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This is not a textual record. This is used as an administrative marker by the George Bush Presidential Library Staff.

Record Group/Collection: George H.W. Bush Presidential Records
Collection/Office of Origin: Speechwriting, White House Office of
Series: Speech File Backup Files
Subseries: Chron File, 1989-1993

OA/ID Number: 13672
Folder ID Number: 13672-006

Folder Title:
Wyoming Environmental Address 6/13/89 [OA 6264] [2]

Stack:	Row:	Section:	Shelf:	Position:
G	26	19	1	6

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

GRAND TETON NATIONAL PARK

DATE: June 7, 1989 TIME: 1:25 pm.

TO: Bob Simon

FROM: John Daugherty

SUBJECT: Research material

NUMBER OF PAGES TO FOLLOW: 10

SPECIAL INSTRUCTIONS: Fax to White House.
(202) 456-6218

SHOULD RETRANSMISSION BE NECESSARY:
PLEASE CALL FTS 328-4234 OR 307-733-2880, EXT. 234

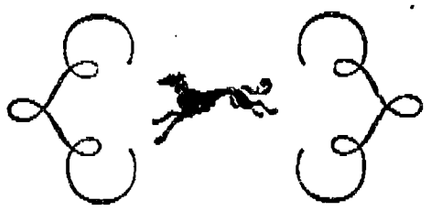
TO REPLY BY TELEFAX:
CALL FTS 328-4209 OR 307-733-2880, EXT 209

Following the FRONTIER

with F. Jay Haynes

PIONEER PHOTOGRAPHER
OF THE OLD WEST

Freeman Tilden



New York / *Alfred A. Knopf*

1964

VI

President Arthur in Yellowstone

SOME YEARS AGO a former ranger at Yellowstone National Park who had been transferred to Washington was browsing in a secondhand bookstore, hoping to turn up some volume concerning the great preserve where he had begun his career. This was his lucky day. On a table, with a gathering of dust upon it, was a neatly bound portfolio of photographs; as he opened it, the first picture he saw was unmistakably a scene at Yellowstone. He turned to the blank leaf at the front. On it was written, in a bold hand:

To his good friend, Gen. Phil Sheridan,
from F. Jay Haynes

The ex-ranger's first thought was that he had stumbled upon a prize quite beyond his financial means. When he learned that $3.50 would buy the portfolio, he seized it with a trembling hand and fled before the dealer could change his mind. Later he came to feel that perhaps he was selfish to keep the trophy, that it belonged in the Bozeman museum of Jack Haynes memorabilia. And there he sent it. It is a delightful memento of President Chester A. Arthur's holiday visit to Yellowstone in the summer

of 1883, and it marks a step in the career of the young Fargo photographer which in later years he looked back on with pardonable pride. For, with the exception of the members of the presidential party, a civilian chief packer, and some Indian guides, Professor Haynes was the only non-military man in the "expedition," which was arranged with the utmost precision by the Lieutenant General of the United States Army.

Unimaginable, these days, would be such a vacation trip for a President. No newspaper correspondents were permitted to accompany the expedition. For several weeks all that the public knew of the movements or the state of health of their chief came from brief messages sent to the Associated Press by Colonel James F. Gregory, the aide-de-camp, after President Arthur had himself released them. The big newspapers throughout the country were furious about this snub. Several, whether in revenge or in competitive ardor, manufactured "dispatches from our own correspondent with the President," but these stories were figments of the imagination; the last official message sent by Colonel Gregory to the Associated Press was a shaft of sarcasm at the expense of the fakers. Gregory remarked that the impostors were so clumsy and ignorant that the alleged correspondents "had themselves traveling in one day over distances that our expedition hardly made in five." President Arthur had had some rather rough treatment at the hands of the newspapers, and as he had no intention of running for office again, he probably derived a touch of satisfaction from the sufferings of the "fourth estate."

Perhaps it was one of these newspapermen who worked off his indignation in the form of a little pamphlet signed with a *nom de plume* and containing pretty sour doggerel verse ridiculing the President's trip. The rare-book section of the Library of Congress has one of the few extant copies.

"The book of the trip," illustrated with photographs by F. Jay Haynes, was published by the Government Printing Office as "A Journey Through the Yellowstone National Park and Northwestern Wyoming." The edition was so limited that few have ever seen it. The Library of Congress has no copy, but it does have a microfilm of it, made at Yale University. The text is readable, but the Haynes photographs, many of which were especially fine, appear as hardly better than a blur.

. . .

Along the Ramparts of the Tetons

THE SAGA OF JACKSON HOLE, WYOMING

By Robert B. Betts

COLORADO ASSOCIATED UNIVERSITY PRESS BOULDER COLORADO

14

The Bottle Trail

In May of 1883, when President Chester A. Arthur went to New York to dedicate the Brooklyn Bridge, it was noticed that his complexion was sallow and his usual vigor was missing. Evidently, the President needed a vacation, but where in 1883 could a president who liked to fish and was not averse to a drink or two go to escape both the pressures of his office and the hounding of reporters, who at the time were giving his administration a rather rough going over? The answer is that any number of private resorts in the East probably would have filled the bill nicely, which is why the vacation President Arthur chose to take was so surprising. He and a select group of nationally prominent men traveled two thousand miles to camp and fish in a remote and uninhabited wilderness, Jackson Hole and Yellowstone Park. And not only did they do so, but they "roughed it" in high style, with a long pack train of horses and mules carrying several tons of supplies, including what subsequently was alleged to be an inordinately large amount of whiskey.

In early August, when the presidential party detrained at Green River, Wyoming, among the many dignitaries who stepped off were Lieutenant General Philip Sheridan, of Civil War fame; Secretary of War Robert Lincoln, Abraham Lincoln's son; and Senator George Vest of Missouri, a good friend of Yellowstone Park who once rose on the Senate floor to rebut a fellow senator's anti-Yellowstone argument that the government had no right being in "show business."[1] At the station to meet them was Troop G of the 5th Cavalry, some seventy-five well-armed mounted men who would provide an escort thought to be desirable in light of Custer's massacre at the Little Bighorn less than a hundred and fifty miles from Yellowstone just seven years earlier. Also at Green River were two Chicago newspaper reporters to whom General Sheridan, in his typically blunt way, made known the policy decided upon regarding press coverage of the junket. He flatly told them that if they followed the President any farther he would have them arrested and thrown in jail.

In what amounted to a total blackout of the press, no correspondent of any kind was permitted to accompany the outing. Instead, official news releases were written by Lieutenant Colonel Michael Sheridan, the general's nephew, and by Lieutenant Colonel James Gregory, then sent to the outside world by a relay system of mounted couriers stationed every twenty miles along the route. Although newspapers across the country were outraged at this high-handed form of censorship, it was not relaxed, so some of the more enterprising editors decided that if their reporters could not cover the news for themselves, they could at least manufacture it. Consequently, a number of wholly fabricated stories were written which are of no help when one tries to find out what really happened when the President and his friends went packing in the Rocky Mountains. Nor do the two colonels' official releases provide much illumination. Oblivious of their rare opportunity to report what may have been the most unusual vacation ever taken by any American president while still in office, their stilted, West Point prose was devoted almost exclusively to descriptions of the scenery and the number of fish caught.

The first stop before jumping off into the wilderness was Fort Washakie, Wyoming, a reservation for the Shoshoni and Arapahoe tribes. As the wagons carrying the vacationers approached the reservation, Indians rode out in large numbers to greet the Great White Father and "dashed around the President's party most gaudily and fantastically arrayed, displaying their skill in horsemanship and gratifying their curiosity."[2] The next day, the Indians entertained their distinguished guests by having several hundred braves astride war ponies charge across a plain to where the President and his group stood, at the last moment reining up in a cloud of dust. Then the chiefs of the two tribes dismounted and stepped forward to be introduced—Coal Black of the Arapahoes and none other than Nick Wilson's brother by adoption, Washakie of the Shoshonis, the great old chief in whose honor the fort had been named. Following this, the Indians and the cavalry escort staged a spectacle which was wildly incongruous, at the very least, especially since the memory of Custer was still fresh in everyone's mind. Mounting their horses, they engaged in a spirited sham battle, complete with war whoops, bugle calls and the firing of rifles and revolvers, all of which were fortunately loaded with blanks.

On the morning of August 9, the pack train started along a route that would take it west into the Wind River Range, across the Continental Divide, down along the Gros Ventre River into Jackson

Many packers and pack animals were needed to transport supplies for President Arthur's "cavalcade" through the wilderness. *F. Jay Haynes photo, Haynes Foundation.*

Hole, then north into and through Yellowstone Park, a journey of about three hundred and fifty miles. Later described by an authority on the West as "one of the most complete pack trains ever organized in this or any other country," the column on the march was most imposing, with Indian guides riding ahead, the cavalry troop fore and aft of the presidential party and, bringing up the rear, one hundred and seventy-five pack horses and mules all piled high with provisions and equipment.[3] Once the caravan plunged into the mountains, a curtain descended through which it is now impossible to see, but, at least according to one account, President Arthur and his friends went on a spree.

Other than Lieutenant Colonel Sheridan's and Lieutenant Colonel Gregory's sterile dispatches, the only document purporting to give a glimpse of what went on is a burlesque in doggerel verse entitled *The Rajah, or the Great Sporting Excursion of 1883*, published the following year and written by someone who used the pseudonym "Unc Dunkam." Who "Unc Dunkam" was is unknown, although he seems to have been either a member of the party or a newsman who obtained his information after the trip, perhaps

from some of the soldiers and packers who went along. Highly exaggerated for dramatic effect, the poem is certainly no Rock of Gibraltar as a reliable source of history, but here and there, particularly in his footnotes, "Unc Dunkam" mentions small details and characteristics of the various personages that add a touch of credibility. Whether history or not, his version has become part of the word-of-mouth lore of Jackson Hole, and it does add spice to what is otherwise only the colonels' prosaic travelogue.

The size and opulence of the President's caravan inspired "Unc Dunkam" to use a rajah as the central symbol of his parody, in one verse of which he wrote that three hundred mules were "All laden with the choicest wine."[4] Surely there were not three hundred mules, and surely they were not laden with wine, but it appears that enough bottles of what was more likely rye or bourbon were taken along to stock a special tent set aside as a bar. "Unc Dunkam" described it in a footnote as "located in the center of the camp, and . . . *generously* supplied with all kinds of *'liquid refreshments,'* except *'water'* . . . These refreshments were to be had 'without money,' and simply for the asking, at any time of the day or night."[5] Thus, according to the anonymous poet, did the illustrious campers blaze a trail with "broken bottles, Every mile, of *their* wilderness *way*."[6] But "Unc Dunkam" most certainly stretched a point. While some partying undoubtedly took place, Chester A. Arthur and his friends would never have made it to Yellowstone if that much alcohol had been imbibed. Long before then, they would have fallen off their horses and broken their necks, or would have fallen into the streams they fished and drowned.

As might be expected of an ardent fisherman who was camping along some of the finest trout waters in North America, the President enjoyed himself thoroughly, although it must be said he sometimes resorted to the less than sportsmanlike use of gang hooks to catch more than one fish at a time. According to an official release, "At one cast the President landed three trout, weighing in the aggregate four and one-quarter pounds, and at each of some six other casts took two fine specimens."[7] On another occasion, the President was reported to have reeled in "thirty-five fish, weighing forty-five pounds" in just a few hours.[8] Even for his time, long before the concept of conservation had to any extent entered the American conscience, Arthur's catches were embarrassingly large, which probably explains why he refused to let the party's official photographer, F. Jay Haynes, take any pictures of him while he was fishing.

The scenic highlight of the trip was Jackson Hole and the Tetons, described at length by the official chroniclers. As the pack train came out of the canyon of the Gros Ventre River into Jackson Hole, "there suddenly burst upon our view a scene as grand and majestic as we had ever witnessed . . . Along the whole westerly edge of this valley, with no intervening foothills to obstruct the view, towered the magnificent Teton Mountains, their snowy summits piercing the air 8,000 feet above the spot where we stood in reverent admiration, and 14,000 feet above the level of the sea. It was the voice of every member of the party that this sight alone would have fully repaid all the toils and perils of the march."[9] The use of the word "perils" is puzzling, because up to this point not one had been reported. On the other hand, "Unc Dunkam" wrote that later, while in Jackson Hole, the President came close to losing his scalp when Indians staged a war dance in his honor. If he is to be believed, one of the Indians became so carried away by the dance, or by the contents of one of the bottles in the bar tent, he

Swung high in air
His warclub, dire and dread,
And would have whack'd
Great Chester on the head![10]

According to the poem, a member of the party pulled a gun and prevented the Indian from carrying out what surely would have been the most bizarre assault ever made on the person of any president of the United States. Also, according to the poem, late one night some of the thirsty packers invaded the bar tent and became so intoxicated they began shooting at imaginary hostile Indians, which by the light of morning turned out to be several dead mules. But other than these two incidents, if anything even remotely resembling them did occur, the entire journey went off without mishap.

While in Jackson Hole, three camps were made: the first in the Gros Ventre River Canyon near where the Sheep Mountain landslide would later take place, the second along the Gros Ventre River south of Blacktail Butte and the third along the Snake River just below the fork of the Buffalo River. The cavalcade then moved up to Yellowstone, where more fishing was done and where President Arther encountered the first member of the fourth estate he had seen since the two Chicago reporters at Green River. Despite General Sheridan's expressed dislike of journalists, this corre-

Indians staging a war dance for President Arthur and his companions. *F. Jay Haynes photo, Haynes Foundation.*

spondent of the *London Times* was not thrown in jail, but probably only because he was in the company of some wealthy and titled Europeans who were on a sightseeing tour of the West. The Englishman was much more awed by Arthur than the dancing Indian in Jackson Hole was reported to have been, writing that "no one would have supposed that the tall, robust man in blouse and white felt hat, with checked shirt and sunburnt face, who shook us heartily by the hand and talked freely to anyone who chose to approach him, was the head of the nation and the lineal descendant in office of the most dignified and punctilious of rulers, George Washington"—which may have been the only time the twenty-first president of the United States and the first have been compared in any way whatever.[11]

On September 1, 1883, President Arthur boarded a Northern Pacific train at Cinnabar, Montana, and started back to Washington to resume the duties of his office. As far as the records go, he showed no signs of a hangover.

- George Bush has called for stricter federal enforcement of illegal ocean dumping. He calls the problem of dangerous medical waste washing up on our beaches a "national disgrace." He will direct the EPA, Coast Guard and FBI to join forces with state authorities to track down illegal dumpers.

- **George Bush will ban all ocean dumping of sewage sludge by 1991.**

- George Bush will instruct EPA to increase its work in developing land-based alternatives for sewage sludge disposal. He's a leader, not a talker, and he will get results.

- George Bush proposes restoring cuts Congress made in our budget for the Coast Guard so they can more effectively prevent illegal ocean dumping.

* * *

ENVIRONMENTAL POLICY STATEMENT
Erie Metropark, Michigan
August 31, 1988

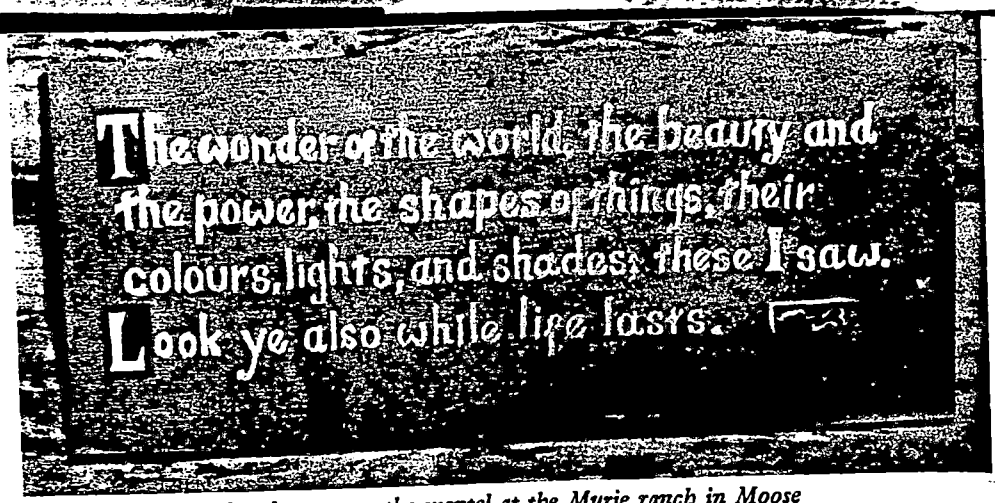
I am here today to talk about building a better America. I am here to make a case I feel very strongly about -- and that is the case for a cleaner environment. It is a case based not only on our own health and safety, and not only on the obligation we have to future generations. It is based on the knowledge that successful economic development and environmental protection go hand in hand. You cannot have one without the other.

This summer has been full of warnings about the condition of our environment. Medical waste has washed up not only on our ocean beaches, but on the shores of this very lake over in Cleveland. Ozone levels and accompanying respiratory problems have been frighteningly high. Even the exceptionally hot weather -- if only symbolically -- has been seen as a portent of things to come.

1988 is the year the earth spoke back. Our land, water, and soil support a remarkable range of human activities; but they can only take so much. We must remember to treat them not as a given, but as a gift.

I am an environmentalist: always have been, from my earliest days as a Congressman, when I first chaired a House Task Force on Earth Resources and population. And I always will be, to my last days as President of this great and beautiful country. That's not inconsistent with being a businessman; nor is it with being a conservative. In fact, it is an essential part of the thinking that should guide either one.

Wapiti Wilderness – Mardy + Olaus Murie



The plaque over the mantel at the Murie ranch in Moose

Margaret Murie in the Wapiti summer range

Olaus Murie snowshoeing (1941)

The M

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State Senate President John F. Turner of Wyoming will be nominated by the President to be Director of the U.S. Fish and Wildlife Service. His Triangle X Ranch is just a few miles from the speech site. He served as tour guide for the Bushes on the 1987 trip to the Tetons; sang and played guitar during an evening barbecue. He runs a guest ranch and wilderness guide service in the Jackson Hole area. Lots of pro-environment accomplishments. Last year he won the "Friend of the Trout" award from the Jackson Hole Trout Unlimited.

THE WHITE HOUSE

WASHINGTON

3/17

MEMORANDUM FOR JANE DANNENHAUER
CAROLYN GAY
KATJA BULLOCK

FROM: REBECCA ARMENDARIZ
OFFICE OF PRESIDENTIAL PERSONNEL
Room 145, X6570

6S 70

Please start appropriate clearance for the following prospective nominee and return clearance/comments to room 145 OEOB. Thank you.

John Freeland Turner
Triangle X Ranch
Moose, Wyoming 83012

Date of Birth 3/3/42 Place of Birth Jackson, Wyoming

Who is under serious consideration for appointment as:

Director, US Fish and Wildlife Service,
Department of Interior

Associate Director Martha Goodwin (x7606)

Presidential Approval _____

Security Package sent 3/16/89 Counsel clearance _____

Legislative clearance _____

Withdrawal/Redaction Sheet
(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01. Resume	Re: John Freeland Turner. (1 pp.)	03/14/89	P-6, (b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Speechwriting, White House Office of
Series: Speech File, Backup
Subseries:
WHORM Cat.:
File Location: Wyoming Environmental Address 6/13/89 [2]

Date Closed: 9/30/2004	**OA/ID Number:** 06264
FOIA/SYS Case #:	
Re-review Case #: 2004-2265-S	
P-2/P-5 Review Case #:	
MR Case #:	**Appeal Case #:**
MR Disposition:	**Appeal Disposition:**
Disposition Date:	**Disposition Date:**

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advise between the President and his advisors, or between such advisors [a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
(b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
(b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
(b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet
(George Bush Library)

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02. Resume	Re: John F. Turner. (1 pp.)	n.d.	P-6, (b)(6)	

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(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
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(b)(9) Release would disclose geological or geophysical information

THE WHITE HOUSE

WASHINGTON

Prepared By: Paula Hobson

DATE: 3/14/89

NAME: John Freeland Turner

NAME & STATE: John F. Turner of Wyoming

POSITION: Director, US Fish and Wildlife Service, Department of the Interior

TYPE: PAS: X PA: SES: FT: X PT: TERM: POP

VICE: Fred M. Dunkle

CURRENT HOME ADDRESS:
Triangle X Ranch
Moose, Wyoming 83012

SEX: M DOB: 3/3/42

BIRTHPLACE: Jackson, Wyoming

PARTY: Republican

RESIDENCE PHONE: [redacted]

LEGAL VOTING RESIDENCE:
(City, State)
Teton, Wyoming

CURRENT POSITION & ADDRESS:
Citizen State Senator
Wyoming State Capitol
Cheyenne, Wyoming 82002

SSAN: [redacted]

RACE: Caucasian

WORK PHONE: (307)733-5500

ETHNIC HERITAGE:
Spanish, English, Germar

PREVIOUS POSITION HELD:
Rancher
Triangle X Ranch

FAMILY:
SPOUSE: Mary Kay

CHILDREN: 3

EDUCATION:
University of Michigan, MS Wildlife Ecology
University of Notre Dame, BS Biology 1964

MILITARY SERVICE:
NONE

AWARDS:
NONE

PREVIOUS PRESIDENTIAL APPOINTMENTS:
NONE

President approved:_____

Security Package Sent: MAR [illegible] JMG

Counsel Clearance:_____

OLA Clearance:_____

JOHN F. TURNER

Triangle X Ranch
Moose, Wyo. 83012
Business (307) 733-5500
Home [redacted]

BUSINESS

Partner in 3rd generation family busness in Jackson Hole, Wyo.; Guest Ranch, Wilderness Pack Trips, River Float Trips, Big Game Hunting, Snow-mobiling & cross-country skiing.

Bank of Jackson Hole. Chairman of Board of Directors '87-'88, member of board '86-'87.

LEADERSHIP

President. Wyo. State Senate Jan.'87 - Jan 10, '89.

Senate Majority Floor Leader. Wyo. State Senate. '85-'87

Vice-President. Wyo. State Senate '83-'85

Caucus Chairman. Senate Republicans. '85-87

Acting Governor. Wyoming. (On several occasions when Governor absent from state. '87 & '88.

COMMITTEES - FEDERAL AFFAIRS

National Wetlands Policy Forum. Member. Development and adoption of a national strategy to protect our nation's wetland resources. Only state legislator or intermountain area representative participating.'87-'88 Assisted with regional public hearing. Seattle, Wash. May '88.

National Park System Advisory Board. 12 member board to advise Secretary of Interior on National Park Service, National Historic Landmarks. '83-'87. Vice Chairman of Board. '87.

Chairman - Wildlife Subcommittee of National Park System Advisory Board. '85-'86.

Pride-In-America Campaign. Advisory Task Force to Secretary of Interior. '85 & '86

Small Business Administration. State Advisory Board '85-'87.

Hovenweep Task Force. Member of 3 member group requested by NPS Director to investigate better means to protect Anasazi Indian resources & get better cooperation of federal agencies. '86

State BLM Advisory Board. Member & Vice-Chairman. '75-'77.

COMMITTEES - STATE

Senate Minerals, Business & Economic Development. Chairman '89 - .Committee Considers all business and environmental legislation.

Joint Legislative Management Audit Committee . Chairman. '87-'89. Conducts major audits and sunset reviews of agencies in executive branch.

Legislative Management Council. Responsible for fulltime legislative staff, approval of committee activities, contracts, and overall leg. operation. Member '85-'89.

Senate Rules Committee. Chairman '87-89.

Senate Education, Health & Welfare Committee. Chairman '81-'83. Member '77 - '83, '89-

Senate Travel, Recreation, & Wildlife Committee. Chairman '77-'81, member '77-'83.

Joint Interim Travel, Recreation & Wildlife Committee. Chairman '77 -'81

Select Committee on School Finance. Member '80-'83. Specially convened to propose and implement constitutionally and politically acceptable method for funding K-12 public schools. Prominent contributor to revolutionary new system.

Senate Agricultural, Water & Public Land Committee. Member '79-'83.

Joint Agricultural Subcommittee. Chairman '82-'83. Called to review and propose changes to procedure and laws for sale of state lands.

Senate Judiciary Committee. Member '75-'76.

Wyo. Health Systems Agency '75-'77

Governor's Commission on Energy Conservation, Member '75-'77

Wyo. Youth Council '75-'77 Member

Fort Union Coal Task Force '76

State Stream Feasibility Study Committee Secretary '73-'74 Only member of state house, to survey streams a plan a scenic & recreational preservation plan.

Legislative-Executive Commission on Re-organization of State Government. Member, '76-'77.

House Revenue Commitee, Member '73-'75

House Committee on Elections, Corporations, and Polititical Subdivisions. '73-'75

House Travel, Recreation & Wildlife Committee, Member '71-'73

House Labor & Federal Relations Committee, Member '71-'73

COMMUNITY INVOLVEMENT & SERVICE

Atlantic Exchange Program, Member of Wyo. Advisory Committee, '87-'88. Business exchange program between Netherlands & United States, Financed by mostly private sector. Expanding to Japan.

Governor's State Prayer Breakfast. Cofounder of event and member of planning committee. '87-'89

Schweiring Scholarship Fund, University of Wyoming. Co-founder of program and fund raiser for Art College, Member of Selection Committee. '87-'89.

Teton Science School. Ex officio Board Member for over a decade to present. Environmental Education & Research Center in Grand Teton National Park.

Murie Collection Committee. Chairman. Review and propose long term protection and utilization program for unique skin, track and skull collection of Olaus & Adolph Murie. '86 - '87

Priority & Review Committee, Univ. of Wyoming. Member '86-'88. Selects research projects and authorizes funds for research to help economic development.

Pride in Jackson Hole. Co-Chairman. '85. Started community program to improve public and private resources throughout community to improve quality of life for citizens and enrich visitor experiences. Multiple projects & organizatior

Governing Board for C-V Ranch. Member of Board. Successfully built residential facility for severely retarded and handicapped youngsters. 5 years.

Wyo. Centennial. Selection committee for best traveling exhibits. '88

Public Lands Institute. '77-78. Member

Wyo. State Winter Fair. Chairman. of Judges selecting state queen. '78

International Business Symposium. Univ of Wyo. Forum member in shaping role for university in global community. '88

Legislative Prayer Breakfasts. Cofounder. Weekly programs for over decade to present.

Wyo. Youth Council. Chairman for Teton Co.. '75-'76

Goodwill Industries. Member of Board of Governors. Work program for rehabilitation and improvement for disabled adults. '73-'74.

Wyoming Waterfowl Trust. Advisory Board Member '87-'88

Yellowstone Teton Travel Association. Charter member of regional travel promotion effort.

AWARDS & RECOGNITIONS

"Friend of the Trout" Highest annual award by Jackson Hole Trout Unlimited. Presented by James Watt. '88

Participant in Atlantic Exchange. Selected for business exchange program to the Netherlands. '87.

Conservationist Legislator of 1987 Award. Wyo. Outdoor Council for "leadership on conservation issues.

State Award for "Outstanding & Dedicated Services" to psychological services in Wyoming. '87. from Wyo. Psy. Assoc.

"Teton County Citizen of the Year" Award, presented by Jackson Hole Chamber of Commerce. '85

Pride in America National Award - Presidential recognition for Pride in Jackson Hole effort. Presented in Wash. D. C. '86.

Bob Duncan Award. Highest state award for assistance to substance abuse programs around Wyo. '85. Presented by Human Service Organizations.

Special Achievement Award. National Conservation Award from National Wildlife Federation, Presented in Washington, D. C. '85.

"Sportsman of the Year" Award. Presented by Jackson Hole Ducks Unlimited '82

"One of the State Senate's Most Effective Senators" Press rating '81 & '83

Special Recognition Award for "Outstanding Contribution to Wildlife Resources of Wyoming." Wyo. Chapter of Wildlife Society. '81

Conservationist Legislator of the Year Award, Presented by Wyo. Wildlife Federation '80.

Special Recognition for "significant contributions to Wyo. Health Systems Agency. From Governor '82

Outstanding Young Man of America Award. '78. From National Jaycees. Nominated by U. S. Sen. Wallop.

Outstanding Freshman Legislator. House of Representative. '71. Press rating.

EDUCATION

M.S. Wildlife Ecology. Univ of Michigan, Ann Arbor, Mich '70 Partial requirements for Ph.D. Completed.

Foreign Studies Program. Assistant Director for Univ. of Notre Dame. Innsbruck, Austria '64 & '65.

B.S. Biology. University of Notre Dame, Notre Dame, Ind. '64

One year graduate work in Zoology. Univ. of Utah, Salt Lake City, Ut. 65/66

PUBLICATIONS

"Report from Republic of China". Analysis of economic opportunities and problems for Wyoming and its resources of coal, soda ash, uranium and tourism. 19 pages. Dec. 88

Hovenweep Report. Drafted report submitted to NPS Director & Secretary of Interior on analysis of protection efforts for Anasazi Indian Resources. Recommendations for Interior. '86

"Great Bears in Our Parks" drafted report with analysis and recoomendations for managing grizzly bears in Yellowstone ecosystem. Report adopted by National Park System Advisory Board and submitted to NPS & Sec't. of Interior '8

The Magnificent Bald Eagle, America's National Bird. Script and photos for book published by Random House. Closeup look at natural history of our national bird.

"Can There Be Freedom for America's Eagles?" Passages Magazine. Article & Photos. May '74. Vol 5. No. 5

"Seasons in High Country" Slide show and presentation about diversity of wildlife complex in northwestern Wyoming through 4 seasons of the year. '70-

"Delights & Dilemmas of Dude Ranching". Wyo. Wildlife. July '72

"Eagles Today" Wyo. Wildlife. Photos. June '73

"Eagles, Vanishing Americas". Sierra Club Bulletin. Article & photos. Oct/Nov. '71

"Their Threatened Reign, The American Eagle & American Osprey." Teton Magazine. Articles & Photos. summer/fall 1970

"Wildlife - a fascinating heritage" Photo outlay & scrip honoring Wyo. wildlife. Jackson Hole News, 2 pp. 1971

Ecology - a WILD idea" 4 pp. script & photos. Jackson Hole News. Mar 23, 1972

RESEARCH

Bald Eagles. Conducted first comprehensive study of active nests in Yellowstone and Grand Teton region. Studied productivity, nesting behavior, habitat, diet, intra- & interspecific relations. 1960's

Bald Eagle. First comprehensive survey and coverage of populations, nesting sites, wintering areas, migration habitats, mortality sources in 8 inter-mountain states. late 1960's.

Ospreys- conducted first monitoring of over 30 active nests in Yellowstone & Grand Teton region. 3 year study of productivity. Failed eggs analyzed for toxic elements. late 1960's.

Birds of Prey. Raptor survey of Superior Township, Ann Arbor, Mich. Followup of Craighead research for species makeup. 2 decades of change. '68-'69

RESEARCH CONTINUED

Grizzlies - two years of intense review of managment practices in Yellowstone National Park as Chairman of Wildlife Subcommittee of National Park System Advisory Board. '84 -'85

Anasazi Indian Resources - In Hovenweep, Mesa Verde, and Four Corners region, on site analysis of overall protection, interpretation, and cooperation between federal, state and local agencies. Led to drafting report to NPS Director & Sec't. of Interior. '86.

POLITICAL

Affiliation: Republican

Bush Campaign. As President of Wyoming Senate, spoke out at specifically called press conference to publicly support Bush candidacy in Primary at time Wyo. seem to be swinging strongly for Dole. Aired on state TV & in statewide newspapers. Joined Wyo. State Legislators for Bush.

Bush Rally - With Neal Bush, helped host Bush hospitality session in Jackson Hole during Primary.

Bush Visits to Wyoming - Cohosted Vice President & Mrs. Bush during visit to our State Capitol, Also assisted in welcoming Bushs to Grand Teton National Park, Helped guide Vice President fishing party on Snake River, even sang and played guitar at small Bush barbeque on shores of Jackson Lake.

Governor's Race. State Co-Chairman for Republican Gubernatorial Candidate, Warren Morton. '82

President Reagan - Member of special republican gathering to welcome visit to Cheyenne. Mar. '82

Years of Legislative Service - 4 yrs, State House; 14 yrs, State Senate. Representing diverse constituency of oil & gas, cattle ranching, dairy farmers, timbering, small business, tourism, etc..

Washington Delegation. Actively involved in all election and re-election efforts of Republican U.S. Senators & Congressman. Wallop Senate Drive Hosted fund raiser kickoffs - '76,'82, & '88. County Finance Chairman '82, Teton Co. Wallop Task Force. '88.

President Ford. Member of welcoming delegation for visit of Gerald R. Ford to Yellowstone National Park, Aug. 29, '76.

ORGANIZATIONS

Western River Guides Association

Wyoming Outfitters & Guides Assoc.

ROTARY

National Tour Association

INVOLVEMENT WITH FEDERAL ISSUES

National Park Gateway - Attempting to protect major entrance corridor to Grand Teton & Yellowstone National Parks, involved in meetings with Washington delegation, landowners, and National Forest Service officials '88

Snake River Minimum Flows - Innitiative with Secretary of Interior Hodel, Bureau of Reclamation officials, and Wyo. State Engineer to work out agreement for better winter flows to protect native cutthroat fisheries and riparian values in Grand Teton National Park. '87 & '88.

National Elk Refuge - Instrumental in arranging cooperative feeding agreement between Fish & Wildlife Service (Ass't Sec't. Ray Arnett) & Game & Fish Dept. of Wyoming '84

Jackson Lake Dam Rehabilitation. In meetings with NPS Director, assured that NPS would give high priority to research Indian resources on shoreline '84. Worked out later agreement making Univ of Wyo. a partner in research effort '85-'88.

Moose Management - Speaker at 21st North American Moose Conference '85.

Forest Service Management, Repeat involvement over two decades in providing input on specifics of managing Bridger Teton National Forest. Involved in numerous meetings & hearings, Multiple statements.

Wyo. Wilderness Legislation. On several ocasions, provided specific information and indepth proposals to Wyo. delegation. Provided overview of wildlife values and critical habitat with detailed maps to Congressional Field Hearing. Casper, Apr. '82.

Wyo. Roadless Resource Area. Proposed as non-wilderness multiple use area to protect grazing, watershed, wildlife & recreational vales in Upper Green River Basin, Northwestern Wyoming. Submitted to Congress. '82.

Scenic Land Preservation Proposals - Worked closely with U. S. Senator Wallop on development and presentation of two federal proposals to protect scenic and agricultural vales on private lands. '82.

Forest Service Budget. Presented to some members of Congress, a review of Bridger Teton National Forest expenditures on management of different uses versus revenues to federal treasury. '84.

MX MIssles. Received agreement from Sec't of Defense Weinberger to conduct public hearings around state on impact of MX placement in Wyoming. '83

Little Granite Well Site - Arranged for Assist. Sec't. Carruthers to visit controversial site and visit with local citizens. '82-'83.

Snowmobiling. Worked with NPS Director and congressional delegation in compromise solution to continue snowmobiling in Pothole region of Grand Teton National Park. '79

INVOLVEMENT WITH FEDERAL ISSUES CONTINUED

Jackson Hole Scenic Area Proposal. On behalf of local ranchers, testimony to congressional hearing. June '77.

Range Improvements. Persuaded Director of BLM in Washington, D. C. and Natural Resource Defense Fund to agree to lift '75 moratorium on range improvements projects on millions of acres of public grazing lands to assist ranchers and farmers. Obtained some clarifications of suit. '75

Snake River Fisheries. Assisted in establishing harvest limit agreement for cutthroat in Grand Teton between State of Wyoming & National Park Service. '72

Mine Reclamation. Testimony to House Interior & Insular Affairs Comm. urging better protection for surface land owner in having consent provisions regarding disruption of surface with mining. Apr. '72.

Price Controls on Beef. Statement to Sec't. of Agricultural Butz opposing any controls on beef meat products. Sec't. replies that consideration of any controls dropped. '72.

Shoshonne National Forest. Congressional testimony on long term management strategy for critical Du Noir Drainage area. '78. Testimony on oil & gas leasing in Washakie Wilderness Area. '82

Yellowstone Centennial. Prompted National Park Service to work closer with local communities in planning events. '71. Addressed International Conference '72.

Eagles. Extensive involvement in state and national arenas as a result of tragic killing in West by agricultural interests. Urged Dept. of Interior to strengthen safeguards. '70. Proposed to Congress establish prohibitions on use of certain toxic agents in predator and rodent control by private parties. '71

STATE LEGISLATIVE HIGHLIGHTS *

Legislative Royalty Account. Cosponosred new saving account for mineral royalty payments to meet future needs. '85

Wyo. Business Development Certers. Helped plan and establish small business assistance outreach centers throughout the state. '86

Clean Coal. Cosponsor of state investment program to encourage research and development of new fuel products which are cleaner and more efficient.'87

21 yr old Drinking. Sponsored increase. '87

Wyo. Lean Beef Program. Cosponsor of new program conducting marketing tests and standards for branded value added meat with lean and natural values. '85-'87

Dairy Price Supports. Representing large number of producers, helped lead effort to eliminate state price setting '80

* Only those state issues which were successful.

STATE LEGISLATIVE HIGHLIGHTS CONTINUED

Health Care Costs. Instrumental in securing authorization for Health Maintenance Organizations for group lans, & Preferred Provider Organizations.'85

Government Employee Cuts. Sponsored significant reductions in administrative personnel and budget in Health & Social Services. '84. Sponsored cuts in employees and budges in Dept. of Administration and Fiscal Control.'85

Health Care Data Authority . Sponsor of data collection office to track services and health care costs. '85

Capitol Facilities Tax. Cosponsor of one of nation's first programs which allow community voters to impose additional sales tax to fund local building projects. '84.

Rural School. Devised and established new finance formula to insure more equal educational opportunities for smaller rural schools. '84.

State Film Office. Assisted in creation of Wyo. promotional office. '83

Agricultural Loans. Sponsored expansion of state program for ranchers & farmers. '83.

Troubled Youth. Sponsor of funding for new state services. '83

Prompt Pay. Sponsor requiring state government to pay bills to private sector within specified time. '83.

State Inheritance Tax. Cosponsor of repeal. '82

Water Development. Cosponsor of project to rehabilitate dam allowing additional 5,000 Acre Ft. of storage. '82.

Unemployment Compensation. Sponsored tightened elegibility requirements to reduce fraud and abu se. '83

Sagebrush Rebellion. Authored guidelines for state administration of federal lands if such transferred by Congress. '80.

Highway Wildlife Deaths. Cosponsored cooperative project between game & fish dept, highway dept., and private sector to reduce road kills of migrating animals. '86.

State Energy Conservation Office. Found compromise to retain state office.'86

Municiple Water. Sponsored requirement for Cheyenne to develop financing plan for $60 million water project on behalf of voters. '80.

Water Rights. Sponsor of measure requiring subdivisions of agricultural lands to responsibly utilize water rights and maintain ditches and systems for neighboring water users. '81

Motion Pictures. Sponsored relaxation of vehicle permitting process for motion picture equipment used temporarily in state '81.

STATE LEGISLATIVE HIGHLIGHTS CONTINUED.

School Construction. Helped develop first state assistance program for construction for poorer school districts. '81 &'77.

Tourist Promotion. Development of matching funds program for state matching grants to local communities to promote local resoruces. '80

Instream Flow. Over several years, leader in drafting and passage of program authorizing instream use of water as beneficial use under Wyo. water law. '82.

Elk Feed Ground. Helped lead effort to establish new elk winter feed ground on Grey's River in Lincoln Co.. '79

Senior Citizens. Sponsored protection for abused, neglected and exploited adult. '79.

Taylor Grazing Lands. Sponsored re-establishing district improvement boards, allow portion of grazing fees to be returned for range improvements.

Reorganization in State Government. Prominent in reorganization of state largest agency - Dept. of Health & Social Services. '79.

Liquor Law Revisions. Obtained more restaurant and retail outlets for resort communities. '79

Small Mines. Sponsored exemptions from stiff reclamation requirements for permitting small gravel operations. '76.

Concurrent Jurisdiction. Sponsor of one of nation's first provisions allowing state,local and federal officials share enforcement of laws, resources and courts in addressing crime within Grand Teton National Park.'77

Independence Rock. Forged compromise between state and landowners allowing development of important state historic site along Oregon Trail. '77

Malpractice Insurance. Helped develop state underwriting pool to assist physicians and hospitals. '76.

Landowner Consent. Sponsor of nation's first provision for landowners.'75

Sulfer Dioxide Emissions. A leader in establishing standards. '75

State Coal Leasing. Prompted review and revisons to state program. '76

Exotic Species. Sponsored prohibition on importation into state. '71.

School Finance. Authored and cosponsored constitutional amendment providing basis for one of nation's most revolutionary school finance program. '81

Dairy Research. Prompted continuance and improvement of research and extension program in Star Valley. '79 & '80

STATE LEGISLATIVE HIGHLIGHTS CONTINUED

Permanent Mineral Trust Fund. First initiated and sponsored concept for Wyoming major inviolate resrve. '74. Cosponsor of constitutional provision allowing oil and gas revenues to flow to fund. '80.

Game & Fish laws. Major contributor in complete overhaul of extensive state game & fish laws which had not been revised since 1930's. '73

Landowners. Sponsored amendment requiring written permission to use private lands for hunting and fishing. '73.

Local Revenues. Sponsor of optional county sale's tax to be authorized on renewal basis by voters. '73.

Mined Land Reclamation. Prominent contributor to drafting and adoption of expanded surface mined reclamation program. '73

Abortion. Leader in prohibiting any public funding for abortions. '74

Insurance cancellation. Sponsor of restricting cancelation of auto coverage except for nonpayment of premiums, fraud or violations.

Upper Green River Basin. Led fight to defeat major dams in prime agricultural and scenic valley of Sublette County. '71

PERSONAL INFORMATION.

