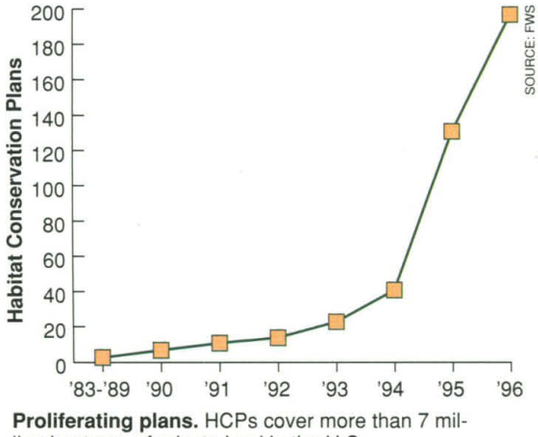
When a Habitat Is Not a Home

Many ecologists say conservation plans designed to ease tensions between landowners and environmentalists are not grounded in good science

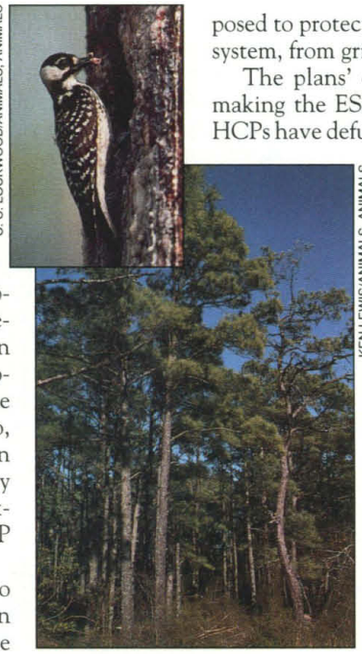
The Alabama beach mouse was listed as endangered in 1985, and within 2 years the U.S. Fish and Wildlife Service (FWS) had put a plan in place to protect it. But in the 12 years since then, hurricanes and beachfront development have destroyed at least one-tenth of the 142 hectares of dune habitat that the mouse was estimated to occupy in 1985. And now developers are poised to build a huge resort community and four new condos in the remaining habitat. "We are getting close to jeopardy," or an imminent slide toward extinction, warned U.S. Geological Survey biologist Nicholas Holler in a memo cited in a lawsuit filed last month challenging the new development.

Under a provision of the Endangered Species Act (ESA) designed to ease tensions between environmentalists and landowners, Alabama developers had worked out a deal with the FWS: They would be allowed to build in part of the mouse's habitat, and harm or even kill some mice, in exchange for restoring some dunes, putting up signs cautioning beachgoers to steer clear of fragile areas, and contributing to a fund for research on the mouse. The plan, called a Habitat Conservation Plan (HCP), was supposed to leave the mouse no worse off than before, and, if Holler is correct, its failure to do so illustrates why such agreements have become increasingly controversial.



Proliferating plans. HCPs cover more than 7 million hectares of private land in the U.S.

In the past few years, environmentalists have criticized the plans for ceding too much territory to developers. But now, a growing chorus of ecologists and conservation biologists is sounding the alarm, too. These scientists are wading into the debate because, after years of wrangling, Congress may be close to rewriting the ESA, and at the center of the fight over the legislation is what it should say about HCPs and other schemes to give landowners incentives to preserve habitat. This month, the Interior Department began seeking comments on proposed regulations for some of these strategies. Also, many biologists have been prompted to speak out by their often frustrating experiences advising HCP committees.


C. C. LOCKWOOD/ANIMALS, ANIMALS

KEN LEWIS/ANIMALS, ANIMALS

Down for the count. A rare red-cockaded woodpecker and the loblolly pine habitat it prefers.

In an April letter to environmental leaders in Congress and the White House, a group of prominent biologists convened by Stanford University conservation biologist Dennis Murphy warns that many of the plans "have been developed without adequate scientific guidance." Members of this group endorse the concept of HCPs. Says Murphy, "They're not only appropriate, but the only way to go." But some members argue that some plans may be doing species more harm than good. Other scientists are even more critical. Several scientific associations have signed onto a letter drafted by the Society for Integrative and Comparative Biology calling for a moratorium on new HCPs.

