ENVIRONMENTAL
STUDIES PROGRAM

SWAMPED

HOW AMERICA ACHIEVED "NO NET LOSS"

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"No Net Loss"

Jonathan Tolman

EXECUTIVE SUMMARY

Environmental policy makers routinely decry the dramatic loss of America's wetlands. Yet over the last decade the convergence of two little known wetland trends has resulted in the achievement of the stated national goal of "no net loss" of wetlands. Indeed, the goal has not only been met, but exceeded. Wetland loss due to agricultural conversion, formerly the number one source of wetland loss, has slowed to a trickle. Also, wetland restoration has exploded in the last decade – what was once a few thousand experimental acres nationwide has become hundreds of thousands of acres a year. When it comes to restored wetlands, the nation is veritably swamped.

As part of the most recent National Resources Inventory (NRI), the U.S. Department of Agriculture's Natural Resource and Conservation Service surveyed wetlands across the country to document their status and trends.

- According to the NRI, the annual gross loss of wetlands between the 1982 and 1992 period was 156,000 acres a year.
- Average annual agricultural losses were 31,000 acres per year, urban losses were 89,000 acres per year and other losses were 37,000 acres per year. The authors of the NRI wetlands survey point out that by the end of the period agricultural losses had likely slowed to an estimated 15,000 acres per year.
- If these trends hold steady, it is probable that the U.S. as a whole lost roughly 141,000 acres of wetlands in 1995.

Beginning in the mid-1980s, the federal government began several non-regulatory programs designed to restore wetlands. Wetland restoration is defined as the reestablishment of wetland hydrology and wetland vegetation to lands which had previously been drained, typically for agricultural purposes. Wetland restoration is distinct from both creation: building a wetland where none has ever existed and enhancement (improving the functioning of an existing wetland). The first programs to begin wide scale restoration were the North American Waterfowl Management Plan and the Partners For Wildlife Program, both operated by the U.S. Fish and Wildlife Service. In the early 1990s the Department of Agriculture began restoring wetlands under the wetland reserve program. In 1995:

- The Partners For Wildlife Program restored 48,000 acres,
- The North American Waterfowl Management Plan restored 42,000 acres, and
- The Wetland Reserve Program enrolled 118,000 acres.

In some cases, not all enrolled or reported acres are returned to wetland status. For example, approximately ten percent of the acres enrolled in the Wetland Reserve Program remain as buffer uplands. Taking into account this small percentage of enrolled uplands, these three wetland programs restored at least 187,000 acres of wetlands, well in excess of the 141,000 acres of wetland converted to other uses every year.

Given the current success of wetland restoration programs and the decline of wetland losses, there is little doubt the nation as a whole has exceeded its expectation of "no net loss." In addition, wetland restoration programs appear to be a more cost-effective method of conserving wetlands than regulatory programs.

Additionally, given the failure of the 404 program there is no logical public policy reason for the federal government to continue to fund the Army Corps of Engineers wetlands program. Reallocating funds from the Corps regulatory program to non-regulatory programs such as the North American Waterfowl Management Plan or the Wetlands Reserve Program would likely result in an increase in both wetland acreage and wetland function and value.

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INTRODUCTION

A stone's throw from the eastern shore of the Chesapeake Bay near the town of Chester, Maryland, sits a modest ten acre wetland. What is unusual about this wetland is not the ducks or geese that stop here on their annual migrations, nor the egrets and herons that stalk its waters for frogs and fish, but the fact that only a few years ago this wetland did not exist.

Generations ago, the area had been a wetland, but with the help of federal and state agricultural subsidies, farmers drained the land to plant crops. Five years ago though, Chesapeake Wildlife Heritage restored the wetland with the permission of the land owner. The owner of Barnstable Hill Farm voluntarily placed the land into a conservation easement. In addition to the ten acre wetland, the Chesapeake Wildlife Heritage restored other wetlands on the farm.

Wetlands are being restored all across the country.

One of these wetlands is a mere one acre. But what it lacks in size it makes up for in function. Any water running off of the nearby fields is funneled into the wetland before flowing into a 50-foot ditch which runs straight into the Chesapeake Bay. According to the Smithsonian Environmental Research Center, which installed monitoring devices, the wetland removes 40 percent of the nutrients from the runoff before the water reaches the Chesapeake Bay.[1] Over the last five years Chesapeake Wildlife Heritage has restored more than 100 acres of wetlands in the Chesapeake Bay watershed.

Wetlands are not just being restored in a few isolated areas by non-profit organizations. They are being restored all across the country by numerous federal, state and local government programs, as well as non-profit programs. The farm of Samir Shabb in Mason County, West Virginia, is an example. More than a hundred years ago, the area was drained of wetlands to create a dairy farm. Today, 60 acres have been restored by a program funded by the

[1] Dennis Whigham, Thomas Jordan, Kathleen Callahan, and Toni Pepin, *Effectiveness of Constructed Wetland For Control of Agricultural Runoff and Wildlife Habitat*, Smithsonian Environmental Research Center, February 1995.

U.S. Department of Agriculture (USDA). The Natural Resource Conservation Service, a division of USDA, paid Shabb the cost of restoring the wetlands and purchased a conservation easement.[2]

This type of restoration has become more common across the country. A decade ago, wetland restoration was a virtually unknown science. Today, hundreds of acres of wetlands are being restored on a daily basis through voluntary efforts.

The North American Waterfowl Management Plan has restored 400,000 acres of wetlands in the United States alone.

FEDERAL WETLAND RESTORATION PROGRAMS

During the 1980s and early 1990s, Congress funded a series of programs designed to acquire, restore and enhance wetlands. One report issued by the Department of Interior, indicated that between 1989 and 1992, 834,405 acres of wetland had been restored or enhanced. Many of these acres were restorations or enhancements on publicly owned lands, but a significant quantity also occurred on private lands.

In addition to restoration programs on federal land and wholly privately funded efforts, there are four programs which constitute the bulk of restoration on private land: the Partners for Wildlife Program, the North American Waterfowl Management Plan, the Wetlands Reserve Program and, to a lesser extent, the Corps of Engineers 404 mitigation.

Since 1987, the Fish and Wildlife Service has entered into thousands of voluntary agreements with private landowners to restore converted or degraded wetlands on their property. To date, the Partners for Wildlife Program has restored more than 210,000 acres of wetlands, according to the Department of Interior.[3]

Since 1986, Congress has appropriated funds for the restoration of waterfowl habitat under the North American Waterfowl Management Plan. Much of the restored habitat is wetland. During this period, the North American Waterfowl Management Plan has restored 400,000 acres of wetlands in the United States alone.[4]

The 1985 Food Securities Act authorized the creation of the Wetland Reserve Program. In 1992, the Soil Conservation Service secured permanent

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[2] Brad McElhinny, "Doctor Brings Wetlands Back To Life, Federal Funds Helped Restore Private Farm To Original State," *Charleston Daily Mail*, September 23,1996, p. A1.

[3] Interagency Task Force On Wetlands, *A National Program for Wetlands Restoration and Creation, Report of the Interagency Committee On Wetlands Restoration and Creation to the Policy Coordinating Group*, Department of Interior, August 1992, p. 10.

[4] Ibid.

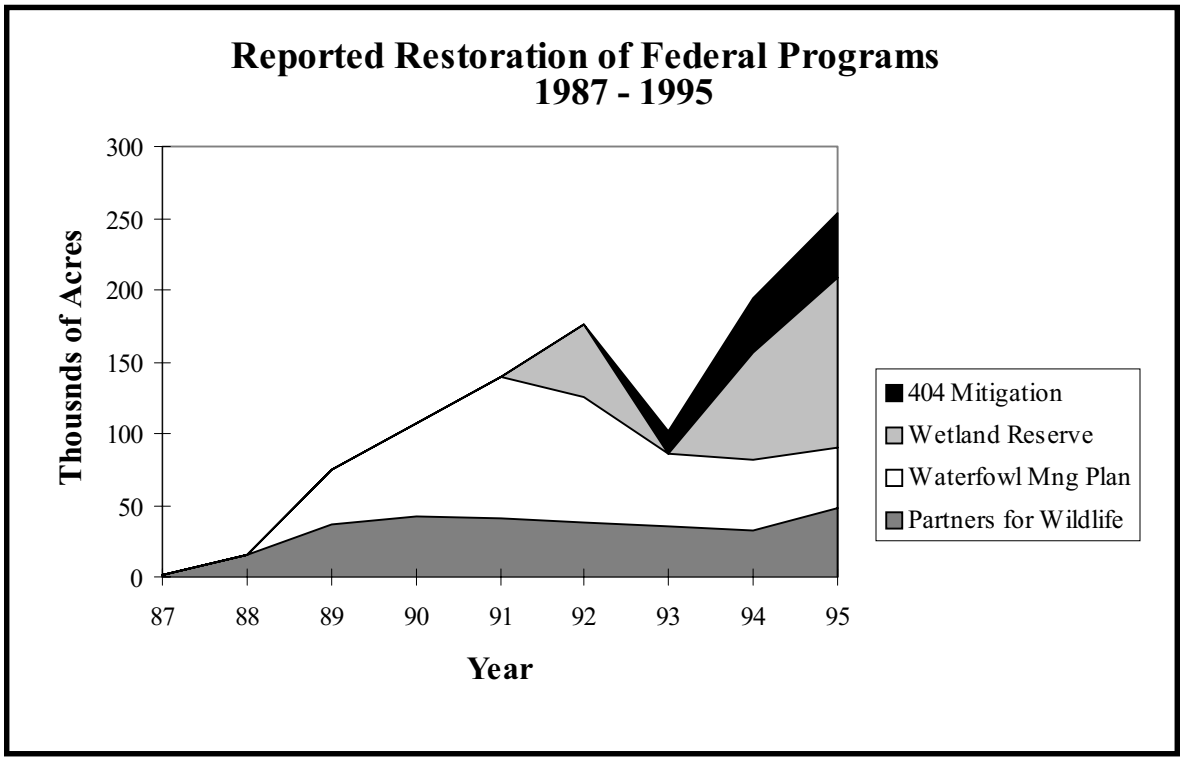
easements through voluntary arrangements for the restoration of 50,000 acres of cropland. In 1994, the SCS signed up an additional 75,000 acres of land for restoration.[5]

