

# Endangered Species UPDATE

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

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THE UNIVERSITY OF MICHIGAN  
**School of Natural Resources**



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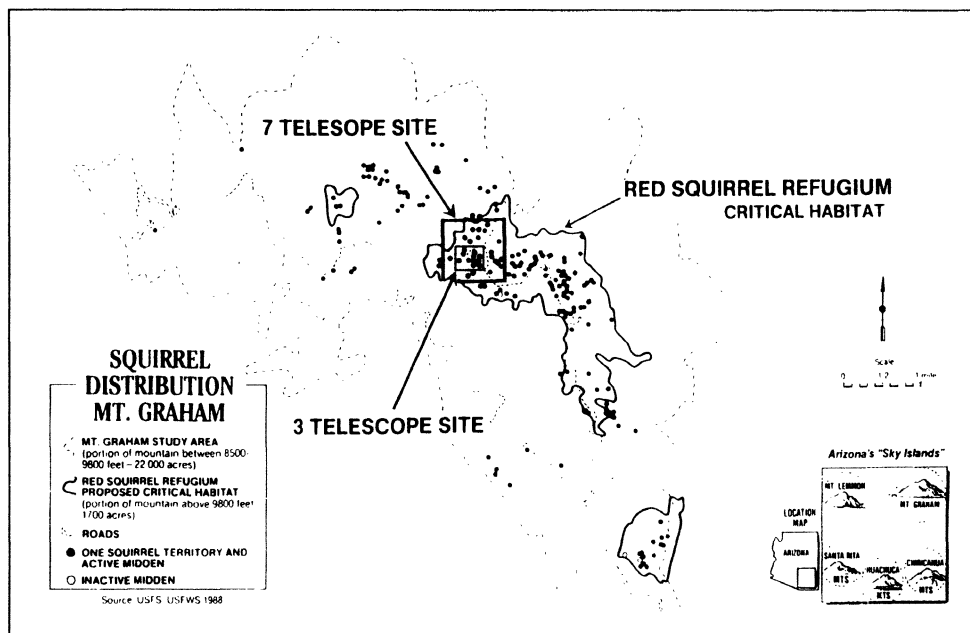
# Endangered Arizona Ecosystem Threatened by Telescope Development: The Mount Graham Red Squirrel Controversy

by  
Paul Hirt

An endangered species controversy has been raging in Arizona for the past five years pitting astronomers against biologists, and spawning a U.S. General Accounting Office (GAO) investigation, congressional oversight hearings (scheduled for June 26, 1990), and a Sierra Club Legal Defense Fund (SCLDF) lawsuit. The controversy has also led to the creation of an environmental protection coalition of unprecedented proportions. Superficially viewed as "squirrels vs. 'scopes" because an endangered sub-species of red

an elevation of 10,700 feet, towering more than a vertical mile above the Gila River Valley of southeastern Arizona. It is part of the Coronado National Forest, which, as a whole, possibly hosts the greatest diversity of plant and animal species of any unit in the National

unique and rare biotic communities and associations of plants and animals which reach the limits of their northern or southern distributions on Mt. Graham. The mountain also hosts at least 17 species that have protected status under state and federal endangered species



programs, with more undergoing study. Mt. Graham has been called a "museum of evolution" similar in character to the Galapagos Islands.

In addition to these ecological characteristics, the mountain has qualities at-

squirrel has helped to block construction of a massive observatory complex, the controversy entered the national spotlight recently when Secretary of Interior Manuel Lujan remarked in reference to it, "Do we really have to save every subspecies?" and "Nobody's told me the difference between a red squirrel, a black one, or a brown one." What is this issue that has spurred so much national attention and contention?

