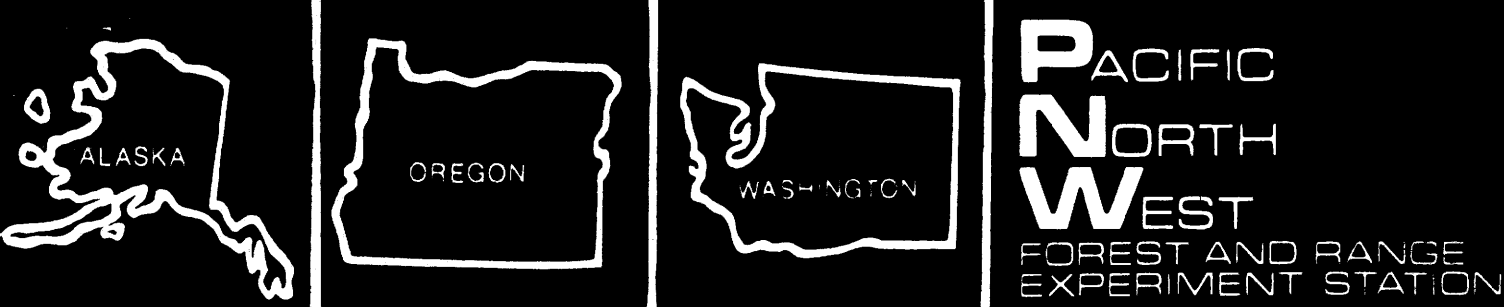




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SELECTED 1966-69 INTERIOR ALASKA WILDFIRE STATISTICS WITH LONG-TERM COMPARISONS

by

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ABSTRACT

This paper presents selected interior Alaska forest and range wildfire statistics for the period 1966-69. Comparisons are made with the decade 1956-65 and the 30-year period 1940-69, which are essentially the total recorded statistical history on wildfires available for Alaska.

Keywords: Forest fires, range burning, Alaska.

INTRODUCTION

The purpose of this paper is to summarize and coordinate the most recent period and the past three decades of wildfire activity for interior Alaska.^{1/} Formal records on interior Alaska wildfires in summarized form became available about 1940. Throughout the past three decades, records and recording procedures have changed as have other activities in the wildfire control. Previous publications

^{1/}Interior Alaska is essentially defined as that portion south of the Brooks Range, excluding the "panhandle" and Aleutian chain.

have covered Alaskan wildfire statistics in detail through 1965.^{2/ 3/} The period 1966-69 was selected for this summary because it completes the third decade since records of this type have been assembled. Wildfire and its impact in Alaska's interior are becoming more important as concern and interest in the northern environment increase.

We now have wildfire data covering the decades of the forties, fifties, and the sixties for the interior of Alaska. The 1966-69 data have been previously summarized, however, only in office reports which are generally unavailable to the public. Additionally, the period 1966-69 was one of extremely high fire activity as indicated in the tables by the numbers and acreage burned. Information summarized is a continuing attempt to provide more useful background material for reference in wildland resource management protection and utilization.

FIRE OCCURRENCE

During the 1966-69 period, 1,417 forest and range fires burned in Alaska's interior. The number of fires occurring in these four years was slightly over half the earlier 10-year total of 2,178 fires. The ratio of lightning-caused fires to man-caused fires for the 4-year period is generally comparable to the preceding decade of 1956-65; however, the average annual number of fires was up considerably. Tables 1-5 are provided in the same format as tables in a previous publication (see footnote 3) which allows easy direct comparison of these data.

In the monthly fire occurrence history for the 1966-69 period (fig. 1), the characteristic peak occurs during midsummer for the lightning-caused fire category. However, some deviation from the previous data is evident for man-caused fires, which peak in May, as recorded in earlier reports, but the decline is not as rapid as experienced in the preceding decade. Lightning-caused fires, on the other hand, reached their peak 1 month later than reported previously. This situation in part is a reflection of the protracted fire seasons during the 1966-69 period. In respect to the 30-year summaries, (1940-69), a June peak for the lightning-caused fire occurrence still is most representative of long-term trends.

²Charles E. Hardy and James W. Franks. Forest fires in Alaska. Ogden, Utah, Intermountain Forest & Range Exp. Sta. USDA Forest Serv. Res. Pap. INT-5, 163 p., illus., 1963.

