

CHAPTER TOPICS

- Using Riparian Buffers
- Trout Buffers (Tr)
- Water Supply Buffers
- HQW/ORW Buffers
- Chain of Lakes

CHAPTER SIX

BUFFER RULES

IN THE CATAWBA RIVER BASIN

USING RIPARIAN BUFFERS TO PROTECT STREAM QUALITY AND INTEGRITY

A stream and its riparian area function as one. The condition of a riparian area plays a pivotal role in the integrity of a stream channel and instream water quality. While any type of streamside vegetation is desirable, forests provide the greatest amount of benefit and the highest potential for meeting both water quality and habitat restoration objectives. Riparian forest buffers are managed to protect water quality through the control of nonpoint source pollution and the maintenance of the stream environment.

Riparian forest buffer systems are typically comprised of an area of trees, usually accompanied by shrubs and other vegetation, adjacent to a waterbody and managed as three integrated streamside zones that are designed to intercept surface runoff and subsurface flow.

A sound scientific foundation exists to support the sediment reduction, nutrient reduction and ecological values and functions of riparian forest buffers. The use of riparian buffers as a management tool should be promoted.

There are many different types of buffers within the Catawba River Basin, but they all have the same purpose, to reduce the amount of pollutants and excess nutrients running off the land and into surface waters. The types of buffers include trout, water supply, HQW, ORW and the Chain of Lakes buffers. The first four are based off of primary and secondary use classification. The Chain of Lakes buffers were initiated by the Environmental Management Commission to help protect the lakes against sedimentation and excess nutrients. Each buffer type may vary in width and have differing rules and regulations. These differences are described below in their respective sections along with a map indicating locations within the basin.

NEED FOR & BENEFITS OF THE CHAIN OF LAKES BUFFERS

The presence of intact riparian buffers and/or wetlands in urban areas can reduce urban impacts. Establishment and protection of buffers should be considered where feasible, and the amount of impervious cover should be limited as much as possible. Wide streets, large cul-de-sac, and long driveways and sidewalks lining both sides of the street are all features of urban development that create excess impervious cover and consume natural areas. Certain sections of the chain (Lake Rhodhiss and Lake Wylie) are already impaired due to the impacts from the accumulation of excessive nutrients. Riparian buffers are one way to help protect the Catawba River and its lakes from runoff pollution, particularly from new development. Some of these benefits include:

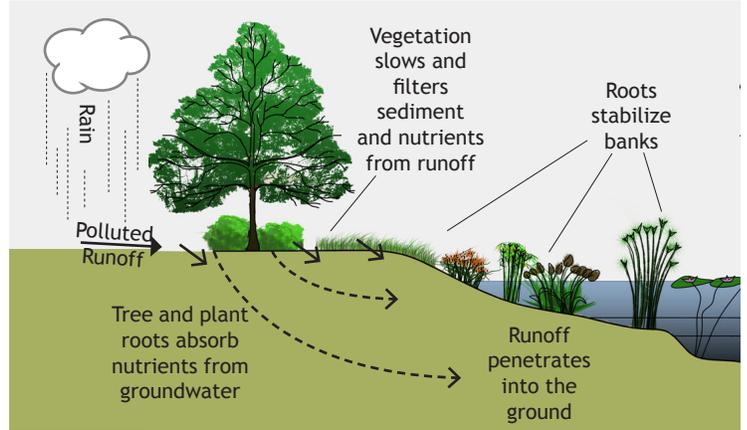
💧 **Filtering runoff:** Rain that runs off the land can be slowed and infiltrated in the buffer, which helps capture nutrients, sediment and other pollutants before they reach the lakes (Figure 6-1). Slowing the velocity of the runoff is critical in areas with large slopes or unstable soils. Runoff with high velocity has the force to transport sediment and other pollutants in its path to the receiving waterbody, and can quickly cause gullies and slope failures.

💧 **Nutrient Removal:** Phosphorus and nitrogen from lawn and crop fertilizers and animal waste are taken up by tree roots where they are then stored in leaves, limbs and roots instead of reaching the water. Some groundwater nitrogen is also converted to nitrogen gas by bacteria that live around the roots.

💧 **Provides Canopy and Shade:** Shading by buffer vegetation can moderate water temperature along the shorelines, providing some relief for aquatic life in the hot summer months.