The battle is over a small pocket of spruce-fir forest at the highest elevations of a "sky-island" mountain range in the desert Southwest. Called "Mount Graham," or the "Pinaleno Mountains," this rugged range attains

Forest system.<sup>1</sup> The spruce-fir forest is a relict from the Pleistocene Era and is separated by a sea of desert from other similar forests found in the Rocky Mountains and high plateau areas of the West. Many of the plants and animals associated with this 700 acre Canadian-type habitat have evolved in isolation from other related gene pools since the retreat of the last Ice Age approximately 11,000 years ago. Three mammals are endemic to the mountain — including the now famous Mt. Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*)— as well as a dozen or more plants and invertebrates. Besides endemic species, there are

tractive to astronomers: dark skies and a relatively arid climate. The Steward Observatory at the University of Arizona (UA) in Tucson has coveted Mt. Graham as a potential astrophysical site since the early 1980s. The UA has telescopes on four other mountain peaks surrounding Tucson, three on Coronado National Forest land already, yet they desire to develop Mt. Graham as an additional site. Since 1984, the UA has been trying to clear the way for approval of an observatory composed of at least seven telescopes and support facilities. Approval was delayed and limited, and now construction has been stalled, due to concerns raised by fed-

<sup>1</sup> A 1978 USFWS report identified southeast Arizona as having the greatest density of mammal species (*species density not population density*) in the United States. The report also identified eight "unique and nationally significant wildlife ecosystems" in Arizona, and all but one of them occurred in the southeast part of the state (*Unique Wildlife Ecosystems of Arizona*, Albuquerque: Region 2, 1978). The Forest Service says, "The diversity of plants and animals found on the Coronado is unique in the National Forest system." They have identified 576 vertebrate species, including 321 birds, 113 mammals, 90 reptiles, 33 fishes, and 19 amphibians. As of 1986, 64 of these species were classified as threatened or endangered by federal or state agencies (*Final EIS, Coronado National Forest Plan*, Albuquerque: Southwestern Region, 1986; pp. 5, 54, 68).

eral and state wildlife agencies and a diverse coalition of opponents. The coalition includes most of the "Big Ten" national environmental organizations (Sierra Club, Audubon Society, National Wildlife Federation, etc.) as well as such odd bedfellows as animal rights groups, rod and gun clubs, Earth First! and an international group of over six dozen Ph.D.s in the natural sciences which call themselves "Scientists for the Preservation of Mt. Graham."

The issue has attained national and even international attention through news stories in the *Wall Street Journal*, *New York Times*, *San Francisco Chronicle*, *Denver Post*, *High Country News*, *U.S.A. Today*, West Germany's news magazine *Stern*, other periodicals in Italy and Great Britain, and on National Public Radio. Arizona reporters have called this the most controversial and acrimonious environmental debate in the state's history. At the present time, the SCLDF is suing the U.S. government for violations of the Endangered Species Act (ESA), the Senate has called for a GAO investigation, and the House has scheduled oversight hearings. The main scandal involves allegations that two key U.S. Fish and Wildlife Service (USFWS) biologists were ordered to alter their findings in order to justify a "predetermined intent" to approve observatory development within the critical habitat of the endangered Mt. Graham red squirrel. These allegations were made by the two federal biologists last year in sworn depositions submitted during the SCLDF lawsuit in U.S. District Court in Tucson (*Mount*

*Graham red squirrel v. Clayton Yeutter, et al.*).<sup>2</sup>

Another aspect of the issue which has attracted attention is the fact that Congress passed a special authorization for the observatory in October of 1988 — attached as a rider to the Arizona-Idaho Conservation Act (AICA) — mandating that the first phase of the project proceed. The authorization was designed to cut short the formal environmental review process which had thus far denied approval of the observatory proposal. Complaining that further "delays" would cause their collaborators to seek out alternate sites, the UA succeeded in convincing the Arizona delegation to legislatively preempt the federal agencies' authorities and allow immediate construction of the first three telescopes.

The rider, Title VI of the AICA, "satisfied" National Environmental Policy Act (NEPA) requirements, even though the Forest Service had yet to write a Final Environmental Impact Statement (EIS). It also eliminated or delayed implementation of certain USFWS required mitigation measures, and may have exempted the first phase of the project from some of the provisions of the ESA. There are conflicting opinions about the degree to which the rider exempted the first three telescopes from further application of Section 7 of the ESA dealing with biological consultation. That issue is being litigated now and will be a topic of discussion at the oversight hearings in June.

