

## ECOLOGY

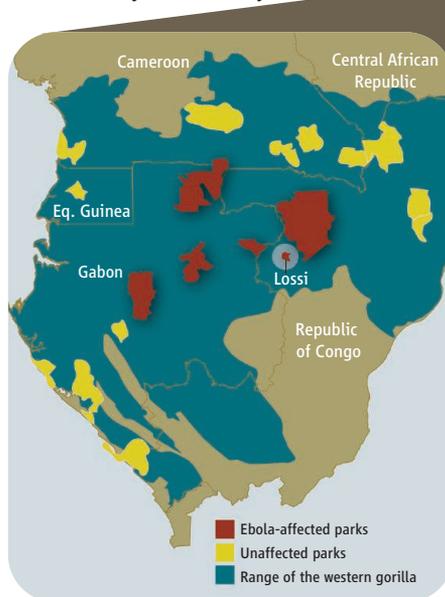
## Tracking Ebola's Deadly March Among Wild Apes

It is grim work to document the deaths of nearly all your study subjects. Primatologist Magdalena Bermejo and her colleagues have watched as dozens of the gorillas they had studied either disappeared or turned up dead over the past 4 years. The suspect is Ebola, a hemorrhagic fever that has also killed dozens of people in the region straddling the border between Gabon and the Republic of the Congo. On page 1564, the researchers present evidence that the disease has wiped out as many as 5000 gorillas in the region surrounding the Lossi Sanctuary, a much higher number than previous estimates. They also suggest that ape-to-ape transmission is a major factor in the spread of the disease—which some experts say offers a glimmer of hope for attempts to slow its deadly progress.

As the disease has swept through several wildlife sanctuaries and national parks, killing off chimpanzees and gorillas alike, virologists and great ape specialists have been frustrated in their efforts to explain how the disease is spreading. For years, scientists sharply disagreed on whether apes caught Ebola primarily from a reservoir species, such as bats or birds, that could carry the virus without getting deathly ill, or whether it was mostly spread from an infected ape to its contacts (*Science*, 13 June 2003, p. 1645, and 16 January 2004, p. 298). An answer has proved elusive: Scientists had no idea which of hundreds or even thousands of forest species might serve as a reservoir, and it is extremely difficult to observe whether apes in the wild are passing a virus to each other. But over the last year, a consensus has begun to emerge. Although both mechanisms of spread probably play a role, evidence has been mounting that apes are indeed passing the virus to each other. Bermejo's data support that theory, with some of the best documentation yet of the disease spreading among social groups.

Between October 2002 and January 2003, Bermejo, a primatologist for ECOFAC in Libreville, Gabon, and the University of

Barcelona, suffered the disappearance of 130 of the 143 gorillas she and her colleagues had painstakingly habituated for study. Determined to document what was happening, the researchers identified seven other social groups in the area and monitored their sleeping nests twice a week. Between October 2003 and January 2004, they



**Deadly spread.** In the past decade, Ebola has killed chimps and gorillas across sanctuaries and parks in Gabon and the Republic of the Congo.

report, Ebola killed 91 of the 95 animals. The scientists found that the lag time between deaths in neighboring groups was 11.2 days—similar to the 12-day human incubation period. Combined with a north-to-south pattern of deaths over time, the researchers say, the evidence is very strong that the virus is spreading from one social group to another.

Although he initially favored the reservoir theory, virologist Stuart Nichols of the U.S. Centers for Disease Control and Prevention in Atlanta, Georgia, says the recent evidence has convinced him. Combined with genetic studies of the viral strains that have caused outbreaks over the past 30 years, “it really does look like we have this epizootic wave spreading generally westward through the Congo basin,” he says, with ape-to-ape transmission on a local scale.

By extrapolating from more wide-ranging transect surveys they conducted, Bermejo and her colleagues conclude that in a 2700-square-kilometer region surrounding the Lossi Sanctuary, roughly 5000 gorillas have succumbed to the current epidemic. “It is impressive data from a difficult area to work in,” Nichols says, but the estimate is not as solid as the group’s smaller-scale observations. The researchers tested only 12 carcasses, nine of which tested positive for Ebola. “If this was a human outbreak, you’d want to see a lot more testing” to confirm that a single disease is to blame, he says. Still, he says, “my personal opinion? They’re probably right.”

Despite the grim numbers, co-author Peter Walsh of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, says he sees hope in the growing consensus about ape-to-ape spread. He has long advocated a vaccination campaign for wild apes. The new data suggest that disease is spreading at a predictable rate, he says, which can help scientists anticipate where it might hit next. At least five candidate human vaccines have been shown to protect monkeys in the lab against Ebola



infection, says Walsh, who is pushing to try one in the wild. “There are technical hurdles to jump through. But they’re surmountable,” he says.

Others are less optimistic. Not only is it difficult to imagine how to reach enough wild apes to slow or stop the spread, says Heinz Feldmann, an Ebola virus vaccine

expert at the Public Health Agency of Canada’s National Microbiology Laboratory in Winnipeg, Manitoba, but releasing vaccines in the wild might also pose secondary ecological risks. Conservation experts and primatologists “all would like to do something. But no one has a good strategy at the moment,” he says.

