

ELK MIGRATION AND MANAGEMENT STUDY

GRAND TETON NATIONAL PARK

1950



NATIONAL PARK SERVICE - WYOMING GAME AND FISH COMMISSION

A REPORT OF THE FINDINGS OF A JOINT TECHNICAL STUDY GROUP COMPOSED OF PERSONNEL OF THE WYOMING GAME AND FISH COMMISSION (GAME DIVISION AND FEDERAL AID PROJECT 27-R-4) AND THE NATIONAL PARK SERVICE (GRAND TETON NATIONAL PARK) PREPARED FOR THE INFORMATION OF THE ADMINISTRATIVE OFFICIALS OF THESE AGENCIES IN COMPLIANCE WITH PUBLIC LAW 787.

JOB COMPLETION REPORT

SURVEYS AND INVESTIGATIONS PROJECTS

STATE: WyomingPROJECT NO. 27-R-4WORK PLAN NO. 8JOB NO. 1

Title of Job: Migration and Management Study of the Jackson Hole Elk Herd.

Objectives: To obtain information relative to the fall migration of elk from their summer ranges to the Federal Elk Refuge and other wintering areas in Jackson Hole and to study and report kill records and other data pertinent to the management of the Jackson Hole Elk Herd.

Techniques Used: Aerial and ground reconnaissance and analysis of existing recorded information.

Findings:

Public Law 787 (81st Congress) created an enlarged Grand Teton National Park which includes within its boundaries most of the Jackson Hole National Monument. The Act further provided for a joint study by technical and administrative personnel of the Wyoming Game and Fish Commission and the National Park Service of that portion of the Jackson Hole elk herd which would be affected by the creation of the enlarged park. Sec. 6 (a) of the Act follows, "The Wyoming Game and Fish Commission and the National Park Service shall devise from technical information and other pertinent data assembled or produced by necessary field studies or investigations conducted jointly by the technical and administrative personnel of the agencies involved, and recommend to the Secretary of the Interior and the Governor of Wyoming for their joint approval a program to insure the permanent conservation of the elk within the Grand Teton National Park established by this Act. Such program shall include the controlled reduction of elk in such park by hunters licensed by the State of Wyoming and deputized as rangers by the Secretary of the Interior, when it is found necessary for the proper management and protection of the elk."

This report is in effect, a compilation of the data collected by the field technicians of the Wyoming Game and Fish Commission who conducted studies with National Park Service officials. The report includes (1) an introduction outlining briefly facts considered important to the solution of the elk management problem; (2) results of the joint elk migration study; (3) elk kill records pertinent to the problem; (4) a concise summary of available information and ~~(5) recommendations for consideration of administrative officials of the Wyoming Game and Fish Commission and the National Park Service.~~

INTRODUCTION

The management of the Jackson Hole Elk Herd has been for many years and is today one of the most important and difficult tasks of the Wyoming Game and Fish Commission. The mere mention of this the World's largest elk herd, is almost sure to start a heated argument in any group of sportsmen. Most Wyomingites have very definite ideas, based usually on meager and fragmentary knowledge of the situation, about what should have been done in the past and what should be done now and in the future to preserve this priceless natural resource. Dire predictions are continually being made that unless game department policies are changed the herd is doomed. These predictions have been hurled at administrators concerned with the herd's management periodically since 1900. However, today, despite the fact that in the memory of living men Jackson Hole was a wilderness and is now highly developed as a cattle and recreational area, the Jackson Hole elk herd is still with us. Extravagant claims are continually being made about the numbers of elk which made up the herd in the "good old days". Thirty, forty and even fifty thousand head are mentioned as estimates of old timers. The following census figures of the Forest Service and Game Department are the only data claiming any sort of authenticity that is available:

<u>YEAR</u>	<u>OFFICIAL COUNT</u>	<u>YEAR</u>	<u>OFFICIAL COUNT</u>
1912	13,528	1935	22,035
1916	19,763	1938	17,370
1921	9,346	1941	17,902
1925	19,492	1945	15,014
1932	19,885	1949	16,070

The early history of the Jackson Hole Elk Herd is marked by disasterous losses during severe winters. During the winter of 1909-10 about one-half the herd perished despite the fact the State Legislature provided \$5,000.00 for hay. In 1910-11 the herd again suffered terrific loss estimated at over 2,500 head. On August 4, 1912 Congress appropriated \$45,000.00 and in 1913 added \$5,000.00 for the purchase of land to raise hay for the supplemental feeding of elk. With these funds 1760 acres of private land was purchased. The addition of 1040 acres of adjoining public land made a total of 2800 acres and marked the establishment of the National Elk Refuge. Through the Izaak Walton and Rockefeller additions the refuge has grown to about 25,000 acres. On this refuge about half the Jackson Hole Elk herd winters. The remainder of the herd is scattered over four regularly used State feed grounds and Forest lands.

