Article 8 | Environmental Protection

Sec. 8.1 Purpose

Durham County is endowed with an abundance of natural resources, including land, forests, streams and rivers, lakes, wildlife and natural beauty. Inappropriate development threatens the quality of the natural resources that make it a special place to live and work. Durham's governing bodies recognize that establishing standards for the protection of Durham County's natural resources represents prudent stewardship of the land and good business. The multiple purposes of natural resource protection standards are:

A. To preserve and enhance the quality of the water in rivers, streams, ponds and lakes that flow into and out of Durham County;

B. To minimize future flooding problems by restricting development in flood prone areas;

C. To preserve the water carrying capacity of watercourses and the natural water storage capacity of the floodplain;

D. To protect land and watercourses from pollutants, sedimentation and erosion;

E. To retain open spaces in order to protect their environmentally-sensitive character;

F. To protect and conserve significant natural resources from degradation due to inappropriate development. Such natural resources include Inventory Sites, wildlife and plant life habitats, wetland areas and riparian areas;

G. To minimize the impact of development by controlling the location, intensity, pattern and design of development and construction activities;

H. To enhance the aesthetic appearance of Durham as a means of improving quality of life and attracting new businesses and residents;

I. To improve air quality by reducing the heat island effect; and

J. To protect environmentally sensitive lands while recognizing the legitimate expectations of property owners and Durham's economic development goals.

Sec. 8.2 Exemptions from Environmental Protection Standards

8.2.1 Water Supply Reservoirs

Public water supply reservoirs and associated facilities shall be exempt from the requirements of this Article unless explicitly acknowledged within any section.

Sec. 8.3 Tree Protection and Tree Coverage

8.3.1 Tree Coverage Standards

A. Purpose

The primary purpose of the tree coverage standards is the preservation and maintenance of undisturbed tree cover and the provision of replacement tree cover on development sites in the Suburban Tier. Tree coverage serves to reduce glare, noise, air pollution, and soil erosion; to moderate temperatures; to reduce stormwater runoff; to preserve remnants of Durham's native ecology; to provide habitat for native plants and wildlife; to provide a healthy living environment; and to make Durham County a more attractive place to live.

B. Applicability

1. Tree coverage standards shall only be applied in the Suburban Tier.

2. Developments in the RR and RS-20 Districts shall be exempt from tree coverage requirements provided enforceable assurances are provided that no mass grading will be utilized during the development process.

C. Tree Coverage

1. New development other than additions to existing single-family detached houses shall include tree coverage areas on a portion of the development tract.

2. Additions to development existing as of the effective date of this Ordinance shall provide tree coverage as a percentage of the area proposed for disturbance.

3. Locations

a. Tree coverage areas in new subdivisions shall be located in common open space or buffers required by other provisions of this Ordinance.

b. Any forested land in the floodway, floodway fringe (unless proposed to be filled or developed in accordance with paragraph 8.4.3B.2), preserved wetlands and wetland buffers, steep slope areas, stream buffers, Durham Natural Inventory Sites, Major Transportation Corridor (MTC) buffers, and any portion of the tract left undisturbed in order to create required perimeter buffers that satisfies the minimum size requirements established in Sec. 8.3.1D , Preserved Tree Coverage, or Sec. 8.3.1E, Replacement Tree Coverage, below may be used as tree cover.

4. Tree coverage standards may be met either by preserving existing trees on the site, by planting replacement trees, or a combination of both. The percentage of a tract which shall have tree coverage is as indicated in the table below. The total tree coverage area shown reflects the addition of replacement tree coverage area to the preserved tree coverage area shown.

Residential Development	
Preserved Tree Coverage Area (%)	**Total Tree Coverage Area Required (%)**
20	20
At least 15 but less than 20	23
At least 10 but less than 15	24
Less than 10	25
Nonresidential Development	
Preserved Tree Coverage Area (%)	**Total Tree Coverage Area Required (%)**
10	10
At least 8 but less than 10	13
At least 6 but less than 8	14
Less than 6	15

5. For the purposes of calculating tree coverage requirements, the water surface area of ponds, lakes and other water bodies (excluding stormwater control structures) shall be excluded from the total land area of the development tract.

6. Tree preservation and tree replacement areas shall be shown on all preliminary plats, final plats, site plans and development plans in order to clearly assign tree replacement responsibility to future owners. Tree preservation and tree replacement areas on any individual lot shall be clearly shown on all plot plans for the lot.

7. Property owners shall be responsible for protecting and preserving tree preservation and tree replacement areas during and after the development process in accordance with standard horticultural practice and Sec. 8.3.2, Protection of Existing Vegetation.

D. Preserved Tree Coverage

Areas proposed as tree preservation shall meet the following requirements to satisfy the tree coverage standards in Sec. 8.3.1, Tree Coverage an Protection Standards:

1. The provisions of Sec. 8.3.2, Protection of Existing Vegetation, shall be fulfilled.

2. Tree preservation areas shall be located in the areas listed in Sec. 8.3.1, Tree Coverage Standards, above. Additional tree preservation areas may be located outside of these areas, in which case they shall be located in order to preserve specimen trees and to preserve clusters of trees that add to the aesthetic quality of the development as viewed from the public right-of-way.

