July 30, 2015

Gary J. Brower, Esq.
Attn: DEP Docket Number 05-15-04
NJ DEP
Office of Legal Affairs
Mail Code 401-04L
401 East State Street, 7th Floor
P.O. Box 402
Trenton, NJ 08625-0402

Re: ***Comments on Proposed Amendments -Flood Hazard Area Control Act Rules; Coastal Zone Management Rules; & Stormwater Management Rules (PRN 2015-053)***
Commerce and Industry Association of New Jersey

Dear Mr. Brower,

The Delaware Riverkeeper Network respectfully submits these comments. Generally speaking, in our reading and assessment of the proposed changes, while there are sections that will regulate greater protections for the State's natural resources and residents and we applaud those, there are many sections that will do just the opposite. DRN opposes the elements of the Flood Hazard Area Control Act rules where they reduce protections in by streamlining the permitting process, creating greater waiver opportunities, reducing naturally-effective buffers, removing well-experienced, dedicated DEP staff from being an active part of the in-the-field process and other measures that will ultimately and negatively impact the States natural resources and place residents at risk.

We also protest the incredibly short time frame for public comment given the length and complexity of the rule proposal and the summer vacation time of year that the public comment period spans. It seems clear that NJDEP is not interested in truly informed and thoughtful public comment.

That being said, the Delaware Riverkeeper Network submits these comments for the record. In addition to the comments provided below (Attached), we attach the review of an expert we have commissioned to assist in our review and the preparation of our comments..

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Overall these regulations are highly problematic, in many instances they allow water quality to degrade, including for anti-degradation streams, for habitat to be diminished, for landcover and activities that reduce infiltration and increase water runoff, and allow for flood peaks and flows to increase – all in violation of the stormwater, coastal zone and flood hazard mandates of NJ law. This regulatory proposal needs to be reconsidered, line by line, to prevent legal backsliding.

New Jersey was an active part of the DRBC's Floodplain Regulation Evaluation Subcommittee which included specific recommendations for strengthening floodplain regulations and protections. We include this report with our comments and recommended that New Jersey incorporate the many recommendations it includes to the extent NJ does not already and that NJ not allow any backsliding for its current regulatory standards and mandates.

Coastal Zone Management Provisions

7:7E-3.26 (d)(1) and (2) should be reference bankfull as the measuring point for purposes of the riparian zone when the top of bank is not discernible. Using bankfull is more scientifically defensible and should be easily determined by an expert with the appropriate training necessary to help an applicant apply the various mandates of the Flood Hazard Area Rules. According to Natural Channel Design, Review Checklist, US Fish & Wildlife Service, Stream Mechanics, and the U.S. EPA (Nov. 2011): Bankfull is "The bankfull stage is the elevation of the water surface during a bankfull flow (Figure 2). This stage is often identified in the field by a geomorphic indicator, such as the top of the bank, slope break, highest part of a point bar or a scour line. The bankfull discharge is the flow that fills the active channel and represents the breakpoint between channel-forming processes and floodplain processes. It is assumed for most projects that the bankfull discharge equals the effective discharge, which is the flow that transports the most sediment over a long period of time."

7:7E-3.26 (e)(2) we would recommend to you that this provision regarding the mandatory buffer width for trout production waters, trout maintenance waters, and waters flowing through endangered or threatened wildlife or plant species habitat should articulate 150 feet as the minimum mandatory width and allow for a demonstration by interested parties regarding the appropriateness for mandating a wider buffer if needed to properly support the particular species associated with the waterway at issue. For example, there are a number of species of birds for which 300 feet or more are necessary to properly support the species, if it can be shown that regulated waters flow through habitat for a threatened or endangered species that require this larger buffer width, then the department should have the authority to mandate it in any coastal zone, stormwater or flood hazard area authorization given.

7:7E-3.26 (e)(3) should increase the mandatory buffer width for all waters not identified elsewhere in 7:7E-3.26 (e)(1) or (2) be increased to a minimum 100 foot buffer. This mandatory buffer minimum should be provided for in every regulatory provision that otherwise mandates a buffer that is smaller, and it should apply to all new development and redevelopment projects.

In addition, in all provisions regarding a mandatory buffer width for trout production waters, trout maintenance waters, and waters flowing through endangered or threatened wildlife or plant species habitat there should be a provisions that allows for a demonstration by interested parties regarding the appropriateness for mandating a wider buffer if needed to properly support the particular species

associated with the waterway at issue. For example, there are a number of species of birds for which 300 feet or more are necessary to properly support the species, if it can be shown that regulated waters flow through habitat for a threatened or endangered species that require this larger buffer width, then the department should have the authority to mandate it in any coastal zone, stormwater or flood hazard area authorization given.

Forests and riparian vegetation play an important role in ensuring stormflows are stored and released gradually rather than immediately surging downstream in large flood pulses. The dissipation of flood energy will vary with the width of the riparian buffer in comparison with the channel width.[1] It is essential to have riparian buffers that are wide enough to provide adequate flood control, damage reduction, erosion prevention, and the many other non-flood related benefits. Scientific evidence suggests that a minimum buffer of 100 feet is needed to provided essential flood protection benefits.[2] Smaller widths do not adequately maintain most of the beneficial function of riparian buffers and therefore, are of much more limited value.

The importance of streamside buffers in protecting and enhancing water quality cannot be overstated. In addition to preventing water pollution, buffers enhance the health of stream ecosystems, allowing them to provide important services that further reduce the impacts of water quality pollutants to downstream environments. The scientific literature supports the conclusion that a minimum of 100 foot riparian buffer must be maintained to provide both the upland and instream services necessary to protect the water quality of adjacent streams and rivers. Although the optimal buffer width may vary from site to site, a 100 foot fixed-width minimum buffer policy is both scientifically supported and administratively simpler to implement with larger buffer requirements being important and necessary for preserving the healthy and integrity of anti-degration waters (e.g. C-1 streams, trout production and trout maintenance streams, and streams that flow through habitat of threatened or endangerd species of plant or animal).

See discussions below for the water quantity, quality and economic values of increasing the buffer mandate as it applies to all waters not more firmly protected by larger buffer mandates. That information applies equally to this section of our comment.

7:7E-3.26 (h) should be expanded. As noted above, the importance of riparian buffers cannot be overstated. Concepts which needed to be added and/or better emphasized in this section as well as in sections associated with the benefits of buffers in both the Flood Hazard Area Rule and Stormwater Rule include (but are not limited to):

- Stress that healthy vegetated riparian buffers are irreplaceably important to people as well as animals and the environment;

[1] Tabacchi, E., Lambs, L., Guilloy, H., Planty-Tabacchi, A. M., Muller, E., & Decamps, H. (2000). Impacts of riparian vegetation on hydrological processes. Hydrological processes, 14(16-17), 2959-2976.

[2] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.; Johnson, A.W. and D. M. Ryba. 1992. A literature review of recommended buffer widths to maintain various functions of stream riparian areas. Prepared for King County Surface Water Management Division, as cited in Buffer Strip Function and Design, An Annotated Bibliography, Compiled for Region III Forest Practices Riparian Management Committee. Aquatic Resource Consultants, Renton, WA.

- Erosion of public and private lands that not only washes away the investment of private landowners and public bodies, but also can undermine and threaten infrastructure; as land washes away, buildings and critical infrastructure can also be damaged or threatened.[3] Houses and roads can be washed away, bridge foundations can be undermined, utilities can be damaged, and communities can be isolated.

- Sediment that is eroded into streams and rivers cause significant off-site and downstream impacts due to sedimentation. Siltation of waterways and navigational channels reduces reservoir storage capacity, reduces hydrologic electric production capacity, shortens the life and increases the maintenance costs of dams, and results in commercial shipping damages due to inland grounds, delays and engine problems. Dredging is very expensive, and the financial burden falls on the public. For example, 130 million m^3 of sediments are dredged annually from ports and channels in the U.S.[4] at a cost of over $520 million.[5] Furthermore, estimated reservoir siltation costs range from $274 to $851 million.[6] The most significant factor affecting annual sedimentation of reservoirs is the quantity of sediments that flow into reservoirs which is directly linked to the rate of erosion upstream. Analysis shows that it would be more economical to fund management practices that reduce erosion and sedimentation than to rely on continual dredging.[7] For example, a one-ton reduction in soil erosion can conserve up to $1.38 in reservoir benefits which equates to up to $154 million saved over a 15 year period.[8]

- Riparian buffers also have aesthetic value that enhances quality of life and itself can translate into economic benefit. The aesthetic value of buffers can have a direct economic impact through increased property values, increased business sales, and increased livability, as well as indirect economic impact through increased health due to pollution-reduction benefits, reduced crime rates, enhanced recreational opportunities, and higher visitor satisfaction.

- Riparian buffers can increase property values. For example , the stream buffer network in the Pennypack Park area of Philadelphia accounted for 33% of the land value of properties located within 40 feet of the park and 9% of the value of those located within 1,000 feet.[9] Conserving forests and planting trees on residential and commercial sites enhance property values up to 37%.[10] Properties adjacent to water bodies command a price premium, but a buffer design incorporating a view corridor could potentially enhance the aesthetics by framing the water view, resulting in an even higher sales price. Furthermore, water quality has a significant effect

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[3] Swanson, et al; Center for Watershed Protection, "Impacts of Impervious Cover on Aquatic Systems", Watershed Protection Research Monograph No. 1, March 2003

[4] Lewis et al. (2001). Dredging impact on an urbanized Florida bayou: effects on benthos and algal-periphyton. Environmental Pollution, 115(2), 161-171.

[5] Pimentel et al. (1995). Environmental and economic costs of soil erosion and conservation benefits. SCIENCE-NEW YORK THEN WASHINGTON-, 1117-1117.

[6] Tegtmeier, E. M., & Duffy, M. D. (2004). External costs of agricultural production in the United States. International Journal of agricultural sustainability, 2(1), 1-20.

[7] Williams, J.R. and Smith, C.M. (2008) Economic Issues of Watershed Protection and Rehabilitation. In Hargrove, W.L., Editor. Sedimentation in Our Reservoirs: Causes and Solutions. Kansas State University Agricultural Experiment Station and Cooperative Extension Service, Manhattan, KS.

[8] Hansen, L., & Hellerstein, D. (2007). The value of the reservoir services gained with soil conservation. Land economics, 83(3), 285-301.

[9] Hammer et al. (1974). The effect of a large urban park on real estate value. Journal of the American Institute of Planners, 40(4), 274-277.).

[10] Foster et al. (2011) The value of green infrastructure for urban climate adaptation. Rep. Center for Clean Air Policy. Retrieved from: http://dev.cakex.org/sites/default/files/Green_Infrastructure_FINAL.pdf

on property values.[11] Riparian habitat increases property values more so than just planting trees because homebuyers differentiate between the healthy riparian buffers instead of merely indiscriminately valuing "green" spaces.[12] Any increase in property value results in an increase in property tax revenue which therefore benefits the community as a whole.

- Buffers can reduce heating and cooling costs for buildings and homes by providing shade, windbreaks, and winter cover.[13]

- In addition to individual landowner benefits, there are many business benefits to riparian buffers through perceived higher quality livability which translates into increased sales and higher rental rates.

