

Forthcoming rules governing federal oversight of wetlands could produce more sensible environmental policy.

An Opening for Meaningful Reform?

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RECENT LEGAL DEVELOPMENTS HAVE called into question the scope of the federal government's jurisdiction over the nation's wetlands. Section 404(a) of the Clean Water Act (CWA) authorizes the U.S. Army Corps of Engineers to issue permits for the discharge of dredged or fill material into "waters of the United States." Section 404(b) requires the U.S. Environmental Protection Agency, "in conjunction with the Corps," to promulgate environmental guidelines that control the Corps' permitting decisions.

Section 404 originally assigned the Corps the authority to issue permits for the discharge of dredge or fill material into "navigable waters." The term stems from the Rivers and Harbors Act of 1899, the forerunner to the CWA. In the CWA, the term "navigable waters" was retained but broadly described as "waters of the United States" as the Act was intended to address environmental problems as opposed to simply protecting navigable waters.

By 1977, the Corps had adopted a broad regulatory definition of "waters of the United States" that included "waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie pot-holes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce." As written, virtually all wetlands came under federal jurisdiction under Section 404.

In January of 2001, the U.S. Supreme Court placed limits on that federal authority in its decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*. The Court threw out the Corps' long-asserted claim that it has Section 404 jurisdiction over isolated, non-navigable intrastate waters when

they are used by migratory birds. Though the Court's holding in the case was narrowly framed, the broader language in the opinion has raised questions about the scope of the decision and, by inference, the types and number of wetlands no longer subject to federal regulation.

This past January, the Corps and EPA issued "guidance" on the Supreme Court's decision and published an Advance Notice of Proposed Rulemaking on the Clean Water Act regulatory definition of "waters of the United States." The guidance states that the Corps and EPA "are now precluded from asserting CWA jurisdiction... over waters such as isolated, nonnavigable intrastate vernal pools, playa lakes, and pocosins."

While many in the regulated community argue that the Advanced Notice provides too little guidance for field staff or applicants attempting to determine whether a particular aquatic feature is still subject to CWA jurisdiction, there is little doubt that the developments mark a significant change in federal regulation of wetlands.

FEDERAL PERMITTING

The Clean Water Act authorizes two different types of wetland permits: general and individual. General permits are stream-lined permits that are issued nationwide (NWPs) or regionally (RGPs) for activities that have only minimal individual and cumulative impacts. Examples of activities covered by NWPs include minor road crossings, utility line backfills, and bank stabilization projects.

An activity that has more than a minimal impact on wetlands or that is not covered by some general permit must receive an individual permit in order to proceed. In this process, the Corps evaluates the applicant's specific proposal as part of a standard process that typically requires public notice and a high degree of scrutiny of the proposed project.

The main issues that must be resolved in this process include the following:

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the applicant must establish that all practicable steps have been taken to avoid and minimize adverse impacts before the Corps or other agencies will consider the mitigation proposal. Consistent with the Corps' no-net-loss policy, the applicant must fully compensate for unavoidable impacts to wetlands.

COSTS

The Corps' wetland permitting program has grown increasingly controversial as developers, consumers, taxpayers, and others affected by the regulation complain about its high cost and questionable effectiveness at safeguarding the environment. Federal regulation of wetlands can be enormously expensive when considered in terms of total economic impacts per acre of wetlands conserved. The direct economic costs of wetland permitting result from three main factors: the expense of preparing and negotiating the permit and performing necessary mitigation, reduction in project output to lessen environmental impacts, and delay in completing the project.

The costs of wetland regulation can be understood within a market equilibrium framework. Suppose that wetland permitting will affect a housing development planned for an area with jurisdictional wetlands or other waters. Development is often land-constrained either because of a scarcity of suitable sites (as is common in California and parts of the Northeast) or factors

- Does the applicant have no practicable alternative that would avoid impacts to the waters of the United States, and has the applicant minimized unavoidable impacts?
- Does the mitigation proposal adequately compensate for any adverse impacts of the project?
- Does the project contribute to significant degradation of the aquatic ecosystem?
- Is the state where the activity is to take place satisfied that the project is consistent with state water quality standards and coastal zone management plans?
- Is the project contrary to the public interest?

According to Corps and EPA policy, the first two issues must be handled according to a process called "sequencing" in which

such as the limited capacity of regional planning authorities to process applications for proposed developments. In either instance, the shadow value of project output exceeds its marginal cost and the pre-regulation equilibrium is for the project output to be below that equating marginal cost and demand.

