respecting all bears, respect will be returned at least in terms of human safety. Grizzlies then will not have to be the scavaging nuisances that public ignorance has tagged them to be.

# ***PROFILE:* Ernst Gayden**

*by N.S. Nokkentved*

In 1975 Ernst Gayden bought a small piece of land at the foot of Sumas Mountain in the Nooksack Valley. During the summer of 1985 he began to apply his interest in appropriate technology to his dream of designing and building his own house. He started to build a passive-solar house, which, now, is near completion.

The design of the house is based on principles of passive-solar heating Gayden learned at the Illinois Institute of Technology. Large windows face the south, and inside the house a massive concrete wall and concrete floors absorb and store heat from the sun.

Gayden's interest in solar heating is part of a larger interest in appropriate technology - which means just that, solving problems with technology that is appropriate to the situation - that grew out of his study and work in human ecology.

Appropriate technology is a growing area of interest. Although the need is not yet apparent in this country, it is very much alive in the Third World, he said. "It is an essential part of the future."

Gayden, 63, had taught at Huxley College of Environmental Studies since 1971 and has seen it change from offering a truly environmental education to training technicians. The changes have come as a result of an attempt by the college to prepare students for the kinds of jobs available "out there," and to meet students' expectations.

As a professor at the University of Washington, he had been unable to introduce environmental concerns in the curriculum there. He then heard about a new college at Western - Huxley - a college of Environmental Studies.

At Huxley he developed a program that introduced environmental planning to city and regional planning. It was the first fully developed program of its kind in the country at an undergraduate level, Gayden said, and was part of the Huxley curriculum for ten years.

The program lacked any direct impact on the profession of planning, Gayden said, because most students were undergraduates. It ended in 1981, not from a fault of the program, but because two other faculty members left. He couldn't carry it alone, he said.



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Gayden, his short hair graying around his now balding plate, was born in California and grew up in eastern Kansas in a family of teachers. His grandfather, whose five daughters all became teachers, was a teacher, and Gayden's father also was a teacher.

A large, barrel-chested man, he sat in an old wooden rocker that creaked as he shifted his bulk forward.

"I decided when I came back from the war that I was going to do what I wanted to," Gayden said. He determined that he would not let his race get in the way of what he wanted to do.

During his experiences as a soldier in Italy during World War II, he became curious about the nature of a society that makes war on other societies. When he returned from the war, he began to study sociology.

After graduating from the University of Chicago in 1948, with a Bachelor of Philosophy, he went to work for the Chicago Housing Authority and later the Cook County Department of Public Aid in the slums of Chicago.

He began to see how decisions were made that affected people's lives. He saw a lack of environmental awareness in planning. This same lack of awareness led to many of the pollution and resource problems in our cities today, Gayden said.

This lack in planners also inspired him to want to teach so future generations would not have this problem. In 1967 he received an M.S. in city and regional planning from Illinois Institute of technology. After he graduated he was hired at the University of Washington to teach city and regional planning.



*"I decided when I came back from the war that I was going to do what I wanted to."*



In 1969, out of concern for the future of the Pike Place Market, Gayden began a study of the market farmers - to find out who the farmers were, where their farms were, what they grew and how they grew it. He was a regular user of the market that was being threatened by urban re-development.

He became a board member of the Friends of the Market in 1970 and worked with that organization to preserve the Public Market on Pike Place in Seattle. The market is one of the few where farmers sell only their own produce.

While working at the UW and, later, Huxley, Gayden was a member of the King County Design Commission from 1968 to 1985. One of the two remaining original members at the time of his resignation, he served as the urban planner on the six member commission. The other members were two architects, two engineers and one landscape architect.

The commission also included a lay chairperson. The function of the commission was to select and recommend design firms for all King County capital development projects, as well as approving submitted designs.

Meanwhile, the demise of the Environmental Planning concentration at Huxley in 1981 led Gayden to establish courses in appropriate technology. He started them as a different approach to environmental planning to replace the defunct program. This new approach - Applied Human Ecology - has led to the formation of the Center for Applied Human Ecology/Appropriate Technology.

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*Ernst Gayden's owner-built solar home nears completion.*

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In 1981 the Huxley faculty agreed to the new center which Gayden has been developing ever since.

"No funds, no budget, no space, just me," he said.

The program offers students an introduction to living and working in the Third World. Gayden has spent three winters in Morelia, where the Mexican portion of the program is centered, to lay the groundwork for what he hopes is something that will continue and grow.

"It's a slowly evolving under-cover operation," Gayden said looking over the top of his gold-rimmed glasses.

A lot of people just accept the way things are going and feel they can't do anything to change things, he said.

"We are doing it ourselves. If we can't control ourselves then it is lost," Gayden said. "A lot of people think things are happening to them and do not accept that we do it to ourselves."

Gayden appreciates the opportunities of teaching at Huxley College and being part of a truly democratic faculty. He appreciates the latitude to teach the things he thinks are important to environmental studies.

"I guess that's what holds me here."

