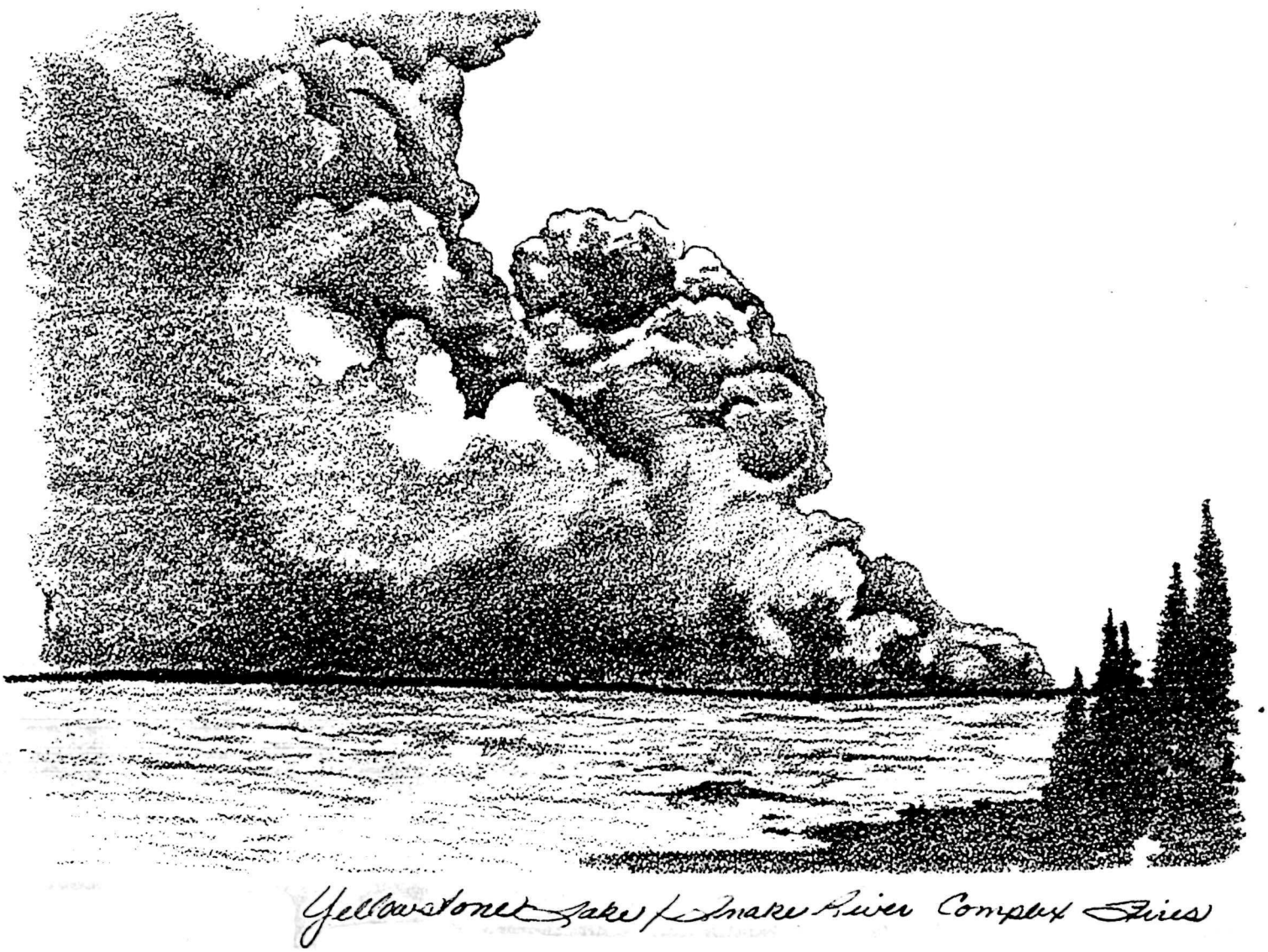
National Park Service
Wildland Fire Report
1988



National Park Service
Wildland Fire Report
1988

Prepared by:
Judi Zuckert
Fire Information Specialist
February 1989

National Park Service
Branch of Fire Management
3056 Elder Street, Suite A
Boise, Idaho 83705-4707

TABLE OF CONTENTS

Wildland Fire Activity Summary

The year 1988 will likely be viewed as a benchmark year for the National Park Service's wildfire management program, due to an unlikely combination of long-term drought, unusual summer weather patterns, and a park named Yellowstone. More acres of national park land burned in Yellowstone alone in 1988, than had burned agency-wide in any previous year.

Weather: The stage was beginning to be set for a dramatic fire season as early as 1987, as drought conditions extended over much of the west. In 1988, the drought persisted and intensified, with broad areas receiving only 30 to 50% of a normal winter snowpack in 1988. This extended drought resulted in fuel moistures that were extremely low, both in live and dead fuels. Compounding the problem were a series of unusually intense dry cold fronts bearing strong winds that occurred in August and September in areas already fighting the largest fires.

Chronology of Events: The fire year began for the National Park Service (NPS) in January and February with a number of small, human-caused fires in the Southeast, and a fire started by a volcanic eruption at Hawaii Volcanoes NP that burned several houses just outside the park boundary. In March, fire activity in the Southeast, both human and lightning-caused, necessitated a small mobilization of crews and resources to the Southeast. Prescribed burns were conducted in the Southeast Region. NPS personnel were primarily involved in non-local suppression activity in and around Great Smoky Mountains National Park.

Fire activity continued in the Southeast in April, and included two 5,000 acre wildfires in Big Cypress, and prescribed burns conducted in Midwest Region. A Southeast Region NPS crew was dispatched to the Ocala National Forest in Florida, and Midwest Region NPS personnel were dispached to non-park suppression efforts in Minnesota. In May, wildfire activity persisted in the Southeast, and began in the Southwest, with a 1,300 acre wildfire in the Carlsbad Caverns area. Prescribed burns and prescribed natural fires also occurred in the Southeast and Southwest.

In June, a human-caused fire ignited in Mexico swept across the international border and burned a total of 11,500 acres, including 3,500 acres in Coronado National Monument. Other unusual wildfires reported during the month included a fire burning in underground coal debris at Big South Fork National Recreation Area, and a fire adjacent to a steep cliff at Obed Wild and Scenic River to which firefighters had to rappel. Fire dangers of very high to extreme were reported in parks scattered from Massachusetts to California, and from Michigan to New Mexico. During the month, a squad of NPS firefighters was dispatched from the Pacific Northwest Region to large fires in Ontario, Canada, and a squad from the National Capitol Region was dispatched to a Southeastern forest. Additional park personnel were dispatched to non-local fires in the Southeast, Southwest, Alaska, and California. Prescribed natural fires burned in the Rocky Mountain, Southwest, and Western Regions, and one prescribed burn was conducted in the Pacific Northwest Region.

Wildfires were reported in seven of the ten NPS regions in July. Major fire activity was beginning to occur in Yellowstone, and six major fires there transitioned from prescribed natural fires to wildfires: Fan, Falls, Clover, Mist, Shoshone, and Red. The North Fork Fire, a human-caused fire ignited accidentally on the Targhee National Forest just west of Yellowstone, escaped initial attack and also began spreading rapidly in the park. Fires in Yellowstone threatened Grant Village and Old Faithful for the first time. Large wildfires also occurred in Grand Canyon and Zion, and prescribed natural fires were managed in six regions. NPS personnel from around the country were dispatched to fires in the Midwest, Southeast, Rocky Mountain, and Alaska regions.

During August of 1988, the national focus of fire activity was centered in the Greater Yellowstone Area. In addition to the major fires previously mentioned, several additional fires entered the park from adjacent forests. These fires included the Hellroaring, Storm Creek, and Mink fires, and the Hunter and Huck fires burning in Grand Teton National Park. A Greater Yellowstone Area Command was formed to oversee suppression efforts in the area. By month's end, over 820,000 acres were reported burned in the area, and over 9,500 personnel were committed to fires there, including 850 NPS firefighters and overhead, and the use of military troops.

Unprecedented, extreme fire behavior was being reported on all of the Yellowstone area fires, with spotting up to 1 1/2 mile ahead of fires, 100-150 foot flame lengths, one-day fire advances of up to 10 miles, and rates of spread of up to 2 mph in forest fuels! This type of fire behavior had not been reported in the continental United States since 1910. Fire and backcountry travel restrictions were implemented in parks in the Rocky Mountain and Western regions due to the extreme fire danger. The National Park Service suspended the conduct of all prescribed natural fires and prescribed burns.

September in Yellowstone looked a lot like August. The NPS mobilization of personnel peaked with 1,416 people, from all regions, assisting on non-local fire suppression efforts. The lack of significant precipitation continued, and extreme fire behavior spurred by additional wind-storms caused major fire runs, additional large acreage increases, and major threats to structures and communities, including Old Faithful, Canyon, Mammoth, Silver Gate, and Cooke City. No major structures or lives were lost in any of the threatened communities, due to heroic efforts on the part of many, many firefighters. By mid-month, cooler temperatures and increased humidities finally slowed the progress of the fires, and all but three of the Yellowstone area fires were contained by the month's end. In addition to Yellowstone, the Red Bench Fire, that started west of Glacier National Park, entered Glacier and burned a total of 37,500 acres.

All of the Greater Yellowstone Area fires were controlled in October, with over 843,000 acres estimated to have burned within the 2.2 million acre park (exact acreage is still being determined). Approximately 100 NPS personnel worked during the month on rehabilitation projects in Yellowstone, Grand Teton, and Glacier National Parks.

The major fire suppression effort during the month was the Buckeye Fire at Sequoia National Park. Buckeye was a cigarette-ignited fire that threatened the Giant Forest grove of giant sequoias as well as facilities. The fire was controlled at 2,870 acres, with no major losses; success of the control effort was largely due to prior prescribed burns that had been conducted in the area and had significantly reduced fuel loading.

In November and December, wildfire occurrence was limited mainly to small, accidental or arson-caused ignitions in the Southeast and Southwest. At Gateway National Recreation Area, an underground fire burning in old landfill began to smoulder in the same subsurface location where a fire was supressed two years earlier. Prescribed burning was again permitted in accordance with agency guidelines; the largest burns were conducted in Everglades National Park There were no prescribed natural fires allowed, pending the findings of the Interdepartmental Fire Policy Review Team.

Branch of Fire Management

Accomplishments: It was an extremely busy and productive year for the Branch staff. It was also a year of transition, as new personnel were hired to fill three of the four fire management specialist positions in Boise.

The Yellowstone fires absorbed the time and attention of much of the staff for almost half of the year. Six of the ten office staff members were dispatched to Yellowstone on fire assignments, for a total of 152 work-days. Positions filled included

Area Commander, Fire Behavior Analyst, Resource Unit Leader, Training Coordinator, Claims Team, and Operations Section Chief trainee. In addition, four staff members were associated with Boards of Review for the Yellowstone fires, which accounted for an additional 40 work-days of travel and meetings. The staff also participated in the Interdepartmental Fire Policy Review Team, eight other wildfire and policy reviews, and numerous operations evaluations, coordinating groups, multi-agency command meetings, working teams, and other meetings.