Despite the advantage to the herd afforded by the National Refuge the very severe winter of 1919-20 killed about half the herd reducing its numbers to the lowest ebb in its recorded history (9,346). Very severe losses were again suffered during the winter of 1942-43 when 12,000 elk wintered on the refuge. One thousand fifty-seven elk carcasses were counted on the refuge and it became apparent to even the most stubborn advocates of unlimited elk numbers that the numbers of elk that could be wintered on the refuge successfully had some limit. Numbers of elk wintering on the National Elk Refuge had gradually increased from 4,000 in 1937 to 12,000 in 1942.

Studies carried on by U. S. Fish and Wildlife Service officials indicated that a maximum of 7,000 head of elk could be successfully wintered on the National Elk Refuge during an average winter.

A memorandum of understanding was entered into by the Wyoming Game and Fish Commission and United States Fish and Wildlife Service in which it was agreed that in so far as possible not less than 5,000 and not more than 7,000 head of elk would be wintered on the National Elk Refuge. With the furnishing of an additional 1,000 tons of hay by the Wyoming Game and Fish Commission and the United States Fish and Wildlife Service, it has been assumed that more elk can be successfully wintered on the Refuge; however, it is realized by all responsible officials of the Wyoming Game and Fish Commission and the U. S. Fish and Wildlife Service that if numbers of elk on the refuge are allowed to build up beyond reasonable numbers that damage to the refuge area resulting in reduced carrying capacity will occur and that elk will die of disease, starvation or both.

The problem of summer range for elk while not nearly as critical a problem as that of winter range must be considered. Over grazing of any area will inevitably lead to reduced carrying capacity. The rights of legitimate stock interests must be protected. The Wyoming Game and Fish Commission must be free to manage the Jackson Hole Elk herd so as to effect equitable distribution of the herd over the available elk range. Over concentration of elk on any area must be prevented by regulated kill and other management practices.

It would be presumptuous indeed to claim that the management of the Jackson Hole Elk herd in the past has always been perfect. Errors and mistakes have undoubtedly been made; however, the fact remains that the herd is still in excellent condition and is without doubt the most important and valuable elk herd in the United States. Its importance to the State of Wyoming would be hard to exaggerate.

1950 ELK MIGRATION STUDY

For many years the most immediate and pressing problem confronting managers of the Jackson Hole Elk herd has been the effecting of an adequate hunter harvest. Many Wyoming people will not recognize the need for limiting the number of elk in Jackson Hole. They stubbornly insist that elk numbers should be continually increased. Early in the history of the Jackson Hole elk herd, pressure from this faction of public opinion forced passage of hunting regulations which resulted in inadequate hunter harvest. Elk numbers increased beyond the carrying capacity of range and existing facilities resulting in either disastrous winter losses from disease and starvation or firing line slaughters. It is possible that in the future the carrying capacity of both winter and summer elk ranges may be increased. If and when range carrying capacities are increased, corresponding increase may be made in elk numbers. Until such time, however, elk numbers must be very carefully controlled.

It has always been the hope of the Wyoming Game and Fish Commission that adequate hunter harvest could be effected without hunting migrating elk. In most areas of the state this has been possible. In Jackson Hole it has not been possible. Despite the fact that early hunting has always been allowed there has never been an instance where adequate hunter harvest has been effected without the hunting of migrating elk.

Recognizing the importance of the elk migration to the management of the elk herd the Wyoming Game and Fish Commission has for many years studied migration routes. Since the creation of the Jackson Hole Monument and its subsequent inclusion in the Grand Teton National Park, the National Park Service has also conducted studies of the migration of elk through and near Park lands.