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# WILD and SCENIC

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*by Susan Dixon*

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In 1978 the Skagit River became Washington's first river system to be accepted into The National Wild and Scenic Rivers Act. The Skagit, along with its tributaries the Sauk, Suiattle and Cascade, was first chosen into the Act as a study river in 1968. Because the river flows through a national forest, the river system was put under the administration of the Mt. Baker-Snoqualmie National Forest.

The Skagit comprises the largest drainage basin in Puget Sound and is renowned for its fisheries. Five species of salmon, three species of sea-going trout and a wide range of resident fish live and reproduce in these waters. An estimated 30% of the young fish entering the Puget Sound are from the Skagit River System. The water quality of the Skagit River has been rated excellent. The biological quality of the river is high as evident by the high species diversity and their productivity.

One of the largest migrations of bald eagles in the lower 48 states reside along the middle stretches of the Skagit in the fall and winter. The Nature Conservancy has acquired 850 acres along the river joined with Department of Game land to total 1500 acres along a seven mile stretch of river.

The Skagit, designated as Recreational, runs upstream from Sedro Woolley to Bacon Creek, North of Marblemount (58.5 miles). Its tributaries are designated as Scenic for 99 miles.

This year the Klickitat and the White Salmon rivers joined the Skagit as protected rivers.

The Klickitat, in South Central Washington, has been designated as a Recreational river. The White Salmon river, further east, was given a scenic designation. The upper portions of both

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The Skagit River

*Corbin Piper*

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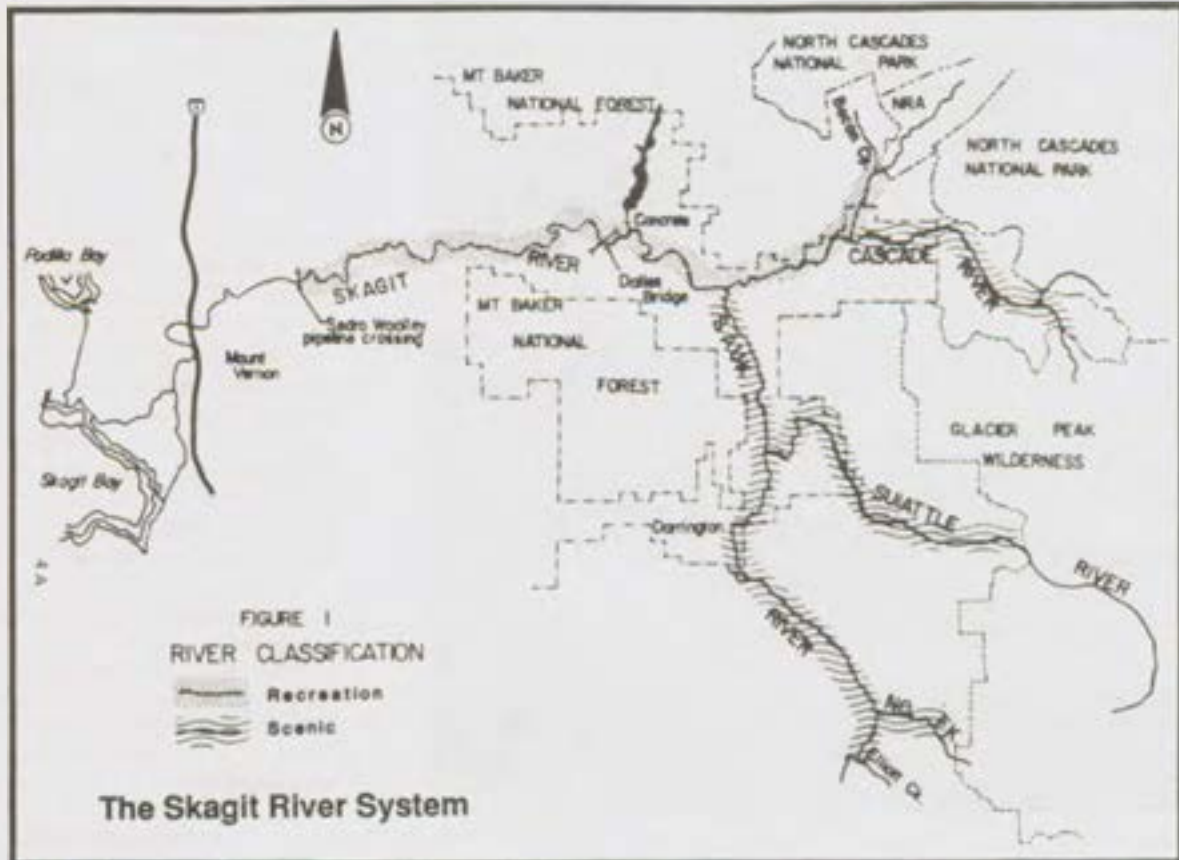
ivers are understudy by the Forest Service for possible future designation.

Recently, the Okanogan, Wenatchee and Olympic National Forests have proposed rivers in their forests to be considered as Wild and Scenic. Wolf Creek, Methow, Chewack and the Pasayten rivers in North Central Washington have been proposed by the Okanogan National Forest. The Wenatchee National Forest suggested two rivers, the Upper White and the Chiwawa, be designated.

