

A DETAILED RESPONSE
FROM THE NATIONAL PARK SERVICE

TO

The Grizzly and the Juggernaut
by Alston Chase, Outside, January 1986

p. 29, para. 1-3

Mr. Chase's story about the Frank Island bears is not true (if not a purposeful distortion). He leads the reader to believe that the Park Service let the bears go hungry for a long time. This is not true. Here is the actual chain of events, showing that from the first discovery of bear sign on the island until the removal of the bears was only fifteen days: *ambling*

June 20--Possible bear scat first reported on island; efforts begin to determine if scat is from bear and if bears are still on island.

June 26--Three grizzly sibling cubs first sighted on island.

June 29--Decision made to trap and move bears.

July 1---Park Service (NPS) and Interagency Grizzly Bear Study Team (IGBST) personnel visit island to choose trap sites, plan logistics of trapping operation. First bait stations placed as part of trapping procedure. At this time preparations were also underway to get large boat from storage in order to transport the necessary four traps to the island.

July 2---Four traps (these are the large "culvert traps" used to capture and move grizzly bears) moved to island and baited, but left locked open to permit the bears to adjust to their presence.

July 3---Traps inspected; bears had consumed some baits. Traps rebaited and again locked open.

July 4---Traps inspected, all bait gone. Traps rebaited and set for capture.

July 5---Traps inspected; sow caught in one trap, and one cub caught in another. Other two cubs nearby and were lured into trap that day. All bears moved to "transfer trap" aboard workboat and transported to south shore of Flat Mountain Arm of Yellowstone Lake.

This was a fairly normal bear-moving operation except for the unusual logistical problems of getting a workboat into the water so soon after ice-out and of moving the necessary equipment and personnel into place. Mr. Chase seems not to have understood how such an operation works, or the amount of time it takes, and we want to make it clear to the readers.

It may be of interest to bear enthusiasts to know that the sow was never sighted until it was actually in the trap. Frank Island is a large island, and bears are very secretive when they want to be.

There is a second misunderstanding in Mr. Chase's discussion of the Frank Island bears, one that has led to a serious misinterpretation of Park Service actions. He says that the Park Service made the choice to "let the situation develop naturally." He seems to be implying that by suggesting that course the Park Service was suggesting the bears be allowed to die. First, as the above chronology shows, the Park Service decided to move the bears only three days after their presence on the island was visually confirmed. Second, though letting the situation develop naturally was indeed one of the courses of action considered, it obviously was not the course chosen, and moreover has been misunderstood by Mr. Chase. It is well known among Yellowstone bear students that bears occasionally swim considerable distances in Yellowstone Lake. Frank Island is only two miles from the nearest shoreline. It was this eventuality, that the bears might return to shore on their own, that was briefly considered as part of the option to "let the situation develop naturally."

Thus there seem no grounds for suggesting that the Park Service was remiss in the Frank Island bear operation. The presence of considerable amounts of fresh scat on the island indicates that the bears were in fact getting substantial amounts of food and were not in danger of perishing in only a few days, and the time from visual confirmation of bear presence until the bears were ashore after the trapping was only nine days.

Reference: U.S.N.P.S. Case Incident Record #843601, Pat Osmont, 8/18/84. p. 29, para. 4.

Mr. Chase has not understood the size of the grizzly bear protection effort. There are not "dozens of government personnel" working "full time" on bear protection. There is one: Sandy Fowler of Yellowstone's bear management office. Elsewhere throughout the Yellowstone area (the park, the surrounding national forests, and state lands), there are numerous individuals who devote some part of their work time--in most cases, a small part--to bear protection.

p. 29, para. 6

Mr. Chase has neglected to tell readers that the number 200 is a minimum estimate. In scientific language, that means that there are at least 200 bears.

Further, if we assume that by "authorities" he means the IGBST, then the total of 50 adult reproducing females is in error. The IGBST minimum estimate of this segment of the population as of 1984 was "just under 40." The number 50 is used in the same report for certain hypothetical

exercises. Perhaps Mr. Chase became confused in his reading.

Reference: Journal of Wildlife Management 48(4):1436.

p. 30, para. 1

Mr. Chase uses quotations from scientific journals in a selective and subjective manner. For example, this same paper from Ecology, upon which he relies to prove that the bears are in trouble, also makes the two following statements:

In the absence of the supplemental food supply provided by the garbage dumps, it seems quite likely that the Yellowstone grizzly population will, if man-caused mortalities can be reduced efficiently, stabilize at a new population level (Ecology 66[2]:333)

We believe further attention to possible regulatory mechanisms is needed, and should be a part of continuing research on Yellowstone grizzlies (p.334).

The point is that Mr. Chase takes journalistic liberties with his sources, pulling pieces of information out of context and using them to prove one thing when their authors intended them to suggest something entirely different.

p. 30, para. 2

We do not know where Mr. Chase got the idea that the "events" involved in the grizzly population's projected decline are "beyond the government's control." All the government agencies involved, including the NPS, the U.S. Fish and Wildlife Service (USFWS), the Forest Service (USFS), and the wildlife agencies of the three surrounding states (Montana, Wyoming, and Idaho) have acknowledged their responsibilities and control obligations in protecting the grizzly bear. The whole point of current efforts is that, under the terms of the Endangered Species Act of 1973, the Federal Government has been charged with the special responsibility of ensuring the survival of the great bear to the greatest extent possible.

The many threats listed in this paragraph as attributed to Amos Eno are real, and all can be controlled by government. Why Mr. Chase should choose to represent otherwise is hard to imagine.

References: Endangered Species Act, 1973.

NPS. 1982. Final environmental impact statement, grizzly bear management program.

Mealey, S., et al. 1979. Guidelines for management involving grizzly bears in the greater Yellowstone area. USDA-FS.

USFWS. 1982. Grizzly bear recovery plan.

p. 30, para. 3

The claim that "information has been manipulated" is a popular idea among the well-known "barroom biologists" who are quick to offer it but never show any interest in trying to prove it. What information? The remark is vague and conjures up whatever image the reader may prefer about government "secrecy." There is no accountability for this kind of journalistic excess, and thus there is no defense against it except to say that it is untrue. It is untrue, and though it has been made a few times, no proof has been forthcoming.

p. 30, para. 4

Here is the heart of Mr. Chase's supposed case against the agencies, organizations, and individuals who are attempting to restore a natural grizzly bear population in Yellowstone. He makes his case by setting up a strawman, claiming that the Park Service has an idealistic, impractical goal of primitiveness for Yellowstone. If the agency were as impractical and idealistic as he claims, there would be grounds for criticism. However, the many documents upon which current management is based make it quite clear that there are recognized, practical limits to the degree of primitiveness that can be achieved. Through his practice of selective and out-of-context quotation, Mr. Chase has suggested a course of action that the Park Service simply is not following. Park Service management directions are a matter of public record, and anyone interested in understanding them should refer to the documents rather than to Mr. Chase's highly flavored interpretations of them.