The first effect of regulation is to increase the marginal cost of development because of the cost of permitting and the need to mitigate wetland losses by constructing wetlands elsewhere. The next effect of regulation is to reduce the output of the project as a result of the effort to reduce losses in wetland acreage as a term of the permit. The third effect of wetland permitting is the welfare cost of delaying completion of the project. The need to obtain a wetland permit from the federal government leads to the delay of development activities and loss of economic benefits that could have been generated during the period of delay.

A simple example serves to illustrate the costs of wetland

permitting in this framework. Consider a 1,000-unit housing project to be built on 200 acres (an average of five homes per acre, including roads, open spaces, and other infrastructure). Suppose that 40 acres are considered to be wetlands. Suppose also that the pre-regulation price of the homes in the project is \$250,000, the elasticity of demand is -1.67, and demand is linear. The pre-regulation marginal cost of homes in the project is assumed to be a constant \$200,000.

Earlier research indicates that the cost to prepare and negotiate a permit is roughly \$500,000 for a project of this size. Adding the cost of mitigation to this figure, a conservative estimate of total out-of-pocket costs to the developer to obtain a permit is \$2 million, or \$2,000 per home. The second source of economic impact is the reduction in the size of the project resulting from federal review. Suppose the Corps reduces the size of the project to 900 units. The third basic effect is the delay in completing the project that results from regulation. Earlier research suggests that wetland permitting of the type required for this project would delay its completion by over two years.

Based on those figures, what are the economic impacts of wetland regulation for the hypothetical project? Homes in the project are now more expensive to construct and there are fewer of them, so their market price will increase. Under the assumptions above, the price of a home in the project will increase from \$250,000 to \$265,000.

Consumers lose from wetland regulation in three ways. Some are unable to purchase homes at all because of the reduction in the size of the project. Some do purchase homes, but at higher prices. And what consumption does occur is two years later than it would have been without the regulation. The impacts of permitting on developers (and landowners) are more complex. While producers gain from the increase in home prices, they lose from the increase in costs and from the delay in completing the project and receiving their return on investment.

Taking consumers and producers together, the total economic losses from wetland permitting are \$19.5 million for this project. That figure counts the cost of project delay, which amounts to \$12.5 million, or over half of total losses. While permitting reduces the size of the project from 1,000 to 900 completed units (which results mainly in losses to consumers), both consumers and producers must wait two extra years for the 900 units to be completed.

Several interesting conclusions emerge from this example:

- Wetland permitting can be quite expensive. Total economic losses amount to nearly \$20 million, which implies costs of \$1 million per wetland acre conserved. In general, the cost of permitting will vary depending on the reduction in output, the delay in completing the project, the amount of mitigation required, and the cost of preparing and negotiating the permit.

- Consumers bear the brunt of losses from wetland permitting. They are unambiguously harmed by increases in price and reductions in the number of homes available for purchase. Developers and landowners fare bet-

ter because they can pass on some costs to consumers and because they benefit from price increases.

- Traditional measures of the cost of regulation, namely the out-of-pocket cost of obtaining a permit and performing mitigation, are far off the mark. In this example, they understate true impacts by an order of magnitude.

- A full cost-benefit analysis of permitting would also have to consider the benefits of wetland protection and the cost of alternative conservation policies. Do those benefits exceed \$1 million per acre? A narrower question is whether there are policies that protect wetlands at lower cost than permitting.

ALTERNATIVES TO FEDERAL REGULATION

Given the high cost of permitting and the fact that the federal government spends considerable time and energy regulating wetlands of only marginal environmental value, it is worthwhile to ask whether the Supreme Court's January 2001 ruling will lead to meaningful reform. That is, will federal regulation of isolated wetlands be replaced with more cost-effective and appropriate conservation strategies? I would like to consider three alternatives to federal permitting: state and local regulation, non-regulatory programs of the federal government, and the activities of private groups.

State and local regulation A basic tenet of economic federalism holds that public goods should be provided by the government with the jurisdiction closest in scope to the public good in question. Thus, it is important to consider the types of environmental services provided by isolated wetlands and ask whether those wetlands rise to the level of national public goods or whether they are primarily local.

A June 2002 report by the Fish and Wildlife Service categorizes 19 types of isolated wetlands widely distributed around the United States. With regard to the ecological function of the isolated wetlands, the Service singles out some principal types of benefits:

Water storage and slow water release — Isolated, depressional wetlands may provide flood protection and reduce the amount of damage from storms by impounding water. Because isolated wetlands have no natural outlets, they may also recharge groundwater supplies and offer fish and wildlife habitat, especially during the dry season. As a result of their water storage function, they may provide recreational opportunities such as ice skating, photography, hunting, and boating.

