MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

February 26, 1974

Dr. Harvey E. Sheppard, Staff Officer
Division of Biological Sciences
National Research Council
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Sheppard:

In response to your request of February 8 and an earlier one from Dr. Cowan, I have attempted to explain the variations in mortality that appear in the Craighead, Greer, Cole reports. Larry Roop has been helping me to double check the 1971 Wyoming mortalities; and if there should be any change in these, I will report them to Dr. Cowan. I regret the delay in getting information to the committee; but I have been unusually busy, and I wanted to receive confirmation on some of the Wyoming mortalities for 1971 that we had not checked out with a personal interview.

Review of Mortality Data

1968

In 1968, Cole recorded a total of 5 deaths; we recorded 19. Cole's data do not include:

1. Five grizzlies that met death in Yellowstone Park other than by control measures. These were:

   One cub at Bridge Bay incinerator. Cause of death undetermined.

   Three cubs possibly killed by an adult grizzly near Rabbit Creek.

   One adult male shot by tourist at Pelican Creek.

2. One control and 3 hunter kills in Montana adjoining the Park. (checks with Greer)

3. Three illegal kills or kills by ranchers in Wyoming, adjacent to Yellowstone National Park.

4. Two confirmed deaths, but causes of death unknown in Idaho adjacent to Yellowstone National Park.

We do not know how Greer accounts for two more deaths in Yellowstone Park than we have recorded. We have ten; Greer has 12, Cole has five.

1969

In 1969, we recorded a total of 23 deaths; Cole recorded ten. Cole's data do not include:

1. One control death in Park. We cannot determine which bear mortality he failed to list without having access to his mortality records listed by date and location of death.

2. One grizzly hit by a car and killed on 6/17 at Biscuit Basin near Old Faithful.

This accounts for the difference between Cole's record of ten and our record of 12 deaths in the Park.

Greer lists 11 deaths in Park for 1969. We suspect he did not record a death at Grant Village that occurred on September 14.

We recorded 11 deaths outside the Park which accounts for our total mortality of 23 animals. Nine of these were in Montana (7 hunter kills and 2 illegal kills) and two were in Idaho. Greer lists only five hunter kills and one illegal kill. We suspect Greer did not receive a mortality record on an illegal kill at Cooke City dump on 7/12 and that he did not record two hunter kills - one in hunting area 314 and one in hunting area 310. He may have considered these to be outside the Yellowstone Ecosystem but they are not.

There were two authenticated kills in Idaho; one by a rancher at Reas Pass on 9/28 and another at Tygee Creek on 7/27.

1970

Cole lists a total of 20 mortalities in Yellowstone National Park (12 deaths, 8 to zoos). Both Cole and we list the following 20 deaths: eight control deaths, eight to zoos, four National Park Service drug overdoses. In addition, we recorded six others. They are:

1. Grizzly killed by auto on 6/17 at Norris Junction.

2. Another killed by auto on 5/22 at Firehole Lake Loop road.

3. A cub found dead in Hayden Valley on 6/24.

4. Another cub in Hayden Valley on 8/16.

5. Two cubs of female #184. This female was trapped and released three times. Her cubs were not trapped and released with her. The female returned each time to seek her cubs, but they had dispersed. When the female returned and was captured the fourth time, she was dispatched. All evidence indicated the cubs did not survive. They were never sighted alive in spite of intensive efforts to locate them.

We recorded seven deaths in Montana; Greer recorded five. Both of us recorded four hunter kills. The two mortalities that Greer may not have included were a control kill at Hebgen Lake on 8/28 and an illegal kill at Hell Roaring Creek on 10/18.

Six grizzlies died in Wyoming. These mortalities were received from Wyoming Fish and Game Biologists. These deaths were four hunter kills and two kills by ranchers.

Seven mortalities occurred in Idaho. Six were by ranchers and one was a control death.

As shown in Table 19 of our report, the total was 46.

Recently, we were notified of five additional mortalities in Park County, Wyoming. These were hunter kills and were reported to us by Dale West on 5/30/73. This raises the ecosystem mortalities to 51 for the year 1970.

1971

Cole lists six deaths in Yellowstone National Park and 32 deaths outside the Park. We list seven deaths in the Park (so does Greer) and 38 outside for a total of 45. The six deaths Cole lists are all control deaths. We recorded in addition:

1. One death from a car on 8/12 at Madison Junction.

2. One cub death in Hayden Valley on 5/23.

The minimum number of deaths would therefore be eight, one more than we recorded in Table 19 of our computer analysis.

Our record of 22 deaths in Montana agrees with Greer's record. We have no way of knowing which mortalities Cole failed to list in his table.

Our records for Wyoming show 12 mortalities; four were illegal kills or kills by ranchers and eight were hunter kills. These data were provided by Marvin Hockley of the Wyoming Game and Fish Department and later verified by Larry Roop. (Larry Roop's letter of confirmation will be forwarded.)

We recorded four deaths in Idaho; one was a control kill and three illegal kills or kills made by ranchers.

These records account for our total of 45 deaths shown in Table 19, plus one additional death which was verified after we compiled our report.

1972

Cole lists nine deaths in the Park and 12 in other areas. We list ten deaths in the Park and 17 in other areas for a total of 27. The nine deaths listed by Cole are control deaths. In addition to these, we recorded the death of a cub killed by a car at Old Faithful on 6/18.

We recorded five deaths in Montana, three by control and two were illegal kills. The illegal kills were a female and cub at Red Canyon near West Yellowstone on or about September 2.

In Wyoming we recorded seven deaths; two were control, one illegal kill, and four hunter kills.

We recorded five deaths in Idaho; two were control, two illegal kills or kills by ranchers, and one cause of death unknown.

These records account for the total of 27 shown in Table 19 of our report.

1973

The compilation of deaths for 1973 has not yet been completed. Cole's record of zero deaths in the Park does not, as usual, consider any deaths but control ones.

Enclosed is a rough map of the Yellowstone ecosystem of approximately five million acres. This was determined by location of grizzly bear kills. We are currently refining the map for publication and are using it as a basis for computing the ecosystem population prior to 1968.

I hope this information proves helpful. We would appreciate receiving a record of the committee's final compilation so we can make any necessary adjustments in our records and use these in a final draft of our computer analysis.

Sincerely,

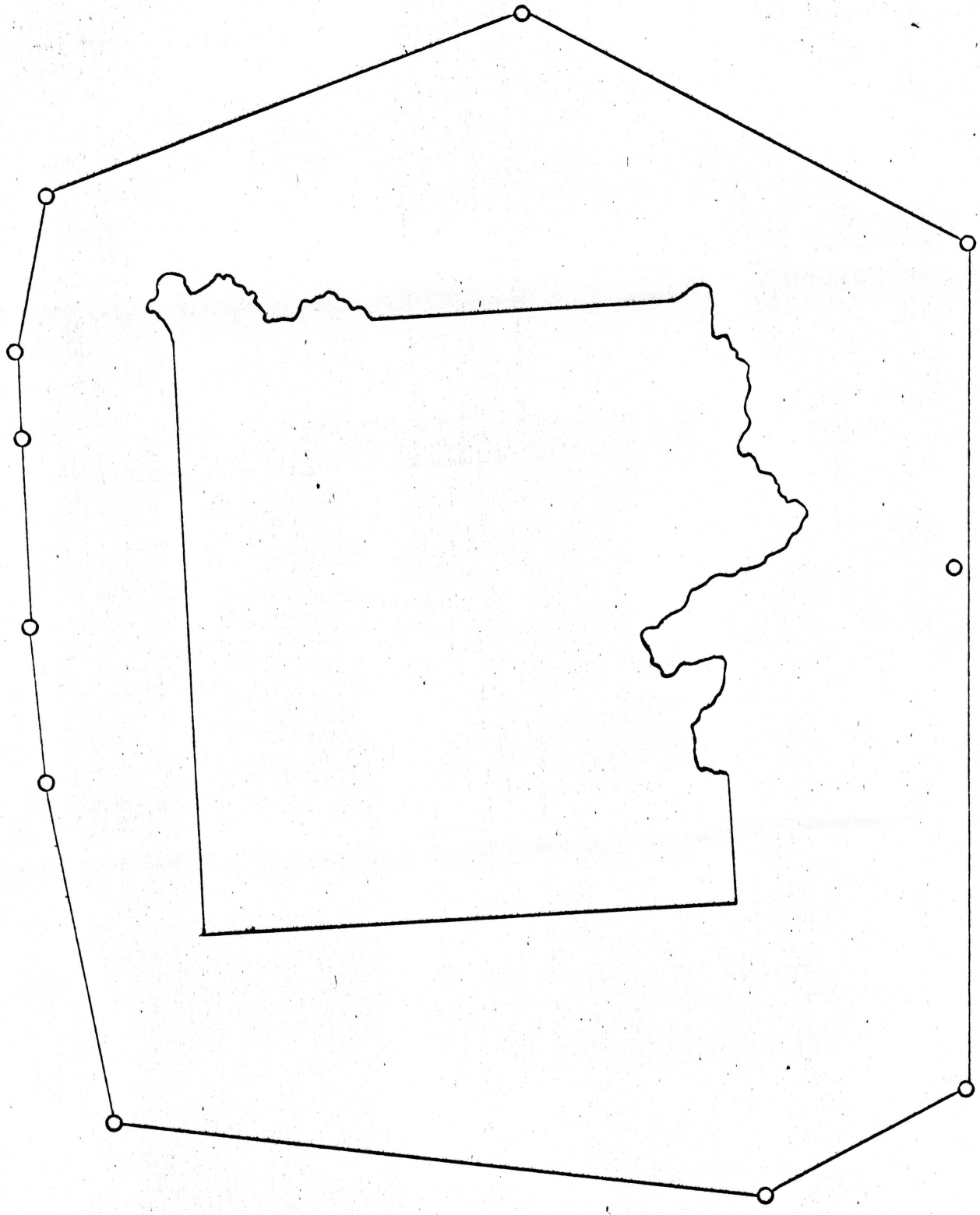
John Craighead

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

Yellowstone Ecosystem Determined from Kills of Marked and Unmarked Grizzlies

Craighead 1959 - 1972



Intra-campus MEMORANDUM

Univ. Mont. Letters.