Amidst strong opposition from local residents, the Olympic National Forest has proposed that the Dungeness, Gray Wolf and Duckabush Rivers be considered for designation. Local opposition is not a surprise, as logging and fishing are large employers. A Wild and Scenic designation of a local river is sometimes seen as a threat to jobs.



Wild and Scenic designation is often seen as threatening to residents along the river. *Corbin Piper*



## The National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers Act, established by Congress in 1968, offered the first federal protection for the rapidly disappearing free-flowing rivers in the United States. This policy was to compliment rivers that have dams and other human-built construction with those designated for protection. Designation is given to streams and rivers that are recognized as having outstanding scenic, archeologic, recreational, geologic, historic, culture, fish, wildlife and other ecological values.

The policy is not intended to restore rivers to their primitive condition but to preserve their present natural state. Though the law prohibits construction of dams and other human-built constructions, the river segment designated may flow between large dams.

The primary objectives of the Act are to protect and maintain existing scenic and recreational values of rivers and to make them accessible to the public. They must be long enough (generally 25 miles or more) to provide a meaningful recreational experience, have a sufficient volume of water, and have high or restorable water quality.

The Act does not specifically safeguard the water quality of free-flowing rivers. Full maintenance of river waters requires controlling activities in the entire watershed. The Act is designed to take in only as much of the river corridor as needed to protect its values. Stringent enforcement of pollution control laws are required for wild and scenic rivers.

The National Wild and Scenic Rivers Act consists of three categories - wild, scenic, and recreational. Each reflect the condition of the river at the time of designation and determine the manner of needed management.

Wild River Areas include those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and unpolluted waters.

Scenic River Areas are those rivers or sections of rivers free of impoundments with shorelines largely undeveloped but accessible in places by road.

Recreational River Areas are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines and that may have undergone some impoundment or diversion in the past.

The Act limits the land area of a river unit to an average of 320 acres of land per mile of river - equivalent to a one-quarter mile corridor on each bank. The area, however, can include more than the allocated acreage as long as it is balanced by fewer acres along other stretches of the river segments.

Since private land-ownership usually resides inside the designated area, the federal government is required to work with the landowner with easements or zoning arrangements. Although the Wild and Scenic Rivers Act authorizes government acquisition of up to 100 acres per river mile and condemnation in extreme circumstances, each river is individually reviewed for appropriate management.

In general, acquisitions are confined to natural, historic, and recreational areas that are critical to maintaining the quality of the river corridor. The use of the scenic and public use easements is emphasized.

A scenic easement is an agreement between a property owner and the government in which the owner promises to refrain from putting his property to undesirable appearances or uses. The owner of the property remains its owner and the property stays on the tax rolls, but the government pays him for giving up his right to do certain things with it. For example, it could prevent the owner from building an apartment house or cutting of brush or trees along the riverbank. Each scenic easement is detailed for such agreements.

A public use easement is a permission by the landowner to allow public access on a specified portion of the land. The property owner has the right to restrict trespassers.

The process of designation takes several years, but during this time water resource protection laws apply to the river in the study for up to three years after submission. This applies no matter if the river is called to be designated.



*Photographs by N. S. Nokkentved*



# Sehome Hill Arboretum

**E**ven on rainy days the Sehome Hill Arboretum offers solitude, quiet and a place to seek refuge from life's cares. Numerous birds and small mammals make the hill their home year round. Tall Douglas firs clothe the hill and the panoramic view of Bellingham and the bay from the lookout at the top is breath-taking.

Untouched since it was logged in the latter part of the 19th century, the arboretum represents the wilderness that once covered the Pacific Northwest. Shortly after the turn of the century, Sehome Hill became a city park, and the old logging trails served as pathways.

The original arboretum of about 35 acres of college owned land was approved by Western's Board of Trustees in 1969. Added to this in 1974 was an equal area of the city park to become the official Sehome Hill Arboretum, as a result of an agreement between the university and the city of Bellingham.





DOE Engineer D.H. Watson, Jr. explains the N Reactor controls to student group.

## Hanford Tour '87 - or - What is the Half-Life of a Radioactive Huxley Student?

by Rich Royston and N.S. Nokkentved

**T**wenty Huxley students, on a recent class field trip, were whisked around the Hanford Nuclear reservation in an air-conditioned big blue tour-bus, as Mike Talbot, more than six feet tall in his high-heeled cowboy boots, regaled the students with his smooth Department of Energy public relations presentation.

The tour of the 570 square-mile Hanford reservation, which straddles the Columbia river just above Richland, WA gave the students, members of Ruth Weiner's Environmental and Energy Issues class at Huxley College of Environmental Studies, a close-up view of the facilities and methods of handling radioactive waste and other hazardous materials.

The desert scrub-land of the reservation is inhabited by rattlesnakes, jackrabbits, coyotes, and the ubiquitous sagebrush. The facility was started in 1944 to produce plutonium for the nuclear bombs dropped on Japan. It employs more than 14,000 people on its \$1 billion annual budget.

Part of this close-up view included students being

checked for radiation exposure on leaving the vitrification pilot project, the last facility visited. The vitrification process transforms liquid radioactive waste into glass by heating it to more than 1,000 degrees Celsius.

