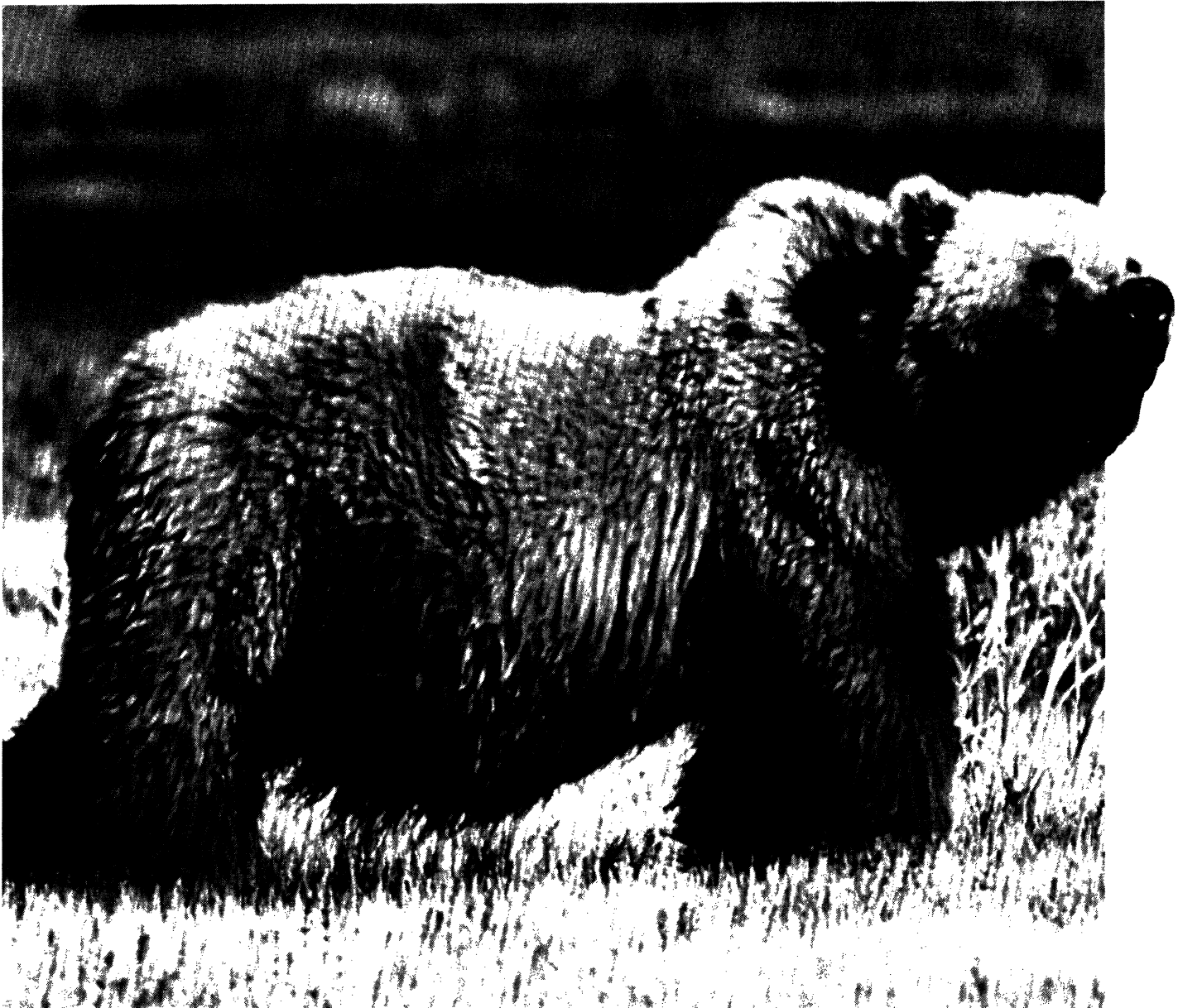


Endangered Species UPDATE

Including a Reprint of the latest USFWS
Endangered Species Technical Bulletin

October 1988 Vol. 5 No. 12

THE UNIVERSITY OF MICHIGAN
School of Natural Resources



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What Place for the Grizzly?

