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20 March 2006

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Re: Removal of Yellowstone grizzly bears from ESA Threatened Status

Dear Dr. Servheen,

The International Association for Bear Research and Management (IBA) has carefully reviewed the U.S. Fish and Wildlife Service proposed rule to (1) establish a distinct population segment (DPS) of the grizzly bear (*Ursus arctos horribilis*) for the greater Yellowstone Ecosystem and surrounding area, and (2) remove the Yellowstone grizzly bear DPS from the Endangered Species Act List of Threatened and Endangered Wildlife. We offer the following suggestions and insights to these proposals.

IBA is the professional organization for wildlife biologists working to conserve and restore the world's bears through research, science-based population and habitat management, and education. Our organization is comprised of nearly 600 bear specialists from 47 countries and includes university professors, biologists working in natural resource agencies, non-governmental organizations, and zoos, graduate students, and educators. Our members conduct scientific research, monitor and manage bear populations, and work to prevent human-bear conflicts. IBA sponsors international conferences and publishes the peer-reviewed scientific journal "Ursus" which is the foremost source of technical and scientific information about the world's 8 bear species. Nearly all biologists involved in bear conservation throughout the world belong to IBA and we offer our expertise to providing science-based independent perspectives and suggestions relative to the proposed management changes.

The grizzly bears of Yellowstone National Park have been studied intensively for a longer period of time than any population of bears in the world. Following population decline during the early 1970s, data presented by members of the Interagency Grizzly Bear Study Team document a gradual increase in Yellowstone grizzly numbers that began in the mid-1980s and has continued to the present. It is a compelling testament to the conservation value of the U.S. Endangered Species Act (ESA). This record serves as an example of the steps that can be taken to reverse the trajectory of threatened populations of large carnivores and other species.

The IBA recognizes the successful efforts of the Interagency Grizzly Bear Study Team, Interagency Grizzly Bear Committee, Grizzly Bear Recovery Coordinator, Yellowstone Ecosystem Subcommittee, independent scientists, committed non-governmental organizations and others who have been instrumental in reversing the decline of this important population of grizzly bears.

The goal of the ESA is to devise an effective management approach that will lead to the recovery of species listed as Endangered or Threatened and result in their removal from that list. We fully support this goal. However, because it is difficult to achieve total security for a population or to scientifically identify the precise point at which a population is "reasonably" robust to demographic perturbations, substantial debate is to be expected among both scientists and members of the public regarding potential responses by wildlife populations to changes in management that may accompany changes in their designated status. In the case of Yellowstone's grizzly bears, varying interpretation of the facts has led different experts, all of whom have the best interests of bears in mind, to hold divergent opinions regarding how much certainty should be required to formally recognize the population status as Recovered.

The grizzly bear population of the GYE has done well under ESA protection. Both delisting and retaining threatened status have the potential of providing benefits or posing risks to the bear population. Our concern is to ensure that whatever course of action is taken regarding delisting, management practices remain adequate to assure that the grizzly population of the GYE continues to thrive. We outline our concerns regarding the need for continuing research and monitoring of population demographics, habitat and food resources upon which the bears depend, and issues of connectivity and genetics of the Yellowstone bears. Commitments to fund the necessary work will be crucial to ensure that any reversal of positive trends will be detected and addressed in time to prevent another serious population decline.

Therefore, on behalf of the association's membership, the IBA Council supports and submits these comments respectfully and in good faith that they may help inform a complicated debate and lead to an improved future for the bears of the Greater Yellowstone Ecosystem.

To assist the IBA Council, our association's governing body, in assessing IBA's response to the proposed rule, we convened a committee to critically review the substantial body of material that comprised important aspects of the rule. The IBA Council fully adopts, as

an integral part of IBA's findings, the committee's assessments of issues that should be addressed in the proposed rule. To avoid redundancy, we do not reiterate the committee's findings here, but direct your attention to their report to Council, at the end of this letter. The placement of those findings in no way detracts from their importance to our assessment.