Guards wearing jungle camouflage, with Uzi submachine guns slung casually over their shoulder scrutinized identification badges as students passed through the metal detectors of top security checkpoints. The gates were blocked by concrete barriers to foil terrorist truck-bombers.

The first facility toured was the N Reactor control room simulator. It is an exact duplicate of the actual control room, and it is used to train reactor operators. The only difference between the simulator and the actual control room is that the simulator is attached to a computer instead of a reactor. The computer simulates actual operating conditions, including the emergency shut-down procedure - "scram."

The intent of this part of the tour was to demonstrate that the N Reactor is not as great a threat to safety in Washington and the United States as Reactor No. 4 at Chernobyl was to Russia. Like the Chernobyl reactor, the Hanford N Reactor is graphite moderated and has no containment building to prevent the release of radioactive materials in the event of an accident.



In a tunnel near the top of Gable Mountain, the NSTF conducts tests on basalt rock.

D.H. Watson Jr., an engineer at the N Reactor, explained to the group of students that the N Reactor has a "confinement system" designed to control and reduce the amount of radioactive emissions in the event of an accident. This includes a complex system of air filtration. The safety measures also are harder to override at the N Reactor, Watson said. The Soviets had overridden all the relevant safety system of the Chernobyl reactor.

The students, asked many pointed questions of the DOE officials, but answers were broad and often missed the point. In a question-and-answer session at the close of the tour, Mike Lawrence, manager of the DOE's Richland operation, acknowledged contamination of the water table under the reservation by tritium, nitrates and Iodine-129, as reported in a Seattle newspaper, but downplayed the problem and the number of years before those substances will migrate into the Columbia River.

Lawrence said tests have shown the amount of tritium in the river above the reservation are the same as below the reservation. Environmental Protection Agency guidelines allow the tritium waste to be evaporated or injected into the ground. Waste management officials at Hanford inject the tritium into the ground because they feel, with its 12-year half-life, this is a safer disposal method than releasing it into the atmosphere through evaporation.

Other facilities visited were the Near Surface Test Facility and the Defense Waste Management area. In a NSTF trailer at the foot of Gable Mountain, the DOE provided box lunches - a sandwich, a fudge brownie, carrot and celery sticks, an apple, and coffee, tea or milk - while a Hanford geologist lectured on the principles of the mined high-level waste repository.

At the NSTF, tests are conducted on Basalt rock to gather data relative to the storage of high-level radioactive waste in similar rock deep underground. The testing is done without placing radioactive materials in the ground.

One concern expressed by Lawrence was the massive cleanup necessary at Hanford from years of unsafe disposal practices. The Environmental Protection Agency has estimated that the cost of environmental cleanup at Hanford will run over one billion dollars.

Liz Bowers, a nuclear engineer at the Defense Waste Management Headquarters, urged the students to apply for jobs at Hanford.

"We need chemical engineers," she said. "If you want job security, this is the right place. We'll be here a long time. Part of our annual \$600 million budget goes toward site cleanup." Bowers added, "That'll take years."

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# WORLD

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# BANK

## Financing the Third World

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*by Scott Williams*

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**T**he World Bank is an institution that loans money to the developing nations of the world. Until recently, loans were given to developing nations for specific projects such as dams, roads, and port facilities. The debt crisis of 1982, which saw billions in loan defaults all over the developing world, has brought the Third World debt problem to the forefront. Since that time, the World Bank's policy has changed considerably.

In March 1986 World Bank President A.W. Clausen was replaced by former Congressman Barber Conable. He is the first head of the World Bank without a banking or business background. It will be Conable's job to administer Treasury Secretary James Baker's new Debt Initiative unveiled in October 1985.

The Initiative will direct \$29 billion to 15 debtor nations from 1986-1989 in exchange for economic reforms such as privatizing government run enterprises and encouraging private investment and a free market. \$20 billion is to come from private banks and \$9 billion will be provided by the World Bank and other multi-lateral development banks. The Initiative gives the World Bank a watchdog role in the process, and it will be their job to convince governments to accept the changes, to convince private banks to risk their funds, and to insure that the reforms are enacted and adhered to by the debtor countries.

Baker's Debt Initiative has been criticized for two main reasons. Interest rates and repayment terms were not changed by the new Initiative; the new loans are as demanding as the old, making them difficult to repay until the reforms take effect. Also, critics say the new loans will not address social inequities, such as income disparity, in debtor nations. An example of this is in Brazil where World Bank funded programs are moving peasant farmers to the Amazon to farm on fragile rainforest soil.

A good example of the World Bank's new stance is unfolding in sub-saharan Africa. The World Bank and other multi-lateral banks are committed to reversing the economic decline that has characterized the region the last 20 years.

In the last two decades agricultural production has dropped while food imports have increased six-fold. Other industries have similarly declined. The World Bank names several reasons for this decline. Political instability, lack of education, poor geographical conditions, and poor management have all contributed to an inflexible African economy, the Bank says.

The World Bank proposes to grant these countries loans on the condition that the debtors take steps to implement free market oriented policy changes, encouraging private investment and privatizing government run enterprises, to improve the quality of investments and expenditures, and to improve human resource development, encouraging the education and training of native people to run the economic machinery.