by Stan Tixier

The grizzly bear needs a lot of land. Key to survival of this federally listed, threatened species is maintaining and enhancing the habitat that remains for the grizzly bear in the lower 48 states. Because many interests have a stake in what happens to this land, coordination and cooperation are key to successful recovery of the bear and its habitat. For the past four years, an assortment of state and federal agencies has worked quietly to cooperate in and coordinate all aspects of grizzly bear habitat and population management. This venture, done under the auspices of the Inter-agency Grizzly Bear Committee, could set a new precedent in cooperative natural resource management.

The grizzly bear, which once roamed the western United States from Canada to Mexico, now lives on about 20,000 square miles in six areas of four states: Montana, Idaho, Wyoming, and Washington. Grizzly bear populations exist in the greater Yellowstone area of Wyoming, Montana and Idaho; along the Continental Divide in northern Montana; in the Cabinet/Yaak area in northwestern Montana and northeastern Idaho; in the Selkirk mountains of northern Idaho, and in the North Cascades of northwestern Washington. How to manage these lands to help grizzly bear populations recover has been the subject of increasing controversy.

A complex array of agencies and individuals have jurisdiction over land used by the bears. Critics call this complexity a threat to survival. Natural resource professionals see this diversity as an opportunity to provide many benefits to the public, including healthy populations of grizzly bears.

A Crowded Picture

The land management picture is crowded. Most grizzly habitat is in four

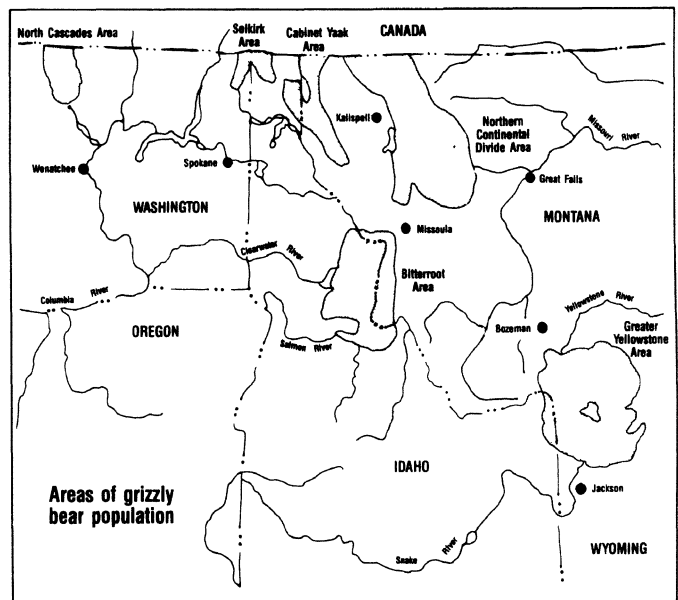
national parks — Glacier, Grand Teton, North Cascades, and Yellowstone—and 19 national forests—Beaverhead, Bridger-Teton, Custer, Flathead, Galatin, Idaho Panhandle, Shoshone, Targhee, Lewis and Clark, Helena, Lolo, Kootenai, Colville, Bitterroot, Nez Pierce, Clearwater, Okanogan, Wenatchee, and Mt. Baker-Snoqualamie. Some grizzly habitat is also under the jurisdiction of the Bureau of Land Management, Indian tribes, state agencies, counties, and private landowners. The Fish and Wildlife Service is responsible for aiding the recovery of threatened and endangered species. State wildlife agencies in Montana, Idaho, Wyoming and Washington administer wildlife populations, including grizzly bears.

Each agency has its own agenda and operating procedures. For instance, the National Park Service preserves land for public enjoyment. It administers national parks as natural areas, based on the policy of noninterference with park life forms and their natural environment. The Forest Service administers national forest land for multiple uses, including wildlife, watersheds, recreation, timber, grazing, minerals, and wilderness—depending on the unique character of each area.

