

Endangered Species UPDATE

*Including a Reprint of the latest USFWS
Endangered Species Technical Bulletin*

May 1991 Vol. 8 No. 7

THE UNIVERSITY OF MICHIGAN
School of Natural Resources



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Florida's Proposed Incidental Take Rule for Gopher Tortoises

by

Mark T. Kopeny

Background

For centuries, inhabitants of Florida "pulled" gopher tortoises (*Gopherus polyphemus*) from their burrows for subsistence and profit. In the late 1950's, developers and other land-clearers in Florida began eroding the habitat base of the gopher tortoise on a significant scale. By the 1970s, it had become apparent that the gopher tortoise was in significant decline in Florida as a result of overharvesting and habitat conversion.

The Florida Game and Fresh Water Fish Commission (Commission) listed the gopher tortoise as a Species of Special Concern in 1979, allowing a limited harvest of the species until 1985. The gopher tortoise exhibits all four criteria cited in the Florida Wildlife Code (39-1.004) for eligibility as a Species of Special Concern: it has not recovered from previous population depletions; it is vulnerable to decline such that it may become threatened (in parts of its range); it may already meet criteria for threatened status (in parts of its range); and because its burrow constitutes important habitat for a variety of species of upland wildlife, the tortoise maintains a unique and vital ecological niche. The gopher tortoise is listed as Threatened in Mississippi and Alabama by the U.S. Fish and Wildlife Service. In Florida, the species is under review for federal listing.

State regulation prohibits the unauthorized taking of all Species of Special Concern, including the gopher tortoise, and the Commission interprets any form of intentional harvest as a violation of that prohibition. Although "gopher pullers" no longer pose a significant threat to the gopher tortoise, the species continues to decline as its habitat is converted, fragmented, and otherwise degraded.

"Optimal" gopher tortoise habitat in Florida consists primarily of fire-

maintained, upland pine forest, and pine scrub communities on high, dry sandhills, ridges, and dunes. High pinelands, interior and coastal scrubs, and xeric oak hammocks largely encompassed the pre-settlement distribution of tortoises in Florida. Development and agricultural interests are rapidly converting these community types.

Most conversion of land occupied by tortoises renders it essentially unusable by tortoises. Longleaf pine and xeric oak scrub are now considered endangered communities in Florida. Given current rates of conversion, Kautz (in prep.) projects that longleaf pine will disappear from Florida's private lands by the end of this century and sand pine scrub by the middle of the next century. Losses of tortoise habitat in natural areas are offset to an unknown extent by the species' ability to adapt to altered plant communities — primarily rangeland, fallow agricultural areas including freeze-killed citrus groves, low intensity silvicultural operations, and drained flatwoods.

The typical by-product of extensive upland conversion in Florida is a landscape with disjunct, relatively small tracts of gopher habitat. Many of these tracts are too small to support stable tortoise populations and too small for fires ignited by lightning to occur at frequencies that maintain the composition and structure of the original community.

Prior to settlement, gopher tortoises were probably common throughout most of the state except the low, wet interior of south Florida. Auffenberg and Franz (1982) estimated that the major native habitats of presettlement Florida were capable of supporting about 2.0 million gopher tortoises. They also estimated, based on the amount and types of habitat available to tortoises in the mid-1970s that Florida's uplands supported about 1.3 million tortoises at that time.

The status of the tortoise continues to decline. Tortoise distribution is now spotty in north and central Florida, but the potential for tortoise conservation in these areas is high because much of the habitat base remains. Gopher tortoises are now rare in most of south Florida below Lake Okeechobee and along peninsular Pinellas County on Tampa Bay. The tortoise's habitat base in south Florida, never extensive, now is virtually gone.

Current Protection

State regulation prohibits the taking, possessing, transporting, or selling of Species of Special Concern, or their nests or eggs, unless the Commission's executive director issues a permit to do so. Molesting and killing are construed as forms of taking, regardless of whether or not the action results in possession of the animal or its nest or eggs. State regulation does not explicitly prohibit the taking that occurs as the result of land-clearing activities. The Commission has recently begun to clarify its own interpretation of the prohibition in this regard and within the last year has initiated two investigations that resulted in charges for this sort of taking of gopher tortoises.