UNIVERSITY OF MONTANA

April 18, 1974

TO: Grizzly Bear Ad Hoc Faculty Committee

FROM: "Ginger" Schwarz, Secretary, Mont. Coop. Wildlife Research Unit "Ginger" Schwarz

RE: Letters for your file

Dr. Craighead noted that you had not received copies of his letter of March 28 to Dr. Cowan which was sent prior to his meeting with the NAS-NRC Committee in Denver. Also enclosed is a copy of the signed letter of April 15 to Dr. Handler from your committee.

nh
Enclosures

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

April 15, 1974

Dr. Philip Handler, President
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Handler:

The undersigned constitute an ad hoc faculty committee recognized by President Robert Pantzer of the University of Montana. The function of this committee is to review and advise President Pantzer on the problems the Craigheads have encountered in their research in Yellowstone National Park. Another function is to keep abreast of the correspondence between Dr. John Craighead and the NAS-NRC Committee which the National Academy of Sciences has authorized to investigate the problem.

After years of research, the Craigheads have indicated that the management and preservation of the grizzly bear in the Yellowstone ecosystem is a serious problem requiring a prompt solution. Their research has shown that the grizzly bear reproduces very slowly and, in the Yellowstone ecosystem, bear mortality has been especially high during the past few years. Therefore, the survival of the grizzly bear seems to be imperiled.

The Craigheads have 15 years of data to substantiate their position. They have been able to publish only a portion of their findings due to the long period of field investigations and the tremendous mass of data accumulated. They have, however, prepared numerous reports which the NAS-NRC Committee is now using as a basis for their study. We recognize the need for a committee to study the situation, as a service to the resource and to the scientific community, but we see no need for the committee to publish anything other than a brief statement of conclusions and management suggestions. The grizzly bear population situation is either serious or it is not serious. Furthermore, after having investigated this situation in great detail, we conclude Dr. Craighead has shown willingness to cooperate with the NAS-NRC Committee. He is, however, reticent to provide data in addition to that already in the Committee's hands since it has been impossible to obtain assurance these and other unpublished data will not be published in the final committee report. If these data were published by the committee, it would preempt interpretation and publication of these data by Craighead/associates.

It appears to us that the important objective of this NAS investigation

is to obtain the truth and to protect the scientific and academic freedom of the researchers. We believe that the full report of the NAS-NRC Committee, which relies heavily on the unpublished Craighead data already in their hands, should be kept absolutely confidential pending publication of the original data, findings, and interpretations by the original researchers. Our concern is one based primarily on an NAS-NRC Committee taking an investigator's data, and possibly his conclusions, and publishing them before this investigator has an opportunity to publish his own work. We are sure you appreciate the nature of the problem involved here.

Sincerely yours,

R. A. Solberg

Richard A. Solberg, Professor of Botany and Dean, College of Arts and Sciences

Robert P. Banaugh

Robert P. Banaugh, Professor and Chairman of Computer Science

Franklin Sogandares-Bernal

Franklin Sogandares-Bernal, Professor of Microbiology

Fred Shafizadeh

Fred Shafizadeh, Professor of Chemistry and Director of Wood Chemistry Laboratory

Carl L. Larson

Carl L. Larson, Professor of Microbiology and Director, Stella Duncan Memorial Laboratories

H. Richard Fevold

H. Richard Fevold, Professor of Chemistry

Mitsura J. Nakamura

Mitsura J. Nakamura, Professor and Chairman of Microbiology

James A. Walsh

James A. Walsh, Professor and Chairman of Psychology

Richard N. Ushijima

Richard N. Ushijima, Professor of Microbiology

das:
xc: Dr. Robert Pantzer

UNITED STATES GOVERNMENT

Memorandum

TO : Leader, Montana Cooperative Wildlife Research Unit **DATE:** February 26, 1974

FROM : Acting Chief, Division of Wildlife Research

SUBJECT: Grizzly Bear Study

John, we need to know the approximate date that you plan on submitting the completed manuscript related to your grizzly bear studies. I think that you will agree that it is imperative that this information become available for peer review within the very near future.

Because of an impending action between Regenstein vs. Anderson, the Solicitor's Office has given us the following instructions: any correspondence that refers to the grizzly bear research as it may pertain to the Park Service Environmental Impact Statement and/or population dynamics of the Yellowstone grizzly must be routed through Ms. Allender of the Interior Department's Solicitor's Office, via Division of Wildlife Research (Washington). Her telephone number is 202-343-4444. Any questions regarding the case directly must be referred to Robert Werdig, Assistant U.S. Attorney General, 202-426-7263. This directive apparently covers both written and verbal responses to either the grizzly bear research or the legal case.

Thanks for your help.

Joseph E Townsend

Joseph E. Townsend

MISSOULA, MONTANA
RECEIVED
FEB 28 1973
MONT. COOPERATIVE WILDLIFE
RESEARCH UNIT

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

March 7, 1974

Dr. Frank C. Craighead Sr.
87 East Avenue
Naples, Florida 33940

Dear Dad:

I am enclosing a copy of some of the information I have send to the NAS Committee. Also enclosed is a directive which I just received. I interprete this directive to mean that I can not send any of the population information directly to the committee, and that it will probably be censored by the Solicitor's Office in Washington. Just as I begin to think things might be breaking for us, they seem to get worse.

The bright side of this, if there is one, is that it should now become unmistakably clear to the NAS Committee that the Department of the Interior will go to any extent to protect the agency and to cover up mistakes.

Will give you more details over the phone.

Love,

John

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

Encl: 2

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

April 4, 1974

Dr. Philip Handler, President
National Research Council
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Handler:

A proposal to form a committee on the Yellowstone grizzly bear situation was expressed in a letter to you from the Honorable Rogers C. B. Morton, Secretary of the Interior, dated February 6, 1973. The Council of the National Academy of Sciences approved acceptance of this task at its March meeting; and based on a proposal submitted to the U.S. Department of the Interior, a contract was signed on June 27, 1973, between the Department and the National Academy of Sciences. The contract sets forth the objectives of the committee.

I am concerned that the committee may be exceeding the purpose and the intent for which it was established.

In order for the committee to meet its objectives, it must rely heavily on 15 years of data accumulated by Drs. John and Frank Craighead and their colleagues. Much of this information is in progress reports that do not constitute publication and which have been labeled not for publication or citation and must, therefore, be treated as privileged information.

It appears to me and to several scientist-members of my faculty, who have served as my sounding board, that a detailed report by this committee will "scoop" 15 years of dedicated and original research efforts by the Craighead Research Team. Dr. John Craighead has attempted to resolve this problem with the NAS Committee but without apparent success. He has agreed to provide the information requested but under terms that would protect his interests and that of his co-workers. There is no other comparable compilation of information on the population dynamics of grizzly bears. The Craighead research is unique in methodology, in long-term continuity of effort, and in biological conclusions.

We do not believe the task of the NAS committee should include interpretation and publication of unpublished data gathered by researchers at this

institution, especially when our researchers have not yet been able to finalize their own report for peer analysis. I believe that the NAS committee should not preempt, in published form, the use of these hard-gained data without first obtaining full permission of the individuals involved.

I would like to have a copy of the NAS Committee report (confidential if necessary) to see how the committee is citing the source of the many data, individual statistics, and concepts provided by the Craigheads.

A short precise judgement of the grizzly bear situation based on the committee's evaluation of the Craighead and the Park Service's data would be ethically correct and would meet the NAS study objectives.

This evaluation could then be followed up by separate in-depth publications by the Craigheads and by the National Park biologists. This would preserve scientific and academic ethics. It would also enable the scientific community to be the ultimate judge of the two research efforts and conclusions reached independently by the two groups.

Dr. Craighead has informed me that he can produce a summarized version of his grizzly bear population analysis for publication in Bio-Science or similar journals by May 30, and a completely documented manuscript for publication in Wildlife Monographs by October 1974. I urge you to extend him this courtesy and thereby protect his long-term research effort to document the ecology of a threatened and endangered species.

I have requested Dr. Craighead turn over to me all correspondence on this matter for my review. To also keep you informed, I am attaching the full correspondence between Dr. Craighead and the NAS Committee members.

Sincerely yours,

Robert T. Pantzer
President

das

Encl: Correspondence with NAS Committee

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

Department of Zoology

22 April 1974

Dr. Philip Handler, President
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear President Handler:

Dr. John Craighead is a Professor of Zoology at this University in addition to being Leader of the Montana Cooperative Wildlife Research Unit. Because of the apparent intention of Dr. Ian McT. Cowan to include in his committee report and probably publish either a select portion or perhaps all of the unpublished Craighead data made available to the NAS select Grizzly Bear Committee, Dr. Craighead recently asked me to review his file of correspondence with and concerning this committee.

I am certain that you agree with me that it is unethical for anyone to publish without consent any unpublished data made available to the committee.

The committee should be able to reach its conclusions and refer to unpublished or in press data without actually publishing those data. Furthermore I do not believe that the National Academy of Sciences would be party to the unauthorized publication of any researchers' data.

Professor John Craighead is now hesitant to cooperate as fully with the Committee as he did at first. I believe it is time for the Academy to make a clear statement concerning this matter. Such a statement would reassure all the researchers cooperating with the Committee. Such reassurance would insure full cooperation and the best possible report from the committee.