This new approach by the World Bank has not met with total success. The primary reason for this is the lack of commitment by private banks. They have not been willing to risk their funds on the poor credit risks which the Baker Initiative targets. The World Bank is also having trouble compelling the developing countries to accept their policy reforms. Especially in Latin America, the price of the loans have been too great. When agreements are reached, the World Bank is finding difficulty in some cases to enforce the changes. In the long term, however, it is hoped that the new loans will help the developing nations to stand on their own economically.

The World Bank receives its reserves from 149 member nations around the world. 20 percent of the annual commitments are made by the United States. The next biggest contributions are made by Japan and West Germany both with 5 percent, and France and Great Britain with 4.6 percent each. The bank currently has \$41.3 billion in outstanding loans with another \$15 billion a year being loaned.

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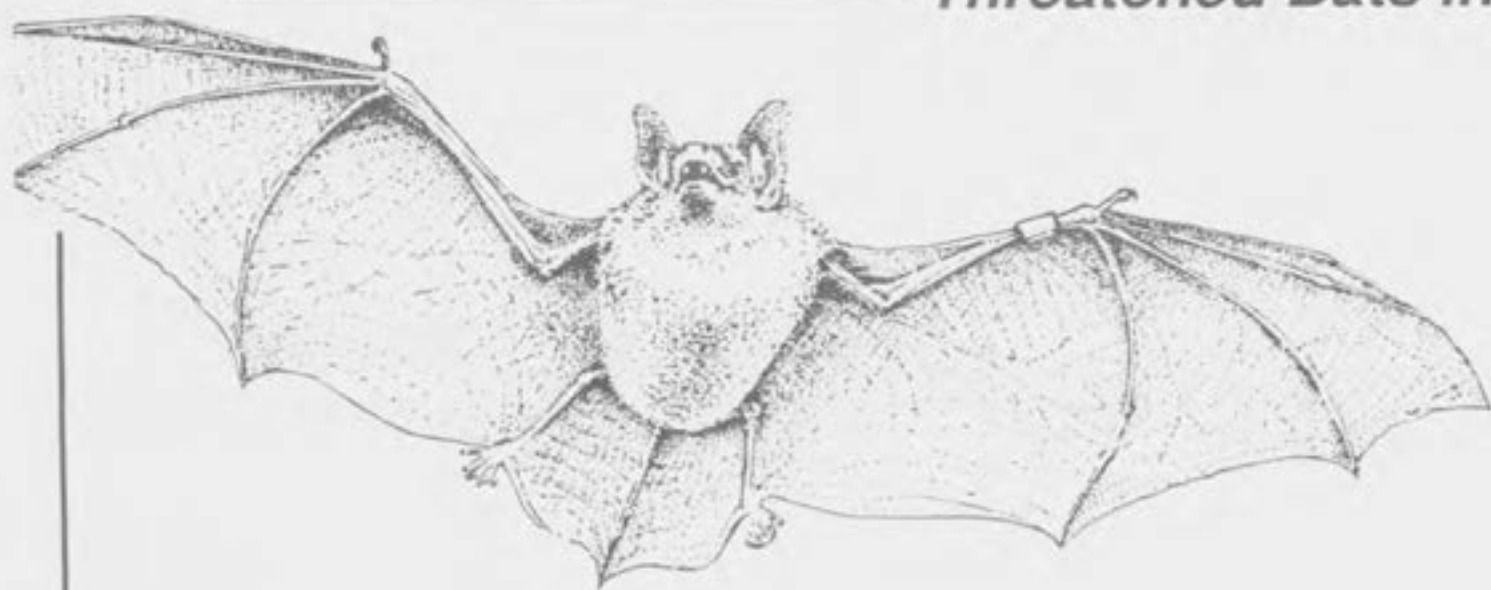


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by Claire Cdebaca

The Chuckanut Mountains of Whatcom County are home to one of the gentlest bat species in the United States, the Plecotus townsendii. Townsend's Big-Eared bat is an insectivorous bat whose populations have been seriously declining, rangewide. Loss of habitat and human handling have been the main causes of this decline.

These bats, primarily located in climax forests, use talus slides, limestone caves, and basalt flows for roost sites. Logging practices of clearcutting and bulldozing destroy their prime habitat and render the area unsuitable for foraging.

The maternity cave of one population in Washington has not been relocated since a timber harvest and may have been buried by bulldozing. Clearcuts create "edge" habitat or open, shrub vegetated areas unsuitable for the insect prey species upon which the Big-Eared Bats are dependent for food.

Night flying moths and insects make up the diet of these bats who are highly specialized foragers. The bats use echolocation (the use of soundwaves to determine the distance and position of objects) to find their prey in flight. Echolocation is either not used or is ineffective in locating

stationary prey as the bats do not attempt to capture not-moving insects.

The Mt. St. Helens explosion destroyed some known caves and as yet several colonies have not been relocated.

They may have perished, as the nursing mothers (almost the entire female population of any colony) would have been in the maternity caves at the time of the major eruption if they had not previously relocated their young.

One of the serious problems with this species is that once a colony has abandoned a site, it will rarely reoccupy the site, and being territorial, no other colony will occupy an abandoned site.