Born: March 3, 1942 Age: 46

Married. Wife: Mary Kay

Children. John Francis (Tote) Age 17

Kathy Mapes Age 16

Mark Freeland Age 14

6/3/89

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cc) Nature Watch
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Movie ✓"A Polish Vampire
" (1984) Eddie Deezan.
Movie ✓✓✓ "The Big
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e" (1985) Chuck Connors.
Wish You Were Here (s)
Heathcliff—Cartoon
Fishin' With Orlando Wilson
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erne & Shirley
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orts Bowling (Delayed)
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Weekend TV

Environment Focus for Global Pop Concert; Ethics, AIDS, Piano Contest on News Shows

Pop music fans are in for another of those benefit concert extravaganzas today as Sting, Diana Ross and Elton John headline a satellite global telecast to help bring attention to the world's environmental problems.

"Our Common Future," a five-hour concert from New York, London and Brazil hosted by "Live Aid" creator Bob Geldof, Sigourney Weaver and Richard Gere, will be broadcast in its entirety on the Arts & Entertainment Channel at 5 p.m. and on KABC-TV Channel 7 at 11:30 p.m. Channel 7 will also broadcast three hours of the event, which features performances from R.E.M., Midnight Oil, Herbie Hancock and others, today at noon.

The Children's Miracle Network Telethon, designed to raise money for children's hospitals around the country, also begins today at 6 p.m. (9)(3), 7 p.m. (8). The 21-hour fund-raiser is hosted by Marie Osmond, Merlin Olsen and John Schneider.

Oprah Winfrey pops up tonight at 7 on Channel 7 as host of "Just Between Friends," a personal look at friendship.

Other programs include:

□

TODAY: Mothers and their teenage daughters appear on "Teen Talk," 6:30 a.m. (9). . . .

Rep. Charles Wilson (D-Tex.) and Ed Rollins of the National Republican Congressional Committee guest on "Evans & Novak," 9:30 a.m. and 9:30 p.m. (CNN). . . .

"Newsmaker Saturday" interviews Secretary of State James Baker, 10:30 a.m. and 2:30 p.m. (CNN). . . .

"West 57th" reports on Berlin and prospects for the reunification of East and West Germany, Oral Roberts and Jodie Foster, 10 p.m. (2)(8). . . .

John Hiatt and Los Lobos perform on "Austin City Limits," 11:30 p.m. (28).

□

SUNDAY: "Headlines on Trial" debates alternative medicine, 6 a.m. (4). . . .

"2 the Point" looks at the upcoming Imagen Awards, a children's march to help clean up the environment, summer workshops and courses at Plaza de la Raza and the American Cancer Society's hot line, 7 a.m. (2). . . .

"Sunday Today" reports on the Van Cliburn piano competition and young adults who live at home, 7 a.m. (4)(36)(39). . . .

Secretary of Defense Richard Cheney guests on "Newsmaker Sunday" 7:30 a.m. and 2:30 p.m. (CNN). . . .

"Sunday Morning" reports on the effect that AIDS has on small towns, the artwork of Thomas Hart Benton, race horse Sunday Silence and the land conservation group Nature Conservancy, 8 a.m. (2)(8).

"Meet the Press" talks with Rep. Newt Gingrich (R-Ga.) about ethics in the House of Representatives, 8:30 a.m. (4)(36)(39). . . .

"The McLaughlin Group" talks about Jim Wright's resignation, President Bush's NATO triumph and the New York mayoral battle, 9 a.m. (4), 5:30 p.m. (50). . . .

"News Conference" interviews Richard Fore of the California Commission on Drugs, 9:30 a.m. (4). . . .

Financier James Goldsmith examines the U.S. economy on "American Interests," 10 a.m. (28). . . .

"Tony Brown's Journal" examines methods of treating AIDS, 10:30 a.m. (28). . . .

"Business World" reports on U.S. businesses that deal with the Chinese government, 11 a.m. (7).

Ethics on Capitol Hill is the topic on "This Week With David Brinkley," 11:30 a.m. (7)(10). . . .

Harold Ezell of the Immigration and Naturalization Service guests on "Newsmakers," 4 p.m. (2). . . .

Atty. Gen. Richard Thornburgh, Rep. John Dingell (D-Mich.) and Edward Rollins, co-chairman of the National Republican Congressional Committee, discuss ethics and politics on "Face the Nation," 4:30 p.m. (2), 11:30 p.m. (8).

"60 Minutes" reports on allegations of illegal wire taps in Cincinnati, a psychologist who claims that a special lens helps dyslexics and a Florida judge who believes tough sentences deter violent crime, 7 p.m. (2)(8). . . .

The documentary "Profits From Poisons," about the harm that pesticides are doing in the Third World, screens at 8 p.m. TBS (cable).

—STEVE WEINSTEIN

The Soaps

Love Will Find a Way . . . Be It Romantic, Illicit or Otherwise

By NANCY M. REICHARDT

ALL MY CHILDREN: Jeremy broke up with Natalie after Remy found proof that Natalie had reported Marissa to the immigration department for using false passports (as part of Marissa's spy business). Jeremy was relieved when Marissa regained consciousness after falling down the stairs. After his divorce was final, Adam married Dixie, but he saw Brooke's face while he was making love to Dixie. Karen gave Adam a shoulder to lean on after he told Brooke he still loves her. Marissa told the police that Natalie didn't

AS THE WORLD TURNS: While held captive in Montega, Lily was stunned to see Duncan, who said that he was secretly drunken Cass, who thought that she was his deceased wife Kathleen until he recovered from his hangover. Nicole told Donna that Jason deserved to die because he killed their mother years ago. Cass told Felicia that she will soon be released from prison because Nicole confessed to killing Jason. Derek admitted to Stacey that when he was a youngster, he killed Felicia's step-father, Noah, because Noah had beaten Felicia. Amanda was furious that Evan kept her in the dark about the fact that he is really Janice's son, Earl.

THE BOLD AND THE BEAUTIFUL: Macy, who is more than a little intrigued with Mick, convinced him to stick around and photograph Sally's fashion line even though Mick dislikes the clothes. Macy wasn't pleased when Mick showed an interest in Donna. Brooke moved in with Donna until her wedding day.

DAYS OF OUR LIVES: Roman was stunned when Abe told him that the police believe Diana, not Cal, shot Roman but has blocked the shooting out of her mind. Kimberly later hypnotized Diana, who then admitted to Roman and Abe that she remembered shooting Roman while he was struggling with Cal. Jack (Billy)

THE WHITE HOUSE
WASHINGTON

number of visitors

2.6 million 7/4

11.2 million four-day weekend

Duncan Morrow

343-7394

National Park System

visitors statistics

THE WHITE HOUSE
WASHINGTON

6/5/87 max. 73 - 36°

6/6/87 76° - 41°
a little rain in afternoon

6/7/87 76 - 39°
.31" rain

6/8/87 73° - 42
.26 rain

Whether in Tetons

Ann Blakely, NPS

FTS 328-4220

The First

PARACHUTE—*Continued*

Parachute. *See under* Aviation

PARACHUTE-JUMP COMBAT DECORATION. *See* Medal: Combat decoration

PARACHUTE-JUMPING CONTEST

Parachute-jumping contest was held October 12, 1923, at Mitchel Field, N.Y. Two men on a Martin bomber and 2 men on a de Havilland jumped from a 4,500-mile height and landed 400 feet from each other, one and a half minutes apart. The first to land was Staff Sergeant Theodore Schieuming of Brooklyn, N.Y. One thousand spectators witnessed the jump.

PARACHUTE WEDDING. *See* Wedding

PARACHUTIST

Parachutist to make 124 jumps in one day was Neal Stewart of Birmingham, Ala., a paratrooper on 30-day leave from Fort Bragg, N. C., who made 124 jumps at Grand Praire, Tex., out of a small plane. His first jump was at 2:16 A.M., July 4, 1952, and the last on July 5, 1952, from an altitude of approximately 500 feet.

PARADE

Automobile parade. *See* Automobile parade

Labor Day parade. *See under* Holiday

Parade in which all the marching music was supplied by transistor radio receivers was held from 11:00 A.M. to 12:00 A.M. on July 4, 1977, at Streamwood, Ill. The marchers carried portable transistor radios that were all tuned to receive the program of music broadcast by radio station WRMN (1410 AM), Elgin, Ill. The parade was witnessed by thousands and telecast over channel 2 and channel 5.

Parade with float tableaux was held in Mobile, Ala., on the evening of Mardi Gras day, February 24, 1868. The Order of Myths produced the first pageant. Next day followed the Infant Mystics and their pageant, then the Knights of Revelry. These are the original mystic societies of the South, and all still parade in Mobile's pageants. *(History of Mardi Gras—Mobile Carnival Association)*

Street parade held by a mystic society was held by the Cowbellian de Rakian Society, organized on December 31, 1830, in Mobile, Ala. The peculiar feature of this society and those which followed later was that absolute secrecy was maintained about their membership, the members never appearing except in costume and in mask. Parades were held annually on New Year's Eve, the first, December 31, 1830, being an impromptu raid on a hardware store staged by a score of young bloods, who were led, according to tradition, by Michael Krafft. On March 5, 1867, Mobilians abandoned the New Year's Eve celebration in favor of daylight parades which were held on Mardi Gras, literally Fat Tuesday, or Shrove

The First

Tuesday, the day preceding Ash Wednesday and the penitential season of Lent as observed in Catholic and Episcopal liturgy. *(Erwin Craighead —Mobile: Facts and Tradition)*

PARCEL POST. *See* Postal service

PARCEL POST DOMESTIC AIR SERVICE. *See* Airmail service

PARCEL POST STAMP. *See* Postage stamp

PARENT-TEACHER ASSOCIATION

Parent-teacher association (local) was the Froebel Society of Brooklyn, N.Y., founded in 1884 to further the "advancement of educational interests and the promotion of self-culture." It was named for the German educator Friedrich Wilhelm August Froebel.

Parent-teacher association (national) was the National Congress of Mothers, organized February 17, 1897, in Washington, D.C., by Alice McLellan Birney and Phoebe Apperson Hearst at a meeting attended by 2,000 persons. At the annual meeting of March 9, 1908, the name was changed to the National Congress of Mothers and Parent-Teacher Associations. On May 9, 1924, the name was changed to the National Congress of Parents and Teachers.

PARISH, CATHOLIC. *See* Catholic parish

PARK

Park land purchased by a city was Elm Park, containing 27 acres, which was sold to Worcester, Mass., on March 17 and March 20, 1854, by Levi Lincoln and John Hammond.

Park (national) was the Yellowstone National Park, Wyo., authorized March 1, 1872 (17 Stat. L. 32), by "an act to set aside a certain tract of land (2,142,720 acres) lying near the headwaters of the Yellowstone River as a public park." The first superintendent was Nathaniel Pitt Langford. Yellowstone Park now consists of 2,213,205 acres in the following states: Wyoming, 2,039,216 acres; Montana, 142,501 acres; Idaho, 31,488 acres. Hot Springs National Park in Arkansas, consisting of 911 acres with 46 hot springs, was established as a reservation by an act of Congress on April 20, 1832 (4 Stat. L. 505). It was not until March 4, 1921 (41 Stat. L. 1407), that it was designated as the Hot Springs National Park. Therefore, although it is the oldest national park, it was not the first one to be so called.

Park (national) in which there was an active volcano was the Lassen Volcanic National Park in the Sierra Nevada in California. It was established by an act of Congress approved August 9, 1916 (39 Stat. L. 443). It contains 104,526 acres, including the famous Lassen Peak, 10,453 feet high.

Park (national) east of the Mississippi and the first located on an ocean is the Acadia National Park, on the island of Mount Desert, about a mile

THOMAS IVES

HIDDEN MENACE: Invisible CO_2 emitted along with smoke from this Arizona copper smelter is warming up the air

GLOBAL WARMING

Feeling the Heat

THE PROBLEM: Greenhouse gases could create a climatic calamity

BY MICHAEL D. LEMONICK

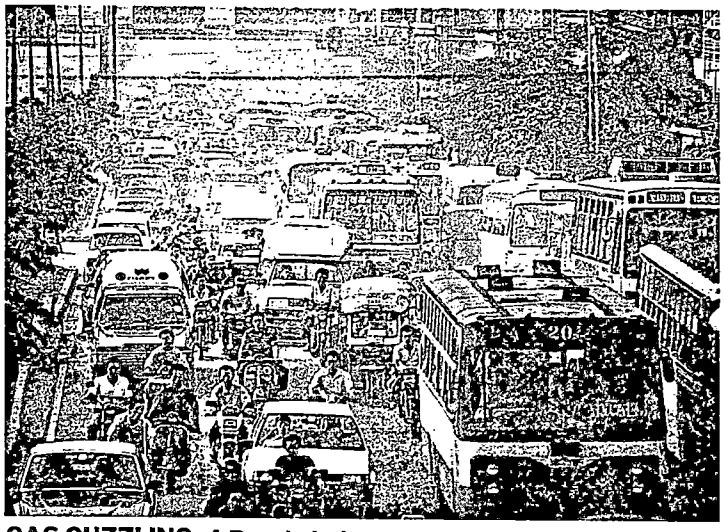
For more than a decade, many scientists have warned that cars and factories are spewing enough gases into the atmosphere to heat up the earth in a greenhouse effect that could eventually produce disastrous climate changes. But until recently, the prophets of global warming garnered about as much attention as the religious zealots who insist that Armageddon is near. When Colorado Senator Timothy Wirth held congressional hearings on the greenhouse effect in the fall of 1987, the topic generated no heat at all. "We had a very, very distinguished panel," Wirth recalled at the TIME Environment Conference, "and who was in the cavernous hearing room? Six or seven people, and two or three of them were lost tourists."

So Wirth decided to schedule another hearing in the summer, hoping hot weather would make people pay attention to the greenhouse issue. Sure enough, when the hearing convened last June 23, the thermometer read 99° F, a Washington record for that day. The room was packed when James Hansen, head of NASA's Goddard Institute for Space Studies, turned global warming into front-page news at last. "It is time to stop waffling so much," he declared. "The evidence is pretty strong that the greenhouse effect is here."

Hansen thus became perhaps the most prominent scientist willing to say straight out that the earth-warming effect of excess carbon dioxide (CO_2) and other gases generated by industry and agriculture had crossed the line from theory into fact. By itself, Hansen's bold assertion was dramatic enough. But the unusual string of weather-related disasters that struck the world last summer could not have been better timed to drive his point home. The heat waves, droughts, floods and hurricanes may be previews of what could happen with ever increasing frequency if the atmosphere warms 3° F to 8° F by the middle of the next century, as some scientists predict.

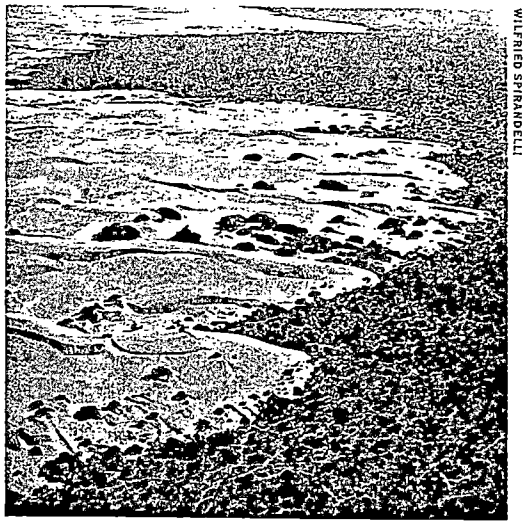
On the other hand, the summer's disasters may have had nothing to do with the greenhouse effect. They could have been random events—all part of the natural year-to-year variations in weather. Many climatologists called Hansen's remarks premature and feared that if this summer happens to be cool, public worries about the greenhouse effect will quickly fade.

Unfortunately, scientists cannot agree on how much global warming has occurred, how much more is on the way and what the climatic consequences will be, giving policymakers an excuse for delay. But no one disputes the fact that the amount of CO_2 in the atmosphere has risen and continues to increase rapidly and that the human race is thus conducting a dangerous experiment



ROBERT NICKLESBERG—GAMMA/LIAISON

GAS GUZZLING: A Bangkok tie-up symbolizes growing Third World energy demands, which hurt efforts to cut fossil-fuel use



WILFRIED SPIRANDELLI

IOWA'S FUTURE? Climate change could erode land into dunes like these in Somalia

on an unprecedented scale. The possible consequences are so scary that it is only prudent for governments to slow the buildup of CO_2 through preventive measures, from encouraging energy conservation to developing alternatives to fossil fuels.

Some forecasters have suggested that the impact of global warming will not be uniformly bad around the world. After all, Canada would not complain if the productive corn-growing lands of the U.S. Midwest shifted north across the border, and the Soviet Union might welcome a warmer, more hospitable Siberia. But while the broad outlines of a hotter world are easy to draw, more specific projections are riddled with uncertainty, since the regional weather patterns that would prevail are largely unpredictable. If Canada becomes much dryer than it is now, for example, higher temperatures will not help much.

Moreover, while some nations will probably end up with a more benign climate than they now have, the pace of change could be so jarring that the benefits would be lost. "We're talking about rates of climate change perhaps 100 times faster than at any time in human history," said Stephen Schneider of the National Center for Atmospheric Research. Ecosystems will not be able to adjust so quickly, he said, "and the faster things change, the more likely it is that the impact will be negative." Warned Thomas Lovejoy of the Smithsonian Institution: "There will be no winners in this game of ecological chairs, for it will be fundamentally disruptive and destabilizing, and we can anticipate hordes of environmental refugees dwarfing the numbers of the Dust Bowl era or the boat people."

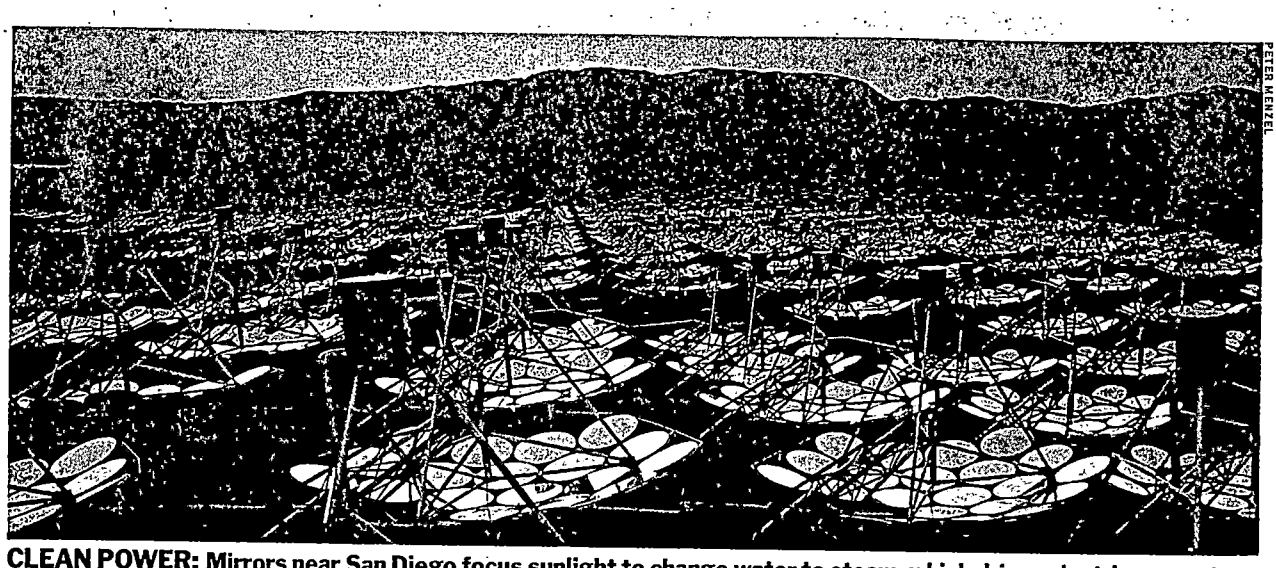
Ironically, the same greenhouse effect that may be so dislocating made earth hospitable to life in the first place. Without a heat-trapping blanket of naturally occurring CO_2, the planet would have an average surface temperature of only 0° F instead of 59° F. Reason: like the glass panes of a greenhouse, CO_2 molecules are transparent to visible light, allowing the sun's rays to warm the earth's surface. But when the surface gives off its excess heat, it does so not with visible light but with infrared radiation. And since CO_2 absorbs infrared rays, some of the excess heat stays in the atmosphere rather than escaping into space. How much heat is retained depends on how much CO_2 is in the air.

Recent research has confirmed that this is more than just theory. By drilling deep into Antarctic and Arctic ice, scientists have been able to measure the amount of CO_2 in air bubbles trapped in ancient layers of snow. They have also looked at fossilized plant tissues for clues as to how warm the air was during the same period. The conclusion: CO_2 levels and global temperatures have risen and fallen together, over tens of thousands of years. And there is evidence from space: Mars, which has little CO_2 in its atmosphere, has a surface temperature that reaches −24° F at best, while Venus, with lots of CO_2, is a hellish 850° F.

The ebb and flow of CO_2 on earth was caused by only natural processes until less than 200 years ago. With the arrival of the Industrial Revolution in the early 1800s, man suddenly threw a new factor into the climatic equation. Carbon dioxide is released in large quantities when wood and such fossil fuels as coal, oil and natural gas are burned. As society industrialized, coal-burning factories began releasing CO_2 faster than plants and oceans, which absorb the gas, could handle it. In the early 1900s, people began burning oil and gas at prodigious rates. And increasing

What Nations Should Do

1. **Impose special taxes on carbon-dioxide emissions, which would encourage energy conservation.**
2. **Increase funding for research on alternative energy sources, including solar power, and safer designs for nuclear reactors.**
3. **Provide financial aid to enable developing nations to build high-efficiency power plants rather than conventional facilities.**
4. **Launch a mammoth international tree-planting program.**
5. **Develop techniques for recovering part of the methane that is given off by landfills and cattle feedlots.**



CLEAN POWER: Mirrors near San Diego focus sunlight to change water to steam, which drives electric generators

population led to the widespread cutting of trees in less developed countries. These trees are no longer available to soak up excess CO_2, and whether they are burned or left to rot, they instead release the gas. By the late 1800s atmospheric CO_2 had risen to between 280 and 290 parts per million. Today it stands at 350 p.p.m., and by 2050 it could reach 500 to 700 p.p.m., higher than it has been in millions of years.

But carbon dioxide, once thought to be exclusively responsible for the greenhouse effect, is now known to cause only half the problem. The rest comes from other gases. Chlorofluorocarbons, or CFCs, are not only destroyers of the stratosphere's ozone layer but powerful greenhouse gases as well. So are nitrogen oxides, which are pollutants spewed out of automobile exhausts and power-plant smokestacks. Another greenhouse gas is methane, the primary component of natural gas. Methane is also generated by bacteria living in the guts of cattle and termites, the muck of rice paddies and the rotting garbage in landfills. Each of these sources is fostered by human activity—even the termites, which thrive in the clearings left after tropical rain forests are cut down. Humanity's contribution to the greenhouse effect comes from so many basic activities that man cannot realistically expect to stop the process, only slow it down.

A first step toward doing that is to ban the production of CFCs, which are used to make plastic foam and as coolants in refrigerators and air conditioners. These gases account for an estimated 15% of the greenhouse effect. Another strategy is to burn as much methane as possible. That adds CO_2 to the air, but getting rid of the methane is well worth it. Both gases trap heat, but as a greenhouse gas, methane traps 20 times as much heat as carbon dioxide, molecule for molecule.

Methane from cattle feedlots will be very difficult to collect, but the gas in garbage landfills is already being tapped and burned at many sites around the U.S. At the Fresh Kills landfill on New York City's Staten Island, for example, methane that would otherwise have escaped into the air is being collected by a gas company and used to heat thousands of homes. The technique essentially involves driving a pipe into the depths of the garbage, then trapping the gas that rushes out. This should be done at all landfills.

Another step that could be taken to counteract global warming is to slow—and ideally stop—deforestation. But that is an enormously complex task, and so a simple companion strategy should be adopted at the same time: the planting of trees, and plenty of them, to absorb CO_2 from the air. "It surely has to be one of the most benign things we can do," said Gus Speth of the World Resources Institute. Tree planting can be encouraged at all levels of society, from individuals putting an extra tree or two in their backyards to local communities and private organizations planting an acre at a time to provincial and national governments reforesting on a more widespread basis.

Admittedly, trees are just a stopgap. Unless a tree is used for lumber, it eventually dies and rots or is burned, releasing whatever CO_2 it has absorbed. But since the rapid pace of change may be the greatest danger posed by global warming, stopgaps could be important. If nothing else, reforestation will buy time to put other preventive measures into place.

Tree planting will have negligible impact, however, if people continue to pump CO_2 into the atmosphere at current rates. While wood and fossil-fuel burning will never be eliminated, they can be cut down significantly. An immediate way to do so is through conservation. When oil prices soared in the 1970s, industries responded by becoming much more energy efficient. But the plunge in the price of oil from $36 per bbl. in 1982 to less than $12 per bbl. this fall has cooled the enthusiasm for conservation. Governments must rekindle that interest and boost energy saving by setting or raising minimum efficiency standards for automobiles, appliances and other machinery.

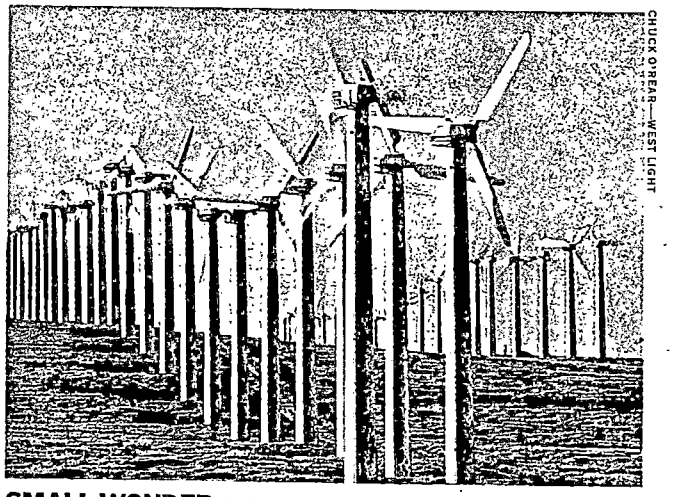
Although developed countries waste the most energy, there are plenty of opportunities for conservation in the developing world, where energy-using equipment tends to be older and more inefficient. Third World conservation would not only help slow greenhouse warming but also let countries save money by reducing dependence on energy imports. If the industrialized countries expect cooperation, though, they should make available at minimal cost the most advanced energy-saving technology, especially for power plants, and help finance the purchase.

By far the most efficient and effective way to spur conservation is to raise the cost of fossil fuels. Current prices fail to reflect the very real environmental costs of pumping carbon dioxide into the air. The answer is a tax on CO_2 emissions—or a CO_2 user fee, if that is a more palatable term. The fee need not raise a country's overall tax burden; it could be offset by reductions in income taxes or other levies.

Imposing a CO_2 fee would not be as difficult as it sounds. It is easy to quantify how much CO_2 comes from burning a gallon of gasoline, a ton of coal or a cubic yard of natural gas. Most countries already have gasoline taxes; similar fees, set according to the amount of CO_2 produced, could be put on all fossil-fuel sources. At the same time, companies could be given credits against their CO_2 taxes if they planted trees to take some of the CO_2 out of the air.

A user fee would have benefits beyond forcing a cutback in CO_2 emissions. The fuels that generate carbon dioxide also generate other pollutants, like soot, along with nitrogen oxides and sulfur dioxide, the primary causes of acid rain. The CO_2 tax would be a powerful incentive for consumers to switch from high-CO_2 fuels, such as coal and oil, to power sources that produce less CO_2, notably natural gas. When burned, methane generates only half as much CO_2 as coal, for example, in producing the same amount of energy.

Ultimately, though, the world must move away from fossil fuels for most of its energy needs. Said Berrien Moore, director of the Institute for the Study of the Earth, Oceans and Space at the University of New Hampshire: "Even if you cut emissions of CO_2 in half, the atmospheric concentration will keep going up. You're still adding CO_2 faster than you're withdrawing it, so the balance keeps rising."



CHUCK O'REAR—WEST LIGHT

SMALL WONDER: Wind farms like this one in Livermore, Calif., slow global warming only a little, but every bit helps

Of all the known nonfossil energy sources, only two are far enough along in their development to be counted on: solar and nuclear, neither of which generates any greenhouse gases at all. Solar power is especially attractive. It produces no waste, and it is inexhaustible. Not all solar power comes directly from the sun: both wind and hydroelectric power are solar, since wind is created by the sun's uneven warming of the atmosphere and since the water that collects behind dams was originally rain, which in turn was water vapor evaporated by solar heating.

But wind and hydroelectric power can be generated at only a relatively few sites, and so governments should redouble financing for research to develop efficient, low-cost photovoltaic power. Photovoltaic cells, which produce electric current when bathed in sunlight, were briefly in vogue during the energy crises of the 1970s, and while public attention and Government funding have waned, research into the technology has continued. "The capital costs have come down from about $50 a peak watt to $5," said Speth. If they drop to $1, solar power will become competitive. That could happen without significant Government research support—but it will happen sooner with it.

Sometime early in the next century, solar enthusiasts hope to see vast tracts of photovoltaic collectors providing cheap electricity that can be transmitted over long distances. Alternatively, the electricity could be used to produce hydrogen from water. That could open up all sorts of possibilities. Cars, for example, could be redesigned to run on hydrogen, and that would produce a dramatic reduction in CO_2 emissions.

Nuclear power is more controversial; until recently the mere mention of it made environmentalists blanch. They had good reason, considering the accidents at Three Mile Island and Chernobyl, the problem of radioactive waste and the horror stories about U.S. weapons plants. But the greenhouse effect is forcing some antinuclear activists to rethink their position. "I was a strong opponent of the nuclear program in France," said Brice Lalonde, France's Environment Under Secretary and a former presidential candidate on the Ecologist Party ticket. "Now I am reassessing the whole thing." France gets more than 70% of its electricity from nuclear plants and has an impressive safety record.

Reactors in France, like all conventional reactors, depend for their safety in part on the skill and alertness of their operators. To minimize the risk of human error, engineers have developed designs for much safer types of nuclear reactors. But while these reactors, like experimental solar cells, show great promise, they are not yet economical enough to go on-line in significant numbers. It should therefore be a priority of governments to spend more money on research aimed at lowering the cost of safe nuclear and solar power and making them primary energy sources. Otherwise the global warming that results from overreliance on fossil fuels could produce an increasingly uncertain and potentially bleak future. ■

The Good News: Osage, Iowa, Counts Kilowatts

The houses and businesses in Osage, a town of some 3,600 people in northern Iowa, seem just like buildings anywhere else in small-town America. Only a close look reveals the difference. Examine, for example, the new insulated roof on the local hospital that shaves utility bills 20%. Or venture into the basement of Steele's Super Valu grocery to see the wall that owner Everett Steele built around his cooling compressors to capture heat, which is then pumped into the store. Osage's model conservation program saved the town an estimated $1.2 million in energy costs in 1988 and made a modest but worthwhile contribution toward slowing down global warming.

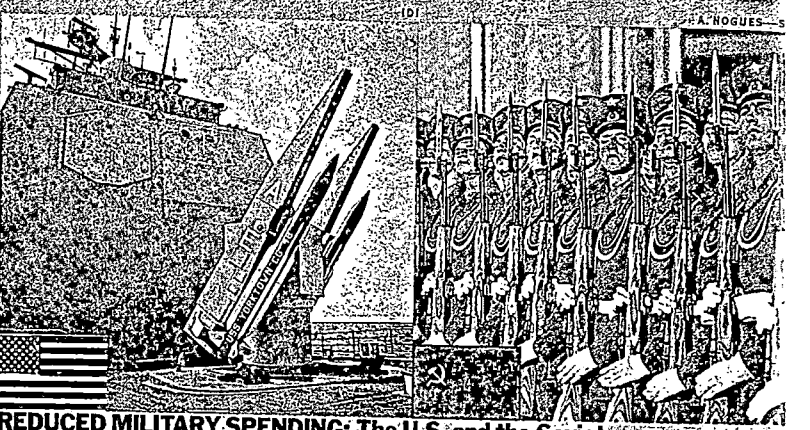
The folks in Osage save energy the old-fashioned way: they plug leaky windows, insulate walls and ceilings, replace inefficient furnaces and wrap hot-water heaters in blanket insulation. Since 1974, the community has cut its natural-gas consumption some 45% and reduced its annual growth in electricity demand by more than half, to less than 3% a year.

Much of the town's energy saving can be traced to the zeal of Weston Birdsall, general manager of Osage Municipal Utilities. Looking back to 1972, when he took over the utility company, Birdsall recalls, "That's about the time OPEC reared its ugly head. We had to do something." Birdsall preached conservation door to door, offering to give every building a free thermogram, a test that pinpoints places where the most heat is escaping. More than half the town's property owners accepted the offer.

Birdsall's conservation campaign still flourishes long after similar efforts elsewhere have flagged. The utility recently decided to give customers $15 fluorescent light bulbs, which use far less energy than incandescent models. While Birdsall's strategies are based on simple, widely known techniques, few cities or towns apply the methods as diligently as Osage does. "Why aren't more people doing this?" Birdsall asks. Maybe more of them will if they come to realize that conserving energy not only saves money but also helps save the environment.

A Global Bargain

Far more difficult than signing international treaties will be finding the money to make them work. The impoverished Third World countries, burdened with debt, cannot afford expensive environmental projects without outside help. Nor is the U.S. in a position to fund a new ecological Marshall Plan on its own. Here are the elements of a north-south deal that could pool the financial resources of the industrialized world and channel them into sustainable development plans for the poorer countries.



REDUCED MILITARY SPENDING: The U.S. and the Soviet Union could cut back their nuclear and conventional forces, shrinking their defense budgets and freeing funds for domestic and foreign environmental programs.

Hands Across the Sea

Rich and poor, north and south, nations must get it together or face common disaster

BY THOMAS A. SANCTON

It is easy to draw up a plan of action for protecting the earth. But that plan will fail unless it is forged with international fellowship and carried out on a global scale. How much good can one country do by reducing carbon-dioxide emissions if another nation offsets that with an increased output of CO_2? How can one country keep its beaches clean if its neighbor down the coast dumps sewage or syringes into the sea? "On most environmental questions, the nation-state is obsolete," said Pace University's Nicholas Robinson. "We have to talk about multinational cooperation."

The first goal of that cooperative effort should be to gather the information needed to fashion effective policies. "We've got to get the earth in intensive care, to start to monitor the vital signs of the planet," said John Eddy of the University Corporation for Atmospheric Research in Boulder. This could be done by launching an International Earthwatch Program, possibly under the aegis of the United Nations, to coordinate multinational research projects and centralize essential data on the state of the world. Such an umbrella program could pool the results of hundreds of existing research efforts. A prime candidate for this program would be the Mission to Planet Earth, recommended by former astronaut Sally Ride, which would use NASA facilities to study the earth from space. In addition to improving knowledge of the earth's ills, an International Earthwatch Program could provide the basis for a widespread awareness-building campaign aimed at preparing public opinion for the sacrifices and life-style changes that will be necessary in the coming decades. Environmental education programs should be immediately introduced into schools and workplaces around the world, and government leaders should bring these issues into the heart of political debate.

But research and education are no substitutes for concrete action. The world community must move promptly toward comprehensive treaties to protect the air, soil and water. A framework for the effort exists within the U.N., which has already taken some important initiatives. In 1972 the U.N. organized the landmark Stockholm conference, which set up the United Nations Environment Program. It was under UNEP's sponsorship that 24 countries signed the 1987 Montreal Protocol, calling for a reduction in the output of ozone-destroying chlorofluorocarbons. There have also been proposals to enhance UNEP's role as a sort of intergovernmental superagency on environmental questions.

Paralleling the U.N.'s efforts, multilateral financial institutions have a crucial role to play. The World Bank, which lends money for Third World development projects, was long criticized by environmental groups for backing large, ecologically unsound programs—a cattle-raising scheme in Botswana that led to overgrazing, for example. During the past few years, however, the World Bank has been seeking to factor environmental concerns into its programs. One product of this new approach is an environmental action plan for Madagascar. The 20-year plan, which will be drawn up jointly with the World Wide Fund for Nature, aims at heightening public awareness of environmental issues, setting up and managing protected areas and encouraging sustainable development. Similar aims should also guide the lending policies of the International Monetary Fund, regional development banks and bilateral assistance programs.

Much of the current environmental crisis is rooted in, and exacerbated by, the widening gap between rich and poor nations. Industrialized countries contain only 23% of the world's population, yet they control 80% of the world's goods and are also responsible for the bulk of its pollution. On the other hand, it is the developing countries that are hardest hit by overpopulation, malnutrition and disease. As these nations struggle to catch up with the developed world, a vicious circle begins: their efforts at rapid industrialization poison their cities, while their attempts to boost agricultural production often result in the destruction of their forests and the depletion of their soils.

The greatest obstacle to economic and environmental improvements in the developing countries is their mammoth foreign debt. Collectively, the Third World owes $1.2 trillion to the

BURDEN SHARING: U.S. allies like Japan and West Germany would no longer be under pressure to raise military spending and could contribute to global security by increasing aid to the developing countries.

AID FOR THE THIRD WORLD: In exchange for foreign funds, the developing nations would agree to curb deforestation and adopt other responsible environmental policies.

banks and governments of industrialized countries. A new World Bank report estimates that in 1988 the developing countries made net payments of $43 billion to the industrial nations, up from $38 billion in 1987. How can the rich nations expect poor countries to launch environmental programs while struggling to pay off those crippling loans? Clearly, the Third World's debt payments will have to be lightened or postponed. The best way of doing that seems to be using debt forgiveness as leverage for winning environmental concessions.

One approach that has already been pursued successfully on a small scale is the so-called debt-for-nature swaps. Conceived by the Smithsonian Institution's Thomas Lovejoy in 1984, these innovative deals often involve the cooperation of governments, bankers and conservation groups. In a typical debt-for-nature swap earlier this year, the World Wildlife Fund, a nonprofit organization based in Washington, bought $1 million worth of Ecuadoran debt held by Bankers Trust at the discounted price of $354,500. The bank was happy to get the troublesome loan off its books, while the World Wildlife Fund gained the power to improve that country's environment. The fund accomplishes this by transferring the loan payments to Fundación Natura, a conservation group in Ecuador. Fundación Natura, in turn, uses the money to protect and maintain national parks and wildlife preserves.

However it is accomplished, a greater share of the world's capital will have to flow into developing countries. What they need, said Senator Albert Gore, is a new Marshall Plan for economic development and environmental preservation. But where will the money come from? For starters, the U.S. and the Soviet Union could reduce military spending in order to boost aid for environmental programs. Nobel laureate Murray Gell-Mann, a professor of theoretical physics at the California Institute of Technology, argued that the superpowers should redefine "global security" to include "the issues of population, environment and sustainable development." Yet the U.S., the world's largest debtor, can no longer supply the bulk of aid to the Third World. Nor can the economically strapped Soviet Union provide much financial help.

That leaves Japan, now the world's most financially powerful country, with a heavy responsibility for taking a leading role in bankrolling solutions to the environmental crisis. Japan has long shied away from assuming a major place in international affairs because of its militaristic adventures of the 1930s and '40s, but as Prime Minister Noboru Takeshita has made clear, his country realizes its international duty and is willing to shoulder it.

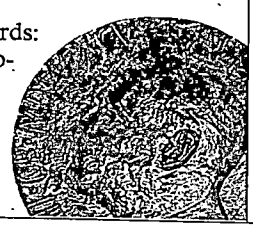
Japan's foreign aid appropriations of more than $10 billion in 1988 outstripped U.S. outlays, and Tokyo has increased its contributions to the World Bank and other environment-conscious lending institutions. The Takeshita government is willing to give more, but its efforts have ironically been hampered by the U.S., which is reluctant to give the Japanese a greater say in running these international groups. One solution might be to set up a new financial entity, an International Bank for Environmental Protection, in which the Japanese could have a major responsibility for both funding and management.

America, for its part, is at a turning point. The Reagan Administration, with its poor record on environmental issues, is coming to a close. President-elect Bush, who turned the pollution of Boston Harbor into a successful campaign issue, has an opportunity to show that he is serious about saving the planet—even after the election. He sent out an encouraging signal last week by naming veteran conservationist William Reilly to head the Environmental Protection Agency. Reilly, 48, president of the World Wildlife Fund, promised a "new and constructive course" on environmental problems. It is none too soon. ***—Reported by Barry Hillenbrand/Tokyo and Richard Hornik/Washington***

Nobel for a Noble Cause

Physicists and chemists can earn the ultimate recognition: a Nobel Prize. Why not accord the same honor to environmental scientists? At the TIME conference, the proposal was backed by everyone from U.S. Senator Albert Gore to Vasili Peskov, a correspondent for the Moscow newspaper *Komsomolskaya Pravda*. Peskov suggested that the first environmental Nobel be given posthumously to Rachel Carson, whose 1962 book *Silent Spring* helped alert the world to the pollution threat.

Alfred Nobel's will set up five awards: physics, chemistry, medicine or physiology, literature and peace. But that limitation was overcome in 1968, when Sweden's Central Bank financed a separate economics prize in memory of Nobel.



What The U.S. Should Do

The U.S. has made significant strides in pollution control and energy conservation during the past 15 years, but the country remains the world's biggest user of natural resources and a major despoiler of the global environment. Because of the size of its economy, the U.S. consumes one-fourth of the world's energy each year. Yet for a given amount of energy, the U.S. produces less than half as much economic output as Japan and West Germany. Meanwhile, the commitment to reduce pollution has flagged. Although the U.S. accounts for less than 5% of the global population, it generates 15% of the world's sulfur dioxide emissions and 25% of nitrogen oxides and carbon dioxide. Each American produces an average of 3½ lbs. of trash a day.

When energy was expensive, Americans treated it that way. Between 1973 and 1985, when the price of oil surged, U.S. per capita energy consumption fell 12% and the average amount of goods and services generated per person rose 17%. In the past few years, however, energy use has risen as the price has declined. Americans, who own more than 135 million cars, or about one-third of the world's total, have been driving more and have resumed their love affair with large gas-guzzling cars.