In 1973, and in an omnibus bill in 1985, Florida lawmakers enacted powerful legislation that authorized Florida's Department of Community Affairs to manage growth within the state. This agency was empowered to regulate large-scale developments in Florida — residential, industrial, and commercial projects that each impact hundreds or thousands of acres. With consensus of local and regional governments, Community Affairs can require large-scale developers to preserve habitat for listed species. Community Affairs is not a natural resource agency; it solicits ad-

vice from the Commission on what protection measures developers should undertake to mitigate the anticipated impacts of proposed developments on habitat of listed species.

The protection that results from Florida's growth management legislation represents the state's most significant development-related preservation of upland wildlife habitat to date. In fiscal year 1988-89, the only period for which figures have been compiled at the Commission, developers in Florida protected over 2600 acres of upland habitat for listed species in order to receive approval to develop (Mike Allen, pers. comm.). A large proportion of that acreage supports gopher tortoise populations.

Developments regulated by Community Affairs account for, perhaps, 5% of land conversion in Florida. The large majority of land conversion in Florida proceeds with little or no mitigation of impacts to listed species or their habitat. All development in Florida is subject to review of impacts to wildlife at the county level, but this rarely results in habitat set-asides or other meaningful mitigation. The clearing of sensitive uplands for agriculture and silviculture proceeds essentially unregulated by the state.

A relatively small number of land-clearers, mostly developers, apply for permits from the Commission to relocate tortoises off their property in order to avoid killing the animals. The Commission issues about 100 permits a year to land-clearers who want to relocate gopher tortoises. Often, the land-clearer has been prompted to relocate by a biological consultant who advised of the potential legal and public relation problems associated with killing tortoises. Many biologists in Florida maintain that relocation may protect individual tortoises, but that it provides no discernable protection to the species; moving tortoises between areas while the species' habitat base erodes makes little sense from a conservation perspective and only diverts attention from the real problem.

The Proposed Incidental Take Rule

In July 1990, Commission staff (Staff) proposed to its five-member

governing board that the board consider amending the existing take rule. Staff intended to address specifically the taking of gopher tortoises that occurs incidentally during land-clearing activities. The proposed rule specified the circumstances in which an incidental take permit would be necessary and the terms under which such a permit would be issued. In short, in order to obtain a permit to incidentally take tortoises, a developer would be required to preserve habitat for tortoises.

The rule-making process lasted 7 months. Most of the participating public fell into two broad categories: environmentalists (conservationists and animal rights advocates) and professional land-clearers (predominantly development and agricultural interests).

In the proposed rule, the "take" prohibition extended beyond destruction of the animal itself to the burrow of the animal. The intended unit of regulation was the "maintained burrow," not the tortoise. A maintained burrow is characterized by an entrance that has not collapsed or grown over with vegetation to the extent that a tortoise must excavate or otherwise modify it to enter. Staff defined "take" as any land-clearing activity within 50 feet of a maintained burrow. This interpretation of take, while extending beyond the animal itself, fell far short of an interpretation of habitat destruction per se as a "take."

According to the proposed rule, land owners would be issued a permit to take maintained tortoise burrows if they preserved 0.18 acres of habitat for each maintained burrow taken. A single tortoise normally is associated with two or more maintained burrows. Staff anticipated that in most cases the amount of habitat protection required of a permittee would not constitute a large proportion of his or her property. Nevertheless, in order to avoid the issue of inverse condemnation of property, the rule stipulated that under no circumstances, and regardless of the density of tortoise burrows, would a permittee be required to protect more than 25% of his or her developable uplands in order to receive an incidental take permit.

The proposed rule provided permittees two basic alternative means for preserving 0.18 acres per maintained bur-

Endangered Species UPDATE

A forum for information exchange on endangered species issues
May 1991
Vol. 8 No. 7

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Instructions for Authors:

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 10-12 double-spaced typed pages. For further information, contact the editors at the number listed below.