3. Clusters of Trees

a. The tree coverage area for a cluster of trees shall be determined by the exterior boundary of the total root protection zones for all of the trees in the cluster.

b. For parcels greater than one acre, no tree preservation area for a cluster of trees may be counted toward meeting the tree coverage standard unless it includes a minimum of 1,000 square feet (or such smaller area as required by paragraph 8.3.1C.4 above) and has no individual dimension of less than 25 feet.

c. For parcels one acre or less, no single tree preservation area for a cluster of trees may be counted toward meeting the tree coverage standard unless it includes a minimum of 500 square feet (or such smaller area as required by paragraph 8.3.1C.4 above) and has no individual dimension less than 15 feet.

d. At least 75% of the tree coverage included within any tree preservation area shall be composed of trees with at least a two inch dbh as determined through use of landscape sampling pursuant to Sec. 9.3.3, Sampling.

e. At least 75% of the root protection zone for a cluster of trees shall be located on the subject site for it to be considered a protected cluster.

4. Individual Trees

The tree coverage area for an individual tree shall be determined by the tree's root protection zone. At least 75% of the root protection zone for a tree shall be located on the subject site in order for that tree to count as preserved. Individual trees may be counted toward tree coverage credit provided that the tree's diameter is at least ten inches dbh or greater. Where specimen trees of 18 inches dbh or greater are preserved outside of other required buffers, tree coverage credit shall be granted at one and one-half times the size of the root protection zone.

5. Construction in Preserved Tree Coverage Area

a. Preserved tree coverage areas shall not be used for active recreational purposes, except for walking paths and foot trails constructed with minimal disturbance of tree roots and existing vegetation provided a registered arborist has certified that the construction of the trail has been designed to minimize impact to the existing trees. No tree over 10 inches dbh shall be removed for the construction of trails.

b. All buildings shall be set back at least 10 feet from the edge of any preserved tree coverage area.

c. Utility lines and drainage channels shall be minimized within the root protection zones of trees to be saved and preferably located adjacent to driveways and in groupings as allowed by sound engineering practices.

E. Replacement Tree Coverage

Areas proposed as tree replacement shall meet the following requirements to satisfy the standards found in Sec. 8.3.1C, Tree Coverage:

1. For parcels greater than one acre, no tree replacement area may be counted toward meeting the tree coverage standard unless it includes a minimum of 1,000 square feet (or such smaller area as required by paragraph. 8.3.1C.4 above) and has no individual dimension of less than 25 feet.

2. For parcels one acre or less, no tree replacement area may be counted toward meeting the tree coverage standard unless it includes a minimum of 500 square feet (or such smaller area as required by paragraph 8.3.1C.4 above) and has no individual dimension less than 15 feet.

3. When replacement trees are provided in order to satisfy the requirements of Sec. 8.3.1C, Tree Coverage, coverage credit shall be accrued in accordance with the following table with credit calculated based on the required planting area for

the proposed trees up to a maximum credit for any single tree of 275 square feet. In meeting this standard, at least 50% of replacement trees shall be two and one-half inches dbh or greater. A minimum of 50% of replacement trees shall be large, maturing, hardwood species native to Durham County.

Hardwood Caliper (inches)	Non-Hardwood Height (feet)	Credit (square feet)
4	18 or over	275
3½	16 to 18	250
3	14 to 16	225
2½	12 to14	200
2	10 to12	175
1½	8 to 10	150
1	7 to 8	100
Less than 1	Less than 7	No credit

EXAMPLE: *10 trees at 2½-inch caliper requires 2,000 square feet of planting area, and provides 2,000 square feet of replacement tree credits.*

4. Where evidence can be provided that a development tract is entirely in agriculture (other than forestry) and has been continuously maintained in such use since January 1, 1980, the tree coverage standard indicated in Sec. Sec. 8.3.1C, Tree Coverage, may be reduced by 33% and the replacement tree requirement may be entirely met with trees of any size greater than two inches in caliper with tree coverage credit granted in accordance with the table above. Such tree coverage requirement reductions shall not apply to nonresidential development.

5. Areas designated as replacement tree coverage shall be subject to the use limitations imposed on preserved tree coverage in Sec. 8.3.1D.5, Construction in Preserved Tree Coverage Areas, except that stormwater control measures designed as bioretention facilities shall be allowed.

6. Replacement trees shall be planted before any Certificate of Compliance is issued, unless the planting has been deferred to an appropriate season in accordance with the requirements of Sec. 9.11.2, Extensions for All Other Development.

8.3.2 Protection of Existing Vegetation

Any trees preserved on a development tract in order to meet Ordinance requirements or otherwise indicated to be preserved shall meet the following protection standards.

A. Protection measures to be used during grading and construction shall be specified on all grading, site, and erosion control plans with details of the tree protection fence(s) and its location shown on site plans and erosion control plans.

B. Root protection zones shall be established around all trees to be preserved. The root protection zone shall either be a six-foot radius around the tree or a one foot radius for every inch of tree dbh, whichever is greater.

C. A tree protection fence constructed of a material resistant to degradation by sun, wind, and moisture for the duration of the construction, shall be installed at the same time as the erosion control measures, and shall remain in place until all construction

is complete. Such fencing shall be mounted on metal posts placed no further than ten feet apart. Silt fencing shall not serve as tree protection fencing except in unusual circumstances, such as when topography limits the area available for installation of both tree protection fencing and erosion control measures.

D. At the start of grading involving the lowering of the existing grade around a tree or stripping of topsoil, a clean, sharp, vertical cut shall be made at the edge of the tree save area at the same time as other erosion control measures are installed. Tree protection fencing shall be installed on the side of this cut farthest away from the tree trunk. This procedure shall be incorporated as a note on the grading and erosion control plans.