Because of its sheer size and influence, the U.S. must be in the vanguard of the effort to solve the earth's environmental crisis. Even before international bodies come up with global strategies, the U.S. can take many steps, unilaterally and immediately.

1. Raise the Gasoline Tax

A gallon of unleaded gasoline, which costs roughly 95¢, is nearly a third cheaper now than it was eight years ago. When inflation is taken into account, the price decline is closer to 50%. Raising the federal gasoline tax by 50¢ per gal., from 9¢ to 59¢, over the next five years would renew drivers' interest in fuel conservation.

2. Toughen Auto Fuel-Efficiency Requirements

Federal regulations require that automakers produce fleets of cars with an average fuel efficiency of 26 m.p.g. The Government originally set a fuel-efficiency target of 27.5 m.p.g. for 1986, but the Reagan Administration allowed the car companies to postpone that goal. The new Administration should institute the 27.5 m.p.g. requirement and then gradually raise it to 45 m.p.g. by the year 2000.

3. Encourage Waste Recycling

The Federal Government should set national goals and standards for recycling programs but leave their implementation to state and local agencies. As an immediate first step, the President and Congress should require federal agencies to increase steadily their use of recycled paper products.

4. Promote Natural-Gas Usage

Far more abundant than anyone thought a decade ago, natural gas is the cleanest hydrocarbon fuel available. But in many cases, utilities that wish to switch from coal-fired power generation to gas-fired must go through a lengthy process to obtain a federal permit. Such regulations, which inhibit the increased use of natural gas, should be eased.

5. Encourage Debt-for-Nature Swaps

The U.S. opposes all government-subsidized debt relief for Third World countries. At a minimum, federal regulators should encourage U.S. banks to participate in programs that reduce debt in exchange for steps taken by debtor nations to protect tropical rain forests and other resources.

6. Support Family Planning

In 1984 the Reagan Administration cut off U.S. aid to the two major international family-planning organizations. Reason: the United Nations Fund for Population Activities and the International Planned Parenthood Federation have been accused of assisting some local population agencies that provide or pay for abortions. Unless the growth in the world population is slowed, it will be impossible to make serious progress on any environmental issue. The U.S. should immediately restore the aid it withdrew.

7. Ratify the Law of the Sea

The U.S. has never ratified the 1982 U.N. Convention on Law of the Sea, which sought to regulate mining and other commercial development. The Administration argues that the treaty interferes with private exploitation of the sea. That ideological issue should be put aside so that the U.S. can exercise global leadership and clear the way for international pacts aimed at protecting the atmosphere.

8. Make the Environment a Summit Issue

When the leaders of the major industrial nations gather next June in Paris for their 15th economic summit, George Bush should push to make environmental problems the No. 1 agenda item. Ronald Reagan's success at previous summits stemmed from his insistence on dealing with only one major topic. Should Bush take that approach in Paris, global environmental issues stand a better chance of getting the attention they deserve.

"What Is Wrong With Us?"

A Senator's impassioned call for action

If the steps needed to save the environment are well known and feasible, then why are they not taken? In a speech at the TIME *conference, Senator Albert Gore of Tennessee, one of the most ardent environmentalists in Congress, explored this crucial question. Excerpts from his remarks:*

When I announced I was running for President, I said the greenhouse effect, the depletion of the ozone layer and the global ecological crisis will, by the end of this election year, be recognized as the most serious issue facing this country and the world. Three days later, a George Will column ridiculed the naiveté of a politician who could imagine that issues of this kind would be politically salable.

I guess he was partly right and partly wrong. I was right in that the issue has, during this year, attained enormous importance and new recognition. But he was right, since it didn't do me any good politically. There are still barriers to political action. Let me discuss five of them.

▶ Number one, there are areas of uncertainty about the greenhouse effect and the dire nature of the ecological crisis we face, which are seized upon as excuses for inaction. This is a psychological problem common to all humanity. If strong responses are needed and yet there is some residual uncertainty about whether you are going to have to make those responses, the natural psychological tendency is to magnify the uncertainty and say, "Well, maybe we won't really have to face up to it."

But the fact that we face an ecological crisis without any precedent in historic times is no longer a matter of any dispute worthy of recognition. And those who, for the purpose of maintaining balance in debate, take the contrarian view that there is significant uncertainty about whether it's real are hurting our ability to respond.

▶ The second barrier to political action is an unwillingness to believe that something so far outside the bounds of historical experience can, in fact, be occurring. To put it another way, this set of problems sounds like the plot of a bad science-fiction movie. People automatically assume it can't be real.

▶ The third political barrier is the assumption that it will be easier and more sensible to adapt to whatever climate change occurs than it will be to prevent the crisis. But the change could come so swiftly that adaptation will be all but impossible.

▶ The fourth barrier is the lack of widespread awareness among the peoples of the world about the nature of the problem. Most political leaders, let alone their public, are unaware of what is happening and how severe it is. That must be changed.

▶ The fifth barrier to political action is the knowledge that many of the ultimate solutions are almost unimaginably difficult. And since they are harder than anything we have done before, and the efforts may all come to naught anyway, why mess with them? Why not conserve our energy and just not even try? That is a formidable barrier, not least because the solutions require international cooperation on a scale that is totally unprecedented in history.

BARRY STAVER

"Did God choose an appropriate technology when he gave human beings dominion over the earth? The jury is still out."

Those five barriers must be overcome before the political system reacts. The role of leadership is critical in spreading awareness, in framing solutions, in offering a vision of the future we want to create, as well as a vision of the nightmare we wish to avoid.

There is an old science experiment in which a frog is put into a pan of water, and the water is slowly heated to the boiling point. The frog sits there and boils because its nervous system will not react to the gradual increase. But if you boil the water first and then put the frog in, it immediately jumps out.

We are at an environmental boiling point right now. Is the destruction of one football-field's worth of forest every second enough to make the frog react and jump out of the pan? What will it take? If, as in a science-fiction movie, we had a giant invader from space clomping across the rain forests of the world with football field–size feet—going boom, boom, boom every second—would we react? That's essentially what is going on right now.

We saw the two whales trapped in the Arctic ice, struggling for air, and the world responded. The U.S. and the Soviet Union cooperated. Yet we see 40,000 babies starving every day, and we don't react. What is wrong with us?

There used to be a debate in the '70s about appropriate technology. Now the question is: Did God choose an appropriate technology when he gave human beings dominion over the earth? The jury is still out. And the answer has to come in our lifetime from the political system.

There are precedents. We made human sacrifice, once commonplace, obsolete. We made slavery obsolete. These things, just like changes in weather patterns, took a long period of time. But now, just as climate changes are telescoped into a very short period of time, changes in human thinking of a magnitude comparable to the changes that brought about the abolition of slavery must take place in one generation.

We know how to solve the problem. It will be unimaginably difficult. The cooperation required will be unprecedented. But we know what to do. What is required is a change in thinking and a change in the equilibrium of the world's political system.

Right now the political equilibrium is characterized by short-term policies at the expense of long-term policies. It is characterized by actions to confer national advantage at the expense of actions designed to promote global advantage. It is characterized by preparations for war, ignorance and starvation.

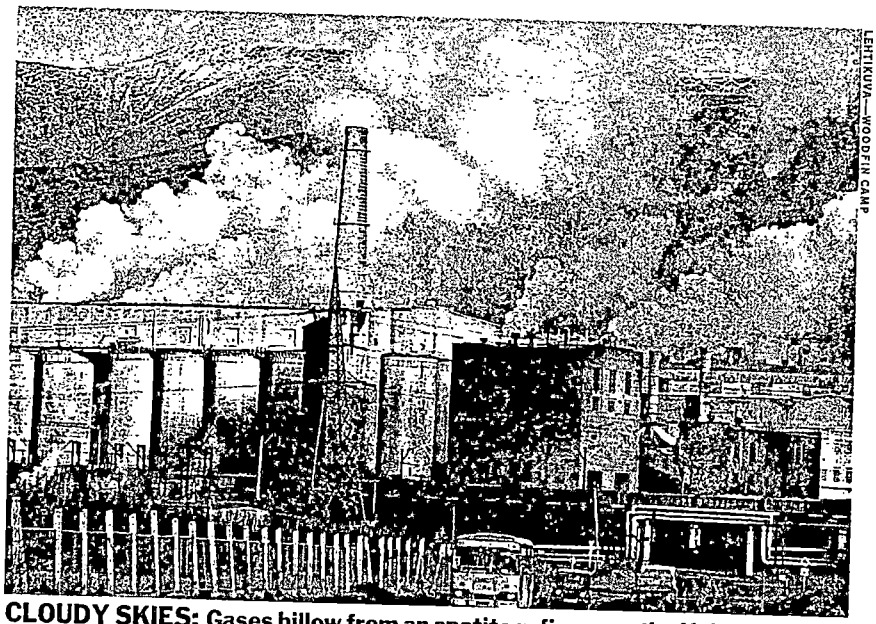
Our challenge as political leaders is to come up with an agenda of solutions, which we are doing. But the larger challenge for all of us is to shift the world's political system into a new state of equilibrium, characterized by more cooperation, global agendas and a focus on the future. As General Omar Bradley said at the end of World War II, "It is time we steered by the stars and not by the lights of each passing ship." ■

The Greening of the U.S.S.R.

As his public cries out for a cleanup, Gorbachev fights a pall of pollution

BY DICK THOMPSON

The Soviet Union is an environmentalist's nightmare. The industrial city of Nizhni Tagil, some 700 miles east of Moscow, is sometimes wrapped in clouds of gaseous wastes so thick and toxic that drivers must turn on their headlights at noon and children walking home from school get skin rashes. Every year 700,000 tons of toxic substances are spewed into the city's air. Not only Nizhni Tagil but more than 100 other major cities, including Moscow, also have air-pollution levels ten times as high as the acceptable standards set by the Soviets.



LEHTIKUVA—WOODFIN CAMP

CLOUDY SKIES: Gases billow from an apatite refinery on the Kola Peninsula

The land and water are not in any better shape. The riverbed of the Neva, which meanders beside the magnificent Hermitage in Leningrad, is covered with a thick layer of oil. Ill-advised dam construction and inappropriate irrigation projects have caused the level of the Aral Sea to drop 40 ft. It is possible that this body of water, the world's sixth largest sea, will not exist in 20 years. Siberia, once pristine, is laced with wastes from steel, chemical and coal industries. Worrisome numbers of dead sturgeon are floating atop the polluted Volga River, threatening the Soviets' prestigious caviar supply. Resorts along the Black Sea have banned swimming after the government's warning that the waters are contaminated with dysentery and typhoid germs.

For decades the Soviet people accepted the situation in silence. But *glasnost* has made them less afraid to speak out. Citizens worried about the environment are demonstrating by the thousands and contributing to political unrest in the Baltic States. Elsewhere, budding environmental groups have even sponsored candidates for city elections.

Amid the turmoil the Soviet government has finally begun to move. The Kremlin has reorganized a number of departments into the new State Committee for the Protection of the Environment, Goskompriroda, and given it an impressive range of powers. "In this restructuring," said Nicholas Robinson, a Pace University professor and an expert on the Soviet environment, "the Communist Party Central Committee has decided that, after disarmament, environmental protection is the No. 1 world issue." An aggressive cleanup program has already begun. Projects are being re-evaluated in light of their environmental impact. Fines have been levied on some polluters, and criminal proceedings have been started against others.

Internationally, the Soviets are pushing for stronger accords to protect the environment and are seeking ways to integrate their atmospheric-research efforts with those under way elsewhere. For the first time since World War II, the Soviet Union and the U.S. may have found a common enemy: global climate change. Said President Mikhail Gorbachev in his speech this month to the U.N. General Assembly: "International economic security is inconceivable unless related not only to disarmament but also to the elimination of the threat to the world's environment."

One sign of the Soviets' willingness to join international environmental efforts was their presence at the TIME conference in Boulder. Fyodor Morgun, the recently appointed head of Goskompriroda, made his first trip to the U.S. (and only his second journey outside the Soviet Union) to attend the meeting. And he was startlingly frank about the situation in his country. "We have started too late," Morgun told the group. "Our air is not up to the proper mark, our soil is polluted, and our forests are affected. Drastic measures were taken in the West 15 to 20 years ago to improve the environment. Now my country must get to work on this as well."

The Soviet environmental disaster has been a long time in the making. Beginning in the days of Stalin, ecological concerns were shunted aside in the rush toward industrialization. *Valovaya produktsiya,* a phrase that translates into "gross output" and is abbreviated as *val,* was at the heart of the problem. Industry bureaucrats have long been evaluated—and rewarded—only in terms of gross output. Rivers were fouled and forests stripped in the rush to transform raw materials into material wealth. No premium was placed on efficiency, and no environmental concerns restrained *val.* Trucks in Siberia, for example, are still left running every hour of every day throughout the winter because the vehicles are very difficult to start in the cold, and diesel fuel is plentiful.

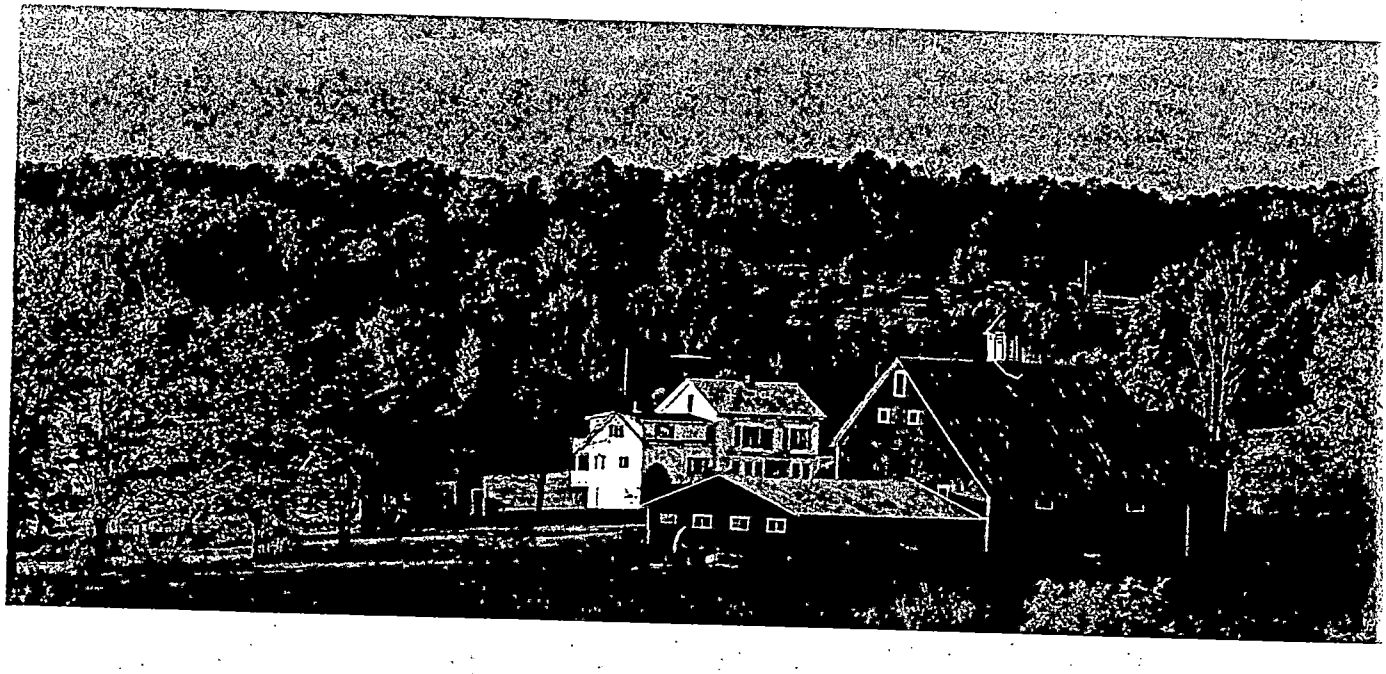
Nowhere are the consequences of unchecked industrialization more obvious than in Siberia's Lake Baikal basin. Nearly 30 years ago, Minlesbumprom (the Ministry of Timber, Pulp and Paper, and Wood Processing Industry) erected the Baikalsh pulp factory on the shores of this majestic body of crystal-clear water. The crescent-shaped lake holds 80% of the country's fresh water and 20% of the world's supply. Three-fourths of the lake's 2,500 fish and plant species, including the Baikal nerpa, a fresh-water seal, are unknown anywhere else in the world.

Preparing for the Worst

If the sun turns killer and the well runs dry, how will humanity cope?

BY PHILIP ELMER-DEWITT

If the nations of the world take immediate action, the destruction of the global environment can be slowed substantially. But some irreversible damage is inevitable. Even if fossil-fuel emissions are cut drastically, the overall level of carbon dioxide in the atmosphere will still increase—along with the likelihood of some global warming. Even if toxic dumping is banned outright and that ban is strictly enforced, some lakes and aquifers will be tainted by poisons that have already been released. Even if global population growth could somehow be cut in half, there would still be more than 45 million new mouths to feed next year, putting further strain on a planet whose capacity to sustain life is already under stress.



Sooner or later the earth's human inhabitants, so used to adapting the environment to suit their needs, will be forced to adapt themselves to the environment's demands. When that day comes, how will societies respond? How well will the world cope with the long-term changes that are likely to be in store?

To help answer those questions, political scientist Michael Glantz of the National Center for Atmospheric Research has pioneered the use of a technique known as "forecasting by analogy" to predict the effects on society of future climatic change. In a series of case studies, Glantz and his colleagues analyzed the response of state and local governments to actual environmental events across the U.S., from a 12-ft. rise in the level of Utah's Great Salt Lake to the depletion of the aquifer that supplies groundwater to eight Great Plains states.

When Glantz's forecasting technique is applied to the rest of the world, two things become clear. One is that virtually every long-term environmental change is occurring in miniature somewhere on the planet, whether it is a regional warming trend in sub-Saharan Africa or the vanishing coastline in Louisiana. The other is that Homo sapiens is an immensely resourceful species, with an impressive ability to accommodate sweeping change. In countries and regions hit by climatic upheavals, people have come up with a variety of solutions that are likely to have broad applicability to the global problems of tomorrow.

How would societies respond, for example, if the oceans were to rise by 3 ft. to 5 ft. over the next century, as some scientists have predicted? One option would be to construct levees and dikes. The Netherlands, after all, has flourished more than 12 ft. below sea level for hundreds of years. Its newest bulwark is a 5.6-mile dam made up of 131-ft. steel locks that remain open during normal conditions, to preserve the tidal flow that feeds the rich local sea life, but can be closed when rough weather threatens. Venice is beginning to put into place a 1.2-mile flexible seawall that would protect its treasured landmarks against Adriatic storms without doing ecological damage to the city's lagoon.

Shoring up cities such as New York, Los Angeles, Paris, London and Rio de Janeiro would require equally monumental measures. In the U.S. the Environmental Protection Agency estimates that the cost of protecting developed coastal areas could reach $111 billion. Southern Louisiana, which is losing land to the Gulf of Mexico at the alarming rate of one acre every 16 minutes, has already drawn up an ambitious mix of programs. In the biggest project, a $24 million pumping station would divert millions of gallons of silt-rich Mississippi River water onto the coastline to help stop saltwater intrusion and to supply sediment that will build up the eroding land. At least one parish is considering plans for a backstop dike to give residents time to escape should the sea finally reach their doors.

Poorer countries have fewer options. Wracked by periodic floods, Bangladesh cannot simply evacuate the "chars"—bars of

All that is under assault. Currently, the pulp factory produces 200,000 tons of cellulose fibers a year, and its effluent, discharged directed into the lake, has created a polluted zone 23 miles wide. Clouds of yellowish smoke belching from the factory's smokestacks have settled over 770 sq. mi. of Siberian wilderness and have killed an estimated 86,000 fir trees.

The environmental offenses at Baikal and elsewhere revived the deep relationship that the Soviets have with nature. "Please believe me," said Morgun, "the people have awakened." From Armenia to Zaporozhye, hundreds of thousands have taken to the streets to protest everything from air pollution to nuclear-power plants. In April 10,000 people demonstrated against the conditions in Nizhni Tagil. Protesters in Priozyorsk were successful in closing a major paper plant that had been dumping waste into Lake Ladoga, the source of drinking water for 6 million people. Many of the political demonstrations in the Baltic States are linked to the environment. Said Marshall Goldman, associate director of the Russian Research Center at Harvard University: "In almost every republic in which there is a movement for independence or the assertion of political rights, it has been led by an environmental movement."

BARRY STAVER

"We have started too late. Our air is not up to the proper mark, our soil is polluted, and our forests are affected. Drastic measures were taken in the West 15 to 20 years ago to improve the environment. Now my country must get to work on this as well."

FYODOR MORGUN

Gorbachev, whose background is in agriculture, has shown a special concern for the environment from the beginning of his reign. Early on, he toured the country and took care to detour from the carefully prepared showcase routes to inspect firsthand the polluted rivers and devastated forests. Funds for environmental protection, about $24 billion this year, are projected to reach $46.4 billion annually in the first half of the 1990s. At the same time, Gorbachev's regime has cracked down on polluters. Around Lake Baikal, about two dozen violations of ecological standards have been referred to prosecutors. In Nizhni Tagil the government has closed ten factories for failing to control toxic emissions and has begun criminal investigations against more than ten other plants.

But the Soviet leader may face a potential conflict between his desire for a cleaner environment and his hopes of rapidly raising the living standards and consumption levels of his people. Without careful pollution control, boosting production will befoul the environment even more. And money that goes into antipollution equipment cannot be used for industrial expansion. In Boulder, Morgun emphasized that the Kremlin wanted to get around this dilemma by redirecting money from military spending into the civilian economy. That, he said, depended on continued progress in arms-control talks with the U.S.

From an international perspective, the most disturbing aspect of the Soviet economy is the enormous quantity of carbon dioxide it puts into the air. Because the machines in many Soviet factories are obsolete and inefficient, they consume an inordinate amount of energy, making the country one of the largest contributors to the greenhouse effect. The Soviets are aware of this problem and hope to solve it by importing technology designed to improve energy efficiency and pollution control. They hope that much of that technology will come from the U.S. Said Morgun: "We will go anyplace, over any mountain, over an ocean to get the technology. And if you offer some kind of technology, we will be glad to accept it. We would be most grateful."

That is a plea the U.S. should take seriously, by easing restrictions on the export of industrial technology to the Soviets. Unfortunately, the biggest barrier to such shipments is not export controls but the lack of hard currency. The U.S. cannot finance the Soviet drive to conserve energy and control pollution, but America should offer as much technical assistance as possible. The Soviets seem to be sincerely determined to clean up their act, and the U.S. should help out. *—Reported by Ann Blackman/Moscow and Richard Hornik/Washington*

LUCHINE-OGONIOK—SYGMA

LUCHINE-OGONIOK—SYGMA

TROUBLED WATERS: The once majestic Aral Sea may be gone in 20 years; studying the dried-up bed

goods that he distributed generously along the way. Most of the goods went for beaver skins. The servants, Souci and Morrison, showed the Indians how to prepare the pelts. Larocque's eagerness to promote the harvest of beaver led him to disregard the usual inhibitions about taking pelts in summer. At the end of his tour he reported that he had bought 122 beaver pelts "not in consideration of what they were worth (because they are all summer skins) but in order to show to the savages the value that I attach to the beaver skins and to the goods that we give them." With his superiors in mind he added that "at the same time I wished to be able to prove that there are beaver in this region. . . ."

Larocque learned that while beaver dams adorned the whole length of the Powder River, it might take some time to convince the Indians of the value of the beaver trade. He wrote in a classic understatement that some of the natives "seemed to desire that I go away." The Indians hinted that the twenty-three pelts Larocque had taken up to that time were "a great many more than we needed." The Indians, like whites who were to come and endure fur trapping for only a short time, disliked trapping beaver for money.

The Larocque Journal includes other information that probably interested his employers: the fact that the Snake Indians placed great value on blue beads, that the Powder River was always muddy and "scarcely drinkable," that August nights could get very cold along the Powder, and that many buffalo, deer, antelope, and bear lived in the area, although the land between the Powder and the Little Missouri was remarkably dry and had "scarcely any vegetation."

Larocque did in fact go away and stay away, though not for the Indians' reasons. When he said farewell to his hosts on September 14, he asked them to "kill beaver and bear during the whole winter" because he would return the following autumn with all the trade goods they desired. However, the North West Company decided to concentrate on expanding in Canada for the time being, and Larocque never came back to Wyoming.

But absence of the French Canadians was more than compensated for by the succeeding rash of white Americans who entered Wyoming to trap and to explore. John Colter became the first white American to reveal the wonders of Wyoming geography, although there remains some doubt about where he went and what he saw. Colter was with the Lewis and Clark expedition as it returned in 1806 and encountered two trappers in present-day North Dakota who persuaded Colter to go trapping with them. Since they could use Colter's knowledge of the Montana country, the trappers offered to outfit him if he would enter a partnership with them. Lewis and Clark detached Colter at the Mandan villages after exacting promises from all the other members of the expedition that they would not ask for the same privilege.

Presumably Colter and his partners trapped in the Crow country of northern Wyoming. They did not prosper; perhaps they quarreled. In the spring of 1807 Colter paddled a canoe down the Missouri all by himself until he met a fur trade party of forty-two men led by Manuel Lisa, prominent Spanish fur trader out of Saint Louis, at the mouth of the Platte. For the second time Colter postponed his return to Saint Louis. Lisa's party included three other veterans of Lewis and Clark's expedition—George Drouillard, John Potts, and Peter Wiser—who probably had a hand in arranging for Colter's employment by Lisa.

The Lisa party arrived in October at the confluence of the Big Horn and Yellowstone rivers, where some of the men built a trading post and others trapped, and where John Colter received a special assignment to search for Crow Indians in northwestern Wyoming and invite them to the new trading post. Presumably he found one village and learned there about others. He carried a thirty-pound pack loaded with items with which he could win good will and hire guide service. When Lisa gave Colter this assignment he unwittingly marked him for future fame, for in conducting the search he discovered what came to be called Colter's Hell, Jackson Hole and Yellowstone Park.

The official Journals of Lewis and Clark, published in 1814, included a map of their route with a dotted line added to show where Colter went. On this map the topography around Colter's route is peculiar in several respects, which should not be surprising, considering that Colter made a 500-mile hike in the

dead of winter, kept no notes, had never done any mapping, conveyed his information to William Clark from memory three years later, and died before he had a chance to check the map. However, the map bears too much resemblance to modern maps of the area to be dismissed as imaginary. Particularly significant is the presence of two large lakes corresponding to Jackson and Yellowstone lakes and a large river flowing north out of one, as the Yellowstone River does.

The thermal activity observed by Colter, to which the name "Colter's Hell" was later applied, was on the Shoshone River just west of present Cody, Wyoming. Little thermal activity occurs there now, but there is evidence to indicate that there could have been a good deal of it in Colter's time. Colter might have seen hot springs and geysers at West Thumb but he missed by at least twenty miles the major geyser basins of what became Yellowstone Park.

The National Park Service Museum at Moose in Jackson Hole exhibits a rhyolite lava stone, thirteen inches long, on which is carved "John Colter" and "1808." An Idaho farmer plowed up this stone in 1931 just west of Jackson Hole. There is no way to establish the authenticity of the stone.

Almost as well known as his discovery of the Yellowstone Park area is Colter's footrace later in 1808 northwest of Yellowstone Park. Captured by Blackfeet Indians, Colter was given an opportunity to run for his life. Stripped naked and hotly pursued, he ran six miles to a stream where he concealed himself in driftwood until nightfall when very quietly he stole away. Seven days later he arrived at Lisa's fort with sore feet and a sunburned back.

After other narrow escapes Colter returned to Missouri in 1810, got married, and settled down on a farm. Probably the mountains would have lured him back sooner or later, had he not died of yellow jaundice in 1813. In 1976 the splendid Colter Bay tourist facilities on Jackson Lake made an impressive memorial for this heroic discoverer of the area. His fame all over the country has made many people think of remote, sparsely settled Wyoming, something that practically no one was doing in Colter's own time.

For some years few people believed the Colter stories about the wonders of northwestern Wyoming. Then the Blackfeet Indians and a German-born, New York-based fur trader unwittingly combined forces to send many more whites through Wyoming in one year than had been there in all previous years. John Jacob Astor, head of the American Fur Company and its subsidiary, the Pacific Fur Company, sent Wilson Price Hunt overland in 1811 to take charge of a trading post which a seaborne party was building at Astoria, Oregon, at the mouth of the Columbia. Hunt's expedition, known as the Overland Astorians, was the first expedition to cross the continent after Lewis and Clark. Astor's original plan called for Hunt to follow the route of Lewis and Clark, but fear of the Blackfeet in Montana caused him to leave the Missouri River at the Arikara villages at the present line of the South Dakota–North Dakota border and head toward the Big Horn Mountains of Wyoming. Three Lisa veterans—John Hoback, Jacob Reznor, and Edward Robinson—who had recently come in across northern Wyoming and had joined Hunt's party, recommended the change of plan. Perhaps John Colter, who had talked to Hunt in Missouri, also suggested that the Blackfeet should be avoided.

After trading their boats for horses at the Arikara villages, the Astorians began their overland journey in July 1811. Many of them had to walk because most of the horses were loaded with packs of merchandise for the trading post at Astoria. As it extended along the Grand River in northern South Dakota, the caravan included sixty-two men, one woman, and two children. The party must have crawled slowly from day to day as it wended up the rivers and across the grassy plains, a landscape stirred by occasional dust devils in the summertime and broken up only occasionally by landmarks like Devils Tower, the rocky volcanic core that can be seen for twenty miles across the plains. Making and breaking camp with such a multitude must have been an enormous undertaking, but not entirely unpleasant in the early stages when the party was well-stocked with supplies. Then there would have been rich moments around the campfire, since two-thirds of the men were French Canadians, who, Washington Irving said, were "ever ready to come to a

LARSON STATE BK

Wyoming

United States Department of the Interior

NATIONAL PARK SERVICE
P.O. BOX 37127
WASHINGTON, D.C. 20013-7127

IN REPLY REFER TO:

DATE: 6/8/89 TIME: 10:25

NUMBER OF PAGES TO FOLLOW: 7

TO: BOB SIMON, WH 456-6218

FROM: MOLLY ROSS, AIR QUALITY DIV.

SUBJECT: SUMMARIES OF PARK AIR QUALITY

REMARKS: CALL WITH ANY QUESTIONS (343-4911)

Prepared for: President Bush **BRIEFING STATEMENT**
Submitted: June 8, 1989

TITLE: Air Quality in Yellowstone, Grand Teton and Other National Parks (NPs)

ISSUE: Air pollution effects on national park resources.

STATUS:

The National Park Service has been monitoring rain chemistry at Yellowstone since 1980 and other air quality parameters since 1987. Some monitoring was also conducted at Grand Teton from 1983-1986. These parks have some of the best visibility and lowest pollutant levels anywhere in the United States. However, both parks contain sensitive visual, aquatic, and alpine resources. For example, given the relatively pristine visual air quality (visibility ranges from 100-250 km and averages 180 km) even small increases in fine particles (e.g., sulfates) would be noticeable. Ozone and sulfur dioxide levels at Yellowstone are below the national standards, but ozone levels may be high enough to injure sensitive vegetation. No specific studies have been done in Yellowstone to determine whether air pollution is affecting vegetation.

DEPARTMENT POSITION:

The Clean Air Act gives Federal Land Managers an affirmative responsibility to protect air quality related values in "class I" areas (including Yellowstone and Grand Teton NPs) from adverse impacts. The Act also establishes a national goal of remedying existing and preventing future visibility impairment in such areas. The Department places a high priority on protecting park resources from the adverse effects of air pollution.

ISSUE BACKGROUND:

The NPS operates and maintains a large network of over 60 monitoring stations throughout the country, including in Yellowstone and Grand Teton NPs, which provides information on visibility, ozone, sulfur dioxide, and acid rain. Monitoring data indicate that national parks, including some in remote areas, are not immune to elevated levels of pollution. For example, ozone levels above the national health and welfare standards have occurred in several parks (e.g., Santa Monica Mountains NRA, Sequoia NP, Shenandoah NP, Indiana Dunes NL, Cuyahoga Valley NRA), including remote parks like Acadia NP. Acadia had ozone levels that were above the national standards by 60 percent at least six times during the summer of 1988. Ozone injury has been found on native vegetation in many parks, including some areas where levels are below the national standards.
Visibility monitoring has shown that in excess of 90 percent of the time, scenic vistas are impaired to some extent by manmade pollution at all monitoring sites. The best visibility generally occurs in the West (i.e., Colorado Plateau, Rocky Mountain, and Great Basin areas). The worst visibility occurs in the East, with the worst visibility monitored in NPS units occurring at Shenandoah and Great Smoky Mountains NPs. Sulfates are responsible for 40-70 % of the visibility degradation in national parks throughout the country, except in the Pacific Northwest, where smoke-related materials dominate.

PROGRAM CONTACT: John P. Christiano, Chief, Air Quality Division, National Park Service, Telephone (303) 969-2070 or FTS 327-2070.

A/S SURNAME:

Enclosure 2

Highlights and Updates
Air Quality in the National Parks
May 1989

Ozone levels and impacts: Since the National Park Service began monitoring ozone in selected parks in the 1980's, ozone concentrations have approached or exceeded the national ambient air quality standard in several park units, including remote "rural" parks (e.g., Acadia, Sequoia, Great Smoky Mountains, Shenandoah, Channel Islands, Joshua Tree, Mammoth Cave, Pinnacles, Guadalupe Mountains) as well as parks closer to urban areas (e.g., Saguaro, Indiana Dunes, Cuyahoga Valley, Santa Monica Mountains). During the summer 1988 ozone episode that affected the eastern United States, many eastern parks monitored very high ozone concentrations (e.g., Acadia - 179 ppb; Shenandoah - 151 ppb; Mammoth Cave - 140 ppb; Cape Cod - 182 ppb; Cuyahoga Valley - 164 ppb), threatening not only park biological resources but also visitors' health. The attached maps, one for 1987 and one for 1988, show the highest hourly ozone concentrations at our ozone monitors for the indicated years.

Visible ozone injury affects vegetation in most of the approximately fifty park units surveyed, including units where the national ambient air quality standard for ozone has not been exceeded. For example, various species of pine (Jeffrey, ponderosa, Eastern white) have been shown to be affected by ambient levels of ozone in various parks. Also, preliminary experiments indicate that high levels of ozone can affect root and shoot growth of sequoia seedlings. Narrower than expected genetic diversity of ozone-sensitive species has been found in certain park areas. The absence of sensitive genotypes of quaking aspen in parks with high ozone concentrations may be indicative of an "unnatural" selection process.

Visibility: Air pollution causes varying degrees of visibility impairment at all park monitoring stations virtually all the time. Sulfates are the single most important contributor to visibility impairment in park units except in the northwestern United States, where fine carbon plays a more prominent role. For example, sulfates are responsible for approximately 70 percent of the overall visibility impairment in Shenandoah National Park and 50 percent in the Colorado plateau parks (e.g., Grand Canyon, Bryce Canyon, Canyonlands), and sulfates can play an even greater role in significant visibility degradation episodes. NPS modeling studies show that the sulfates impairing park visibility can originate long distances away and accumulate regionally; under other meteorological conditions, these pollutants can originate from local sources. For example, NPS studies of the Grand Canyon show that in the summertime, when visibility at the park is the worst on the average, the park's visibility is primarily affected by regional, often long-distant sulfate-laden pollution; whereas in the wintertime, when visibility at the park is the best on the average, the Grand Canyon can nevertheless suffer extreme visibility degradation episodes caused by local large sources whose sulfur emissions are trapped and transformed under common stagnation conditions.

The attached map shows fine sulfur concentrations from the NPS visibility monitoring stations for the 1984-1986 period. The figures indicate that fine sulfur concentrations in the East are nearly an order of magnitude higher than fine sulfur concentrations in the West. Correspondingly, typical visibility conditions in many eastern park areas are considerably more degraded than in

most western park areas. Nevertheless, the median visibility conditions at panoramic western parks are perceptibly degraded from natural conditions, and visibility degradation episodes can obscure the views significantly. The Service's view monitoring, using 35mm cameras, documents this degradation, and the Service has assembled the resulting slides into sets of "spectrum slides" for approximately 40 parks. These slides graphically illustrate the difference in the views on the best, worst, and average days. Finally, many western park areas are particularly sensitive to increases in fine particulate (e.g., sulfate) pollution, since relatively small additions of fine particles to a clean atmosphere can dramatically degrade the visibility.

The Service has not been monitoring visibility for a sufficient time period to establish long-term trends. However, National Weather Service data show that average summertime visibility over much of the eastern United States has decreased since 1948 more than 50 percent to a current visual range of less than 25 kilometers. In the Great Smoky Mountains, median summertime visibility is less than twelve kilometers, compared to an estimated natural visibility of approximately 60 kilometers. Seasonal trends have been documented at all NPS monitoring sites, with more extensive visibility degradation occurring in the summer than in the winter.

Aquatic Resource Effects: Through participation in the National Acid Deposition Program for monitoring wet deposition, the Service has identified areas receiving very acidic deposition and has documented regional trends and gradients. For example, monitoring shows that Sequoia and Kings Canyon National Parks has received wet deposition with concentrations of nitrate and sulfate that are two and five times higher, respectively, than in remote parts of the world.

NPS research has documented the vulnerability to acidification of many park lakes and streams, with the subsequent threatened loss of biological species dependent on the potentially affected aquatic resources. Many park units are located in areas with low buffering capacity and, therefore, subject to damage if deposition depletes this reserve. In the West, for example, most low alkalinity lakes and streams occur in the glaciated, high elevation and subalpine zones of the numerous mountain ranges which are home to many parks and wilderness areas. In these areas, watersheds are small, with steep slopes and thin, acidic soils. The lowest alkalinity waters are associated most often with granitic and gneissic rock types but may also be found in volcanic areas and certain sedimentary areas. Research in Shenandoah National Park has shown that a monitored stream--predicted for near-term acidification based on the limited sulfate adsorption capacity of its associated soils--has actually become approximately three times more acidic over a six-year period, as elevated concentrations of loosely-bound sulfate have been washed out of the soils and into the stream. At Isle Royale National Park, and in forested ecosystems throughout the upper Midwest, sulfate is minimally adsorbed to the soil, suggesting that nutrient leaching is possible in many of these systems, and that the sulfate mobility could be accelerating ecosystem acidification. Preliminary data show an increase in nutrient leaching across the region.

Parks have also documented instances of temporary increases in the acidity of park lakes and streams following acid rain events. Studies show, for example, that high elevation waters in the Sierra Nevada are being temporarily acidified

during spring snowmelts and following acidic summer storms.

Cultural Resource Effects: The overwhelming majority of the nation's historic properties are found in urban areas. Historic buildings and monuments in eastern cities are presently exposed to less sulfur dioxide but to more acid in rain than in the first three quarters of the 20th century. Research to determine the impact of air pollutants on park cultural resources has been undertaken at Mesa Verde (1983-1988), Gettysburg (1986-1989), and Independence (since 1984). Sulfur dioxide pollution at Independence National Historical Park is five times greater than at Gettysburg National Military Park, which is 20 times greater than at Mesa Verde National Park (since several copper smelters have shut down). Rain acidity (hydrogen ion) and sulfur dioxide are known to accelerate the decay of limestone, marble, some sandstones, and bronze. As both sulfur dioxide concentrations and rain acidity increases, so do marble erosion rates. Together, these pollutants may account for 20-25 percent of marble loss through dissolution. In other words, the lifespan of marble buildings and monuments may be decreased by one-fifth to one-fourth. In areas protected from rain, the sulfates tend to accumulate and cause discoloration and eventually spalling (fracturing).

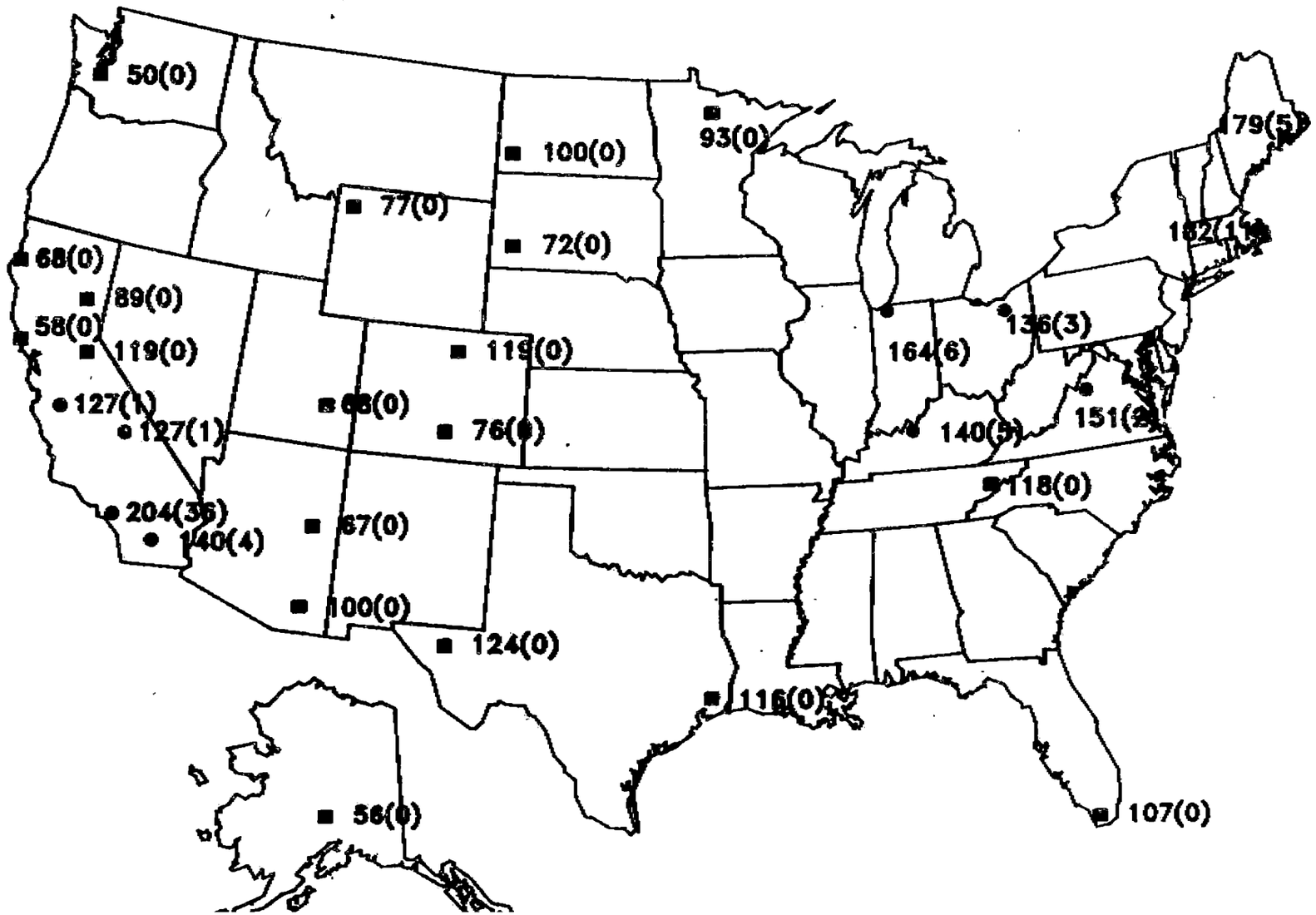
There is some evidence that other pollutants (e.g., nitrogen oxides and airborne particulate matter) also play a role in accelerating stone decay. Laboratory studies in Sweden indicate that in the presence of nitrogen oxides, sulfur dioxide uptake by limestone is substantially increased. Findings by research groups in Italy and the United States indicate that fly ash and particulate matter play a major role in pollution-related stone decay.