Subscription Information:

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Endangered Species UPDATE
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Cover:

Gopher tortoise
(*Gopherus polyphemus*)
Photo by Russell Burke

The views expressed in the Endangered Species UPDATE are those of the author and may not necessarily reflect those of the US Fish and Wildlife Service or The University of Michigan.

Production of this issue was made possible in part by support from Chevron Corporation and the National Fish and Wildlife Foundation.

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row taken. One alternative would have been to set aside the required habitat on the property in question, where the take would occur, and to use (develop, clear, etc.) the remaining habitat. The other alternative would have been to use all the tortoise habitat in question and contribute other tortoise habitat elsewhere—offsite. There were two reasons for incorporating an “offsite” alternative. First, in many instances the small amount of habitat to be preserved, if set aside onsite, would not be adequate to maintain a tortoise population in the long term. Second, the offsite alternative would provide the land-clearer more flexibility in deriving a profit from his or her land, reducing the likelihood of a successful lawsuit against the Commission for inverse condemnation of property.

One mechanism for the permittee to preserve habitat offsite would have been to buy land options in a regional “mitigation park” and contribute those options to the state. The concept of regional mitigation parks was developed several years ago to accommodate developers that are required to preserve habitat by the Department of Community Affairs.

Staff established minimum thresholds in the proposed rule, below which land-clearers would not require a permit to incidentally take maintained tortoise burrows. In seven south Florida counties where the gopher tortoise and its habitat base are endangered, land owners intending to clear 2 or more acres with 10 or more maintained burrows would have required a permit. In the remainder of the state, where tortoise populations are more secure, land owners intending to clear 10 or more acres with 10 or more maintained burrows would have required a permit.

Rationale Behind the Proposed Rule

The proposed rule was an attempt to address a growing conservation problem, before it escalated significantly, by imposing a presumably moderate economic impact on development and agricultural interests and providing a moderate level of protection to gopher tor-

toises. Staff reasoned that it would be possible to maintain the species’ distribution throughout much of Florida by permitting land-clearers to take the species at the “habitat acquisition rate” of 0.18 acres per maintained burrow.

Gopher tortoises occur in all 67 counties in Florida. They are considered rare only in portions of south Florida, where densities presumably were never high. There is enough tortoise habitat already in public ownership to virtually ensure the perpetual existence of the species in Florida. These facts did not argue in favor of staff’s proposed rule.

What did argue in favor of the proposed rule is the likely fate of the gopher tortoise based on the state’s pattern of growth and our knowledge of the life history and demographics of the species. Current patterns of land use in Florida will likely lead to the extirpation of gopher tortoises across large expanses of their present range. The perimeter of the range will contract. At some future point, tortoise distribution will likely be restricted primarily to national and state forests, state parks, and wildlife management areas. Tortoises will be all but extirpated in south Florida where most public holdings are wetlands.

Does Florida need tortoises anywhere except on public lands? Does Florida need tortoises in small, heavily urbanized Pinellas County? These types of questions pertain more to social/political objectives than to biology. Regarding “need”, the pivotal question for Staff was, “What protection for tortoises should the Commission provide in order to fulfill its constitutional mandate to protect and conserve the public’s wildlife resources.” Equally important, the Commission’s General Counsel had to consider whether the rule would violate private property rights and whether the Commission had the authority to regulate land use.

Concerns Expressed by Environmentalists

Staff encountered several obstacles in trying to gain support for the rule from the environmental community. Environmentalists did eventually extend support, some quite strong and some

qualified (see MacDonald 1991). Most notably, that support came from the Florida Audubon Society, Florida Defenders of the Environment, Florida Chapter of the Sierra Club, Florida Chapter of The Wildlife Society, the Society for the Study of Amphibians and Reptiles, and the Gopher Tortoise Council.

Nominally, the gopher tortoise enjoys a considerable degree of protection in Florida because it is a listed species. The general public and to a lesser extent Florida’s environmental community initially believed that the Commission and other state agencies provide the gopher tortoise a much greater degree of protection than in fact exists. In reality, the tortoise is virtually unprotected from its greatest threat—upland conversion. Ironically, the public felt the Commission intended to yield to influential special interests and “sell out” gopher tortoises, when just the opposite was intended. Before the process was over, it was apparent that the rule would result in more, not less, protection for gopher tortoises.

