

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



In this Issue:

The Endangered
Species Act and the
Politics of the Spotted
Owl Controversy

Northern Spotted Owl
Listed as Threatened

Listing Proposed for
Louisiana Black Bear
and Three Plants

Washington FWS
Office of Endangered
Species Reorganized

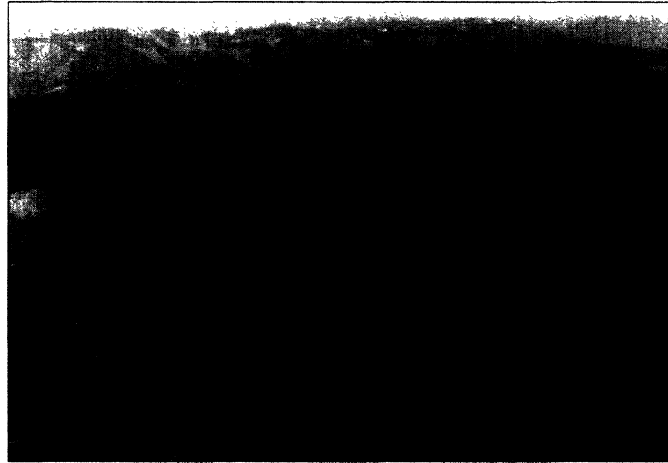
The (Endangered) Endangered Species Act: Political Economy of the Northern Spotted Owl

by
Marc C. Liverman

The northern spotted owl was listed by the US Fish and Wildlife Service (FWS) as a threatened species on July 23, 1990.¹ The exceedingly well-documented cause of the owl's imperilment is loss and modification of its habitat due to logging, exacerbated by catastrophic events such as wildfire, volcanic eruptions, and wind storms. The population is now in rapid decline, up to 14% per year in some areas.²

The most controversial aspect of the owl's ecology is, of course, its penchant for vast tracts of old growth, where well over 90% of the owls are found.³ (Most "non-old growth" owls occur in stands with residual pockets of old growth interspersed with younger stands.) Median annual home ranges for pairs have been estimated to be 9,930 acres in the Olympic Peninsula, 6,308 for the Washington Cascades, 2,955 for the Oregon Cascades, 4,766 for the Oregon Coast Range, and 3,340 for Klamath mountains of southern Oregon and northern California.⁴ Exactly why the owl requires old growth, and in such vast quantities, is still unknown, although food supplies, availability of foraging perches, suitable microclimate, and predator avoidance have all been implicated. Saturation of increasingly scarce habitat has sent many owls wandering into unsuitable habitats, where starvation, exposure, predation, and occasional human persecution take an inevitable toll.

Much of the logging at issue has occurred since 1960, resulting in the conversion of late successional conifer forests west of the Cascade Range summit into young stands lacking the structural characteristics required by the owl. Current forest management plans largely call for short timber rotations in the future, a situation preventing rees-



A western Oregon landscape fragmented by clearcuts and roads

USFWS

tablishment of the forest structure critical to the owl's survival. There is currently a lack of good habitat protected in preserves and, because of regional economic considerations, tremendous political resistance to any conservation schemes which call for habitat set-asides or alteration of logging practices now devastating owl habitat.

To date, the FWS has not played a lead or even a main role in determining the owl's fate. In the FWS' view, the owl poses a problem of ecosystem management that is too complex and politically charged for their strained resources to resolve.⁵ The FWS has never before attempted to define critical habitat for a listed species along complex gradients of latitude, elevation, and vegetation such as occur throughout the owl's range, and, so far, shows no sign of undertaking that exhausting task.

Moreover, it is questionable whether the Endangered Species Act (ESA) will be able to support the scale of ecosystem protection deemed necessary to protect the owl. Although conservation of "ecosystems upon which endangered and threatened species depend" is listed in section 2(b) as the first purpose of the ESA, similar language is absent from other critical parts of the bill.