In 1993, the Army Corps of Engineers began keeping records of how many acres of wetlands were being required as mitigation for development or other projects. In many cases, private landowners are barred from developing their land if they do not mitigate. In 1993, the Corps required more than 15,000 acres of wetland mitigation. In 1994, the Corps required more than 38,000 acres of wetland mitigation.[6]

Other sources of wetland restoration are not insignificant.

For 1994, the combined acreage of these four programs was an estimated 195,000 acres. This figure does not include the thousands of acres which have been restored on federal lands, nor does it include solely private efforts. These other sources of wetland restoration are not insignificant and make the recent record of wetland restoration even more impressive.

For example, in 1994 alone, Ducks Unlimited restored or enhanced 51,260 acres of wetland. This figure represents efforts solely by Ducks



[5] Keith Wiebe, Abebayehu Tegene, and Betsey Kuhn, *Partial Interests in Land, Policy Tools for Resource Use and Conservation, U.S. Department of Agriculture Economic Research Service*, AER No. 744, November 1996, p. 21.

[6] *Section 404 of the Clean Water Act and Wetlands: Special Statistical Report*, U.S. Army Corps of Engineers Regulatory Branch, July 1995, p. 11.

Unlimited and does not include Ducks Unlimited's numerous other cooperative efforts with the Fish and Wildlife Service.[7]

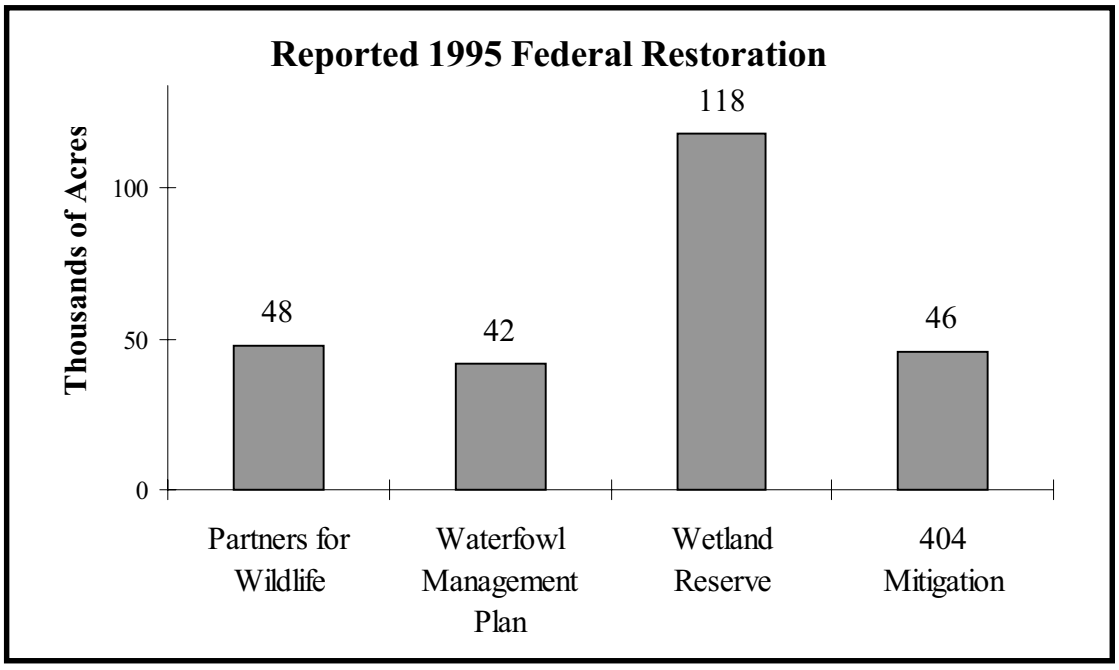
Numerous companies are also engaged in wetland restoration.

Numerous companies are also engaged in wetland restoration. Dow Chemical has protected or restored more than 60,000 acres of wetlands on or near its properties across the country.[8] Private conservation, such as the efforts by Dow and Chesapeake Wildlife Heritage, has been largely overlooked, yet it is a significant source of wetland restoration.

There are also one-time federal wetland restoration programs which occasionally occur. For example, in response to the massive flooding in the mid-west in 1993, Congress authorized and appropriated funds for the Emergency Wetlands Reserve Program which enrolled 77,000 acres of land mostly in Missouri and Iowa.

Wetland restoration in 1995 showed similar, if not improved, statistics. The Partners for Wildlife program restored 48,000 acres; North American Waterfowl Management Plan restored 42,000 acres; the Wetland Reserve Program enrolled 118,000 acres; and the Corps of Engineers required 46,000 acres of mitigation.[9]

STATUS AND TRENDS OF WETLAND ACREAGE



[7] Jonathan Tolman, "Achieving No Net Loss," *National Wetlands Newsletter*, Environmental Law Institute, Vol. 17, No. 3, p. 6.
[8] "North American Waterfowl Management Plan Committee Selects Recipients Of Its 1995 Wetlands Conservation Awards," *PR Newswire*, May 8, 1995.
[9] Army Corps of Engineers Regulatory Branch, *Section 404 Program, Regulatory Statistics*, 1996, Office of Management and Budget, *Budget of the United States, Fiscal Year 1997*, Appendix, pp. 583, footnote 24, footnote 5.

Although wetland restoration programs are progressively restoring more wetlands each year, the fundamental question is whether or not these restoration efforts are outpacing wetland losses. Three studies have analyzed the status and trends of wetlands in the United States. The first report was *National Wetlands Inventory: Status and Trends Mid-1950's to Mid 1970's*, where the Department of Interior surveyed wetlands between 1954 and 1974. The report found that during the twenty year period, the average annual net loss was 458,000 acres.

The second wetland study, *Status and Trends of Wetlands in the Conterminous United States, Mid-1970's to Mid-1980's*, found that between the years of 1974 and 1983, the U.S. was losing an estimated 290,000 acres of wetlands a year. This is the study that many alarmist environmentalists cite as evidence that the U.S. is losing 290,000 acres a year. For example, Jan Goldman-Carter of the National Wildlife Federation told a Senate hearing:

> "In 1991, the FWS released another major wetlands study entitled Status and Trends of Wetlands in the Conterminous United States. This report confirms that the Nation's wetland hemorrhage continues, with the primary cause of wetlands destruction still being conversion to agricultural land uses. Some of the findings of the report include the following: During the nine year study period, the nation had a net loss of 2.6 million wetland acres. This translates to an average annual net loss of approximately 290,000 acres." [10]

Many alarmist environmentalists cite evidence the U.S. is losing 290,000 acres a year.

The third report consists of data from the Department of Agriculture's National Resources Inventory (NRI). The NRI is a survey conducted by the Soil Conservation Service every five years. The 1994 NRI wetland report used data collected from 1982 to 1992 and determined that the U.S. had lost on net approximately 80,000 acres a year.[11]

Although the previous three studies characterize past wetland losses, further analysis is necessary to determine the *current* status of wetland losses.