Both the National Park Service and the Wyoming Game and Fish Commission published detailed reports of migration studies last year. The reports agree in general as to numbers and routes followed by migrating elk. Both reports should be read and studied by those particularly interested in this problem.

The 1950 elk migration was studied by a joint crew composed of Wyoming Game and Fish and National Park Service officials. Complete agreement was reached in the field on all track counts. The following is a summary of elk migration track counts made during 1950:

SUMMARY OF ELK MIGRATION TRACK COUNTS - 1950 (See next page)

The chart figures lay no claim to absolute accuracy. They are influenced, as are all track counts, by certain limitations. The tracks of small bands of elk in snow can be accurately counted. The larger the band of elk the less accurate the track count will be. The figures certainly do not represent a total of the numbers of elk crossing the transect line. Small herds of elk crossed during periods when the ground was bare and frozen and so were not counted. The tracks of others were covered by fresh snow which fell before observers reached the crossings. However, during the ~~harvest~~ best period of migration snow conditions were ideal and most of the elk crossed in relatively small bunches; so while the count is not complete and is subject to human error, it does offer the best available information on the relative numbers of elk using the various migration routes.

Migration routes were located by aerial reconnaissance supplemented by foot and horseback surveys. Most of the aerial reconnaissance was done in 1949. The principal migration routes are shown on the map at the end of this report. Numbers of elk using each route are shown in red and circled.

In order that significant differences and parallels in the 1949 and 1950 elk migration may be noted the following is quoted from the Wyoming Game and Fish Commission migration report of 1949:

"In spite of relatively mild weather there was a noticeable bunching of elk by October 10th. Apparently some southward movement was already underway as elk were sighted more frequently each day in the area immediately north of Buffalo Fork from that time on. By the eleventh of October the foot hunters working north from the Moran-Togwotee Pass Highway were able to make kills within a mile north of the road. The first actual crossing of the Buffalo River known to this study was made the evening of October 13th by seven mature bulls. During the next six days the movement was light and scattered.

Following the termination of the hunting season the night of the fifteenth, large bands of elk began to congregate in the area immediately north of the Buffalo Fork. On the twentieth, during heavy snowfall, what had been a trickle

SUMMARY OF ELK MIGRATION TRACK COUNTS - 1950

	OCT.		NOVEMBER																												DEC.		1950	1949
			2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	26	27	28	5	6	TOT.	TOT.					
TETON PARK NORTH EN- TRANCE ROAD TO JACKSON LAKE.	48	27	95	46	21	8		18	42	17	29	29		14		8			15	17	4	3	13	5	7	5	471	600						
JACKSON LAKE RANGER STA- TION TO WILD- LIFE PARK.	60	59	60	25	15	47		50	200	25	43	60	50	5	37	20	15	37	36	40	15	5	15	2	6		927	1450						
PACIFIC CREEK BRIDGE TO BUFFALO RIVER RANCH.	126	10	25	39	45	46	9	257	839	87	220	188	156	15	65		7	5	70	59	8	10		5	95		2386	2950						
HATCHET RANCH ROAD TO WEST END TURNER FENCE.	40		15			49	46	728	440	31	182	246	61	39	131	19		17	132	24	17	5					2222	1400						
BOX CREEK TO TURPIN MEA- DOWS.	3						17	158	241	7	38	73		8	26	9		11	26	58	6	9		10	17	6	723	900						
TURPIN MEA- DOWS TO TOG- WOTEE PASS.	78							442	275	20	55	94		41	26				28	33	7	20		7			1126	700						
TOTALS	355	96	195	110	81	150	72	1653	2037	187	567	690	267	122	285	56	22	70	307	231	57	52	28	29	125	11	7855	8000						

of elk became a surging flood. Approximately 300 head moved around the south end of Jackson Lake, thence down Burnt Ridge, across the Snake River, through the Potholes and finally across Antelope Flats to the Refuge. That same night the first major crossing of the Buffalo Fork got underway when an estimated 800 head crossed the Moran-Dubois highway between Four Mile Meadows and Buffalo Ranger Station. Approximately 200 elk came out of Pacific Creek, past the Wild Life Park, thence through the Potholes and across Antelope Flats to the Refuge. Aerial reconnaissance revealed that by the following evening there were nearly a thousand elk on the Refuge meadows and scattered along the south bank of the Gros Ventre River. Additional animals were massing in the heavy timber just off the south end of Jackson Lake.