Proponents of continued logging at current levels are also calling for ESA

reform. They believe that the ESA has become a tool for environmentalists whose hidden goal is to block economic development and multiple use of public lands. President Bush, Agriculture Secretary Yeutter, and Interior Secretary Lujan are influential members of the ESA reform group. Together, they recently proposed a plan to "achieve a balance between protection of owl habitat and concern for jobs" that includes unspecified amendments to the ESA.⁶

Although no definite ESA amendments are under consideration by Congress at this time, critics have suggested changes that would affect every key provision. These include modifications to limit the Act's scope to control of commercial exploitation only, as well as provisions to allow public input and consideration of economic factors at the listing stage, liberalized taking regulations, a broader hardship exemption process, categorical exclusions for activities on private lands, expanded powers for the Endangered Species Committee (the cabinet-level group with authority to exempt federal agencies from ESA compliance), and insulation from judicial review.

Fortunately, the ESA, for all of its faults, has always been enormously popular with voters and legislators alike. Direct attacks on the ESA have so far been mostly theoretical. But the ESA has nonetheless been substantially, if temporarily, undermined by assaults in the form of riders to the Interior appropriations bill. These riders have substantially ended citizen access to judicial review of federal forest management activities for the past six years, not just under the ESA, but under virtually all other environmental regulations as well. Legislation to make

such suspensions permanent is now under active consideration in Congress.

The following discussion outlines the political forces and history behind the spotted owl controversy in the Pacific Northwest, the outcome of which will have important ramifications for the larger crisis facing the ESA as a whole.

The Listing Process

By 1973, members of The Wildlife Society, the FWS Office of Endangered Species in Washington, DC, and even representatives of the wood products industry were aware of the implications which the spotted owl's old growth dependence had for conservation efforts and the federal timber sale program.⁷ Yet, despite this early warning, no action was taken to correct what was clearly a collision course between logging and the owl.

By the mid-1980s, regional forest activists were involved in a fervent debate over the merits of a petition to list the owl under the ESA. On one hand, they reasoned, the owl was clearly at risk. Yet many feared losing the ESA altogether in the backlash that would surely result from such a legal challenge to the ever-increasing logging levels in federal forests. The argument became moot in January of 1987, however, when without warning two individuals in Massachusetts formed a group called Green-World and submitted a one page petition to the FWS to list the owl as threatened. A few months later, 27 regional and national environmental organizations filed a second petition (17 pages long) to list the owl and designate critical habitat.

In December 1987, the FWS completed its status review and announced that listing was not warranted at that time because of the need for population trend information and other biological data. Forest activists responded with a lawsuit challenging that finding. They succeeded in having the decision remanded to the FWS, with an order to supplement the status review and provide an analysis and explanation for its decision not to list. The FWS convened a second status review team which received significant new information not available in the original record, as well as substantially more public comment. The team eventually completed the sup-

plemental status review, resulting in a listing decision in April of 1989.

Timber Economics

The logging industry was the most powerful business in the United States until the late 19th century. Wherever it occurred, logging created the dominant economic and political culture until either it exhausted the native forest resource or human populations grew large enough to support diverse economic activities in addition to, or instead of, timber extraction. When the industry arrived in the Pacific Northwest after its long advance across the continent, it found that the largest, most valuable forests had been saved for last.

Most of the region's productive forest land is in private hands, but by the 1940s much of that was well on its way to complete conversion. To keep wood supplies high enough to satisfy the need for war materials and the later demands of the post-war housing boom, policies designed to keep federal forests intact were reversed. Rapid liquidation of large old growth reserves located in the National Forest System, administered by the US Forest Service (FS), and on lands managed by the Bureau of Land Management (BLM) became the order of the day.

Rather than subsiding after the post-war era, logging on federal lands rose dramatically. Criticism of FS management during the 1960s and 70s resulted in the passage of sweeping reform legislation calling for "multiple use" forest plans. But even these reforms were unable to stop the escalating cut, until oil price shocks and the general economic recession slashed the demand for wood products in the early 1980s.

Some small logging operations were forced out of business during this period, but most struggled to adapt with the aid of generous federal subsidies. Automation and, when allowed, log exports became major industry tactics to cope with a market made increasingly complex by declining private timber supplies and increasing inter-regional and international competition, labor costs and environmental concern.