William Karesh of the Wildlife Conservation Society agrees. He is working with colleagues on preliminary studies to see whether edible bait, such as vaccine-dusted fruit, might be an effective tool. But he says any vaccination campaign is many years away.

—GRETCHEN VOGEL

## EUROPEAN RESEARCH

# Unprecedented Budget Increase Draws Faint Praise

**PARIS**—A big research budget going up by about 40% sounds like European scientists have reason to celebrate. But when the European Parliament gave its final seal of approval last week to the Seventh Framework Programme (FP7), a €55 billion, 7-year package to boost science and innovation, the research world seemed less than ecstatic—primarily because many think Europe still doesn’t have its priorities right.

Yes, scientists say, they’ll get a lot more money—but much less than the European Commission had initially proposed for FP7. Yes, they will get a prize they have long coveted: the European Research Council (ERC), a €7.5 billion scientist-run agency that will reward excellence. But a much bigger chunk—more than €30 billion—will go to the vast, goal-oriented lab coalitions that Brussels loves and most researchers hate.

FP7 still needs to be approved by the E.U.’s Council of Ministers later this month, but intense informal talks have assured that it will be. “I feel relieved and tired,” Slovenian economist Janez Potočnik, the European commissioner for research, told *Science* last week after the parliamentary vote, which came just in time for the program’s formal kickoff in January.

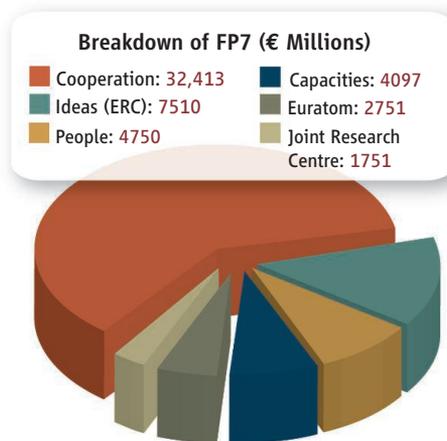
Potočnik had proposed a much bigger shot in the arm for science when he launched the first draft of FP7: some €73 billion over 7 years, which would have roughly doubled the E.U.’s annual contribution to research and innovation. That 2005 plan got stranded in a crisis over the E.U.’s budget (*Science*, 24 June 2005, p. 1848)—a “missed opportunity,” given that Europe is still far from its stated goal of

spending 3% of gross domestic product on research, Potočnik admits. Still, the 40% increase is “a major change,” he says.

The FP7 package, which will run through 2013, has four main pillars. “Cooperation,” the E.U.’s pot for applied research projects that require participation from many labs or companies across the continent, gets €32.4 billion. Its three major components address information and communication technologies, health,

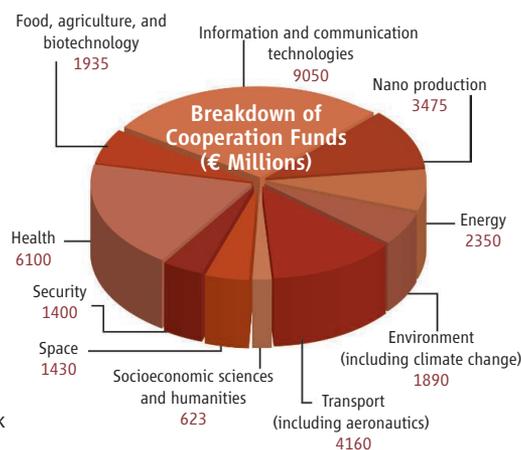
which will be spent on the International Thermonuclear Experimental Reactor project for fusion research.

Despite its size, the “Cooperation” part leaves many researchers lukewarm. Besides research, it serves lofty goals such as regional development, social equality, and transnational collaboration. The result, researchers say, is a compromise with contracts so burdensome that some researchers don’t even bother apply-



**Big deal.** “Cooperation” gets the biggest chunk of research funding; ERC is next, under “Ideas.”

and transport. “People”—which includes the popular Marie Curie portable grants for young scientists—provides €4.8 billion for training, work abroad, and luring expats back to Europe. “Capacities” contains some €4.1 billion for new research infrastructure, such as radiation sources, data banks, and telescopes. The last category, “Ideas,” funds the ERC. Also approved—although technically part of another treaty—is €2.8 billion for Europe’s nuclear energy organization, Euratom, most of



ing. “You’re sending kilos of paperwork to Brussels—it’s really a disaster,” says Bart De Strooper, a Belgian Alzheimer’s disease researcher who led a petition against bureaucracy and in favor of the ERC in 2004.

That kind of criticism is “not fair,” Potočnik says. “We have millions of examples of how [Framework] makes people work together across Europe.” And although battling the bureaucracy is “a long journey” in Brussels, he promises that FP7 will require less of it. ▶

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Gretchen Vogel

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