From the foregoing it might be assumed that once the elk surmounted the major obstacles in their paths (namely Highway 287 and the Snake or Buffalo Rivers) they continued on to the wintering areas without stopping. However, with the exception of those animals going around the south end of Jackson Lake, this was not generally the case after the first three days of the migration. Frequently the trails of elk herds dispersed on the aspen covered hills (Burro, Uhl, etc.) south of the Buffalo Fork and the animals remained in the area for as long as three weeks. How much longer they sometimes remained there could not definitely be determined as changing weather conditions did not permit continuous, conclusive observations beyond that time.

Heavy movements of elk continued for several days following the initial "break through" then tapered off during the remainder of October. On the twenty-third an estimated 800 elk made an eastward crossing of the Snake River just above the point where it empties into Jackson Lake. Most of these remained on the grassy slopes just east of the river for a week before infiltrating across Highway 89 and continuing in a southeasterly direction toward the Wildlife Park.

During early November the weather was generally fair and elk movements were light and sporadic. By the tenth there had been a moderate snowfall and the elk were again heading south in increasing numbers. During the next few days about 60 head travelled from Moose Creek down the west side of Jackson Lake, across Moran Bay and toward Antelope Flats. The 68 head which had summered on Elk Island swam south to the mainland and followed those from Moose Creek to the Refuge. Another large herd moved across the Snake River from Berry Creek and spread through the timber along Highway 89. From there they wandered erratically southward to converge near Emma Matilda Lake and finally recross the Snake River, just west of the Wildlife Park. Activity also increased on the Pacific Creek, Box Creek and North Buffalo Fork trails with the movement of as many as 496 elk being noted in one 24-hour period.

By November 15, migration was again on the wane and only small, scattered bands were using the trails. This situation continued until December 15th, at which time there were so few elk remaining north of Buffalo Fork that further outlay of time for the study was not considered practical."

Weather undoubtedly exerts more influence on elk migration than any other factor. As snow begins to accumulate and temperature drops, elk begin to become restless and gather in herds. For a time these herds wander about rather aimlessly, drifting downward in search of food not buried by deep snow. At this point the factor

of hunting pressure becomes extremely important. The herds avoid areas frequented by hunters and so are pushed into areas where there are no hunters or where there are fewer hunters. Thus elk normally using one migration route may be forced into other established migration routes or even into making new ones.

During the 1950 hunting season, heavy hunting pressure along Pacific Creek obviously pushed elk into migration routes to the east.

A study of the relative migration figures for 1949 and 1950 also indicates that hunting pressure holds back elk migration. In 1949 the migration really got underway on October 19th four days after the close of the hunting season. About half of the elk counted across the transect line during the 1949 study made the crossing between October 19th and 25th. Again in 1950 the migration began on November 9th four days after the close of the hunting season and again over half the elk counted during the entire study crossed in five days.

The winters of 1949 and 1950 were roughly comparable in severity so it can reasonably be assumed that the twenty-day difference in the beginning of migration can be explained by the twenty-day difference in hunting season length.

During the 1950 migration 48 $\frac{1}{2}$ % of the elk counted across the study transect line moved across park land at some time during their migratory movement.

TETON MANAGEMENT AREA HUNTER HARVEST

Hunter harvest, the only means open to the Wyoming Game and Fish Commission for the reduction and control of elk numbers, is all important to a management study of the Jackson Hole elk herd. The following is a summary of the elk kills of 1949 and 1950. In the first table only specific designations are made for areas where kills were possible in the area of Grand Teton National Park.

KILLS RECORDED ON CHECK STATION CARDS - 1949

SPECIFIC KILL AREA	TOTAL KILL	KILL ON PARK LANDS
Berry Creek	27	27
Pacific Creek	117	42
Pilgrim Creek	61	11
Spread Creek	124	10
Uhl Hill	19	19
Arizona Creek	16	4
Lizard Creek	9	4
Ditch Creek	21	4
Snake River	6	4
Antelope Flat	6	6

Kills Recorded on Check Station Cards-1949 (Cont'd)

