GRIZZLY BEAR MANAGEMENT
MANAGEMENT SUGGESTIONS AND DATA

Letter - People to whom management reports were sent
George Sprague's article on National Parks & research

July 23, 1968

Mr. Paul M. Tilden, Editor
National Parks Magazine
1701 Eighteenth St., N.W.
Washington, D. C. 20009

Dear Mr. Tilden:

Thank you for your letter of July 12th and I am happy to learn that the National Parks Association will be responsible for producing a book on our grizzly bwar management report. I will be looking forward to receiving more details from you.

In answer to your query concerning commitments, the answer is that we have made no commitment to any other agency or person for the publication of our report MANAGEMENT OF BEARS IN YELLOWSTONE NATIONAL PARK. We do, however, have plans to publish more detailed scientific papers involving some of the information included in the report.

We also plan eventually to publish a monograph that would include some of the information that we have presented in the management report, For example, information on population tynamics and structure, mortality rates, and reproductive biology. We do not want to give exclusive rights to this material since it would then prevent us from producing a major work some time in the future.

Perhaps the best way to get around this would be to copyright the book in our names but with the understanding that proceeds of sales, etc., would go to the National Parks Association. Perhaps we should explore the possibility of author royalties after the initial cost of the publication had been met. Neither Frank nor I wish to capitalize on this work; however I think it is only fair that if the publication should sell considerably better than predicted, that the authors should share in the proceeds.

As you know, there is still a great deal of work involved on the part of all of us to get this report into a published form, and both Frank and I will do our best to make it as worthwhile a publication as we can - both with regard to text and illustrations.

Very sincerely,

John J. Craighead,
Unit Leader

JJC:AB

NATIONAL PARKS ASSOCIATION

Publishers of National Parks Magazine

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Washington, D.C.

July 12, 1968

Dr. John J. Craighead
Montana Cooperative Wildlife Research Unit
University of Montana
Missoula, Montana 59801

Dear Dr. Craighead:

We seem to be in a position to go ahead with the publication of the Grizzly Bear Study as soon as the many preliminary arrangements can be pulled together. Mr. Thomas Webster and I will be responsible for the production of the book, and have already done some exploratory work in the matter of printing and the general appearance of the volume. As soon as we get a little farther along, I will present you with a more exact picture of the book as it might finally appear.

Meanwhile, one of the things that I would need to know immediately is whether or not any other organization, agency or person has any commitment toward the publication of this book. This is a point which I would think it vital to clear up before anything else happens.

Tom Webster will be calling you on the same day this letter is mailed, but this letter will serve to keep us in touch also.

Cordially yours,

Paul Tilden

Paul M. Tilden, Editor
National Parks Magazine

PMT:jmk

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

UNIVERSITY OF MONTANA
MONTANA FISH AND GAME COMMISSION
WILDLIFE MANAGEMENT INSTITUTE
FISH AND WILDLIFE SERVICE, UNITED STATES DEPARTMENT OF THE INTERIOR

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801
July 24, 1968

Mr. Paul M. Tilden, Editor
National Parks Magazine
1701 Eighteenth St., N.W.
Washington, D. C. 20009

Dear Mr. Tilden:

Thank you for your letter of July 12th and I am happy to learn that the National Parks Association will be responsible for producing a book on our grizzly bear management report. I will be looking forward to receiving more details from you.

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Unit Leader

JJC:AB

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Montana Cooperative Wildlife Research Unit
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Missoula, Montana 59801

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MISSOULA, MONTANA 59801

April 23, 1968

Dear Frank:

I have received letters from Joe Linduska of the Bureau of Sport Fisheries and Wildlife and from Tony Smith, National Park Service Magazine, concerning publication of our bear on MANAGEMENT OF BEARS IN YELLOWSTONE NATIONAL PARK. Tony Smith is very interested and I am going to explore this possibility.

I feel we will probably have to make quite a few changes in the paper if it is to be published in National Parks Magazine, but perhaps not. In any event, I think we should add some information and delete other.

Under population dynamics I would like to add a paragraph on reproductive biology which would just briefly summarize some of the findings I have presented in our paper on that subject. Also I think that under Management Suggestions we should consider a section entitled "Informing the Public" or "Bear-Man Relationships" or something to that effect. We could then discuss in a general way the problem bears such as those in Glacier last summer and discuss what causes such incidents and preventive measures.

I have in mind an organization something like this:

I. Basic nature of the grizzly
   a. Census
   b. Critical reaction distance for attack
   c. Types of attack
      1. Sudden and without apparent provocation
      2. Attacks induced by bear-man relationships such as feeding

II. Bear man associations
   a. Garbage dumps
   b. Hand feeding and conditions this brings about
   c. Behavior in relation to specific areas of conditioning such as dump areas, back country, etc.
   d. Movement of bears in relation to feeding sites
   e. The type of control and the number of personnel needed to safeguard the public from grizzly attack.

These are just some very general ideas. Let me know what you think of this and whether you would want to rough something out while I work on other aspects of the report.

Sincerely,

John

Grizzly Bear Mgt. Folder

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MISSOULA, MONTANA 59801

February 13, 1968

Dr. Clarence Cottam, Director
Welder Wildlife Foundation
P. O. Drawer 1400
Sinton, Texas 78387

Dear Clarence:

Thanks so much for your nice letter of January 29th. If, as you indicated, you should see George Hartzog in the near future, I certainly think it would be helpful if you were to make some casual comments about our grizzly bear management report.

I have not given much thought to publication of the report since I have a wealth of data yet that I am trying to work up for scientific papers. However, I believe the report would have considerable value if published and certainly could get much wider distribution than at present.

Frank and I would be agreeable to publication of the report by the National Park Service or through the North American Fauna Series. Actually, I think it would probably be more appropriate to publish the report through the National Park Service and to later do a much more comprehensive monograph on the grizzly for the North American Fauna Series. In any event, I know of no more competent spokesman than you and I would certainly appreciate any suggestions that you care to make to appropriate people in Washington with regard to publication of the report.

It has occurred to me that it might be desirable to publish the report in the same way the work authored by you, Dr. Leopold, and others was handled. I believe this report was published through the American Forestry Magazine. I am wondering how the idea strikes you for making some firm arrangement for publication of reports dealing with the management of specific resources within the National Parks. The Leopold Report clearly indicated the need for research in specific areas and I think that publication of reports dealing with the management of specific park resources would be a logical follow-up to the Leopold Report which stated and defined so well the broad objectives, scope, and philosophy of park management.

It is my feeling that it would be desirable to publish management reports through media that would make them available to a wide range of resource managers, administrators, and scientists. Publications of this nature in the technical journals are often not widely circulated. Also, all too

often the researchers prepare a management report based on years of research only after they have finally published their basic findings in scientific journals. This tends to cause a long delay between the accumulation of knowledge and the application of this knowledge in practical management - and in too many cases, the work is terminated short of offering any concrete plan for management.

I recognize the weakness in publishing a management paper prior to complete analyses of all the data and without all of the supporting evidence. However, I think the errors inherent in this procedure are minor compared to the alternative of no management suggestions. So frequently researchers fail to prepare management plans or make management suggestions following years of research.

Essentially what I am suggesting is that the National Park Service consider publishing not only reports that deal with the broad scope of park management and policy, but also specific management plans based on intensive research. For example, in Yellowstone Park alone, there is need for a well-spelled out program for the management of big horn sheep, elk, moose, and buffalo - to mention only a few.

Hopefully detailed management plans will be developed by researchers in these areas and will become the basis for the management of these resources within Yellowstone National Park.

Sincerely,

John

John J. Craighead

JJC:AB

UNITED STATES DEPARTMENT OF AGRICULTURE
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NORTHERN REGION
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MISSOULA, MONTANA 59801

ADDRESS REPLY TO
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2630

SEP 2 8 1967

John J. Craighead, Leader
Montana Cooperative Wildlife Research Unit
University of Montana
Missoula, Montana 59801

Dear John:

We appreciate the opportunity to review your manuscript, Management of Bears in Yellowstone National Park. It has been routed to a number of people in the Regional Office for their review and information. I am sure they will find it interesting and informative. It will receive our close study and will be helpful in developing future programs and plans.

