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COLOR MARKER FOR BIG GAME

John J. Craighead and Dwight S. Stockstad

U. S. Fish and Wildlife Service, Missoula; and Montana State Fish and Game Department, Kalispell, Montana

In population studies it is necessary to recognize and observe in the field individuals and age classes over a period of several years. When this can be accomplished with a high degree of certainty, data can be obtained on breeding age, breeding behavior, and daily and seasonal movements of individuals. Similar data as well as information on sex, age structure, mortality, and behavior can be obtained for the population unit. Under favorable conditions, accurate population counts can be derived from ratios of marked to unmarked animals observed.

Many methods of marking individuals and age classes in big game populations have been tried. However, there is still need to develop, through field testing, a permanent visible marker applicable to young and adults of various big game species. This paper reports some progress along this line.

Mutilation has been recognized as a permanent marker for field identification. A clipped or notched ear, a docked tail, a dismembered toe, fur clipping, and branding have all been used; but visibility has generally been poor unless mutilation was drastic. Branding has possibilities still not fully explored; but to be visible, the brand must be large, and younger animals may be maimed. Aldous and Craighead (1958) successfully marked bighorn sheep (*Ovis canadensis nelsoni*) by branding the horns.

Various visible markers have been used with some degree of success. A brass neck collar that would adjust with growth was used on foxes by Sheldon (1949). Ealey and Dunnett (1956) used plastic collars on nocturnal mammals and Progulske (1957) developed a leather collar for marking white-tailed deer (*Odocoileus virginianus*). Jordan (1958) successfully belled mule deer (*Odocoileus hemionus*) in California, using leather strap collars. Retrapping showed that 4 out of 29 straps broke within a 15-month period. Because of the danger of constriction during future growth, Jordan concluded that it was not advisable to use a collar on fawns, and that bucks should not be belled with a permanent neck strap or chain before the age when growth is nearly complete. Progulske (1957) had earlier reached similar conclusions for white-tailed deer. Jordan (1958) suggested the use of a non-permanent material such as ribbon or straps or chains with a weak link. Such devices are valuable for certain purposes but insure a non-permanent rather than a permanent marker.

The development of a permanent color marker involves the testing of marker material for durability, color retention, and methods of attachment. Although this paper is confined to describing a color marker for big game, the conclusions reached with regard to color retention and visibility of marking material were first derived from work with birds and then found to apply to color-marking of large mammals. Plasticized polyvinyl chloride tape was

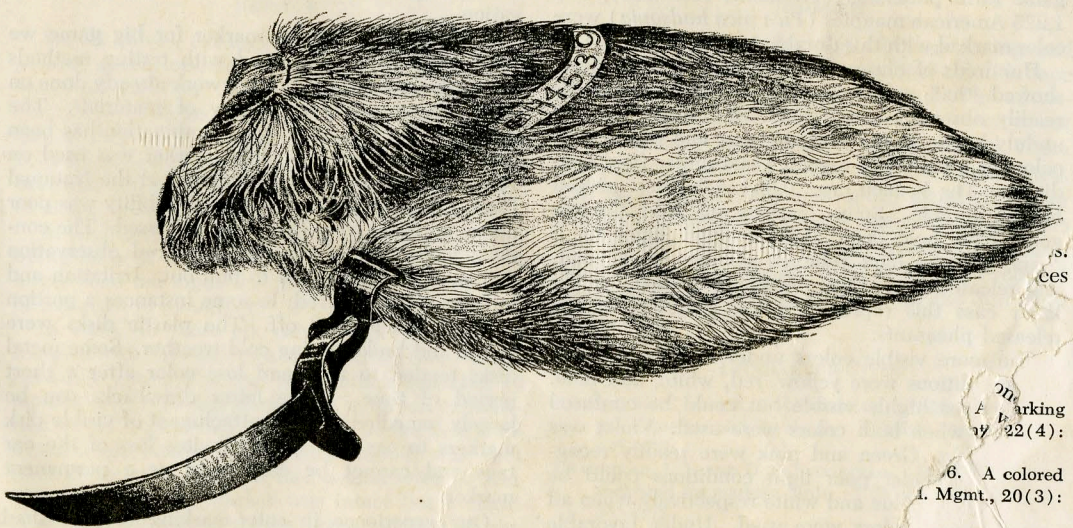


FIG. 1. Attachment of color marker and numbered ear tag. The jesse knot is loosely tied to sho[illegible] for marking noc- be cinched tight to complete the tie.

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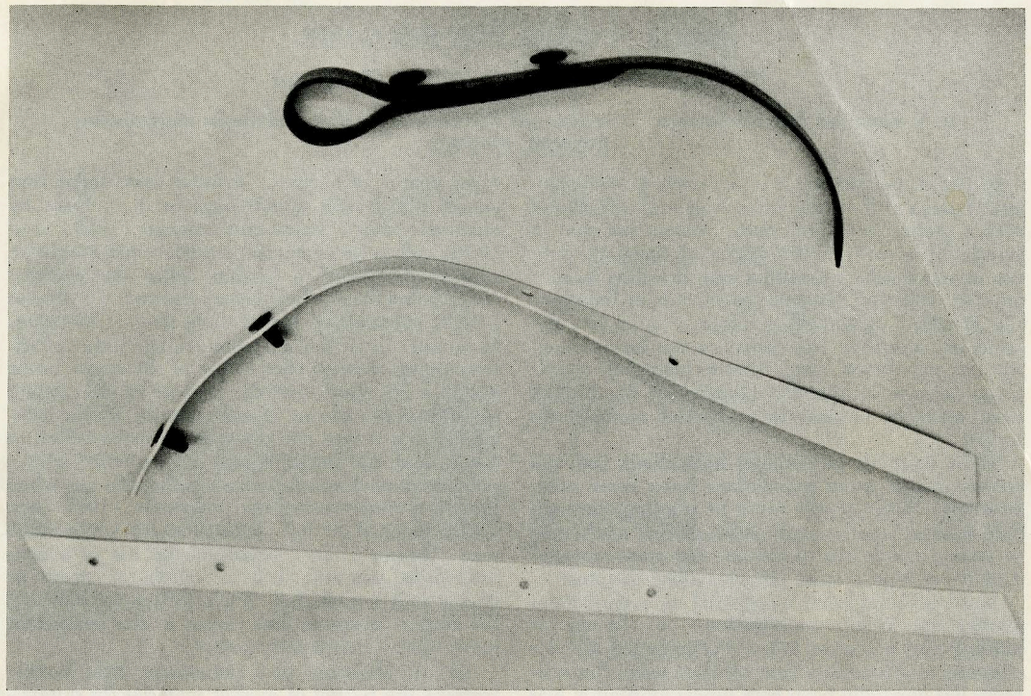


FIG. 2. Method of securing plastic marker with rivets. Numerous color combinations can be made by splicing different color tapes between the loop to form a tail. Tail and loop are then of different colors.

selected for testing and first used on Canada geese (*Branta canadensis*) by Craighead and Stockstad (1956).

Over a 5-year period, 538 Canada geese, 3,900 game farm pheasants (*Phasianus colchicus*), and 1,225 American magpies (*Pica pica hudsonia*) were color marked with this durable tape.

Hundreds of observations of these marked birds showed that polyvinyl chloride tape could be readily observed in the field. It did not become unduly brittle at low temperatures and retained its color for a period of several years under field conditions. The ½-inch tape, 0.062 inch thick, proved highly durable. Some markers on wild Canada geese have held color and remained intact for 5 years; magpies have retained markers for 4 years, and released game farm pheasants 2 years. In the latter case this represented the longevity of the released pheasants.

The more visible colors under a wide range of conditions were yellow, red, white, and blue. Orange was highly visible but could be confused with red when both colors were used. Violet was variable. Green and pink were readily recognized under poor light conditions could be confused with blue and white respectively when all these colors were used. Under favorable conditions and with sufficient time for observation, animals could be identified with certainty.

By splicing with rivets, 64 combinations are possible. Judgment must be used in omitting the less visible colors and confusing combinations. The colors and combinations selected for use will vary with the species marked and the difficulty of observation.

In developing a color marker for big game we were particularly concerned with testing methods of attachment and confirming work already done on color retention and durability of materials. The metal ear tag and metal disk combination has been used by many workers. This marker was used on 15 penned elk (*Cervus canadensis*) at the National Bison Range, Moiese, Montana. Visibility was poor unless an excessively large disk was used. The constant movement of the disk hindered observation and caused the ear tags to pull out. Irritation and inflammation occurred; in some instances a portion of the ear sloughed off. The plastic disks were brittle and broke during cold weather. Some metal disks tended to fade and lose color after a short period of time. These latter drawbacks can be largely remedied, but the attachment of visible disk markers to ear tags simply invites loss of the ear tags and cannot be considered as a permanent marker.

Our experience in color-marking of birds had shown the merits of plasticized polyvinyl chloride tape. We first tested this in 1954 on big game by attaching the tape to metal ear tags on penned mule deer and 23 elk at the National Bison Range. The visibility of this marker was excellent, but retention was unsatisfactory. In less than 1 year some ear tags pulled out from the weight and movement of the plastic streamer; irritation of the tissue occurred on nearly all animals tested.

Further experiments with the plastic tape were conducted on elk calves released on the National Bison Range. Plastic tape was threaded through a slit made in one ear and fastened with the jesse knot (Fig. 1). The technique of slitting the ear was simultaneously and independently conceived by us and Aldous and Craighead (1958). This method of attachment has been reported by them, but without detailed description or evaluation of the method.

METHOD

The procedure is simple and rapid. The lower edge of the ear is sponged with alcohol. A ¾-inch longitudinal slit is made in the cartilaginous basal portion of the ear approximately 1 inch from the edge. This should be done with a razor-sharp scalpel or pocket knife. There appears to be little or no pain and bleeding is slight. The plastic tape (8 to 10 inches long) is dipped in alcohol, threaded through the incision and tied as described by Craighead and Stockstad (1956). Punch-hole centers (3½–4 inches apart) form a loop that will not bind and allows amply for ear growth. The ear should be wiped with alcohol or other disinfectant before the animal is released. Quick-set rivets can be used in place of the jesse knot (Fig. 2). Experiments currently under way on bighorn sheep (*Ovis canadensis canadensis*) and grizzly bear (*Ursus horribilis*) indicate rivets may be more durable than the knot but slightly more time consuming to install.

RESULTS

Six elk calves, ear-tagged and color-marked with yellow, green, orange, white, violet, and red tape were released on the National Bison Range in December 1956 and collected a year later. Inspection of the ears and markers revealed no loss of the colored plastic markers. Neither breakage nor wear occurred and none of the colors, with the exception of violet, showed any apparent fading.

In each instance, the incision had healed, developing little or no scar tissue. A slit, only slightly larger than the tape, was present with no evidence of irritation or sloughing.

In 1957, 10 more elk calves were marked and released with the objective of collecting them over a period of years. The first two animals collected 10 months after marking showed no irritation or infection where the ear had been slit. The markers were in excellent condition. A third animal was shot after 20 months. The ear had healed with no scar tissue present; the marker was intact but a slight crack had developed at the corner of one of the punch holes. A fourth elk collected 21 months after marking still had the plastic marker in the ears but the tail of the marker had broken. This elk could be recognized as a marked animal only with difficulty. The ear was in excellent condition. Color retention was good in all cases.

During the winter of 1959, biologists of the Montana State Fish and Game Department color-marked a number of wild elk in the manner described. Approximately a year later, four of these animals were retrapped and examined. Two animals had lost their ear markers and two had retained them. No information was obtained on the condition of the ears.

It is believed that the method of color-marking described is applicable to a wide range of large and medium-sized mammals and may have advantages over other methods currently in use. However, it is evident that a more durable but flexible tape with similar color retention would greatly prolong usefulness and could conceivably last the lifetime of an animal, thus classing it as a permanent marker. The authors believe such a tape can be developed. One possibility is to imbed a thin nylon fabric in the plasticized polyvinyl chloride tape to prevent breakage, especially at low temperatures. Since flexibility and lightness are essential, increasing the thickness of the tape does not appear to be a solution. Perhaps there are other synthetics on the market or currently being developed that will qualify. The value of a permanent or near-permanent color marker for big game is such that special effort should be made to obtain or develop a suitable material. Our experiments on marking elk would indicate that threading a tape through a slit in the ear produces a marker limited in longevity only by the durability of the tape. Preliminary tests on bighorn sheep lambs and grizzly bears show that this marking method has promise for these species.

SUMMARY

Color-marking of big game by ear-slitting and inserting colored plasticized polyvinyl chloride tape is described and the results evaluated. The advantages of the method described are that very young as well as adult animals can be safely marked. There have been no adverse effects on the animals tested. The tape can be easily and rapidly attached. Color retention is good and at least eight different colors can be used, some being more visible than others. Threading a tape through a slit in the ear produces a marker limited in longevity only by the durability of the tape.

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Received for publication January 18, 1960.

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE NATIONAL PARK SERVICE
AND
THE BUREAU OF SPORT FISHERIES AND WILDLIFE
PROVIDING FOR
RESEARCH ON THE GRIZZLY BEAR, URSUS ARCTOS
IN YELLOWSTONE NATIONAL PARK BY THE
MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

WHEREAS: The National Park Service and the Bureau of Sport Fisheries and Wildlife recognize the significant scientific and cultural values of a wild, free-ranging population of grizzly bear, Ursus arctos, in Yellowstone National Park, and

WHEREAS: The National Park Service has implemented a program to restore the grizzly bear population within said park to its natural abundance, distribution and ecology, through the removal of garbage and other introduced food items from the diet of the grizzly bear, and

WHEREAS: The Bureau of Sport Fisheries and Wildlife, through the Montana Cooperative Wildlife Research Unit, has conducted a long-term study of grizzly bear population dynamics and distribution within the national park, and

WHEREAS: A cooperative study of the patterns of grizzly bear distribution, movement and behavior during the transition period from bears feeding on garbage to bears feeding on natural food sources would be a significant contribution to the understanding of this species,

NOW THEREFORE: The Service and the Bureau mutually agree that a grizzly bear study program by the Montana Cooperative Wildlife Research Unit should proceed under the following conditions:

1. The objectives of all proposed research activities undertaken as a result of this agreement shall be consistent with the policies and objectives concerning the administration and management of Yellowstone National Park.

2. Original data obtained using research techniques employed by the Montana Cooperative Wildlife Research Unit shall be respected as being the property of the Bureau of Sport Fisheries and Wildlife in order that publication of original data may result, and that proper credit can go to the researchers and authors. However, all data and other pertinent observations that may result from research conducted by the Montana Cooperative Wildlife Research Unit within Yellowstone National Park or related activities under the agreement shall be made freely available by the Bureau to the National Park Service for the sole purpose of internal use in carrying out management activities for which the Service is responsible.

Any information (such as size and weight statistics and ear tag numbers) obtained by the National Park Service as a result of bear management actions (such as the capture and transplant of problem bears) will be made freely available to the Montana Cooperative Wildlife Research Unit, which shall respect the source of such information and the

proprietary rights of the National Park Service for the original publication of such information.

3. All oral and written statements, including, but not limited to, progress reports, popular and scientific articles and other publications, talks, and press releases prepared by the Montana Cooperative Wildlife Research Unit concerning grizzly bear research within Yellowstone National Park shall be submitted to the Director, Bureau of Sport Fisheries and Wildlife for approval prior to publication or otherwise disseminated to the public.

4. The Bureau recognizes the National Park Service as having the responsibility and authority for all management activities within Yellowstone National Park and the Bureau will obtain the concurrence of the Director, National Park Service, prior to making any expressions relating to the management of grizzly bears within said national park.

5. The capture, marking or collecting of biological specimens and samples, other than scats, shall not be undertaken except as may be requested by the National Park Service.

6. Field research activities under this agreement shall be limited to the Montana Cooperative Wildlife Research Unit Leader, who shall serve as Principal Investigator, and to qualified, full-time students and faculty members of the University of Montana and other qualified employees or associates of the Montana Cooperative Wildlife Research Unit who have attained their eighteenth birthday, and whose names

appear in an approved study plan as provided for in Item 8 below.

7. The Principal Investigator shall be responsible for insuring that all participants associated with research carried out under this agreement understand and abide by the conditions herein.

8. Research activities carried out in Yellowstone National Park under this agreement shall be contingent upon receipt of a study plan that meets with the concurrence of the Director, National Park Service, and is approved by the Director, Bureau of Sport Fisheries and Wildlife. The Study Plan shall be prepared for proposed research to be conducted for each calendar year and shall state specific objectives, methods, and activities involved in the project. This Study Plan shall be submitted annually in time for consideration by the two Directors (or their respresentatives) at the annual review as provided for in Item 12 below.

9. Nothing in this Memorandum of Understanding shall be construed as obligating either party hereto for the expenditure of funds or for the future payment of monies in excess of appropriations authorized by law.

10. Nothing contained herein shall be construed as limiting in any way the responsibility and authority of the Director, National Park Service, to manage Yellowstone National Park, and to engage in or permit others to engage in research required by him to carry out that management.

11. That no member of, or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this Memorandum of Understanding, or to any benefit that may arise therefrom; that this provision shall not be construed to extend to this agreement if made for a corporation for its general benefit.