Today, the Pacific Northwest timber economy still depends on federal old growth forests for a significant part

Endangered Species UPDATE

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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.

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Cover:

Northern spotted owl
(*Strix occidentalis caurina*)
Photo: Portland Audubon Society

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of the cut. Indeed, even though less than 10% of the region's original forest remains as ecologically viable old growth, there is very little else left to sell since significant second growth on land in any ownership is still decades away from maturity.

Divisions within the FS over cut levels is creating a crisis and straining the loyalty of agency employees. James Torrence, who retired recently after a 34-year career with the FS (including the last three years as Regional Forester in the Pacific Northwest), has expressed concern that the Bush Administration and some Northwest politicians appear unwilling to face reality about cut levels. In particular, Torrence is alarmed by administration proposals to override professional forest management in order to protect timber-related jobs.⁸

Nor is the problem limited to FS personnel in the Northwest. Indeed, acting National Forest Supervisors from states ranging from northern Idaho to New Mexico have warned that the FS is "out of control" and out of touch with the land stewardship values on which it was founded.⁹ A group calling itself the "Association of Forest Service Employees for Environmental Ethics" claims that over 1,500 of the Service's 38,000 employees have joined them in an effort to change the agency's resource management direction.¹⁰

Although one quarter of the timber cut in the region is now exported as logs, automation throughout the industry has virtually decoupled cut levels from employment. The new forest plans are themselves calling for substantially reduced cut levels. Nonetheless, listing and recovery of the owl has emerged as the major focus of regional timber employment concern.

Predictions of job losses due to conservation of the owl are based on complex assumptions and vary wildly, depending upon the area affected and the source of the estimate. Conservationists estimate that there could be "no net loss" of jobs, if exports originating from private lands are redirected to domestic use. Government agencies predict losses of 14,000-28,000 jobs over ten years, if the ISC recommendations and forest plans (described below) are implemented without limiting log exports

from private lands. Meanwhile industry analysts predict that up to "hundreds of thousands" of jobs will be lost, if dozens of rural communities collapse and threaten the viability of major urban areas.

Timber Politics

Politics have always played an enormous role in determining the timber sale levels in federal forests. While the forest plans currently being implemented in the Pacific Northwest were in preparation, the regional delegation in Congress was able to consistently assert timber quotas to keep the cut on an ever upward trend. In some cases, forests were ordered to harvest over 45% more than professional forest managers would otherwise have recommended.

Forest activists sued to stop damage to forest soils and watersheds, and to preserve options for spotted owl recovery. They won injunctions which substantially limited timber sales in sensitive areas -- including sales programs that would have logged over 85% of the owl's remaining habitat. In each case, however, Congress intervened to suspend the court's jurisdiction and allow the contested sales to go forward, albeit often with modifications intended to make them less environmentally destructive.

Fearing the worst from a listing decision, Congress established an Inter-agency Scientific Committee (ISC) in October of 1989, with members from the BLM, FWS, FS, National Park Service, state representatives from Washington, Oregon, and California, and "interest-group advisors" (from the industry, environmental groups and academia). This group was charged with developing a scientifically credible conservation strategy for the owl. However, when the ISC presented its recommendations¹¹ calling current owl management plans "unacceptable," and proposed instead that a system based on large habitat conservation areas be designated across the owl's range, politicians again reacted sharply.

This time, the Northwest delegation went directly to President Bush. In June of 1990, he agreed, among other things, to convene a "high-level inter-

agency task force," chaired by the Secretary of Agriculture, to work directly with key members from congressional committees with jurisdiction over forestry and endangered species issues, the Northwest delegation, and governors of Washington, Oregon and California, to devise a management plan for the FS to follow during fiscal year 1991.¹²

President Bush's task force has a number of flaws: it ignores the most credible scientific information to date (the ISC report); delays recovery for both the owl and timber dependent communities; provides vague, uncertain and probably nonexistent protection for the owl; rewards federal agencies, industry, and Congress for ignoring mounting evidence indicating a species in danger; and gives cabinet-level officers a mere 60 days to complete the complex task of long-range planning for federal forests of the entire region.