Phasing out the refuse dumps in the Park would seem to require drastic readjustment by the grizzlies if the supplemental feeding is not effective. What will be the probable impact at the campgrounds in the Park and the adjacent campgrounds and refuse dumps on National Forests? Possibly we should plan to phase out or eliminate the dump at West Yellowstone at the same time phasing out is being accomplished in the Park.

Is the high mortality outside the Park largely legal hunting or a variety of causes?

A copy of our Northern Region grizzly bear policy is enclosed for your information.

Thanks again for the chance to review your very interesting study.

Sincerely yours,

Neal

NEAL M. RAHM
Regional Forester

Enclosure

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TITLE 2600 WILDLIFE MANAGEMENT

2633.4 - Endangered Species Areas. The range of the grizzly bear in Montana and north Idaho is considered an endangered species area. It is the intent of the Forest Service to favor the grizzly on its range. Within this range and adjacent areas where Forest Supervisors consider maintenance of bear populations to be desirable, the following special considerations will be taken to favor grizzly bear:

1. Forest officers will strongly support hunting regulations designed to sustain grizzly bear populations.

2. Measures favoring grizzly bear habitat will be considered in wildlife management, wilderness area, and district multiple use plans. Support research and administrative studies on grizzly bear and their habitat.

3. Human use will be controlled on key ranges to meet objectives of sustaining or restoring grizzly bear populations. This can be done by restricting access, among other things.

4. Some property damage and inconvenience to Forest Service personnel will have to be tolerated.

5. Work crews will not be permitted to carry guns on the job in grizzly bear range. A high-powered rifle may be kept in camp for emergency use; however, this rifle will not be used against grizzly bear unless an attack is underway. The rifle may also be used to escort crewmen away from areas near dangerous or marauding grizzlies.

This restriction will not prevent Forest Service personnel from taking guns into grizzly range on legitimate big-game hunts.

6. When an ill-tempered grizzly is known to be a hazard to work crews or the general public, prompt administrative action will be taken to remove people from danger. Immediate followup with the proper local State game officer will be made to resolve the problem.

7. The need to protect grizzly bears will be publicized.

Precautions to Minimize Bear Incidents. In order to minimize bear incidents which would endanger personnel and property in grizzly country, the following should be done:

1. Request hunters to report knowledge of wounded bear to forest rangers or game officers.

2. Incinerate all garbage in camps which are occupied for more than two nights.

3. Advise lone travelers or small groups to talk, whistle, wear bells, or make noise. If a bear is sighted, maneuver to give it the

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human scent. Bear are afraid of the human scent and usually are frightened away by noise.

4. Be particularly alert for bear when traveling on foot. Attempt to locate bear in travel path in order to avoid a close encounter. Take a safe haven when a bear is sighted. If a bear approaches and you cannot reach a safe place, it is better to play dead than to run.

5. Do not use old crosscut saw blades or anything which could seriously maim a bear to bar cabin windows and doors.

These precautions will be incorporated in crew instructions, handout literature, and other public contact media.

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MISSOULA, MONTANA 59801

September 15, 1967

Mr. Keith Nelson, Superintendent
Glacier National Park
West Glacier, Montana 59936

Dear Mr. Nelson:

I was distressed to learn of the tragic grizzly bear attacks that occurred at Glacier National Park during mid August.

As you know, my brother and I have been conducting an intensive study of the grizzly bear in Yellowstone National Park over the last nine years. We have directed a great deal of our effort towards determining causes of bear-man conflicts and we have learned a great deal about the behavior of the grizzly bear by instrumenting them with radios. Over the past eight years we have instrumented approximately 40 grizzlies - some of these in the back country and some that have been problem animals in the frequented camp grounds.

Neither my brother nor I have had any official word from the National Park Service in regard to the August incidents. However, we received numerous long-distance telephone requests from newspapers and other public information media for our opinions on the incidents in Glacier. In all instances we indicated that we had no first-hand information and so could not comment on these specific incidents.

We did, however, more in self defense than anything else, provide basic information on the ecology of the grizzly.

I am sure we are going to get many more requests in the future concerning these incidents and so I would appreciate it greatly if you could make available to me and to my brother a complete official record of the two grizzly bear attacks and the action taken by your staff following the attacks.

Perhaps our experience with grizzly bears over the years could be used to advantage by the National Park Service and we could offer some helpful suggestions as to how such incidents might be prevented in the future.

Your cooperation in this matter would be greatly appreciated.

Yours very sincerely,

John J. Craighead

JJC:AB

cc Mr. C. Edward Carlson, Chief
Division of Wildlife Research

October 10, 1967

Mr. C. R. Gutermuth
Wildlife Management Institute
Wire Building
Washington, D. C. 20006

Dear "Pink":

Thank you so much for your letter of September 29th. I was delighted to learn that you had a session with Director Hartzog.

You may be interested to know there is considerable dissatisfaction with our report on the part of members of the Yellowstone staff ostensibly because we criticized certain practices of the Park Service. Actually we were very restrained in our comments concerning Park policy and personnel. Some of the things we have observed would be hard to believe! However, public airing of these would do more harm than good as far as the management of grizzlies is concerned.

There are a few things that I have been wanting to get off my chest for some time and I would like to mention these to you. I would hope that the information might enable you to straighten out a few things without involving Frank and myself if this is possible.

Working in the back yard of the National Park Service imposes certain problems which are not easily aired except among personal friends.

To begin with, I think you would be interested to know that following the Glacier incidents and up to the present time neither Frank nor I have ever been contacted either officially or informally by any member of the National Park Service in order to get our advice on the matter. If anything, they have studiously avoided contacting us.

Following the incidents we were deluged with letters and phone calls from conservation organizations, newspapers, radio stations, etc., asking our opinion on the grizzly bear attacks. We gave freely of our information on the grizzly bear, refraining from making any comments concerning the specific situation in Glacier indicating we had no first-hand knowledge.

However, I know from past experience what the situation was at Granite Park and I have had a lot of correspondence since informing me of the situation. There is no doubt that one and probably both grizzly bears

had been literally hand fed over a period of time and that the visitors had been allowed - and in fact encouraged - to sleep in the area where the grizzlies were fed.

Feeding grizzlies at dumps does not tend to make them disdainful of man; however hand feeding, where the bear definitely associates the food with man, soon conditions the animal to such an extent that he loses his normal fear of human beings. These bears can become extremely dangerous and it only takes the right situation to bring about a tragic incident.

Both Frank and I were in Yellowstone Park at the time of the bear incidents. The Superintendent of Yellowstone sent their biologist, Mr. Cole, up to Glacier to investigate. He was widely proclaimed as a grizzly bear specialist. I have known him for many years - he is a range management specialist and has had absolutely no experience with grizzly bears..

Although I have not yet had a chance to talk with him, some of our people have, but he has absolutely refused to comment on the grizzly bear incidents in Glacier.

As you will see from the enclosed letter, I wrote to Mr. Nelson requesting a copy of the report. I think it is obvious that this is a polite brushoff. No doubt it will take a while for a final report, but I am sure there have been reams of incidental reports prepared and that a lot of valuable information is currently available on the Glacier incidents.

I will not go into detail at this time as to what I think probably occurred at Glacier. I do wish to say, however, that grizzly bears do not normally act in this manner and that nine years of intensive study have shown us that they act in this way only when they become overly familiar with human beings. Also there has to be an almost complete disregard for the dangerous nature of the grizzly for incidents like these to occur. It generally follows that where a bear is literally hand fed and appears to be tame and friendly that people in the vicinity recognize only the apparent friendly nature of the bear and do not realize its potential for destruction.

I firmly believe that these incidents were completely unnecessary. I think that this entire matter should be brought out into the open because if it is not, it will mean serious injury or similar type deaths in the future and eventually destruction of the grizzly bear.