Maternity caves and hibernation caves are usually located within a 20 mile radius of each other. This makes habitat and roost sites of prime importance to the ability of the colony to survive as there are a limited number of caves and other sites available within any territory.

It is not known why Plecotus townsendii does not like human handling or intervention. Attempts to band and survey these bats have had disastrous effects. Western Washington University Biology Professor Clyde Senger conducted a population survey in Washington in the early 1970's. The survey was terminated in its third year as the populations had declined below 30% of the original numbers. The population stabilized around this level of 30% after a few years. No surveys have been conducted since.

Human intervention in maternity caves (caving) has resulted in relocation of the maternity group. Young can be dropped and abandoned by such moves.

## Whatcom County

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**Human intervention in maternity caves ... has resulted in relocation of the maternity group. Young can be dropped and abandoned by such moves.**

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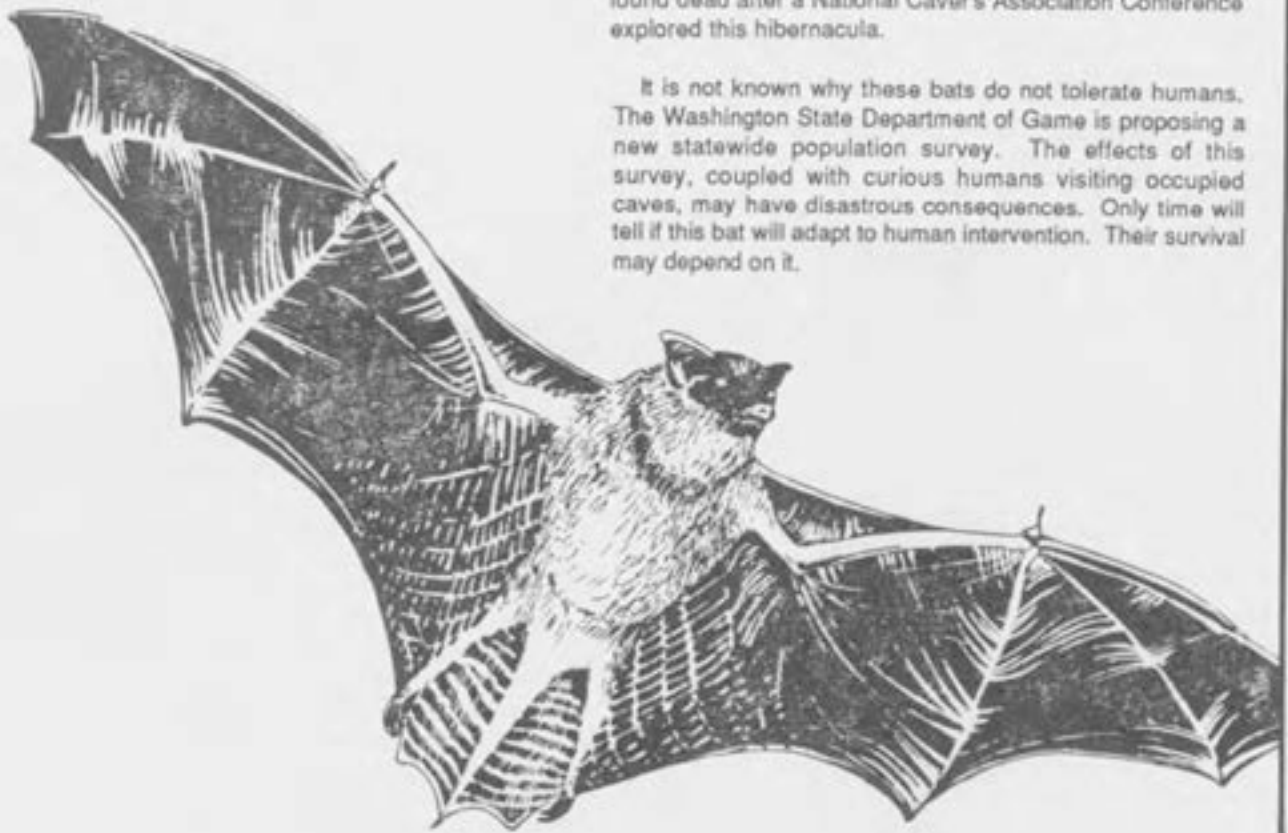
Caving in hibernation caves can cause severe problems. These bats have been known to fly 20 miles or more in blizzards after human handling or intervention. Such an energy expenditure, without means to replenish lost winter fat stores, means death for the individuals who have relocated. As they do not normally rouse during the winter, it requires at least two days of fat reserves for males just to rouse from hibernation and up to 21 days of fat reserves for females.

During the rousing process, the bat is totally defenseless and cannot fly for the first 15 minutes of the process. This makes them easy prey for researchers and vandals.

The maternity cave in the Chuckanuts, called the Bat Cave, is one of the last known caves in use in Whatcom County. It is a very popular cave for novice spelunkers (cave explorers). The Big-Eared Bats use this cave from late March through late July while they are bearing and nursing their young. These bats have been known to share their caves with other species of bats but not with humans.

