16 April 2003

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

Re: Comments of Pacific Rivers Council opposing any rulemaking to change the regulatory definition of the waters of the United States.

Dear EPA:

Thank you for the opportunity to comment on the Advance Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of "Waters of the United States" (68 Fed. Reg. 1991 (January 15, 2003). Our comments respond to questions one and two posed by the Advanced Notice of Proposed Rulemaking (ANPRM), at page 1994, and also to several other requests for information located elsewhere in the notice.

We urge you to withdraw this proposed rulemaking and the associated guidance memorandum. Federal Clean Water Act protection for the waters that could lose protection under this proposal is necessary to achieve the purpose of the Act and legally justified. Although the proposal is motivated in part by the Supreme Court decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers,*[1] (*SWANCC)*, this case in no way requires the proposed changes.

There is only one definition of "waters" in the Act, thus any waters excluded from protection by the EPA and the Corps will lose protection under all provisions of the Act and its regulations. Removing the protection of these provisions for the waters put in question by the ANPRM will result in water pollution and aquatic ecosystem degradation that is simply inconsistent with the goals and the requirements of the Act.

COMMENTS

Question One: Whether, and, if so, under what circumstances, the factors listed in 33 CFR 328.3(a)(3)(i)-(iii) (i.e., use of the water by interstate or foreign travelers for recreational or other purposes, the presence of fish or shellfish that could be taken and sold in interstate or foreign commerce, and the use of water for industrial purpose by industries in interstate commerce) or any other

[1] 531 U.S. 159 (2001).

factors provide a basis for determining CWA jurisdiction over isolated, intrastate, non-navigable waters?

a. All current regulatory factors and definitions should be left in place

The limited holding of *SWANCC* is that "33 C.F.R. § 328(a)(3) . . . as clarified and applied to petitioner's balefill site pursuant to the "Migratory Bird Rule" . . . exceeds the authority granted to respondents under § 404(a) of the CWA."[2] Thus, none of the factors listed above are addressed by the *SWANCC* Court and all should be left in place because they protect waters necessary to meet the goals of the Act. Additionally, the factors in the "Migratory Bird Rule" that are not based on migratory birds were also not addressed in *SWANCC* and should also be left in place.

The Act's purpose is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1252(a). Each factor listed above protects waters important to achieving the goals of the Act and the agencies should continue to protect waters based on these factors.

b. All waters that are hydrologically or biologically connected to 'navigable' or other waters of the US, directly or indirectly, are among those protected under the Act.

All waters which are hydrologically or biologically connected to navigable or other waters of the United States are among those waters protected by the Act. It is imperative that protection measures – including the establishment of appropriate water quality standards – extend to seeps, springs, wet meadows, and wet areas, recognizing the importance of these aquatic features to the aquatic ecosystem.

In *SWANCC*, the US Supreme Court recognized that the term "navigable" is of "limited import."[3] The *SWANCC* Court reiterated it's finding in *United States v. Riverside Bayview Homes*[4] (*Riverside Bayview*) that the Act reaches those waters that are "inseparably bound up with the 'waters' of the United States."[5] The *SWANCC* Court also explains that its ruling in *Riverside Bayview* was based on the "significant nexus between the wetlands and "navigable waters.""[6]

When the terms "inseparably bound up" and "significant nexus" are interpreted in light of the Act's purpose of "restor(ing) and maintain(ing) the chemical, physical, and biological integrity of the Nation's waters,"[7] all waters that are hydrologically connected to the Nation's waters clearly fall within the Act's jurisdiction. For example, it is undisputed that the Act has as part of its goal the protection of our Nation's navigable waters, and the only scientifically credible way

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[2] 531 U.S. at 174.
[3] 531 U.S. at 167, *citing United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121 (1985).
[4] 474 U.S. 121 (1985).
[5] 531 U.S. at 167, *citing Riverside Bayview*, 474 U.S. at 134.
[6] *Id.*
[7] 33 U.S.C. 1252(a)

to protect these navigable waters is to protect all waters which are hydrologically connected to them.

Importantly, EPA's own guidance memorandum regarding *SWANCC* recognizes that "(t)he Supreme Court has not itself defined the term "adjacent," nor stated whether the basis for adjacency is geographic proximity or hydrology."[8] The only scientifically credible way to define the term "adjacent" in the context of the Act is to relate it to hydrologic and biological connectivity. The fact that a particular water body is isolated, intrastate or non-navigable itself is irrelevant to the question of whether it is "inseparably bound up with 'waters' of the United States." For example, while adjacency of a stream or wetland to a navigable water body would indicate a very high likelihood that management of such stream or wetland would affect that navigable water body, lack of adjacency certainly does not indicate the converse.

