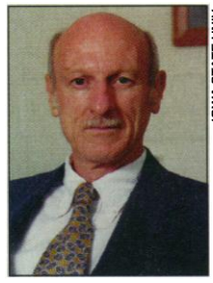
NATIONAL ACADEMIES

Bison Study Marks Radical Shift for Research Council

Are Montana cattle at risk from Yellowstone National Park bison carrying a disease that causes cows to abort? The National Research Council (NRC) is studying the question, and its answer is likely to be controversial—but perhaps not as controversial as the process the NRC is using to arrive at its weighty opinion.

The debate over the infected bison, pitting the U.S. Department of Agriculture (USDA) and ranchers against National Park Service officials and environmentalists, is so fierce that the Park Service decided to ask the NRC for an impartial scientific assessment of the problem. But the council, the operating arm of the National Academies of Sciences and Engineering and the Institute of Medicine, is itself embroiled in controversy over whether its procedures for such studies must follow federal guidelines for public access. So instead of assembling a panel of experts for a series of closed meetings—the time-honored process that a federal court has called into question—the council is hiring two scientists to carry out the $200,000 study.

Academy officials hope that this radical departure from normal practices will shield them from legal challenge. "It would be absolutely immune [from lawsuits] because no committee is involved," says William Colglazier, executive officer for the NRC. But the larger question is whether it will damage the council's reputation for quality. "It's a good experiment," says Paul Risser, president of Oregon State University in Corvallis and chair of the NRC's board on environmental studies and toxicology. "But it's a huge risk."



IOWA STATE UNIV.

No bull. Cheville says he'll be impartial.

Council officials say it will be more difficult to produce in-depth and balanced reports with paid principal investigators than with volunteers serving on committees. "Something is lost by not abiding by the traditional consensus approach," Colglazier admits. But the council's spate of legal problems has forced its hand. In separate lawsuits, the NRC is currently battling animal-welfare and environmental groups, which contend that the council must abide by federal rules on openness that apply to government advisory committees (*Science*, 30 May, p. 1328).

Ironically, the council's new procedures may further inflame the bison debate. Environmentalists are angered at the selection of Norman Cheville, a veterinary pathologist at Iowa State University in Ames, as one of the two principal investigators. Cheville is a longtime employee of USDA, which has threatened to decertify the safety of Montana beef because the wandering Yellowstone bison herds are infected with brucellosis. To stop the spread of the disease, the government killed nearly 1100 bison last winter. "He's got very good credentials, but he has spent most of his career working for USDA," says D. J. Schubert, a

Study Shows One-Fifth of Female Bison Infected

BOZEMAN, MONTANA—As the National Research Council begins its novel study of the threat to cattle posed by Yellowstone's bison herd (see main text), scientists are beginning to make headway in understanding the source of that threat: brucellosis, the chronic bacterial disease that can cause bison and cattle to abort their calves. At a meeting on bison ecology and management here 2 weeks ago, veterinarian Thomas J. Roffe of the Department of Interior's National Wildlife Health Center in Bozeman reported that one-fifth of females in Yellowstone's herd appear to be infected.

In past studies, about half of the park's bison have tested positive for antibodies to the bacterium *Brucella abortus* with standard blood tests for cattle. But the test can't distinguish between animals that have an active infection and those that were exposed but fought off the disease. So Roffe and other members of a team of state and federal scientists spent days kneeling in the snow beside dozens of bison carcasses, dissecting out lymph nodes and reproductive tissues from animals that were shot as they wandered out of the park in search of forage.

DOUG LONEMAN

Dead end. Yellowstone Park bison have been killed to prevent the spread of brucellosis.

Tissue cultures completed so far have turned up the disease agent in eight out of 20 female bison that had tested positive on antibody blood tests. Because about half the herd tests positive, the researchers calculated that about 20% of females carry the bacterium. Team members haven't completed tests on samples from males; at present, they are concentrating on the females because the disease is believed to spread primarily through brucella-laden birthing tissues left on the range after a calf is born or aborted.

The new finding is only one small piece of the larger question of whether Yellowstone bison pose a significant threat to cattle grazed on lands outside the park. Scientists still don't know, for instance, what fraction of the bison herd is infectious at any one time, among a host of other mysteries. "I was amazed when we started this [how] little baseline work had been done," says team member Jack C. Ryan, a veterinary pathologist at the Department of Agriculture's National Veterinary Services Laboratory in Ames, Iowa.

Indeed, Roffe would like to see the central question in the debate about the herd reframed: Instead of seeking to quantify the precise risk to neighboring cattle, he thinks researchers should be trying to learn enough about the disease so that managers can work to minimize the risk of bison-to-cattle transmission—an occurrence that's never been documented. Toward that end, the team is radio collaring up to 60 bison females, which the researchers are planning to follow for 5 years. **–Yvonne Baskin**

Yvonne Baskin is a science writer who divides her time between Bozeman, Montana, and San Diego.

wildlife biologist who works for a public interest law firm in Washington, D.C. "There is just no way he can be objective."

Cheville insists otherwise. "I wouldn't take the job if there was a possibility of bias or skewed information," he says. "We will provide the facts." Council officials add that they will soon hire a second investigator—a university wildlife biologist—to complement Cheville. The NRC plans a public hearing in Bozeman, Montana, at the end of July to kick off the study.

Park Service officials say they are happy with the arrangement, although a committee would have been preferable. "It's the best we can get right now," says Michael Soukup, who directs the Park Service's natural resource stewardship and science program. "We need to take action." He adds that the NRC "swore up and down" that the quality of the study would be comparable to an NRC committee report.