A sampling of the documents upon which management is based is given above, in the "references" for our comments on Mr. Chase's p. 30, para. 2.

At this point it must be noted that it is Mr. Chase's erroneous assumption that guides and misleads him through the rest of his article. His specific complaint is that a commitment held by the Park Service and by a host of other concerned groups, including the Audubon Society, to some unrealistic goal of primitiveness for Yellowstone is keeping all these people from accepting the need to change management. He seems unable to come to terms with the possibility that all these people--who run clear across the political spectrum in public and private life--are convinced that his proposed changes simply aren't necessary. This does not mean that this vast assortment of people (and Mr. Chase's barrage is a broad one) would object to management changes if they do seem necessary. It means only that they do not think they are necessary yet.

For example, the Park Service has not ruled out the possibility that at some point in the future it may be necessary to supplementally feed grizzly bears. Mr. Chase seems convinced that the Park Service does not consider that option possible, and he is wrong. He builds a case on the supposed intractability of people that he either has not understood or is misrepresenting for some reason. ?

Later in the same paragraph, there is this sentence:

Based on assumptions that were never examined, this policy has been run not by scientists dedicated to saving the grizzly, but by managers interested in saving the reputation of the government.

It never becomes quite clear what this means. Grizzly bear management in Yellowstone has largely been a response to the data and recommendations of the IGBST.

What crucial studies have never been done? Since 1973 the IGBST has produced more than 60 reports, publications, theses, and assorted other research documents on all aspects of grizzly bear ecology. It is through this sort of careful research that such things as carrying capacity and population trend are determined and monitored (to the extent that such things can be monitored; Mr. Chase implies that science has given us, or can give us, precise answers to all our grizzly bear questions, and he is quite mistaken). This research has as Mr. Chase points out cost a lot of money. Without it we wouldn't even know that the population might be declining. The studies have been conducted under the guidance and oversight of the Interagency Grizzly Bear Committee in its various forms and the Grizzly Bear Recovery Coordinator. Mr. Chase has made a vague claim here and then used it to "prove" something it does not prove. ?

p. 30, para. 5

We suggest, in opposition to Mr. Chase, that there are some good reasons why government grizzly bear policy "still enjoys the support of the federal bureaucracy and many environmental groups." In fact it has had to earn that support; it did not have it so broadly in the early 1970's, and current policies are in part a response to earlier lack of support. Mr. Chase sees this broad support as proof only that all those in favor of the policy are misguided. We see it as proof that the policy is indeed rightly directed. Readers will note, as Mr. Chase continues, that the NPS, USFS, USFWS, and the various state agencies are joined by the National Audubon Society, the Wildlife Society, the Greater Yellowstone Coalition, and the editorial staff of Bioscience in being misguided, according to his estimation. Though he is certainly entitled to his opinion, it remains unclear to us why he is qualified to sit in judgment of this broad array of professional wildlife managers, scientists, and conservationists. The National Park Service is not operating in the absence of scientific advice.

p. 30, para. 6

eliminate from?

Mr. Chase is ignorant of grizzly bear history. His remark that "grizzlies had been chased off the plains" is nonsense. Perhaps he was indulging in some sort of rhetorical flourish. Grizzlies were not chased off the plains; they and their food sources were simply destroyed. To suggest that these bears went somewhere else is to reveal a simplistic understanding of ecology.

Furthermore, the process was far from complete by 1872. In many portions of the west, there were still plains-dwelling grizzly bears at that time.

It would also be instructive to learn from Mr. Chase just where on the plains (we assume he means the Great Plains, having started with a discussion of the Missouri River) grizzly bears were feeding on trout and salmon. Some California grizzly bears may have been displaced from some salmon streams by 1872, but Mr. Chase is not discussing California here.

p. 31, para. 2

Mr. Chase should be responsible for explaining to readers--and to the Park Service--just what portions of the bear's "original ecosystem" was destroyed by the white man. More important than any destruction, which remains unidentified by Mr. Chase, was the augmentation of their natural food supply with garbage. ?

p. 31, para. 3

The quotation by Theodore Roosevelt has been improperly given. A sentence has been deleted following the sentence that ends with the words "special sources of food supply." It should have been noted with an ellipsis. It is, however, a revealing sentence. Theodore Roosevelt, like many others, is recruited to Mr. Chase's cause only as long as his statements support what he is hoping to prove. Here is the entire quotation as it appeared in the original Roosevelt text. We have underlined the portion that Mr. Chase deleted and include all of the first sentence, placing that part of it in brackets that precedes Mr. Chase's quotation:

[I was sorry not to see the bears, for the effect of protection upon bear life in the Yellowstone] has been one of the phenomena of natural history. Not only have they grown to realize that they are safe, but being natural scavengers and foul feeders, they have come to recognize the garbage heaps of the hotels as their special sources of food supply. Throughout the summer months they come to all the hotels in numbers, usually appearing in the late afternoon or evening, and they have become as indifferent to the presence of men as the deer themselves--some of them very much more indifferent. They have now taken their place among the recognized sights of the Park...

We see later that Mr. Chase is interested in proving that the reopening of dumps in the park will be good for the bears. We also are aware that there is considerable disagreement among scientists over whether or not bears that feed on human garbage are less or more likely to become habituated to humans and attack them. Most of the evidence, in fact, suggests that garbage-feeding bears are more likely to attack than those not conditioned to human foods. We wonder if Mr. Chase's deletion of Roosevelt's remarks on the subject is merely accidental or is because Roosevelt suggests that dumps make bears more bold.

?
man-conditioned

References: Roosevelt, T. 1905. Outdoor pastimes of an American hunter.

Herrero, S. 1985. Bear attacks: their causes and avoidance. This second title contains a thorough review of attacks and their relationships to garbage feeding.

p. 31, para. 4

The Park Service certainly promoted the dumps show, but this statement implies they originated it. They did not.

Later in the same paragraph is some more of Mr. Chase's naive ecology. Like a few earlier writers, he has implied that somehow the grizzly bears increased (presumably because of the dumps) from 40 to 260 in ten years. What was happening in that period was an increase in annual visitation of from about 80,000 in 1920 to over 220,000 in 1930. The result was that more and more garbage enabled the dumps to rapidly "recruit" more bears from the wild portions of the park. To imply that this was somehow a real increase in the number of grizzly bears is not realistic.

p. 31, para. 5

Near the middle of this paragraph, Mr. Chase contradicts himself. It was not true that few visitors saw the grizzly bear. Mr. Chase has just reported that many hundreds saw them every night at the dumps shows where the grizzlies were counted.

This and the previous paragraph contain a great deal of chronological confusion. In the previous paragraph, immediately following the mention of dump counts in the period between 1920-1930, he mentions the Rabbit Creek dump, which was not open at that time. Then he tells us of tort claims, though the Federal Tort Claims Act was not passed until 1947. We are not aware of any bear injury in Yellowstone that resulted in tort claims under this act before the 1960's. It is interesting though, that the government was compelled through other legal channels to pay damages to the family of a woman killed by a bear in 1942; that was the first instance of any kind of reimbursement for damages from Yellowstone bear-caused injury.