Bronzes corrode in the presence of sulfur pollutants, converting orignial bronze surfaces to green and black streaks and pits, corrosion products that are generally thought to be disfiguring. Below pH 4, these corrosion products dissolve at an increased rate, removing original material and increasing staining of masonry materials, such as statue bases and walls.

Effects on Park Visitors: Air pollution can affect the experience of park visitiors. With respect to visitors' health, ozone concentrations in several parks approach or exceed the national ambient air quality standard set to protect human health. With respect to visitors' welfare, NPS research has documented that an environment undisturbed by man, including clean, clear air, is very important to park visitors. Degradation of such an environment threatens a decrease not only in the level of inspiration and sense of well-being of park visitors, but also in the amount of time and money park visitors are willing to spend at affected park areas.

NATIONAL PARK SERVICE

HIGHEST HOURLY OZONE CONCENTRATIONS 1988 - ppb
(NO. OF DAYS WITH HOURLY CONCENTRATIONS OVER 125)



NATIONAL PARK SERVICE

HIGHEST HOURLY OZONE CONCENTRATIONS 1987 - ppb
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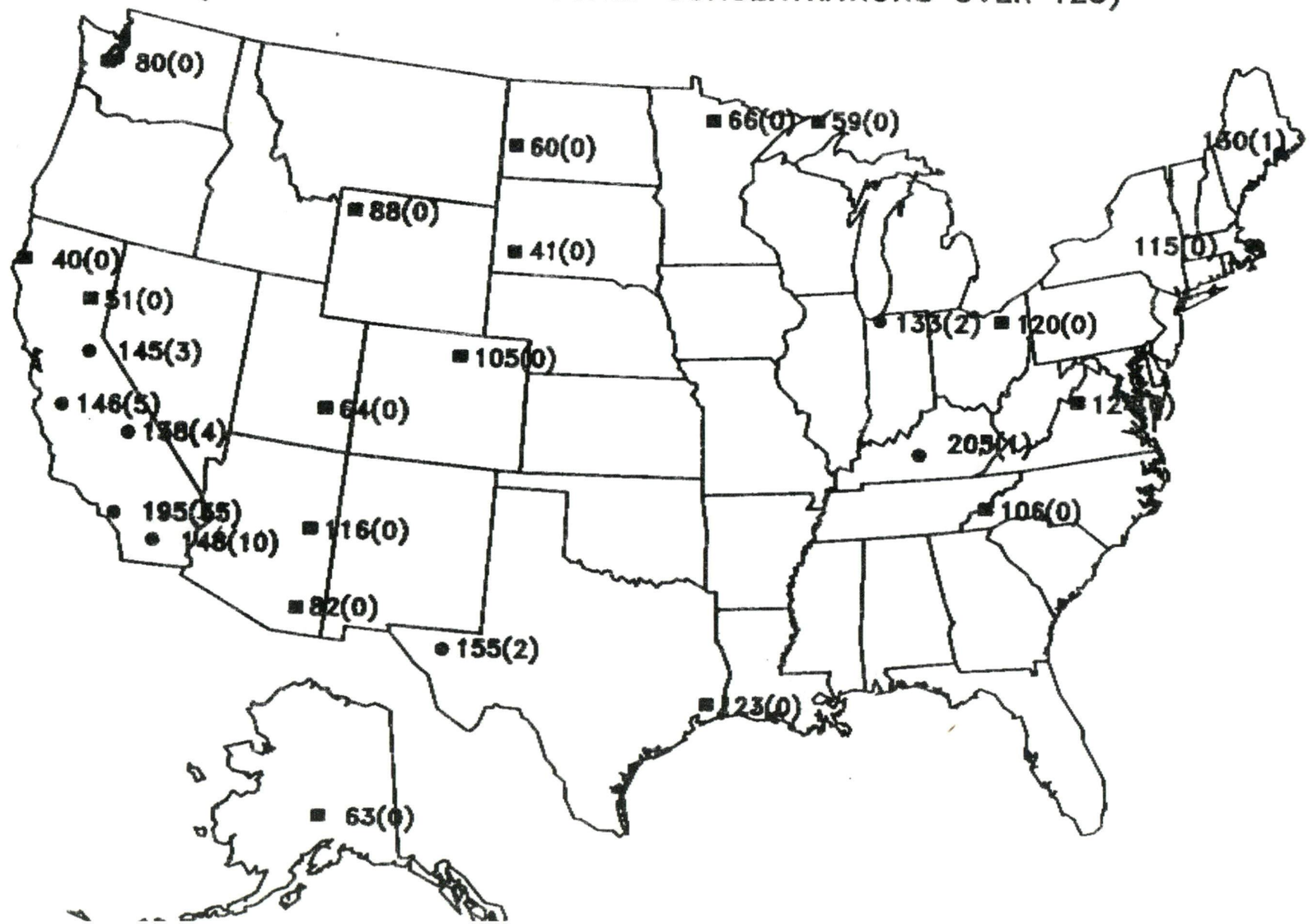
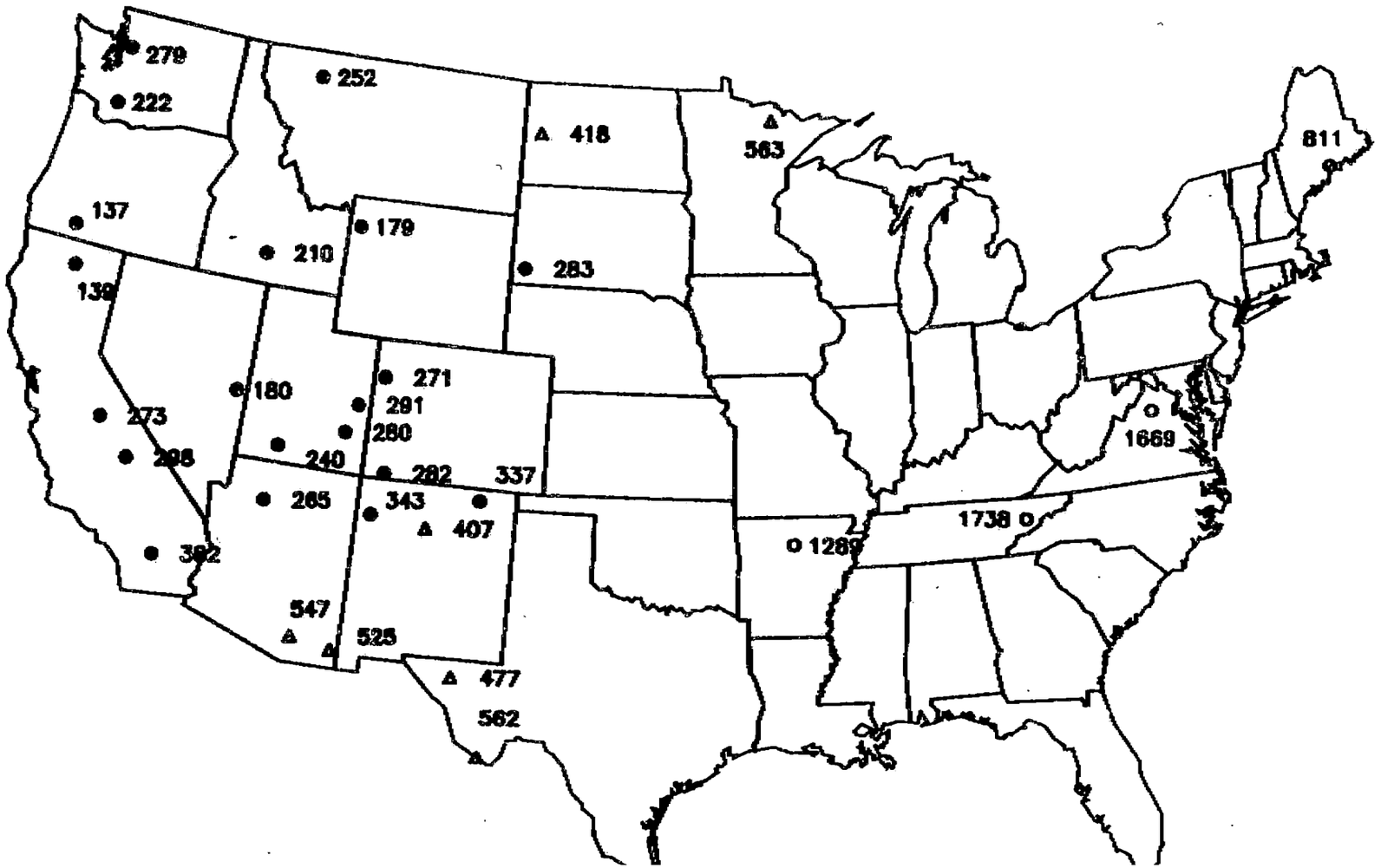


NPS SAMPLING SITES

FINE SULFUR CONCENTRATIONS (ng/m3)

June 1984 - May 1986



KNOWN VISIBILITY EFFECTS IN NATIONAL PARK UNITS

May 1985

Introduction

Visibility monitoring has shown that in excess of 90% of the time scenic vistas are affected by man-made pollution at all National Park Service (NPS) monitoring locations within the lower 48 United States. Even in remote areas such as Grand Canyon National Park, visitors sometimes cannot see the opposite canyon rim or the canyon depths because of poor visibility. At Yosemite National Park, smoke from fires sometimes obscures the view of the well known massive cliffs and domes. In Shenandoah National Park, the "Blue Ridge" often appears an unnatural white, gray, or brown, and in Great Smoky Mountains National Park, the natural haze is usually overwhelmed by man-made haze. A brief synopsis of the NPS visibility program follows.

Visibility Monitoring

Visibility monitoring has evolved from human observer-based measurements to the use of complex, but highly accurate, automated electro-optical instruments. Over the past years a number of federal agencies have operated and maintained visibility monitoring programs as follows:

- The longest historical visibility data record is based on the furthest distance large natural targets can be seen. The National Weather Service has recorded "observer determined visual range" at airports since 1948.

- The National Park Service has established 35 long-term visibility monitoring sites at various remote locations throughout the lower 48 states. The NPS monitoring program was initiated in 1978 at fourteen National Park Service units in the Southwest. Shortly thereafter, visibility monitoring sites were added in the northern Great Plains and northern Rocky Mountains, and in Acadia, Shenandoah and Great Smoky Mountains National Parks. Most recently, visibility monitors have been deployed at parks in the Pacific Northwest and in California.

- The Bureau of Land Management, United States Forest Service, Electric Power Research Institute and other utility industries have operated shorter term visibility monitoring programs.

Most monitoring programs incorporate, at a minimum, a teleradiometer measuring sky-target contrast at 550 nanometers (green wavelength), a 35 millimeter camera system, and a size selective fine particulate monitor.

Visibility Monitoring Results

The National Weather Service data, although not specifically analyzed for visibility trends within national parks, shows long-term trends for geographic regions that include a number of national park units. Results of this analysis show the following:

- Summertime visibility over much of the eastern United States has decreased since 1948 more than fifty percent to a current visual range of less than 25 kilometers (km). In the Great Smoky Mountains, median summer visibility is less than 10 km.

- Although visibility in California's urban and industrial centers has improved since 1967-1968, visibility in California pristine areas has decreased from 1959 to 1976.

It is important to note that in order to simplify the discussion on this complex subject, all the optical data from the visibility monitoring sites has been portrayed in terms of standard visual range, a measure of how far one can see. However, standard visual range is only one of several visibility indices that should be considered in evaluating the degradation of scenic views. Although standard visual range values indicate how far one can see, they do not necessarily indicate how well one can see specific vista features. Other indices would consider color, texture, and proximity of the scene.

Although the NPS monitoring network has not been operated over a sufficient time period to establish long-term trends, it does yield information on seasonal and spatial variation in visibility, as follows:

- Computations using data at all monitoring locations indicate that even at a specific site, there is a wide range in the estimated standard visual range. Appendix I, attached, lists the standard visual ranges at the 10th, 50th, and 90th percentiles (e.g., at the 10th percentile the visibility is equal to or less than the listed value 10% of the time, or one day out of 10).

- The standard visual ranges given in Appendix I also indicate that there is great variability (a) from park to park, and (b) among seasons, with the summer visual air quality generally the worst and the winter the best.

- Atmospheric pollution concentrations are highest during summer months and lowest during winter season.

- The above points are illustrated in the monitoring results for Grand Canyon National Park as shown in Figure 1. The variations in standard visual range are consistent with the higher pollution concentrations in both fine and coarse mass during summer months and lower pollution concentrations during winter months. The higher concentration of particulates is responsible for reduced visual range. Furthermore, the difference in the scenic view between the 90th percentile standard visual range and the 10th percentile is significant. The 10th percentile at Grand Canyon National Park is a visual range of 105 km, a level at which many features in Grand Canyon cannot be seen, the colors of nearby vistas are washed out and some textural features are lost.

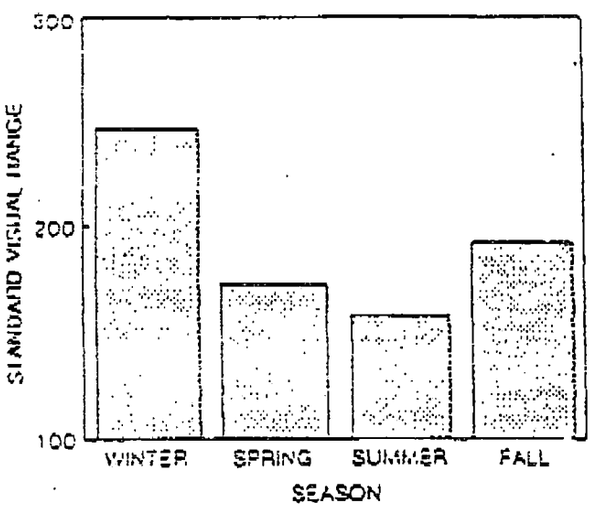


Figure 1a.

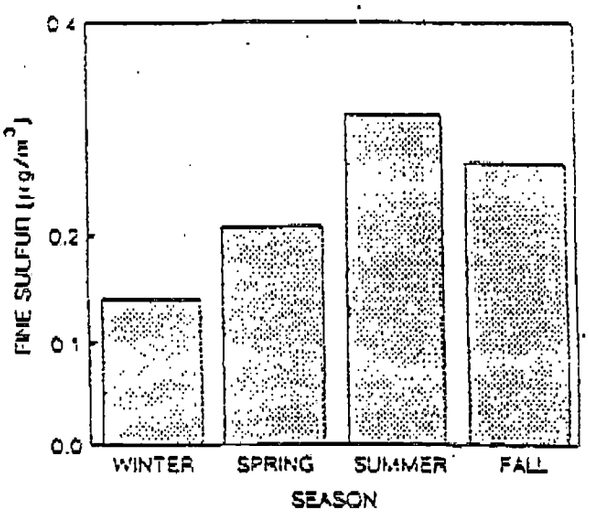
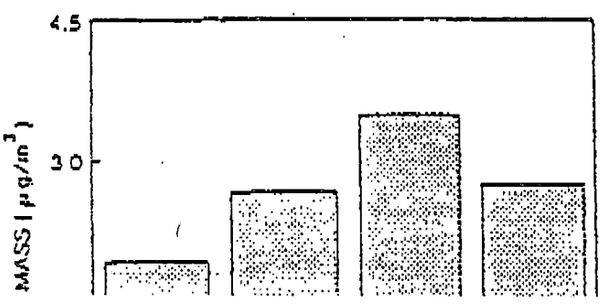
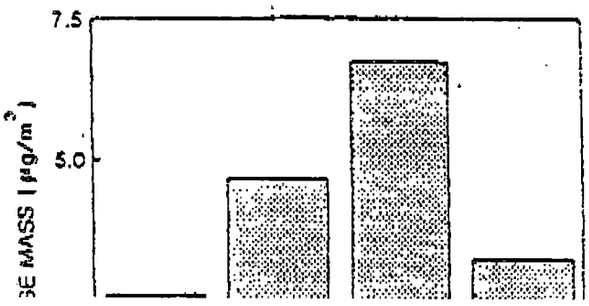


Figure 1b.





- Eastern visibility degradation from man-made pollution is significantly worse than western visibility degradation. Summertime visual range in the East is typically less than 25 km. A map of visual ranges in the western United States for summer 1982 is shown in Figure 2 (Note: numbers on this map should be compared to the best possible visibility, which is 391 km.). The highest average visual range (180 km), occurs in the northern parts of Nevada and Utah and the southern portion of Idaho. The region with the next highest average visual range (165 km), corresponds to that geographic area that contains Grand Canyon, Bryce Canyon and Canyonlands National Parks, commonly known as the Colorado Plateau. Southern Arizona, New Mexico, and the "Front Range" area of the Rocky Mountains have an average visual range of 140 km. The lowest visual range in the western United States is found in California.

- The NPS has also documented "pockets" of wintertime layered haze at Bryce Canyon and Mesa Verde National Parks. On winter mornings, for instance, portions of Navajo Mountain as seen from Bryce Canyon were completely or partially obscured as much as 80% of the time.

Particulate Monitoring Results

Fine particles (smaller than 2.5 micrometers in diameter, i.e., one-tenth the diameter of a fine human hair) are generally responsible for a major share of visibility impairment. The National Park Service fine particulate monitoring program shows the following:

- In most national park units the largest single contributor to fine mass is sulfates which make up 30 to 40% of the fine mass in the western parks and 40 to 60% of the fine mass in the eastern parks. Sulfates are "derivative" pollutants, formed in the atmosphere through the transformation of gaseous sulfur oxide emissions.

- Generally, southern Arizona, southern New Mexico, and the Big Bend area of Texas have the highest fraction (greater than 40%) of the fine mass as sulfates. In the Great Plains, Colorado Plateau area, and southern California, the proportion of sulfates is between 30 and 40%, while in the remainder of the western U.S., where there is sufficient data to report, the sulfates to fine mass ratio is near 20%. Finally, Shenandoah National Park, an eastern park, shows a 56% sulfates to fine mass ratio. For the western United States, the percent of fine mass that is sulfates for the year 1983 is shown in Figure 3.

- In the western United States, the highest sulfur concentrations are found in southern California, Arizona, and New Mexico and in the Big Bend area of Texas. Lowest year-round sulfur concentrations were found in northern California and southern Oregon. These spatial variations in sulfur concentration in the western United States for summer 1983 are shown in Figure 4.

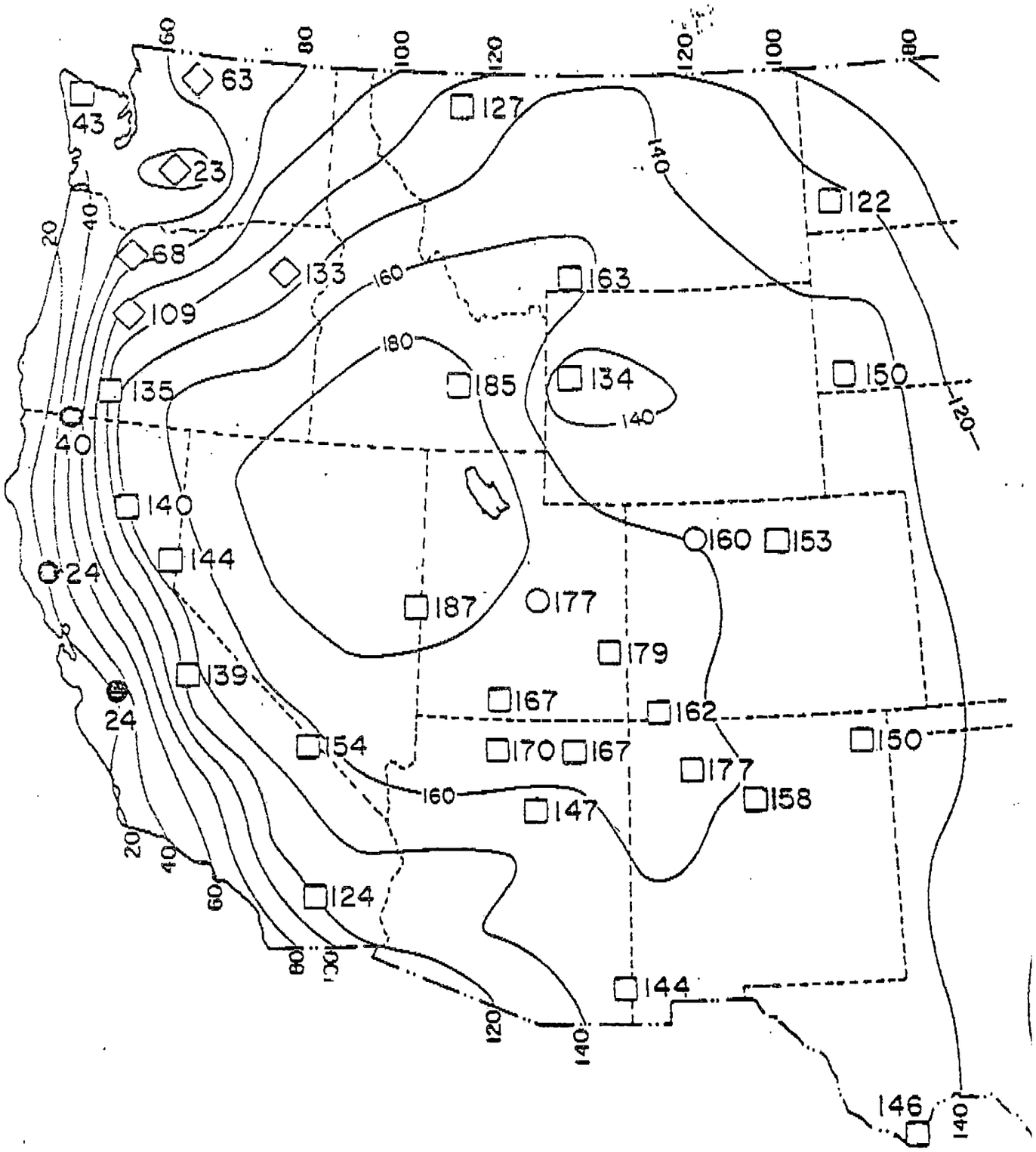


Figure 2. Isopleths of Standard Visual Range over the western United States for Summer, 1982.

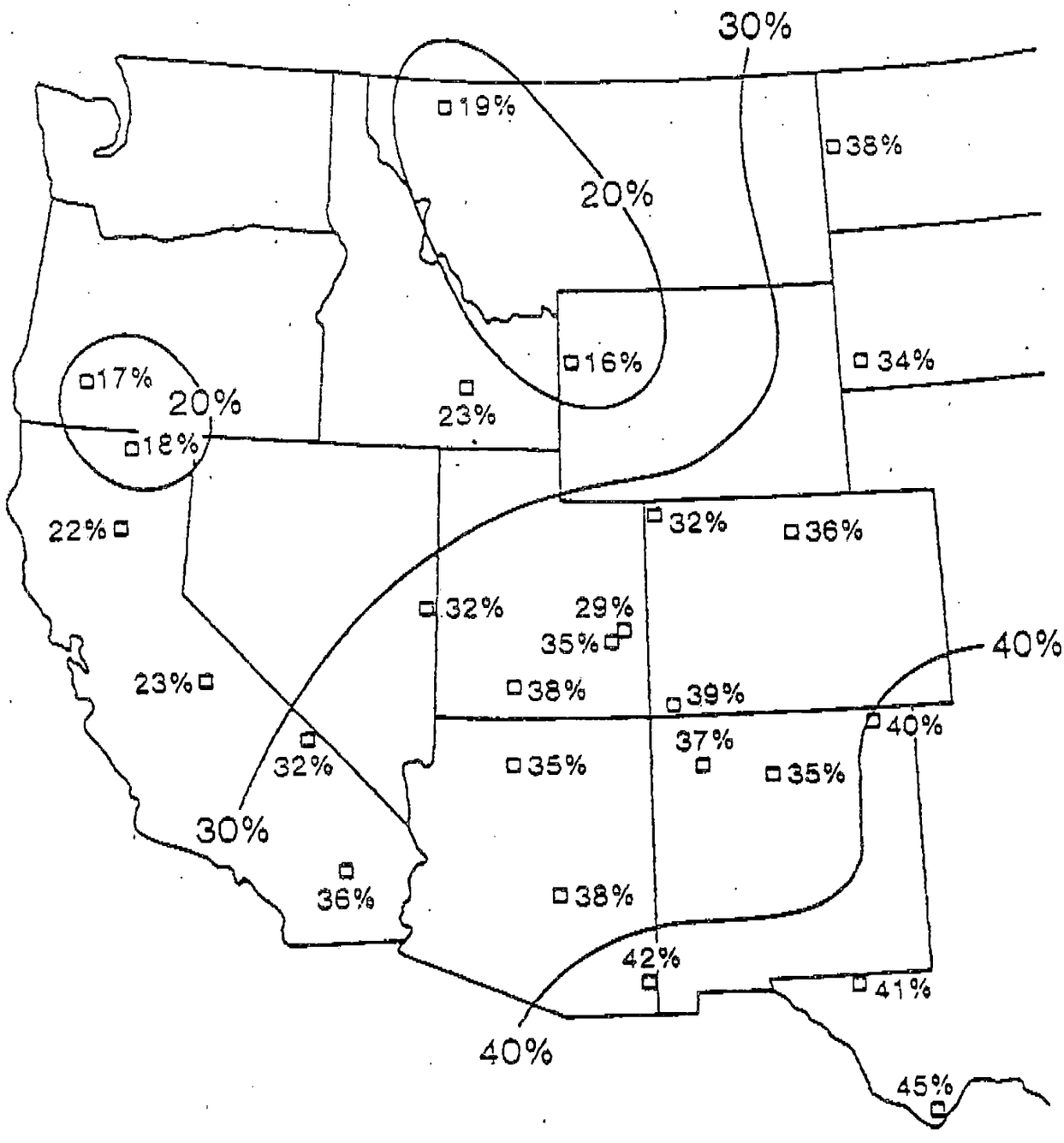
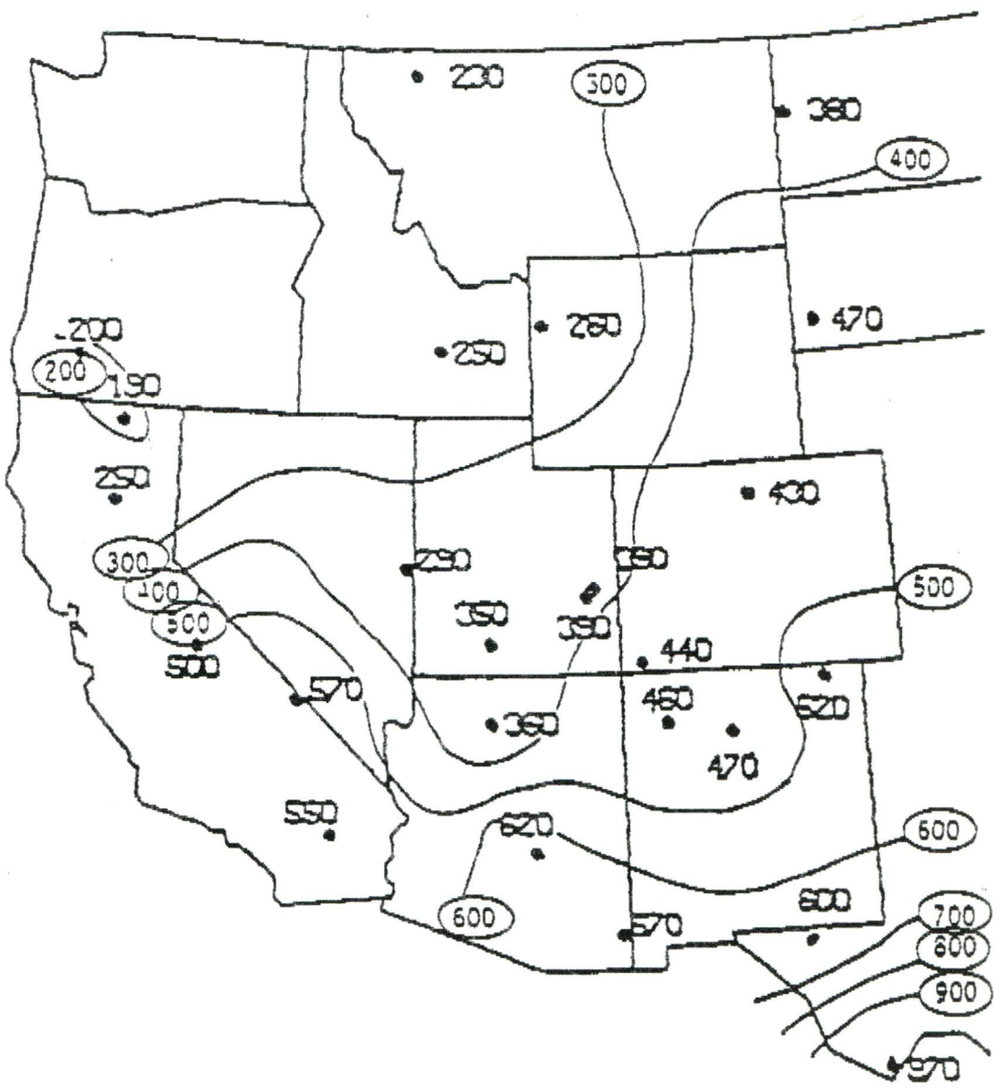


Figure 3. Isopleths of fine sulfate to fine mass ratio in western United States for Summer, 1983.

NPS PARTICULATE MONITORING NETWORK
JUN - AUG 1983 (SUMMER)
CONTOUR MAP OF FINE SULFUR



CONTOUR LINES SHOW REGIONS OF EQUAL CONCENTRATIONS
BASED ON INDICATED AVERAGES IN NANOGRAMS/M**3.
CONTOUR LEVELS AT EVERY 100 NANOGRAMS/M**3.

Figure 4. Isopleths of Sulfur Concentrations in western United States for Summer, 1983.

Causes of Visibility Impairment

Visibility data, when combined with particulate composition and concentration, allow for developing an understanding of which of the many atmospheric constituents are responsible for visibility reduction ("light extinction budgets"). Because different size particles reduce visibility with varying degrees of efficiency, it does not automatically follow that an aerosol species making up a certain fraction of total mass will be responsible for that same fraction of visibility reduction. Sulfates are especially important contributors to visibility impairment because their size usually makes them very effective scatterers of light. Therefore, the relative contribution of sulfates to visibility reduction can be significantly greater than their percentage contribution to the total airborne mass. Statistical analysis of currently available visibility and particulate data show the following:

- Sulfates are the single most important contributor to visibility impairment in NPS units except in the northwestern United States, where fine carbon plays a more prominent role.

- In the Colorado Plateau, an area containing Grand Canyon, Bryce Canyon, and Canyonlands National Parks as well as a number of other park units, sulfates are responsible for 40 to 60% of visibility impairment.

- In Shenandoah National Park, sulfates appear to be responsible for over 70% of visibility degradation.

- On the average, soil-related ("crustal") material is responsible for 10-30% of the visibility impairment.

- Typically, 20% of the visibility reduction is associated with other fine mass, which is comprised of organic carbon, elemental carbon, and nitrates.

Appendix II, attached, summarizes the relative importance of various particulates to visibility reduction at several national park units.

APPENDIX I Standard Visual Ranges at the 10th, 50th, and 90th percentiles at a number of NPS monitoring sites. The visual range numbers listed in this table reflect the effects of meteorological conditions as well as atmospheric pollution.

STANDARD VISUAL RANGE (KM): FREQUENCY OF OCCURENCE (%)

SITE	Winter 1982			Summer 1982		
	10%	50%	90%	10%	50%	90%
Acadia NP	40	76	146	40	75	140
Bandelier NM	112	207	379	107	166	257
Big Bend NP	93	186	374	79	139	242
Bryce Canyon NP	163	274	*	113	159	222
Canyonlands NP	80	204	*	125	176	247
Capitol Reef NP	100	212	*	106	160	242
Capulin Mountain NM	155	253	*	89	140	221
Chaco Culture NHP	159	233	342	139	177	226
Chiricahua NM	128	228	*	80	139	240
Colorado NM	122	223	*	-	-	-
Craters of the Moon NM	-	-	-	109	170	265
Death Valley NM	119	214	384	65	110	185
Grand Canyon NP	156	259	*	105	153	223
Grand Teton NP	77	128	213	81	127	198
Great Smoky Mountains NP	2**	67**	176**	5**	24**	47**
Guadalupe Mountains NP	137	175	222	90	129	185
Joshua Tree NM	-	-	-	64	113	200
Lassen Volcanic NP	-	-	-	84	143	242
Lehman Caves NM	-	-	-	120	188	293
Mesa Verde NP	184	241	316	117	162	226
Navajo NM	160	241	363	102	155	221
Olympic NP	-	-	-	36	65	117
Rocky Mountain NP	95	169	299	64	118	216
Shenandoah NP	-	-	-	3	17	78
Theodore Roosevelt NP	59	122	249	72	122	206
Wind Cave NP	-	-	-	70	123	217
Wupatki NM	92	186	376	86	141	232
Yellowstone NP	90	184	376	-	-	-

* Indicates undefined
** IVA data

APPENDIX II.

PARK:	Grand Canyon	Bryce Canyon	Canyonlands	Chaco Culture	Theodore Roosevelt	Big Bend	Shenandoah
% VISIBILITY IMPAIRMENT DUE TO:							
Sulfate	63%	61%	66%	36%	49%	64%	76%
Other Fine Mass	17%	23%	10%	23%	32%	17%	---
Coarse Mass	20%	16%	24%	41%	19%	19%	---

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FAX TRANSMITTAL

DATE: June 5, 1989

TO: Edward E. McNally

ATTENTION: _____
(if applicable)

FAX NUMBER: 202/456-6218
(if international, include Int'l(011), country , & city code)

COMPANY: The White House

ADDRESS: 122 OEOB, Washington, DC

FROM: Walter J. Hickel

NUMBER OF PAGES INCLUDING THIS PAGE: 10

IF YOU EXPERIENCE ANY PROBLEMS RECEIVING THIS FAX, PLEASE CALL US AT (907) 276-7400.
OUR TELEFAX NUMBER IS (907) 258-4857
THIS FAX WAS SENT BY: Yvonne

...further to my conversation with Mead Treadwell...

THE IRVINE LECTURES
BY WALTER J. HICKEL
LECTURE NO. 4 - October 1976

THE EMPTINESS OF THE WORLD

LAST WEEK WE TOOK A LOOK AT A RE-DEFINITION OF THE ENVIRONMENT AND DISCUSSED HOW OUR SYSTEM OF GOVERNMENT CAN BE MADE TO RESPOND TO THE PROBLEMS WE HAVE.

THIS WEEK WE ARE GOING TO LOOK AT AN ISSUE THAT TOTALLY FASCINATES ME.

THE ISSUE IS THE QUESTION OF LIMITS.

WHAT LIMITATIONS ARE THERE ON THE EARTH . . . ON MAN . . . ON THE HUMAN CAPACITY TO CREATE?

AS YOU MAY HAVE GATHERED BY NOW, I DO NOT SUBSCRIBE TO THE PHILOSOPHY OF GLOOM AND DOOM.

FROM TIME TO TIME HEADLINES PREDICT THE END OF THE WORLD.

THEY SAY WE ARE RUNNING OUT OF SPACE . . . WE ARE RUNNING OUT OF RESOURCES . . . WE ARE RUNNING OUT OF EVERYTHING.

AN EXAMPLE OF THIS ATTITUDE WAS THE CLUB OF ROME.

THIS GROUP WAS MADE UP OF VERY PRESTIGIOUS, HIGHLY INTELLECTUAL MEN.

THEY FED WHAT THEY WANTED TO FEED INTO A COMPUTER.

AND THE COMPUTER ANSWERED THAT THE WORLD WOULD SOON BE PICKED CLEAN OF ALL RESOURCES.

THEIR SOLUTION WAS TO LIMIT GROWTH.

I IMMEDIATELY CHALLENGED THE CLUB OF ROME.

I CHALLENGED IT PUBLICLY.

IF THE HUNGRY AND THE NEEDY OF THE WORLD ARE TO BE CARED FOR . . .

. . . IF MAN IS TO BE MAN . . . IF CULTURES ARE STILL TO BE CREATED . . .

. . . THERE MUST BE GROWTH.

THE CLUB OF ROME HAD BEEN GUILTY, LIKE THE ROMANS OF CENTURIES AGO, OF DECIDING THAT BECAUSE THEY WERE COMFORTABLE THEY EXPECTED THEIR SLAVES AND THEIR OTHER PEOPLE TO BE CONTENT.

4/2

LAST APRIL THE CLUB OF ROME ANNOUNCED IT HAD MADE A 180 DEGREE TURN.

I'M GLAD THEY'VE TURNED AROUND.

BUT THE PUBLIC, AND ESPECIALLY SOME EDUCATORS, HAVE BEEN HEAVILY INFLUENCED BY THEIR ORIGINAL PROCLAMATION.

IT APPALLS ME WHEN OUR SCHOOL CHILDREN ARE TAUGHT THAT IT IS SINFUL TO USE RESOURCES.

THERE IS NO BETTER WAY TO STUNT THE ASPIRATIONS OF A GENERATION . . .

. . . NO BETTER WAY TO UNDERCUT THEIR DESIRE, CLOUD THEIR DREAMS, AND DAMPEN THEIR HOPES.

IT'S ESPECIALLY BAD, BECAUSE IT IS SO UNREAL.

IT IS RIDICULOUS TO SAY WE ARE RUNNING OUT OF RESOURCES.

WE HAVEN'T EVEN SCRATCHED THE SURFACE OF WHAT GOD PUT ON EARTH . . .

. . . AND WHAT GOD PUT IN MAN.

THE WEAKNESS OF PREDICTING THE FUTURE WITH A COMPUTER IS THAT IT CAN ONLY COMPUTE ON THE BASIS OF WHAT IS KNOWN.

WHAT IF WE HAD USED A COMPUTER 200 YEARS AGO TO FORECAST ENERGY RESOURCES FOR TODAY?

AT THAT TIME MAN DEPENDED ON FIREWOOD, HORSES, WATER, AND WIND.

THE COMPUTER WOULD HAVE FORECAST DOOM AND STARVATION, BECAUSE THERE AREN'T ENOUGH TREES AND HORSES ON EARTH TO CARE FOR THE NEEDS OF TODAY'S POPULATION.

COMPUTERS HAVE THEIR PLACE, BUT I HAVE MORE FAITH IN THE CREATIVE CAPACITY OF MAN . . . AND THAT IS UNCOMPUTABLE.

DON'T LISTEN TO THOSE WHO TELL YOU THERE ARE NO MORE TOOLS TO WORK WITH . . . NO MORE OPPORTUNITIES TO EXPLORE . . . NO MORE FRONTIERS TO CHALLENGE.

THEY ARE EVERYWHERE.

THE GREAT FRONTIER OF TOMORROW WILL BE TO DISCOVER THE WORLD'S EMPTINESS.

IT CAN BE SO EASY FOR THE WORLD TO HANDLE FIVE, SIX, OR SEVEN BILLION PEOPLE.

SHOCKING?

IT'S NOT SHOCKING. IF YOU FACE THE SITUATION AS IT IS . . . AND IF YOU HAVEN'T LOST YOUR CAPACITY TO IMAGINE . . . OR TO CARE.

IN THE LAST CHAPTER OF WHO OWNS AMERICA?, I TOUCH ON THE ISSUE OF WORLD POPULATION.

BASED ON THE PREDICTIONS OF POPULATION EXPERTS, CARTOONISTS PICTURE MANKIND STANDING BACK TO BACK ON EVERY AVAILABLE INCH OF GROUND.

THIS IS SO UNREAL. BUT PEOPLE BELIEVE IT.

THE DAMAGING RESULT IS THAT IT BREEDS A VERY NEGATIVE ATTITUDE . . . ESPECIALLY ABOUT PEOPLE.

ONCE AGAIN, MAN IS SEEN AS THE ENEMY.

HAVE YOU EVER MET A POPULATION EXPERT WHO WAS AN OPTIMIST?

WELL YOU HAVE NOW.

IT MAY SOUND LIKE I AM ATTACKING THE TEN COMMANDMENTS . . .