³Richard J. Barney. Interior Alaska wildfires, 1956-1965. Juneau, Alaska, USDA Forest Serv. Pac. Northwest Forest & Range Exp. Sta., Inst. N. Forest., 47 p., illus., 1969.

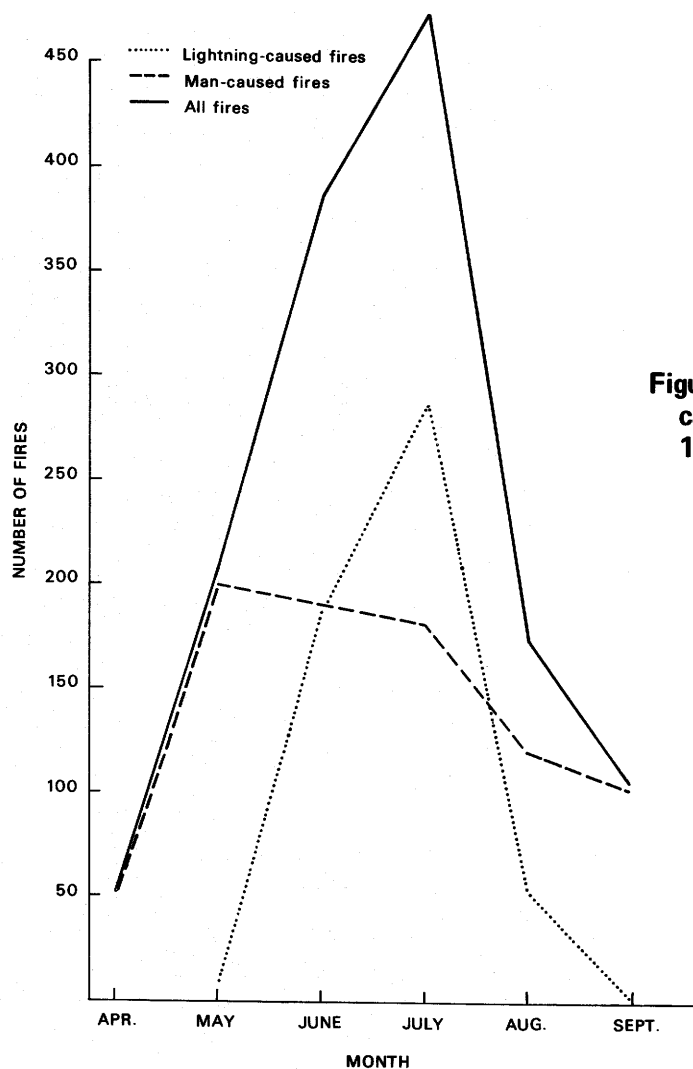


Figure 1.—Total number of fires by cause and month, interior Alaska, 1966-69.

AREA BURNED

As table 1 indicates, 6, 206, 977 acres burned during the 1966-69 period. The most recent 4 years almost equaled the preceding 10 years in terms of acreage blackened by wildfire. The average for acres burned per fire is higher in the "All" fire category as well as the lightning-caused fire category, compared with the preceding decade. This is also true of the man-caused fires; however, the difference is perhaps much more startling since the increase is greater than 800 percent. The average size for lightning-caused fires during the last 4 years was approximately 8,805 acres per fire. The annual number of fires has also risen considerably above the 1956-65 average of 218 in all years except 1967. Lightning-caused fires continued to burn the largest percentage of the total acreage. This point was accentuated during the 1968 and 1969 seasons because

so many fires were left to burn without control, having been classed as economically inaccessible for fire control action by the Bureau of Land Management.

Wildfire distribution by size class^{4/} as indicated in table 2 shows the same type of relationships continue as were portrayed in the data from the previous 10-year period. The majority of man-caused fires fall into the Class A category, whereas lightning-caused fires fall most often in Class B, with Class E running a close second. More than 80 percent of all man-caused fires fall into Class A or B size class and over 90 percent are held or controlled to Class C or smaller. This relationship does not hold in respect to the lightning-caused fires. The size-class distribution differences between lightning-caused fires and man-caused fires again can probably be attributed to differences of detection time and travel time from the headquarter's attack station to the fire, as well as the lower resource value classes and resultant lack of action on many of the more distant interior fires.