- Rivers and greenways in the form of riparian buffers contribute to quality of life. People prefer natural environments with a preference for trees[14] and clean water,[15] characteristics of healthy and functioning riparian areas. Quality of life is a major factor in corporate and business location decisions and retention rates since the use of adjacent greenways is a benefit to employees for exercise and relaxation.[16]

- Office locations adjacent to rivers are more attractive to prospective tenants, therefore commanding higher rental rates. Additionally, waterfront development which uses green infrastructure can preserve, improve, or restore environmental services of healthy watershed,[17] resulting in a return of monetary investment through an increase in business and greater worker productivity. For example, shoppers will travel further, stay longer, and be willing to pay higher prices for goods in green communities.[18]

- Green infrastructure and exposure to natural areas can enhance worker productivity[19] and promote community well-being and participation.[20] Both residents and planners prefer

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[11] Liu et al. (2014). Estimating the impact of water quality on surrounding property values in Upper Big Walnut Creek Watershed in Ohio for dynamic optimal control. AAEA Annual Meeting, Minneapolis, MN, July 27-29, 2014; Leggett, C. G., & Bockstael, N. E. (2000). Evidence of the effects of water quality on residential land prices. Journal of Environmental Economics and Management, 39(2), 121-144.

[12] Bark et al. (2009). Habitat preservation and restoration: Do homebuyers have preferences for quality habitat?. Ecological economics, 68(5), 1465-1475

[13] Klapproth, J. C., & Johnson, J. E. (2001). Understanding the science behind riparian forest buffers: benefits to communities and landowners. Virginia Cooperative Extension.

[14] Sullivan W.C. (1994) 'Perceptions of the rural-urban fringe: citizen preferences for natural and developed settings' Landscape and Urban Planning Vol. 29, pp. 85-101.

[15] Sullivan et al. (2004) 'Agricultural buffers at the rural-urban fringe: an examination of approval by farmers, residents, and academics in the Midwestern United States' Landscape and Urban Planning Vol. 69, pp. 299-313.

[16] Murray et al. (1995) Economic Impacts of Protecting Rivers, Trails and Greenway Corridors. Murray, Ray, et al. San Francisco, CA: Rivers, Trails and Conservation Assistance, National Park Service, Western Region, Fourth Edition. Retrieved from: http://www.nps.gov/pwro/rtca/econ_index.htm

[17] Aerts, J. C., & Wouter Botzen, W. J. (2011). Flood-resilient waterfront development in New York City: Bridging flood insurance, building codes, and flood zoning. Annals of the New York Academy of Sciences, 1227(1), 1-82.

[18] Wolf, K. L. (2007). The environmental psychology of shopping. Research Review, 14(3), 39.; Wolf, K. L. (2005). Business district streetscapes, trees, and consumer response. Journal of Forestry, 103(8), 396-400.; Wolf, K. L. (2003). Public reponse to the urban forest in inner-city business districts. Journal of Arboriculture, 29(3), 117-126.

[19] Kaplan, R. (1992) Urban forestry and the workplace. In Gobster, P.H. (Ed.). Managing Urban and High-Use Recreation Settings. USDA Forest Service, General Technical Report NC-163. North Central Forest Experiment Station, Chicago, IL.

[20] Newton, J.L., Sullivan, W.C., 2005. Nature, culture, and civil society. J. Civ. Soc. 1 (3), 195–209

riparian buffers in both suburban and rural landscapes.[21] However, the preference is for ecologically-functional riparian habitat and not arbitrary "green" open space.[22]

- There is a growing trend to increase the amount of naturalized open spaces including riparian buffers because of the social-economic benefits which include stress reduction and mitigation,[23] recovery from fatigue and attention deficit symptoms in both adults and children,[24] and increased public safety.[25] Furthermore, the decrease in mental fatigue as a result of naturalized open spaces can increase and foster social networks and relationships, factors which can result in less crime.[26] For example, in Philadelphia, substantially lower rates of assault, robbery, and burglary were associated with communities with higher vegetative abundance.[27]

- The water quality benefits provided by riparian buffers prevent adverse effects on human health through the reduction of pollution of drinking water and the indirect health hazards associated with nitrogen, algal toxins, and other water pollutants.[28]

- Trees and vegetation in riparian buffers provide air pollution-reduction benefits which in turn also provides health benefits and reducing health care costs. For example, computer simulations show that trees and forests in the U.S. prevent approximately 850 deaths and 670,000 incidences of acute respiratory symptoms.[29]

- Minimum 100 foot buffers don't just help filter out pollution but preserve the instream ecological systems that help remove pollution which benefits aquatic life and animal life but also protects drinking water; recreation in the form of fishing, swimming, wading and boating; protects and enhances the fair market value of nearby homes.

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[21] Kenwick et al. (2009) 'Preferences for riparian buffers' Landscape and Urban Planning Vol. 91, pp. 88-96.
[22] Bark et al.(2009) 'Habitat preservation and restoration: Do homebuyers have preferences for quality habitat?' Ecological Economics Vol. 5, pp. 1465-1475.
[23] Ulrich et al. (1991). Stress recovery during exposure to natural and urban environments. Journal of environmental psychology, 11(3), 201-230.; Ulrich, R. S. & Simons, R. F. (1986). Recovery from stress during exposure to everyday outdoor environments. In J. Wineman, R. Barnes & C. Zimring, Eds., Proceedings of the Seventeenth Annual Conference of the Environmental Design Research Association. Washington, D.C.: EDRA, pp 115 122.
[24] Taylor et al. (2001). Coping with ADD The surprising connection to green play settings. Environment and Behavior, 33(1), 54-77.; Cimprich, B. (1993). Development of an intervention to restore attention in cancer patients. Cancer nursing, 16(2), 83-92.; Kaplan, R., & Kaplan, S. (1989). The experience of nature: A psychological perspective. CUP Archive.
[25] Troy et al. (2012). The relationship between tree canopy and crime rates across an urban–rural gradient in the greater Baltimore region. Landscape and Urban Planning, 106(3), 262-270.; Wolfe, M. K., & Mennis, J. (2012). Does vegetation encourage or suppress urban crime? Evidence from Philadelphia, PA. Landscape and Urban Planning, 108(2), 112-122.; Kuo, F. E., & Sullivan, W. C. (2001). Environment and crime in the inner city does vegetation reduce crime?. Environment and Behavior, 33(3), 343-367.
[26] Kuo, F. E. (2003). The role of arboriculture in a healthy social ecology. Journal of Arboriculture, 29(Part 3), 148L 155.; Sullivan, W. C., & Kuo, F. E. (1996). Do trees strengthen urban communities, reduce domestic violence? (Vol. 4). Northeastern Area State and Private Forestry, Urban Forestry Center for the Midwestern States.
[27] Wolfe, M. K., & Mennis, J. (2012). Does vegetation encourage or suppress urban crime? Evidence from Philadelphia, PA. Landscape and Urban Planning, 108(2), 112-122.
[28] Camargo, J. A., & Alonso, Á. (2006). Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: a global assessment. Environment international, 32(6), 831-849.; Wolfe, A. H., & Patz, J. A. (2002). Reactive nitrogen and human health: acute and long-term implications. AMBIO: A Journal of the Human Environment, 31(2), 120-125.
[29] Nowak et al. (2014) Tree and forest effects on air quality and human health in the United States. Environmental Pollution. 193: 119-129.

- The use of watershed protection programs including riparian buffer requirements to achieve drinking water quality standards often cost less than human engineered treatment including reductions in capital, operation, and maintenance costs. For example, treatment costs in the U.S. for drinking water drawn from watersheds with at least 60% forest cover was half the cost of treating water from watersheds with 30% forest cover, and one-third the cost of treating water from watersheds with just 10% forest cover.[30]

- There are also the economic benefits of avoiding the costs of responding to the many harms that result when healthy buffers are absent. Riparian buffers can reduce drinking water treatment costs, limit flood damage expenses, provide stormwater management and infrastructure savings, substantially enhance property values, support creation of high quality products for sale such as craft beer, and boost state revenues by providing recreational areas and attracting tourism.

- Water quality protection programs can also reduce the health risk associated with contaminated drinking water.

- Riparian buffers reduce the cost of flooding by decreasing the frequency of flooding through storage and infiltration, by eliminating the need for expensive stormwater infrastructure, and by reducing the damage caused by flooding through flow attenuation and avoidance. Requiring appropriate buffer widths also ensures we are not building too close to our streams and so that homes and businesses are not located in floodprone areas and therefore are not there to be damaged.

- Buffers intercept runoff, infiltrate a portion of the runoff into the soil and evaporation a portion into the air. By keeping the water onsite as part of a natural system, the runoff is detained until the peak of the storm is past and then released slowly back into the channel, but at a rate at which the ecosystem can absorb it without overflowing. Particularly when coupled with modern stormwater practices focused on reducing the volume of runoff and enhancing natural conditions, buffers reduce surface runoff by maximizing runoff losses through infiltration, evapotranspiration, and groundwater recharge.

- Since riparian vegetation plays an important role in ensuring storm flows are stored, developed areas with preserved and restored buffers may require less or smaller-sized stormwater infrastructure.[31] Riparian buffers are less expensive to construct than storm drainage systems. Stormwater drainage infrastructure includes drains, pipes, inlet structures, curbs, gutters, sanitary sewers, water mains, and detention basins. The costs associated with traditional stormwater infrastructure range from $500 to $10,000 per acre with similar

[30] Postel, S. L., & Thompson, B. H. (2005, May). Watershed protection: Capturing the benefits of nature's water supply services. In Natural Resources Forum (Vol. 29, No. 2, pp. 98-108). Blackwell Publishing, Ltd..

[31] Miller, A.E. and A. Sutherland. 1999. Reducing the Impacts of Storm Water Runoff through Alternative Development Practices. Office of Public Service & Outreach, Institute of Ecology, University of Georgia, Athens, GA; Tourbier, J.T. 1994. Open space through stormwater management: Helping to structure growth on the urban fringe. J. Soil Water Conservation. 1994. vol. 49, no. 1, pp. 14-21.

amounts in maintenance costs over 20 years. [32] Alternatively, existing riparian buffers provide these services for free, and the cost of establishing new buffers is approximately $500 per acre with an order of magnitude less in maintenance costs.[33] For example, Fairfax County, Virginia was able to avoid $57 million in stormwater management costs by retaining forested riparian buffers.