CURRENT WETLAND LOSSES

Examined together, the three studies reveal a slow-down in wetland conversion. This was noted by the authors of the 1974-1983 NWI study: "Since the mid-1980s, indications are that wetland losses are slowing."[12] In fact, wetland losses appear to have been slowing since the mid-1950s. If one takes a closer look at the data from the three studies, it appears that the

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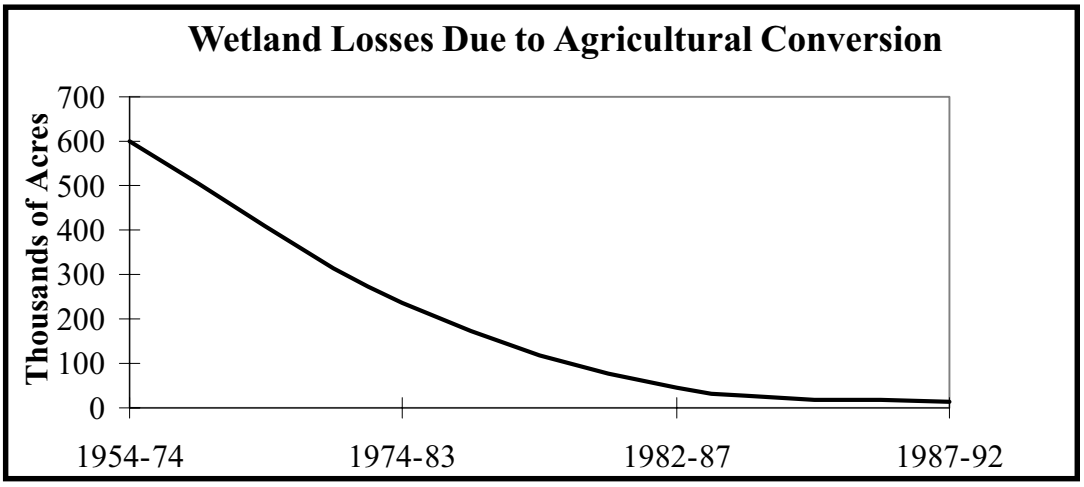
[10]Jan Goldman-Carter, National Wildlife Federation Testimony before the Senate Subcommittee on Environment, Clean Air, Nuclear Regulation, Property Rights, August 2, 1995.

[11] Ralph Heimlich and Jeanne Melanson, "Wetlands Lost, Wetlands Gained," *National Wetlands Newsletter,* Environmental Law Institute, Vol. 17, No. 3, p. 23.

[12] T.E. Dahl and C.E. Johnson, *Status and Trends in the Conterminous United States, Mid 1970's to Mid-1980's*, U.S. Department of Interior, Fish and Wildlife Service, 1991, p. 2.

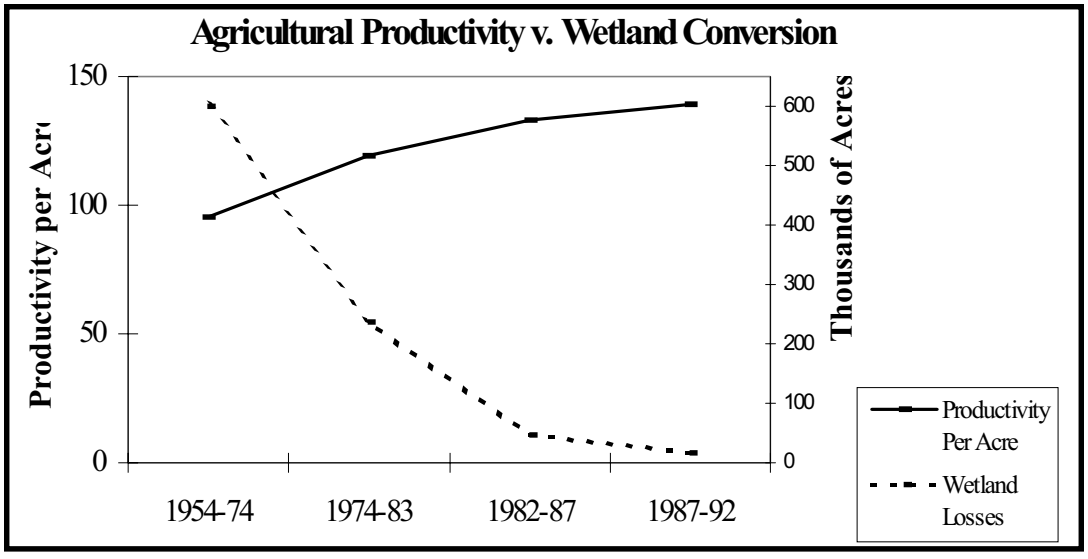
primary reason wetland losses have been slowing is due to decreased agricultural conversion. The most likely reason behind the decline in agricultural loss rates appears to be increasing agricultural productivity.



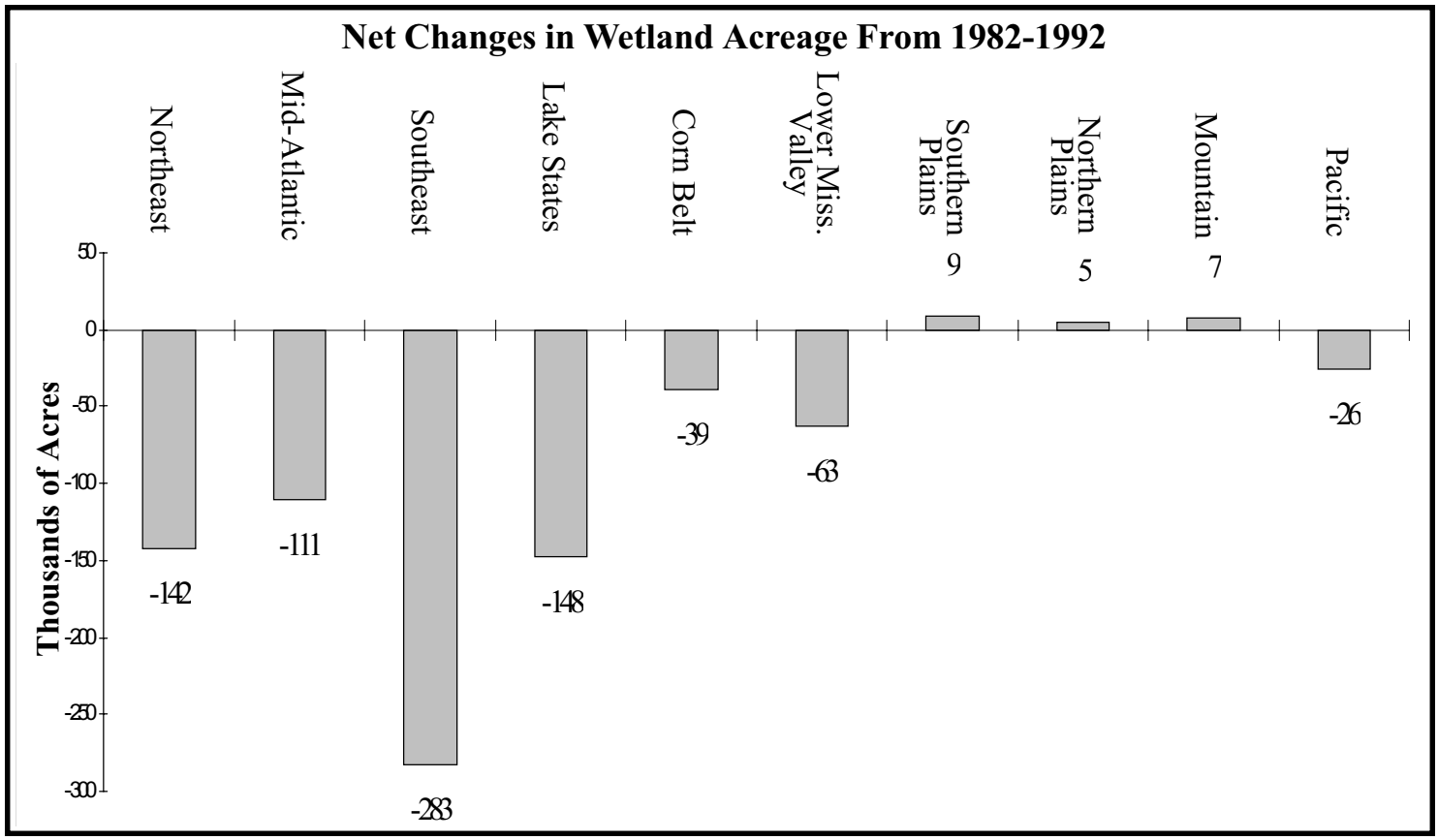
It appears that the primary reason wetland losses have been slowing is due to decreased agricultural conversion.

In the past, as a farmer's productivity on a particular parcel of land decreased, he would typically retire that land and plow under previously unfarmed land. But as new technologies increased the productivity per acre of farmland, the need to plow new land diminished.

As demand for new cropland diminishes, the market value of farmland decreases. Because the value of farmland decreases, the relative cost of converting wetlands to cropland increases. For example, the cost of converting wetland to cropland is estimated at $700 an acre.[13] Since 1985, average farm real estate values have been below $700 an acre. This suggests that in



[13] Randall A. Kramer and Leonard Shabman, "The Effects of Agricultural and Tax Policy Reform on the Economic Return to Wetland Drainage in the Mississippi Delta Region," *Land Economics*, Vol. 69, No. 3 p. 255.



most places of the country, it may be more economical to purchase idle farmland rather than convert wetlands.

Changes in economic conditions between the mid-1970s and late 1980s have made most agricultural drainage unprofitable. Reduced prices for agricultural commodities and decreased land values have generally made wetland conversions undesirable. The additional marginal effect of swampbuster and income tax reform provisions over the last decade have further reduced wetland conversion profitability. These reforms, combined with reduced profitability due to market conditions, made almost all agricultural conversions unprofitable in the late 1980s and early 1990s.

The 1992 NRI regional breakdown clearly shows the dichotomy between the largely agricultural regions and non-agricultural regions. Areas such as the Northern and Southern Plains actually experienced a net gain between 1982 and 1992, while non-agricultural regions such as the North and Southeast experienced substantial losses.

