

Two Views of a Swamp

Scientists dispute legislators' take on wetlands

By TINA ADLER

Environmentalists and the Weyerhaeuser lumber and paper company are waging a legal battle over 17,000 acres the company owns near Plymouth, N.C. The environmentalists think the property is a wetland, which would call down legal restrictions on its use. Weyerhaeuser disputes the classification. Both sides agree that the land has soil and vegetation typical of a wetland, but they disagree on how wet it actually is.

As part of the court case, both have submitted their assessments to Environmental Protection Agency officials, who will decide whether or not the property qualifies as a wetland, explains Tom Welborn, chief of EPA's wetland protection section in Atlanta. That decision could affect what the company can and cannot do with the land.

Stories of projects held up because of regulators' and environmentalists' concern for wetlands abound—as do stories of valuable wetlands getting paved over. Such tales of woe have become so common that policy makers and scientists alike have tried to stop the storytelling and take action to make wetland regulations fairer and more consistent. The two groups, independently, made new attempts this May. But they came up with very different views of what constitutes a wetland.

On May 16, the U.S. House of Representatives passed legislation to reauthorize the Clean Water Act, but with provisions that make it easier for landowners and developers to obtain permits to dredge and fill wetlands. The Senate is considering a similar version of the bill.

While representatives were putting the final touches on their bill, a group of scientists and legal experts convened by the National Academy of Science's National Research Council in Washington, D.C.,

was finishing up its report on the science of identifying and delineating wetlands. Congress had requested the document in 1993, to help clear up confusion. The NRC committee had expected to complete the report in December 1994, but it didn't arrive on Congress' doorstep until May 9 of this year.

More important, the report didn't come in time for the new Congress to

ing regulations, the new congressional leaders seek to completely revamp the current rules.

"Many of the [report's] conclusions and recommendations underscore the committee's confidence in... current regulatory practice for characterizing and delineating wetlands," Lewis wrote in the preface. However, the committee does call on the federal government to update

the 1987 Army Corps of Engineers Wetlands Delineation Manual, which regulators use to implement the Clean Water Act. The manual, for instance, does not extend its standard regulations to permafrost wetlands.

But Sen. J. Bennett Johnston (D-La.), who introduced the Senate version of the Clean Water Act reauthorization, believes that current rules constitute a "rigid regulatory program that is devaluing property and preventing construction on land that rarely, if ever, has water on the surface but still is considered to be a wetland."



This red maple's shallow, adventitious roots and multiple trunks help it survive in its wetland home. Regulators consider this tree a hydrophyte, but because many red maples grow well outside of wetlands, it fails to meet Congress' proposed definition of wetland biota.

include its findings in the proposed bill, congressional staff say. The absence of their conclusions is quite evident, NRC committee members assert.

The NRC document supports and slightly expands the definition of wetlands embodied in current federal regulations. The definition in the proposed legislation, on the other hand, would remove from federal jurisdiction roughly half of the country's wetlands, asserts NRC committee chairman William M. Lewis Jr. of the University of Colorado in Boulder. Authors of the proposed Clean Water Act legislation say only 7 to 10 percent of wetlands would lose their federal protection.

Although the NRC group declares that solid science backs up most of the exist-

When asked about the proposed legislation, NRC committee members tend to shake their heads over the same troublesome points.

For example, the bill states that wetlands must have water on the surface for 21 consecutive days during the growing season in the majority of the years for which records are available. But some wetlands don't get inundated for that long, and others never get inundated at the surface, says Lewis.

The NRC committee, by contrast, avoided specifying the number of days an area must stay wet in order to deserve wetland status. "It's our hope that people reading this document would realize the shaky ground of any [such] criteria," says committee member A. Michael Macrander, an environmental specialist at Shell Oil Co. in Houston.

The NRC report does provide an esti-



This tidal salt marsh in York River State Park in Virginia floods irregularly. Does it flood enough to be a wetland? The answer depends on whether you ask members of Congress or scientists.

mated number of days that wetlands stay wet. Unless the region has some unique features, regulators can assume that in most years it takes about 14 days of saturation during the growing season to create the oxygen-depleted soil typical of a wetland, the authors assert.

They point out, however, that "the 14-day duration threshold should be viewed as provisional, because it does not account for factors that can cause variation in the threshold." For example, temperature can change how long it takes anaerobic conditions to develop in saturated soils, they note.

Only certain plants and animals thrive in wetlands' anaerobic substrate. Policy makers and scientists have long debated how many key wetland indicators—hydrology, substrate, and biota—they need in order to call some damp spot a wetland. Will two out of three do, for example?

Nope, say the authors of the proposed legislation. They require "clear evidence" of all three. But getting accurate records of all three can prove very difficult, researchers counter.