Many environmentalists entered the rule-making process with the position that the compensation required of a land-clearer must equal the loss that is permitted. For example, if a land-clearer takes ten tortoises, he or she must protect enough habitat to support ten tortoises. The proposed rule was not equitable in this sense; it required protection of less than two tenths acre per maintained burrow while the average gopher tortoise territory in Florida is about one acre. To many environmentalists, this seemed to violate the ethics as well as the biology of conservation. By the end of the rule making process, most environmentalists still were not comfortable with 0.18 acres per maintained burrow, but accepted as unrealistic “no net loss” of tortoises or even “one-for-one” mitigation.

Staff held that implementation of this rule would likely have led to secure tortoise populations in most of north and central Florida. Environmentalists generally concurred with this assessment, but maintained that the tortoise problem in south Florida would not be addressed through the rule. Staff responded that

(Continued on UPDATE page 4)

the rule might be of some conservation value in south Florida, but additional recovery efforts would undoubtedly also be necessary in that part of the state. Many environmentalists held that, far from contributing to tortoise conservation, implementation of the rule would in fact lead to the extirpation of gopher tortoises in south Florida.

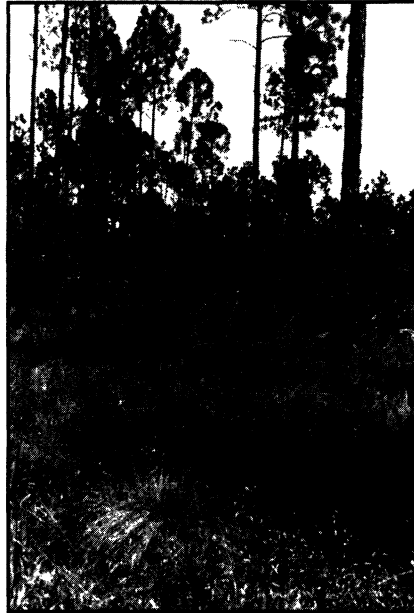
Regardless of the proposed rule, animal rights groups and some conservation groups are firmly in favor of a large-scale relocation program to move gophers out of harm's way on proposed development sites. Staff incorporated relocation in the proposed rule, but only to a limited extent. This resulted in very limited support for the rule from animal rights advocates. Some conservationists also qualified their support of the rule based on the relocation issue.

Concerns Expressed by Development and Agriculture

Development and agricultural interests lobbied heavily to defeat the proposed rule (see Blizzard 1991). They maintained that, in passing the rule, the Commission would be exceeding its authority to regulate wildlife and would in fact be regulating private land use. They also held that implementation of the rule would violate constitutional property rights and would impose an inordinate burden on Florida commerce. Commission's General Counsel was prepared to refute the arguments concerning authority and constitutionality (Antista 1991). Staff had prepared a preliminary economic impact statement and intended to contract an independent economist to perform a comprehensive analysis later in the rule-making process.

Opposing groups and individuals also maintained that the rule was not warranted based on biological grounds. Assertions were made, for example, that the tortoise is not in serious decline in Florida; that tortoises populations can persist in the long term in active citrus groves; and that scrub and sandhill communities are not terribly important in maintaining the distribution of tortoises in Florida. Arguments such as these were dismissed by Staff and virtually all

of Florida's wildlife professionals, the environmental community, and even the general public. Unfortunately, much of the debate took place in an administrative forum where Staff found it difficult to refute such arguments because specific counter-arguments (e.g. the state-



Sandhill pine plantations with longleaf pine canopy and wire grass understory make excellent habitat for the gopher tortoise. Photo by R. McCann.

wide population of gopher tortoises is decreasing; tortoise populations can not persist in the long-term in active citrus groves) have not been thoroughly addressed through research.

Finally, representatives of development and agriculture maintained that it would be inappropriate to regulate private interests because the gopher tortoise can be maintained in perpetuity in Florida solely on lands already in public ownership. Staff responded that the rule is needed in order to maintain the distribution of the species throughout the state and that appropriateness of the rule does not hinge on the specter of statewide extinction.