E. No storage of materials, dumping of waste materials, fill, or parking of equipment shall be allowed within the root protection zone, and no trespassing shall be allowed within the boundary of the root protection zone, and shall be so noted on the grading and erosion control plans and posted at each end of the tree protection fence with perimeter signs spaced a maximum of 100 feet on center thereafter. Each sign shall read "no trespassing/tree protection area" and "prohibido entrar/zona proctectora para los arboles".

8.3.3 Tree Survey

A. Purpose

The primary purpose of the tree survey requirements is to provide better information about the presence and location of significant trees on sites proposed for development. This information is needed before plans for development are so far advanced that it is unreasonable and impractical to modify the plans to protect the trees identified on the tree survey. Knowing the location and size of specimen trees helps the staff and governing body evaluate possible modifications to the proposed plans to preserve significant trees and improve the appearance of proposed development.

B. General Tree Survey

For a Development Plan showing building envelopes rather than building footprints, a generalized survey describing existing forest stands, indicating the range of species and approximate size of trees on the tract, shall be provided.

C. Specimen Tree Survey

1. A specimen tree survey shall be required for any Development Plan showing specific building footprints, site plan, or preliminary plat.

2. The specimen tree survey shall show the general location, species and size of any specimen trees, which shall be defined as all trees other than trees of the *Pinus* genus greater than 18 inches dbh. Specimen trees of the *Pinus* genus shall only be considered significant and required to be shown on tree surveys in the Rural Tier.

3. A specimen tree survey shall not be required for land in the floodway, floodway fringe (unless proposed to be filled or developed in accordance with paragraph 8.4.3B.2, Fill or Development in the Floodway Fringe), preserved wetlands and wetland buffers, steep slope areas, stream buffers, Major Transportation Corridor (MTC) buffers, and, if preserved, Durham Natural Inventory Sites.

D. Land Disturbance Tree Survey

1. A land disturbance tree survey shall be required for any site plan, preliminary plat, grading plan, or erosion control plan.

2. The land disturbance tree survey shall show the location, species, size and root protection zone of any tree greater than 10 inches dbh that is within a tree protection area and within 30 feet of any area proposed for disturbance. For the purpose of this paragraph, a tree protection area shall include any floodplain, steep slope area, stream buffers, required landscape buffers, tree coverage areas, Inventory sites, and wetlands.

8.3.4 Clear-Cutting

A. Standard

Properties shall not be clear-cut during the conduct of forestry activities. To maintain the visual character of the site from adjoining properties and right-of-way, a vegetated perimeter buffer shall be maintained while tree harvesting for forestry occurs. A 32-foot wide buffer of naturally existing vegetation shall be maintained along all boundaries of the property being forested that adjoin other properties. Along public rights-of-way, a 50-foot buffer of naturally existing vegetation shall be maintained, exclusive of areas required for access to the site.

B. Penalties

1. City

Site plans proposing development of properties that failed to maintain such a buffer during forestry activities shall be denied for a period of five years from the date of clearing.

2. County

Site plans proposing development of properties that failed to maintain such a buffer during forestry activities shall be denied for a period of three years from the date of clearing.

Sec. 8.4 Floodplain Protection Standards

8.4.1 Purpose

The primary purpose of the floodplain protection standards is to preserve and maintain the natural floodplain in an undisturbed vegetated state in order to maintain flood storage capacity, control stormwater, improve water quality and conserve plant and wildlife habitat.

8.4.2 Development Restricted in the Floodway and Floodway Fringe

A. Development and land disturbing activity within the floodway and floodway fringe shall be prohibited, except as provided below, or allowed pursuant to a variance approved by the Board of Adjustment in accordance with Sec. 3.15, Variance.

B. Land within the floodway and floodway fringe shall not serve to meet minimum lot size requirements, except in the Rural Tier and on property zoned RR or RS-20 in the Suburban Tier where at least 50% of the required lot area is located outside the floodway or floodway fringe.

8.4.3 Development Allowed in the Floodway and Floodway Fringe

A. Development Requiring Development Review Board Approval

Land in the floodway and floodway fringe may be used for the following purposes, provided that such uses are designed and constructed to minimize clearing, grading, erosion and water quality degradation and are in compliance with the Flood Damage Protection Ordinance.

1. Crossings by streets, driveways, and railroads provided that they cross floodways and floodway fringe areas as nearly perpendicular to the stream as possible. Such facilities may run within and parallel to the stream (in the floodway and floodway fringe) if no other access to the property is feasible.

2. Active and passive recreational activities.

3. Intakes, docks, utilities (including water and wastewater treatment, stormwater control and sedimentation and erosion control facilities), bridges, other public facilities and water-dependent structures.

4. Wetlands constructed or restored for mitigation purposes.

B. Development Requiring Governing Body Approval

1. Parking in the Floodway Fringe

Land in the floodway fringe may be used for up to 20% of the parking required for the development on the tract: however, no more than 20% of the floodway fringe land on any development tract shall be used for parking. Parking in the floodway fringe shall require site plan approval from the governing body. In reviewing the site plan, consideration shall include whether the proposed parking is designed and arranged to minimize adverse environmental impact from placement of parking in the floodway fringe.

2. Fill or Development in the Floodway Fringe

In order to achieve higher quality site design and better utilization of the land adjacent to the floodway fringe, a property owner or developer may fill or use

for development up to ten percent of the floodway fringe area contained within the boundaries of any development site provided that the governing body finds that:

a. The proposed fill or development provides for a better balance between overall efficiency of the site design, and improved conservation elsewhere on the site than would be possible without intrusion into the floodway fringe area; and

b. The proposed fill or development represents the minimum amount of floodway fringe intrusion to achieve this better balance.