"No net loss" became an environmental buzz word in the Bush Administration.

ACHIEVING "NO NET LOSS" — THREE SCENARIOS

In his 1989 State of the Union speech, President George Bush pledged that his administration would attempt to achieve "no net loss" of wetlands. The phrase "no net loss" became an environmental buzzword in the Bush Administration. In August 1993, when President Clinton announced his

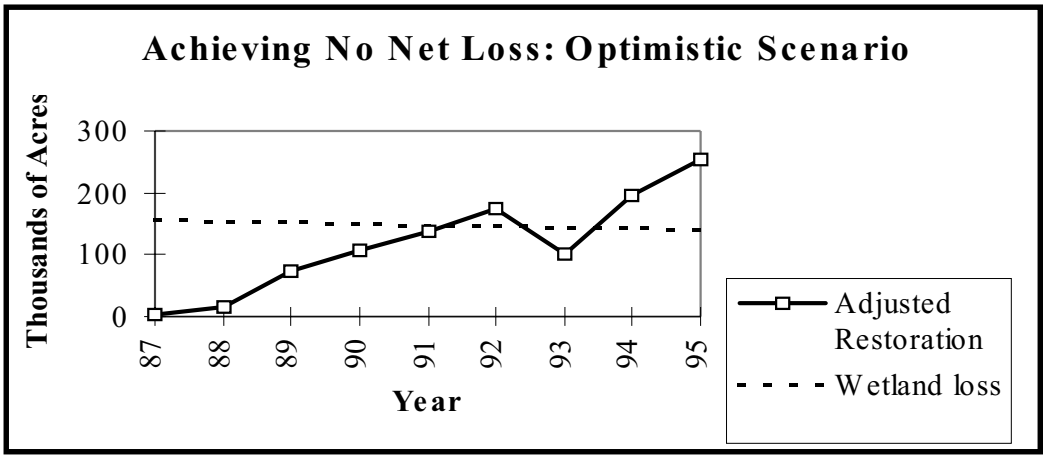
comprehensive wetlands plan, he too committed his administration to the goal of achieving "no net loss" of wetlands.

Given the current level of wetland restoration and the slow-down in wetland conversion, there is little doubt that the nation as a whole has achieved the goal of "no net loss" of wetlands. Depending on which assumptions are used, cases can be made for the fact that the U.S. is barely achieving no net loss or is greatly exceeding it.

There is little doubt that the nation as a whole has achieved the goal of "no net loss" of wetlands.

Optimistic Scenario

Under the most optimistic scenario, it is assumed that all of the acreage reported under the Partners for Wildlife Program, the Wetland Reserve Program, the North American Waterfowl Management Plan and mitigation under the 404 program are restored wetlands. Under this scenario, it is assumed that agricultural losses have declined to 15,000 acres per year,[14] while development and other losses remain constant at 89,000 and 37,000 acres respectively. The four restoration programs totaled 254,000 acres in



1995. When that is compared with an estimated loss rate of 141,000 acres per year, an optimistic view would indicate that the U.S. gained 113,000 acres of wetlands in 1995.

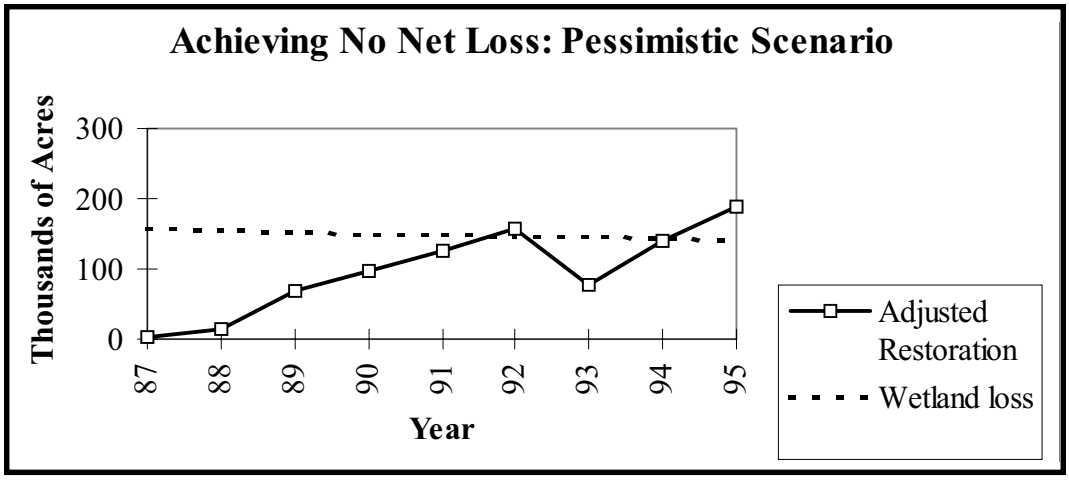
Pessimistic Scenario

Under this scenario it is assumed that the gross loss of wetlands remains unchanged from the 1982 to 1992 period at 156,000 acres per year. It is also assumed that of the four federal programs which result in the restoration of wetlands, only Partners for Wildlife Program, North American Waterfowl Management Plan and the Wetland Reserve Program result in effective wetland restoration and only at 90 percent of the reported rate. (In

[14] Ralph Heimlich and Jeanne Melanson, "Wetlands Lost, Wetlands Gained," *National Wetlands Newsletter,* Environmental Law Institute, Vol. 17, No. 3, p. 24.

other words, this scenario assumes that wetland restoration is inflated by approximately ten percent of the actual figures.)[15] This scenario assumes that no 404 mitigation results in wetland restoration. There has been extensive debate over the effectiveness of mitigation under section 404. In one study conducted in Florida, only 16 percent of the freshwater wetland mitigation projects were successful.[16]

Given these pessimistic assumptions, wetland restorations for 1995 are estimated at 187,000 acres. Compared with wetland losses of 156,000 acres per year, this results in an estimated net gain of 31,000 acres of wetlands.



Probable Scenario

Under this scenario, it is assumed that agricultural losses have declined to 15,000 acres per year,[17] while development and other losses remain constant at 89,000 and 37,000 acres respectively. As in the pessimistic scenario, it is assumed that wetland restoration under the Partners For Wildlife, North American Waterfowl Management Plan and Wetland Reserve programs have been inflated by approximately ten percent. However, in contrast to the pessimistic scenario, it is assumed that half of the wetland mitigation acreage from the 404 program results in restored wetlands. Of the several studies which have been done on the success of wetland mitigation, most have found that approximately half of the mitigation has failed.[18]

These scenarios do not account for some significant wetland restoration efforts.

[15] Personal conversation with Don Butz, USDA Natural Resource Conservation Service, August 1994. According to Butz, in the first sign-up period, 1,300 acres enrolled in the Wetland Reserve Program remained as buffer uplands. Of 50,000 acres enrolled this is approximately three percent. Butz expected the amount of buffer to increase in future sign-ups, but he did not believe that it would exceed seven percent.

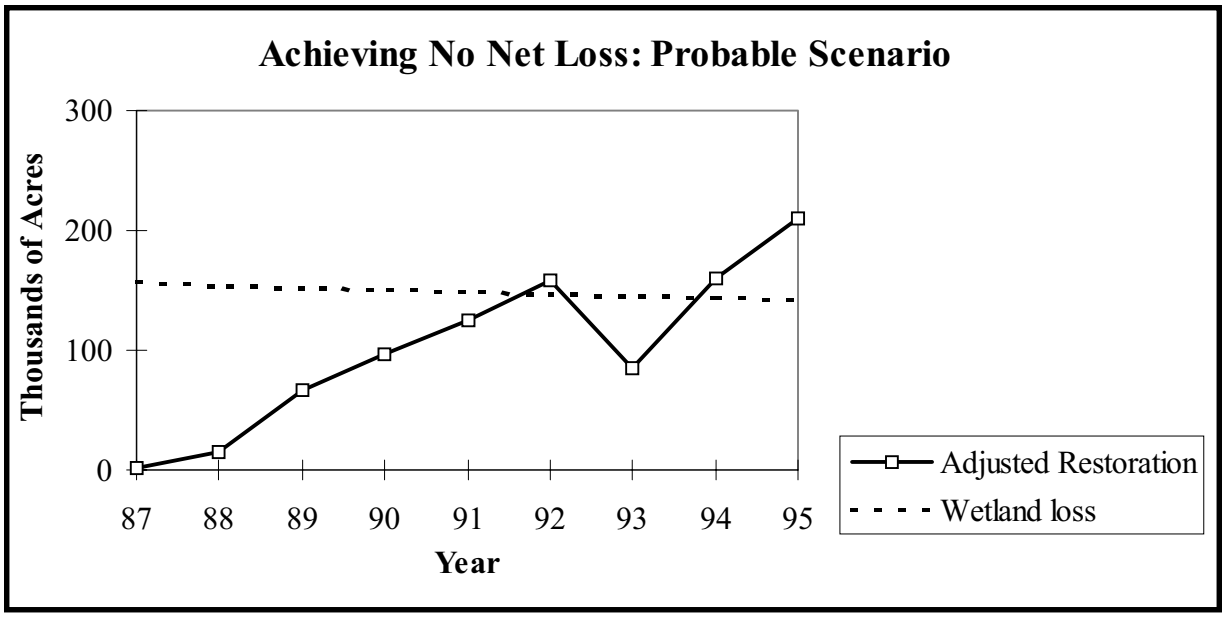
[16] Ann Redmond, "How Successful Is Mitigation?," *National Wetlands Newsletter*, Environmental Law Institute, January/February 1992, p. 5.