This rider distinguishes Mt. Graham as another example of the recent grow-

<sup>2</sup>In a deposition dated January 11, 1990, USFWS Arizona field office head Sam Spiller was questioned regarding his office's development of two drafts and a final Biological Opinion (BO) on the impact of the proposed observatory on the Mt. Graham red squirrel. On pages 93 and 94, Spiller was asked about a "no jeopardy" decision in one of the earlier drafts regarding construction of four telescopes on Mt. Graham's "High Peak." Here is an excerpt of the interrogation: Q: "Did he [the regional director] direct you to produce an opinion that would put the scopes on High Peak?" A: "Yes." Q: "Before that decision was made, you had not conducted an adequate and complete evaluation of the adverse action on the squirrel, is that correct?" A: "Yes, that's correct." Spiller was then asked, "[w]hat happened in May of 1988 that resulted in a change in the analysis between the two biological opinions, the draft and the final?" A: "My regional director and the assistant regional director, Jim Young, met with telescope proponents..." Q: "And by telescope proponents, you mean representatives of the University of Arizona, is that correct?" A: "Yes." ... Q: "And it's your understanding that at this meeting the decision was made to switch the observatory site from High Peak, is that correct?" A: "Yes." ... Q: "As a biologist, is there any biologically sound justification for changing the project site from High Peak to Emerald Peak?" ... A: "I don't know of any" (pages 65-69). An excerpt from the first draft BO, page 38, says this about the Emerald Peak site: "Placement of a facility here would require clearing of spruce-fir habitats... The destruction of habitat on Emerald Peak for siting an observatory would have greater detrimental impacts than the proposed siting on High Peak. Furthermore, those impacts on Emerald Peak could not be reduced below jeopardy with reasonable and prudent alternatives." (Emphasis added.) The final BO was produced two months after the regional director's meeting with the University and it approved an observatory on Emerald Peak.

## Endangered Species UPDATE

A forum for information exchange on endangered species issues  
April 1990  
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Suzanne Jones.....Editor  
Dr. Terry Root.....Faculty Advisor

### 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 please contact Suzanne Jones at the number listed below.

### Subscription Information:

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Cover:  
Mt. Graham Red Squirrel  
(*Tamiasciurus hudsonicus grahamensis*)

Photo by Bob Miles,  
Arizona Game and Fish Department

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

ing trend toward legislating species-by-species exemptions to the ESA. In addition, this issue is a paradigm of flawed process. It exemplifies the abuse of procedures, the loss of agency decision-making autonomy, and the politicization of science. The November 1, 1988 issue of the *Land Letter*, a national newsletter covering public lands issues for resource professionals, featured a story on the Mt. Graham rider. Its headline characterized the rider as "the worst threat [to the ESA] since Tellico Dam," quoting wildlife attorney Michael Bean of the Environmental Defense Fund. With important cases like the spotted owl coming down the pike, it is important to be cognizant of the tactics used by development supporters to circumvent the protections afforded by ESA, NEPA, and other environmental protection laws. What follows below, then, is a brief history of the controversy from 1982 to the present, highlighting problems in the environmental assessment and decision-making process.

Between 1982 and 1985, the Arizona Game and Fish Department (AGFD) researched and prepared a report under contract to the USFWS on three endemic sub-species of mammals living on Mt. Graham. One of them, the Mt. Graham red squirrel, was recommended for listing as endangered. Also in those same years, the UA developed a proposal to build 18 telescopes with support facilities, to be placed on several peaks in a 3,500 acre area at the summit of Mt. Graham. Without the benefit of any environmental analysis, the Coronado National Forest approved the entire observatory proposal in its 1985 Coronado Forest Plan.

When the plan was released for public comment, a great outcry ensued. In response the Coronado forest supervisor agreed to prepare a separate EIS for the observatory. But this initial endorsement set a significant precedent and encouraged the UA to continue full-scale planning in anticipation of imminent approval. In October of 1986, the Coronado published their Draft Mt. Graham EIS. As a result of the environmental impact analysis, the new Pro-

posed Action (PA) called for a much more conservative development of five telescopes to be built on only one peak, "High Peak." Even though this seemed like a major reduction in scope — so to speak — the PA did not actually foreclose opportunity for future expansion of facilities. It essentially approved the first phase of the astronomers' proposal and provided all the necessary elements for an expanding observatory.