Grizzly bears and man can co-exist providing they are managed properly and proper precautions are taken by the visiting public.

I would like to suggest that you write the Superintendent of Glacier and request full details on the incidents. Because I am a federal employee and because there no doubt will be litigation against the Government, I am in no position to press this matter further.

Kindest personal regards,

John J. Craighead

JJC:AB

cc: Mr. G. Edward Haslam

October 10, 1967

Mr. Alfred G. Etter
Defenders of Wildlife
Box 117
Aspen, Colorado 81611

Dear Mr. Etter:

Under separate cover I am sending you a copy of our bear report. I am considering publishing the report either in part or in whole so would prefer that you contact me if you plan to use any of the material in a publication.

I got no satisfaction from my letter to the Superintendent of Glacier. He indicated it would take a long time to complete the report and I am sure that it will be difficult to pry loose any information from that source. However, I am going to keep trying.

I am rather surprised at Mr. Fagergren's comment since I have been particularly careful not to express my views on the Glacier incident since I have not had any first-hand information.

You may be interested to know that although my brother and I were contacted by many organizations and newspapers throughout the country at the time of the Glacier incident, we have not even at this writing been contacted once officially or otherwise by the National Park Service - this in spite of the fact that we have spent nine years intensively studying the grizzly and bear-man incidents in the Park, and in spite of the fact that the Park Service did not have an animal ecologist to send to Glacier to investigate the incidents. The individual who went had had absolutely no prior experience with grizzly bears.

I cannot help but feel that the Service is attempting to cover up the true situation. Unfortunately, by not requesting advice and help from my brother and myself, they automatically place us on the other side of the fence since any comment that we make publicly they can and will take as opposition to their own views. Apparently this is the reason that Fagergren commented as he did.

I think the facts of the situation will show that the Service is very much at fault and that they have compounded their mistakes by not releasing information and by failing to seek help from competent authorities.

I, of course, would not like you to quote me on this. What I have told you is simply for your own information and to help you untangle a very "rotton" situation.

I feel that if this situation is not properly aired that it will mean injury and possibly death to other visitors to the national parks and it will certainly place the grizzly bear in great jeopardy. I still feel that the way to tackle this Glacier situation is to get the facts as the Park Service sees them. I have had numerous letters from other sources that plainly indicate that the incidents could have been prevented and are the result of mismanagement.

Very sincerely,

John J. Craighead

JJC:AB

September 18, 1967

Mr. Horace M. Albright
427 Landfair Avenue
Los Angeles, California 90024

Dear Mr. Albright:

Thank you very much for your interesting letter of August 28th.

I too regret the tragic incidents in Glacier National Park - particularly since I feel that these incidents could have been prevented if proper precautions had been taken. Also it is difficult for me to understand why the officials of the National Park Service never contacted either my brother or myself for information or aid.

Because we had received no official information, we limited our remarks to the press to ecological information that we obtained in our research studies in Yellowstone. Unfortunately, however, the press all too frequently misquoted and distorted the information we provided.

Under separate cover I am sending you a copy of our final report on bear management in Yellowstone. This represents only a tiny fraction of the information we have accumulated and we hope to get out more basic data in the scientific journals. When this occurs, I will certainly see that you receive copies. I would greatly appreciate any comments or suggestions that you have time to make concerning our report.

After reading your very fine article in The Backlog, I am sure we will be in very close agreement on management suggestions. I think it is particularly important that the grizzly population be concentrated in the geographic center of Yellowstone, even if this requires maintaining the present earth-fill dumps. I am not too sure about the desirability of re-establishing public viewing areas where grizzlies are fed. I do think that a limited amount of viewing of grizzlies could be done in the way we have indicated in our report, and hopefully the Park administration will act on this suggestion.

I have greatly admired the work you have done and the constructive influence you have exerted in the field of conservation. I do hope that the next time you come to Yellowstone or the Tetons that you will look me up and we can exchange ideas on the subject of bear management in Yellowstone.

I am leaving to meet with Canadian officials who are planning a research program for the polar bear. It should be a very exciting and interesting trip.

My Father is living in Homestead, Florida, and is busier than ever. It keeps me on the run trying to keep up with him when I visit there. Am forwarding a work on orchids which he has written and which may be of interest to you.

I hope to hear from you again in the near future.

Yours very truly,

John J. Craighead

JJC:AB

HORACE MARDEN ALBRIGHT
427 LANDFAIR AVENUE
LOS ANGELES, CALIFORNIA 90024

August 28, 1967

My dear Dr. Craighead:

While I have not had the pleasure of meeting your brother and you in recent years, I have been in close touch with your research in the lives and habits of bears, especially the grizzly of Yellowstone National Park. Now I have noted your comments about the killing of grizzlies in Glacier National Park, following the tragic killing of two young girls who had been working in the park. I write to tell you that I heartily agree with your expression of regret that there was killing of grizzlies after the death of the girls. I feel that efforts should have been made to trap them, or get scientists suchas your brother and yourself on the job with your instruments for tranqulizing and examining bears trapped or still at large.

I have been wondering what your final report on the grizzly research in Yellowstone will recommend. I have hoped that you might see merit in returning, at least temporarily, to the feeding of selected food from the tables of the park kitchens, such as we fed bears in the 1920's and 30's. When in the early '40s, the bear feeding grounds were closed, I felt sure that a wrong decision had been made, and I still feel that way. I was living in New York then and often sat with the Conservation Committee of the Camp Fire Club, and the executive committee of the Boone & Crockett Club, and we discussed the bears time after time. I was asked to write my views on the practice of feeding selected food and I did this in an issue of the BACKLOG of the Camp Fire Club of America of April, 1945. I have only two copies of this issue, but I am lending one to you for perusal and criticism in the light of your recent research program. Please return it to me some time. There is no hurry.

I wonder where your father is these days. He was one of my closed friends in the days when I was Superintendent of the Yellowstone and he was the Chief of the Bureau of Entomology. I know he is a friend of Frank Masland, and I think Frank told me that your father was well and enjoying retirement. Please remember me to him when you write to him or see him.

Your articles, especially those in the National Geographic have been superb, and I hope to see more of them. I am going to Yellowstone Park Friday and will be there until Sept. 5th, then will go to Jackson Lake Lodge for a week. I am still a trustee or director of three of the conservation corporations headed by Laurance S. Rockefeller. I trust our trails will cross some day in that wonderful country.

With admiration and high esteem, I am

Sincerely yours,

Horace M. Albright

Dr. John J. Craighead,
University of Montana,
Missoula, Montana

Notes on Glacier Incident Glacier
GRIZZLY BEAR ATTACKS

John's Sport Illus. article on grizzlies — Menace to Our Northern Parks
* E.M. Rissa letter regarding P.S. Bear policy etc
7. CC's — Grizzly Bear Notes On Bear Attacks — Glacier Natl Park — 1967
Jay's notes on July 9, 1968 conversation with Cole
The Complexity of Bear-Man relations — Cong. Record
Glacier newspaper accounts
The Grizzly Bear Murder Case — Olson — Sports Illus
Official Report U.S.N.P.S. — Grizzly Bear Attacks at Yosemite Park & Trout Lake in G.N.P. Aug. 13, 1967
Podersen's article

SMITH HAINES LUNDBERG & WAEHLER

27 August 1967

Dr Frank Craighead
Wildlife Reasearch Unit
University of Montana
Missoula, Montana

Dear Dr Craighead,

Due to the recent incidents in Glacier National Park I thought it might be of some value to forward the following observations:

(The enclosed comments are based on 9 years of living near, hunting near and working inGlacier National Park (1951 - 1959) and on the experiences of hunting companions and co-workers during the period. During this time I encountered noone especially competent in hunting bear nor residents, including park employees adequately equipped to study or record comprehensively the activities of bears.)

1. I have always assumed there were definite relationships between the berry crop and activities of both black and grizzly bears. Ie, we evaluated the chance of good berry harvests by the number of bears encountered at the local dump, along the highways etc. There may have been a direct dietary connection or a concurrent effect on the bears or other foods ie the activities of ground squirrels etc.