Balancing act

Although Congress wrote language into the ESA providing for HCPs 15 years ago, the plans didn't proliferate until the early 1990s when Interior Secretary Bruce Babbitt began promoting them as alternatives to "environmental train wrecks." Today, 212 HCPs have been approved, and at least 200 more are in the works in 19 states. Some are small—encompassing no more than a few dozen hectares—and protect a single species. Others cover 160,000 hectares or more and are supposed to protect dozens of species in an ecosystem, from grizzly bears to salamanders.

The plans' defenders maintain that by making the ESA more landowner-friendly, HCPs have defused efforts by property-rights advocates and some lawmakers to scuttle the ESA. Moreover, because many endangered species live primarily on private lands, giving landowners incentives to shelter rare species may be vital to preserving the country's biological heritage. "HCPs are the only way to improve some species' chances of survival," says Michael Bean of the New York City–based Environmental Defense Fund.

But the plans' strongest critics contend that the basic goal of HCPs is unsound. The ESA generally requires the feds to prepare a "recovery plan" to help each listed species rebound to the point that it can be taken off the list. But in the case of species covered by HCPs, this objective of "recovery" is typically replaced by the goal of preventing populations from declining further. In effect, the HCP provision constitutes an end run around the ESA, these critics contend. "The HCP process is fatally flawed," argues Fraser Shilling, a zoologist at the University of California, Davis, who elaborates on this viewpoint in a Policy Forum on page 1662.

Even scientists who don't find fault with the fundamental concept of HCPs say the plans share common flaws. According to many observers, the most widespread problem is that HCPs don't provide enough habitat for listed species. For example, a team of scientists advised that 53,000 hectares be set aside as part of the Balcones Canyonlands HCP in Travis County, Texas, to protect six invertebrate cave species and two small songbirds, the black-capped vireo and golden-cheeked warbler. But after an 8-year battle with developers and landowners, Fish and Wildlife promulgated a plan that encompassed just 12,000 protected hectares. That's not enough to support local populations of the black-capped vireo, asserts ecologist

Craig Pease of the University of Texas, Austin: "It looks like the plan is going to cause the local extinction of a species it was set up to protect."

Ecologists also worry that numerous small HCPs may be scattered across a landscape with little regard for whether the fragmented assemblage does much good for threatened species. Says ecologist Gary Meffe of the Savannah River Ecology Laboratory in Aiken, South Carolina, the landscape can "become Swiss cheese, then more holes than cheese." By many accounts, that's what is pushing the Alabama beach mouse to the verge of extinction. The mouse's dune habitat was owned by separate developers. Instead of managing the land under one big plan, HCPs were added piecemeal, fragmenting several kinds of dunes critical for the mouse's survival.

Even when an HCP does cover a large area, it may not protect most of the species in the ecosystem. Rather than compiling detailed data on the geographical ranges of every last species in an ecosystem, scientists are increasingly building HCPs around the habitat needs of a few well-studied "indicator" species, or by clustering species according to the type of habitat they occupy. But this "has to be done with extreme caution," says Murphy.

Yet it often is not, argues Charlie Raines of the Sierra Club Cascades Chapter in Seattle. When designing the 68,000-hectare, 285-species Plum Creek Timber plan in Washington state, officials divvied up all 285 species according to just nine habitat categories. For example, they set aside stands of trees along rocky slopes for peregrine falcons, mountain goats, and Larch mountain salamanders because all use cliffs and rocks. But this scheme is too coarse-grained to provide for all these species' habitat needs, Raines contends. Planners didn't give enough weight to the fact that mountain goats and falcons eat very different foods, for instance, or that amphibians cannot escape a forest fire like falcons can. "To say that the area will adequately provide for the species over time by itself is a totally unsupported assumption," says Raines.

Part of the problem is that scientists haven't yet reached a consensus on how best to group species. Says wildlife biologist Tim Cullinan of the National Audubon Society field office in Olympia, Washington, it's clear from the scientific literature that "everybody does it differently." Cullinan doesn't fault the plan for its grouping scheme, which he describes as "creative." Some other multispecies plans barely make the effort, he says.