I feel that the uniquely prestigous position of the National Academy of Sciences places the additional burden on the Academy of establishing precedents for the cooperative, ethical attitudes of American scientists.

Sincerely,

Donald A. Jenni
Professor and Chairman

DAJ:lp

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

April 8, 1974

Dr. Frank Craighead Sr.
87 East Avenue
Naples, Florida 33940

Dear Dad:

Think you will be interested in how things are progressing. I don't think they are quite as black as the correspondence indicates, however, there is no question that the NAS Committee is going to usurp as much of our data as they can get away with. I'll keep you posted as things develop.

I was interested in your letter concerning Reed. I think it would be great if you can have a talk with him, but I think you should recognize that as far as I can determine, Reed has not changed his position with regard to Frank and me. There is no question that he was the one largely responsible for authorizin g the NAS Committee to appropriate our study. Note Reed's comment in the Wall Street Journal. He is as vindictive as ever. You might want to reconsider your offer to work with him. Will tell you more on the phone.

When I was visiting you, you mentioned that you had returned the ERTS-1 satellite report, "An Evaluation of the Use of ERTS-1 Satellite Imagery for Grizzly Bear Habitat Analysis" which contained the colored photos. I haven't received it. Possibly you forgot to mail it or it is lost in the mail. Could you check and see if you possibly still have the report?

Lots of love to you and mom.

Sincerely,

John J. Craighead

JJC:gs

Encl:

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

March 28, 1974

Grizzly Bear Investigating Comm.
National Academy of Sciences

Gentlemen:

A copy of the attached government directive, I believe, was mailed to Dr. Cowan and to Dr. Sheppard in November; it is dated November 9, 1973, and signed by the Acting Director, Bureau of Sport Fisheries and Wildlife. We are not sure that the committee did receive a copy of this directive.

To comply with the government directive, we immediately had the attached sheet incorporated in a page immediately following the title page and attempted to see that anyone with the book received a copy to insert in "A Computer Analysis of the Yellowstone Grizzly Bear Population". We are concerned that since your committee received advanced copies before they were released that you may not have received this insert (in compliance with Washington) or the directive. If there has been an error in this information not reaching you, we are, herewith, enclosing another copy for insertion and a copy of the government directive for your perusal. We also apologize for this possible oversight.

I am also enclosing a copy of a directive which I received February 28 signed by Joseph E. Townsend. This directive was mailed by us to Dr. Cowan and to Dr. Sheppard, but we neglected to send copies to other members of the committee. I do not know what this will mean in terms of providing information for the committee. Hopefully, it will be no problem.

I am looking forward to see all of you at the North American.

Kindest personal regards.

Sincerely,

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs
Encl: Govt directive of Nov. 9, 1973
Insert to be placed in Computer Analysis
Govt directive of Feb. 28, 1974

UNITED STATES GOVERNMENT

Memorandum

TO : Leader, Montana Cooperative Wildlife Research Unit

DATE: November 9, 1973

FROM : Acting Director, Bureau of Sport Fisheries and Wildlife

SUBJECT: Permission to Publish "A Computer Analysis of the Yellowstone Grizzly Bear Population."

You are authorized to release and submit for publication the manuscript "A Computer Analysis of the Yellowstone Grizzly Bear Population." The following statement should be incorporated in a page immediately following the title page:

> "Support of this project by the U.S. Department of the Interior does not imply endorsement of the conclusions or policies expressed herein."

The manuscript requires extensive editing to improve clarity and presentation of information. We ask that the authors devote attention to this matter prior to release or publication. We also strongly suggest that you carefully review the population estimates and the reliability of census data on which they are based.

N. Schmidt

5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

This is a preliminary draft, not a publication, and is to be treated as priviledged material. No portion of it may be cited without written permission from the authors.

"Support of this project by the U.S. Department of the Interior does not imply endorsement of the conclusions or policies expressed herein."

UNITED STATES GOVERNMENT

Memorandum

TO : Leader, Montana Cooperative Wildlife Research Unit DATE: February 26, 1974

FROM : Acting Chief, Division of Wildlife Research

SUBJECT: Grizzly Bear Study

John, we need to know the approximate date that you plan on submitting the completed manuscript related to your grizzly bear studies. I think that you will agree that it is imperative that this information become available for peer review within the very near future.

Because of an impending action between Regenstein vs. Anderson, the Solicitor's Office has given us the following instructions: any correspondence that refers to the grizzly bear research as it may pertain to the Park Service Environmental Impact Statement and/or population dynamics of the Yellowstone grizzly must be routed through Ms. Allender of the Interior Department's Solicitor's Office, via Division of Wildlife Research (Washington). Her telephone number is 202-343-4444. Any questions regarding the case directly must be referred to Robert Werdig, Assistant U.S. Attorney General, 202-426-7263. This directive apparently covers both written and verbal responses to either the grizzly bear research or the legal case.

Thanks for your help.

Joseph E Townsend

Joseph E. Townsend

MISSOULA, MONTANA
RECEIVED
FEB 28 1973
MONT. COOPERATIVE WILDLIFE
RESEARCH UNIT



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8, CANADA V6T 1W5

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

March 22, 1974

Dr. John J. Craighead, Leader
Montana Cooperative Wildlife
Research Unit
University of Montana
Missoula, Montana 59801
U. S. A.

Dear John:

Thank you for your letter of February 22. I, and I am sure the rest of the Committee, thoroughly appreciate the very heavy problem that you have in analyzing the accumulation of 15 years of very active field research. At the same time, I am sure you will realize also that certain claims have been made by yourselves and others publicly. These are not just general statements; they are rather specific statements concerning the trends in the population of grizzlies.

Such statements can only be made after a data analysis, which substantiates these statements, has been made. Therefore, it seems to us that these statements, which have been made by both sides, either are or are not substantiable by information which has been made public. We will be regarding the two specific documents which have been made available to us by your group as fully available to us for quoting and have been proceeding on this basis. Our understanding is that these are the substantial results of your analyses and, though they are not final and are subject to minor corrections, that the analyses up to this point are accurate and the statements that have been derived from them represent your considered judgment of the interpretation of those data.

The thrust of my remarks is that my Committee is proceeding on the basis that any and all statements in these two reports can be used as a basis for establishing our study, and that permission will not be necessary for us to use the data in these reports as the basis of our study.

Of course, where there do seem to be inconsistencies between various aspects of the reports we will check these out with you. It is in no way our intention to try and put any of the concerned and dedicated research workers that have been involved in this grizzly study in a bad public light. However,

I am sure you will realize that once major public statements have been made with reference to an animal as popular and as of great concern as the grizzly bear these have to be substantiable. It seems obvious to us that data which you have not yet analyzed could not have been used as a basis for any statements which have emanated, and that the same thing applies to data from the studies made by National Parks authorities.

should be "up-dated"

All members of the Committee will be present at the wildlife conferences in Denver and this would be a useful opportunity for us to get together to discuss any substantial matters. At that time we will have our report in draft form and will have identified the most important issues which we should still try to sort out with you.

Would it be possible for you to meet the Committee on March 31 in the Denver Hilton Hotel? If this is possible would you please phone Harvey Sheppard at the National Research Council regarding the most convenient time.

Best regards.

Sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies

/bt

cc Dr. Frank Craighead
Mr. Harvey Sheppard

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

March 6, 1974

Dr. Harvey E. Sheppard
Division of Biological Sciences
National Research Council
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Sheppard:

I am enclosing a copy of the memorandum that I discussed with you over the phone dated February 26. I hope that the procedure of routing population information via the Solicitor's Office will not cause a delay in getting information to the NAS Committee.

Sincerely,

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

Encl: 1

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

February 26, 1974

Dr. Harvey E. Sheppard, Staff Officer
Division of Biological Sciences
National Research Council
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

Dear Dr. Sheppard:

In response to your request of February 8 and an earlier one from Dr. Cowan, I have attempted to explain the variations in mortality that appear in the Craighead, Greer, Cole reports. Larry Roop has been helping me to double check the 1971 Wyoming mortalities; and if there should be any change in these, I will report them to Dr. Cowan. I regret the delay in getting information to the committee; but I have been unusually busy, and I wanted to receive confirmation on some of the Wyoming mortalities for 1971 that we had not checked out with a personal interview.

Review of Mortality Data

1968

In 1968, Cole recorded a total of 5 deaths; we recorded 19. Cole's data do not include:

1. Five grizzlies that met death in Yellowstone Park other than by control measures. These were:

   One cub at Bridge Bay incinerator. Cause of death undetermined.

   Three cubs possibly killed by an adult grizzly near Rabbit Creek.

   One adult male shot by tourist at Pelican Creek.

2. One control and 3 hunter kills in Montana adjoining the Park. (checks with Greer)

3. Three illegal kills or kills by ranchers in Wyoming, adjacent to Yellowstone National Park.

4. Two confirmed deaths, but causes of death unknown in Idaho adjacent to Yellowstone National Park.

We do not know how Greer accounts for two more deaths in Yellowstone Park than we have recorded. We have ten; Greer has 12, Cole has five.

1969

In 1969, we recorded a total of 23 deaths; Cole recorded ten. Cole's data do not include:

1. One control death in Park. We cannot determine which bear mortality he failed to list without having access to his mortality records listed by date and location of death.

2. One grizzly hit by a car and killed on 6/17 at Biscuit Basin near Old Faithful.

This accounts for the difference between Cole's record of ten and our record of 12 deaths in the Park.

Greer lists 11 deaths in Park for 1969. We suspect he did not record a death at Grant Village that occurred on September 14.