12. The terms of this Memorandum of Understanding shall be reviewed annually prior to each February 28th, for its content and compliance, by the Directors of the Bureau of Sport Fisheries and Wildlife and the National Park Service, or their designated representatives. As a part of this review, the two Directors shall also evaluate the progress made in fulfilling the research objectives envisioned in the Study Plan referred to in Item 8 above, and will review the Study Plan proposed for the new (current) calendar year.

13. This Memorandum of Understanding shall become effective when signed by the parties hereto and shall continue in force until terminated by mutual agreement or by either party upon ninety days notice in writing to the other of his intention to do so. Amendments to this Memorandum of Understanding may be proposed by either party and shall become effective upon approval by both parties.

NATIONAL PARK SERVICE

Date: AUG 4 1971

By: Raymond H. Freeman
Acting Director

BUREAU OF SPORT FISHERIES AND WILDLIFE

Date: AUG 4 1971

By: Lewis M. Smith
Acting Director

August 11, 1971

Mr. George Gardner
Special Assistant to
Assistant Secretary for
Fish & Wildlife & Parks
Dept. of the Interior
18th & C Streets
Washington, D. C. 20240

COPY

Dear George:

This is the first bear management report which I promised to send you. I am enclosing Dr. Linn's criticisms and my reply. You will note some of the passages which were somewhat critical of the National Park Service. You may recall that this report was in the hands of the Yellowstone administration for several months prior to distribution. I had requested them to delete any material which they thought could possibly be embarrassing to the National Park Service. There was not a single comment made on this report until after it was distributed. The Park Service had ample opportunity to delete critical material prior to distribution. They also had more than a year to come to some agreement with us on deletion of material after the document was distributed, but they made absolutely no attempt to resolve the problem.

It was a real pleasure to get to know you and I hope we have more opportunities in the future to get together. I appreciate your help and interest in this matter.

Sincerely,

John Craighead

JC/mj
Enclosures (3)

NOTE: This same information was sent to Charles Loveless.

Dr. Thomas Baskett
Chief, Division of Wildlife Research

August 10, 1971

Dr. John Craighead, Leader
Montana Coop. Wildlife Research Unit

Grizzly Bear - Man Relationships in Yellowstone National Park

COPY

Dr. Linn was quite perturbed because he had never received a copy of the report "Grizzly Bear - Man Relationships in Yellowstone National Park. I am sending him off a copy today and I am enclosing a copy of my letter to him.

John Craighead

JC/mj

MIKE MANSFIELD
MONTANA

United States Senate
Office of the Majority Leader
Washington, D.C. 20510

August 5, 1971

Franklin Sogandares, Ph.D.
Professor and Chairman
Department of Zoology
University of Montana
Missoula, Montana 59801

Dear Professor Sogandares:

This will acknowledge receipt of the copy of your letter of the 22nd of July addressed to Secretary Morton regarding the difficulties experienced by Doctors John and Frank Craighead in their dealings with Yellowstone National Park.

I am aware of the situation you have discussed in your letter and am presently working with Senator Metcalf in the hope of bringing about an equitable solution to the situation in the near future.

Thank you for keeping me informed, and with best personal wishes, I am

Sincerely yours,

Mike Mansfield

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LEE METCALF, MONT.
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BILL BROCK, TENN.

JAMES R. CALLOWAY
CHIEF COUNSEL AND STAFF DIRECTOR

United States Senate
COMMITTEE ON
GOVERNMENT OPERATIONS
WASHINGTON, D.C. 20510

27 July 1971

Professor Franklin Sogandares
Department of Zoology
University of Montana
Missoula, Montana 59801

Dear Professor Sogandares:

Thanks for furnishing me copies of your correspondence regarding the Craighead research program at Yellowstone National Park.

Prior to receipt of your letter, I had expressed my concern in and support of this matter to Interior Department officials. I am again getting in touch with appropriate Department officials. I will write you again upon receipt of reports in the matter.

Kindest regards.

Very truly yours,

Vance Hartke

Hamilton, Montana
July 26, 1971

Senator Lee Metcalf
Senate Office Building
Washington, D. C. 20510

Dear Lee:

I recently learned from some of my colleagues at the University that John Craighead, his students, and research team have been prohibited from continuing their grizzly bear research in Yellowstone National Park. Lee, as you know, I am familiar with the research the Craigheads have done in Yellowstone National Park on grizzly bears, black bears, and elk over the past twelve years. I am also aware of the harassment they have had to face the past four years in order to pursue their work. Because of the dictatorial tactics of Superintendent Jack Anderson and because of his deliberate misrepresentation of the research situation and the Craigheads' position on bear management to officials of government, the Craigheads have been denied the opportunity of continuing their valuable research at the most critical time in their long term study of the grizzly. Lee, it appears to me after reading the Craighead report "Grizzly Bear - Man Relationships in Yellowstone National Park", 1970, that Superintendent Anderson's action is a deliberate move on the part of the Superintendent to conceal the true state of affairs and to prevent an objective evaluation of the Park's bear management program by the Craigheads and other personnel of the University of Montana.

I urge you to authorize President Pantzer to set up an investigating committee, similar to the committee that investigated clear-cutting practices in the Bitterroot Valley. I also urge you to encourage greater public involvement in the National Park Service's decision making processes. All major decisions affecting the resources of our National Parks should be brought before the public. In this respect, the National Park Service is a greater offender than the U. S. Forest Service.

Lee, last but not least, if no effective action can be brought to bear immediately, I would like to see Dale Burke of the Missoulian explore and expose this from the Washington level to the on-site situation in Yellowstone. This is bureaucracy at its worst; it should be corrected in Washington by proper directives, but perhaps exposure through the press is our only resort.

As ever,

G. M. Brandborg

cc to: Dean Solberg
Dr. Sogandares
D. Aldrich
Brock Evans
F. Craighead
Dr. S. Thatcher Hubbard

July 27, 1971

Dr. S. Thatcher Hubbard
East 111 Central Avenue
Spokane, Washington 99207

COPY

Dear Thatch:

Things are rapidly coming to a head on the grizzly bear situation in Yellowstone. I think that you could be of a great deal of help if you would write a letter to Senator Lee Metcalf and other members of the Montana delegation somewhat along the lines of Mr. Brandborg's letter which I am enclosing. I am also enclosing a copy of President's Pantzer's letter to Senator Metcalf and several other pertinent letters from members of the University administration showing the stand they have taken on the issue.

At the present time, we have not only been denied the opportunity to continue our research in Yellowstone, but the superintendent has denied us the daily information on the capture and removal of bears so that we are unable to analyse the current success or failure of the management program.

In addition to a letter to Senator Metcalf, it would be extremely helpful if you would write a letter to Jack Anderson, superintendent of Yellowstone National Park, telling him you have read both Glen Cole's and the Craigheads' report on the situation in Yellowstone and because of the critical nature of the problem this summer, you would like the superintendent to send you weekly summaries of the number of bears captured in the various campgrounds of the Park and the progress made in trapping and transplanting of grizzlies, as well as the number of control actions taken. Request that you would like this data from the middle of May to the middle of July. You might indicate that you have some expert ecologists on your staff who wish to review this data, or a statement along this general trend of thought.

Kindest personal regards,

John Craighead

JC/mj
Enclosures

July 22, 1971

The Honorable Rogers C. B. Morton
Secretary of the Interior
Department of the Interior
Washington, D. C. 20240

Dear Sir:

I understand that you have recently been informed of a problem that some of our faculty members are having with regard to Wildlife Research in Yellowstone National Park.

President Robert T. Pantzer of our institution contacted Senator Lee Metcalf, with a copy of his correspondence to Senator Mansfield, regarding the difficulties Drs. John and Frank Craighead have had continuing their research on grizzlies in Yellowstone Park.

This brief note is to urge you to look into the matter as soon as possible. The urgency of the matter is dictated by the fact that we are now in midsummer and it looks as if we may well lose an entire summer's research if present operational policies are maintained.

We shall be glad to provide you with any information on the issue, at your request.

Sincerely,

Richard A. Solberg, Dean
College of Arts and Sciences

Department of Zoology

University of Montana
Missoula, Montana 59801
(406) 243-0211

22 July 1971

The Honorable Rogers C. G. Morton
Secretary of the Interior
Department of Interior
Washington, D.C. 20240

My dear Mr. Secretary:

For the past four years Drs. John and Frank Craighead, faculty members in my department, have been subjected to considerable harassment at the hands of Mr. Jack Anderson, Superintendent of Yellowstone. As you are well aware, by popular articles in the National Geographic and by several national television programs, the Craigheads have been studying grizzly bears in the Yellowstone for many years. Mr. Anderson's allegations are that the Craigheads have not submitted reports of their work to the Park Service, and that they recommend continuance of the garbage pits as a management technique for grizzly bears. These two items are receiving widespread misrepresentation by Mr. Anderson to both elected and appointed public officials, including your own under-secretary, Mr. Reed. Thus, I feel it necessary as their chairman, to set the records straight and to provide you, as Secretary, with printed matter which will allow you to draw your own conclusions. All of the reports on grizzly studies, by the Craigheads, have been made available to Park authorities.

Please note in the report "Grizzly Bear-Man Relationships" (Pp. 51, 59) that the Craigheads do not advocate maintenance of open pit dumps in Yellowstone. The other reprints represent some of the research results which may be useful in management of the great bears.

The Craigheads continue to be denied access to Park records, by the superintendent of Yellowstone, as a follow up to their twelve year study of grizzlies. Thus, I request your intervention in this matter by directing the superintendent of Yellowstone to open these daily park records on grizzlies to the Craigheads, and to their colleagues at the University of Montana.

Additionally, the Superintendent has given orders to detag all bears marked by the University Research Team over a twelve-year span, with a consequent loss of data and great expenditures of funds and time. The Superintendent has also denied the Craigheads data on the detagging and redistribution of grizzlies. By detagging these bears and denying access to data pertaining them, the Superintendent, a non-scientist, is irresponsibly destroying a long-range program of great value to the Park and scientific community.

Respectfully yours,

Franklin Sogandares, Ph.D.
Professor and Chairman

FS/nh
Enc. 8
cc: Dean Solberg
President Pantzer
Senator Metcalf
Senator Mansfield

HORACE MARDEN ALBRIGHT
427 LANDFAIR AVENUE
LOS ANGELES, CALIFORNIA 90024

July 13, 1971.

Messrs Frank and John Craighead,
Moose, Wyoming.

My dear good friends:

At this time of the year, one or both of you scientists must be at your Grand Teton Park home, and so I'm addressing you there.

I'm wondering where we are in the Yellowstone grizzley bear problem, and will welcome any views you care to express to me. I'll be in Yellowstone about Sept. 1st for a few days, then in Grand Teton Park for about ten days Sept. 6th-16th, or thereabouts. I'll be at the Jackson Lake Lodge. Mr. Rockefeller's meetings this year will be on Sept. 9th and 10th.

I have become quite well acquainted with the new assistant secretary of the Interior, Nathaniel Reed. I met him in Washington in April when he and I attended the spring meeting of the Secretary's Advisory Board on National Parks, Historic Sites, Buildings and Monuments and its Council made up of former members of the Board of which I am one having been a member 1952-1958. Then June 23-28, I was with the Board again at Grand Canyon for some conferences and Nat. Reed was there too.

Nat. and I had a talk about you men and your long study of the Yellowstone grizzlies. He told me that he had approved the closing of the Trout Creek dump, but had directed that you men be welcomed back into the ranks of consultants on the grizzlies and should have full access to the lands and problems to be researched. Has this policy met your ideas of cooperation?

I have noted that a large male grizzlies was killed after invading a campground at Canyon. I suppose by now more have been killed.

I was to have been in Florida at Disney World March 22nd-23rd but I had a bad back and felt the long plane ride might be bad for it, so I went to Grand Canyon instead. Your father was to meet me at Disney World, and one day from the Disney offices here, I had a little visit with him on the telephone, and I'm sure we both enjoyed it.

I'll be here until August 1st, then away for about ten days on a trip to Stanford University for the wedding of my only grandson, and then here until we fly to West Yellowstone about Sept. 1st. We usually stay a day or two with Trev. Povah at his ranch outside West Yellowstone before going on to Yellowstone headquarters. I am not sure that I'm very welcome around Mammoth Hot Springs. My best regards to to both of you.

Sincerely yours,

HMA

MONTANA

United States Senate
Office of the Majority Leader
Washington, D.C. 20510

July 9, 1971

Mr. Robert Pantzer
President
University of Montana
Missoula, Montana 59801

Dear Bob:

This will acknowledge receipt of the copy of your letter of July 2, addressed to Senator Metcalf discussing a problem which has developed in conjunction with the University of Montana's research activities in Yellowstone National Park.

I am indeed sorry to learn that Doctors Craighead have encountered difficulties with the Park officials. I will be happy to discuss this with the officials here in Washington to see if I can come up with better understanding of this research program.

Thank you for writing and alerting me to this situation. With best personal wishes, I am

Sincerely yours,

Mike Mansfield
Ellen

P. S. The above was dictated before Senator Mansfield left for Montana.

JOHN L. McCLELLAN, ARK., CHAIRMAN
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WILLIAM V. ROTH, JR., DEL.
BILL BROCK, TENN.
JAMES R. CALLOWAY
CHIEF COUNSEL AND STAFF DIRECTOR

United States Senate
COMMITTEE ON
GOVERNMENT OPERATIONS
WASHINGTON, D.C. 20510

7 July 1971

Dr. Robert T. Pantzer
President
University of Montana
Missoula, Montana 59801

Dear Dr. Pantzer:

Thanks for your 2 July letter concerning the Craighead research program at Yellowstone National Park. I have written Secretary of the Interior Rogers C.B. Morton in this matter and will share his response with you when it is received.

Kindest regards.

Very truly yours,

Lee Metcalf

cc: Dr. John Craighead
Dr. Frank Craighead

JOHN L. MC CLELLAN, ARK., CHAIRMAN
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Lee Metcalf

cc: Dr. John Craighead
Dr. Frank Craighead

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Horace M. Albright Training Academy
Box 477
Grand Canyon, Arizona 86023

IN REPLY REFER TO:

July 6, 1971

Dr. John J. Craighead
Bureau of Sport Fisheries and Wildlife
Montana Cooperative Wildlife Research Unit
University of Montana
Missoula, Montana 59801

Dear John:

I appreciate having a copy of your report on Grizzly Bear - Man Relationships in Yellowstone National Park. It brings back many memories, of course, I well recall the formative days in getting started and some of the flap along the way. I have not been in close touch with it, of course, but am delighted to see the finished report.

My comments must be brief, basically I agree with the validity of your recommendations. I had not realized the rapid phase-out of the Trout Creek and Rabbit Creek dumps although I have been generally aware of the plan to do this "sometime" along with plans for sanitizing campgrounds - very expensive. I am particularly pleased with your regional approach which involves both the Forest Service and State Fish and Game Departments, and the problems in the border communities of Gardiner, West Yellowstone, Flagg Ranch and I presume Cooke City. If a viable grizzly population is the goal, then management must include all of these factors - plus stockmen, hunters, vacation home owners, outdoor clubs, and news media.

I had hoped that our preliminary endeavors to substitute carrion for artificial food as an interim measure were a guide for further action at the appropriate time. Someway this has not been done I gather. I still believe it would work - but here too you recall that we talked with Fish and Game people and sportsmen's clubs before we did it.

I have one question, on page 47 you mention the absence of wolves - is there a wolf population in Yellowstone now? Enough to be significant? Also, you mention Moment's report - I did not see it. Can you give me a reference?

John I see no real possibility that I will be out your way this summer, although I should love to do so of course. And it would be a very real pleasure to chat with you. This must await some other happy occasion.

And meanwhile I congratulate you on a very scholarly, informative, thorough report, with the added benefit of sharing your thoughtful recommendations with the Service. I am certain it will be seriously considered. Your basic alternatives are almost the same as you and I had discussed early in the program - they still sound logical to me and calculated for the welfare of our wonderful bears as they get caught up in the environmental crunch of too many people.

It was High Adventure, John - well planned and executed, and I am proud to have had an initial part in it. Congratulations to you and Frank for your determination, your continuing drive to get it done. It will be most helpful to a lot of us in understanding.

With every good wish.

Sincerely yours,

Lemuel A. Garrison
Director

Park tourists miss begging bears

Arizona Republic July 4, 1971

United Press International

YELLOWSTONE NATIONAL PARK, Wyo. — Tourists to the nation's oldest national park have noticed one of the area's main attractions missing this year — the black bears which traditionally beg food from passing motorists.

Park officials announced in May certain campgrounds in the park might be restricted to trailers and recreation vehicles to limit bear-camper conflicts and to force the animals back to nature.

The bear-management program has apparently succeeded because the bears are no longer as widely visible in the more populated areas of the park — and tourists are complaining about it.

The park's Canyon Campground has been closed to tent campers all year and park officials earlier considered imposing restrictions on Fishing Bridge, Pelican Creek, Grant Village and Bridge Bay.

"But there are no plans to restrict the other campgrounds at this time," Vernon Hennesay, assistant park superintendent, said.

He noted some of the campgrounds are located in the natural migration route of the grizzly bear and could be a problem unless campers keep their areas clean.

Hennesay also noted the park service has closed the old open pit garbage dumps, which provided the bears with an easy food source.