The Outcome

In January 1991 the Commission's 5-member governing board directed staff to discontinue rule-making efforts regarding the incidental take of gopher tortoises. The two primary reasons provided by board members for this decision were; 1) the Commission does not

have the resources to administer the rule because of current and projected budget limitations, and 2) other government agencies currently regulate land use and do consider impacts to wildlife. Two other considerations were made apparent from discussions between board members immediately prior to their decision; 1) whether or not the Commission has the authority to pass a rule that may have the effect of regulating private land use, and 2) whether or not the status of the gopher tortoise warrants the likely economic impact of the rule. The consequences of the board's decision, for the gopher tortoise and the Commission, remain to be seen.

Acknowledgments

Mike Allen, Brad Hartman, Randy Kautz, Bruce Means, Rick McCann, Brian Millsap, and Don Wood reviewed earlier drafts of this paper. Brad Hartman conceived and developed the proposed incidental take rule, and developed many of the perspectives presented here. I gratefully acknowledge these individuals for their contributions.

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Book Review

Natural Resources for the 21st Century 1990. Island Press.

edited by R. Neil Sampson and Dwight Hair

Natural Resources for the 21st Century is a two-part collection of papers presented at the "Natural Resources for the 21st Century" conference held November 14-17, 1988 in Washington, DC. All papers were reviewed by Melany C. Neilson of the USDA Soil Conservation Service as well as by the listed editors, representing the American Forestry Association.

"...establishes a foundation for the development of a balanced perspective on all natural resources and the means to separate fact from fiction."

The purpose of the book is to provide natural resource management professionals and organizational decision makers with a current source of information that deals with the wide array of issues we face in formulating wise management plans for natural resources. It gives the reader an excellent perspective of integrated natural resource management through a current analysis of scientific facts and long term resource trends. The book establishes a foundation for the development of a balanced perspective on all natural resources and the means to separate fact from fiction. From that position, it would serve a student of natural resource management as an excellent source of current information as well - particularly those beginning their professional careers.

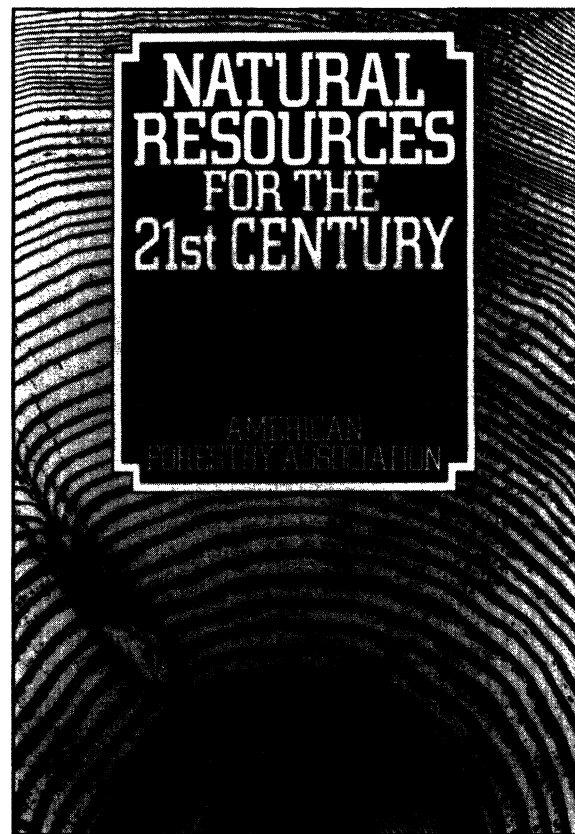
Most of us know that sustainable use, through holistic management of natural resources, is necessary for maintaining and increasing the productive capacity of the earth so as to meet the needs of our ever increasing population. We also know that "quality of life" issues are increasingly an important part of natural resource management pro-

gram objectives. The information provided in this book can provide you with a much better understanding of what is

land use and soil sustainability, forests, rangelands, wetlands, water, wildlife, fisheries, recreation, and wilderness, as well as with recycling. This is excellent, detailed information that will serve the reader as an accurate reference source. Each chapter concludes with a complete listing of the author's references which in and of themselves, provide another excellent source of information.