- Riparian buffers provide for public recreational uses that are compatible with all of the other water quality and flood protection benefits they provide. The most popular river activities include fishing, boating, and bird watching, all activities which provide tourism revenue. The total economic contribution of fishing in Pennsylvania, New York, and New Jersey exceeds $3 million, and another $2.5 million is supplied from paddle based boating.[34] An additional $2 million is spent on the gear to support these industries, and $3 million is generated from related travel.[35] Furthermore, nearly $750,000 is generated in state and federal taxes on all of these water recreation income streams.[36]

- Since healthy riparian buffers are important for supporting healthy fish populations – providing the food, habitat, pollution protection, and temperature control fish need for sustainable lives, the benefit of buffers for fishing based recreation and eco-tourism is closely connected with the economic benefits of this favored American past time. In 2006, the U.S. Fish & Wildlife Service reported that fishing was the "favorite recreational activity in the United States" with 13% of those 16 and older (29.9 million anglers) spending an average of 17 days fishing a year and more than $40 billion on trips, equipment, licenses and other items to support their fishing activities.[37] A large portion of that money, 44% ($17.8 billion), was spent on items related to their trips, including food, lodging and transportation.[38] In the Upper Delaware River, wild trout fishing resulted in $17.69 million for local business revenue in 1996, and $7.25 million (41%) of this spending by anglers remained in the local communities surrounding the tail water fisheries area.[39] Research shows that the angler expenditures in the local region ultimately results in $29.98 million in local economic activity which supports 348 jobs with total wages of $3.65 million; and provided $719,350 in local taxes. [40] Furthermore, nearby towns benefit from the clean water and resulting healthy fish populations found in tributary streams. For example, the Beaverkill and Willowemoc Rivers are credited with providing towns such as Roscoe and Livingston Manor with $10 million in annual expenditures

[32] Palone, R. S., & Todd, A. H. (Eds.). (1998). Chesapeake Bay riparian handbook: a guide for establishing and maintaining riparian forest buffers. US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry.
[33] Palone, R. S., & Todd, A. H. (Eds.). (1998). Chesapeake Bay riparian handbook: a guide for establishing and maintaining riparian forest buffers. US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry.
[34] Pawelko, K.E.B. et al. (1995). Examining the nature of river recreation visitors and their recreational experiences on the Delaware River. Pg. 46
[35] Pawelko, K.E.B. et al. (1995). Examining the nature of river recreation visitors and their recreational experiences on the Delaware River. Pg. 46
[36] Pawelko, K.E.B. et al. (1995). Examining the nature of river recreation visitors and their recreational experiences on the Delaware River. Pg. 46
[37] US Fish and Wildlife Service. (2006). National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, National Overview." (Preliminary Findings) May 2007. Pg. 5
[38] US Fish and Wildlife Service. (2006). National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, National Overview." (Preliminary Findings) May 2007. Pg. 5
[39] Maharaj, V. et al. (1998). The Economic Impact of Trout Fishing on the Delaware River Tailwaters in New York. Report prepared for American Sportfishing Association and Trout Unlimited, October 1998.
[40] Maharaj, V. et al. (1998). The Economic Impact of Trout Fishing on the Delaware River Tailwaters in New York. Report prepared for American Sportfishing Association and Trout Unlimited, October 1998.

from their sport fishery.[41] Friends of the Upper Delaware estimate that fly-fishing in the region could generate $58 million per year in economic activity, creating new jobs with virtually no infrastructure or environmental threat, for which there is already a trained work force and where control would remain local.[42]

- In addition to generating revenue, recreational opportunities generate jobs. According to the New Jersey Department of Fish and Wildlife, New Jersey state parks received 12 million visits in one year (1994) statewide, with wildlife recreation, fishing and hunting responsible for 75,000 jobs and $5 billion in retail sales.[43] Valley Forge Historical Park, through which the Schuylkill River and tributary streams flow, created 1.23 million recreation visits in 2001 with park visitors spending "$33.3 million dollars within an hour's driving distance of the park, generating $10.4 million in direct personal income (wages and salaries) for local residents and supporting 713 jobs in the area."[44]

Stormwater Management Provisions

7:8-3.3(b)(2) & 7:8-4.2(c)(13) & 7:8-5.5(h) The proposed deletions should not be instituted.

Using this rulemaking primarily focused on the Flood Hazard Area Control Act rules to remove a fundamentally important underpinning of the water quality protections and buffer protections found in the Stormwater Management rules and program is not legally appropriate and fails to provide the public the opportunity to fully review, consider, understand and comment upon the implications or the proposed change (in this case the deletion of text and a concept that is fundamental to the Stormwater rules and program).

The special water resource protection area mandate in the Stormwater Management Rules, NJAC 7:8-5.5(h), is intended to address water quality issues associated with stormwater runoff from development projects, the focus of the Flood Hazard Area rules is fundamentally different (i.e. scope of Flood Hazard rules is to protect communities from the health, safety, environmental and community harms caused by development within fluvial and tidal flood hazard areas and to preserve the benefits of these areas when they are protected). To propose an amendment that undermines and fundamentally alters a key provision in the stormwater management rules through amendment to the Flood Hazard Area rules allows for an undermining of the stormwater rules in a piecemeal way where the ramifications of the change are far broader than they appear from the mere deletion of the proposed text. The special water resource protection areas found in the stormwater rules are a fundamental underpinning of the stormwater rules as well as for antidegradation protection in the state and for other required Clean Water Act mandates – to remove this concept puts the legal and scientific defensibility of the stormwater management rules in question.

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[41] Maharaj, V. et al. (1998). The Economic Impact of Trout Fishing on the Delaware River Tailwaters in New York. Report prepared for American Sportfishing Association and Trout Unlimited, October 1998.
[42] Findley, Craig. Friends of the Upper Delaware River. "Adequate and Constant Releases - Equal's a Growing Economy." 8 April 2007
[43] Eubanks, T. and Stoll, P.K. (2000). Wildlife-associated Recreation on the New Jersey Delaware Bayshore, The Economic Impact of Tourism Based on the Horseshoe Crab-Shorebird Migration in New Jersey. 16 February 2000. Prepared for the New Jersey Department of Environmental Protection.
[44] Michigan State University. (2003). Impacts of Visitor Spending on the Local Economy: Valley Forge National Historical Park, 2001. Prepared for National Park Service Social Science Program and Department of Parks, Recreation and Tourism Resources.

To the extent the NJDEP wants to bring the riparian buffer mandates of the two rules into conformance with one another, they should be taking the most stringent language from each rule, rather than the least restrictive, to craft a new provision that is recited in both sets of rules. In addition, the rule would have to be written to be clear that the buffer established must address the stormwater, water quality, water quantity, ecological, community and flood damage issues of both rules and ensure that the buffers mandates effectively addresses that array of issues as well. This new provision should be articulated both in the flood hazard area rules and in the stormwater management rules to ensure a firm understanding that compliance with the riparian buffer mandates is necessary to comply with both overarching pieces of legislation (i.e. stormwater mandates and flood hazard area mandates, as well as coastal zone mandates).

In addition, the riparian buffers mandate should:

- Apply "to all waters designated Category One under the Surface Water Quality Standards (NJAC 7:9B) and all perennial or intermittent streams that drain into or upstream of the Category One waters" within the associated HUC 14 drainage whether or not shown on the USGS Quadrangle Maps or County Soil Surveys(quoted language from FHA introduction);

- Should apply to both new development and redevelopment projects;

- Should prohibit new development projects in the protected buffer area;

- If disturbance in the buffer zone is allowed by virtue of a special exception or waiver being granted, should ensure that intrusion is minimized to the maximum extent possible, necessarily results in significant actions to enhance the integrity of the buffer area that remains such proactive and ongoing steps to prevent intrusion by degrading invasive plant species, and results in high level mitigation within the same sub watershed in the form of newly created buffers;

- Should require minimum 100 foot buffers on all streams that do not already have enhanced buffer mandates (i.e. 300 foot buffers for C-1 streams and 150 foot buffers from trout production/maintenance streams, or flow through threatened or endangered species habitat);

- Should require 150 foot buffers for all 303 d water quality impaired streams.

- For trout production waters, trout maintenance waters, and waters flowing through endangered or threatened wildlife or plant species habitat, should include provisions that allow for a demonstration by interested parties regarding the appropriateness for mandating a wider buffer if needed to properly support the particular species associated with the waterway at issue. For example, there are a number of species of birds for which 300 feet or more are necessary to properly support the species, if it can be shown that regulated waters flow through habitat for a threatened or endangered species that require this larger buffer width, then the department should have the authority to mandate it in any coastal zone, stormwater or flood hazard area authorization given.

Flood Hazard Area Control Act Rules

7:13-1.1(c)(2) The term "healthy vegetation" should not be replaced with simply "vegetation". Invasive vegetation and lawnscapes, for example, do not provide the same habitat benefits, erosion prevention, stormwater infiltration, peak flow reductions and/or water quality benefits as healthy native vegetation does. It is inaccurate and diminishing to the effectiveness of the regulation to make this change.

NJ 7:13 1.1 The definition of top of bank needs to use the concept of bankfull, as defined above, rather than using the centerline of the waterbody in those instances when there is some difficulty discerning a change or break in the slope of the land.

7:13-1.2 and 4.2 As indicated in these Rules, the values of a riparian forested buffer are scientifically proven of of tremendous benefit for the natural resources and residents of the State. As such, DRN supports any opportunity to be "more" stringent on protecting these forested riparian buffers because of the unquestionable value/ecosystem services they provide. We support where DEP's rules state that if a plot scores greater than a 16 on the scale than the entire plot as well as the adjacent plots are considered forested – again due to the ecosystem services all forested riparian buffers provide. But it is for those outstanding services that DRN objects to the proposed rule that if a plot scores less than 16 using the prescribed methodology deeming it "unforested" that the adjacent ½ acre plots are therefore also deemed unforested. If there is the presence of a forested riparian buffer and it is not the land area of interest, the Rule should not be providing incentive/encouragement to eliminate that buffer.

7:13 2.1(c) Preliminary approval, or mere subdivision approval should not be enough to support exemption from the requirements of these rules. In the case of primary site plan approval or simply securing a minor, final or preliminary subdivision approval are all projects that are at a point in the process when the intended project can be designed so as to accommodate the mandates of this rule. Allowing projects so early on in the process to avoid the mandates of this rule is a severe undermining that is neither necessary nor appropriate.

7:13 – 2.4 The additions made to the regulated activities found in (a) are good additions that should be maintained as they all involve activities that can and do impact flooding, flood damages, flood levels and flood impacts, as well as having a direct affect on the carrying capacity of neighboring waterbodies.

NJAC 7:13-10.2 The existing mandate of NJAC 7:13-10.2 that limits under an individual permit the area of riparian zone vegetation that can be cleared, cut and removed for various regulated activities is not only appropriate but necessary for both the protection of water quality as required by state and federal law but also for the protection of communities from flooding and flood damages. In fact, the 50 foot riparian zone requirement that applies to most NJ waterways should be increased to become a 100 foot riparian zone minimum – as discussed below there is ample scientific evidence to document that minimum 100 foot of buffer is necessary for securing the water quantity, water quality, and other benefits buffers provide. The riparian zone areas of allowed disturbance should most certainly not be increased.

7:13 – 2.5 The 5 year term for an applicability determination, or if conditions change as described in the rule, should remain in place. With development, weather patterns, and land use practices so constantly in flux, including as the result of climate change, it is important that there be an outside and obvious time boundary on how long a determination remains viable for, but allow the flexiblity of earlier expiration if conditions on the ground warrant.

7:13 – 3.6 It is very wise that DEP is modifying the language in 7:13 – 3.6 (c)1i to require a hydrologic analysis that considers existing land use coverage as opposed to simply existing development conditions. Landuse cover, including different types of vegetation from lawnscapes to forests, can have a significant impact on the outcome of the calculation – having this more precise capturing of the existing condition for purposes of this calculation is wise.