Closing the dumps accomplished two purposes, he said. "First it keeps the bears away from camping areas, and second, it forces the bears to return to their natural habitat for food."

Officials said that while tourists might not like the new policy, it is necessary. Last year the park reported three injuries from grizzlies and 30 to 35 injuries from black bears.

This year, there have been only two persons slightly injured and no serious bear-human confrontations in campgrounds have been reported.

"So far," Hennesay said, "the program is doing exactly what we wanted it to do and we are quite pleased."

He said tourists have been cooperating with the park officials in most cases.

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JERRY T. VERKLER, STAFF DIRECTOR

United States Senate
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
WASHINGTON, D.C. 20510

16 June 1971

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

Dear Doctor Craighead:

I believe you will be interested in the enclosed material from the National Park Service in further reference to grizzly bear management in Yellowstone Park.

Best wishes.

Very truly yours,

Lee Metcalf

Enclosure

United States Department of the Interior

NATIONAL PARK SERVICE

Yellowstone National Park, Wyoming 82190

IN REPLY REFER TO:

June 10, 1971

N16

Honorable Lee Metcalf
United States Senate
Washington, D. C. 20510

Dear Senator Metcalf:

On the occasion of my recent meeting convened by the Honorable Senator Hansen and representatives of the Congressional delegations from Wyoming, Montana and Idaho, we gave a briefing on the status of the Grizzly and Black Bear management programs in Yellowstone National Park.

At the conclusion of the meeting, Senator Hansen asked that each Congressional member be mailed the attached material covering the bear management program in Yellowstone. We are enclosing two additional pieces which we thought would also be of interest to you.

If we can be of further assistance on any briefing material, we will be most happy to work with your office.

Sincerely yours,

Jack K. Anderson
Superintendent

Enclosures 5

Research Note No. 3
Bear Management 1970
A Bear Management Policy and Program for YNP
Preservation and Management of Grizzly Bears in YNP
An Ethologist's Views on Managing Grizzly Bears

JUN 15 1971

HENRY M. JACKSON, WASH., CHAIRMAN
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JERRY T. VERKLER, STAFF DIRECTOR

United States Senate
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
WASHINGTON, D.C. 20510

June 15, 1971

John Craighead
University of Montana
Missoula, Montana 59801

Dear John:

Thank you for your letter concerning the bear management situation in Yellowstone National Park.

I had the opportunity of meeting with Jack Anderson and other personnel of the National Park Service concerning the bear management program now being implemented.

I also talked to Superintendent Anderson about the termination of your research in Yellowstone. He explained that two years ago you had asked for a two year extension of your bear research program and this extension has terminated. Evidently extensive marking of bears will not be allowed.

Superintendent Anderson indicated that he would be glad to discuss with you the possibility of research on other types of animals.

With best regards,

Sincerely,

Clifford P. Hansen
U. S. S.

CPH:ewg

UNIVERSITY OF CALIFORNIA, BERKELEY

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SCHOOL OF FORESTRY AND CONSERVATION
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BERKELEY, CALIFORNIA 94720

April 13, 1971

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

Dear John:

I have not had time to study your Yellowstone grizzly report in enough detail to write you my reactions. This has been in part because the report has been placed on reserve reading list in our library for use of my students in preparing for a class discussion of the Yellowstone grizzly problem as one in a series of "Case histories in wildlife conservation." The presentation of this case and subsequent class discussion went very well indeed and I can now retrieve the report for my own more careful reading. If I have any additional suggestions or comments regarding the report, I shall send them to you promptly knowing that the manuscript is already being prepared for publication. Thank you very much for sending this copy to me.

Sincerely,

A. Starker Leopold

ASL:na

March 31, 1971

COPY

Dr. A. Starker Leopold
School of Forestry and Conservation
University of California
Berkeley, California 94720

Dear Starker:

I am sure that you are as busy as ever and may not yet have had an opportunity to look over the grizzly bear report I sent you several weeks ago.

Following the meeting of your committee in Yellowstone in 1969 you indicated to me that you would be willing to review any paper I should prepare relating to management of grizzly bears in Yellowstone. The report I sent you is scheduled for publication sometime this spring. If you have any comments that you wish to make concerning the manuscript, I would certainly appreciate receiving them. If I don't hear from you, I shall conclude that you have no strong objections to the report. We have made minor revisions in wording in order to prevent any unnecessary misunderstanding of our position by members of the National Park Service.

I hope to hear from you in the near future.

Sincerely,

John J. Craighead
Unit Leader

JJC/mj

March 19, 1971

Dr. A. Starker Leopold
School of Forestry and Conservation
University of California
Berkeley, California 94720

COPY

Dear Starker:

As I indicated to you in an earlier letter, I have received word from Superintendent Jack Anderson that we cannot continue our grizzly bear research in Yellowstone. The reasons he has given for this cannot be substantiated and I have taken the matter up with our Washington office. Hopefully, Tom Baskett can resolve this at the Washington level.

I have just returned from a meeting of various agencies to discuss the closure of the West Yellowstone dump and how this should be done and what could be expected in the way of movement of grizzly bears into West Yellowstone. I think it would be a grave mistake for the National Park Service to close, or even attempt to begin phasing out the Trout Creek dump at the same time they are relocating and bear-proofing the West Yellowstone dump. I stated this at the meeting. I think the reasons for my position are evident in the documenting report I sent to you and the other members of your Committee. Mr. Anderson stated he has not seen this report although it has been in Dr. Linn's hands for about six weeks.

It seemed quite clear that Jack Anderson plans to proceed with closing Trout Creek dump this spring and essentially he backed up his stand by stating that the Natural Sciences Advisory Committee had reviewed the Park program and fully supported the program. I think it is useless for me to argue the point one way or another now, but I do think it was unfortunate that Mr. Anderson felt it necessary to prevent us from returning to the Park to continue our work at such a critical time in the documentation and evaluation of the management program. I intend to fight this through the proper channels, but in view of public sentiment the whole situation could get out of hands I believe you and your Committee could resolve the situation very quickly by authorizing Frank and me, and our colleagues, to continue our research on grizzly bears in Yellowstone with full cooperation from the National Park Service. The pros and cons of who is right or wrong in the situation can later be decided by an impartial committee of scientists.

Regardless of the reasons given for denying us the opportunity to complete our wesearch work, we have been "thrown out" because we have tried to

present our position and this has not been in agreement with those held by certain people in the Yellowstone administration. I am not in disagreement with the bear management policy formulated by your Committee although there have been statements and innuendos made in public and otherwise that I am in disagreement.

As I see it, the question is no longer one of how grizzly bears should be managed, but whether scientists can be denied the freedom of our national parks because their findings are not palatable to the administrators. Basically, this resolves down to a question of scientific and academic freedom.

Sincerely,

John J. Craighead
Unit Leader

JJC/mj

COPY

March 11, 1971

Dr. A. Starker Leopold
School of Forestry and Conservation
University of California
Berkeley, California 94720

COPY

Dear Starker:

Our report entitled "Grizzly bear - man relationships in Yellowstone National Park" has just been cleared by our Washington office, and I have been given clearance to submit it to a scientific journal for publication. A copy was delivered immediately to Bob Linn by Dr. Baskett, but I have not yet had an opportunity to send our copies since I have been in New Zealand for the past four weeks. I am sending you a copy of the report as requested and copies will also go to the other members of the National Park Service Natural Sciences Advisory Committee. Minor changes have been made in this report, the most important of which occurs on page 59.

You will find that most of the data incorporated in this report was presented to your Committee (although far too hastily, I feel, for careful study) when we met in Yellowstone to help formulate a grizzly bear management policy. I would like you to know that we have made repeated and sincere attempts to present this data to Jack Anderson and Glen Cole at a number of meetings, all of which are well documented, and have been very disappointed in their reaction to the data and the management suggestions we have made. For this reason, I would appreciate it very much if you would give me your impression of the paper and, if you have time, make suggestions. This paper was delivered at the bear conference in Calgary in November and was very well received. At the same meetings, both Glen Cole and Cliff Martinka delivered papers on their grizzly bear studies and management plans. This paper is only a part of a much more comprehensive treatment of grizzly bear biology and management which should be completed in the near future. I will send you a copy of this when it is ready for publication.

At the present time it looks as though our grizzly bear research in Yellowstone will be terminated by Superintendent Jack Anderson. I had hoped this would not occur since the reasons given for terminating the research have placed me in the position of having to defend my professional reputation and my record of research and cooperation in Yellowstone.

Sincerely,

John J. Craighead
Unit Leader

JJC/mj
Enclosure

March 11, 1971

Dr. Alvin L. Bertrand
Department of Sociology
and Rural Sociology
Louisiana State University
Baton Rouge, Louisiana 70803

COPY

Dear Dr. Bertrand:

I am enclosing a copy of our report entitled "Grizzly bear - man relationships in Yellowstone National Park." This report has just been cleared by our Washington office, and I have been given clearance to submit it to a scientific journal for publication. A copy was delivered immediately to Bob Linn by Dr. Baskett, but I have not yet had an opportunity to send out copies since I have been in New Zealand for the past four weeks. Minor changes have been made in this report, the most important of which occurs on page 59.

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John J. Craighead
Unit Leader

JJC/mj
Enclosure

March 11, 1971

Dr. Charles E. Olmsted
Department of Botany
University of Chicago
Chicago, Illinois 60637

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John J. Craighead
Unit Leader

JJC/mj
Enclosure

March 11, 1971

Dr. Stanley A. Cain
Department of Conservation
School of Natural Resources
The University of Michigan
Ann Arbor, Michigan 48104

COPY

Dear Dr. Cain:

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Sincerely,

John J. Craighead
Unit Leader

JJC/mj
Enclosure

March 11, 1971

Mr. Sigurd Olson
P. O. Box 157
Ely, Minnesota 55731

COPY

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John J. Craighead
Unit Leader

JJC/mj
Enclosure

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BERKELEY, CALIFORNIA 94720

January 29, 1971

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

Dear John:

Through a graduate student in the School of Forestry I had a chance to read a copy of your report entitled "Grizzly bear -- man relationships in Yellowstone National Park." I would like very much to have a copy of this report, if one is available. I would request moreover that copies go to 11 members of the NPS Natural Sciences Advisory Committee, since the report contains much of your data that we have been anxious to see since implementation of our grizzly management policy of 1969. Herewith is a list of the names and addresses of committee members. I presume, of course, that the report already has gone to the Park Service at Mammoth and in Washington.

Thanks so much.

Sincerely,

A. Starker Leopold

ASL:na
encl.

/

Advisory Committee Membership

Dr. Alvin L. Bertrand
Department of Sociology and Rural Sociology
Louisiana State University
Baton Rouge, Louisiana 70803

Dr. Stanley A. Cain
Department of Conservation
School of Natural Resources
The University of Michigan
Ann Arobr, Michigan 48104

Dr. Charles E. Olmsted
Department of Botany
University of Chicago
Chicago, Illinois 60637

Mr. Sigurd Olson
P.O. Box 157
Ely, Minnesota 55731

March 22, 1971

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

COPY

Dear Mr. Albright:

Thanks so much for your letter of March 18. I was very interested in some of the comments you made.

I agree with you 100% that it may not be feasible to completely close the Trout Creek dump and certainly the dump cannot be phased out until the entire Park and adjoining areas are thoroughly sanitized. We recently had a meeting concerning the closing of the West Yellowstone dump this summer. I went on record warning the Trout Creek dump should not be closed at the same time the West Yellowstone dump is closed. However, Jack Anderson indicated that they intended to proceed with the closing of Trout Creek dump and would evaluate the situation through out the summer.

I think it would be desirable to get rid of all dumps both inside and outside the Park, if this is feasible. The only way we can determine this for certain is to phase out all dumps both inside and outside the Park and thoroughly sanitize campgrounds, etc. Many of the grizzly bears will have concentrated at Trout Creek. There are now about 140 individuals there and this will probably increase to approximately 180 to 190. We could then experiment with a slow phase out of the Trout Creek dump and thoroughly document what happens. I am afraid that if we or some other objective researchers are not there to evaluate the situation, we will never get a thorough documentation of what happens. In view of the policy laid down by the Natural Sciences Advisory Committee, I think we have no alternative but to try to phase out all dumps in Yellowstone. If this proves unsuccessful, then the Trout Creek dump, or some alternative to it, will have to be an essential part of the grizzly bear management program.

We appreciate your help and interest. I know we are going to need all the help we can get. It is going to be a tough battle.

Sincerely,

John J. Craighead

JJC/mj

HORACE MARDEN ALBRIGHT
427 LANDFAIR AVENUE
LOS ANGELES, CALIFORNIA 90024

March 18, 1971.

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

My dear John:

You were thoughtful and kind in giving me an opportunity to read the latest Yellowstone grizzly bear report that your brother Frank and you have prepared for publication in Bioscience.

I have carefully read it once with full consideration of the maps and tables, and am part way through on the second round. The report is outstanding from every standpoint - very convincing and most impressive.

I have only one offhand comment, and that is you seem inconsistent in a continuing advocacy of phasing out the last of the garbage disposal grounds while not giving yourself an "escape clause" as we lawyers say, providing the disposal grounds or pits at or ne ar Gardiner, West Yellowstone, Flagg Ranch and Cooke City are also phased out . I dont think you can ever phase out Trout Creek while the outside grounds continue to exist. To me this is espe cially true as long as killing of grizzlies is permitted in the adjoining states. Personally, I have never felt that every one of the Yellowstone "feeding grounds" can be phased out and still try to keep a safe number of grizzlies in the park.

To me, it is a crying shame that the Park Servic e is not recognizing fully the expertise and vast knowledge you Craighead brothers have, and will not let you continue your research. I am going to do what I can to get you reinstated. I am going to Washington April 15th and will be in the East until May 15th. I will attend, by invitation, the spring meeting of the Secretary's Advisory Board on National Parks, Historic Sites, Buildings and Monuments, and will have plenty of opportunity to discuss Yellowstone grizzlies. In a letter to "Spud" Bill, deputy director, a few days ago, I told him that I could not understand why the Craigheads were "phased out" of the grizzly research and Linn, Cole and Jack Anderson substituted. I suspect Anderson regards me as a "hairshirt" or something worse for I am grousing about other things than just the grizzlies.

From the Walt Disney people here I get good reports of your marvelous Dad. They have him consulting on some of their Florida problems, and they have the highest admiration and respect for him.

Please continue to keep me posted. I read Frank's statement in the Jackson Hole News, and I wrote the editor that I fully concurred in the views of the Craighead brothers. I'm going to talk with Melville Grosvenor in Washington. He also belongs to the Council of the Adv. Board.

Faithfully yours,

Horace M. Albright Jr

March 11, 1971

COPY

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

Dear Mr. Albright:

I have just completed a paper entitled "Grizzly Bear - Man Relationships in Yellowstone National Park" which will be published in BioScience in the near future. I am sending you an advance copy of the manuscript because I know of your great interest in the grizzly bear situation in Yellowstone. I would like to have the manuscript kept confidential until it is published in BioScience. I would greatly appreciate any comments or suggestions you care to make. I am terribly concerned over the situation in Yellowstone and I think that this paper will alert the scientific community to this situation, but it will take people like you and others to make the Park Service see the light. I have presented all this information to Mr. Anderson, Park Superintendent, and Mr. Cole, Chief Biologist, at one time or another, but have had no favorable response whatsoever.

I hope this finds you in excellent health and that I will have the privilege of meeting again with you next summer.

Sincerely,

John J. Craighead

JJC/mj
Enclosure

P. S. I think you will be interested in my latest correspondence with Jack Anderson in which we have attempted to continue our grizzly bear research in Yellowstone National Park. I am deeply concerned that without independent, objective research and monitoring of the grizzly situation in Yellowstone that the control measures will intensify and the grizzly in Yellowstone will be truly threatened. I do not wish to impose my views of grizzly bear management on the National Park Service, but I am very concerned because the Yellowstone administration has completely disregarded our data and suggestions and have now taken the ultimate step of refusing to allow us to continue our grizzly bear research within the Park.

HORACE MARDEN ALBRIGHT
427 LANDFAIR AVENUE
LOS ANGELES, CALIFORNIA 90024

November 24, 1970

My dear John Craighead:

Where are we three - Frank, you and I - on the Yellowstone Park grizzly problem?

I have read the storiexs in the Jackson Hole News, and have written the editor that I agree with the Craigheads. I have also subscribed to the paper, although my cataracts do not let me read very little about anything.

Confidantially, Dr. George Ruhle telephones me that he spent most of the summer in Glacier Park, hiked all over it, and only saw one grizzly track; no other sigh of a grizzly. This is pretty bad news. Dr. Ruhle was up there working on a revision of his Glacier National Park Guide, now quite out of date - especially in what it said about grizzly bears.

It was a pleasure to meet and talk briefly with Frank and you in the Yellowstone country in early September.

The Walt. Disney people who are building the great Disney World in Florida are very enthusiastic over contacts made with your Dad on my recommendation. They think he is great, and expect to have him work with them on the plans for the protection of their 8,000 acre swamp which they want to keep as wilderness.

Greetings and good wishes to all the Craigheads for the Christmas season and the New Year, and warmest regards.

Sincerely yours,

Horace M. Albright

Dr. John Craighead,
Department of Zoology,
University of Montana,
Missoula, Mont.