> ***Commentary:*** *Intrusion within the floodway fringe may allow preservation of other significant resources on the site, and the governing body is empowered to review the balancing of these two concepts.*

8.4.4 Density Credits

A. No credit shall be allowed for land in the floodway, except in the RR District where 100% density credit may be given for land in the floodway in Conservation Subdivisions pursuant to Sec 6.2.4, Conservation Subdivision.

B. The amount of land in the floodway fringe may be credited for residential density on adjacent land in the same development at a rate of 50% of that allowed by the zoning, except in the RR District where 100% density credit may be given for land in the floodway fringe in Conservation Subdivisions pursuant to Sec 6.2.4, Conservation Subdivision.

8.4.5 Variances

The Board of Adjustment may grant variances to the requirements of Sec. 8.4, Floodplain Protection Standards, in accordance with the provisions of Sec. 3.15, Variances. The Board of Adjustment shall not be authorized to grant variances to the requirements of the Flood Damage Protection Ordinance.

Sec. 8.5 Stream Buffer Protection Standards

8.5.1 Purpose

The primary purpose of the stream buffer protection standards is to maintain land adjacent to streams in a vegetated state in order to enhance and maintain water quality, protect stream channel wetlands, minimize stormwater runoff, reduce sedimentation and erosion, conserve plant and wildlife habitat and protect wildlife movement corridors.

> ***Commentary:*** *Note that streams may have additional stream buffer requirements in accordance with Sec. 8.7, Watershed Protection Overlay Standards, Section 401 Water Quality Certification administered by the North Carolina Division of Water Quality, and related requirements within the jurisdiction of the US Environmental Protection Agency and US Army Corps of Engineers.*

8.5.2 Types of Stream Buffers

A. The stream buffer protection standards shall apply to intermittent streams, perennial streams, and naturally occurring ponds and lakes. Stream buffers shall be clearly indicated on all development plans, site plans, preliminary plats and final plats.

B. Where maps show a difference in stream type for a particular reach of stream, the map that shows the greater level of stream protection shall apply.

C. When a property owner or applicant believes that the appropriate maps are in error, the Development Review Board shall have the authority to determine the location or presence of the stream in accordance with stream location criteria adopted by the Development Review Board.

8.5.3 Pond Removal

> ***Commentary:*** *Note that ponds that appear on USGS or NRCS maps are wetlands and may require approval from the North Carolina Department of Environment and Natural Resources and the US Army Corps of Engineers prior to being drained.*

A. City

If a property owner or applicant proposes to remove a pond and the pond drains an area 25 acres or greater, a stream buffer of the size required on the stream immediately downstream of the pond shall be maintained along the portion of the stream located where the pond is to be removed.

B. County

If a property owner or applicant proposes to remove a pond and such removal is approved by the County Engineer or designee, a stream buffer of the size required on the stream immediately downstream of the pond shall be maintained along the portion of the stream located where the pond is to be removed.

8.5.4 Stream Buffer Size

Stream buffers shall apply on each side of the stream and shall begin at the most landward limit of the top of the bank perpendicular to the direction of stream flow.

Stream buffers for both intermittent and perennial streams shall be a minimum of 50 feet in width.

8.5.5 Stream Buffer Use Limitations

A. Land within the stream buffer shall not serve to meet minimum lot size requirements, except in the Rural Tier and on property zoned RR or RS-20, in the Suburban Tier, where at least 50% of the lot is outside the stream buffer.

B. Buildings and other features that require grading and construction shall be set back at least ten feet from the edge of the stream buffer.

C. To avoid a loss of effectiveness in protecting streams, the stream buffer shall remain in natural undisturbed vegetation in the Suburban and Rural Tiers, except as provided by this section or allowed pursuant to a variance approved by the Board of Adjustment in accordance with Sec. 3.15, Variances. Except in the Neuse Basin, where the 30 feet closest to the stream shall remain in undisturbed vegetation, clearing and revegetating stream buffers in the Suburban and Rural Tiers for the purposes of improving pollutant removal efficiency may be permitted based upon a conclusive finding by the Development Review Board that such efficiency will be improved.

D. Except in the Neuse Basin, where the 30 feet closest to the stream shall remain in undisturbed vegetation, stream buffers within the Urban, Compact Neighborhood, and Downtown Tiers may be landscaped rather than left in an undisturbed state, at the discretion of the property-owner in accordance with an approved revegetation plan.

E. Any use allowed by this section shall be designed and constructed to minimize the amount of intrusion into the stream buffer and to minimize clearing, grading, erosion and water quality degradation.

F. Crossings by streets, driveways, railroads, recreational features, intakes, docks, utilities, bridges or other facilities shall be allowed provided that they are designed to minimize the amount of intrusion into the stream buffer. Such facilities may run generally within and parallel to the stream buffer only where no alternative location is practical and when their design minimizes the amount of intrusion of the stream buffer.

G. Stormwater control structures and temporary erosion control structures shall be considered utilities for the purposes of this section and may be allowed in stream buffers, provided that:

1. The property owner or applicant demonstrates to the satisfaction of the City Public Works Director or County Engineer, or their designees, as appropriate, that such facilities cannot be practicably located outside of the stream buffer, and that any proposed stormwater control structure is sited and designed to minimize disturbance of the stream and stream buffer. Siting stormwater control structures away from the stream channel shall be considered preferable to siting such structures in the stream channel;

2. Alternate methods of stormwater and erosion control shall be considered prior to approval of such structures in the stream buffers; and

3. A vegetated buffer of a width determined by the City Public Works Director or the County Engineer, or their designees, as appropriate, may be required around the stormwater control structures.

