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DUCKS UNLIMITED

April 16, 2003

Water Docket
Environmental Protection Agency
Mailcode 4101T
1200 Pennsylvania Ave., NW
Washington, DC 20460
Attention: Docket ID No.OW-2002-0050

Dear Sir:

Ducks Unlimited, Inc. (DU) is a membership-based waterfowl and wetland habitat conservation organization with over one million members, supporters, and volunteers. The mission of DU is to conserve, restore, and manage wetlands and associated habitats for North America's waterfowl, and for the benefits these resources provide other wildlife and the people who enjoy and value them. Almost all the conservation work that DU has accomplished over our 66-year history, nearly 11 million acres on the North American continent, has been achieved by working in cooperative partnerships with private landowners, other non-governmental organizations, and state and federal agencies.

Ducks Unlimited's Perspective and Comment Objectives:

Ducks Unlimited is providing these comments to the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers in regard to the January 15, 2003 *"Advance Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of 'Waters of the United States,'"* (ANPRM; FR Doc. 03-960). Conservation of wetland resources is clearly central to the mission of Ducks Unlimited. Our membership cares passionately about these wetlands, and they are keenly aware of the dependence of waterfowl and other associated wildlife on the conservation of wetlands and associated water resources. DU is very concerned about the potential impacts of any change in the definition or interpretation of "waters of the United States" that could have the effect of lessening jurisdictional coverage of wetlands under the Clean Water Act (CWA). Any change in CWA jurisdiction that eliminates coverage of various waters and wetlands would negate many of the conservation benefits that our volunteers and members have worked so hard for over the last 66 years. Thus, we have a strong interest and stake in this issue.

Ducks Unlimited is a science-based organization. Every aspect of our on-the-ground habitat conservation activity is rooted in the fundamental principles of scientific disciplines such as wetland ecology, waterfowl biology, landscape ecology, and quantitative spatial analysis. DU scientists continually review our management practices to ensure that scarce dollars are used in the right places, and in the right ways, to provide the greatest level of conservation benefits. Our comments in response to the ANPRM are based on our extensive scientific knowledge of this subject area.

As requested in the ANPRM, we are providing "input on issues associated with the definition of 'waters of the United States'" to contribute to an assessment of "the implications of the SWANCC decision [U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County* v. *U.S. Army Corps of Engineers*, 531 U.S. 159 (2001)] for jurisdictional decisions under the CWA." The ANPRM states that "the goal of the agencies is to …further the public interest by clarifying what waters are subject to CWA jurisdiction and affording full protection to these waters …." Consistent with that language, DU's objective is to help promote an understanding and recognition of the fact that while many wetlands may have the appearance of being "geographically isolated," the overwhelming majority are in fact not *hydrologically or functionally* isolated. Thus, there exists a hydrologic linkage that, consistent with the stated purpose and intent of the CWA and important subsequent case law, constitutes a "significant nexus" between these wetlands and other jurisdictional waters. In other words, most so-called "isolated" wetlands are, in fact, *functionally* adjacent to navigable waters.

Ducks Unlimited has more direct experience with Section 404 of the CWA than with other sections of the Act (e.g., Section 311 spill program and Oil Pollution Act, and Section 402 National Pollution Discharge Elimination System), and our comments relative to definition of "waters of the United States" therefore carry a 404 perspective. However, we expect that that the interpretation we advance herein could also be applied to other sections of the Act in which a definition of "waters of the United States" is necessary to determine CWA jurisdiction. Furthermore, we believe that a common definition and interpretation of "waters of the United States" consistently applied to all sections of the Act referencing that phrase would be beneficial to the agencies, the regulated community and the public interest.

Finally, on the fundamental question of whether the agencies should move forward with a new rulemaking, we do not believe that it is necessary to initiate a rulemaking to clarify the interpretation and definition of "waters of the United States" in light of SWANCC. Clarification of this definition can be achieved through the use of existing and accepted administrative procedures already available to the agencies. If any proposed rule were to be offered, it should only be offered if it strengthens protection of the Nation's water quality and wetlands. From those perspectives, the comments below are offered with the belief that they can be equally used to help guide administrative clarification of "waters of the United States," or to help strengthen protection of wetlands and water quality in a manner fully consistent with the CWA and judicial precedent in the event the agencies consider a rulemaking necessary.

<u>Brief Summary of Legislative and Legal Issues:</u>

In the SWANCC decision the Supreme Court acknowledged that “Congress passed the CWA for the stated purpose of “restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation’s waters” (U.S. Case No. 99-1178, para. 10). Their decision also reaffirmed federal jurisdiction over navigable waters, their tributaries, and wetlands adjacent to each for purposes of upholding the intent of Congress and the CWA to protect the integrity of the nation’s waters. Several critical issues embedded in the SWANCC decision are inherently and almost wholly of a legal nature. These issues relate to points of law involving federalism, the scope and use of the Commerce Clause, and treatment of Supreme Court precedence. While these are matters of significant import, they are primarily issues subject to legal debate and interpretation within the court system. DU is not commenting directly upon these points of law, but rather will focus our comments on providing information and science-based perspective related to the issues most directly tied to wetlands and water quality issues that can help inform the legal debate.

By invalidating one facet of the so-called Migratory Bird Rule as a sole basis for determining jurisdictional wetlands, the SWANCC decision had the effect of limiting federal jurisdiction relative to which waters and wetlands are subject to regulation under Section 404 of the CWA. However, while retaining navigable waters, their tributaries, adjacent wetlands, and wetlands which cross state lines within the definition of “waters of the United States,” their decision did not make clear the new jurisdictional limits.

Citing the Supreme Court’s earlier decision in *United States v. Riverside Bayview Homes* (474 U.S. 121, 1985) in their SWANCC decision, the majority stated that “we recognized that Congress intended the phrase ‘navigable waters’ to include ‘at least some waters that would not be deemed navigable’ under the classical understanding of that term” (*Id.*, at 133). They also re-stated their *Riverside Bayview* observation that “Congress’s concern for the protection of water quality and aquatic ecosystems indicated its intent to regulate wetlands ‘inseparably bound up with the ‘waters of the United States’’” (*Id.*, at 134). They go on to clarify in their SWANCC decision that “It was the significant nexus between the wetlands and ‘navigable waters’ that informed our reading of the CWA in *Riverside Bayview Homes*” (U.S. Case No. 99-1178, para. 12).

With these statements the Supreme Court seemed to clearly view the connection between wetlands and “navigable waters” as a critical determinant for exercising federal CWA jurisdiction over wetlands. Ultimately, however, their decision called into question the status of waters and wetlands that are non-navigable, geographically isolated, or intrastate, i.e., those lacking an apparent significant nexus to navigable waters. Therefore, to shed light on the question of waters and wetlands that are jurisdictional in view of SWANCC, the focus should be placed on the definitions of “tributary,” “adjacent,” and “significant nexus” as they relate to the interrelationships between geographically isolated wetlands and navigable waters.