University of Montana
Missoula, Montana 59801
(406) 243-0211

July 2, 1971

Senator Lee Metcalf
United States Senate
Senate Office Building
Washington, D. C. 20510

Dear Senator Metcalf:

It is understood that you have recently had some information regarding a problem which confronts research activity in Yellowstone National Park conducted by our faculty and students. Because of recent developments, I now see fit to write you for assistance regarding the matter. It is suggested that this matter should be brought to the attention of the appropriate officials in the Department of Interior.

Drs. John and Frank Craighead, most competent biologists with interest in wildlife, have spent about twelve of the past years conducting research and training students in Yellowstone National Park. As you know, Dr. John Craighead is on the staff here at the University of Montana and is one of the outstanding faculty members at the University. The Craighead research in Yellowstone National Park has concerned itself with problems pertaining to grizzly bear, black bear, elk, and also biotelemetry techniques. Their work is internationally known and has its emphasis on a search for the truth pertaining to the welfare of wildlife.

It is my understanding that very recently the Craigheads have been inhibited in continuing their research in Yellowstone National Park by the Superintendent of that Park. I am advised there have been no specifically expressed reasons offered for this action, and certainly it was made without agreement by the Craighead brothers or consultation with administrative or faculty members of the University of Montana.

The Craigheads have represented the University of Montana all of these years in research activities in Yellowstone which initially came about at the request of the National Park Service. Studies have been financed principally by National Science Foundation and National Geographic grants and Atomic Energy Commission contracts to the researchers and to the University. The conduct of the work has been governed by Memoranda of Understanding between the National Park Service and the University of Montana's Wildlife Research Unit. The reports and publications of research findings have been made available to the National Park Service and to the organizations providing the financial support.

It is my understanding that they have been criticized by National Park Service personnel for reporting findings to government and state resource agencies, conservation clubs, the scientific community, and the general public. They have been accused of certain alleged breeches of agreement with the National Park Service. The Craighead brothers deny all such accusations but have been unable to present their case because no mechanics exist for public review of administrative decisions in the National Park Service.

As President of the University of Montana, I think it is essential that these matters be brought to your attention for a number of reasons. Though there may be other reasons, I would like to present the following to you.

1. Has the right to conduct research freely on national resources important to the state of Montana and the nation itself been violated by the unilateral decision and discriminatory action of the Superintendent of Yellowstone National Park?

2. Has not the University of Montana responsibility to the state and the nation to conduct research on resources that affect the state and the nation and to report its findings without jeopardy?

3. Does an infringement of this responsibility constitute an infringement of academic freedom and a federal encroachment on state and state university rights and responsibilities?

With full recognition of the qualifications of the Craighead brothers, their past success in research activity and their international renown, it seems to me extremely important that this whole matter be fully investigated. This is important in the welfare of researchers, this institution, the state of Montana, the nation, and the very pursuit of knowledge so important as it relates to all wildlife interests which are involved.

I urge you to take appropriate steps to examine this situation, for the purpose of corrective measures which seem to be essential.

Sincerely yours,

Robert T. Pantzer
President

RTP:md
cc: Senator Mike Mansfield
Congressman John Melcher
Congressman Richard Shoup

JAN 2 9 1977

Dr. Robert Lynn
National Park Service
Department of the Interior
Washington, D.C. 20240

Dear Bob:

For your information, I have attached a copy of a manuscript by John and Frank Craighead entitled "Grizzly Bear - Man Relationships in Yellowstone National Park." This manuscript has been approved by us and sent to Dr. Frank Williamson, Editor, BioScience. This paper would be a belated contribution to the collection of papers already published in BioScience for November 1, 1970, under the general title "Man and the Grizzly--Coexistence." Editor Williamson committed himself to a companion paper by the Craigheads in a note following the abstracts of articles on page 1139 of the November 1, 1970, issue (photocopy attached).

Dr. Williamson has informed me that he plans to run the Craighead article and one by Glen Cole in the same issue of BioScience. I have attached a photocopy of his letter. Considering the fact that a great many people are already aware of the institutional disagreement surrounding the grizzly, I think it is a good idea to get the information out in the most objective form possible.

For our part, we have reviewed the Craighead manuscript very carefully and although the conclusions drawn are critical of NPS policy, we have tried our best to see that the statements are based on research findings as far as possible, and put in a logical, objective, and unemotional way. I hope that the appearance of the two articles will help clear the air, and that we then can get on with the publication of more of the fine zoological data that the Craigheads amassed during their years of work at Yellowstone.

Sincerely yours,

/s/

Thomas S. Baskett
Acting Assistant Director-Research

Enclosures

cc:
Dr. J. Craighead
N.R. Holler (WR)
J. Palmer (WR)
Dr. F. Williamson

AR:TSBaskett:rfs 1/29/71

ADDRESS ONLY THE DIRECTOR,
BUREAU OF SPORT FISHERIES
AND WILDLIFE

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
WASHINGTON, D.C. 20240

September 13, 1971

Mr. Neil J. Reid
Management Ecologist
Office of the Chief Scientist
National Park Service
U.S. Department of the Interior
Washington, D.C. 20240

Dear Jim:

Because of my earlier involvement, Dr. John Craighead asked me to reply to your letter to him, dated August 17, 1971, concerning the "Grizzly Bear - Man-Relationships in Yellowstone ..." report and/or manuscript.

I doubt that much will be gained by further historical research into this matter, but for whatever it's worth, I'll recount relevant events as best I can.

John Craighead gave a paper last fall at Calgary; it was based on an early version of what was to become the Craigheads' BioScience manuscript, recently published. They distributed some copies of that version; I do not know how many, but am told that it was a small number, and mostly to participants at the symposium. A few more were sent out later in answer to specific requests. There was no Bureau-wide distribution or anything that resembled that. I believe Glen Cole participated in the same symposium, and although I am unable to check it out at this writing, was under the impression that he distributed an informal version of his paper at that time, too.

Later, when the BioScience arrangement hove into view, we put the Craighead paper through reviewing and editorial process here. When it was approved and ready for submission, in our view, I sent Bob Linn an information copy. Many moons passed before publication, and I assumed that the Park Service people had ample time to see it before Glen Cole's companion article for BioScience was firmed up.

Dr. Craighead

That's the way I understand things, and I doubt that further research on these points would be fruitful. Rather, as much as possible, it seems to me that the BioScience articles should be permitted to speak for themselves.

Sincerely yours,

Thomas S.Baskett
Chief, Division of Wildlife
Research

MONTANA

United States Senate
Office of the Majority Leader
Washington, D.C. 20510

August 27, 1971

Mr. Franklin Sogandares
Professor and Chairman
Department of Zoology
University of Montana
Missoula, Montana 59801

Dear Professor Sogandares:

Senator Mansfield is out of the country attending the 59th Interparliamentary Union Conference and, in his absence, we wish to acknowledge receipt of the copy of your letter of August 20 addressed to Senator Metcalf.

We know Senator Mansfield will be sorry to hear that the bear research project at Yellowstone was not satisfactorily resolved following the discussions here in Washington. We are confident the Senator will discuss this matter with Senator Metcalf upon his return.

With best personal wishes, I am

Sincerely yours,

Peggy DeMichele
Administrative Assistant to
Senator Mansfield

University of Montana
Missoula, Montana 59801
(406) 243-0211

August 24, 1971

Mr. Merrill W. Englund
Administrative Assistant
Office of Senator Lee Metcalf
Senate Office Bldg.
Washington, D. C. 20510

Dear Mr. Englund:

Thank you very much for sending me the Memorandum of Understanding between the National Parks Service and the Bureau of Sport Fisheries and Wildlife in connection with the grizzly bear research in Yellowstone National Park. I am very pleased that this has come about and wish to thank Senator Metcalf and all others who participated in this endeavor.

It is indeed hoped that this shall resolve the administrative problems which have previously existed and I have every belief that this will be the true condition. Obviously, this should be to the greatest welfare of the Service and Bureau involved and the research so vital at this time.

Sincerely yours,

Robert T. Pantzer
President

RTP:md
cc: Dr. John Craighead, Montana Cooperative Wildlife Research Unit
Dean Richard A. Solberg, College of Arts & Sciences

Dr. Thomas Baskett, Chief
Division of Wildlife Research

August 23, 1971

Dr. John Craighead, Leader
Montana Coop. Wildlife Research Unit

Grizzly bear - man relationships in Yellowstone National Park

I am enclosing a letter which I just received from Neil J. Reid of the National Park Service. This was in response to the letter I wrote to Bob Linn when I recently sent him another copy of the report "Grizzly Bear-Man Relationships in Yellowstone National Park". At that time I also forwarded you copies of the correspondence.

I think the letter speaks for itself and also the carbon of my letter of March 19 at which time I sent Jack Anderson a copy of the report. Since Bob Linn had an opportunity to see our manuscript and had the opportunity to state that he felt it was highly critical, I feel that we met our obligations. It is this sort of situation which has repeated itself time and time again, whether by intent or by lack of communication, that has brought on and aggravated most of the problems we have encountered in our relationships with the National Park Service.

I would appreciate if you would answer Mr. Reid's letter since you have first-hand information on the copy of the manuscript that was presented to Dr. Linn.

John Craighead

JC/mj
Enclosure

UNITED STATES GOVERNMENT

Memorandum

BUREAU OF SPORT FISHERIES AND WILDLIFE

TO : Dr. Thomas Baskett, Chief
Division of Wildlife Research

DATE: August 20, 1971

FROM : Dr. John Craighead, Leader
Montana Cooperative Wildlife Research Unit

SUBJECT: Memorandum of Understanding on Grizzly Bear Research in Yellowstone and Proposed Study Plan for Grizzly Bear Research

I received the revised Memorandum of Understanding between the Bureau and the National Park Service for conducting research on grizzly bears in Yellowstone National Park, and the revised study plan. The Memorandum of Understanding and the work plan as revised requires further revision if the objectives of the research are to be met and if, indeed, independent research is to be carried out at all.

It is my understanding that the purpose of this agreement and work plan was to make arrangements at the highest administrative level that would enable two research teams, one representing the National Park Service and one representing the Bureau of Sport Fisheries and Wildlife, to conduct independent research on essentially the same problem (how to establish a natural population of grizzlies with a minimum of danger to the public and to the bears) within Yellowstone National Park and to analyse and report findings and conclusions independently. It seems obvious from the problems that have developed in the field between the two research teams and from the differences of opinion expressed in research journals (see BioScience) that two independent but cooperative research efforts are necessary.

In order to conduct research in Yellowstone National Park, the Montana Cooperative Wildlife Research Unit needs an independent research team working closely with, but not dependent on, the National Park Service's biologists. We require freedom to continue to gather a wide range of data, to handle immobilized bears, to record first-hand information on the number of bears in campgrounds, the number of captures, the number of bears dispatched or killed in control actions, and the information concerning transplants and returns. This is the type of information that we have gathered for 12 years using techniques and methods developed by our research teams (see BioScience). It is essential that we have freedom to continue to do this; as well as freedom to analyse these and other data obtained directly from the Superintendent's office. In addition, it is necessary that we be encouraged to draw conclusions, and report independently of the National Park Service's research team. Our analyses and our reports will, of course, be submitted to the National Park Service for review prior to publication.

It was my understanding that the Memorandum of Understanding between the Bureau and the National Park Service, which I reviewed in Washington, D. C. on August 5, 1971 would be revised in accordance with recommendations specified by me and by Dr. Solberg, representing the University of Montana. It was also my understanding that the proposed research study plan reviewed by Dr. Loveless, Dr. Linn, George Gardner, and myself would not be substantially altered.

I would like to comment on the revised Memorandum of Understanding and the work plan as it relates to a successful and harmonious research program in Yellowstone.

SPECIFIC COMMENTS ON THE MEMORANDUM OF UNDERSTANDING

Page 2, Section 2, last paragraph

I object to this paragraph because it precludes publication by the Unit team of data that are the very essence of the problem to be investigated. I can only interpret this to mean that data will be provided under the terms of the work plan, but that we can really do nothing with it. Since the Bureau research team started collecting these data in 1959 and published these (see BioScience); and since we have recognized the importance of obtaining this information during 1971 and future years, I believe that the National Park Service should not have proprietary rights.

I suggest that if the intent of this agreement is to obtain the best possible analysis and interpretation of the effect of present management actions that both parties to the agreement should not only have the right but should be encouraged to interpret and publish separately. This is the essence of science.

Page 3, section 5, entire paragraph

In order to continue a food habits study of grizzlies we requested that section 5 be altered to read: "The capture, marking or collecting of biological specimens and samples (other than scats and portions of dead animals) shall be undertaken when mutually agreed by the National Park Service and the Bureau of Sport Fisheries and Wildlife." Specifically, we wish to continue to collect the lower jaws and femurs of dead ungulates in order to age them and to determine their physical condition at the time of death. This has yielded important information on predation by grizzlies and the use of winter-killed animals. To inspect jaws and femurs at Park Headquarters (as specified by the revised work plan) would preclude us from sampling by area or time, or determining our sample sizes. This is not research.

SPECIFIC COMMENTS ON THE PROPOSED STUDY PLAN

General Objective I. Page 1, No. 3

We need to have authority to gather our own data (as we have in the past) in capture, release, control actions, confrontations, property damage, and visitation of grizzlies to campgrounds and developed areas. We need to supplement these with data from the log books of the sub-district rangers.

I suggest that this objective should read: "Both the National Park Service and the Bureau of Sport Fisheries and Wildlife shall be free to independently gather all data relating to capture, release, control, confrontations, property damage, campground visitations, transplants and returns. The objective of both parties to this agreement shall be to accumulate as complete a record as possible and to interpret the data independently in the best traditions of science.

SPECIFIC COMMENTS ON SPECIFIC OBJECTIVES

General Objective No. 1, Page 1

Specific objective No. 4 in our original work plan was eliminated with no explanation.

General Objective No. 1, Page 2, No. 4

Our research teams have handled nearly 600 grizzlies during the past 12 years. We need authorization to take our own measurements, make our own observations, etc., unless we specifically specify otherwise. It is recognized there may be times when it may not be possible to record our own information, however, we had no serious problem in this respect during many years of cooperative work with National Park rangers.

General Objective No. 2, Page 2

There is no purpose in fulfilling specific objectives No. 1 and No. 2 unless general objective 1 can be conducted in a scientific manner. This information is needed for comparative purposes.

General Objective No. 3, Page 3

Again it is essential that we gather and tabulate our own data. Weekly summaries are normally not recorded so the data can be statistically analysed. Independent recording of the raw data is the basis of research and when two research teams are working with very different hypotheses, one team should not be dependent on data gathered and summarized by the other team. The opposite approach should be encouraged so as to get the broadest possible prospective on the problem.

General Objective No. 4, Page 3

This is an impossible research arrangement and has already been commented upon under page 3, section 5, of the Memorandum of Understanding (see Page 2 of this memorandum).

GENERAL PROCEDURES

Procedure 2, Page 3

Is there a need to specify how and under what conditions we get the bear management data? A statement encouraging independent data gathering would, I believe, be more in keeping with the intent of the agreement. A point of friction in the past has been the provision of summarized statements rather than raw data.

It is with reluctance and concern that I withdraw my research efforts from Yellowstone National Park. I do not believe it is now feasible for me to conduct research on the effect of management actions on grizzly bears in Yellowstone. I regret that the attempt to resolve this was not successful, but I do appreciate the effort of those who tried.

Tom, I would like you to request the National Park Service to provide me with all records of capture, death, dispatch, and transplants of grizzlies marked by our research team. In view of the vast amount of data that we have made available to the National Park Service, and the cost of the grizzly bear project, I think this is a very reasonable request. (Under separate cover, I am sending you our latest report on research conducted in National Parks.)

I hope that we will have the opportunity to negotiate a contract to conduct research in Yellowstone National Park at a later date.

John J. Craighead

Enclosure

Department of Zoology

University of Montana
Missoula, Montana 59801
(406) 243-0211

20 August 1971

Dr. Tom Baskett, Chief
Division of Wildlife Research
Bureau of Sports Fisheries and Wildlife
Department of the Interior
Washington, D. C. 20240

Dear Dr. Baskett:

Enclosed is a copy of a letter to Senator Metcalf in which his office inquired if the Memorandum of Understanding between the MCRU and the Park Service was satisfactorily implemented. I am including you as a recipient of this correspondence in order to keep you informed, and to further let you know that the situation could take a turn for the worse. I would personally urge you to come out here where the appropriate administrative officials could discuss this matter with you in detail.

Sincerely,

Franklin Sogandares
Professor and Chairman

jm

enc.

Department of Zoology

University of Montana
Missoula, Montana 59801
(406) 243-0211

20 August 1971

Frank C. Craighead Jr.
Environmental Research Institute
P.O. Box 156
Moose, Wyoming 83012

Dear Frank:

Thanks for your letter of 20 August. Unfortunately, the devious devils are back at it again with J. J.'s Memo of Understanding. Most scientists could not believe that these fellows are just absolutely without ethics. I am convinced that the only way to make public lands available to the public for scientific research, not harming resources, is to fire the entire Park Service - from the Undersecretary to the Park Superintendents and Chief Biologists. Then some half-decent people would have to be installed in these jobs.