Ironically, announcement of the new task force follows one month after two Northwest members of Congress accused President Bush of suppressing a study showing how more than 20,000 regional timber jobs could be saved, even with major cut reductions to protect the owl.¹³ The study suggested nearly two dozen possible actions to mitigate job losses through trade policy changes (primarily by banning log exports), community outreach, education, family support, loans and grants, revenue sharing, and land stewardship. Administration representatives called the report an "internal working document" and labeled the accusation a "political attack."

Public Perception

Lack of a strong federal agency willing and able to assert early control of the regional debate surrounding the owl's fate created a high stakes free-for-all. It is doubtful whether a single adult citizen of the region has been spared involvement in the debate at some point, as bright lines were drawn between employees working for the same agency, representatives at virtually every level of government, conservation groups, industries, and even neighbors.

Unable to break the administrative and legal deadlock threatening to extir-

(Continued on UPDATE page 4)

pate the owl, forest activists began an urgent campaign to nationalize the issue. They reasoned that since the owl was endangered, the forest ecosystem was not far behind. Moreover, since the ecosystem was a national resource under the protection of national laws and possessing features comparable to the best-loved national parks, they figured national ownership of the issue could finally remove it from the grip of the Northwest delegation -- a group dedicated to the timber culture.

Although sympathies have varied, the owl issue has indeed received frequent nationwide coverage in print and electronic media. This coverage has included feature articles in *New Yorker* (May 14, 1990), *Time* (June 25, 1990), and *National Geographic* (September, 1990) among others, and hour-long television specials on national television. However, forest activists were not alone in their recognition that the owl issue would be decided ultimately in a national forum. The wood products industry also mounted a national, multi-million dollar public relations campaign to present its own side of the story.

Conclusion

Final resolution of the owl issue cannot be predicted. Congress is considering at least five distinct "long-term legislative solutions," and President Bush's task force is preparing yet another as this article is being written. Three major lawsuits to protect owl habitat are in court, but are stayed temporarily by riders to the annual Interior appropriations bill -- riders that are themselves now due for expiration or renewal before October 1st. Furthermore, the FWS has endorsed the ISC Report, but has postponed indefinitely its own work on a recovery plan for the owl.

The role of timber in the Pacific Northwest has been compared to cotton in the Deep South.¹⁴ Cotton culture was so important to planters, mill owners, and workers that they fought the deadliest, most divisive war in United States history to preserve it -- a war whose effects are still felt more than a century later. In the end, the cotton culture disappeared, a victim of ecologically unsound land management practices, new

technology, substitute products, competition from other regions, and overwhelming political opposition.

In the South, where King Cotton lost its grip long ago, residents have passed far beyond that initial stage of grief to become optimistic again. In Enterprise, Alabama, they even built a monument to the boll weevil: a pest that was largely responsible for breaking the cotton industry's back, but that also forced the region into a more diversified, and profitable livelihood.

It will be many years, if ever, before the Pacific Northwest sees a monument to the owl, even though far-sighted industry spokespersons have suggested that such a monument would be fitting.¹⁵ Difficult choices about what will happen to the remaining 10% of the old growth will not wait, however. Clearcutting of primarily old growth in the Northwest is proceeding at the startling rate of 225 square miles per year. That rate will destroy all remaining old growth in less than 20 years, and all habitat capable of supporting interior forest species in less than eight years.

Like the cotton industry in its decline, the wood industry is using enormous political influence to fight for an old way of doing business. Eventually, change will come, but for now, many people associated with the timber industry in the Pacific Northwest are locked into denial of the ecological and legal necessity of conserving the northern spotted owl, and indeed all forest species. They refuse to acknowledge that, even if the ESA were to be repealed entirely, their industry is in an inexorable transition to more non-traditional products, fewer employees, and smaller profits.