💧 **Provides food and habitat for wildlife:** Leaves fall into a lake or river where they provide food to the aquatic food chain. The riparian buffer itself also offers habitat for many animals including songbirds, turtles and amphibians.

FIGURE 6-1: HOW RIPARIAN BUFFERS WORK



TROUT BUFFERS

TROUT WATERS (TR) CLASSIFICATION

Trout waters are defined in the Environmental Management Commission Rule (15A NCAC 2B .0202) as “waters which have conditions which shall sustain and allow for trout propagation and survival of stocked trout on a year-round basis”. All named and unnamed tributaries to trout waters usually carry the trout waters classification. This classification does not and is not intended to provide public access to streams for fishing on private and public lands and does not regulate, in any way, fishing activities (seasons, size limits, creel limits, and bait and lure restrictions) handled by the NC Wildlife Resources Commission.

TROUT BUFFER LAW

The Sedimentation Pollution Control Act of 1973 requires buffer zones along trout waters.

G.S. 113A-57(1) of this Act states:

“Waters that have been classified as trout waters by the Environmental Management Commission shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation within the twenty-five percent (25%) of the buffer zone nearest the land-disturbing activity, whichever is greater. Provided, however, that the Sedimentation Control Commission may approve plans which include land-disturbing activity along trout waters when the duration of said disturbance is temporary and the extent of said disturbance would be minimal.”

TROUT BUFFER REQUIREMENTS

Division of Land Resources (“DLR”) Rule 15A NCAC 04B .0125 specifies the following requirements for buffer zones for trout waters that must be met:

- 💧 The (minimum) 25-foot buffer must be measured horizontally from the top of the bank.
- 💧 A land-disturbing activity in the buffer zone adjacent to trout water can be permitted if the duration of the disturbance is temporary and the extent of the disturbance is minimal. Permission must be received from DLR.
- 💧 To be considered minimal, a land-disturbing activity must meet two conditions. (1) The land-disturbance must be limited to a maximum of ten percent of the total length of the buffer zone on your property. (2) There must not be more than 100 linear feet of disturbance in each 1000 linear feet of buffer zone. For example, if there is 750 linear feet of buffer zone on your property, up to 75 linear feet of that buffer can be disturbed. If there is 1500 linear feet of buffer zone on your property, you are still limited to 100 linear feet of disturbance in any 1000 linear foot section along the stream. Please check with the appropriate Regional Office (contact information on back) to verify that the proposed activity is minimal.
- 💧 If the disturbance will exceed 10 percent or 100 linear feet in every 1000 linear feet, approval for the disturbance must be obtained from the Director of the DLR. Please submit your trout buffer variance request through the *DLR Central Office*.
- 💧 A land-disturbing activity within a buffer zone adjacent to trout water that will cause adverse stream temperature fluctuations, as set forth in 15A NCAC 2B .0211, is prohibited.