We will keep trying because this is an important issue of principle. Regrettably we have to go very easy, because these same mentalities may fix the blame on J. J. and effect "sanctions" on J. J. and/or the Unit.

Warmest regards,

Franklin Sogandares
Professor and Chairman

FS/nh

Department of Zoology

University of Montana
Missoula, Montana 59801
(406) 243-0211

20 August 1971

Senator Lee Metcalf
Senate Office Building
U. S. Senate
Washington D.C. 20510

Dear Senator Metcalf:

I want to thank you for attempting to straighten out the problems surrounding the research of Dr. Craighead and the Montana Cooperative Wildlife Unit in Yellowstone Park.

On the 16th of August your administrative assistant, Mr. Merrill W. Englund, graciously sent me a letter including a copy of the Memorandum of Understanding which would govern the Craighead's and Montana Cooperative Wildlife Research Unit's research in Yellowstone Park. Regrettably, I must report to you that the Memorandum which was presented at your meeting attended by Dean Solberg and Dr. Craighead, and sent to me by your assistant, is not in fact the final Memorandum which was implemented.

At the meeting Dr. Craighead and Dean Solberg requested that certain specific points hampering the research be removed from the memorandum. After you left the meeting, the Park's service personnel agreed to consider this. The Memorandum of Understanding that resulted from their "review" was even more stringent than the one the Craigheads had been working under previously in the Park. The final Memorandum presents such a straitjacket, that I must say as a scientist myself, that I would not work under such a Memorandum of Understanding in the Park.

As a result of this very bad situation, Dr. Craighead has dropped all of his studies in Yellowstone Park, and has requested me not to pursue this matter further. Since there are several principles involved in this issue, however, some of which concern you, the University, the people of this state, and the general public, I feel that something must be done to straighten this matter out. It would seem that the public should be able to conduct investigations of its own resources without political interference.

Although Dr. Craighead has asked me not to continue on this path, I feel it

imperative that the matter be taken up again. I hope that you will see fit to reopen the issue with the responsible Park officials, and come to the rescue of the curtailed privileges of Montana citizens and the Montana faculty.

With very best wishes,

Sincerly yours,

Franklin Sogandares
Professor and Chairman

FS/nh

cc: Dean Solberg
Dr. Baskett
Senator Mansfield

University of Montana
Missoula, Montana 59801
(406) 243-0211

20 August 1971

Dr. Robert Lynn
Chief Scientist
National Park Service
Department of the Interior
Washington, D.C. 20240

Dear Dr. Lynn:

Scientists at the University of Montana intend to continue studies of flora and fauna in Yellowstone and Glacier National Parks. I am writing to inquire procedures to be followed by the University of Montana in working out a satisfactory arrangement under which research could be conducted.

Sincerely yours,

Richard A. Solberg, Dean
College of Arts and Sciences

nh
cc: Vice-President Landini
Senator Metcalf
Senator Mansfield

University of Montana
Missoula, Montana 59801
(406) 243-0211

20 August 1971

Dr. Tom Baskett
Chief
Division of Wildlife Research
Bureau of Wildlife and Fisheries
Department of the Interior
Washington, D.C. 20240

Dear Dr. Baskett:

I was sorry to hear that Dr. Craighead will not be working in Yellowstone due to the inability to obtain a memorandum of understanding providing a satisfactory climate in which to conduct research.

Dr. Craighead does not wish to pursue this matter further, and in fact has asked me not to intervene. However, there is a point of principle involved in this issue, as well as the future research of Montana faculty and graduate students who have a responsibility to study and to report on State resources.

This institution intends to continue to conduct research in National Parks lying within our state boundaries. President Pantzer has directed me to explore this subject in detail.

I would like to make it clear again that neither Dr. Craighead nor the Montana Wildlife Research Unit plays a role in the decision to pursue this matter further.

With very best wishes,

Sincerely,

Richard A. Solberg, Dean
College of Arts and Sciences

nh

United States Department of the Interior

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
N22-CS

August 17, 1971

AIRMAIL

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

Dear John:

Bob Linn is enjoying the relative tranquility of Isle Royale this week, and he has asked that I acknowledge receipt of the publication, "Grizzly Bear - Man Relationships in Yellowstone National Park."

We did, as you indicated, receive an informational copy (xerox) of this paper previously from Dr. Baskett. At that time, however, we were under the impression that it was a manuscript that had been submitted to BioScience for publication, and we were not aware that it had been reproduced by the Bureau of Sport Fisheries and Wildlife for public distribution. I believe Bob's primary concern is that while your publication is highly critical of Yellowstone's bear management program, and has been given wide public distribution, apparently no effort has been made to supply copies of the finished paper to Superintendent Jack Anderson, who has the responsibility for carrying out the subject management program. He has a need to know what information is being disseminated to the public concerning the discharge of his responsibilities. Therefore, I am forwarding the copy of the report you sent to Bob to Jack Anderson.

Thank you.

Sincerely yours,

Neil J. Reid
Management Ecologist
Office of the Chief Scientist

Dr. Thomas Baskett, Chief
Division of Wildlife Research

August 17, 1971

Dr. John Craighead, Leader
Montana Coop. Wildlife Research Unit

New York Times article of 8/16/71 on grizzly bears

This will confirm your telephone call of August 16 in which you requested information on the New York Times news release on the grizzly bear situation in Yellowstone National Park. Enclosed is a copy of a release which appeared in The Missoulian today, which I presume is very similar or identical to the story that appeared in the New York Times.

In late December or early January, Miss Dana Little of the New York Times telephoned and asked if I would make available to her a copy of the paper to be submitted to BioScience. I don't know where she learned that I had submitted a paper to the journal, but I would like to make it clear that I did not on my own initiate contact with Miss Little. I informed her I could not release the report, but that it would be published in BioScience during the summer of 1971. Perhaps a month later Miss Little telephoned again and I reiterated my position and suggested she contact Dr. Robert Leisner, Associate Editor of BioScience. She contacted Dr. Leisner and he later informed me that he had tentatively agreed to send her a copy of my paper when it appeared in BioScience. I am enclosing a copy of Dr. Leisner's letter of July 28 to Miss Little. Unfortunately, I was in the field when this letter arrived and I did not see it prior to my recent trip to Washington.

In reconstruction, it appears that Dr. Leisner gave Miss Little permission to see an advance copy with the understanding that nothing would appear in print until August 15. However, apparently BioScience did not meet its publication date and so the article in the New York Times appeared a few days before it appeared in BioScience.

The telephone interview which is attributed to me and which appears in the last paragraph of the article occurred either in December of 1970 or January of 1971. There was no correspondence of any kind between me and Miss Little following her second request for the management paper.

My office contacted Jack Anderson on August 16 and he stated that he was not concerned about the release and that he also had been quoted from a previous interview and that he considered the matter closed.

John Craighead

cc: Dr. Charles Loveless

Closed-Dump Plan Threatening Grizzly

(C) 1971 New York Times News Service

WASHINGTON — The grizzly bears of Yellowstone National Park are in danger of being eliminated by the very policy that is designed to protect them, according to two prominent wildlife biologists.

John and Frank Craighead, brothers associated with the Montana Cooperative Wildlife Research Unit, say the problem is the three-year-old park policy of closing the isolated garbage dumps on which the bears had fed for years.

The Craigheads say that the closing of the dumps is "creating" instead of eradicating troublesome campground bears.

According to the biologists, the grizzlies, denied their traditional campground feeding sites, are not returning obediently to the back country but are dispersing throughout the park.

More bears, the brothers say, are entering campgounds in search of food and others are extending their home range beyond park borders, where they lack protection and are hunted.

The Craigheads, who recently completed a 12-year study of the relationship between grizzlies and man, expressed their views in an article appearing in the current issue of Bioscience magazine, published by the American Institute of Biological Sciences here.

In a companion article in Bioscience by Glen F. Cole, Yellowstone's chief research biologist, and in telephone interviews with Cole and the park's superintendent, the preventive bear-management goals were defended and praised. The goals were recommended by an advisory committee of the National Park Service, composed of university professors, park personnel, and consultants.

The closing of the garbage dumps was an effort to maintain a natural state in the park and to reduce the chances of conflict between bears and campers in a park that attracts more than two million visitors a year.

With the garbage cut off quickly, the park services said, the bears would be forced to turn immediately to natural foods in the woods and away from the heavily populated campsites and visitor areas, which account for only 5 per cent of the 3,500-square mile parkland.

Park rangers now destroy or ship to zoos all "two-time offenders" entering a campsite in a successive two-year period after having been transplanted to other parts of the park. Since the new policy was enacted, the Craigheads say, 12.3 grizzlies a year have been killed or sent to zoos, compared with 4.1 a year from 1959 through 1967.

Last summer, 22 grizzlies — the highest number in park history — were destroyed or sent to zoos, a figure the Craigheads say "exceeds 10 per cent of the Yellowstone population," which they put at about 200.

Human injuries since 1968 have averaged 3.33 a year, they say, while they were only half as numerous from 1959 through 1967.

Jack K. Anderson, Yellowstone superintendent, said in a telephone interview that the program was going "extremely well," that only two bears had been destroyed this summer and there had been no human injuries but "some property damage."

According to the Craigheads, the dump closings have greatly increased the probability of conflicts between man and bears and are endangering perhaps the largest concentration of protected grizzlies south of Canada, a species already listed as "rare" by the Interior Department.

Both the park service advisory committee and the Craigheads agreed that the grizzlies must ultimately be forced to natural foods and away from the park's heavily populated campsites and visitors areas. But the Craigheads recommended the slow phasing out of the dumps, "weaning" the bears gradually to new feeding habits, social behavior and movement patterns.

In a telephone interview, John Craighead said: "The grizzly is indiscriminate in his eating habits. There's no scientific evidence to prove he has ever turned to one food in favor of another. He's always taken food where he easily found it, whether man were present or not. Denied one source, he will not consciously seek another, he will just begin to move around more."

28 July 1971

Miss Dana Little
c/o New York Times
1920 L. Street, N. W.
Washington, D. C. 20036

Dear Miss Little:

Enclosed are xerox copies of page proof of the editorial and Craighead's article scheduled for publication in the August 15 issue of BioScience. Our editor, John Behnke suggested that you might also be interested in the editorial which deals with national parks.

In allowing you to see advance copies of these materials, it is understood that anything developed from them will not appear in print, in any form, prior to the issuance of the August 15, 1971 issue of BioScience.

In addition, if any of the material is used, it is requested that credit be given the authors and the journal.

Sincerely yours,

Robert S. Leisner
Associate Editor
BioScience

Encls: 2
cc: Mr. John Behnke
Dr. John J. Craighead

RSL:dah

CLINTON P. ANDERSON, N. MEX.
ALAN BIBLE, NEV.
FRANK CHURCH, IDAHO
FRANK E. MOSS, UTAH
QUENTIN N. BURDICK, N. DAK.
GEORGE MC GOVERN, S. DAK.
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GORDON ALLOTT, COLO.
LEN B. JORDAN, IDAHO
PAUL J. FANNIN, ARIZ.
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JERRY T. VERKLER, STAFF DIRECTOR

United States Senate
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
WASHINGTON, D.C. 20510

16 August 1971

Dr. John Craighead
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Missoula, Montana 59801

Dear Dr. Craighead:

I believe you will be interested in the enclosed Memorandum of Understanding between the National Park Service and the Bureau of Sport Fisheries and Wildlife in connection with grizzly bear research at Yellowstone National Park. As you know, it is the result of a 4 August meeting held by Senator Metcalf and attended by Interior Department officials and yourself.

The Memorandum provides for continued grizzly bear research at Yellowstone by the Craighead team. I hope this resolves the administrative problems which have existed in regard to this matter.

I write while the Senator is working out of his Montana office during the Congressional recess.

Very truly yours,

Merrill W. Englund
Administrative Assistant
to Senator Lee Metcalf

Enclosure

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Grizzly Bear - Man Relationships in Yellowstone National Park

John J. Craighead and Frank C. Craighead, Jr.

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The grizzly bear, *Ursus arctos horribilis,* is an intelligent, extremely efficient omnivore and a relatively inefficient carnivore. This large bear feeds on grasses, sedges, tubers, berries, nuts, carrion, meat caches, rodents, big game, livestock, garbage, and even modern packaged foods. The propensity to seek and utilize a wide range of edibles has brought the grizzly into frequent contact with man. This ecological relationship of the omnivorous grizzly associating with omnivorous man and the predatory bear competing with the predatory human has led and will continue to lead to confrontations, property damage, and occasional conflict and injury. The grizzly has a long history of seeking and taking the food it wants with little opposition. The erratic, aggressive, and frequently unpredictable behavior of both grizzly and man increases the probability of conflict. The opportunity for confrontation and for injury to humans is small, but it is greater in national parks than elsewhere.

To understand grizzly bear-man relationships in Yellowstone National Park, we must first recognize that the ecology of bear and man has always overlapped. Within recent geological time, wherever the species existed, the grizzly bear was at or near the top of the North American food pyramid.

The North American Indian and the grizzly bear coexisted in a spacious environment. Two questions we wish to explore are can the grizzly bear and modern man co-exist in the congested environments of our large national parks? Specifically, can man and grizzly live together in Yellowstone? Secondly, if they can co-exist, how should man achieve this? Both questions require more than theoretical or philosophical answers, ethological extrapolation, administrative decrees, or generalized guidelines.

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We, our colleagues, and our graduate students sought to answer these questions 12 years ago when we began a long-term study of the grizzly bear within the 19,943 km^2 (7700 miles^2) National Park and adjacent national forests (Craighead et al., 1960). Since 1959, we have captured, examined, and released over 550 grizzlies, immobilized and individually color-marked 256 and logged over 40,000 man-hours observing and recording their activities and behavior. In addition, 24 individual grizzlies have been fitted with radios and radio-monitored for approximately 30,000 hours in order to obtain data on movements, home ranges, food habits, social and denning behavior, and an understanding of bear-man relationships (Craighead and Craighead, 1965, 1969, 1970).

Some Biological Facts

Using data from 324 censuses totaling 11,340 hours and from an intensive trapping, re-trapping, and marking program, we have calculated a minimum of 175 grizzly bears in the Yellowstone area. One-third of the adult females (about 15) breed each year and produce an average of 33 cubs or a 19% annual increment. The females first breed successfully at 4 ½ years though many may not produce cubs until they are 8 or 9 years old (Craighead et al., 1969). The annual increment slightly exceeds the mortality rate; thus, the population grew at an average annual rate of approximately six grizzlies per year from 1959 through 1966 (Craighead and Craighead, 1967). An increase in the death rate, especially of adult females, could jeopardize the population.

In the summer months, grizzlies gradually, but steadily, congregate at Trout Creek (Fig. 1) and at other major open-pit dumps in and outside of Yellowstone. Grizzlies are attracted to these dumps from all portions of the Park and from the adjoining national forests. Peak densities are reached in August. Our observations indicate that there are few grizzlies in the Yellowstone backcountry during this time. Mullen and Booth (1969) also found fewer grizzlies on the Shoshone National Forest adjacent to Yellowstone during August than prior to and after this month. Our census and movement data (Craighead and Craighead, 1967) show that Yellowstone National Park serves as a summer refuge for many grizzly bears whose home ranges extend beyond the Park boundaries. We have computed that a 12,950 km^2 (5000 miles^2) area including Yellowstone National Park and an adjacent 16.1-km (10-mile) corridor of national forest land supports an average of about one grizzly bear to every 75.1 km^2 (29 miles^2). Some grizzlies spend their lives entirely within the Park; others do not. Those that move outside the Park boundaries are hunted. Forty-eight per cent of the grizzlies shot outside the Park from 1959 to 1968 were adult animals and 52% were subadults ranging from yearlings to 4-year olds, showing that outward movement from within the Park is not confined to young animals. These data suggest that movements of grizzlies out of the Park result from the species' natural mobility and should not be interpreted as evidence that grizzlies have exceeded the carrying capacity of their environment in Yellowstone National Park.

Studies have been made of the movements and home ranges of grizzlies inhabiting Yellowstone and adjacent portions of four national forests. Data from color-marked and radio-tagged bears show that most, perhaps all, of the grizzlies in this population feed at one or more of the earth-filled garbage dumps (Fig. 2) at sometime during the course of their lives; some visit the dumps frequently, others infrequently. Thus, it is doubtful if the term "wilderness grizzly" is useful if we mean an animal having no contact with "artificial" food sources. For example, 114

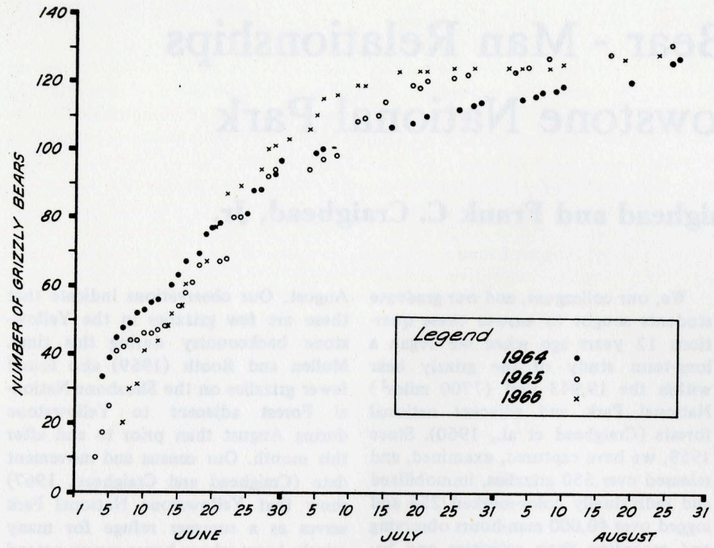


Fig. 1. Seasonal coalescence of grizzly bears at Trout Creek Dump. Each data point represents a 3 ½ hour census.

marked grizzlies were identified at the Trout Creek Dump during the summers of 1966 through 1968. Table 1 lists the number of these marked animals identified at the dump and also in the backcountry. During a 3-year period, 37% of all the marked grizzlies that visited the Trout Creek Dump were also observed in the backcountry. Because of the pattern of human use in Yellowstone National Park, areas a kilometer or more from roads and developed areas conform to the definition of wilderness as it is stated in the National Wilderness Preservation Act. Approximately 95% of the 7806 km^2 (3400 miles^2) in Yellowstone National Park can be considered backcountry. Most backcountry observations were made in spring and fall when the grizzlies were dispersed. As Table 1 shows, all age classes disperse throughout the Yellowstone backcountry.