In 7:13 – 3.6 (c)1ii of the rules it is good that NJDEP, at a minimum, continues to use 125% of the 100 year flow rate and flood for purposes of the calculations in this section – doing so ensures the additional protection necessary to account for future development, to recognize possible variability's in hydrologic modeling, to consider temporary blockages to culverts and other hydraulic impediments, to allow for error, bias, manipulation and changing conditions. But given the dramatic effect of climate change on sea level rise, and the number, duration and intensity of storm events in New Jersey, it would be more appropriate for the rules to be focused on the 500 year event – this will ensure that we are not continuing to build structures that will be the subject of flooding and flood damages in the foreseeable future given climate change predictions for our region.

7:13 4.1(c) (1) & (2) The rules should not be modified to only apply the buffer mandate to regulated waters upstream from category one waters, trout production waters, trout maintenance waters – the requirement that buffers be required on all tributaries instead of the more limited regulated waters category is important to ensure full protection for the waterways and watersheds that feed our higher quality waterways. To not mandate the riparian buffers be on all tributaries, as opposed to simply regulated waters, will actually result in less buffers upstream, which will result in an increase in polluted runoff and a decrease in the capacity of upstream tributaries that become less protected by buffers to help remove instream pollution. The result will be degradation of the C-1 and trout production and maintenance waters, thus violating the anti-degradation requirements of the Clean Water Act and implementing state laws.

Similarly, the buffer mandate for tributaries upstream from trout maintenance waters should not be limited to those tributaries located within one mile of the trout maintenance water – doing so will result in an increasing level of pollution and therefore a degradation of water quality.

The modification that limits the riparian buffer mandate to only regulated waters, as opposed to all waters, flowing through threatened and endangered specie habitats, and to only upstream regulated waters, will also have the net effect of degrading water quality and healthy habitats necessary for providing best protection to species that are important ecologically and are most at risk from decline and/or extinction. To allow this degradation of habitat for threatened and endangered species (plant and/or animal) whether designated by federal or state law, can result in illegal takings and habitat degradation.

7:13 – 4.1(c)(3) The riparian zone for all waters that are not discussed in provisions (c)(1) or (2), i.e. Category one waters and upstream tributaries, trout production waters and upstream tributaries, trout maintenance waters and upstream tributaries, and waters flowing through threatened or endangered species habitat, should be increased from a 50 foot minimum to a 100 foot minimum buffer width. Additionally, as noted above, NDEP should also increase the mandatory buffer width for all waters not identified elsewhere in 7:7E-3.26 (e)(1) or (2) to a minimum 100 foot buffer. This mandatory buffer minimum should be provided for in every regulatory provision that otherwise mandates a buffer that is smaller, and it should apply to all new development and redevelopment projects.

Forests and riparian vegetation play an important role in ensuring stormflows are stored and released gradually rather than immediately surging downstream in large flood pulses. The dissipation of flood energy will vary with the width of the riparian buffer in comparison with the channel width.[45] It is essential to have riparian buffers that are wide enough to provide adequate flood control, damage reduction, erosion prevention, and the many other non-flood related benefits. Scientific evidence suggests that a minimum buffer of 100 feet is needed to provide essential flood protection benefits.[46] Smaller widths do not adequately maintain most of the beneficial function of riparian buffers and therefore, are of much more limited value.

One literature review found that for flood attenuation the science pointed to a range of widths from 65 feet to 492 feet.[47] This review demonstrates that for flood attenuation a mandatory 100-foot minimum is actually on the smaller side of the range – a more conservative approach would actually mandate a larger buffer requirement closer to 250 feet. For example, modeled overbank flow widths for watersheds in Kansas indicate that a stream-buffer ordinance of 100 feet would not provide the maximum peak-flow attenuation for storms greater than the 10-year return interval, but 250 feet buffers would contain the average overbank top width for up to the 500-year storm.[48]

Protected, structure-free, riparian areas also prevent storm damage by keeping the area adjacent to waterways free of buildings, roadways and other man-made structures and activities vulnerable to storm-related damage. Rivers naturally increase in size and change shape within the floodplain in response to storms. Locating structures or other vulnerable land uses within these areas makes them susceptible to flooding and increases flood risk. Avoidance is the best and most cost-effective way to prevent flood damage.

Numerous studies have quantified the removal efficiencies of streamside buffers, and research shows that it is not just the mere presence of a buffer but also the buffer width that is important (See Table 1,

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[45] Tabacchi, E., Lambs, L., Guilloy, H., Planty-Tabacchi, A. M., Muller, E., & Decamps, H. (2000). Impacts of riparian vegetation on hydrological processes. Hydrological processes, 14(16-17), 2959-2976.

[46] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.; Johnson, A.W. and D. M. Ryba. 1992. A literature review of recommended buffer widths to maintain various functions of stream riparian areas. Prepared for King County Surface Water Management Division, as cited in Buffer Strip Function and Design, An Annotated Bibliography, Compiled for Region III Forest Practices Riparian Management Committee. Aquatic Resource Consultants, Renton, WA.

[47] Fischer & Fischenich, Design Recommendations for Riparian Corridors and Vegetated Buffer Strips, emrrp, April 2000.

[48] Scott, M. A. (2012). An Analysis of Flow Attenuation Provided by Stream-Buffer Ordinances in Johnson County, Kansas (Masters Thesis). University of Kansas.

2, and 3).[49] Although site specific conditions can influence the effectiveness of buffers, many researchers have concluded that buffers can remove between 55 and 99% of nutrients, sediment, and other water contaminants when equal or greater to 100 feet in width (See Table 1,2, and 3).[50] Additionally, a buffer width of 100 feet or more enhances stream health better enabling it to provide the ecosystem services needed to process the remainder of pollutants and as such, protect downstream water quality.

Wider riparian buffers provide greater capacity for biological uptake to remove contaminants from runoff and groundwater. Greater buffer area equates to more biological organisms including plants, trees, and soil microbes. More plants and more microbes have the greater potential for uptaking more nutrients and processing higher concentrations of water pollutants. Removal efficiency per unit width of buffer varies inversely with water flux, but consistently increases with increasing buffer width.[51] For example, nitrogen removal estimates for narrow buffers less than 100 feet range from 45% to 88%, but removal estimates for buffers greater than 100 feet range from 81% to 92%.[52] Therefore, effective nitrogen removal requires buffers that are at least 100 feet, and removal efficiencies will be even greater for buffers that are wider than 100 feet (Table 1).[53] Likewise, a buffer of 100 feet could effectively remove close to 100% of phosphorus (Table 2) and up to 93% of pesticides.[54]

[49] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.; Mayer, P.M., S.K. Reynolds, Jr., M.D. McCutchen, and T.J. Canfield, (2007). Meta-Analysis of Nitrogen Removal in Riparian Buffers. Journal of Environmental Quality 36:1172-1180.

[50] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.; Mayer, P.M., S.K. Reynolds, Jr., M.D. McCutchen, and T.J. Canfield, (2007). Meta-Analysis of Nitrogen Removal in Riparian Buffers. Journal of Environmental Quality 36:1172-1180.

[51] Vidon, P. G., & Hill, A. R. (2006). A LANDSCAPE-BASED APPROACH TO ESTIMATE RIPARIAN HYDROLOGICAL AND NITRATE REMOVAL FUNCTIONS1. JAWRA Journal of the American Water Resources Association, 42(4), 1099-1112.

[52] Zhang, X., Liu, X., Zhang, M., Dahlgren, R. A., & Eitzel, M. (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. Journal of environmental quality, 39(1), 76-84.; Mayer, P.M., S.K. Reynolds, Jr., M.D. McCutchen, and T.J. Canfield, (2007). Meta-Analysis of Nitrogen Removal in Riparian Buffers. Journal of Environmental Quality 36:1172-1180.

[53] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.

[54] Zhang, X., Liu, X., Zhang, M., Dahlgren, R. A., & Eitzel, M. (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. Journal of environmental quality, 39(1), 76-84.

Table 1: Summary of select studies reporting percent removal within riparian buffers of nitrogen from runoff based on buffer size and illustrating the large variability in buffer efficiency.[55]

Study	< 100 ft (30 m)	~100 ft (30 m)	>100 ft (>30.5 m)
Young et al. 1980		87%	
Barker & Young 1984			99%
Magette et al. 1987	17-51%		
Schwer & Clausen 1989		76%	
Lowrance et al. 1995	4-23%	80%	
Lowrance et al. 2001	5-50%	80%	95%
Mayer et al. 2007	58-71%	85%	
Zhang et al. 2010	73-88%		92%
Sweeney & Newbold 2014	0-95%	55-99%	6-99%

Table 2: Summary of select studies reporting percent removal within riparian buffers of phosphorous from runoff based on buffer size and illustrating the large variability in buffer efficiency.[56]

Study	<100 ft (30 m)	~100 ft (30 m)	>100 ft (>30.5 m)
Young et al. 1980		88%	
Magette et al. 1987	41-53%		
Schwer & Clausen 1989		78%	
Lowrance et al. 1995	24-29%	77%	
Lowrance et al. 2001	62-65%	80%	90%
Blattel et al. 2005	14-28%		
Newbold et al. 2010	22%		

In addition to greater biological ability to process contaminates, wider buffers have more capacity for chemical sorption. More soil means more soil surface area. More soil surface area equates to a greater potential for available sorption sites. Conversely, soil sorption sites in narrow buffers can

[55] Young et al. (1980). Effectiveness of vegetated buffer strips in controlling pollution from feed lot runoff. Journal of Environmental Quality 9: 483-487.; Magette, W.L. et al. 1987. Vegetated filter strips for runoff treatment. CBP/TRS 2/87. U.S. Environmental Protection Agency. Region III, Chesapeake Bay Liaison Office, Annapolis, MD.; Schwer, C. B., & Clausen, J. C. (1989). Vegetative filter treatment of dairy milkhouse wastewater. Journal of Environmental Quality, 18(4), 446-451.; Lowrance et al. (1995). Water quality functions of riparian forest buffer systems in the Chesapeake Bay watershed. U.S. Environmental Protection Agency Rep. EPA903-R-95-004. Washington, D.C.:U.S. EPA; Lowrance et al. (2001). EVALUATION OF COASTAL PLAIN CONSERVATION BUFFERS USING THE RIPARIAN ECOSYSTEM MANAGEMENT MODEL. JAWRA 37(6): 1445-1455.; Zhang, X., Liu, X., Zhang, M., Dahlgren, R. A., & Eitzel, M. (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. Journal of environmental quality, 39(1), 76-84; Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA 50(3), 560-584.