Past court interpretations of what constitutes a tributary, at all levels, seem to overwhelmingly support a broad definition. Because of the obvious ability of any pollutant or fill material to flow downhill through a tributary watercourse, even intermittently, and ultimately degrade water quality of a downstream navigable water, courts have consistently recognized the functional connections of tributary water to navigable waters. This has generally been the case for even altered or artificial connections such as channelized streams and drainage ditches. The surface water relationships between tributaries and navigable waters are apparent and easily observed. The effect of this view has been to responsibly provide CWA protections to waters with clear surface connections to navigable waters.

However, the Supreme Court’s view of wetlands with respect to the issue of jurisdiction seems to search for a similarly obvious physical connection to navigable waters. Hence, their discussion places an emphasis on isolation and adjacency, terms usually used within an inherent context of physical proximity. Although the seeming importance of proximity may appear to be intuitive if one looks only at surface water connections between wetlands and navigable waters, this limited perspective fails to recognize the *functional* relationships that generally exist between these waters, and that surface physical connections may be ephemeral. However, these functional linkages have a direct impact on federal interests such as water quality, flood storage and damage abatement, and navigation, and thus a direct bearing on the issue of jurisdiction.

Therefore, DU’s comments will provide information that demonstrates the complex, but nevertheless direct, linkages existing between navigable waters and the vast majority of wetlands, even ones that appear from a geographical perspective to be isolated or intrastate. We will provide information that demonstrates that, as a result of these functional relationships, the significant nexus the Supreme Court views as critical to establishing jurisdiction indeed exists for most wetlands, and exists to an extent that should establish the presumption of jurisdiction in the absence of specific information to the contrary. We believe that the preponderance of existing case law, and the science underlying it, already provides ample support for the view that (1) all other waters that are navigable-in-fact, and (2) all tributaries to those waters, whether perennial, intermittent, or ephemeral, should remain within the federal jurisdiction of the CWA. The direct relationship of water quality in traditionally navigable waters and of pollutants that could be discharged to any these kinds of tributaries makes any change in rules unnecessary and counter to the intent of the Act.

<u>Status and Importance of Wetlands of the United States:</u>

The U.S. Fish and Wildlife Service (FWS) periodically produces reports on the status of the Nation’s wetlands. Their most recent status report (Dahl 2000) indicated that of the estimated 221 million acres of wetlands in the U.S. at the beginning of European settlement, 53% (115.5 million acres) had been lost by 1997. Many millions of additional acres of existing wetlands have been negatively impacted as well. Although the series of FWS reports show that wetland loss rates have declined from about 458,000 acres/year during the 1950s-70s (Frayer et al. 1983), annual rates of loss are still on the order of 117,000 acres (when factoring out the addition of open water ponds and conversion of forested wetlands to scrub-shrub wetlands).

Because of the functional linkages between wetlands and other waters (expanded upon in our comments below), wetland science and classification do not categorize these data in a way that separates out isolated wetlands. In all but some very narrow instances of wetland types, isolated wetland is a legal or regulatory construct, not a valid scientific classification. Hence, Dahl (2000) does not contain data that allow an assessment of the status of so-called isolated wetlands. However, most of these isolated wetlands likely fall into the classification of freshwater emergent wetlands. The average size of wetlands in this class is 7.2 acres (Dahl 2000). A total of 1.2 million acres (100,000 ac/year) of freshwater emergent wetlands per year were lost between 1986 and 1997, which was 4.7% of all wetlands remaining in this category (Dahl 2000). Thus, while not allowing for the unambiguous science-based segregation of isolated wetlands, these data nevertheless clearly demonstrate that the category of wetland in which most isolated wetlands would be classified continues to experience the highest loss rate of all wetland types.

The prairie potholes of the northern great plains of the U.S. are classic examples of wetlands that would largely be viewed as "geographically isolated." It is estimated that there were originally 20 million acres of prairie pothole wetlands, largely in the Dakotas, Minnesota and Iowa; however, the best estimate is that only approximately 7 million acres of these wetlands remain – i.e., 2/3 have been lost (U.S. Dept. of the Interior 1988).

The importance and value of the nation's wetlands, even though they comprise only 5% of the United States' land surface, are now well recognized and documented. For example, among many other facts and links cited at the EPA website (www.epa.gov/owow/wetlands 2003):

?? approximately one-half of North America's bird species (>700 species in the U.S. alone) are wetland-dependent or associated;
?? more than one-third of the United States' threatened and endangered species are wetland-dependent, and nearly half are wetland-associated.

However, because isolated wetland is a legal construct and not a scientific classification, a partitioning of such values for isolated wetlands cannot be done.

Due to their strong association with geographically isolated wetlands, waterfowl provide a good example with which to demonstrate the societal and economic significance of withdrawing CWA protections from wetlands solely on the basis of their physical proximity to navigable waters or their tributaries. The prairie pothole region is the most important breeding area for the most economically important species of ducks (e.g., mallards, blue-winged teal, northern pintails) in North America (Ducks Unlimited 2001). An estimated 50% of the average total annual production of ducks comes from the potholes (Dahl 1990), and in wet years 70% or more of the continent's duck production can originate in this region (Ducks Unlimited 2001).

Waterfowl are a tremendously valuable interstate and international economic resource. Almost 3 million migratory bird hunters, including approximately 1.6 million duck hunters, expended approximately $1.4 billion in 2001 for hunting related goods and services (U.S. Fish and Wildlife Service 2002). In 1991, a similar survey documented expenditures of $1.3 billion, having a total economic multiplier effect of $3.9 billion considering the 46,000 additional jobs and $176 million in sales and income tax revenues produced (U.S. Fish and Wildlife Service 2000). The 2001 study documented that 14% of the migratory bird hunting took place in a state other than the one in which the participant resided. The percentage of interstate commerce associated with the use and enjoyment of this wetland-dependent resource is considerably higher in some regions of the country. For example, in North Dakota, with its large number of prairie pothole wetlands and associated waterfowl resources, 47% of the state's approximately 64,000 waterfowl hunters in 2001 were non-residents (M. Johnson, North Dakota Game and Fish Department, pers. comm.). In Arkansas, there were approximately 89,000 waterfowl hunters in 2002 and over 42% traveled there from other states (R. Sebren, Arkansas Game and Fish Commission, pers. comm.). It is important to note that virtually all of the waterfowl harvested in mid- and southern latitude states such as Arkansas, where average annual harvest has exceeded 1.3 million ducks since 1995 (Fronczak 2002), migrate there from northern production areas that contain abundant wetlands, and where most of those wetlands might be considered geographically isolated.