No one liked the Forest Service PA. The UA wanted approval for more than five telescopes and more than one peak. Conservationists, the AGFD, and the USFWS wanted no telescopes at all. The Coronado Forest received 1,351 individual letters of comment on the Draft EIS — the largest response it had ever received on any issue — split about 50/50 pro and con. The entire Arizona congressional delegation came on board at this point, and jointly sent a letter to the Chief of the Forest Service supporting the observatory and urging him to approve a larger allocation than just the five telescopes on High Peak. The Coalition to Preserve Mt. Graham, representing 37 groups at that time, submitted a 100+ page comment on the Draft EIS documenting literally dozens of violations of law -- both procedural and substantive. The AGFD accused the Coronado of "bias" and endorsed the maximum protection alternative. The US Dept. of Interior, also opposing development, warned of a "resource conflict of national significance."<sup>3</sup>

The designation of the Mt. Graham red squirrel as an endangered species in 1987 interrupted the Forest Service's preparation of a Final EIS. Like many other species recommended for listing in the 1980s, the red squirrel listing was inexplicably delayed in Washington, D.C. for months. A letter-writing campaign and threat of a lawsuit broke it free in June of 1987. Critical habitat was proposed at the same time as the listing, but remained undesignated for several more years. The aforementioned Sierra Club lawsuit apparently dislodged the delay in 1990, nearly two years beyond the deadline for designation as required by law. (Designation of

critical habitat would have made it much more difficult to approve the observatory because the telescopes are expected to cause the loss or adverse modification of over 100 acres of prime foraging habitat.)

Because the squirrel became officially endangered in 1987, the law required consultation with the USFWS before an observatory could be approved. Thus, the USFWS was put on the hot seat. In early 1987, researchers from the UA, Forest Service, AGFD, and USFWS cooperated in the development of a Biological Assessment (BA) to serve as the data base for the subsequent Biological Opinion (BO) that would determine the fate of the observatory proposal. The UA in the meantime had scaled back to a ten telescope proposal, which the USFWS essentially ignored as they assessed the impact of the Forest Service's five telescope PA.

On August 31, 1987, the USFWS completed their BO and transmitted it to the Forest Service and the UA for review before releasing it to the public. *They concluded that the Forest Service's PA would jeopardize the survival of the red squirrel over the long term* (p. 5 & 29). By law, the USFWS must offer "reasonable and prudent alternatives" to the PA if such a "jeopardy" opinion is rendered. They offered four, in descending order of preference: (1) all telescopes would be placed on other existing, developed sites in southern Arizona; (2) & (3) the four telescopes would be placed on various peaks and ridges on Mount Graham outside of high quality squirrel habitat; and, least preferable, (4) four telescopes would be placed on seven acres on High Peak, similar to the Forest Service's Draft EIS recommendation.

The USFWS justified Alternative 4 by claiming that the jeopardy was minimal, and could be mitigated by tight land use restrictions and the closing and reforestation of the jeep trail to the Emerald Peak area -- an area which the UA dearly desired to develop. *In sworn testimony, however, the head of the USFWS field office in Phoenix claimed that there was a "predetermined in-*

<sup>3</sup>See *Public Comments and Forest Service Response to the DEIS, Proposed Mt. Graham Astrophysical Area, Pinaleno Mountains, Coronado National Forest* (Albuquerque: USFS Southwestern Region, 1988), pp. 619-20, 245-421, 670-71, & 710-12.

(Continued on UPDATE page 4)

tent" by the Regional Director to provide an allocation on High Peak, even before any studies were completed. He said that he was "directed" to approve a High Peak observatory in the 1987 BO (see footnote #2). The Regional Director, Mike Spear, claims that there was simply a communications breakdown. The GAO investigation is supposed to clear this controversy up.

Regardless of any possible miscommunications, Senator Dennis DeConcini and other members of the Arizona delegation were pressuring both federal agencies to "cooperate" with the UA and to "expedite" an acceptable allocation. In fact, just six weeks after the USFWS released the BO for internal review, DeConcini was recorded on a radio talk show in Safford, Arizona, stating that he had "convinced the Forest Service just recently to expand their environmental study to include Emerald Peak." "They were not going to do that," he added, "and we asked them to do that under an expedited procedure, and I met with Sotero Muniz, the director of the Forest Service for this region, just last week..." DeConcini went on to say he was optimistic that the project would go forward, and that he was "prepared to fight" the opposition. "I'm committed to it, and I'll do anything I can, including trying to change the law to let it happen," he concluded. (By October of 1988 he had made good on his promise to legislatively intervene on behalf of the UA.)