1. We agree that grizzly bears in the Greater Yellowstone Ecosystem comprise a Distinct Population Segment. However, we also recognize that the long-term persistence of the population would be substantially enhanced by re-establishing connectivity with populations to the north. Unfortunately, current ownership and development patterns on lands separating bear populations make it unlikely that such connection will occur. Similar lack of connectivity is an issue for the recovery of other isolated grizzly bear populations in the western US, as well. If the GYE bears are to be treated as a DPS, we urge that the same attention be directed to these other isolated populations, and that their status be similarly assessed and evaluated.

As a Distinct Population Segment, grizzlies in the Greater Yellowstone Ecosystem are isolated genetically with little likelihood of immigration to the area from other populations. Because of the documented loss of genetic heterogeneity related to this isolation, and advances in conservation genetics science since the 1993 USFWS plan, we recommend that whether or not delisting occurs, specialists in bear genetics, including a population ecologist, be impaneled to conduct a new comprehensive analysis of genetic issues that may affect the population and how to best mitigate impacts. The panel should (1) address the potential importance of further inbreeding and other problems to genetic health of the population, (2) assess whether augmentation of bears from nearby populations is advisable, and, (3) if so, recommend the number and frequency of translocations that should take place. Efficacy of any translocations undertaken should be assessed by monitoring the survival and breeding success of translocated bears through radio telemetry.

Regardless of the practical difficulties inherent in re-establishing connectivity, augmentation to achieve genetic health of a population is a poor second choice. Proactive management designed to maintain or re-establish connectivity between populations is **always** preferable to having to resort to mitigation measures that require translocation of bears or augmentation of populations. We recommend that despite the practical difficulties that exist in re-establishing connectivity, all opportunities that arise which could contribute to connectivity be pursued. Specifically, we continue to recommend re-establishment of the Rule that was rescinded by the US Department of Interior in 2001 to re-introduce grizzly bears to the Bitterroot Ecosystem of Montana and Idaho.

2. The studies of Yellowstone population undertaken since 1975 under the auspices of the Interagency Grizzly Bear Study Team provide compelling evidence that the grizzly bear population in the Greater Yellowstone Ecosystem has increased in both density and distribution since the mid-1980s. According to these studies (Schwartz et al. 2006), data suggest that in the core population recovery area, bear density is approaching carrying

capacity. Further increases in population cannot be expected within the core area, but may occur primarily through further expansion of geographic range into surrounding areas.

The Conservation Plan specifies that population monitoring based on unduplicated sightings of females with cubs-of-the-year will continue. Recently developed methodology uses these same data to estimate both population size and trend. However, it is unclear how this methodology can take into account the likely demographic differences between bears in the core range versus those in the expanding front of the population. Sex-age composition, reproductive rate, and mortality rate at the edge of the range are potentially quite different from those at the core, particularly as the core population approaches carrying capacity. Additionally, if all population assessment is based on counts of females with cubs, demographic changes may be missed or only detected after considerable time lag. For example, age of first reproduction is likely more sensitive to changes in food supply than litter size or pregnancy rate, with significant effects on population reproductive rate, yet changes in this parameter are largely invisible in the absence of studies using radio-telemetry. We recommend that telemetry studies be conducted to explore these questions and supplement traditional data on sightings of females with cubs.

3. The Proposed Rule has criteria that lead to a required "Biology and Monitoring Review"; however, it lacks a clear set of demographic and/or habitat effectiveness conditions that would lead to automatic or expedited relisting. This should be a required condition of delisting for several reasons. First, inclusion of these conditions would serve to allay some of the controversy surrounding the proposed delisting. Such conditions should be broadly acceptable to those who maintain that delisting will enhance continued improvement of conservation status of the grizzly in the area. At the same time, it should help to ensure that demographic and habitat suitability/security conditions would not deteriorate, and therefore help to satisfy concerns of those who oppose delisting.