Examples of waters that are jurisdictional if directly or indirectly hydrologically connected to navigable or other waters of the US include:

a) streams that flow intermittently, ephemerally, in the sub-surface, or through human made conveyances;
b) all wetlands that discharge to groundwater that later flows into a navigable stream, and wetlands that are discharged to from groundwater which is hydrologically connected to navigable waters
c) wetlands within the 100-year flood plain of a navigable water
d) the hyporheic zone of any navigable water or one of its tributaries[9]
e) groundwater

The "significant nexus" is that these aquatic areas have the ability to influence important attributes of the waters that they are connected to, including nutrient, sediment and other pollutant loading, stream temperature, flow maintenance and fish and amphibian habitat. For a discussion of how wetlands and other waters potentially affected by this rulemaking affect downstream water bodies and beneficial uses supported by our aquatic system, please see (5) below.

In over twenty post-*SWANCC* cases, the US Department of Justice (DOJ) has taken the position that the existing definition of waters of the US is necessary for achieving the goals of the Act. For example, in *US v. Rapanos*, DOJ stated in its brief that "(t)o exclude non-navigable tributaries and their adjacent wetlands from the coverage of the Act would disserve the recognized policies underlying the Act, since pollution of non-navigable tributaries and their adjacent wetlands can have deleterious effects on traditionally navigable waters."[10]

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[8] 68 Fed. Reg. 1991, 1997 (January 15, 2003).
[9] "One of the most overlooked components of a stream and its valley is the hyporheic zone, the area of flow beneath the surface of the stream bed (Stanford and Ward 1988; Bencala 1993). In alluvial valleys, the hyporheic zones may extend several meters below the channel bed, as well as a kilometer or more laterally." Spence et al. , B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR. (Available from the National Marine Fisheries Service, Portland, Oregon), at §3.8.
[10] Brief for United States*,* filed in the United States Court of Appeals for the Sixth Circuit in July, 2002.

In summary, the purpose of the Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." It is critical to recognize that our Nation's waters, including our navigable waters, are strongly influenced by all of the waters that are hydrologically connected to them. Therefore, a rule which eliminates protection for any of these hydrologically connected waters would violate the Act and the EPA is without authority to make such a rule.

c) None of the language in *SWANCC* may impact aquatic areas that have been designated as Essential Fish Habitat under the Magnuson-Steven Act or areas that may impact such habitat or the fish depending on it

The ANPRM states that the agencies will consider the impact of *SWANCC* on §404, §303, §311, §401, and §402 of the CWA. The stated jurisdictional reach of §311 is broader than "navigable" waters. It targets discharges of "oil or hazardous substances" (unless permitted under §402) to a number of areas in addition to "navigable waters," including discharges "which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C.A. § 1801 et seq.])."[11] Thus jurisdiction under §311 is extended to those areas important for aquatic species managed under this fish conservation act.

The Sustainable Fisheries Act,[12] passed in 1996, amended the habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act (renamed the Magnuson-Stevens Act). The amended Magnuson-Stevens Act mandates the identification of Essential Fish Habitat (EFH) for managed species and the development of measures that minimize damage to EFH, and conserve and enhance the habitat necessary to fish to carry out their life cycles.[13] Any discharges to waters that are identified as EFH, or to waters that may have downstream effects on EFH, as well as any discharges that may directly affect aquatic species managed under the Magnuson-Stevens Act, therefore by definition "may affect natural resources . . . under the Magnuson-Stevens Fishery Conservation and Management Act." Such discharges thus are prohibited by §311 of the CWA, and the EPA is without authority to allow any discharges that "may affect" these resources.

Question Two: Whether the regulations should define "isolated waters," and if so, what factors should be considered in determining whether a water is or is not isolated for jurisdictional purposes?

We do not believe that creating regulations to define isolated waters is necessary or advisable. The long-standing definition of "waters of the United States" is not questioned by *SWANCC* and is necessary for achievement of the Act's goals.

3. Are other revisions needed to the existing regulations on which waters are deemed jurisdictional under the CWA?

[11] 33 U.S.C. 1321(b)(1).
[12] Public Law 104-297.
[13] Public Law 104-297, § 303(a)(7).

The *SWANCC* Court rendered an "as-applied" decision regarding whether the Migratory Bird Rule could be used to protect a human-made series of ponds based solely on the use of these ponds by migratory birds. These ponds were not classified by the Corps as jurisdictional wetlands, neither were they hydrologically connected to other waters. We do not support any changes to the existing regulations at this time.

4. Data and information on the availability and effectiveness of other Federal or State programs for the protection of aquatic resources, and practical experience with their implementation.

The existence of overlapping protection is irrelevant to the agencies' efforts to fully implement the Act. The fact that a state or another federal program may also currently offer protection for aquatic resources does not mean that the agencies can avoid their duties under the Act. It is important to note that the motivation and purpose behind many of these potentially "overlapping" programs is the CWA itself, particularly with respect to state programs designed to address nonpoint sources. Although some states may choose to go beyond federal minimums, it is likely that shrinking federal jurisdiction under the Act will have the ripple effect of shrinking the scope of state programs as well. It is critical that the Act's scope be maintained in order to ensure that it continues to serve as the nation's compass for water quality protection.