Following are highlights of some of the year's accomplishments:

Budget/Systems - Firepro III conceptual planning and preliminary analysis completed, staffing needs analysis conducted, Sun 4 work station for geographic information sytem projects purchased and installed, hazard fuels and fire situation reporting software developed and implemented on Wildland Fire Management Computer System.

Information - Wildland Fire Management Computer System training developed and conducted, National Situation Coordinator training developed and conducted, Computer System Users' Guide revised and distributed, National Situation Coordinator Handbook revised, 6 supplemental national situation coordinators detailed to Boise to handle Yellowstone-related information requests.

Prescribed Fire - Prescribed Fire For Burn Bosses course rewritten, Fire Effects on Public Lands course developed and presented, Smoke Management Techniques course developed and presented, numerous fire management plans and prescribed burn plans reviewed.

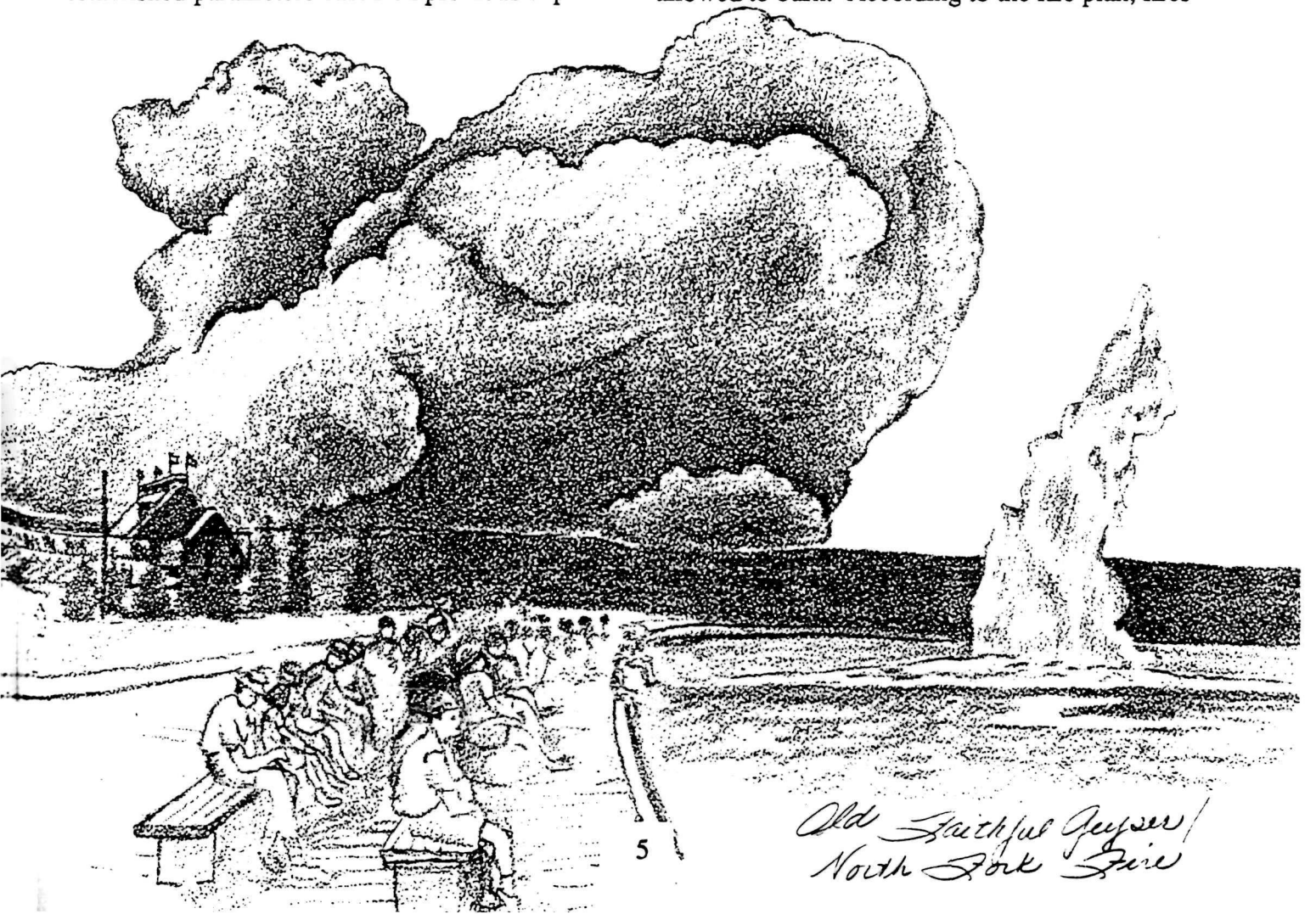
Suppression - Area Commander position filled at Yellowstone for 49 days, hotshot crews duty stations moved from Branch to long-term host parks, agency overhead development program initiated, fireline handbook revised, capital equipment purchased for parks, administrative procedures chapter of NPS-18 revised.

Training - 693 trainee assignments filled in Yellowstone, instructor cadre questionnaire distributed, multi-agency training schedule expanded on Wildland Fire Management Computer System, suppression curriculum revision initiated.

Yellowstone Fires

Drought/Climate History -The fall of 1987 was unusually dry in the Yellowstone area. With that in mind, park fire specialists began more than a dozen separate fire danger indices in early April of 1988. The monitoring included measurement of moisture content of several types of fuels, daily computations of "spread component" (a measure of a potential fire's ability to produce heat that would make the fire fighting difficult), lightning risk, man-caused fire risk, "ignition component" (the probability of a firebrand producing a fire that would require suppression), and several others. All these indices were monitored daily; 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 previous experience. But it was weather that eventually proved most difficult to anticipate. Yellowstone had experienced an untypical weather pattern in recent years. Though there had been 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



Old Faithful Geyser/
North Fork Fire

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 had 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 down trees were measured at seven percent. At 8 to 12 percent, lightning will start lots of fires, many of which will burn freely. A series of unusally high winds, associated with dry fronts, fanned flames that even in the dry conditions would not have moved with great speed.

Fighting the Fires

By July 15 it was clear that recent weather patterns were not of use in predicting this summer's weather. As of that day, the perimeter of fires in the park was about 8,600 acres. After that day, no new natural fires were allowed to burn. Exceptions were made for natural fires that started adjacent to existing fires, when the new fires were clearly going to burn into existing fires. After July 21, all other fires were subjected to full suppression efforts as manpower would allow. As of that day, the perimeter of the fires in the park totalled less than 17,000 acres. On July 27, during a visit to Yellowstone, the Secretary of the Interior reaffirmed that the natural fire program had been temporarily suspended and all fires would be fought. Man-caused fires had been vigorously suppressed all along.

An extensive interagency fire suppression effort was initiated in mid-July in the Greater Yellowstone Area, to attempt to control or contain an unprecedented series of wildfires. The extreme weather conditions and heavy, dry fuel accumulation presented even the most skilled professional firefighters with conditions rarely observed.

Accepted firefighting techniques, such as constructiing fire lines along the edges of the advancing fires to create fuel breaks and backfiring to reduce fuel accumulations in front of advancing fires, were frequently ineffective because fires spread long distances by "spotting," a phenomenon by which wind carries embers from the tops of the 200-foot flames far out across unburned forest to start spot fires well ahead of the main fire. Regular spotting up to a mile and a half away from the fires made the widest bulldozer lines useless and enabled the fires to cross such major topographic features as the Grand Canyon of the Yellowstone River. Fires routinely jumped such traditionally recognized barriers as rivers and roads.

Fires often moved two miles per hour, with common daily advances of five to ten miles, consuming even very light fuels that would have been unburnable during an average season. The fast movement, coupled with spotting, made frontal attacks on the fires impossible and dangerous, as fire crews could easily be overrun or trapped between a main fire and its outlying spot fires.

Even at night the time fires could not be fought. Normally, wildfires "lie down" at night as increased humidity and decreased temperature quiet them; humidity remained low at night, and fire fighting was further complicated by extreme danger from falling trees.

Fire fighting efforts were directed at controlling the flanks of fires and protecting lives and property in the advancing paths of the fires. The experts on site generally agreed that without help from the weather, in the form of rain or snow, there was no technology in existence that could stop the fires.

The frustration and wonder of the firefighters at these conditions were summed up by Denny Bungarz, a U.S. Forest Service fireboss from Mendocino National Forest in California. Bungarz was incident commander on the North Fork Fire, the one that threatened seven park developments and one gateway community. Bungarz said, "We threw everything at that fire from Day One. We tried everything we knew of or could think of, and that fire kicked our ass from one end of the park to the other." Similar sentiments were expressed by

other leading firefighters. Efforts to protect structures in the park were almost totally successful; only a small number of cabins and outbuildings were lost.

By the last week in September, about 50 lightning-caused fires had occurred in the park, eight of which were still burning. More than $100,000,000 had been spent in control efforts on fires in the Greater Yellowstone Area, and most major park developments - and a few surrounding communities - had been evacuated at least once as fires approached within a few miles of them. At the operation's peak, nine thousand firefighters (including army and marine units), more than 100 fire engines and dozens of helicopters from many states participated in a huge, complex effort to control the fires and protect developments.

Restoration

Later in the fall, as the fires were diminishing, plans were underway in Yellowstone Park to develop comprehensive programs for all aspects of post-fire response. These will include replacement, rehabilitation, or repair of damaged buildings, powerlines, fire lines, trails, campsites and other facilities. An estimated 882 miles of fire line, dozens of fire camps, tons of litter, 100 miles of roads, more than 600 miles of trails, and innumerable helispots and other local impacts will eventually require restoration. The restoration of Yellowstone's wilderness setting - that is, the healing of the necessary wounds of firefighting - will be of great importance to the National Park Service, to many members of the conservation community, and to the public.

Research

The scientific community both private and public sector, has already shown great interest in monitoring the ecological process following these major fires. The National Park Service is cooperating with other agencies and independent researchers and institutions in developing comprehensive research directions to take full advantage of this unparalleled scientific opportunity. It is probably safe to say that this research effort will be unparalleled in the history of the national parks, and its impact will be felt throughout the scientific community for many years to come.

(Yellowstone Fires text provided by Yellowstone National Park.)