This local colony has its hibernation cave in the Mt. Baker/Snoqualmie National Forest. Several young were found dead after a National Caver's Association Conference explored this hibernacula.

It is not known why these bats do not tolerate humans. The Washington State Department of Game is proposing a new statewide population survey. The effects of this survey, coupled with curious humans visiting occupied caves, may have disastrous consequences. Only time will tell if this bat will adapt to human intervention. Their survival may depend on it.



# Air Pollution:

## Behind Closed Doors

by Alice Panny

**"Chemicals ingested indoors make the home more of a toxic waste dump than any chemical plant nearby."**

**W**elcome to the latest frontline in the battle against air pollution: the home. Recently completed studies by the Environmental Protection Agency and the National Toxicology Program show that people are being exposed to surprisingly high levels of toxic chemicals in their homes. Pollution levels were found to be consistently 2 to 5 times higher indoors than out, and for some chemicals, the levels were up to 70 times higher. Little variation was recorded between houses in industrial and suburban settings.

Scientist Lance Wallace, who evaluated data from the 5-year study, said that chemicals ingested indoors "make the home more of a toxic waste dump than any chemical plant nearby. Even downwind from a chemical plant, it's better to leave the windows open." Said another researcher, "If you found these levels outside, you'd demand to know where they were coming from".

In a typical home, air is replaced about once an hour giving a ventilation rate of 1.0 air changes per hour. In an older house, "tightened" to conserve energy, the rate of air changes is .75 per hour, while in newer "super tight" houses, a .1 or .2 ventilation rate is not uncommon. Signs of inadequate ventilation include condensation on the inside of windows in winter, mold or mildew on walls or ceilings, and smarting eyes or frequent respiratory illnesses.

But inadequate ventilation is rarely the main culprit. The buildings themselves, the activities of the occupants (such as heating and cooking), water systems, and household chemical products are the main sources of pollution. The following are some of the chemical mysteries waiting behind closed doors.

**Carbon Monoxide, Nitrogen Dioxide:** These two pollutants are frequently found near heating systems, gas ranges, kerosene heaters, and garages. Nitrogen dioxide irritates the respiratory tract, contributes to diseases such as asthma and bronchitis, and, with prolonged exposure, can cause permanent lung damage. Carbon Monoxide can cause slow reactions, headaches, drowsiness, and nausea at low levels.

Gas furnaces, especially old ones, should be checked for leaks, cracks, or dirty heat exchangers, and inefficient or leaking vent systems, which can give off carbon monoxide and nitrogen dioxide.

Unvented gas ranges should be used only with a hood and fan that vents outside. Adjust pilot and burner flames to burn blue; orange or yellow flames increase emissions several-fold. Leaks can be detected by spraying a mixture of soap and water on suspect areas. If bubbles form there may be a leak.

High interior levels of carbon monoxide can be created by cars started or warmed up in adjacent garages, carports, or just outside the house.

Woodsmoke contains benzo-a-pyrene, a known carcinogen. Woodstoves and chimney systems should draw well and be thoroughly sealed. Slow, low fires, though more heat-efficient, don't burn as clean or draw as well.

**Fungi, Bacteria :** These two irritants can form in air conditioning systems, humidifiers and dehumidifiers, and dirty air conditioners. Fungi and bacteria contribute to asthma, allergies, and cases like legionnaires disease and "sick building syndrome" (a designation bestowed by engineers on buildings where 30% or more of the occupants suffer similar symptoms that disappear within 8 hours of leaving). One recently tested government building had levels of up to 83,700 fungi per cubic meter of air due to slime in the air conditioning. An official there described the situation as "comparable to a chicken coop or swine-confinement facility".

**Formaldehyde:** This chemical is found in particle board, plywood, carpets, drapes, furniture stuffing, cosmetics, and some mobile homes and RV's. Formaldehyde irritates eyes, skin, lungs, and can cause headaches and nausea. It has been found to cause cancer in experimental animals. It is more of a problem in newer houses and tightly insulated vehicles. Exposure can be reduced by maintaining proper ventilation, and applying an epoxy sealer over wood surfaces.

**Methylene Chloride, Benzene:** Contained in solvents, paint strippers and thinners, most spray paint, some aerosol hairsprays, insecticides, and furniture polish, methylene chloride and benzene are sometimes labeled as "chlorinated solvents" or "aromatic hydrocarbons" or listed under "inert ingredients". Studies have linked these substances to cancers, nervous system disorders, and diabetes.

**Radon:** Radon is a naturally occurring radioactive gas found in varying amounts everywhere. It diffuses out of the ground and into the air, or into basements. The EPA estimates that it may cause between 5,000 and 20,000 lung cancer deaths per year, making it the second leading cause of lung cancer. As radon

decays, it attaches to particles of dust, which are inhaled. Once in the lungs, radon emits alpha particles which cause damage to all adjacent cells. If you live in , or spend a lot of time in a basement, or are buying a new home, you may want to have a radon check done. For information on this write to : Terradex Corporation, 460 N. Wiget Lane, Walnut Creek, Cal. 94598

**Asbestos:** A grayish, fibrous material, asbestos is found chiefly in steam or hot water pipe insulation, boiler insulation, and some wall and ceiling insulation. It can also be found in roofing and flooring products, spackling compounds, heating duct connectors, door gaskets for wood stoves, brake linings, and fabrics. Asbestos can cause lung, uterine, and intestinal cancer, asbestosis, and other afflictions. Left undisturbed, asbestos poses no threat to human health. A threat appears when people pull, sweep, or vacuum it. If asbestos must be disturbed it should be completely wet or a trained contractor should deal with it. If remodeling, avoid sanding or scraping anything you suspect might contain asbestos such as tile, sheet-type flooring, shingles, and textural paint sold before 1978.

