

SCIENCE NEWS

This Week

undocumented immigrants to the United States in the late 1990s. Nevertheless, the undercount was far less than the bureau's researchers and others expected it to be.

The census forms filled out by U.S. residents early in 2000 recorded more than 274.6 million people. The Census Bureau's initial demographic analyses, conducted separately from the census, predicted there would be a population of about 281.4 million, or nearly 7 million more people than were actually recorded.

Adjustments to those figures that stem from one of the bureau's supplemental surveys, known as the Accuracy and Coverage Evaluation, suggest that the census undercounted the actual number of residents by only 3.3 million, says Robert E. Fay of the U.S. Census Bureau in Washington, D.C. He and other demographers discussed the nation's most recent population count last week in Boston at the annual meeting of the American Association for the Advancement of Science.

Despite the overall reduction of the undercount estimate, the demographers found more undocumented immigrants than they had expected. Prior to the 2000 census, the statisticians thought the count would tally between 5 million and 6 million undocumented immigrants, says Jeffrey S. Passel, a statistician at the Urban Institute in Washington, D.C. His own current analysis suggests there are about 8.5 million undocumented residents. About 4.7 million of these, or 55 percent, can be traced back to Mexico. About 1.9 million come from other nations in Latin America, and 1.1 million come from Asia. Just a few hundred thousand of the undocumented immigrants arrived from Europe, Canada, and Africa. Many entered the United States during or after 1998, Passel notes.

The profile of the typical undocumented immigrant has changed over recent decades, says Frank D. Bean, a demographer at the University of California, Irvine. In the 1960s and 1970s, there was a seasonal, temporary migration of workers into the United States, primarily to work in agriculture. In the 1980s and 1990s, the inflow became less seasonal as more immigrants took part in nonagricultural sectors of the economy such as the garment, hotel, and restaurant industries.

Bean attributes most of the dramatic boost in the rate of undocumented immigration in the late 1990s to two factors. The U.S. strong economy during these years encouraged immigrants to stay in the country. Also,



REED TAKEOVER A *Phragmites* invader can start a new patch from just an inch of root.

an increased number of border patrol agents, especially along the U.S.-Mexico border, led to undocumented immigrants' fearing they couldn't return if they visited their homeland. This late-decade surge added about 500,000 residents to the United States each year and was the primary reason demographers undercounted the nation's population, Bean says.

Currently, the Census Bureau pegs the U.S. population at nearly 286.5 million, says Fay. The most recent data show about 1.2 percent population growth between the April 2000 census and July 1, 2001.

If this rate of increase holds up, the nation's population will breach the 300-million mark late this decade. However, census analysts speculate that changes in immigration patterns that result from the Sept. 11, 2001, terrorist attacks, as well as from the recent downturn in the U.S. economy, may slow population growth somewhat. —S. PERKINS

Cryptic Invasion

Native reeds harbor aggressive alien

A mild-mannered reed native to the United States is getting blamed for mayhem created by an evil twin, says a Yale researcher.

Tall *Phragmites australis* plants, often just called *Phragmites*, have waved their tasseled tops over wetlands in North America for millennia, says Kristin Saltonstall. However in the 1970s, botanists became alarmed after seeing how extensively the species pushed into new territory and formed dense patches that crowded out other plants.

Perhaps an alien strain of the species was taking over by stealth. To investigate that possibility, Saltonstall analyzed genes from leaves of *P. australis* collected worldwide. She found that a strain now common in the United States has close relatives among Eurasian strains and could be an invader.

This strain shows up only occasionally among *Phragmites* collected before 1910 but dominates modern herbarium collections, Saltonstall reports in the Feb. 19 *Proceedings of the National Academy of Sciences*.

Scientists have documented such invasions by foreign strains of native species in several marine creatures, including a crab. Saltonstall says she doesn't know of other such cases on land. "There could be plenty of others," she cautions, since these invaders hide in plain sight until someone does genetic testing.

The earliest traces of *P. australis* in North America come from 40,000-year-old silt dung in the Southwest. More recent signs show up in cores of earth pulled from East Coast marshes. The cores indicate that at least 3,000 years ago, *Phragmites* grew in mixed communities of wetland species, not in the all-*Phragmites* blankets that have become common.

To sort out the strains, Saltonstall analyzed DNA in chloroplasts, the photosynthetic organelles in plant cells. Saltonstall compared two particularly variable regions in DNA harvested from 257 North American *Phragmites* patches and 88 populations from the rest of the world. The Smithsonian Institution even supplied her with a sample from Afghanistan.

Five mutations turned up in North American populations but were found nowhere else, says Saltonstall. She proposes that plants bearing these five markers represent long-standing North American strains.

In contrast, a strain now common in the eastern states didn't bear the markers and fell instead into a cluster of Eurasian *Phragmites*. This strain accounted for 6 percent of the pre-1910 U.S. museum samples that Saltonstall checked but represented 61 percent of samples collected after 1960.

Now that Saltonstall can identify this exotic strain genetically, Cornell University *Phragmites* specialist Bernd Blossey is looking for ways to spot it on sight. "It may be easier than we expected," he says.

He foresees efforts to find and protect native *Phragmites*, particularly along the East Coast. —S. MILIUS

SALTONSTALL