In addition, long-time residents of the towns and ranches in and around grizzly bear country have a stake in what happens to the land. Owners of resorts and small-town businesses may welcome the tourist revenue from visi-

tors hoping to see a grizzly bear. For others, a lifestyle dependent upon the land and its resources—logging, ranching, mining, real estate development—may be hampered by efforts to restrict developments in grizzly bear habitat.

Governors, congressmen, and other elected representatives in the four states with grizzly bear populations are sensitive to the needs of their local constituents and often intercede when local in-



terests are threatened by federal or state bureaucracies.

In the greater Yellowstone area, home to about 200 grizzly bears, nearly 30 different political entities govern the land. That includes 2 national parks, 6 national forests reporting to 3 different regional offices, 2 national wildlife refuges, 3 states, 13 counties, and the Bureau of Land Management.

And the wide-ranging grizzly is no respecter of political boundaries. The bear's home range is among the largest of any mammal; 100 to 400 square miles is average, with some males ranging 1,100 square miles or more. The bears of Yellowstone National Park

spend a good deal of time on adjacent national forest land and some time on private land. Although private land is only 1 percent of the grizzly's habitat in the Yellowstone area, about 60 percent of the human-bear conflicts occur there. Close coordination is needed for bear habitat management among the varying entities.

Interagency Cooperation

For several years a unique blend of state and federal agencies has been tackling this problem. The Interagency Grizzly Bear Committee was created in 1983 to get top-level agency action on grizzly bear management problems and to coordinate grizzly bear research, management and funding in the lower 48 states. The committee was established by a memorandum of understanding among the secretaries of interior and agriculture and the governors of Idaho, Montana, Wyoming, and Washington.

Every agency that has a stake in grizzly bear recovery is represented on the committee— those that administer the land and those that manage the animal itself. Committee members include the regional directors of the Forest Service, Park Service, and Fish and Wildlife Service; fish and game directors from the four states; a BLM state director; and Canadian representatives. Subcommittee members include the officers from these agencies as well as Indian tribal representatives. Different agency heads serve a two-year term as committee chairman.

The need for a coordinated approach to managing grizzlies and their habitat was recognized long before 1983. Grizzly bear problems were among many natural resource issues approached jointly through the Greater Yellowstone Coordinating Committee established in the early 1960's and comprised of the Forest Services Northern, Rocky Mountain, and Intermountain regional foresters; the Park Service's Rocky Mountain regional director; and affected park superintendents and forest supervisors. A forerunner to the Inter-

agency Grizzly Bear Committee was the Interagency Grizzly Bear Steering Committee, established in 1973 to coordinate grizzly bear investigations in the Yellowstone area.

When the grizzly bear was listed as a threatened species in 1975 under the Endangered Species Act, agency officials saw the need for integrated bear and bear habitat management beyond the greater Yellowstone area. Listing occurred because of concerns about a possible population decline, continuous resource demands on shrinking bear habitat, and deficient information on grizzly bear biology.

After the Fish and Wildlife Service developed its final recovery plan for the grizzly bear in 1982, officials developed the Interagency Grizzly Bear Committee to coordinate management and research for all grizzly bear habitat areas. The committee and its subcommittees cover all entities of the six known grizzly bear ecosystems: Yellowstone, Northern Continental Divide, Cabinet-Yaak, Selkirk, Bitterroot, and North Cascades. Other subcommittees coordinate research and public information and education efforts.

The committee's goal is to help the grizzly bear populations recover through coordinated policy, planning, research, management, and funding in the lower 48 states. There is also a need for coordination along the United States-Canadian border because, again, grizzly bears in the Selkirk, Cabinet-Yaak, North Cascade, and Northern Continental Divide ecosystems do not recognize political subdivisions. Wildlife officials from British Columbia recently became associate committee members.