Colglazier says the study will undergo the same intensive reviews given to committee reports: "It's certainly different from an NRC committee report, but it will get the same stamp of approval." He adds, "We will have to be even more stringent" in assessing the bias and possible conflicts of interest of principal investigators. "It's a real challenge."

One council staffer who directs committee reports agrees that "it can be done with integrity, but it requires more work." Finding a researcher to accept what amounts to a full-time job as an investigator, for example, is harder than asking scientists to meet for a few days, the staffer adds.

Thomas Cochran, a physicist who works for the Natural Resources Defense Council in Washington, which is involved in one of the lawsuits against the NRC, says the council is sacrificing quality to avoid the law. "Which will produce the better result—a committee [that follows the government rules] or an individual writing a report that goes through their review process?" he asks.

That message is not lost on Risser, who agrees with the need to avoid legal challenges but is concerned with the long-term implications. "We can't stick our heads in the sand" and hope legal threats go away, Risser says. "But I fear for the reputation of the NRC in the long term."

For now, however, the council is moving ahead with the idea. Colglazier says he expects to see four or five more studies follow the new approach in coming weeks.

–Andrew Lawler

REGIONAL SCIENCE

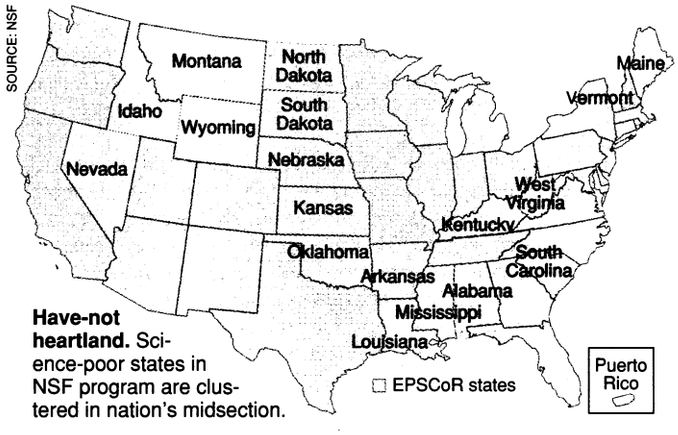
NSF Offers Carrot to 'Needy' States

Phil Boudjouk, a chemist at North Dakota State University in Fargo, knows his state is no research powerhouse. Indeed, the latest state rankings from the National Science Foundation put North Dakota dead last in the amount of money coming from NSF, and 48th when all federal research agencies are included. But Boudjouk believes there are individual North Dakota scientists who can hold their own in a national competition for research grants. This fall, his faith will be put to the test.

NSF is implementing new guidelines* for its 17-year-old Experimental Program to Stimulate Competitive Research (EPSCoR), which is designed to give a boost to states lacking a strong research base. EPSCoR had given researchers in these states a chance to compete for a share of a small but protected pool of money, but the new rules offer a financial incentive for these researchers to plunge into NSF's nationwide competition for funding. If they do well, their success could one day close down the very program that nurtured them.

"It's an excellent concept, and a critical step for scientists from EPSCoR states to make the leap into the big pool," says Boudjouk, who also heads the state's EPSCoR activity. "Is it the beginning of the end for this program? Perhaps, although it may take longer than 3 or 4 years."

Congress created this initiative in 1979 as a counterweight to the geographic imbalance in the distribution of federal research dollars—in particular, the relative dearth of money going to the South and upper Midwest. A state's eligibility is determined largely by how much federal and NSF research funding it receives and its number of scientists per capita. A favorite among congressional delegations from poor and rural areas, EPSCoR has grown from five states sharing $3 million into a $38-million-a-year program in 18 states and Puerto Rico (see map). And its popularity has spawned similar efforts in other federal agencies.



Have-not heartland. Science-poor states in NSF program are clustered in nation's midsection.

Under the existing NSF program, states can receive up to $1.5 million a year to develop the infrastructure needed for science (large equipment, computing power, and the like) and to fund individual and small-group research projects in areas deemed important to the state's scientific and economic growth. Last year, about 1100 researchers were supported by peer-reviewed EPSCoR grants.

NSF has decided to replace this arrangement with 3-year cooperative agreements that change the rules. A portion of the total program budget—some $10 million set aside for investigator grants—would be pooled with a similar amount drawn from NSF's regular research account. Scientists who previously submitted their proposals for the smaller but sheltered pot of EPSCoR money within their states will now compete in the stiffer nationwide competition; those earning the best reviews would receive funding from NSF's regular research directorates.

The bonus would kick in for those just below the first cut: Program managers will be able to stretch their budgets by using the pot to fund half the cost of well-reviewed proposals from EPSCoR states. That arrangement also benefits the states. "A state could double its research funding," explains Richard Anderson, who runs NSF's EPSCoR program. "We see it as quite an incentive [to participate]."

NSF officials are hoping that scientists from EPSCoR states will move more quickly into mainstream funding if their grants are reviewed along with everybody else's. "We've found that faculty don't graduate as quickly as we'd like," NSF director Neal Lane last month told a Senate committee, whose members voiced strong support for the new approach.

Boudjouk predicts that as many as half of the 80 North Dakota researchers who have received small EPSCoR grants will eventually snare a larger, NSF-wide grant. "I think most of our successes will come in the third year," he says, "because it usually takes more than one application to win an award. But I feel we're definitely ready to compete with everybody else."

–Jeffrey Mervis

* Publication number NSF 9751, on the Internet at: www.nsf.gov/pubs/1997/nsf9751/nsf9751.htm