[56] Young et al. (1980). Effectiveness of vegetated buffer strips in controlling pollution from feed lot runoff. Journal of Environmental Quality 9: 483-487.; Magette, W.L. et al. 1987. Vegetated filter strips for runoff treatment. CBP/TRS 2/87. U.S. Environmental Protection Agency. Region III, Chesapeake Bay Liaison Office, Annapolis, MD.; Schwer, C. B., & Clausen, J. C. (1989). Vegetative filter treatment of dairy milkhouse wastewater. Journal of Environmental Quality, 18(4), 446-451.; Lowrance et al. (1995). Water quality functions of riparian forest buffer systems in the Chesapeake Bay watershed. U.S. Environmental Protection Agency Rep. EPA903-R-95-004. Washington, D.C.:U.S. EPA; Lowrance et al. (2001). EVALUATION OF COASTAL PLAIN CONSERVATION BUFFERS USING THE RIPARIAN ECOSYSTEM MANAGEMENT MODEL. JAWRA 37(6): 1445-1455.; Blattel et al. (2005), ABATEMENT OF GROUND WATER PHOSPHATE IN GIANT CANE AND FOREST RIPARIAN BUFFERS. JAWRA Journal of the American Water Resources Association, 41: 301–307.; Newbold, J. D., Herbert, S., Sweeney, B. W., Kiry, P., & Alberts, S. J. (2010). Water Quality Functions of a 15-Year-Old Riparian Forest Buffer System1. JAWRA Journal of the American Water Resources Association, 46(2), 299-310.

become saturated reducing the effectiveness to retain certain pollutants.[57] Wider buffers also promote sorption by increasing the contact time between dissolved chemicals and soil particles. For example, enhanced retention of herbicides was shown in buffers with slower flow rates and longer buffer widths because of the greater opportunity for infiltration and sorption.[58]

Table 3: Summary of select studies reporting percent removal within riparian buffers of sediments in runoff based on buffer size and illustrating the large variability in buffer efficiency.[59]

Study	<100 ft (30 m)	~100 ft (30 m)	>100 ft (>30.5 m)
Magette et al. 1987	72-86%		
Schwer & Clausen 1989		89%	
Lowrance et al. 1995	61-75%	97%	
Lowrance et al. 2001	60-80%	90%	90%

[57] Roberts, W. M., Stutter, M. I., & Haygarth, P. M. (2012). Phosphorus retention and remobilization in vegetated buffer strips: a review. Journal of environmental quality, 41(2), 389-399.

[58] Krutz, L. J., Senseman, S. A., Zablotowicz, R. M., & Matocha, M. A. (2005). Reducing herbicide runoff from agricultural fields with vegetative filter strips: a review. Weed Science, 53(3), 353-367.

[59] Magette, W.L. et al. 1987. Vegetated filter strips for runoff treatment. CBP/TRS 2/87. U.S. Environmental Protection Agency. Region III, Chesapeake Bay Liaison Office, Annapolis, MD.; Schwer, C. B., & Clausen, J. C. (1989). Vegetative filter treatment of dairy milkhouse wastewater. Journal of Environmental Quality, 18(4), 446-451.; Lowrance et al. (1995). Water quality functions of riparian forest buffer systems in the Chesapeake Bay watershed. U.S. Environmental Protection Agency Rep. EPA903-R-95-004. Washington, D.C.:U.S. EPA; Lowrance et al. (2001). EVALUATION OF COASTAL PLAIN CONSERVATION BUFFERS USING THE RIPARIAN ECOSYSTEM MANAGEMENT MODEL. JAWRA 37(6): 1445-1455.; Liu, X., Zhang, X., & Zhang, M. (2008). Major factors influencing the efficacy of vegetated buffers on sediment trapping: A review and analysis. Journal of Environmental Quality, 37(5), 1667-1674.; Yuan, Y., R.L. Bingner, and M.A. Locke, 2009. A Review of Effectiveness of Vegetative Buffers on Sediment Trapping in Agricultural Areas. Ecohydrology 2:321-336.; Zhang, X., Liu, X., Zhang, M., Dahlgren, R. A., & Eitzel, M. (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. Journal of environmental quality, 39(1), 76-84; Newbold, J. D., Herbert, S., Sweeney, B. W., Kiry, P., & Alberts, S. J. (2010). Water Quality Functions of a 15-Year-Old Riparian Forest Buffer System1. JAWRA Journal of the American Water Resources Association, 46(2), 299-310.; Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.

Lui et al. 2008	78-97%	
Yuan et al. 2009	84%	
Zhang et al. 2010	90%	
Newbold et al. 2010	43%	
Sweeney & Newbold 2014	64%	84%

In order for riparian buffers to physically retain water pollutants, there must be sufficient space to intercept runoff and slow the velocity of flow. Because deposition of sediments is a size-selective process, most of the larger particles settle out within the first few meters of a buffer. However, the effective removal of smaller silt and clay particles require wider buffers.[60] Numerous studies have shown that sediment removal consistently increases with buffer width (Table 3).[61] Buffers only 35 feet wide can be expected to remove as much as 65% of sediment, but 100 foot buffers can trap up to 85% of sediment.[62] The increased removal attained by wider buffers represents the fraction of sediments which are small in size but damaging to water quality and aquatic organisms.

The width of a stream's riparian buffers also impacts its ability to process or handle pollutant loading from the landscape. Channel width, bank stability, temperature, inputs of debris, and biologic communities all respond to changes in the width of the streamside forest.[63] A streamside forest of just under 100 feet will maximize the width of the stream channel providing the greatest amount of ecosystem per unit length of stream and the greatest potential for effective ecosystem services.[64] In order to produce the stream temperatures that would occur in a fully forested watershed, a buffer width of more than 100 feet is needed.[65] These factors among others impact a stream's ability to sustain healthy macroinvertebrate populations and fish communities.

The importance of streamside buffers in protecting and enhancing water quality cannot be overstated. In addition to preventing water pollution, buffers enhance the health of stream ecosystems, allowing them to provide important services that further reduce the impacts of water quality pollutants to downstream environments. The scientific literature supports the conclusion that a minimum of 100 foot riparian buffer must be maintained to provide both the upland and instream services necessary to protect the water quality of adjacent streams and rivers and that New Jersey's current 50 foot minimum is not protective enough for our waterways or communities. Although the

[60] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.; Gharabaghi, B., Rudra, R. P., & Goel, P. K. (2006). Effectiveness of vegetative filter strips in removal of sediments from overland flow. Water Quality Research Journal of Canada, 41(3), 275-282.

[61] Zhang, X., Liu, X., Zhang, M., Dahlgren, R. A., & Eitzel, M. (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. Journal of environmental quality, 39(1), 76-84; Liu, X., Zhang, X., & Zhang, M. (2008). Major factors influencing the efficacy of vegetated buffers on sediment trapping: A review and analysis. Journal of Environmental Quality, 37(5), 1667-1674.

[62] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584.

[63] Sweeney, B. W., & Newbold, J. D. (2014). Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association, 50(3), 560-584

[64] Sweeney, B. W., Bott, T. L., Jackson, J. K., Kaplan, L. A., Newbold, J. D., Standley, L. J., ... & Horwitz, R. J. (2004). Riparian deforestation, stream narrowing, and loss of stream ecosystem services. Proceedings of the National Academy of Sciences of the United States of America, 101(39), 14132-14137.

[65] Sweeney, B. W., Bott, T. L., Jackson, J. K., Kaplan, L. A., Newbold, J. D., Standley, L. J., ... & Horwitz, R. J. (2004). Riparian deforestation, stream narrowing, and loss of stream ecosystem services. Proceedings of the National Academy of Sciences of the United States of America, 101(39), 14132-14137.

optimal buffer width may vary from site to site, a 100 foot fixed-width minimum buffer policy is both scientifically supported and administratively simpler to implement

7:13—1.2, 4.1 and 10.7 (Deletion of provisions regarding acid producing soil deposits)
DRN understands DEP's interest in have County Soil Conservation Districts provide the on-site evaluation of presence/absence of acid producing soils. We question the assertion that those County agencies have sufficient staffing to take on this added regulatory responsibility.

As part of this comment, we ask that DEP have the Soil Conservation Districts weigh-in on their ability to manage these new responsibilities and whether the applicants will be covering those new costs in permitting fees.

We also do not agree with DEP's rule change that a 150 foot buffer can be replaces with a 50 foot buffer supported by "engineering mechanisms." The 150 foot buffer relies on the natural abilities of the land and distance to ameliorate any negative impacts of the acid soils on the waterways. Engineering mechanisms require regular monitoring and maintenance. They are susceptible to failure due to neglect, tight agency budgets, ignorance and human error. DRN urges DEP NOT to eliminate the 150 foot buffer because a 50 foot, engineering-supported rule will lead to degraded waterways.

7:13-6.4 The allowance for the use of more than one permit by rule, general permit by certification, or general permit on a site needs to be explicit that when determining whether the individual limits and conditions of these permit options are or are not exceeded, this determination must be based upon a cumulative consideration of the projects at the single site at issue.

7:13-6.6 There should be no allowance for an extension of a general permit authorization beyond the initial five year term. In addition, if it is demonstrated that conditions have changed upstream, downstream or at the project site such that the impacts of the authorized project exceed what was originally anticipated or envisioned, the general permit must become invalid.

7:13-6.7 (b)(5)(i) It needs to be explicit that the revegetation required by this provision must be native vegetation in every instance – the allowance in (2) for the use of non-native and even invasive vegetation in actively disturbed areas must be removed. In no instance should lawnscapes be allowed, even if that was the vegetative condition that pre-existed project construction. As noted above, lawnscapes provide little ecological value, do not filter pollution, do not reduce runoff or encourage infiltration, as such to allow the revegetation requirement to be fulfilled via lawn grass will result in a degradation from a water quality, water quantity and habitat perspective. When new development or redevelopment projects occur, as an appropriate mechanism to help counter the inevitable environmental degradation that will result from the creation or maintenance of impervious cover and land disturbance, taking the opportunity to enhance vegetation quality and quantity should be a high priority – restoration of areas with enhanced forested and high value vegetative communities is an opportunity that should be embraced, not avoided. Mandating enhanced vegetation, including native, noninvasive, forested habitats, will help prevent and reduce pre-existing runoff volumes and peaks, and pollution inputs, thereby enhancing health and safety of the creek and both adjacent and downstream communities. Trees and shrubs, whether immediately adjacent to a stream, in its floodplain, or outsite the floodplain are beneficial to downstream flows and quality, they are more effective at infiltrating, reducing pollution and preventing erosion and so should be

mandated to the greatest degree possible in order to reverse and prevent degradation of water quality and in order to reverse and prevent an increase in downstream flood peaks and volumes as is the mandate of the laws discussed in this rulemaking.

7:13-7.1 Activities Permitted by Rule are characterized as regulated activities that have been found to have a de minimis impact of flooding and the environment. Given this definition/goal of the permit by rule program the kinds, quality and number of activities that are included in the permit by rule section as proposed is hugely overbroad and allows activities that individually and particularly cumulatively can have significant impacts on water quantity, water quality, infiltration, water pollution, erosion, and habitat degradation. For example the inclusion of stream cleaning , forestry activities, construction of roadways and utility lines, construction activities in the tidal flood hazard area, access to a building (despite that it barrier free), construction of water dependent structures, construction of fencing, swimming pool construction, foot bridge construction, tank construction, athletic and recreational structure construction, etc. These all require disturbance in the riparian zone and/or flood hazard area, result in new impervious cover, result in the loss of or the inability for regrowth of native vegetation, etc. and as such cannot be said to have a de minimis impact on flooding and the environment, including when considered cumulatively across a watershed and across projects, and so should not be included as permit by rule options – they all require some higher level of scrutiny and implementation guidance than what has been provided.

All of these require a level of scrutiny and decision-making to ensure that individually and cumulatively they do not have an adverse impact.