The committee emphasizes programs in three major areas: grizzly bear population and habitat management, law enforcement, and public education. It is coordinating research to assess and minimize impacts of human development on vitally needed grizzly bear habitat. It has also helped to devise policy restricting or mitigating development that would reduce the land available to the bear, both in quantity and quality of habitat.

Endangered Species UPDATE

A forum for information exchange on endangered species issues

October 1988
Vol. 5 No. 12

Rob Blair..... Editor
Michael Soule..... Faculty Advisor

The Endangered Species UPDATE welcomes articles related to species protection in a wide range of areas including but not limited to: research and management activities for endangered species, theoretical approaches to species conservation, and habitat protection and preserve design. Book reviews, editorial comments, and announcements of current events and publications are also welcome.

Readers include a broad range of professionals in both scientific and policy fields. Articles should be written in an easily understandable style for a knowledgeable audience. Manuscripts should be 7-10 double spaced typed pages. For further information please contact Rob Blair at the number listed below.

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Cover:
Grizzly Bear
(*Ursus arctos*)

Photo by Gene Colling

Cumulative Effects

A key research effort is to provide managers with a tool to assess the combined or cumulative effects of several activities on a given area of grizzly bear habitat. Managers realize that cumulative impacts may be greater than the effects of individual activities. To assess this situation, the committee developed a computerized process to analyze cumulative effects of any combination of activities — called “cumulative effects analysis.” The model shows what impacts a given combination of activities will have on grizzly bear food and cover, habitat diversity, and seasonal range. Managers can use this tool to minimize adverse development impacts and spot management opportunities that may benefit the bear and its habitat. For instance, the model might show that the combination of road construction, human activity, and reduction in cover required to implement a proposed timber sale may have detrimental impacts on the bear. In this case, a manager might be able to mitigate the impacts by requiring temporary roads and only limited access to the area during certain seasons to accomplish the sale. On another site, partial clearing of a site and replanting with huckleberries might increase bear habitat.

In the greater Yellowstone area, national forest and national park managers have developed a joint aggregation of management plans. This aggregation summarizes existing management provisions of the Park Service and Forest Service to provide a picture of the area as plans are applied over the next decade. It shows impacts of the plans on all natural resources in the area, including bears and their habitat.

Other habitat-related research includes monitoring bear population trends to see where and how human activities have impacts on the grizzly, use of satellite imagery and terrain models of plant communities to map grizzly bear habitat, and studies on the impacts of roading and oil and gas development on bear habitat.

Cooperative management also has helped maintain or enhance grizzly bear habitat. “Grizzly Bear Guide-

lines,” adopted by land managers with public counsel, coordinate different land uses with the needs of the grizzly bear. Grizzly bear habitat on park and forest land is managed in terms of zones or situations, with the highest restrictions on development activities in areas key to grizzly survival. In those habitat areas zoned “Management Situation 1,” grizzly bears are the priority resource, and conflicts are resolved in favor of the bear. For, instance, a livestock operator may have a permit to graze sheep in a Situation 1 area on national forest land. However, if a grizzly bear begins following the herd and attacking sheep, the sheep will be moved off the national forest area if necessary. If the bear persistently returns to the area occupied by sheep, forest managers might resolve the problem by moving the sheep to another permitted grazing area. Leases for oil and gas drilling in Situation 1 areas would be issued only with restrictive stipulations to protect the bear, such as temporary roads and limited visits by drillers during certain seasons.

On land considered less important grizzly habitat, other uses become more important in this zoning scheme. Situation 3 areas, for example, include campgrounds and other areas where grizzly bears may be infrequently present and where intensive human use makes the bears’ presence undesirable. The priority in these areas is to minimize human-bear conflict; bear relocation is a common strategy when problems persist.

Problem bear relocation itself is a major exercise in interagency coordination. State game departments manage wildlife; the Fish and Wildlife Service is responsible for grizzly bear recovery; and bears are often relocated to or from national park and national forest land. All these entities must be involved. Idaho state law also requires coordination with the agriculture department’s animal damage control division, which handles predator control.