At the close of this paragraph is another factual error. Later in the article Mr. Chase uses Stephen Herrero's book Bear Attacks to support his case; he should have read it more carefully. Black bears have killed a number of people in North America and may even have been responsible for the 1942 death in Yellowstone.

p. 31, para. 6

There is a factual error in the middle of this paragraph. It is not true that "bear incidents were in decline." They were increasing in the 1950's and 1960's.

References: Statistical summaries of bear population estimates, injury rates, bear mortality, and other related information has been compiled from park files and other sources and presented in P. Schullery, 1980, The Bears of Yellowstone.

p. 31, para. 7

Mr. Chase has not understood the nature of the arrangement between the NPS and the Craighead research team. The NPS requested a population report. They received what was primarily a set of management recommendations, which was not part of ongoing agreements between the team and the NPS. The document submitted, though it contained much preliminary discussion of bears and their numbers, was not a formal evaluation of population; nor did the Craighead team claim it to be so. Mr. Chase appears to have assigned to it a finality of presentation that none of the participants perceived in it.

Note also in this paragraph that the Craigheads in this report (which was entitled "Management of Bears in Yellowstone National Park") reported an increase in population of from 154 to 202. It is worth pointing out that at this point--1967 and up until at least 1970--the Craighead team was convinced that this was essentially a count of the total population. As they said in the report (p. 42), "Because almost all Yellowstone grizzlies visit the refuse dumps, we believe that almost all have been seen and counted from 1959 to 1966." This will become important later in the article.

Later in that paragraph Mr. Chase again reveals his ignorance of ecological science. The science of ecology had its formal origins before 1900. The journal Ecology is in its 66th volume as of 1985. It may not be as old as geology, but it is hardly a new science.

p. 32, para. 3

The last sentence here is mysterious; it is probably intended to be. By saying "if any" is Mr. Chase suggesting that Yellowstone cannot support grizzly bears at all? The historical record offers conclusive evidence that the park and surrounding wild lands can--and for many years before

the arrival of modern man did--support grizzly bears. It is easy to talk about carrying capacity as he has done here; but establishing it is extraordinarily difficult with an animal like the grizzly bear, a secretive, far-ranging, slow-reproducing carnivore of complex habits.

p. 32, para. 4

In the middle of this paragraph we get to a dispute that Mr. Chase does not adequately explain. The Craigheads believed that the dumps compartmentalized people and bears and kept them apart. The Park Service, based on experience in several parks, did not agree; as of yet the scientific and practical jury is still out on an issue that Mr. Chase seems determined to portray as quite simple. At least since the time of the Roosevelt quotation given earlier, many bear authorities have assumed that garbage-feeding causes bears to lose their fear of, or caution around, humans. Current scientific studies, incidentally, are revealing hitherto unappreciated levels of complexity in bear-human interactions; and some of these have further clouded the issue of whether or not dumps can be somehow maintained in bear country without the bears becoming "man-conditioned."

References: See Herrero, as listed above, for a review of past garbage-related research. See the following titles for recent findings on bear-human interactions:

Jope, K.L. 1985. Implications of grizzly bear habituation to hikers. Wildlife Society Bulletin 13:32-37.

McCullough, D. 1982. Behavior, bears, and humans. Wildlife Society Bulletin 10:27-33.

p. 32, para. 5

Mr. Chase has misunderstood the process by which modern endangered species legislation was developed. In 1967 the terms rare and endangered were used without the same legislative meaning as now. Here is how it was at that time. In 1967 there was only a primitive version of the modern legal concept of "endangered species." There was, however, a working document produced by the USFWS called the "Red Book." The Red Book was a tentative listing of animals that either might or clearly did need protection. Here is a paragraph from the third revision of the Red Book that explains the status of these early classifications:

In January of 1964, a tentative list was circulated among the advisors, and comments and suggestions were solicited. With the help of these suggestions a revised list was circulated for review and comment, and with these further suggestions this third revision is now presented as a "working list." It will be subject to continued revision as circumstances change and as knowledge about the species increases. The Bureau will appreciate the continuing advice and comments of all concerned.

It was this informal "working list" upon which the grizzly bear was listed as endangered. There is a world of difference between this degree of protection and that offered by the Endangered Species Act of 1973.

In 1966 there was passed the first endangered species legislation in this country, the Endangered Species Preservation Act of 1966. This act was a halting, almost primitive document that gave little authority or mandate to federal agencies. According to historian Michael Bean, in The Evolution of National Wildlife Law (1977), "the only clearly discernible element of the program it authorized was habitat protection." These were the circumstances. Mr. Chase may like to think that this tentative situation is the equivalent of today's much more sophisticated definitions, but he is wrong to do so. Throughout the period before 1974, including all of the 1960's, it was legal to hunt grizzly bears in lands adjacent to Yellowstone Park. There simply was not the level of concern that later would develop about the "endangered" status of the bear.

Similarly, the claim made four paragraphs later, that "in March 1969 the Interior Department removed the grizzly from the endangered species list, thus sanctioning future killing" is equally misinformed and misleading. In 1969, as in 1967, there was nothing to stop managers--or hunters--from legally killing grizzly bears in the Yellowstone ecosystem. What was actually going on in the endangered species selection process was the revision mentioned in the quotation given above. Mr. Chase implies that the Interior Department needed to change some law to permit grizzlies to be killed; that is nonsense.

p. 32, para. 6

As with some other issues that Mr. Chase has oversimplified, the jury is still out over whether or not rapid or slow closure of the dumps would cause less harm ultimately. The level of harm caused by fast closure of the dumps would cause less harm ultimately. The level of harm caused by fast closure in no way proves, however, that the level would have been lower during a slow closure. Park Service officials and scientists even today suspect that the slow closure, by drawing out the disruption over a greater period of time and allowing just that many more generations of bear cubs to learn to eat human foods, would have done more harm in the long run. Mr. Chase has ignored the substance of Park Service arguments in favor of fast closure here; they are a matter of public record, and were reviewed by meetings of the Secretary of the Interior's Advisory Board in 1969 and 1970.

p. 32, para. 7

What is most important here is that Mr. Chase has his chronology wrong. He is talking about 1967-1969, when the dumps were still open, and he is claiming that the Craighead estimate of a 75% dump census efficiency and

the Park Service estimate of 350 bears, were made then. They were not. The Craighead estimate did not appear until 1974 and the Park Service estimate until 1973.

p. 32, para. 10

The statement that the grizzly bear became "for the first time, a real danger to visitors" ignores historical reality. It ignores for example several dozen injuries caused by grizzly bears before 1969 in periods of less visitation including a fatality in 1916. Grizzly bears are always dangerous to visitors.

p. 32, para. 11

The story of Harry Walker is tragic and complex; Mr. Chase makes it merely simple. Harry Walker was camped illegally outside of a development and food was left around the campground. It is nonsense to say that Park Service actions turned huge carnivores into a menace; grizzly bears are always dangerous to visitors. The question has been to what extent did Park Service management tend to increase or decrease the menace, and the answer is not as simple as Mr. Chase likes to believe.

p. 33, para. 1

There is a technical inaccuracy in this paragraph. The sentence beginning on the seventh line is incorrect. The stipulations were developed in Washington and agreed upon by the National Park Service and John Craighead's supervisor in the U.S. Fish and Wildlife Service. John Craighead was a government employee throughout the study.

p. 33, para. 2

It is worth noting that Yellowstone's Superintendent requested Craighead data on their tagged bears so that park personnel could know the past history of the grizzly bears they were moving. The Craigheads refused to provide it.