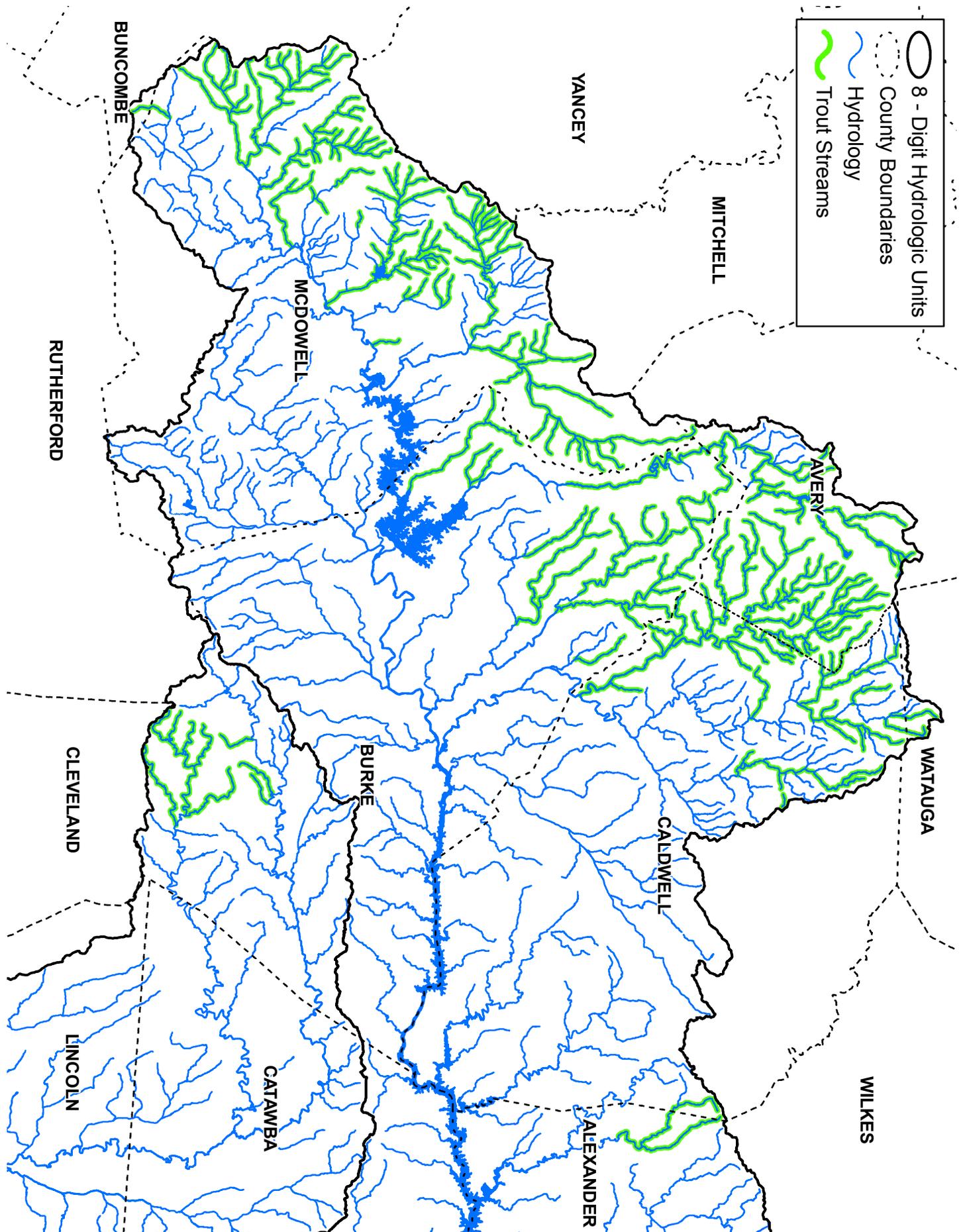
TROUT WATERS IN THE CATAWBA RIVER BASIN

Almost all trout waters in the Catawba River basin are located in the upper portion of the headwaters subbasin (03050101), with a few stream miles in the headwaters of the South Fork subbasin (03050102). Figure 6-2 indicates where these waters are with a thick green line.

For more information on trout buffers:

- 💧 *Frequently Asked Questions About Trout Buffers* Fact Sheet;
- 💧 Contact the *Division of Land Resources*: (919) 733-3833;
- 💧 Contact the Division of Water Quality: (919) 807-6300;
- 💧 Or, contact your Regional Office: Asheville (828) 296-4500 | Mooresville (704) 663-1699

FIGURE 6-2: TROUT WATERS IN THE CATAWBA RIVER BASIN



WATER SUPPLY BUFFERS

WATER SUPPLY (WS) CLASSIFICATION

Water Supply I (WS-I):

Waters protected for all Class C uses plus waters used as sources of water supply for drinking, culinary, or food processing purposes for those users desiring maximum protection for their water supplies. WS-I waters are those within natural and undeveloped watersheds in public ownership. All WS-I waters are HQW by supplemental classification.

Water Supply II (WS-II):

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I classification is not feasible. These waters are also protected for Class C uses. WS-II waters are generally in predominantly undeveloped watersheds. All WS-II waters are HQW by supplemental classification.

Water Supply III (WS-III):

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a more protective WS-I or II classification is not feasible. These waters are also protected for Class C uses. WS-III waters are generally in low to moderately developed watersheds.

Water Supply IV (WS-IV):

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I, II or III classification is not feasible. These waters are also protected for Class C uses. WS-IV waters are generally in moderately to highly developed watersheds or Protected Areas. More information: [Water Supply Watershed Protection Program Homepage](#)

WATER SUPPLY BUFFER LAW

Water Supply - I (WS-I):

💧 Entire water supply watershed: Agricultural activities must maintain a 10-foot vegetated buffer from perennial surface waters or equivalent control as determined by the Soil and Water Conservation Commission (Administrative Code 15A NCAC 02B .0104 (p), (1) in the *Redbook*).