[17] Ralph Heimlich and Jeanne Melanson, "Wetlands Lost, Wetlands Gained," *National Wetlands Newsletter,* Environmental Law Institute, Vol. 17, No. 3, p. 24.

[18] Dennis King and Curtis Bohlen, "Estimating the Costs of Restoration," *National*

Although this is certainly not an encouraging figure, it does suggest that many 404 mitigation projects are successful. Consequently it would be reasonable to include 404 mitigation acreage, albeit at a highly discounted rate.

Given these more likely assumptions, wetland restorations for 1995 are estimated at 210,000 acres. Compared with wetland losses of 141,000 acres per year, this results in an estimated net gain of 69,000 acres of wetlands.



Even the optimistic scenario may be under estimating the true rate of wetland restoration in the country.

These scenarios are necessarily limited in their scope and do not account for some significant wetland restoration efforts. First, they do not include wetland restoration programs targeted at Federal land such as the National Wildlife Refuges. Second, they do not take into consideration wetland restoration done with private funds in private programs. Groups such as Ducks Unlimited and Chesapeake Wildlife Heritage are routinely restoring wetlands outside of the scope of the federal programs analyzed here. Finally, they do not consider one-time wetland restoration projects such as the Emergency Wetland Reserve Program. Consequently, even the optimistic scenario may be underestimating the true rate of wetland restoration in the country.

THE EFFICACY OF THE 404 PROGRAM

The data is fairly clear that nationwide the U.S. has achieved the publicly stated goal of "no net loss" of wetlands. In addition, this goal was achieved largely through voluntary, incentive-based restoration programs, and not through the federal land use regulations imposed by the U.S. Army Corps of Engineers under section 404 of the Clean Water Act. Working with landowners has been better for the environment than working against them.

In addressing the second issue, one of the largest questions is to what extent the 404 program has reduced wetland losses. According to one environmentalist:

> "After a promising start, Section 404 has mutated into a fast track for wetland wreckers and a hoax on the American public. It is a hoax perpetrated and perpetuated by a wasteful bloated bureaucracy that is efficient only at finding ways to shirk its obligations and that when beaten upon by developers, spews wetland destruction permits as if it were a piñata."[19]

This is not what one would consider a ringing endorsement of the effectiveness of the 404 program. And in truth, there is little evidence to suggest that the 404 program has had any measurable effect on the reduction of wetland losses. The data suggests that the U.S. would still be experiencing "no net loss" of wetlands even if the 404 program disappeared. In fact, if the funds used to run the Corps of Engineers regulatory program were diverted to voluntary incentive programs, the rate of gain would likely be even greater.

"No net loss" of wetlands was achieved largely through voluntary, incentive-based restoration programs.

As previously discussed, virtually all of the reduction in wetland losses have come in the agricultural sector. Conversion of wetlands to agricultural uses has declined from an astronomical 600,000 acres a year in the mid 1960s to an estimated 15,000 acres per year today. In contrast, wetland losses due to urban development and other causes actually increased from 55,000 acres per year to an estimated 89,000 acres per year.

This distinction is critical. If the 404 program were effective at reducing wetland losses, one would expect to see declines in the sectors that are most effected by 404. One study of the 404 program found that only eight percent of applications for a 404 permit were for agricultural projects, while the remaining 92 percent were for development projects, largely residential and commercial.[20] Clearly the 404 program has not targeted agricultural conversion over development in the permitting process.

The decline of agricultural conversion of wetlands is a long-term trend that predates the 404 program and is clearly tied to the economics of agricultural land use and the relative cost of wetland conversion. Given technological advances in modern agriculture, and declines in the subsidization for draining wetlands, wetland conversions for agriculture have slowly become less and less economical. Today, in most regions of the country it is simply more economical to buy or lease already idle farm land than it is to convert wetlands into cropland. The existence of the 404 program cannot explain the decline of wetland losses in the agriculture sector.

If the 404 program was effective at deterring wetland losses, its effects should be most profound in the development sector. By their very nature

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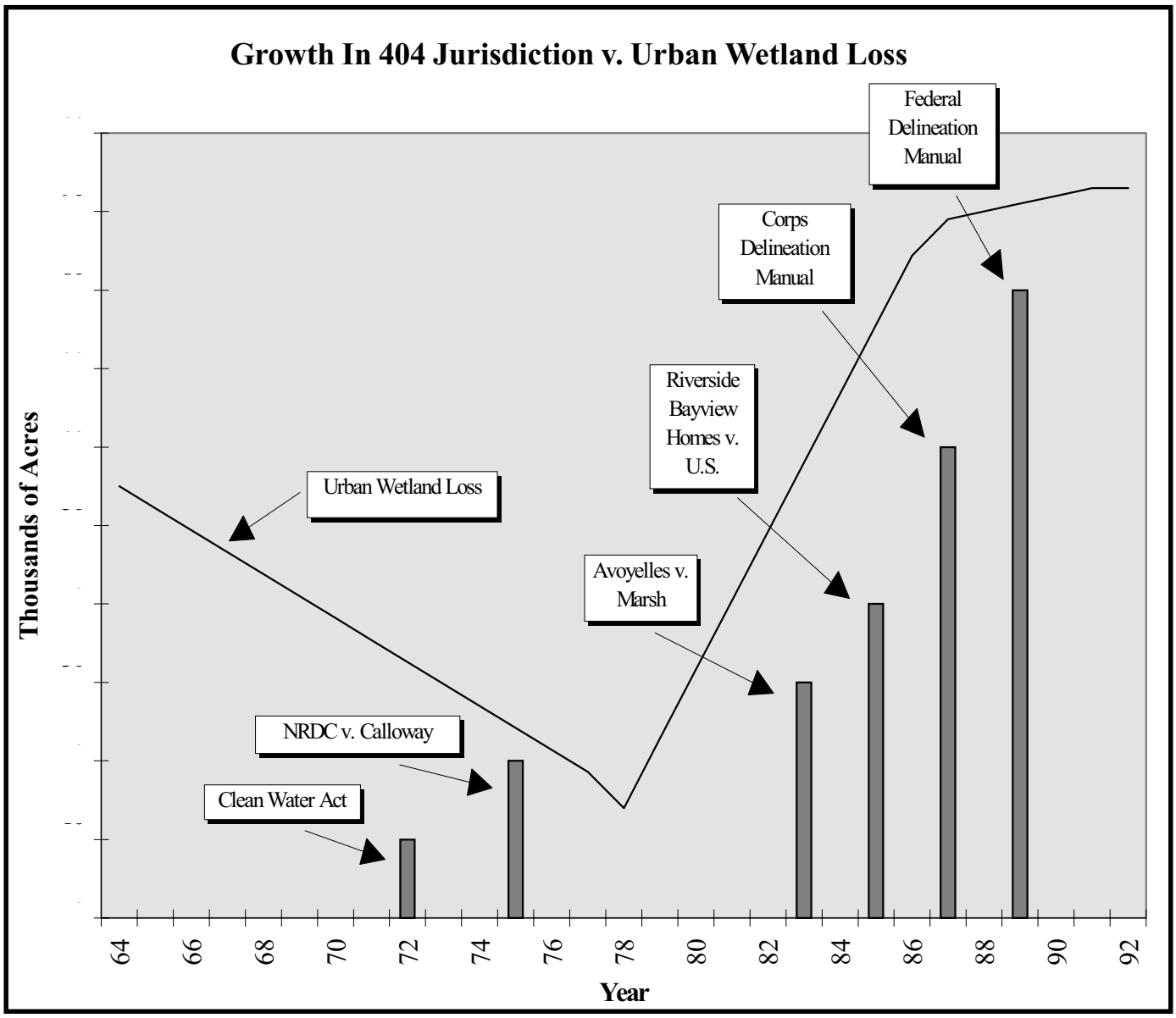
Wetlands Newsletter, Environmental Law Institute, May/June 1994, p. 3.

[19] Ted Williams, "The Wetlands Protection Farce," *Audubon,* March-April 1995, p. 30.

construction and development are far easier to regulate with a permitting program than is agriculture. Rarely are farmers subjected to the kinds of local permits to which housing, commercial or industrial construction are routinely subjected. Since these industries must already apply for local permits, piggybacking federal permits would be easier when compared with the agriculture sector.



Despite this, there has been no evidence of the 404 program reducing wetland conversions due to development. Even more recently, data from the 1987 NRI suggest that conversion for developed uses was greater after 1987 than before. Authors of one study of the NRI data noted: "Nor does increased

wetland conversion seem consistent with a perceived tightening of wetland regulation under section 404 and in state programs since 1987."[21] In other words, even though the 404 program has greatly expanded its jurisdiction and enforcement since 1987, there has been an *increase* in wetland losses due to development, particularly in urban areas. On a nationwide basis, the 404 program has not been effective at deterring wetland loss.