We recorded 11 deaths outside the Park which accounts for our total mortality of 23 animals. Nine of these were in Montana (7 hunter kills and 2 illegal kills) and two were in Idaho. Greer lists only five hunter kills and one illegal kill. We suspect Greer did not receive a mortality record on an illegal kill at Cooke City dump on 7/12 and that he did not record two hunter kills - one in hunting area 314 and one in hunting area 310. He may have considered these to be outside the Yellowstone Ecosystem but they are not.

There were two authenticated kills in Idaho; one by a rancher at Reas Pass on 9/28 and another at Tygee Creek on 7/27.

1970

Cole lists a total of 20 mortalities in Yellowstone National Park (12 deaths, 8 to zoos). Both Cole and we list the following 20 deaths: eight control deaths, eight to zoos, four National Park Service drug overdoses. In addition, we recorded six others. They are:

1. Grizzly killed by auto on 6/17 at Norris Junction.

2. Another killed by auto on 5/22 at Firehole Lake Loop road.

3. A cub found dead in Hayden Valley on 6/24.

4. Another cub in Hayden Valley on 8/16.

5. Two cubs of female #184. This female was trapped and released three times. Her cubs were not trapped and released with her. The female returned each time to seek her cubs, but they had dispersed. When the female returned and was captured the fourth time, she was dispatched. All evidence indicated the cubs did not survive. They were never sighted alive in spite of intensive efforts to locate them.

We recorded seven deaths in Montana; Greer recorded five. Both of us recorded four hunter kills. The two mortalities that Greer may not have included were a control kill at Hebgen Lake on 8/28 and an illegal kill at Hell Roaring Creek on 10/18.

Six grizzlies died in Wyoming. These mortalities were received from Wyoming Fish and Game Biologists. These deaths were four hunter kills and two kills by ranchers.

Seven mortalities occurred in Idaho. Six were by ranchers and one was a control death.

As shown in Table 19 of our report, the total was 46.

Recently, we were notified of five additional mortalities in Park County, Wyoming. These were hunter kills and were reported to us by Dale West on 5/30/73. This raises the ecosystem mortalities to 51 for the year 1970.

1971

Cole lists six deaths in Yellowstone National Park and 32 deaths outside the Park. We list seven deaths in the Park (so does Greer) and 38 outside for a total of 45. The six deaths Cole lists are all control deaths. We recorded in addition:

1. One death from a car on 8/12 at Madison Junction.

2. One cub death in Hayden Valley on 5/23.

The minimum number of deaths would therefore be eight, one more than we recorded in Table 19 of our computer analysis.

Our record of 22 deaths in Montana agrees with Greer's record. We have no way of knowing which mortalities Cole failed to list in his table.

Our records for Wyoming show 12 mortalities; four were illegal kills or kills by ranchers and eight were hunter kills. These data were provided by Marvin Hockley of the Wyoming Game and Fish Department and later verified by Larry Roop. (Larry Roop's letter of confirmation will be forwarded.)

We recorded four deaths in Idaho; one was a control kill and three illegal kills or kills made by ranchers.

These records account for our total of 45 deaths shown in Table 19, plus one additional death which was verified after we compiled our report.

1972

Cole lists nine deaths in the Park and 12 in other areas. We list ten deaths in the Park and 17 in other areas for a total of 27. The nine deaths listed by Cole are control deaths. In addition to these, we recorded the death of a cub killed by a car at Old Faithful on 6/18.

We recorded five deaths in Montana, three by control and two were illegal kills. The illegal kills were a female and cub at Red Canyon near West Yellowstone on or about September 2.

In Wyoming we recorded seven deaths; two were control, one illegal kill, and four hunter kills.

We recorded five deaths in Idaho; two were control, two illegal kills or kills by ranchers, and one cause of death unknown.

These records account for the total of 27 shown in Table 19 of our report.

1973

The compilation of deaths for 1973 has not yet been completed. Cole's record of zero deaths in the Park does not, as usual, consider any deaths but control ones.

Enclosed is a rough map of the Yellowstone ecosystem of approximately five million acres. This was determined by location of grizzly bear kills. We are currently refining the map for publication and are using it as a basis for computing the ecosystem population prior to 1968.

I hope this information proves helpful. We would appreciate receiving a record of the committee's final compilation so we can make any necessary adjustments in our records and use these in a final draft of our computer analysis.

Sincerely,

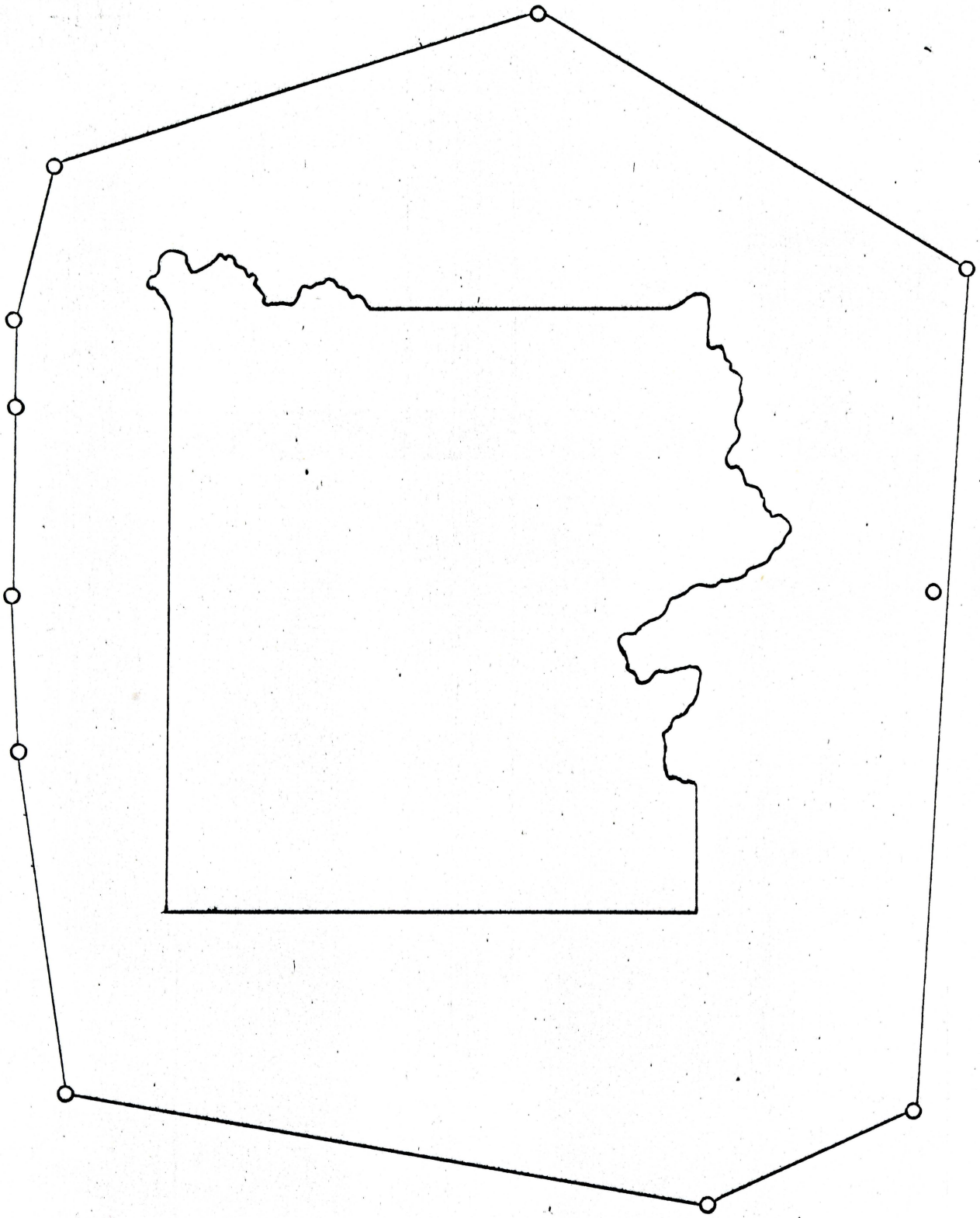
John Craighead

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

Yellowstone Ecosystem Determined from Kills of Marked and Unmarked Grizzlies

Craighead 1959 - 1972



MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

February 22, 1974

Dean I. McT. Cowan
Faculty of Graduate Studies
University of British Columbia
Vancouver, Canada V6T 1W5

Dear Ian:

You have accepted a difficult assignment from the Department of the Interior with a time limitation we believe to be unrealistic, if not impossible. Nevertheless, we will respond to reasonable and specific requests for use of data from our unpublished 1967 and 1973 reports and respond at a later date for information which we are now compiling and analyzing. It was the unanimous decision of my colleagues here to authorize only specific requests for use of data from our 1967 and 1973 reports because the former report is obviously outdated in many respects. We are altering the latter (computer report) to meet suggestions of reviewers. My colleagues feel that by responding only to your specific requests for data, we can best give you the information you require; sending you a large amount of uncorrelated and uninterpreted data would necessitate an extensive amount of work for your committee. There has already been too much misinterpretation of our preliminary and confidential reports. Please do not compromise us in this respect.

We agree that you must reach the best possible judgements. We are concerned that your decision to meet an imposed deadline does not recognize the massive amount of data we must analyze to provide you with conclusive scientific evidence for those judgements. Perhaps, the Park Service biologists have such data; if so, the information has not come to our attention. We hope your time limitation and our inability to meet your reporting date with a fully documented report, that is specific for the Yellowstone population, will not substantially affect your conclusions and recommendations. I am sure you will agree that most wildlife management decisions are still largely political in spite of the best efforts of our profession. We believe the Yellowstone grizzlies could be an exception. I am confident that when full analyses and interpretations of our data are completed, we will have the basis for a sound, undisputed, biological decision for a specific wildlife management problem. I think you will agree that this can only be accomplished with the 15 years of data we have gathered. We question whether such a decision can be made until all the pertinent data have been analyzed. If it cannot, then your report may only serve to further aggravate an already confused situation, and expand the repercussions we are all so concerned about. Because this would be unfortunate for the resource and for our profession, we are

willing to do all that is reasonable and will comply with committee requests to the best of our ability.