Newly constructed utility lines (traditional telephone poles, mono, lattice work) would require an established "fall-down zone" requiring a substantial, significant and measurable right-of-way impacting the riparian zone functionality. Mitigation/compensation should be a requirement. Further, over the course of the entire linear project, even if one pole is considered de minimus, the total and cumulative impact of all the poles will add up to a substantial, significant and measurable impact and should therefore require mitigation/compensation.

In all provisions where there is an allowance for the removal of riparian zone vegetation to accommodate a permit by rule activity there must be a mandate that the vegetation be restored with native, non-invasive species, with a minimum requirement for tree and shrub plantings and an absolute prohibition on the use of lawn grass to fulfill this revegetation mandate.

7:13-7.4 To the extent this provision allows for the removal of riparian zone vegetation, it must also mandate that it be replaced with healthy native vegetation with an emphasis on trees and shrubs, and must absolutely prevent the use of nonnative and invasive species.

7:13-7.5 It is inappropriate to allow removal of accumulated sediment and debris as a permit by rule activity. There is too much opportunity for abuse and also uneducated implementation of this provision/activity. The provision does not provide the kind of guidance necessary to ensure that uneducated individuals and/or municipalities do not undertake activities that will in fact impact streams flows and health habitats and conditions. The allowance for the removal of riparian vegetation to "gain access" to the waterway provides no limitation on what that means, for example is it access for people or equipment, what is the size of the vegetative cut, and what must be done to repair the vegetative removal after the activity is done.

We have seen the allowance of stream cleaning projects be abused time and again by municipalities – sometimes intentionally and sometimes not, but always with adverse impacts. "Stream cleaning" activities should always require a heightened level of scrutiny.

7:13-7.10 There should be no permit by rule allowance for generation construction activities, construction should always require permitting and review.

7:13-7.12 & 7.13 & 7.14 It is inappropriate to allow any increase in the size of a building or construction of new structures without review and permitting. Allowing these kinds of increases can result, in time and over space, to an increase in cumulative impacts on a waterway and downstream communities. They result in new impervious cover, in every instance there is the allowance of vegetation removal, and the placement of the structure prevents the regrowth of any healthy vegetation and so the cumulative impacts of these kinds of projects, particularly in developed communities where there are a lot of property owners taking on a lot of projects large and small.

7:13-7.21 Pools are not an appropriate use for the flood hazard area or riparian zone – they are luxury features that should be accommodated elsewhere on a property.

7:13-7.24 Tanks are not an appropriate use for a flood hazard area or riparian zone, they should be accommodated elsewhere eon the property. Regardless of how firmly one believes a tank is situated above ground the opportunity for failure and the tank to be released into the waterway and to cause downstream and instream harms is too great.

7:13-7.26 The inclusion of artificial turf as a permit by rule activity is a huge mistake given the science available that links artificial turf with water quality degradation, particularly when located nearby, and/or discharging to, local waterways.

The pollutant substances found in artificial turf contribute to contamination of soil, plants and aquatic ecosystems and pose a risk of toxic effects for aquatic and sediment dwelling organisms. The resulting environmental harm is on-going and long-term, happening over many years. The varying content of tires used for infill of turf systems makes this threat a moving target. A growing body of scientific analysis is documenting a concerning level of environmental threat and harm and is further demonstrating the need for more research regarding artificial turf and its ramifications for the environment.

1. Public Employees for Environmental Responsibility (PEER) (2012). Petition for a Rulemaking on Surface Heat from Artificial Turf, Submitted by PEER to Consumer Product Safety Commission, Sept 6, 2012. Available at: http://www.peer.org/assets/docs/doc/9_6_12_PEER_Petition_heat_rulemaking.pdf
    a. As well explained by an oft cited petition to the Consumer Product Safety Commission for rulemaking: "When tires are shredded and pulverized, their surface area increases exponentially, as does the particulate and gas yield from the tire material. Since tires are made of very harmful materials, including 24 gases found to be harmful to humans, carbon black, (a carcinogen which makes up 30% of tires), latex, benzothiazoles, phthalates, lead, mercury, cadmium, zinc and many other known toxins, when the fields heat up, they become increasingly dynamic. Of primary concern is the interaction of particles and gases, 'because when particles adsorb onto the surface of gases, they become 10-20 times more toxic than the materials themselves.'"
    b. Furthermore, artificial turf becomes more toxic as it heats up.

2. Sadiktsis, I., et al. (2012). Automobile Tires A Potential Source of Highly Carcinogenic Dibenzopyrenes to the Environment. Environmental science & technology, 46(6), 3326-3334. Available at: http://www.locchiodiromolo.it/blog/wp-content/uploads/2012/03/Sadiktsis-et-al-Automobile-Tires-Potential-Source-of-Highly-Carcinogenic-2012.pdf
    a. The variability in PAH concentrations between different tires is large.
    b. Due to "leaching of PAHs from recycled tire rubber material, tires are a source of environmental pollution of PAHs through their entire lifecycle."
3. Connecticut Department of Environmental Protection (2010). Artificial Turf Study: Leachate and Stormwater Characteristics, Final Report. Available at: http://www.ct.gov/deep/lib/deep/artificialturf/dep_artificial_turf_report.pdf
    a. Stormwater runoff from artificial turf contained zinc, manganese, and chromium at levels toxic to aquatic organisms.
    b. Therefore, there is a potential risk to surface waters from the installation of artificial turf. Zinc levels could cause exceedence of acute aquatic toxicity criteria. This risk is especially high for smaller watercourses.
    c. Best management practices and treatment (i.e. wetlands, wet ponds, infiltration structures, compost filter, sand filters, or biofiltration structures) should be used for stormwater runoff from artificial turf fields that discharge to surface waters.
4. Yaghoobian, N., et al. (2010). Modeling the thermal effects of artificial turf on the urban environment. *Journal of Applied Meteorology and Climatology*, *49*(3), 332-345.
    a. An urban temperature model showed an increase in local atmospheric temperatures of up to 4° C (39° F) in areas where natural grass cover had been replaced with artificial turf.
5. Han, I. K., et al. (2008). Hazardous chemicals in synthetic turf materials and their bioaccessibility in digestive fluids. Journal of Exposure Science and Environmental Epidemiology, 18(6), 600-607. Available at: http://www.nature.com/jes/journal/v18/n6/pdf/jes200855a.pdf
    a. Zinc was found to exceed soil limits and the leaching rate from rubber granules was up to 20 times more than the leaching rate from agricultural applications of manure and pesticides. "Runoff with high Zn [zinc] from synthetic turf fields may produce adverse effects to plants and aquatic life."
6. KEMI, Swedish Chemicals Agency (2007). Facts: Synthetic Turf. April 2007. Available: http://www2.kemi.se/upload/trycksaker/pdf/faktablad/fbsyntheticturf.pdf.
    a. Hazardous substances found in tires may persist in the environment including polycyclic aromatic hydrocarbons (PAHs), phthalates, phenols, and certain metals.
    b. Most PAHs are persistent, bioaccumulative and carcinogenic.
    c. Phthalates and phenols are not chemically bound to the rubber and as a result can leach from the infill material. These chemicals are persistent and bioaccumulative and can have long-term effects on the environment.
7. Meil, J., & Bushi, L. (2006). Estimating the Required Global Warming Offsets to Achieve a Carbon Neutral Synthetic Field Turf System Installation. *Athena Institute. Ontario Canada.* Available at: http://sfrecpark.org/wp-content/uploads/AthenaICarbonOffsets.pdf
    a. Artificial turf systems have a carbon footprint due to the greenhouse gases emitted during the life cycle of synthetic turf systems compared to natural grass surfaces.
    b. To achieve a 10-year carbon neutral synthetic turf installation, 1861 trees would need to be planted to offset the field's carbon footprint.

8. Källqvist, T. (2005). Environmental risk assessment of artificial turf systems. *Norwegian Institute for Water Research*, 19.
    a. Recycled rubber varies considerably in its chemical composition, even when from the same manufacturer.
    b. Leaching of contaminants from artificial turf as the result of surface water runoff from precipitation is a great risk for the environment. It is predicted that chemicals leaching from synthetic turf materials occurs slowly, and as a result the environmental harms may take place over many years. There is also a level of "erosion" that takes place and can result in fine particles that could be carried to local waterways. Chemicals have even been shown to leach from the artificial turf fibers.
    c. The leachate from artificial turf can contain a variety of metals (including lead, cadmium, copper, mercury and zinc) and organic pollutants (including PAHs, phthalates, 4-t-octylphenol and iso-nonyphenol).
    d. The runoff from an artificial turf field poses "a positive risk of toxic effects on biota in the water phase and in the sediment."
    e. Of the organic compounds at issue, octylphenol represents the greatest risk, and possibly could occur at levels where hormone disrupting effects are a concern.
    f. The Norwegian Institute for Water Research has determined that it is "appropriate to perform a risk assessment which covers water and sediments in watercourses which receive run-off from artificial turf pitches."
9. Thale, S.W. et al. (2004) Potential Health and Environmental Effects Associated with Synthetic Turf Systems- final report. Byggforsk, Norwegian Building Research Institute. Available at: http://www.isss-sportsurfacescience.org/downloads/documents/vskyslv2qq_nbiengelsk.pdf
    a. While recycled rubber is a greater source of pollution, newly manufactured rubber also contains levels of hazardous substances; in the case of zinc and chromium the levels of recycled and newly manufactured rubber are comparable.
    b. The synthetic grass fibers can also be a significant source of pollution, albeit significantly lesser amounts leach from the synthetic grass than the rubber infill
10. Tucker, M.R. (1997). Ground Rubber: Potential Toxicity to Plants. Media Notes for North Carolina Growers, North Carolina Dept. of Agriculture & Consumer Services, April 1997. Available at: http://www.ncagr.gov/agronomi/pdffiles/rubber.pdf
    a. When talking about the use of ground rubber as a supplement to planting soils, the North Carolina Department of Agriculture and Consumer Services sent out a notice identifying the risk that zinc leaching from the rubber causes a decline in plant growth "directly attributable to zinc toxicity."
11. Quoting Dr. Linda Chalker-Scott, Washington State University - Turfgrass Resource Center, Facts About Artificial Turf and Natural Grass. (n.d.) Available at: http://plasticfieldsfornever.org/ArtificialTurfBooklet.pdf
    a. "There is no question that toxic substances leach from rubber as it degrades, contaminating the soil, flora, and fauna and aquatic systems."
12. Turfgrass Resource Center (n.d.) Facts About Artificial Turf and Natural Grass. Available at: http://plasticfieldsfornever.org/ArtificialTurfBooklet.pdf
    a. Part of artificial turf maintenance is the regular replenishment of the infill. Some of the infill is merely settling, but some of it is washing away or literally "walking away" with players after use. The effects of this "runaway" infill are unknown and more research is needed to draw conclusions– where is it going and what impacts is it having?

b. Maintenance of artificial turf can include application of algaecides or disinfectants to keep the surface clean and application of fabric softener to mask the odor of the artificial turf. What is the final destination of these chemicals and their implications for the environment and those coming into contact with them while playing on the fields?
c. There is no indication that artificial turf drains more effectively for purposes of a stormwater infiltration system than natural grass. In addition, infiltration systems are designed to work with whatever surface coating they receive from natural grass to porous paving. Although there is no assumed benefit from an infiltration perspective of natural turf or artificial turf, in many cases the complex systems designed for artificial turf fields have experience problems, work incorrectly, or inefficiently.