2. Grizzlys have been unpleasant vis-a-vis trail crews in Glacier on a fairly regular basis. Several have been blown to oblivion when they showed continuing antisocial behavior. Many of these cases were not reported to supervisory personnel. How many pathological bears were "officially" dispatched should be available from park records or from Dave Canavina (now retired); these do not represent all the ones eliminated.

3. After a Grizzly chased a close friend none of us went into "bear Country" - inside or outside the Park-without a side arm, sawed-off shot gun or a rifle. I take it the carrying of weapons in the Park by local and/or experienced trail crew, hikers etc far exceeded that which arrests or recorded shootings might indicate. Of course none of the bears so killed were recorded voluntarily for obvious reasons.

4. Trail crews operating in "bear country" took elaborate precautions to prevent bear encounters.

5. The travel pattern in the back country has changed from the guided parties of the 20's and 30's to the do it yourselfers following WW II. (If one can believe the guides who were around in the 50's they carried and used firearms to protect their dudes and livestock.)

6. It would appear that there may be basis for investigation of the relationship between fire weather and bear activities for the following reasons:

A. During the first 12 years of the post WW II increase in hikers (and the change in their age, character, guidance etc.) there were no fire years. The fire suppression officer used to brag that during this period the adverage burn was less than 1/10 acre per year. 1958 was the first big fire year since WW II. During this period there were no reported attacks.

B. I believe it was in 1958 that my father reported the first grizzly "roadside bum". As I recall this was the first such incident in the memory of those then working in the Park. This yearling was ambling along the road accepting handouts. It was recognized as a menace with possible mental disorder and was shot after being traped and weighed (perhaps recorded), without much administrative or scientific fuss. (Other grizzlys had been trapped but not daylight roadside bums.)

C. During the peak of the 1958 fire season I was sent to Apgar Lookout to shoot a " huge black bear " which was trying to break into the Lookout much to the consternation of the couple inside. The bear was not found, however, the incident was - so far as memory served without precident.

D. I was not in Glacier during '60 or '61 when the first reported UNPROVOKED attacks took place but I take it from the H H News that they were fire years - at least in comparison with the pre '58 seasons.

E. The most recent attacks took place in a period of extreme fire weather.

I have no thoughts on how fire weather may be related to bear activities. It could be diet, direct mental or physical etc. There are several other theories which come to mind - a general increase in population of bears and dudes increasing the incidence of contact and therefore the fear of the bears and the fear of the dudes declines. A separate or related activity might be the decline of people in the backcountry who could or would use poison, dynamite and firearms to take care of rambunctious bears.

7. The problems of data collection - at least in so far as past activities are concerned is sizeable. Five summers of employment and 15 years of direct and indirect contact indicate that while there are some Park personnel with requsite training, few if any have the interest nor time to make meaningful contributions to scholarly research on the problem. Especially since the policy of frequent job rotation has been established they seem to know frustratingly little about the Park much less its more elucive residents. The emphasis is on public relations and administration. Naturalists must be concerned with fireside chats and rangers with speeders. I noted with interest that the park recently hired a biologist. He is to assist the person in charge of wildlife management - this position has been primarily concerned with killing house cats in Park Headquarters although I don't know what Bob Wassem has been able to accomplish in the recent past.

If there is any connection between fire weather and bear activities this connection would tend to be fuzzed by the lack of interest in such events during the flap and flux of fire fighting (ie the Apgar Lookout incident C. above) Visitors are not interested in going in the woods when fire danger is high and/or are frequently prohibited from doing so.

8. Grizzlies seem to now be occupying new areas around West Glacier. I have no firsthand information but the H H News has reported cattle kills, bear kills and an auto-bear accident in areas where there were no bears in previous years.

9. The Granite Park case may present a special situation because of the feeding of bears. The one summer I worked at Sperry Chalet (trail crew) I was somewhat disturbed with an unwarrented feeling of professionalism in the Chalets staff re their ability to feed animals. It would appear that the real concern expressed about the grizzlys feeding on garbage at Many Glacier dump - I believe the dump was moved out of the park after the unsuccessful Agra-mat experiment - and the summary killing of the roadside bum (6. B above) were well founded.

10. It would appear to the outside observer that both of the deaths could have been prevented by application of past practices. First the Trout Lake bear had shown a nasty streak on two previous occasions. Im not sure what the recent decision of the Montana Fish and Game Comm. is based of fact or opinion, but it appears wise not to trust a grizzly a second time or count on a move to change his temperment. At the very least once a grizzly is reported to be giving trouble ethier the area should be closed to unarmed visitors or the bear should be done away with. I have seen blacks reformed with a pick handle but the modern penal theories so far do not work on ursus horribilis.

Re Granite Park if the Park regulations were inforced ie no feeding and the chalet garbage was hauled out or protected the frequency of bears would be decreased. The trail crews at Granite for years were bothered with bears but a little powder (4 or 5 sticks) in a lunch bag with an electric detenator calmed several into rugs.

11. It appears by not taking what might be considered reasonable action USNPS ~~they~~ may be in for liability simular to that incurred re the mauling near Many Glacier where a particularly dense ranger sat on his thumb while the bear chewed.

12. Besides the troublesome bears which met official or unofficial ends in the Park, poachers (Blackfeet and otherwise) in the past accounted for a number.

On a different tack we enjoyed the report of a 2nd generation of Craigheads in the recent National Geographic.

Sincerely

E M Risse
% SHLW 617 Calle Europa
Santurce, Puerto Rico 00909

UPON RETURN FROM HUDSON BAY

ANSWER LETTER FROM
E. M. Risse
Puerto Rico

REFERENCE TO GLACIER INCIDENT

October 12, 1967

Mr. E. M. Risse
x/o SHLW 617 Calla Europa
Santurce, Puerto Rico 00909

Dear Mr. Risse:

I certainly did appreciate your very informative letter concerning grizzly bear incidents in Glacier National Park. I agree completely with your analysis of the situation - in fact so much so that I have taken the liberty to make duplicates of your comments and send them to a few people who are in a position to do something about the situation in Glacier.

You may be interested to know that although my brother and I have been studying grizzly bears intensively for nine years and have been especially interested in grizzly-man relationships, we did not get a single inquiry from the Park Service concerning the Glacier Park incident nor was our advice sought in the matter.

I cannot help but feel that this will be another cover-up job and that therefore there will be more such incidents in the future. I am hoping to get a copy of the official report. I think this should shed some light on whether the Park Service is finally going to face up to the situation.

I do appreciate your suggestions and I think they will prove extremely helpful in eventually rectifying the situation.

Sincerely,

John J. Craighead

JJC:AB

27 August 1967

Dr Frank Craighead
Wildlife Reasearch Unit
Univereity of Montana
Missoula, Montana

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(The enclosed comments are based on 9 years of living near, hunting near and working inGlacier National Park (1951 - 1959) and on the experiences of hunting companions and co-workers during the period. During this time I encountered noone especially competent in hunting bear nor residents, including park employees adequately equipped to study or record comprehensively the activities of bears.)

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Sincerely

E M Riese
% SHLW 617 Calle Europa
Santurce, Puerto Rico 00909

XERO COPY XERO COPY XERO COPY XERO COPY

NO.

NAME Grizzly Bear Mgt.
Park S. YNP & Glacier

Frank Craighead

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Yellowstone National Park, Wyoming 82190

IN REPLY REFER TO:
N1427
N26

May 1, 1969

To: Superintendent, Yellowstone

From: Supervisory Research Biologist

Subject: Grizzly bear

The attached is part of the "grizzly section" of a progress report which is being prepared. It was considered necessary to communicate this information ahead of the final preparation of the report because of requests from cooperating agencies and researchers.