Additional observations in the backcountry and at other garbage dumps during other years also show that, in the spring and fall months, the grizzlies that feed in summer at these garbage disposal areas also frequent the Yellowstone wilderness.

All Yellowstone grizzlies, regardless of their feeding habits or degree of association with man, inhabit wilderness portions of the Park and adjoining national forests from October through April. Thus, management of grizzly bears in Yellowstone Park affects not only resident animals in the Park but also grizzlies inhabiting four national forests in three states.

Food disposal areas (Fig. 2) have attracted grizzlies for over 80 years. They have shaped and are integrally meshed with grizzly bear ecology in Yellowstone. Except for the nature of the food, they are ecological equivalents of the spawning salmon runs that attract and concentrate Alaskan brown bear (*Ursus arctos middendorffi*) during the summer months. Yellowstone garbage sites concentrate the grizzly bears during a 3-month period from June through August.

Key questions posed are: Have the garbage dumps basically altered the grizzly's relationship to man? Have they increased or decreased grizzly-man conflicts in Yellowstone? Should they be eliminated and, if so, how? To answer these questions we must understand bear-man relationships and the nature of bear-man conflicts.

Bear-Man Relationships

We can classify grizzly bears inhabiting the Yellowstone area into four types, based on their feeding behavior as related to humans. These are: (1) bears which forage at the garbage disposal areas during summer months; (2) those that either occasionally or habitually visit campgrounds or developed areas; (3) bears man-conditioned by food handouts at lodges and construction camps; and (4) grizzlies which reside throughout most of the year in the backcountry and rarely visit a garbage dump, campground, or other developed areas. Overlapping of types occurs, yet the four categories are quite distinct. The majority of bears fall into the first category. Those in the second and third categories, though few, are the most troublesome. Practically no Yellowstone grizzlies qualify for the fourth category.

Behavior of grizzlies frequenting garbage dumps. We have obtained no evidence that the Yellowstone area has two distinct populations of grizzlies – "wild living" animals inhabiting the wilderness country and "garbage-addicted" grizzlies inhabiting the dumps and developed areas of the Park. On the contrary, thousands of man-hours spent observing grizzlies at open-pit dumps and hundreds spent observing these same color-marked animals and monitoring radio-instrumented bears in wilderness country divulged not two distinct populations but two distinct behavioral patterns. Many of the grizzlies that feed at the isolated, open-pit, garbage dumps exhibit less fear and greater tolerance of man at these areas than at other areas. The same animals that ignore human scent at the dumps are quickly alerted by it in the backcountry. From hundreds of encounters that we made with grizzlies when they were 0.8 kilometer (½ mile) or more from the dumps, we observed that, in most instances, they were alert and wary and would generally flee when they heard us or got a scent. Tolerance of man while feeding on artificial food at the dumps is definitely linked with specific sites. It is not a general toleration of humans or of human scent although in rare instances the on-site conditioning may alter behavior in other locations. Animals that feed at garbage dumps, presumably where the human scent is strong, ignore it there but not elsewhere. We have little evidence that garbage feeding changes their human avoidance behavior. Troublesome grizzlies normally develop their behavioral patterns toward humans under quite different circumstances.

The Yellowstone garbage dumps provide grizzlies with an abudance of palatable food, congregate them for an unnaturally long period of time, and alter some of their behavioral patterns. Feeding at these dumps does not normally develop grizzlies into garbage-seeking animals, make them dependent on humans (Leopold, 1970), or create incorrigible animals. This does not imply that the garbage dumps are beneficial and should be kept open: it does mean that eating "unnatural" versus "natural" food does not, in itself, significantly alter the behavior of Yellowstone's grizzlies toward human beings.

Behavior of grizzlies frequenting campgrounds. Of 36 grizzly bears captured and initially marked in campgrounds, 64% re-entered a campground or developed area following their release; 28% re-entered two or more times. Among 221 grizzlies initially captured and marked at garbage disposal sites or in the backcountry, 36 (16%) were later captured in a campground or developed area. Only 9.5% re-entered two or more times (Table 2). Thus, many grizzlies initially captured and marked in campgrounds had already developed chronic campground feeding habits and they became problem animals more often than grizzlies captured and marked elsewhere. The data in Table 2 also suggest that capturing and marking grizzlies, which was essential to document the animals' behavior and movements, did not condition them to man or convert them into troublesome bears. Had this occurred, a much higher percentage of those captured and marked outside of campgrounds would have become "campground foragers." Evidence indicates that most of the troublesome grizzlies were developing or had already developed into problem animals before they were captured and marked in campgrounds.

The large number of animals marked (over 60% of the population at one time), as well as the unmarked grizzlies, exhibited a normal range of bear behavior. However, only bear-man relationships involving marked grizzlies could be individually and quantitatively documented. Therefore, few objective or legitimate comparisons can be made between avoidance or confrontation behavior of marked versus unmarked animals. Since we have no evidence that capturing and marking grizzlies altered their behavior toward humans, information obtained from marked animals is considered representative of both marked and unmarked ones.

From observations of marked bears and from records of radio-tagged ones, we learned that grizzlies become accustomed to campground foraging during spring and fall migratory movements when their travel routes intercept campgrounds. During this same period, grizzlies extend their home ranges searching for food. This pattern has been especially evident at the Lake and Canyon Village Campgrounds. Yearlings and 2-year-olds may wander into campgrounds following weaning, a time when they normally begin to disperse and establish home ranges of their own. For this wide-ranging, inquisitive animal, chance alone, no doubt, accounts for the discovery of, and addiction to, the food available in campgrounds. Those that learn to frequent campgrounds become conditioned to the near presence of humans. Those that enter infrequently remain shy and secretive. Habitual campground foragers normally develop behavioral patterns in response to the presence of man that are markedly different from those of grizzlies that feed at the isolated, open-pit dumps.

Any grizzly which frequents a campground is a potential hazard because humans may startle it at close range and be attacked. However, it is important to discriminate between habitual offenders and those that enter campgrounds for short periods of time, then move on and do not repeat the offense except infrequently over a period of years. It is difficult to define precisely the habitual offenders or incorrigible animals on a basis of frequency of visitation or frequency of recapture in campgrounds. However, until better criteria can be formulated, we have defined habitual offenders as those recaptured four or more times. Table 3 shows that among 72 grizzlies of both sexes, 69% were either never recaptured or were recaptured only once; 87% were not recaptured or were recaptured one to three times. Only 13% were recaptured four, five, or six times. These individuals constitute the habitual offenders.

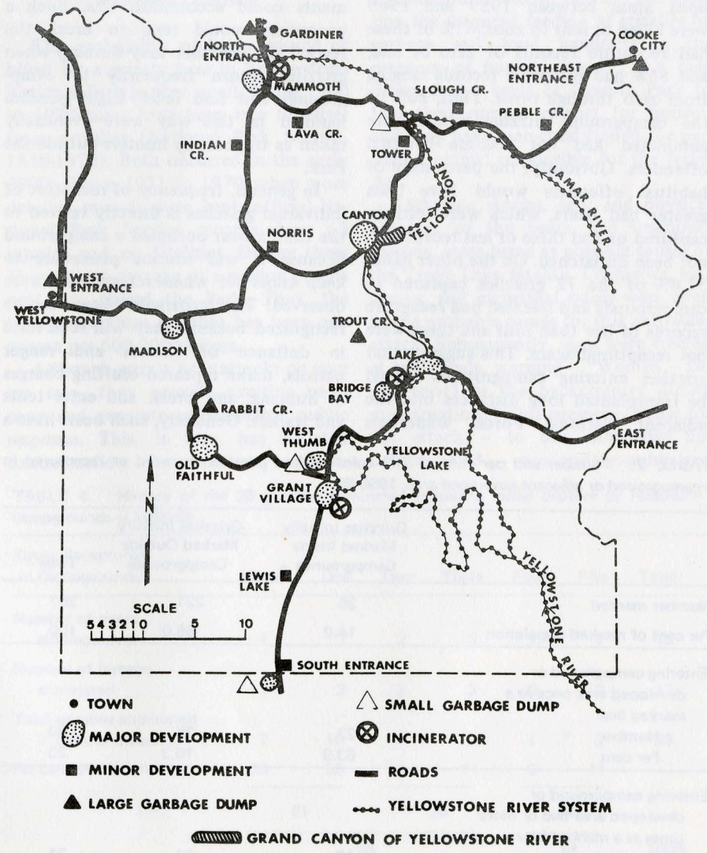


Fig. 2. Map of Yellowstone National Park showing developed areas, garbage dumps, and incinerators.

TABLE 1. Color-marked grizzlies observed at Trout Creek Dump and reobserved in wilderness areas[a] of Yellowstone National Park from 1966 to 1968

					Adults		
Cubs	1-Year Olds	2-Year Olds	3-Year Olds	4-Year Olds	Males	Females	Total
229	218	183	158	141	30	39	
230	219	202	177	144	207	40	
236	220	216	185	147	217	101	
240	221	227	211	165		112	
241	233		228	183		128	
256				188		132	
				208		141	
						163	
						172	
						173	
						187	
						228	
6	5	4	5	7	3	12	42

[a]Wilderness and backcountry are used synonymously in the text. They are undeveloped, roadless areas retaining their primeval character without permanent improvements or human habitation. In these areas, the earth and its community of life are untrammeled by man, and man himself is a visitor.

Table 4 shows that 28 of the 72 bears captured in campgrounds or developed areas between 1959 and 1969 were killed or sent to zoos; 61% of these had recapture records of zero or one, and 86% had recapture records ranging from zero through three. Thus, 86% of the campground grizzlies which were eliminated had not become habitual offenders. Obviously, the percentage of habitual offenders would have been greater had bears, which were initially captured or had three or less recaptures, not been dispatched. On the other hand, 51.4% of the 72 grizzlies captured in campgrounds and released had recapture records of less than four and these were not recaptured again. This suggests that grizzlies entering campgrounds should be transplanted long distances into the adjacent National Forest wilderness country following a first capture rather than dispatched. Cooperative agreements could accomplish this. Such a procedure would tend to break the reward pattern that may develop when grizzlies return frequently to campgrounds and find food. Eight grizzlies handled in this way were eventually taken as trophies by hunters outside the Park.

In general, frequency of recapture of individual grizzlies is directly related to the time a bear occupied a campground because it was routine procedure to keep traps set whenever grizzlies were observed. The incorrigible bears can be recognized because they will seek food in defiance of visitors and ranger patrols, make repeated bluffing charges at humans, and break and enter tents and trailers. Generally, such bears have a long history of campground tenancy. There is no question about the necessity of eliminating such animals. The problem is what to do with infrequent offenders. We believe great discrimination should be practiced in eliminating grizzlies after the first capture or with recapture records of one through three.

TABLE 2. Number and per cent of 257 color-marked grizzlies captured or recaptured in a campground or adjacent developed area, 1959-69

	Grizzlies Initially Marked Inside Campgrounds	Grizzlies Initially Marked Outside Campgrounds	Total
Number marked	36	221	257
Per cent of marked population	14.0	86.0	100
Entering campground or developed area once *as a marked bear*			
Number	23	36	59
Per cent	63.9	16.3	23
Entering campground or developed area two or more times *as a marked bear*			
Number	10	21	31
Per cent	28.0	9.5	12

Behavior of grizzlies conditioned by food handouts. By radio-tracking grizzlies that had been regularly fed in the presence of humans or that had developed foraging habits bringing them into frequent and close association with man, we learned that such animals developed behavioral patterns that made them extremely dangerous. They learn to associate food-getting with humans and soon lose their fear of man and human scent. They become thoroughly conditioned to man. This conditioning is not associated with a particular feeding area, as is the case with grizzlies that feed at remote garbage dumps, but is a general conditioning to man wherever he is encountered. Such animals may co-exist with people for extended periods of time but, sooner or later, these man-conditioned animals are startled by humans at close range, defy interference at a food source, or completely disregard humans in their attempts to get food. This may occur in a campground, on a trail, or in the backcountry. The result may be a bear-man encounter ending in human injury or death.

For a grizzly to lose its shyness or fear of man requires cooperation and encouragement, and the initiative is usually with man. One male grizzly, No. 202, was radio-tracked for 2 consecutive years during the summer and autumn. Yearling No. 202 was instrumented and radio-monitored for 56 days in 1965. During that time, he established a 69.9 km^2 (97 $miles^2$) home range that encompassed Canyon Village, but he did not visit the campgrounds and caused no trouble. However, the following spring when he emerged from winter sleep, he swam the river and traveled the north rim of the canyon which led him directly into the Canyon Village Campground with its food supply.

As a 2-year-old, he was radio-monitored for 118 days of 1966. Though frequenting the campground, he gave no serious trouble until fall when he began visiting two construction camps in the area. He received food handouts and soon became bold enough to attempt to enter trailers and to feed fearlessly in the presence of humans. During 1966, this animal established a home range 323.7 km^2 (125 $miles^2$), with Canyon Village Campground as his center of activity.

Emerging from winter sleep as a 3 ½-year-old animal, he returned to his old haunts in the campground. No. 202 was not an aggressive bear, had inflicted no injury, and had caused little or no property damage, but he had been conditioned by food handouts, had lost his normal respect for man, and, thus, became a potential menace to the safety of visitors. He was shot as a precautionary measure at the age of 3 ½.

Fortunately, grizzlies conditioned by food handouts at concessionaires or work camps have been rare in Yellowstone National Park. They have been more numerous in Glacier National Park. On the evening of 13 August 1967, at two widely separated locations in Glacier, grizzly attacks resulted in the deaths of two 19-year-old concessionaire employees and serious injury to an 18-year-old boy. Both attacks can be linked to food handouts and man-conditioned bears (Olsen, 1969; National Park Service, 1979; Leopold, 1970; and personal communications, Gerry Atwell, 1967; Frank Evans, 1967). Once man-conditioned by food handouts, the grizzly must be destroyed. The solution to such conditions is campground sanitation, frequent ranger patrols, and thorough enforcement of the National Park Service regulations pertaining to the feeding of bears.

Behavior of grizzlies in the backcountry. Grizzlies, living under wilderness conditions, utilize natural food but may be attracted to food made available by humans, and may become man-conditioned. For example, in 1961, a crew working on the control of blister rust experienced frequent confrontations and attacks from a 3-year-old, male grizzly in the Washburn Range, far from a developed area. At first the bear was shy and avoided the men. Over a period of several weeks, he gradually lost his shyness. He excavated buried lunch trash and then accepted lunch scraps thrown to him. Eventually, he approached boldly for food and made bluffing charges. On five occasions, he treed members of the crew and then rifled their packs and lunch pails. We later captured, color-marked, and numbered this animal. He became No. 80; his movements to and from campgrounds are shown in Figure 3. This thoroughly man-conditioned grizzly was shot in June 1963 by Park rangers after molesting visitors camped in wilderness country near Lewis Lake. This documented account illustrates the role of food handouts in developing incorrigible bears. Generally, conditioning to man evolves in developed areas, but it is not necessarily limited to them.

TABLE 3. Recapture record of grizzlies captured in campgrounds — 1959-69

	Number of Times Recaptured in a Campground							
	None[a]	One	Two	Three	Four	Five	Six	Total
Males	13	16	4	4	2	1	1	41 (57%)
Females	13	8	2	3	1	3	1	31 (43%)
Total	26	24	6	7	3	4	2	72 (100%)
Per Cent	36	33	8	10	4	6	3	
	69		18		13			
	87				13			(100%)

[a]None = captured in a campground and never recaptured.

Bear-Man Conflicts

The probability of being injured or killed by a grizzly bear in Yellowstone National Park is very small. From 1900 to 1970 there have been two fatalities from grizzlies (National Park Service, 1880-1970). Both occurred in the early 1900s. From 1931 to 1970, when more detailed records were kept, official National Park Service records show 63 injuries and no fatalities. During these 39 years, an average of a million people per year visited the Park. Thus, the injury rate from grizzlies has been one person per 600,000 visitors.