H. For development on lots of record created prior to January 1, 1997, septic system drain field repair areas may be allowed in stream buffers, provided that:

1. The intrusion into the stream buffer is the minimum necessary;

2. The intrusion shall not result in an undisturbed stream buffer less than 30 feet; and

3. The property owner or applicant demonstrates to the satisfaction of the Durham County Health Department that the repair area cannot be located outside of the stream buffer.

I. Stream buffers may be used for passive recreational activities, such as trails, provided that service facilities for such activities, including but not limited to parking, picnicking and sanitary facilities, are located outside of the stream buffer.

J. Sanitary sewer lines, on an alignment generally parallel to the stream, may be allowed in stream buffers, provided that:

1. The property owner or applicant demonstrates to the satisfaction of the City Public Works Director or the County Engineer, or their designees, as appropriate, that the lines cannot be practicably located outside of the stream buffer;

2. Design and construction specifications minimize damage to the stream and the possibility of line leakage; and

3. The line is generally located at least 35 feet from the top of the stream bank and the easement is no closer than 20 feet from the top of the bank.

K. Site plan approval by the Development Review Board shall be required for any of the stream buffer intrusions described above. When any of the activities described above involves land clearing, the cleared area shall be revegetated in a manner described on the site plan. However, where a site plan is not required by any other provision of this Ordinance, the County Engineer, or designee, is authorized to approve plans for erosion control structures in stream buffers.

8.5.6 Piping Streams

A. Perennial Streams

Except in the Rural Tier, perennial streams may be piped, thereby exempting the piped section of the stream from stream buffer requirements, only when allowed by Sec. 8.5.5F or when the Board of Adjustment issues a variance in accordance with the provisions of Sec. 3.15, Variances, and makes the following findings in addition to the findings required in Sec. 3.15.10, Environmental Protection.

1. The site plan proposing perennial stream piping includes features on the site, such as best management practices, that provide water quality benefits at least equal to those of the stream buffer; and

2. The proposed perennial stream piping is not substantially in conflict with the other objectives of this section.

B. Intermittent Streams

Except in the Rural Tier, intermittent streams may be piped, thereby exempting the piped section of the stream from stream buffer requirements, only when the Development Review Board, or, for projects that do not require a site plan by any other provision of this ordinance, the City Public Works Director or County Engineer, or their designee, as appropriate, determines that:

1. The site plan proposing intermittent stream piping includes features on the site, such as best management practices, that provide water quality benefits at least equal to those of the stream buffer; and
2. The proposed intermittent stream piping is not substantially in conflict with the other objectives of this section.

C. Where stream piping is approved, a vegetated buffer area or other device approved by the City Public Works Director or County Engineer, or their designee, as appropriate, shall be provided at any intake structure. All buffers and physical improvements related to the stream piping shall be located entirely on the site or on easements adjacent to the site.

8.5.7 Density Credits

No credit shall be allowed for land within stream buffers, except in the RR District, where density credits may be given for stream buffers in conservation subdivisions pursuant to Sec. 6.2.4, Conservation Subdivision.

Sec. 8.6 Water Supply Reservoir Buffer

8.6.1 Reservoir Buffer Standards

A. A reservoir buffer shall be maintained from the normal pool of all water supply reservoirs as shown in the table below, except that the buffer around any reservoir shall not apply to land that does not naturally drain to that reservoir.

Reservoir	Buffer Width
Lake Michie	250 feet
Little River Reservoir	250 feet
Jordan Reservoir	250 feet[1]
Falls Reservoir	250 feet[1]

[1] On nonresidential uses, the buffer width shall extend to 1,000 feet in accordance with Sec. 4.11.4, Nonresidential Land Use Restrictions.

B. Reservoir buffers shall remain in natural undisturbed vegetation, except for intrusions allowed pursuant to Sec. 8.5.5, Stream Buffer Use Limitations.

8.6.2 Buffer Reductions

A. At the request of a property owner, the governing body may reduce the reservoir buffer requirements through the issuance of a Major Special Use Permit, pursuant to Sec. 3.9, Special Use Permit, whenever it determines that:

1. The reservoir buffer would result in exceptional hardship, depriving the property owner of all reasonable use of the property.

2. The proposed intrusion into the reservoir buffer is the minimum amount necessary to relieve that exceptional hardship.

B. In making its determination, the governing body shall consider topography, erosion potential, and the size of the parcel, in addition to the review factors specified in Sec. 3.9.8, Criteria for Approval or Major and Minor Special Use Permits.

Sec. 8.7 Watershed Protection Overlay Standards

8.7.1 Applicability

The watershed protection overlay standards of this section shall apply to the Watershed Protection Overlay as set forth in Sec. 4.11, Watershed Protection Overlay.

8.7.2 General Requirements

A. Minimum Lot Size

1. In all Watershed Protection Overlays, except F/J-B and E-B, the minimum lot sizes indicated in the following table shall be applied in all new subdivisions unless the subdivision uses the cluster provision in accordance with Sec. 6.7, Cluster Subdivision, or the conservation subdivision provisions of Sec. 6.2.4, Conservation Subdivision.

	Minimum Lot Size	
Overlay	Rural Tier	Suburban Tier
M/LR-A	3 acres[1]	20,000 square feet
M/LR-B	3 acres[1]	20,000 square feet
F/J-A	3 acres[1]	1 acre
E-A	Not Applicable	20,000 square feet

2. In the F/J-B and E-B overlays, developers of single-family subdivisions shall comply with the requirements of the underlying zoning district.