Nutrient retention and recycling — Isolated wetlands can be sources, sinks, or transformers of chemicals, and as a result they play an important role in biogeochemical processes. The Fish and Wildlife Service report singles out two types of isolated wetlands – ombrotrophic bogs and cypress domes – as examples of potentially isolated wetlands that recycle nutrients internally. They

have the potential to serve as chemical sinks and may provide regional water quality benefits as they minimize problems caused by agricultural, municipal, and industrial pollution.

Sediment retention — Depressional wetlands may trap sediment. In fact, the volume of wetlands may be reduced over time through their propensity to accumulate sediment.

Substrate for plants and animals — Isolated wetlands can provide substrates that foster plant growth and colonization by a wide array of animals. Isolated wetlands are important for maintaining biodiversity because their geographic isolation has led to the evolution of endemic species.

Most of those benefits are local or regional in nature, suggesting that isolated wetlands may be efficiently managed by

despite not having a wetland law per se. And Florida has invested billions of dollars of state funds in a massive land acquisition program that brings environmental resources under permanent public control while providing compensation to willing sellers. Differences among states in terms of their wetland policies should not be cited as evidence of inefficiency or government failure. To the contrary, differences in policy among states may simply reflect differences in citizen preferences, economic conditions, and the inventory and quality of existing wetlands.

Non-regulatory initiatives Non-regulatory programs of the federal government are also powerful tools to protect wetlands. The nation's farm programs contain large conservation provisions that protect land and finance its rehabilitation. Three programs administered by the U.S. Department of Agriculture are of special significance to isolated wetlands: the Conservation Reserve Program (CRP), the Wetlands Reserve Program (WRP), and Swampbuster.

Differences among states do not necessarily mean inefficiency or government failure, but may reflect different preferences or economic conditions.

states and cities. Because there are likely to be few spillovers, decentralized regulation can tailor wetland strategies to local economic conditions and can better represent the preferences of constituents. In this sense, the Supreme Court's ruling got it about right from a public finance perspective.

Not surprisingly, states vary widely in terms of their wetland regulations and other efforts directed at wetlands protection. Most states that have wetland laws base their regulation on permits that are related to draining and filling wetlands. States adopting a regulatory approach to wetlands conservation usually have a legislative framework that protects isolated wetlands because laws apply to all wetlands and not just those that are navigable or adjacent to navigable waters. There are cases, however, where state regulation is limited to specific priority areas, e.g., coastal areas.

Some states have comprehensive, virtually seamless wetlands statutes and accompanying permitting programs. Examples of this include Minnesota, New Hampshire, New York, Massachusetts, and Maine. Some environmental groups have argued that the Supreme Court decision presents a compelling need for other states to adopt this approach with respect to isolated wetlands.

Whether this suggested approach has merits, a review of state wetland programs suggests that other approaches are at least available, and may in fact perform quite well. For example, California has achieved notable success in protecting its wetlands in the absence of a wetland statute. Indeed, the state was the first in the nation to achieve the goal of "no net loss"

The CRP provides farm owners or operators with an annual per-acre rental payment and half the cost of establishing a permanent land cover, in exchange for retiring environmentally sensitive cropland from production for 10 to 15 years. The 2002 Farm Act set the enrollment limit at 39 million acres. Producers can offer land for competitive bidding based on an Environmental Benefits Index (EBI) during periodic signups, or can automatically enroll more limited acreages in practices such as riparian buffers, field windbreaks, and grass strips.

Congress authorized the WRP under the 1985 Farm Act. Under the 2002 Farm Act, the acreage cap is increased from 1.075 million acres to 2.275 million acres. Landowners who participate in the WRP may sell a permanent or 30-year conservation easement or enter into a 10-year cost-share restoration agreement to restore and protect wetlands. The landowner voluntarily limits future use of the land, yet retains private ownership. The U.S. Department of Agriculture pays 100 percent of restoration costs for permanent easements and 75 percent for 30-year easements and restoration cost-share agreements.

First established in 1985, the so-called "Swampbuster" provision of the Farm Act states that farmers or ranchers lose eligibility for farm program benefits if they produce an agricultural commodity on a wetland converted after December 23, 1985, or if they convert a wetland after November 28, 1990, and make agricultural production possible on the land. Swampbuster has been shown to have a significant disincentive effect on conversion of isolated wetlands for agriculture.