The North American waterfowl resource not only links the nation's and continent's wetlands from an ecological perspective, but also provides the basis for international commerce linkages as well. For example, in 2001, over 30% of the migratory bird hunters in the three Canadian provinces of Alberta (16%), Saskatchewan (45%) and Manitoba (30%) were citizens of the United States (S. Wendt, Canadian Wildlife Service, pers. comm.).

Furthermore, commerce tied to the waterfowl resource (and other wetland-associated fish and wildlife) is not restricted to hunting. In 2001, 14.4 million people participated in watching waterfowl, with associated expenditures and values also measured in the billions of dollars (U.S. Fish and Wildlife Service 2002). Approximately 30% of that waterfowl watching was conducted in states other than the participant's state of residence. The expenditures by migratory bird hunters and wildlife watchers in Texas totaled $1.3 billion in 2001 (U.S. Fish and Wildlife Service 2002), and when compared to the state's agricultural commodities this level of expenditure would rank second behind only cattle and calves (http://www.ers.usda.gov/statefacts/TX.htm).

Finally, the citizens of the United States and our society place a high priority on conservation of wetlands and maintenance of high standards of water quality. A recent nationwide survey (Responsive Management 2001) documented that there were 15 times the number of citizens who believed there were too few wetlands compared to the number that thought there were too many. The same survey showed that 91% of the public thought that it was "very" (64%) or "somewhat" (27%) important to protect or conserve wetlands. Only 3% were neutral or considered it unimportant.

Demand for freshwater for drinking water, irrigation, industrial and other uses has risen dramatically, increasing approximately 42% between 1960 and 1995, for example (Heinz 2002). Furthermore, survey after survey has reinforced that the American public has a deep concern about water quality and high expectations for water conservation. For example: water pollution was identified as the most important environmental issue facing Florida (Responsive Management 1998a); 65% of Idaho residents thought more time and money should be spent on protecting Idaho's water resources (Responsive Management 1994); 89% of Indiana residents thought that improving water quality was very important (Responsive Management 1998b); 75% of West Virginia residents thought much more effort should be spent on restoring streams that have been damaged by acid rain or acid mine drainage (Responsive Management 1998c). In all of these studies, water-related issues were by far the top environmental priorities among the survey respondents.

Even these few examples highlight the ecological importance and associated economic and societal value of wetlands. It is also clear from the waterfowl example that there is a direct relationship between geographically "isolated" wetlands and a valuable economic resource supporting important interstate and international commercial activities.

Potential Implications of Redefining "Waters of the United States":

There are clearly significant implications to the status of wetlands, their associated resources, and water quality functions if Clean Water Act protections are removed from a broad spectrum of wetlands. The water quality and other functional implications of accelerated wetland loss are expanded in discussions below.

Recent declines in wetland loss rates and increases in protection afforded wetlands under the CWA during the same period are not coincidental. Rule-making decisions in the wake of SWANCC can be anticipated to have a substantial effect on future wetland trends. If hydrologic links between wetlands and navigable waters are recognized when defining "adjacency," "tributary," and "significant nexus," then the CWA might continue being a factor in stemming the decline of wetland loss rates. However, if these terms are not defined in a hydrologic context, the number of wetlands afforded Section 404 protection will unquestionably decrease. Three independent analyses support this, concluding and demonstrating that large proportions of wetlands in many regions of the country will lose Section 404 protections if these hydrologic links are ignored (see following). Given the historical link between these protections and trends in wetland loss, it can be reasonably concluded that restricting CWA jurisdiction and protection will increase future rates of wetland loss and degradation.

A report compiled by DU scientists in 2001 ("*The SWANCC Decision: Implications for Wetlands and Waterfowl*"; enclosed) includes analyses which estimated up to 76% of the wetland acreage in the prairie pothole region, 86% in the Gulf coastal prairies, 33% of the U.S. Great Lakes, and 12% of the mid-Atlantic coast could be excluded from CWA protections (Petrie et al. 2001). The corresponding percentages of the *numbers* of wetlands that might no longer be considered jurisdictional are 96%, 96%, 90% and 88%, respectively (Petrie et al. 2001). Furthermore, small wetlands are at a disproportionately higher risk of being lost (see Petrie et al. (2001) for a more in-depth discussion of implications and consequences of SWANCC and its potential impacts to "isolated" wetlands). Small wetlands tend to provide different functions than large wetlands. They are typically shallower than large wetlands, warm more quickly, have a larger ratio of vegetated area to surface acreage, dry more frequently, and possess a greater perimeter:size ratio. These characteristics are typically associated with functional attributes such as increased productivity of vegetation and invertebrates, and contributions to groundwater (Eisenlohr and Sloan 1972; Millar 1971; Sloan 1972; Weller 1981; Willams and Farvolden 1967). For example, one analysis (U.S. Fish and Wildlife Service 2001) suggested that duck production in the pothole region of the U.S. northern prairies would decline by over 70% if all wetlands less than 1 acre were lost.

A recent report by the FWS (Tiner et al. 2002), *"Geographically Isolated Wetlands: A Preliminary Assessment of Their Characteristics and Status in Selected Areas of the United States,"* should be consulted as an important resource as EPA considers a possible rulemaking or changes to CWA administration. This report reviews 19 categories of geographically isolated wetlands, and contains a wealth of literature citations related to the hydrology, functions, and other characteristics of these wetlands. It also includes a preliminary analysis of wetlands across the country and demonstrates that millions of acres of the nation's wetlands could be removed from CWA protections if the SWANCC decision were to be ultimately interpreted to exclude these wetlands from federal jurisdiction.

A memorandum prepared by the Association of State Wetland Managers (available at www.aswm.org) notes that the SWANCC decision potentially removes CWA protection from 30-60% of the United States' wetlands. Their preliminary estimates for percentages of wetlands removed from protection in individual states included: Wisconsin – 79%; Indiana – 31% of wetland acreage and 74% of wetland numbers; Delaware – 33% of freshwater wetlands. Personnel from the Texas Parks and Wildlife Department estimated that nearly 100% of all playas could be without Section 404 protection as a result of SWANCC (J. Raasch, pers. comm.). In Nebraska, biologists estimated that 60% of all wetlands of the state could be classified as geographically "isolated" in light of SWANCC, and that 90% of the 34,000 acres of Rainwater Basin wetlands would lose Section 404 protection (LaGrange 2001). Such a loss of protection of these particular wetlands would be devastating inasmuch as only about 400 of the original 4,000 basins present in the Rainwater Basin region remain today (Petrie et al. 2001).

The ANPRM requests information regarding the effectiveness of other federal programs being used to restore and conserve wetlands and other aquatic ecosystems. In addition, agency news releases refer to programs such as the North America Wetland Conservation Act (NAWCA), Wetland Reserve Program (WRP), and other much smaller programs as if to suggest that the wetland gains provided by these voluntary, incentive-based conservation programs might be able to offset any increased losses resulting from jurisdictional changes to the CWA. However, although federal programs to restore wetlands on private lands have been hugely successful, existing programs would not balance the accelerated future wetland loss that would result if hydrologic connections between wetlands and navigable waters, and their tributaries, were ignored in determining CWA jurisdiction.