B. Impervious Surface Limits

1. Any development in a Watershed Protection Overlay shall be subject to limits on the amount of impervious surfaces permitted in accordance with the following table. Development plans, site plans, preliminary plats, and final plats shall clearly identify the amount of existing and proposed impervious surfaces.

Overlay	Low Density Option Impervious Surface Limit	High Density Option Impervious Surface Limit
M/LR-A	6%	Not permitted
M/LR-B	6%	Not permitted
F/J-A	Within one-half mile of the normal pool: 6%; Between one-half and one mile from the normal pool: 9%	Not permitted in the Rural Tier. 40%, for all areas not in the Rural Tier and for those uses allowed in Sec. 4.11.4; Nonresidential Land Use Restrictions, intensities greater than 25% shall require a Major Special Use Permit pursuant to Sec. 3.9, Special Use Permit.
F/J-B, E-B	24%	70%
E-A	24%	Not permitted

2. The impervious surface limit provisions of this section may be exceeded through an impervious surface credit transfer. Credit for the impervious surfaces allowed on one or more parcels ("donor parcels") may be transferred to non-contiguous parcels ("receiving parcels"), such that the amount of

impervious surface available for a development project would be the total of what is normally allowed on the receiving parcel plus what is transferred from the donor parcel(s). Impervious surface credit transfer is subject to the following provisions:

a. The donor parcel and receiving parcel shall be located within the same water supply watershed.

b. The impervious surface credit transfer shall not be from a donor parcel in Area B to any receiving parcel in Area A.

c. The portion of the donor parcel which is restricted from development as part of the impervious surface credit transfer shall remain in a vegetated or natural state or used for crop production or pasture provided that best management practices (BMPs) as developed by the Soil and Water Conservation District are utilized. The portion of the donor site restricted from development shall be protected from all future development through use of a permanent conservation easement in favor of either:

(1) Durham County; or

(2) A land trust or similar conservation-oriented non-profit organization with legal authority to accept such easements (the organization shall be bona fide and in perpetual existence and the conveyance instruments shall contain an appropriate provision for retransfer to the County in the event the organization becomes unable to carry out its functions). If the entity accepting the easement is not the County, then a third right of enforcement favoring the County shall be included in the easement.

d. The impervious surface credit transfer shall be reviewed and approved through use of the site plan process pursuant to Sec. 3.7, Site Plan Review.

C. Stormwater Control Requirements

Where development proposes intensity greater than the maximum authorized by the Low Density Option, engineered stormwater controls shall be used to control stormwater runoff from the first inch of rainfall in order to meet water quality concerns.

D. Ownership, Design and Maintenance of Engineered Stormwater Controls

1. Unless otherwise approved, ownership of the engineered stormwater controls shall remain with the property owner or a property owner's association, which shall be responsible for the continued care and maintenance of such controls.

2. Engineered stormwater controls shall be designed and constructed in accordance with standards and specifications established by the City Public Works Director or County Engineer, or their designees, as appropriate.

3. No final plat shall be approved, or if no final plat is required, no construction drawings shall be approved for a site proposed for development, until:

a. The City Public Works Director or County Engineer, or their designees, as appropriate, has approved plans and specifications for the proposed engineered stormwater controls and the property owner has entered into an Operation and Maintenance Agreement with the City or County, as appropriate, in accordance with the terms established by either the City

Public Works Director or County Engineer, or their designees, as appropriate; and

b. The property owner has posted a performance bond or other surety instrument satisfactory to the City or County, as appropriate, in an amount determined by the City Public Works Director or County Engineer, or their designees, as appropriate to assure maintenance, repair, or reconstruction necessary for adequate performance of the engineered stormwater controls.

4. No certificate of compliance shall be issued for any structure constructed within a site proposed for development until the City Public Works Director or County Engineer, or their designees, as appropriate, has approved construction of the engineered stormwater controls and after review of submitted "as-built" drawings.

E. Stream Buffers

Stream buffers subject to the use limitations of Sec. 8.5.5, Stream Buffer Use Limitations, shall apply to all perennial and intermittent streams as defined in Sec. 8.5.2, Types of Stream Buffers, in a Watershed Protection Overlay, with the width of the buffer measured from the top of stream bank perpendicular to the direction of flow as set forth below:.

Overlay	Perennial Stream Buffer Width	Intermittent Stream Buffer Width
M/LR-A	150 feet	50 feet
M/LR-B	150 feet	50 feet
F/J-A	150 feet	100 feet
F/J-B, E-B	100 feet	50 feet High Density Option 100 feet
E-A	150 feet	50 feet

F. Wastewater Treatment and Facilities

1. Wastewater Treatment

Except as indicated below, wastewater treatment facilities shall be prohibited in all Watershed Protection Overlays.

a. Individual on-site ground absorption systems shall be permitted, subject to the approval of the Durham County Health Department or the State of North Carolina, as applicable.

b. A spray irrigation wastewater treatment system to serve a single-family house shall be permitted, provided that:

(1) The owner enters into a written agreement with the Durham County Health Department which:

(a) Provides for Health Department access to the property for the purpose of monitoring the system during its construction and operation; and

(b) Provides that the owner and certified operator shall provide to the Health Department copies of any and all applications, plans,

permits, reports and any other documents concerning but not limited to the permitting, system, design, construction, operation, monitoring or repair of the system.