. . . BUT MY THOUGHTS ARE MY OWN, AND I AM CONVINCED THEY WILL STAND THE TEST OF TIME.

I AM NOT SAYING THAT THERE AREN'T PROBLEMS CONNECTED WITH POPULATION.

BUT THOSE PROBLEMS AREN'T WHAT MOST PEOPLE THINK THEY ARE.

A GREATER PERCENTAGE OF THE WORLD'S POPULATION STARVED TO DEATH A THOUSAND YEARS AGO THAN TODAY.

THE ISSUE IS ONE OF DISTRIBUTION OF RESOURCES . . . AND THE WISE USE OF WHAT WE HAVE AVAILABLE.

THINK ABOUT IT FOR A MINUTE.

EVERY PERSON ON EARTH, NOT JUST EVERY AMERICAN, BUT EVERY HUMAN BEING ON THE GLOBE, COULD EACH BE GIVEN 2,000 SQUARE FEET . . . THAT'S THE EQUIVALENT OF A GOOD-SIZED HOUSE.

A FAMILY WITH THREE CHILDREN WOULD HAVE 10,000 SQUARE FEET.

YES, YOU COULD TAKE ALL THE PEOPLE ON EARTH . . . GIVE EACH ONE THIS AMOUNT OF SPACE . . . AND THEY WOULD ALL FIT IN THE STATE OF TEXAS.

FIGURE IT OUT. TEXAS CONTAINS 262,970 SQUARE MILES.

THAT EQUALS 7.3 TRILLION SQUARE FEET. THE WORLD POPULATION IS 4 BILLION.

NO, IT'S NOT GOD'S FAULT THAT HE GAVE US TOO LITTLE LAND.

IT'S OUR FAULT FOR NOT UTILIZING INTELLIGENTLY WHAT WE HAVE.

IF YOU WANT TO GO BACK IN HISTORY, WHEN MAN FIRST CAME TO THIS EARTH, IT APPEARED TO BE CROWDED.

HE SEEMED TO BE RUNNING OUT OF THINGS IN HIS LITTLE CAVE, OR THE ISOLATION OF HIS LITTLE SPOT ON EARTH.

NOW, IN MODERN TIMES WE ARE LOCKED INTO A BEEHIVE CONCEPT OF LIVING.

AND BECAUSE OF THAT CONCEPT, WE HAVE BECOME NEGATIVE AND PESSIMISTIC.

IF YOU FLY OVER, OR JUST LOOK AT A MAP OF THE GREAT VACANT AREAS OF THE GLOBE, THEN YOU'LL UNDERSTAND WHAT I'M SAYING.

WE'RE NOT GOING TO RUN OUT OF SPACE OR RESOURCES.

THE ONLY THING WE MIGHT RUN OUT OF IS IMAGINATION.

THINK ABOUT THE OCEANS, THE OCEAN BOTTOM, THE JUNGLES, THE ARCTIC, AND THE ANTARCTIC.

AS TO THE RESOURCES ON LAND, MAN HAS JUST SLID AROUND ON THE SKIN OF THE APPLE.

WE HAVEN'T EVEN BEGUN TO THINK ABOUT THE CORE.

IT MAY BE THAT I HAVE A DIFFERENT PERSPECTIVE BECAUSE OF THE AREA IN THE WORLD WHERE I LIVE.

I HAVE SPENT MY ADULT LIFE IN THE ARCTIC AND IT'S HARD FOR THE REST OF AMERICA TO UNDERSTAND THE UNTOLD RICHES WAITING THERE.

YOU ALREADY KNOW SOMETHING ABOUT NORTH SLOPE OIL.

THIRTY BILLION BARRELS HAVE BEEN LOCATED IN THE REGION OF PRUDHOE BAY.

THIS IS ENOUGH TO SUPPLY THE SOUTH 48 WITH TWO MILLION BARRELS A DAY FROM NOW UNTIL THE YEAR 2000.

BUT THAT'S JUST THE BEGINNING.

ESTIMATES OF OTHER ALASKA OIL RESERVES, BOTH ON- AND OFF-SHORE ADD ANOTHER 20 TO 30 BILLION BARRELS.

AND NOW NINE OFF-SHORE CONTINENTAL SHELF AREAS ARE BEING LEASED BY THE FEDERAL GOVERNMENT FOR OIL EXPLORATION.

POTENTIAL RESERVES OUT TO A DEPTH OF 200 METERS, SWELL THE TOTAL OIL POTENTIAL BY ANOTHER 600-700 BILLION BARRELS.

TO TOP ALL THIS, ALASKA'S COAL RESERVES MAY EXCEED A TRILLION TONS, AND NATURAL GAS ESTIMATES COME IN AT 238 TO 438 TRILLION CUBIC FEET.

THIS IS NOT TO MENTION THE COPPER, NICLE, IRON, ZINC, AND ALL BUT ONE OF THE THIRTY MAJOR MINERALS USED BY MODERN INDUSTRY.

BUT REMEMBER, I'M TALKING NOW ONLY ABOUT ALASKA . . . AND ALASKA IS A SMALL PART OF THE WORLD ARCTIC.

THE ARCTIC COVERS A TOTAL OF SOME TEN MILLION SQUARE MILES ON THE TOP OF THE GLOBE, EXTENDING ROUGHLY FROM THE 60TH PARALLEL UP AND ACROSS THE NORTH POLE.

IN THIS REGION LIES ALMOST HALF OF CANADA, ALL OF GREENLAND AND ICELAND, PARTS OF SCANDINAVIA, AND AN INCREDIBLE SWEEP OF NORTHERN RUSSIA AND SIBERIA.

IN AREA, IT'S AS BIG AS WESTERN EUROPE, THE CONTINENTAL UNITED STATES, JAPAN, INDIA, AND CHINA COMBINED . . . NATIONS THAT SUPPORT TWO BILLION PEOPLE.

ALASKA IS SEPARATED FROM THE REST OF THE UNITED STATES.

THEREFORE ITS UNIQUE CHARACTER AND POTENTIAL IS ALIEN TO AMERICAN UNDERSTANDING.

BUT OUR NEIGHBORS, THE CANADIANS, HAVE UNDERSTOOD THEIR ARCTIC, AND SO HAVE THE RUSSIANS . . .

. . . BECAUSE THEY HAVE HAD TO LIVE WITH IT.

IT WAS THE RUSSIANS WHO WERE THE FIRST TO GRASP THE ARCTIC'S INCREDIBLE POTENTIAL.

IRONICALLY, IT WAS AN AMERICAN WHO GAVE THEM THE IDEA.

HIS NAME WAS PERRY McDONOUGH COLLINS, A SAN FRANCISCO BUSINESSMAN IN THE 1850s.

HE HAD AN ALMOST RELIGIOUS BELIEF IN THE DESTINY OF SIBERIA.

COLLINS TRAVELLED SEVERAL TIMES ACROSS THE PACIFIC AND AMAZED AND DELIGHTED HIS HOSTS WITH HIS DREAMS OF OPENING UP WHAT WAS CONSIDERED BY CZARIST RUSSIA TO BE A HOSTILE COUNTRY FIT ONLY FOR CONVICTS.

ONE OF THOSE WHOM COLLINS MET WAS COUNT AMURSKI, A DYNAMIC SOLDIER IN HIS LATE THIRTIES WHO COMPLETED THE CONQUEST OF SIBERIA BY WINNING THE VAST AMUR TERRITORY FROM CHINA.

THE COUNT WAS SURROUNDED BY YOUNG OFFICERS WHO AT ONE POINT TALKED OF CREATING A UNITED STATES OF SIBERIA LINKED ACROSS THE PACIFIC OCEAN WITH THE U.S.A.

COLLINS PLANTED THE SEED. HE URGED THE RUSSIANS TO BUILD A RAILROAD ACROSS SIBERIA.

HIS SUGGESTION, ADOPTED A HALF CENTURY LATER, WAS TO BECOME THE TRANS-SIBERIAN RAILROAD . . . STRETCHING 5500 MILES FROM THE URAL MOUNTAINS TO VLADIVOSTOK.

IN 1891 THE CONSTRUCTION OF THE LINE BEGAN.

AFTER A HUMAN SAGA THAT MUST HAVE RIVALLED THAT OF THE PYRAMIDS, UNINTERRUPTED RAILS LAY ACROSS THE BREADTH OF RUSSIA IN 1904.

IN THE PROCESS THE RUSSIANS LEARNED TO WORK IN THE ARCTIC.

THEY WERE FORCED TO BUILD FIRES TO WARM THE "ARCTIC STONE," THE NAME THEY GAVE TO PERMAFROST.

IN THE WINTER THEY HAD TO CHOP OUT AND MELT VAST QUANTITIES OF ICE FOR THEMSELVES, THEIR HORSES, AND EVEN THEIR LOCOMOTIVE BOILERS.

FOR IN SOME AREAS, ALL BUT THE LARGEST RIVERS WERE FROZEN TO THE BOTTOM.

CRITICS IN ENGLAND AND AMERICA LAUGHED AT THE RAILROAD.

THEY CALLED IT "RUSTY STREAKS OF IRON THROUGH THE VASTNESS OF NOTHING TO THE EXTREMITIES OF NOWHERE."

BUT THE RUSSIANS SUCCEEDED.

EVEN THEY, HOWEVER, DIDN'T REALIZE THEY WERE BUILDING A CAUSEWAY TO THE FUTURE.

IN MANY WAYS, THE SAGA OF SIBERIA HAS JUST BEGUN.

WHILE WE IN THIS COUNTRY ARE IN A PHILOSOPHICAL TURMOIL, OF WHETHER TO DEVELOP OUR RESOURCES, A NEW GENERATION OF SIBERIANS IS CARVING A CIVILIZATION OUT OF THEIR ARCTIC.

I PREDICT THAT SIBERIA WILL BECOME THE GREAT INCENTIVE NATION OF THE FUTURE.

AT THIS VERY TIME, AS WE MEET HERE IN THIS ROOM, THE NEW BREED OF SIBERIAN IS BUILDING A 2000-MILE EXTENSION TO THE TRANS-SIBERIAN RAILROAD.

THEY CALL IT "THE PROJECT OF THE AGE." AND IT HAS CAPTURED THE IMAGINATION OF THE YOUNG PEOPLE ACROSS RUSSIA.

THE NEW RAILROAD LOOPS UP TOWARDS SOUTHEAST SIBERIA . . . THE SITE OF THE GREAT MINERAL AND OIL AND GAS DISCOVERIES OF THE FUTURE.

FIFTY-SIX INCH GAS PIPELINES ARE UNDER CONSTRUCTION . . . 4000 MILES OF THEM . . . TO TAKE SIBERIAN GAS WEST TO EUROPE AND EAST TO THE PACIFIC OCEAN.

YES, SIBERIA IS CHARGED WITH EXCITEMENT AND DRIVE AND PROMISE.

AND, UNLIKE THE SOCIALISM ENVISIONED BY MARX AND LENIN, THE YOUNG HAVE BEEN LURED TO SIBERIA BY FRINGE BENEFITS, LONGER HOLIDAYS, AND MORE PAY.

CALL IT WHAT YOU LIKE . . . THAT'S CAPITALISM.

MY CONCERN IS THAT IN TWENTY YEARS WE WILL LOOK ACROSS THE BERING STRAIT . . . FROM A NATION WHOSE GREATNESS HAS BEEN ECLIPSED . . . AS SURELY AND COMPLETELY AS THE GREAT BRITAIN OF TODAY . . . AND WE'LL SAY . . .

. . . "THE SIBERIANS ARE SUCCEEDING WITH A SYSTEM WE ENVISIONED. WE JUST DIDN'T HAVE THE GUTS TO FOLLOW THROUGH."

AND THEY HAVE ONLY BEGUN TO TOUCH THE VASTNESS OF THEIR LAND.

AFTER ALL, THE SOVIET UNION HAS ELEVEN TIME ZONES.

IT HAS FIVE OF THE WORLD'S THIRTEEN LONGEST RIVERS, ALL FLOWING <u>NORTH</u> INTO THE ARCTIC OCEAN.

BUT IT'S NOT THEIR WEALTH OF SPACE OR RESOURCES THAT WILL MAKE THE DIFFERENCE.

IF RUSSIA EVER BURIES US . . . AS KHRUSCHEV SAID THEY WOULD . . . IT WILL NOT BE BECAUSE OF IDEOLOGY OR MILITARY MIGHT . . .

. . . IT WILL BE BECAUSE THEY OUTWORK US.

YOU CAN CARVE THAT IN GRANITE. IT'S A FACT OF LIFE.

THE SOUR FACE IN MOSCOW DOESN'T BOTHER ME. JUST WAIT TILL THE HAPPY FACE OF SIBERIA OVERWHELMS IT.

AND DON'T WRITE OFF THE SIBERIANS' SUCCESS BECAUSE YOU IMAGINE THEY DISREGARD ENVIRONMENTAL CONCERNS.

TEN PERCENT OF THEIR CONSTRUCTION BUDGET IS ALLOCATED TO PROTECTING ENVIRONMENTAL VALUES.

- -

IN MANY WAYS, THESE REMOTE AREAS OF THE WORLD ARE THE BEST AREAS FOR RESOURCE DEVELOPMENT.

IN CARING FOR THE ENVIRONMENT, YOU HAVE TO TAKE INTO CONSIDERATION THREE FACTORS . . .

. . . MAN, MAN'S NEEDS, AND NATURE.

IN THE ARCTIC, YOU BASICALLY ELIMINATE ONE OF THOSE THREE CONCERNS . . . MAN.

AS LIVING SPACE, THE ARCTIC WILL NEVER COMPETE WITH WARMER CLIMATES.

NO ONE IS GOING TO PRUDHOE BAY, ON ALASKA'S NORTH SLOPE, AND BUY A RETIREMENT HOME.

IT'S ONE OF THE MOST DESOLATE REGIONS ON THE FACE OF THE EARTH.

IT IS NOT ONLY COLD AND SEES NO SUN FOR MANY WEEKS IN MID-WINTER . . .

. . . IT IS A DESERT . . . WITH ONLY THREE OR FOUR INCHES PER YEAR.

IT IS NOT A WELCOME ENVIRONMENT FOR HUMANS.

THEREFORE, IN THE ARCTIC WE CAN CONCENTRATE ON MAKING MAN'S NEEDS AND NATURE COMPATIBLE.

I'M NOT SAYING IT'S EASY.

I'M SAYING IT IS DO-ABLE . . . AND THE CHALLENGE CAN HELP REJUVENATE OUR NATION.

A COUPLE OF MONTHS AGO I WAS SITTING IN THE OFFICE OF A GOVERNOR OF ONE OF OUR OIL-RICH STATES.

HE SAID, "I KNOW AMERICA NEEDS THE OIL . . . BUT OUR COASTLINE IS SO DELICATE."

4/9

I REPLIED, "YES, IT IS DELICATE, AND SO ARE THE COAL-BEARING AREAS IN MONTANA . . .

. . . AND SO ARE THE OIL-SHALE REGIONS IN COLORADO. . .

. . . AND THE VAST OIL DEPOSITS IN GEORGE'S BANKS OFF THE ATLANTIC COAST . . .

. . . AND SO IS THE NORTH SLOPE OF ALASKA!".

YES, ALL THESE AREAS ARE DELICATE.

BUT DOES THAT MEAN WE QUIT?

DO WE THROW UP OUR HANDS AND GIVE UP?

WHO SAYS WE CAN'T TAP THESE RESOURCES AND PROTECT THE ENVIRONMENT AS WE DO IT?

THE ENGLISH AND THE NORWEGIANS HAVE SUCCEEDED IN THE EXTREMELY DIFFICULT CONDITIONS IN THE NORTH SEA.

THE SIBERIANS ARE DOING IT AT THIS VERY MOMENT.

AMERICA CAN DO IT . . . IF WE AREN'T STOPPED BY THE FEARFUL AND THE PROPONENTS OF DOOM AND GLOOM.

THE FRONTIERS ARE OUT THERE.

WE MUST FIRST CONQUER THE FRONTIERS WITHIN OURSELVES.

YOUR QUESTIONS PLEASE.

goods that he distributed generously along the way. Most of the goods went for beaver skins. The servants, Souci and Morrison, showed the Indians how to prepare the pelts. Larocque's eagerness to promote the harvest of beaver led him to disregard the usual inhibitions about taking pelts in summer. At the end of his tour he reported that he had bought 122 beaver pelts "not in consideration of what they were worth (because they are all summer skins) but in order to show to the savages the value that I attach to the beaver skins and to the goods that we give them." With his superiors in mind he added that "at the same time I wished to be able to prove that there are beaver in this region. . . ."

Larocque learned that while beaver dams adorned the whole length of the Powder River, it might take some time to convince the Indians of the value of the beaver trade. He wrote in a classic understatement that some of the natives "seemed to desire that I go away." The Indians hinted that the twenty-three pelts Larocque had taken up to that time were "a great many more than we needed." The Indians, like whites who were to come and endure fur trapping for only a short time, disliked trapping beaver for money.

The Larocque Journal includes other information that probably interested his employers: the fact that the Snake Indians placed great value on blue beads, that the Powder River was always muddy and "scarcely drinkable," that August nights could get very cold along the Powder, and that many buffalo, deer, antelope, and bear lived in the area, although the land between the Powder and the Little Missouri was remarkably dry and had "scarcely any vegetation."

Larocque did in fact go away and stay away, though not for the Indians' reasons. When he said farewell to his hosts on September 14, he asked them to "kill beaver and bear during the whole winter" because he would return the following autumn with all the trade goods they desired. However, the North West Company decided to concentrate on expanding in Canada for the time being, and Larocque never came back to Wyoming.

But absence of the French Canadians was more than compensated for by the succeeding rash of white Americans who entered Wyoming to trap and to explore. John Colter became the first white American to reveal the wonders of Wyoming geography, although there remains some doubt about where he went and what he saw. Colter was with the Lewis and Clark expedition as it returned in 1806 and encountered two trappers in present-day North Dakota who persuaded Colter to go trapping with them. Since they could use Colter's knowledge of the Montana country, the trappers offered to outfit him if he would enter a partnership with them. Lewis and Clark detached Colter at the Mandan villages after exacting promises from all the other members of the expedition that they would not ask for the same privilege.

Presumably Colter and his partners trapped in the Crow country of northern Wyoming. They did not prosper; perhaps they quarreled. In the spring of 1807 Colter paddled a canoe down the Missouri all by himself until he met a fur trade party of forty-two men led by Manuel Lisa, prominent Spanish fur trader out of Saint Louis, at the mouth of the Platte. For the second time Colter postponed his return to Saint Louis. Lisa's party included three other veterans of Lewis and Clark's expedition—George Drouillard, John Potts, and Peter Wiser—who probably had a hand in arranging for Colter's employment by Lisa.

The Lisa party arrived in October at the confluence of the Big Horn and Yellowstone rivers, where some of the men built a trading post and others trapped, and where John Colter received a special assignment to search for Crow Indians in northwestern Wyoming and invite them to the new trading post. Presumably he found one village and learned there about others. He carried a thirty-pound pack loaded with items with which he could win good will and hire guide service. When Lisa gave Colter this assignment he unwittingly marked him for future fame, for in conducting the search he discovered what came to be called Colter's Hell, Jackson Hole and Yellowstone Park.

The official Journals of Lewis and Clark, published in 1814, included a map of their route with a dotted line added to show where Colter went. On this map the topography around Colter's route is peculiar in several respects, which should not be surprising, considering that Colter made a 500-mile hike in the

Wyoming's first tourist

dead of winter, kept no notes, had never done any mapping, conveyed his information to William Clark from memory three years later, and died before he had a chance to check the map. However, the map bears too much resemblance to modern maps of the area to be dismissed as imaginary. Particularly significant is the presence of two large lakes corresponding to Jackson and Yellowstone lakes and a large river flowing north out of one, as the Yellowstone River does.

The thermal activity observed by Colter, to which the name "Colter's Hell" was later applied, was on the Shoshone River just west of present Cody, Wyoming. Little thermal activity occurs there now, but there is evidence to indicate that there could have been a good deal of it in Colter's time. Colter might have seen hot springs and geysers at West Thumb but he missed by at least twenty miles the major geyser basins of what became Yellowstone Park.

The National Park Service Museum at Moose in Jackson Hole exhibits a rhyolite lava stone, thirteen inches long, on which is carved "John Colter" and "1808." An Idaho farmer plowed up this stone in 1931 just west of Jackson Hole. There is no way to establish the authenticity of the stone.

Almost as well known as his discovery of the Yellowstone Park area is Colter's footrace later in 1808 northwest of Yellowstone Park. Captured by Blackfeet Indians, Colter was given an opportunity to run for his life. Stripped naked and hotly pursued, he ran six miles to a stream where he concealed himself in driftwood until nightfall when very quietly he stole away. Seven days later he arrived at Lisa's fort with sore feet and a sunburned back.

After other narrow escapes Colter returned to Missouri in 1810, got married, and settled down on a farm. Probably the mountains would have lured him back sooner or later, had he not died of yellow jaundice in 1813. In 1976 the splendid Colter Bay tourist facilities on Jackson Lake made an impressive memorial for this heroic discoverer of the area. His fame all over the country has made many people think of remote, sparsely settled Wyoming, something that practically no one was doing in Colter's own time.

For some years few people believed the Colter stories about the wonders of northwestern Wyoming. Then the Blackfeet Indians and a German-born, New York-based fur trader unwittingly combined forces to send many more whites through Wyoming in one year than had been there in all previous years. John Jacob Astor, head of the American Fur Company and its subsidiary, the Pacific Fur Company, sent Wilson Price Hunt overland in 1811 to take charge of a trading post which a seaborne party was building at Astoria, Oregon, at the mouth of the Columbia. Hunt's expedition, known as the Overland Astorians, was the first expedition to cross the continent after Lewis and Clark. Astor's original plan called for Hunt to follow the route of Lewis and Clark, but fear of the Blackfeet in Montana caused him to leave the Missouri River at the Arikara villages at the present line of the South Dakota–North Dakota border and head toward the Big Horn Mountains of Wyoming. Three Lisa veterans—John Hoback, Jacob Reznor, and Edward Robinson—who had recently come in across northern Wyoming and had joined Hunt's party, recommended the change of plan. Perhaps John Colter, who had talked to Hunt in Missouri, also suggested that the Blackfeet should be avoided.

After trading their boats for horses at the Arikara villages, the Astorians began their overland journey in July 1811. Many of them had to walk because most of the horses were loaded with packs of merchandise for the trading post at Astoria. As it extended along the Grand River in northern South Dakota, the caravan included sixty-two men, one woman, and two children. The party must have crawled slowly from day to day as it wended up the rivers and across the grassy plains, a landscape stirred by occasional dust devils in the summertime and broken up only occasionally by landmarks like Devils Tower, the rocky volcanic core that can be seen for twenty miles across the plains. Making and breaking camp with such a multitude must have been an enormous undertaking, but not entirely unpleasant in the early stages when the party was well-stocked with supplies. Then there would have been rich moments around the campfire, since two-thirds of the men were French Canadians, who, Washington Irving said, were "ever ready to come to a

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET

ROUTE SLIP

TO ~~Ron Cogswell~~ R	**Take necessary action** ☐
Dave Gibbons	**Approval or signature** ☐
Bob Grady	**Comment** ☐
	Prepare reply ☐
	Discuss with me ☐
	For your information ☐
	See remarks below ☐
FROM Mark Taylor MT	**DATE** 6/1/89

REMARKS

Attached is an Interior press release, dated today, that describes the new Interior and Agriculture fire suppression policy.

The new policy strengthens but does not radically change prior practice, under which all fires on public lands were suppressed except those that met certain criteria ("prescriptions") set by area-specific fire management plans. The new policy requires that all fires, including prescribed fires, be suppressed until fire management plans are strengthened to meet various broad requirements ~~recommended by the Departments'~~ joint fire policy review team. As plans are, in effect, recertified, prescribed burns will resume.

The target date for completing the review and revision of all fire management plans is May 1, 1990. Most will be recertified much sooner -- probably this summer. However, plans as complex as Yellowstone's will probably require the entire period to update. There will be no prescribed burns at Yellowstone this year.

Interior has briefed congressional staff and interest groups on the new policy and the initial reaction seems positive.

OMB FORM 4
Rev Aug 70

DEPARTMENT of the INTERIOR
news release

OFFICE OF THE SECRETARY

For Release June 1, 1989

Steve Goldstein, USDI (O) 202-343-6416
(H) 202-887-5248
Kelly Shipp, USDA (O) 202-447-4623

NEW U.S. FIRE MANAGEMENT RECOMMENDATIONS
APPROVED BY SECRETARIES OF INTERIOR AND AGRICULTURE

Secretary of the Interior Manuel Lujan and Secretary of Agriculture Clayton Yeutter today directed federal officials to suppress all natural fires in national parks and wilderness areas until individual fire management plans for the areas are determined to be in compliance with new federal recommendations.

The directive was one of fifteen the two cabinet members adopted from the recommendations of the federal interagency Fire Management Policy Review Team. The team was established last year to analyze U.S. Department of the Interior and U.S. Department of Agriculture fire management policies in national parks and wilderness areas.

The recommendations affect fire management policies of USDI's National Park Service, Bureau of Land Management, Fish and Wildlife Service and Bureau of Indian Affairs, and USDA's Forest Service.

Lujan and Yeutter said many of the fifteen recommendations will require long-range planning and coordination for implementation, but that others will become effective immediately.

In addition to the recommendation to suppress for the interim all natural fires in national parks and wilderness areas, other directives to be adopted immediately include the following:

(more)

-- All wildland fires will be declared either prescribed fires or wildfires. All wildfires will be fought with appropriate suppression action.

(A prescription as it applies to a prescribed fire is a written statement of the limits under which a fire may burn in a specific geographic area. The limits include such criteria as weather conditions and fuel moisture. A prescribed fire is managed by qualified personnel in order to achieve specific resource management objectives. Prescribed fires may be started by management ignition or by natural ignition such as lightning. A wildfire is declared when a fire occurs in an area for which there is no prescription, or when a prescribed fire exceeds the prescribed conditions or geographic limits of the prescribed area.)

-- The responsible line officer will certify in writing daily that prescribed natural fires are within prescriptions, and that adequate resources are available to ensure that each prescribed fire will remain within prescribed boundaries and conditions throughout the next 24 hours, given reasonably foreseeable weather conditions and fire behavior. If these conditions cannot be met, the fire shall be declared a wildfire and suppressed.

Other review team recommendations include measures for improving interagency coordination, providing adequate staffing, training, research, equipment and funding, strengthening fire management plans, bringing those plans into compliance with the National Environmental Policy Act, and measures for increasing public involvement in policy decisions.

In reviewing federal firefighting policies, the team gathered input from state and local officials, private citizens, academic experts, concessionaires and outfitters, environmental groups and business interests. Eleven public meetings were held across the country to solicit comments on the report. The public comments and the resulting findings were incorporated and submitted in a final report to the secretaries of the Interior and Agriculture.

Recommendations from the final report are attached.

-DOI-

FINAL REPORT OF THE FIRE MANAGEMENT POLICY REVIEW TEAM

May 5, 1989

RECOMMENDATIONS

The Team recommends that the Secretaries of Agriculture and the Interior implement the following policy and direction:

1. Existing USDI and USDA fire management policies governing wilderness and parks must be strengthened and reaffirmed to limit their application to legitimate prescribed fire programs. Clarification is needed to prevent inappropriate use of fundamentally sound policies.

2. The agencies reaffirm their policies that fires are either prescribed fires or wildfires. The agencies reject as impractical and unprofessional the practice that fires can be allowed to burn free of prescriptions or appropriate suppression action.

3. USDA and USDI agencies will periodically review fire management plans for parks and wilderness for compliance with current policy, direction, and the additional requirements recommended by this report. No prescribed natural fires are to be allowed until fire management plans meet these standards.

4. Current fire management plans must be strengthened by:

   a. Developing joint agency fire management plans, agreements, or addendums to existing plans for those areas where fires could cross administrative boundaries. Periodic joint review of these plans should occur. These will include agreement on processes and criteria to be used to make decisions on prescribed vs. wildfire and suppression strategies and tactics.

   b. Including a comprehensive set of criteria which will be used in deciding whether or not to allow natural ignitions to burn as prescribed fires. In addition to those criteria currently required and commonly used, the following factors will be **considered**:

      (1) Energy release component.

      (2) 1000-hour fuel or duff moisture content.

      (3) Appropriate consideration of the national and regional fire situation, including the numbers of fires and amount of available resources to suppress them.

      (4) Limits on numbers of fires burning in the planning unit at one time.

      (5) Limits on projected length of active perimeter and acreage burned.

      (6) Indicators of cumulative drought effects on fire behavior.

      (7) Potential impacts upon visitors, users, and local communities, both on and off site.

c. Clearly describing the decision process and factors to be addressed before a fire is declared a prescribed natural fire.

d. Including criteria to be used in declaring a prescribed fire a wildfire. There must be interagency agreement on these factors in areas where fire may move across administrative boundaries and shared suppression resources may be required.

e. Clearly identifying areas that need protection from fire, such as developments within or adjacent to wilderness and park boundaries. Fire management plans should also include actions that are to be taken, such as hazard fuel reduction or installing fuel breaks, to protect such developments or areas.

f. Clearly stating the management objectives being addressed by the prescribed natural fire program, including identification of specific values gained as a result of allowing natural fires to burn unsuppressed within prescribed conditions and areas.

g. Clearly describing the process to be used to ensure adequate public involvement and coordination with local governments in both plan development and implementation.

5. Agencies will cooperatively develop regional and national contingency plans and procedures and provide the appropriate program monitoring and direction, including curtailment of prescribed fire activities when necessary because of competition for national and regional fire suppression resources.

6. The responsible line officer or designee shall certify in writing daily that a fire is within prescription and adequate resources are available to ensure that each prescribed natural fire will remain within prescription through the ensuing 24-hour period, given reasonably foreseeable weather conditions and fire behavior. If the fire cannot be kept within prescription with available forces and funds, it shall be declared a wildfire and appropriate suppression action initiated.

7. Agencies must re-evaluate the opportunities to use management ignited prescribed fire to achieve management objectives and to complement prescribed natural fire programs. Additionally, hazard fuels must be reduced to protect selected areas, particularly developments within and adjacent to boundaries, from prescribed natural fire and high wildfire risk. Fuels will be treated along park and wilderness boundaries or internally where there are high values at risk.

8. Fire program management will be improved by establishing properly staffed regional and unit level organizations.

a. Agencies will ensure the availability of qualified staff and knowledgeable line officers for developing, implementing, and managing prescribed fire programs.

b. National Park Service regional offices will establish a full-time regional fire coordinator to develop and oversee park programs in accordance with FIREPRO III, where appropriate.

c. Agencies will implement the concept of highly trained, well-equipped and mobile tactical teams to provide on-the- ground monitoring and management of prescribed natural fires in national parks and wilderness.

d. Agencies will ensure the strengthened policy is understood and implemented by all appropriate personnel.

e. Agency managers will assure that personnel develop a thorough understanding of the management objectives for the lands they are managing.

f. The National Park Service is to complete an analysis of normal fire year operations, FIREPRO III, in order to define essential minimum wildland fire program needs and to take action to meet those needs.

9. Additional interagency emphasis will be given to addressing opportunities for improving fire management programs.

a. The National Wildfire Coordinating Group (NWCG) charter should be expanded specifically to include prescribed fire program coordination.

b. The NWCG should take the lead in developing common terminology for prescribed burning programs and describing wildfire suppression alternatives.

c. Agencies will develop joint criteria for selecting appropriate suppression tactics in wilderness and parks.

d. Agencies will improve public and agency understanding and acceptance of using appropriate suppression tactics that meet fire management objectives and minimize the adverse impact on wilderness values and park resources.

10. Agencies will ensure NEPA compliance for fire management plans. Agencies will increase opportunities for public involvement and coordination with state and local government when revising or developing fire management plans.

11. Interpretation and public information before and during fires will be improved.

a. Agencies will ensure that timely, accurate, and consistent information is provided for the public on the purpose, presence, and status of prescribed natural fires, as well as impacts on the community due to closed roads, trails, smoke, back country restrictions, and other effects.

b. Interpretive and fire status messages are for different purposes, and agencies should strive to keep them separate and distinct. There should also be a distinction between the information needs for prescribed fires and wildfires.

c. Agencies should ensure that the public is informed of the risks involved in fire management programs.

d. Agencies will use common terminology for prescribed natural fire programs.

12. USDI and USDA will review the methods of funding prescribed fire and fire protection programs with the objective of improving interagency program effectiveness. Planning and presuppression activities should be financed by program funds rather than through emergency fund transfers and supplementals.

13. There is a need for additional research related to fire management programs.

a. USDI and USDA will develop coordinated research programs utilizing the unique capabilities of both organizations.

b. The feasibility of prescribed burning forests using stand replacement fire will be investigated and tested by implementing an appropriate interagency field research program.

c. Research will be increased to improve the ability to predict severe fire behavior, conduct long-term weather forecasting, and identify past abnormal events.

d. Efforts will be undertaken to develop and implement an expert system that integrates a wide array of fuel, topographic, weather, climatological, fire behavior, post-fire effects, and other information and readily displays such information in an interactive mode for the user at a computer terminal. This expert system would help to assure that important variables are not overlooked as decisions are made regarding long duration fires.

e. Efforts will also be undertaken to develop comprehensive data bases for park and wilderness resources and provide for state of the art analyses and display as well as an efficient, continuous monitoring system to insure timely update of information.

f. Development of additional emission factors for wildland fuels and better methods for projecting air quality impacts of prescribed and wildfires are needed, since smoke and air pollution are major considerations in deciding when to terminate prescribed natural fires and in scheduling management ignited prescribed fires.

14. If any Federal bureau engages in prescribed natural fire programs in Alaska, that bureau is responsible for adherence to the standards established as a result of these recommendations. The well-established terminology describing levels of wildfire suppression in Alaska should not be changed for the sake of conformity with the broader categories used elsewhere.

15. The agencies will cooperate fully in determining whether allegations of misuse of policy are true and take measures to ensure that any such practices not occur in the future.

June 6, 1989

MEMORANDUM FOR ED McNALLY

FROM: BOB SIMON

SUBJECT: HISTORY OF THE JACKSON AREA

John D. Rockefeller visit Jackson Lake for the first time in 1924. He was disturbed by the growing tacky commercialism of the area. In 1927, Horace Albright, the Yellowstone superintendent, convinced Rockefeller to buy up land in the Jackson hole area to preserve it as parkland. Rockefeller formed the Snake River Land Co. and secretly bought over 30,000 acres for more than $1.4 million. This land, and other land, was eventually turned into the present Grand Tetons National Park.

President Chester Arthur was the first President to travel through the Tetons and Yellowstone, in 1883. By this time, word had travelled East about the beauty of the area, so Arthur took a vacation out there to see the sights and meet some Indians. After debarking the train, the Presidential party, including half the cabinet, traveled by pack train, and slept in tents, along the Snake River, through Jackson Hole and up to Yellowstone. They were accompanied by two troops of cavalry.

Newspaper reporters were banned from the trip. Gen. Sheridan told two reporters from Chicago that if they followed, they would be arrested and jailed. President Arthur occasionally issued press releases on their activities on the trip.

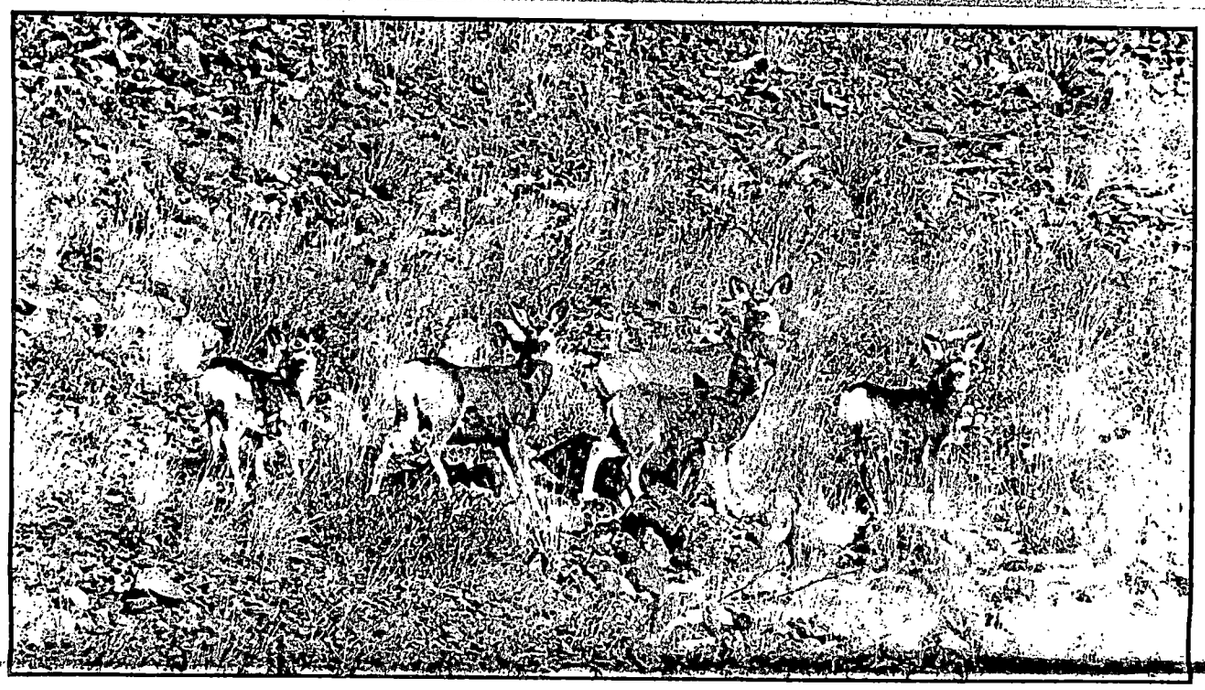
The path Arthur followed was known as the "Bottle trail" named for the empty bottles of booze that trailed the Presidential party.

1872 — Yellowstone became natl. park

Yellowstone Today

A National Park Service Publication For Yellowstone Visitors

Summer 1989 * Information * Regulations & Safety * Activities



A Message From Superintendent Bob Barbee

I welcome you to a special time of year in Yellowstone National Park.

Summer is an exciting season in Yellowstone; many visitors enjoy the park's thermal features, world-renowned wildlife and other scenic wonders. But it is also a time for careful planning. Information to help you stay safe and to protect the park can be found elsewhere in this newspaper.

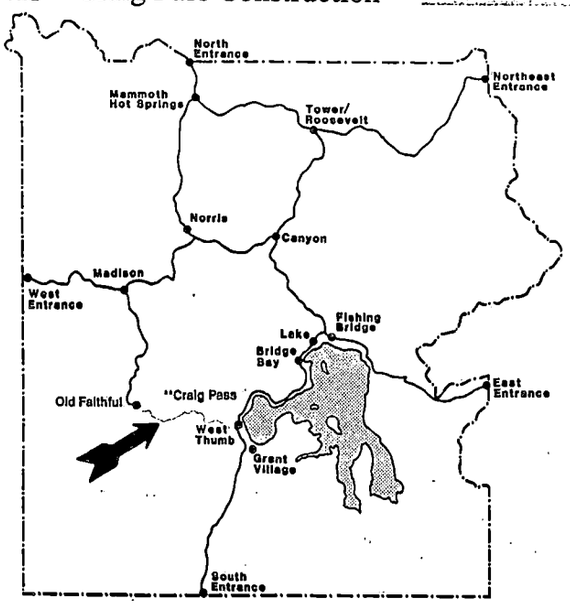
Much of the park was affected by wildland fires during the summer of 1988; these are described in the enclosed fire supplement. As the first post-fire summer visitors, you have a unique opportunity to view a changed and evolving Yellowstone. Please feel free to share your impressions with us.

Over the last several years the National Park Service has made a major effort to repair and rehabilitate many of Yellowstone's historic facilities. We are now in the process of repairing or replacing several of the park's roads, and you may experience delays, especially between Old Faithful and West Thumb. Thank you for your patience.

We benefit today from the care past generations have given Yellowstone. This is fitting, since it is for both preservation and use that national parks have been set aside. Our care now will help keep the park a priceless, wild gift for future generations.

My staff and I hope your adventure in Yellowstone is safe, fulfilling and unforgettable.

Craig Pass Construction



Craig Pass, the 17 mile road linking Old Faithful and West Thumb, is undergoing construction to rebuild and improve the roadbed, **so travel will be restricted at certain times**, as indicated in the following table. Hikers: This will affect access to trailheads located on that stretch of road (see page 6). Bicyclists: Bicycles are not permitted on the Craig Pass Road. Craig Pass closes for the season on September 11, 1989.

	Day 9am-9pm	Night 9pm-9am
Monday	Open-15 min. delay	Closed
Tuesday	Open-15 min. delay	Closed
Wednesday	Open-15 min. delay	Closed
Thursday	Open-15 min. delay	Closed
Friday	Open	Open
Saturday	Open	Open
Sunday	Open	Closed

For International Visitors

Yellowstone National Park has unique dangers; see page 5.

Le Parc national de Yellowstone présente des risques particuliers. Regardez la page 5. Des renseignements en francais sont disponibles aux centres des visiteurs dans le parc.

Der Yellowstone National Park hat gewisse Gefahren. Sehen Sie Seite 5. Sie können Information auf Deutsch in den Besucherzentren bekommen.

Existen peligros únicos en el Parque Nacional Yellowstone. Vea página 5. Se puede conseguir información en español en los Centros de Visitantes.