Purchasing funds There is a growing tendency for public agencies to create “purchasing funds” for procurement of environmental amenities from willing sellers – an approach exemplified by the CRP and WRP. One basic advantage of purchasing funds versus permitting is that the former gives landowners an incentive to be forthcoming about the existence of wetlands (or other environmental assets) on their property. Traditional regulation, by contrast, gives landowners an incentive to “shoot, shovel, and shut up.” By creating a market for environmental services, purchasing funds may lead to the discovery of environmental amenities that were heretofore secret.

An economic analysis of environmental purchase funds as an alternative to regulation must also recognize the rent-seeking considerations that lead to their establishment and continue to affect the funds’ behavior once they become operational. The CRP, for example, is part of a broader effort to increase and stabilize agricultural income and to a large extent is being used as a vehicle to accomplish that objective. Thus, establishment of criteria for access to this program may be affected by politi-

lands: Restoration of wetlands is usually much less expensive than conservation. Protection of existing wetlands is more expensive than restoration because there is a large supply of former wetlands that are only marginally suited to economic uses. Many of those marginal working lands are used in agriculture. Wetlands that are profitable to develop, by contrast, can be quite expensive to conserve.

A recent study by the U.S. Department of Agriculture calculated the costs of conserving wetlands through programs that acquire partial interests in land and restore wetlands. The average cost of conservation under the programs was around \$1,300 per acre. The study also concludes that the WRP achieves restoration at around \$600 per acre.

Private groups Private conservation groups have made important contributions to wetland protection, and it is likely that they will modify their strategies in response to the Supreme Court’s January 2001 decision. For example, Ducks Unlimited’s singular focus is to protect land and water where waterfowl

Many former wetlands are only marginally suited to economic uses and could be restored, while some current wetlands would be profitable to develop.

cal-economic factors. The allocation of funding among various environmental objectives (what percentage of the total budget will be allocated to the improvement of water quality versus prevention of soil erosion, etc.) is likely to be affected by the identity of the likely recipients of the funds. Farmers in the Dakotas and Texas receive a large amount of CRP funding while only miniscule amounts are allocated to procure environmental benefits in locations in the Southwest and West, despite the existence of substantial environmental amenities in those regions.

Rent-seeking behavior affects not only the allocation of funding among environmental objectives but the criteria for targeting the funds allocated to each objective. In the past, funding was targeted to maximize the acreage enrolled in a program rather than maximizing environmental benefit per dollar spent. The old criteria served farmers best because they could enroll their least productive lands for conservation efforts, even when the benefits were not substantial. A transition from targeting to maximize acreage enrolled in a program to targeting to maximize environmental benefits (subject to budget constraints) may reduce significantly the acreage enrolled in a program and farmer’s income, but significantly increase environmental benefits.

Another factor that bears on the comparison of regulatory and non-regulatory approaches is that the latter can provide incentives for the conversion of prior wetlands back to their natural state. Economists have noted a basic dichotomy between programs intended to conserve existing wetlands and those attempting to restore lands that were previously wet-

land, migrate, or winter. Since the organization’s inception in 1937, it has protected 2.7 million acres in the United States, nearly 6.0 million in Canada, and 1.7 million in Mexico, totaling more than 10 million acres of protected waterfowl, wetlands, and related habitats in North America. With nearly 700,000 supporters, Ducks Unlimited has raised more than \$1.7 billion for conservation efforts.

Ducks Unlimited and other environmental groups like The Nature Conservancy achieve their particular goals by developing conservation strategies that will ensure long-term conservation programs. They utilize sound science to determine the optimal method of land and water protection. Depending upon the target area and the goals of the specific project, land is either purchased by the organization outright, obtained through conservation easements or management contracts, or enrolled in federally funded programs. Further, Ducks Unlimited, The Nature Conservancy, and other private groups form essential conservation partnerships, influence public policy, and engage in critical community education and outreach.

The method by which either group protects habitat depends upon several factors, including whether or not the land is agricultural, the availability of land in a given region, and the degree to which the habitat meets the organization’s criteria for conservation. Land easements are often an effective tool of conservation, embracing the interests of both landowner and conservationist. Because an easement effectively prohibits certain land uses, the land’s income and sale value can be negatively

affected. Therefore, landowners entering into conservation easements are often given estate, income, or property tax incentives. Easements may also involve state tax relief that would vary from state to state.