There are some aspects of the so-called Yellowstone grizzly bear controversy, and our research, that we need to discuss more fully with you. Could I meet with you within the next month?

Sincerely,

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

6431

NATIONAL RESEARCH COUNCIL

ASSEMBLY OF LIFE SCIENCES

2101 Constitution Avenue Washington, D. C. 20418

DIVISION OF BIOLOGICAL SCIENCES

February 8, 1974

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

Dear Doctor Craighead:

The last meeting of the Committee on Yellowstone Grizzlies reviewed at some length the available data on grizzly bear mortality in Yellowstone National Park and the surrounding areas. They have found it difficult to understand the variations in mortality, although they appreciate that reports come from various sources, subject to varying degrees of credibility.

A brief summary of the data available follows:

Kenneth Greer's Report on Mortality of Grizzly Bears from all Causes in the Area Surrounding and Including the Park (Montana only).

	1967	1968	1969	1970	1971
Hunting Trophies	2	3	5	4	9
Accidents or violations	3	1	1	1	5
Marauders Killed -- (not reported separately)				--	8
Yellowstone Park	6	12	11	16	7
Man-caused removals from the population	11	16	17	21	29

Note: I have written to Greer for his 1972 and 1973 data.

Summarizing the data from Table 3 and Table 4 of Glen Cole's Report

Mortality of Grizzly Bears in the Park and Surrounding Area

	1968	1969	1970	1971	1972	1973
Yellowstone Park	5	10	12	6	6	0
Deaths in other areas	(omitted from Table 4)		21	32	12	11
Deaths in undeveloped area					2	
Donated to zoos	0	0	8	0	1	0
Man-caused removals	--	--	41	38	21	11

Data from Table 19, Page 70, Craighead Report, "Computer Analysis of the Yellowstone Grizzly Bear Population"

Grizzly Bear Mortalities by Major Causes in Yellowstone National Park and Surrounding Areas

	1968	1969	1970	1971	1972
Hunter Kill	3	7	8	17	4
Control Kill	5	11	22	13	14
Other	11	5	16	15	9
Total	19	23	46	45	27

You will note that Greer and Cole do not agree on the mortality in Yellowstone Park. Of course, Greer does not report mortality figures in Idaho and Wyoming. However, both Glen Cole's data and your data presumably includes information from both Idaho and Wyoming. They differ, perhaps, because of different sources of information and a different geographical area considered. It would be appreciated if you would give us a breakdown of Table 19 by Park and State areas. A map showing the approximate area you regard as the Yellowstone "ecosystem" for grizzly bears would be most helpful.

I hope I am not asking too much, but any help you could give us on arriving at proper rationale of these divergent figures would be helpful. Of course, if you have compiled any mortality data for 1973, we would very much like to have them.

Sincerely,

Harvey E. Sheppard
Staff Officer

HES:mst

cc: Drs. Cowan, Hoffman,
and Swanson

THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8, CANADA V6T 1W5

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

January 31, 1974

Dr. John Craighead
Montana Cooperative Wildlife Research Unit
The University of Montana
Missoula, Montana 59801
U. S. A.

Dear John:

I am sorry to have been so long in replying specifically to your letter of December 19, but I wanted to hold my reply until the Committee had had a chance to discuss the contents of your letter. We did this at our most recent meeting in Seattle about a week ago.

In the view of the Committee they have undertaken a commitment to analyze and report upon all data available, and to have this report completed by the end of May, 1974. The controversy has reached levels of bitterness which are creating very unfortunate consequences in many parts of the world and we feel that it is important that we have our report ready as quickly as possible.

I am sure you will accept our view that the only basis upon which we, or anyone else, can form conclusions are data analyzed and exposed to the critical scrutiny of one's peers. With this in view, therefore, we will reach our judgment on the basis of data which have been made available to us in published form or in direct response to our queries directed to yourself and to Glen Cole.

Naturally, we want to reach the best possible decision and if there are important bits of evidence which have not been brought to our attention, but are in a form in which analysis can be undertaken and the results entered into our conclusion, these indeed will be most helpful.

The Committee has decided that it would like to submit the analytical section of its report to yourself and to Glen Cole so that each of you may study it in detail and with great care, and make any substantive input that you feel would be helpful. I am sure that you will appreciate

our view that we cannot reach conclusions beyond available data so that if either of you are going to request us to change any of our findings it will be necessary to present the data which clearly supports the change requested.

I am sure you will appreciate our request that this preliminary draft of our report remain in strictest confidence.

In the meantime you will be hearing from Mr. Sheppard with regard to some special points, and you may also get specific requests for assistance from one or two other members of the Committee. Each of us have undertaken to draft a separate section of the report so that we can make progress on it rapidly.

With best regards.

Sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies

/bt

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

December 19, 1973

Dr. Ian McTaggart Cowan, Chairman
Dean, Faculty of Graduate Studies
University of British Columbia
Vancouver, B. C., Canada

Dear Ian:

As you know, my colleagues and I have devoted many years of our professional lives to conducting research with the Yellowstone grizzly bears. We have spent three extremely frustrating years attempting to salvage a research effort that was terminated at a critical period in the research for reasons which were difficult to comprehend. We have been under great pressure and harassment to provide "instant answers" to administrators who have not provided us either with the time or money to thoroughly process and evaluate our data.

Our recent report, "A Computer Analysis of the Yellowstone Grizzly Bear Population" is a brief, preliminary, draft prepared to show government officials the basis for our concern for the grizzly population. It was done at the request of the government and under the pressures of meeting a deadline.

As a result of this extensive research effort, we concluded that the Yellowstone grizzly bear population was approaching a critical condition. We have voiced this concern in the interest of the resource, and we believe our warnings have served to moderate the National Park Service's management policy. We recognized that we would expose ourselves to criticism by questioning the policy of the government before we could completely process and analyze 13 years of data. However, the very critical implications of our preliminary analysis demanded that we immediately voice our concern. Thus, taking an active part in the solution of a complex resource problem was a moral duty that we could not evade. Conceding to political solutions which appeared contrary to our findings was not possible; and to have complied could have produced the "right" political solutions by doing the wrong thing for the resource.

Our research group is thoroughly capable of interpreting the data we have collected. Our research design and continuity of effort for obtaining population parameters is scientifically sound. Our computer analysis is the first of its kind for a large carnivore. Our conclusions are tentative and will not be finalized until we have thoroughly processed and

analyzed all of our pertinent data, and have carefully reviewed constructive criticism from consulting scientists.

You have our 1973 unpublished computer analysis as well as our unpublished 1968 report. In addition, you have requested much of our raw data. As I have indicated before, this situation presents some problems of concern to us as well as to you and your committee members. The problems are:

1. Others, by mandate, have been placed in the position of interpreting our data and drawing conclusions before we are able to do so.

2. The interpretation of data by those (no matter how competent the interpreters) who are unfamiliar with both the study and the specific techniques used to gather the data will very probably result in errors in judgement. Thus the task should be performed by the researchers themselves.

3. The very act of providing the requested data will place excessive demands on our time and consequently will prevent us from proceeding with our own interpretations and incorporating valid criticisms into our final write-up.

To avoid placing your committee in a position which could be questioned by other scientists and academicians, we feel you should request us to continue to process and interpret our data as rapidly as possible and to then invite criticism and incorporate the valid criticisms into a final report which will be made available to your committee. At that time, we will also attempt to provide any additional supporting data you request.

Your last letter left me in doubt as to your plans for publication. If you are unable to give us assurance that your report will not be published or that it will remain unpublished until we have published or, if you do not have control over the disposition of the report, then my colleagues and I feel the only solution is for us to review all criticisms, incorporate valid ones, and give you the final result to judge.

We believe this approach will solve the problems I have posed and be in the best scientific tradition. One of the biggest problems I face internally is that I am not the sole legal owner of the data collected and am responsible to numerous supporting organizations and individuals.

We recognize that you have a deadline for your report. We too are also working under severe time and budget restrictions. We have had many problems preparing the preliminary population analysis which you now have

Since our resources are limited, we would appreciate help and suggestions from your committee as we complete our report.

Sincerely,

John Craighead

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

JJC:gs

XC: All members of NAS committee
President Pantzer

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

November 23, 1973

Dr. John J. Craighead
Leader, Montana Cooperative
Wildlife Research Unit
University of Montana
Missoula, Montana 59801
U. S. A.

Dear John:

I have been in touch with Harvey E. Sheppard of the Biological Sciences Division of the National Research Council concerning one or two queries raised in your letter to me of November 13. The National Academy of Sciences does not ordinarily issue "formal" mandates or directives to its committees. The committee on the Yellowstone grizzlies was proposed in a letter to Dr. Philip Handler, President of the National Academy of Sciences, from the Honourable Rogers C. B. Morton, Secretary of the Interior, dated February 6, 1973. The Council of the National Academy of Sciences approved acceptance of this task at its March meeting, and, based on a proposal submitted to the U.S. Department of the Interior, a contract was signed on June 27, 1973 between the Department and the National Academy of Sciences.

The contract sets forth the objectives of the committee as follows:

"The National Academy of Sciences, through its division of Biology and Agriculture, NRC, will establish a committee to study and evaluate data on population dynamics of the grizzly bears in Yellowstone National Park, and to make recommendations as to the scientific and technical implications of those data. The study has two objectives:

(a) To evaluate existing data and assess the impact of park policies on the grizzly population.