公園来客 センターズ には、日本語で 公園 の情報 が 有ります。

Emergency Dial 911
Contact A Ranger 344-7381

Index

Telling the Fire Story in Two Parks

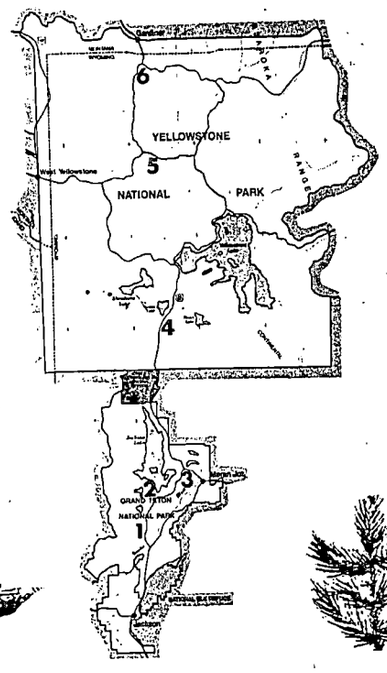
Interested in the wildfires of 1988? Turn to the separate fire supplement enclosed in this newspaper for some background reading. Then, use this map and descriptions to view several fire sites -- from burns which occurred in 1988 and earlier -- in both Yellowstone and Grand Teton National Parks. Look for other fire sites along the roads. After June 17, stop to see the special fire exhibit at the Grant Village Visitor Center (see page 3). Finally, ask a park ranger your fire-related questions.

SELECTED FIRE SITES IN GRAND TETON NATIONAL PARK

1. Beaver Creek Fire
In August, 1985, a lightning-caused fire burned over 1,000 acres on the west side of the Teton Park Road between Moose and South Jenny Lake Junction. A summer walk to Taggart Lake reveals wildflowers, grasses and flowering shrubs; many lodgepole pines have germinated and aspens have suckered in the growing seasons following the fire.

2. Mystic Isle Fire
Along the east shore of Leigh Lake, you can witness what has occurred since lightning struck Mystic Isle in August 1981. Notice the abundant young lodgepole pines which have germinated in fire-created openings.

3. Signal Mountain
Drive the Signal Mountain Summit Road (no trailers or large motorhomes, please) to view a forest that burned in 1879, when massive fires swept through the Jackson Hole valley. In the past 110 years, lodgepole pines have matured. Sub-alpine fir and Engleman spruce will continue to replace the lodgepole pine until fire once again returns the forest to a younger stage.



SELECTED FIRE SITES IN YELLOWSTONE NATIONAL PARK

4. Lewis River Canyon
Shooting firebrands far in advance of the flame wall, a wind-whipped blaze leapt the 500 yard wide Lewis River Canyon in summer 1988. The scene puts human-made barriers in perspective; even the most resourceful fire-fighting crews cannot control fires of this magnitude.

5. Blow Down/Fire Site
In 1984, a violent storm — windshear or tornado — snapped and scattered these pine trees. Though seedlings sprouted the next spring and the forest had begun to recover, the fallen trunks were ready fuel when flames reached the site in 1988. After two successive deforestations, it may remain a meadow for decades but fire-adapted lodgepole cones will eventually reseed a new forest.

6. Burn Mosaic on Bunsen Peak
Wildfires do not burn evenly, but rather leave a mosaic pattern of completely charred, slightly singed, and untouched vegetation. Such uneven burns are a boon to wildlife, with varied habitat attracting diverse birds and mammals.

Exploring Yellowstone: Getting Started

"Now that I'm here, where do I go?" It's not an unusual question, especially for first time visitors. Consider the facts: Yellowstone is the largest national park in the lower 48 states, encompassing 2.2 million acres or 3,472 square miles. It is larger than the states of Delaware and Rhode Island combined and spreads across the borders of three states - Wyoming, Montana and Idaho. Three hundred fifty miles of paved road wind through the park, crossing the Continental Divide three times. Elevations range from approximately 5,300 feet at the North Entrance to almost 12,000 feet at Eagle Peak on the park's east boundary, although most roads lie at 7,500 to 8,000 feet.

Historically, visitors often referred to Yellowstone as "Wonderland," and that may be even more appropriate today. An unparalled array of geothermal phenomena - geysers, hot springs, steam vents and mud pots - are preserved here, evidence of a volcanic past (and future?). The Grand Canyon of the Yellowstone is famous for its colors, shapes, and waterfalls (the Lower Falls, at 308 feet, is the highest in the park). The park shelters a variety and abundance of wildlife found in few other places. Yellowstone Lake and numerous rivers, streams, and waterfalls constitute a major Western water resource. With so much to see and do, it's easy to be overwhelmed. The following tips and information will help you plan your time to suit your interests and energy level. Rangers at visitor centers can fill in the details and help you make the most of your visit to Yellowstone.

The park's major scenic attractions are located along the Grand Loop Road, the roughly figure-eight shaped road in the center of the park. The total mileage around the Loop is 142 miles. The distance around the Upper Loop is 70 miles; the Lower Loop, 96 miles. Actual driving time is difficult to estimate because the maximum speed limit is 45 mph or lower where posted, roads are narrow, winding, and full of pot holes and frost heaves, and traffic may be heavy and slow moving. **Note: If you plan to drive Craig Pass, linking Old Faithful and West Thumb, delays and closures are in affect due to road construction; see maps on the front and back pages of this newspaper.** While it is possible to drive the Grand Loop in a day, major attractions like Old Faithful Geyser and the Grand Canyon of the Yellowstone can only be seen by driving to a parking area and walking to the feature. If you have limited time, consider spending it at just one area instead of trying to "see the park" from the road. Many people believe that to fully appreciate just the major attractions in Yellowstone requires a minimum of three days.

Geysers and Hot Springs

Yellowstone's volcanic past is embodied in its geysers and hot springs. The world's greatest concentration of thermal features is located in Yellowstone: about 10,000 thermal features are known, of which 200 to 250 are geysers. Many of the most famous features can be found along the fifty mile road between Mammoth Hot Springs and Old Faithful. Areas of thermal activity include the Mammoth Hot Spring Terraces, Norris Geyser Basin, Fountain Paint Pots, Firehole Lake Drive, Midway Geyser Basin, Biscuit Basin, Black Sand Basin, and the Old Faithful area. Visitor Centers along this road are located at Mammoth Hot Springs, Norris Geyser Basin, and Old Faithful. A self-guiding museum is located near Madison Junction.

Grand Canyon

The Grand Canyon of the Yellowstone extends from Canyon Village north to Tower Junction. However, the most famous and spectacular section, including the Upper and Lower Falls of the Yellowstone River, is seen from overlooks along the North and South Rim Roads in the Canyon Village area. The northern-most extent of the canyon is visible from Tower Fall and Calcite Springs overlooks 19 miles north of Canyon Village. The drive between Tower Junction and Canyon Village goes over Dunraven Pass, the highest road in the park at 8,859 feet. Along the way you will find spectacular views of the Absaroka Mountains, the Yellowstone caldera and, on a clear day, the Teton Mountains to the south. During June and July, wildflowers carpet the slopes of Mt. Washburn. A visitor center is located at Canyon Village.

Lake Area

Yellowstone Lake, with 110 miles of shoreline and a 136 square mile surface area, is North America's largest mountain lake. Its relatively high elevation (7,733 feet) is one reason why the lake is ice-locked at least half of the year. The area is prime habitat for a variety of birds and mammals, and spectacular scenery plus fishing and boating have long made the area popular with visitors. Nearby, Mud Volcano and West Thumb Geyser Basin hint at a complex geologic history; present activity is unique and ever-changing. Permits, required for fishing and boating, are available at Lake Ranger Station and Grant Village Visitor Center (note that the general fishing season begins May 27; June 15 on Yellowstone Lake; July 15 on the lake's tributary streams). A museum is located at Fishing Bridge.

Wildlife Viewing

Yellowstone is home to a variety and abundance of wildlife unparalleled in the lower 48 states. Nearly all wildlife species inhabiting the park when it was first officially explored 117 years ago survive today. It is difficult to describe exactly where wildlife may be seen; habitat preferences and seasonal cycles of movement determine, in a general sense, where a particular animal may be at a particular time. Early morning and evening hours are when animals tend to feed and thus are more easily seen. But remember that the numbers and variety of animals you see are largely a matter of luck and coincidence. Check at visitor centers for detailed information. Please use pullouts when viewing wildlife, and remember that Yellowstone's animals are wild; use binoculars or telephoto lenses for safe viewing and to avoid disturbing them.

History

Mammoth Hot Springs is park headquarters. It is also the site of Fort Yellowstone, built during the Army era (1886 to 1918) of park administration. The former Bachelor Officers' Quarters is now the Albright Visitor Center where the story of Yellowstone's colorful history is told.

SERVICES AND FACILITIES

See page 11 for a directory of visitor services. All facilities, accommodations and services are available from approximately mid-June to late August. However, facilities and services are limited before and after that period. Please note opening and closing dates. General park information is available by calling National Park Service headquarters at (307) 344-7381. Reservations for lodging and activities such as bus tours, horse rides, boat rental, etc. may be made through TW Recreational Services, Inc.; call (307) 344-7311.

These highlights will help you plan your visit to Yellowstone, but much is left for you to discover. If you supply the time and curiosity, Yellowstone's wonders will be revealed to you. May your visit be safe, rewarding and memorable.

Yellowstone Today is published four times annually by the Division of Interpretation, Yellowstone National Park, WY 82190, (307)344-7381, ext. 2204, in cooperation with the Yellowstone Association.

Visitor Centers and Museums

ALBRIGHT VISITOR CENTER, MAMMOTH HOT SPRINGS
Open year round. Hours 8:30am - 5:00pm through June 10; 8:00am-7:00pm June 11-August 26; 8:00am-6:00pm August 27-Sept. 4. Information, exhibits of the park's natural and human history, publications. A movie, "The Challenge of Yellowstone," is shown throughout the day. Call (307)344-7381, ext. 2357 for more information.

OLD FAITHFUL VISITOR CENTER
Hours 8:30am-4:30 pm through June 10; 8:00am-6:00pm June 11-Sept. 4; after Labor Day hours will be posted. Information, publications, geyser eruption predictions. A nine minute movie, "Yellowstone: A Living Sculpture" is shown throughout the day. Call (307) 344-7381, ext. 6001 for more information.

CANYON VISITOR CENTER
Hours 9:00am-5:00pm through June 10; 8:00am-6:00pm June 11-August 26; after August 27 hours will be reduced and posted. Information, publications, exhibits of Canyon geology and natural history. A movie, "The Faces of Yellowstone" and a slide program are shown throughout the day. Call (307) 344-7381, ext. 6205, for information.

NORRIS MUSEUM
Hours 9:00am-4:30pm through June 10; 8:00am-6:00pm June 11-August 26; after August 27 hours will be reduced and posted. Information, publications, exhibits on geothermal features and on the extraordinary life forms that live in the geyser basin. Call (307)344-7733 for more information.

FISHING BRIDGE VISITOR CENTER
Hours 9:00am-5:00pm through June 10; 8:00am-6:00pm June 11-August 26; after August 27 hours will be reduced and posted. Information, publications, and exhibits of Yellowstone's birds, wildlife and lake geology. Call (307)344-7381, ext. 6150 for more information.

MADISON EXPLORERS MUSEUM
Open May 28. Located 1/4 mile south of Madison Junction; open morning to evening. Exhibits describe the exploration and establishment of Yellowstone as the world's first national park. Facility is unstaffed.

GRANT VILLAGE VISITOR CENTER
Open June 17. Hours 8:00am-6:00pm June 17-August 26; after August 27 hours will be reduced and posted. A special exhibit "Yellowstone and Fire," depicting the causes, events, response of people and renewal processes associated with fire, will be on display. A video with footage of the fires will also be shown every half hour. Come explore a fascinating natural process that has been occurring in Yellowstone every 250-400 years. For more information, call (307)344-7381, ext. 6602.

Self-guiding Trails

Many of Yellowstone's famous scenic splendors can be seen from these trails. Slow down, stretch your legs, and discover the sights, smells and sounds of wilderness.

MAMMOTH HOT SPRINGS TERRACES
Unique among Yellowstone's thermal features, almost two tons of new rock are added to the terraces each day by hot spring waters. Paths wind through a hillside of active and inactive terraces. For your safety and the protection of fragile formations, please stay on boardwalks and trails.

NORRIS GEYSER BASIN
Explore the hottest, most active thermal basin in the park. Trails start at the museum and lead to colorful hot springs and a number of active geysers. In this area of thin crust, unstable ground and boiling water, please stay on designated paths and boardwalks.

FOUNTAIN PAINT POT TRAIL
Located 8 miles north of Old Faithful on the road to Madison Junction. Active, ever-changing mud pots make this area unique, as does the variety of thermal activity and color. To protect fragile formations and delicate thermal colors, and for your safety, please stay on boardwalks.

THREE SENSES NATURE TRAIL
Located on Firehole Lake Drive. One-way road begins about one mile south of the Fountain Paint Pots parking area. Braille and visual texts help you "tune into" the sounds, smells and textures of Yellowstone.

UPPER GEYSER BASIN
The world's greatest collection of geysers is located here, including Old Faithful Geyser. Several miles of trail begin at the Old Faithful Visitor Center; stop in for orientation information, and for eruption times of predictable geysers: Castle, Grand, Riverside, Daisy and Great Fountain. Avoid damaging thermal features or yourself by staying on designated boardwalks and trails.

WEST THUMB GEYSER BASIN
Situated on the shore of Yellowstone Lake, boiling springs meet icy lake water. Stay on boardwalks and paths to preserve delicate features and avoid injury.

MUD VOLCANO TRAIL
Located approximately 6 miles north of Fishing Bridge Junction (approximately 10 miles south of Canyon Junction). Thermal features of unusual color and activity are found here -- Mud Volcano and Dragon's Mouth, to name a few. Thin crust and unstable ground overlie boiling water. Protect yourself and help preserve fragile formations by staying on designated trails and boardwalks.

GRAND CANYON OF THE YELLOWSTONE
The Canyon and the Upper and Lower Falls can be seen from overlooks along the rim drives. The North Rim Drive takes you to Inspiration, Grandview, and Lookout Points. A spur road leads to an overlook at the brink of the Upper Falls. The South Rim Drive leads to Uncle Tom's Trail and Artist Point. Trails also wind along both rims.

CALCITE SPRINGS OVERLOOK AND TOWER FALL
Calcite Springs overlook is located approximately 1-1/2 miles south of Tower Junction. From the trail you can see Calcite Springs' activity plus unique geological formations. Two miles south of Tower Junction is the Tower Fall area. A short trail leads from the General Store to an overlook of the 132 foot waterfall.

Entrance Fees

Legislation passed by Congress last year raised the ceiling on entrance fees charged at Yellowstone and Grand Teton National Parks. Entrance fees are now $10 for a private, noncommercial automobile, and $4 for each visitor entering by snowmobile, motorcycle, bus, bicycle or on foot. These fees are good for a seven day pass to both parks.

Also available for $15 is an annual calendar year pass to Yellowstone and Grand Teton National Parks. The $25 Golden Eagle Passport, also effective for a calendar year, allows the permit holder and accompanying passengers to enter all parks which charge entrance fees.

The Golden Age Passport (for those over 62) and Golden Access Passport (for the handicapped) are still offered free of charge to qualifying individuals. They entitle the holder and accompanying passengers in a private, noncommercial vehicle free admission to parks plus a 50 per cent reduction in user fees for camping, boat launching, etc.

DISCOVER YELLOWSTONE... WITH A RANGER
Ranger-led activities, offered from mid-June through Labor Day, are featured in *Discover Yellowstone*. Look for this publication at visitor centers, stores and gift shops starting June10.

The Yellowstone Association

The Yellowstone Association was founded in 1933 to assist with educational, historical and scientific programs for the benefit of Yellowstone National Park and its visitors. One of the Association's major activities is the operation of book sales outlets in park visitor centers. Proceeds from these sales and from membership revenues are used to:
**Support expanded naturalist training and programs
**Publish trail guides, books and pamphlets about Yellowstone
**Sponsor the Yellowstone Institute (see page 10)
**Purchase books for the park research library and employ part-time librarians
**Contribute to funding of museum exhibits and research equipment.

You are invited to become a member of the Yellowstone Association. Benefits to Yellowstone Associates, aside from demonstrating interest and support in the organization's philosophy and projects, include:
**Discounts on class fees
**A 15% discount on books sold by The Yellowstone Association in visitor centers or by mail
**An informative newsletter
**Discounts on Institute products
**Invitations to special events
**A family membership covering donor, spouse, and children through age 20
**A tax deduction
**Discounts at many association bookstores in other national parks

Associate	$ 25_____
Contributing	50_____
Sustaining	100_____
Patron	250_____
Sponsor	500_____
Benefactor	1000_____

NAME_____

ADDRESS_____

CITY_____STATE_____ZIP_____

Make checks payable to "The Yellowstone Association" or charge to ( )Visa ( ) MasterCard

Number_____

Expiration Date_____

Signature_____

Mail to: The Yellowstone Association, P.O. Box 117, Yellowstone National Park, WY, 82190 or leave at the sales desk at any Visitor Center.

The Wondrous Ways of Heat and Water

Perhaps no single natural feature in any national park enjoys the fame and notoriety of Old Faithful Geyser. Millions of visitors have journeyed from all around the world to view this spectacular geo-logic wonder. For many, it comes as a surprise to discover that Old Faithful is just one of some 10,000 thermal features sprinkled liberally across the sprawling Yellowstone landscape. Indeed, the number and variety of Yellowstone's thermal splendors is unmatched anywhere in the world.

All thermal activity in nature is the result of volcanically heated water that comes to the surface in a variety of ways. In Yellowstone, the different thermal features are classed as hot springs, mud pots, fumaroles, and geysers.

It is generally assumed by geologists that a slowly cooling body of molten rock (magma) exists at relatively shallow depths beneath Yellowstone. As rain and snow fall on the park, some of it seeps down into the earth and eventually comes in contact with the heat from this magma.

Under tremendous pressure, this water is able to be heated to great temperatures without turning to steam - temperatures much higher than the boiling point. The superheated water begins to rise and works it way back to the surface emerging as one of Yellow stone's thermal wonders.

A hot spring occurs anytime hot, rising thermal water reaches the surface. In most cases, the water forms a steamy, sometimes bubbling pool. A great amount of variety including color, temperature, amount of water discharged, and level of activity exists among the various hot springs adding much to their charm.

Mudpots occur when a small amount of heated water rises to dissolve and mix with the overlying rock. The result is a bubbly, soupy mixture ranging in texture from thin to thick and viscous. Though generally tan in color, mudpots often contain minerals that create shades of gray, black, white, pink, and red, giving rise to the term "paint pots." Mudpots are found on the Fountain Paint Pots Trail, at Mud Volcano, Artist's Paint Pots, and in numerous backcountry locations in the park.

Steamboat Geyser, the world's largest, erupted in January and again on May 5, 1989. This geyser is highly unpredictable; these eruptions were the first since September, 1984.

For more information of the thermal features of Yellowstone or to obtain geyser eruption predictions, ask at any visitor center.

Fumaroles are basically steam vents. The steam is often expelled with tremendous force causing the ground to tremble and producing a strong roaring sound. Fumaroles are commonly found in many of the major geyser basins in Yellowstone.

Undoubtedly the most spectacular of the various kinds of thermal features are the geysers. Geysers have a complex plumbing system in which great quantities of hot water are stored at depth under tremendous pressure. A narrow part of the conduit leading to the geyser's vent or pool is blocked by steam bubbles preventing the water from coming to the surface.

Eventually the build-up of steam and super-heated water is great enough so that a small decrease in pressure within the system causes a chain reaction in which much of the hot water flashes instantly to steam. The steam then pushes the remaining water up and out of the tube in a violent eruption.

Geysers have been known to erupt to heights of 1,000 feet in the past. Currently, the world's largest geyser, Steamboat (found at Norris Geyser Basin in Yellowstone, see photo), reaches heights of 400 feet during eruptions, the force of which is sometimes great enough to throw rocks into the air. Some geysers occasionally blow out their own internal plumbing, either altering or stopping entirely their eruptive activity.

The park contains over 200 geysers, the largest concentration found anywhere. Each one has a different pattern of activity, and these patterns are themselves constantly changing. For many people, the chance to experience close-up the power and beauty of the earth's inner workings is a moving experience; one that has contributed mightily to Yellowstone's popularity and the shaping of its destiny.

Yellowstone Park Medical Services

If injury or sudden illness threatens to spoil your visit to Yellowstone, or you left your prescription drugs in last night's motel room, or you require periodic clinical laboratory testing throughout your travels -- Yellowstone Park Medical Services (YPMS) is there when you need us. YPMS, a division of West Park Hospital, Cody, Wyoming, has been providing health care for Yellowstone National Park's visitors and employees since 1980.

Outpatient services are offered at three convenient locations throughout the park -- Lake, Old Faithful and Mammoth. The Lake facility is also a full service hospital with 10 inpatient beds, 24-hour ambulance and emergency service, and laboratory, pharmacy and radiology services.

Our medical staff includes experienced and highly qualified professionals from across the country. We work closely with National Park Service Medical Technicians and Park Medics to provide up-to-date prehospital care. Patients requiring advanced medical care are transported to area hospitals or medical centers for further evaluation and treatment.

YPMS provides medical services to 5,000 to 6,000 visitors and employees each year. We see routine problems as well as unique ones: scaldings from the super-heated waters of thermal features; gorings by bison, moose or elk; or, very rarely, bear maulings. Please be careful and cautious throughout your visit.

It is our goal to offer the very best medical care possible to Yellowstone's visitors and employees in this uniquely beautiful wilderness setting.

COMPREHENSIVE MEDICAL CARE IN A WILDERNESS SETTING...

Lake Clinic, Pharmacy & Hospital
Emergency Room, 24-hour service
Clinic Hours: 8:30am-8:30pm
Open 7 days per week
May 29 - September 15, 1989
Phone (307) 242-7241

Old Faithful Clinic
Hours: 8:30am-5:00pm
Open 7 days per week
May 29 - October 11, 1989
Phone (307) 545-7325

Mammoth Family Clinic
Hours: 8:30am-5:00pm,
Monday-Friday
Open Year Round
Phone (307) 344-7965

EMERGENCIES -- DIAL 911

YELLOWSTONE PARK MEDICAL SERVICES
A division of West Park Hospital -- Cody, Wyoming
We're there when you need us!

Auto Assistance with Yellowstone Park Service Stations

Since its admittance to Yellowstone National Park in 1915, the automobile has become a sightseeing bus, a security blanket and a lifeboat for people touring the park. With over 350 miles of paved roads through one of North America's last remaining intact wilderness ecosystems and the world's greatest collection of geothermal features, Yellowstone offers an unmatched touring experience.

Yellowstone Park Service Stations (YPSS) operates eight full-service service stations and four automotive towing and repair shops to meet the needs of the motoring public. Our service stations offer gasoline as well as other automotive accessories. We also perform tire repairs, oil changes and other routine maintenance.

YPSS also provides emergency road and wrecker service from its four repair shops. The shops are staffed with certified automotive technicians to assist park visitors with minor vehicle problems.

On behalf of our 100 employees, YPSS welcomes you to Yellowstone National Park. We ask that you treat the park, its wildlife, its resources and your fellow park visitor with respect. Enjoy your stay and remember, "Keep your eyes on the road, your hands on the wheel, for in Yellowstone, SAFE DRIVING IS NO ACCIDENT."

WARNING!

Some things all visitors must know...
Hazards in Yellowstone National Park

Emergency: Dial 911 — **Contact A Ranger 344-7381**

Yellowstone is a wilderness filled with natural wonders that are also potential hazards. **There is no guarantee of your safety.** Regulations are strictly enforced to protect you and the park's wonders.

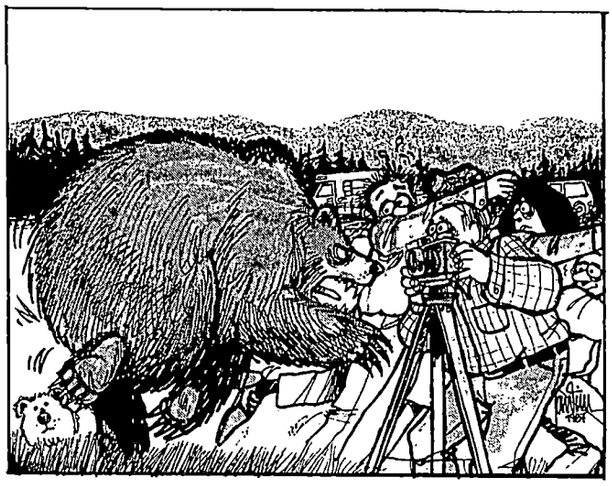
All wildlife, especially bison and bears, are unpredictable and dangerous. View animals at a distance or from your car. **Keep a safe distance from all wildlife. It is against the law to approach within 100 yards of bears or within 25 yards of other wildlife.** For your safety and the animals' welfare, avoid all wildlife with young.

Beware of Falling Trees

Following the fires of 1988, thousands of dead trees, known as snags, were left standing in Yellowstone. These snags may fall with very little warning.

Be cautious and alert for falling snags along trails and roadways, and in campsites and picnic areas. Avoid areas with large numbers of dead trees.

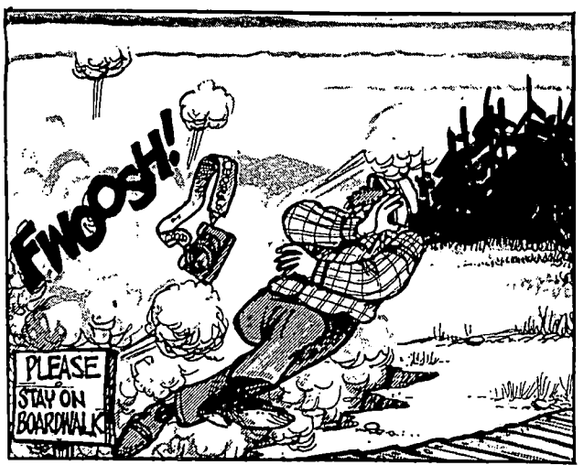
Again, there is no guarantee of your safety.



Avoid These Situations

Your visit may be marred by tragedy if you violate park rules. Law enforcement rangers **strictly** enforce park regulations to protect you and the park. Please help keep our contacts with you pleasant by paying special attention to park regulations and avoiding these common problems:

—speeding (radar enforced)
—driving while intoxicated
—improper food storage
—camping violations
—pets off leash
—littering
—swimming in thermal pools
—removal of natural features
—approaching wildlife too closely
—boating and fishing violations
—failure to remove detachable side mirrors when not pulling trailers



Bears Are Dangerous

All of Yellowstone is Bear Country. People have been seriously injured, maimed, and killed by bears. **Do not approach bears!** Observe them at a distance (you are at risk if you are closer than 100 yards). Bears may appear tolerant of people but are known to attack without warning. **Feeding wildlife is unlawful.** Animals who are fed often become demanding and aggressive, cause personal injury, and must be destroyed.

Odors attract bears! Bears need your concern - not your food. **Never leave food or garbage unattended.** Dispose of garbage in bear-proofed trash or garbage cans. **Store all food and cooking utensils in a secure place** such as:

—the trunk of your car
—suspended 10 feet above the ground and 4 feet horizontally from a tree or post
—a food storage box is available in selected sites in campgrounds.

If you are involved in a conflict with a bear, (regardless of how minor) or if you observe a bear or bear sign, report it to a park ranger as soon as possible. Someone's safety may depend on it.

Animals Are Unpredictable

Warning: Bison are more dangerous than they appear. Each year visitors approach bison too closely and are gored. People have been killed by these animals which weigh up to 2,000 pounds and sprint at 30 mph, three times faster than you can run.

Bison may appear tame and slow but are wild, unpredictable and dangerous.

Do not approach bison or any wildlife. View and photograph them from the safety of your vehicle.

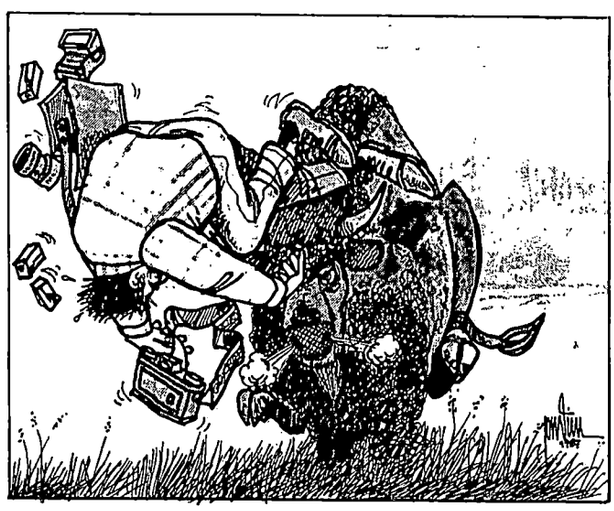
Scalding Water Can Ruin Your Vacation

Stay on boardwalks and designated trails. Scalding water underlies thin, breakable crusts; pools are near or above boiling temperatures. Each year, visitors off trail in thermal areas have been seriously burned, and people have died in the scalding water. Boardwalks and trails protect you and preserve delicate formations.

Pets are prohibited in thermal areas.

Swimming or bathing in thermal pools or streams whose waters flow entirely from a thermal spring or pool is prohibited.

Yellowstone's thermal features are extraordinary natural wonders. Here, the world's last great array of geysers, hot springs, mud pots and fumaroles is preserved. However, thermal features are fragile and easily damaged. Walking on them, carving or defacing them, or removing souvenir pieces of formation destroys decades or centuries of intricate natural processes. Throwing objects into thermal features clogs underground channels, affects water circulation and has destroyed a number of geysers and hot springs. It is illegal to deface features, throw objects into them or remove any natural features from the park.



Watch Your Children

Your hand and your voice may be too far away once your child leaves your side...

Please -- Protect Yourself and Your Park

Important Information

Emergency Dial 911

Contact A Ranger 344-7381

ACCIDENTS
Report all accidents or injuries to a park ranger.

BICYCLING
Bicycling is permitted on established public roads, parking areas, and designated routes. There are no bicycle paths along roadways. **Bikes are prohibited on backcountry trails and boardwalks.** We strongly recommend that safety gear, including helmet and high visibility clothing, be worn by all bicyclists. Park roads are narrow and winding; most do not have a shoulder, or shoulders are covered with gravel. During April, May, and June, high snowbanks make travel more dangerous. Road elevations range from 5,300 to 8,860 feet and relatively long distances exist between services and facilities. Motorists frequently do not see bicyclists or fail to give them sufficient space on the road. Drivers sometimes pass on hill crests, blind curves or in oncoming traffic. Vehicles, especially motor homes or those towing trailers, may have wide mirrors. Extraordinary caution is advised.

BOATING
A permit is required for all vessels and must be obtained in person at any of the following locations: South Entrance, Lewis Lake Campground, Grant Village Visitor Center, Bridge Bay Marina, Lake Ranger Station, and Mammoth Visitor Center. The fee is $10 for motorized vessels and $5 for nonmotorized vessels. Grand Teton National Park's boat permit will be honored; however, a free Yellowstone tag is required. All vessels are prohibited on park rivers and streams except the channel between Lewis and Shoshone Lakes, where only hand propelled vessels are permitted.

CAMPING
Camping is permitted only in designated campgrounds. It is illegal to camp in pullouts, picnic areas, or parking lots. Canyon Village Campground, Fishing Bridge RV Park and Fishing Bridge Campground are restricted to hard-sided camping units only.

CAMPFIRES
Campfires are permitted in designated campgrounds and in picnic areas where fire grates are provided. Backcountry use permits are required for campfires in the backcountry. Any dead and down material may be used as firewood.

CLIMBING
Rock climbing in Yellowstone is dangerous due to loose, crumbly rock. Climbing is not recommended.

DEFACING PARK FEATURES
Collecting natural or archeological objects, or removing, defacing or destroying any plant, animal, or mineral is prohibited. Travel into fragile thermal areas may result in damage to the area or serious injury from scalding water.

FIREARMS
Firearms are not allowed in Yellowstone. However, unloaded firearms may be transported in a vehicle when the weapon is cased, broken down or rendered inoperable, and kept out of sight. Ammunition must be placed in a separate compartment of the vehicle.

LOST AND FOUND
Report lost and found items to any visitor center or ranger station. A report will be filed and the article returned when possible. For more assistance write: Yellowstone National Park, Visitor Services Office, P.O. Box 168, Yellowstone National Park, Wyoming 82190.

MOTORCYCLES
Motorcycles, motor scooters, and motor bikes must be operated on park roads; no off road or trail travel is allowed. Operators must carry a valid state driver's license and vehicles must display valid state license plates.

PERMITS
Permits are required for **boating, fishing, and overnight backcountry use.** Carefully read the regulations and safety information you receive with your permit.

PETS
Pets must be leashed. They are prohibited on trails, in the backcountry and in thermal areas.

PICNIC AREAS
Overnight camping is not allowed in any of the park's picnic areas. Fires may be built only in fire grates available in picnic areas at Lava Creek, Snake River, Grant Village, Spring Creek, Nez Perce, and the east parking lot of Old Faithful. Liquid fuel stoves may be used for cooking at other locations. Most picnic areas have pit toilets, but none have drinking water.

SHOULD YOU DRINK THE WATER?
Intestinal infections from drinking untreated water are increasingly common. Waters may be polluted by animal and/or human wastes. When possible, carry a supply of water from a domestic source. If you drink water from lakes and streams boil it a minimum of two minutes to reduce the chance of infection.

STORMS
Yellowstone's weather is unpredictable. A sunny warm day may become fiercely stormy with wind, rain, sleet and sometimes snow. Lightning storms are common; get off water or beaches and stay away from ridges, exposed places, and isolated trees. Without adequate clothing and gear, an easy day hike or boat trip can turn into a battle for survival. Exposure to wind, rain, or cold can result in hypothermia. This rapid loss of body heat can cause death if not treated. Early warning signs: shivering, slurred speech, memory lapses, drowsiness, and exhaustion. Cold water is a special hazard to fishermen and boaters.

STREAM CROSSING
Fording a stream can be hazardous, especially during spring snowmelt/high water. Check at local ranger stations for current trail and stream conditions.

SWIMMING
There are no swimming pools in Yellowstone, and swimming, bathing, or wading in thermal features, or in streams whose waters flow from thermal features, is illegal. River, stream, and lake water is so cold that hypothermia is a serious possibility. Swimming is generally discouraged.

THEFT
Theft is a potential problem. To avoid becoming a victim:
- —lock your vehicle.
- —keep all valuables out of sight.
- —put your name, address, or identification number on all valuable property.
- —report theft or vandalism to a ranger immediately.

TRAFFIC
Yellowstone has over 350 miles of roads. Most are narrow, rough, and busy! **Some sections are steep with sharp drop offs.** Drive cautiously and courteously; use pullouts to observe wildlife and scenery and to allow other traffic to safely pass. **Be especially cautious of frost heaves and road damage;** cool temperatures may occur any time of the year. The maximum speed limit is 45 mph unless otherwise posted. Watch out for animals on the road, especially at night. Bicycles and motorcycles present special hazards. Drive defensively.

Camping in Yellowstone National Park

Twelve campgrounds are operated by the National Park Service in Yellowstone. **All campsites are available on a first-come, first-served basis with the exception of Bridge Bay campground which is on the nationwide Ticketron campground reservation system.** This reservation system is in effect June 10 to September 3. Reservations for Bridge Bay may be made up to eight weeks in advance in person at any one of 600 Ticketron outlets throughout the country, including Bridge Bay campground. Reservations may also be made by mail through Ticketron, Department R, 401 Hackensack Avenue, Hackensack, NJ 07601, or by phone by calling one of the following numbers, 9:00am-9:00pm Pacific time: (213) 410-1720; (303) 825-8447; or (602) 340-9033.

Camping or overnight vehicle parking in pullouts, parking areas, picnic grounds, or any place other than a designated campground is not permitted, and there are no overflow camping facilities.

Canyon Village and Fishing Bridge campgrounds are restricted to hard-sided camping units only - no tents or tent trailers - due to the frequency of bears.

All camping is limited to 7 days between June 16 and August 25. Check out time for all campgrounds is 10:00am. Additional camping facilities are available in national forest areas and communities outside the park.

RV Park
A trailer village (no tents or tent trailers allowed) is operated by TW Recreational Services, Inc. at Fishing Bridge. Water, sewer, and electrical hookups are available for $17.00 per day. For information and reservations, call TW Recreational Services, Inc. at (307) 344-7311 or write TW Recreational Services, Inc., Yellowstone National Park, WY 82190

Quiet Hours
Camping in Yellowstone is a special experience. Each visitor deserves the opportunity to hear the birds, wildlife and streams in this beautiful environment. Respect the rights of other campers and comply with the law by adhering to quiet hours, **8:00 pm to 8:00 am,** which will be strictly enforced. No generators, loud audio devices or other noise disturbances will be allowed during this time.

Group Camping
Group camping areas are available for large organized groups with a designated leader such as youth groups, educational groups, etc. (family reunions or similar gatherings do not qualify).

The nightly fee is $2.00 per person. Advance reservations are required and can be made beginning January 1 by contacting Yellowstone National Park, Attention Visitor Services Office, Yellowstone National Park, Wyoming 82190, (307) 344-7381.

Campground	Dump Station	No. of Sites	Fee	1989 Dates[2]
Mammoth	No	85	$7.00	Year Round
Madison	Yes	292	$7.00	May 5 - October 31
Bridge Bay[1]	No	420	$9.00	May 26 - September 25
Norris	No	116	$7.00	May 19 - September 18
Slough Creek	No	29	$5.00	May 26 - October 31
Tower Fall	No	32	$5.00	June 2 - September 18
*Fishing Bridge	Yes	98	$7.00	May 26 - September 5
*Canyon Village	Yes	280	$7.00	June 9 - September 11
Indian Creek	No	75	$5.00	June 9 - September 18
Grant Village	Yes	403	$7.00	June 16 - October 16
Pebble Creek	No	36	$5.00	June 16 - September 11
Lewis Lake	No	85	$5.00	June 16 - October 31

***Hard sided camping vehicles only**
[1] On Reservation System (see description above)
[2] Dates may change due to weather or resource management concerns

IF YOU PLAN TO HIKE NEAR CRAIG PASS...

Road construction on Craig Pass, located between Old Faithful and West Thumb, will affect access to and use of trailheads along this route. Parking may not be available.

Please plan your trip accordingly; talk with a park ranger concerning access before hiking these trails.

Hiking Information

Yellowstone National Park, encompassing 2.2 million acres, is one of America's premier wilderness areas. Most of the park is backcountry and managed as wilderness. Over 1,100 miles of trails are available for hiking. However, there are dangers inherent in wilderness: unpredictable wildlife, changing weather conditions, remote thermal areas, cold water lakes, turbulent streams, and rugged mountains with loose, "rotten" rock are among them. Visiting wilderness means experiencing the land on its terms. You have chosen to explore and enjoy the natural wonders of Yellowstone but there is no guarantee of your safety. Be prepared for any situation! Carefully read all backcountry guidelines and regulations.

Rules

To preserve Yellowstone's backcountry and enhance your wilderness experience, the National Park Service has established the following regulations and guidelines.

Contact a park ranger before you begin a day hike or overnight trip.

PERMITS
Permits are required for some day hikes and all overnight trips. Yellowstone Park has a designated backcountry campsite system and a non-fee permit is required for overnight stays. Permits can be obtained only in person and no more than 48 hours in advance. Each designated campsite has a maximum limit for the number of people and stock allowed per night. The maximum stay per campsite varies from 1 to 3 nights per trip. A day-use permit is required for some areas. Bear activities sometimes require hiking and camping restrictions. Permits are also required for boating and fishing. Information and permits are available at ranger stations and visitor centers.

CAMPFIRES
Campfires are permitted only in established fire pits. Burn only dead and down wood. Wood or ground fires are not allowed in some campsites. Your fire must be attended at all times and be completely extinguished before you leave.

PACK IT IN - PACK IT OUT
All refuse must be carried out of the backcountry. This includes items partly burned in the fire pit such as foil, tin or glass.

FIREARMS - PETS
Firearms, pets, motorized equipment, and wheeled vehicles are prohibited in the backcountry.

SANITATION
Bury human waste 6 to 8 inches below the ground and a minimum of 100 feet from a watercourse. Waste water should be disposed of at least 100 feet from a watercourse and campsite. Do not pollute lakes, ponds, rivers, or streams by washing yourself, clothing or dishes in them.

PROTECTING NATURAL FEATURES
Removing, defacing or destroying any plant, animal, or mineral is prohibited. Leave historical and archeological items in place. Report your findings to a park ranger.

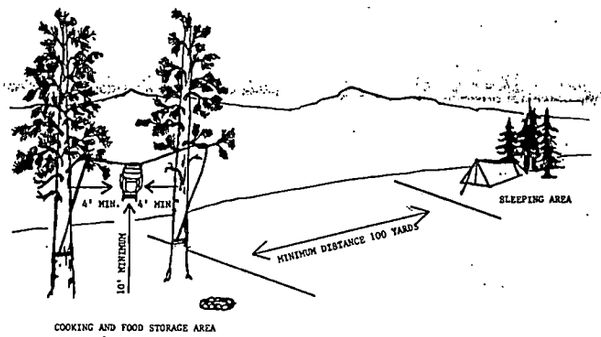
Hiking and Camping in Bear Country

Yellowstone Park is home to both grizzly and black bears. **Although the risk of an encounter with a bear is low, there are no guarantees.** Know how to minimize the risks.

HIKING
Make your presence known; do not surprise a bear. Hike in groups and make noise. Many experienced hikers wear bells, whistle, talk loudly, or sing. If you see a bear, give it plenty of room. Do not make abrupt moves or noises that might startle it. If you cannot detour, wait until the bear moves away from your route. Do not try to approach it for a better look or a picture. Sows with young or bears defending a carcass are especially dangerous - be alert!

CAMPING
Never camp in an area that has obvious evidence of bear activity such as digging, tracks, or scat.