Agency officials have developed a grizzly relocation procedure flow chart to outline protocol for handling bear problems. Reports on a nuisance bear outside a national park go to the state game agency, which, in turn, initiates a

conference call with the Fish and Wildlife Service, Animal and Plant Health Inspection Service, and appropriate land agencies. If capture is necessary, state game officials trap the problem bear with help from the Fish and Wildlife Service and the land management agency involved. If the bear is transferred from a national forest to a park, helicopter costs for bear relocation are shared by the state, Fish and Wildlife Service, originating forest, and park.

Agencies have teamed up in writing and enforcing rules, providing supplies, and working with communities to better manage the land used by grizzly bears. In the Yellowstone area, interagency cooperative management is forcing the bears to rely more on natural food sources rather than human garbage, thus reducing opportunity for bear-human interactions and problems.

It works this way: Yellowstone and Teton National Parks enforce rules requiring visitors to use sanitary camping practices for storing garbage and fresh food out of bears’ reach and smell. Each year, regional foresters from the three Forest Service regions encompassing the Yellowstone area issue a joint special order for national forests in that area. That order covers similar sanitary practices for campers, backpackers, and hunters. National forests also have written similar requirements into permits issued to backcountry outfitters and guides. The forests also provide bear-proof storage containers and meat hanging poles for Yellowstone backcountry users. The Fish and Wildlife Service and state fish and game agencies work with the Park Service and Forest Service to enforce these regulations, patrolling the backcountry to identify, warn, or prosecute offenders. In addition, the Interagency Grizzly Bear Committee’s Yellowstone Subcommittee members are working with so-called “gateway communities”— towns that border the Yellowstone area — to help them bear-proof holding containers and reduce visits to town by “garbage bears.”

In the town of West Yellowstone, garbage containers are being bear-proofed in and around town through a cooperative effort by the committee, the city of West Yellowstone, Gallatin

(Continued on UPDATE page 4)

County, Montana Natural resources Department, the Gallatin National Forest, and private organizations arranged by the Audubon Society. The Forest Service bought 16 bear-proof dumpsters in 1985 and placed them in national forest campgrounds in the West Yellowstone area. After the campgrounds closed in the fall, the dumpsters were moved into town to replace the most-used dumpsters that were not bear-proof. The Montana state legislature has authorized additional money on a matching fund basis for bear-proofing waste disposal containers in the area. So far, \$40,000 has been matched with contributions, including the Forest Service dumpster donation and funds from Gallatin County, Burlington Northern Foundation, and the Montana Department of Fish, Wildlife and Parks. The Audubon Society and the Greater Yellowstone Coalition, another private organization, are continuing to seek additional matching funds to buy all necessary dumpsters.

Cooperative Law Enforcement

Cooperative law enforcement is an Interagency Grizzly Bear Committee success story. Since the interagency group developed, the Forest Service, Park Service, and Fish and Wildlife Service have initiated joint backcountry horseback patrols in grizzly bear country. These multipurpose patrols monitor grizzly bears, help sheep herders keep bears and sheep apart, investigate human-bear incidents, and sometimes catch and prosecute grizzly bear poachers. They also visit hunter, outfitter, and backpacker camps to educate backcountry visitors on grizzly bear protection laws and outline required procedures for safe food storage and camping in grizzly bear country. Each federal agency also enforces special regulation for visitors to grizzly bear habitat. Agency officials possess multiple credentials so they have wider authority to protect the bear. For instance, Forest Service, Park Service, and fish and game department officials from Wyoming, Idaho, and Montana hold USFWS credentials.

All bear-related investigations are made by a joint state-federal team.

When there is a bear mortality, carcasses are sent to a crime lab for a necropsy similar to that conducted in a homicide investigation. There is also a sharing of equipment, manpower, horses, patrol cabins, and intelligence, which creates more efficient use of each agency's resources. In addition, the patrols have reduced the number of dirty backcountry camps that attract bears, solved several illegal bear killing cases, and served as a deterrent to bear killings by commercial poachers.

