

## How wild is today's world?

For 18 months, environmental policy analyst J. Michael McCloskey and geographer Heather Spalding pored over aerial navigation charts from the U.S. Defense Mapping Agency, scouting for what navigators abhor—the absence of landmarks. Focusing on areas they describe as “affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable,” they ignored regions showing roads, settlements, buildings, airports, railroads, pipelines, power lines, dams, reservoirs and oil wells. Their labors yielded what they now term the first global wilderness inventory.

Constrained by time and the degree of resolution in the charts, McCloskey and Spalding, both with the Sierra Club in Washington, D.C., limited their tally to land tracts including at least 1 million acres. Even so, they found that roughly 18.56 million square miles—about a third of the planet's land mass—remain wild.

Antarctica, totally wilderness, leads the list. Following it are North America (37.5 percent wilderness), the Soviet Union (33.6 percent), Australasia, which includes islands in the southwest Pacific (27.9 percent), Africa (27.5 percent), South America (20.8 percent), Asia (13.6 percent) and Europe (2.8 percent). In general, the qualifying tracts form several broad bands: one sweeping across northern Alaska, Canada and the northernmost part of the Soviet Union; another running southwest from the far eastern Soviet Union through Tibet, Afghanistan and Saudi Arabia into Africa; an east-west belt through the Sahara; and another running north-south through the center of Australia. Wild patches appear in Africa, around the Amazon and along the Andes.

Warm deserts and temperate regions each account for 20 percent of the identified wildlands, tropics for 11 percent, mixed mountain systems for almost 4 percent and cold deserts for another 3 percent.

Less than 20 percent of the identified wilderness is legally protected from exploitation. Moreover, report the researchers in the latest *AMBIO* (Vol. 18, No.4), “at least half of the remaining stock of wilderness is not self-protecting by virtue of its forbidding nature. It can slip away easily with little notice of encroachment as billions more are added to the human population.” Other analysts have called for roughly tripling the areas protected in nature reserves. “The new inventory shows it's still not too late to accomplish this,” says McCloskey.

## Dioxin-in-paper update

To gauge the pervasiveness of dioxin contamination in the U.S. manufacture of paper products, the American Paper Institute (API) and Environmental Protection Agency jointly assayed pulp and wastes at all 104 U.S. paper mills that use a chlorine pulp-bleaching process, which can generate toxic dioxins and furans (SN: 2/18/89, p.104). According to API President Red Cavaney, “near-final” results of this study confirm trace levels of dioxin in some facet of the operations at all mills. Median levels range from 3.5 parts per trillion (ppt) in hardwood pulp to 6 ppt in softwood pulp, 17 ppt in pulp-mill sludge and 24 parts per quadrillion in wastewater.

An in-depth analysis of 25 mills—to identify which bleaching steps are most important in dioxin formation—should be completed by the end of the year, Cavaney says. Already, however, many mills have begun modifying their manufacturing processes. Modifications include reducing levels of chlorine used in bleaching, substituting chlorine dioxide or oxygen-based compounds for elemental chlorine and pretreating wood pulp to limit the release of lignin, a substance involved in dioxin formation. Cavaney says some of these changes have helped mills lower dioxin to one-tenth or one-hundredth the levels recorded in the 104-mill survey.

## International tusk politics

This October, a treaty organization known as the Convention on International Trade in Endangered Species (CITES) will decide whether to place African elephants on its list of most threatened or endangered animals. Such listing prohibits CITES' signatory nations from engaging in commercial trade in these animals or their products.

The move to consider including African elephants reflects CITES specialists' assessment, reported in June, that all efforts to control the poaching of elephants for their ivory have failed. To cut the market for ivory—in hopes of saving African elephants from an expected acceleration in slaughter by poachers between now and the threatened October trade ban—Japan, Hong Kong, the United States and the 12-nation European Economic Community have in recent weeks severely limited their ivory imports.

The United States and the European Economic Community, which formerly imported 10 and 20 percent of Africa's ivory respectively, will ban all imports except of legally acquired game “trophies.” Japan, which formerly imported 38 percent of all African ivory, has vowed to import only whole tusks. Moreover, Japan has pledged to get those tusks only from African nations that maintain effective elephant-management programs and that have signed the CITES treaty. Hong Kong—which formerly bought and carved raw African ivory, then reexported most of it in commerce—has agreed to ban new imports but will continue to export existing stockpiles as “worked” ivory. U.S. Fish and Wildlife Service officials say Hong Kong's current stockpile of at least 500 tons constitutes more than the total volume of ivory traded worldwide in any year.

The Ivory Trade Review Group, which includes many of the world's leading elephant researchers, trade specialists and economists, conducted a year-long analysis of the African elephant crisis for presentation last month at a CITES elephant meeting in Botswana. Since 1979, the group concludes, poaching has roughly halved the number of surviving elephants—to 625,000. The killing of bull elephants, prized for their big tusks, has so depressed their numbers that in some African regions they now represent less than 5 percent of all adult elephants. Evidence now shows, according to the report, that where bulls are so rare, “a female is likely to come into estrus without being detected by a male,” further depressing the population.

As the bulls disappear, poachers increasingly hunt females, which often leave behind dependent calves. The orphans “may now account for up to one in three of all elephant deaths,” the study finds. Moreover, elephant societies usually depend on the leadership of a mature matriarch. In one Tanzanian population, only 15 percent of elephant families are led by such a female, compared with a norm of 75 percent.

## Smog ozone: How the problem grows

Last year, another 37 U.S. communities failed to meet the federal air quality standard for smog ozone, EPA announced last week. This is nine more than had been predicted (SN: 2/25/89, p.119), bringing the number of violating regions to 101. The “sharp increase” in areas failing the ozone standard “is dramatic proof of the pressing need for a new clean air bill,” EPA Administrator William K. Reilly said in announcing the new figures.

Ironically, the bill President Bush sent to Congress on July 21 relaxes many ozone-cutting provisions described in an earlier outline of the Bush proposal (SN: 6/17/89, p.375). For example, 29 cities—not just three, as formerly stated—would be eligible for exemption from a year-2000 deadline for meeting the ozone standard (perhaps for up to 11 years) without facing sanctions, according to an analysis of the bill by the House subcommittee on health and the environment.