Further, delisting should not occur without safeguards that require participating jurisdictions to monitor the same population parameters using comparable methodology that enable consistency of analysis of population changes. Standards should produce sufficient precision in analysis to justify management responses. Methodology and measurement of population and habitat parameters must be comparable across jurisdictions in order for the entirety of the assessment and management actions that may follow to be effective.

Regardless of whether the proposed rule is accepted by the US Fish and Wildlife Service, we suggest other techniques be considered for monitoring of the habitat criteria. For example, Resource Selection Functions (RSF) may provide a more empirical approach compared with the currently used Cumulative Effects Model. In addition, we also suggest that production, growth rate and survival of cubs of radio-collared females be monitored as additional indicators of habitat capability/value.

4. Present programs and practices in the GYE that promote coexistence between bears and humans have been very successful and we expect these practices to continue. Further, if the decision is made to delist the grizzly bear and thereby transfer authority to state rather than federal agencies (i.e. more local control), this should be accompanied by systematic and robustly designed research in human dimensions/human attitudes towards grizzly bears. Documenting changes in attitudes towards grizzly bears by local residents concomitant with delisting, elucidating why changes occur, and how changes are manifested, could contribute substantially to our understanding of the human side of wildlife management, for helpful reference in future situations.

5. The Conservation Strategy outlines management plans that provide for monitoring of habitat, food sources, mortality, and demographics in all 3 states. We believe that these provisions can provide a reasonable degree of protective feedback to alert agency managers of shifts in population demographics or habitat conditions, **if implemented as written, and enhanced as suggested both above and in the addendum below**. However, multi-year commitment of funds, personnel, and political support on the part of the states is critically important to the success of this Strategy. Population and habitat monitoring on the scale described are expensive and complex. Yet, the sources of the money to implement monitoring fully and consistently with multiyear commitment have not been identified.

As currently worded, the Memorandum of Understanding between the signatories of the Conservation Strategy can be interpreted as implying that if funding for monitoring and management is not available, then those activities will not be accomplished, leaving assessment of delisting unknown. This section reads, "Funding of this MOU is subject to approval and appropriations by approved state and federal entities. All agencies will take appropriate steps to seek funding to implement this document. The adequacy of the regulatory mechanisms demonstrated by this Conservation Strategy is dependent upon funding being available to fully implement the management and monitoring actions detailed in this document."[1] There is no stated or agreed-upon course of action should any or all of the states fail to adequately fund or carry out their part of the agreement. If this interpretation is correct, we find that continuation of recovered status must be contingent upon maintaining appropriate funding levels necessary to accomplish monitoring and management crucial to assessing population status. Therefore, we find that if delisting occurs, non-allocation of the funding necessary to monitor and assess the status of the DPS should be included as a condition that should automatically trigger consideration for re-listing.

The IBA Council hopes that the suggestions that follow and those above are helpful and will be instrumental in improving the conservation efforts necessary to maintain a viable grizzly bear population in the Yellowstone Ecosystem far into the future.

[1](http://mountain-prairie.fws.gov/species/mammals/grizzly/ConservationStrategygrizzlybearGYA.pdf p.12)

Sincerely,

Harry Reynolds
President
International Association for Bear Research and Montana

Addendum:

Report of the IBA Committee to Review Delisting of the Yellowstone Grizzly Bear

3 February 2006

Dale McCullough, Chair
Professor Emeritus, Ecosystem Sciences; University of California Berkeley
Fred Allendorf
Professor, Biological Sciences; University of Montana, Missoula
Andrew Derocher
Professor of Biological Sciences; University of Alberta, Edmonton
John Schoen
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Introduction