This USFWS approval of a High Peak observatory turned out to be inadequate for the UA's needs, however. The astronomers insisted that the agency include Emerald Peak in any allocation. Their lawyers had marshaled an argument that the BO was illegal because it did not study the UA's version of a "viable observatory." Since the Forest Service PA was unacceptable to the astronomers, the BA and BO based on it were moot, they argued. Although this is a rather specious argument that probably would not have stood up in court, the Coronado Forest Supervisor, in September of 1987, chose to suspend the biological consultation, suppress the BO, and start all over again.

The Forest Service then directed the UA to submit a firm and final "minimum viable observatory" proposal for analysis in an "Expanded Biological Assessment." The UA complied in October 1987 (see *Final EIS, Public Comments*, pp. 544-51), with a proposal for a seven telescope observatory to be built on both High and Emerald Peaks (including space for two very large instruments that had twice been disallowed). This new proposal was the subject of another several months of environmental analysis, accelerated by the Forest Supervisor against the wishes of the consulting scientists, and in February of 1988 the Expanded BA was published. Two of the four authors — the two not directly employed by the Forest Service — distanced themselves from the document as soon as it was released. One co-author, Dr. Peter Warshall, charged that the Forest Service had unilaterally edited the findings, softening the assessment of the observatory's impact. He submitted a lengthy critique of the document. AGFD biologist Barry Spicer, author of the original study and proposal to list the squirrel in 1984, claimed the document "was so rushed, we have not been able to do a thoroughly reliable job." Nevertheless, the BA still indicated that the UA's latest seven telescope proposal was unacceptable. Starting in February, the second 90-day consultation began, based on this new BA.

On April 18, 1988, the Phoenix field office of the USFWS completed a second draft BO. It reiterated the conclusions of the 1987 BO, i.e. seven telescopes would negatively impact too many acres of habitat, foreclose too much opportunity to regenerate habitat that had already been lost, and pose unacceptable additional risk of extinction for the red squirrel. They offered four telescopes on High Peak again as a least preferable alternative, and required the closure of access to Emerald Peak, judging that telescopes on Emerald could not be effectively mitigated.

This "draft" BO was never released to the public. Instead the document was put on hold in response to a UA request for an extension of the consultation pe-

riod. The astronomers and their representatives then met privately with the regional and assistant USFWS directors at the Tucson airport in May of 1988, to drive home the fact that High Peak alone was unacceptable. According to the court depositions, after that meeting Regional Director Mike Spear told his biologists in Phoenix to provide an Emerald Peak allocation, regardless of their earlier conclusions (footnote #2). Again, this is explained as a failure to communicate, and the GAO is expected to pass judgement on the circumstances and motivations involved in this series of events. The GAO report will be presented at the oversight hearings the morning of June 26, before the House National Parks and Public Lands subcommittee (Bruce Vento presiding). The hearings are also co-sponsored by Gerry Studds' subcommittee in the House Merchant Marine and Fisheries Committee.

As a result of this private meeting and the subsequent directive to change the Opinion, the field biologists rewrote their document so it would include an allocation on Emerald Peak. The agency formally released this reworked BO in July of 1988. It included three "reasonable and prudent alternatives." The third and least preferable one offered 3 telescopes on Emerald Peak only, with a host of mitigation measures attached to it. The second alternative repeated the offer of four telescopes on High Peak. The first, most preferred alternative, remained as no telescopes.

Still, as of July, the UA had not secured approval of their "minimum viable observatory." But Emerald Peak offered what they needed for a foot-in-the-door. The Emerald Peak site by itself was large enough to eventually support all seven telescopes. With this preliminary, biologically unjustified approval, the UA went to Congress for relief. Claiming that the biologists were biased and that environmentalists intended to stonewall the project to death, they asked the Arizona delegation to pass a law that would: (a) approve seven telescopes on Emerald Peak — three now and four more later; (b) deem the requirements of applicable environmental laws "satisfied" so that opponents could not delay their project any

longer with appeals and litigation; and (c) eliminate many of the mitigation measures required in the BO that the UA saw as unnecessary.

