

Tree Preservation on Ridge Tops and Hillsides in Buncombe County

Presented by the Buncombe County
Environmental Advisory Board

Introduction

- On June 19th, 2007 the Buncombe County Board of Commissioners adopted resolution #07-06-12, “Resolution Requesting the County Environmental Advisory Board Draft, ‘*A Policy Regarding Tree Preservation On Ridge tops and Hillsides*’”, recognizing that ridge tops and hillsides are important to the citizens of Buncombe County.
- Trees on steep slopes and ridgetops are important and should be preserved for their scenic quality, and their ability to reduce hillside erosion and stormwater runoff, and preserve water quality. After study of this issue, the Advisory Board believes there is clear justification establishing guidelines for preserving native trees and vegetation on the ridge tops, steep slopes and hillsides of Buncombe Country.

This justification is built upon economic and environmental concerns.

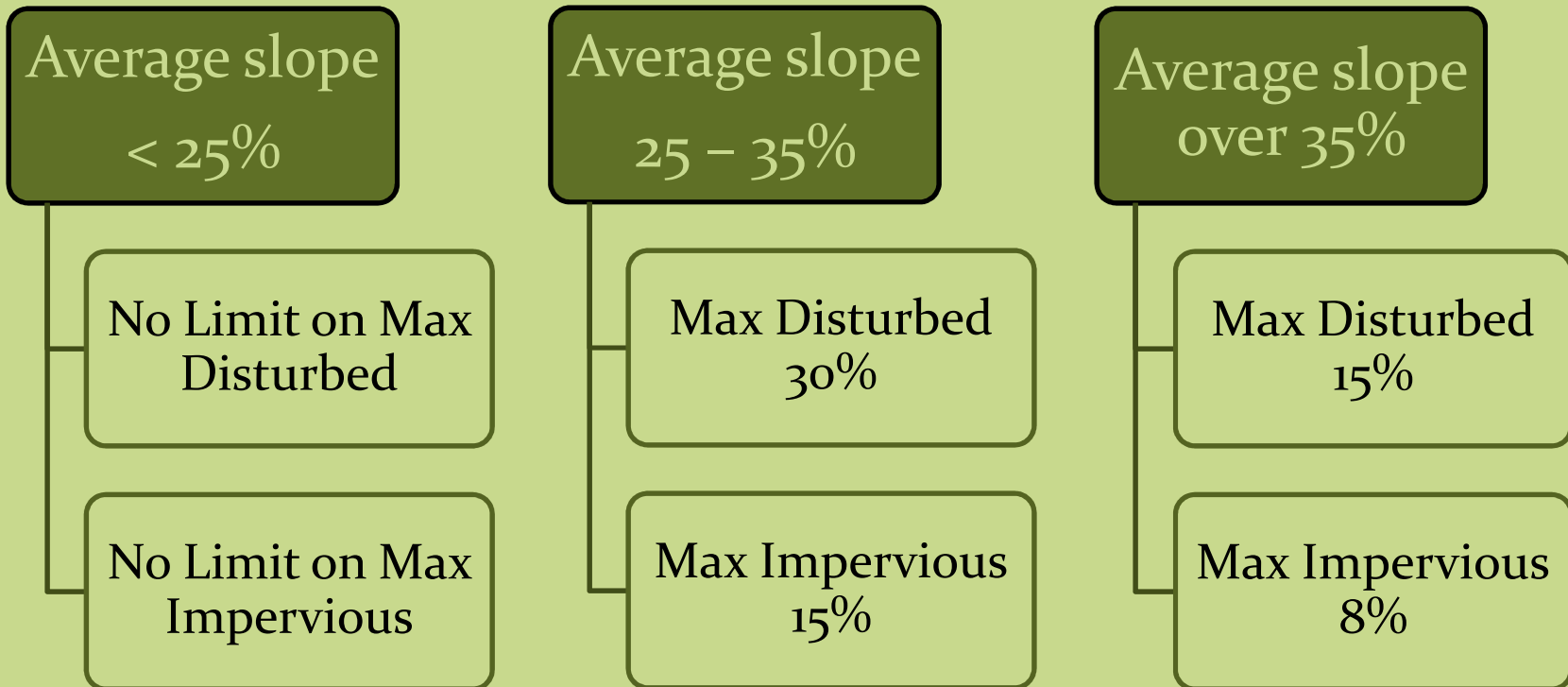
Purpose and Intent

1. Provide builders and planning staff with comprehensive standards and user-friendly guidelines to preserve native trees and vegetation on ridge tops and hillsides throughout Buncombe County.
2. Investigate and identify the economic and long-term impact of the recommendations contained in this report.
3. Establish guidelines for the *initial* development of subdivisions on steep slopes and ridge tops.
4. This report does not attempt to regulate or prohibit landowners from practicing timber management, agriculture, horticulture, cutting of firewood or otherwise managing or utilizing their land. As requested, this report addresses the benefits and costs associated with preserving trees/vegetation on steep slopes and ridge tops.