As requested, our committee has reviewed the documentation for delisting, and done an evaluation of the case for delisting the Yellowstone grizzly bear from the ESA. Our review can be summarized as: 1) reviewing the population analysis supporting the decision to delist; 2) discussion of issues of genetic management; 3) reviewing the proposed plans to continue management of grizzly bears in the Greater Yellowstone Area (GYA) should delisting occur; and 4) discussion of the pros and cons of the IBA taking a position on the issue. In essence, we have treated the science issues first, the most uncontroversial area, and then moved on to the socio-political aspects, the more debatable topics. We do not make a specific recommendation on whether on not the IBA should go on record as supporting delisting. Instead, we try to frame the issues in a way that will help the IBA to make their decision. Regardless of IBA's final decision on this issue, our committee recognizes the significant accomplishments of the Interagency Grizzly Bear Study Team, Interagency Grizzly Bear Committee, Grizzly Bear Recovery Coordinator,

Yellowstone Ecosystem Subcommittee, and others who have worked effectively to turn this population around since it was listed three decades ago as threatened.

Review of the Issues

Meeting Delisting Criteria

The revised method for calculating total population size is intended to be appended to the Recovery Plan and the Conservation Strategy. The revised method uses counts of adult females with cubs-of-the-year to the total number of independent females and then moves through a modeled sex ratio based on population structure to determine the number of males. Lastly, the number of cubs < 2 years old is added to obtain the total population size. In general, such approaches to estimating population size are vulnerable to error because of errors in any particular term caused by annual variation, or more seriously, by directional trends. Estimating grizzly bear populations is a difficult and expensive task. The approach originally developed for the Yellowstone Ecosystem was the best available at the time, given the available tools and resources. However, a more reliable inventory of the population is possible today given advances in DNA mark and recapture methods and this would have been preferable. Is a DNA based estimate essential? No, but it would increase the accuracy of the population estimation.

For this section, we assessed if the methods being applied were 1) state-of-the-art, and 2) adequate to address the application to remove grizzlies in the Greater Yellowstone Area (GYA) from the Federal List.

On the first point, we do not believe the methods are currently state-of-the-art although the document "Reassessing methods to estimate population size and sustainable mortality limits for the Yellowstone grizzly bear" provides a thorough overview of the approach taken. Fundamentally, the method as presented is vulnerable to error although it is scientifically rigorous. Our preference would have been to see confirmation of the ratio-based approach using an independent estimator directly from a mark and recapture study using hair snags and DNA. Perhaps this is an approach that could be considered as a supplemental tool for future management whether or not the population is delisted.

Is the method adequate to support an application to delist grizzlies? This question is more difficult to answer. Under the "current method", the minimum population size in 2004 was 431 bears but this increases to 588 in 2004 if the "revised method" is applied. The increase in numbers is due to the modeling approach used. Ratio-based methods are prone to error and the change in methods alone reflects a difference of 157 bears, or roughly 36% of the "current method". We have less than complete confidence in such an approach although it is a good second choice if no direct estimations are available. Ratio methods evolve over time as new information or approaches are applied, and in another 5-10 years the 2005 "current method" may well be considered inadequate.

Demographic Recovery Criterion 1 – (Maintain a minimum of 15 unduplicated females with cub-of-the-year over a running 6-year average) it appears likely that the criterion, as

stated, has been met and that the inventory approach applied is sufficient. However, there remains the question of whether or not this criterion was sufficient in the first place.

Demographic Recovery Criterion 2 – (16 of 18 bear management units within the Recovery Zone must be occupied by females with young with no 2 adjacent bear management units unoccupied during a 6-year sum of observations). This criterion was stated as being met and the only merit of this issue deals with a broad geographic base for the population. This issue is not controversial although the data are not clearly presented in the Federal Register.

The approach taken for estimating known-to-unknown mortalities is also difficult to assess without undertaking a review of the supporting references cited in the document (Cherry et al. 2002, and Study Team 2005). The change to the new ratio of known-to-unknown (1 to 1.7) is certainly more conservative than the old one (2 to 1) but there are no means of verifying the reliability of the estimate.