5. Data and information on the functions and values of wetlands and other waters that may be affected by the issues discussed in this ANPRM.

The wetlands and streams that could lose protection under the a rule change perform critical functions in maintaining the chemical, physical, and biological integrity of our Nation's waters. Discussed below are some water quality and habitat parameters and some of the functions that some of the areas that could lose protection provide in maintaining these. Examples are given of how impacts to these areas would propagate downstream, impacting attainment of §303 water quality standards and beneficial uses, and the ability to meet the goal of §402. We do not discuss the specific economic values accrued from the areas that perform these critical functions, but clearly many of these functions are irreplaceable at any dollar amount.

a) Water Quality

Section 303 protects beneficial uses of regulated waters. Water quality is critical to maintaining beneficial uses including agricultural, industrial, domestic and municipal water supplies, recreation, power generation, and maintaining populations and habitat of salmon and other aquatic organisms.

Attainment of §303 water quality standards cannot be meaningfully discussed without reference to the condition of headwater streams, many of which exhibit only seasonal flow, and wetlands. Intermittent streams play an important role in storing and processing organic materials, later transporting the products downstream.[14] Intermittent streams also store sediment, later providing

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[14] FEMAT (Forest Ecosystem Management Team). 1993. Forest ecosystem management: an ecological, economic, and social assessment. Report of the Forest Ecosystem Management Assessment Team. U.S. Government Printing Office 1993-793-071. U.S. Government Printing Office for the U.S. Department of Agriculture, Forest Service;

it to larger streams.[15] Wetlands contribute to meeting water quality standards by accumulating nutrients, trapping sediments and pollutants, and transforming substances.[16] Hydrologic pathways such as precipitation, surface runoff, groundwater, tides, and flooding rivers transport energy and nutrients to and from wetlands.[17] Additionally, by reducing flood flow amounts and velocities, wetlands reduce erosion.[18] Because wetlands receive, store, and release water in various ways, including through contact with ground water and surface water,[19] filling or discharging pollutants to wetlands can have water quality impacts in other parts of a watershed.

Based on these same principles, failing to extend CWA jurisdiction to all waters that are hydrologically connected to "navigable" or other waters will, in some cases, result in the "discharge of pollutants"[20] to these waters without permits, in violation of §402.

i) Sediment

Section 303 beneficial uses that are adversely affected by high sediment loads and turbidity include agricultural, industrial, domestic and municipal water supplies, power generation, water storage, and maintenance of fish and other aquatic populations and habitat. For power generation, turbidity increases wear on the turbines and increases water treatment costs.[21] Increased sedimentation in reservoirs can significantly decrease the life of the structure.[22] Fish are adversely impacted by siltation and turbidity in numerous ways. The following summary of these impacts is excerpted from *An Ecosystem Approach to Salmonid Conservation.*[23]

U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Land Management, and National Park Service; U.S. Department of Commerce, National Oceanic and Atmospheric Administration and National Marine Fisheries Service; and the U.S. Environmental Protection Agency, at V-36.

[15] *Id.*

[16] *See e.g.* National Research Council, Committee on Characterization of Wetlands. 1995. Wetlands: Characteristics and Boundaries, at 31, *citing* Mitsch, W.J., C.L. Dorge, and J.R. Wiemhoff. 1979. Ecosystem dynamics and a phosphorus budget of an alluvial cypress swamp in southern Illinois. Ecology 60:1116-1124; Lowrance, R.R., R.L. Todd, and L.E. Asmussen. 1984a. Nutrient cycling in an agricultural watershed, I. Phreatic movement. J. Environ. Quality 13:22-27; Lowrance, R.R., R.L. Todd, J. Fail, O. Hendrickson, R. Leonard, and L. E. Asmussen. 1984b. Riparian forests as nutrient filters in agricultural watersheds. BioScience 34:374-377; Whigham, D.F., C. Chitterling, and B. Palmer. 1988. Impacts of freshwater wetlands on water quality: A landscape perspective. Environ. Mgmt. 12:663-671; aulkner, S.P., and C.J. Richardson. 1989. Physical and chemical characteristics of freshwater wetland soil. Pp. 41-72 in Constructed Wetlands for Wastewater Treatment, D. A. Hammer ed. Chelsea, MI: Lewis Publishers; Johnston, C.A. 1991. Sediment and nutrient retention by freshwater wetlands: Effects of surface water quality. Critical Reviews in Environmental Control. 21:491-565; and FEMAT 1993 (*see* supra note 14), Appendix V-E, *citing* National Research Council, Committee on Restoration of Aquatic Ecosystems. 1992. Restoration of Aquatic Ecosystems. National Academy Press. 552 p.

