Water Quality Agenda Item Number 2:

Consideration of Revisions to the Neuse River Riparian Buffer Rule

In accordance with House Bill 1402, a Stakeholder Advisory Committee has been meeting since October 1998 to discuss revisions to the Neuse Riparian Buffer Rule. The Stakeholder Advisory Committee includes 23 members representing a broad range of interests, including development, agriculture, local government, mining, forestry and environmental. The members of the committee are listed on the next pages.

House Bill 1402 directed the Stakeholder Advisory Committee to address several specific issues, including establishment of a mitigation program, delegation of the program to local governments, definition of a stream, determination of "no practical alternatives," and designation of allowable uses. As a result of the committee's recommendations, a revised Neuse Riparian Buffer Rule and three additional accompanying rules have been drafted and are now presented to the Water Quality Committee.

The contents of this package include:

- A list of members of the Stakeholder Advisory Committee.
- A report describing the Stakeholder Advisory Committee's final recommendations on the Neuse Riparian Buffer Rules.
- The revised Neuse Riparian Buffer Rules developed by the Stakeholder Advisory Committee.
- A copy of House Bill 1402.
- Meeting minutes from Stakeholder Advisory Committee meetings.
- The products of two technical advisory committees that assisted the Stakeholder Advisory Committee in developing the revised rules.
- A copy of the current temporary Neuse Riparian Buffer Rule.

Neuse Buffer Stakeholder Advisory Committee: Report of Final Recommendations to the Environmental Management Commission

I. Executive Summary

House Bill1402 established the Stakeholder Advisory Committee for the Neuse Buffer Rule (Appendix 2). The Committee consisted of 23 members representing specific organizations with interests ranging from environmental protection, local government, development, industry and federal and state regulatory agencies. The Committee's role was to recommend modifications to the Neuse Buffer Rule (NBR) as adopted in 15A NCAC 2B .0233 by the Environmental Management Commission (Appendix 1). The intent of this process is to protect and enhance the water quality of the Neuse River while not imposing an undue burden on the regulated public.

The Committee met 14 times between October 21, 1998 and February 26, 1999. One meeting was held in Goldsboro, one in New Bern, and the remainder held in Raleigh. The Committee heard from a number of technical witnesses in a variety of areas while developing their recommendations, including a Forestry Technical Advisory Committee and a Stream Technical Advisory Committee. This report describes the operation, decisions and conclusions of the committee. The appendices to this report describe the members, meeting minutes, technical advisory committee reports as well as a proposed revised Neuse Buffer Rule, proposed rules for local government delegation and legislation.

II. Background

The Neuse Buffer Rule (NBR) was first adopted as a temporary rule by the Environmental Management Commission on June 11, 1997 after extensive public comment and review, including four public hearings (effective date of July 22, 1997). Since then, the Commission has approved two revisions to the temporary rule. The NBR is part of a comprehensive package of Neuse River Nutrient Sensitive Waters Management Strategy rules designed to achieve a 30% reduction in the amount of nitrogen reaching the Neuse River at New Bern.

The main purpose of the NBR is to prevent additional increases, and where possible, contribute to reductions in nitrogen. The other rules that make up the Neuse River Nutrient Sensitive Waters Management Strategy, such as wastewater treatment plant limits and urban and agricultural runoff controls, are designed to achieve the nitrogen reduction. The NBR establishes a 50-foot riparian buffer along all intermittent and perennial streams, lakes, ponds and estuaries in the Neuse Basin with runoff directed through the buffer as diffuse flow to remove nutrients. The rule provides exemptions for activities such as road and utility crossings, greenway trails and water-dependent projects, which are difficult to completely avoid siting in the buffer.

During May 1998, the Division of Water Quality held a series of training sessions in an effort to address questions and concerns regarding implementation of the buffer rule. Following the training sessions, considerable concerns still existed among the staff and regulated community over the provisions of the rule and implementation of those provisions. During the Summer of 1998, meetings were held between members of the General Assembly, the Department of Environmental and Natural Resources, the regulated communities and the conservation communities to discuss the concerns over the buffer rule.

As a result of the concerns continued to be expressed by all parties, the General Assembly promulgated statutory language. House Bill 1402 established how the rule was to be implemented on a temporary basis, created a stakeholder committee, established a requirement to allow for alternatives to maintaining the buffer through a compensatory mitigation program, established a Riparian Buffer Mitigation Fund and program, and established a requirement for the Environmental Management Commission (EMC) to adopt rules to provide for delegation of the program to interested local governments. The stakeholder committee was tasked with evaluating the rules and making recommendations on improvements to the EMC and the Environmental Review Committee of the General Assembly.

III. Stakeholder Advisory Committee Structure and Operation

The Committee consisted of 23 members of organizations specified in HB 1402. The Secretary of the Department of Environment and Natural Resources appointed Dr. Ken Reckhow of the N.C. Water Resources Research Institute as chair. DWQ staff served as staff for the committee. Steve Smutko and Nan Freeland of the Natural Resources Leadership Council at NCSU served as facilitators.

The general topics of discussion at the fourteen meetings are listed below. Minutes of these meetings are attached as Appendix 3. An initial two-day meeting was held on October 21 and 22, 1998 in Waynesborough State Park in Goldsboro. The purpose of the first meeting was to review the NBR, visit field sites that presented typical NBR implementation issues and develop discussion topics for future meetings.

The November 12, 1998 meeting was devoted to stream mapping and included presentations from experts from the Natural Resources Conservation Service, NC Geological Survey, NC Center for Geographic Information and Analysis and NCSU. Methods for defining streams were discussed at the November 13, 1998 meeting. The Stakeholder Advisory Committee established a Stream Technical Advisory Committee (TAC) at this meeting (see Appendix 4 for its final report). The Forestry Technical Advisory Committee, established ten years ago as part of the changes made to the Sedimentation Pollution Control Act related to forestry, was convened during the NBR review process to discuss buffer protection requirements for forestry (Appendix 5).

The December 3 and 4, 1998 meetings included discussion on delegating the buffer protection program to local governments, identifying the edge of the buffer and

vegetational concerns, mapping streams, and defining forest vegetation. During these meetings, the Committee also discussed options for buffer width and allowable uses within the buffer. The December 18, 1998 included presentations from NC Division of Coastal Management staff on their proposed buffer rules and DWQ engineering staff on stormwater management.

On January 7 and 8, 1999, the Committee heard from buffer experts at NCSU and mitigation experts from DWQ. The primary issues discussed on those days were mitigation, and allowable uses, particularly electric utilities. The meetings on January 21 and 22, 1999 consisted mainly of reports by the Stream and Forestry TAC and discussions on mitigation, stormwater management, delegation and buffer widths.

The February 1, 1999 meeting covered allowable uses, buffer width and vegetation, mitigation and delegation. A meeting was held on February 15, 1999 to reach conclusions on definitions, delegation, mitigation and legislation. The final meeting of the Committee was held on February 26, 1999 in New Bern. Discussions centered on vegetation and buffer widths, forestry use in the buffer and allowable uses, including mining.

IV. Major Accomplishments and Conclusions

The committee agreed to operate by consensus where possible, and where consensus was not possible, the differing positions of Committee members were to be reported to the EMC for use in their decision making. The Committee's efforts are summarized in the proposed revised Neuse River Buffer Rule, the new Mitigation and Delegation Rules (Appendix 1) and the proposed Legislative Changes (Appendix 6). On most issues, the Committee reached consensus or near consensus. The next section includes a list of the issues on which the Committee did not reach consensus and a summary of the differing opinions. Below are the major accomplishments of the Committee:

(1) **Stream definitions** – The Committee decided to continue using the USGS topographic and county soil survey maps to define streams. Waters that appear on either of these maps would be covered by the rule unless there is a field determination that a stream shown on the map does not exist on the ground or there is an existing use in the buffer. Either DWQ or delegated local government staff can make the field determination. During this initial phase, waters that do not appear on the maps shall not be subject to the rule even if they exist on the ground. A longer-range program of applied research and mapping is needed to produce higher quality maps of stream locations. Funding from the N.C. Legislature will be necessary to develop a more reliable map of streams of the Neuse River basin and (eventually) the entire state.

(2) **Mitigation** – As required by HB 1402, a process was set up to allow the option of compensatory mitigation in for impacts to the buffer. This process would allow either mitigation to be carried out by the developer, private banks or the N.C. Wetlands Restoration Program. The Committee agreed that mitigation should be expanded beyond the area of coverage applicable and in the types of compensatory mitigation provided for in HB 1402 (see section on Legislative Changes below).

(3) **Delegation** – As required by HB 1402, a process was established to allow voluntary delegation of this program to qualified local governments with DWQ oversight (see Delegation Rule and Legislative Changes).

(4) **Buffer Width and Vegetation** – The Committee achieved a near-consensus to recommend that the EMC adopt a 50-foot buffer with two zones that would be applied for all vegetation. Zone 1 would be 30 feet wide and Zone 2 would be 20 feet wide with grading and fill allowed. Maintenance of existing vegetation in Zone 1 would be required. The footprint of existing land uses within the buffer would be exempt, with the buffer rule only applying when (and if) land use changed. The people on the Committee who did not agree with this recommendation believed that the extension of the rule to all vegetation rather than just areas with forest vegetation was too expansive. Additionally, concern was raised that extending the buffer protection to all vegetation would limit opportunities for mitigation.

(5) **Allowable Uses** – A list of 36 specific activities were separated into categories of exempt, allowable, allowable with mitigation and prohibited. Uses listed as **exempt**, such as archaeological activities and dam maintenance, can be done without staff review. Uses listed as **allowable**, such as greenway trails, mining, driveway crossings wider than 25 feet or railroad crossings greater than 150 linear feet, need written staff approval but do not require mitigation. Uses listed as **allowable with mitigation**, such as in-stream ponds (mitigation can be on-site) and stormwater management facilities, need written staff approval and compensatory mitigation. Uses listed as **prohibited** may not be undertaken in the buffer without a variance. Although consensus was not reached on each of these 36 uses, the assignment of these uses to these categories received general support by the committee.

(6) **Forestry Management** – The Committee approved by consensus revised provisions to increase the amount of logging allowed in Zone 1 based on a compilation of parts of several draft rules proposed by the Forestry TAC with the addition of return times for harvesting. However, the committee did not reach consensus on the requirement for management of the 10-foot area directly adjacent to surface waters.

(7) **Legislative Changes** – A specific list of legislative suggestions was developed including:
   a) Establishing a training program with fees,
   b) Allowing compensatory mitigation on perennial as well as intermittent streams,
   c) Allowing options to mitigation, which are functionally equivalent in addition to buffer restoration,
   d) funding a stream mapping process, and
   e) Revising the delegation process.

V. Issues on Which the Committee Did Not Reach Consensus

Issue 1: The Width and Vegetation Requirements for the Buffer

The Committee heard a presentation from Dr. Wendell Gilliam (Soil Science Department at NC State University) on the scientific research supporting various buffer widths. Dr. Gilliam's presentation and technical bulletin reflected that different buffer widths display a range of nitrogen removal rates depending on the location and adjacent land use. For example, in Coastal Plain agricultural settings, a 30-foot buffer of deep-rooted vegetation combined with a grassed filter strip to diffuse flows has been sufficient to obtain a high nitrogen removal rate. However, in the Piedmont, Dr. Gilliam said that a 50-foot forested buffer strip would be needed for nitrogen removal because of the differences in slopes and soils. Some of the literature cited in Dr. Gilliam's technical bulletin shows that high nitrogen removal rates may not achieved until buffer widths reach 70 to 80 feet.

The majority of the Committee agreed that the buffer should be 50 feet wide and apply to all vegetation with exemptions for existing uses. However, some members of the Committee believed that the extension of the rule to all vegetation rather than just areas with forest vegetation was too expansive. Additionally, concern was raised that extending the buffer protection to all vegetation would limit opportunities for mitigation.

Issue 2: Ratios for Mitigation

The Committee did not agree on appropriate ratios for mitigation. They decided to present the Commission with a range of ratios for impacts to Zones 1 and 2. The range for impacts to Zone 1 was 1.5 to 5 and the range for Zone 2 was 1 to 2.