ODORS ATTRACT BEARS
—Avoid carrying or cooking odorous foods.
—Food and garbage must be secured from bears. Hang all food at least 10 feet above the ground and at least 4 feet horizontally from any post or tree trunk.
—Sleep a minimum of 100 yards from where you hang your food, garbage, and prepare your meals.
—Keep your sleeping gear clean and free of food odor.
—Do not sleep in the clothes you cook in.
—Hang the clothing you wore while cooking and eating in plastic bags.
—There is evidence that menstruation, sexual intercourse, cosmetic odors and sweet smelling substances may attract bears.



COOKING AND FOOD STORAGE AREA

IF YOU ENCOUNTER A BEAR
Even if you have taken all precautions, you may still encounter a bear. If you do:
—Stay calm; it will probably leave you alone. Do not make abrupt moves or noises that might startle the bear.
—Give the bear plenty of room. Slowly detour, keeping upwind so it will get your scent and know you are there. If you cannot detour, look for a climbable tree while waiting for the bear to move away from your route.
—If a grizzly charges, your options are:
- *drop a pack or jacket to distract the bear
- *climb at least 12 feet up a stout tree
- *as a last resort, assume a "cannon ball" position to protect your head and stomach while playing dead.

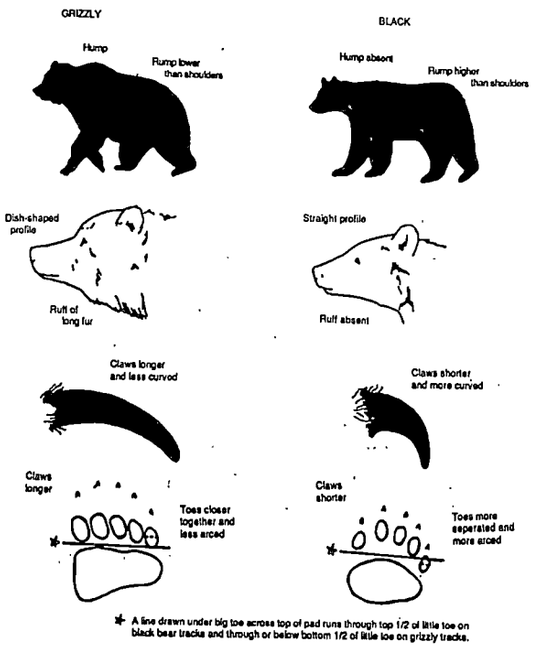
Because grizzlies can attain short bursts of speed up to 40 mph, running away is a poor option.

If you are involved in a conflict with a bear, regardless of how minor, report it to a park ranger as soon as possible. Someone else's safety may depend on it.

BEAR MANAGEMENT AREAS
Exceptional combinations of food, shelter and space draw grizzlies to some parts of Yellowstone more than others.

In these BEAR MANAGEMENT AREAS, human access is restricted to reduce impacts on the bears and their habitat. Information about these areas and their restrictions is available at ranger stations and visitor centers.

Bear Facts: Characteristics of Grizzly & Black Bears



* A line drawn under big toe across top of pad runs through top 1/2 of little toe on black bear tracks and through or below bottom 1/2 of little toe on grizzly tracks.

GRIZZLY BEAR
(Ursus arctos horribilis Ord)

COLOR: Varies from black to blonde; frequently with white-tipped fur, giving a grizzled "silvertip" appearance.

HEIGHT: About 3-1/2 feet at the shoulder; reaches 6 to 7 feet when standing on hind legs.

WEIGHT: Adults average 350 lbs. Some weigh 650 to 700 lbs and, rarely, 800 lbs or more. Females are generally smaller than males.

HOME RANGE SIZE: Males: 73 to 1059 square miles; Females: 11 to 486 square miles.

LIFE EXPECTANCY: 15 to 20 years in the wild; 30 or more in captivity.

BLACK BEAR
(Ursus americanus Pallas)

COLOR: Varies from pure black to brown, cinnamon or blonde; in the Rocky Mountains about 50 percent are black with a brown muzzle.

HEIGHT: About three feet at the shoulder.

WEIGHT: Adults range from 125 to over 500 lbs. Females are generally smaller than males.

HOME RANGE SIZE: Males: 2 to 76 square miles; Females: 1 to 19 square miles.

LIFE EXPECTANCY: 15 to 20 years in the wild; 30 or more in captivity.

A small grizzly is often difficult to distinguish from a large black bear. However, all bears are dangerous; treat them with extreme caution. Sows with cubs are especially ferocious when protecting them from real or perceived danger. If you discover an animal carcass, be alert; these are important sources of food, especially during spring, and bears will aggressively defend their caches.

Where Are The Bears?

In the past, bears were a common sight in Yellowstone National Park — along the roads, in campgrounds and developed areas. Massive traffic "bear jams," personal property damages and injuries caused by bears were also common. As visitation to the park increased, so did the number of bear incidents. During the period from 1931 through 1969, bears, both black and grizzly, caused an average of 148 property damages and 48 personal injuries per year. Some roadside beggar bears were being accidentally killed by motor vehicles, and aggressive bears involved in personal property damage or injuries had to be destroyed. The situation was not good for either people or bears, and the National Park Service sought to correct it.

What caused this problem? Bears were associating people with mealtime. Ninety-five percent of the injuries to people by bears were related to bears seeking human foods and garbage. In the early days of the park, both black and grizzly bears quickly developed a taste for readily available human foods. The presence of open garbage dumps and the willingness of travellers to stop and feed bears along the roadsides only encouraged this taste. Simply put, bears had come to depend on peoples' food and garbage as a substitute for their natural diet.

So what was the National Park Service to do to correct this problem? During the late 1960s and early 1970s, an intensive bear management program began with an emphasis on restoring and maintaining natural populations of grizzly and black bears as part of the park's native fauna, and on providing for the safety of park visitors. To accomplish these goals, the following objectives were critical:

1. **Public Awareness:** Inform and educate people about bears, especially about the value of having bears and how to minimize conflicts when visiting or living in bear country. Emphasize the need to eliminate unnatural food sources in the form of human food and garbage in order to reduce property damage, personal injuries and the subsequent removal of problem bears.

2. **Elimlnate Unnatural Food Attractants:** This is a program based on prevention. All human food and garbage is secured so that it is unavailable to bears. This is accomplished by providing visitors and employees with bearproof garbage cans and by implementing strict food security regulations. Ranger patrols insuring regulation compliance, prohibiting the feeding of wildlife, frequent garbage pickups, and the hauling of all garbage out of the park daily are additional measures the National Park Service takes to meet this objective.

3. **Prompt Management Response:** When prevention, through the elimination of all unnatural food attractants, does not deter a bear from frequenting an area where people congregate, an attempt is made to modify the bear's behavior. Trapping the bear and relocating it to an area away from concentrations of people is the most common method used. If attempts fail, and the bear continues to pose a threat to people, it is removed from the population.

4. **Continued Research on and Monitoring of Bears and Their Activities:** Research provides management with factual knowledge about bear distribution, population dynamics, behaviors and the ecology of bear-human interactions. This information is essential when evaluating the effectiveness of management programs affecting or affected by the grizzly bear population.

The monitoring of bear activity identifies areas where the potential for a conflict between people and bears exists and insures that the management program is implemented when necessary. To insure the safety of park visitors and employees and the protection of bears, areas with high levels of bear activity are patrolled by rangers and posted with warning signs, or restricted.

The majority of information about bear activity comes from people who report sighting bears or signs of a bear being in an area (such as tracks or scat). Everyone who sees a bear, or is involved in a bear incident, should report it to a park ranger. The bear's welfare and safety of other park visitors may be at stake.

The first years of the program showed that as unnatural food sources were eliminated inside the park, some bears switched to natural diets. Bears that continued to utilize unnatural food sources were trapped and relocated away from concentrations of people in hopes they would establish themselves totally independent of unnatural food sources. Those bears that returned to areas with concentrations of people and continued to seek unnatural foods and to threaten the safety of park visitors were removed from the population.

As the program progressed and as bears either switched to natural diets or were removed from the population, the numbers of property damages and injuries and the need to remove "problem" bears were reduced. The intense bear management program begun in the 1960s and early 1970s remains in place today in Yellowstone. However, it is no longer aimed at correcting a problem situation but at preventing such a situation from developing.

Bears continue to be observed in Yellowstone, many from the roadways. Most bear observations occur during early morning or evening hours, and near tree cover along the edge of open areas. The bear population in Yellowstone today is wild and continues to exist as part of a natural system, providing park visitors lucky enough to see a bear with a true National Park experience.

Aversive Conditioning to Manage Bears

In cooperation with the Wyoming Game and Fish Department, the National Park Service is researching the possibility of modifying bear behavior through aversive conditioning. This program targets bears that are in danger of getting into problem situations which could lead to their removal from the Yellowstone population.

If you see or hear about park rangers or game wardens shooting at bears with "odd looking" weapons, they are using a modified gas gun to propel a projectile. This projectile is filled with water and is designed to explode on impact, creating a source of pain without causing harm to the bear. When a bear is involved in an activity that could lead to problems, it will be shot with one of these projectiles. The objective is for the bear to associate pain with that particular activity and hopefully avoid similar situations in the future.

While preventing bears from getting into problem situations in the first place is the best method of insuring the survival of the bear, this project may provide a future means of saving bears that would otherwise be removed from the population.

Trumpeter Swans Need Your Help

In the past, Yellowstone National Park has been instrumental in conservation efforts to save the trumpeter swan. Recently, the trumpeter swan has been facing more problems, both natural and man-caused, than ever before.

In an effort to reduce man-caused problems, the Trumpeter Swan Recovery Fund was established. Our most recent project is a cooperative venture involving Yellowstone National Park, the Montana Department of Fish, Wildlife and Parks, the U.S. Fish and Wildlife Service and the Call of the Wild Ranch just south of Livingston, Montana. The project calls for replacing existing mute swans on the ranch with captive bred trumpeter swans; the eventual goal is for natural reproduction of trumpeter swans on the ranch, with the offspring flying freely in the Paradise Valley and throughout the Greater Yellowstone Ecosystem. You can help in the recovery of the trumpeter swan by making donations to the following tax deductible fund:

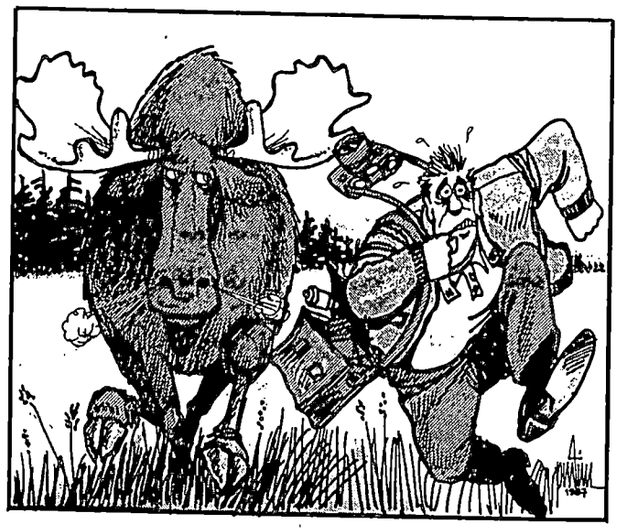
Trumpeter Swan Recovery Fund
c/o Yellowstone Association
P.O. Box 117
Yellowstone National Park, WY 82190

Photographers: Don't Let This Develop

Yellowstone inspires the photographer in all of us. Wildlife are particularly fascinating to observe and photograph, perhaps because there are few places where it is possible to see an animal in its natural environment. Nearly all the animals inhabiting Yellowstone when it was established 117 years ago still roam this vast wilderness. However, no matter how tame these animals may appear to be, they are wild, unpredictable and dangerous. Females with young are very protective and can be ferociously aggressive. **Keep a safe distance from all wildlife. It is against the law to approach within 100 yards of bears or within 25 yards of other wildlife.** A simple way to know if you are disturbing wildlife is: if you cause an animal to move, you are too close.

Every year, the major cause of injury to visitors by wildlife is approaching animals too closely. At least 90 percent of bison gorings have resulted when visitors approached to within 10 to 15 feet to take a picture. In the past few years, two people have been killed by grizzly bears in national parks while trying to get photos. As a rule, a camera lens of less than 200mm is inadequate for wildlife photography. If your camera is not equipped with telephoto lenses, do not attempt closeup photography. Instead, photograph the animal in its surroundings or purchase slides or books. Be especially alert when photographing bears. Look for signs of activity such as tracks, scat, or animal carcasses. Make the bear aware of your presence by making noise.

Animals in the wild behave differently than animals in zoos, and undisturbed space is among the greatest of their needs. Respect this, and you will be rewarded by seeing more of their natural activities and discovering how they live in the wild. You'll also expand your photo opportunities and have a safe, rewarding visit.



Hamilton Stores, Oldest Park Concessioner

As 1990 approaches, Hamilton Stores looks forward to celebrating its 75th anniversary. We take great pride in being the oldest concessioner under the jurisdiction of the National Park Service and a family owned, third generation business. In 1915, Charles Ashworth Hamilton established Hamilton Stores, Inc. with the purchase of the old Klamer General Store in the Upper Geyser Basin of the Old Faithful area. Pictures of the facility, complete with horses and buggies parked in front, still exist. Very quickly after those pictures were taken, Hamilton Stores, Yellowstone Park, and most definitely, the entire nation, moved into the automobile age. Hay barns were replaced by service stations and we all moved into a new era.

The wonders of Yellowstone are now accessible to all who wish to explore and enjoy them. To those who prefer a leisurely pace, much of this great park can be viewed by car. To those who desire a more personal experience, nature walks, backcountry hiking and backpacking, by permit, are options.

Hamilton Stores takes pride in its many years of serving the traveling public with its fifteen facilities within Yellowstone. Comprised of eight general stores, three photo shops, two mini-convenience stores, a Christmas and Photo Shop in the Mammoth area, and a tackle shop located in the Bridge Bay Marina, we carry and provide a broad range of products and services needed by visitors during their stay in Yellowstone.

From food products, home decor and gifts, apparel, souvenirs, fishing, camping and photo supplies, right down to on-site photo processing in select locations, we try to offer the various conveniences necessary and desirable to assist in making your Yellowstone stay as pleasant and memorable an experience as possible.

Hamilton Stores invites you to visit its locations and share a bit of our history. Welcome to Yellowstone... and our best wishes for an enjoyable stay in your National Park.

Church Services & Handicapped Access

Schedules of services of worship are posted at visitor centers, campgrounds and on other bulletin boards throughout Yellowstone. Services take place both in the park and in communities located outside of the park.

A listing of facilities, scenic areas and features which are accessible to the handicapped can be obtained at any visitor center. For more information, or to make suggestions, contact the Handicapped Access Coordinator, Yellowstone National Park, WY 82190.

Expedition Yellowstone -- An Exciting Learning Experience

The National Park Service announces a new curriculum for upper elementary grades called *Expedition: Yellowstone!* Students are now able to learn about the park either by studying it at their school or by combining classroom work with a trip (an "Expedition!") to Yellowstone.

Aimed at the 4th, 5th and 6th grade levels, the curriculum materials consist of a teacher's workbook and a storybook, tied together by shared concepts. Teachers registering to participate in the program will also receive information for planning an "Expedition!" to the park. Rustic cabins at the Lamar Buffalo Ranch may be reserved and school groups are assigned a park ranger to help plan and prepare their trip.

For more information, mail this coupon to the address below, leave it at any visitor center or call (307) 344-7381, ext. 2338.

Expedition Yellowstone
National Park Service
P.O. Box 168
Yellowstone National Park,
Wyoming 82190

Please send me more information about the *Expedition Yellowstone!* program

Name _____

School _____

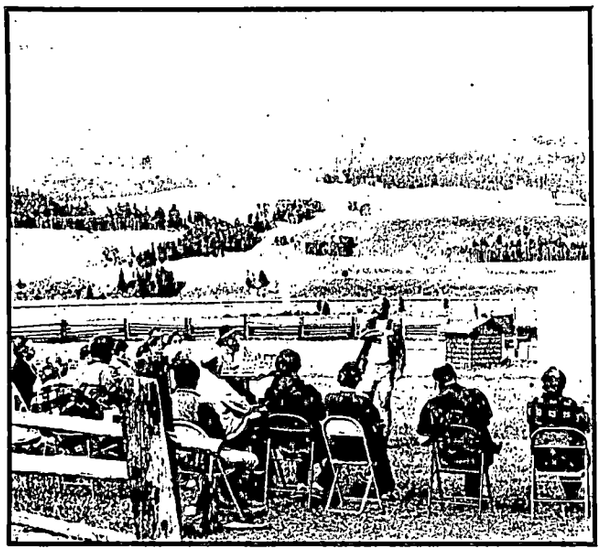
Address _____

City, State, Zip _____

(Area Code) Phone _____

_____ (Check)
Please call me, I have a question.

Nature Study at Yellowstone Institute



Bill Lang, editor of *Montana the Magazine of Western History,* conducting a class at the Yellowstone Institute in the Lamar Valley. Over 60 courses on topics such as geysers, grizzlies, photography, wildflowers and park history are offered. For details on these learning vacations, call (307) 344-7381, ext. 2384 or write to Box 117, Yellowstone National Park, WY 82190 *(Photo by Gene Ball)*

Don't Forget Your Fishing Permit

In Yellowstone, bald eagles, osprey, pelicans, otters, grizzly bears and other wildlife take precedence over humans as consumers of fish. Additionally, all fish are wild (there is no stocking), so there must be sufficient adult fish to reproduce and maintain populations and to assure genetic diversity. These facts require both a philosophical and literal distinction between recreational angling and consuming fish. In Yellowstone, angling is based on fishing for native species or wild trout in a natural setting.

Fishing regulations in Yellowstone National Park have evolved as ongoing research reveals population trends and interrelationships with the rest of the Yellowstone ecosystem. Increasing numbers of anglers have also influenced the development of regulations by their impact on certain species and aquatic habitats. Regulations have been simplified to a concept known as "species management." This approach is commonly used by fish and wildlife agencies in the western United States, and it will more effectively achieve management goals of preserving and restoring native fishes and their habitats, managing fish as an essential part of the total park ecosystem, and providing recreational fishing opportunities for park visitors consistent with the first two goals.

With some exceptions, Yellowstone's fishing season begins on the Saturday of Memorial Day weekend and closes on October 31. **Exceptions:** all rivers and streams in the Yellowstone River drainage south of the Chittenden Bridge at Canyon open July 15 (including those portions of Yellowstone Lake within 100 yards of a river or stream outlet); all lakes in the Yellowstone River drainage south of the Chittenden Bridge open June 15; the Trout Lake drainage above Soda Butte Creek including Trout, Buck and Shrimp Lakes opens June 15; Agate Creek and Cottonwood Creek, and the Yellowstone River within 100 yards of the mouths of Agate and Cottonwood Creeks, open to fishing on July 15; the Madison, Firehole, Gibbon, Snake, Lewis (below the falls), Lamar and Gardner Rivers and Soda Butte Creek will remain open until the West Entrance Road is closed to visitor traffic for the winter.

A current fishing permit (issued free of charge) is required and must be carried by all persons 12 years of age and older who are fishing in Yellowstone Park. Contact a ranger for more information.

Wolf Pac Now Available for Teachers

A new series of curriculum materials on wolves is currently in production by the National Park Service and the Denver Museum of Natural History. "Wolf Pac!" is designed to help teachers and parents, together with their children, learn more about one of the most fascinating and controversial animals in North America, the gray wolf. "Wolf Pac!" consists of several publications about wolves as well as activities for young people targeted to grade levels K-4, 5-8, and 9-12.

These materials will be ready for shipment in June, 1989, and the best part is...they're free! How do you get them? Simply supply us with the information requested below, and we'll see that a copy of "Wolf Pac!" is sent to you as soon as it's available.

Yes, I would like to receive "Wolf Pac!" Please send my copy to:

Your Name_____

Your School_____

Address_____

City, State, ZIP_____

Grades Taught_____ Is this your home or school address?_____

Please turn this coupon in to any Yellowstone Visitor Center or mail it to: "Wolf Pac!", Division of Interpretation, P.O. Box 168, Yellowstone National Park, WY 82190.

Information On Neighboring Parks

Information about roads and facilities in Grand Teton and Glacier National Parks is available by calling these numbers:

Grand Teton National Park
(307) 733-2880
Glacier National Park
(406) 888-5441

TW Recreational Services, Inc. Yellowstone's Lodging Concessioner

TW Recreational Services, Inc. has been Yellowstone's lodging concessioner since 1979. Summer operations include the park's lodging facilities, R.V. Park, restaurants, cafeterias, snack shops, cocktail lounges, gift shops, cookouts, corrals, sight-seeing services and a full service marina on Yellowstone Lake. Winter operations include lodging, restaurants, lounges, ski shops, snowcoach tours and snowmobile rental.

TW Recreational Services, Inc. has decades of experience in providing lodging, food, gift shops and other visitor services at national parks, state parks, state lodges and recreational areas. The company operates visitor facilities at Zion and Bryce Canyon National Parks in Utah, North Rim - Grand Canyon National Park in Arizona, Everglades National Park in Florida, and Scotty's Castle, Death Valley National Monument in California.

During the past several years, TW Recreational Services, Inc. has provided millions of dollars in investment funding for new concession facilities at Yellowstone, Zion and Bryce Canyon National Parks, and improvements in concession facilities at Grand Canyon's North Rim and Everglades National Parks.

The staff and management extend a warm welcome to Yellowstone visitors. We invite your questions and comments and will do our utmost to assure your visit to Yellowstone is a memorable experience. Contact TW Recreational Services, Inc., Yellowstone National Park, WY 82190. Phone (307) 344-7311 for information and reservations.

TW Recreational Services, Inc. hires more than 2000 seasonal employees in Yellowstone National Park. For employment information and applications, please contact the above address.

Directory of Visitor Services

Facilities & Services offered by

Hamilton Stores, Inc. * TW Recreational Services, Inc. * Yellowstone Park Service Stations * Yellowstone Park Medical Services

Reservations are suggested for lodging & activities; call TW Recreational Services (307) 344-7311.

National Park Service Information (307) 344-7381; Emergency Dial 911

Accommodations

OLD FAITHFUL INN - Rooms, suites. May 5-October 11
OLD FAITHFUL SNOW LODGE - Rooms and cabins. May 19-October 30
OLD FAITHFUL LODGE - Cabins. May 23-September 25
GRANT VILLAGE - Rooms. May 31-September 18
LAKE YELLOWSTONE HOTEL - Rooms, suites, cabins. May 24-September 17
LAKE LODGE - Cabins. June 5-September 11
CANYON LODGE - Cabins. June 12-August 28
ROOSEVELT LODGE - Cabins. June 3-September 5
MAMMOTH HOT SPRINGS HOTEL - Rooms, cabins. May 27-September 17

Restaurants, Cafeterias Fast Foods

* **OLD FAITHFUL INN DINING ROOM** - May 5-October 11
OLD FAITHFUL INN, PONY EXPRESS SNACK SHOP May 25-September 25
OLD FAITHFUL SNOW LODGE FAMILY RESTAURANT - May 19-September 5; reopens October 11-October 30
OLD FAITHFUL LODGE SNACK SHOP - May 24-September 25
OLD FAITHFUL LODGE CAFETERIA - May 23-September 24
OLD FAITHFUL FOUR SEASONS SNACK SHOP May 26-September 5
* **GRANT VILLAGE RESTAURANT** - May 31-Sept. 18
GRANT VILLAGE STEAK HOUSE - May 31-June 6, dinner only; June 7-Sept. 4, breakfast and dinner
* **LAKE YELLOWSTONE HOTEL DINING ROOM** May 24-September 17
LAKE LODGE CAFETERIA - June 5-September 11
LAKE LODGE SNACK SHOP - June 6-August 27
CANYON LODGE SNACK BAR - June 5-Sept. 5
CANYON LODGE CAFETERIA - June 12-August 28
CANYON LODGE DINING ROOM - June 18-Aug. 25
ROOSEVELT LODGE DINING ROOM - June 3-September 5
ROOSEVELT LODGE COOKOUT - Dinner June 4-September 4. Breakfast June 27-August 18
* **MAMMOTH HOT SPRINGS HOTEL DINING ROOM** - May 27-September 17
MAMMOTH FAST FOODS - May 13-September 24

* Dinner reservations required. Inquire at hotel front desk or dining room host stand.

Hotel & Lodge Gift Shops

OLD FAITHFUL INN - May 5-October 11
OLD FAITHFUL SNOW LODGE - May 19-October 30
OLD FAITHFUL LODGE - May 23-September 25
GRANT VILLAGE - May 31-September 18
LAKE YELLOWSTONE HOTEL - May 24-Sept. 17
LAKE LODGE - June 5-September 11
CANYON LODGE - June 12-August 28
ROOSEVELT LODGE - June 3-September 5
MAMMOTH HOT SPRINGS HOTEL - May 27-September 17

Public Showers Laundry

OLD FAITHFUL LODGE - Showers. May 23-Sept. 25
GRANT VILLAGE CAMPGROUND - Showers and laundry. June 16-October 16
LAKE LODGE - Laundry. June 5-September 11
FISHING BRIDGE RV PARK - showers and laundry. May 27-September 10
CANYON VILLAGE CAMPGROUND - Showers and laundry. June 9-September 11

Light Meals Fast Foods

OLD FAITHFUL PHOTO SHOP - April 20-October 22
OLD FAITHFUL BASIN STORE - May 6-October 11
OLD FAITHFUL BAC STORE - May 14-September 14
WEST THUMB STORE - April 28-October 15
GRANT VILLAGE GENERAL STORE - June 10-September 18
BRIDGE BAY MARINA STORE - June 9-Sept. 16
LAKE GENERAL STORE - May 21-September 17
FISHING BRIDGE GENERAL STORE - May 20-September 7
CANYON PHOTO SHOP - April 27-October 10
CANYON VILLAGE GENERAL STORE - May 26-September 4
TOWER FALL STORE - May 27-September 12
ROOSEVELT STORE - June 3-September 5
MAMMOTH HOT SPRINGS GENERAL STORE - Open year round

General Stores

OLD FAITHFUL BASIN STORE - May 6-October 11
OLD FAITHFUL BAC STORE - May 14-September 14
GRANT VILLAGE MINI STORE - June 1-September 26
****GRANT VILLAGE GENERAL STORE** - June 10-September 18; one hour film processing - approx. June 10-September 4
WEST THUMB STORE - April 28-October 15
BRIDGE BAY MARINA STORE - June 9-Sept. 16
LAKE GENERAL STORE - May 21-September 17
****FISHING BRIDGE GENERAL STORE** - May 20-Sept. 7 One hour film processing - approx. May 20-Sept. 4
CANYON VILLAGE GENERAL STORE - May 26-September 4
TOWER FALL STORE - May 27-September 12
ROOSEVELT STORE - June 3-September 5
MAMMOTH HOT SPRINGS GENERAL STORE - Open year round
** This location offers one hour film processing

Photo Shops Gifts, Souvenirs

****OLD FAITHFUL PHOTO SHOP** - April 20-October 22 One hour film processing - approx. May 1-Sept. 10
BRIDGE BAY MARINA STORE - June 9-Sept. 16
****CANYON PHOTO SHOP** - April 27-October 10 One hour film processing - approx. May 26-Sept. 4
MAMMOTH HOT SPRINGS CHRISTMAS AND PHOTO SHOP - June 2-August 31
** This location offers one hour film processing

Service Stations

OLD FAITHFUL, Lower Station -April 20-Oct. 31or later
OLD FAITHFUL, Upper Station - May 13-September 5
GRANT VILLAGE - June 1-September 18
LAKE YELLOWSTONE - May 20-September 18
FISHING BRIDGE - May 1-October 31 or later
CANYON VILLAGE - May 8-October 10
TOWER JUNCTION - June 3-September 5
MAMMOTH HOT SPRINGS - May 12-October 9

OLD FAITHFUL REPAIR SERVICE - May 26-September 4. Wrecker service will be provided from the Old Faithful stations May 8-October 14.
GRANT VILLAGE REPAIR SERVICE - June 1-September 18
FISHING BRIDGE REPAIR SERVICE - May 26-September 10. Wrecker service will be provided from Fishing Bridge stations May 8-October 14.
CANYON REPAIR SERVICE - May 26-September 4

OLD FAITHFUL LP GAS PLANT - May 15-Sept. 16
GRANT VILLAGE LP GAS PLANT - June 1-September 18
FISHING BRIDGE LP GAS PLANT - May 1-Oct. 31

Marina

BRIDGE BAY MARINA - Dock rental June 2-September 18; Scenicruiser excursions June 5-September 18; Boat rental, guided fishing trips June 15-September 18.

Horse Operations

MAMMOTH HOT SPRINGS - Trail rides. May 27-September 17
CANYON LODGE - Trail rides. June 10-Sept. 5
ROOSEVELT LODGE - Trail rides, June 3-September 4; Stagecoach Outing, June 3-Sept. 4; Old West Cookouts: Dinner, June 4-September 4; Breakfast, June 27-August 18.

Medical Services

LAKE HOSPITAL - May 29- September 15
Phone (307) 242-7241
OLD FAITHFUL CLINIC - May 29-October 11
Phone (307) 545-7325
MAMMOTH HOT SPRINGS CLINIC - Open year round, weekdays; phone (307) 344-7965

Campgrounds

Operated by the National Park Service. First come, first served except for Bridge Bay. Select sites early. Dates subject to change.

* **MAMMOTH HOT SPRINGS** - Open Year Round
* **MADISON** - May 5-October 31
* **BRIDGE BAY** - May 26-September 25
On reservation system; see page 6.
* **NORRIS** - May 19-September 18
SLOUGH CREEK - May 26-October 31
TOWER FALL - June 2-September 18
* **FISHING BRIDGE - Hard-sided camping vehicles only;** May 26-September 5
FISHING BRIDGE RV PARK - Utility hookups. **Hard-sided camping vehicles only.** Maximum length 40 feet. Operated by TW Recreational Services, Inc. Call (307)344-7311 for reservations. May 27-September 10
* **CANYON VILLAGE - Hard-sided camping vehicles only.** June 9-September 11
* **GRANT VILLAGE** - June 16- October 16.
* **INDIAN CREEK** - June 9-September 18
PEBBLE CREEK - June 16-September 11
LEWIS LAKE - June 16-October 31
* Triangle Firewood sells firewood at these campgrounds

Facilities and services are available in communities near the park. For information, contact the Chambers of Commerce in:

Billings, Montana
(406)245-4111

Bozeman, Montana
(406)586-5421

Cody, Wyoming
(307)587-2297

Cooke City-
Silver Gate Montana
(406)838-2265

Gardiner, Montana
(406)848-7681

Jackson, Wyoming
(307)733-3316

Livingston, Montana
(406)222-0850

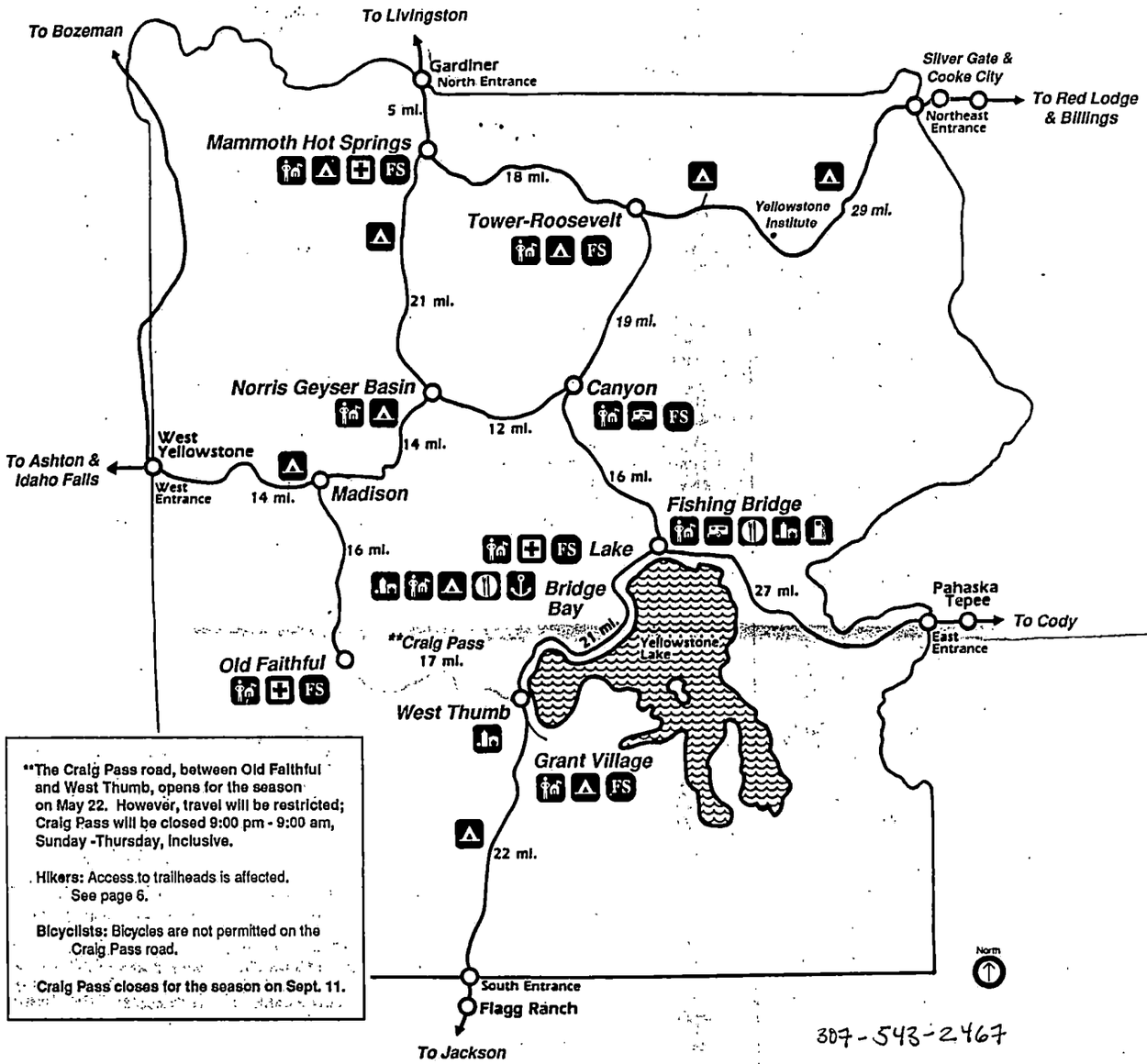
Red Lodge, Montana
(406)446-1718

West Yellowstone,
Montana
(406)646-7701

Dubois, Wyoming
(307)455-2556

Yellowstone National Park Roads and Facilities

Emergency: Dial 911 Contact a Ranger: (307) 344-7381



**The Craig Pass road, between Old Faithful and West Thumb, opens for the season on May 22. However, travel will be restricted; Craig Pass will be closed 9:00 pm - 9:00 am, Sunday -Thursday, inclusive.

Hikers: Access to trailheads is affected. See page 6.

Bicyclists: Bicycles are not permitted on the Craig Pass road.

Craig Pass closes for the season on Sept. 11.

307-543-2467

- Visitor Center or Ranger Station
- Campground
- Campground - Hard-sided vehicles only
- Food Service
- General Store
- Marina
- Hospital or Clinic
- Gasoline
- FS Full Services*

*Full services indicates lodging, food service, general store, gasoline, rest rooms and telephone.

A listing of park facilities and services, with opening and closing dates for the 1989 season, is on page 11.

A more complete park map can be obtained at any entrance station, visitor center or service station.

June 6, 1989

MEMORANDUM FOR ED McNALLY

FROM: BOB SIMON

SUBJECT: HISTORY OF THE JACKSON AREA

John D. Rockefeller visit Jackson Lake for the first time in 1924. He was disturbed by the growing tacky commercialism of the area. In 1927, Horace Albright, the Yellowstone superintendent, convinced Rockefeller to buy up land in the Jackson hole area to preserve it as parkland. Rockefeller formed the Snake River Land Co. and secretly bought over 30,000 acres for more than $1.4 million. This land, and other land, was eventually turned into the present Grand Tetons National Park.

President Chester Arthur was the first President to travel through the Tetons and Yellowstone, in 1883. By this time, word had travelled East about the beauty of the area, so Arthur took a vacation out there to see the sights and meet some Indians. After debarking the train, the Presidential party, including half the cabinet, traveled by pack train, and slept in tents, along the Snake River, through Jackson Hole and up to Yellowstone. They were accompanied by two troops of cavalry.

Newspaper reporters were banned from the trip. Gen. Sheridan told two reporters from Chicago that if they followed, they would be arrested and jailed. President Arthur occasionally issued press releases on their activities on the trip.

The path Arthur followed was known as the "Bottle trail" named for the empty bottles of booze that trailed the Presidential party.

June 6, 1989

MEMORANDUM FOR ED McNALLY

FROM: BOB SIMON

SUBJECT: TETON SCIENCE SCHOOL

The Teton Science School is a non-profit private school formed in 1967. Its budget is covered 70% by tuition and 30% by donations.

The School is on Park Service land, leased to the school until 2003.

The School's mission is to educate interested citizens and students about the natural history and ecology of the Teton/Yellowstone area and wildlife.

Students range from 5th grade to senior citizens. Local schools, college students, and high school students from as far as New England take advantage of the varied courses offered. Senior citizens make up an increasing number of the students. Scouting groups also take courses.

The school operates 50 weeks of the year. Classes last from 1 day to six weeks. The typical course is 3-5 days. Lectures, field trips, and raft trips are some of the teaching methods. Sometimes the School will conduct research for the Park Service, but the main purpose of the research is as a teaching method.

Visible at the speech site: Grand Teton peaks in the background, grasses and pale green sagebrush in the foreground. Wildflowers likely to be present: purple larkspur, blue lupine, yellow arrow-leafed balsam root. Hawks and bald eagles are present overhead. Elk, muledeer, and moose can be seen sometimes near the school.

At the school is the Murie museum: a collection of 2,500 specimens of stuffed birds and animals. Olaf and Mardy Murie collected these specimens over a long lifetime of pioneering work in surveying the Jackson area for the government in the early part of this century. Mardy, 86, still lives in the area. Olaf, one of the guiding forces in the founding of the Wilderness Society, is now deceased.

June 6, 1989

MEMORANDUM FOR ED McNALLY

FROM: BOB SIMON

SUBJECT: THE PRESIDENT AND GEORGE P. AT JACKSON LAKE

The President, Mrs. Bush and George P. spent three nights at Jackson Lake on June 5-8, 1987. Jeb Bush did not go.

George P. didn't catch any fish while with the President, but he did catch three when he went fishing with Mrs. Bush.

The President caught two or three fish. They let all the fish go.

The President let George P. drive the power boat. Later, they went out together in a row boat.

(McNally/Simon)
June 8, 1989, 11:00 a.m.
Draft Two (TETONS)

PRESIDENTIAL REMARKS: ENVIRONMENTAL ADDRESS
GRAND TETONS NATIONAL PARK
TUESDAY, JUNE 13, 1989

Thank you, _____, for that warm introduction. And thank you also for one of the best birthday presents anybody in the state of Wyoming ever got -- an evening with my grandson, fishing on Jackson Lake.

Maybe you know the classic line from the Wind in the Willows: "There is nothing -- absolutely nothing -- half so much worth doing as simply messing about in boats." [[PAUSE]] And it's a good thing. Because we sure didn't catch any trout.

And it's always good to see my other fishing buddy, Al Simpson, and my friend Malcolm Wallop. But I was a little surprised to see them here in the Tetons to look at wildlife. You'd think they'd see enough of that in Congress.

It's well known here that Wyoming's first tourist was a trapper named John Colter, a veteran of the Lewis and Clark Expedition. In 1808 Colter was captured by the locals and -- stripped naked and hotly pursued -- given a chance to run for his life. Seven days later he arrived at a Spanish fort -- with sore feet and a sunburned back. [[PAUSE]] Today, George P. and I are awful glad Wyoming's attitude towards visitors is -- what's the phrase? -- kinder, gentler.

We meet in the heart of an environmental success story. Part of a tradition that began when Abraham Lincoln granted

Yosemite Valley to California, to set aside as a preserve, and continued through Teddy Roosevelt and others who found inspiration in these majestic American peaks.

Creating national parks was an American idea -- an idea imitated around the world. **And it was one of our best.**

Since these lands were set aside, five generations of Americans have enjoyed Yellowstone and the Tetons -- the largest intact natural area in the temperate zones of the Earth. And yesterday I stood in the East Room at the White House to announce a proposal designed to ensure we do our part to improve and preserve our natural heritage from coast to coast -- and beyond. **For another five generations -- and beyond.**

And today, with my back to the Pacific and the jewels of the American Rockies, I look east across this fertile and productive land and call on the American people -- and on Congress -- to join me in this new initiative to make a better world.

Last summer, I called 1988 "the year the Earth spoke back." Time dubbed spaceship Earth "the Planet of the Year." And although, ultimately, medical waste and that wandering barge may not present as grave a danger as the ozone holes that we cannot see, touch or smell, they helped provide the jolt we needed.

I've said it before, when talking about issues such as drug abuse, crime and national security: The most fundamental obligation of government is to protect the people -- the people's health, the people's safety, and, ultimately, our family values and traditions.

Clean air and a healthy environment is essential for the safety of all our people, and the protection of our traditions.

Nowhere are these traditions more real -- more alive -- than here in the western reaches of Wyoming.

It is a land of legend, of campfire tales of brave Sioux warriors, of Butch Cassidy and the Union Pacific Railroad, of range wars between cattlemen and sheep ranchers. Just over that ridge to the east lies the headwaters of the Wind River, one of the settings in the epic Western, Lonesome Dove. The book begins with the famous passage from T.K. Whipple:

"All America lies at the end of the wilderness road, and our past is not a dead past, but still lives in us. Our forefathers had civilization inside themselves, the wild outside. We live in the civilization they created, but within us the wilderness still lingers. What they dreamed -- we live. And what they lived -- we dream."

Frontier legends have filled America's movie screens -- and America's imagination -- for most of this century.

But the frontier is not the end of the road. It is our inspiration.