It is also worth noting that further information on the bears was still being gathered. Mr. Chase has misunderstood the research techniques of the Craighead team. Very few grizzly bears were radiocollared at any one time. The Park Service did remove these collars, but the collars were not necessary for identification of individual grizzly bears. Individual bears studied and handled by the Craighead team also wore inconspicuous markings, usually small eartags. These tags were not removed by the Park Service but were used to identify individual bears during management action. Grizzly bears that had no Craighead eartags were given new tags by the Park Service. It was Superintendent Anderson's conviction that he was receiving too many complaints about tagged and collared wildlife, and that the collars had served sufficient purpose. The main Craighead study of Yellowstone grizzly bears was essentially complete in 1969; in that

year John Craighead reported that the objectives of the study were 95% achieved. What was terminated was a proposed extension of the study.

There is much question over whether or not the population was being decimated. Work by the IGBST would eventually suggest that the Craighead's claims of the population being decimated were not accurate.

p. 33, para. 3

There is a factual error in this paragraph. If by "grizzly attacks" Mr. Chase means bear-caused human injuries, he is wrong. The average rate of injuries was substantially lower in the period 1970-1975 than it had been in the period 1960-1969. These figures are reviewed in various Park Service bear management reports and were available to Mr. Chase.

References: Cole, G. 1976. Management involving grizzly and black bears in Yellowstone National Park, 1970-1975. NPS Natural Resources Report No. 9.

p. 34, para. 2

This paragraph contains a factual error. Though it is true that the NAS Committee criticized the Park Service in many ways, their report was not "virtually complete confirmation of the Craigheads' conclusions." The NAS, for all its criticism of the Park Service, could not be persuaded that the population was in danger. Indeed, they suspected that it was already on the way to recovery. That is in the NAS Report which is a public document. That, for all the criticisms, gave the Park Service some reason to believe they were on the right track with present management, because bear mortalities dropped rapidly after 1971 (most of these mortalities were not Park Service management actions; for example in 1970, when 48 bears were removed from the Yellowstone ecosystem by all causes, the Park Service killed 12 and sent 8 to zoos. The other 28 were removed from surrounding lands by a variety of agencies, vehicle accidents, and hunter kills).

Mr. Chase's statement that "by 1974 bear mortalities were averaging more than 30 a year" is meaningless without knowing what years he includes. If, for example, he includes 1972-1974, the average is about 17.

Here also is one of his specialties, the vague innuendo, when he says that the NAS Committee noted "that grizzly kills may have been higher than reported..." That is not true. The Committee noted that it had received one complaint of unreported kills. The Committee in fact was unable to get the complainant to substantiate the claim and did not accept the claim. It noted it. It had to, officially.

Mr. Chase has also ignored an important later development in the work of the NAS Committee. In 1975, after further consideration of the Craighead data and Cole's interpretations of it, Committee Chairman Ian McTaggart

Cowan reported a "discrepancy" in the Committee's computations. He reported them to Glen Cole in a letter dated April 29, 1975. This letter is also a public document available from Park Service files. Here is the relevant material from the letter:

In general, the most important change from your standpoint is to increase the number of grizzlies in the "back country" segment of the population so that we will now be estimating that the total population averaged 301 grizzlies over the 1959-1979 period. This is well within the estimates which you are quoting on your pages 19-23.

p. 34, photograph

The caption incorrectly identifies the person as Richard Knight. It is Gary Brown of the National Park Service--unless, of course, the bear happens to be named Richard Knight.

p. 55, para. 1

This paragraph contains a host of misunderstandings. Mr. Chase seems to have great difficulty in understanding the meaning of scientific statistics.

First, to compare Knight's and Craigheads' trapping rates is an apple-and-oranges comparison. The Craigheads' trapping work was done as needed on bears concentrated at dumps and near dumps; they could have trapped even more had they liked. Knight's work was done with bears dispersed from most of these old concentrations. Of course he trapped fewer bears; they were individually more difficult to find. They would have been more difficult whether their numbers were reduced or not.

The same criticism applies to Mr. Chase's comparison of identifying new bears. This process is always more difficult in a dispersed population. The comparison is meaningless as presented.

Furthermore, the statement that the IGBST had "tagged a total of 46" bears is misleading in the extreme. The IGBST had put radio collars on 46 bears; they had handled and observed a great many other bears besides. Perhaps Mr. Chase's confusion results from the IGBST reports concentrating so heavily on the data gathered from those 46 bears. A more complete statistic on radiocollaring could have been provided. By the end of the 1984 field season, the IGBST had radiocollared a total of 118 grizzly bears and monitored them for various lengths of time. Mr. Chase's discussion would lead readers to believe that as of 1979 the IGBST had only been able to find 46 bears. That is not true. As of 1979 the IGBST had radiocollared 46 bears as part of their study. They had observed or handled many others. By 1984, working with a dispersed population and without making an effort to handle or tag every bear in the population, the IGBST had handled 219 individual bears.

One other error of fact occurs in this paragraph. The Rabbit Creek dump, according to Craighead reports, was not the largest one. Mr. Chase has repeatedly referred to it as having more than 100 bears present at once. This is an error. In 1966 there were 48 bears observed at Rabbit Creek, and in most other years the total was less than 35. It was the Trout Creek dump that sometimes attracted as many as 100 bears.

References: Craighead, J. and F. Craighead. 1967. Management of bears in Yellowstone National Park.

Knight, R., B. Blanchard, and D. Mattson. 1985. Report of the Interagency Study Team, 1983 and 1984. NPS.

p. 55, para. 2

The meaningfulness and significance of the numbers presented in the first three sentences of this paragraph depend on at least two things: 1) how many of the Craighead-marked bears died of natural causes in the interim, and 2) what percentage of the population the Craigheads were actually marking. Craighead research tended to mark bears conditioned to garbage; those would be the bears most likely to be removed after the dumps were closed. As we have shown, the NAS Committee supported Park Service contentions that the population of non-dump bears was considerably larger than the Craigheads believed it to be. The question came down to whether or not the NAS Committee was right, and how well the non-dump bears reestablished the population. Mr. Chase's overstatements--and his numerous anonymous quotations, the hardest kind to verify--aside, there is still great scientific discussion and disagreement over these points.

p. 55, para. 3

It is not true the IGBST used "assumptions far more optimistic than the Craigheads had employed." The word "optimistic" may not apply to the situation at all. Copies of the papers by Knight and Eberhardt are available from Park Service files.