Issue 3: The Price for Mitigation

The majority of the Committee agreed that the price computed by the DWQ Wetland Restoration Program was appropriate and necessary to successfully complete mitigation activities. However, some members of the committee believed that this price was too high.

Issue 4: Exemptions for Small Impacts
Initially, the Committee considered providing an exemption for small impacts that remove less than a specified area or length of riparian buffer. Some members of the Committee believed that an exemption for small impacts would increase the efficiency of the buffer rule by allowing DWQ and the delegated local authorities to focus on more significant buffer impacts. However, the majority of the Committee agreed that the revised draft rule provides enough provisions for small impacts to the riparian buffer such as driveway crossings and utility service. However, some members of the committee believed that an additional exemption for small impacts based on the area of the impact should have been included.

Issue 5: Forest Harvesting in the Ten Feet Directly Adjacent to Surface Waters
The majority of the committee agreed to allow removal of high-value trees (as specified in the Definitions Rule) within the first ten feet directly adjacent to surface waters. However, some members of the committee believed that there should be a ten foot no-cut zone directly adjacent to streams where tree harvest would be entirely prohibited.

Issue 6: Forest Harvesting Where the Majority of the Trees are 10-inches DBH or Greater
The majority of the committee agreed that for a mature stand of trees, the harvesting requirements should allow removing 50% of the trees that are 10-inches DBH or greater. However, some members of the committee believed that the harvesting requirements for mature stands should allow removing 50% of the trees that are 5-inches DBH or greater.

Issue 7: Inclusion of Land Donation as an Option for Mitigation
The majority of the committee agreed that land donation should be allowed as an option for meeting mitigation requirements as specified in House Bill 1402. However, some members of the committee preferred that this not be offered as an option for meeting mitigation requirements.

VI. Summary

In general, the Neuse River Buffer Stakeholder Advisory Committee is recommending NBR revisions and additional accompanying rules to the Environmental Management Commission that are clarified and more easily implemented by state and local government. The rule still provides protection the primary function of stream buffers – namely, to remove nutrients from runoff – and thereby contribute to the legislative goal of 30% reduction in nitrogen to the Neuse River.

Appendices

Appendix 1:
Proposed Revised Neuse River Buffer Rules

15A NCAC 2B .0202:	Definitions
15A NCAC 2B .0233:	Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Riparian Buffers
15A NCAC 2B .0242:	Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Delegation of Authority for the Protection and Maintenance of Riparian Buffers
15A NCAC 2B .0243:	Mitigation Program for Protection and Maintenance of Riparian Buffers

15A NCAC 2B .0202 is proposed for modification as follows:

.0202 DEFINITIONS

'Channel' means a natural water-carrying trough cut vertically into low areas of the land surface by erosive action of concentrated flowing water or a ditch or canal excavated for the flow of water. (current definition in Forest Practice Guidelines Related to Water Quality, 15A NCAC 1I .0102)

'DBH' means Diameter at Breast Height of a tree, which is measured at 4.5 feet above ground surface level.

'Ditch or canal' means a man-made channel other than a modified natural stream constructed for drainage purposes that is typically dug through inter-stream divide areas. A ditch or canal may have flows that are perennial, intermittent, or ephemeral and may exhibit hydrological and biological characteristics similar to perennial or intermittent streams.

'Ephemeral (stormwater) stream' means a feature that carries only stormwater in direct response to precipitation with water flowing only during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the water table, and stormwater runoff is the primary source of water. An ephemeral stream typically lacks the biological, hydrological, and physical characteristics commonly associated with the continuous or intermittent conveyance of water.

'High Value Tree' means a tree that meets or exceeds the following standards: for pine species, 14-inch DBH or greater or 18-inch or greater stump diameter; and, for hardwood or wetland species, 16-inch DBH or greater or 24-inch or greater stump diameter.

'Intermittent stream' means a well-defined channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and hydrological characteristics commonly associated with the continuous conveyance of water.

'Modified natural stream' means an on-site channelization or relocation of a stream channel and subsequent relocation of the intermittent or perennial flow as evidenced by topographic alterations in the immediate watershed. A modified natural stream must have the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.

'Perennial stream' means a well-defined channel that contains water year round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also

carries stormwater runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.

'Perennial waterbody' means a natural or man-made basin that stores surface water permanently at depths sufficient to preclude growth of rooted plants, including lakes, ponds, sounds, non-stream estuaries and ocean. For the purpose of the State's riparian area protection program, the waterbody must be part of a natural drainageway (i.e. connected by surface flow to a stream).

'Stream' means a body of concentrated flowing water in a natural low area or natural channel on the land surface.

'Tree" means a woody plant with a DBH equal to or exceeding 5-inches.

.0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: PROTECTION AND MAINTENANCE OF RIPARIAN BUFFERS

(1) PURPOSE. The purpose of this rule shall be to protect and preserve riparian buffers in the Neuse River Basin to maintain their nutrient removal functions.

(2) APPLICABILITY. This rule shall apply to 50-foot wide riparian buffers directly adjacent to surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries), excluding wetlands. The riparian buffers protected by this Rule shall be measured pursuant to Item (3) below. For the purpose of this Rule, a surface water shall be present if the feature is approximately shown on either the most recent version of the soil survey map prepared by the Natural Resources Conservation Service of the United States Department of Agriculture or the most recent version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States Geologic Survey (USGS). Riparian buffers adjacent to surface waters that do not appear on either of the maps shall not be subject to this Rule. Riparian buffers adjacent to surface waters that appear on the maps shall be subject to this Rule unless one of the following applies.

(a) EXEMPTION WHEN AN ON-SITE DETERMINATION SHOWS THAT SURFACE WATERS ARE NOT PRESENT. When a landowner or other affected party believes that the maps have inaccurately depicted surface waters, he or she shall consult the Division or the appropriate delegated local authority. Upon request, the Division or delegated local authority shall make on-site determinations. Any disputes over on-site determinations shall be referred to the Director in writing. A determination of the Director as to the accuracy or application of the maps is subject to review as provided in Articles 3 and 4 of Chapter 150B of the General Statutes. Surface waters that appear on the maps shall not be subject to this Rule if an on-site determination shows that they fall into one of the following categories.

(i) Ditches and manmade conveyances other than modified natural streams.

(ii) Manmade ponds and lakes that are located outside natural drainage ways.

(iii) Ephemeral (stormwater) streams.

(b) EXEMPTION WHEN EXISTING USES ARE PRESENT AND ONGOING. This Rule shall not apply to portions of the riparian buffer where a use is existing and ongoing according to the following.

(i) A use shall be considered existing if it was present within the riparian area as of July 22, 1997. Existing uses shall include, but not be limited to, agriculture, buildings, industrial facilities, commercial areas, transportation facilities, maintained lawns, utility lines and on-site sanitary sewage systems. Only the portion of the riparian area that contains the footprint of the existing use is exempt from this Rule. Activities necessary to maintain uses are allowed provided that no additional vegetation is removed from Zone 1, existing diffuse flow is maintained, and surface waters are not disturbed. Grading and revegetating Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised, the ground is stabilized and existing diffuse flow is maintained.

(ii) At the time an existing use is converted to another use, this Rule shall apply. An existing use shall be considered to be converted to another use if any of the following applies:
(A) Impervious surface is added to the riparian buffer in locations where it did not exist previously.
(B) An agricultural operation within the riparian buffer is taken out of production.
(C) A lawn within the riparian buffer ceases to be maintained.

(3) ZONES OF THE RIPARIAN BUFFER. The protected riparian buffer shall have two zones as follows:
(a) Zone 1 shall consist of a vegetated area that is undisturbed except for uses provided for in Item (5). The location of Zone 1 shall be as follows:
(i) For intermittent and perennial streams, Zone 1 shall begin at the most landward limit of the top of bank or the rooted herbaceous vegetation and extend landward a distance of 30 feet on all sides of the surface water, measured horizontally on a line perpendicular to the surface water.
(ii) For ponds, lakes and reservoirs located within a natural drainage way, Zone 1 shall begin at the most landward limit of the normal water level or the rooted herbaceous vegetation and extend landward a distance of 30 feet, measured horizontally on a line perpendicular to the surface water.
(iii) For surface waters within the 20 Coastal Counties (defined in 15A NCAC 2B .0202) within the jurisdiction of the Division of Coastal Management, Zone 1 shall begin at the most landward limit of the normal high water level, the normal water level, or the landward limit of coastal wetlands as defined by the Division of Coastal Management and extend landward a distance of 30 feet, measured horizontally on a line perpendicular to the surface water.
(b) Zone 2 shall consist of a stable, vegetated area that is undisturbed except for activities and uses provided for in Item (5). Grading and revegetating Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised. Zone 2 shall begin at the outer edge of Zone 1 and extend landward 20 feet as measured horizontally on a line perpendicular to the surface water. The combined width of Zones 1 and 2 shall be 50 feet on all sides of the surface water.

(4) DIFFUSE FLOW REQUIREMENT. Diffuse flow of runoff shall be maintained in the riparian buffer by dispersing concentrated flow and reestablishing vegetation.
(a) Concentrated runoff from new ditches or manmade conveyances shall be converted to diffuse flow before the runoff enters the riparian buffer.
(b) Periodic corrective action to restore diffuse flow shall be taken if necessary to impede the formation of erosion gullies.

(5) TABLE OF USES. The following chart sets out the uses and their designation under this Rule as exempt, allowable, allowable with mitigation, or prohibited. The requirements for each category are given in Item (6).

	Exempt	Allowable	Allowable with Mitigation	Prohibited

Airport facilities: • Airport facilities that impact equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Airport facilities that impact greater than 150 linear feet or one-third of an acre of riparian buffer		3	3	
Archaeological activities	3			
Bridges		3		
Dam maintenance activities	3			
Drainage ditches, roadside ditches and stormwater outfalls through riparian buffers: • Existing drainage ditches, roadside ditches, and stormwater outfalls provided that they are managed to minimize the sediment, nutrients and other pollution they convey to waterbodies • New drainage ditches, roadside ditches and stormwater outfalls provided that a stormwater management facility is installed to control nitrogen and attenuate flow before the conveyance discharges through the riparian buffer • New drainage ditches, roadside ditches and stormwater outfalls that do not provide control for nitrogen before discharging through the riparian buffer • Excavation of the streambed in order to bring it to the same elevation as the invert of a ditch	3	3		3 3
Drainage of a pond in a natural drainage way provided that a new riparian buffer that meets the requirements of Items (3) and (4) is established adjacent to the new channel	3			
Driveway crossings: • Driveway crossings on single family residential lots that disturb equal to or less than 25 linear feet or 2,500 square feet of riparian buffer • Driveway crossings on single family residential lots that disturb greater than 25 linear feet or 2,500 square feet of riparian buffer • Driveway crossings in a subdivision as defined in N.C.G.S. ___ that cumulatively disturb equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Driveway crossings in a subdivision as defined in N.C.G.S. ___ that cumulatively disturb greater than 150 linear feet or one-third of an acre of riparian buffer	3	3 3	3	

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Fences provided that disturbance is minimized and installation does not result in removal of forest vegetation	3			
Forest harvesting – see Item (10) of this Rule.				
Fertilizer application: • One-time fertilizer application to establish replanted vegetation • Ongoing fertilizer application	3			3
Grading and revegetation in Zone 2 only provided that diffuse flow and the health of existing vegetation in Zone 1 is not compromised and disturbed areas are stabilized.	3			
Greenway trails		3		
Historic preservation	3			
Landfills				3
Mining activities • Mining activities that are covered by the Mining Act provided that new riparian buffers that meet the requirements of Items (3) and (4) are established adjacent to the relocated channels. • Mining activities that are not covered by the Mining Act OR where new riparian buffers that meet the requirements of Items (3) and (4) are NOT established adjacent to the relocated channels.		3	3	
Non-electric utility lines: • Impacts other than perpendicular crossings in Zone 2 only • Impacts other than perpendicular crossings in Zone 1 • Perpendicular crossings that disturb equal to or less than 40 linear feet of riparian buffer • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of riparian buffer • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer	3	3 3	3 3	
On-site sanitary sewage systems - new ones that use ground adsorption				3
Overhead electric utility lines: • Impacts other than perpendicular crossings in Zone 2 only • Impacts other than perpendicular crossings in Zone 1[1] • Perpendicular crossings that disturb equal to or less than 150 linear feet of riparian buffer[1] • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer[1]	3 3	3 3		

[1] Provided that, in Zone 1, none of the following practices are used in installation or maintenance activities: mechanized clearing of woody vegetation, land grubbing or grading, stump removal, rip rap and fertilizer application other than a one-time fertilizer application to re-establish vegetation.