Public Education

Humans are the main cause of grizzly bear deaths. Bears have been shot, trapped, and poisoned for sport, protection of human life, livestock predator control, and commercial hunting. Some have been killed in attempts to rid the country of grizzly bears—a tradition that started with early explorers who believed the animal was threat to humans. Habitat alteration and the encroachment of civilization have contributed to the bear population decline.

Committee agencies have worked to reduce human-bear conflicts by educating those who visit or live in grizzly bear country on how to get along with the bear. Bears are opportunistic animals and quick learners; they will return regularly to a food source. To prevent this, communities and resorts in bear habitat have been encouraged to clean up and secure garbage at sites that attract bears. Agencies and private cooperators have provided bear-proof storage containers and game meat hanging poles in backcountry areas, along with clean-camp regulations for outfitters and the public. The agencies have jointly printed several pamphlets on safe bear country visitation, including "Bear Us in Mind," and "Grizzly, Grizzly, Grizzly!" The interagency committee recently published and distributed its first annual report, "Bear Tracks," a short, popularized summary of its activities. The committee also has developed a portable grizzly bear exhibit for use at airports, chambers of commerce offices, agency offices, and other sites. The exhibit explains grizzly bear recovery efforts and provides sources for more information. Member agencies

are developing copies of this exhibit for public education efforts.

Well Worth the Effort

Interagency Grizzly Bear Committee members hold meetings to hear from those who live near grizzly bears or who are interested in the bears. The committee meets twice a year, including a spring field tour in one of the grizzly bear ecosystems. During this tour, members schedule public hearings in adjacent towns and try to meet informally with resort owners, ranchers, recreationists, agency field people, and others who live or work with the bears.

At these listening sessions, committee members have heard a variety of conflicting ideas on dealing with the grizzly bear. Some participants have asked for bear protection at all costs, with a moratorium on all activities that might have adverse impacts on grizzly bears. Others have asked for the right to protect themselves, their livestock, and their property from problem bears. Some say the rules and regulations for outfitters and for bear country use are too much bureaucratic interference, threatening their way of life. Oil and gas companies, timber companies, and ski resort developers are often frustrated by perceived delays and difficulties bear protection regulations mean for their projects.

There probably is no single answer to how people can "get along with the bear," minimize encroachments on bear country, and still pursue their varied needs and interests. That's why the Interagency Grizzly Bear Committee will continue to direct many interests, missions, and methods toward a single goal: restoring viable grizzly bear populations and habitat in the United States. The management task is complex, but the goal is simple and, in the minds of many people, well worth the effort.

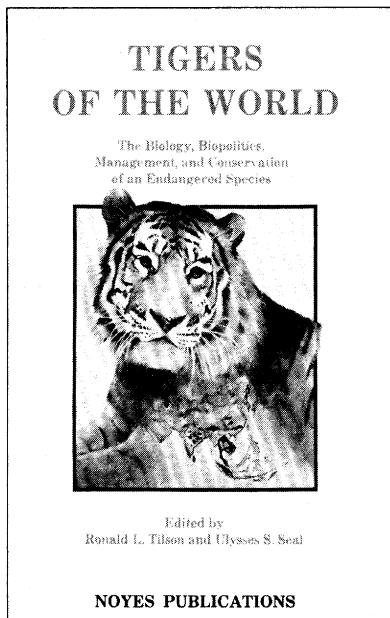
Stan Tixier is the former chairman of the Interagency Grizzly Bear Committee and a regional forester with the Intermountain Region, Forest Service, U.S. Department of Agriculture, 324 25th Street, Ogden, Utah 84401.

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Book Review

Tigers of the World: The Biology, Biopolitics, Management, and Conservation of an Endangered Species

Edited by Ronald Tilson and Ulysses Seal



In the past 50 years, the world population of tigers (*Panthera tigris*) has plummeted from over 100,000 individuals in eight subspecies to around 5,000 individuals in five subspecies. Three of these subspecies have gone extinct and a fourth is seriously endangered. The remaining tiger populations, with the possible exception of one population in Bangladesh, are both too fragmented and too small for long-term survival.