More important is another of Mr. Chase's statistical confusions in this paragraph. The rate of observation of grizzly bears varies dramatically with environmental factors. The IGBST has documented with great care the extent to which grizzly bears are or are not visible from aircraft. For example in the period 1977-1979, of 1,826 radiolocations made of instrumented bears, 90% occurred when the bear was in timber; and the vast majority of the rest occurred within 100 meters of timber. Grizzly bears are very difficult to see from aircraft, and only slight changes in environmental conditions can affect the usually very low number of visual contacts that are made. Here Mr. Chase has taken a piece of information that is actually almost irrelevant and used it to make a point. Flights are aimed primarily at locating radiocollared bears; radiolocation occurs whether the bear is actually seen or not, by tracking the bear's signal.

Mr. Chase has then taken this statistical irrelevancy and positioned it in front of the statement that Knight and Eberhardt have concluded that the population is declining at about 2% a year, as if Knight and Eberhardt relied on the changing observation rate to reach their conclusion. In neither of their papers about population trend (1984 and 1985) do they relate observation rate to population status in any way. In other words, Mr. Chase is trying to prove his points using information that will not serve that purpose.

p. 55, para. 8

The statement that the Craigheads have been vindicated requires comment. In their 1974 computer evaluation of the population (the document in which they estimated that their dump censuses counted about 75% of the bears), the Craigheads also estimated the population as of 1974. Based on their interpretations of their data and the mortality totals between 1969 and 1973, they estimated that there were about 136 bears left in the Yellowstone area. This was not a minimum estimate. They further believed that this population was declining.

So, in 1982, Knight estimates a minimum of 200 bears. This would mean that the population somehow "declined" from 136 all the way down to 200. Several hypotheses have been advanced to explain this problem, most of which suggest that the Craigheads were seriously underestimating the bear populations. Of course that is what the NAS Committee and Glen Cole had agreed was the case in 1975. Calling Knight's new estimate a vindication of the Craigheads is as erroneous as calling it a vindication of Cole.

p. 55, para. 10

In this paragraph, Mr. Chase gets into another pet theory, that Yellowstone's grizzlies have been going hungry. Again, he reveals naivete about ecology.

Several studies done of dump bears in North America in the 1970's have established what the Craigheads were suggesting back in the 1960's: that dumps can measurably bolster the nutritional budget of a bear population. With enough free and easy food, bears will grow larger, have more young, and live longer than in a wild state. The reverse is also true; once bears are restored to a natural state, they will not grow as large, have as many young, or live as long. This has nothing to do with hunger; it is merely a response to environmental conditions. Mr. Chase's occasional references to bears "suffering" from insufficient nutrition display an ignorance about the process. Even in a natural setting, there will be great variations in the average weights, litter sizes, and longevity of bears. Indeed, Dr. Harold Picton, a biologist at Montana State University, published a paper in Nature in 1978 in which he demonstrated that the decline in litter size in Yellowstone grizzlies in the 1970's could have been entirely the result of a drying climatic trend that occurred during that time. The 1960's were much wetter, on the average,

in Yellowstone; and population responses to such effects are well documented in many mammals. Knight and Eberhardt, being scientists and knowing the limitations of the data gathered since 1959, were not willing in their 1984 and 1985 reports to estimate to what extent the declines in size were due to dump closures and to what extent they were due to climate. Mr. Chase has attributed the entire loss to the dump closures, and again has misrepresented Knight and Eberhardt's published works.

The misrepresentation aside, it must be restated that these are not hungry grizzly bears. Most of them, as Mr. Chase has told us, were not alive when the dumps were open. With only natural foods they are not growing as large as they did when they had the dumps. There are in various places in North American and Europe grizzly bear populations with much smaller average size than those in Yellowstone.

The issue addressed by Knight and Eberhardt and under discussion by other scientists is rather more complicated than Mr. Chase's number exercises will allow. Knight and Eberhardt point out that the present bear population, at present weights, litter sizes, and longevity, can maintain itself if only we reduce human-caused mortality. They observe that if over the past fifteen years the average mortality of reproducing females had been reduced by only one per year, the population would have at least stopped the decline and may even have shown a slight increase. This has nothing to do with how much bears weigh. It is a question of giving a naturally-occurring bear population a chance to reproduce itself. As Knight and a host of other scientists have pointed out, and as Mr. Chase suggests, the human-caused mortality has, and continues to be, too high. If we are not willing to solve that problem, attempts to somehow manipulate the population's nutrition as Mr. Chase proposes later may be futile anyway.

p. 55, para. 12

The statement that "no systematic work" has been done "on the question of carrying capacity" is nonsense. The entire research effort of the IGBST, as well as formidable vegetation mapping research projects by the Park Service, have all been aimed at least in part at determining how many grizzly bears Yellowstone can support. Such errant claims suggest again that Mr. Chase simply does not understand grizzly bear research.

p. 55, para. 14

Mr. Kay's theories have not been well received by the scientific community, as Mr. Chase himself suggests later. To whatever extent they can be applied to Yellowstone bear management, however, the Park Service has reviewed them when permitted to do so. His theories are not persuasive in our estimation and in the specific cases of reported decline in berry production and loss of cover we have seen no evidence to support the claims.

p. 55, para. 17

In this paragraph we again have reason to wonder why Mr. Chase altered the quotation by Theodore Roosevelt. Here we have Frank Craighead saying that supplemental feeding is natural. The logic of this escapes us. If we accept as a definition of unnatural "things contributed to the ecosystem by modern man" then feeding the bears with man-provided food is unnatural.

p. 56, para. 1

John Craighead has identified the situation well here in this quotation. There were indeed places where nature, and even Native Americans, provided concentrations of food to bears. However, though it may be true that the "bears don't differentiate" (and we are not sure, keeping in mind what is known about bear habituation to humans) park managers must differentiate or lose track of the value system upon which park management philosophy is based. That value system, as explained earlier, encourages avoiding human influence where it is not absolutely necessary. And, as also said earlier, the Park Service and its many supporters in the environmental community do not believe it is necessary yet.

Furthermore if it does become necessary we hope that managers have the dignity not to pretend that supplemental feeding is somehow natural.