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Periodic maintenance of modified natural streams such as canals and a grassed travelway on one side of the surface water when alternative forms of maintenance access are not practical		3		
Playground equipment: • Playground equipment on single family lots provided that installation and use does not result in removal of vegetation • Playground equipment installed on lands other than single-family lots or that requires removal of vegetation	3	3		
Ponds in natural drainage ways: • New ponds provided that a riparian buffer that meets the requirements of Items (3) and (4) is established adjacent to the pond • New ponds where an appropriate riparian buffer that meets the requirements of Items (3) and (4) is NOT established adjacent to the pond		3	3	
Protection of existing structures and facilities when this requires additional disturbance of the riparian buffer or the stream channel		3		
Railroad crossings: • Railroad crossings that impact equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Railroad crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer		3	3	
Removal of previous fill or debris provided that diffuse flow and any vegetation removed is restored.	3			
Road crossings: • Road crossings that impact equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Road crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer		3	3	
Scientific studies and stream gauging	3			
Stormwater management ponds: • New stormwater management ponds provided that a riparian buffer that meets the requirements of Items (3) and (4) is established adjacent to the pond • New stormwater management ponds where a riparian buffer that meets the requirements of Items (3) and (4) is NOT established adjacent to the pond		3	3	

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Stream restoration	3			
Streambank stabilization		3		
Temporary roads: • Temporary roads that disturb less than or equal to 2,500 square feet provided that vegetation is restored within six months. • Temporary roads that disturb greater than 2,500 square feet provided that vegetation is restored within six months.	3	3		
Temporary sediment and erosion control devices: • In Zone 2 only provided that the vegetation in Zone 1 is not compromised and that discharge is released as diffuse flow in accordance with Item (4). • In Zones 1 and 2 to control impacts associated with uses approved by the Division or that have received a variance provided that sediment and erosion control for upland areas is addressed to the maximum extent practical outside of the riparian buffer.	3	3		
Underground electric utility lines: • Impacts other than perpendicular crossings in Zone 2 only • Impacts other than perpendicular crossings in Zone 1[2] • Perpendicular crossings that disturb less than or equal to 40 linear feet of riparian buffer[2] • Perpendicular crossings that disturb greater than 40 linear feet of riparian buffer[2]	3 3	 3 3		
Vegetation management: • Emergency fire control measures provided that topography is restored • Periodic mowing and harvesting of plant products in Zone 2 only • Planting vegetation to enhance the riparian buffer • Pruning forest vegetation provided that the health and function of the forest vegetation is not compromised • Removal of individual trees which are in danger of causing damage to dwellings, other structures or human life • Removal of poison ivy • Removal of understory nuisance vegetation as defined by the NC Parks and Recreation Department	3 3 3 3 3 3 3			

[2] Provided that, in Zone 1, any land disturbance is returned to natural contour and ground cover restored as soon as possible and that none of the following practices are used in installation or maintenance activities: mechanized clearing of woody vegetation, stump removal and fertilizer application other than a one-time fertilizer application to re-establish vegetation.

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Water dependent structures as defined in 15A NCAC 2B .0202		3		
Water supply reservoirs: • New reservoirs provided that a riparian buffer that meets the requirements of Items (3) and (4) is established adjacent to the reservoir • New reservoirs where a riparian buffer that meets the requirements of Items (3) and (4) is NOT established adjacent to the reservoir		3	3	
Water wells	3			
Wetland restoration	3			

(6) REQUIREMENTS FOR CATEGORIES OF USES. Uses designated as exempt, allowable, allowable with mitigation and prohibited in Item (5) shall have the following requirements:
   (a) EXEMPT. Uses designated as exempt are allowed within the riparian buffer. Exempt uses shall be designed, constructed and maintained to minimize soil disturbance and to provide the maximum water quality protection practicable. In addition, exempt uses shall meet requirements listed in Item (5) for the specific use.
   (b) ALLOWABLE. Uses designated as allowable may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item (7). These uses require written authorization from the Division or the delegated local authority.
   (c) ALLOWABLE WITH MITIGATION. Uses designated as allowable with mitigation may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item (7) and an appropriate mitigation strategy has been approved pursuant to Item (9). These uses require written authorization from the Division or the delegated local authority.
   (d) PROHIBITED. Uses designated as prohibited may not proceed within the riparian buffer unless a variance is granted pursuant to Item (8).

(7) DETERMINATION OF "NO PRACTICAL ALTERNATIVES." Persons who wish to undertake uses designated as allowable or allowable with mitigation shall submit a request for a "no practical alternative" determination to the Division or to the delegated local authority. The applicant shall certify that the criteria identified in Sub-Item (7)(a) are met. The Division or the delegated local authority shall grant an Authorization Certificate upon a "no practical alternatives" determination. The procedure for making an Authorization Certificate shall be as follows:
   (a) For any request for an Authorization Certificate, the Division or the delegated local authority shall review the entire project and make a finding of fact as to whether the following requirements have been met in support of a "no practical alternatives" determination:
      (i) The basic project purpose cannot be practically accomplished in a manner that would better minimize disturbance, preserve aquatic life and habitat, and protect water quality.
      (ii) The use cannot practically be reduced in size or density, reconfigured or redesigned to better minimize disturbance, preserve aquatic life and habitat, and protect water quality.
      (iii) Best management practices will be used if necessary to minimize disturbance, preserve aquatic life and habitat, and protect water quality.
   (b) Requests for an Authorization Certificate shall be reviewed and either approved or denied within 60 days of receipt of a complete submission based on the criteria in Sub-Item (7)(a) above by either the Division or the delegated local authority. Failure to issue an approval or denial within 60 days shall constitute that the applicant has demonstrated "no practical alternatives." The Division or the delegated local authority may attach conditions to the Authorization

Certificate that support the purpose, spirit and intent of the riparian buffer protection program. Complete submissions shall include the following:

(i) The name, address and phone number of the applicant;

(ii) The nature of the activity to be conducted by the applicant;

(iii) The location of the activity, including the jurisdiction and the 14-digit hydrologic unit;

(iv) A map of sufficient detail to accurately delineate the boundaries of the land to be utilized in carrying out the activity, the location and dimensions of any disturbance in riparian buffers associated with the activity, and the extent of riparian buffers on the land;

(v) An explanation of why this plan for the activity cannot be practically accomplished, reduced or reconfigured to better minimize disturbance to the riparian buffer, preserve aquatic life and habitat and protect water quality; and

(vi) Plans for any best management practices proposed to be used to control the impacts associated with the activity.

(c) Any disputes over determinations regarding Authorization Certificates shall be referred to the Director for a decision. The Director's decision is subject to review as provided in Articles 3 and 4 of Chapter 150B of the General Statutes.

(8) VARIANCES. Persons who wish to undertake uses designated as prohibited have the option of pursuing a variance. The Division or the appropriate delegated local authority may grant minor variances. The variance request procedure shall be as follows:

(a) For any variance request, the Division or the delegated local authority shall make a finding of fact as to whether the following requirements have been met:

(i) There are practical difficulties or unnecessary hardships that prevent compliance with the strict letter of the riparian buffer protection requirements;

(ii) The variance is in harmony with the general purpose and intent of the State's riparian buffer protection requirements and preserves its spirit; and

(iii) In granting the variance, the public safety and welfare have been assured and substantial justice has been done.

(b) MINOR VARIANCES. A minor variance request pertains to activities that are proposed only to impact any portion of Zone 2 of the riparian buffer. Minor variance requests shall be reviewed and approved based on the criteria in Sub-Item (8)(a) above by the either the Division or the delegated local authority pursuant to G.S. 153A-Article 18, or G.S. 160A-Article 19. The Division or the delegated local authority may attach conditions to the variance approval that support the purpose, spirit and intent of the riparian buffer protection program. Requests for appeals of decisions made by the Division shall be made to the Office of Administrative Hearings. Request for appeals made by the delegated local authority shall be made to the appropriate Board of Adjustment under G.S. 160A-388 or G.S. 153A-345.

(c) MAJOR VARIANCES. A major variance request pertains to activities that are proposed to impact any portion of Zone 1 or any portion of both Zones 1 and 2 of the riparian buffer. If the Division or the delegated local authority has

determined that a major variance request meets the requirements in Sub-Item (8)(a), then it shall prepare a preliminary finding and submit it to the Commission. Preliminary findings on major variance requests shall be reviewed by the Commission within 90 days after receipt by the Director. Requests for appeals of determinations that the requirements of Sub-Item(8)(a) have not been met shall be made to the Office of Administrative Hearings for determinations made by the Division or the appropriate Board of Adjustments under G.S. 160-A-388 or G.S. 153A-345 for determinations made by the delegated local authority. The purpose of the Commission's review is to determine if it agrees that the requirements in Sub-Item (8)(a) have been met. Requests for appeals of decisions made by the Commission shall be made to the Office of Administrative Hearings. The following actions shall be taken depending on the Commission's decision on the major variance request:

(i) Upon the Commission's approval, the Division or the delegated local authority shall issue a final decision granting the major variance.

(ii) Upon the Commission's approval with conditions or stipulations, the Division or the delegated local authority shall issue a final decision, which includes these conditions or stipulations.

(iii) Upon the Commission's denial, the Division or the delegated local authority shall issue a final decision denying the major variance.

(9) MITIGATION. Persons who wish to undertake uses designated as allowable with mitigation shall meet the following requirements in order to proceed with their proposed use.

(a) Obtain a determination of "no practical alternatives" to the proposed use pursuant to Item (7).

(b) Obtain approval for a mitigation proposal pursuant to 15A NCAC 2B .0243.

(10) REQUIREMENTS SPECIFIC TO FOREST HARVESTING. The following requirements shall apply for forest harvesting operation and practices.

(a) The following measures shall apply in the entire riparian buffer:

(i) Logging decks and sawmill sites shall not be placed in the riparian buffer.

(ii) Access roads and skid trails shall be prohibited except for temporary and permanent stream crossings established in accordance with 15A NCAC 1I .0203 of this Subchapter. Temporary stream crossings shall be permanently stabilized after any site disturbing activity is completed.

(iii) Timber felling shall be directed away from the stream or water body.

(iv) Skidding shall be directed away from the stream or water body and shall be done in a manner that minimizes soil disturbance and prevents the creation of channels and/or ruts.

(v) Individual trees may be treated to maintain or improve their health, form or vigor.

(vi) Harvesting of dead or infected trees or application of pesticides necessary to prevent or control extensive tree pest and disease infestation shall be allowed. These practices must be approved by the

Division of Forest Resources for a specific site. The DFR must notify DWQ of all approvals.

(vii) Removal of individual trees that are in danger of causing damage to structures or human life shall be allowed.

(viii) Natural regeneration of forest vegetation and planting of trees, shrubs, or ground cover plants to enhance the riparian buffer shall be allowed provided that soil disturbance is minimized. Plantings shall consist primarily of native species.

(ix) High intensity prescribed burns shall not be allowed.

(x) Application of fertilizer shall not be allowed except as necessary for permanent stabilization. Broadcast application of fertilizer and/or herbicides to the adjacent forest stand shall be conducted so that the chemicals are not applied directly to or allowed to drift into the riparian buffer.

(b) In Zone 1, forest vegetation shall be protected and maintained with selective harvest allowed in accordance with the following restrictions:

(i) Tracked or wheeled vehicles are not permitted except at stream crossings designed, constructed and maintained in accordance with 15A NCAC 1I .0203.

(ii) Soil disturbing site preparation activities are not allowed.

(iii) Trees shall be removed with the minimum disturbance to the soil and residual vegetation.

(iv) In the first 10 feet of Zone 1 directly adjacent to the stream or waterbody shall be undisturbed except for the removal of individual high value trees as defined provided that no trees with exposed primary roots visible ~~in~~ on the streambank be cut.