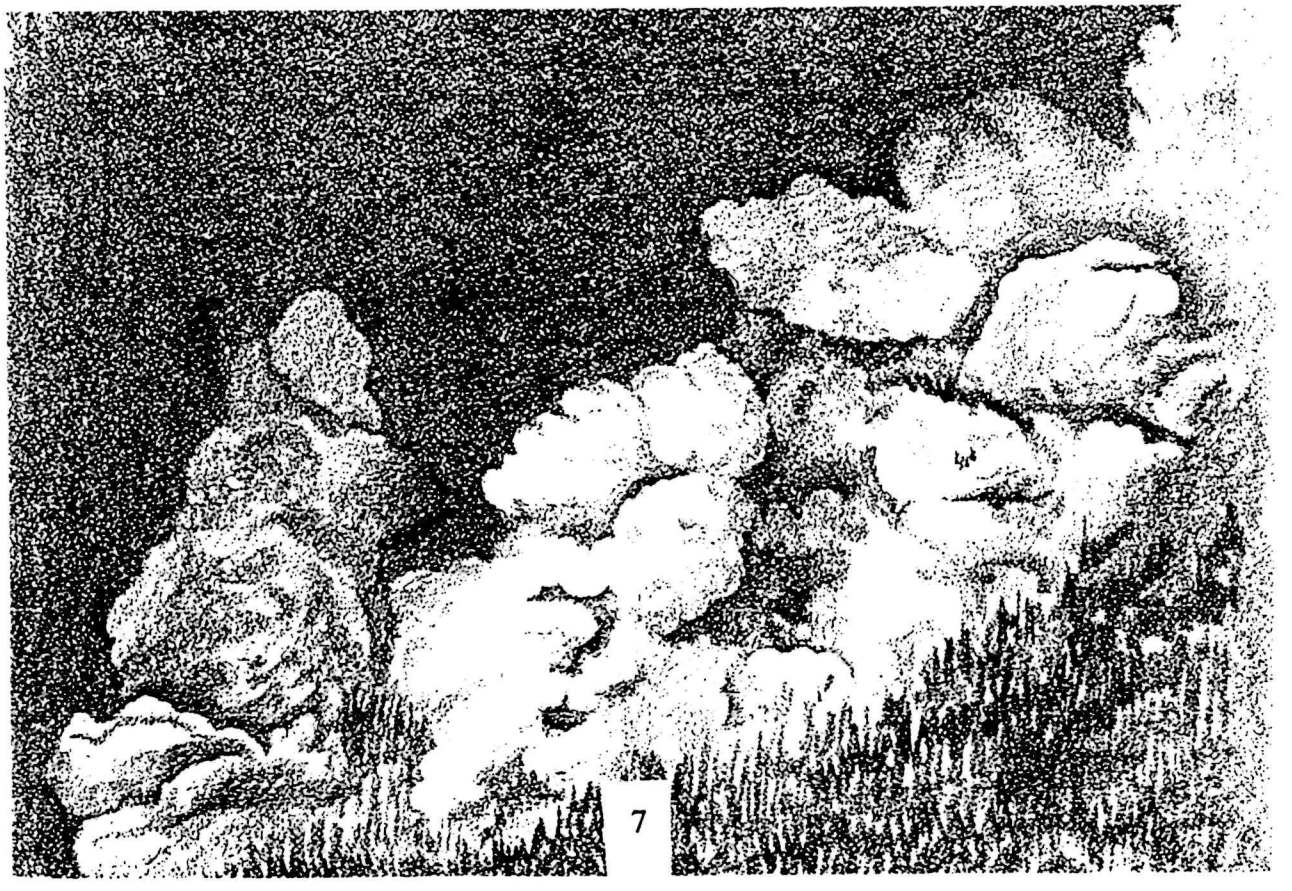


Table 1. National Fire Activity 1988

FIRE TYPE	# FIRES	ACRES
Suppressed on NPS lands by NPS full control strategy	681	893,387
Suppressed on NPS lands by NPS modified control strategy	148	43,859
Suppressed on NPS lands by other federal agency	15	3,850
Suppressed on NPS lands by non-federal agency	51	85
TOTAL WILDFIRES	895	941,181
Prescribed natural fires	156	56,591
Prescribed burns	95	19,350
TOTAL PRESCRIBED FIRES	251	75,941
Self-extinguished on NPS lands	105	2,149
Mutual aid by NPS on other lands	188	34,628
Support actions (non-local)	1,048	-----
False alarms	64	-----

Table 2. Wildfires and Acres by Size Class 1988

SIZE CLASS	AGENCY LAND		OTHER LANDS		ALL LANDS	
IN ACRES	FIRES	ACRES	FIRES	ACRES	FIRES	ACRES
A (0 - .2)	470	52	72	8	542	60
B (.3 - 9)	253	517	61	194	314	711
C (10 - 99)	95	2,679	32	1,223	127	3,902
D (100 - 299)	26	4,259	11	1,872	37	6,130
E (300 - 999)	14	5,090	6	5,557	20	10,647
F (1000 - 4999)	18	40,900	5	12,907	23	53,807
G (5000 +)	19	887,685	1	357,074	20	1,244,759
TOTAL	895	941,181	188	378,835	1,083	1,320,016

There were 895 wildfires reported on NPS land in 1988, which is 95% of the normal fire year calculation (Table 6). Approximately 81% of the wildfires were controlled at under 10 acres in total size. There were many more large fires than in any previous year, which reflects the difficulties encountered in successfully suppressing fires once they became established.

Table 3. Wildfires by Cause 1988

CAUSE	AGENCY LANDS # FIRES	AGENCY LANDS # ACRES	AGENCY LANDS % FIRES	AGENCY LANDS % ACRES
Lightning	414	464,755	46.3	49.4
Campfire	92	24,865	10.3	2.6
Smoking	42	375,718	4.7	39.9
Debris Burning	32	1,267	3.6	0.1
Incendiary	98	2,519	10.9	0.3
Equipment Use	14	247	1.6	0
Railroads	7	155	0.8	0
Children	17	312	1.9	0
Misc/Unknown	179	71,344	20.0	7.6
TOTAL	895	941,181	* 100	* 100

As usual, the most common cause of wildfires on NPS land was lightning. The unusually large acreage amount attributed to ignition by smoking is due to the North Fork Fire in Yellowstone. That fire was started by a carelessly discarded cigarette, on the Targhee National Forest.

* Percents do not exactly equal 100, due to rounding.

Table 4. Large Wildfires 1988

REGION	PARK	SUPPRESSION STRATEGY	FIRE NAME	NPS ACRES	TOTAL ACRES	FUEL TYPE
ARO	Kobuk Valley	Contain	Selawik	300	7,800	black spruce
PNR	Crater Lake	Control	Prophecy	900	1,900	dense conifer
RMR	Dinosaur	Control	Zenobia	4,080	5,145	sage/grass
	Glacier	Control	Red Bench	27,500	37,500	dense conifer
	Grand Teton	Contain	Hunter	156	5,440	dense conifer
	Grand Teton	Contain	Huck	11,411	111,200	dense conifer
	Wind Cave	Control	Windy	1,150	1,150	open pine
	Yellowstone	Control	Fan	18,100	20,900	dense conifer
	Yellowstone	Control	Clover-Mist	178,891	319,575	dense conifer
	Yellowstone	Control	Snake River Complex	164,987	164,987	dense conifer
	Yellowstone	Control	North Fork/ Wolf Lake	372,199	385,035	dense conifer
	Yellowstone	Control	Hellroaring	19,625	66,725	dense conifer
	Yellowstone	Control	Storm Creek	18,200	95,000	dense conifer
	Yellowstone	Control	Huck	25,625	111,200	dense conifer
	Yellowstone	Control	Mink	41,550	116,325	dense conifer
	Zion	Control	Hiker	1,355	1,355	pinyonjuniper
SER	Big Cypress	Contain	Baldino	5,500	5,550	palmetto
	Big Cypress	Contain	Hackett	1,442	1,442	palmetto
	Big Cypress	Contain	Copeland	1,924	1,924	sawgrass
	Big Cypress	Contain	Charjumper	4,955	4,995	sawgrass
	Big Cypress	Control	Wilson	2,212	2,212	sawgrass
	Big Cypress	Contain	Deep Lake	2,050	2,680	sawgrass
	Big Cypress	Control	Skillet # 2	1,733	1,733	sawgrass
	Great Smoky	Control	Shop	1,506	1,506	hardwood
SWR	Carlsbad	Control	Walnut Canyon	1,300	1,300	brush
	Carlsbad	Control	Lechugilla	2,053	2,053	sage/grass
WRO	Coronado	Control	Peak	3,750	9,975	chamise
	Grand Canyon	Contain	Dutton	3,290	3,290	open pine
	Sequoia	Control	Buckeye	3,075	3,075	dense conifer
	Yosemite	Control	Piute	1,200	1,200	dense conifer
	Yosemite	Contain	Walker	2,360	2,360	conifer

Table 5. Large Prescribed Natural Fires 1988

REGION	PARK	FIRE NAME	NPS ACRES	FUEL TYPE
Alaska	Gates of Arctic	A251	1,500	black spruce
	Noatak	Eli River	14,000	alpine tundra
Rocky Mtn	Yellowstone	Fan	3,500	dense lodgepole
	Yellowstone	Red	1,000	dense lodgepole
	Yellowstone	Mist	1,527	dense lodgepole
	Yellowstone	Clover	10,700	dense lodgepole
	Yellowstone	Lovely	1,666	dense lodgepole
	Yellowstone	Shallow	5,945	dense lodgepole
	Yellowstone	Fern	1,985	dense lodgepole
Western	Yosemite	Le Conte	3,150	healthy conifer
	Yosemite	Walker	1,090	healthy conifer
	Yosemite	Echo	1,564	healthy conifer
	Yosemite	Alaska	1,015	healthy conifer

There were a total of 156 prescribed natural fires managed during 1988. Of these, only 13 fires reached 1,000 acres or larger. The Yellowstone fires were overtaken by or converted to wildfires; the acreages displayed are the total fire sizes while the fires were being managed as prescribed natural fires.

There were no prescribed burns conducted during the year that exceeded 1,000 acres in size.