Most of the time, good records on an area's hydrology, substrate, and biota "are completely lacking," says NRC committee member Joy B. Zedler, director of the Pacific Estuarine Research Laboratory at San Diego (Calif.) State University.

In any case, researchers can often deduce wetland status using two of the three indicators. "It is often scientifically defensible...to infer information about one factor from another," the NRC authors assert. They add a caveat, however: The presence of characteristic substrate and biota doesn't always mark a genuine wetland, because both indicators can persist for some time after the area has dried out.

Other areas, such as certain floodplains, don't have the hydric soils that typify wetlands, yet they still act as wetlands, the report explains. And instead of the hydrophytic vascular plants normally found in wetlands, some wetland biota include primarily algae.

"There is no scientific basis for excluding these environments from designation as wetlands," the report states.

The proposed legislation would categorize wetlands in part on the basis of

their ecological significance. However, researchers don't have the tools to quickly and inexpensively characterize wetlands' functions, Zedler says.

"Although it is possible to evaluate the functions of wetlands, the precision is low for some types of functions and in some regions," the NRC report states. "Assessing the value of wetlands

requires the use of methods from economics and other related fields, and is not yet well developed."

In addition, wetland regulations need to take into account regional differences in the biota, substrate, and hydrology that define a wetland, the committee asserts. A one-size-fits-all policy fails to protect wetlands, it notes.

Under almost any set of rules, designating exactly where a wetland begins and ends proves difficult, in part because of the transition zone between the wetland and upland, scientists say.

"I go out to a site and for legal purposes I have to draw a line in the sand and say 'this is and this isn't a wetland'.... It's kind of an artificial call from an ecological standpoint," says Thomas E. Kelsch, an EPA environmental scientist in Washington, D.C.

"The legal boundary is something of an artifact," agrees Joseph S. Larson, director of the Environmental Institute at the University of Massachusetts in Amherst.

"Where the edge of a wetland is is a multibillion-dollar question," says NRC committee member William J. Mitsch, an environmental scientist at Ohio State University in Columbus. But the federal government is providing "precious little support" for research to determine wetland boundaries, Mitsch adds. "I find that pretty extraordinary."

Scientists' problems with delineating wetlands for legal purposes and their complaints about the legislation reflect a bigger issue, some wetland experts say.

Researchers should have the job of describing a wetland, its ecological boundaries, and what they know of its functions, scientists say. Policy makers should use this scientific evaluation, along with economic and political considerations, to decide where in a wetland to establish jurisdiction. But they shouldn't then pretend they are protecting the entire wetland or all of its functions, researchers argue.

Lewis finds the proposed wetland legislation particularly irksome because its authors claim to protect wetlands, he says, but really just change the definition so fewer exist to protect.

"It's important to distinguish between the role of science and the role of policy making," Macrander contends. He says the NRC report does just that: It states that "scientific principles will not always dictate the appropriate [regulatory] choice." For example, regulations that attempt to minimize economic problems yet protect the core wetland area "might set the boundary at the innermost part of the transition zone."

EPA already makes that distinction. Weyerhaeuser could apply for a special permit to log in Plymouth whether the land ranks as a wetland or not. □

Why Sweat a Swamp?

Why all this fuss over land that people used to refer to simply as swamps, mires, bogs, fen, marshes, or potholes—that they christened with such cheery names as the Great Dismal Swamp?

In colonial times, wetlands covered 221 million of the United States' 2.3 billion acres. Until recently, the federal government encouraged the draining and filling of those lands. Since the 1780s, 22 states have lost 50 percent or more of their wetlands, and 10 states have lost 70 percent or more, the Fish and Wildlife Service (FWS) calculated in 1991. Now, the government often requires the creation of new wetlands to compensate for any destroyed.

True, wetlands often act as big natural sponges that attract mosquitoes. But little prairie potholes, wet mountainous meadows, and patches of frozen arctic tundra carry the wetland title too. And wetlands, like good compost piles,

break down leaves and stems into edible goodies for insects, shellfish, and algae, which themselves become supper for striped bass, bluefish, salmon, and flounder.

Wetlands resemble New York City: Some animals and plants would die if they had to live anywhere else, while others just like to stop in temporarily. Forty percent of threatened and endangered species rely on wetlands, FWS estimates. Even a small patch of wetland that stays dry most of the year may serve as the only breeding ground for a local species, researchers say.

Because they do act as sponges, wetlands help prevent flood damage. They store flood water and release it slowly. The water may also get cleaner while it sits in a wetland. Sediment filters out and microbes digest some of the water's organic matter, scientists have discovered.

— T. Adler