In August of 1988, legislation drafted by Patton, Boggs, and Blow (the D.C. lobbying firm hired by the UA to lobby for their project) and by Senator DeConcini's office was leaked to the press and the fight over the legislation began. DeConcini's proposed language essentially met the criteria noted above, although it was revised a number of times in the process of traveling through congressional committees until it was deemed to be consistent with the (skewered) BO. The legislation subsequently passed as a rider on the Arizona-Idaho Conservation Act in October of 1988. Even then, the congressional record shows that Senators DeConcini and McCain, and Congressman Jim Kolbe all promoted a slightly different view of the intent of the legislation than their other colleagues.

These members of the Arizona delegation, along with the Bush Administration's Justice Department and lawyers for the UA now argue that in this rider Congress mandated construction of the first three telescopes regardless of any changed conditions or new information. In contrast, the Sierra Club plaintiffs, along with members of the House Merchant Marine and Fisheries Committee (which has jurisdiction over endangered species), argue that the rider did *not* exempt the project from the provisions of the ESA.

Since the October rider was passed, the red squirrel population has suffered a devastating population decline due to drought conditions affecting its food sources. Its estimated numbers decreased from an already critical low of approximately 280 individuals in 1988, to about half that in the spring of 1990. The population is now below any reasonable estimate of a "minimum viable" size. This population decrease, together with the allegations that the BO was improperly prepared, and the fact that critical habitat was just recently designated, provide just cause for the reopening of biological consultation and the preparation of a new BO.

On May 9, 1990, Congressman Walter Jones (D-NC), Chairman of the Mer-

chant Marine and Fisheries Committee, and Congressman Gerry Studds (D-MA), Chairman of the Subcommittee on Fisheries, Wildlife Conservation and the Environment, sent a letter to Forest Service Chief Dale Robertson and USFWS Director John Turner, stating that they never intended the ESA to be circumvented and that biological consultation should be reinitiated. Some statements in their letter have important implications for other instances where legislative exemptions to the ESA are contemplated, and so are reproduced here in some detail:

We are writing to clarify the intent of Congress with respect to the Arizona-Idaho Conservation Act (Public Law 100-696). . . During the 100th Congress, we became aware of draft legislative language under consideration in the Senate which would have waived the ESA and NEPA as legal impediments to the construction of the observatory on Mount Graham. Given our Committee's jurisdictional interest in matters affecting the ESA and NEPA and our general opposition to amendments which amend or weaken those statutes, we expressed our objection to the proposed language [emphasis added].

As a result, alternative language was drafted, which we supported precisely because it was consistent with the existing requirements of Section 7 of the ESA . . .

The U.S. Fish and Wildlife Service's (FWS) Section 7 consultation regulations are direct and easy to understand . . . Language referring to these regulations is regularly included in Biological Opinions issued by the FWS, including the July 14, 1988 Opinion on the Mount Graham Observatory. One of the reasons we supported the AICA was the fact that this language providing for the reinitiation of consultation was included in the Biological Opinion. Nothing in Title VI of the AICA waives, weakens or in any way undermines the legal effect of this language.

A month later, a similar letter was issued by Congresswoman Claudine Schneider (R-RI) who sits on Gerry Studds' subcommittee. It was a bipartisan letter co-signed by over a dozen members of the two subcommittees sponsoring the hearings. The letter reiterated the call for reinitiation of consultation and further requested that no habitat disturbance occur until a new BO is written. The Forest Service had argued that even if reconsultation were to take place, they had no authority to hold up the construction permit. Ms. Schneider and her colleagues disagreed.

Officials of the USFWS in the Albuquerque Regional Office and Phoe-

nix Field Office recently indicated that they would like to reinitiate consultation. Unfortunately, the Washington Office of the USFWS, the Justice Department, and the Forest Service still cling to the view that the AICA rider exempted the first three telescopes from any further environmental review under Section 7 of the ESA. The oversight hearings may provide the forum for resolution of this stalemate. If not, final hearings in U.S. District Court in Tucson are scheduled for July 18. In the meantime, the UA has said it will begin clearing the forest for the three telescope pads as soon as the congressional hearings are completed. Thus, by the time a decision is made about reconsultation, the whole issue may be moot.