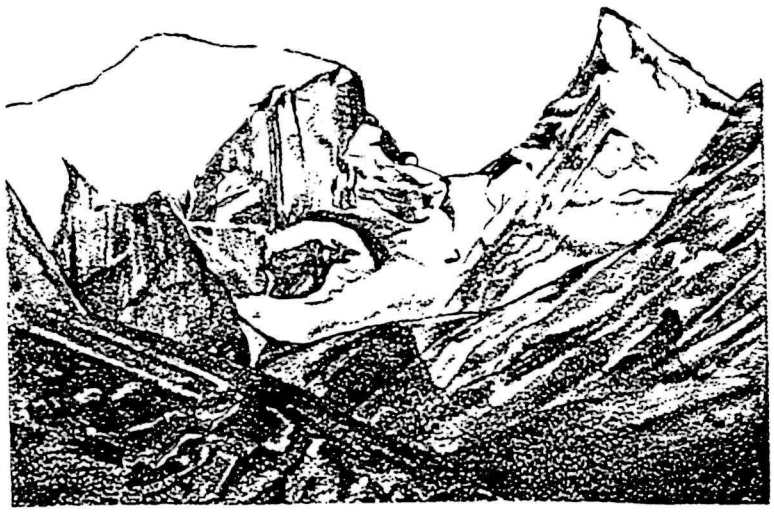


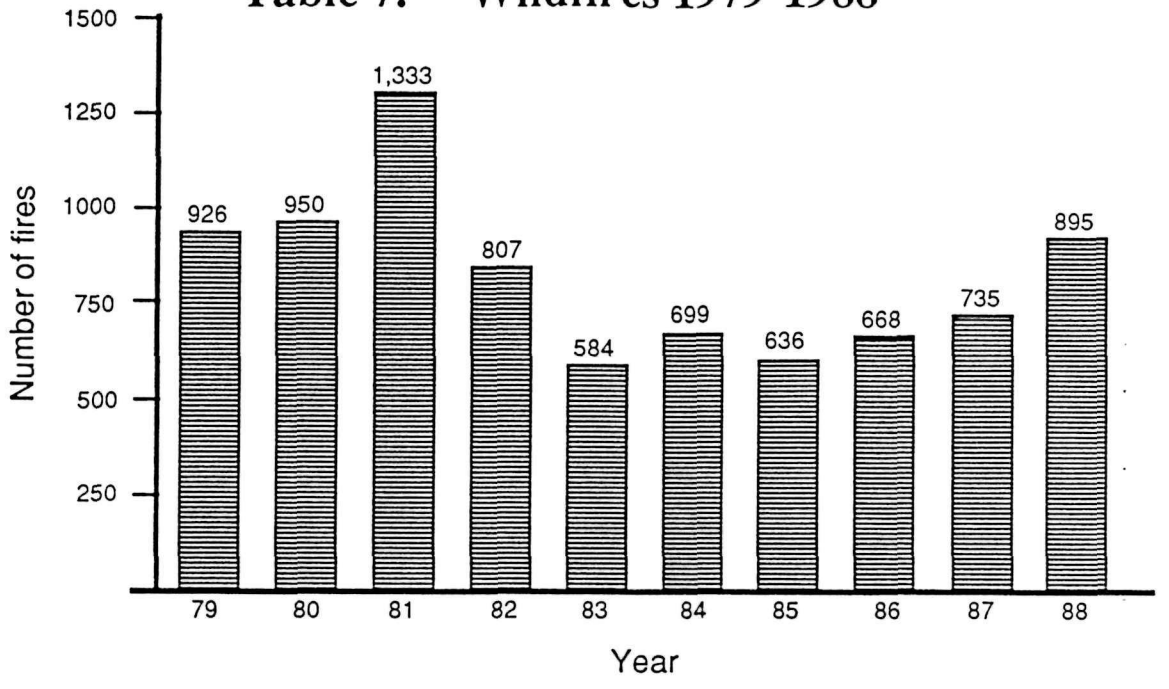
Table 6. NPS Normal Fire Year Statistics

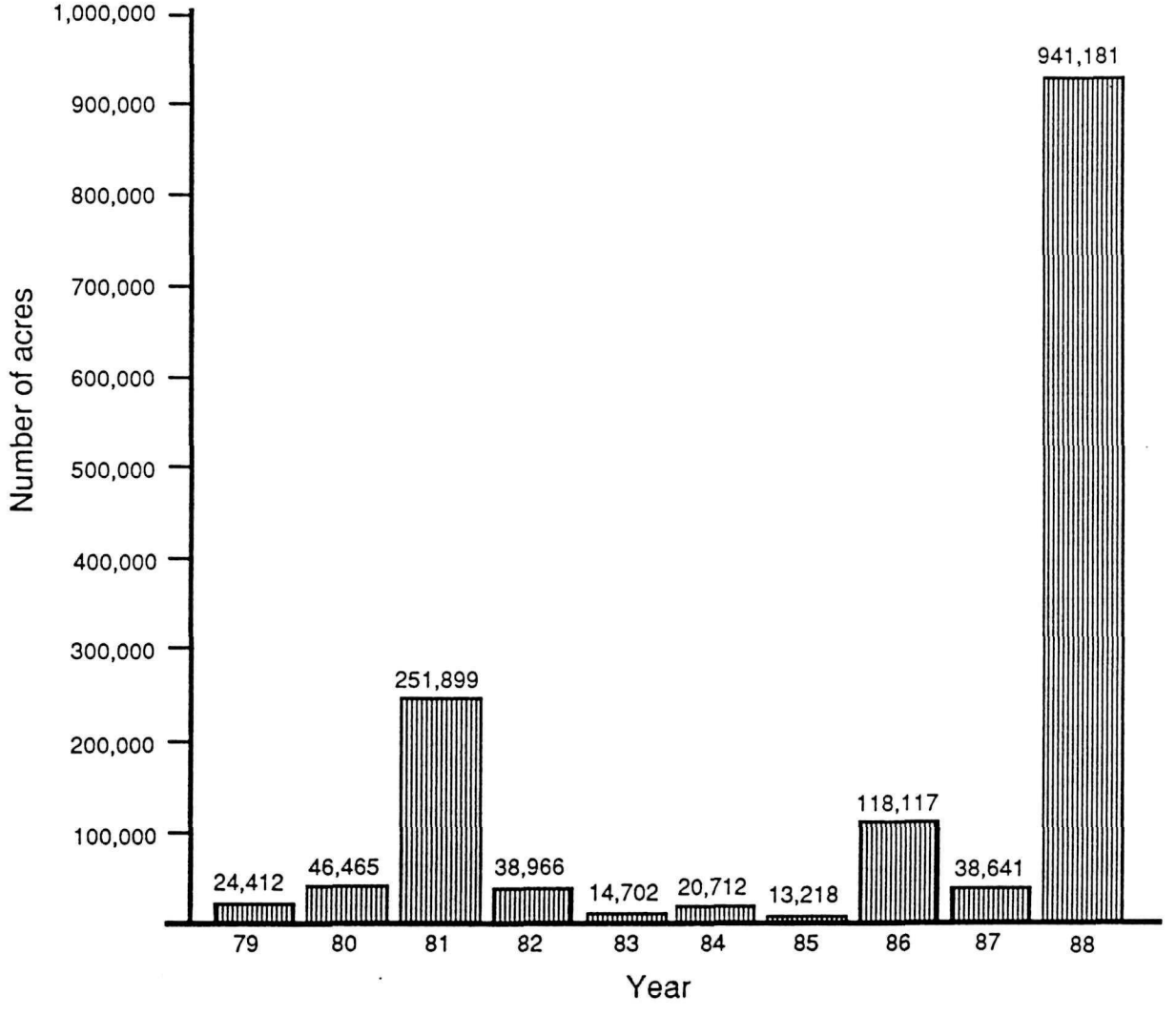
SIZE CLASS IN ACRES	NUMBER OF WILDFIRES	NUMBER OF PRESCRIBED NATURAL FIRES
A (0 - .2)	506	90
B (.3 - 9)	307	34
C (10 - 99)	77	22
D (100 - 299)	22	9
E (300 - 999)	17	11
F (1,000 - 4,999)	8	8
G (5000 +)	1	2
TOTAL	938	176

Start days: 282 Peak number of starts in a single day: 23

The normal fire year calculation displayed here is based on an analysis of National Park Service fire history for the ten years from 1978 through 1987. "Normal" occurrence is defined as the third worst year in a ten year analysis period, and the statistics for each size class may be derived from different years.

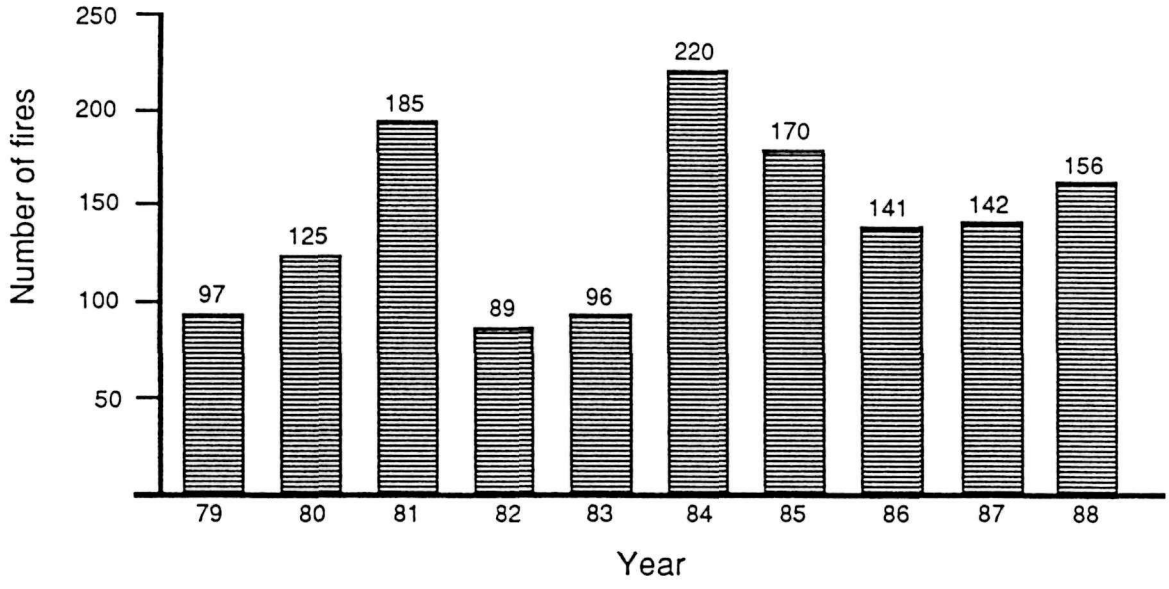
Table 7. Wildfires 1979-1988

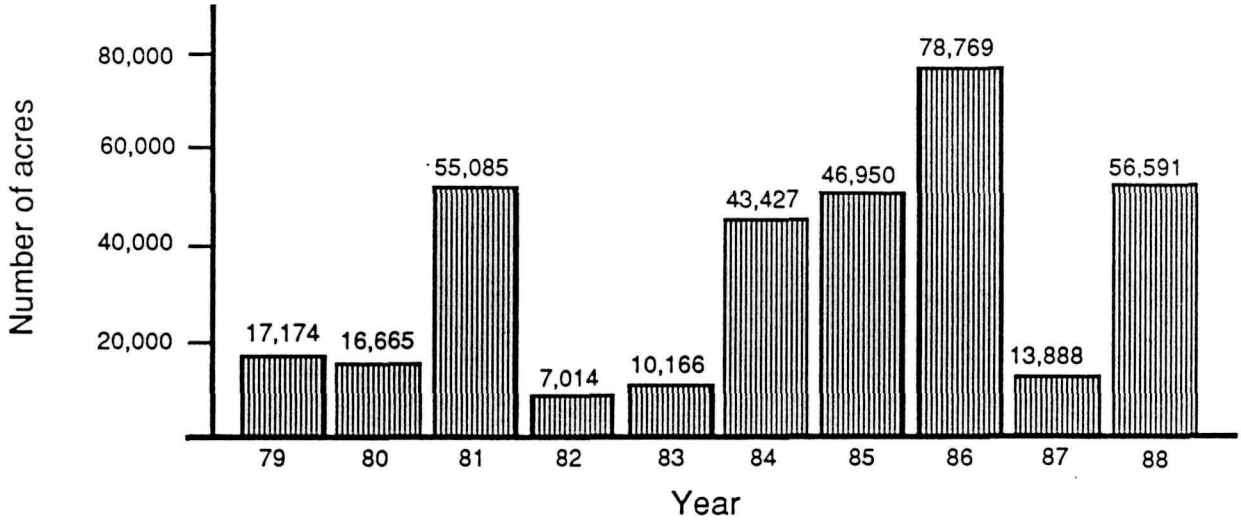




More wildfires were reported in 1988 than in any year since 1981, when the agency reached a high of 1,333 wildfires. More acreage burned in 1988 than in any previous year in NPS history.