Glen F. Cole

Glen F. Cole

Enclosure

RESEARCH NOTE
Yellowstone National Park
April 1969

Glen F. Cole
Supervisory Research Biologist

GRIZZLY BEAR (Ursus horribilis)

From March through September of 1968, 648 sightings of grizzly bears were reported to the Yellowstone Biologists' Office. Known duplicate sightings of bears during a day were counted as one sighting. About one-third of the sightings were in developed areas (Table 4). The greatest overall use of developed areas by grizzlies coincided with late June through August periods of heavy visitor use in campgrounds. The Canyon and Grant Village areas apparently had more consistent use by grizzlies over this period. Sightings in the Fishing Bridge development reached high levels in late August. Canyon, Grant Village and the Fishing Bridge-Pelican areas were frequented by from three to up to six adult grizzly bears during July and August. At least two female grizzlies with cubs were present.

Park Rangers captured and transplanted a total of 61 grizzlies (10 known repeat captures) during 1968 (Table 5). Circumstances relating to the six grizzlies killed are shown in Table 6. Grizzly sightings sharply declined in developed areas in late August and September. This was probably in response to lessened artificial food sources, abundant whitebark pine nut crops at high elevations and some benefits gained from transplanting animals in more distant park areas where they could utilize subalpine habitats.

The 414 reported sightings of grizzly bears away from developed areas that were mainly viewed from roads indicate that large numbers of Yellowstone visitors had an opportunity to view the animals (Table 7). The animals appeared to come out of hibernation from March through April, with females with current young being the latest. Sightings of up to a dozen different bears daily were common from May into the first half of July.

These outstanding viewing opportunities appeared to result from the bears initially preying upon (circumstantial) or attempting to prey upon ungulates, scavenging on ungulates, and spending a great deal of time digging for rodents which were particularly abundant (Table 8). Spring growing conditons that retained vegetation in a succulent stage into July may have also contributed.

A review of accumulated park records, reports by Craighead (1967), Bray and Barnes (1967) and the preliminary findings from studies of free-ranging wild grizzlies in Glacier National Park (Martinka 1969), suggested the following as appropriate recommendations for the protection and management of black and grizzly bears in Yellowstone:

1. Encourage an awareness that the black and grizzly bears are native faunal species within park ecosystems which are being preserved for their scenic, educational, cultural and scientific values; and an understanding that the extent to which man does not alter the habits, population dynamics and ecology of bears will determine the overall integrity of ecosystems and Yellowstone National Park as a natural area.

2. Encourage an understanding that the black and grizzly occur as populations (rather than as individuals) and that recruitments or immigrations of young animals into or from populations occur in relation to limiting habitat and/or

food conditions and mortality rates for adult bears. This makes emigrations of younger animals outside boundaries a measure of the extent of natural regulation within park populations.

3. Replace open dumps which alter bear habits and ecological relationships with other disposal facilities. Artificially maintained numbers and distributions of gulls and ravens may be an additional undesirable effect from dumps.

4. Continue installations of bearproof tops on all outdoor trash cans and use plastic liners to reduce odors.

5. Continue attempts to inform visitors how to camp and travel in bear country and relate the illegal feeding of bears to property damage and personal injuries which ultimately leads to animals being destroyed.

6. Recognize that bears which have become habitual users of artificial food sources in campgrounds and other developed areas can be progressively replaced by other animals that would not learn to habitually use such foods if recommendations 2 to 4 were fully implemented.

7. Utilize the upper Lamar and other park areas with subalpine habitats for transplanting problem grizzlies away from developed areas. This provides the animals with an opportunity to utilize habitat and/or food niches which, in contrast to areas in proximity to dumps, are not already saturated with dominant adults.

8. Initiate long-range plans for substituting overnight camping facilities at the margins or outside Yellowstone boundaries for those within superior grizzly and black bear habitat in the park interior. The park interior could be used for daytime scenic touring, picnicking and viewing or photographing wildlife which is either displaced or must be "controlled" because of conflicts with humans in large overnight camping complexes. Fencing campgrounds could serve as an alternative, but less satisfactory, long-term solution.

Literature Cited

Barnes, Victor G. and Olin E. Pray. 1967. Population characteristics and activities of black bears in Yellowstone National Park. Colorado Coop Wildl. Res. Unit, Colo. State Univ., 199 p.

Craighead, John J. and Frank C. Craighead. 1967. Management of bears in Yellowstone National Park. (unpubl. report) 113 p.

Martinka, C. J. 1969. Terrestrial ecology studies, Glacier National Park. Nat. Park Serv. Progress Rpt. 1968-69 (mimeo report, in press).

Table 4.--Number of reported sightings of grizzly bear in different park developed areas, 1968.

Developed areas	April 16-30	May 1-15	May 16-31	June 1-15	June 16-30	July 1-15	July 16-31	August 1-15	August 16-31	September 1-15
West Yellowstone	1	1								
Lake		2	1	2					1	
Fishing Bridge			4		1		4		38	
Pelican						2		8	2	
Bridge Bay					1	1	1	5		
Grant Village				3		7	19	9	5	
Canyon				1	22	35	29	8	9	10
Old Faithful			1							
Madison					1					
	1	3	6	6	25	45	53	30	55	10

Table 5.--Numbers of grizzly bear captured and transplanted from park developed areas, 1968.

Developed area	May	June	July	Aug.	Sept.	Total
Canyon	2	1	10	2	1	16
Lake complex[1]	5	3	5	9	4	26
Grant Village			9	7	3	19
	7	4	24	18	8	61

[1] Lake, Fishing Bridge, Pelican, Bridge Bay

Table 6.--Grizzly bear killed during 1968.

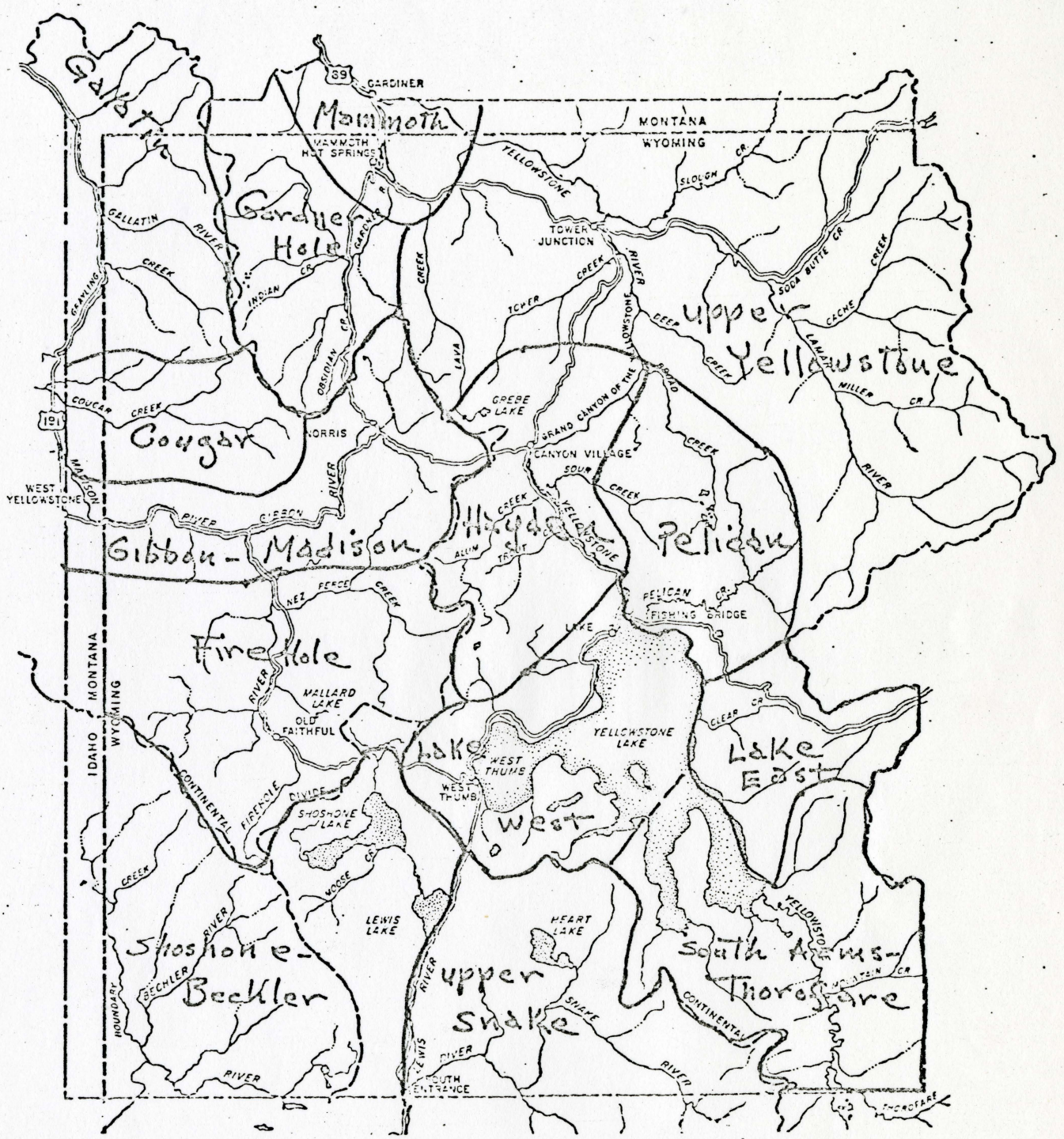
Date	Location	Circumstances
June 10	Fishing Bridge	Bear breaking into occupied house trailer; shot
June 18	Old Faithful	Bear eating from ice chest left out by camper. Charged Ranger when hit with drug syringe and shot.
July 16	Pelican Creek	Shot by visitor.
July 19	Grant Village	Accidental hit with drug syringe in spine; bear shot.
July 23	Fishing Bridge	Bear attracted to beach area by fish entrails left by fishermen. Bear bedded in adjoining willow thicket where it threatened but did not harm fisherman. Charged investigating Ranger and shot.
August 4	Fishing Bridge	Same circumstances as July 23 but bear slightly scratched fisherman going through willow thicket. Shot by Ranger.