Although grizzly bear attacks on man are rare, they provide exciting news copy and generate apprehensive, public response. This, in turn, has initiated control action often with over-reactionary measures that have been harmful to the co-existence of the grizzly and man. Following the 1967 fatal incidents in Glacier National Park, four female grizzlies were shot and a cub was wounded. Only one of these animals was conclusively linked with the attacks. The National Park Service Report, "Grizzly Bear Attacks at Granite Park and Trout Lake in Glacier National Park, August 13, 1967," suggested garbage-feeding as a conditioning factor, but did not mention the frequent feeding of grizzlies on garbage and food handouts in the presence of human viewers. This conditioned the bears at Granite Park to lose their normal respect for humans and may have man-conditioned the particular animal responsible for the tragedy.

Lightning storms, age, and physical ailments of the bears, and unknown reasons, were listed as possible causes of the Trout Lake fatality. Cosmetics, hair sprays, and menstrual odors were cited as the probable causes for this particular attack. Subsequently, signs were erected at trail heads, warning – "Women – Do not travel in the backcountry during menstruation." This presumed cause for the attack – to our knowledge unsubstantiated – was widely publicized

TABLE 4. History of the 28 grizzlies eliminated following initial capture or recapture in campgrounds – 1959-69

Times Recaptured in Campgrounds	None[a]	One	Two	Three	Four	Five	Total
Number of males eliminated	4	7	2	0	1	1	15
Number of females eliminated	3	3	2	3	0	2	13
Total grizzlies eliminated in control measures	7	10	4	3	1	3	28
Per cent eliminated	25	36	14	11	3	11	
	61		25		14		
	86				14		100%

[a]None = captured once in a campground and eliminated.

and probably deterred many women from making wilderness hikes.

Personal injury records. Personal injuries caused by grizzly bears have been recorded in Yellowstone National Park for the past 40 years (1931-70). We have found it difficult to evaluate these records because the injuries have varied in severity from bruises and minor wounds, requiring no professional medical attention, to those that required hospitalization. Also, there has been doubt whether some injuries were inflicted by grizzlies or by black bears. We have accepted with reservations the data which show 62 known and probable injuries from grizzlies, or 1.55 per year.

From 1959 through September 1970, we worked closely with Park rangers to keep more accurate records of personal injuries inflicted by grizzlies (Table 5). Injuries during this period averaged two per year or approximately one injury for every 900,000 visitors. This is hardly a record that would support the removal of all grizzlies from Yellowstone (Moment, 1968) or a drastic control program within the Park. However, during 3 years of the Park Service's present program of bear management (1968-70), injuries averaged 3.33 per year. In comparison, injuries were only half as numerous from 1959 to 1967 – averaging 1.67 per year. We believe that the increase is due largely to the present management practices that have forced grizzly bears into campgrounds and developed areas of the Park (Fig. 5).

Control measures. Control of grizzlies within the Park is performed by the ranger staff. Troublesome animals are either killed or shipped to zoos. The term "dispatch" includes both of these control measures. From 1931 to 1970, 140 grizzlies have been killed; this is a 40-year average of 3.50. The exact number shipped to zoos during this period is unknown.

Seventy-four grizzlies have been dispatched by the Yellowstone administration during our 12-year period of research. This averages 6.17 grizzlies per year (Table 5). During 9 years of this period (1959-67), prior to the enactment of the Park Service's present program of bear management, control averaged 4.1 per year. During 3 years of revised management (1968-70), control averaged 12.3 grizzlies per year. Twenty-two grizzlies were eliminated from the Yellowstone population in control measures in 1970. Information on the number of deaths occurring from other causes during 1970 is not yet available. However, there was an average of 11 such deaths per year from 1959 through 1966. These represent only those deaths where the causes of death were known. If we assume that 11 grizzly bears will die in addition to those eliminated by control, then the expected loss from the population during 1970 will total 33. This just equals the average annual increment (Craighead and Craighead, 1967), but statistics compiled during our study indicate that as many grizzlies die each year from unknown as from known causes. Consequently, the population loss for 1970 will greatly exceed the average annual increment. It is obvious that the Yellowstone grizzly population cannot long sustain such losses.

A comparison of the annual control figures and personal injuries with Park visitation from 1959 through 1970 (Table 5, Fig. 4) shows no correlation with the increase in visitor numbers. A correlation should be expected. We attribute the lack of one to the fact that the open-pit dumps served to concentrate and isolate the grizzly bear population during the tourist season. Also public use of these areas has been restricted, thereby reducing the probability of grizzly-visitor interactions. We believe that the increased number of bears killed or sent to zoos (Table 5) during 1968-70 was directly related to the abrupt phasing out of the Trout Creek Dump and the closure of the Rabbit Creek Dump, which forced grizzly bears into campgrounds. This destroyed the effective zoning of grizzly and man that prevailed from 1959

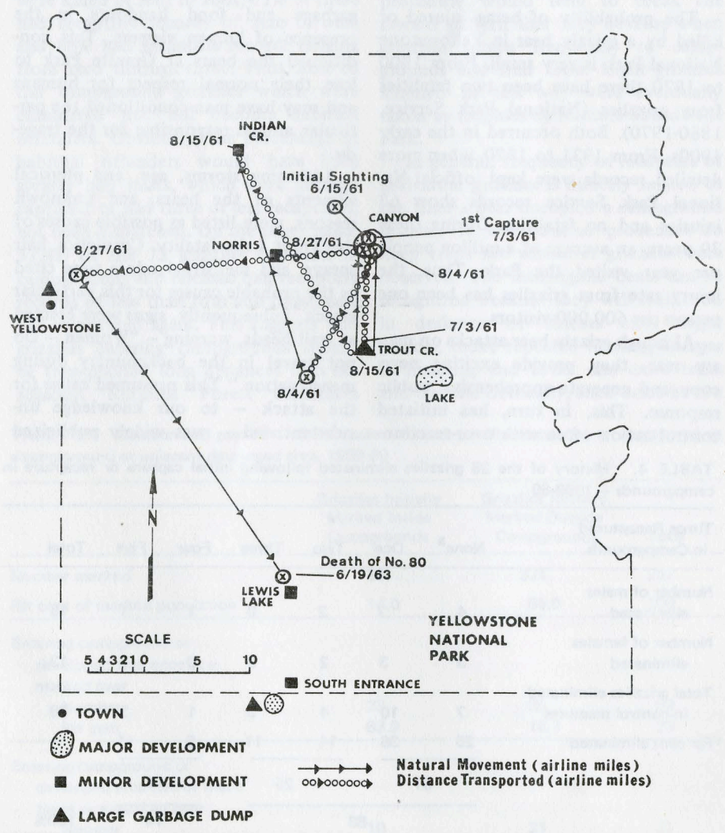


Fig. 3. Movements of Grizzly No. 80.

TABLE 5. Injuries from grizzly bears, and control measures in Yellowstone National Park, 1959-70

Year	Park Visitors[a]	Personal Injuries	Control Measures: Grizzlies Killed	Control Measures: Grizzlies Sent to Zoos	Control Measures: Total
1959	1,408,667	0	6	1	7
1960	1,443,288	0	4	0	4
1961	1,528,088	1	1	2	3
1962	1,925,227	2	4	0	4
1963	1,872,417	6	2	4	6
1964	1,929,316	1	2	1	3
1965	2,062,476	4	2	0	2
1966	1,130,313	1	3	0	3
1967	2,210,023	0	3	2	5
1968	2,229,657	1	5	0	5
1969	2,193,814	6	10	0	10
1970[b]	2,200,000	3	14	8	22
Total	22,133,286	25	56	18	74

[a] Data obtained from Yellowstone Park records, 1959-69.

[b] We estimated visitor numbers for 1970.

through 1967. As we have shown, the average number of grizzlies dispatched during the last 3 years is three times the average for the preceding 9 years. Using 200 grizzlies as a maximum population estimate (based on 324 census of 3 ½ hours each totaling 11,340 hours, Craighead and Craighead, 1967), we can calculate that the population reduction effected by control measures for 1970 alone (22 grizzlies through 15 September) will exceed 10% of the Yellowstone population.

Control methods must differentiate between the dangerous, but relatively few, man-conditioned animals in the population and those essentially wild animals that for generations have fed at the remote garbage dumps and, in the course of seasonal movements or rare periods of natural food scarcity, have entered developed areas. Grizzlies become man-conditioned by eating in the presence of humans.

Transplants. For many years, troublesome campground grizzlies in Yellowstone National Park have been transplanted to remote areas within the Park. To evaluate the effectiveness of transplant and release as a technique for disrupting the campground foraging habits of grizzlies, we marked captured animals and released them at suitable sites from 1959 through 1967. We then recorded their movements by recapturing them. Starting in 1968, this task has been performed by Park rangers. Table 6 shows that over an 11-year period, there were 145 releases of grizzlies within Yellowstone National Park at varying distances from the campgrounds or developed areas where they were captured. Our data show that 68% of these animals returned to the same or another campground following release. Although the percentage returning decreased with the distance transported, the capture-transport-release technique within the Park is clearly only a partial solution for dealing with troublesome grizzlies. Information from campground bears radio-tracked for extended periods of time further supported this conclusion. We believe more distant releases on federal lands adjacent to the Park would prove more successful.

Campground management. A concerted effort has been made to remove food from campgrounds or make it unavailable to bears. The installation of numerous, bear-proof garbage cans has helped the sanitation problem. However, campgrounds are still attractive to bears and will probably remain so as long as visitors are careless with their food or deliberately distribute table scraps to entice birds, bears, and other animals.

Behavior of Grizzlies in Response to Revised Management Practices

In 1941, officials of Yellowstone National Park abruptly closed the Canyon Village and Old Faithful feeding stations where large numbers of grizzlies and black bears were viewed by the public. The following year, rangers found it necessary to kill 28 grizzlies and 54 black bears when these animals dispersed to campgrounds and the hotels at Canyon Village, Lake, and Old Faithful in search of food. An emergency situation existed that year, even though only 191,830 visitors were recorded in the Park.

From 1968 through 1970, with visitor numbers exceeding 2 million per year, the Yellowstone administration proceeded to repeat this type of management by abruptly phasing out the Tower, West Thumb, Trout Creek, and Rabbit Creek open-pit garbage dumps.

In 1967, prior to this decision, we had made a report to the National Park Service, *Management of Bears in Yellowstone National Park,* (Craighead and Craighead, 1967). In that report, we recommended slow phasing out of the open-pit garbage dumps, cautioning that:

> Because phasing out of refuse dumps will disperse the grizzlies by destroying an attractive, if not essential, food source, the transition from pits to incinerators must proceed gradually, enabling the grizzlies to develop new feeding habits as well as altered social behavior and movement patterns. If the transition is slow and follows a recommended procedure, it is possible that no severe changes in population level, distribution, or behavior will result. If, on the contrary, the phasing out operation is abrupt, and a carefully planned procedure is not followed, the result most certainly will be increased grizzly incidents in campgrounds, accelerated dispersal of bears to areas outside the Park, and greater concentrations of grizzlies at

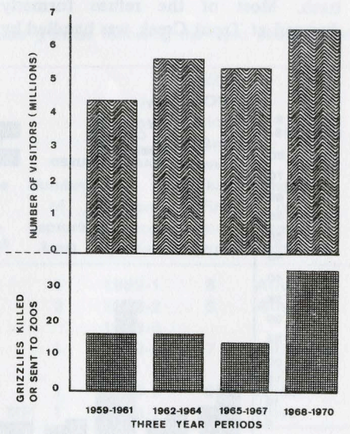


Fig. 4. Comparison of number of visitors and number of bears dispatched at Yellowstone National Park during 3-year periods, 1959-70.

TABLE 6. Record of the release of grizzlies after initial capture in a campground or developed area and subsequent recapture, 1959-69

	Distance Grizzlies Transported (airline km)				
	0 - 10	11 - 20	21 - 30	31 - 40	Totals
Number of releases after initial capture	75	46	20	4	145
Number of recaptures in any campground or developed area after release	53	32	12	1	98
Per cent of recaptures in any campground or developed area after release	70.7	69.6	60.0	25.0	67.6

the public dumps in Gardiner and West Yellowstone, where food will be available but where adequate protection will not. The net result could be tragic personal injury, costly damages and a drastic reduction in the number of grizzlies.

Phase-out of open-pit dumps. During the summers of 1959 through 1967, approximately 1000 cans of unsorted edibles and trash had been deposited daily at Trout Creek. The refuse was lightly covered with soil, usually on the day of deposit. The volume of food attracted and held grizzlies in the area during the summer months. During 1959-67, we documented the effect of this artificial feeding situation on the habits and behavior of grizzlies.

In 1968, the volume of garbage taken to Trout Creek was drastically reduced and we documented the effect of this on grizzly behavior. Edibles were partially separated from trash and dumped, but not buried. The sorted food consisted of approximately 50% nonedible trash. Most of the refuse formerly dumped at Trout Creek was handled by the newly installed incinerator at Bridge Bay which had an operating capacity of 272.7 kg (6000 lb.) per hour. Our records, made when the refuse was dumped, showed that a maximum of eight cans per day were deposited from 3 June through 14 June; between 15 June and 15 July, the number gradually increased to 40 per day. During the remainder of the summer, the number was not increased significantly except when the Bridge Bay incinerator broke down.

The early summer cut-off of food, followed by a drastic reduction in edibles during the summer of 1968, dispersed the grizzlies throughout the Park. Our documentation of marked animals showed that many found their way into campgrounds, traveling between Trout Creek and the Canyon Village and Lake Campgrounds. Others moved back and forth between Trout Creek and the dumps at Rabbit Creek and West Yellowstone. This type of movement did not occur from 1959 through 1967 prior to the phase-out. Our censuses of population units in the vicinity of each major dump showed that these units tended to be self-contained with very little exchange of animals (Craighead and Craighead, 1967).

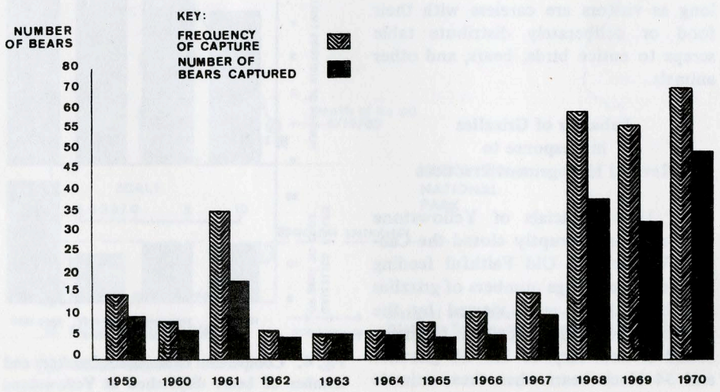


Fig. 5. Frequency of capture and number of grizzly bears captured in campgrounds.

Many unmarked grizzlies also entered campgrounds. Fifty-four per cent of the 37 grizzlies captured in campgrounds in 1968, 48% of 33 captured in 1969, and 41% of 49 captured in 1970 were unmarked. The movement of practically all the Trout Creek grizzlies, marked and unmarked, was greatly accelerated. A measure of this movement and disruption of long-established habits is reflected in the frequency of capture and the numbers of grizzlies captured in campgrounds each year during the period 1959-67 as compared to similar data for 1968 to 1970. The number of individual grizzlies captured in 1968 is approximately four times the average for the previous 9 years and double the previous high of 1961. Frequency of capture was the highest recorded in 10 years (Fig. 5).

In 1969 we continued on-site measurements of the volume of garbage dumped at Trout Creek. Between 130 and 170 cans were deposited daily from 15 June through August. Most of this was in plastic bags. Only about half the contents were edible. As in 1968, the garbage and trash were not buried, so the grizzlies that arrived at the dumps first were able to consume most of the food by evening; this left little to hold animals which arrived later. From 1959 through 1967, the general procedure was to dump trash with garbage and partially cover it with soil each day. This provided a long feeding period and allowed numerous animals to share the food. This procedure had, in the past, kept the grizzlies concentrated.

The dispersal of grizzlies that began in 1968 continued in 1969. The slight increase in the amount of garbage, designed to rectify the situation, was ineffective. The frequency of capture as well as the number of grizzlies captured in campgrounds and developed areas remained high (Fig. 5). In 1970, following the closure of the Rabbit Creek Dump, frequency of capture of grizzlies in campgrounds climbed still higher to a peak of 72; just twice the value of the 1961 peak. The number of individual grizzlies captured was 49, the greatest number ever recorded (Fig. 5). Thus, data on the number of individual grizzlies captured in campgrounds during the 3 years of revised management clearly show that the new management

practices have been creating problem bears that then must be dealt with by the Park administration. In Table 7, the frequency of capture and the number of individuals captured in campgrounds and developed areas during 1959 through 1967 was totaled and compared with similar data for 1968 through 1970. The rate of capture for 9 years (1959-67) was 117; for the past 3 years it was 190. The number of individual grizzlies captured for the same periods also increased.

Of the total number of grizzlies involved in campground foraging it is particularly revealing that 57 were captured during the 9 years prior to the rapid phase-out of the open-pit dumps, whereas 70 were captured during the first 3 years of phase-out (Table 7). Thus, from 1959 through 1967 an average of six grizzlies became campground foraging bears each year, but during the rapid cut-back in garbage (1968 through 1970), an average of 23 grizzlies became campground-oriented each year. Data in Table 7 also show that Grant Village, which was first opened to the public in 1967, presumably had no problem bears that year, as none were captured. The following years it was visited by grizzlies. Twenty-five were captured during the 3-year period of revised management. Similarly, no grizzlies were captured at Slough Creek, Tower Fall, Madison Junction, and Mammoth from 1959 to 1967, but grizzlies were captured at these campgrounds from 1968 to 1970.