Part II titled: "Perspectives and Analyses" provides quite broad insight into the resource status information and trends provided in Part I. It is a most insightful conclusion through the analyses of the trends as a whole. There are sociological evaluations, analytical evaluations, political evaluations, and a call for action for all resource management profession-

als. Lastly, there is a focus on the concept of natural resource sustainability, a focus on the challenges for change in natural resource management, and a review of the impacts of these impending changes on our expectations for improving our quality of life in the 21st century. Part II provides us with a challenge to respond to the call for change in our traditional means of managing natural resources and it is a call we must all respond to.



happening to our natural resources and allow you to more successfully address emerging "quality of life" issues.

"... provides us with a challenge to respond to the call for change in our traditional means of managing natural resources and it is a call we must all respond to."

Part I is titled: "An Inventory of Renewable Natural Resources." It provides detailed information on issues dealing with population, economic development, climatic trends, agricultural

Reviewed by John Witherspoon, Director of the International Seminar on Forest Administration and Management at the School of Natural Resources, University of Michigan. Ann Arbor, MI 48109-1115

Gopher Tortoise Conservation: Missing the Trees for the Forest

by Russell Burke

Mark Kopeny (see page 1 of this issue) does a fine job of reviewing the history of Florida's proposed incidental take rule, particularly in outlining the strengths and weaknesses of the Florida Game and Fresh Water Fish Commission's (GFC) attempts to protect gopher tortoises. As a biologist who has studied the species, a long-term member of the Gopher Tortoise Council, and a 10-year observer of the GFC, I was convinced when the proposal was released that Commission staff were making a sincere effort to increase protection of the species statewide. Kopeny is correct that conservationists' objections focused on two points: the inadequate amount of land required in exchange for permission to kill a tortoise, and the lack of official encouragement for relocations. Here I will address the second point, and suggest that the Commission's failure to more fully utilize relocations is in part due to an emphasis on populations, rather than individuals, ignoring the fact that the trees make up the forest.

To many people sharing a certain moral framework, relocations are necessary as long as we allow "development" of occupied habitat. Given that we cannot save everything, a commonly accepted system ranks as most important those species that share many attributes with ourselves. Tortoises, though certainly farther down this scale than chimpanzees or baby seals, appeal to many humans because they are long-lived, conspicuous, harmless, and important to many other species. Thus they are different from their burrow commensals, and so have generated far more interest from non-biologists than all 300+ commensal species combined. This is not to say that the other species are unimportant, but that to many people the unnecessary death of a tortoise is a particular affront.

Fellow wildlife biologists have said that relocations do not include the rest of the burrow community, are unsuccessful,

and also affect the gene pool, health, and social structure of tortoises at the recipient site. Certainly, nobody has managed to successfully relocate any of the commensal species. This is a great opportunity for research, which should be funded by the forces that make it necessary. However, reports on approximately a dozen gopher tortoise relocations have been published and they have generally had about 40-50% "success" rate, based on the number of animals found when the release site was surveyed some time later. "Success" depends a great deal on the intensity of the follow-up survey. Of course, relocations of such a long-lived species will require long-term monitoring to determine degree of "success", but at least one gopher tortoise relocation has demonstrated annual reproduction and a 40% "success" rate five years after release.

As far as gene pools and local adaptation are concerned, work on desert tortoises (*Gopherus agassizi*) found no significant genetic differences between tortoise populations within the same major river drainage. Despite several investigations, there is no evidence that relocation disturbs the normal social structure (which has never been adequately characterized) of a recipient site population.

Another common objection is that any good recipient site already has as many animals as it can support. However, thousands of acres of suitable habitat have been created by reclaimed phosphate mining lands, forests that are being returned to more natural conditions due to controlled burning, the retreat of the citrus industry, drainage in south Florida, and the protection of formerly hunted areas. This makes it unnecessary to use sites with any significant resident tortoise presence. While there are no data on carrying capacity for gopher tortoises in any habitat, there is wide variability in tortoise densities even within a single habitat type. Current densities may be more dependent on

historical factors than ecological ones.

