Science: Opening the Next Chapter of Conservation History

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From its inception, the U.S. Department of the Interior has been charged with a conflicting mission. One set of statutes demands that the department must develop America's lands, that it get our trees, water, oil, and minerals out into the marketplace. Yet an opposing set of laws orders us to conserve these same resources, to preserve them for the long term, and to consider the noncommodity values of our public landscape. This dichotomy between rapid exploitation and long-term protection demands what I see as the most significant policy departure of my tenure in office: the use of science—interdisciplinary science—as the primary basis for land management decisions.

For more than a century, that has not been the case. Instead, we have managed this dichotomy by compartmentalizing the American landscape. Congress and my predecessors handled resource conflicts by drawing enclosures: "We'll create a national park here," they said, "and we'll put a wildlife refuge over there." Simple enough, as far as protection goes. And outside those protected areas, the message was equally simplistic: "Y'all come and get it. Have at it." The nature and the pace of the resource extraction was not at issue; if you could find it, it was yours.

But what we're learning, thanks to modern biology and a more reasoned and thoughtful understanding of the landscape, is that we cannot protect the splendor and biological diversity of the natural world by simply fencing off a few protected areas within an overall landscape of exploitation. It doesn't work for a number of reasons: First, the empty open spaces of the American West are filling up; there simply is not much more land to set aside as a means of protecting biological diversity.

Second, the lands we manage do not fit into neat compartments: Everglades National Park is dying because forces outside the park—forces beyond the fence—are affecting the hydrological flows so essential to the Everglades' ecosystem. Lines on a map don't always protect lands inside the preserve. Finally, migratory wildlife doesn't stay within the boundaries. Some birds migrate across the North American continent and some, like the Arctic tern and a few of the plovers, migrate all the way down to the tip of South America. But their flyways are now threatened because the blocks of habitat are being fragmented and pulled out from under them at critical points on their course.

Our new mission, then, is to look beyond the fences. It is a recognition of modern ecosystem biology and of the island biogeography work done by E. O. Wilson and others. These concepts pose a much harder challenge by saying, "We can't satisfy our debt to nature with a few parks, scattered like postage stamps here and there." More and more, we have to come to grips with a much larger and more challenging problem, and that is how we live in equilibrium with our surroundings.

Nowhere illustrates these challenges better than the old growth forests of the cascade range in the Pacific Northwest. These forests contain some of the oldest trees that remain in America. Towering Douglas firs, red cedars, and hemlock are underlain with dwarf maples and a rich fabric of ferns and other small plants. The forests are home to salmon, eagles, minute insects, elk, and bear. Early on, conservation leaders recognized that these magnificent forests, unique on this planet, deserved a measure of protection. Spectacular national parks were established at Mount Rainier, Crater Lake, and on the Olympic Peninsula. Congress then opened the door to relentless exploitation of the rest of the land. In the ensuing orgy of clear-cutting, the original forest expanse was reduced by 80 percent, leaving a few protected islands in a sea of devastation.

Today this pattern is clearly visible to satellites and even to airline passengers looking down at the boundary of Olympic National Park. Outside the boundary line are 60° mountainsides stripped to rock and mud, criss-crossed by logging roads, slowly sliding down into barren stream beds where salmon once spawned. The pattern is the preservation of 1 acre for the ruination of 10. In the Northwest the inevitable result of clear-cutting was the onset of a biological crisis. The decline of the spotted owl and the disappearance of spawning salmon signaled an entire forest ecosystem in trouble. And in reaction a federal judge, Judge William Dwyer, shut down all timber harvesting on federal land until land management agencies could produce a plan that complied with the law.

These events in turn prompted the most important land management initiative of this administration. The Pacific Forest Plan, approved by Judge Dwyer last December, represents, in my judgment, the beginning of an entirely new chapter in American resource history. Our response to Judge Dwyer's order was to start from scratch; to deploy science in a search for a model of sustainable forestry. We decided that a forest plan, to meet the requirements of the law, must extend clear across the entire west Cascade forest system. We brought federal land management agencies together to produce a landscape scale plan. Judge Dwyer in his review of the final plan, wrote: "Given the current condition of the forests, there is no way the agencies could comply with the environmental laws without planning on an ecosystem basis."

The forest plan had to both protect the old growth forest system and avoid repeated crises in the future. The scientific team of hundreds of scientists from a score of agencies and universities representing many different scientific disciplines assembled a list of more than a thousand indicator species, including vertebrates, fish, mollusks, lichen, fungi, arthropods, and byophytes. Theirs was an anthology of old growth forest biology. They performed a viability analysis for each species, to understand how they relate, what their population dynamics are, what kind of space is necessary for its survival, what kind of timber cutting is or is not compatible with its existence. They then translated that information onto geographic information systems to provide the analytical power for viability and population analyses and to construct ten different land management models for consideration. Reviewing this effort Judge Dwyer concluded that the plan is "the result of a massive effort by the executive branch of the federal government to meet the legal and scientific needs of forest management."