We are uncomfortable with the conclusion in the Register that "Independent males can endure a relatively high mortality rate without affecting the overall stability or trajectory of the population…" At some point, a reduction of males in a population will affect recruitment, and there should be some means of detecting if that point is being reached. Further, possible destabilization of population structure through removal of males is an issue that warrants further investigation, as studies are not conclusive on this point.

Demographic Recovery Criterion 3 – (running 6-year average for total known, human-caused mortality should not exceed 4 percent of the minimum population estimate…). While the criterion has been met, as stated, we question the merits of the criterion itself. Human-caused female grizzly bear mortality cannot exceed 30 percent of the mortality in any 2 consecutive years and this level may be sufficient; nevertheless, it needs to be considered within the context of total mortality.

Distinct Population Segment - Defining the area as a distinct population segment was logical from a biologically and bureaucratic perspective although it ignores recovery in a broader ecological context of connectivity. The decision that 130 km is "too far for normal grizzly bear dispersal distances" is a statement that ignores specific conditions on the landscape (human alteration and population fragmentation) and ultimately, the recovery of these linkages will be crucial for the long-term persistence of the Yellowstone population. This issue will be addressed further below.

In summary, the review of the population is carefully considered and it has produced considerable evidence for delisting. Still we have concerns as stated above, which can be summarized as follows: 1) adequacy of models used to estimate population abundance that are not validated; 2) lack of a DNA-based population estimate for long-term population monitoring; 3) lack of estimates of known-to-unknown mortalities required to validate and continue ongoing assessment – the dynamics of this variable are unknown and human-related mortality is a critical component of the population monitoring process; and 4) clarification of the role of male mortality in population dynamics.

Genetic Issues

The Yellowstone grizzly bear population has been isolated for more than seventy years. Yellowstone grizzly bears have substantially less genetic variation than the Northern Continental Divide population of grizzly bears (Miller and Waits 2003). The USFWS has estimated that the Yellowstone population may have been reduced to roughly 200 bears in the 1970s. Currently, the genetic effective population size (*Ne*) is about 125 bears (25% of 600 bears; Allendorf et al. 2005). This is much lower than the general scientific consensus of 500 or more for long-term persistence (Allendorf and Ryman 2002). An isolated population of grizzly bears would have to have at least 2,000 in order to achieve an effective population size of 500 in order avoid harmful effects of genetic drift and inbreeding. Given that Schwartz et al. (2005) present results that suggest 500 to 600 bears are experiencing limits of the environment, a population of 2,000 is unrealistic. This highlights the need for either the creation of effective corridors, or translocation of bears into GYA.

The USFWS plan to monitor genetic variation in the Yellowstone grizzly population is not likely to provide helpful information. There will be genetic drift and continued loss of genetic variation occurring because the bears in the GYA are isolated. Moreover, there will be long lag times between the demographic events that would result in a loss of genetic variation, and the ability to detect those events with molecular methods because of the long generation time of grizzly bears. The loss of heterozygosity caused by inbreeding will be found in the "grand-progeny" of the affected generation, perhaps 10-20 years following the demographic event.

There is also a serious problem with the power to detect a decline in diversity. There will not be sufficient power in the monitoring to make it effective. Let's say we want to detect when the *Ne* drops below 50. An *Ne* of 50 is too small, but let's use it for the sake of argument. We expect a decline of heterozygosity of 1% (1/2Ne) in 10 years (1 generation) with an *Ne* of 50. Detection of such a small amount of heterozygosity will be impossible given the population size of Yellowstone grizzly bears and the number of progeny produced.