The WRP and NAWCA are by far the two largest federal programs that provide funds for wetland restoration. Since WRP implementation began in 1992, an average of 116,056 acres have been restored or protected annually (www.nrcs.usda.gov/programs/wrp/). Beginning in 1991, NAWCA has averaged 62,000 wetland acres/year restored and protected (J. Moniot, USFWS, pers. comm.). Thus, these programs together restored and protected wetlands at an annual rate of less than 180,000 acres over the past decade (note that this is a maximum figure because many acres are actually associated upland habitats). However, even with these programs in effect, net wetland losses averaged approximately 117,000 acres per year (adjusted Dahl 2000 data) over the last decade despite the relatively inclusive CWA jurisdictional interpretation existing at the time. In addition, cumulative negative impacts (e.g., altered hydroperiods, nutrient and other chemical pollution, sedimentation) have continued to significantly reduce ecological function in many of the nation's remaining wetlands.

Therefore, the goal of no net wetland loss is not being achieved, even with federal jurisdiction over most isolated wetlands and with federal programs providing voluntary-based incentives for wetland restoration. Even within the regulatory Section 404 program, despite progress over the last 20 years, the goal of no net loss of wetlands is not being met for wetland functions (National Research Council 2001). Thus, a loss of Section 404 protections for so-called "isolated" wetlands would clearly widen the gap between wetland losses and gains, pushing the Administration's goal of no-net loss even further out of reach. Even a very small increase in the annual rate of wetland loss (e.g., to 0.35% of the nation's remaining wetlands) could elevate annual losses of wetland acres to the high levels of the 1950's to 1970's (i.e., approximately 450,000 acres/year; Frayer et al. 1983).

In summary, rule-making decisions hinging on the definitions of "isolated wetland," "adjacent" and "significant nexus" have the potential to reverse 3 decades of progress in slowing the rate of net wetland loss and degradation, and state and federal programs are extremely unlikely to ever be funded at levels sufficient to offset these losses.

Relationships of the Terms "Tributary," "Adjacent" and "Significant Nexus:"

The regulatory definition of "*tributary*" seems to have achieved somewhat of a consensus (although not unanimity) in the courts over the last few decades (e.g., 243 F. 3d 526, 9th Cir. 2001; 108 F. 3d 1336, 1342, 11th Cir. 1997; 143 F. Supp. 2d 1169, D. Idaho 2001). It is generally accepted that a tributary can be any watercourse through which pollutants or other materials could flow to, and which would impair the quality of, receiving waters that would ultimately flow into a navigable waterway. This has included natural stream channels, intermittent tributaries, drainage ditches, etc. Thus, for purposes of the Clean Water Act, jurisdictional decisions relative to tributaries that ultimately have the potential to provide input to navigable waters is relatively clear and direct. Nevertheless, any future rulemaking could likely benefit from explicit clarification of this point. We strongly encourage that any definition of tributary based on existing case law should be consistent with the common sense notion and regulatory approach that any hydrologic linkage of a tributary to navigable waters would trigger CWA jurisdiction.

As a result of actions by the regulatory agencies, decisions by the court system, and amendments to the CWA by Congress (see SWANCC opinion and dissent for background and legal citations), there has been a dynamic but steady evolution of what wetlands have fallen within CWA jurisdiction over the last 30 years. As stated earlier, the result of the Supreme Court's SWANCC decision, taken within the context of previous Supreme Court decisions (e.g., *Riverside Bayview Homes*) and subsequent SWANCC interpretations by lower courts, the regulatory definitions of adjacency and significant nexus are critical to resolving the limits of federal jurisdiction in addressing Congress' intent with the CWA "to restore and maintain the …integrity" of the Nation's waters.

Riverside Bayview and other Section 404-related cases in which adjacency was central to evaluating jurisdiction have tended to interpret the term from within a strictly physical and geographical context. However, even from that perspective the Supreme Court's ruling in *Riverside Bayview* was based on an implied connection between wetlands and the navigable waters to which they were adjacent. The Court stated that "Congress evidenced its intent to 'regulate at least some waters that would not be deemed 'navigable' under the classical understanding of that term'" (474 U.S. 121, 1985, at 133), and that "We found that Congress' concern for the protection of water quality and aquatic ecosystems indicated its intent to regulate wetlands 'inseparably bound up with the 'waters' of the United States" (*Id*., at 134). These and other assertions of the Court carry an implicit but clear recognition that water quality of open navigable waters (or their tributaries) is directly related to water quality in wetlands located in close physical proximity.

The Court thus recognized wetland function as being an essential element of proximity and determination of federal jurisdiction. In SWANCC, the Court re-stated that "It was the significant nexus between the wetlands and 'navigable waters' that informed our reading of the CWA in *Riverside Bayview Homes*" (U.S. Case No. 99-1178, para. 12). Therefore, the Court accepted that adjacency carries with it the presumption of a functional relationship, i.e., the significant nexus, between the wetlands and navigable waters. In light of the acknowledged interrelationship of these terms (i.e., "adjacent" and "significant nexus"), we suggest that conceptual clarity might be advanced by replacement of these two terms with a single one, "functional adjacency." The central issue here would be the recognition that adjacency, from the standpoint of water quality maintenance, should not be viewed as being simply limited by physical proximity, but rather in terms of functional linkages. Thus, functionally adjacent wetlands could be physically distant from a navigable water (just as a surface tributary deemed jurisdictional may be located many miles upstream of a navigable water), yet its direct functional linkage to (i.e., its significant nexus with) the navigable water for purposes of maintaining water quality as directed by the CWA would remain as the central element of a jurisdictional decision.

A functional foundation for jurisdictional decisions related to wetlands, whether geographically isolated or not, would help advance the discussion beyond having to attempt to base jurisdictional decisions on what could otherwise be a relatively arbitrary delineation of what constitutes adjacency. In addition, this approach is lent support by the recent report on "*Compensating for Wetland Losses Under the Clean Water Act*" (National Research Council 2001). Recognizing the advancements in wetland science over the last 30 years, that report places some emphasis on the use of wetland functional assessment to provide an avenue for improving wetland mitigation within the CWA. In addition, the U.S. Army Corps of Engineers' (USACE) December 24, 2002 Regulatory Guidance Letter No. 02-2 (p.3) on "…Compensatory Mitigation Projects …Pursuant to Section 404 of the Clean Water Act…," positively acknowledged the recommendations of the National Research Council's report and placed a special emphasis on "one-to-one functional replacement" of wetlands.