Table 7.--Number of reported sightings of grizzly bear in different park areas away from developments, 1968.

Areas:	March		April		May		June		July		August	
	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31
Gardiner Hole	1											
Mammoth				1					1			
Upper Yellowstone			1	15	4	2	4				2	4
Gibbon-Madison			9	6	6	3	1		5			
Firehole			1	1	12	5	1	3				
Hayden Valley				7	22	107	43	50	34	23	2	9
Pelican		2	1	2	5		3		2		4	
Lake West					1	1	1	1		2		
Upper Snake								1			2	
Shoshone Bechler								1				
	1	2	12	32	50	118	53	56	42	25	10	13

Table 8.--Numbers of grizzly bear and recorded activity by months, 1968.

Activities	Month: March	April	May	June	July	August
Digging		9	38	3	3	2
Grazing on vegetation			10	42	20	4
Attempted predation on ungulates		2	1			
Feeding on ungulates		5	11			
Fishing				1		
Traveling	3	11	36	10	13	2
Other		7	12	1	2	
	3	34	108	57	38	8



Geographical division of Yellowstone National Park
Grizzly Bear Observations

Reprinted from Transactions of the Thirty-Sixth North American Wildlife and Natural Resources Conference, March 7, 8, 9, 10, 1971. Published by the Wildlife Management Institute, Wire Building, Washington, D. C. 20005

STATUS AND MANAGEMENT OF GRIZZLY BEARS IN GLACIER NATIONAL PARK, MONTANA

C. J. MARTINKA

Office of Natural Science Studies, National Park Service, Glacier National Park, Montana

Glacier National Park in northwestern Montana was established in 1910 to preserve a representative area of the northern Rocky Mountains. The Park's status as a natural area requires that indigenous biota be retained under natural conditions for their aesthetic, educational, cultural, and scientific values. A population of grizzly bears (*Ursus arctos*) inhabits the Park as a native faunal species (Bailey and Bailey, 1918).

Research was initiated in 1967 to obtain quantitative data on the dynamics and ecology of the Park's grizzly population. This paper presents results relating to the status of the grizzly population between 1967 and 1970. Additional data on park visitation, human confrontations with grizzlies, and bear management procedures are

summarized and evaluated for the 25-year period from 1946 through 1970.

PROCEDURES

Grizzly population estimates were obtained from a 290-square-mile sample area in the northcentral region of the Park (Figure 1). Sample area boundaries were selected to include a distribution of habitats and physiographic features which was representative of the entire Park. Park personnel and other qualified observers, who regularly traveled trails through the area, were asked to report the number, location, and description of grizzly bears sighted. These data were supplemented with additional observations by the author.

The number of different bears observed on the representative sample

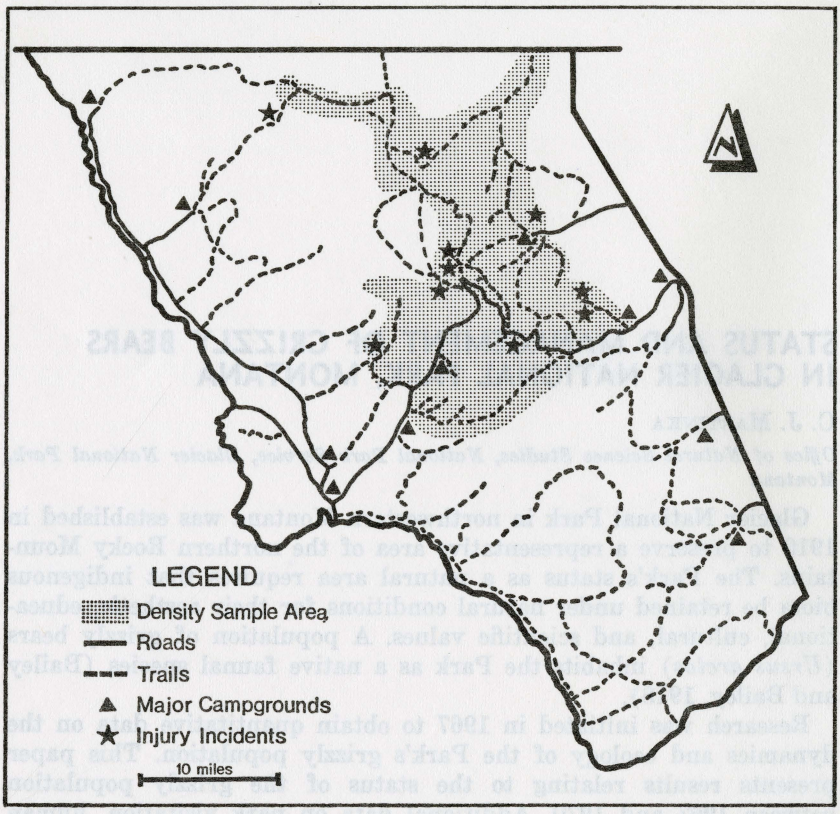


Figure 1.—Location of density sample area, access routes, major campgrounds, and personal injury confrontations involving grizzly bears in Glacier National Park.

area was determined each year. Bear locations, age classes, descriptions, and sighting dates were used to exclude possible duplicate observations. Density computations for the sample area were expanded to estimate the population for the 1583-square-mile Park area.

Park visitation data were obtained from annual travel reports, backcountry campfire permits, and trail registers. Annual wildlife reports provided data on confrontations (personal injury or equipment damage) and management actions (disposal, transplant, or visitor control) involving grizzly bears.