(2) The owner shall not act as the certified operator for a spray irrigation system to be installed on his or her property.

c. Publicly-owned wastewater treatment facilities, and replacement and expansions of such facilities, shall be allowed in F/J-B and E-B overlays.

d. Wastewater treatment facilities may be permitted in the F/J-A overlay through the issuance of a Major Special Use Permit pursuant to Sec. 3.9, Special Use Permit, subject to the restrictions described in Sec. 12.7, Water and Sanitary Sewer Systems:

2. Sanitary Sewer Services

a. Except in the Rural Tier, public and private sanitary sewer lines, force mains, and pump stations shall be permitted within all Watershed Protection Overlays. Public and private pump stations shall be equipped with the following safety features:

(1) Battery-backed alarm systems activated by pump failure or power outage, connected by an automatic dialer to a 24-hour maintenance service approved by the City Public Works Director or County Engineer, or their designees, as appropriate.

(2) Provision for connection of a portable generator. The City Public Works Director or County Engineer, or their designees, as appropriate, may require the pump station to be equipped with on-site, stand-by power.

b. Within the Rural Tier, new public or private sanitary sewer lines or outfalls, including necessary force mains and pump stations, may be permitted within the Watershed Protection Overlays subject to City Council or Board of Commissioners approval, as appropriate:

(1) To serve an existing use or structure for which a health hazard has been documented by the County Health Department or the State of North Carolina; or

(2) If associated with a wastewater treatment facility permitted pursuant to paragraph 1, Wastewater Treatment, above.

c. In considering such extensions, all reasonable alternatives shall be considered prior to a decision to extend the sewer services. All service connections, installed in accordance with the North Carolina Plumbing Code, shall be permitted only in accordance with Durham City Code, Sections 23-80 through 23-83.

G. Hazardous and Nuclear Materials

1. Prior to site plan approval, an Emergency Contingency Plan shall be prepared and submitted through the Planning Department to the Durham County Fire Marshall and the Environmental Resources Director for review and approval. The Emergency Contingency Plan shall be prepared in accordance with the requirements in the Superfund Amendments and Reauthorization Act (SARA),

Title III and shall be updated annually. In addition, the Emergency Contingency Plan shall include:

a. A site plan showing buildings and the locations of points of storage, transfer and use of nuclear and hazardous materials;

b. A list of nuclear and hazardous materials kept on-site in any quantities;

c. The location of spill control valves on any bridges and causeways; and

d. The person responsible for on-site spill control and containment, and the appropriate means of contacting that person on a 24-hour basis.

2. Any container or tank used to store hazardous materials shall be equipped with leak detection devices and shall be double-walled or have other secondary containment features.

3. Points of storage, transfer and use of substantial quantities of hazardous materials shall be protected by a dike or comparable containment structure, constructed of a material resistant to hazardous material the dike or structure is designed to contain. The dike or structure shall be sized to handle at least the maximum amount of material to be stored or used and shall be constructed and installed in a manner to exclude rainwater and stormwater runoff.

4. All floor drains that could collect hazardous materials shall be connected to a corrosion resistant tank or catch basin sized to handle the maximum amount of hazardous material to be stored or used. These floor drains shall not be open to the site's natural drainage system and discharges to the site's storm drainage system or to adjacent surface waters shall be prohibited.

5. Points of storage, transfer and use of hazardous or nuclear materials shall have roof coverage.

8.7.3 Exceptions

All development within Watershed Protection Overlays shall be subject to the restrictions in this section, with the following exceptions:

A. Existing Development

For the purposes of this section, existing development shall be considered to include any impervious surfaces constructed before January 1, 1994. All new uses and activities and all expansions of previously-existing uses and activities shall conform to Sec. 4.11.4, Nonresidential Land Use Restrictions and Sec. 8.7.2, General Requirements.

B. Existing Single-Family Lots

1. New construction and additions to existing residential buildings on single-family residential lots recorded prior to January 1, 1994 shall be constructed in accordance with the watershed protection regulations, if any, in effect at the time the lot was created.

2. Single owners of multiple adjacent lots that do not comply with the minimum lot size indicated in Sec. 8.7.2A, Minimum Lot Size, shall be required to recombine those nonconforming lots in a manner to create conforming lots and, in these cases, the provisions of this section shall apply. If multiple adjacent nonconforming lots were in single ownership on Feb 15, 1997 for the City jurisdiction and August 25, 1997 for the County jurisdiction, notwithstanding

any transfers occurring after such date, such lots shall be recombined to create lots that conform with the provisions of this section.

C. Stormwater Control Exemptions

Proposed development projects not in the Rural Tier, and in F/J-B or E-B overlays involving less than one acre cumulatively, of land disturbing activity shall be exempt from the stormwater control requirements indicated in this Section.

8.7.4 High Density Option Approval

Any development utilizing the High Density Option within the F/J-A overlay shall require site plan approval by the appropriate governing body.

8.7.5 Changes to Tier Boundaries

Neither the City nor the County shall extend the Urban or Suburban Tier boundaries further into the M/LR-A or F/J-A overlays.

Sec. 8.8 Steep Slope Protection Standards

8.8.1 Purpose

The primary purpose for the slope protection standards is to minimize grading, land instability and the removal of vegetation in order to:

A. Protect the quality of wetlands and water courses below the slope from increased sedimentation;

B. Protect steep slope plant and animal habitat from disturbance and development; and

C. Preserve the aesthetic quality of the natural terrain.

8.8.2 Steep Slope Areas

A. Slope is the relationship of vertical rise to horizontal run, expressed as a percentage. Steep slope areas shall be defined as land areas that:

1. Have a grade of 25% or more;

2. Have an area of 5,000 square feet or greater; and

3. Are located within 200 feet of any floodway fringe or perennial stream or within 100 feet of an intermittent stream.

B. Steep slope areas refer to natural grades and shall not include man-made grades. Slope calculations shall use the smallest contour interval for which maps are available. Steep slope areas shall be determined irrespective of tract boundaries.