[17] Mitsch, W.J., and J.G. Gosselink. 2000. Wetlands. John Wiley & Sons, New York. 920 pp.

[18] *Id.*

[19] Wetland Functions and Values Training Module, EPA. On the wet at: http://www.epa.gov/watertrain/wetlands/text.html

[20] 33 U.S.C. 1362(12), CWA §502(12) defines "discharge of pollutants" to mean "(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft."

[21] Reid, L.M. 1993. Research and Cumulative Watershed Effects. USDA Forest Service Gen. Tech. Rep. PSW-GTR-141, at 90.

[22] *Id.*

[23] Spence et al. 1996 at §5.1.2, *see* supra note 9.

> Siltation and turbidity adversely affect fish at every stage of their life cycle (Iwamoto et al. 1978). In general, deposited sediments have a greater impact on fish than do suspended sediments: spawning and incubation habitats are most directly affected (see Section 5.2.2). Particulate materials physically abrade and mechanically disrupt respiratory structures (e.g., fish gills) or surfaces (e.g., respiratory epithelia of benthic macroinvertebrates) in aquatic vertebrates and invertebrates (Rand and Petrocelli 1985). Sediment covers intergravel crevices which fish use for shelter, thereby decreasing the carrying capacity of streams for young salmon and trout (Cordone and Kelley 1961; Bjornn et al. 1974). Fish vacate pools in summer after heavy accumulation of sediments (Gammon 1970). Finally, turbidity affects light penetration, which in turn affects the reactive distance of juvenile and adult salmonids for food capture (see Section 5.2.2).

Siltation and turbidity also impact stream-dwelling amphibians by, for example, filling intergravel crevices which juveniles and adults use for cover and by scouring algae (the main foodsource for juveniles) from gravel and streambed surfaces.

Achievement of water quality standards relating to sediment (reduced turbidity and narrative standards) relies in significant part on reducing anthropogenic sediment inputs to headwater streams, many of which exhibit only seasonal flow. For example, forestry related activities tend to cause acute sediment loading in smaller streams but smaller, chronic relative increases in sediment loading in larger-order streams.[24] The result is a continual increase and accumulation of sediment in a downstream direction.[25]

In Oregon, the connection between forestry impacts on small, seasonal streams and the impairment of downstream beneficial uses is well recognized by both EPA and NOAA. In their 1998 Findings regarding Oregon's Coastal Nonpoint Pollution Control Program, submitted pursuant to § 6217(a) of the Coastal Zone Act Authorization Amendments of 1990, the agencies stated: "Oregon has a number of species, in particular anadromous salmonids, that are endangered, threatened, or otherwise seriously at risk, due in part to forestry activities that impair coastal water quality and beneficial uses, including salmon spawning, breeding, and rearing habitat."

EPA and NOAA specifically expressed concerns about adequate protection of seasonal, non-fish bearing, small and medium streams. In their Findings, the agencies stated that:

> (U)nder existing State forest practices, medium, small, seasonal, and non-fish bearing streams may be subject to loss of sediment retention capacity, increases in delivery of fine sediments, and increases in temperature due to loss of riparian vegetation. Another concern is provision of adequate long-term supplies of large woody debris in medium, small, seasonal, and non-

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[24] Beschta, R. L., J. R. Boyle, C. C. Chambers, W. P. Gibson, S. V. Gregory, J. Grizzel, J. C. Hagar, J. L. Li, W. C. McComb, M. L. Reiter, G. H. Taylor, and J. E. Warila. 1995. Cumulative effects of forest practices in Oregon. Oregon State University, Corvallis. Prepared for the Oregon Department of Forestry, Salem, Oregon, at §7.6-134.
[25] *Id.*

> fish bearing streams, a shortage of which can result in decreases sediment storage in upstream tributaries increased transport and deposition downstream, and overall adverse impacts to beneficial uses.

These problems motivated the agencies to call for stronger protection under state rules for "medium, small, and non-fish bearing streams, **including intermittent streams**."[26] The ecological principles behind these concerns apply nationwide.

The Findings also recognize that land management induced mass wasting impairs water quality and prevents full support of beneficial uses in Oregon's Coast Range. Landslides and debris flows often occur in steep headwater systems. Intermittent channels are sites of land management-initiated debris flows which can significantly impact aquatic habitat.[27] EPA and NOAA identified "protection of areas at high risk for landslides" as one of the areas "where existing practices under the (Oregon Forest Practices Act) and (Oregon Forest Practices Rules) should be strengthened to attain water quality standards and fully support beneficial uses."[28]