TABLE 6-1: DEFINING LOW & HIGH DENSITY DEVELOPMENT FOR WATER SUPPLIES (DENR-DWQ, 2009)

WATER SUPPLY LEVEL	AREA AFFECTED	LOW DENSITY OPTION (DU=Dwelling Unit; AC=Acre)	HIGH DENSITY OPTION ¹
WS-I	Entire water supply watershed	Undeveloped	Undeveloped
WS-II	½ mile critical area ²	1 du / 2 ac or 6% built upon area	6-24% built upon area
	Rest of watershed	1 du / 1 ac or 12% built upon area	12-30% built upon area
WS-III	½ mile critical area ²	1 du / 1 ac or 12% built upon area	12-30% built upon area
	Rest of watershed	1 du / ½ ac or 24% built upon area	24-50% built upon area
WS-IV	½ mile critical area ²	1 du / ½ ac or 24% built upon area ⁴	24-50% built upon area ⁴
	Protected area ³	1 du / ½ ac or 24% built upon area ^{4,5}	24-70% built upon area ^{4,5}

1 - High Density Option requires control of runoff from the first 1 inch of rainfall through use of engineered stormwater controls. 2 - Critical Area is ½ mile and draining to water supplies as measured from the normal pool elevation of reservoir, or ½ mile and draining to a river intake. 3 - Protected Area is five miles and draining to water supplies as measured from the normal pool elevation of reservoirs, or 10 miles upstream of and draining to a river intake. 4 - These rules apply only to project requiring a Sedimentation and Erosion Control Plan. 5 - ½ acre lot or 36% built upon surface area is allowed for projects without a curb and gutter street system

Water Supplies - II, III & IV:

- 💧 Critical Area: (which is a ½ mile and draining to water supplies as measured from the normal pool elevation of reservoirs, or ½ mile and draining to a river intake.)
- 💧 Agricultural activities must maintain a 10-foot vegetated buffer from perennial surface waters or equivalent control as determined by the Soil and Water Conservation Commission;
- 💧 A 30-foot buffer is required on all low density developments;
- 💧 And, a 100-foot buffer is required on all high density developments.
- 💧 Rest of Watershed:
- 💧 A 30-foot buffer is required on all low density developments;
- 💧 And, a 100-foot buffer is required on all high density developments.

Table 6-1 defines what low and high density development means for Water Supplies I-IV. For additional information about water supplies and development density see Administrative Code 15A NCAC 02B .0212 in the *Redbook*.

WATER SUPPLIES IN THE CATAWBA RIVER BASIN

Most of water supply waters in the Catawba River basin are located along the Chain of Lakes and the South Fork Catawba River. Figure 6-3 indicates the locations of these waters and respective levels, which are intended to protect downstream water supplies.

HIGH QUALITY & OUTSTANDING RESOURCE WATER BUFFERS

HQW & ORW CLASSIFICATIONS

High Quality Waters (HQW):