There has been no evidence of the 404 program reducing wetland conversions due to development.

Although the available evidence suggests the 404 program has little, if any deterrent effect, it does result in the protection of select individual wetlands and also in the creation or restoration of wetlands due to required mitigation. However, these marginal benefits may not be worth Section 404's costs, particularly if one includes the regulatory burdens placed upon private landowners and the escalating legal and political conflicts over federal land use control.

COST-EFFECTIVENESS OF FEDERAL PROGRAMS

While the 404 program appears to do little to deter wetland losses in the nation as a whole, it does result in the restoration of wetlands when developers are required to mitigate for the loss of wetlands. Intuitively, one would assume that a federal program that required developers to restore wetlands would be less expensive for the government than directly paying for wetland restoration. However, this assumption appears to be incorrect.

Wetland Reserve Program

In June 1992, the first enrollment for the Wetland Reserve Program began in nine pilot states: California, Iowa, Louisiana, Minnesota, Mississippi, Missouri, New York, North Carolina and Wisconsin. A total of 2,337 farmers agreed to participate in the program representing a total of 462,078 acres. Of these, 49,888 acres were enrolled for a total federal cost of $46,000. Per acre costs of the program averaged $923 per acre. The majority of this cost, $742, went to easement purchase. Average restoration cost $181 per acre, including technical assistance and settlement fees.[22]

Even though the 404 program has greatly expanded its jurisdiction and enforcement since 1987, there has been an increase *in wetland losses due to development.*

The Wetland Reserve Program was not funded in 1993, but in 1994 funding was restored to $66.7 million. Approximately 75,000 acres were enrolled from the nine pilot states as well as Arkansas, Illinois, Indiana, Kansas, Nebraska, Oregon, South Dakota, Tennessee, Texas, Virginia and Washington. The cost of enrollment in WRP for 1994 dropped to $889 per acre.[23]

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[20] Virginia S. Albrecht and Bernard N. Goode, *Wetland Regulation In The Real World*, (Washington DC: Beveridge and Diamond, February 1994).
[21] Ralph Heimlich and Jeanne Melanson, "Wetlands Lost, Wetlands Gained," *National Wetlands Newsletter,* Environmental Law Institute, Vol. 17, No. 3, p. 25.
[22] Keith Wiebe, Abebayehu Tegene, and Betsey Kuhn, *Partial Interests in Land, Policy Tools for Resource Use and Conservation*, U.S. Department of Agriculture

These marginal benefits may not be worth Section 404's costs.

For 1995 the WRP received $93.2 million, which it is estimated will restore 118,000 acres at a cost of $790 per acre.[24] Over the four years the WRP has been operating, the majority of the costs associated with enrollment under the Wetland Reserve Program are incurred in the purchasing of easements for the land. The average easement cost under the Wetland Reserve Program is $600 per acre. Consequently, the actual costs of restoring the idle farm land to its original wetland status is less than $200 per acre.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan (NAWMP) is one of the longest running federal programs designed to protect, restore and enhance the nation's wetlands. During the decade that the NAWMP has been funded by the federal government, the program has restored, enhanced and protected more than two million acres of wetlands.

The NAWMP takes advantage of the fact that many individuals and organizations place economic and social value on the presence of high quality wetlands, particularly those that are habitat for waterfowl, especially migratory waterfowl. Groups like Ducks Unlimited and local duck and hunting clubs historically have placed significant value on wetlands as habitat for wildlife.

The average easement cost under the Wetland Reserve Program is $600 per acre.

Under the NAWMP, the federal government offers grants and matching funds to local and regional groups to purchase conservation easements on privately owned wetlands, restore areas that were historically wetlands but have been drained and to enhance existing wetlands. In 1995 the NAWMP protected 69,988 acres of wetlands, restored 41,775 acres, and enhanced 111,763 acres. The total budget for 1995 was $56 million, but because of the public-private nature of the NAWMP, the federal contribution for 1995 was only $44 million.[25]

Like the Wetland Reserve Program, much of the costs associated with the NAWMP involve the purchase of conservation easements, typically permanent easements. The costs of these easements vary greatly from region to region. Easements in the prairie pothole region, eastern Montana, and North and South Dakota, are relatively inexpensive, approximately $109 per acre, compared with easements in California's Central Valley which can exceed $1,700 per acre.[26] Nationwide, the average cost of purchasing conservation easements under the NAWMP is estimated at $640 per acre.

Economic Research Service , AER No. 744, November 1996, p. 21.

[23] Ibid.

[24] Ibid.

[25] North American Waterfowl and Wetlands Office, "North American Joint Venture Progress Reports," U.S. Fish and Wildlife Service, November 1996, <http://www.fws.gov/~r9nawwo/jvdir.html>.

[26] Personal interview with Harvey Whitemire, U.S. Fish and Wildlife Service, Denver, Colorado; Dec. 16, 1996; personal interview with Charles Baxter, U.S. Fish and

Like the cost of easements, the cost of restoration also varies from region to region, although not as dramatically. Restoration costs in the prairie pothole region are typically less than $100 per acre, restoration in the Central Valley costs on average $250 per acre, and restoration in the Lower Mississippi runs $150 per acre. The estimated average cost for wetland restoration nationwide under the NAWMP is $133 per acre.[27]

404 Program

Determining the cost effectiveness of the 404 program is somewhat different than determining that of acquisition and restoration based programs such as NAWMP and WRP. Under the 404 program, funds are not allocated to each specific project. Rather, the Corps of Engineers is given one lump sum each year to administer the entire regulatory program which includes not only regulations regarding wetlands, but also permits involving truly navigable waters.

The government's cost of protecting and restoring wetlands under the 404 program is approximately $3,980 per acre.

The budgetary appropriation for fiscal year 1995 for the Corps' entire regulatory program was $101 million. The vast majority of the Army Corps of Engineers' regulatory program involves two kinds of permits, Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.[28] According to regulatory program statistics compiled by the Corps, approximately 77 percent of the administrative workload is consumed by section 404 permits.[29] The administrative cost to the federal government of running the wetlands portion of the regulatory program is therefore estimated at $78 million.

In 1995, the Corps granted permits for the conversion of 26,300 acres of wetlands to other uses. In granting the permits, the Corps required 45,900 acres of mitigation. Of the permits it processed in 1995, the Corps denied only a very small fraction — 0.5 percent. The small number of permits that the Corps actually denies, combined with the fact that the Corps only reviews a small fraction of the wetlands that are lost every year, tend to confirm the notion that the 404 program has little or no deterrent effect on wetland losses. Consequently, the Corps' regulatory program can only claim, at a maximum, to be restoring and protecting the acreage mitigated minus the acreage permitted, approximately 19,600 acres. This acreage figure attributable to the Corps assumes that 100 percent of the mitigation acreage is restored wetlands and that 100 percent of the restorations are successful. Given these assump-

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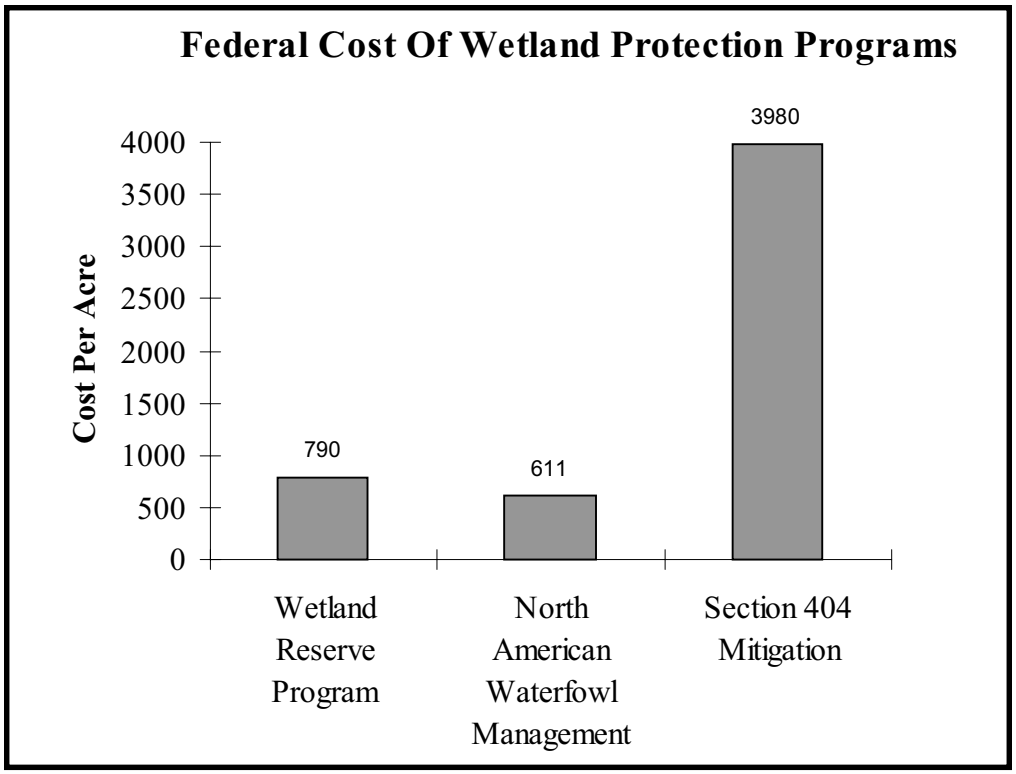
Wildlife Service, Vicksburg, Mississippi; Dec. 16, 1996, personal interview with Dave Paullin, U.S. Fish and Wildlife Service, Sacramento, California; Dec. 16, 1996.