The ecocenter has many useful applications in Yellowstone at present. Though there is yet no evidence that Native Americans created such ecocenters in Yellowstone (and thus no reason to feel compelled to duplicate such ecocenters, however prevalent they may have been in other parts of the grizzly's range) there is a growing evidence of several natural ecocenters that did not exist in good size during the Craighead study. Management policies that permitted elk and bison numbers to increase in the 1970's and fisheries regulations that permitted Yellowstone Lake trout to reestablish a robust population after the collapse of the 1950's and 1960's are helping create new ecocenters such as the Pelican Valley, where bears feed heavily on winterkilled bison each spring; the northern Yellowstone elk range, where bears are now regularly denning on known areas of spring carcass concentration; and the many tributaries of Yellowstone Lake, where bears are gathering each spring to eat trout.

p. 56, para. 3

Dr. Knight tells us that he has been misrepresented in this paragraph. He did make roughly the statements shown, but he then concluded that he did not think that there was reason to believe that present policies were not working.

p. 56, para. 6

It is important to point out that, though Durward Allen is certainly not the only person to feel the way he does (assuming that he has been accurately quoted), he is not expressing Park Service policy. He is only voicing a view held by many esthetically-motivated people who are quite willing to admit that they are esthetically motivated.

p. 56, para. 7

Dr. Meagher has objected that she has never made any such statement to Mr. Chase.

p. 56, para. 9-10

It is true and it is openly acknowledged that the decision to remove garbage from Yellowstone is motivated by cultural concerns rather than by purely scientific ones. That is no secret and has been obvious to all reasonable observers. It is equally no secret, however, that these same people believe, based on their best interpretations of scientific information, that keeping garbage out of Yellowstone is also biologically possible without losing the bears. The IGBST has generated a wealth of information that the Park Service and many independent groups believe has suggested that this is possible. Mr. Chase unwittingly falls into the rut he accuses many others of being in; he sides with those few who insist that garbage is natural. People holding this position are also relying in part on cultural definitions--or what Mr. Chase curiously describes as metaphysics--to promote their case. His notion that one's position on the garbage issue is somehow used as a measure of one's environmental awareness is seductive, but we are not aware of its application during the controversy. He is attempting to show that scientific arguments were bypassed in the interest of philosophical preferences, but the debate between the Park Service and the Craigheads as it was waged in the technical literature is a debate over numbers of bears, not over the philosophical issue of whether a bear eating garbage is natural or unnatural. The Park Service wanted to go as far as practical in restoring natural balances in the park; that was philosophical preference that was established as the agency's mandate. Though the Park Service did sometimes question the Craigheads' understanding of that mandate, it was because of scientific disagreements not philosophical ones that the Park Service did not accept Craighead recommendations about feeding bears.

p. 56, para. 13

It may be that the staff of the Greater Yellowstone Coalition will respond to this themselves. It seems to be a poorly veiled accusation that the Coalition simply used the grizzly bear to further other ends. In fact, the IGBST has established as did the Craigheads years earlier that the lands outside the park, well over two millions acres of them,

are of critical importance to the grizzly bear. If Mr. Chase does not agree with the Coalition, the IGBST, and the Craigheads on this point then he ought to explain why his information is better than theirs.

p. 56, para. 14

Here Mr. Chase cuts a wide swath through the ranks of the grizzly bear's protectors. It is unlikely that the various "watchdog" organizations that have so often criticised various aspects of park policy will take this accusation of an "unholy alliance" happily. Indeed, the watchdogs showed signs that, rather than relinquishing their role, they were finally seeing management act the way they wanted it to.

But behind Mr. Chase's remarkable accusation that all the good guys got together behind the wrong idea is a very troubling thought. How is it that Mr. Chase can be sure that he has this situation figured out better than the host of lifelong professional managers, scientists, and assorted other conservationists who have spent many years sorting out the metaphysical from the facts? He is calling not just the Park Service, and not just some of this country's foremost conservation organizations, but also some of our most distinguished ecological thinkers and writers--Sigurd Olson, he says, and others--fools who could not distinguish science from esthetics.

p. 56, para. 16

Knight was not alone in objecting to the saturation trapping which seemed a bad idea to many observers and authorities.

p. 57, para. 1-4

It is unfortunate that someone violated the confidence of this memorandum, but it is more unfortunate that Mr. Chase has chosen to exploit and distort its intent. Dr. Meagher was at that time Supervisory Biologist in Yellowstone and was dealing with a perceived personnel issue, not a political "problem." It is, additionally, absurd to say that Knight's star "waned." As Mr. Chase will show later, it did not wane at all; and Knight's study has since that time entered its most published stage.

p. 57, para. 7

Mr. Chase implies that Wauer was "reassigned" for reasons to do with his memo. He should ask Mr. Wauer or any other person involved if there is any reason to think so. The fact is Mr. Wauer's transfer was of his own wish and was in the planning stages quite some time before the memo was written.

p. 58, para. 2

Here we find Mr. Chase attacking one of the most distinguished of American conservation organizations, the Audubon Society. Audubon, through its officers and magazine, has not been consistently a supporter of the Park Service program but in recent years has indeed backed the program more. For Mr. Chase to assume that they are doing so out of some conspiratorial misdirection is outrageous. These people have been conserving and preserving nature for longer than the National Park Service; they may not always be right, but their credentials are infinitely superior to Mr. Chase's.

p. 58, para. 6

There is a factual error in the first sentence. The ad hoc committee was created by the IGBC, not by the Interior Department.

p. 58, para. 7-8, p. 59, para. 1-3

Mr. Chase has misunderstood the findings of this committee and has done no justice to the presentation of information in their report. The committee's findings are available from Park Service files.

Again Mr. Chase has relied on loaded language - the bears "suffered from lack of food." The bears were not suffering hunger pangs any greater than bears normally suffer; they simply weren't growing as large, having as large litters, or living as long as they had when there were dumps.

His statement that annual man-caused mortalities of bears was only 4.18 during the dump era results from an apparent misreading of a table in the committee's report. When hunting kills are included in that figure, the annual man-caused mortalities of bears in the period 1959-1969 was 19.5.

Mr. Chase has found a statement in the committee's report that he can use to support his case. To use this one is to ignore the thoroughness with which the committee explained why the state of affairs existing in the 1960's, when the dumps may have helped hold bears in some safety, is no longer in effect. For example, he could have quoted the following remark, made later in the report, after due consideration of current conditions:

Supplemental feeding is not a cure-all and should not become a substitute for proper management of habitat and human activities inside and outside of Yellowstone Park.

More importantly on page 59, he has ignored many other considerations by the committee of the consequences of supplemental feeding. The committee simply did not concede "all the arguments in favor of supplemental feeding." In fact they presented a clear, powerful, and scientific set

of arguments against it. If Mr. Chase genuinely believes that such concessions were made in the committee report, he is mistaken.