**Chloroform, Trichloroethylene:** These are two volatile toxic chemicals found in many municipal drinking water supplies. The main danger of chloroform and trichloroethylene is from inhalation during showers, when the hot spray of water releases chloroform and trichloroethylene into the air. Symptoms include stomach upset, nervous system depression, narcosis, heart and liver malfunctions, dizziness, and fatigue. While each doubling of shower time quadruples the dose of accumulating gases, cold showers can reduce vaporization by 50%. Keeping the door closed and venting the air outside also will limit the spread of gases.

**Tetrachloroethylene:** This chemical is in that fresh-from-the-dry-cleaner smell found on clothes or sleeping bags. It has been found to cause nerve disorders, damage to liver and kidneys, and possibly cancer. Alternatives to dry cleaning include Woolite or washing the sleeping bag with special sleeping bag soap.

**Paradichlorobenzene:** This carcinogenic threat is found in chemical air fresheners, and mothballs. Cedar, lavender, rosemary, mint, or peppercorns in a sachet can be substituted in drawers and closets. Many non-toxic herbal air fresheners are available.

Another solution to indoor air pollution is the use of houseplants. The spider plant and other low light-requiring, abundantly foliated plants are effective in removing formaldehyde, carbon monoxide, and nitrogen dioxide from the air.

# The World Bank: Guilty of environmental assault

World Bank loans to Third World nations have demonstrated that openhanded spending may create more misery than it cures. The loan-supported projects actually block economic progress, as they carry with them deforestation, capital-intensive monoculture, and overgrazing which can destroy the natural systems base essential for sustainable development.

Traditionally, World Bank programs have not been aimed at improving a country's physical quality of life; rather, they have caused environmental destruction, population relocation, and increased poverty.

An example of World Bank catastrophe is the loan to the Brazilian government to build a 1,000 mile highway through the Amazon rain forest and open the Polonoroeste region in western Brazil to settlers. More than 500,000 settlers, lured by government promises of cheap and fruitful land, found only poor soil unable to sustain agriculture.

This should have been no surprise to the World Bank, as the Bank's own environmental experts had predicted the settlement failure and recommended the program be halted. Eventually, in 1985, the World Bank suspended loan payments, but damage done to the Polonoroeste region is irreparable, and more than 200,000 of the settlers have contracted malaria from mosquitos in the rain forest.

A similar environmental disaster propelled by a World Bank loan is the Indonesia Project. Hundreds of

thousands of people from the island of Java were resettled to the Indonesian parts of Borneo and New Guinea. The project resulted in the destruction of millions of acres of rain forest and placed the settlers in an environment that would not sustain long term development. Ultimately, the project means further debt to the country and further depletion of the country's resources. The interest payments on the loan, like most World Bank loans, drain the country of capital needed to start up self-sufficient industries and farming.

In Botswana a project is underway that will fence off what had been communal grazing land and re-allocate the land to a few ranchers to raise cattle for export-beef. Senator Bob Kasten, R-Wisconsin, a frequent critic of the Bank, predicts that the project will extend human suffering in Botswana. Excessive cattle grazing will destroy grasslands that are the country's basic economic resource. The World Bank was warned about the danger of overgrazing, which can lead to desertification, but as usual, warnings by the bank's environmental staff were ignored in favor of interest revenues.

Last October the Environmental Defense Fund sent a report

condemning the Indonesia Project to Barber Conable, director of the World Bank. Conable responded by saying that the Bank has adopted a new policy of balancing growth with environmental protection.

In *State of the World 1987*, Lester Brown states, "As the natural systems that underpin economies deteriorate, actions that make good sense environmentally will begin to converge with those that make good sense economically ... But will that convergence occur before the irreversible changes unfold?"

According to an article in the *Christian Science Monitor*, the Bank is now considering environmental aspects of development projects. The World Bank says it now considers, prior to making a loan, the environmental aspects of a project such as erosion due to tree cutting on hillsides, potential dam floods, overgrazing, intensive farming and timber harvesting.

"We're still unsure what is rhetoric and what is substance on the part of many key development officials," said Lawrence Williams, director of the international programs at the Sierra Club.

If the World bank would look at the potential long term effects of proposed projects then financial and environmental catastrophes could be avoided. The World Bank's commitment to environmental protection is commendable, but whether the commitment takes effect must yet be seen.

by Amy Morrison



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*So much depends  
upon  
a red wheel  
barrow  
glazed with rain  
water  
beside the white  
chickens*

*William Carlos Williams  
(1883-1963)*