(v) In the outer 20 feet of Zone 1, the following requirements apply to selective harvesting:

(A) When the majority of the trees are 10 inches DBH or greater, the following provisions apply. No trees less than 10 inches DBH may be cut. A maximum of 50 percent of the trees greater than 10 inches may be cut and removed. The reentry time for harvest shall be no more frequent than every 15 years.

(B) When the majority of the trees of an established plantation are less than 10 inches DBH, the following provisions apply. A maximum of 50 percent of the planted trees may be cut and removed. The reentry time for thinning may be no more frequent than every five years. (The objective of these provisions is to create a naturally regenerated riparian forest buffer, consisting of naturally occurring species.)

(C) When the majority of the trees of a natural stand are less than 10 inches DBH, the following provisions apply. A maximum of 50 percent of the pine trees may be cut and removed. The reentry time for thinning may be no more frequent than every five years.

(c) In Zone 2, harvesting and regeneration of the forest stand shall be allowed provided that sufficient ground cover is maintained to provide for diffusion and infiltration of surface runoff.

(11) REQUIREMENTS SPECIFIC TO LOCAL GOVERNMENTS WITH STORMWATER PROGRAMS FOR NITROGEN CONTROL. Local governments that are required to have local stormwater programs pursuant to 15A NCAC 2B .0235 shall have two options for ensuring protection of riparian areas on new developments within their jurisdictions as follows.

(a) Obtain authority to implement a local riparian buffer protection program pursuant to 15A NCAC 2B .0242.

(b) Refrain from issuing local approvals for new development projects unless either:

(i) The person requesting the approval does not propose to impact the riparian buffer of a surface water that appears on either the most recent versions of the soil survey maps prepared by the Natural Resources Conservation Service of the United States Department of Agriculture of the most recent versions of the 1:24,000 scale (7.5 minute quadrangle) topographic maps prepared by the United States Geologic Survey (USGS).

(ii) The person requesting the approval proposes to impact the riparian buffer of a surface water that appears on the maps described in Sub-Item (11)(b)(i) above and either:

(A) Has received an on-site determination from the Division pursuant to Sub-Item (2)(a) that surface waters are not present;

(B) Has received an Authorization Certificate from the Division pursuant to Item (7) for uses designated as Allowable under this Rule; ~~or~~

(C) Has received an Authorization Certificate from the Division pursuant to Item (7) and obtained the Division's approval on a mitigation plan pursuant to Item (9) for uses designated as Allowable with Mitigation under this Rule; or

(D) Has received a variance from the Commission pursuant to Item (8).

(12) OTHER LAWS, REGULATIONS AND PERMITS. In all cases, compliance with this Rule does not preclude the requirement to comply with all federal, state and local regulations and laws.

.0242 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: DELEGATION OF AUTHORITY FOR THE PROTECTION AND MAINTENANCE OF RIPARIAN BUFFERS

(1) PURPOSE. This Rule sets out the requirements for delegation of the responsibility for implementing and enforcing the state's riparian buffer protection program to local governments.

(2) PROCEDURES FOR GRANTING AND RESCINDING DELEGATION. The Commission shall grant and rescind local government delegation of the Neuse River Basin Riparian Buffer Protection requirements according to the following procedures.

(a) Local governments within the Neuse River Basin may submit a written request to the Commission for authority to implement and enforce the State's riparian buffer protection requirements within their jurisdiction. The written request shall be accompanied by information which shows:

(i) The local government has land use jurisdiction for the riparian buffer demonstrated by delineating the local land use jurisdictional boundary on USGS 1:24,000 topographical map(s) or other appropriate scale map(s);

(ii) The local government has the administrative organization, staff, legal authority, financial and other resources necessary to implement and enforce the State's riparian buffer protection requirements based on its size and projected amount of development;

(iii) The local government has adopted ordinances, resolutions, or regulations necessary to establish and maintain the State's riparian buffer protection requirements; and

(iv) The local government has provided a plan to address violations with appropriate remedies and actions.

(b) Within 90 days after the Commission has received the request for delegation, the Commission shall notify the local government whether it has been approved, approved with modifications, or denied.

(c) The Commission, upon determination that a delegated local authority is failing to implement or adequately enforce the state's riparian buffer protection requirements, shall notify the delegated local authority in writing of the local program's inadequacies. If the delegated local authority has not corrected the deficiencies within 90 days of receipt of the written notification, then the Commission shall rescind the delegation of authority to the local government and shall implement and enforce the State's riparian buffer protection requirements.

(d) The Commission may delegate its duties and powers for granting and rescinding local government delegation of the State's riparian buffer protection requirements, in whole or in part, to the Director.

(2) APPOINTMENT OF A RIPARIAN BUFFER PROTECTION ADMINISTRATOR. Upon receiving delegation, local governments shall appoint a Riparian Buffer Protection Administrator who shall coordinate the implementation and enforcement of the program. The Administrator shall attend an initial training session by the Division and subsequent annual training sessions. The Administrator shall ensure

that local government staff working directly with the program receive training to understand, implement and enforce the program.

(3) PROCEDURES FOR USES WITHIN RIPARIAN BUFFERS THAT ARE ALLOWABLE AND ALLOWABLE WITH MITIGATION. Upon receiving delegation, local authorities shall be responsible for reviewing proposed uses within the riparian buffer and issuing approvals if the uses meet the State's riparian buffer protection requirements. Delegated local authorities shall issue an Authorization Certificate for uses if the proposed use meets the State's riparian buffer protection requirements, or provides for appropriate mitigated provisions to the State's riparian buffer protection requirements. The Division shall have the authority to challenge a decision made by a delegated local authority for a period of 30 days after the Authorization Certificate is issued. If the Division does not challenge an Authorization Certificate within 30 days of issuance, then the delegated local authority's decision will stand.

(4) VARIANCES. After receiving delegation, local governments shall be responsible for reviewing variance requests, providing approvals for minor variance requests and making recommendations to the Commission for major variance requests pursuant to the State's riparian buffer protection program.

(5) LIMITS OF DELEGATED LOCAL AUTHORITY. The Commission shall have jurisdiction to the exclusion of local governments to implement the State's riparian buffer protection requirements for the following types of activities:
   (a) Activities conducted under the authority of the State;
   (b) Activities conducted under the authority of the United States;
   (c) Activities conducted under the authority of multiple jurisdictions;
   (d) Activities conducted under the authority of local units of government.

(6) RECORD-KEEPING REQUIREMENTS. Delegated local authorities are required to maintain on-site records for a minimum of 5 years. Delegated local authorities must furnish a copy of these records to the Director within 30 days of receipt of a written request for the records. The Division will inspect local riparian buffer protection programs to ensure that the programs are being adequately implemented and enforced. Each delegated local authority's records shall include the following:
   (a) A copy of variance requests;
   (b) The variance request's finding of fact;
   (c) The result of the variance proceedings;
   (d) A record of complaints and action taken as a result of the complaint;
   (e) Records for stream origin calls and stream ratings; and
   (f) Copies of request for authorization, records approving authorization and Authorization Certificates.

.0243 MITIGATION PROGRAM FOR PROTECTION AND MAINTENANCE OF RIPARIAN BUFFERS

(1) PURPOSE. The purpose of this rule is to set forth the mitigation requirements that apply to the State's riparian buffer protection program.

(2) APPLICABILITY. This rule applies to persons who wish to impact a riparian buffer when one of the following applies:
   (a) A person has received an Authorization Certificate pursuant to 15A NCAC 2B .0233 for a proposed use that is designated as "allowable with mitigation."
   (b) A person has received a variance pursuant to 15A NCAC 2B .0233 and is required to perform mitigation as a condition of a variance approval.

(3) THE AREA OF MITIGATION. The required area of mitigation shall be determined by either the Division or the local delegated authority according to the following:
   (a) The impacts in square feet to each zone of the riparian buffer shall be determined by the Division or the local delegated authority by adding the following:
      (i) The area of the footprint of the use causing the impact to the riparian buffer.
      (ii) The area of the boundary of any clearing and grading activities within the riparian buffer necessary to accommodate the use.
      (iii) The area of any ongoing maintenance corridors within the riparian buffer associated with the use.
   (b) The required area of mitigation shall be determined by applying the following multipliers to the impacts determined in Sub-item 3(a) to each zone of the riparian buffer:
      (i) Impacts to Zone 1 of the riparian buffer shall be multiplied by **(1.5 to 5).**
      (ii) Impacts to Zone 2 of the riparian buffer shall be multiplied by **(1 to 2).**
      (iii) Impacts to wetlands within Zones 1 and 2 of the riparian buffer that are subject to mitigation under 15A NCAC 2H .0506 shall comply with the mitigation ratios in 15A NCAC 2H .0506.

(4) THE LOCATION OF MITIGATION. The mitigation effort shall be located in the same Nutrient Management Zone of the Neuse River Basin of the proposed impact or lower in the basin. The four Nutrient Management Zones are laid out in the Division's Report, 'Total Maximum Daily Load for Total Nitrogen to the Neuse River Estuary, North Carolina' (February 1999).

(5) ISSUANCE OF THE MITIGATION DETERMINATION. The Division or the local delegated authority shall issue a mitigation determination that specifies the required area and location of mitigation pursuant to Items (3) and (4).

(6) OPTIONS FOR MEETING THE MITIGATION DETERMINATION. The mitigation determination made pursuant to Item (5) may be met through one of the following options:
   (a) Payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7).
   (b) Donation of real property or of an interest in real property pursuant to Item (8).

(c) Restoration or enhancement of a riparian buffer that is not otherwise required to be protected. This shall be accomplished by the applicant after submittal and approval of a restoration plan pursuant to Item (9).

(7) PAYMENT TO THE RIPARIAN BUFFER RESTORATION FUND. Persons who choose to satisfy their mitigation determination by paying a compensatory mitigation fee to the Riparian Buffer Restoration Fund shall meet the following requirements:

(a) SCHEDULE OF FEES: The amount of payment into the Fund shall be determined by multiplying the acres or square feet of mitigation determination made pursuant to Item (5) by $0.96 per square foot or $41,625 per acre.

(b) The required fee shall be submitted to the Division of Water Quality, Wetlands Restoration Program, P.O. Box 29535, Raleigh, NC 27626-0535 prior to any activity that results in the removal or degradation of the protected riparian buffer for which a "no practical alternatives" determination has been made.

(c) The payment of a compensatory mitigation fee may be fully or partially satisfied by donation of real property interests pursuant to Item (8).

(d) The fee outlined in Sub-item (7)(a) shall be reviewed every two years and compared to the actual cost of restoration activities conducted by the Department, including site identification, planning, implementation, monitoring and maintenance costs. Based upon this biennial review, revisions to Sub-item (7)(a) will be recommended when adjustments to this Schedule of Fees are deemed necessary.

(8) DONATION OF PROPERTY. Persons who choose to satisfy their mitigation determination by donating real property or an interest in real property shall meet the following requirements:

(a) The donation of real property interests may be used to either partially or fully satisfy the payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7). The value of the property interest shall be determined by an appraisal performed in accordance with Sub-item (8)(d)(iv). The donation shall satisfy the mitigation determination if the appraised value of the donated property interest is equal to or greater than the required fee. If the appraised value of the donated property interest is less than the required fee calculated pursuant to Sub-item (7)(a), the applicant shall pay the remaining balance due.

(b) The donation of conservation easements to satisfy compensatory mitigation requirements shall be accepted only if the conservation easement is granted in perpetuity.

(c) Donation of real property interests to satisfy the mitigation responsibility shall be accepted only if such property meets all of the following requirements:

(i) The property shall be located within an area that is identified as a priority for restoration in the Basinwide Wetlands and Riparian Restoration Plan or shall be located at a site that is otherwise consistent with the goals outlined in the Basinwide Wetlands and Riparian Restoration Plan.

(ii) The property shall contain riparian buffers not currently protected by the State's riparian buffer protection program that are in need of restoration.

(iii) The restorable riparian buffer on the property shall have a minimum length of 1000 linear feet along a surface water and a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.

(iv) The size of the restorable riparian buffer on the property to be donated shall equal or exceed the acreage of riparian buffer required to be mitigated under the mitigation responsibility determined pursuant to Item (3).

(v) The property shall not require excessive measures for successful restoration, such as removal of structures or infrastructure.