There is diversity in preferences for public goods that are more than local in scope. Even for a public good such as biodiversity, some people have much larger demand than others. Therefore, the federal government cannot satisfy the demands of all citizens. Some will perceive that their taxes are too high and there are too many wetlands, while others will feel that there are not enough wetlands and they would be willing to pay for additional conservation. This is especially true in the case where there is a positive correlation between marginal valuation of wetland services and income.

A major problem encountered in the design of environmental policies is the lack of understanding by the government about the public's valuation of environmental amenities. The activities of private conservation groups to purchase and protect wetlands reveal what the public appreciates relative to the cost of protection. There is an element of efficiency in the choices of private groups that may be lacking in the choices of public-sector activity where the allocation of oversight activity is not based on environmental benefits generated per dollar spent.

Because of the potential for "free-riding," there may be inadequate funding for the activities of private groups. This well-known incentive problem justifies public intervention, one form of which may be subsidizing the activities of private conservation groups. While there is a clear theoretical rationale for public intervention in the form of financial incentives (including disincentives in the form of permitting and taxation), much regulatory activity does not appear to meet efficiency criteria and may use wetland policies to achieve other goals.

A fundamental problem with federal wetland regulation vis-à-vis private conservation activities is that the Corps is not forced to pay attention to factor prices. Private groups have better incentives to target the land with the highest level of environmental amenities per dollar spent. When a private organization decides about investment in wetland conservation, the group's expenditures include both purchase of land and investment in improvement on wetland quality. Because land is costly, the group may buy less land and obtain a higher level of wetland services by upgrading its land base. The Corps does not pay for land and treat it as a zero-cost input. Accordingly, it spreads its budget and oversight resources over a much larger acreage. While from the Corps' perspective the land has no opportunity cost, from a societal perspective the land has value owing to its ability to provide other services. Thus, there may be a tendency to over-regulate and restrict activity on more land than is socially optimal.

CONCLUSION

The Supreme Court has recently circumscribed the federal government's authority to regulate discharge into wetlands and other waters of the United States. In particular, the federal government has lost its ability to regulate discharge into so-called isolated wetlands based solely on their use by migratory birds. Will this rollback of federal authority result in the wholesale

destruction of isolated wetlands? Or, will other conservation measures be utilized that may actually result in more efficient and economically appropriate management of wetlands?

An economic assessment of the federal wetland permitting program curtailed by the Supreme Court reveals at least two areas of concern. First, the program can be very expensive, especially when considered in terms of economic impacts per wetland acre conserved. A simple example shows that those costs can easily exceed \$1 million per acre. Another source of concern is that the government does not adequately target regulation to wetlands of special environmental significance. Rather, significant resources are spent regulating such "wetlands" as desert washes, erosional channels on hillsides, and even areas that never have water on their surface at all.

With regard to alternatives to federal regulation of wetlands, I begin with a threshold observation: Even now, a portfolio of policies protects wetlands in the United States. Federal and state efforts to conserve wetlands include both regulatory and non-regulatory initiatives. Private conservation groups also do a remarkable job of identifying environmentally meaningful wetlands and securing them for the future. Thus, even with no new state legislation, the January 2001 Supreme Court decision will most likely not result in the wholesale destruction of isolated wetlands, particularly those of high environmental significance.

Another main conclusion is that protection of wetlands is an important policy objective, but that optimal intervention must also take into account economic costs. Those must include not only costs to the regulator, but also costs to the public. Existing federal regulation under-emphasizes or even side-steps the economic impacts of permitting. In this respect, private groups seemingly have more appropriate incentives because they must pay real money to lock up land for preservation and are thus forced to consider factor prices when targeting their acquisition efforts.

Another major conclusion is that because not all wetlands provide the same level of environmental services, procedures for targeting or discrimination among wetlands can improve the efficiency of wetland policy and increase the overall level of environmental quality. This observation is in keeping with the spirit of the 2001 Court decision, namely, that not every wetland is entitled to the same level of federal protection. Importantly, even the federal government can target wetlands through its Section 404 program without a change in the underlying Clean Water Act. Private conservation groups have correct incentives in this respect because they attempt to maximize environmental benefits per dollar spent.

The Supreme Court's 2001 decision may provide an opening for meaningful changes in wetlands policy. The forces put in motion as a result of the decision may result in the replacement of existing, relatively non-discriminatory regulation with policies reflecting the differences in quality of environmental services as well as cost to the public. Hopefully, this process of reform will lead to more creative institutions and more efficient protection of wetlands. Implicit in this notion of efficiency is a benefit-cost calculus (and a fundamentally pragmatic approach) that looks at the meaning of what is accomplished in the field. 