Wetland Functions and Clean Water Act Jurisdiction:

Wetlands perform a broad array of ecosystem functions, all carrying some measure of societal value (National Research Council 1995). Wetland functions can be categorized into three basic categories: (1) *hydrologic*, including basic functions such as short and long-term surface water storage and maintenance of water tables; (2) *biogeochemical*, including transformation and cycling of elements, retention and removal of dissolved substances, accumulation of nutrients and carbon, and accumulation of inorganic sediments; and, (3) *habitat and food web support*, including maintenance of associated plant and animal communities, and maintenance of energy flow (National Research Council 1995).

The most important wetland-related issues involved with the ANPRM and Clean Water Act administration in light of the SWANCC decision are related to the concepts and interpretations of adjacency and significant nexus. Our relatively brief evaluation of geographically isolated wetland function will focus on hydrologic functions and linkages, and their association with the type of biogeochemical functions related to water quality and therefore covered under the CWA.

It should be recognized that there is an enormous amount of scientific literature associated with these issues. For just three examples, in reviewing the comments and considering the issues raised by the ANPRM, the agency's staff should carefully consult: (1) the bibliography on "Isolated Wetlands" compiled by the Association of State Wetland Managers (available at www.aswm.org/science/isolated.htm), containing approximately 500 citations; (2) the recent 70+ page USFWS report on "Geographically Isolated Wetlands…" (Tiner et al. 2002); and, (3) the "*National Water Summary on Wetland Resources*" (Fretwell et al. 1996).

Due to the expansive breadth of the issues related to the ANPRM and the relatively limited comment period, we can only provide a relatively cursory review of relevant literature. However, our objective is to highlight sufficient examples from this extensive literature to demonstrate that, in order to safeguard the nation's water quality, determinations of wetland adjacency must be interpreted as meaning more than mere physical proximity. We will focus on citing examples of the functional linkages of geographically isolated wetlands and navigable waters to support our general assertion that there is a functional adjacency, or significant nexus, between them as a general rule. Finally, although we divide our citations into the three general categories of "*surface water storage and flood abatement*," "*groundwater relationships*," and "*water quality maintenance*," we do so largely for the sake of organizational convenience. These issues are inextricably linked and are all directly related to the question of CWA jurisdiction.

Surface Water Storage and Flood Abatement:
Wetlands in any watershed, including geographically isolated wetlands, serve a critical function in storing and holding water and associated pollutants (including sediment) that otherwise could flow swiftly and directly to a navigable water. Thus, they play a significant role in regional water flow regimes by intercepting storm runoff and storing and releasing those waters in a delayed fashion, either through surface or groundwater discharge (Mitsch and Gosselink 1986). The presence of many isolated wetlands decreases runoff velocity and volume by releasing water over an extended period (Carter 1996). The net effect of this important wetland function is to abate flooding by lowering and moderating the peaks of flood stages, thereby reducing flood damages (Mitsch and Gosselink 1986). The presence of wetlands in watersheds was found to be a significant factor in the reduction of 50- to 100-year floods (Novitski 1978). Winter (1989) stated that for selected watersheds in Minnesota the mean annual flood increases were inversely related to the percentage of lakes and wetlands within the watersheds. The decrease of 80% of the storage capacity of the Mississippi River as a result of levees and loss of forested and other wetlands (Gosselink et al. 1981) is widely considered an important contributing factor to the increasing frequency flooding along the Mississippi River (Belt 1975). Ogawa and Male (1983) employed a hydrologic simulation model to demonstrate that for relatively low frequency floods (those occurring with 100-year interval or greater, but those with the greatest potential for catastrophic losses) the increase in peak streamflow was very significant for all sizes of streams when wetlands were removed from the watershed. Therefore, viewed on the whole, these studies provide an example of the importance of landscape position of small and isolated wetlands relative to wetland functions and values. Individual contributions of small wetlands distributed across a landscape, and often located within topographically higher portions of the watershed and geographically isolated from flowing waters, can nevertheless exert a very significant and demonstrable cumulative effect on wetland functions such as floodwater storage and water quality improvement.

Prairie pothole wetlands, often viewed as prototypical isolated wetlands, clearly illustrate the significant and measurable contribution that geographically isolated wetlands provide to this valuable function. Prairie potholes in North Dakota have been estimated to hold roughly half the surface water within the state (Ripley 1990). However, roughly twothirds of the original 20 million acres of potholes have been lost through drainage (U.S. Dept. of the Interior 1988). A number of studies concluded that loss of these pothole wetlands contributed significantly to flooding and increases in associated damages along the Red River of North Dakota and in portions of Minnesota and Iowa (e.g., Brun et al. 1981; Campbell and Johnson 1975; Moore and Larson 1979). Ludden et al. (1983) found that small basins in the Devil's Lake watershed in North Dakota (many, if not most, geographically isolated) could store 72% of the total runoff from a 2-year frequency flood and approximately 41% of the total runoff from a 100-year frequency flood. Hann and Johnson (1968) found that depressional areas in north central Iowa had the ability to store more than one-half inch of precipitation runoff within their watersheds. Studies in landscapes with other types of isolated wetlands have similarly demonstrated that drainage of such wetlands results in increased peak flows of navigable waters and their tributaries (Skaggs et al. 1980).

As an illustration of the recognized value of these types of functional contributions of wetlands (including those that are isolated) to flood abatement in a watershed, the city of Boston is acquiring 5,000 acres of wetlands in the Charles River watershed to avoid the necessity of constructing a $100 million dam for flood control (Dailey et al. 1999). In a related study, the U.S. Army Corps of Engineers (1972) determined that flood damages would increase by $17 million per year if the 8,400 acres of wetlands in the Charles River basin were drained.

From the standpoint of water storage, isolated wetlands can lose their water through evapotranspiration, into the soil profile and to groundwater (see below) or, more than often realized, as surface water flow. In many years, potholes appear physically separated with little evidence of surface water connection. However, during wet cycles (as most recently occurred in the early 1990s in the Dakotas) water tables rise and surface water levels reach outlet elevations of most potholes (LaBaugh et al. 1998; Sloan 1972; USGS 1999; Winter et al. 1998). This phenomenon results in temporary but real physical connections among and between potholes, and between complexes of potholes and drainage ditches, streams, and rivers in the region, with associated impacts on regional water regimes in navigable waters and their tributaries (Leitch 1981; Sloan 1972; Stichling and Blackwell 1957; Winter 1989; USGS 1999).

Thus, many apparently geographically isolated wetlands are in fact functionally adjacent to, and exhibit a significant nexus with, navigable waters that are clearly jurisdictional from the perspective of the Clean Water Act and other federal interests, such as flood control. In essence, the water that is or can be contained in any wetland, no matter how isolated, is water that would otherwise ultimately flow downhill (either over the surface or through the ground after accounting for evapotranspiration) and into a navigable water or a tributary if that wetland was drained or filled. Any associated pollutants, including sediment, would be carried downhill with that water in the absence of those wetlands.