The management option finally selected by President Clinton, Option 9, has three major parts: (i) a system of interconnected old growth reserves; (ii) a system of stream buffers to protect salmon and other aquatic species; and (iii) a new set of rules, known as new forestry, for areas outside the core reserves where logging will take place. The biocide of clear-cutting has been abandoned in favor of new forestry's selective logging, leaving behind sufficient forest structure to maintain biological connections and to sustain natural forest regeneration. The forest plan also includes an extensive analysis of the economic future of timber-dependent communities in Washington, Oregon, and California, providing for transition eco-

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nomic assistance for the development of value-added industries and new employment in forest and stream restoration projects. Recent indicators offer encouraging examples of how these measures are taking hold: The unemployment rate in Oregon is now at its lowest point in a generation.

This analytical, science-based approach has enabled the Department of the Interior to place the burden of species conservation on federal land whenever possible. This approach has led directly to use of the so-called "4(d) rules" to release small wood lot owners from most requirements of the Endangered Species Act. A similar technique, habitat conservation plans, are now being worked out with large landowners.

In sum, the forest plan abandons the old "protect one, abandon ten" mentality in favor of providing biological diversity and sustainable economic activity across the entire landscape. The final landscape plan, mapped out by teams of scientists from myriad sources, and constructed bit-by-bit using modern geographic information technology, has no precedent on this scale. It marks the beginning of a new, applied science of landscape conservation, using the tools of many sciences to find an acceptable balance between human communities and nature.

As we achieve this new level of success, there is a menacing cloud on the political horizon. It is no longer the spotted owl that is threatened; it is the scientists who have saved it who are now endangered. Like most contracts, the Contract with America has fine print. That fine print includes a plan to eliminate the three Interior science agencies: the U.S. Geological Survey (USGS), the National Biological Service, and the U.S. Bureau of Mines. They are not vague and they are not indirect with their attack. They don't intend to reduce simply the size of these programs: in budgetary terms, they plan to "zero them out." The proposed destruction of these three agencies is the resource equivalent of book burning. In 17th-century Portugal, after a major earthquake devastated that country, the political leaders responded by burning a few more heretics at the stake. Today, the response to California earthquakes is to burn the USGS.

Those who seek to abolish the science agencies claim they only want to prevent overregulation of our natural resources under statutes like the Endangered Species Act and the Clean Water Act. Fair enough. While I may disagree with their goals, the content and form of regulatory policy is always a proper subject for political debate. Let's have at it. But to make science take the fall for political differences is to declare that there should be no science except that science which produces politically correct answers.

Not all criticisms of the link between government science and the regulatory process are unfounded. There are two allegations in particular which should be taken seriously. First, some feel that government scientists, being human, are sometimes biased toward the attitudes of regulators who supervise them. The best way to counter any such inclination is to keep scientific research a step removed from the regulatory process. That is what we have done at the Interior Department; that was the rationale for creating the National Biological Service and insulating it from regulatory bureaus. The great irony is that some who rightly oppose irresponsible regulation now seek to destroy institutions that help to prevent it.

The second issue is the need for peer review. The Interior Department must be able to establish a stronger tradition of peer review for government research, in the best traditions of American science. Outside peer review has long been an integral part of the work of the USGS, but it has not been emphasized so much at either the Bureau of Mines or in the biological research traditionally carried out within the Interior Department. That too has changed in the National Biological Service and argues for making it independent.

The current peer review debate also demands a threshold of proof written into the statute. For the Fish and Wildlife Service, this means that rather than doing a literature search and designating a species as endangered, regulators there must subject their judgment both to outside peer review and to an established threshold of proof. Both points are valid, they are currently being addressed in Interior's regulatory reforms, and they are certainly appropriate for legislative debate when the Endangered Species Act is reauthorized.

A great many legitimate questions have been asked about the role of government science today. I have a few of my own:

In the wake of Kobe, where more than 5000 people perished only weeks ago, how can they possibly suggest abolishing the USGS and its programs? In the wake of Northridge and Loma Prieta, which caused tens of billions in damage, how can they possibly suggest that we need not refine the seismologic techniques to provide better and more timely information regarding earthquake hazards?

When mining is still the most dangerous occupation in America, why is this now the time to dismantle the mine health and safety programs of the Bureau of Mines?

Only weeks after two clusters of bald eagles have died—16 on a lake in Arkansas and 7 on a refuge in Wisconsin—we are in the midst of an intensive, national research effort to find the silent killers. Why would America abolish the one agency that can save our national symbol?

What does all this add up to? It adds up to an important departure for the future of American science. That future is not a matter of abstract philosophical debate. Scientists have been brought to the forefront of conservation on an unprecedented scale. They are ingrained in partnerships, forming the basis for sound decisions, at work across the American landscape.

But the threat to these partnerships is both genuine and immediate and this attack must not succeed. Elimination of science is the resource equivalent of book burning, and they have already ignited their first torch. In February, the House cut the National Biological Service by 20 percent for the next 6 months and plans to cut it entirely next year. There was no public debate, no discussion on the open floor; it happened quietly and quickly in a subcommittee. And the President cannot shut down the U.S. government just to save a science agency.

We are now at a moment of transition for American resource management. We are finally both ready and able to use the best tools of modern science to call forth a very different vision for our future. It is a vision that says we need not choose between economic growth and environmental protection—one living at the expense of the other. Science is not the problem. Science is what has made this country work. Indeed, only science—applied, interdisciplinary science—will let us realize our vision.