The frontiers we face in the final decade leading to the year 2000 are different from those our forefathers faced in the mountains and meadows of the American Rockies. What we face are the frontiers of the mind -- scientific, geographic, cultural -- that remain to be crossed. Let's cross them.

Some say we are running out of time. Running out of resources. Running out of everything.

The only thing we are running out of is imagination -- and the will to bring what we can imagine to life.

Yes, there is a new breeze blowing. And borne upon that wind is a new breed of environmentalism. Our mission is not just to defend what's left -- but to take the offense, to improve our environment across the board.

And we're off and running. With a Clean Air proposal that promises recovery, renewal, and restoration.

And it cannot be an American effort alone. As I said in Europe last month, **environmental destruction knows no borders**. And as the mistrust of the cold war begins to give way to a new recognition of our common interests, international environmental challenges offer model opportunities for cooperation.

Last fall, two whales were saved off American shores by a Soviet icebreaker, a Japanese-built tractor -- and a group of determined American Eskimos with saws and boathooks. Yes, there is a new breeze blowing. And as we speak it is carrying a 156 foot schooner from the Statue of Liberty to Leningrad, an East-West voyage for the environment. And a week ago the airwaves were filled with a five hour concert telecast -- broadcast around the world from New York, London and Brazil -- on environmental challenges and our common future.

Many such international events are symbolic. But here at home, the substance awaits. It's in my new proposals to Congress

-- proposals for cleaner air, for an end to acid rain, urban smog ozone depletion and ~~other harmful~~ toxic emissions.

Congress has been deadlocked on Clean Air for a long time. When my proposals pass, it will mark the first improvements in the Act in 12 years. Other attempts have failed. Competing interests have gridlocked.

I understand the traffic jam. Before deciding on these proposals, I met with representatives of business, energy, mining and consumer groups. With people like you here today, who share my passion for the outdoors. And just last Thursday I sat down with the leaders of every major environmental group in America.

I've listened to these competing voices -- to their well-intentioned ideas -- and the sometimes strident honking of their gridlocked horns.

Now, none of the special interest groups are going to get everything they wanted. But today, there's some important common ground. Because there's one thing everyone agrees on: We need action. **And we need it now. It is the right -- the right -- of every American to breath clean air.** And you damned well shouldn't have to drive two thousand miles to do it.

Environmental gridlock must end.

Now, this isn't the first time Congress has had to struggle with questions about the kind of America we are going to bequeath to our children. And it's not even the first time the debate was carried right on into the Tetons.

A little over a hundred years ago, a battle over the future of the parks was building in Congress. Some wanted to exploit the land. And as the debate raged in the summer of 1883, President Chester Arthur boarded a train headed west out of Washington. By the time he reached Chicago, the press was warned that any reporters who followed would be dropped off the next railroad bridge. [[PAUSE]] No, Marlin. That wouldn't work on Air Force One.

On August 5th, 1883, the presidential train stopped in Wyoming at the banks of the North Platte River, and Arthur embarked by mule wagon for a small fort in the Wind River valley. There the roads ended. And there began a three week, 350 mile odyssey by horseback, as the President traversed the Tetons and Yellowstone. And for anybody inconvenienced by my Secret Service motorcade, I apologize. But you ought to be glad I didn't bring along the 75 calvary soldiers that followed Arthur through Jackson Hole.

President Arthur emerged from the Tetons having retained his reputation as a skilled fisherman. And -- unlike me -- he had 105 pounds of trout to prove it. He called the journey "better than anything [he] ever tried before," and returned to Washington to tell the glory of the Tetons.

You know how the story ended. You are looking at it -- a scene so unspoiled it is little different from the view John Colter first saw in 1808.

And yet, today the Tetons are again threatened by development. And this time the threat comes not from steam engines and logging saws, but from the very West Wind that shaped those peaks, bearing the often invisible acids that gust in from the sun-baked smog of the coast.

It's ironic that, as I've visited with people in these mountains, again and again people say how nice it is to get away from urban air pollution. Well, the bad news is: It's starting to follow you here. But the good news is: We're not going to put up with it any longer. Not here. And not at home where you live most of your lives.

The clean air initiatives we launched yesterday at the White House mark a new chapter in the tradition of protecting our people and their parks. And with the help of Congress, we will conquer the challenges of acid, ozone and emissions. Wherever the next generation may find your children, our goal is nothing less than an America where all the air breathes as clean as morning in the Rockies. Let's cross those frontiers.

June marks the beginning of summer. A family time. A time of remembrance and tradition. An estimated 300 million visitors will come to America's national parks this year -- and yes, I know it sometimes seems like most of them are camped out at your campsite. And with each new day, American families clamber across the craggy trails above us, around Jenny Lake and Paintbrush Canyon, and the aptly-named Rock of Ages. Hands young and old press against the hard basement rock -- exposed by the

elements and nearly as ancient as the Earth itself -- touching the past, testing their future. People return from these spaces rejuvenated, confident, somehow younger.

Our stewardship of the Earth is brief. We owe it to those who follow to keep that in perspective, to be responsible passengers along the way. There is a saying in the Himalaya: "To a flea, alive for 80 days, a man is immortal. And to a man, alive for 80 years, a mountain is immortal. Both are wrong."

We stand in the shadow of the Tetons -- still an unspoiled frontier thanks to the vision of leaders no longer alive. But it is not the last frontier. After the sun went down last night, we got a glimpse of the frontier beyond, George P. and I. It was up there beyond the peaks -- past the clear mountain air that we want to preserve for all Americans -- up there in the stars. And as we closed our eyes to rest, we saw again the one frontier beyond the stars -- the frontier within ourselves.

In the frontiers ahead, there are no boundaries. We must pioneer new technology, new solutions. We were reminded recently of the potential -- still struggling to get beyond theory -- of fusion power and superconductivity at room temperature.

Look upon these American peaks -- and at the American people around you -- and remember. We have hardly scratched the surface of what God put on Earth -- and what God put in man.

# # #

June 6, 1989

MEMORANDUM FOR ED McNALLY

FROM: BOB SIMON

SUBJECT: THE PRESIDENT AND GEORGE P. AT JACKSON LAKE

The President, Mrs. Bush and George P. spent three nights at Jackson Lake on June 5-8, 1987. Jeb Bush did not go.

George P. didn't catch any fish while with the President, but he did catch three when he went fishing with Mrs. Bush.

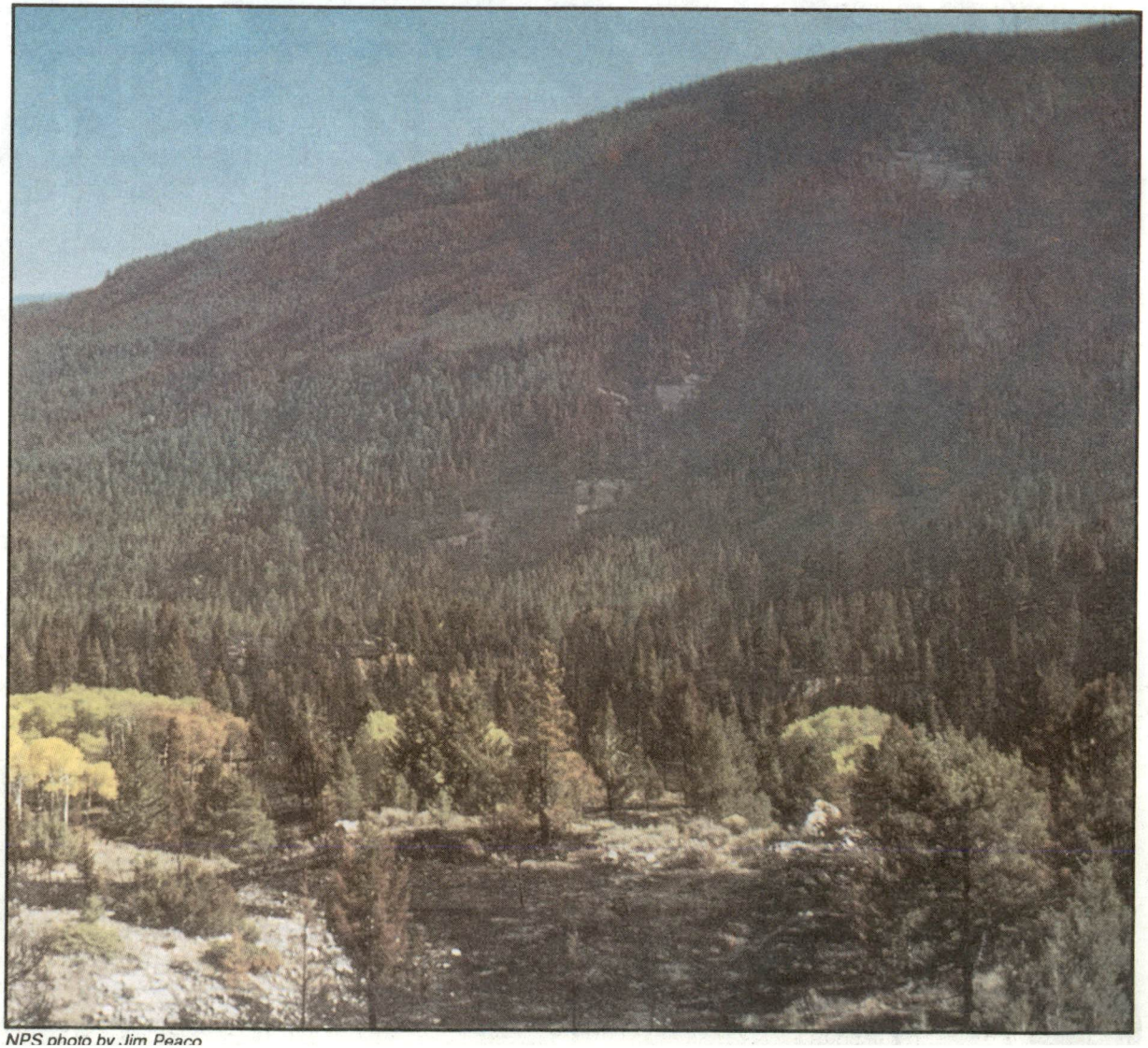
The President caught two or three fish. They let all the fish go.

The President let George P. drive the power boat. Later, they went out together in a row boat.

Yellowstone *fires* 1988

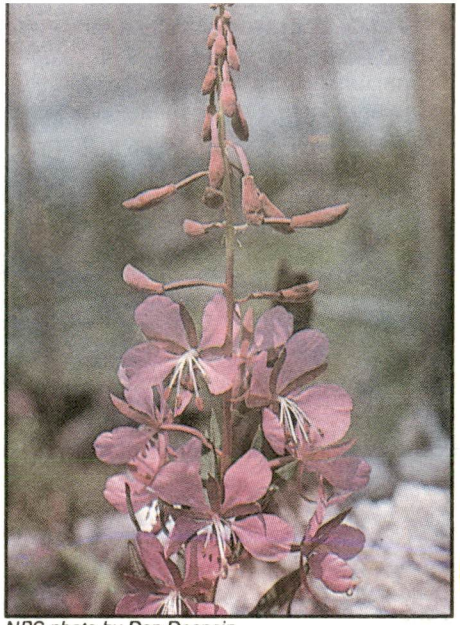
A Special Supplement to Yellowstone Today

NPS photo by Jim Peaco



NPS photo by Jim Peaco

NPS photo by Jim Peaco



NPS photo by Don Despain

Photos clockwise from top:
Crown fire in a lodgepole pine stand.

A mosaic of burned and unburned forest on the slopes of Bunsen Peak.

Some lodgepole pine cones require fire to release seeds.

Fireweed is one of the first plants to appear after a fire.

A bull elk grazes in a newly burned meadow.

Welcome To A Changing Yellowstone

In 1988, Yellowstone and its neighbors experienced a summer like no other in local memory. The Yellowstone fires are already being described as the greatest ecological event in the history of the national parks, and they also were the cause of the greatest fire fighting effort in all of history.

Those of us who live in this part of the Rockies, and the many others who visited the park last summer, received a lesson in the power of nature that we will never forget. We saw spectacular and sometimes frightening fire behavior, and together we rode an emotional roller coaster while the fires grew and spread, sending convection clouds to the stratosphere. We knew the oppressive effects of the dense smoke, but also knew that if the smoke cleared it meant that the winds had returned and the fires were again on the move. It has been a time of human drama, intense media attention, and most of all, awe-inspiring natural changes in the Yellowstone landscape.

Yellowstone is still the magnificent place it always has been; fires are a part of the life processes here, and the park will heal and regenerate its natural scars as it has countless times before. I'm excited about that process, and equally excited to welcome you. We have the rare opportunity to witness wilderness regeneration on a scale rarely seen anywhere on earth. Nature is not always a gentle hostess, but it never fails to be an inspiring teacher. This supplement to Yellowstone Today has been produced to introduce you to what happened here, what it means to the park's natural communities, and what it means to you.

So welcome to Yellowstone, a park with a new face. The features that have attracted tens of millions of visitors in the past are still here: the geysers, wildlife, trout streams, beautiful vistas and peaceful moments are as available as ever. But to them has been added a new attraction, a memorable lesson in wilderness processes that in their own way are as beautiful as an elk or a mountain lake.

Enjoy your park. It has never offered more than it does now.

Robert Barbee, Superintendent

A number of individuals, organizations, corporations and school groups have expressed interest in helping Yellowstone National Park recover from the fires. In response, the Park Rehabilitation and Recovery Program has been organized to coordinate donations and provide information about recovery and rehabilitation projects.

To find out more, ask at any visitor center or write/call the Superintendent, P.O. Box 168, Yellowstone National Park, WY 82190, (307) 344-7381, ext. 2363; or write/call the Student Conservation Association, P.O. Box 550, Charlestown, NH 03603, (603) 826-5206.

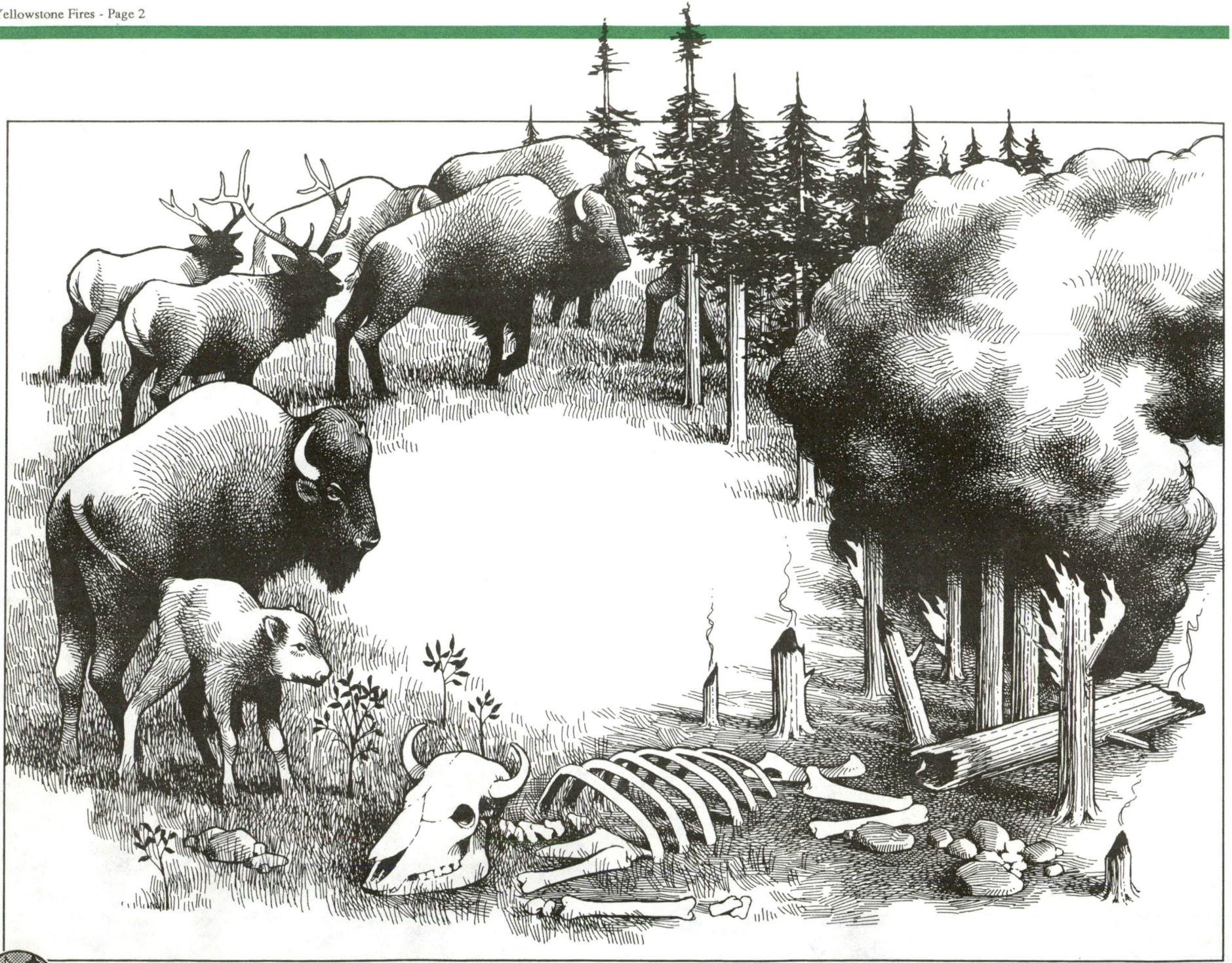


Illustration by Doug Griswold, San Jose Mercury News

Fire History

Naturally caused fires have occurred in the Yellowstone area as long as there has been vegetation to burn - at least since vegetation appeared following the retreat of glaciers about 12,000 years ago. Fire, climate, erosion, and a vast assortment of life forms ranging from microbes to insects to mammals have all played roles in the creation of the vegetative landscape of Yellowstone. During several thousand years of intermittent occupation of the Yellowstone area, native Americans may also have influenced the vegetation in many ways, such as setting fires (accidental or intentional), moving seeds (in plant foods or horse's feed, for example), or influencing the numbers or movements of various plant-eating animals.

After the park was established in 1872, park managers gradually improved their ability to monitor and control fires. Virtually no effective fire fighting was done until 1886, when the U.S. Cavalry was placed in charge of protecting the park. In fact, the soldiers marked the debut of federal involvement in fighting wildfires in the United States.

In the early days, fire suppression was most effective on the park's northern grasslands; fires were not allowed to burn freely on the grasslands and groves of the northern range for nearly a century. Over the rest of the park, which is largely covered by forest, reliable and consistent fire suppression had to wait until modern airborne firefighting techniques became available, in the last thirty or forty years.

Fire Management Plan

Ecologists have known for many years that wildfire is essential to the evolution of a natural setting. In 1972, Yellowstone initiated a program to allow some natural fires to run their courses. The plan was developed and implemented after consultation with related agencies, and with the endorsement of the conservation and scientific communities. Over the years, the plan has been revised and updated as the lessons of each fire season were translated into management practice. All park fires are managed according to criteria in the fire management plan.

Yellowstone's fire management plan has four goals:

1. To permit as many lightning-caused fires as possible to burn under natural conditions.

2. To prevent wildfires from destroying human life, property, historic and cultural sites, special natural features, or threatened and endangered species.

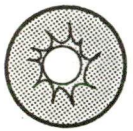
3. To suppress all man-caused fires (and any natural fires whose suppression is deemed necessary) in as safe, cost-effective, and environmentally sensitive ways as possible.

4. To resort to prescribed burning when and where necessary and practical to reduce hazardous fuels, primarily dead and downed trees.

During the sixteen years since this plan has been in effect, tens of thousands of lightning strikes have simply fizzled out with no acreage burned. Of those that have occurred, 235 produced fires that were allowed to burn. Most burned only a small area. In most years Yellowstone is too wet to allow fires to reach any significant size. The largest natural fire in the park's written history prior to 1988 was a burn at Heart Lake in 1931. It was fought, but burned about 18,000 acres.

Fire was permitted to reassert its role in creating and maintaining the natural variety of habitats and vegetation types typical of a healthy wilderness.

During 1989, the Fire Management Plan is suspended pending complete review. All fires will be fought this year.



1988 Drought Worst On Record

The fall of 1987 was unusually dry in the Yellowstone area. With that in mind, park fire specialists began monitoring more than a dozen separate fire danger indices in early April, 1988. By July 1, each was being monitored at 26 locations around the park as part of the routine administration of the park's fire management plan. Through this monitoring system, coupled with regular consultation with regional fire authorities and close attention to weather conditions, fire risk seemed well within established parameters based on experience. But it was weather that eventually proved most difficult to anticipate.

Yellowstone experienced an untypical weather pattern in recent years. Though there was below-average precipitation in winter, summers were abnormally wet, reaching 200 to 300 percent of normal rainfall in July.

Anticipating the continuation of this pattern, park managers and fire behavior specialists saw reason to expect that natural fires could be allowed to burn. Six consecutive years of significantly above-average July rainfall suggested that July of 1988 would be similarly wet.

April rainfall was 155 percent of normal, and May rainfall was 181 percent of normal, but practically no rain fell in June, July, or August, an event previously unrecorded in the park's 112-year written record of weather conditions. In early summer, about 20 lightning-caused fires had been allowed to burn. According to the fire plan, fires were evaluated on a case-by-case basis, each on its own situation and merits, before being allowed to burn. Eleven of these burned themselves out, behaving as such fires did in previous years.

But those that survived into the extremely dry weeks of late June and July met dramatically changed conditions. By late July, moisture content of grasses and small branches in the park reached levels as low as two or three percent, and moisture in downed trees was measured at seven percent. At 8 to 12 percent moisture, lightning will start lots of fires, many of which will burn freely. A series of unusually high winds, associated with dry fronts, fanned flames that even in the dry conditions would not normally have moved with great speed.

Commonly Asked Questions

How many people fought fires in the Greater Yellowstone Area and how many were injured?

A total of more than 25,000 fire fighters worked in the Greater Yellowstone Area in 1988. There were no fireline fatalities or critical injuries prior to October. In early October, there was one fatality on the Clover Mist Fire on the Shoshone N.F. and one critical injury resulting from falling snags. This is a remarkable record considering that suppression continued more than three months with a peak of some 9,500 people and 117 aircraft, with strong, erratic winds, major fire runs and numerous falling trees. A pilot was killed in a light plane crash after transporting fire personnel on September 12. On September 20, a Bell 206 helicopter crashed while filling a bucket on the Clover-Mist Fire, but the pilot was not seriously injured.

What was the total amount spent on fire suppression for the 1988 Greater Yellowstone Fires?

Nearly 120 million dollars has been spent on fire suppression efforts.

What were the major fire suppression impacts?

About 665 miles of hand lines and 137 miles of bulldozer lines were constructed; 32 miles of bulldozer line was in Yellowstone National Park. About 1.4 million gallons of fire retardant were dropped, 10 million gallons of water were dropped by helicopters alone, and innummerable water pumping stations were established. There were also 51 spike camps, 150 helispots and a major camp established for each fire. Portions of National Forests were closed to hunting for safety reasons. Many of these impacts required restoration, which began last fall.

How many acres burned in Yellowstone National Park?

Burn Type	Burn Area (Acres)	Percentage of Burned Area	Total Percent of YNP Area
Canopy	562,350	56.9	25.3
Surface	372,350	37.7	16.8
Meadow	25,200	2.5	1.1
Sage/Grassland	29,025	2.9	1.3
Unburned	1,232,875		55.5
Total in burned area	988,975		
Total acres in park	2,221,800		

Figures are preliminary; final figures will not be available

What effect will the fires have on grizzly bears?

Many research biologists now believe the effects of the fires will enhance areas used by grizzly bears by increasing the diversity of both plant and animal food sources available to the bear. Much needs to be learned, however, and no clear answers may be readily available for several years, although sightings were made of grizzlies eating carcasses last fall and this spring.

In an effort to gain more information of future movements in burned areas, the Interagency Grizzly Bear Study Team will attempt to increase the number of radio-collared bears in the area of the Clover-Mist Fire. At present, 36 bears are radio-collared in the Greater Yellowstone Area, but not all are in areas in or near the burns.

There were 19 sightings of female grizzlies with 40 cubs of the year in the Greater Yellowstone Area in 1988, which is considered excellent cub production for this population.

Concern has been expressed about fire effects on whitebark pine, a fall food source for grizzlies. Less than 20 percent of the whitebark pine stands in and near the fire areas were affected. Impacts will not be known for several years.

What was the extent of soil sterilization from the fires?

Extensive study, mapping of burn intensity, and soil sampling at hundreds of locations have shown that most fires heated soil only to light or moderate intensity; less than one-tenth of one percent of the soil received heat intense enough to penetrate more than two inches deep and kill seeds, roots, bulbs, rhizomes, and other plant matter necessary to regeneration. However, because of steep topography and canyon "chimneys" the percentage of high intensity burn on the Shoshone National Forest has been estimated to be as high as 10-15 percent.

What buildings were burned or damaged?

Structures destroyed in Yellowstone National Park included 18 cabins used by employees and guests, a backcountry patrol cabin, storage structures and other miscellaneous structures. The Forest Service structures destroyed were the Bull Moose Cabin in the Hellroaring drainage of the Absaroka-Beartooth Wilderness and a Shoshone National Forest toilet. One trailhead was damaged. Private structures destroyed and damaged in the Crandall area included 17 mobile homes, 4 dwellings, a general store, and 12 garages and outbuildings. The estimated value of "facilities" damaged or destroyed is $3,280,000.

Where will I see the effects of the 1988 fires as I drive through the park and how can I learn more about them?

The map below shows approximate roadside locations of areas burned during the 1988

Percent of total YNP acres affected	44.5 %

Where will trees be planted to reforest burned areas?

Within the next three or four years, about 7500 acres of tree planting will occur on the Gallatin, Shoshone, and Targhee National Forests. These are preliminary estimates and may be revised upwards.

No major reforestation efforts are planned for Yellowstone National Park or for wilderness in Greater Yellowstone Area National Forests. In keeping with the legislative mandates of these areas, natural reforestation will be permitted to occur. Research indicates that trees in burned areas released abundant seeds following the fires varying with the severity of the burns. Yellowstone Park plant ecologist Don Despain has already documented seed densities in burned forests ranging from 50,000 to 1,000,000 seeds per acre, which equals one to 20 seeds per square foot. Within five years there may be 1,000 seedlings per acre, depending upon how much competition they face from grasses, wildflowers and shrubs. Allowing the park to reforest itself is a concept widely supported in the scientific community

How many animals died in the Greater Yellowstone Area as a result of the fires?

The following chart summarizes where and how many animals are known to have died.

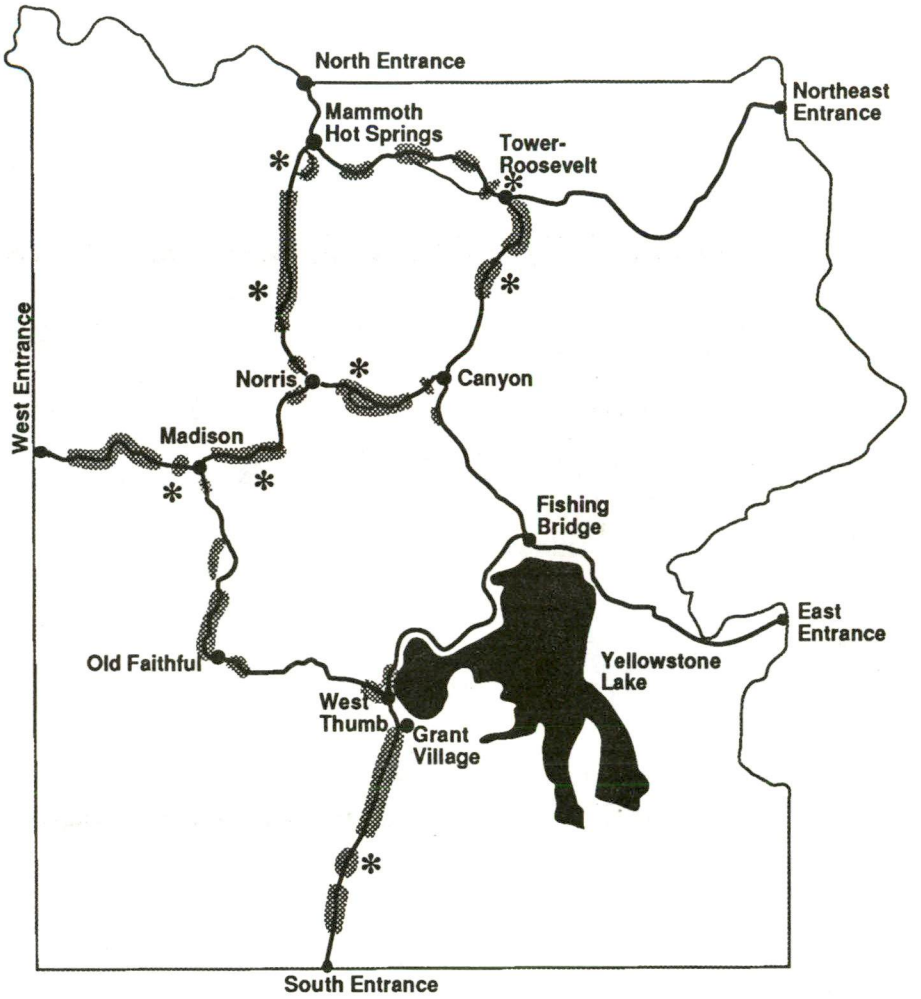
Area	Elk	Deer	Moose	Black Bear	Bison
National Forest lands in Montana	5	2	1	2	0
National Forest lands in Wyoming	83	30	9	4	0
Yellowstone Nat'l Park	257	4	2	0	9
Totals	345	36	12	6	9

No dead grizzly bears, antelope or bighorn sheep were found, but it is now suspected that 2 grizzly bears may have died as a result of the fires. There were also numerous small mammals and birds lost as well as an unknown number of trout. A total of 345 dead elk were discovered in the Greater Yellowstone Area by post-fire surveys. The summering elk population in the Greater Yellowstone Area is approximately 93,000.

Large animals were relatively unaffected during the fires. This conclusion is based on the movements of over 150 collared large mammals and observations from numerous aerial surveys. Data indicated that there was short-term displacement from normal ranges as fire moved through an area.

places.

Asterisks (*) indicate locations of roadside exhibits explaining particular aspects of the fires; **exhibits will be in place by the end of June.**



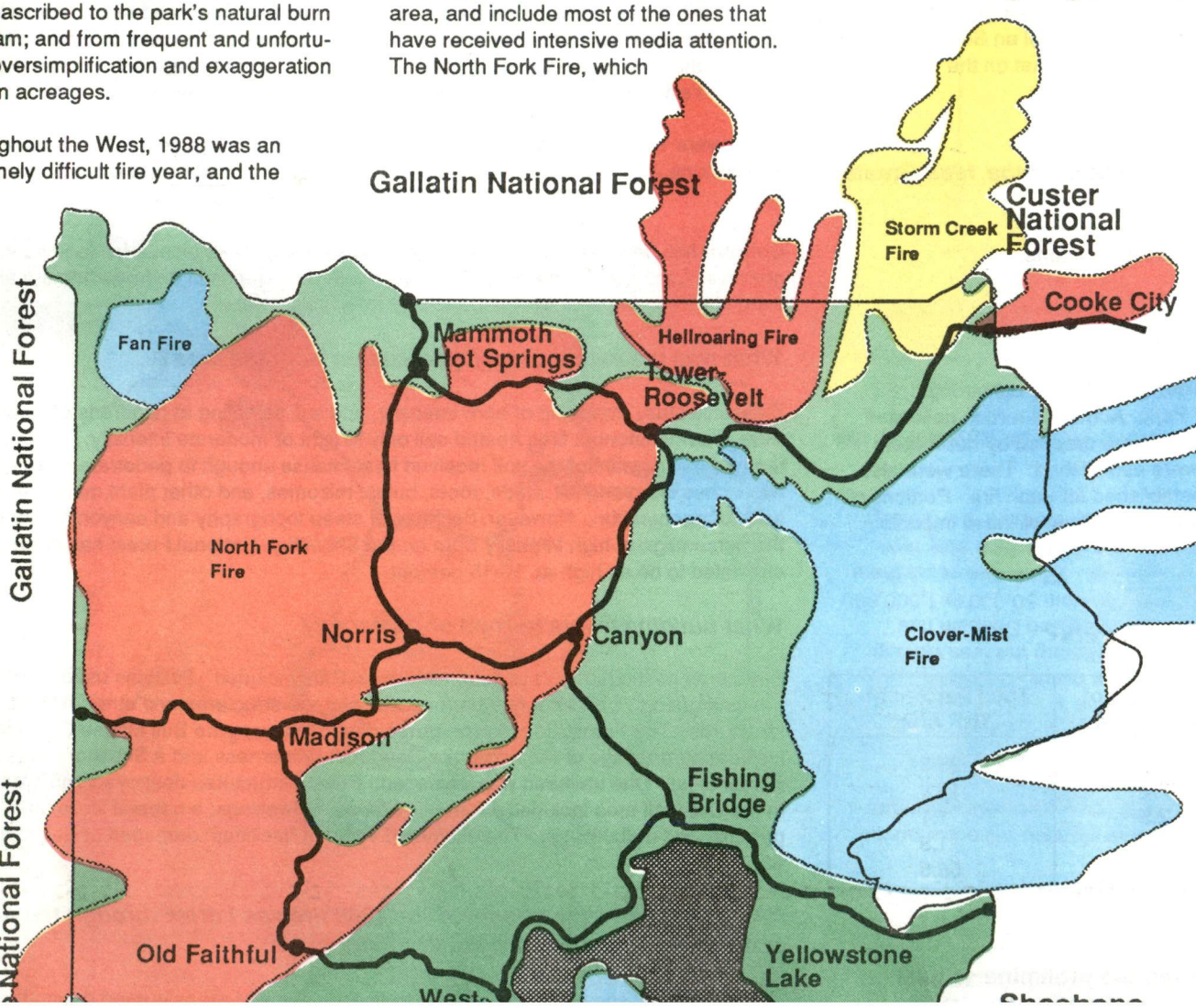
Grant Village Visitor Center features a special new exhibit, "Yellowstone and Fire," (open June 17) with displays interpreting the role of fire in Yellowstone's landscape as well as peoples' attitudes about fire.

Visitor centers feature books and a video tape about the fires. Rangers will present programs and conduct walks or hikes into areas that burned last year. To find out what may be offered during your visit, ask at any visitor center or purchase *Discover Yellowstone,* a biweekly magazine listing all ranger-led activities offered in Yellowstone during the summer months. *Discover Yellowstone* is sold at visitor centers, stores and gift shops throughout the park.

What Burned?

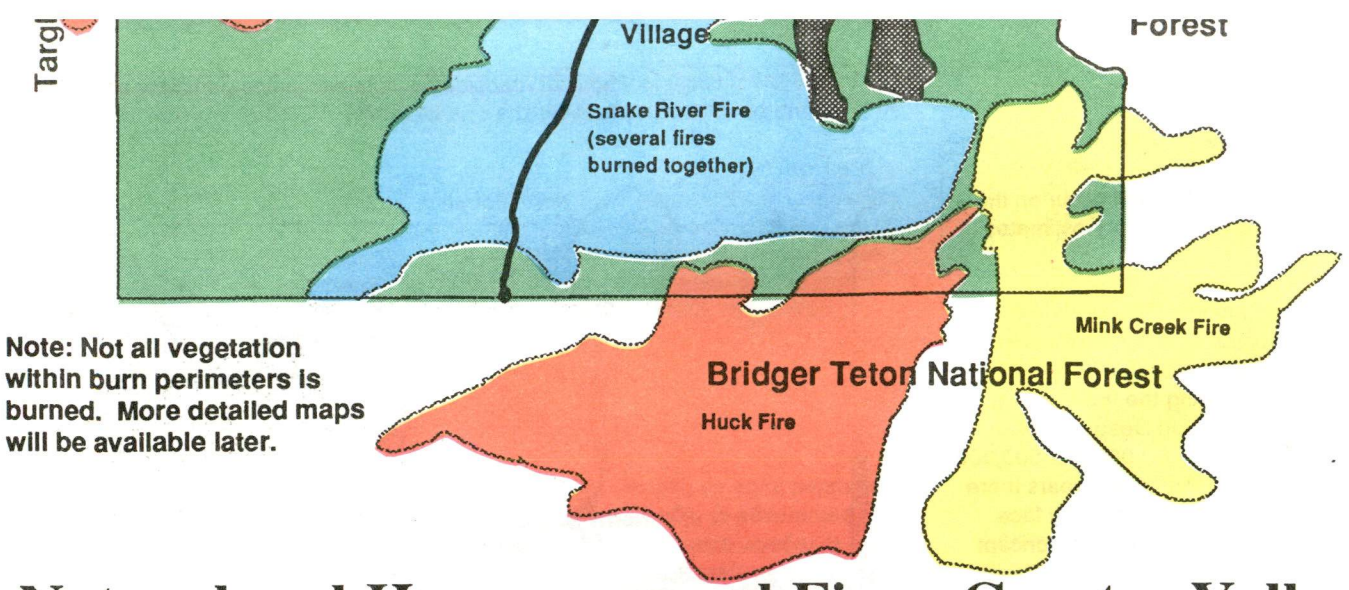
No topic has caused more confusion in the media and in the public mind than the actual extent of the fires. Confusion has resulted from all fires in the Greater Yellowstone Area, which includes more than ten million acres of public land, being called "Yellowstone Park fires;" from all fires in the Yellowstone area being ascribed to the park's natural burn program; and from frequent and unfortunate oversimplification and exaggeration of burn acreages.

Throughout the West, 1988 was an extremely difficult fire year, and the country surrounding Yellowstone Park was hit heavily. A number of major fires, most notably the North Fork Fire, the Hellroaring Fire, the Storm Creek Fire, the Huck Fire, and the Mink Fire, started outside the park and moved in. These fires accounted for more than half of the total burn in the Greater Yellowstone area, and include most of the ones that have received intensive media attention. The North Fork Fire, which threatened Old Faithful, Madison, Canyon, Norris, West Yellowstone, Mammoth Hot Springs, and Tower-Roosevelt , was a human-caused fire that originated in the Targhee National Forest and was the subject of immediate suppression efforts. The Storm Creek Fire started as a lightning strike in the Absaroka-Beartooth Wilderness of the Custer National Forest northeast of Yellowstone Park, and eventually threatened the Cooke City-Silver Gate area, where it received exstensive national television coverage and was usually reported as a result of Yellowstone Park's natural fire program.



Additional confusion resulted from continued media and public belief that managers in the Yellowstone area let park fires continue burning unchecked, out of devotion to the natural fire plan, long after such fires were in fact being fought. Public confusion was probably heightened by misunderstandings over just what the firefighting strategies were; if crews were observed letting a fire burn an area, it may have seemed to the casual observer that the burn was merely being monitored. In fact, in many instances fire bosses recognized the hopelessness of stopping fires in certain situations, and concentrated their efforts on the protection of buildings and developed areas. The most unfortunate public and media misconception about the Yellowstone firefighting effort may have been that human beings can always control fire if they really want to; the raw, unbridled power of these fires cannot be overemphasized.

Perhaps the worst source of confusion, however, has resulted from oversimplification of burn acreages. The daily reports issued cooperatively by the U.S. Forest Service and the National Park Service on fire status gave total acreages within the perimeters of each fire, pointing out that, "only about half of the vegetation has burned within many fire perimeters."



Note: Not all vegetation within burn perimeters is burned. More detailed maps will be available later.

statement about unburned vegetation. The park was regularly portrayed as a blackened moonscape.

Aerial mapping indictes that about 1.4 million acres in the Greater Yellowstone Area received some type of burning. Within Yellowstone Park, mapping indicates that a maximum of 988,925 acres experienced some kind of burning. Of that, 562,350 acres was "canopy burn," meaning that the forest was blackened. Another 372,350 acres was "surface burn," meaning that only the forest understory burned and most trees will not die. Burned meadow and sage-grasslands totalled 54,225 acres, only 2.4% of the park.

Natural and Human-caused Fires, Greater Yellowstone Area, 1988

Natural fires originating in Yellowstone National Park

Natural fires originating on adjacent U.S. Forest Service lands

Human-caused fires originating outside the park

What the Fires Mean to Yellowstone's Friends

Ultimately, the greatest impacts of the 1988 Yellowstone fire season will not be ecological. Yellowstone itself is already well on its way to responding to the massive stimuli provided by the fires: natural revegetation is underway, wildlife is adapting, and the wilderness setting survives.

Far greater concern is now being expressed in many circles over the future of management of Yellowstone and other parks. The course of the summer's fire management raised many questions, and some management actions and policies will be challenged. There are debates underway about firefighting logistics, as well as over the natural fire management plan itself.

The American public, management agencies, and many special interest groups now face a singular challenge: to come to grips with a newfound understanding of the power of the natural settings we are attempting to preserve and celebrate in the national parks. Beyond the operational questions of just how best to fight fires in wilderness, and beyond the policy questions of how an agency can be true to its mandate and yet anticipate an extraordinary event of this sort, are deeper questions of just what we want from our parks, and just how far we are willing to let nature go in giving it to us.

Fire is one of the last great natural "public enemies." The same ecological community that decades ago taught us that predators are not bad in any intrinsic sense, and that natural diversity is as useful to human culture as a closely managed harvest, has more recently recognized that wildfire also has it values — scientific, esthetic, and even commercial. Fire is and has always been an essential part of the setting in our parks and natural areas; we cannot ignore its role, and to return to the total exclusion of it from those areas would be a folly for which our descendants would pay dearly.

Our goal in the national parks is the same as it has always been: to find some balance — some "reasonable illusion," as ecologist A. Starker Leopold so aptly put it in 1963 — between the directions the natural setting might take on its own and our needs of it. We seek a course of action that will permit us to appreciate fire's place and power without so wholly risking the financial and emotional disasters of the 1988 fire season. But even at that we would be well advised to retain enough humility to know that nature will not always be controlled despite our best, most carefully planned management.