Management efforts should focus on the feasibility of reconnecting Yellowstone-area bears to other populations in order to promote long-term recovery. In the short term, relocation of bears may be necessary. The proposal in the conservation plan to translocate two bears into Yellowstone every 10 years is not sufficient to offset the problems of isolation. The at least-one-migrant-per-generation (OMPG) rule of thumb that this based is based upon assumes equilibrium (Mills and Allendorf 1996). Equilibrium is not a good assumption in this situation because of the recent decline in diversity in Yellowstone bears. In addition, OMPG assumes that introduced individuals are equivalent to resident individuals. It is likely that introduced bears will have a lower probability of survival than resident bears for some time after the introduction. A more complete analysis of the number of bears that needs to relocated is beyond this review, but it should be

undertaken, and a plan developed to monitor the survival and reproductive success of the individuals introduced to GYA.

Adequacy of the State Conservation Plans

We have reviewed the Proposed Rule to de-list the Yellowstone Grizzly, including the Conservation Strategy, as well as the three state grizzly bear management plans. Based on our review of the information, it is clear that the Yellowstone grizzly population has met the established criteria for recovery. Our focus in this section is to evaluate the adequacy of the State management plans. In our opinion, the Montana management plan is by far the best of the three States but all three, in combination, provide a reasonable regulatory mechanism for cooperatively managing the Yellowstone grizzly bear population.

The State fish and game agencies are the key organizations responsible for managing grizzly bears outside of the Primary Conservation Area (PCA) which largely overlaps reasonably secure habitat surrounding Yellowstone and Grand Teton national parks and several national forests. The State of Wyoming has the most responsibility for lands outside the PCA, followed by Montana and then Idaho, which is probably a relatively minor player in comparison to Wyoming and Montana. The plans are all coordinated and basically use the same language and basic methodology for monitoring population parameters and habitats. All the State plans have provisions for regulated hunting when and if the population can sustain that additional mortality. All State plans have a strong education/outreach effort, which is probably a key issue for building local public support and sustaining grizzly populations outside the PCA.

The biggest unknowns include the respective agencies' long-term commitment to sustaining the grizzly population outside the PCA, and the ability to adequately fund the state management programs. Funding is a key issue that must be ensured over the long term for the population to expand and be sustained. Another issue is the long-term commitment of the adjacent national forests to manage their lands in a way that is compatible with sustaining an expanding grizzly bear population. However, much (59%) of all suitable grizzly bear habitat outside the PCA lies within secure habitat with minimal roads (including designated wilderness, wilderness study areas, and inventoried roadless areas) on national forest lands. In light of the recent change to the Roadless Rule, maintaining the habitat security of inventoried roadless areas remains a concern because state governors can petition for changes in roadless status.

We have excerpted some of the key statements regarding state management programs below.

The proposed rule (Fed. Register: Vol. 70, No. 221, 11-17-2005) on Yellowstone grizzly delisting states:

"The Conservation Strategy is the management plan which will guide the management and monitoring of the Yellowstone grizzly bear population and its habitat after delisting.

It establishes a regulatory framework and authority for Federal and state agencies to take over management of the Yellowstone grizzly bear population form the Fish and Wildlife Service." (p. 69875)

"State and Federal agencies which are a party to the agreement have signed a memo of understanding in which they have agreed to implement the strategy." (p. 69875)

"The Strategy will direct management of grizzly bears inside the Primary Conservation Area (PCA), whereas the State plans will cover all suitable habitat outside the PCA." (p. 69875)

"The three State grizzly bear management plans direct State land management agencies to maintain or improve habitats that are important to grizzly bears and to monitor population criteria outside the PCA. Idaho, Montana, and Wyoming have developed management plans for areas outside the PCA to: 1) Ensure the long-term viability of grizzly bears and preclude re-listing, 2) support expansion of grizzly bears beyond the PCA, into areas of suitable habitat, and 3) manage grizzly bears as a game animal, including allowing regulated hunting when and where appropriate." (p. 69876)

"State wildlife agencies will be responsible for monitoring habitat and populations parameters in areas outside the PCA. The three State grizzly bear management plans detail what habitat and demographic criteria each State will monitor. All three States will document sightings of females with cubs and provide this information to the Study Team. Additionally, State wildlife agencies will provide known mortality information to the Study Team, which will annually summarize this data with respect to location, type, date of incident, and the sex and age of the bear for the DPS area." (p. 69882)