Table 8. Prescribed Natural Fires 1979-1988

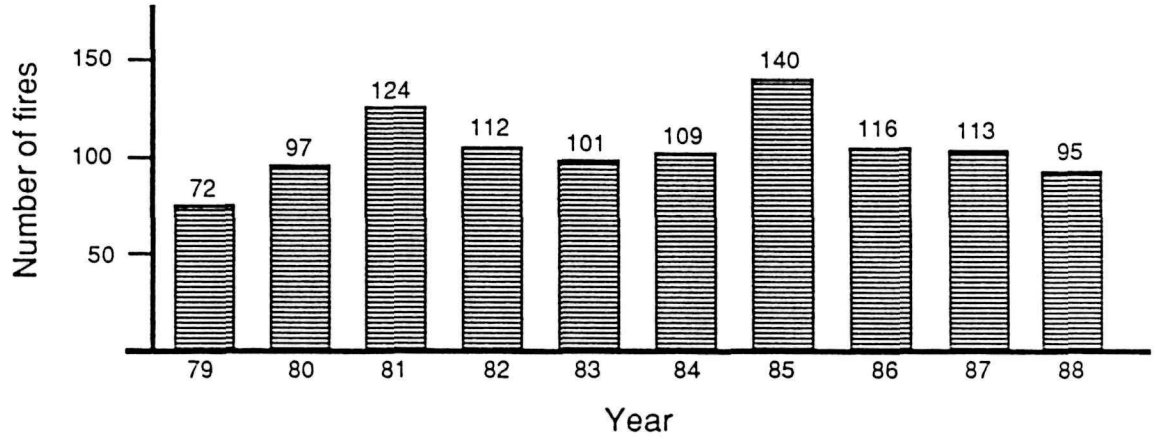


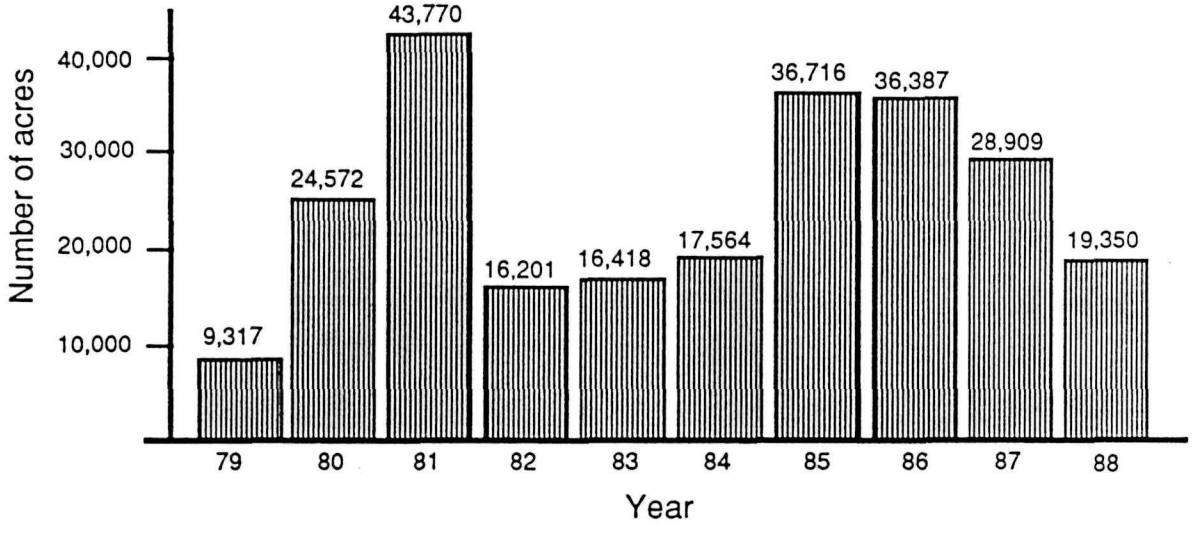


The number of prescribed natural fires managed in 1988 represents about 89% of the normal fire year calculation of 176 fires. The number of prescribed fires would have been greater had their been no agency directive stopping prescribed fires during the summer and fall fire seasons.

There are 44 NPS areas, in 7 regions, that include prescribed natural fire as a management option in their fire management plans. All of these fire management plans will be reviewed in 1989.

Table 9. Prescribed Burns 1979-1988

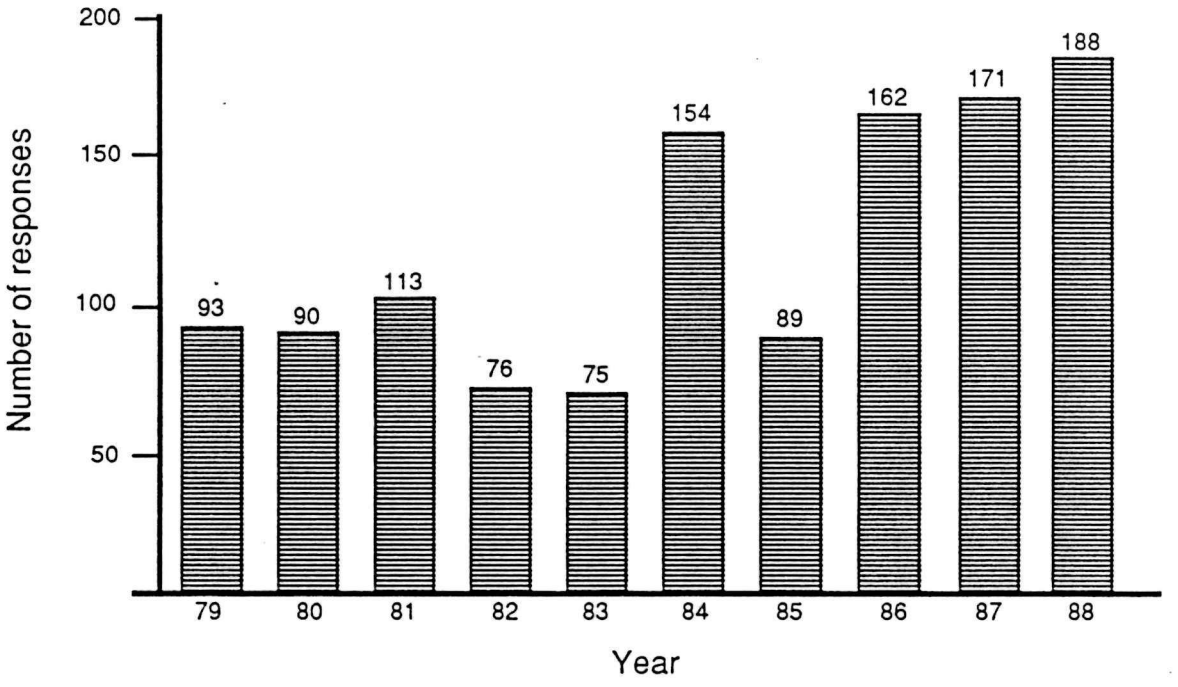




There were fewer prescribed burns conducted in 1988 than in any year since 1979. The number of prescribed burns would have been greater had burning conditions not been so extreme, or if there had been no ban on burning during part of the summer and fall burning seasons.

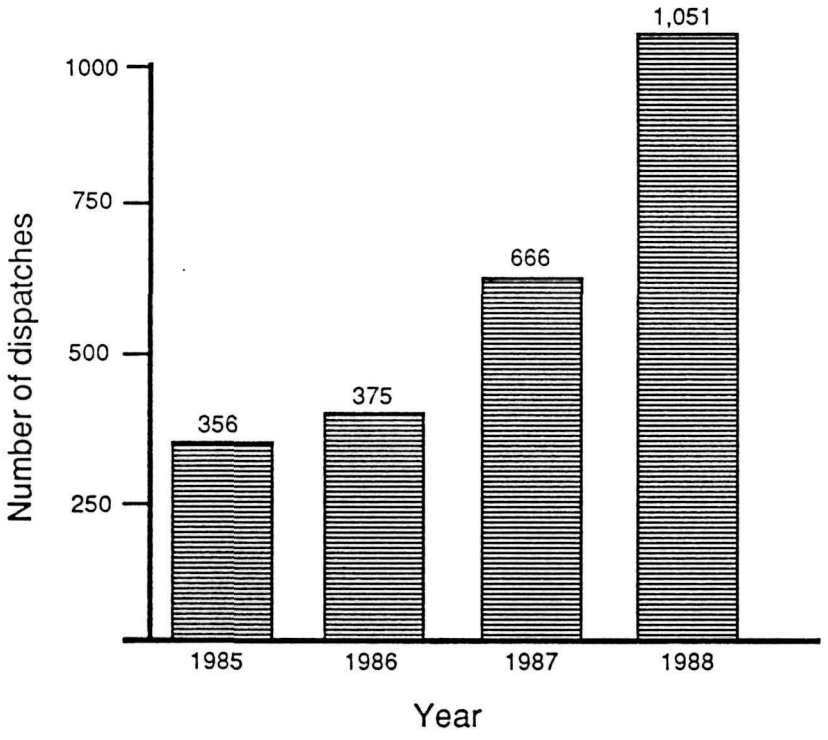
There are 58 NPS areas, in 8 regions, that include prescribed burning as a management option in their fire management plans.

Table 10. Mutual Aid Responses 1979-1988



The National Park Service has been gradually responding to more mutual aid requests in recent years. Mutual aid responses are defined as suppression assists to other agencies under a Memorandum of Understanding, interagency agreeement, or contract. Mutual aid responses also include NPS suppression action taken on other lands to prevent fire spread onto NPS lands. Mutual aid responses are geographically local, and do not include mobilizations of personnel from one region to another.