Although the FS is intimately familiar with habitat problems caused by widespread and relentless conversion of old growth to managed stands, they have played an almost trivial role in the old growth debate. The FS has no internal old growth policy, and will probably never become involved in larger problems of ecosystem management unless it receives new instructions and significantly greater funding from Congress. Whatever regulatory mechanisms that now exist to protect old growth and the wildlife that depend on it for survival,

they may be carried out in consultation with the FWS, but almost certainly not at its command.

One thing is beyond doubt, however: the world view of residents in the Pacific Northwest has changed considerably from the halcyon days of 1970. Back then, it was easy to believe that there existed all the logs, all the wildlife, all the wilderness, all the profits, and all the timber jobs anyone could want forever. However, now that the limitations of finite resources are more obvious, many see the threatened demise of the northern spotted owl as a preview of worse things to come -- an unraveling forest ecosystem and lost hopes for a sustainable forest industry.

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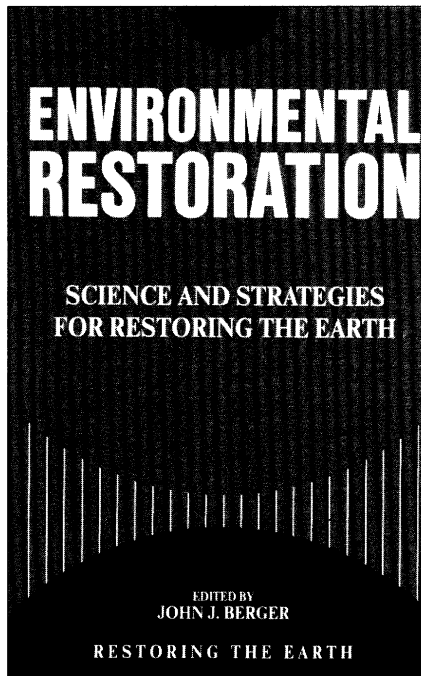
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Book Review

Environmental Restoration: Science and Strategies for Restoring the Earth

edited by John J. Berger



Environmental Restoration: Science and Strategies for Restoring the Earth is a collection of many of the scientific and technical papers presented at the Restoring the Earth Conference, held in January of 1988 at the University of California at Berkeley. The conference was organized with the hope of increasing public awareness of environmental restoration, providing a forum for the sharing of scientific and technical knowledge on ecological restoration and planning, and facilitating the development of a major restoration movement. The publication of these papers is a further step towards these goals.

As was acknowledged at the conference, the art and science of ecological restoration have been practiced for quite some time. Around the turn of the century, several landscape architects pioneered in ecological restoration, creating "natural" gardens in both public and private projects. During the 1930s, the University of Wisconsin Arboretum initiated research in restoring native

Wisconsin plant communities. In recent years, conferences, such as this one at Berkeley, have helped to focus the need for continued research into the science and technology of restoration, and the need for greater sharing of what is already known.

Despite its long history, restoration has been held suspect by many leading conservationists and scientists who fear that knowledge about restoration will help only to legitimize further habitat destruction. Opponents argue that an emphasis on restoration will dilute the limited pool of funds and energy that ought instead to be concentrated on preservation efforts. The spirit of the conference and this book, however, is that restoration and preservation must go hand in hand to repair damages to existing wounds and prevent further deterioration of the global environment. With this intent, the conference brought together a wide array of restorationists: scientists, consultants, students, corporate officials, architects, landscape architects, horticulturalists, farmers, writers, artists, members of volunteer organizations, and many others.

As a collection of only scientific and technical papers from the conference, this volume loses some of the humanistic and social appeal of the restoration movement which gave so much energy to the conference. On the other hand, the book does provide an extremely valuable record of the wide array of restoration experiments and planning efforts presented at the conference. Topics range from the restoration of agricultural land and temperate forests, to that of estuaries, rivers, and lakes. There are also papers on urban environments, waste management, reclamation of mining lands, soil bioengineering, and conflict resolution. The volume includes some 58 papers and abstracts, as well as a general bibliography on restoration.