FIRE DANGER RATING

Table 3 shows fire occurrence as experienced by various classes of spread index and buildup index based on the National Fire Danger Rating System. The index value used of necessity was the value from the closest or most "representative" station for the day of fire start. One caution is that the fire could have burned for several weeks or even months. The distributions are relative indicators of relationships and show general trends.

Frequency distributions of the buildup index and fires are quite similar to those portrayed in earlier summaries. More than 80 percent of the acreage burned occurred above a buildup index of 80, and 40 percent of fire starts occurred above that same buildup-index level. Over 40 percent of acreage burned when the spread index was higher than 40, and a shift in fire incidence was demonstrated at the higher spread-index levels compared with the previous 10-year periods. More fires occurred at both higher buildup-index and spread-index levels than had been recorded during the previous 10-year period. As an example, eight fires occurred at a buildup index of 200 and higher and 56 fires occurred above the spread index of 70 with six fires occurring in the 90-100 category. Again, as pointed out earlier,

⁴Classes are: A, 1/4 acre or less; B, 1/4 acre to 10 acres; C, 10 to 100 acres; D, 100 to 300 acres; E, 300 acres and larger.

the large acreage burned and number of starts at the lower index levels is attributed to the fact that many of the fires starting earlier in the season were allowed to continue burning throughout the season until they went out naturally. These same fires accounted for a large percentage of the acreage burned.

For other comparisons, tables 4 and 5 indicate fire statistics summaries by Bureau of Land Management districts and administrative areas. In addition, these tables provide a general view of the fire problem and distribution on a more regional basis rather than the interior as a whole. On a district basis,^{5/} the Fairbanks District has the dubious honor of accounting for approximately 10 times more acreage burned during the 4-year period than the Anchorage District. At the same time, the number of fires was in many respects quite similar between districts, differing only by approximately 100 fires. Figure 2 shows the resource area boundary locations.

THE 30-YEAR PERIOD

In combining the 30-year fire statistics from available sources,^{6/} we find that annual fire incidence ranges from a low of 53 fires per year, which was experienced in 1949, to a high of 512 fires in 1969. The peak in man-caused fire occurrence was in 1969, compared with 1968 for lightning-caused fires. The smallest number of man-caused fires was reported as far back as 1949 which coincides with the minimum total number of fires. No lightning-caused fires were reported in 1940, 1941, and 1942. Doubtless, lightning was occurring during this period; however, detection and reporting procedures apparently did not account for any.

The shifts in annual numbers of fires, the changing ratios of man-caused to lightning-caused fires, and many of the other variations surrounding fire statistical summaries are in part a function of improved technology. These improvements include changing detection methods, changing suppression capabilities, and changing prevention methods. Therefore, it is difficult to normalize fire statistics over a long-term period. We may, however, generalize from the long-term

⁵The Fairbanks District is comprised of four administrative areas, Arctic, Delta, Fairbanks, and Koyukuk; the Anchorage District is comprised of five management units, Bristol Bay, Cook Inlet, Glenallen, McGrath, and Southeast.

⁶See footnotes 2 and 3.