<u>Groundwater Relationships:</u>
There is a much greater degree of linkage between geographically isolated wetlands and navigable waters via groundwater connections than is generally appreciated. Functional

adjacency must be considered in a hydrologic context, not merely a physical or geographic one, in order for the regulatory environment to adequately address the stated purposes of the CWA and intent of Congress. Isolated and other wetlands can, and very often do, contribute to groundwater recharge (and discharge), and this groundwater then continues to move downslope toward intermittent or flowing streams ultimately terminating in navigable waters (Winter et al. 1998).

For prairie potholes, where the water table tends to be a subdued image of the topography and is generally very near the land surface (Sloan 1972), pothole wetlands can serve as groundwater recharge sites (Euliss et al. 1999). Some potholes have a net seepage outflow (groundwater recharge basins), others have a net seepage inflow (groundwater discharge basins), and many basins function alternately and at times have a net outflow into the groundwater and at other times have a net inflow (Sloan 1972). Net seepage outflow into the groundwater can amount to 20-30 percent of the total water loss for prairie wetlands (Eisenlohr and Sloan 1968; Eisenlohr and Sloan 1972; Shjeflo 1968; Winter and Rosenberry 1995). Some hydrologists have in the past expressed the view that wetlands are typically not recharge areas because the soil under many wetland basins is impermeable (Larsen 1982). However, in the prairie pothole region, there is little groundwater recharge under dry uplands outside depressions, and groundwater recharge from small depressions constitutes a large proportion of the total recharge in many areas (van der Kamp and Hayashi 1998). This apparent conflict has been resolved by studies showing that connections between the groundwater and surface water in the isolated potholes occur mainly at the shoreline zones where more impermeable soils of the basin grade into more permeable soils, or through fractures in the basins substrate (Eisenlohr and Sloan 1972; Millar 1971; Sloan 1972; Weller 1981; Willams and Farvolden 1967). Furthermore, because seepage contributions to groundwater are greatest where wetland shoreline is largest relative to the water volume (Millar 1971), the smallest pothole wetlands are proportionately more important to groundwater connectivity. Sloan (1972) stated that water seepage to groundwater was greater for ephemeral and temporary wetlands than for other wetland types.

To support CWA jurisdiction, it is important to note that the groundwater to which the pothole wetlands are linked subsequently provides input to lower-lying wetlands and stream valleys (van der Kamp and Hayashi 1998). Numerical simulation of regional groundwater flow systems in Stutsman and Kidder counties, North Dakota, portrayed lateral movement of groundwater flow over 27 km to discharge into Pipestem Creek (Winter and Carr 1980). In Minnesota, Ackroyd et al. (1967) concluded that lakes and wetlands act as natural reservoirs that sustain and regulate streamflow during dry periods. Thus, there is a direct linkage of water in pothole wetlands to navigable waters and its tributaries, thereby meeting the significant nexus standard. Water retained in a pothole for some period is cleansed of much of its load of pollutants before it enters groundwater (see discussion below). Therefore, if the retention process is shortened by ditching or filling, then the cleansing function is lost or degraded and there would be a direct negative impact on the quality of receiving navigable waters.

This wetland-groundwater-navigable water/tributary linkage has been demonstrated for other categories of geographically isolated wetlands as well. For example, Novacek (1986) stated that sandhills and associated wetlands in Nebraska (including wet meadows) are important to water table and aquifer recharge, with the region containing 5 principal drainage basins that all ultimately empty into the Platte and Missouri rivers. These sandhill wetlands developed as groundwater seepage areas in the valleys of wind-deposited sand dunes (Sidle and Faanes 1997). Tiner et al. (2002) also indicated that most sandhill wetlands are interconnected with the local groundwater and the agriculturally important Ogallala, or High Plains, aquifer. Furthermore, Weeks and Gutentag (1984) stated that groundwater from this aquifer discharges naturally into flowing streams and springs, and that the aquifer and valley-fill deposits and associated streams comprise a stream-aquifer system that links the High Plains aquifer to surface tributaries of the Platte, Republican and Arkansas rivers. Slade et al. (2002) showed that channel gain or loss in Beals Creek (draining into the Colorado River basin) corresponds to discharges from or recharges to the Ogallala aquifer, further strengthening documentation of the linkage of isolated wetlands, groundwater, and flowing navigable waters.

In the case of vernal pools in California, Hanes and Stromberg (1996) reported that wetlands with discontinuous or a weakly developed hardpan had high rates of seepage and therefore contributed to subsurface flow. Tiner et al. (2002) stated that during the wet seasons these geographically isolated wetlands formed hydrologically-linked complexes that could drain into perennial streams.

Once thought highly unlikely, data from hydraulic and chemical studies have demonstrated that playa wetlands are also foci for Ogallala aquifer recharge (Scanlon et al. 1994; Wood and Osterkamp 1984). In the case of playas, infiltration rates were significantly greater in the center of the basin than near its margin (Zartman et al. 1994). This study showed a positive correlation between infiltration and soil clay content, with the high recharge rates being due to soil cracking and macropores in playa lake clay substrates. Rainwater and Thompson (1994) stated that increased levels of urban runoff had increased water collection in playas and that infiltration had also increased. They further stated that these factors had increased the contribution of playas to Ogallala aquifer recharge and that, in some areas, infiltration from playas that receive runoff are the principal source of aquifer recharge.

Geographically isolated wetlands in karst topography are often directly linked to subsurface water flows of relatively high velocity, moving easily through underground channels, caves, streams, and cracks in the rock. There tend to be many springs and seeps, many with surface connections, which are the source of some large streams (Winter et al. 1998). In "*Ground Water and Surface Water: A Single Resource*," Winter (1998) stated that groundwater recharge is efficient in karst terrain. Entire streams can go subsurface and reappear in other areas, and contaminants are easily mobilized in these regions.

Thus, as in the case of water storage and flood abatement and the functional relationships that have been shown to exist between isolated wetlands and navigable waters, the demonstrated linkages between geographically isolated wetlands, groundwater and navigable waters within a broad variety of wetland categories supports the contention that adjacency and significant nexus must be interpreted from a functional perspective if water quality is to be protected as intended by the CWA.

Water Quality Maintenance:

The importance of the relationships between wetlands and the water quality of the "waters of the United States" is central to an informed understanding of what should constitute jurisdictional wetlands under the CWA. It is now well-established that wetlands of all types have the capability of improving water quality by trapping, precipitating, transforming, recycling, and/or exporting many of its chemical and waterborne constituents (Mitsch and Gosselink 1986; van der Valk et al. 1978). They serve as a natural buffer zone between upland drainage areas and open or flowing water. They can improve water quality by removing heavy metals and pesticides from the water column, and by facilitating the settling out of sediment particles to which many pollutants are attached. Wetlands remove excess nutrients, e.g., phosphorus and nitrogen compounds, by incorporating them into plant tissue or the soil structure and by fostering an environment in which microbial and other biological activity pulls these compounds out of the water, thereby enhancing its quality.