[27] North American Waterfowl and Wetlands Office, "North American Joint Venture Progress Reports," U.S. Fish and Wildlife Service, November 1996, <http://www.fws.gov/~r9nawwo/jvdir.html>.

[28] Note: the Corps also administers and regulates Section 103 permits of the Marine Protection, Research, and Sanctuaries Act of 1972. However, in 1995 there were only 28 permits processed as compared to 15,000 section 10 and section 404 permits.



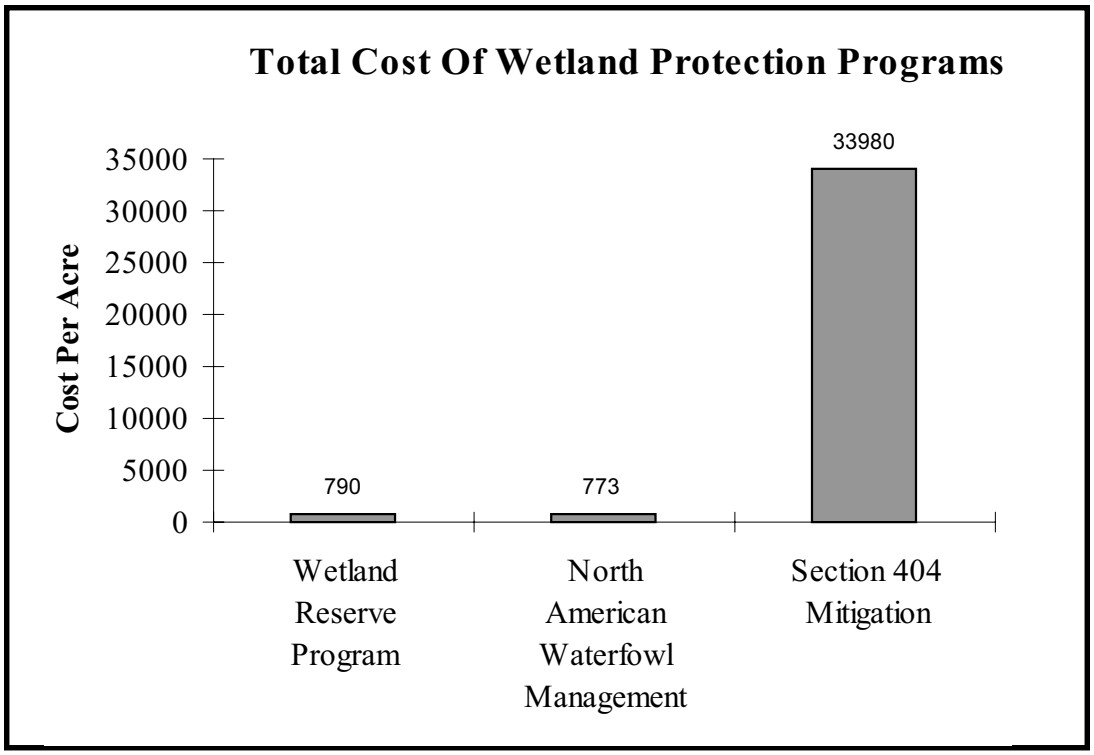
tions, the government's cost of protecting and restoring wetlands under the 404 program is approximately $3,980 per acre.

While the government's costs are only $3,980 per acre, the actual costs associated with mitigation are considerably higher.

Most of the studies conducted on mitigation required under the 404 program suggest that 100 percent replacement of wetland acreage does not occur. As discussed earlier, even 50 percent replacement is highly optimistic given the percent of mitigation that is restoration or creation of wetlands and also given the success rate of those restoration or creation projects. Unfortunately, even at an optimistic 50 percent replacement rate, the 404 program does not result in a net increase in the acreage of wetlands.

Under the 404 program, the permit seekers are typically required to pay for the costs of the mitigation. While the government's costs are only $3,980 per acre, the actual costs associated with mitigation are considerably higher. One analysis of the cost of 90 different mitigation projects estimated the average cost per acre at $30,000.[30] Therefore the total cost of the 404 program would actually be $33,980 per acre (see chart page 17).

[29] U.S. Army Corps of Engineers, "1995 Regulatory Quarterly Report," Office of the Chief, Headquarters Washington D.C., received from C. Robertson, Dec 5, 1996.



NON-QUANTIFIED COSTS OF WETLAND PROTECTION PROGRAMS

In addition to the direct costs that have been analyzed for the various programs, there are additional non-quantified costs of the 404 program which should also be taken into account. Chief among these are the sociopolitical costs of a burdensome and bureaucratic permitting program. The processing of permits is often a time-consuming and labor-intensive process. In some cases the processing of an individual permit can take years, only to have the permit ultimately denied. Costs to the federal government can be substantial when compared to other low cost voluntary programs. The costs to the landowner can often be staggering. There is little data available that could quantify these costs, but one recent case provides an excellent example.

In some cases the processing of an individual permit can take years.

In 1964, Mr. Gaston Roberge purchased a 2.8 acre commercial lot in Old Orchard Beach, Maine. Over a decade later, Roberge allowed local officials to dump excess fill on his lot. In 1986, when Roberge had retired and went to sell his land, the U.S. Army Corps of Engineers announced that the lot was an illegally filled wetland. The prospective buyer withdrew his offer, and the Corps required that Roberge apply for an after-the-fact permit. Three years later the Corps denied the permit. At this point, Roberge solicited the help of the Fairness to Landowners Committee, a Maryland-based property rights group.

As it turns out, the Corps had never adequately surveyed Roberge's property, and it was determined that the area was not actually a wetland. The Corps subsequently dropped its demand for a permit. This entire episode had taken six years, cost Roberge tens-of-thousands of dollars in consulting and

legal fees, not to mention the lost opportunity cost of a buyer for the property. In 1992, Roberge filed suit alleging a temporary taking of his property. In an internal memo uncovered during the course of the legal fight, a Corps employee wrote, "Roberge would be a good one to squash and set an example – Old Orchard is heating up these days." According to an internal Corps investigation of the incident, the comment reflects a response to a boom in land development at the time. Ultimately, the Corps of Engineers settled the case, paying Roberge $338,000.

The Roberge case highlights the problems with the 404 program. The government paid $338,000 in order to save zero *acres of wetlands.*

The Roberge case highlights the problems with the 404 program. In the first instance, the 404 program was being used to slow or deter development, not save wetlands. More importantly, the costs of engaging in such regulatory behavior are expensive and largely ineffectual. The final result of the incident was one in which the government paid $338,000, on top of all the resources it had already devoted to the Roberge case, in order to save *zero* acres of wetlands. The wasted resources are staggering. If the 404 program had never existed and the federal government had placed that $338,000 in the North American Waterfowl Management Plan, it would have restored an estimated 500 acres of wetlands – and this case is not alone.

The Roberge case is one of several that resulted in the payment for the taking of private property. Other cases have resulted in similar, if not larger, compensation awards. In *Beure-Co. v. U.S.*, the government paid $425,000 in compensation for 13 acres of wetlands. In *Florida Rock Industries v. U.S.,* the government paid $1,029,000 in compensation for 98 acres of wetlands. In *Formanek v. U.S.*, the government paid $933,921 in compensation for 11 acres of wetlands.[31]

WHY 404 FAILS

The vast majority, approximately 80 percent, of wetlands occur on private land.

There are two fundamental reasons why the 404 program fails to protect wetlands. First, the geographical nature of wetlands hinders the 404 program. Because wetlands are spread throughout the landscape, they are inherently difficult to regulate, especially by a centralized regulatory bureaucracy. The Corps of Engineers regulatory division contains 1,150 full-time equivalent employees. If Alaska is excluded, this means that every Corps employee would be responsible for regulating 90,000 acres of wetlands spread out over approximately 1.7 million acres. This would essentially be equivalent to each employee regulating an area the size of the entire state of Delaware. This would be difficult enough if the Federal government owned all the land. In the real world, however, the vast majority, approximately 80 percent, of wetlands occur on private land. This makes their regulation even more difficult, especially if a significant number of landowners are uncooperative or feel threatened by the federal governments regulatory program.

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[30] Dennis King and Curtis Bohlen, "Estimating the Costs of Restoration," *National Wetlands Newsletter*, Environmental Law Institute, May/June 1994, p 5.

Second, the transitional nature of wetlands creates an enormous barrier to regulation. Unlike open water, which is easily identified and delineated, the exact boundaries between uplands and wetlands are often difficult to distinguish.