GRIZZLY POPULATION STATUS

Sample area densities and the expanded estimates for the Park's grizzly population are shown in Table 1. The mean density estimate of one grizzly per 8.1 square miles was intermediate as compared to other populations (Table 2). Troyer (1962) attributed the high

TABLE 1. DENSITY AND POPULATION ESTIMATES FOR GRIZZLY BEARS IN GLACIER NATIONAL PARK FROM 1967 THROUGH 1970 AS DETERMINED FROM SIGHTINGS ON A 290 SQUARE MILE AREA WITHIN THE PARK

Year	Number of Different Bears Observed	Number of Square Miles Per Bear	Expanded Estimate for the Park Population
1967	32	9.1	175
1968	34	8.6	184
1969	42	6.9	230
1970	37	7.8	203
MEAN	37	8.1	198

TABLE 2. DENSITY ESTIMATES FOR VARIOUS NORTH AMERICAN GRIZZLY BEAR POPULATIONS

Population Location	Estimated Number of Square Miles Per Bear	Source of Data
Kodiak Island, Alaska	0.5	Troyer (1962)
Glacier National Park, British Columbia	5	Mundy (1963)
Yukon Territory, Canada	10	Pearson (1970)
Mt. McKinley National Park, Alaska	15	Dean (1958)
Whitefish Range, Montana	15	Jonkel (1967)
Yellowstone National Park, Wyoming	11–17	Cole (1970)

density on Kodiak Island to ample food supplies that resulted from interspersions of high quality habitat types. In contrast, a low density adjacent to the northwest boundary of Glacier National Park was considered to reflect a lack of openings in extensive coniferous forests (Jonkel, 1967). The intermediate grizzly population density within Glacier National Park possibly relates to an intermediate composition and interspersion of important habitat types.

Observational data indicated that grizzly bears were not uniformly

distributed within the sample area. During a helicopter flight in September 1967, a density of one grizzly per 2.1 square miles was determined for a 25-square-mile area of the McDonald Creek drainage. Comparable densities were computed for the same area from reported sightings between 1968 and 1970. Consistently few sightings in certain other sample area localities suggested densities of one grizzly per 10 to 20 square miles.

Annual estimates of the Park's grizzly population prior to 1967 ranged from 90 to 130. These figures were generally derived from reported observations and area estimates of grizzlies by field rangers and the estimate for the previous year. Higher estimates during this study (Table 1) are considered to reflect greater efficiency of the sample area census technique rather than a population increase.

Annual differences in density and population estimates probably resulted from inherent defficiencies in the sample area census technique. General difficulty in observing grizzlies, even though they were known to frequent an area, suggested that computed figures were minimum estimates. Factors tending to inflate estimates included extensive wandering of subadult grizzlies and partial inclusion of adult home ranges on the periphery of the area sampled. Relatively consistent results over a four-year period and comparisons with other populations suggested that density and population estimates were reasonable and that the grizzly population was probably at or near habitat carrying capacity.

NUMBERS OF PARK VISITORS

Numbers of park visitors between 1946 and 1970 increased at a mean annual rate of 4.2 percent from 201,000 to 1,242,000. The rate of increase progressively declined through the early 1960s, but accelerated after 1965 (Table 3). Visitors used developed areas and backcountry areas resulting in two characteristic types of travel within the Park.

Developed areas included facilities directly accessible to motoring

TABLE 3. SUMMARY OF VISITATION TO GLACIER NATIONAL PARK DURING 5-YEAR PERIODS FROM 1946 THROUGH 1970

Period	Mean Annual Visits		Mean Annual Camper Days[1]	
	Number	Percent Increase	Number	Percent Increase
1946–50	354,000	—	95,000	—
1951–55	611,000	73	157,000	65
1956–60	726,000	19	172,000	10
1961–65	801,000	10	196,000	14
1966–70	1,006,000	26	267,000	36

[1] One camper for one day in developed area campgrounds.

visitors (Figure 1). In addition to hotels and motels, roadside campgrounds that totaled 1,225 sites by 1970 served as important overnight accommodations. Trends in numbers of campers using developed areas correlated with annual visitation trends prior to 1961 (Table 3). The increase in camping activity during the 1960s exceeded the increase in annual visits and accompanied a general replacement of tent camping by trailers and pickup campers.

Backcountry areas were accessible to foot and horse travelers. Numerous campsites, five trail shelters, and two concessioner-operated chalets served as overnight accommodations. Hiking has largely replaced horses as the principal form of backcountry travel and campfire permit records indicate that backcountry travel increases were as great or greater than increases in total annual visitation. In addition, hiking tours conducted by park naturalists contributed to increased backcountry use during recent years. Backcountry travelers annually comprised approximately 5 to 10 percent of total visitors from 1967 through 1970.

RELATIONSHIPS BETWEEN GRIZZLIES AND HUMANS

Ten confrontations with grizzly bears resulted in injuries to 14 humans between 1946 and 1970 (Table 4). Thirteen injuries occurred

TABLE 4. PERSONAL INJURIES AND EQUIPMENT DAMAGES INFLICTED BY GRIZZLY BEARS IN GLACIER NATIONAL PARK DURING 5-YEAR PERIODS FROM 1946 THROUGH 1970

Period[1]	Injury Incidents			Equipment Damage Incidents
	Number of Confrontations	Number of Persons Injured	Injuries per One Million Visitors	
1946–50	0	0	0	0
1951–55	0	0	0	2
1956–60	4	6	1.7	3
1961–65	3	4	1.0	1
1966–70	3	4[2]	0.8	8
TOTALS	10	14	0.8	14

[1] One personal injury was recorded prior to 1946.
[2] Includes two fatalities in 1967.

in backcountry areas and one along a road prior to spring snow removal (Figure 1). No injuries were recorded prior to 1956, but the injury rate sharply increased to a maximum of 1.7 per one million visitors between 1956 and 1960. Rates progressively declined after 1960. Injuries varied from superficial bites and scratches to two fatalities in 1967.

Six confrontations that resulted in injuries to nine humans were classified as defense-reaction (Table 5). Five involved small groups of

TABLE 5. SUMMARY OF GRIZZLY CONFRONTATIONS RESULTING IN INJURIES TO HUMANS IN GLACIER NATIONAL PARK FROM 1946 THROUGH 1970

Incident Type	Number	Visitor Activity	Class of Grizzly Involved	
			Female With Young	Adult(s)
Defense-reaction	6	Hiking[1]	5	1
Other	4	Camping	3	1
TOTALS	10		8	2

[1] One photographer included.

one to five hikers and one a single photographer. Female grizzlies with young were involved in 83 percent of these incidents as compared to a mean occurrence of 23 percent in the adult/subadult population segment (Martinka, 1970). Subadult and single adult grizzlies appeared to avoid direct conflicts with humans. These data suggest that most injuries to hikers (or photographers) resulted from protective responses of maternal female grizzlies when confronted. Herrero (1970) reported that females with young caused 71 percent of the injuries inflicted by grizzly bears to hikers in North American national parks.

Four confrontations that resulted in three injuries and two fatalities were classified as other than a defense-reaction relationship. Each occurred at night in a designated backcountry campsite, including two near a chalet. Female grizzlies with young were disproportionately involved, but the confrontations apparently resulted from attraction of the bears to a camping area by food or its odors. Stokes (1970) suggested that such behavior probably results from prior experience with unnatural food sources.

Fourteen confrontations involved damage to personal equipment (Table 4). Ten occurred in backcountry campsites and four in roadside campgrounds. In addition, sporadic damage to government patrol cabins occurred during early spring and late fall. Damage incidents were apparently related to attraction of grizzlies to the area by food or its odors and, in general, appeared to involve a few individual animals in which the desire for food overcame characteristic shyness toward humans.

MANAGEMENT OF GRIZZLIES

A total of 30 grizzly bears was disposed of or transplanted between 1946 and 1970 (Table 6). In backcountry areas, 13 grizzlies were destroyed in response to human injuries or personal equipment damages. In developed areas, 12 grizzlies were destroyed and 5 transplanted in response to equipment damages or to prevent human confrontations with bears frequenting these areas.

TABLE 6. GRIZZLY BEARS TRANSPLANTED OR DESTROYED IN GLACIER NATIONAL PARK DURING 5-YEAR PERIODS FROM 1946 THROUGH 1970

Period	Numbers Captured and Transplanted	Numbers Destroyed
1946–50	1	0
1951–55	1	1
1956–60	0	11
1961–65	1	3
1966–70	2	10
TOTALS	5	25

The increased number of human injuries and equipment damages between 1956 and 1970 led to an increase in the number of grizzlies destroyed. An average of 1.6 (range 0-7) grizzlies was destroyed each year during this period. Annual variations in the number destroyed reflected differences in the number of confrontations as well as the opportunity to selectively destroy the individual bears involved.