(b) To provide, if available data warrant, guidance to the National Park service for the future that will ensure the integrity of the Yellowstone grizzly bear population."

This constitutes the official charge to the committee. Within that charge the committee has substantial freedom to conduct its affairs as it sees best. The committee is to submit its report in six copies to the contractor by May 31, 1974. The NAS customarily releases the findings of its studies 30 days after delivery to the contracting agency.

Whether or not the report is formally published will in large measure be up to the National Park service. Such reports are often made available to the public through the National technical information service, or by some other appropriate means.

You will note that the formal contract refers specifically to the Yellowstone National Park. It is the view of the committee that restriction within those geographic boundaries would be inappropriate and would inhibit the committee from reaching adequate conclusions with reference to the entire population. Thus, we will do the best we can to gather such data as are available from the adjacent areas under the jurisdiction of the several states, or of the United States Forest Service, and include these within our analyses. I hope this clarifies certain of the questions that you quite naturally had in your mind.

You will have recently received a letter from Richard Knight and with it a series of comments arising from a study of your data and analyses by the biologists at Yellowstone National Park. They raise some interesting questions which are very important to all of us in reaching a full understanding of the data and the inferences that can be drawn from them.

I would much appreciate your sending me your comments on these questions.

Best regards.

If the report becomes the property Interior.

Sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies
and Chairman of Grizzly
Bear Committee

/bt

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

November 23, 1973

Dr. John J. Craighead, Leader
Montana Cooperative Wildlife
Research Unit
University of Montana
Missoula, Montana 59801
U. S. A.

Dear John:

I quite appreciate the matters raised in your letter of November 13 and the importance of them to you. I can only apologize over the neglect that led to your not being informed of the establishment of the committee, nor the names of those that had been appointed to it.

I shall ask the Secretary of the Committee, Mr. Russell B. Stevens, to send you a copy of the mandate or directive that is to guide the work of the National Academy meetings.

Your second question concerns the nature of our report. It is still too early for us to have formed any clear opinion as to how the report will be structured. Our present thinking is, as I outlined it in my preliminary remarks at Missoula, that we will undertake all the studies necessary for us to attempt to designate the present status of the grizzly bear population in and adjacent to Yellowstone National Park and any trends that are discernible within this population. I think it is possible that we will proceed from there to make some general recommendations with reference to any problems that we see and management measures that might be taken to alleviate these problems.

I have no way of knowing whether the report is to be published or not. However, I would assume that it will be because I am a great believer in complete public exposure of the nature of the input and the nature of the conclusions reached in reports of studies such as the one we are undertaking.

The unpublished data that we have requested and have been receiving from yourself and from others will be used with every possible discretion. At a time when our report is approaching a final stage, it seems to me that it would be most appropriate to consult with yourself and with others who have provided unpublished data for permission to publish such of it as we may find it necessary to use. This

is a matter which concerns me greatly because I am only too well aware of the prior rights to publication that accrue to the scientist who obtained the data in the first place.

We are attempting to aim for a deadline in the month of May. I think it is unlikely that we will be finished with the study and subsequent report before that time, but I think May may well be a possibility.

The help of yourself and Frank is absolutely essential to the task which we have undertaken on behalf of all of us who are concerned with the survival of a healthy population of grizzlies in your part of North America, and I know that every member of the committee appreciates the frankness with which you have discussed all relevant matters with us and the very large body of essential data which you have put at our disposal.

Best regards.

Sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies

/bt

NATIONAL RESEARCH COUNCIL
ASSEMBLY OF LIFE SCIENCES
2101 Constitution Avenue Washington, D. C. 20418
DIVISION OF BIOLOGICAL SCIENCES

November 16, 1973

Mrs. "Ginger" Schwarz
Montana Cooperative Wildlife
Research Unit
University of Montana
Missoula, Mont. 59801

Dear Mrs. Schwarz:

It was a pleasure to hear from you, especially it is a privilege to hear from a lady who doesn't mind being a "Mrs."

I appreciate your sending a copy of the 1967 report. However, this has already been distributed, in xerox form, to the committee and an additional mailing is not necessary. This report is being returned to you today under separate cover.

I wrote to Dr. Craighead requesting an additional copy of his summary of data. If I could be favored with that copy it would be appreciated.

We will refund the cost of the reports you sent out. All I need is a statement, such as "so many reprints or xerox copies - cost $20.00," and the specific agency to whom you wish the check to be addressed. The accounting office needs to know the correct designation, whether the university, the unit, Dr. Craighead, or to whom.

Could I also ask one additional favor? Since you did not send me a set for my reference file, please let me have a sort of bibliographic list of the reports sent to the Committee.

I sincerely appreciate your help, and regret that our meeting was on a Saturday and we did not get a chance to meet you.

Very best regards,

Harvey E. Sheppard
Staff Officer

HES/ejh

The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering to serve government and other organizations

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

October 30, 1973

Dr. John J. Craighead
Leader, Montana Cooperative
Wildlife Research Unit
University of Montana
Missoula, Montana 59801
U.S.A.

Dear John:

It was very good of you and your brother to spend a long and useful day with us last Saturday. Arising out of our discussions with you and later with Cole and his colleagues in Yellowstone Park there are a number of questions on which we would very much appreciate specific details. Several of these we have already discussed with you and you agreed to let us have the information but I thought it better to summarize everything in one place for both our references.

The questions are these:

1) We would very much appreciate the details concerning the trial runs on population estimates that you did using the Peterson index and the Schnabel index.

2) There seems to be a discrepancy between figures you have and the figures Cole has concerning the bears killed inside and outside the park by years. The discrepancy regarding inside the park is very small and amounts to I think one bear in one year, however, the discrepancy for mortalities occuring outside the park is sufficiently large to be important. For instance, in 1971, you record 12 bears killed in Wyoming; Cole's records cover only 6. In the same year your records show 22 killed in Montana; the information Cole has shows just 20. Could you give us the precise details concerning the mortalities in each of these years and places as you have them?

3) We would much appreciate a list covering all the years of your study showing frequencies of litters of 1, 2 and 3 offspring. We would appreciate having this only for individually different bears for any one year.

4) Your chart of the full breeding history of 15 identifiable females is a rich source of very important data. I understood you to say that you have approximately a total of 30 individualized histories. If it is not too difficult to assemble the data we would very much appreciate having access to this.

cont'd.

5) There is a discrepancy in the notes taken by some of us concerning your estimate of the number of females breeding at 2 year intervals and 3 year intervals. This we can obtain from your chart of breeding histories. However, we would appreciate a statement from you concerning the summarized figure for the proportion of females of breeding age known to be breeding, that is, to have produced cubs in any one year.

6) The ratios of marked to unmarked animals definitely identified in each category during back country surveys. The evidence of the known marked to unmarked ratio as taken from bears shot outside the park is 16% lower than the average figure (39%) of marked to unmarked bears within the park. This is extremely important in making any adjustments that may have to be made in estimating the population. Is it possible from your data to develop a marked to unmarked ratio in concentric circles around the known marking site for each bear? Say we took the circles as 10 miles apart or 20 miles apart, whatever your data will support. It would be extremely useful to know whether there is any evidence that can be derived in this way of a decrease in the % of marked bears related to distance away from the original marking site.

7) I think we will all agree that it is impossible to get accurate sex ratios of adult bears by the techniques of marking and subsequent field evaluation. However, you can be absolutely certain of the sex ratios of cubs handled by you and of yearlings handled by you. Looking back through your data you may find that there are 2 year olds that had a behavioural history which enabled you to identify supportable sex ratios on the basis of animals that you had marked as cubs or yearlings. Beyond that age it seems to me that the very strong evidence from all other studies of bears is that the males occupy larger home ranges and move more than females and are thus going to be over-represented in any sampling program.

It may be possible to get at the data in a round about way working from the known ages of your sample of adult bears, but even this will tend to be somewhat biased. The maximum age situation for each of the groups could provide us with a clue if we assumed a steady mortality rate through the years of adult activity, but the numbers involved are so small.

I welcome your comments on this matter of adjustments that should be made in the observed sex ratio when one is estimating the population. Another way of approaching it might be to run a Schnabel index on the 2 sexes separately rather than on the total population.

I am sure that you will agree that even minor alterations in ratio figures can make a very great deal of difference when we are considering a population of relatively small size and mortality rates at the level that they have been observed.

cont'd.

8) Inasmuch as you said that you have been unable to get hold of the actual details of tagged bears which had been removed from the population in the last few years I am sending you a copy of the list given to us by Glen Cole.

9) Do you have any probability figures for any individual bear being seen at the dump subsequently to its being originally marked?

10) What evidence is there that the camp ground bears included or did not include a disproportionate % of 3 and 4 year old young that had been born to bears habituated to feeding on the garbage dumps? Put another way, were the camp ground bears weighted in the direction of the newly graduated young?

With very best regards.

Sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies

c.c. Members of the Committee
on Yellowstone Grizzlies

/sa

of data from

Table 4

(Interim Report)

GRIZZLY BEAR REMOVALS DUE TO CONTROL IN YELLOWSTONE NATIONAL PARK, 1970-72

Date	Sex	Age[1/]	Marked	Removed from:	Action:
5/29/70	M	I	NPS-1785	Old Faithful	Unintentional
6/ 9/70	M	I	NPS-1784	Slough Cr.	INTENTIONAL
6/14/70	F	A		Grant Village	Unintentional
6/16/70	F	I		Grant Village	Zoo
6/16/70	F	I		Grant Village	Zoo
6/16/70	M	I		Grant Village	Zoo
6/18/70	F	I		Tower	Unintentional
6/28/70	M	A		Old Faithful	Unintentional
7/ 3/70	M	A	Craghd. #171; NPS-1781	Old Faithful	Zoo
7/ 4/70	M	A	NPS-1786	Grant Village	INTENTIONAL
7/ 4/70	F	I	NPS-1960	Madison	Zoo
7/ 6/70	M	I	Crghd. #247	Fishing Bridge	Zoo
7/17/70	F	I	NPS-1789	Fishing Bridge	Unintentional
7/31/70	M	I	NPS-1782	Slough Cr.	INTENTIONAL
8/11/70	F	A	Crghd. M1 (pink pndt.)	Lake	Unintentional
8/13/70	F	A	Crghd. #184 (G484)	Canyon	INTENTIONAL
9/ 7/70	F	A		Grant Village	Zoo
9/ 7/70	F	I		Grant Village	Zoo
9/14/70	F	A	Crghd. #8	Grant Village	INTENTIONAL
9/14/70	M	I		Grant Village	INTENTIONAL
1970 total = 20					
6/21/71	M	A	Crghd. G618, G363	Canyon	INTENTIONAL
7/ 7/71	M	A	NPS-1956	Fishing Bridge	INTENTIONAL
7/18/71	F	I	NPS-7121	Fishing Bridge	Unintentional
7/24/71	F	A	Crghd. G740	Canyon	Unintentional
7/29/71	F	A	Crghd.00-164; NPS-7132	Canyon	INTENTIONAL
8/ 4/71	M	A	Crghd.G356, G27	Plover Pt.	INTENTIONAL
1971 total = 6					
6/26/72	F	A	NPS-1792	Riverside Geyser	INTENTIONAL
7/14/72	M	A	Crghd. #211 (G734)	Bridge Bay	Zoo
7/17/72	M	A	NPS-7201	Bridge Bay	Unintentional
7/29/72	M	A	NPS-7122	Bridge Bay	INTENTIONAL
8/ 4/72	M	A	Crghd.tag/rope;NPS7209	Canyon	INTENTIONAL
8/16/72	M	A	Crghd. G183	Canyon	Unintentional
8/20/72	F	A	Crghd. G37	Clear Creek	Unintentional
8/24/72	F	A	NPS-7275	Fishing Bridge	Unintentional
8/24/72		I	NPS-7273	Fishing Bridge	Unintentional
1972 total = 9					

1/ I = immatures (cubs to 3-yr-olds); A = adults (4+)

MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT

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

UNIVERSITY OF MONTANA

MISSOULA, MONTANA 59801

November 13, 1973

I. McT. Cowan, Dean
Faculty of Graduate Studies
University of British Columbia
Vancouver 8, Canada

Dear Ian:

I'm sorry to be so late in answering your letter of October 30, but I have been away from the office for a number of days.

Our meeting with your committee was, I am sure, as informative for us as it was for you. We will do our best to provide you with information needed for your committee to evaluate our research effort and to critically review our population analysis. The questions you posed in your letter of October 30 will require some time to answer, but I will start on the task immediately. I am forwarding copies of your letter to other members of our research team to get the benefit of their thinking and to keep all of them informed.

I have a few questions on which I would appreciate answers but first will attempt to place some facts and events in perspective for both of our references and so that we begin a very delicate task with no misunderstandings. I think you should know that I had not been officially informed about the formation of your committee or its mandate. Your letter of September 26, 1973, asking for information was the first official notice that I received, although I had seen press releases. I tried to obtain information from my superiors in Washington, D. C., but they were unable to inform me. It was not until October 19 that I received a list of the committee members. Mr. Peterson did not contact me when he conferred with other participants involved in this inquiry.

Therefore:

1. Please supply me with the mandate to the committee or a copy of the mandate or directive that you have received from the National Academy of Sciences.

This information has been requested by my colleagues in the grizzly bear research, and I too need to know the mandate of your investigation. Please do not interpret this as a reluctance to cooperate fully; it is rather a need to have more specific information so we can work cooperatively toward a common goal and at the same time I can meet my

responsibilities and obligations to my research partners and to our financial supporters.

2. I have some questions concerning the nature of your report. Is it to be published? If so, is it to be a general evaluation of our published findings and recommendations as stated in our last manuscript, titled, A Computer Analysis of the Yellowstone Grizzly Bear Population?

The unpublished data you have requested, I presume, will be used only for committee evaluation of our findings, conclusions and recommendations prior to our interpretation and publications of them in our own scientific papers. I can conceive that your committee may find it necessary to use some of our unpublished data to compare with data or conclusions of National Park Service biologists. Should this be the case and should it be necessary to publish these, I am confident that we can work out an arrangement satisfactory to all of us.

A complete understanding on these points is essential.

Sincerely,

John Craighead

John J. Craighead, Leader
Mont. Coop. Wildl. Res. Unit

XC: Members of the Committee on Yellowstone Grizzlies
✓ Dr. Frank C. Craighead, Jr.
✓ Joel Varney
✓ Dr. Maurice Hornocker

JJC:gs

our copy

NATIONAL RESEARCH COUNCIL
NATIONAL ACADEMY OF SCIENCES NATIONAL ACADEMY OF ENGINEERING
2101 CONSTITUTION AVENUE WASHINGTON, D.C. 20418

Division of Biological
Sciences

October 23, 1973

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

Dear Doctor Craighead:

Your letter to Dr. Stevens of October 18th outlining arrangements for the meeting of the Committee on Yellowstone Grizzlies on October 27th is sincerely appreciated.

I am sending a copy of my memorandum covering, as far as I can with the information at hand, details of the three day meeting. I have a copy of your letter to Dean Cowan, and I am enclosing a roster of the Committee in the event you have not received one. I have provided the Committee with copies of your 1967 report; your 1969 report on Reproductive Biology of Young Female Grizzly Bears; and your 1971 article in Bio-Science on Grizzly Bear-Man Relationships. The Committee has asked to have your report on Reproductive Biology of Old-Age Female Grizzly Bears, with Dr. Hornocker, which may not have been published. If you could make this report available at Saturday's meeting it would be most helpful.

We are looking forward to this meeting, and I sincerely hope that Dr. Frank Craighead can be present also. I have had some correspondence with your father in Homestead, Fla., and promised to visit him on my next trip to the Florida Keys. Unfortunately I did not get to go this summer, and I hope that he is in good health.

Sincerely,

Harvey E. Sheppard
Staff Officer

Enclosures

RECEIVED
OCT 26 1973
MISSOULA, MONTANA
MONT. COOPERATIVE WILDLIFE UNIT

NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES NATIONAL ACADEMY OF ENGINEERING

2101 CONSTITUTION AVENUE WASHINGTON, D.C. 20418

Division of Biological Sciences October 23, 1973

MEMORANDUM

TO: Committee on Yellowstone Grizzlies and Guests

FROM: Harvey E. Sheppard

SUBJECT: Arrangements for meeting of October 27-29, 1973

Dr. John J. Craighead has kindly made arrangements for the Committee on Yellowstone Grizzlies to meet in the Conference Room at the Forest Sciences Laboratory. The meeting will convene at 9:00 a.m. on Saturday, October 27th. The Forest Sciences Laboratory is located on the south side of the University campus at 800 East Beckwith Avenue, Missoula.

The Committee members are reminded of the reservations made for them at the Village Motor Inn for the nights of October 26th and 27th. Please notify the Inn of any desired change in these reservations (Tel: 406/728-3100).

The following guests are expected to be present:

John J. Craighead, Leader, Montana Cooperative Wildlife Research Unit, and Frank C. Craighead, Jr.

Maurice G. Hornocker, Leader, Idaho Cooperative Wildlife Research Unit

Roger S. Bumstead, Fish and Wildlife Habitat Unit, Division of Natural Resources, Forest Service, USDA, Northern Region

Clifford J. Martinka, National Park Service, USDI, Glacier National Park

Robert Phillips, Bureau of Sport Fisheries and Wildlife, USDI.

MISSOULA MONTANA
RECEIVED
OCT 26 1973
MONT. COOPERATIVE WILDLIFE UNIT

The meeting at Yellowstone National Park will convene on Sunday in the Conference Room at Yellowstone National Park Headquarters, Mammoth. The time of this meeting will depend

on whether the planned flight over the Park can be accomplished on Sunday morning. Reservations for the Committee have been made at the Wilson Motel in Gardiner.

The meeting on Monday, October 29th, at Bozeman, Montana will convene shortly after arrival at Bozeman. The meeting at Bozeman will be in the Conference Room of the Forestry Sciences Laboratory on the Montana State University campus. No reservations have been made in Bozeman for Monday night, as this should not be a problem and the travel plans of each member of the Committee are not known.

Guests at the Park meeting will include Jack K. Anderson, Superintendent of the Park, Glen F. Cole, Mary Meagher, Douglas Houston, and Richard Knight.

Guests at the Bozeman meeting should include Wesley R. Woodgerd, State Fish and Game Director; Joseph V. Basile, Forest Service, USDA, Intermountain Forest and Range Experiment Station; Kenneth R. Greer, Montana Department of Fish and Game; Larry J. Roop, Wyoming Game and Fish Department; James B. White, Director, Wyoming Game and Fish Department.