In January 2003, the EPA and NOAA reiterated their concerns regarding the need to protect headwater streams and associated landslide-prone areas in Oregon.[29] Specifically, the agencies noted that Oregon's forestry measures were inadequate to meet temperature and sediment targets in approved TMDLs. The agencies' stated expectation is that, if Oregon chooses to apply the Oregon Forest Practices Act consistently, the two sets of science based recommendations that Oregon had put forward will "be fully adopted, **particularly those addressing small and non-fish bearing streams and management of landslide prone areas.**"[30]

ii) Chemical pollutants

Pollutants other than sediment generally enter water chronically through industrial processes, and runoff from agricultural, mining and urban areas. Another source is episodic inputs from spills. Additionally, excessive nutrient loading resulting from various types of land management can have adverse impacts on water quality and beneficial uses. §303 beneficial uses that rely on absence or minimization of such pollutants include agricultural, industrial, domestic and municipal water supplies, recreation, aesthetic enjoyment, and maintenance of fish, amphibian and other aquatic populations and habitat.

Adverse effects of toxic pollutants on salmonids include direct mortality and sublethal impacts such as behavioral or morphological abnormalities.[31] Some toxins can bioaccumulate in fish

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[26] *Id.* (emphasis added).
[27] FEMAT 1993at V-72, *see* supra note 14.
[28] EPA & NOAA. 1998. Findings for the Oregon Coastal Nonpoint Program.
[29] EPA & NOAA. 2003. 6217 Boundary Decision and Response to Oregon's Supplemental Information in response to the Federal Findings of January 1998, submitted April 1999, January 2002 and October 2002.
[30] *Id.* (emphasis added).
[31] Spence et al. 1996 at §14.2.4, *see* supra note 9.

making them unsafe for human consumption.[32] Toxic pollutants also have lethal and sublethal impacts on amphibians, including endocrine disruption and facilitation of disease spread.[33]

Revoking §402 protection for any waters that are hydrologically connected to "navigable" waters or other waters of the US will defeat the goals of §402 because any water that is hydrologically connected to a water body is potentially capable of delivering pollutants to it. Though properties of different chemicals affect how they move through a watershed,[34] it is clear that some pollutants can travel long distances through hydrologically connected waters. Even perched wetlands, that are vertically "isolated" from groundwater, can recharge groundwater by lateral seepage.[35] Some (though not all) wetlands can release water to ground water and/or surface water and many navigable surface streams and their tributaries are partially groundwater supplied. In this situation, allowing §402 discharges to a wetland that discharges to such groundwater, for at least some chemicals, will defeat the goal of §402.

Revoking §404 protection against filling wetlands that are hydrologically connected to surface waters will also significantly impair water quality in these surface waters. Wetlands contribute to meeting water quality standards by accumulating nutrients, trapping sediments, and transforming substances.[36] Some nutrients, as well as toxic substances, are taken up by plants, while others are bound to suspended solids, which subsequently settle to the bottom.[37] A study in Iowa found that nitrate concentrations in streams are inversely related to the percentage of total watershed area in wetlands.[38] Revoking prohibitions against filling these areas will result in more pollution to our Nation's waterways.

iii) Stream temperature

Increases in stream temperature can retard or preclude meeting §303 beneficial uses including agricultural, industrial, domestic and municipal water supplies, and maintenance of fish, amphibians and other aquatic populations and habitat.

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[32] *Id.*

[33] *See e.g.*, Relyea, Rick A. and N. Mills. 2000. Predator-induced stress makes the pesticide barbaryl more deadly to gray treefrog tadpoles (*Hyla versicolor*). PNAS Early Early Edition, online article, www.pnas.org/cgi/doi/10.1073/pnas.031076198; Boone, M.D. and R.D. Semlitsch. 1999. Interactions of an Insecticide with Larval Density and Predation in Experimental Amphibian Communities. Conservation Biology: Vol. 15, No. 1, pp. 228-238; Angermann, J.E., G.M. Fellers, and F. Matsumura. 2002. Polychlorinated biphenyls and toxaphene in Pacific Tree Frog tadpoles (Hyla regilla) from the California Sierra Nevada, USA. Environmental Toxicology and Chemistry: Vol. 21, No. 10, pp. 2209-2215; Hayes, T., Haston, K., Tsui, M., Hoang, A., Haeffele, C. and Vonk, A. 2002a. Feminization of male frogs in the wild. Nature, 419, 895 – 896; Hayes, T. et al. 2002b. Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses. Proceedings of the National Academy of Sciences, 99, 5476 - 5480.

[34] Reid 1993 at 76, *see* supra note 21.

[35] Brooks, K.N., Ffolliott, P.F., Gregersen, H.M., and L.F. DeBano. 1997. Hydrology and the Management of Watersheds, 2nd edition. Iowa State University Press, Ames, Iowa, *citing* Kleinberg, K. 1984. Hydrology of north central Florida Cypress Downs. In *Cypress Swamps,* ed. K. C. Ewel and H. T. Odum, 72-82. Gainesville: Univ. of Florida Press.