(vi) Restoration of the property shall be capable of fully offsetting the adverse impacts of the requested use;

(vii) The property shall be suitable to be successfully restored, based on existing hydrology, soils, and vegetation;

(viii) The estimated cost of restoring and maintaining the property shall not exceed the value of the property minus site identification and land acquisition costs.

(vi) The property shall not contain cultural or historic resources.

(vii) The property shall not contain any hazardous substance or solid waste.

(ix) The property shall not contain structures or materials that present health or safety problems to the general public. If wells, septic, water or sewer connections exist, they shall be filled, remediated or closed at owner's expense in accordance with state and local health and safety regulations.

(x) The property shall have the potential to remove nitrogen, improve water quality and enhance natural resources after restoration. The Division shall consider whether the property is adjacent to or includes:

(A) a Department-approved restoration or preservation project or public lands;

(B) a sensitive natural resource, as identified in the Basinwide Wetland and Riparian Restoration Plan;

(C) known occurrences of rare species as identified by the North Carolina Natural Heritage Program in the "Natural Heritage Program List of Rare Animal Species of North Carolina" or the "Natural Heritage Program List of the Rare Plant Species of North Carolina";

(D) Significant Natural Heritage Area as identified by the North Carolina Natural Heritage Program in the "North Carolina Natural Heritage Program Biennial Protection Plan, List of Significant Natural Heritage Areas." Copies of these documents may be obtained from the Department of Environment and Natural Resources, Division of Parks and Recreation, Natural Heritage Program, P.O. Box 27687, Raleigh, North Carolina 27611;

(E) federally or state-listed sensitive, endangered, or threatened species, or their critical habitat;

(F) non-supporting, partially supporting, or support-threatened waters as designated by the Division pursuant to 40 CFR 131.10(a) through (g). This material is available at the Department of Environment and Natural Resources, Division of Water Quality,

Water Quality Section, 512 North Salisbury Street, Raleigh, North Carolina;

(xi) The property and adjacent properties shall not have prior, current, and known future land use that would inhibit the function of the restoration effort.

(x) The property shall not have any encumbrances or conditions on the transfer of the property interests.

(d) At the expense of the applicant or donor, the following information shall be submitted to the Division with any proposal for donations or dedications of interest in real property:

(i) Documentation that the property meets the requirements laid out in Sub-Item (8)(c);

(ii) US Geologic Survey 1:24,000 (7.5 minute) scale topographic map, county tax map, USDA Natural Resource Conservation Service County Soil Survey Map, and county road map showing the location of the property to be donated along with information on existing site conditions, vegetation types, presence of existing structures and easements;

(iii) A current property survey performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the State Board of Registration for Professional Engineers and Land Surveyors in "Standards of Practice for Land Surveying in North Carolina." Copies may be obtained from the North Carolina State Board of Registration for Professional Engineers and Land Surveyors, 3620 Six Forks Road, Suite 300, Raleigh, North Carolina 27609;

(iv) A current appraisal of the value of the property performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the Appraisal Board in the "Uniform Standards of Professional North Carolina Appraisal Practice." Copies may be obtained from the Appraisal Foundation, Publications Department, PO Box 96734, Washington, D.C. 20090-6734; and

(v) A title certificate.

(9) RIPARIAN BUFFER RESTORATION OR ENHANCEMENT. Persons who choose to meet their mitigation requirement through riparian buffer restoration or enhancement shall meet the following requirements:

(a) The applicant may restore or enhance a riparian buffer that is not protected under the State's riparian buffer protection program if:

(i) The area of riparian buffer restoration is equal to the required area of mitigation determined pursuant to Item (3); or

(ii) The area of riparian buffer enhancement is three times larger than the required area of mitigation determined pursuant to Item (3).

(b) The location of the riparian buffer restoration or enhancement shall comply with the requirements in Item (4).

(c) The riparian buffer restoration or enhancement site shall have a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.

(d) The applicant shall first receive an Authorization Certificate for the proposed use according to the requirements of 15A NCAC 2B .0233. After receiving this

determination, the applicant shall submit a restoration or enhancement plan for approval by the Division. The restoration or enhancement plan shall contain the following.

(i) A map of the proposed restoration or enhancement site

(ii) A vegetation plan. The vegetation plan shall include a minimum of at least two native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity.

(iii) A grading plan. The site shall be graded in a manner to ensure diffuse flow through the riparian buffer.

(iv) A fertilizing plan.

(v) A schedule for implementation.

(d) Within ~~90 days~~ one year after the Division has approved the restoration or enhancement plan, the applicant shall present proof to the Division that the riparian buffer has been restored or enhanced. If proof is not presented within this timeframe, then the person shall be in violation of the State's or the delegated local authority's riparian buffer protection program.

(e) The mitigation area shall be placed under a perpetual conservation easement whose terms are acceptable to the Division.

(f) The applicant shall submit annual reports for a period of five years after the restoration or enhancement showing that the trees planted have survived and that diffuse flow through the riparian buffer has been maintained. The applicant shall be responsible for replacing trees that do not survive and for restoring diffuse flow if needed during that five-year period.

Appendix 2: House Bill 1402

Appendix 3:
Minutes of Stakeholder Advisory Committee Meetings

Appendix 4:
Stream Technical Advisory Committee Report

Stream Technical Advisory Committee (TAC)
Report to the Neuse River Buffer Stakeholders Committee
June 12, 2008

Introduction

The Stream TAC (Appendix I) was established by the N.C. Division of Water Quality in December 1998 upon the recommendation of the Neuse River Buffer Stakeholders Committee to provide technical, scientific input related to the definitions of streams and waterbodies in the Neuse River basin. The Stream TAC consists of members of staff from the Division of Water Quality (regulatory and non-regulatory), Division of Water Resources, environmental consultants, and academic experts. Academic experts represent the disciplines of forest hydrology, geology, wetland ecology and stream dynamics from NCSU and ECU. The Committee had an orientation meeting, a field day in the Piedmont, a field day in the Coastal Plain and a wrap-up discussion day covering the period from December 10, 1998 to January 15, 1999. The Stream TAC operated by consensus and open discussion. The following report represents the findings of the Committee and its recommendations to the Neuse River Buffer Stakeholders Committee. [1]

Background

Streams vary in their geomorphology, flow duration and biology along their entire length as one proceeds down a channel from the smallest headwater channels with ephemeral (stormwater) flow through segments with intermittent flow and then to the larger segments where intermittent flow changes to perennial flow. Also the differences between physiographic regions (such as Piedmont versus Coastal Plain) or subregions (such as Triassic basin in the Piedmont versus the inner and outer Coastal Plain subregions) are often distinctive. Finally subtler small-scale differences in very local geology, soils and topography can make dramatic differences in the character of these streams.

Thus far, the scientific community has done limited work to definitively resolve these differences due to their complexity and (at least until now) the fact that there was little compelling need for a definitive answer to these differences. Therefore the Stream TAC believes that separation of flow into ephemeral or diffuse (stormwater), intermittent, and perennial channels can be difficult at times. However the Stream TAC believes that a reasonably precise methodology can be developed and used by the private sector, DWQ staff and other experts to make decisions which are scientifically valid, easily understandable, efficient, consistent, reliable and cost-effective which are the mandates of HB 1402. However this on-site methodology and process ***can not*** *be simple and practitioners will need extensive education and training to meet these legislative goals.*

Recommendations

I. Overall schedule and approach - *The Stream TAC supports the three step process for stream and water body definitions as proposed by the Neuse River Buffer Stakeholders Committee (Appendix II). As long as this process is followed (notably Step 2 for additional research to examine map-related criteria such as watershed area), the Stream TAC believes that the legislative goals relative to surface water determinations (Section 1.8 (1) of HB 1402) can be met with the following provisions and suggestions.*

II. Narrative definitions of channels- *The Stream TAC has reviewed and recommends that the attached narrative definitions be utilized for various types of stream channels (Appendix III). The Committee believes that quantitative (i.e. numerical) elements in the definitions are not appropriate at this time due to scientific uncertainties. The Committee plans to reexamine this issue after additional information is collected during this coming calendar year.*

III. Stream Evaluation Methodology - *The Stream TAC believes that the numerical, four-column stream evaluation method developed by DWQ staff (as revised by the Stream TAC) should be*

[1] This report represents a consensus of the Stream TAC group as discussed at its meeting on 15 January 1999. However time did not allow a final review of this report by Stream TAC members. John Dorney and Jim Gregory did the final editing and present it as representing the Stream TAC's recommendations.

adopted as the official methodology to determine stream origins according to the Neuse River buffer rules (Appendix IV).

A minority of three Stream TAC members (Jeff Bruton – N.C. Division of Water Resources; Stan Riggs –ECU and Will Harmon – NCSU) recommended that ephemeral (stormwater) channels also be buffered since they also convey nutrients in their stormwater flow. A majority of the Stream TAC however believe that ephemeral channels are hydrologically distinct from intermittent streams and that the EMC intended to buffer channels beginning with intermittent streams.

This numerical methodology and its accompanying manual should be further refined over the next calendar year with October 1999 as a goal for completion of a thoroughly field-tested methodology. Graduate student research funded by DWQ with oversight of the Stream TAC will conduct this work. A final version would then be subject to public review and (if warranted) public hearing before final adoption by the EMC. The Stream TAC recognized that there are differences between coastal plain and piedmont streams (as well as between other physiographic subregions) but that at this point in time, it is unclear how or if they should be handled differently by the stream evaluation methodology. This issue should be addressed in Step 2 of the stream evaluation process.

Numerical criteria for defining the point from which an intermittent or perennial stream begins are outlined below. The Stream TAC recommends that DWQ staff select the cutoffs since this is a regulatory rather than a scientific decision. The cutoffs below are those proposed by DWQ staff.

A. ***Intermittent flow*** *– The Stream TAC believes that a numerical cutoff (using the revised four column rating sheet) of 19 points is an appropriate, consistent value to use to determine where intermittent stream flow begins in a stream system. This value should be reexamined after additional data are collected during 1999.*

B. ***Perennial flow*** *– The Stream TAC believes that a numerical cutoff is premature at this time since the Committee has not had sufficient time to conduct adequate fieldwork in this regard. As an interim measure, the Committee recommends that DWQ continue to use its present policy of determining the origin of a perennial stream by the presence of biological indicators of stream permanence such as fish, crayfish, mussels (clams) or large (multi-year) tadpoles. This process should be reexamined after additional data are collected during 1999.*

C. ***Mitigation for unclear situations*** *– The Stream TAC explicitly acknowledges that some stream determinations are controversial. This results from the combination of streams that diverge widely from the norm and intense development pressures in the western part of the Neuse River basin. Controversial situations include:*

- Deeply incised upland gullies that are relics of accelerated erosion during agricultural use in the past.

- Modified natural streams , i.e. channelized or those moved from their natural locations.

- Stormwater ditches that exhibit intermittent flow and develop some of the biological characteristics of intermittent streams

The Committee suggests that mitigation (along with on-site stormwater management) be allowed for these unclear situations. These situations would be defined as streams where the score from the evaluation system ranges from 15 to 19.

