

U.S. biosurvey reveals worrisome trends

As in legal contracts and cake decorating, the devil is in the details of the U.S. Geological Survey's first large-scale assessment of the country's living wealth.

The two-volume "Status and Trends of the Nation's Biological Resources," released last week, doesn't assign an overall grade for ecological health. However, its discussion of major forces affecting U.S. flora and fauna and its regional summaries pile up facts for a significant heap of concern.

"I truly hope the reading public will sit back and say, 'We need a new environmental conscience,'" says the project's director, Michael J. Mac of USGS in Reston, Va. Some 200 researchers labored for 4 years to write a nontechnical accounting more comprehensive than the USGS 1995 report, "Our Living Resources."

"To me, the big revelation was non-indigenous species," says USGS Director Charles G. Groat. According to the report, more than 6,500 interlopers have established themselves in the United States, including 91 mollusks, more than 2,000 insects and arachnids, and 239 plant pathogens. These pushy newcomers have wiped out some of the country's former residents and helped edge 315 natives onto lists of threatened and endangered species.

Even a mild-mannered invader may carry dangerous hitchhikers, warns Peter S. White, director of the North Carolina Botanical Garden in Chapel Hill and author of the report's Southeastern section. Nursery stock transported both American chestnut blight and the woolly adelgid aphid, which thinned conifer forests.

At the mention of invasive species, White whips out a manifesto—which he recently nailed to a tree for dramatic effect—urging horticulturists to greater vigilance. Overall, however, the report concludes, "little attention has been paid—and almost no progress has been made—in addressing the problem of non-indigenous species."

The report also highlights water use as a major shaper of U.S. ecological resources. As early as 1965, the daily water withdrawals from the environment for human use, totaling 1.3 billion cubic meters per day, already exceeded the dependable supply by 13 percent, the authors say. "Trends clearly show that our present water-development and use practices

cannot continue," they conclude.

The land-use chapter notes that housing lots are getting bigger, exaggerating suburban sprawl. In seven states once covered with grasslands, less than 1 percent of tall-grass prairie remains.

What researchers don't know emerges as a major theme. "The gaps tend to be in the less cuddly things: mollusks, aquatic plants," Groat laments. Consider even the most beloved invertebrates. Coauthor Paul A. Opler in Fort Collins, Colo., says, "We don't have any good objective data on our nation's butterflies."

Janet N. Abramovitz, who heads the biodiversity group at the Worldwatch Institute in Washington, D.C., calls the report "the kind of thing the government should do more of. Otherwise, there isn't a compendium of this kind of information."

The next major environmental-status report due out takes a different approach, says Robin O'Malley of the Heinz

J.T. Kartesz/North Carolina Botanical Garden



Map shows the number of nonindigenous plants that have invaded each state.

Center in Washington. Its report, to be released in November, quantifies 12 aspects of ecosystems. "We are attempting to identify a few things that tell you a lot about the condition of ecosystems—the equivalent of the inflation rate and the gross national product," he says.

As to when the USGS report might get updated, Mac has not recovered sufficiently from preparing this one to do more than wince at the question. —S. Milius

High blood pressure is linked to bone loss

Inexorably, people lose bone mass as they age. Lack of exercise, inadequate calcium intake, a high-salt diet, and, in women, menopause can exacerbate the decline. A new study finds that high blood pressure—already known to hike the risk of heart disease—also coincides with the thinning of the bones.

Researchers tracked 3,676 white women over age 65 at four clinics in or near Baltimore, Pittsburgh, Minneapolis, and Portland, Ore. Precise measurements of the thigh bone revealed that women with an initial systolic blood pressure reading of 148 or more had an average bone-density loss equal to roughly 0.6 percent of their bone mass per year. In contrast, women with a systolic reading of less than 124 suffered bone loss at about half that rate, says study coauthor Joseph M. Zmuda, an epidemiologist at the University of Pittsburgh. Declines in bone density, which can lead to osteoporosis, are due to calcium loss.

The researchers collected the data between 1988 and 1994, measuring bone density for each woman on two occasions 3 1/2 years apart. They report their findings in the Sept. 18 LANCET.

"We all lose bone as we age," Zmuda says. "Women with high blood pressure experience it faster."

The mechanism behind this loss remains unclear, says study coauthor Francesco P. Cappuccio, an epidemiologist and cardiovascular physician at St. George's Hospital Medical School in London. About 97 percent of the body's calcium is stored in bones. Small amounts of calcium also circulate in the blood, where they play a vital metabolic role.

The body keeps its calcium in balance by excreting the excess in urine.

Earlier studies in animals and people indicated that as blood pressure rises, so does calcium in the urine. Although women taking drugs to lower blood pressure were excluded from the study at the start, 623 women began taking such medication during the 3 1/2 years that they were followed. The drugs did not change their bone-loss rate.

High blood pressure is probably not the cause of bone loss but a marker of another problem, Cappuccio says. Excluding these women from the final analysis didn't change the overall findings.

The 15 percent of women in the current study on hormone-replacement therapy had about half as much bone loss, on average, as others did.

The study shows "an interesting association" between high blood pressure and bone loss, says Jeri W. Nieves, an epidemiologist at Helen Hayes Hospital in West Haverstraw, N.Y. Further research that measures salt intake, calcium lost through the urine, or even the level of exercise might help clarify the mechanism at work, she says.

The researchers didn't measure salt intake among the women but suggest that it might play a part. Salt gradually siphons calcium out of the body, and high-salt diets often accompany high blood pressure. "It's pretty unlikely that this massive [bone loss] is due to constant high salt intake," Cappuccio says. "But it may be a contributing factor."

Meanwhile, Cappuccio says, lowering high blood pressure remains a good idea to lessen other health risks. —N. Seppa



J. Jeffrey/U.S. Fish & Wildlife Service

Hawaii's iiwi is considered vulnerable.