[36] National Research Council 1995 at 31, *citing* Mitsch et al., 1979; Lowrance et al., 1984a,b; Whigham et al., 1988; Kuenzler, 1989; Faulkner and Richardson, 1989; Johnston, 1991, *see* supra note 16.

[37] Spence et al. 1996 at §6.10.2, *see* supra note 9.

[38] National Research Council 1995 at 33, *see* supra note 9, *citing* Jones, J.R., B.P. Borofka, and R.W. Bachmann. 1976. Factors affecting nutrient loads in some Iowa streams. Water Research 100:117-122.

Following is list, excerpted from *An Ecosystem Approach to Salmonid Conservation,*[39] of some of the important physiological and ecological processes with regards to salmonids that are affected by temperature:

- Decomposition rate of organic materials
- Metabolism of aquatic organisms, including fishes
- Food requirements, appetite, and digestion rates of fishes
- Growth rates of fish
- Developmental rates of embryos and alevins
- Timing of life-history events including adult migrations, fry emergence, and smoltification
- Competitor and predator-prey interactions
- Disease-host and parasite-host relationships
- Development rate and life history of aquatic invertebrates

Stream temperature can be affected by point sources and also suffers from nonpoint source impacts. Improvement in stream temperature is a classic target of TMDLs. In the forestry context, ample studies demonstrate stream temperature increases in headwater streams after riparian vegetation removal. Negative impacts can accrue to fish, amphibians and other aquatic species that depend for part of their life cycles on these small streams. Another important adverse fisheries impact of heating up these headwater streams is the loss of the cold water refugia that forms where the normally cold headwater stream enters a larger fish-bearing stream. These areas are often critical for fish survival during warm months.

b) Stream flow

§303 beneficial uses affected by stream flow include agricultural, industrial, domestic and municipal water supplies, recreation, aesthetic enjoyment, power generation, water storage and maintenance of fish and other aquatic populations and habitat.

An Ecosystem Approach to Salmonid Conservation summarizes some of the impacts that altered flow regimes have on salmonids[40]:

> Stream discharge strongly influences the amount of habitat available to salmonids and the physical characteristics of those habitats; thus hydrologic changes influence salmonids in a variety of ways. Increases in peak flows can scour spawning gravels, change substrate size, redistribute large woody debris within the channel, facilitate channel incision or widening, and accelerate bank erosion. Reduced summer low flows can dewater stream reaches, prevent or inhibit fish migration, and produce higher summer temperatures. Changes in the seasonal timing of flows may disrupt the

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[39] Spence et al. 1996 at §5.1.2, *see* supra note 9.
[40] Spence et al. 1996 at §14.2.1, *see* supra note 9.

migration of salmonid juveniles and adults, and may increase the frequency with which disturbances occur during specific life stages (e.g., the incidence of spawning gravel scouring during early fall). In addition, natural flood and drought cycles are important for normal establishment of riparian vegetation. Hydrologic changes in watersheds may indirectly affect salmonid habitats by altering soil moisture content and stability, which affect the rate of sediment delivery to streams via mass failures and surface erosion.

Wetlands, and ground water that is recharged by wetlands, provide stream flow control by reducing high flows as well as augmenting low flows. The function that wetlands play in reducing the frequency and severity of flooding is undisputed. Inland wetlands can lower flood peaks by storing flood water and slowly releasing it downstream.[41] If §404 protection is undermined, in watersheds where the result is a loss of wetlands there will also be a loss of ability to store flood water, resulting in higher frequency and severity of downstream flooding.

In addition to reducing flooding, wetlands can influence seasonal distribution of stream flows.[42] Wetlands can reduce the rate of ground water discharge to the stream while increasing the length of time that discharge occurs.[43] The relatively constant and cool temperature of water supplied to streams from groundwater can play an important role in maintaining stream temperatures, and thus changes in discharge rate that will likely occur from loss of wetlands could have negative impacts on salmonids.[44] Other aquatic organisms, such as amphibians, could also be negatively affected.

Land management activities in a watershed can also impact flow regimes. In most instances, land-use activities result in an increase in total water yield due to decreases in evapotranspiration demand following the removal of vegetation.[45] Such land-use activities should be considered in TMDLs for watersheds where flow modification is an identified problem, and addressing the management of the entire hydrologic system – including all wetlands and small streams – is critical to formulating a successful plan.

c) Channel morphology.