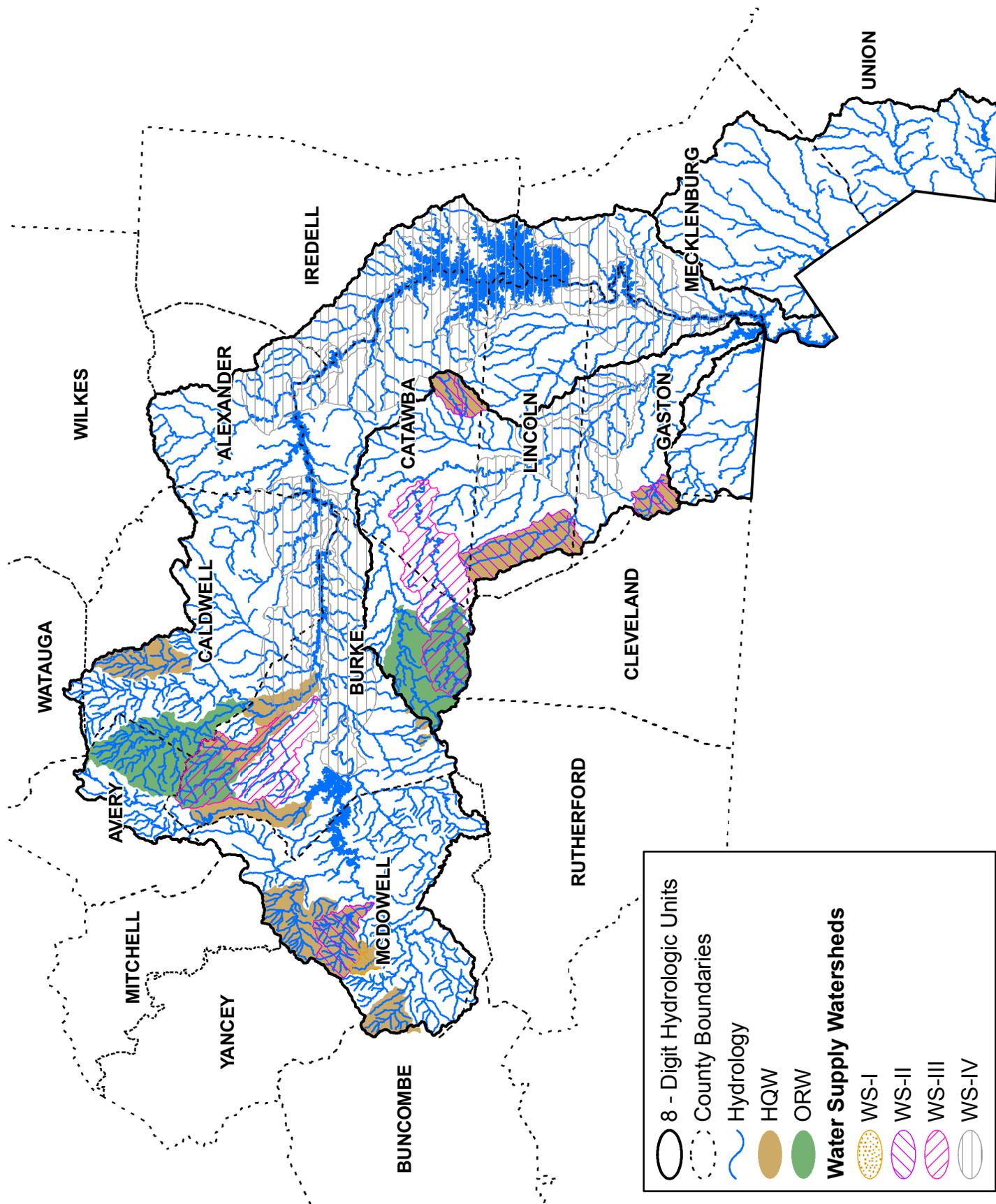
Supplemental classification intended to protect waters which are rated excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, primary nursery areas designated by the Marine Fisheries Commission, and other functional nursery areas designated by the Marine Fisheries Commission.

Outstanding Resource Waters (ORW):

All outstanding resource waters are a subset of High Quality Waters. This supplemental classification is intended to protect unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance. To qualify, waters must be rated Excellent by DWQ and have one of the following outstanding resource values:

- 💧 Outstanding fish habitat and fisheries,
- 💧 Unusually high level of waterbased recreation or potential for such kind of recreation,
- 💧 Some special designation such as North Carolina Natural and Scenic River or National Wildlife Refuge,
- 💧 Important component of state or national park or forest, or
- 💧 Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).

FIGURE 6-3: WATER SUPPLY, HQW & ORW AREAS IN THE CATAWBA RIVER BASIN



HQW & ORW BUFFER LAW

HQW:

- 💧 The affected area for HQW buffers include within one mile from and draining to the HQW waterbody.
- 💧 If a Sedimentation and Erosion Control Plan is required then low density developments (1 dwelling unit per acre or 12% built upon) is required to have a 30-foot buffer.
- 💧 Statewide rules administered by DWQ require certain size animal feedlots to have permit coverage and approved animal waste management plans as well as to implement buffer zones between newly constructed waste facilities/waste application areas and perennial surface waters.

ORW:

- 💧 The affected area for ORW buffers normally include the entire watershed/drainage area.
- 💧 If a Sedimentation and Erosion Control Plan is required then low density developments (1 dwelling unit per acre or 12% built upon) is required to have a 30-foot buffer.
- 💧 Statewide rules administered by DWQ require certain size animal feedlots to have permit coverage and approved animal waste management plans as well as to implement buffer zones between newly constructed waste facilities/waste application areas and perennial surface waters.