Tigers of the World: The Biology, Biopolitics, Management, and Conservation of an Endangered Species addresses the challenges of conserving and managing these populations. The book is a compilation of 46 papers presented at an international symposium held in Minneapolis during April 1986 and sponsored by the Minneapolis Zoological Garden and the IUCN/SSC Captive Breeding and Cat Specialist Groups.

This hefty book exhaustively covers all facets of tiger biology. Researchers from around the world report on such topics as taxonomy of the great cats, their population status, reproductive

biology, captive management, and conservation strategies.

The first section of the book tackles the systematics and taxonomy of the genus *Panthera*, suggests a phylogeny for the tiger, and considers the problem of conserving the genetic heterogeneity of the various subspecies of tiger.

The next sections of the book assess the status of both the wild and captive populations in the world. The authors flesh out habitat requirements of the tigers and include reports on the availability of these habitats.

The central portion of the book should be particularly valuable to anyone managing captive populations of the tiger. It addresses physiological management of individuals, including nutritional requirements, and management of tiger diseases. This section also reports on tiger reproductive biology, and the genetic and demographic management of the captive population as a whole.

The last section of the book is particularly strong. The authors tackle the political and social problems involved in the management of tigers, which are problems rarely addressed in books covering the management of a single species. Papers in this section delve into the politics of managing a large, some say

man-eating, carnivore in the wild, assess various conservation strategies for management, and plot out a global tiger conservation plan.

This book is a valuable compilation of information on tigers and provides an example of the application of conservation biology to a large mammal population that is widely dispersed and fragmented. It should be of use to anyone interested in conservation strategies for any large species.

Tigers of the World is published by Noyes Publications Mill Road at Grand Ave., Park Ridge NJ 07656 510 pp. \$64

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Taxonomy and Conservation: The Case of the Bakersfield Saltbush

by Kathy E. Freas and Dennis D. Murphy

Ambiguous taxonomic status offers fodder for conjecture and research to the academic systematist. For the conservation biologist, however, unresolved taxonomic questions can affect the direction of recovery efforts and reduce the power of environmental legislation to protect rare and endangered species. An understanding of the taxonomic status in question is important in identifying appropriate conservation efforts as well as identifying situations that may not warrant this effort.

Our recent attempts to recover the annual plant *Atriplex tularensis* in the southern San Joaquin Valley, California illustrate the importance of taxonomy in conservation. Historically, the species was narrowly distributed, restricted to six populations in wet saline soils near Bakersfield. Rather than occurring as a predictable part of the summer-blooming flora of the alkali sink scrub community, *A. tularensis* has been abundant only in years of excessive rainfall. High rainfall combined with reliable groundwater maintains high soil moisture through the summer. Agricultural practices in the San Joaquin Valley have resulted in clearing and draining of these wet soils. Until 1983, when a population of about 100 individuals was discovered at The Nature Conservancy's Kern Lake Preserve, the plant had not been reported since 1934 and was presumed extinct. Notable in its rediscovery was the observation that, floral morphology of these individuals matched that described for *A. tularensis*, unlike specimens collected earlier in the century, the plants at Kern Lake Preserve exhibited serrate leaf margins, like those found in *Atriplex serenana* (a common species that occurs on drier soils).

By 1986 the population of *Atriplex tularensis* at the preserve was reduced to fewer than 50 individuals, prompting

a research effort involving the Center for Conservation Biology at Stanford University. Thirteen plants were discovered growing in very dry soil at the preserve in June 1987. Five were successfully transplanted to greenhouses at Stanford where they matured and produced thousands of fruits. These plants also exhibited serrate leaf margins, as well as a mixture of floral characters of *A. tularensis* and *A. serenana*. The same condition was observed when another patch of the plant was discovered growing in a dry canal at the preserve. However, one individual, isolated from other annual *Atriplex* and fitting closely the description for *A. tularensis* was discovered at the preserve, growing in an area of particularly high soil moisture. This plant matured successfully and produced several hundred fruits. At the end of the growing season, the plant was collected and seeds from it were germinated in the greenhouse. Five plants, each fitting the description of *A. tularensis* grew and produced seed. Germination of these seeds resulted in mature plants about two-thirds of which fit the description of *A. tularensis* while the remaining third exhibited combined characters of the two *Atriplex* species.