Table 11. Support Actions 1985-1988

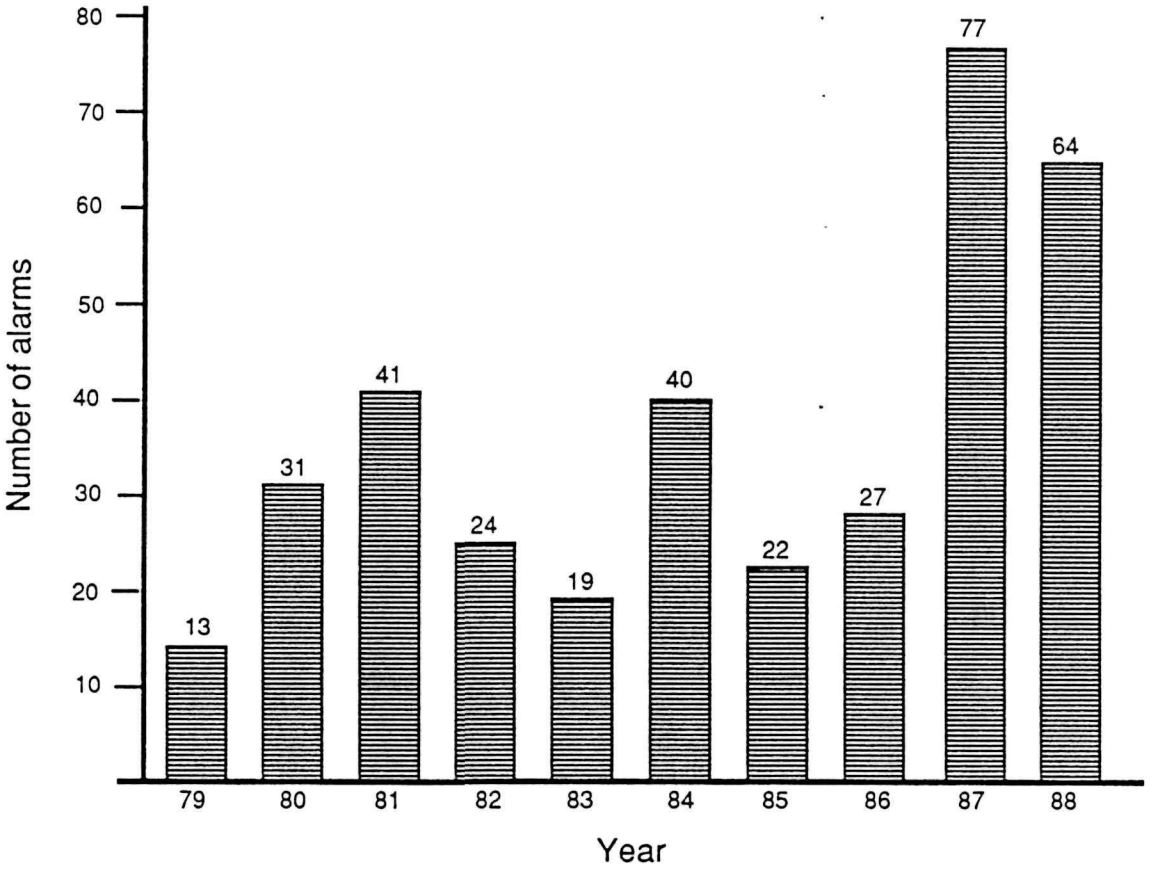


Support actions are primarily wildfire suppression assists to non-local areas. They do not include local, mutual-aid responses. National mobilizations of National Park Service personnel for interagency wildfire suppression efforts were unheard of until 1985. Since that time many agency personnel, whose regular job assignments are not fire-related, have been trained and dispatched to fire assignments.

Table 11 displays the number of support action dispatches reported for the past four years. The actual number of individuals dispatched is substantially greater. The maximum number of personnel dispatched for support actions peaked on September 11, 1988, when there were 1,416 National Park Service employees reported out of their home units. There were over 500 people on support actions from mid-August until the end of September. These figures do not include the large numbers of people who were involved in mutual aid or local suppression activities, or the people involved in fire-related support positions at their home units.

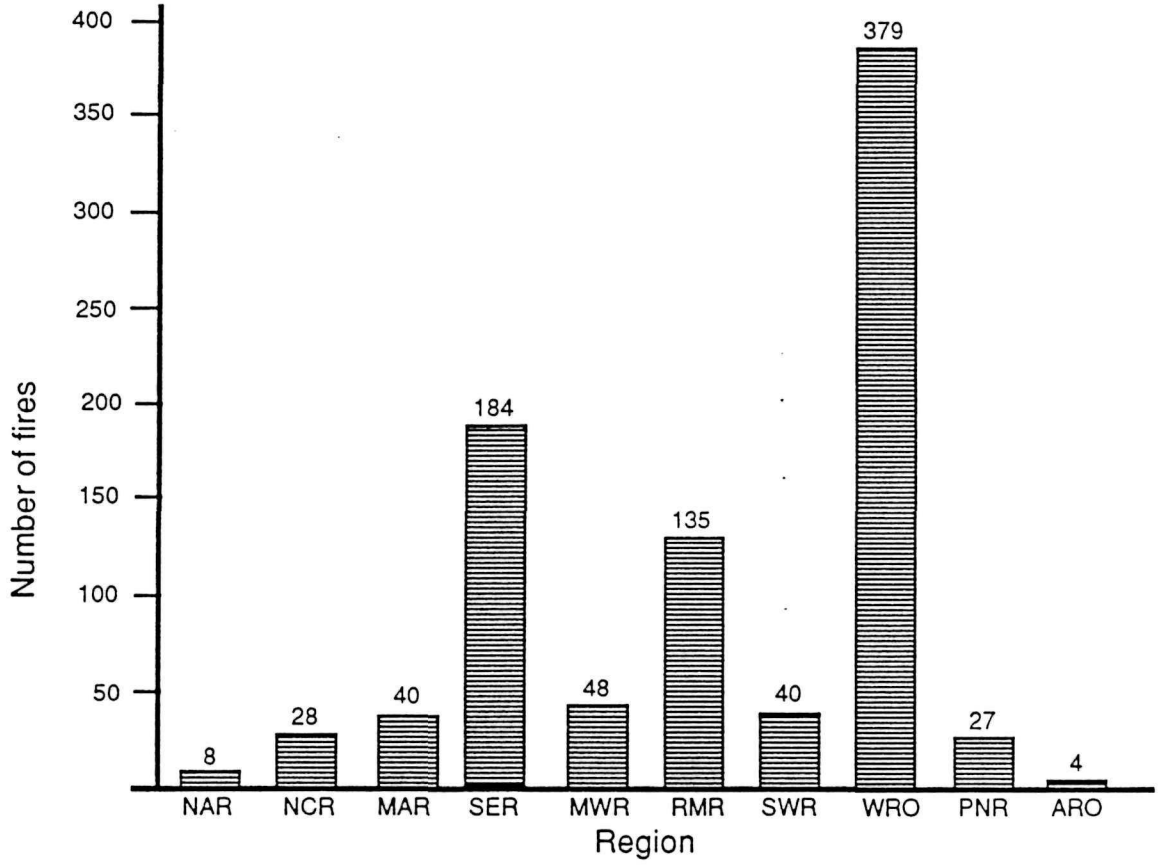
In addition to personnel, NPS helicopters, engines, lead planes, and other equipment were used during the national mobilization.

Table 12. False Alarms 1979-1988



The number of false alarms reported in 1988 dropped about 17% from the high of 77 alarms reported in 1987.