Importantly, water quality contributions by wetlands can occur no matter where the wetland occurs on the landscape, and isolated waters also serve as chemical and nutrient sinks, trapping and holding these compounds (Mitsch and Gosselink 1986). For example, it has been shown that when water naturally filters through Delmarva bays (a category of geographically isolated wetlands) instead of being circumvented through drainage canals to a navigable water, it flows through groundwater pathways to the Chesapeake Bay with much of its nitrogen having been removed (Bachman et al. 1992; Fretwell et al. 1996; Laney 1988; Shedlock et al. 1991). Nitrogen is one of the principal pollutants of concern in the waters of the Chesapeake Bay.

Ramsey et al. (1994) showed that geographically "isolated" playa lake wetlands improve the water quality of storm runoff, demonstrating that water quality in the playa is better than that found in storm runoff before entering the wetland. They stated that this wetland function thereby contributes to improving/maintaining groundwater quality in the aquifer, as would be predicted in light of playas being the principal source of aquifer recharge in some areas (Rainwater and Thompson 1994). Because some of this groundwater discharges naturally into streams and springs (Weeks and Gutentag 1984), from a functional perspective, there is a significant nexus between the status and water quality of the playas to the status and water quality of groundwater aquifers, and navigable waters or tributaries.

Lin and Norman (2003) recently demonstrated that wetlands in California were able to remove an average of 69% of the selenium contained within agricultural runoff to the wetlands, thereby providing a natural mechanism for reducing the availability of this trace element which becomes toxic if bioaccumulated in the food chain. In the Sandhill wetlands of Nebraska, return of too much polluted irrigation water can enter the aquifer or regional watershed through these isolated wetlands and degrade water quality (Winter 1998). Winter (1998) stated that "groundwater and surface-water interactions have a major role in affecting chemical and biological processes in lakes, wetlands and streams, which in turn affect water quality throughout the hydrologic system." Katz et al. (1995) demonstrated the ease with which changes in the chemistry of geographically "isolated" surface waters are transported and reflected in the water quality of groundwater.

The increased flood flow that is directly associated with the loss of geographically isolated wetlands (e.g., Brun et al. 1981) is an important factor in streambank erosion. This kind of erosion is a significant water quality problem in many areas downstream of geographically isolated wetlands in the United States, contributing significantly to sediment pollution loads, including navigable waters. Bellrose et al. (1983) and Mills et al. (1966) describe how sedimentation, including streambank erosion, is creating navigation and ecological problems on the Illinois River.

The societal value of water quality services provided by wetlands, including isolated wetlands, is demonstrated by the actions of New York City to initiate a $250 million program to acquire and protect up to 350,000 acres of wetlands and riparian lands in the Catskills (Dailey et al. 1999). The city is taking this action to protect the quality of its water supply as an alternative to constructing water treatment plants which could cost as much as $6-8 billion. In South Carolina, a study documented that without the wetland services provided by the presence of Congaree Swamp a $5 million wastewater treatment plant would be required (www.epa.gov/owow/wetlands 2003).

There is a vast scientific literature dealing with the relationship of wetlands (including those that are geographically isolated) and water quality. Many studies, as cited above, also document widespread and direct physical linkages between the water contained in wetlands, groundwater, and in flowing waters and tributaries considered "waters of the United States." The literature cited above is but a mere sample of that available on the topic. However, taken as a whole it provides compelling evidence that to protect the nation's water quality, as intended by the CWA and amendments, the definition of adjacency and significant nexus must be evaluated from within a context of wetland and water quality *functions*, not simply physical proximity.

Regulatory Approach:

The apparent confusion and inconsistency in administering the CWA (particularly Section 404) subsequent to the SWANCC decision indicates the need for clarity in the regulatory approach to be applied post-SWANCC. For the benefit of both (1) meeting the intent of Congress and protecting the water quality of the U.S., and (2) providing guidance to the regulated community and public, there needs to be a nationally consistent, enforceable approach to the determination of CWA jurisdiction and Sec. 404 administration.

Prior to the SWANCC decision, there was effectively a presumption that all wetlands were subject to federal jurisdiction unless they fell into one of a relatively few, narrowly defined categorical exclusions. As previously stated, the evolution of Sec. 404 administration to reach this regulatory approach was associated with the gradual reduction in the annual rate of national wetland loss from more than 450,000 to approximately 100,000 acres over the three decades of the CWA's existence. The presumption of jurisdiction, with exclusions being limited to narrow instances on a case-by-case basis, was an important element of the effectiveness of the CWA regulatory approach in contributing to this significant reduction of wetland loss, thereby protecting water quality and other federal interests (e.g., flood damage abatement).

We suggest that, in the case of most categories of wetlands, there is sufficient evidence of functional adjacency, i.e., hydrologic linkage of the waters in geographically isolated wetlands to navigable waters, to warrant the basic presumption of CWA jurisdiction. Specific categories of exemptions from jurisdiction could continue to be delineated and administered as in the past. We believe that the preponderance of scientific evidence for these functional hydrologic relationships demonstrates a significant nexus (e.g., wetland to groundwater, and groundwater to tributary and navigable stream flows) that is sufficiently strong to provide the foundation for this basic presumption of jurisdiction. The functional adjacency of wetlands and navigable waters is so fundamental and generally evidenced among a broad array of geographically isolated wetland types as to permit the reasonable application of this presumptive approach to jurisdiction. However, evidence to the contrary in individual cases or categories of geographically isolated wetlands could be considered.

Without this type of presumption as a foundation, the nature of many of these functional hydrologic relationships is such that the burden of a wetland-by-wetland demonstration of linkage would make effective enforcement and CWA regulation essentially impossible. The manpower and budgetary requirements to prove linkage in each individual case would be beyond anything that could be considered reasonable or realistic. We acknowledge that there may be a few categories of geographically isolated wetlands for which this presumption of a functional linkage might need careful review prior to general application. For example, Great Lakes alvar wetlands typically occur with very thin soils situated on bedrock (Tiner et al. 2002). Hence, they would not generally possess a linkage to navigable waters via groundwater connections. However, before excluding even them from a presumption of functional adjacency, a closer review of what is known about their surface hydrologic linkages would be required. For example, an alvar wetland that during periods of high rainfall can overflow its basin and discharge into a tributary ultimately leading to a navigable water should be considered jurisdictional by virtue of this connection. These wetlands could also be contributing to storage of floodwater in a manner such that their filling or drainage would have an impact on the quality of navigable waters. The literature related to and status of the relatively rare categories of geographically isolated wetland with less clear hydrologic linkages to navigable waters could be reviewed in more detail prior to a presumption of functional adjacency. We believe, however, that based on the science available for the vast majority of geographically isolated wetlands, the case for functional adjacency is sufficiently strong and general to warrant the fundamental presumption of jurisdiction.