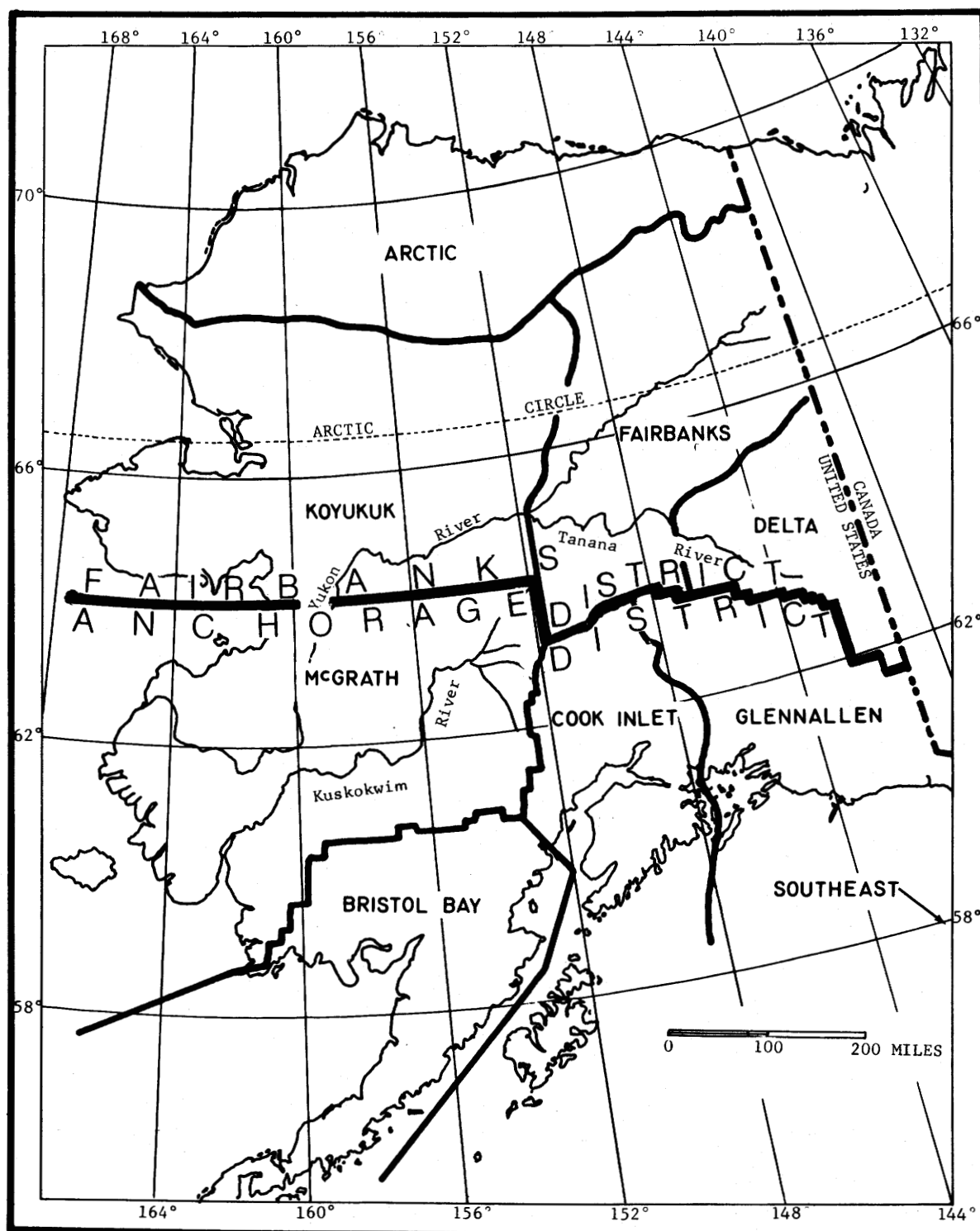


Figure 2.—Map of interior Alaska showing Bureau of Land Management administrative areas as used for sorting data.

trends. It is interesting to note that if we exclude the period of 1940, 1941, and 1942, the general ratio between man-caused and lightning-caused fires ranges between 60 and 80 percent man-caused with the balance being lightning-caused. There are some exceptions, and in 1 or 2 years a reversal of the ratio exists. However, this percentage relationship or ratio is really quite consistent. It is hard to say with certainty whether or not we are experiencing more fires now than we did in the past. This is especially questionable for man-caused fires. Part of this problem is attributed to quicker reporting today and changes in reporting criteria and rules. Part of it is perhaps attributable to our past and present inability to detect all fires and then to classify them properly as to real cause.

Data as presented are the best available and do provide a valuable benchmark by which we may generalize and assess the fire history of an area. Acreage burned over from the 1950 period on is perhaps of most interest. It is the opinion of several fire control people that the accuracy of acreage figures are much better for the decades of the fifties and sixties than during the preceding period. Here again, this is a function of capability of the organization to make such assessments. Table 6 as well as figure 3 illustrate the 1940-69 long-term trends for comparative purposes and more specific appraisal by the reader.