We must conclude that the new bear management practices, programmed to quickly phase-out the open-pit dumps in Yellowstone without first adequately sanitizing the campgrounds, greatly increased the probability of bear-man conflicts as more grizzlies entered congested visitor areas. This program has rapidly "created" troublesome campground grizzlies. The administration's policy formulated to deal with this situation has been to kill or ship to zoos all two-time offenders entering campgrounds or developed areas within a successive 2-year period.

In 1969, the Natural Sciences Advisory Committee of the National Park Service met with Park administrators, biologists, and consultants to review grizzly bear management in Yellowstone National Park and to formulate a bear management policy and program (Natural Sciences Advisory Committee Report, 1969). The Committee summarized the management goals as follows:

1) To maintain populations of grizzly and black bears at levels that are sustainable under natural conditions as part of the native fauna of the Park.
2) To plan the development and use of the Park so as to minimize conflicts and unpleasant or dangerous incidents with bears.
3) To encourage bears to lead their natural lives with minimum interference by humans.

TABLE 7. Frequency of capture and the number of grizzly bears captured in campgrounds

	1959-67		1968-70[b]	
Campgrounds and Developed Areas[a]	Frequency of Capture	Individual Bears Captured	Frequency of Capture	Individual Bears Captured
Canyon Village	48	33	42	24
Lake	40	26	73	48
Old Faithful	9	9	23	17
West Thumb	17	11	7	6
Grant Village	-	-	30	25
Norris	1	1	2	2
Lewis Lake	0	0	1	1
Indian Creek	2	2	0	0
Slough Creek	0	0	3	3
Tower Fall	0	0	3	3
Mammoth	0	0	1	1
Madison Junction	0	0	5	3
Totals	117	82	190	133
Corrected totals[c]		75		124
Total individuals involved		57		70

[a]Canyon Village includes Canyon Village and Otter Creek Campgrounds. Lake includes Lake, Fishing Bridge, Bridge Bay, and Pelican Creek Campgrounds. Grant Village opened in 1967 when the National Park Service began phasing out open-pit dumps.

[b]Unmarked grizzly bears entering campgrounds during 1968 and 1969 could not be individually marked because of Park Service policy prohibiting marking of any animals in Yellowstone. Thus, in addition to marked animals, a minimum number of unmarked individuals, determined by criteria of sex, age, and time of capture, were recorded for the period.

[c]In 16 instances, bears were captured in two areas during a year. The corrected total of individual grizzlies captured per year corrects for this bias.

TABLE 8. Campground captures of five female grizzlies following the rapid phase-out of Trout Creek Dump, 1968-69

Bear No.	Year Marked	Date of First Capture in Campground	Interval in Years Between Marking & First Capture in Campground	Age at First Capture in Campground[a]	Number of Capture Areas	Frequency of Capture by Years	Number of Offspring Produced Between Marking & First Recapture	Status of Female 1969
34	1960	1969	9	19 ½	1	1969-1	6	Alive
39	1960	1968	8	13 ½	2	1968-2 1969-5	5	Alive
40	1960	1969	9	11 ½	1	1969-1	7	Killed for control
109	1961	1969	8	8 ½	1	1969-2	0	Alive
128	1962	1969	7	18 ½ Min	1	1969-1	10[b]	Alive

[a]Age in years — all bears were aged by cementum layer technique. Ages designated minimum (Min) represent minimum cementum layer age. (Craighead et al., 1970.)

[b]No. 128 produced three more cubs in 1970.

The ultimate objective agreed upon by all participants was the sanitary disposal of trash and garbage in a manner that would deny this food source to bears.

The report continued:

> But, in the meantime, there is a disagreement as to the sequence of steps leading to the elimination of garbage from availability to grizzlies. One view is to cut off all garbage quickly, forcing the bears to turn immediately to natural foods. The opposite contention is to phase out garbage feeding over a period of time, "weaning" the bears gradually. The issue hinges on which of these procedures will result in the least number of bears going into campgrounds.

In 1970, following the distribution of the Advisory Committee report, the Park continued its phase-out policy for garbage dumps by completely closing the pit at Rabbit Creek, which prior to this time attracted and held a population that fluctuated between 22 and 48 grizzlies. Our censuses showed an 8-year average of 32 grizzlies in the area during the summer months (Craighead and Craighead, 1967). Eight airline kilometers (5 miles) away a fenced sanitary land-fill dump was installed at Nez Perce Creek as a replacement for Rabbit Creek. With this accomplished, grizzlies with traditions of feeding at Rabbit Creek were completely and abruptly denied a long-established food source.

Movements of individual grizzlies in response to reduced food at the Trout Creek Dump during 1968-69. Five female grizzlies which frequented the Trout Creek Dump were color-marked between 1960 and 1962 (Table 8). They were captured in campgrounds or developed areas for the first time following the reduction of food at Trout Creek in 1968. The long interval between marking and first capture in a campground can be explained if these bears increased their daily movements and extended their home ranges in search of food. The home ranges of No. 39 and No. 40 had been established earlier by radiotracking (Craighead and Craighead, in Prep. a.).

No. 39 extended her home range in 1968 to include Lake Campground and the Bridge Bay-developed area. During 1968-69, she was captured five times at the Bridge Bay incinerator and twice in adjacent developed areas. In both years she was probably attracted there by odors from the incinerator.

We radiotracked No. 40 for 8 consecutive years (Craighead and Craighead, in Prep. b). While this female was radiomonitored, she was never tracked into a campground or developed area. However, she entered the Lake-developed area in 1969 and was shot.

Since grizzlies of all ages made initial campground entries in 1968 and 1969, we do not think that the advanced age of three of the five grizzlies listed in Table 8 was a factor altering their behavior and movements. They were in excellent condition when last captured; all had reproductive records. No. 128 had produced ten cubs prior to her capture in 1969. She bore three more in 1970 at a minimum age of 19 ½ – a total of 13 cubs during the 9 years she was marked. From 1960 to 1970, the five females bore a total of 28 offspring (Table 8). It is evident that management practices which "force" productive females into developed areas where they are subject to control could rapidly alter the population level.

Scarcity of the staple natural foods during 1968 and 1969 did not cause the movement, since the availability of these during the period was not importantly different from other years. Our data on the utilization of natural foods by grizzlies and on the relative abundance of these foods throughout a 12-year period cannot be presented here, but these fully support this conclusion. We, therefore, conclude that the five females recorded in Table 8, as well as 11 other marked grizzlies of both sexes, were captured for the first time in campgrounds in 1968 and 1969 primarily because of the acute food shortage at Trout Creek. Thirty-five unmarked individuals were also captured in campgrounds or developed areas for the first time.

TABLE 9. Dispersal of 34 color-marked grizzlies and two recognizable cubs from Trout Creek following management changes at Trout Creek Dump during 1968 and 1969

	Campgrounds and Developed Areas Visited by Marked Grizzlies							
Marked Bear No.	Lake	Canyon Village	Grant Village	Norris	Cooke City Dump	Tower Dump	West Yellowstone Dump	Rabbit Creek Dump
7								X
10+(2)[a]						XXX		
30	X							
34					X			
39	X							
40	X							
88								X
109	X							
112		X						
128	X							
130			X					X
141	X	X						
144		X						
147								X
166							X	X
183	X							
188		X						
189								X
190							X	
194								X
201								X
207	X	X						
208	X	X						
210	X							
211	X			X				
213							X	X
217	X							
218								X
228		X						
236	X	X						
240	X							
241	X							
242					X			
256	X							
Totals	16	8	1	1	2	3	3	10

[a]The cubs of bear No. 10 dispersed with their mother and could be recognized.

Figure 6 and Table 9 show the movements from Trout Creek of 34 marked grizzlies and two recognizable cubs. Records of these movements were obtained by capturing the animals or by observing their individualized color markings. Sixteen individuals visited the Lake-developed area, eight entered Canyon Village, and ten moved to the Rabbit Creek Dump. Two moved to Cooke City; three, to Tower; three, to West Yellowstone; one, to Norris; and one, to Grant Village. Eight of the marked bears visited two campgrounds or developed areas (Table 9), thus accounting for the total of 44 bears shown in Figure 6.

Dispersal of individual grizzlies following the closure of Rabbit Creek Dump in 1970. Grizzlies inhabiting Rabbit Creek dispersed widely following the closure of that open-pit dump in 1970. Figure 7 shows the movements of 12 color-marked and two recognizable grizzlies to new feeding areas. All of these grizzlies were observed and recorded at Rabbit Creek for between 3 and 11 years prior to the closure (Table 10). Therefore, all could be considered resident members of this population unit.

Seven grizzlies moved 29 airline kilometers (18 miles) to the West Yellowstone Dump, which lies outside of the Park. Two joined the grizzlies at Trout Creek, 30.6 airline kilometers (19 miles) away; these also visited the West Yellowstone Dump. Grizzlies No. 2 and No. 8 moved 22.5 airline kilometers (14 miles) to the Grant Village Campground and developed area. Three grizzlies, including No. 2, moved to the Old Faithful area only 8 airline kilometers (5 miles) distant. Comparison of the 1970 census data taken at Trout Creek and West Yellowstone with other years suggests that many of the unmarked grizzlies from Rabbit Creek also moved to these other open-pit dumps.

In 1970 five grizzlies from Rabbit Creek were captured in campgrounds or developed areas and four were dispatched. None of these had previous campground records. The long intervals between marking and first capture in a campground or developed area (Table 11) show that the policy of rapidly closing the long-established open-pit dumps was still creating problem bears in Yellowstone. The official solution was still to dispatch the animal. There is

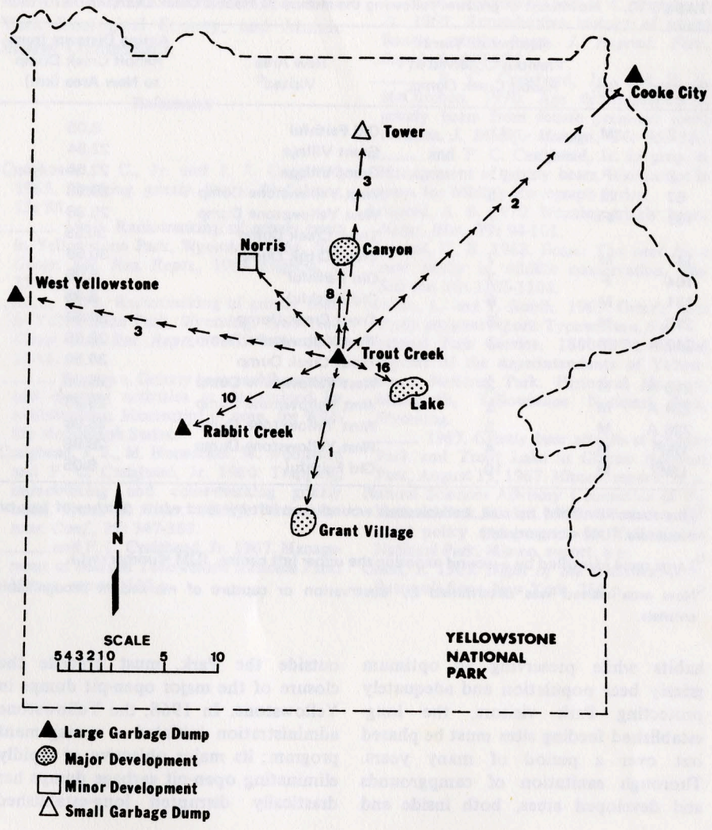


Fig. 6. Dispersal of 34 marked and two recognizable girzzlies following management changes at Trout Creek Dump during 1968 and 1969.

circumstantial evidence that No. 8 severely mauled a Park visitor in Grant Village on 3 September 1970. This color-marked animal had not been captured or observed in a campground during an 11-year period prior to this time.

The Park Service plans to completely close the Trout Creek Dump during the spring and summer of 1971. At the same time, the West Yellowstone Dump will be moved and fenced. This will disperse approximately 180 grizzlies in one season. This action, in all probability, will create more acute bear problems in campgrounds and developed areas in and near the Park than have existed in 100 years of Park history.

Discussion

Grizzly bears and man have coexisted in Yellowstone since the establishment of the Park in 1872. They have shared this environment during the past decade with about a 900,000-to-1 chance of confrontations leading to personal injury. The open-pit garbage dumps that came into existence with the establishment of Yellowstone Park have become traditional feeding areas for grizzlies. A long-term study showed that these dumps have altered the bear's behavior patterns at these sites, but they have not made grizzlies dependent on man or created the incorrigible animals that are a threat to the visiting public. On the contrary, the isolated dumps, with restricted public access, have effectively concentrated grizzly bears during the height of the visitor season. They have been extremely effective in reducing the probability of grizzly-man encounters and injury.

In order to induce the Yellowstone grizzlies to adopt more natural feeding

TABLE 10. Movement of grizzlies following the closure of Rabbit Creek Dump in 1970

Bear No.	Sex	Number of Years Previous Observed at Rabbit Creek Dump	New Area Visited[c]	Airline Distance from Rabbit Creek Dump to New Area (km)
2	M	11	Old Faithful	8.05
			Grant Village	22.54
8	F	11	Grant Village	22.54
57	M	10	West Yellowstone Dump	28.98
139	F	7	West Yellowstone Dump	28.98
			Trout Creek Dump	30.59
147	M	7	Trout Creek Dump	30.59
164	F	7	Old Faithful	8.05
171	M	6	Old Faithful	8.05
213	M	5	Trout Creek Dump	30.59
217 A	M	3	West Yellowstone Dump	28.98
			Trout Creek Dump	30.59
219 A	M	3	West Yellowstone Dump	28.98
224 A	M	3	West Yellowstone Dump	28.98
226 A	M	3	West Yellowstone Dump	28.98
UM[a]	M	4	West Yellowstone Dump	28.98
UM[b]	M	10	Old Faithful	8.05

[a]This male identified by size, conspicuous wound over left eye and white patches of hair on shoulders. (UM = unmarked.)

[b]Large male identified by a wound exposing the upper left canine. (UM = unmarked.)

[c]New area visited was determined by observation or capture of marked or recognizable animals.

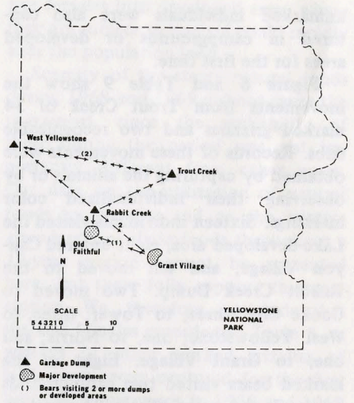


Fig. 7. Movement of 14 marked or recognizable grizzlies following closure of Rabbit Creek Dump, 1970.

habits while preserving an optimum grizzly bear population and adequately protecting Park visitors, the long-established feeding sites must be phased out over a period of many years. Thorough sanitation of campgrounds and developed areas, both inside and outside the Park, must precede the closure of the major open-pit dumps in Yellowstone. In 1968, the Yellowstone administration initiated a management program; its major objective of rapidly eliminating open-pit garbage dumps has drastically disrupted long-established grizzly bear patterns of feeding and movement. This has forced grizzlies into areas of high visitor use and vastly increased the probability of bear-man conflicts. Rapid elimination of "artificial" food at the dumps is not forcing the Yellowstone grizzlies to quickly adjust to an all-natural food diet, but is instead moving them into unsanitized areas inside and outside of the Park.

Since practically all of the grizzlies in the Yellowstone area have fed at open-pit garbage dumps during some time in their lives, a "wild population" cannot be made by denying this food and then dispatching all grizzlies that find it elsewhere in campgrounds and developed areas of the Park. The present rapid phase-out policy, combined with the elimination of two-time offenders, could reduce the grizzly bear population of the Yellowstone Park-National Forest Ecosystem to a dangerously low level in a relatively short period of time. We believe that grizzly bears and man can co-exist in this vast ecosystem if management is tailored to the facts of bear behavior, if all campgrounds and developed areas are sanitized, if open-pit dumps are slowly phased out, if the visiting public is willing to accept a small risk, and if all agencies having a vested responsibility in solving the problem work cooperatively toward common objectives.

TABLE 11. Campground captures of five grizzlies following the closure of Rabbit Creek Dump, 1970

Bear No.	Sex	Year Marked	Interval in Years Between Marking and First Capture in Campground	Age at first Capture in Campground	Capture Areas	Frequency of Capture	Status in 1970
2	M	1959	11	15 ½ - 16½	Old Faithful Grant Village	2	Killed for control
8	F	1959	11	19 ½ ± 2	West Thumb Grant Village	2	Killed for control
164	F	1963	7	12 ½	Old Faithful	1	Alive - Yellowstone
171	F	1964	6	9 ½	Old Faithful	3	Zoo for control
UM[a]	M	1960	10	22 ½- 25 ½	Old Faithful	1	Killed for control

[a]Large male unmarked but identifiable during a 10-year period by a wound exposing the upper left canine.

[b]Exact age unknown.

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