Although perhaps the most important concern had been that relocated tortoises might spread disease to recipient site populations, there were no known examples of reptile epizootics. Recently, however, tortoise upper respiratory disease syndrome (URDS) has decimated numerous desert tortoise populations and it has been suggested that spread of the disease was facilitated by uncontrolled release of infected captive animals. It appears that the disease is probably chronic but dormant in many tortoise populations and that its clinical form is brought on by stress. A relatively simple antibiotic preventative and treatment is available. Thus, tortoises could conceivably be quarantined on the donor site (e.g. ESU 8:2; ESTB XV:9 p.5) and treated before transfer to a release site.

Given these comments, what is a reasonable approach to gopher tortoise conservation in Florida? First, an incidental take law is needed, a law with firm statutory and regulatory footing. Such a law needs to require a fair price for the taking of habitat, to fund the land acquisition and management necessary to preserve large, viable populations of tortoises. In some developments, experimental on-site preserves may be appropriate. Unfortunately, there has been little interest from developers to construct tortoise preserves on-site and the problems of managing such preserves in perpetuity are imposing. In other circumstances, relocations are an appropriate answer. Research is needed to determine how to better implement both, and we need an agency to take an active role in guiding that research. Funding should come from the source of the problem, either on a case by case basis or from a general pool. Certainly relocation is not the answer, but it should be one part of the solution.

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Bulletin Board

Symposium on Society and Resource Management: Call for Papers

The Fourth North American Symposium on Society and Resource Management will focus on the integration of social and biological sciences as they together address natural resource and environmental issues. The Symposium will meet at the University of Wisconsin, Madison, May 17-20, 1992. Persons interested in presenting a paper or poster should submit an abstract no longer than two double-spaced, typewritten pages by December 1, 1991 to: Donald R. Field, Program Chair; School of Natural Resources, University of Wisconsin, 1450 Linden Drive; Madison, WI 53706. USA. (PH (608) 262-6968; FAX (608) 262-6055).

Primate-Talk: A Discussion Forum for Primatology

The Wisconsin Regional Primate Research Center (WRPRC) at the University of Wisconsin, Madison, has announced the availability of a new electronic mail listserver called PRIMATE-TALK. This is an open forum for the discussion of primatology and related

subjects. It is open to electronic mail users world-wide with an interest in primatology. Subject matter may include, but is not limited to: meeting announcements, research issues, veterinary/husbandry topics, job notices, animal exchange information, and book reviews.

People with Internet, BITNET, or UUCP addresses can communicate with PRIMATE-TALK;

send a message to PRIMATE-TALK-REQUEST@PRIMATE.WISC.EDU stating that you would like to sign on. Users of other networks should write WRPRC Library, 1220 Capitol Court, Madison, WI 53715-1299. USA.

Seventh International Snow Leopard Symposium

"Parks, People and Snow Leopards" is the theme of the Seventh International Snow Leopard Symposium to be held in Xining, Qinghai Province, People's Republic of China, July 27-31, 1992. The symposium will address the needs of people, wildlife, and the land through three major topic areas:

1. Distribution, status, and management of wild snow leopards and their prey;
2. Management of protected areas to ben-

efit snow leopards and local inhabitants; and 3. Linking conservation efforts with management of captive snow leopard populations, including diseases, nutrition, and veterinary care. Papers are invited on any of these topics. For more information contact: Helen Freeman, International Snow Leopard Trust, 4649 Sunnyside Avenue North, Seattle, WA 98103. USA. (PH (206) 632-2421; FAX (206) 632-3967)

Conservation of Latin American Germplasm

DIVERSITY, the news journal of the international plant genetic resources community, is devoting a special double issue to those organizations, scientists, and programs that are racing against the clock to preserve Latin America's irreplaceable germplasm. For information on purchasing this special issue (English and Spanish editions) contact: Lisl Harper, Business Manager, *DIVERSITY*, 727 Eighth St., SE, Washington DC, 20003. USA.

Bulletin board information provided in part by Jane Villa-Lobos, Smithsonian Institution.

Announcements for the Bulletin Board are welcomed.

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