"In Idaho, the IDFG will be responsible for monitoring population trends and habitat parameters. Outside of the PCA the IDFG will establish data analysis units to facilitate monitoring of grizzly bear distribution, abundance, and mortality. Habitat criteria will be monitored within each unit but will not be established strictly for grizzly bears. Instead, habitat standards will be incorporated into current management plans for other game species. However, the IDFG will monitor important food sources for grizzly bears including elk, deer, moose, Kokanee salmon, and cutthroat trout. The IDFG also will encourage and work with other land management agencies on public lands to monitor wetland and riparian habitats. Whitebark pine production, important berry-producing plants, and changes in motorized access route density. On private lands, the IDFG will work with citizens, counties, and other agencies to monitor development activities and identify important spring habitat for grizzly bears, then work with landowners to minimize impacts to bears." (p. 69882)

"In Montana, the MTFWP will monitor populations using data from research, distribution changes, DNA samples, confirmed sightings, and known mortalities. The MTFWP will collect and analyze habitat data and monitor habitat changes pertaining to key grizzly bear foods, road densities, road construction and improvements, and coal bed methane activities. In addition, the MTFWP will continue to use State-wide habitat programs to

conserve key wildlife habitats in southwestern Montana, working closely with private landowners to conserve private lands via lease, conservation easements, or fee title acquisition." (p. 69882)

"In Wyoming, the WGFD will establish grizzly bear management units to collect and analyze demographic and distributional data. The WGFD will monitor habitat changes, human activities, road densities, and construction. Habitat standards will be monitored in a manner consistent with those already in place for other wildlife and will not focus specifically on the habitat needs of grizzly bears." (p. 69882)

To summarize the State plans, we consider them to be adequate for managing grizzly bears in suitable habitat outside the Primary Conservation Area. The Montana Plan is quite good while the other two states are less comprehensive and detailed. All three plans commit to monitoring populations and habitats. They also allow for regulated hunting. Hunting will likely be an important tool for building local support for grizzly bears and managing populations that are sharing habitats with people and human activities. All three State plans have detailed criteria for proactively minimizing bear-human conflicts through education and outreach as well as aggressively managing nuisance bears with established protocols and priorities. Outside the PCA, human safety and human activities will be given priority.

Public education is likely one of the most critical factors for sustaining grizzly bear populations, particularly outside of the PCA where most bear-human encounters will occur. We think that all three States have developed good education plans. State funding is a major issue and the management programs will only succeed if adequate funding is available. The Wyoming plan estimates an annual budget of $804K, Montana's budget is $531K, and Idaho's budget is $144K. In our opinion, the Montana and Wyoming programs must be well funded and executed for delisting to proceed. The States have primary responsibility for grizzly bear management in suitable habitat outside the PCA. Fortunately, the PCA encompasses largely secure habitat (86% of the PCA) and 98% of the area is managed directly by the Forest Service or Park Service through the Conservation Strategy. Between 1983 and 2001, the Yellowstone grizzly population was increasing at an estimated rate of 4% to 7%. This fact and the level of secure habitat within the PCA raise the level of security in a delisting action. In our opinion, the regulatory authority and State responsibility for managing grizzly bears is adequate and reasonable. Questions remain regarding future funding and agency commitments to conservation.

Assessment of Delisting

In the preceding analyses, we have been concerned with the verifiable facts of the delisting arguments. In the following we turn to the problems of predicting the future should the grizzly bear in Yellowstone be delisted from the ESA. This is uncharted territory, for no one can know the future. Furthermore, new polices and political

processes will come into play. These matters are at the heart of the delisting debate, and they are key factors that IBA must weigh in any decision to support delisting.