HQW & ORW IN THE CATAWBA RIVER BASIN

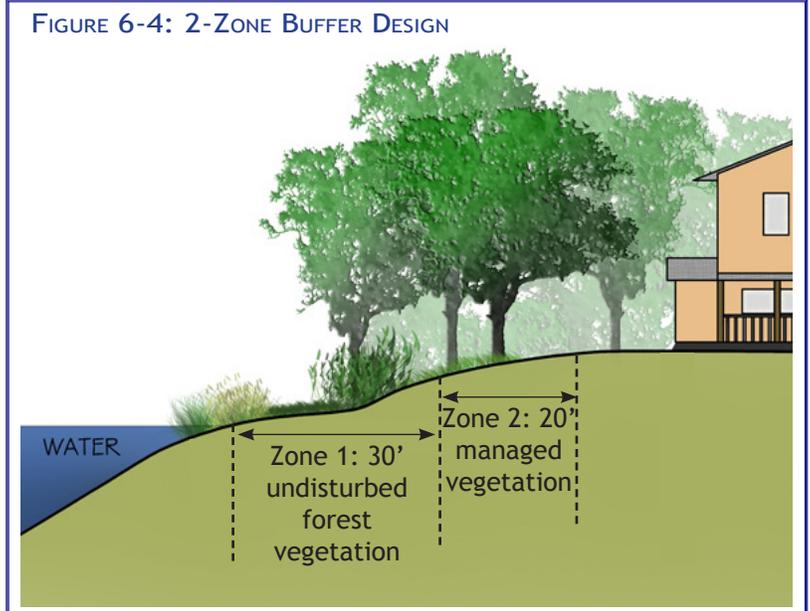
Almost all HQW & ORW designations in the Catawba River basin are located in the upper portion of the headwaters subbasin (03050101), with a few stream miles in the headwaters of the South Fork subbasin (03050102). Figure 6-3 indicates where these waters are located.

CHAIN OF LAKES BUFFERS

THE CHAIN OF LAKES BUFFER RULES

On July 7, 2003, the Environmental Management Commission completed a stakeholder process to protect mainstem riparian habitat on the Catawba River by finalizing the “Catawba River Basin Buffer Rules” (§15A NCAC 02B.0243). The temporary rule became permanent in August 2004.

The Catawba River basin buffer rules apply to a 50-foot wide riparian buffer directly adjacent to surface waters along the Catawba River mainstem below Lake James and along mainstem lakes in the Catawba River basin. The rules create a two-zone protection area that allows for all existing uses that were in place on June 30, 2001 (Figure 6-4). As long as the current land use was in place on that date, the Catawba River basin buffer rules do not apply. Otherwise, Zone One is the 30-foot wide strip closest to the waterline that must remain generally undisturbed. Zone Two constitutes the remaining 20 feet of buffers and allows for grading and revegetating as long as the health of zone one is not impacted. There are many exemptions and activities that are allowable with mitigation inside the buffer zone. Those include, but are not limited to, access roads, view corridors and timber harvesting. For a complete



copy of the rule and the list of all exemptions, please refer to §15A NCAC 02B.0243 in the *Redbook*. For more discussion on the process used to develop the rule, visit the *Nonpoint Source Management Program* website.

CHAIN OF LAKES BUFFER RECOMMENDATIONS

The Chain of Lakes double zoned 50-foot buffer does provide some protections to the lakes. However, as populations in the surrounding watersheds increase and land uses change, so will the amount of impervious surface. These changes will put the lakes at a greater risk for eutrophication. Local governments have the opportunity to adopt a local riparian buffer ordinance to further protect water quality past that of what these buffers can do. A local ordinance can set more stringent rules, like expanding to 100-foot buffers along certain shorelines, require additional stormwater controls on areas with excessive nutrient runoff or reduce acceptable activities within both zones. DWQ recommends local governments take some voluntary action to increase buffer requirements as appropriate for that area. Local requirements should be assessed with the long term plans of the community. As a community grows and the demand on water increases, whether for recreation, drinking or aesthetic purposes, the quality of the water will become more critical. By reducing the pollutants and nutrients entering the lake, municipalities will be able to spend less on filtering drinking water and keeping aquatic weeds from clogging intake pipes. This will also reduce the chances of algal blooms which can prevent adequate recreation use and discourage return visits.