IV. Training and expertise - *The Stream TAC believes that determination of stream type requires well-trained and educated individuals with expertise in geology, geomorphology, soils, hydrology and biology (botany and zoology). Therefore, the Stream TAC recommends that DWQ develop a comprehensive training program for all individuals, both private and public sector, who will conduct field evaluations of stream origin and stream type. This training program will be especially important as the riparian buffer regulatory program is delegated to local governments. The Stream TAC also recommends that the Legislature authorize DWQ to develop a registration and certification program for stream evaluators to ensure that private and public sector practitioners are qualified to conduct this activity. The Stream TAC strongly believes that the determination of stream evaluation and origin cannot be done by all individuals but rather only by a well-trained, appropriately educated group of individuals.*

V. Mean high water situations - *The Neuse River buffer rules also apply to waterbodies such as ponds as measured from the "mean high water line". The Stream TAC recommends that this language be changed to "normal pool level" for ponds, lakes and reservoirs for clarity purposes. The Stream TAC was also asked to make a recommendation for establishing the water's edge for perennially flooded or ponded waterbodies. In situations such as these, the Stream TAC believes that some perennially inundated waterbodies are functionally similar to streams and ponds. For example, many cypress-gum swamps along the lower Neuse and Trent Rivers and along many smaller blackwater streams have flow through them for most of the year (perennial flow) and are functionally connected to streamflow in the channel. Natural ponds also occur in broad floodplains that are abandoned relic channel systems. The Stream TAC believes that the EMC needs to clarify whether they intended buffer zones to be measured from permanently or semi-permanently flooded wetlands (including beaver ponds) before the Stream TAC or DWQ staff attempt to clarify these types of waterbodies.*

VI. Ditches and canals versus modified natural streams- *The Stream TAC believes that it may be difficult to separate ditches/canals from modified natural streams especially in the outer Coastal Plain. However the Committee also believes that a careful analysis using topographic maps, soil surveys and aerial photographs as well as a field analysis of local landscape morphology and soil patterns can help discern the difference. The Committee suggests that the numerical stream evaluation system be used with additional work during 1999 to further distinguish between these features as well as ephemeral (stormwater) channels. The mitigation suggestion as outlined in Step III, C earlier in this report will also help with this situation greatly.*

VII. Intermediate term (Step Two) Research Work - *Planning for the stream evaluation research proposed for calendar year 1999 has begun. The goal is to provide a preliminary report by the end of October 1999 that will address the most urgent stream identification, evaluation and mapping issues. The research team will be: Principal Investigator, James Gregory; Graduate Student Assistants – Danny Smith and Joe Gardner, Master's Candidates in Natural Resources, Hydrology, Dept. of Forestry, NCSU; Cooperators – John Dorney and other DWQ staff; Advisory Committee – Stream TAC. The proposed schedule is as follows:*

Work Plan Development – January to March 1999
Development of field sampling protocols and data management system – March to April 1999
Data Collection – May to August 1999
Preliminary Report – October 1999

VIII. Longer term (Step Three) Research Work - *The Stream TAC believes that the basic approach outlined in DWQ's Pre-application grant proposal to EPA is valid but that additional review and refinement will be needed if it appears that EPA will fund the grant. Also, the initial membership of the Stream TAC had to be limited due to the tight schedule. However for Steps 2 and 3 of the Neuse River Buffer Stakeholders plan, the Stream TAC should be expanded to include individuals familiar with buffer function, piedmont geology, biological indicators (i.e., Crustacea and Mollusca), GIS analysis, coastal plain development patterns, stream dynamics and soils to help refine this grant application.*

IX. Use of maps to determine stream presence - *The Neuse River Buffer Stakeholders Committee has suggested that USGS topographic maps or County soil survey maps be used initially to determine the location of streams. Based on the Stream TAC's fieldwork, the Committee suggests that National Wetland Inventory (NWI) maps be added to the list of maps to be used to initially determine stream location. This recommendation is based on a perennial stream found near New Bern which was not shown on USGS or County soil surveys but was shown on NWI maps.*

Appendix I

Members of the Stream Technical Advisory Committee

Divison of Water Quality
- *Regulatory*
  - *Pete Colwell*
  - *John Dorney*
  - *Eric Fleek*
- *Non-regulatory*
  - *Neil Medlin*
  - *Dave Penrose*
- *Regional Offfices*
  - *Steve Mitchell*
  - *Deborah Sawyer*
  - *Danny Smith*
  - *Joanne Steenhuis*
  - *Roger Thorpe*

Division of Water Resources
- *Jeff Bruton*
- *Dave Wojnowski*

U.S. Army Corps of Engineers
- *Ken Jolly*
- *Dave Lekson*

Environmental Consultants
- *Kevin Martin – Soil and Environmental Consultants*
- *Jerry McCrain – Ecoscience, Inc.*

North Carolina State University
- *Will Harmon – Stream dynamics and restoration*
- *Jim Gregory – Forest hydrology*

East Carolina University
- *Mark Brinson – Wetland ecology*
- *Stan Riggs – Geology*

Streamtac.rep

INTERNAL GUIDANCE MANUAL

N.C. DIVISION OF WATER QUALITY STREAM CLASSIFICATION METHOD

January 19, 1999
Version 2.0

Introduction

This stream evaluation method is intended to distinguish ephemeral channels from intermittent channels. The numerical rating system format was developed based on repeated requests from the regulated community for an objective method of stream evaluation. The 19 point minimum score for determining an intermittent channel was based on the results of over 300 individual field trials conducted in the Piedmont and Coastal Plain portions of the Neuse River Basin during May, June, July and August of 1998, as well as field testing conducted during December 1998 and January 1999. The four tiered weighted scale used for this system is in response to the intrinsic variability of stream channels. The score ranges were developed in order to better assess the often gradual (and sometime variable) transition of streams from ephemeral to intermittent.

Previous versions of this form used a "yes"/ "no" format and was found by NCDWQ staff and by the regulated community to be inadequate to properly encompass and assess the natural variability encountered when making stream determinations in the field. Moderate characters are intended as an approximate qualitative midpoint between the two extremes of Absent and Strong. The remaining qualitative description of Weak represents gradations that will often be observed in the field. The "in between grades" are intended to allow the evaluator the required flexibility in assessing inherently variable features. In addition, the small increments in scoring between gradations will help reduce the range in scores between different evaluators.

How To Use The Classification

I. The Classification Form

The four tiered weighted scale is designed to encompass the range in variability of each character likely to be observed in the field. The Primary and Secondary indicators are weighted to reflect the relative importance that each character has in determining Intermittent channels from Ephemeral channels. Absent, Weak, Moderate, and Strong are defined below. **These definitions are intended as guidelines**. Personal experience and best professional judgement should also be employed in conjunction with these guidelines when evaluating streams. The evaluator must select the most appropriate number for each variable—selection between those in the form is not allowed.

Absent: The character is not observed. (On a scale of 1 to 10, Absent = 0)

Weak: The character is present but you have to search intensely (i.e., ten or more minutes) to find it. (On a scale of 1 to 10, Weak =1, 2, or 3).

Moderate: The character is present and observable with mild (i.e., one or two minutes) searching. (On a scale of 1 to 10, Moderate = 4, 5, or 6).

Strong: The character is easily observable. (On a scale of 1 to 10, Strong = 7 to 10).

Examples:

*(**These are intended as guidelines and the numbers given are provided only for a general reference. The numbers **should not necessarily** be taken literally**).*

Fish: *Absent*: No fish, even after an intense 10 minute search of a large (e.g., 200') liner stretch of stream. Fish sampling should be conducted visually and with a dip net.
Fish *Weak:* One or two fish found after an intense search.
Fish *Moderate*: After a mildly intensive search (i.e., 1 or 2 minutes), you see four or five individual fish, **or** one small school.
Fish: *Strong*: Upon casual observation, you see a half dozen fish **and/or** two or three small schools.

Meanders: *Absent*: The stream is straight.
Meanders: *Weak*: Nearly all of the stream is straight, only one or two very small bends.
Meanders: *Moderate*: Most of the stream is straight although there are a few bends. One or two of these bends may be large.
Meanders: *Strong*: Large portions of the stream bend. The bends will mostly be large or exaggerated.

II. Field Use Of The Classification System

A. Channel Assessment Methodology

Streams are drainage features that change from ephemeral to intermittent to perennial along a gradient or continuum—often times with no single distinct point demarcating these transitions. In order to determine ephemeral streams from intermittent ones using this classification system, the field evaluator must exercise caution. Determinations must not be made at one point without first walking up and down the channel. This initial examination allows the evaluator to examine and study the nature of the channel, make judgements about what is happening in the watershed, and make mental notes (based on the characters used in the classification form) about where along the reach in question the channel likely changes from ephemeral to intermittent. As a general rule of thumb, several hundred feet (sometimes much more) of channel should be walked to make these determinations. It is not possible to make decisions regarding ephemeral versus intermittent from evaluating a single point along the channel.

B. Addressing Weather Induced Variability

As channels convey water, their rate and duration of flow is influenced by recent and long-term weather. In order to "filter" out some of this variability, it is ***STRONGLY*** recommended that field evaluations be conducted at least 48 hours after the last known rainfall. However, please note that the classification method has been designed with enough built in redundancy to allow for reasonably accurate ratings even after a recent rainfall.

Primary Indicators

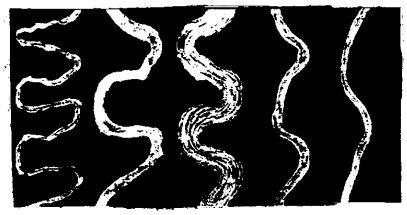
I. Geomorphology

#1 Riffle-Pool Sequence. Pools: Areas of slow moving water. These usually form where the stream widens. Riffles: Shallow areas extending across the streambed where the water moves faster. Usually these areas occur when the stream narrows. Sometimes this faster moving water runs over small rocks, cobble or pebbles (although rocks aren't always needed for a riffle).

#2 USDA Texture In Streambed: Is the material comprising the bottom of the stream different than the material comprising the surface of the ground surrounding the stream? (For example: Are there small pebbles, gravel or sand in the stream whereas the surrounding land is covered with leaves or topsoil, etc.)?

#3 Natural Levees: Are there large "mounds", "hills", or broad low "ridges" of sand or silt deposited parallel (or nearly so) to the stream on its floodplain and adjacent to one or both of its banks? These features may be covered with trees and shrubs or they may be barren sand or silt.

#4 Sinuosity: Does the stream bend? Are there curves in the stream? These bends or curves can be small or large. More formally, sinuosity is the ratio of the length of the channel to the down valley distance (i.e., 1:1 = straight channel).



#5 Active (Or Relic) Floodplain: A flat (or nearly flat) lowland that borders a stream, is covered by its waters at flood stage, and is built of organic matter and/or alluvium due to overbank deposition. These areas may have plants adapted to wet areas growing on them. Small floodplains can be found "inside" the stream's banks in deeply incised channels. More frequently, floodplains are outside of the stream's banks.

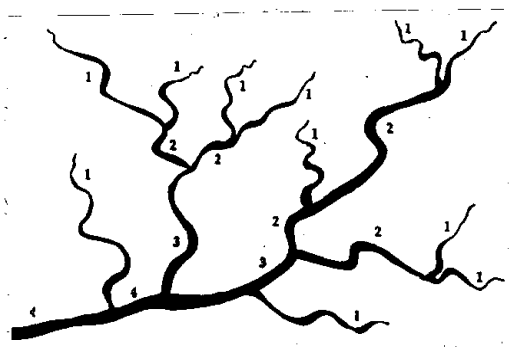
#6 Braided Channels: Are there more than one small stream channels that cross or "braid" over one another. This usually occurs in areas where the land flattens significantly and where there is abundant sediment supply in a wide streambed with shallow water flow.

#7 Recent Alluvial Deposits: Are there recent deposits or accumulations (in the stream or on adjacent floodplains) of sand, silt, cobble, or gravel?

#8 Bankful Bench: When you look at the side of the streambank is there a nearly continuous "bench" eroded into the channel which has accumulated sand or silt. This area is often covered with plants. In dry times when the stream is low, you can often see it part way up the bank. In wet times you may not be able to see it as the stream will be flowing over the bench.

#9 Bed And Bank: Is the water in the stream in a well-defined channel surrounded or "contained" by a higher bank area. In small streams the bank may be very low (sometimes only a few inches) and may not necessarily be a continuous feature.

#10 2nd Order Or Greater Channel: To your knowledge (you can look at SCS County Soils Survey Maps or U.S. Geological Survey Maps, or use field observations) is the channel that you are looking at have one (or more) other channels flowing into it?



Primary Indicators

II. Hydrology

#1 Ground Water: Seeps: Usually seeps have water dripping or slowly flowing out from the ground or from the side of a hill. Water Table: If you dig a hole in the ground near the stream (not in the streambed) of approximately a foot deep and water fills it (usually this will be a slow process) the water table is high and may help keep the stream flowing in dry seasons. High water tables are most common in the Coastal Plain.

Primary Indicators

Biology

#1 Fibrous Roots: When you look in the bottom (or edge) of the stream, are there very small (almost "hair-like") roots there? Fibrous roots do not include roots larger than half the thickness of a finger and are not generally "woody" in appearance or consistency.

#2 Rooted Plants In Streambed: Are there plants growing in the **bed** of the stream? Plants growing on any part of the bank of the stream should not be counted.

#3 Periphyton: When you look on rocks, logs, plants, or twigs in the water is there a "slimy" or "spongy-leafy" growth of algae or very small plants present? Usually the color is a brown-green or dark brown, although this growth can take on the color of the silt or sediment present in the stream.