The number of troublesome grizzlies transplanted to remote park areas remained low and relatively constant throughout the 1946 through 1970 period. Inadequate techniques precluded the usefulness of capturing and transplanting grizzlies in backcountry areas.

Management to minimize the opportunity for grizzlies to use unnatural food sources was initiated prior to 1946. Closure of open refuse dumps with conversion to incineration facilities was completed by 1968. Installation of bear-proof refuse cans in roadside campgrounds and other facilities was initiated in 1963. These and other procedures to eliminate refuse and litter from park areas have progressed to the present. Visitor participation has been encouraged through implementation of a "pack-in, pack-out" policy, which requires removal of unburnable refuse from backcountry areas.

Management to reduce the potential for contacts between grizzlies and humans has been intensified since 1967. A monitoring program which systematically documents reported sightings and confrontations provides a basis for temporary trail closures and/or overnight camping restrictions in areas frequented grizzlies. In addition, ecological evaluations of present and proposed trails, campsites, and other facilities provide guidelines for preventative management where high human use could contribute to potential conflicts with bears. Understanding and cooperation by visitors are gained through an information program which stresses grizzly ecology as well as proper procedures for traveling in grizzly country.

DISCUSSION

A significant increase in the number of human confrontations with grizzly bears occurred in Glacier National Park between 1956 and

1970. Eighty-three percent involved hikers or campers in backcountry areas. The greater number and dispersion of backcountry foot travelers during this period appeared to increase the potential for defense-reaction confrontations as well as contribute to the availability of attracting unnatural food sources. This was particularly evident within the density sample area. Fewer backcountry travelers and a larger proportion of parties on horseback were accompanied by a low incident rate during earlier years.

Declining injury rates during the 1960s were possibly associated with progressive removals of available unnatural foods as well as the immediate removal of grizzlies which frequented areas of high human use. Intensified use of visitor hiking and camping controls and an expanded information program were accompanied by a further decline to 0.3 injuries per one million visitors from 1968 through 1970. Removal of unnatural foods has also helped to maintain a wild free-ranging grizzly population within the Park.

The relatively few grizzly incidents in developed areas occurred in roadside campgrounds and were limited to personal equipment damages. Characteristic shyness of bears appeared most significant in restricting intrusions into developments even though most were located in areas inhabited by grizzlies. In addition, immediate preventative management by transplanting or disposing of bears which frequented developed areas appeared to preclude confrontations, particularly those resulting in injuries. Cole (1970) concluded that removal of artificial foods and consistent preventative removals of bears from developed areas in Yellowstone National Park were necessary to reduce the opportunity for injuries to visitors.

A significant change in dynamics of the Park's grizzly population has apparently not resulted from intensified control of grizzlies. Disposal of troublesome grizzlies at a mean rate of 1.6 per year between 1956 and 1970 represented less than one percent of the estimated population. This low rate of man-induced mortality appeared to be reflected in a comparatively low natality rate of about 15 percent (Martinka, 1970). Troyer (1962) reported a natality rate of 27 percent for a hunted grizzly population.

Management objectives are to retain a natural grizzly population while providing for the reasonable safety of visitors in Glacier National Park. Programs of preventative management during recent years have been accompanied by reduced rates of human injury with minimal influence on the natural status of the grizzly population. A wild free-ranging grizzly population appears to afford the least opportunity for conflicts with humans.

SUMMARY

A population of 175 to 230 grizzly bears was estimated for Glacier National Park for the 1967 through 1970 period. From 1946 through 1970, human confrontations with grizzlies resulted in 2 fatalities, 12 personal injuries, and 14 equipment damages. Most incidents occurred in backcountry areas and were related to protective responses of female grizzlies with young and/or attraction of grizzlies to unnatural foods. Increased numbers of confrontations after 1955 appeared to result from greater backcountry use by hikers and campers. Progressive removal of available unnatural foods, immediate removal of troublesome grizzlies, intensified visitor travel controls, and an expanded information program were accompanied by declining injury rates during the 1960s. Numbers of grizzlies destroyed were sufficiently low to have minimal influence on the natural status of the Park's grizzly population.

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DISCUSSION

DISCUSSION LEADER GULLION: Thank you, Mr. Martinka. This is a most appropriate paper. In some respects, we're talking both about human population control and predator population control. You may be familiar with Dr. Latham's "Economics of Predator Relationships" in which he pointed out that man at one time was probably a major prey species. Here we have a species that certainly is capable of preying upon man. Maybe we haven't gone overboard on predator control on some of our big carnivores. They might solve some of the problems Dr. Howard was talking about.

MR. DALE JONES: (New Mexico): Have you recorded any competition between black bears and grizzly bears, and have you noticed different fluctuations between the population of either?

MR. MARTINKA: This is a question that I don't have the background to answer. There are substantial numbers of black bears in Glacier National Park. We have little quantative data which shows how many or what their relationship is to grizzlies. I suspect that there are almost as many grizzlies as black bears in Glacier Park, primarily because the habitat within the Park is more suitable for the grizzly than it is adjacent to the Park, where we find extensive coniferous forests. This appears to be much more suitable habitat for the black bear and the number of grizzlies on those areas is less. Direct competition may or may not occur between the two species. Available information relates mostly to observations on the use of unnatural food sources and, at this time, I am not too sure that it is really relevant. There appears to be a certain mutual avoidance on the part of both species. For example, we have areas with extensive numbers of grizzlies and black bears during late summer on seasonally occupied huckleberry range. It is quite obvious, when you fly over or go into them, that those drainage heads occupied by grizzly bears are not occupied or utilized by black bears at the same time. It would appear to be an avoidance situation rather than dominance or direct conflict.

DR. LEVI MOHLER (Idaho): You mentioned shyness as a characteristic of the grizzly, and we recognize this. We also realize that in the popular literature, the ferocity and savageness of the grizzly have been bruited about for many years. At what point in the mutual avoidance mechanism between humans and grizzlies does this shyness revert to what is properly called ferocity?

MR. MARTINKA: This is not the type of animal that you walk up to and measure distances that are best to stay away. However, from what limited information we have, some of this "ferocity" is related primarily to defense of young. This may be more important than we have considered it in the past.

The number of close confrontations with single grizzlies that we have recorded, where there was no direct contact, is not great, but it is great enough to suggest that the female protecting her young becomes very significant. I think the area they defend would be defended against nearly any intruder. But even females with young often show an amazing capacity to tolerate people. Some bears have a greater capacity to tolerate people walking by their particular domain than others. In the records of the few incidents that we've had, there is much suggestion that most defense-reaction incidents were related to people walking into a bear without making noise. Quite commonly, the first thing they report is, "I wasn't even talking."

So, characteristic shyness is something which does occur, and even in looking at some of the records in the past, which may or may not be completely factual, they generally indicate involvement of a female with cubs. Steve Herrero did some work throughout the North American parks, and this was one of his conclusions—that the major problem was the female defending her cubs. He brought this out where he compared the grizzly with the black bear which very seldom is involved in a defense reaction confrontation. Her defense mechanism is to send her cubs up a tree. The grizzly doesn't do this, so the alternative is to attack whatever happens to enter her particular realm.

DR. GULLION: How is the grizzly problem in Yellowstone? Do you have that under control, so the grizzlies aren't bothering people?

MR. MARTINKA: Several hours would be necessary to discuss that particular question. Probably this is not the place, because it is quite complex and bears much more thought and discussion.

MR. GULLION: It's interesting to be a prey species occasionally, and to see how we look upon one of our effective predators. Maybe it gives us a better idea of some of the prey-predator problems that we are dealing with in other wildlife species. We need to see how it looks from the other side, occasionally, and the grizzly gives us that opportunity.

If there is no further discussion, then I thank you, Mr. Martinka.