An essential element of implementing successful buffers is public education. DWQ highly recommends educational efforts by local watershed groups, governments and agencies, and support will be provided where possible for these efforts. Public outreach and education is a critical since the majority of land use around the immediate shorelines are residential. If a residence has a better understanding of the buffers purpose and that his or her actions can effect the appearance and quality of the lake, that residence is more likely to take voluntary steps. Residence who are new to the area, especially in the lower half of the chain where populations are increasing quickly, may be unaware of the buffer rules all together. Educational emphasis should be placed on the purpose of the buffers and enhancing local water quality not necessarily what can and can't be done within the zones. The buffers are not in place to impede what an individual can do on their own property, but are designed to enhance the use and enjoyment of the lake for that individual as well as other. Clean lakes are not only beneficial to property values but economically beneficial to the local community and its tourist industry.

It is up to the local population of each lake to take water quality into their own hands. Local voluntary actions are much more effective in the long term and creates ownership amongst citizens. State level action is necessary in certain cases; however, it can cause some to become more concerned with additional regulations and in turn lose site of the real issue. DWQ will assist and support all local efforts that encourage the expansion of lake buffers and/or buffer requirements/guidelines and all educational efforts where possible.

LOCAL BUFFER RULES

Some local governments have developed additional riparian buffer rules to provide more protection to the headwaters of the Chain of Lakes.

LINCOLN COUNTY

Lincoln County adopted a Streamside Buffer Ordinance in 2007 that was modeled after the State's Catawba River Buffer regulations. The County regulations require a minimum 50-foot two-zone buffer on both sides of intermittent and perennial streams. The first 30 feet from streams edge is a 'no touch' zone and the remaining 20 feet is to have managed vegetation or other ground cover. No development or impervious surfaces are allowed anywhere within the 50-foot buffer.

GASTON COUNTY

Gaston County buffer regulations require a minimum 30-foot vegetative buffer for low-density development along perennial water and a 100-foot buffer for high-density development.

MECKLENBURG COUNTY

Mecklenburg County developed an approach in the late 1990's called Surface Water Improvement & Management or SWIM with the objective to "prevent further degradation, preserve the best waters, improving the good and remediating the worst waters" (Mecklenburg County, 2000). This approach includes buffer requirements as listed below. The table and graphics were pulled from the *Charlotte-Mecklenburg SWIM Stream Buffer Implementation Guidelines* document found on their website.

TABLE 6-2: SUMMARY OF MECKLENBURG COUNTY SWIM STREAM BUFFER REQUIREMENTS

JURISDICTION	DATE ORDINANCE ADOPTED	TOTAL BUFFER WIDTHS			
		≥ 640 ACRES	≥ 300 ACRES	≥ 100 ACRES	≥ 50 ACRES
Mecklenburg County(1) unincorporated	11/9/99	total = 100 ft + 50% of area of floodfringe beyond 100 ft stream side=30ft. managed use=45ft. upland=25ft +50% of area of floodfringe beyond 100 ft	total = 50 ft stream side=20ft managed use =20ft. upland=10ft	total = 35 ft stream side=20ft managed use =none upland=15ft	No Buffer Requirements
Charlotte(1)	11/15/99	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County
Pineville(1)	4/11/2000	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County
Cornelius(2)	12/6/99	total = entire floodplain but no less than 100 feet	total = 50 feet no zones	total = 35 ft no zones	
Huntersville(1)	10/19/99	total = floodway + 100% of floodfringe but no less than 100 ft stream side=30ft managed use=45 ft upland=remainder	total = 50 feet stream side=20ft managed use =20ft. upland=10ft	total = 35 ft stream side=20ft managed=none upland=15ft	
Matthews(1)	2/14/2000	same as Huntersville	same as Huntersville	same as Huntersville	
Mint Hill(1)	7/20/2000	same as Huntersville	same as Huntersville	same as Huntersville	
Davidson(1)	10/99 "PLAN" and not Ordinance	Total buffer width = a minimum of 100 feet for all streams within Davidson's jurisdiction. For all FEMA regulated streams the width is 100 feet + 50% of the area of the floodfringe beyond 100 feet - stream side zone = 30 feet, managed use = 45 feet and upland = 25 feet + 50% of area of floodfringe			

All buffers are measure horizontally on a line perpendicular to the surface water, landward from the top of the bank on each side of the stream.
 (1): Function, vegetative targets and uses for each of the buffer zones correspond to the buffer plan developed by the S.W.I.M. Panel dated April 20, 1999 (as summarized on the following page).
 (2): No buffer zones have been designated. The entire buffer area is designated in the Ordinance as "UNDISTURBED."