7:13-7.45 With the Penneast pipeline project we have just witnessed that the allowance of geotechnical investigations, in that case drilling, in close proximity to a waterways is damaging. While there was not vegetation removed the drilling operations resulted in polluted runoff entering a natural pond and a driller unilaterally deciding that they could withdraw water from the pond to support its drilling operations. In addition, the nearby drilling resulted in drilling fluids entering the natural water way through rock fissure/fractures either pre-existing or created by the drilling activity. Drilling, geotechnical and archaeological investigations are invasive and fraught with peril and require review and oversight by DEP.

7:13 – 11.2 With regards to increasing the riparian vegetation removal discussed in this section, the opportunities provided are over broad and are an over-reach.

The DEP's proposal to increase the total amount of riparian zone vegetation allowed to be disturbed in a variety of situations included and discussed in the rule proposal is counter productive and dangerous. For example:

- Increasing the area for roadways, utility lines, building as and other construction activities to "better reflect the Department's experience in permitting" is misplaced – the fact that these kinds of construction projects have sought to increase the level of riparian disturbance does not mean that increased disturbance is required. Pipelines are a good example: while today 100 foot ROWs for pipelines are the norm, in the past much narrower ROWs of 30 to 50 feet were commonplace. Not only were narrower ROWs commonplace in the past, but they are commonplace today when there is a need to protect an area for a rare plant or animal, or a wetland or other special ecosystem. And so what is clear, while the pipeline companies put forth larger ROW's seeking greater disturbance of natural areas, including riparian zones, this increased level of disturbance is not required. The same can be true for many kinds of projects and it is the DEP's job, and the jobs of regulations, to help ensure such projects minimize their footprint in order to protect communities from flooding and flood damages – not to throw up their hands and to simply go along with the larger proposals because it is more commonplace and easier for the agency.

- Allowing the increase of riparian zone encroachment/disturbance for lawns, gardens and other actively disturbed areas the DEP asserts do not impact riparian zone function is fundamentally flawed on its face – lawns, gardens and actively disturbed areas are damaging to riparian zone functionality, very much so. The science is very clear, that wider vegetated buffers are more effective than smaller ones, that minimum 100 foot forested buffers is the

absolutely minimum that should be required for water quality and flood protection, that lawnscapes are almost as significant as pavement for the volume of polluted runoff they create, and that larger buffers are critical for providing quality bird life and wildlife habitat – and so in all instances allowing encroachment to the riparian buffer for these kinds of land uses increases volume of runoff, pollution in runoff, and decreases ecological habitat, water quality protection and flood protection.

- Allowing the increase of riparian zone encroachment/disturbance for roadway and utility line easements and adjacent to bulkheads and revetments is counter productive as it fails to encourage, require and challenge developers, utility and pipeline companies, and road managers to better plant, construct and maintain their projects. ROWs for roadways, utilities, pipelines, etc. do not have to be lawn managed landscapes, they can be vegetated with valued and valuable shrubs, low growing trees and other native vegetation beneficial for reducing rainfall runoff, providing habitat and protecting stream quality. Increasing the level of riparian zone encroachment sacrifices downstream and streamside communities to make life easier for road managers and utility companies – this is not the correct balance.

- In the absence of careful and location specific analysis, allowances for increased encroachment for subsurface sewage systems is counterproductive form a water quality and community protection benefit. For example, On-lot septic systems are an appropriate way to manage wastewater, but they must be done right. When on-lot septics are not properly sited, constructed or maintained they can become significant sources of contamination that can degrade the quality of our streams. Nitrate-nitrogen levels in septic tank effluent can vary greatly, and are a significant source of groundwater contamination. Allowing increased encroachment into the buffer diminishes one of the protective barriers that exist to protect streams and communities from pollution associated with subsurface sewage systems.

- Special analysis and consideration of requested encroachments into the riparian zone for remediation projects and landfill closures are very appropriate and necessary – these are operations that have already taken an environmental toll, their adverse environmental footprint should nor be allowed to expand without a clear demonstration of need.

- Special analysis and consideration of requested encroachments into the riparian zone for trails, boardwalks and footbridges is very appropriate – these are facilities that would, it would seem, be designed to serve public access to nature and enhanced recreation, it is counter productive to allow these very same facilities to have an increased damaging footprint on nature.

Expanding the locations where restoration and enhancement may be conducted for purposes of mitigation, including allowing the option of mitigation banking, is damaging and should not be allowed. The current regulatory requirement ensures that mitigation of environmental harm resulting from encroachment in the riparian zone happens close to the site of damage, thereby ensuring the creeks and communities that are adversely impacted by that encroachment are the same communities that get relief form the damage through the mitigation. The Mitigation mandate is intended to alleviate the environmental and community harm that results from the allowed

encroachment, allowing that mitigation to happen at more distant locations undermines that need and goal.

Increasing the review time for General permits to 90 days is very appropriate and supported by the Delaware Riverkeeper Network.

7:13-11.2 Requirements for a regulated activity in a riparian zone.
The proposed rule changes will allow larger areas of Max Disturbance that are excessive, unwarranted, are a rollback in waterway and community protections and will result in an increasing level of ecological and community harms. An example is a resident now has a 5,000 sq ft allowance and an adjoining septic would get 2500 sq ft more. Sometimes hardships were needed to enlarge these footprints another 1000 sf for instance and made sense so DEP staff would permit it. But the new rules begin with a 7000 sq. ft for the house and as much as 5000 sq ft for the septic allowance opening the possibility that a septic could be added expanding the Max Disturbance to 12,000 sq ft which ushers in the potential for much bigger homes and/or cleared riparian zones.

The expansion of riparian one encroachment and footprints is over broad and will result in increased runoff, flooding, flood damages, pollution and ecological harm.

Furthermore, currently, if a hardship waiver is sought by applicant to exceed the Max Disturbance thresholds listed in Table C, the applicant must compensate at a 2:1 ratio and, as part of the approval process, DEP staff can question the applicant as to the design and footprint of the project working toward a reduction of impact on the functionality of the riparian zone. Currently, DEP regularly grants hardship waivers, particularly in residential areas and where reasonable. This process is working since it relies on experienced regulators who can apply applicable science and experience. The proposed new rules still require some compensation, but eliminate the authority/ability of DEP's staff to question the design and footprint. This is eliminating an important "checks and balances" that the State currently has – relying on DEP staff, who are, as employees of the State, looking out for the State's resources.

Question: How many waiver requests, under Table C criteria, does DEP receive annually and what is the percentage of approvals/denials? Is this change going to have, overall, a deleterious impact on riparian functionality statewide?

7:13-15.1 We oppose the proposed changes.

The current mandate under NJAC 7:13-9.8 that requires the a hardship exemption in order to violate the riparian zone minimums is fully appropriate for both water quality and water quantity protection as required by state and federal laws. The requirement to provide compensation at a 2:1 ratio for approved encroachment into the riparian zone and that such compensation in the form of replanting vegetation or enhancement of vegetation in appropriate areas must take place in the same regulated water as the disturbed vegetation/riparian zone and be situated as close as possible to the area of disturbance is not only fully appropriate and should be maintained, but is crucial to maintain the integrity of the benefits of the riparian zone including both water quality and flood damage reduction benefits.

That the pursuit of a hardship exemption requires additional work, analysis and cost by an applicant is appropriate – vegetated riparian buffers are critically important for protecting and maintaining water quality and preventing/reduced flooding and flood damages and so avoiding this regulatory requirement should not be cheap and easy.

Allowing compensatory action along another waterway deprives the impacted streams and communities of the benefits of a healthy riparian zone – they get damaged by the loss of the riparian zone and do not get the replacement protection or benefits the compensation is supposed to provide.

The proposed modifications to the rule incentivize buffer destruction**.** It encourages developers and others to pursue projects that can result in riparian zone damage by making it easier to get approvals for compensation and by making the identification of that compensation strategy easier to accomplish and pursue.

11.2 (f) (1) The ¼ acre FREE allowance misses the opportunity that new development and redevelopment provides, to require reforestation of buffer areas as a way to compensate for the inevitable ecological harm that new development, redevelopment and ongoing existence of development creates. There should be no ¼ acre allowance, instead as part of the approval process riparian restoration should be required.

Proposed N.J.A.C. 7:13 11.2(f)8 In the proposed rules, roads get a free pass. No compensation or protection of riparuab buffer is required because roads 1) allegedly serve as a barrier (i.e. a berm) to the runoff flow so riparian buffer functionality is asserted not to be needed, and 2 maybe) it may also be seen as a community benefit. Roads do not serve as a barrier to runoff in many if not most instances, in fact often they become a hotter and faster pathway for overland flow to get to a stream. Even when roads are sloped away from waterway, many are still connected to the adjacent waterway with subsurface drainage systems making the functionality of the riparian buffer important for treatment (even though road might be graded in opposite direction). In addition, while they do serve a community function, they also have community impacts, and their increased contribution of an increased volume of hot and polluted water also has a very significant community harm which must be addressed. Those who suffer from the road contributed pollution and increased flows suffer adverse impacts that should not be their burden to bear. Riparian buffers are an important, beneficial and relatively easy way to mitigate the harms roads inflict and so should be an ongoing and even increased mandate.

Currently, per 10.2, Table C, roads (and railroads) require compensation. This should not be changed, if anything it should be increased.

The biomass, including the tree canopy, shrubs and ground cover serves a valuable service (functionality) by retaining rainwater slowing it down and allowing it infiltrate into the groundwater called rate of interception and thereby protecting waterway base flow. These eco-system services will be lost if these riparian buffers are now permitted to be cleared whether or not the runoff effectively flows away from it or not.

A note on mitigation/compensation will be required for the functionality loss/degradation due to utility lines and many other permitted land use activities. Where projects impact multiple regulated areas (e.g FHA, riparian zone, wetlands, etc.) and must be mitigated for or compensated, all impacts to the various functionality should be addressed individually – meaning if a wetland was located in the

riparian zone, compensation should be made for the functionality of the wetland and to the riparian zone. An applicant should not realize the benefits to the cost of the project by only mitigation/compensating the loss of functionality of two resources of the State of NJ because one was located within the other.

The new General permit process is to mirror NJ's relatively new and currently suspect by the environmental community, Site Remediation Program. Under this program, the applicant's consultants (LSRP) are primary in technical and enforcement over-site. Through the proposed rule, DEP is proposing through these rule changes to adopt as many as 15 general permits to be managed similar to state's site remediation program wherein DEP staff serve only to assure project timetables and reports are filed in a timely manner. As with the site remediation program, the applicants or their consultants will be assuring that all the technical, on-site procedures are followed according to the rules and regulation. DEP staff will not, as a matter of the permit procedure, go to the site and provide recommendations as to resource impact mineralization or other beneficial functions that an experienced regulator could provide thereby eliminating an important voice for the State and the resources of New Jersey and the people who depend on those resources. With the new regulations only the applicant and the consultants they are paying will be on-site. The Delaware Riverkeeper Network and others have experienced a number of problems with this approach, with permittees being in primary control of their own permit oversight through the LSRPs they hire, this approach is not working and should not be mirrored in the flood hazard rules.