Table 13. Wildfires by Region 1988



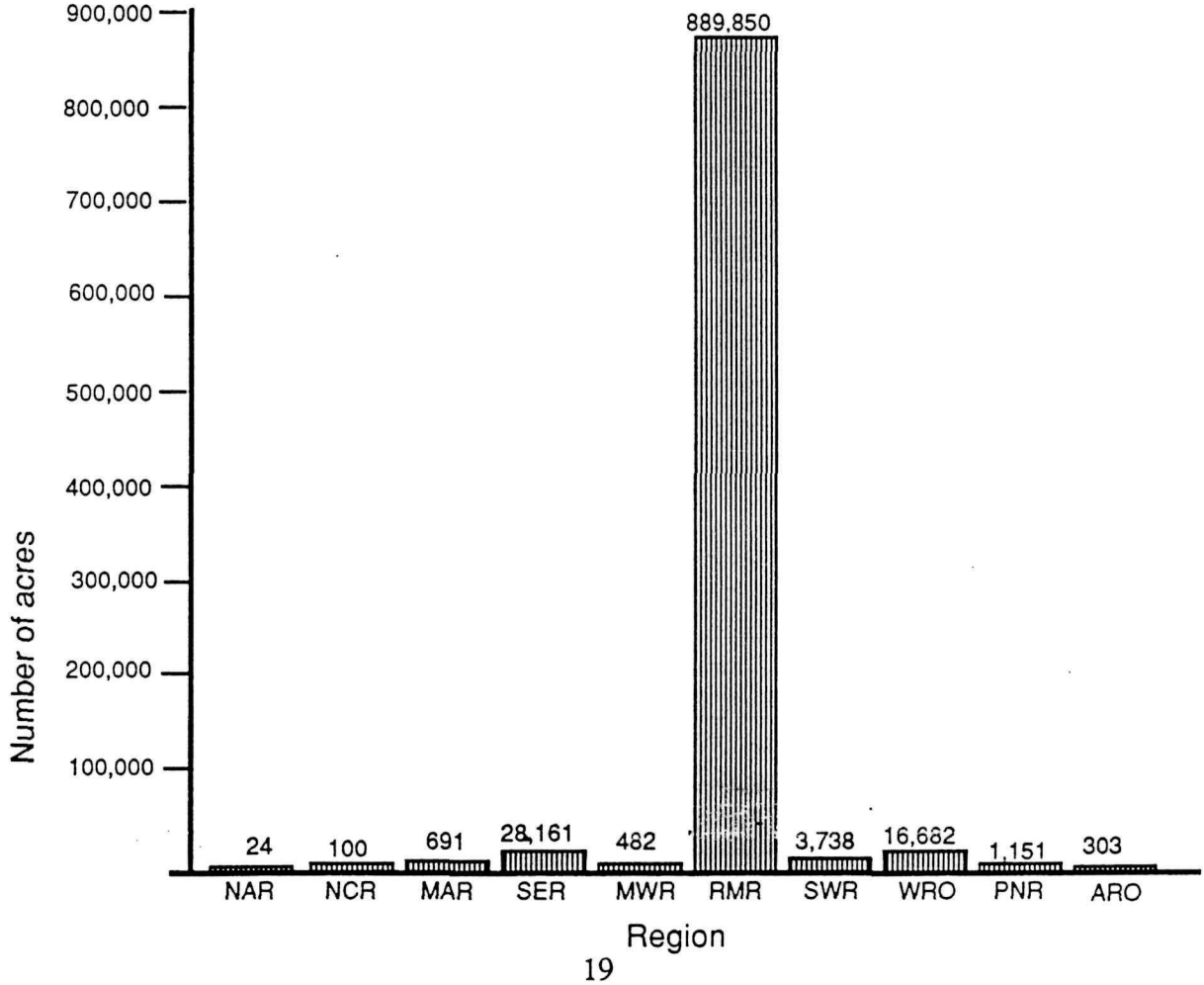
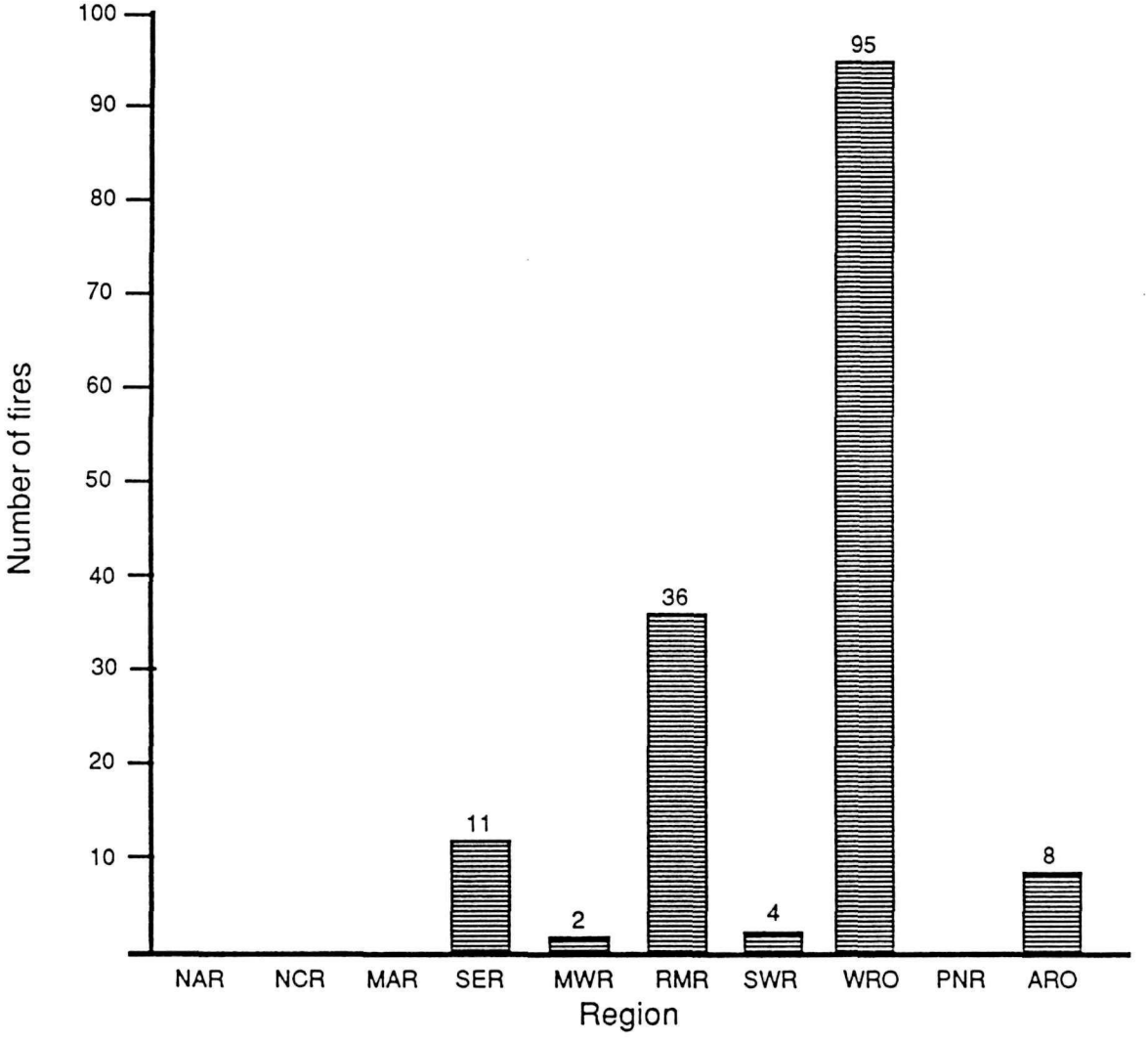


Table 14. Prescribed Natural Fires by Region 1988



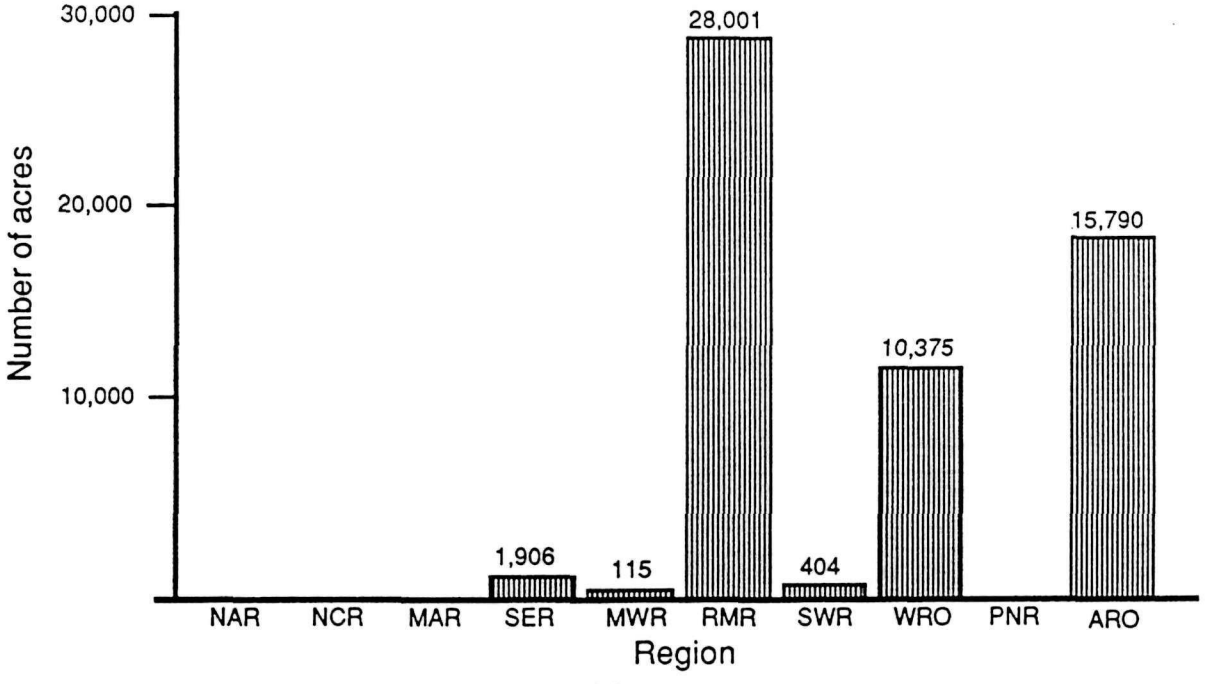
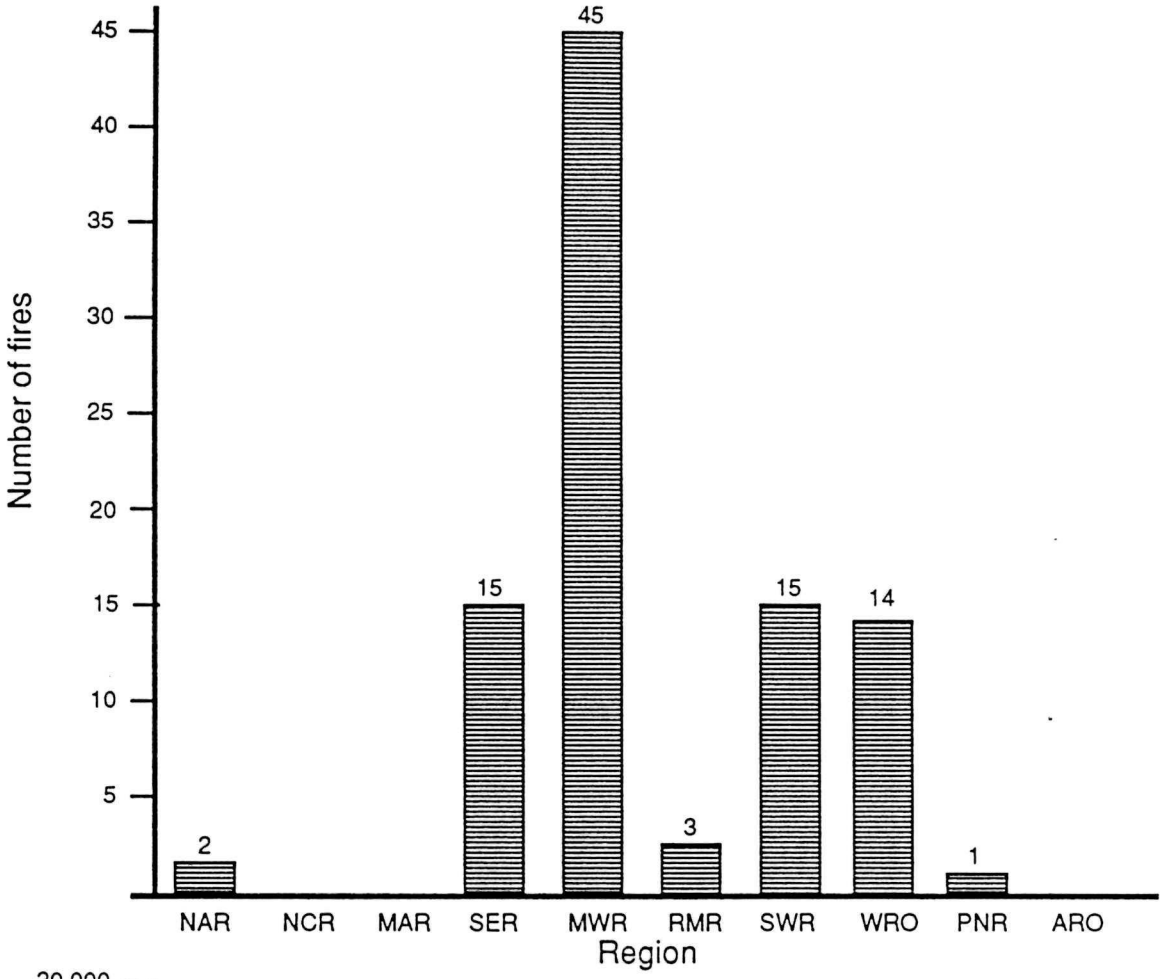