This experience validates the contention that political considerations often exercise a controlling interest over biological decisions. Neither the Forest Service nor the USFWS wanted to be responsible for rejecting the observatory proposal. They each approved small allocations, often against the better judgement of their field biologists, and then tried to toss the ball into the other agency's court for final resolution. Eventually, a political solution overrode both agencies' discretion.

Another lesson to be drawn is that legislative intervention is likely to be attempted when a powerful interest with substantial financial endowments can gain the support of its state congressional delegation. Fortunately, such intervention is likely to run into resistance in the Merchant Marine and Fisheries Committee if it involves significant exemptions to the ESA. Congress seems willing to "expedite" procedural "red tape," but not to weaken or amend the ESA. They also bristle at the thought of federal agencies manipulating data to make controversial decisions appear more palatable. Yet, the question remains, will anything be done about all these Mount Graham improprieties after the hearings? Will the Mount Graham red squirrel become North America's next extinct mammal?

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# Book Review

## The Official World Wildlife Fund Guide to Endangered Species of North America

Edited by David W. Lowe, John R. Matthews, and Charles J. Moseley

As Russell E. Train, Chairman of the World Wildlife Fund, states in the forward, the fact that over 530 U.S. species are listed for protection under the Endangered Species Act may either be viewed as a great achievement in environmental legislation or "a testament to our failure to wisely manage our great wealth of natural resources." This two-volume encyclopedia marks a landmark in providing for the first time a comprehensive accounting of each of these federally listed species. Its stated purpose is to compile available information on U.S. listed species and present it in "a language that is both readable and accurate," in recognition of the need to get this critical information to decision makers, managers, and educators.

The work begins with a brief overview of endangered species legislation in the United States by Michael J. Bean, Chairman of the Environmental Defense Fund. Outlining the evolution and ramifications of species legislation since the passage of the Endangered Species Act, Bean provides a useful background for the rest of the work. This overview is followed by an editors' introduction discussing the volumes' contents, the methods used in obtaining information for the book, and general sources where further information on endangered species may be found. Complementing this information are several appendices containing addresses of U.S. and Canadian agency offices involved with endangered species protection.

The *Guide* covers all species occurring within the United States and Puerto Rico that were listed as federally endangered or threatened as of August 1989. Shorter descriptions of 15 species listed from September to November are contained in appendices. (Future editions will include species added after November 1, 1989.) Volume One is devoted to plants (219) and mammals (58), while Volume Two covers birds

(67), reptiles (28), amphibians (11), fishes (83), mussels (34), crustaceans (9), snails (9), and insects and arachnids (21).

The standardized entry for each species contains a map, black and white photo, and physical description of the



species, along with an account of its habitat, behavior, historic range, current distribution, reasons for decline, and conservation and recovery efforts. For easy reference this information is also summarized in a list at the beginning of each entry, along with the status, date of listing, taxonomic family, diet, and region of occurrence. In addition, readers are provided with access to further information by inclusion of a bibliography and the address of a contact person for each species.

Numerous other efforts were made to increase the *Guide's* usability—especially for readers unfamiliar with the subject matter. Each volume contains a glossary of ecological terms, an appendix of state by state species occurrence, and a quick index of common and scientific species names, as well as a more extensive index containing all "probable permutations" of common names.

The professional appearance and appeal of this work is further enhanced by full color photos of 119 species. (Locating sources of photographs for each species was such a monumental task that the publishers also compiled a 73-page *Endangered Species Photo Locator*, which may be purchased along with the *Guide*.)

Although the entries for each species must obviously be limited in detail and length, the *Guide* provides a thorough introduction to each species and its plight—in a form that will be useful to both high school students and resource managers alike. A starting point thus established, the extensive listing of contacts and bibliographic sources point the way for those pursuing further research. In addition, the compilation of information on all listed species into one reference allows the reader to summarize data by state, habitat type, taxonomic groupings, etc., as needed.