SPECIFIC KILL AREA	TOTAL KILL	KILL ON PARK LANDS
Kelly	2	2
Jackson Lake	3	3
Burnt Ridge	3	3
Signal Mountain	1	1
Two Ocean Lake	8	8
Gros Ventre	49	4
Areas not touching Park	1023	0
TOTAL	1195	152
Field check made by wardens		
Snyder, White, and Charter of local residents.	219	35
Estimate of unchecked residents	190	21
TOTAL KILL	1904	208

The 1949 hunter harvest fell below that desired by managers of the herd necessitating a more liberal season and heavier kill in 1950. A summary of the 1950 elk harvest by drainage and hunting area follows:

SUMMARY OF ELK KILL ON TETON MANAGEMENT AREA DURING 1950

AREA OR DRAINAGE	TOTAL KILL	KILL ON PARK LANDS	AREA OR DRAINAGE	TOTAL KILL	KILL ON PARK LANDS
Alkali Creek	6	0	Clear Creek	34	0
Arizona Creek	23	6	Cottonwood Creek	56	0
Antelope Flat	2	2	Coyote Creek	1	0
Box Creek	182	0	Cache Creek	12	0
Bear Paw Creek	10	0	Calf Creek	7	0
Big Game Ridge	9	0	Cub Creek	1	0
Buck Creek	2	0	Crystal Creek	16	0
Butte Creek	3	0	Cabin Creek	1	0
Bacon Creek	13	0	Collins Creek	1	0
Blind Pass	1	0	Cow Creek	4	0
Blind Basin	3	0	Crowsnest Creek	1	0
Black Rock	47	0	Ditch Creek	23	6
Bruin Creek	2	0	Deep Creek	1	0
Buffalo River	354	62	Dell Creek	2	0
Black Rock Creek	11	0	Dry Cottonwood Creek	14	0
Beauty Creek	5	0	Dallas Creek	5	0
Berry Creek	29	29	Dude Creek	5	0
Baldy Mountain	2	0	Dry Creek	1	0
Burnt Ridge	11	11	Dime Creek	5	0
Bar-B Creek	1	0	Devil Basin	19	0
Burnt Fork Creek	2	0	Deer Creek	6	0
Bench Creek	7	0	Enos Lake	16	0
Bull Creek	2	0	Enos Mountain	1	0
Bailey Meadow	2	0	Enos Creek	4	0
Bunker Hill	1	0	Elk Creek	1	0

AREA OR DRAINAGE	TOTAL KILL	KILL ON PARK LANDS	AREA OR DRAINAGE	TOTAL KILL	KILL ON PARK LANDS
Fish Creek	109	0	Mocasin Basin	1	0
Fox Creek	4	0	Moose Park	1	0
Fly Creek	1	0	Open Creek	1	0
Flat Creek	26	6	Papoose Creek	2	0
Gros Ventre	90	9	Pass Creek	3	0
Gravel Creek	16	0	Polcat Creek	10	0
Gravel Lake	5	0	Pilgrim Creek	125	52
Gravel Mountain	16	0	Purdy Creek	4	0
Gravel Ridge	29	0	Purdy Basin	11	0
Gunsight Pass	4	0	Parker Creek	2	0
Grouse Creek	1	0	Park Creek	9	0
Goosewing Creek	9	0	Pacific Creek	627	253
Granite Creek	5	0	Randolph Mountain	44	0
Glade Creek	10	0	Red Creek	9	0
Green Mountain	1	0	Rodent Creek	7	0
Hidden Creek	1	0	Soda Fork Creek	31	0
Hidden Basin	7	0	Squaw Creek	14	0
Huckleberry Mtn.	6	0	Sohara Creek	7	0
Horsetail Creek	23	0	Scatter Creek	2	0
Hereford Creek	2	0	Slide Lake	26	0
Haystack Creek	3	0	Soda Mountain	1	0
Hidden Lake	1	0	Slate Creek	50	0
Joy Creek	3	0	Sheffield Creek	1	0
Joy Peak	1	0	Sheep Creek	4	0
Jag Creek	5	0	Sheep Mountain	5	0
Kelley Flat	3	3	Stove Creek	2	0
Kinkey Creek	1	0	Two Ocean Lake	22	22
Lizard Creek	4	2	Thorofare Ridge	18	0
Lava Creek	172	23	Turpin Creek	17	0
Layout Creek	1	0	Turpin Meadows	17	0
Lightning Creek	2	0	Trunk Creek	1	0
Leidy Creek	2	0	Terrace Mountain	4	0
Leeds Creek	4	0	Trail Creek	4	0
Lake Creek	2	0	Uhl Hill	4	4
Lafferty Creek	1	0	Snake River	13	5
Leidy Mountain	50	0	Spread Creek	283	22
Logan Creek	1	0	Whetstone Mtn.	23	0
Leidy Lake	4	0	Woody Creek	6	0
Lake of Woods	1	0	Wolverine Creek	5	0
Lloyd Creek	1	0	Willow Creek	4	0
Matilda Lake	9	9	Wood Mountain	2	0
Moose Basin	1	1	Yellowstone River	2	0
Miner Creek	4	0	Unknown	17	0
Miller Creek	2	0	Total	3078	527
Moose Creek	2	0	Local Resident Kill	525	150
Miller Road	2	0	Known and Estimated		
Mink Creek	17	0	illegal kill	35	8
Maurie Creek	1	0	TETON AREA KILL		
			TOTAL	3638	685