In the second paragraph on page 59, Mr. Chase has misinterpreted the committee's statement about cutting the elk herd. The statement in parentheses should be in brackets because it is not the committee's statement. It is Mr. Chase's and it is erroneous; because the committee was at that point discussing only one of the park's herds, the northern herd. The most recent count was less than 18,000, and the total number in the herd may or may not be 20,000.

p. 59, para. 9; p. 60, para. 1-2

Now that Mr. Chase has chosen to expose Mr. Kay's rejection to uncounted numbers of Americans, it probably would do no further harm for the editors of Outside to contact the editors of BioScience to see how they feel about their assessment of Mr. Kay's work. It would appear at this point that the editorial staff of BioScience, one of the most distinguished journals in its field in the world, has joined the Unholy Alliance. Could it not be that Mr. Kay's paper was not suitable for genuine, scientific reasons? Neither Meagher nor Servheen asked to see the manuscript. It is difficult to second-guess the editors of BioScience, but it could well be that Mr. Kay's request that certain reviewers not be used was a clear signal that something was amiss and that just those reviewers should be involved. A factual error by Mr. Chase tends to heighten the confusion: Servheen is not a Park Service biologist. He is an employee of the USFWS.

p. 60, para. 3

Here again we encounter Mr. Chase's confusion over starving bears. We can only assert again that the bears are not starving. The dumps have now been closed for fifteen years; and the grizzly bears, though not growing as large as they did before 1969, are still growing to sizes well within the normal range for bears. An impoverished ecosystem could not produce such animals, much less the occasional 400-, 500-, and even 600-pound grizzly found in Yellowstone.

More importantly, Mr. Chase is in error that the IGBST or the Park Service consider the issue of habitat destruction settled. The opposite is true. Park Service managers, especially Superintendent Robert Barbee, have been quite outspoken on the need for heightened attention to protection of habitat, recommending in the face of enormous political pressure that the Fishing Bridge development in the park must be removed to restore key bear habitat.

p. 60, para. 5

We disagree with Mr. Chase that the Wildlife Society has supported bear policy for the wrong reasons, but we suppose that it is up to the Society

to explain itself. We see its support of the Park Service as one more sign that park policy is what we believe it to be: properly directed.

p. 60, para. 7

This paragraph is simply untrue. In fact environmentalists and their bureaucratic counterparts were listening to biologists. They were listening to the IGBST and the ad hoc committee on supplemental feeding. Mr. Chase may not consider them biologists, but they are currently the leading authorities on the Yellowstone grizzly bear. He, on the other hand, is listening to Frank and John Craighead, both of whom have been renowned scientists in their day but neither of whom has been directly involved in Yellowstone bear research for fifteen years. Frank retired after the Yellowstone project, and John has shifted his studies to other areas. Their opinions should indeed be sought--and are, in the case of John, who is still active in science--but they must be weighed against the opinions of other, more currently qualified authorities. Mr. Chase is pretending, apparently, that the IGBST favored supplemental feeding when that is not true.

p. 60, para. 10-11

It should be explained that at the time of this incident Mr. Phillips had already retired from the Park Service. He was not there in any official government capacity. It is unfortunate that he made no effort to report or check on the noises he heard, because then the noises simply enter the record as possible shots. They could also have been firecrackers, car backfires, or any of several noises associated with construction then going on the area. The Park Service has no record of these shots. The Park Service does not use rifles for bear actions in developments. So, if he did hear a shot and if it was a rifle shot, then it was not fired by the Park Service anyway.

Mr. Phillips might also have checked on the past record of this supposedly "innocent" bear. It and its sibling had been involved in a series of problems, including trying to get into trailers and shoving a fisherman from behind which was very close to an actual attack. Mr. Phillips also is misinformed about trapping procedures. Gary Brown reports that at the incident in question there were two "weapons" present; one was the standard shotgun, necessary at all bear actions, and the other was the "cap-chur" gun, a gun that fires a hypodermic dart.

p. 61, para. 2

There is a factual error in the report. The total of research mortalities since 1973 is four, not six.

p. 61, para. 3

Indeed, even under the best of circumstances with poaching controlled and other forms of human-caused mortalities reduced as far as possible, management will probably be among the leading causes of bear deaths because managers are the only ones legally allowed to kill grizzly bears in the Yellowstone area and thus will be responsible for removing the inevitable occasional problem bear.

Management is truly interagency. In 1983 for example, of six man-caused removals, five occurred outside Yellowstone. Only one was the result of Park Service actions--a bear removed to a zoo. In 1984, of nine man-caused removals, three were from Yellowstone.

The bear's future depends upon many agencies working together, and by far the gravest threats to the bear's welfare are now on those contested lands outside the park itself.

p. 61, para. 4

There are factual errors in this paragraph. No bears simply "traveled to Gardiner." Sow number 10, for example, was relocated out of Cooke City, which is near the northeast corner of the park, to mountains northwest of the park. From there she found her way to Gardiner.

The cub did not have a broken foot. There was a compound dislocation.

p. 61, para. 5

West Yellowstone's "bear problem" did not originate after the closure of the Rabbit Creek dump near Old Faithful. This community had had bears walking the streets for many years, and its problem got considerably better once its own dump was closed.

p. 62, para. 1

It may be that Mr. Chase is unfamiliar with the customary weight loss of grizzly bears during denning; he makes a point of telling how much bear number 15 had lost, as if this is revealing. Number 15 was a large bear. Even after the weight loss he still weighed well over 430 pounds when trapped the last time. Grizzly bears commonly lose 20 to 25% of their weight during denning and in the first few weeks after emergence; in some northern habitats the loss may be as high as 40%. There was no indication during any of number 15's earlier trappings or from the autopsy following his death that he was suffering from "starvation." He was in good health. There is no reason to believe that number 15 killed Mr. May because the bear was unable to get other food. Number 15, in fact, normally came out of denning in February or March; and in the unusually long spring season this gave him he had shown ample skill at feeding himself, sometimes on garbage.

p. 62, para. 6

This is an odd discussion. Grizzly bears, just reported as disappearing, are now "everywhere." There were injuries that year, a total of five in four incidents including the fatality. Keep in mind, however, that in the 1960's during the dump feeding era, grizzly-caused injuries average 4.4 per year. By the 1980's backcountry use had increased several hundred percent. Indeed, the parkwide average annual grizzly bear injury total from 1971-1985 is considerably lower than it was in the 1960's despite great increases in backcountry use.

p. 63, para. 2

This discussion of bear actions takes them out of context. It is impossible for the reader to judge these actions based on Mr. Chase's reporting of them. Each case must be understood in terms of the bear's past history. These bears were involved in various behavior problems including chasing people, destroying property, and displaying determined habituation to human food sources. The two accidental deaths excepted, the bears were no longer showing any potential for remaining in the Yellowstone area without grave risk of a more serious problem. It is regrettable that they had to be removed, but the removals only point up the need for increased efforts to prevent humans from affecting the bears' behavior.