I commend the World Wildlife Fund on the fulfillment of its goal to provide a medium by which conservationists, managers, the media, Congress, and the public can easily and quickly locate information on listed species. As the editors state, "access to this information is vital, not only to raise the level of public debate, but to evaluate the shortcomings and successes of the nation's species protection and conservation programs." Unfortunately, the cost of the volumes will be prohibitive to many who will wish to obtain and use them. (To the publisher's credit, however, a special discount is being offered to academic, zoo, and museum libraries which purchase multiple copies.) Those who can afford the luxury of this work, however, will greatly benefit from use of this landmark resource.

The *Guide* is available for \$195, plus 5% shipping (D.C. residents add 6% tax) from Beecham Publishing, Inc., 2100 "S" St, NW, Washington, DC 20008; (202) 234-0877.

Review by Suzanne Jones, *UPDATE* Editor.

# Bulletin Board

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## Snow Leopard Publications

The International Snow Leopard Trust is a non-profit foundation dedicated to the conservation of the endangered snow leopard and its mountain habitat. Three Trust publications are currently available:

- *Proceedings of the Fifth International Snow Leopard Symposium* (1988), edited by H. Freeman (269 pp), containing papers from the 1986 conference in Srinagar, India, which address three themes: distribution, status and studies of wild populations; management of captive populations; and conservation programs.

- *A Review of the Status and Ecology of the Snow Leopard* (1989), by J.L. Fox (40 pp), which summarizes information on snow leopard ecology, behavior, distribution, and conservation in a very readable form.

- *An Annotated Bibliography of Literature on the Snow Leopard* (1989), by J.L. Fox (69 pp), the most comprehensive catalogue to date on the species, containing over 500 annotated references.

*Proceedings* is available for \$19 (\$17 for ILST members), plus \$2.50 postage each (\$5 overseas). *Status* is \$4, and *Bibliography* \$4.50, plus \$2.50 postage for one or both (\$5 overseas).

For copies, contact: International Snow Leopard Trust, 4649 Sunnyside Ave, North, Seattle, WA 98103.

## Wildlife 2001 Conference

The Bay Area Chapter of the Wildlife Society, the Western Section of the Wildlife Society, and the University of California at Berkeley are sponsoring **Wildlife 2001: Populations** next year in Oakland, California from July 29-31, 1991. This international event is intended for research workers and agency personnel interested in the science, conservation and management of vertebrate populations (excluding fish and primates). The conference is a follow-up of the highly successful **Wildlife: 2000** which emphasized habitat modeling; a companion volume will be published. Papers will assess the state of the art and set the agenda for future applied wildlife population work. The following sessions, with chairs, will be held: Methods (Gary White), Modeling (Carl Walters), Threatened Species (Kathy Ralls), Small Mammals (Lloyd Keith), Marine Mammals (Chuck Fowler), Waterfowl (Doug Johnson), Overabundant Populations (Fred Wagner), Herps (Norman Scott), Large Herbivores (Fred Bunnell), Game Birds (John Roseberry), Seabirds (David Net-

tleship), Passerine Birds (Barry Noon), Large Carnivores (Maurice Hornocker), Raptors (Stan Temple), and Furbearers (Bill Clark). For more information, contact: Dale McCullough (415) 642-8462, or Reg Barrett (415) 642-7261, Dept of Forestry and Resource Mgmt, 145 Mulford Hall, Univ. of California, Berkeley, CA 94720.

## Politics of the Environment

The Congressional Quarterly, a weekly publication reporting on the federal legislative process, has back issues available of their January 20, 1990 Special Report, "Power of the Earth," dedicated to the politics of the environment. This 55 page document provides a historic overview of the environmental movement, details the rise of environmentalism into the political mainstream, and analyzes the politics, key players, and the likely outcomes and ramifications of environmental legislation in the 101st Congress. Cost of the report is \$15 each, plus \$1.95 postage (add 6% sales tax for D.C. residents). Orders of ten or more are discounted. Contact: Aprile Crawford, Congressional Quarterly, Inc., Dept. LB, 1414 22nd Street, NW, Washington, DC 20037 (1-800-432-2250, ext. 437).

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# Endangered Species UPDATE

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