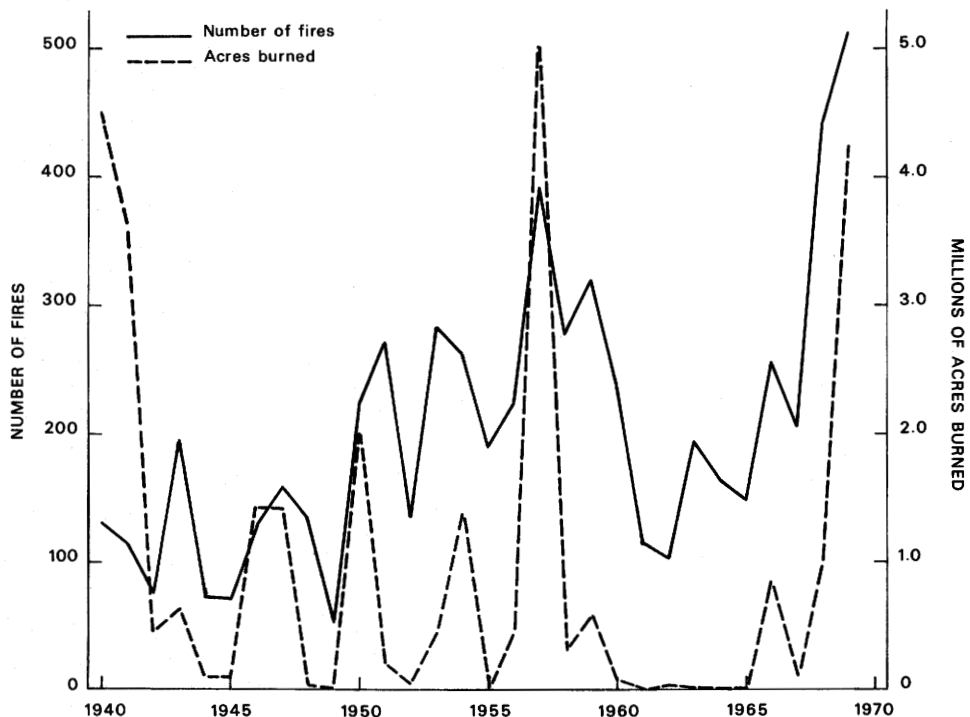


Figure 3.—Number of fires and acres burned in interior Alaska, 1940-69.

SUMMARY

It is hoped that the material presented in this paper coupled with fire statistics mentioned in the previously footnoted sources will assist fire control, fire research, and interested individuals with some of the basic historical information relative to wildfires in the interior of Alaska. As we enter the seventies, a new awareness and concern about the natural environment exists. There is also a new philosophy and capability in fire control itself.

Table 1.--Number of fires, total acres burned, and acres burned per fire, by cause, and percent, interior Alaska, 1966-69

Year	Lightning-caused fires					Man-caused fires					All fires		
	Number	Percent of all fires	Acres burned			Number	Percent of all fires	Acres burned			Number	Acres per fire	Total acres
			Per fire	Total	Percent of total for all fires			Per fire	Total	Percent of total for all fires			
1966	74	28.9	11,368	841,266	98.6	182	71.1	64	11,694	1.4	256	3,332	852,960
1967	73	35.3	1,427	104,162	95.6	134	64.7	36	4,843	4.4	207	527	109,005
1968	63	59.5	3,836	1,008,991	99.6	179	40.5	24	4,310	.4	442	2,293	1,013,301
1969	125	24.4	22,049	2,756,169	65.1	387	75.6	3,813	1,475,542	34.9	512	8,265	4,231,711
Total or average	535	37.8	8,805	4,710,588	75.9	882	62.2	1,697	1,496,389	24.1	1,417	4,380	6,206,977

Table 2.--Number and percent of fires by size class and cause, interior Alaska, 1966-69

LIGHTNING-CAUSED FIRES

Size class ^{1/}	1966		1967		1968		1969		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
A	3	4	9	12	24	9	7	6	43	8
B	30	40	19	26	90	34	31	25	170	32
C	22	30	16	22	55	21	26	21	119	22
D	7	10	7	10	16	6	2	1	32	6
E	12	16	22	30	78	30	59	47	171	32
Total	74	100	73	100	263	100	125	100	535	100