Table 15. Prescribed Burns by Region 1988



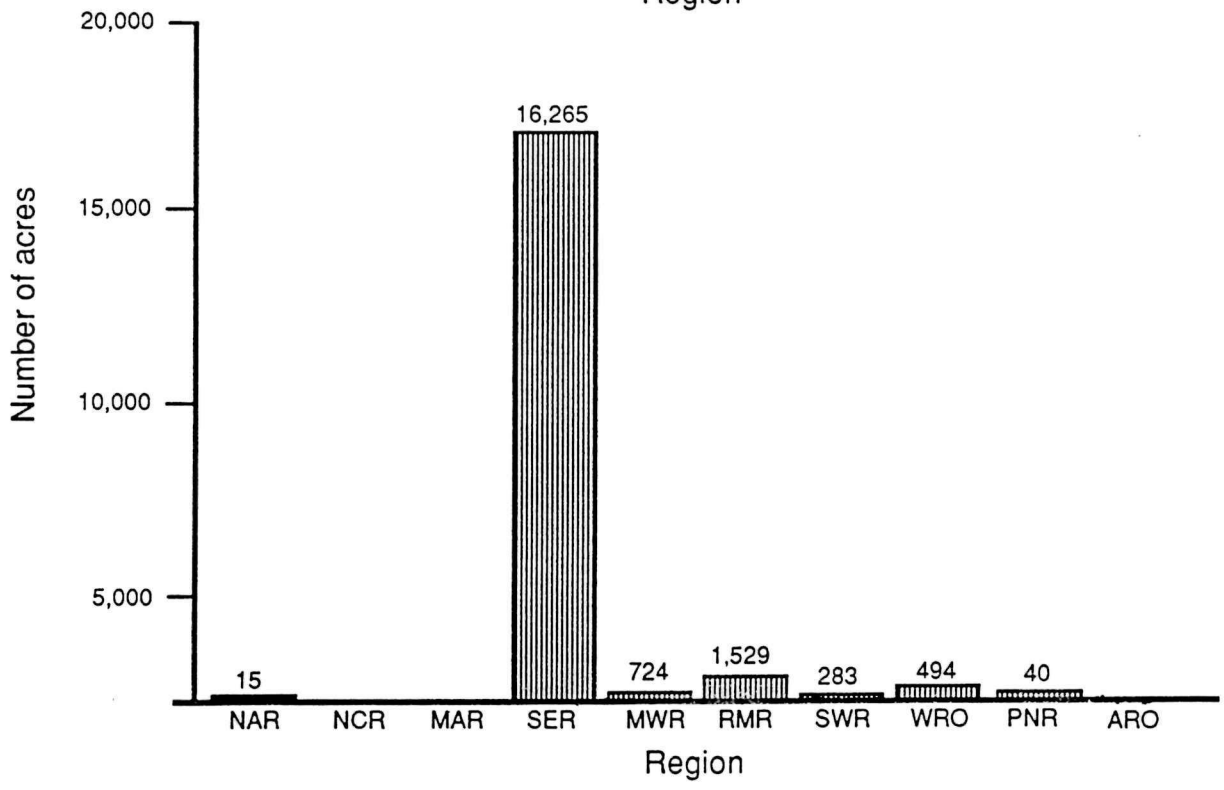
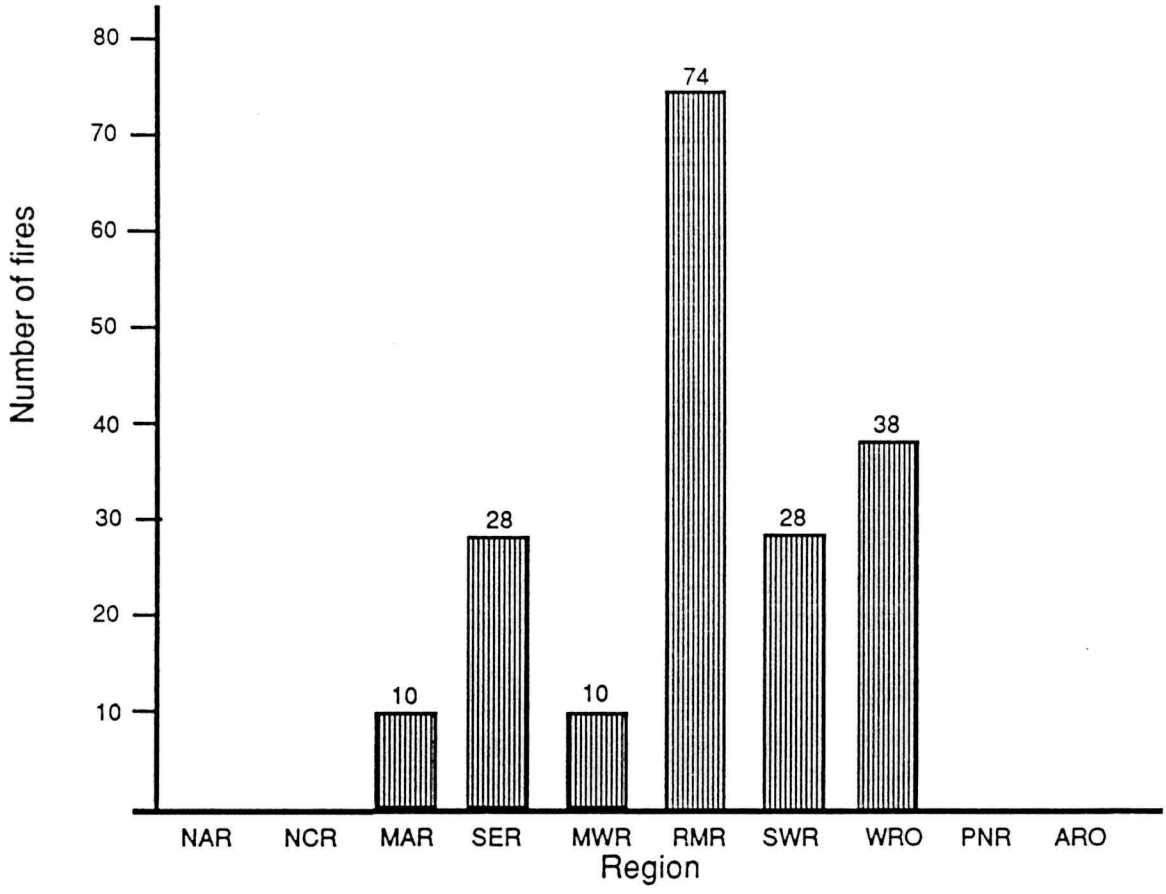


Table 16. Mutual Aid Responses by Region 1988



KEY:

NAR - North Atlantic Region
NCR - National Capital Region
MAR - Mid-Atlantic Region
SER - Southeast Region
MWR - Midwest Region
RMR - Rocky Mountain Region
SWR - Southwest Region
WRO - Western Region
PNR - Pacific Northwest Region
ARO - Alaska Region

Table 17. Interagency Hotshot Crew Wildfire Assignments 1988

Crew	Fire Name	Location	Dates
Alpine	Cooper	Kaibab NF	5/25-5/27
Alpine	Mead	Arizona Strip BLM	6/5-6/7
Arrowhead	Peak	Coronado NF	6/11-6/17
Alpine	Wilderness	Arizona Strip BLM	6/16-6/18
Arrowhead	Buckskin	Arizona BLM	6/18-6/20
Alpine	ABC Misc	Kaibab NF	6/18-6/21
Alpine	Tyndall Meadows	Boise NF	6/23-6/30
Arrowhead	Peach	CDF Riverside	6/29-6/30
Arrowhead	Clearinghouse	Stanislaus NF	7/2-7/7
Alpine	Hiker	Zion NP	7/3-7/9
Arrowhead	Chimney	San Bernadino NF	7/10-7/12
Alpine	Snake River Complex	Yellowstone NP	7/16-7/31
Arrowhead	Camp	Los Padres NF	7/17-7/19
Arrowhead	Railroad	CDF Calaveras	7/20-7/22
Arrowhead	AB Misc	Sierra NF	7/23-7/27
Arrowhead	Willis Gulch	Boise NF	7/30-8/4
Alpine	North Fork	Targhee NF	8/1-8/22
Arrowhead	Ground	Inyo NF	8/8-8/10
Arrowhead	Havilah	Kern County	8/12-8/15
Arrowhead	Warm Springs	Helena NF	8/16-8/28
Alpine	Eagle Bar	Payette NF	8/28-9/5
Arrowhead	Lolo Creek	Lolo NF	8/29-8/30
Arrowhead	Canyon Creek	Lewis and Clark NF	8/31-9/13
Alpine	Huck	Bridger-Teton NF	9/7-9/12
Alpine	McMeeken	Nezperce NF	9/17-9/21
Arrowhead	Miller	CDF Region 4	9/19-9/21
Alpine	North Fork	Targhee NF	9/26-9/30
Arrowhead	Hermit	Shasta-Trinity NF	9/30-10/7
Alpine	Hermit	Shasta-Trinity NF	10/1-10/13
Arrowhead	Horsethief	Cleveland NF	10/11-10/13
Arrowhead	Buckeye	Sequoia NP	10/16-10/24
Alpine	Divide	Angeles NF	10/17-10/25

Table 18. Interagency Hotshot Crew Workload Distribution 1981-1988

YEAR	# WILDFIRES	% TIME WILDFIRE SUPPRESSION	% TIME PRESCRIBED FIRES	% TIME OTHER PROJECTS	% TIME TRAINING	% TIME MISC
1981*	42	38	7	33	11	11
1982	22	22	18	28	16	16
1983	19	20	18	26	16	17
1984	55	53	10	14	9	12
1985	42	65	5	13	7	10
1986	35	50	13	17	8	12
1987	35	63	4	15	8	10
1988	31	79	3	3	6	9

*1981-1984 statistics include Alpine, Arrowhead, and Bison crews.
1985-1988 statistics include Alpine and Arrowhead crews.

The National Park Service presently manages 2 of the 57 Interagency Hotshot Crews as part of its contribution to national interagency fire suppression resources. The crews' primary function is wildfire suppression. When not needed for suppression activities, the crews are able to make significant contributions to park prescribed fire and other physically demanding natural resource projects.

In 1988, the crews were assigned to duty stations at host parks. The Arrowhead Crew was based at Sequoia-Kings Canyon National Parks, and the Alpine Crew was based at Zion National Park.

The high wildfire suppression demands of 1988 resulted in the National Park Service crews spending more of their time on wildfire assignments than ever before. While not on fire assignments, the crews were able to complete other natural resource projects.

Arrowhead crew assignments in 1988 included prescribed burns, trail maintenance, building and utilities projects, boundary clearing, hazard tree reduction, and search and rescue. The work was performed in Sequoia and Kings Canyon National Parks and Sequoia National Forest.

In 1988, Alpine crew project work included prescribed burns, hazard tree reduction, and fencing. This work was performed in Zion National Park, Shasta-Trinity National Forest, Dixie National Forest, and for the Cedar City District of the Bureau of Land Management.

Graphic Design - Laurel J. Simos - BIA, BIFC