The conference was not strictly a scientific meeting and, as with many such conferences, there was an unevenness to the papers presented which is also reflected here. Many readers will want more depth than is allowed in the few short pages allotted to each paper, and some of the entries are lengthened abstracts rather than full-fledged papers. Still, there is much useful information in this volume: information about restoration efforts that is hard to find in other published sources. Additionally, authors' addresses are noted with each article so that interested readers can contact them for further information.

Many of us who attended this conference, as well as subsequent meetings of the Society for Ecological Restoration, realize just how desperately restorationists from all over the world need to be sharing information, learning from each other's mistakes and successes, and holding up restoration work for scientific scrutiny and criticism. Many of the papers in this volume point out just how little we know about some areas of restoration, while providing an encouraging amount of information about what we do know and about what else we could be doing to repair ecological damages. As a record of current restoration activity, *Environmental Restoration* provides hope and inspiration, as well as a deeper understanding of the complex challenges we face in restoring the earth.

Environmental Restoration: Science and Strategies for Restoring the Earth is available for \$34.95 cloth, or \$19.95 paper, from Island Press, PO Box 7, Covelo, CA 95428; 1-800-828-1302.

Reviewed by Robert E. Grese, Assistant Professor at the School of Natural Resources, University of Michigan, in landscape architecture and restoration.

Warm slopes and cool --- Topographic criteria in conservation planning

by S.B. Weiss and D.D. Murphy

Our success in preserving biological diversity for future generations will be largely determined by the array of nature reserves that we create across the global landscape, and the abilities of those reserves to protect species over the long term. The design phase of reserve planning is already greatly constrained by human activities. Within these and other constraints, including the lack of good biotic inventories, conservationists need effective guidelines for the placement of reserves which will encompass the maximum amount of biological diversity and buffer that diversity against the effects of short-term weather variations and long-term climate change. Toward the development of such guidelines, we suggest an approach to reserve design that focuses on topography and its effect on local climate.

Topography creates mosaics of local climatic regimes, referred to as topoclimate. Topoclimates result from variation in rainfall and temperature with elevation, variation in solar exposure across slope and aspect, and the movement of warm and cold air around topographic features. Such effects are obviously most pronounced in mountainous regions. In middle latitudes of the northern hemisphere, for example, the topoclimate gradient extends from warm, dry, south-facing slopes at low elevations to cool, moist, north-facing slopes at high elevations. Along this gradient, equivalent topoclimate regimes (defined as varying topographic configurations that experience effectively equal climatic regimes) typically follow a pattern where north-facing slopes at low elevations have climates similar to south-facing slopes at some higher elevations. This pattern results because increased slope-specific isolation balances decreased temperature and increased precipitation at higher elevations.

At tropical latitudes, elevational gradients have long been recognized as key determinants of mountain climates, but slope exposure also produces significant thermal gradients. Annual insolation totals may appear to vary little across slopes, but at key times of the year insolation levels may differ dramatically between opposing slopes. For example, in Costa Rica (10° N latitude) at the winter solstice, south-facing 30° slopes receive more than twice the daily clear-sky insolation than do north-facing 30° slopes. Greater insolation on south-facing slopes leads to greater evapotranspiration and higher soil moisture deficits (especially important because December is the beginning of the dry season there). These warmer drier conditions are similar to those found in lower elevation habitats. Thus, south-facing slopes at higher elevations provide climatic regimes that support biotic representatives of the lower elevation forest types which are being so rapidly destroyed.

Information on topoclimate variation, therefore, is a useful conservation planning tool; the distribution of biological diversity at all levels of organization — ecosystems, communities, populations, and even genes — is shaped by thermal and moisture gradients. Fortunately, this information is readily available even for remote mountain areas because topographic information can be easily extracted from maps, and topoclimatic variation subsequently can be predicted. Even without detailed species inventories, conservation planners may capture much of the biological diversity in a region by maximizing topoclimatic variation within reserves.