MAN-CAUSED FIRES

A	77	42	65	48	91	51	181	46	414	47
B	79	44	51	38	66	37	131	34	327	37
C	15	8	13	10	13	7	38	10	79	9
D	6	3	1	1	6	3	15	4	28	3
E	5	3	4	3	3	2	22	6	34	4
Total	182	100	134	100	179	100	387	100	882	100

TOTAL FIRES

A	80	31	74	36	115	26	188	37	457	32
B	109	43	70	34	156	35	162	32	497	35
C	37	14	29	14	68	16	64	12	198	14
D	13	5	8	4	22	5	17	3	60	4
E	17	7	26	12	81	18	81	16	205	15
Total	256	100	207	100	442	100	512	100	1,417	100

^{1/} A, 1/4 acre or less; B, 1/4 acre to 10 acres; C, 10 to 100 acres; D, 100 to 300 acres; E, 300 acres and larger.

Table 3.--Number and percent of fires and acres burned, by buildup-index and spread-index classes, interior Alaska, 1966-69

Buildup index					Spread index				
Index class	Fires		Acres burned		Index class	Fires		Acres burned	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
0-19	85	6.4	2,193	<0.1	0-9	22	1.7	1,261	<0.1
20-39	194	14.7	117,907	1.9	10-19	89	6.7	226,735	3.7
40-59	247	18.8	502,192	8.1	20-29	299	22.7	587,408	9.5
60-79	264	20.1	592,633	9.6	30-39	412	31.2	2,888,012	46.7
80-99	225	17.1	1,726,327	27.9	40-49	238	18.1	908,756	14.7
100-119	121	9.1	667,709	10.8	50-59	145	11.0	1,549,261	25.1
120-139	87	6.6	986,882	16.0	60-69	57	4.3	12,225	.2
140-159	56	4.3	917,726	14.9	70-79	29	2.2	4,598	<.1
160-179	20	1.5	543,891	8.8	80-89	21	1.6	109	<.1
180-199	11	.8	113,763	1.8	90-100	6	.5	239	<.1
200-219	4	.3	4,352	<.1					
220+	4	.3	3,029	<.1					
Total ^{1/}	1,318	100.0	6,178,604	100.0	Total ^{1/}	1,318	100.0	6,178,604	100.0

^{1/} The table shows 99 fewer fires and 28,373 fewer acres burned than shown in other tables due to missing fire danger data on some fire reports.

Table 4.--Fire statistics summary by administrative area, Anchorage District, 1966-69

Area	Number of fires by size class ^{1/}					Total number of fires	Number of fires by cause		Acres burned by cause		Total acres burned
	A	B	C	D	E		Man-caused fires	Lightning-caused fires	Man-caused fires	Lightning-caused fires	
Bristol Bay	1	5	0	3	3	12	10	2	2,459	30	2,489
Cook Inlet	109	131	28	13	9	290	283	7	88,197	1,839	90,036
Glennallen	86	40	8	0	3	137	128	9	5,167	176	5,343
McGrath	23	76	47	14	38	198	45	153	57,374	349,942	407,316
Southeast	24	2	0	0	0	26	26	0	<1	0	0
District total	243	254	83	30	53	663	492	171	153,197	351,987	505,184

^{1/} A, 1/4 acre or less; B, 1/4 to 10 acres; C, 10 to 100 acres; D, 100 to 300 acres; E, 300 acres and larger.

Table 5.--Fire statistics summary by administrative area, Fairbanks District, 1966-69

Area	Number of fires by size class ^{1/}					Total number of fires	Number of fires by cause		Acres burned by cause		Total acres burned
	A	B	C	D	E		Man-caused fires	Lightning-caused fires	Man-caused fires	Lightning-caused fires	
Arctic	0	0	0	0	0	0	0	0	0	0	0
Delta	63	47	25	3	28	166	107	59	632,166	925,628	1,557,794
Fairbanks	140	155	51	17	47	410	266	144	710,314	554,847	1,265,161
Koyukuk	11	41	39	10	77	178	17	161	712	2,878,126	2,878,838
District total	214	243	115	30	152	754	390	364	1,343,192	4,358,601	5,701,793

^{1/} A, 1/4 acre or less; B, 1/4 to 10 acres; C, 10 to 100 acres; D, 100 to 300 acres; E, 300 acres and larger.