Fly away home

The size and fragmentation of protected areas aren't the only issues that keep surfacing with HCPs. Scientists also are concerned that some plans rely too heavily on translocating animals. In the southeastern United States, for example, many HCPs for the red-cockaded woodpecker rely on moving the birds from private to federal land. Government officials say many woodpecker populations have become demographically isolated, and moving them to large, protected areas will spur the species's recovery. But ornithologist Jerome Jackson of Mississippi State University notes that while females quickly settle into their new surroundings, adult male woodpeckers often return to their original home. FWS biologist Ralph Costa concedes that the territorial adult males often head for home, but he counters that the high success rate for females and young males justifies the strategy. Similar concerns have been raised about plans that involve moving desert tortoises in Nevada and Pacific pocket mice in California.

PETE DESIMONE/NATIONAL AUDUBON SOCIETY

In reserve. California plan seeks to preserve last vestiges of the state's sage scrub habitat *(above)*.

S. M. BISCEGLIE/ANIMALS, ANIMALS

On the move. Translocated desert tortoises may head for home.

Some observers also argue that new, so-called "safe harbor" initiatives, another approach for preserving species on private lands, may ultimately thin rather than fill out the ranks of some endangered species. The agreements promise landowners that if they enhance habitat on their property to attract an endangered species, they will later be permitted to destroy the habitat—as long as their property doesn't end up harboring fewer endangered creatures than before (*Science*, 1 September 1995, p. 1212). Most conservationists applaud the agreements, saying they will encourage wary landowners to take actions to protect species. But some caution that "safe harbors" might lure animals away from other ESA-protected, privately owned lands, suddenly leaving these owners free to develop their property. Then, if the "safe harbor" landowners later developed their land, the species would have lost out on a chunk of habitat. Says Jackson, "Safe harbor is a great approach for some species that aren't tied to a narrow habitat, but for other species, there could be serious questions."

Finally, scientists have reservations about the "no surprises" clause tacked onto many HCPs. The provision guarantees that, except under "extraordinary circumstances," landowners cannot be made to set aside more land or spend more money to protect species. Since 1995, the federal government has made increasing use of the provisions—which can stay in force for 20, 40, and even 99 years—to appease landowners' fears that the plans could expand as new species are listed. Laverne Smith, head of FWS's division of endangered species, says landowners "want certainty," and the no-surprises clause is "one of the keys" to getting landowners to endorse the plans.

But scientists point out that nature is full of surprises, from fires and floods to epidemics and earthquakes. "A no-surprises policy ... runs counter to the natural world," wrote the group led by Murphy in February. The policy is especially troubling when applied to multispecies plans, which typically include many poorly studied species and, in the case of the Washington state plan, even as yet undiscovered species. "If we find out in the future that some species are detrimentally impacted by [specified] forestry practices, we may not be able to change those plans," says Cullinan. "When there's no science behind the HCP and, when on top of that, you add no surprises, ... I believe that, in many cases, HCPs do more harm than good," says conservation biologist Michael Soulé, a professor emeritus at the University of California, Santa Cruz.

Revamp or revise

Some HCP critics argue that the only way to address the problems with HCPs is to revamp the goal of the plans. They want to require HCPs to boost populations of endangered species, not just halt their decline. The letter signed by the Society for Integrative and Comparative Biology and five other societies, for example, calls for the FWS to hold off on creating HCPs for species for which the service has not yet developed a recovery plan, put it in place, and shown that the species is on the road to recovery.

Other critics reject this approach as naïve. "I would like to see recovery become a goal of HCPs, but I don't know if it's politically realistic at this time," says Soulé. And

some express concern that a concerted push to overhaul HCPs could damage conservationists' efforts on Capitol Hill. The more critical groups could be making a mistake "by digging in their heels," says conservation biologist Peter Brussard of the University of Nevada, Reno. "The chances of losing everything are just tremendously large, particularly in this Congress."

These critics point to a few well-regarded plans that, they say, suggest that the HCP process can work. California's Natural Community Conservation Model (NCCM), for instance, an HCP set up to preserve southern California's coastal sage scrub landscape, adheres fairly closely to a blueprint for preserves drafted by a panel of independent scientists, says Murphy, who helped design the plan. Among the NCCM's other strengths, it protects an entire ecosystem, not simply individual species, so the plan should protect the complex web of habitat and processes on which species depend. "I think in terms of paying attention to biological concerns, they did a pretty good job," says University of California, San Diego, ecologist Ted Case of the San Diego plan, one of several county-scale plans being developed under the NCCM. Brussard also praises an HCP for the desert tortoise in Clark County, Nevada, noting that the plan has "a lot of money behind it" which is being used to maintain federal preserves, and that planners have relied on the advice of an independent scientific adviser.