Future reserve placement in topographically diverse landscapes should include significant portions of the warm end of the topoclimate gradient because warmer, low elevation

habitats have generally been more seriously disrupted than cooler, high elevation habitats, particularly in the tropics. Protection of warm slopes at the lowest elevations available may be the only means of preserving the last remnants of once widespread lowland habitats and the species they support. (This challenge is rendered doubly difficult by the disproportionate conversion of warmer slopes to pasture.) Furthermore, this approach protects the many tropical species that undertake elevational migrations and require seasonal resources available only in lower elevation forest types.

In the context of climate change, topoclimatic variation is of particular importance. Global warming promises to rearrange drastically biological diversity across landscapes as populations migrate to track appropriate climatic conditions. Plant and animal species, relegated to reserves whose climates are rendered unsuitable, may be forced to move hundreds of kilometers across inhospitable habitats to relocate to suitable conditions. In topographically diverse terrain, however, equivalent thermal conditions under new macroclimatic regimes may exist only meters away on cooler slope exposures, or nearby at higher elevations on a mountain slope. Since short-distance migration across slope exposures and elevational gradients is the logical future route for species survival in mountainous reserves worldwide, conservation planners would be well served to consider regional mosaics of topoclimate regimes for guidance in reserve design. In the face of climate change, reserves spare of topographically determined habitat refugia are reserves that undoubtedly will become spare of species diversity in the future.

Weiss and Murphy are biologists at the Center for Conservation Biology at Stanford University.

Bulletin Board

Botanical Gardens Bulletin

The Botanic Gardens Conservation Secretariat (BGCS) is a membership organization which promotes a global conservation network between botanical gardens around the world and maintains a database on over 6,000 endangered plants cultivated in botanical gardens. In May, the BGCS published its first issue of the Latin America Botanic Gardens Bulletin (*Boletín de los Jardines Botánicos de América Latina*). The Bulletin accepts articles in Spanish, with either a full translation or a summary in English and/or Portuguese. It is issued once a year, free to botanical gardens in the region and others by arrangement. Membership is open to all botanical gardens, arboreta and similar institutions by writing to the BGCS at Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, UK.

California Fish Report

Preserving California's inland fish fauna is an especially critical issue: 65 of California's 113 freshwater fish species are endemic, and over 64% of these species are either extinct, endangered, threatened, or identified as species of special concern. "Fish Species of Special Concern of California," a 221 page

report commissioned by the California Department of Fish and Game and produced by the University of California at Davis, documents the plight of 45 California fish species that are now on the decline. Each account contains detailed information on distribution (including a map), life history, habitat requirements, and status and management recommendations. Of interest to resource managers, local government planners and consultants, educators, students, and others involved in fish conservation, copies of the report are available for \$35 from Marketing Services (Attn: Karen Fleming), DFG Natural Heritage Division, 1416 Ninth Street, Sacramento, CA 95814; (916) 322-2493.

Mexican Wolf Fund

Mexican wolves, now extinct in the American Southwest, are among the rarest mammals on earth: 34 exist in six facilities in the US and ten exist in three facilities in Mexico, with very few known to remain in the wild in Mexico. The Wild Canid Survival and Research Center (WCSRC), the only facility in the country breeding both Mexican and red wolves for the US Fish & Wildlife Service, has an Adopt-A-Wolf and Bone Fund Program to help support the care of these animals in captivity, and is

working to secure release sites for reintroduction. The Center, along with the Mexican Wolf Captive Management Committee, recently established a Mexican Wolf Preservation Fund to be used to ensure the optimal everyday care of Mexican wolves being housed in captivity and the recovery of this species into the wild. WCSRC will administer the Fund, with the Captive Management Committee making decisions on how the funds are to be used. For more information, contact: Wild Canid Survival & Research Center, PO Box 760, Eureka, MO 63025; (314) 938-5900.

Annual Special Issue:

The 1990 Special Issue of the *UPDATE* will be published at the end of November. The issue will evaluate the strategy of captive breeding/propagation and reintroduction as a means of preserving endangered and threatened species. The issue will contain case histories of numerous species and will feature over 20 authors.

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

Announcements and news items for the Bulletin Board are welcomed.

Endangered Species UPDATE

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