§303 beneficial uses that can be impacted by changes in channel morphology include fish, amphibians and other aquatic organism populations and habitat, and recreation. Land

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[41] FEMAT 1993 at Appendix V-E, *see* supra note 14, *citing* National Research Council 1992, *see* supra note 16.
[42] Spence et al. 1996 at §6.10.1, *see* supra note *9, citing* Novitzki, R.P. 1979. Hydrologic characteristics of Wisconsin's wetlands and their influence on floods, stream flow, and sediment. Pages 377-388 *in* P. E. Greeson, J. R. Clark, and J. E. Clark, editors. Wetland functions and values: the state of our understanding. Proceedings of the national symposium on wetlands, 7-10 November, 1978. American Water Resources Association, Minneapolis, Minnesota..
[43] Spence et al. 1996 at §6.10.1, *see* supra note *9.*
[44] Spence et al. 1996 at §6.10.1, *see* supra note *9.*
[45] Spence et al. 1996 at §14.2.1, *see* supra note *9, citing* Bosch, J.M., and J.D. Hewlett. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. Journal of Hydrology (Amsterdam) 55:3-23; Satterlund, D.R., and P.W. Adams. 1992. Wildland watershed management, 2nd edition, John Wiley and Sons, Inc., New York.

management can either aggrade or incise channels, and these changes in channel morphology can affect stream temperature, aquatic habitat, and how a channel moves sediment and water. Fish and other aquatic species can be adversely affected by changes in channel morphology in several ways including loss of preferred spawning gravels and loss of rearing and winter habitats.[46]

Increasing sediment supply to a stream beyond its capacity to move the sediment may result in channel aggradation.[47] Conversely, increases in the erosive power of the stream without increases in sediment supply can result in erosion of the channel.[48] Changes in channel morphology can impact other stream parameters. For example, the Water Quality Management Plan for the Grande Ronde, Oregon TMDL[49] contains these items on a list of processes that raise stream temperatures in the watershed:

> 4. Removal of riparian vegetation contributes to stream bank and hill slope failures. Roads also contribute to these failures.
> 5. Bank and slope failures contribute sediment to streams and increase the width depth ratio.
> 6. Solar radiation increases when streams become wider and shallower (creating a larger surface area exposed to the sun in relation to volume – higher width depth ratio).

Any loss of protection for waters that results in additional sediment inputs to streams, and/or loss of sediment storage in a watershed (including in wetlands), may potentially result in changes to downstream channel morphology. Similarly, changes in stream discharge, such as increases in the frequency or magnitude of peak flows, that could result from filling in wetlands could also result in changes channel morphology.

d) Physical aquatic habitat for fish.

Headwater stream function is critical to maintaining and restoring watershed function and fully protecting beneficial uses. Attainment of §303 beneficial uses relating to fish cannot be meaningfully discussed without reference to the condition of headwater streams, many of which exhibit only seasonal flow, and wetlands. In addition to the critical role that these areas play regarding water quality as discussed above, small, non-navigable streams –including non-perennial stream- are critical to fish both because they provide habitat themselves and because their management strongly affects the physical formation of fish habitat in the larger streams lower in the watershed.

In the Pacific Northwest, headwaters make up 85% of total stream miles, taking the form of seeps, rivulets and cascading flows.[50] Nearly three-quarters of the streams in the Sierra Nevada

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[46] Reid 1993 at p. 82-83, *see* supra note 21.
[47] Beschta et al. 1995 at §7.5-79, *see* supra note 24.
[48] *Id.*
[49] http://www.deq.state.or.us/wq/TMDLs/TMDLs.htm
[50] Bury, R. Bruce. 1988. Habitat relationships and ecological importance of amphibians and reptiles. Pp. 61-76. In K.J. Raedeke, Ed. Streamside management: riparian wildlife and forestry interactions. Institute of Forestry Resources, University of Washington, Contribution Number 59.

national forests are ephemeral (54%) and intermittent (20%), whereas only one-quarter (26%) are perennial.[51] As one author explains, "If riparian vegetation is the "aorta of an ecosystem" (Wilson 1979), then headwaters should be considered as the capillaries of the system; they also must be healthy if the system is to function properly."[52]

Intermittent streams play an important role in creating and maintaining the physical habitat structure that fish rely on. Headwater systems provide a functional link between terrestrial processes and fish bearing streams.[53] Employing the River Continuum Concept[54] to riparian protection measures would result in the greatest protection occurring in headwater zones.[55] Importantly, intermittent streams store large wood, later providing it to larger streams.[56] Near natural movement of sediment and organic matter in watersheds is required to ensure creation of adequate habitat conditions for aquatic species and to preserve their food resources.

Small streams and wetlands also provide breeding and rearing habitat for fish that later move downstream. For example, coho salmon spawn and the juveniles rear in smaller, upper tributaries and spring Chinook spawn in the headwaters.[57] Other native fishes including sculpins and suckers, in the western United States rivers also spawn in large numbers in secondary channel branches and in floodplain tributary channels, including those that go dry as surface waters and groundwater tables recede in the summer months. In addition, wetlands may contribute to maintaining variable, but moderate streamflows; cool, well oxygenated, unpolluted water; relatively sediment-free streambed gravel; an adequate food supply; and instream structural diversity provided by woody debris all of which are required by salmonids.[58] Many of these areas receive no special protection under any statutes other than that the CWA's water quality standards and section 404 provisions (although in practice smaller floodplain wetlands and channels are too often neglected).