#4 Bivalves: Are there clams or mussels in the stream? To look for them, dig around in the streambed or look for them where plants are growing in the streambed. Also, look for empty shells washed up on the bank. Some bivlaves (e.g., Fingernail clams) can be pea-sized or smaller.

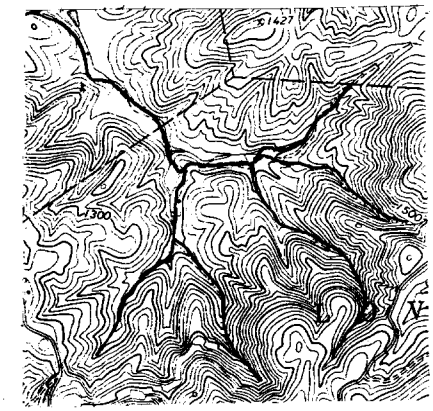
Secondary Indicators

I. Geomorphology

#1 Head Cut: An abrupt vertical drop in the bed of a stream channel. It often resembles a small intermittent waterfall (or a miniature cliff). Intermittent streams sometime start at these areas.

#2 Grade Control Point: Often this feature is distinguished by a large rock outcrop in the channel or by a large root which extends across the channel. These structures separate an abrupt change in grade of the stream bed.

#3 Topography Indicating A Natural Drainage Way?: When looking at the local topography in the field (or on a U.S. Geological Survey Map) does the land slope towards the channel (or are the contour lines fairly close together and roughly sinuous in shape and thereby indicating a "draw"?). In other words, does the land have slopes that seem to drain to or indicate a natural drainage way?



Secondary Indicators

II. Hydrology

#1 This (Or Last's) Years Leaflitter Present In Streambed: Are there leaves (freshly fallen, or some may be "blackish" in color and/or partially decomposed) present in the streambed?

#2 Sediment On Plants (Or Debris): Are plants (or rocks, logs, or other debris) in the stream (or on the streambank or flood plain) stained white, gray, red, brown, or reddish-brown with sediment?

#3 Wrack Lines: Are twigs, sticks, logs, leaves, or other floating material (including litter such as plastic soda bottles, beer cans, styrofoam, etc.) piled up on the upstream side of obstructions in the stream, on the streambank, and/or in the floodplain?

#4 Water In Channel >48 Hrs. Since Last Known Rainfall: Intermittent streams do not always have water in them. Water in intermittent channels may linger in pools or holes in the streambed. A good rule of thumb for distinguishing intermittent streams from ephemeral ones is if they have water in them for more than 48 hours since the last rain.

#5 Water In Channel During Dry Conditions Or In growing Season? Intermittent streams do not always have water in them. Look for water in pool areas or in holes in the streambed. Another good rule of thumb for differentiating ephemeral streams from intermittent ones is if they have water in them during dry (drought) conditions or during the growing season.

#6 Hydric Soils In Sides Of Channel (Or In Headcut): Are hydric soils present in the sides of the channel or in the headcut? Use a soil auger to sample these areas for hydric soil indicators.

Secondary Indicators

III. Biology

#1 Are Fish Present: Look for fish in pools or other areas of standing water in the stream. In addition, look under overhangs in the bank, near tree roots, on the downstream side of rocks or other large obstructions, or in and around plants.

#2 Are Amphibians Present: Look for frogs near the bank and in the water (also look for tadpoles in the water). Salamanders may also be found under rocks, logs, or leaf packs in the stream or in very moist leaf litter, moss, or logs (and under rocks) next to the stream.

#3 Are Aquatic Turtles Present: Look for turtles on rocks or logs in the stream or in and around rocks and logs in areas adjacent to the stream. Also look for turtles basking in areas exposed to sunlight.

#4 Crayfish: Look for crayfish in small pools, under rocks, under logs, sticks or within leaf packs in the stream. Additionally, look for small holes in the muddy streambank or look for distinct "chimneys" (roughly cylindrical chimneys) on the muddy bank.

#5 Macrobenthos: Look under rocks, logs, twigs, and leaf packs. Also look under the streambank and in (and on) any vegetation in the stream. If you have a dip net, drag it around the streambank and in any vegetation or leaf packs present. If you have a kick net set it up downstream of any riffles and kick (and "wash") the rocks in the riffle so that the material disturbed is caught in the downstream net. The use of nets for this step is strongly recommended.

#6 Iron Oxidizing Bacteria/Fungus: In slow moving (or stagnant) areas of the stream are there clumps of "fluffy" rust-red material in the water? Additionally, on the sides of the bank (or in the streambed) are there red or rust colored stains (usually an "oily sheen" or "oily scum" will accompany these areas) on the soil surface? These features are often (although not exclusively) associated with groundwater.

#7 Filamentous Algae: In slow moving areas (or in pools or stagnant areas) are floating green algae (usually not attached to rocks or logs) present?

#8 Wetland Plants In Streambed: Are plants usually associated with wet areas present in the streambed? For example, cattails or black willow? (For determining OBL, FACW, FAC, FACU, or UPL **See Appendix I)** . Submerged aquatic vegetation (SAV) includes rooted plants that generally grow totally submerged under the water's surface.

Appendix 5:
Forestry Technical Advisory Committee Draft Rule

DRAFT 3

.0201 STREAMSIDE MANAGEMENT ZONE

(a) A streamside management zone (SMZ) shall be established and maintained along the margins of intermittent and perennial streams and perennial waterbodies. The SMZ shall be of sufficient width to confine within the SMZ visible sediment resulting from accelerated erosion.
(b) Ground cover, or other means, within the SMZ shall be sufficient to restrain accelerated erosion.
(c) Access roads and skid trails, except as provided in .0203 of this Subchapter, logging decks and mill sites shall be placed outside of SMZs. When barriers such as property lines or limiting land features prohibit the location of any of these outside of SMZs, they can be located within the SMZ. When located within SMZs they shall have effective erosion control and sediment control structures or measures installed to restrain accelerated erosion and prevent visible sediment from entering intermittent or perennial streams or perennial waterbodies.

(d) In waters classified as Nutrient Sensitive Waters (NSW), according to T15A NCAC 2B.223, the following additional measures shall apply to the SMZ for nutrient management. Section .0201 (d) does not apply to NSW waters in the mountain region of the state. The mountain region is defined as the 21 counties in the "Forest Statistics for the Mountains of North Carolina" USDA-FS Southeastern Forest Experiment Station. (Alleghany, Ashe, Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Swain, Transylvania, Watauga, Wilkes, and Yancey.)

(1) The SMZ shall be a minimum width of 50 feet measured horizontally on a line perpendicular to the stream or perennial water body. The SMZ shall consist of two zones.
- (A) Zone 1 shall begin at the top of the bank of an intermittent or perennial stream or at the margin of the normal pool level for a perennial water body and extend landward 30 feet, horizontally, on a line perpendicular to the water feature.
- (B) Zone 2 shall begin at the outer edge of Zone 1 and extend landward a minimum of 20 feet, horizontally, on a line perpendicular to the water feature.

(2) The following measures shall apply in the entire SMZ:
- (A) Logging decks and sawmill sites shall not be placed in the SMZ.
- (B) Access roads and skid trails are prohibited except for temporary and permanent stream crossings established in accordance with .0203 of this Subchapter. Temporary stream crossings shall be permanently stabilized after any site disturbing activity is completed.
- (C) Timber felling shall be directed away from the stream or water body.

(D) Skidding shall be directed away from the stream or water body and shall be done in a manner that minimizes soil disturbance and prevents the creation of channels and/or ruts.

(E) Individual trees may be treated to maintain or improve their health, form or vigor.

(F) Harvesting of dead or infected trees or application of pesticides necessary to prevent or control extensive tree pest and disease infestation shall be allowed. These practices must be approved by the Division of Forest Resources for a specific site. The DFR must notify DWQ of all approvals.

(G) Removal of individual trees that are in danger of causing damage to structures or human life shall be allowed.

(H) Natural regeneration of forest vegetation and planting of trees, shrubs, or ground cover plants to enhance the riparian area shall be allowed provided that soil disturbance is minimized. Plantings shall consist primarily of native species.

(3) In Zone 1:

(A) Forest vegetation shall be protected and maintained with selective harvesting allowed in accordance with the following restrictions:

(i) No trees with exposed primary roots in the stream channel shall be cut.

(ii) Tracked or wheeled vehicles may not operate in the zone, except at stream crossings established in accordance with .0203 of this Subchapter.

(B) A maximum of 50% of the trees 5 inches DBH and greater may be removed, provided there is minimal disturbance to the soil and remaining vegetation. Remaining trees shall be left as evenly spaced as is possible. Time interval between harvests shall be a minimum of five years.

(C) High intensity prescribed burns are not allowed.

(D) Application of fertilizers is not allowed except where needed to achieve permanent stabilization. Broadcast application of fertilizers and/or herbicides to the adjacent forest stand shall be conducted so that chemicals are not applied directly into or allowed to drift into the zone.

(4) In Zone 2, harvesting and regeneration of the forest stand shall be allowed provided that surface disturbance is minimized and sufficient ground cover is maintained to provide for diffusion and infiltration of surface runoff.

.0102 Definitions

(6a) DBH means Diameter at Breast Height of a tree, which is measured at 4.5 feet above ground surface level.

Appendix 6:
Proposed Legislative Changes to H.B. 1402

Neuse River Buffer Stakeholders Committee

Recommendations for Legislation

February 18, 1999

Changes to House Bill 1402 identified in bold and italics

Section 1.4. Alternatives to maintaining riparian buffers; compensatory mitigation fees.

(a) The Commission shall establish a program to provide alternatives for persons who would otherwise be required to maintain existing riparian buffers and who can demonstrate that they have attempted to avoid and minimize the loss of the riparian buffer and that there is no practical alternative to the loss of the buffer. This program is intended to allow these persons to perform compensatory mitigation in lieu of complying with the requirements of the revised temporary rule and permanent rule required by Section 1.8 of this act. Alternatives shall include, but are not limited to:

(1) Payment of a compensatory mitigation fee into the Riparian Buffer Restoration Fund.

(2) Donation of real property or of an interest in real property to the Department, another State agency, a unit of local government, or a private nonprofit conservation organization if both the donee organization and the donated real property or interest in real property are approved by the Department. The Department may approve a donee organization only if the donee agrees to maintain the real property or interest in real property as a riparian buffer. The Department may approve a donation of real property or an interest in real property only if the real property or interest in real property is either:

a. A riparian buffer that will provide protection of water quality that is equivalent to or greater than that provided by the riparian buffer that is lost; or

b. Will be used to restore, create, enhance, or maintain a riparian buffer that will provide protection of water quality that is equivalent to or greater than that provided by the riparian buffer that is lost.

(3) Establishment, restoration, or enhancement of a riparian buffer that is not otherwise required to be protected.

(b) Compensatory mitigation is ***available for loss of a riparian buffer along both intermittent streams, perennial streams, and perennial waterbodies***. Compensatory mitigation shall be conducted within the Neuse River Basin.

(c) The Commission shall establish a standard schedule of compensatory mitigation fees. The compensatory mitigation fee schedule shall be based on the area of the riparian buffer that is permitted to be lost and the cost to provide equivalent or greater protection of water quality by:

(1) Restoring existing riparian buffers.

(2) Acquiring land for and creation of new riparian buffers.

(3) Monitoring and maintaining the restored or created riparian buffers over time.

(4) Constructing approved alternative measures for nutrient reduction which have approximately the same or better functional equivalency as the buffer which was lost.

(d) The Commission may adopt rules to implement this section and may recommend any legislation it determines to be necessary or desirable to achieve the purposes of this section. Rules to implement this section shall not be codified as a part of 15A NCAC 2B.0233 but shall be set out as a separately numbered rule.

Other changes to House Bill 1402 may need to be made depending on the "vegetation" definition.

Delegation of Authority for the Protection and Maintenance of Riparian Areas

(a) The Commission may delegate responsibility for the implementation and enforcement of the State's riparian buffer protection requirements to units of local government that have the power to regulate land use. A delegation under this section shall not affect the jurisdiction of the Commission over State agencies and units of local government. Any unit of local government that has the power to regulate land use may request that responsibility for the implementation and enforcement of the State's riparian buffer protection requirements be delegated to the unit of local government. To this end, units of local government may adopt ordinances and regulations necessary to establish and enforce the State's riparian buffer protection requirements.