Table 6.--Number of fires and acres burned by cause, interior Alaska, 1940-69^{1/}

Year	Lightning-caused				Man-caused				Total	
	Fires		Acres		Fires		Acres		Fires	Acres
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	
1940	0	0	--	--	130	100	--	--	130	4,500,000
1941	0	0	--	--	116	100	--	--	116	3,645,774
1942	0	0	--	--	78	100	--	--	78	452,510
1943	40	20.6	--	--	154	79.4	--	--	194	666,773
1944	18	24.6	--	--	55	75.4	--	--	73	110,604
1945	30	42.2	--	--	41	57.8	--	--	71	117,313
1946	52	40.0	--	--	78	60.0	--	--	130	1,436,597
1947	32	20.1	--	--	127	79.9	--	--	159	1,429,896
1948	21	15.7	--	--	113	84.3	--	--	134	33,676
1949	7	13.2	--	--	46	86.8	--	--	53	17,933
Total	200	17.6	--	--	938	82.4	--	--	1,138	12,411,076
Average	20				94				114	1,241,108
1950	27	12.0	445,595	21.6	197	88.0	1,612,222	78.4	224	2,057,817
1951	27	10.0	17,484	8.0	244	90.0	202,210	92.0	271	219,694
1952	11	8.1	14,556	19.7	125	91.9	59,245	80.3	136	73,801
1953	75	26.3	381,143	81.6	210	73.7	85,605	18.4	285	466,748
1954	63	24.0	1,347,990	97.0	199	76.0	41,930	3.0	262	1,389,920
1955	26	13.7	10,467	28.1	164	86.3	26,765	71.9	190	37,232
1956	64	28.0	446,746	94.0	162	72.0	29,847	6.0	226	476,593
1957	160	41.0	5,029,081	99.0	231	59.0	20,915	1.0	391	5,049,996
1958	92	33.0	228,648	72.0	186	67.0	88,567	28.0	278	317,215
1959	200	62.0	580,830	97.0	130	38.0	15,744	3.0	320	596,574
Total	745	25.8	8,502,540	61.8	1,838	74.2	2,183,050	38.2	2,583	10,685,590
Average	74		850,254		184		218,305		258	1,068,559
1960	62	26.0	32,657	37.0	176	74.0	54,523	63.0	238	87,180
1961	31	26.0	1,283	25.0	86	74.0	3,817	75.0	117	5,100
1962	53	52.0	37,828	97.0	49	48.0	1,147	3.0	102	38,975
1963	79	41.0	13,859	85.0	115	59.0	2,431	15.0	194	16,290
1964	63	38.0	2,430	71.0	101	62.0	1,000	29.0	164	3,430
1965	30	20.0	2,918	41.0	118	80.0	4,175	59.0	148	7,093
1966	74	28.9	841,266	98.6	182	71.1	11,694	1.4	256	852,960
1967	73	35.3	104,162	95.6	134	64.7	4,843	4.4	207	109,005
1968	263	59.5	1,008,991	99.6	179	40.5	4,310	0.4	442	1,013,301
1969	125	24.5	2,756,169	65.1	387	75.5	1,475,542	34.9	512	4,231,711
Total	853	35.1	4,801,563	71.7	1,527	64.9	1,563,482	28.3	2,380	6,365,045
Average	85		480,156		153		156,348		238	636,504
1940-69										
Total	1,798	29.5	13,304,103 ^{2/}	78.0 ^{2/}	4,303	70.5	3,746,532 ^{2/}	22.0 ^{2/}	6,101	29,461,711
Average	60		665,205 ^{2/}		143		187,326 ^{2/}		203	982,057

^{1/} Sources: Data for 1940-55 taken from Charles E. Hardy and James W. Franks. Forest fires in Alaska. Ogden, Utah, Intermountain Forest & Range Exp. Sta. USDA Forest Serv. Res. Pap. INT-5, 163 p., illus., 1963.

Data for 1956-65 taken from Richard J. Barney. Interior Alaska wildfires, 1956-65. Juneau, Alaska, USDA Forest Serv. Pac. Northwest Forest & Range Exp. Sta., Inst. N. Forest., 47 p., illus., 1969.

Data for 1966-69 taken from Bureau of Land Management fire reports.

^{2/} 1950-69 only. Total acres burned during these years, 17,050,635.

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