19% of total kill made on Park lands.

SUMMARY

It is the responsibility of the Wyoming Game and Fish Commission to maintain an elk herd on the Teton Management Area which will yield a maximum hunter harvest on a sustained yield basis. Managers of the herd realize that if elk numbers on any part of the area are allowed to increase beyond the normal carrying capacity of the available forage, that range abuse, resulting in reduced carrying capacity, will occur.

Other land management agencies besides the National Park Service are interested in the management of the Jackson Hole Elk Herd. The Wyoming Game and Fish Commission is committed by agreement with the U. S. Fish and Wildlife Service to limit the numbers of elk on the National Elk Refuge to 7,000 per winter. The Commission has also tentatively agreed with the U. S. Forest Service that a maximum of 14,000 can be carried on the Teton National Forest without seriously injuring the range through overgrazing and without unfair competition with stock grazing interests.

Experience and study have shown us that the Jackson Hole Elk Herd increase at a rate of 3,000 to 3,400 animals per year.

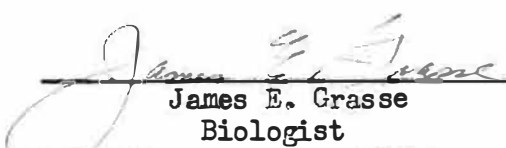
Observation and study have shown that hunting pressure exerts a powerful influence on elk movement and will cause elk to move from heavily hunted areas to areas of lighter hunter presence. The hunting pattern of 1950 was observed and for that area to the north of the Buffalo Fork River may be summarized as follows: Hunting camps lined the highway from Togwotee Pass to the South gate of Yellowstone along highway U. S. 287 and hunters entered the hunting area to the north and east of this highway by almost every possible road and trail. Heavy concentrations of hunters were noted in the Tracy Lake region, on Pacific Creek and near Two Ocean Lake, with minor concentrations on Pilgrim and Arizona Creeks. The area to the north and east of highway U. S. 287 was well covered by hunters and a satisfactory hunter harvest was attained in this area.

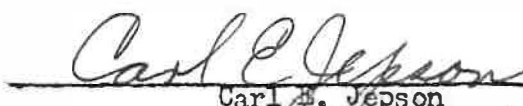
The migration routes of the elk have been located over extensive areas and especially within the area of the park. The general pattern of the migration has been established as a result of this and previous studies. The results of this year's study are well recorded on the attached map and indicate the number of elk that migrate over routes that pass through the park and also those that migrate to their winter feed grounds and do not pass through the park.

The data recorded on the two preceeding tables gives information on the locations of where elk kills have been made during the past two years. This information cannot be taken to be absolutely correct as to the exact location of the hunter's kill. For the reasons that the boundaries of the park have not been marked and its approximate location is not known to many hunters.

During the 1950 hunting season 665 elk were reported to have been killed in the park and of this number 429 were reported as having been killed in the area of the park to the north and east of Highway U. S. 287. The local resident kill of 150 elk for the park may have in part been from this same area. No definite information on the location of the local resident kill is available. The shaded portion of the attached map shows the section of the park in which the greater portion of the elk harvest of the park was made during the 1950 hunting season.

The above report is respectfully submitted, in compliance with public law 787,
for the information and guidance of administrative officials of the Wyoming Game
and Fish Commission and of the National Park Service.


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