Under the assumption that *Atriplex tularensis* and *Atriplex serenana* are distinct species, the occurrence of plants with phenotypic characters of both species is evidence of a breakdown of reproductive isolation, and suggests introgressive hybridization between the two species. Introgressive hybridization results from the exchange of genetic material across an incomplete interspecific barrier, generally through a partially sterile F_1 hybrid. Introgression occurs in areas of species overlap when new environmental conditions provide an opportunity for the introgressive types to become established. Agricul-

tural practices within the former distribution of *A. tularensis* have resulted in a general reduction in the amount of soil moisture that may have allowed *A. serenana*, which is apparently better adapted to drier soils, to persist. Gene flow between *A. tularensis* and *A. serenana*, with the acquisition by *A. tularensis* of characteristics of *A. serenana* that confer ability to withstand drier conditions, may result in hybrids with the ability to persist in habitat patches drier than those in which *A. tularensis* thrived historically. Discovery of apparent hybrids in the canal, which although dry was more moist than surrounding areas, suggests that these hybrids may be able to exploit these patches of intermediate soil moisture. On one hand, one might view the current situation as a "contamination" of the *A. tularensis* with *A. serenana* genes. On the other hand, given the changes in the environment with surrounding agricultural development, conditions in which *A. tularensis* is able to survive may have been eliminated. Hence, introgression may be viewed as having allowed the genetic information contained in the *A. tularensis* gene pool to survive. In either case, conservation efforts targeting *A. tularensis* under current conditions are unlikely to perpetuate the species.

This study suggests that scrutiny of the genetic status of threatened species can direct the course of conservation efforts. Because taxonomic questions may not become apparent until a recovery effort is underway, flexibility in research objectives is critical when assessing the status of an endangered species. In most cases, given the limited funding available for conservation and the increasing number of species needing attention, taxa that are weakly differentiated genetically from widely distributed taxa must take lower priority.

Note from the Editor

December 1988

Dear Subscriber:

As you may already know, the *Endangered Species UPDATE* includes a reprint of the *Endangered Species Technical Bulletin*, which is produced by the US Fish and Wildlife Service. The *UPDATE's* printing schedule mirrors that of the *Technical Bulletin* and I publish the *UPDATE* within a week of receiving the *Technical Bulletin*.

Recently, publication of the *Technical Bulletin* by the USFWS has been delayed in Washington and the latest issue, in particular, was not published for several weeks. Consequently, this October issue of the *UPDATE* is coming to you in December. I held up printing of the October issue for six weeks in order to include the August issue of the *Technical Bulletin*, in the hope of printing it as quickly as possible.

I apologize for this delay. Future issues of the *UPDATE* and *Technical Bulletin* will be published on a revised schedule. The *UPDATE* will be published on the same schedule as the *Endangered Species Technical Bulletin* and, due to the *Technical Bulletin's* irregular publication schedule, the *UPDATE* will be published an average of 10 issues per calendar year but will be enumerated as a monthly publication to aid in its cataloging at libraries. This means that some issues this year will be listed as double issues, for example, November/December.

Thank you for your patience and for supporting the *UPDATE* and its effort to provide a forum on endangered species and conservation. If you have any comments, criticisms, or suggestions, I want to hear them.

Next month, the *UPDATE* will start publishing an opinion page. If you have an idea, thought, or mental meandering that you can pen down in two and a half double-spaced pages, call me or send it. I am planning out the next year's issues and would appreciate appropriate contributions.

Sincerely,



Rob Blair
Editor

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