HES:mst

Committee on Yellowstone Grizzlies

Dr. Ian McTaggart Cowan, Chairman
Dean, Faculty of Graduate Studies
University of British Columbia
Vancouver, B.C., Canada 604/228-2931

Dr. Douglas G. Chapman
Dean, College of Fisheries
University of Washington
Seattle, Wash. 98105 206/543-4270

Dr. Robert S. Hoffmann
Museum of Natural History
University of Kansas
Lawrence, Kans. 66044 913/864-3673

Dr. Dale R. McCullough
Associate Professor, Resource Ecology Program
University of Michigan
Ann Arbor, Mich. 48104 313/764-0458

Dr. Gustav A. Swanson
Department of Fishery and
Wildlife Biology
Colorado State University
Ft. Collins, Colo. 80521 303/491-5020

Dr. Robert B. Weeden
Professor of Wildlife Management
Department of Wildlife and Fisheries
University of Alaska
Fairbanks, Alaska 99701 907/479-7542

Staff Officer: Harvey E. Sheppard
Division of Biological Sciences
National Academy of Sciences
2101 Constitution Avenue
Washington, D.C. 20418

NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES NATIONAL ACADEMY OF ENGINEERING

2101 CONSTITUTION AVENUE WASHINGTON D. C. 20418

DIVISION OF BIOLOGICAL SCIENCES

October 2, 1973

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

Dear Dr. Craighead:

I have been awaiting receipt of a copy of Dr. Ian Cowan's letter to you (of September 26) before getting in touch with you on details of the proposed meeting of the Committee on the Yellowstone Grizzlies in Missoula on Saturday, October 27. Dr. Cowan went no further in his letter than to say "toward the end of October," but when that is translated into action it turns out that the weekend of October 27-28 is the only time available when all of the members can be present. We just hope that the imposition on the Missoula people is not judged overmuch when we ask them for their time on a Saturday.

As Dr. Cowan has indicated, the Committee would like to spend time with you and your brother on the 28th, and we would greatly appreciate it, since you are "on site," so to speak, if you would look into a meeting room that would hold perhaps 8-10 persons. It would be most convenient, of course, if this were in the near vicinity of your working data files, but I leave this to your best judgment. Generally, the Committee would plan to spend two nights in Missoula (accommodations are already taken care of) and to spend the day Saturday with you and your data, and in discussions with two other Missoula-based persons (Roger Bumstead and Robert Phillips). I will be writing Mr. Bumstead and Mr. Phillips separately, but will tell them that I have asked you to check into the matter of a meeting place.

I note that Dr. Cowan directed his copy of the September 26 letter to your brother in New York, but I wonder if it should not

have gone to Moose, Wyoming. We will impose on you to keep him informed and hope that the October 28 date is possible, albeit perhaps not convenient, for him.

We will be grateful for any help you can provide in making arrangements for the Missoula phase of the Committee meeting. Please let me know right away if any insurmountable obstacles show up.

Sincerely,

R. B. Stevens

Russell B. Stevens
Executive Secretary

REPRINTS AND REPORTS GIVEN TO NAS COMMITTEE MEMBERS BY JOHN J. CRAIGHEAD 9/73

1. "Trapping, Immobilizing and Color-Marking Grizzly Bears". John J. Craighead, Maurice Hornocker, Wesley Woodgerd, and Frank C. Craighead Jr. Transactions, North American Wildlife Conference, March 1960.

2. "Radiotracking of Grizzly Bears". Frank C. Craighead, John J. Craighead, and Richard S. Davies. Biotelemetry, 1963.

3. "Tracking Grizzly Bears". Frank C. Craighead and John J. Craighead. BioScience, 1965.

4. "Satellites for Research on Free Roaming Animals". Helmut K. Buechner, Frank C. Craighead, Jr., John J. Craighead and Charles E. Cote. BioScience, December, 1971.

5. "Reproductive Biology of Young Female Grizzly Bears". John J. Craighead, Maurice Hornocker, and Frank C. Craighead, Jr. Journal of Reproduction and Fertility, 1969.

6. "Age Determination of Grizzly Bears from Fourth Premolar Tooth Sections". John J. Craighead, Frank C. Craighead, Jr., Henry E. McCutchen. Journal of Wildlife Management, April 1970.

7. "Radiotracking of Grizzly Bears in Yellowstone National Park, Wyoming, 1962". Frank C. Craighead, Jr. and John J. Craighead. National Geographic Research Report, 1970.

8. "Grizzly Bear - Man Relations in Yellowstone National Park". John J. Craighead and Frank C. Craighead, Jr. BioScience, August, 1971.

9. "Some Comparative Aspects of Milk from Four Species of Bears". Robert Jenness, Albert W. Erickson, and John J. Craighead. Journal of Mammalogy, March 1972.

10. "Grizzly Bear Prehibernation and Denning Activities as Determined by Radiotracking". Frank C. Craighead , Jr. and John C. Craighead. Wildlife Monograph, November 1972.

11. "Radiotracking of Grizzly Bears in Yellowstone National Park, Wyoming, 1959-1960. Frank C. Craighead and John J. Craighead. National Geographic Research Report, 1972.

12. "Studying Wildlife by Satellite". Frank C. Craighead, Jr. and John J. Craighead. National Geographic, 1972.

REPRINTS AND REPORTS GIVEN TO NAS COMMITTEE MEMBERS (cond) JJC 9/73

13. "Radiotracking of Grizzly Bears and Elk in Yellowstone National Park, Wyoming, 1966". Frank C. Craighead, Jr. and John J. Craighead. National Geographic Research Report, 1973.

14. "Tuning in on the Grizzly". Frank C. Craighead, Jr., and John J. Craighead. Science Year.

15. "Elk Migrations In and Near Yellowstone National Park". John J. Craighead, Gerry Atwell, and Bart W. O'Gara. Wildlife Monograph, August 1972.

16. "Home Ranges and Activity Patterns of Nonmigratory Elk of the Madison Drainage Herd as Determined by Biotelemetry". John J. Craighead, Frank C. Craighead, Jr. Robert L. Ruff, and Bart W. O'Gara. Wildlife Monograph, August 1973.

17. "Management of Bears in Yellowstone National Park". John J. Craighead and Frank C. Craighead, Jr. Mimeo report 1967, 118p. (priviledged material - no portion to be cited without written permission).

18. "A Computer Analysis of the Yellowstone Grizzly Bear Population". John J. Craighead, Joel R. Varney, and Frank C. Craighead Jr., July 1973. (priviledged material - no portion to be cited without written permission of the authors).

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

FACULTY OF GRADUATE STUDIES
OFFICE OF THE DEAN

September 26, 1973

Dr. John J. Craighead
Leader, Montana Cooperative
Wildlife Research Unit
University of Montana
Missoula, Montana 59801
U. S. A.

Dear Dr. Craighead:

You will be aware that I have been asked to chair a committee of the National Research Council of the United States to inquire into the present controversy regarding the management of the grizzly in Yellowstone National Park. The committee has already met once and plans to meet in Montana and in the National Park toward the end of October. At that time, we hope to be able to meet with yourself and your brother, as well as with Glen Cole and others who can be helpful to us in providing the data upon which we will have to base our study and recommendations.

It will be essential to our study that we be able to examine all the data that will permit us to examine the various hypotheses concerning the population of bears and the trends in the population, and to this end we very much hope that you will make available to us your computer model and such supporting data as will permit us to examine the nature of the input to the model and, indeed, to run our own explorations of the various assumptions, alternative inputs and related predictions.

In making this request, we are most conscious of the sensitive situation which is created. We completely support the right of the research worker to the first publication of his data. We would like to discuss this and related problems with you when we meet in late October.

In the meantime, we would very much appreciate it if we could have any data that will permit us to examine the validity of the hypothesis that food was the limiting factor affecting the size of the grizzly bear population in Yellowstone Park and that the period of critical food shortage was the June to September period during which the natural food resources were being supplemented by garbage.

There are a number of other details that we would appreciate. I can summarize them as follows.

(a) What constituted a census? Was it a count of the maximum number of individually recognized bears seen during the entire summer period, assuming no mortality during the period?

(b) We gather that the bears not seen for two years were considered to be dead. In two cases, apparently, this was not true because the bears reappeared. To what extent does this alter the census figure for any one period?

(c) Since the counts were taken at artificial food sites, what evidence is there concerning the proportion of the park bears which did not come to dumps?

(d) What were the precise travel routes used while making back-country census? We would like dates and observations at precise points. What was the ratio of marked to unmarked bears in the back-country as against the ratio at the garbage dumps? Is there any evidence for a change in this ratio related to degree of distance from the garbage dumps?

(e) What was the demonstrated rate of tag loss in bears per annum? How was this determined; for instance, were individual bears tattooed at the time that they were marked? Has there been a purposeful program to remove the tag marks upon bears since the active research program was stopped? Has this been applied to bears caught specifically for the purpose of having their tags removed or has it been applied only to bears caught for trans-plant or sending to zoos?

(f) For each bear that was marked on the Craighead program, where was it marked; what was its age, sex, etc; where was it seen subsequently and what was its known fate, if any?

(g) There appears, from data, to have been heavy mortality between cub and yearling age. Are there any clues as to the cause of this? Can it be assumed that the percentages are based upon recognizable females, which were known to have had cubs but lacked yearlings? Is there any evidence of less than an entire litter being lost? Is there any evidence of the death of a female, but the survival of her cubs to yearling age?

(h) The paper by Glen Cole suggests no loss of cubs to yearling age in the last two years. We are not sure how these data were derived. Have you any comments?

(i) What is the evidence for emigration of bears from the Park versus the attractive force of the artificial food supply as a concentrator of bears from outside the Park? It could be that it was this attractive force that artificially inflated the apparent population of the bears within the Park. What evidence would permit us to examine these alternative possibilities?

(j) What has been the influence of the concentration of bears upon the deaths of young; for example is there any difference in the survival figure to yearling age for bears that were feeding at garbage dumps as opposed to those that were not feeding at garbage dumps. Have these figures significantly changed since garbage stocks were removed?

Very sincerely yours,

I. McT. Cowan, Dean
Faculty of Graduate Studies

/bt

cc Mr. Harvey E. Sheppard
National Research Council

Dr. Frank Craighead
President, Environmental
Research Institute
Albany, New York