In our assessment of the State Conservation Plans we concluded that they were adequate for the preservation of the grizzly bear in the GYE—if implemented as stated. We share concerns of some opponents of delisting, however, about the political future of bear management. It is troublesome that the States are anxious to reclaim legal authority to manage grizzly bears, but continue to look to the Federal government for funding of the effort. This highlights the basic conflict between views of bears at the local level (town, county, and state) versus the national view as expressed by Federal actions through the ESA (Clark et al. 2005). It is difficult to manage in the context of a conflict between authority and responsibility. Furthermore, it is difficult to justify compelling a State to fund a program that favors a national view over a local one. This disconnection between who pays and who benefits is a thorny one for the management of Yellowstone grizzly bears.

The answer of the advocates of delisting is that if things don't work out, the Yellowstone grizzly can be listed on the ESA again. However, the current controversy over delisting is likely to be a minor skirmish in comparison to the war that would result from a proposal to relist the Yellowstone grizzly. All of this would happen against the backdrop of local-versus-national interest conflicts, changing demography and social context between the "Old" and "New" West, and in the possible face of a federal administration that (like the current one) may support an anti-conservation agenda. Perhaps re-listing could be achieved, but it would be naïve to assume that it would happen simply because the status of the bears had declined, and it was biologically justified. Furthermore, such a lowered status would, in all likelihood, have to be substantial (i.e., appreciably worse than the current situation) in order to trigger a re-listing movement, and to overcome the inevitable political opposition. This would not be good for grizzly bears in the GYA. As noted in the review of genetic issues, even the current population of 500 to 600 is problematic as a viable population in the long run, even though the data (Schwartz et al. 2005) suggest it is near or at the habitat carrying capacity.

Concerns for small isolated populations have grown over the years since the delisting criteria were produced, and this leaves us with a sense that the delisting is still a work in progress. The criteria for delisting were established at an earlier time when the science of small populations was much more poorly understood. Even if the population can be sustained demographically, loss of genetic diversity is essentially assured. Furthermore, it is our view that current proposals to correct this deficiency may be inadequate. The genetics issue must be a more central part of the agenda for Yellowstone grizzlies, independent of the outcome of the delisting proposal.

Opponents of delisting state that recreating connectivity with other grizzly populations will only occur if Yellowstone grizzlies are retained on the ESA list, and remain a Federal responsibility. Although they are probably right that acquisition of the necessary lands is most likely under Federal initiative, the question remains whether or not functional connectivity can be achieved even under the best cast scenario. Already land

use changes in recent decades may have rendered such a goal beyond reach. Most of the critical lands are in private ownership, many have been developed, and escalating property values will work against public acquisition and/or easements. Neither are grizzly bears in the source populations that give rise to potential immigrants immune from the processes affecting grizzly outside of the PCA in the GYA. Can a corridor of sufficient conductivity be created? Even in the most optimistic prognosis, immigration will be too little to late to treat the current genetics problem. Translocation of bears from the nearest extant populations, which at an earlier time were connected by corridors, into the Yellowstone population is the only realistic approach in the short term, no matter what the long term prospects prove to be.

Should Delisting Be Supported?

If the questions were entirely scientific and biological in character, the issue would be much easier. The science is reasonably solid and better than we usually have at our disposal. It is clear that the recovery process has been successful thus far. There is a clear plan to continue monitoring and manage the population over the coming years. Nevertheless, we wonder about the future status of the population and the management under a new political regime. Will the plans be carried out in practice? These are difficult questions to answer and clearly lie outside the realm of science.

We believe there is sufficient merit in the document to indicate that the delisting criteria have been met, but that there are possible gaps in our knowledge and uncertainties on the status of the population and political support for conservation that make an unconditional endorsement of the delisting a tenuous position for IBA. There are credible scientists advocating on both sides of delisting. Most of the debate focuses not on the science of the case, but the expectation of what will happen when delisting occurs, and authority shifts to the States. The reality is that the debate over delisting is essentially political.

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