p. 63, para. 5

Mr. Chase is ignorant of the IGBST work here. Had he asked Dr. Knight, he would have learned that the IGBST is sure that carrion use is on the increase. A 1984 Park Service publication entitled Fishing Bridge and the Yellowstone Ecosystem documented similar and substantial use of bison carcasses by grizzlies in the Pelican Valley. It is wrong to suggest that the grizzly bears are not adjusting to and exploiting the increase in carrion; Dr. Knight has also documented a tendency by bears to locate their dens in areas of known spring carcass concentration.

p. 64, para. 2

The issue of grizzly aggressiveness is not a new topic either within or without the scientific community. Why Mr. Chase chose to introduce it here as a new development is unclear.

p. 64, para. 3

On several occasions on this page Mr. Chase quotes Dr. Charles Jonkel. Mr. Chase might also have told his readers that Dr. Jonkel, among the most outspoken and independent of grizzly bear authorities, has gone out of his way to express his disapproval of supplemental feeding of the Yellowstone population. In Dr. Jonkel's words, it is a "quick fix approach, not worthy of serious consideration."

p. 64, para. 5

Mr. Chase has not understood Herrero's statement at this point. Herrero, in the book quoted, spoke specifically about bear number 15 and did not attribute the attack to any of Mr. Chase's discussed possibilities. By placing the quotation from Herrero where he did, Mr. Chase leaves the impression that the bear may have attacked because it was not getting enough natural foods to eat. In fact, Herrero proposed that it was garbage feeding that ultimately was the most likely contributing factor. Herrero's own words are useful here. He discounted the possibility that Sernalyn was responsible for the attack:

A more likely contributing circumstance was the bear's habituation to people and its history of garbage feeding. Its first known association with garbage and people was at Pelican Campground, Yellowstone Park, where it was captured in 1971. In 1974, number 15 was captured three times at West Yellowstone dump. Through the years it became so familiar with trap sets that it could get bait without always being caught. Up to 1982 it apparently only fed on garbage intermittently but during fall of that year garbage became increasingly important to it.²⁴ Just prior to the fatal attack on May "strong evidence" indicated the bear obtained garbage or dog food within 200 yards of where May was killed. This food came from private residents who were not securing garbage properly.

This suggestion that bear 15 was behaving more aggressively because of its acquaintance with human foods is of course evidence against Mr. Chase's proposal to reopen the dumps.

p. 64, para. 7

There was indeed a closed session at the IGBC meeting during which the Committee members discussed the possibilities and details of aversion experiments. There was also a public session to review the situation. This session was attended by many journalists, including representatives from Time. The implication of "secret" meeting is that something was withheld from the public, but Mr. Chase never suggests what it might have been or what is wrong with a government body having a closed session for practical reasons to get some work done without undue interruptions.

p. 65, para. 1

Dr. Knight tells us that he did not oppose the idea of the experiments.

p. 65, para. 2

Mr. Chase's conclusions are rhetorical overkill. For one thing, no agency is using angel dust to change the behavior of the bear. For

another, attempts to develop aversives are simply proof that the Park Service does not have an idealistic, unrealistic goal of primitiveness in mind for the Yellowstone grizzly. His statement that the black bear has all but disappeared is unfounded. The "researchers" he refers to are the IGBST, whose studies of grizzly bears have resulted, incidentally, in some black bear sightings. To take these incidental sightings as proof of what Mr. Chase claims is poor thinking and irresponsible journalism. A researcher who is looking for grizzly bears will not necessarily see black bears, because the two species, where they cohabit, do not use the same kinds of habitat equally. It is generally assumed that there are not as many black bears in the park as there were when they were being fed at the dumps and along the roads. There are still unanswered questions about the ecology of the black bear in and around Yellowstone.

It is likely that without human food sources the black bears may have declined in numbers too. Members of the IGBST suggest that Yellowstone is not especially good black bear habitat in any case, and that the new lower numbers may simply be a response to the natural limitations of food supply. To Mr. Chase that may mean that the black bears are "starving;" it is hard to tell just what he thinks. To the Park Service, it means that black bears are more in balance with their environment than they have been for more than 80 years. It also means that there are some splendid opportunities to learn from this new black bear population.

In one particular we share Mr. Chase's alarm. The high mortality of grizzly bears simply must be stopped.

p. 65, para. 3

Estimating minimum viable population size has been a popular and helpful exercise among biologists in recent years. Mr. Chase has presented only one estimate, the highest of many that range from 50 to 125. A fascinating review of both Yellowstone grizzly bear population modeling and minimum viable population estimation is D. McCullough, Interpretation of the Craighead's Data on Yellowstone Grizzly Bear Populations, and Its Relevance to Current Research and Management, presented in 1983 at the Sixth International Conference on Bear Research and Management, Grand Canyon, Arizona. Even if the estimate of 125 is the correct one, we must wonder over Mr. Chase's alarm at a population that is currently estimated to be at least 200. It would appear that managers do have a little room to work with here, to see if perhaps the population will find some new carrying capacity as Knight and Eberhardt have proposed. We do not, however, underestimate the importance of keeping the population well above any reasonable estimate of minimum viable population size.

p. 65, para. 5

This unnamed official obviously shares Mr. Chase's confusion over the number 46, which refers only to bears radiocollared. See earlier comments referring to this problem on page 55 of the article.

p. 65, para. 7

Here at the end of his article, Mr. Chase's various opinions seem to achieve their most confused state. On the one hand he wants to end all trapping, transplanting, and drugging of bears for research. On the other hand he wants research to "begin" on whether or not the park can support grizzly bears naturally. It is just this kind of habitat-bear relationship that the IGBST (and the Craighead study before it) has been concentrating on since 1973. As the National Academy of Sciences Committee on the Yellowstone Grizzly pointed out in 1974, it is only by handling and marking grizzly bears that anything substantive can be learned about their population dynamics (and thus, the carrying capacity of their range). Mr. Chase seems to want it both ways and seems to be unaware that the various IGBST reports he has quoted are part of the effort he is proposing. A complete list of IGBST reports and publications, as well as a complete list of related Park Service reports, is available from the park; these are impressive evidence that the process of determining carrying capacity has been going on for a long time. If Mr. Chase is uncertain of the meaning of the term carrying capacity, the Park Service would be happy to suggest a reading list on the subject.

In order, for example, to stop killing grizzly bears as Mr. Chase proposes, it will be necessary to develop aversive techniques that do not now exist or be prepared to let grizzly bears behave with an assortment of aggressive actions hitherto considered unmanageable. The only way to develop those techniques and to have confidence in them in the Yellowstone area may be to experiment with them in the same place. Research cannot offer the kinds of absolute answers about aversives, carrying capacity, or some other subjects that Mr. Chase seems to believe it can. Furthermore, he seems not to understand that for many years now managers in the Yellowstone area have not been killing grizzly bears "except in the most extreme circumstances"--to use his words.

p. 65, para. 8

Again we must challenge Mr. Chase's notion--and singular personal confidence--that the broad array of agencies, groups, and individuals committed to the protection of the grizzly bear are misguided. His presentation is more than unconvincing. It is ludicrous.