FIGURE 6-5: BUFFER ZONES DIAGRAM

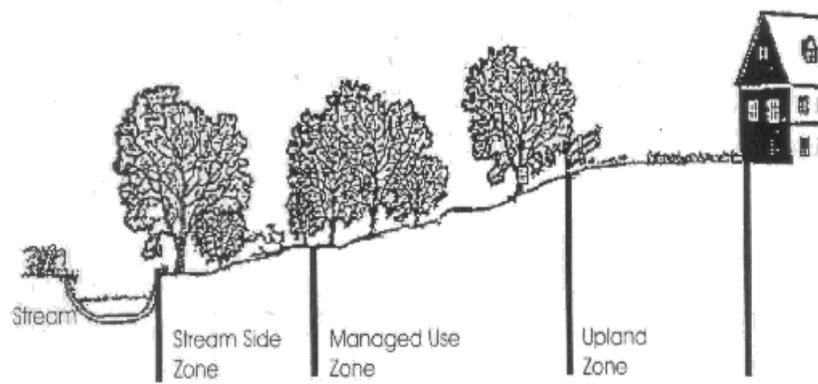


TABLE 6-3: DESCRIPTION OF BUFFER FUNCTION, VEGETATIVE TARGETS & USE WHICH VARY ACCORDING TO THE DIFFERENT BUFFER ZONES

CHARACTERISTICS	STREAM SIDE ZONE	MANAGED USE ZONE	UPLAND ZONE
Function	Protect the integrity of the ecosystems	Provide distance between upland development and the stream side zone	Prevent encroachment and filter runoff
Vegetative Targets (1)	Undisturbed (no cutting or clearing allowed) - If existing tree density is inadequate, reforestation is encouraged	Limited clearing - Existing tree density must be retained to a minimum of 8 healthy trees of a minimum 6 inch caliper per 1000 square feet - If existing tree density is inadequate, re-forestation is encouraged	Grass or other herbaceous ground cover allowed - Forest is encouraged
Uses (2)	Very restricted - Permitted uses limited to: flood control structures and bank stabilization as well as installation of utilities and road crossings with stabilization of disturbed areas as specified in "III E" above.	Restricted - Permitted uses limited to: all uses allowed in the Stream Side Zone, as well as storm water best management practices (BMPs), bike paths, and greenway trails (not to exceed 10 feet in width).	Restricted - Permitted uses limited to: all uses allowed in the Stream Side and Managed Use Zones, as well as grading for lawns, gardens, and gazebos and storage buildings (non-commercial and not to exceed 150 sf).
<p>(1): Re-vegetation of disturbed buffers is required when such disturbances result in the failure of the buffer system to comply with the vegetative targets specified above.</p> <p>(2): Fill material can not be brought into the buffer. Grading is allowed only in the Upland Zone. Commercial buildings or occupied structures are not allowed in the buffer. Permitted uses within the buffer zones should be coordinated to ensure minimal disturbance of the buffer system. For example, if it is necessary to install utilities within the buffer, every attempt should be made to build greenway trails so they follow the cleared areas instead of requiring additional clearing.</p>			

REFERENCES

North Carolina Department of Environment and Natural Resources (DENR). Division of Land Resources (DLR). 2007. *Sedimentation Pollution Control Act of 1973*. North Carolina General Statutes Chapter 113A Article 4 §113A-57(1) Raleigh, NC. <http://www.dlr.enr.state.nc.us/images/Sedimentation%20Pollution%20Control%20Act%20of%201973,%202007%20amendments.pdf>.

_____. DLR. February 1992. *Buffer Zone Requirements*. North Carolina Administrative Code: 15A NCAC 4B .0125. Raleigh, NC.

North Carolina Department of Environment and Natural Resources (DENR). Division of Water Quality (DWQ). May 2007. *Classifications and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina*. North Carolina Administrative Code: 15A NCAC 2B .0202. Raleigh, NC.

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