As noted above, we had commissioned an expert to conduct an additional review of these proposed rule changes and have attached their Report here. The Delaware Riverkeeper Network thanks the Department for the opportunity to comment and we look forward to your response.

Respectfully,

Maya K. van Rossum
the Delaware Riverkeeper

Attachement

Meliora Design

MEMORANDUM

Review of the New Jersey Flood Hazard Area Control Act Proposed Changes

Date: 31 July 2015

To: Maya van Rosum, Delaware Riverkeeper Network

cc: Fred Stine, Delaware Riverkeeper Network

From: Meliora Design, Michele Adams, PE

I have reviewed the proposed changes to the New Jersey Flood Hazard Area Control Act, and the associated changes in the Coastal Zone Management and Stormwater Management regulations, including the repeal of the Special Water Resource Protection Area in the Stormwater Management Rules.

While there are a number of positive changes proposed in the regulations, there are also a number of significant concerns that these changes will result in a net reduction of forested or vegetated riparian zones in the state. In general, the proposed changes increase the amount of area that may be disturbed for a variety of situations, and change the permitting process from one where DEP has direct involvement, to one where there are more situations where the developer is self-certifying. Specifically, the following overarching items are of concern:

1. **Permit process changes:** Standardizing the process for obtaining a permit to be across all three chapters is a positive change so long as the regulations and expected project performance remains at least as rigorous as the current permitting process, and provide a process for both protecting existing riparian areas and existing the area of vegetated and forested riparian area to improve water quality. It is not clear that the proposed regulations will achieve this.

2. **Riparian Zone Changes:** The current rules require a 2:1 ratio of restoration or enhancement in the riparian zone of the same regulated water if a buffer of 50, 150, or 300 feet is disturbed. Applicants must demonstrate a hardship, which the Department has indicated is time and resource consuming, and has also indicated that most cases are granted a hardship but have difficulty meeting the compensation requirements.

   While this may be true, the Department has not provided any data or statistics on the number and types of projects that encounter hardships, or the final permit requirements that are negotiated under the current program. There is no data indicating that the

program is either failing or succeeding to maintain and increase the overall area of protected and vegetated riparian zone, nor is there any data on the referenced hardship impacts created by the process.

3. **Amendments to, and an increase in the number of permits-by-rule, general permits by certification, and general permits.** The Department is expanding the number and types of projects covered under this process, and while some changes make sense, a number of changes leave decisions to be determined by the applicant, reducing the likelihood that the disturbance will be minimized.

4. **An Increase in the allowable area of disturbance under permits-by-rule, general permits by certification, and general permits** The Department has indicated that most cases demonstrate a hardship, but have difficulty meeting compensation requirements. However, this is not justification for increasing the allowable disturbance area, or allowing more projects to be permitted under a process that is not an individual permit. The individual permit process affords the Department the opportunity to review and work with the developer to assure that all options have been considered. It provides for Department input on both the extent of disturbance and ways to reduce or limit the disturbance, as well as consideration of options for mitigation or restoration. Again, the Department should provide statistics/data to support and justify this statement and the specific proposed changes. How many hardships, what type, how much mitigation occurred as a result of hardships granted? Will that mitigation now be lost?

   Under the proposed changes, there will be:

   - An increase in the allowed disturbance for roads, utility lines, buildings, other construction activity
   - An increase in riparian zone vegetation that can be disturbed for lawns, gardens, other; roadway and utility easements, areas adjacent to bulkheads, and other areas
   - Allowances for activities that currently need hardship exemption, such as site remediation, footbridges, septic, etc. While some of these are good, the reconstruction of a septic system within a riparian area should be discouraged.
   - No need to obtain a hardship where it demonstrated that project cannot feasibly meet riparian disturbance limits, but this does not justify that the the project should occur under all conditions. In certain situations, a project should not be permitted.

   Although the proposed changes provide for riparian zone mitigation for all vegetation removed in excess of the limits, by increasing the limits there will automatically be an increase in riparian area disturbance with no anticipated restoration or mitigation. This is a net loss to the state.

5. **Repeal of SWRPA in Stormwater Rules** Currently, SWM rules require a 300' riparian are along Category One streams and certain tributaries, based on USGS quadrangle mapping. Removing this requirement is a positive improvement, as USGS quadrangles are not a reliable determination of streams. However, the SWM rules do not allow development

within the SWRPA, and the FHACA requirements do allow development within the riparian zone, with the extent dependent on the development type. This is a reduction is protection standards and a "roll back" of regulatory standards that should not be included.

6. **Acid Producing Soils** Current CZM and FHHZA rules establish a 150' buffer along waters with acid producing soils, and define excavation requirements. The Department has indicated that this has resulted in unintended problems by causing significant erosion. However, this is a stormwater erosion issue, and should not be addressed by allowing direct discharge to stream. Stormwater discharge requirements should be amended to prevent erosive

We offer the following comments with regards to specific sections:

7:13-2.1 and 1.2 Pg 21
Grandfathering – The five exemptions could encompass a lot of projects, including anything with preliminary approval. How many acres will this impact? How many of these are located on C1 streams? Why is hardship going back to 2007, and are there any statistics on how many projects/acres this may impacts? Economic downturns from 8 years ago do not justify less protection of riparian areas.

7:13-2.4 and 1.2
Regulated Areas Adding language to assure converted non-residential buildings meet residential standards is very good, especially in urban areas where buildings are re-purposed.

7:13-1.2 and 4.2
Forested or Unforested: More stringent standards for forested riparian disturbance is .good, as is providing clarification for determination consistent with CZM and Highlands Act.

7:13-1.2, 4.1, 10.7
Acid Producing Soil Deposits Removing requirement for stormwater discharges to be located outside 150-ft riparian zone. This is a stormwater issue, and if discharges are erosive overland they are likely to be erosive in-stream. Stormwater discharge requirements should be modified, and riparian buffers maintained so that infiltration and filtration can occur (in all soil types). While there may be erosion problems, DEP should not remove riparian buffer requirements in lieu of addressing stormwater design standards.

7:8-5.5 and 7:13-4.1 and 11.2
Deletion of SWRPA and related incorporation into 300-ft riparian zone: Deleting 300 ft riparian zone from SWRPA and incorporating new standards into FHACA rules. This section includes improvements such as:

- FHACA rules will apply regardless of size and density of development (unlike SWRPA rules)
- Tributaries are protected regardless of appearance of USGS quad (unlike SWRPA rules). USGS Quads are not an accurate or scientifically developed source of stream classification

- Design and construction standards within riparian zones will now be uniform.
- Requiring "proof" of necessity where riparian zone disturbance exceeds limits (but limits are increasing)

Concerns include:

- Rule proposes changes (increases) in the limit of riparian zone disturbance under both individual, permit-by-rule, and general permits.
- Presumes that development within riparian zone is "sometimes unavoidable" and sets requirements by type of development. This presumes that development really is unavoidable and allows the applicant to make the determination. This statement should be supported by information/data to justify the statement and the proposed criteria.
- Removing requirements that are "burdensome, unmanageable, unhelpful to goal of riparian zone protection", but no data of specifics are provided to demonstrate that these requirements are "unhelpful". "Burdensome" is not a justification for reducing standards.

7:13-1.2 Adding flexibility for disturbing riparian zone vegetation.: Areas already developed, paved, or farmed will be considered disturbed. Encouraging development in previously disturbed riparian zones is a good proposal, but simply conceding that development can occur in previously disturbed areas accepts the "status quo" and concedes any efforts to improve current conditions. Water quality and stream health will not improve if the current conditions are accepted as baseline. Under this proposal, it appears that restoration of existing disturbed areas will only happen as part of mitigation for disturbance elsewhere. DEP must provide a method or process for the net area of undisturbed or restored riparian zones to increase with time, not decrease. Again, statistics and data to justify this decision should be provided.

Forests and other non-ornamental woody vegetation are not considered "disturbed", including individual trees. In theory this is good, but since the rule allows clearing under the tree canopy, this "protection" is essentially meaningless. Disturbing below the canopy of a tree is likely to result in the decline and loss of the tree unless undertaken in a manner to assure tree health. So this is meaningless unless requirements for tree and forest protection are defined and implemented. Since disturbance will happen under permit-by-rule, general permit by certification, or general permit, the practice will be "self-monitoring" and meaningless for riparian function protection.

7:13 -11.2(b) General requirements for all projects within riparian zone

This will **remove requirement that applicant explore reducing size or scope of project**. This is a significant change and dramatically reduces DEP's role in actively working with applicant's to limit project impacts. Instead, this provision concedes that project size and scope are determined by the applicant. Again, no supporting data or statistics are provided to justify that project size is determined by zoning, and no data on past results are provided of active Department involvement in reducing project size and scope. This change appears to provide a significant reduction in the protection of riparian zones, and without supporting data to justify the statements, this provision should **not** be adopted.

7:13-11.2(c) and (d) Activities allowed within 25 feet of top of bank

New development within 25 feet of top of bank are generally prohibited, and existing impervious from previous activity required to be removed. This is good.

Redevelopment allowed in certain circumstances. This is reasonable.

Proposed rule would allow removal and replacement of impervious that prevents reasonable use or access to site. Reasonable use or access may be maintained with a reduced area or disturbance or impervious area. But removing the process for Department staff to provide input on what is "reasonable" and to actively review and require some reduction in riparian area disturbance is also a "roll back" of current levels of protection and should not be permitted.

7:13-11.2(e) Limitations on Riparian Zone Vegetation that can be cut, cleared and/or removed

The narrative for this section indicates that under current rules "riparian zone allowance is insufficient to accommodate responsible development". This statement indicates that the priority is development and not riparian zone protection.

Table 11.2 defines the maximum amount of riparian zone disturbance for different activities, with exceedance of these limits sometimes requiring justification and sometimes requiring hardship exemption. Of concern is the clarification that an individual permit can cover multiple activities, and that the allowable area is for each activity. This could significantly "add up" and the Department has not provided any justification that the disturbance allowances are justifiable or necessary. This does not apply to residential activity, which is considered cumulative (this is good).

There are a number of permitted activities for up to ¼ acre of vegetation loss in an actively disturbed area. Some of these make sense (i.e. replacing vegetation), but some do not. Septic systems should not be relocated within a riparian zone, nor should structures be allowed to be relocated within a riparian zone. Water quality will not improve if the existing conditions are accepted as baseline. Table 11.2 exempts disturbance to vegetation within an existing right-of-way, or areas sloped away from regulated water. Right-of-way areas should not be uniformly exempted, there should be a process for the Department to work with applicants on a case-by-case or right-of-way typology to determine which portions should be exempted and which should be protected. Again, some information or statistics should be provided to justify the proposed changes. There is no indication how big of an impact utility right-of-way disturbance has on riparian zones, and the extent associated with different rights-of-way (rail, highway, local roads, utility, etc.). Given the availability if GIS data, the Department should be developing statistics and metrics to justify this and other proposed changes.

Sincerely,

Michele Adams, PE
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