C. Steep slope areas shall be clearly indicated on all site plans, development plans, preliminary plats and final plats. When a property owner or developer believes that the presence or location of a steep slope area is different than what is shown on the appropriate topographic map, the Development Review Board shall have the authority to determine the location or presence of the moderate or steep slope area for purposes of meeting the requirements of this section.

8.8.3 Steep Slope Development Limitations

Development and land disturbing activity on steep slope areas shall be conducted only in accordance with the following requirements. Compliance with these requirements shall be determined by the approving authority.

A. Development shall be designed and constructed in order to minimize disturbance to the natural landform as much as possible. Development shall demonstrate appropriate terrain-adaptive design and construction techniques. An inability to design a particular development allowed by the underlying zone without significant disturbance to the natural landform may indicate that the site should not accommodate the full amount of proposed development. Alternate site design and construction measures shall be encouraged to mitigate the effects of development on steep slopes. The grade of reconstructed slopes shall not exceed 50%. Non-load bearing retaining walls shall be encouraged in order to reduce the amount of disturbance to the natural slope.

B. In order to accommodate building placement on steep slope areas, street and side yard setbacks on lots on the interior of the development may be reduced by up to 50% by the Development Review Board.

C. On any tract proposed for construction, no more than 15% of the steep slope area on the tract shall be graded. For purposes of this calculation, the land areas of individual steep slope areas on the tract shall be added together to establish the total steep slope area for the tract.

D. Development shall be designed and arranged in order to minimize the impact of street construction on steep slope areas. Proposed right-of-way for major thoroughfares, minor thoroughfares and collector streets shall be exempt from the steep slope area grading limits of this section, provided that the Development Review Board determines that proposed rights-of-way are designed and arranged in order to minimize the impact on steep slope areas.

8.8.4 Density Credits

The amount of land designated as steep slopes may be credited for residential density on adjacent land in the same development at a rate of 15% of that allowed by the zoning.

Sec. 8.9 Wetlands Protection Standards

8.9.1 Purpose

The primary purpose of the wetlands protection standards is to conserve and maintain natural wetlands in an undisturbed vegetated state in order to provide storage of stormwater runoff, minimize degradation of preserved wetlands from the impacts of adjacent development, improve water quality and preserve plant and wildlife habitat.

8.9.2 Application of Wetlands Protection

The City and County acknowledge the pre-eminence of the Federal and State governments with regard to the identification and regulation of wetlands. Accordingly, the standards contained within this section shall not duplicate the requirements of the US Army Corps of Engineers (the Corps) or the North Carolina Department of Natural Resources, Division of Water Quality (DWQ), but shall require the buffering of wetland areas, identified by these agencies, on development plans, site plans, preliminary plats, and final plats.

8.9.3 Exemptions from Wetland Buffer Requirements

A. The wetland buffer shall not apply to any wetland approved for dredging or filling under a Section 404 Permit issued by the Corps or a Section 401 Water Quality Certification issued by the DWQ.

B. The wetland buffer shall not apply to wetland areas associated with man-made ponds or man-made drainage ditches.

C. The wetland buffer shall not apply to any retained wetland area less than one acre in size.

8.9.4 Wetland Buffer Width

A. The wetland buffer shall be provided along the perimeter boundary of the wetland area and shall be at least 25 feet in width.

B. The approving authority may reduce the wetland buffer to as little as ten feet in width, provided it determines that the proposed development includes site features or will employ construction management techniques to provide at least a comparable level of protection for the wetland area. Such site features and construction management techniques shall include but not be limited to additional grass or revegetated buffers, double silt fencing, diversion ditches with temporary slope drains and application of sod on any slope adjacent to wetlands.

8.9.5 Wetland Buffers Use Limitations

Wetland buffers shall remain in natural undisturbed vegetation, except as provided below.

A. Crossings by streets, driveways, culverts, railroads, recreational features, intakes, docks, utilities, bridges or other facilities shall be allowed. Stormwater control facilities and wetlands constructed for mitigation purposes shall be allowed in wetland buffers.

B. Wetland buffers may be used for passive recreational activities, such as walking and bicycling trails, provided that service facilities for such activities, including but not limited to parking, picnicking and sanitary facilities, are located outside of the wetland buffer. Water-oriented recreational facilities, such as boat or fishing piers located within wetland buffer areas, shall require a use permit from the Board of Adjustment pursuant to Sec. 3.8, Sedimentation and Erosion Control.

C. Land within the wetland buffer shall not serve to meet minimum lot size requirements except in the Rural Tier and on properties zoned RR or RS-20, in the Suburban Tier, where at least 50% of the lot is outside of the wetland buffer or wetland.

D. Any use allowed by this section shall be designed and constructed to minimize the amount of intrusion into the wetland buffer and to minimize clearing, grading, erosion and water quality degradation.

Sec. 8.10 Durham Inventory Site Protection Standards

The protection of Durham Inventory of Natural Areas and Rare Species (known as Durham Inventory Sites), whenever practicable, is accomplished through a series of development standards, including, but not limited to:

A. Site plan review procedure in Sec. 3.7;

B. Special use permits in Sec. 3.9;

C. Conservation subdivisions in Sec. 6.2.4;

D. Open space in Sec. 7.2; and

E. Tree protection and tree coverage in Sec. 8.3.