It is also important to note that many species depend on wetlands or small streams for one or more portions of their life cycle, and the Act's protection for these areas likely plays an important role in preventing the conditions that would lead to listing more species as threatened and endangered under the Endangered Species Act (ESA). The ESA serves as a critical safety net for species if and when they become imperiled and listed. However, the ESA is often ineffective at preventing the reduction in habitat, population numbers, and threats that lead to

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[51] United States Forest Service (USFS). 2000. Sierra Nevada Forest Plan Amendment: Draft Environmental Impact Statement. Pacific Southwest Region.
[52] Bury 1988, *see* supra note 47.
[53] Gomi, T., R.C. Sidle, and J.S. Richardson. 2002. Understanding processes and downstream linkages of headwater systems. Bioscience 52(10):905-916.
[54] Vannote, R.L., G.W. Minshall, K.W. Cummins, J.R. Sedell, and C.E. Cushing. 1980. The river continuum concept. Canadian Journal of Fisheries and Aquatic Sciences 37:130-136.
[55] Noss, R.F. ed. 2000. The redwood forest: History, ecology, and conservation of the coast redwoods. Island Press. Covelo, California.
[56] *Id.*
[57] Lichatowich, J. 1999. Salmon Without Rivers. Island Press. 317 pp.
[58] Spence et al. 1996 at §6.10.3, *see* supra note 9, *citing* Cederholm, C.J. 1994. A suggested landscape approach for salmon and wildlife habitat protection in western Washington riparian ecosystems. Pages 78-90 *in* A. B. Carey and C. Elliot, editors. Washington Forest Landscape Management Project Progress Report. Washington Department of Natural Resources, Olympia, Washington.

listings. The protection that the current CWA regulations offers to wetlands and streams should be utilized as a proactive way to help maintain healthy populations of a myriad of species that depend on these areas.

e) Physical aquatic habitat for fauna other than fish, including amphibians, reptiles and fresh water mollusks.

"Temporary" streams, wetlands, and wet meadows provide important breeding, rearing, and dispersal habitat for many endangered and at-risk amphibian species.[59] For example, in the Pacific Northwest some amphibian species breed only in mountain streams including the tailed frog, Cope's salamander, Pacific Giant salamander, and torrent salamander.[60] The red-legged frog breeds in intermittent waters.[61] In addition, some reptile species and many fresh water mollusks depend on wetlands and small streams. Western pond turtles rely on wetlands,[62] and many freshwater mollusk species are restricted to single stream systems, seeps and springs.[63]

6. Data and comments (from State and local agencies) on the effect of no longer asserting jurisdiction over some of the waters (and discharges to those waters) in a watershed on the implementation of Total Maximum Daily Loads (TMDLs) and attainment of water quality standards.

Loss of jurisdiction over small streams, including non-perennial streams, would eviscerate the ability to formulate credible and effective TMDLs and to attain water quality standards. We recognize that one of the current weaknesses in many current water quality standards is that they are not written in ways that fully reflect the role of small streams - such that their direct meaning for non-perennial streams may not always be entirely clear. However, the fact that there is room for improvement in full implementation of the current Act does not justify completely removing poorly regulated waters from CWA jurisdiction. This would make it even more difficult to encourage actual implementation of measures to control nonpoint sources of pollution and to meet existing TMDLs and water quality standards.

CONCLUSION

We urge the EPA to immediately withdraw this ANPRM and the associated Guidance, and fully implement the Clean Water Act under the current regulations, except in the narrow as-applied situation addressed in *SWANCC*. Thank you for your consideration of these comments.

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[59] *See e.g*., Knutson, M.G., J.R. Sauer, D.A. Olsen, M.J. Mossman, L.M. Hemesath, and M.J. Lannoo. 1999. Effects of Landscape Compositions and Wetland Fragmentation on Frog and Toad abundance and Species Richness in Iowa and Wisconsin, U.S.A. Conservation Biology 13:1437-1446; and Lowe, W.H. and D.T. Bolger. 2002. Local and landscape scale-predictors of salamander abundance in New Hampshire headwater streams. Conservation Biology 16:183-193.
[60] FEMAT 1993, Appendix V-E, *see* supra note 14.
[61] *Id. citing* O'Connell, M.A., J.G. Hallet and S.D. West. 1993. Wildlife use of riparian habitats: A literature review. TFW-WL1-93-001, *citing* Hayes, M.P., Jennings M.R. 1986. Decline of ranid frog species in western North America: Are Bullfrogs (*Rans catesbeiana)* responsible? Journal of Herpetology 20: 490-509.
[62] FEMAT 1993, *see supra note* 14.
[63] *Id.*

Sincerely,

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