Stanford's Murphy, who helped draft the California plan, says that more plans would be successful if a few new rules were written into the ESA. First, planners must be permitted to alter the plans if circumstances change or new data become available, wrote the scientists convened by Murphy earlier this year. But landowners should not have to pick up the bill, says Murphy. "No surprises" can work, the scientists' statement said, as long as public funds are used to pay for any revisions. The letter also recommends that the law require that scientists with no vested interests weigh in on the initial design of larger HCPs, especially multispecies plans, and that small plans at least be evaluated in a regional context. The scientists also prescribe that mechanisms for monitoring species be built into the plans. "What we really need is reliable data," Murphy says. "[Long-term, flexible] management is where the science really comes to bear."

The one thing everyone agrees on is that a dearth of information about how HCPs are doing is clouding the debate. Several organizations, however, have HCP assessments in the works. The Washington, D.C.–based environmental group Defenders of Wildlife has a report due out later this year on 25 HCPs. The Society for Conservation Biology also is planning an HCP project. The American Institute of Biological Sciences (AIBS) and the National Science Foundation–funded Center for Ecological Analysis and Synthesis in Santa Barbara, California, are putting together a 2-year project to examine success stories as well as a few flops. "There is an urgent need for a comprehensive and systematic description and evaluation of existing HCPs," says AIBS President Frances James of Florida State University, Tallahassee, who says the project will involve scientists, environmental lawyers, resource managers, and property-rights advocates.

As James points out, the results may come out too late to influence ESA reauthorization. But given that HCPs appear to be here to stay, the effort surely won't be wasted.

–Jocelyn Kaiser

FRANCE

Allègre Reenergizes Research Ministry

PARIS—Could a shared youthful passion for basketball lead to a healthy future for French science? That, at least, is the hope of many French scientists, after France's newly elected Socialist Prime Minister Lionel Jospin last week named geochemist Claude Allègre to head a new Ministry of National Education, Research, and Technology. Allègre has been good friends with Jospin since their days at the University of Paris in the late 1950s, when the pair devoted their leisure hours to basketball and political activism, and he has also been a longtime Jospin adviser on science and education. During the Socialist government of 1988 to 1993, for example, when Jospin was minister of education, Allègre served as his chief counselor.

Top table. Research Minister Claude Allègre *(right)*, with President Jacques Chirac and Labor Minister Martine Aubry.

Researchers who spoke to *Science* warmly welcomed Allègre's appointment. "It's nice to have a scientist in charge of science again," says microbiologist Richard D'Ari of the Institut Jacques Monod in Paris. The conservatives, who held power from 1993 until their defeat in parliamentary elections earlier this month, had irritated many French researchers by appointing a series of nonscientists to the post. This annoyance turned to outright anger when, 2 years ago, research was demoted to a subministry. Jospin has reinstated it to Cabinet level under Allègre.

In an interview with *Science*, Allègre said that his first task will be "to reestablish research and higher education as a budgetary priority." The first steps toward that end, he says, will begin this autumn, as the government plans to launch a drive to recruit young scientists and increase financial support for doctoral students. Allègre hopes to reverse a decline in scientific employment in both the universities and France's public research agencies that has plagued the country over the past several years. Allègre also says that the government will reactivate the ambitious university building program that was cut back severely under the conservative government. And he expects to get the extra money these ambitious measures will cost: "There will be no problem. I will have the money I need."

Among those applauding Allègre's appointment is physicist Hubert Curien, who was research minister under the previous Socialist administration. Allègre "is an extremely innovative scientist and a man with a lot of ideas," says Curien. "We can expect a lot of interesting reforms from him." And astronomer Françoise Pradérie of the Paris Observatory says she hopes that Allègre will develop a real policy for research, something she says was missing during the previous government.

Some researchers say privately that they expect heads to roll at France's giant research agencies, the CNRS and INSERM. CNRS Director-General Guy Aubert and INSERM Director-General Claude Griscelli were both appointed by the conservative government and have been closely associated with its cost-cutting policies. But Allègre declines to comment on such speculation, saying only that "it is too early" for such decisions. "For the moment," he says, "we must give new hope to the researchers."

Allègre says he is confident that his old school chum Jospin will back him up all the way: "The prime minister said [research and higher education] will be a priority, so it will be a priority."

–Michael Balter