In addition, from the perspective of CWA regulatory administration, this basic approach would be administratively similar to that used in the past to determine jurisdiction. There has been extensive past experience with this fundamental approach. Given that, we believe that this presumptive approach would facilitate both the agencies and the public in making the transition to post-SWANCC CWA administration with the least degree of regulatory confusion and uncertainty.

Summary:

In 1972, Congress passed the Clean Water Act for the stated purpose of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation's waters." Over the past 30 years court decisions have generally upheld the authority of the Environmental Protection Agency and U.S. Army Corps of Engineers to administer the Act as needed to address Congressional intent to restore and maintain the quality of "waters of the U.S." However, the Act was not explicit in defining those waters. Also, due to advances in the scientific understanding of the interdependence of water quality in navigable waters and other water bodies such as wetlands, and due to ongoing changes in societal expectations, there has been a steady evolution of CWA amendments and implementing regulations regarding the wetlands and waters that are considered jurisdictional.

Court challenges regarding which waters and wetlands are included within the Act's "waters of the U.S." have been an important part of the evolution of Section 404 regulation. The linkage and direct impact of surface waters such as tributaries, intermittent streams, and drainage ditches to water quality of navigable waters has generally been recognized and upheld. In the case of surface water connections, there is an observable link between waters. However, the relationship between wetlands and the water quality of flowing waters, or other federal interests, is often not so directly observed. The significance of this difference was highlighted in January 2001 by the Supreme Court case referred to as the SWANCC decision. In their decision, the Court ruled that geographically isolated wetlands could no longer be considered jurisdictional solely on the basis of use of the wetlands by migratory birds, a resource with interstate and international commerce implications. Their decision had the effect of withdrawing federal jurisdiction and CWA protections from certain isolated, intra-state, non-navigable wetlands.

There have already been negative impacts to wetlands as a result of the SWANCC decision, but future impacts could be devastating. Because the Supreme Court did not explicitly define "isolated" in their decision, the scope of waters and wetlands remaining within federal jurisdiction is unclear. This has resulted in inconsistency in interpretation and regulatory application within the agencies, and confusion among the interested or regulated public. Administrative decisions have excluded jurisdiction from many wetlands that would have been protected prior to SWANCC, and wetland loss has accelerated.

Wetland loss has serious implications for water quality of streams and rivers throughout the U.S. The trend of water quality improvement over the last 30 years would be reversed if geographically isolated wetlands ultimately fall outside federal jurisdiction. However, the Supreme Court decision continues to support CWA jurisdiction over wetlands that are “adjacent” to or possess a “significant nexus” with navigable waters and their tributaries. Their decision in SWANCC simply invalidated use of one aspect of the Migratory Bird Rule as the sole basis for determining jurisdiction. This makes it imperative that the definitions of “adjacency” and “significant nexus” be clarified and made explicit for determining jurisdiction of isolated wetlands.

If CWA protections are not explicitly restored to the nation’s wetlands in a broadly inclusive way, a surge in wetland loss will have serious economic and social consequences. The United States has already lost 53% of its wetlands, with losses still exceeding 115,000 acres/year. These losses are occurring disproportionately among freshwater emergent wetlands that include most isolated wetlands. Over 65% of the prairie potholes in the United States, a part of the most important region on the continent for breeding ducks, have already been lost. Of the remainder, 80% are less than one acre in size and almost all could be considered geographically isolated and may no longer be covered by CWA protections. The potholes and other wetlands across the country are tremendously important as wildlife habitat. Both the natural resource and economic values of these wetlands to the millions of citizens who care about them and their associated wildlife is significant. In 2001, there were more than 3 million migratory bird hunters who spent more than $1.4 billion in pursuit of this avocation. An important percentage of the commerce associated with waterfowl hunting is interstate and international. In North Dakota, 47% of the waterfowl hunting was by non-residents in 2001, and 42% of the waterfowl hunting in Arkansas in 2002 was by non-residents. The vast majority of the waterfowl hunting in Arkansas is dependent upon ducks that were produced in northern breeding habitats dominated by isolated wetlands. There were also 14.4 million people nationwide who participated in watching waterfowl in 2001; 30% of that activity took place in states other than the participants’ state of residence. Due in part to past wetland losses more than one-third of the threatened and endangered species of the U.S. are dependent upon wetland habitats, and almost one-half are associated with wetlands. Once listed as threatened or endangered, the cost of species management goes up dramatically.

Advancements in the sciences of wetlands, groundwater, and hydrology over the last 30 years have demonstrated the functional linkages between wetlands and navigable waters and tributaries. Many geographically isolated wetlands are linked to other waters through the hydrologic functions of *surface water storage and flood abatement, groundwater relationships,* and *water quality maintenance*. Thus, if water quality and other federal interests and authorities (e.g., flood control) are to be protected, determinations of jurisdiction based on adjacency or a significant nexus must go beyond a measure of geographic proximity to consider adjacency from a functional perspective.

The scientific literature documents the array of linkages between geographically isolated wetlands and other jurisdictional waters. Many geographically isolated wetlands develop surface linkages to flowing water during times of high rainfall and/or during extended periods of above average precipitation patterns. Essentially all wetlands store water that, in the absence of the wetland, would flow much more rapidly to navigable waters carrying sediment and other pollutants that would degrade the quality of receiving waters. Most categories of geographically isolated wetlands have demonstrated linkages with groundwater systems and aquifers that in turn discharge into navigable waters. Thus, the general function of water quality maintenance provided by all wetlands, including geographically isolated wetlands, is provided to the groundwater and navigable waters to which it is ultimately linked. The literature establishes that most geographically isolated wetlands are in fact functionally adjacent to navigable waters. Although these functional linkages are not as visually obvious as surface water connections through tributaries, they are just as directly related to the restoration and maintenance of our nation's water quality.

In light of this information, Ducks Unlimited believes it is critical that the agencies proceed to clarify definitions of adjacency and significant nexus to reflect the actual functional relationships, i.e., functional adjacency, between geographically isolated wetlands and navigable waters. This clarification can be accomplished administratively, without a new rulemaking process, in a way that would be wholly consistent with the intent and language of the Clean Water Act and subsequent case law. With functional definitions of adjacency and significant nexus in hand, the agencies should then move expeditiously to take any and all actions necessary to consistently apply the protections of Section 404 and other sections of the CWA to geographically isolated wetlands across the U.S.

We appreciate the opportunity to provide input into this critically important issue, and Ducks Unlimited will continue to stay engaged as this process unfolds. If you have any questions or desire further information regarding our comments, please contact Dr. Scott Yaich (901-758-3874; email syaich@ducks.org).

Sincerely,

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