(b) Within 90 days after the Commission receives a complete application requesting delegation of responsibility for the implementation and enforcement of the State's riparian buffer protection requirement, the Commission shall review the application and notify the unit of local government that submitted the application whether the application has been approved, approved with modifications, or disapproved. The Commission shall not approve a delegation unless the Commission finds that local implementation and enforcement of the State's riparian buffer protection requirements will equal implementation and enforcement by the State.

(c) If the Commission determines that any unit of local government is failing to implement or enforce the State's riparian buffer protection requirements, the Commission shall notify the unit of local government in writing and shall specify the deficiencies in implementation and enforcement. If the local government has not corrected the deficiencies within 90 days after the unit of local government receives the notification, the Commission shall rescind delegation and shall implement and enforce the State's riparian buffer protection program. If the unit of local government indicates that it is willing and able to resume implementation and enforcement of the State's riparian buffer protection requirements, the unit of local government may reapply for delegation under this section.

(d) The Division of Water Quality in the Department shall provide technical assistance to units of local government in the development, implementation, and enforcement of the State's riparian buffer protection requirements.

(e) The Division of Water Quality in the Department shall set up and administer a training program to qualify State and local government staff, and the private sector in the stream identification procedures as identified in 15A NCAC 2B.0233. The Division shall be able to charge appropriate training fees to cover the costs incurred and staff time used to carry out the training. Staff from State agencies shall be exempt from paying the training fees.

Other

The Neuse River Riparian Buffer Stakeholder Advisory Committee requests that the Legislature provide a 5 million dollar appropriation to the Division of Water Quality to be used in developing statewide stream delineation maps which will identify streams and waterbodies under the jurisdiction of State riparian buffer rules. In addition an ongoing appropriation of $200,000 per year should be made to the Division for staff positions and support to administer the mapping program.

The Neuse River Riparian Buffer Stakeholder Advisory Committee also requests a 1 million dollar appropriation for the Wetlands Restoration Program to fund initial riparian buffer restoration efforts.

Appendix 7:
Current Temporary Neuse Buffer Rule

.0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: PROTECTION AND MAINTENANCE OF RIPARIAN AREAS WITH EXISTING FOREST VEGETATION

The following is the management strategy for maintaining and protecting riparian areas in the Neuse River Basin:

(1) Riparian areas shall be protected and maintained in accordance with this Rule on all sides of surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries) as indicated on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps or other site-specific evidence. This Rule only applies to riparian areas where forest vegetation is established in Zone 1 (as described in Sub-Item 3(a)) as of July 22, 1997. Forest vegetation, as defined in 15A NCAC 2B .0202, of any width in Zone 1 must be protected and maintained in accordance with this Rule. This Rule does not establish new buffers in riparian areas. Exceptions to the requirements of this Rule for riparian areas are described in Sub-Items (2)(a-h). Maintenance of the riparian areas should be such that, to the maximum extent possible, sheet flow of surface water is achieved. This Rule specifies requirements that shall be implemented in riparian areas to ensure that the pollutant removal functions of the riparian area are protected and maintained.

(2) The following waterbodies and land uses are exempt from the riparian area protection requirements:

(a) Ditches and manmade conveyances other than modified natural streams;

(b) Areas mapped as intermittent streams, perennial streams, lakes, ponds, or estuaries on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps where no perennial waterbody, intermittent waterbody, lake, pond or estuary actually exists on the ground;

(c) Ponds and lakes created for animal watering, irrigation, or other agricultural uses that are not part of a natural drainage way that is classified in accordance with 15A NCAC 2B .0100;

(d) Water dependent structures as defined in 15A NCAC 2B .0202, provided that they are located, designed, constructed and maintained to provide maximum nutrient removal, to have the least adverse effects on aquatic life and habitat and to protect water quality;

(e) The following uses may be allowed where no practical alternative exists. A lack of practical alternatives may be shown by demonstrating that, considering the potential for a reduction in size, configuration or density of the proposed activity and all alternative designs, the basic project purpose cannot be practically accomplished in a manner which would avoid or result in less adverse impact to surface waters. Also, these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices.

(i) Road crossings, railroad crossings, bridges, airport facilities, and utility crossings may be allowed if conditions specified in 2(e) of this Rule are met.

(ii) Stormwater management facilities and ponds, and utility construction and maintenance corridors for utilities such as water, sewer or gas, may be allowed in Zone 2 of the riparian area as long as the conditions specified in 2(e) of this Rule are met and they are located at least 30 feet from the top of bank or mean high water line. Additional requirements for utility construction and maintenance corridors are listed in 2(f) of this Rule.

(f) A corridor for the construction and maintenance of utility lines, such as water, sewer or gas, (including access roads and stockpiling of materials) may run parallel to the stream and may be located within Zone 2 of the riparian area, as long as no practical alternative

exists and they are located at least 30 feet from the top of bank or mean high water line and best management practices are installed to minimize runoff and maximize water quality protection to the maximum extent practicable. Permanent, maintained access corridors shall be restricted to the minimum width practicable and shall not exceed 10 feet in width except at manhole locations. A 10 feet by 10 feet perpendicular vehicle turnaround is allowed provided they are spaced at least 500 feet apart along the riparian area.

(g) Stream restoration projects, scientific studies, stream gauging, water wells, passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archaeological activities are allowed provided that they are located in Zone 2 and are at least 30 feet from the top of bank or mean high water line and are designed, constructed and maintained to provide the maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices. Activities that must cross the stream or be located within Zone 1 are allowed as long as all other requirements of this Item are met.

(h) Stream crossings associated with timber harvesting are allowed if performed in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).

(3) The protected riparian area shall have two zones as follows:

(a) Zone 1 is intended to be an undisturbed area of forest vegetation. Any forest vegetation, as defined in Rule .0202 of the Section, in Zone 1 as of July 22, 1997 shall be maintained and protected in accordance with this Rule.

(i) Location of Zone 1: Zone 1 begins at the top of bank for intermittent streams and perennial streams and extends landward a distance of 30 feet on all sides of the waterbody, measured horizontally on a line perpendicular to the waterbody. For all other waterbodies, Zone 1 begins at the top of bank or mean high water line and extends landward a distance of 30 feet, measured horizontally on a line perpendicular to the waterbody.

(ii) The following practices and activities are allowed in Zone 1:

(A) Natural regeneration of forest vegetation and planting vegetation to enhance the riparian area if disturbance is minimized, provided that any plantings should primarily consist of locally native trees and shrubs;

(B) Selective cutting of individual trees of high value in the outer 20 feet of Zone 1, provided that the basal area of this outer 20-foot wide area remains at or above 75 square feet per acre and is computed according to the following method. Basal area of this outer 20-foot wide area shall be computed every 100 feet along the stream to ensure even distribution of forest vegetation and shall be based on all trees measured at 4.5 feet from ground level. No tracked or wheeled equipment is allowed in Zone 1 except at stream crossings which are designed, constructed and maintained in accordance with Forest Practice Guidelines Related to Water Quality (15A NCAC 1J .0201 - .0209).

(C) Horticulture or silvicultural practices to maintain the health of individual trees;

(D) Removal of individual trees which are in danger of causing damage to dwellings, other structures or the stream channel;

(E) Removal of dead trees and other timber cutting techniques necessary to prevent extensive pest or disease infestation if recommended by the Director, Division of Forest Resources and approved by the Director, Division of Water Quality; and

(F)Ongoing agricultural operations provided that existing forest vegetation is protected and requirements in Rules .0236 and .0238 of this Section are followed.

(iii) The following practices are not allowed in Zone 1:

(A) Land-disturbing activities and placement of fill and other materials, other than those allowed in Items 2 and 3(a)(ii) of this Rule, that would disturb forest vegetation, as defined in Rule .0200 of this Section;

(B) New development, except as provided in Sub-Items 2(d), 2(e) and 2(f) of this Rule;

(C) New on-site sanitary sewage systems which use ground adsorption;

(D) The application of fertilizer; and

(E) Any activity that threatens the health and function of the vegetation including, but not limited to, application of chemicals in amounts exceeding the manufacturer's recommended rate, uncontrolled sediment sources on adjacent lands, and the creation of any areas with bare soil.

(b) Vegetation in Zone 2 shall consist of a dense ground cover composed of herbaceous or woody species which provides for diffusion and infiltration of runoff and filtering of pollutants.

(i) Location of Zone 2: Zone 2 begins at the outer edge of Zone 1 and extends landward a minimum of 20 feet as measured horizontally on a line perpendicular to the waterbody. The combined minimum width of Zones 1 and 2 shall be 50 feet on all sides of the waterbody.

(ii) The following practices and activities are allowed in Zone 2 in addition to those allowed in Zone 1:

(A) Periodic mowing and removal of plant products such as timber, nuts, and fruit is allowed on a periodic basis provided the intended purpose of the riparian area is not compromised by harvesting, disturbance, or loss of forest or herbaceous ground cover.

(B) Forest vegetation in Zone 2 may be managed to minimize shading on adjacent land outside the riparian area if the water quality function of the riparian area is not compromised.

(C) On-going agricultural operations provided that requirements of Rules .0236 and .0238 of this Section are followed.

(iii) The following practices and activities are not allowed in Zone 2:

(A) Land disturbing activities and placement of fill and other materials, other than those allowed in Items 2 and 3(b)(ii) of this Rule;

(B) New development, except as provided in Sub-Items 2(e) and 2(f) of this Rule;

(C) New on-site sanitary sewage systems which use ground adsorption;

(D) The application of fertilizer; and

(E) Any activity that threatens the health and function of the vegetation including, but not limited to, application of chemicals in amounts exceeding the manufacturer's recommended rate, uncontrolled sediment sources on adjacent lands, and the creation of any areas with bare soil.

(c) Timber removal and skidding of trees shall be directed away from the water course or water body. Skidding shall be done in a manner to prevent the creation of ephemeral channels perpendicular to the water body. Any tree removal must be performed in a manner that does not compromise the intended purpose of the riparian area and is in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).

(d) Maintenance of sheet flow in Zones 1 and 2 is required in accordance with this Item.

(i) Sheet flow must be maintained to the maximum extent practical through dispersing concentrated flow and/or re-establishment of vegetation to maintain the effectiveness of the riparian area.

(ii) Concentrated runoff from new ditches or manmade conveyances must be dispersed into sheet flow before the runoff enters Zone 2 of the riparian area. Existing ditches and manmade conveyances, as specified in Sub-Item 2(a) of this Rule, are exempt from this requirement; however, care should be taken to minimize pollutant loading through these existing ditches and manmade conveyances from fertilizer application or erosion.

(iii) Periodic corrective action to restore sheet flow should be taken by the landowner if necessary to impede the formation of erosion gullies which allow concentrated flow to bypass treatment in the riparian area.

(e) Periodic maintenance of modified natural streams such as canals is allowed provided that disturbance is minimized and the structure and function of the riparian area is not compromised. A grassed travelway is allowed on one side of the waterbody when alternative forms of maintenance access are not practical. The width and specifications of the travelway shall be only that needed for equipment access and operation. The travelway shall be located to maximize stream shading.

(4) If a local government has been issued a Municipal Separate Stormwater Sewer System permit or has been delegated to implement a local stormwater program, then the local government shall ensure that the riparian areas to be protected are, as a standard practice, recorded on new or modified plats.

(5) Where the standards and management requirements for riparian areas are in conflict with other laws, regulations, and permits regarding streams, steep slopes, erodible soils, wetlands, floodplains, forest harvesting, surface mining, land disturbance activities, development in Coastal Area Management Act Areas of Environmental Concern, or other environmental protection areas, the more protective shall apply.

(6) Where application of this Rule would prevent all reasonable uses of a lot platted and recorded prior to the effective date of this Rule, a variance may be granted by the Environmental Management Commission if it finds that:

(a) practical difficulties or unnecessary hardships would result in strict application of the Rule;

(b) such difficulties or hardships result from conditions which are peculiar to the property involved; and

(c) the general purpose and intent of the Rule would be preserved, water quality would be protected and substantial justice would be done if the variance were granted.