In an effort to create a modicum of regulatory certainty in the identification of wetlands, the Corps developed a manual for the identification and delineation of wetlands in 1987. Including the appendix, the manual is a 150-page technical and scientific document, and it typically requires intensive training to use properly. In order to conduct a wetland delineation, a property owner would have to obtain a copy of the manual, a copy of the *National List of Plant Species That Occur in Wetlands*, and a copy of the National Technical Committee for Hydric Soils *Criteria for Hydric Soils*. The owner would then be required to identify the dominant plant species on his property, know their scientific names, and determine, according to the national list, whether or not the vegetation on the property is hydrophytic (literally, water loving). The owner would also have to identify the soil and determine according to certain criteria whether it is hydric and was formed under wetland conditions.

Unless the regulator has access to extremely detailed records about the vegetation and hydrology that existed on a site prior to conversion, proving wetland destruction is virtually impossible.

In reality, a majority of the public is only vaguely aware that the 404 program even exists and has little idea which agency actually implements the program. It is highly unlikely that most people are aware of the *1987 Corps Delineation Manual*, or *Criteria For Hydric Soils*, or the *National List of Plant Species* that occur in wetlands. Identifying native plant species by their scientific name is a highly technical skill that the average person rarely possesses. The identification of soil types is generally considered even more arcane.

Also because of their transitional nature, once a wetland has been converted to some other use, whether a parking lot, a strip mall, or a corn field, it is often extremely difficult to prove that a wetland was destroyed. Unless the regulator has access to extremely detailed records about the vegetation and hydrology that existed on a site prior to conversion, proving wetland destruction is virtually impossible. For the vast majority of land in this country reliable information of that type simply does not exist. If it does exist, it is usually in the possession of the land owner, not the regulator.

Given the geographical scope of wetlands, the resources of the Corps, and the transitional nature of wetlands, the risk of being prosecuted for developing wetlands is extremely small. This is easily demonstrable by comparing annual wetland losses with the Corps' own regulatory statistics. Current annual losses of wetlands are estimated at 141,000 acre per year. In 1995, the Corps of Engineers processed 26,000 acres worth of wetland permits. There is no record of the 115,000 acres that were likely lost that year. This means that approximately 80 percent of the wetlands lost in the country are completely unaccounted for under the 404 program.

In addition to the 404 program's failure to deter wetland losses nationwide, the program has also be comparatively ineffective in mitigation as well, as noted earlier. This should not be surprising, given the incentive structure of the program. Under the 404 program, the incentive on the part of the landowner is to obtain the permit. In most cases, the permit is obtained prior to the initiation of the mitigation. Consequently, so long as the permitee makes at least some mitigation effort, it is unlikely, even if the mitigation is unsuccessful, that the Corps will take the extraordinary measure of withdrawing the permit. Given this incentive structure, it is highly probable that 404 mitigation will always be significantly less effective than other positive incentive restoration programs, such as Wetlands Reserve or the North American Waterfowl Management Plan. In these programs, the incentive is to create habitat, and more care is taken to ensure the ecological value of a restored wetland.

A NOTE ON NATIONWIDE 26

Approximately 80 percent of the wetlands lost in the country are completely unaccounted for under the 404 program.

When the Corps was required to assume jurisdiction over wetlands in the mid-1970s, Corps officials realized that they did not have, nor were ever likely to have, the resources to regulate activities in all wetlands. Consequently the Corps created a system of nationwide permits covering certain activities. One of the more controversial of these nationwide permits is known as Nationwide 26. Nationwide 26 is a blanket permit for activities in isolated wetlands. Anyone seeking to fill isolated wetlands could qualify for a Nationwide 26 permit, if the wetland impacts were below a certain threshold.

In 1984, the Corps established two thresholds for Nationwide 26. If a project resulted in the loss of less than one acre of isolated wetlands, the project qualified for a Nationwide 26 permit automatically and the applicant did not even need to inform the Corps about the activity. If the project affected more than one acre, but less than ten acres, the applicant was required to notify the Corps in a letter explaining the project and its wetland impacts. If the Corps did not respond within 30 days, the permit was deemed granted.

Advocates of wetland regulation have long argued that Nationwide 26 was a loophole in the program that allowed a large amount of wetland acreage to be developed without scrutiny. Further, they would argue, the 404 program would be more effective at stopping wetland losses if Nationwide 26 were eliminated. Bowing to pressure from such advocates, the Corps recently changed the thresholds for Nationwide 26 from one and ten acres respectively to one-third and three acres. After two years, the Corps will abolish Nationwide 26 completely.

These changes, however, are unlikely to reduce wetlands losses substantially. First, the general public is probably as aware of Nationwide 26 as it is of the *National List of Plant Species That Occur In Wetlands*. A public never aware that it did qualify for a Nationwide 26 permit is unlikely to suddenly realize that it no longer qualifies.

Also, the Corps denies only a small percentage of the 404 permits that it actually processes. Forcing applicants who previously developed wetlands under Nationwide 26 into the individual permit program will increase costs and delay projects. But the actual denial rate of individual permits is approximately 0.5 percent. So for those who have the resources to wait it out, the chances of obtaining a permit are extremely high.

The elimination of Nationwide 26 will create a huge workload burden on the Corps that ultimately will make the program even less effective.

Finally, the elimination of Nationwide 26 will create a huge workload burden on the Corps that ultimately will make the program even less effective. The Corps readily acknowledges this fact in the final rule published in the federal register. "An IP [individual permit] workload increase of this magnitude would render the program ineffective and would be a disservice to the American public and overall environmental protection."[32] Doubling or quadrupling the workload of the Corps without a commensurate increase in resources simply makes a mockery of an already ineffectual regulatory effort.

A NOTE ON THE VALUE OF WETLANDS

Wetland protection efforts, whether public or private, whether regulatory or voluntary, should be concerned with the quality of wetlands, not just their quantity. The fundamental importance of wetlands to society is not their wetness. Rather, it is the functions they provide. It is their ecological value that should be maintained. In some cases, it may be possible to maintain some of the functions and values without maintaining wetness. For example, flood control is often considered a wetland function, but many types of geological features can serve as flood control, and not all of these are wetlands.

Some of the federal programs already have this focus. The North American Waterfowl Management Plan, for example, is focused specifically on restoring wetlands to provide habitat for wildlife, a widely recognized value. In order to realize that goal, more than 400,000 acres wetlands have been restored, 1.8 million have been enhanced and 1.3 million have been preserved in the United States. Clearly this program is not aimed simply at restoring acres of wetlands, but restoring their functions and values.

Wetland protection efforts should be concerned with the quality of wetland, not just their quantity.

Programs like the North American Plan, as well as efforts by groups like Ducks Unlimited, have contributed to the third consecutive record-high duck population. The fact that the U.S. has experienced three years of record-high duck populations suggests not only that the U.S. is gaining acres of wetlands, but that the functions and value of those wetlands are also increasing.

CONCLUSION

[31] Courtney Lafountain, *Saving Wetlands Without Soaking Landowners*, Center for the Study of American Business, Policy Brief #164, January 1996, p. 19.

[32] Department of Defense, Department of the Army, "Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits," *61 Federal Register 65874*, December 13, 1996.

There is no logical public policy reason for the federal government to continue to fund the Army Corps of Engineers' wetlands program.

Analysis of wetland restoration programs clearly shows that wetland restoration is exceeding current wetland losses. In other words, the nation as a whole is achieving no net loss of wetlands. Futhermore, some regions of the country have been achieving no net loss for nearly a decade.

There is little evidence to support the claim that the Corps of Engineers' wetlands regulatory program significantly deters urban development of wetlands. Nor do the data suggest that the 404 program has had any measurable nationwide effect on the reduction of wetland losses. Because of its regulatory nature, the 404 program is a costly restoration program, with documented low success rates.

The non-quantifiable costs of the 404 program are equally, if not more egregious, than the quantified costs. In many cases, the 404 program delays permits, requires applicants to spend extraordinary sums on consulting and legal fees and can effectively take their property rights. When faced with the fact that the nation as a whole is no longer losing wetlands, continued support of such a program is entirely unwarranted.

Given the failure of the 404 program, there is no logical public policy reason for the federal government to continue to fund the Army Corps of Engineers' wetlands program. Reallocating funds from the Corps' regulatory program to non-regulatory programs such as the North American Waterfowl Management Plan or the Wetlands Reserve Program would likely result in an increase in both wetland acreage, as well as wetland function and value.

Although far from perfect, incentive-based programs, such as the North American Waterfowl Management Plan and the Wetland Reserve Program appear to be far more cost effective and equitable means of protecting and restoring America's wetlands.

ABOUT THE AUTHOR

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Prior to working with CEI, he was Associate Producer of the weekly television show "TechnoPolitics." In 1991, Jonathan served as Special Assistant for the President's Council on Competitiveness, focusing on environmental and natural resource regulation. In 1992, he worked for the White House as an environmental analyst in the Office of Policy Development. Prior to coming to Washington, D.C., Jonathan worked as an Environmental and Chemical Analyst for Kennecott Copper Corp. in Salt Lake City. He received his B.S. in political science from the University of Utah.