Buncombe County Current Status

- Buncombe County does not directly require tree/vegetation preservation. Any tree/vegetation preservation is accommodated by the limitations provided in the Hillside Development Standards, the Multi-Family Dwelling Ordinance, the Residential Low Density zone (RLD, 1 unit/ acre) and possible preservation requirements by subdivisions. RLD zones are designated for sensitive steep slopes, but 1 unit/acre is the maximum protection it affords.
- The primary method of preserving trees and native vegetation is to limit the percent of the development site disturbed. Current limitations are only administered under regulations contained in the Hillside Development Standards (§ 70-68(e)(1)(i)) and by the multi-family development ordinance.

Hillside Development Standards: Max.% Disturbed and Impervious



Limitations of Hillside Development Standards (HDS)

- Hillside Development Standards are not required if a subdivision falls below the 25% *average* slope threshold, regardless of the slope of any individual lot or areas of road construction.
- Developers draw boundaries of phased developments to avoid the Hillside Development Standards.
- Roads and infrastructure are not accounted for in the maximum percentage disturbed or maximum percentage impervious calculations.

Hillside Development Standard: As Implemented

100 Acre development with 25% avg. slope:

1. Maximum Units Allowed:
1.25 units/acre (at 25% avg. slope)
1.25 units x 100 = **125 units allowed**
2. Roads, utilities and other infrastructure installed
No limits to the percentage disturbed for roads and infrastructure
3. Final platting is completed with minimum lot size, maximum percentage disturbed and percentage impervious determined for lots only, based on *average* slope of the individual lots

Hillside Development Standards

Roads and infrastructure should be included in the maximum percentage disturbed.

Implementing this practice, as the standard originally intended, would produce the following benefits to our developments:

- Encourage creative road design
- Include slope analysis
- Determine sensitive house placement
- Decrease the overall amount of disturbance in the development.

Maximum percentage disturbed Approved vs. Implemented

Avg. Slope %	As Currently Approved	As Currently Implemented
15-19%	No Limit	No Limit
20-24%	No Limit	No Limit
25-19%	30% Disturbed 15% Impervious	30% Lots No Limit - Roads/Infrastructure
30-34%	30% Disturbed 15% Impervious	30% Lots No Limit - Roads/Infrastructure
35-39%	15% Disturbed 8% Impervious	15% Lots No Limit - Roads/Infrastructure
40%+	15% Disturbed 8% Impervious	30% Lots No Limit - Roads/Infrastructure

Economic Benefits

Preserving native vegetation and trees on our mountains has the following economic benefits:

1. Market Value of Homes and Land

Data show that preservation of vegetation and trees on ridge tops, slopes and hillsides result in higher market value of homes.

- A survey of sales of 844 single family residential properties in Athens, GA indicated that preserving trees in developments was associated with a 3.5 to 4% increase in sales prices and increased property tax valuations (Source: USDA Forest Service – S.E. Forest Experimental Station – Athens, GA)
- Preliminary analysis concluded that Seattle’s “greenstreets” added 6% to the value of the properties (Source: NC Cooperative Extension “Low Impact Development – an economic fact sheet”)

Economic Benefits, Continued

2. Scenic Value

Preserving the scenic beauty of our mountains supports local economies by generating significant revenue through eco-tourism, local businesses and jobs.

- Blue Ridge Parkway: Data show that preventing a decline in the scenic quality from the Parkway would avoid losses of \$5.4 billion annually from scenic overlooks, and \$6 billion annually from roadside views (Source: Blue Ridge Parkway Scenic Experience Project, 2003)
- In 2004, North Carolina State Parks generated
 - \$289,000,000 in sales
 - \$129,000,000 on residents' income
 - 4,924 full-time equivalent jobs(Source: NC Department of Environment and Natural Resources, Division of Parks and Recreation, "Economic Contribution of Visitors to Selected North Carolina State Parks", 2008)

Economic Benefits, Continued

3. Reduced Storm Water Infrastructure Costs

Preserving native vegetation and trees reduces storm water management costs by reducing stormwater runoff, flooding and erosion.

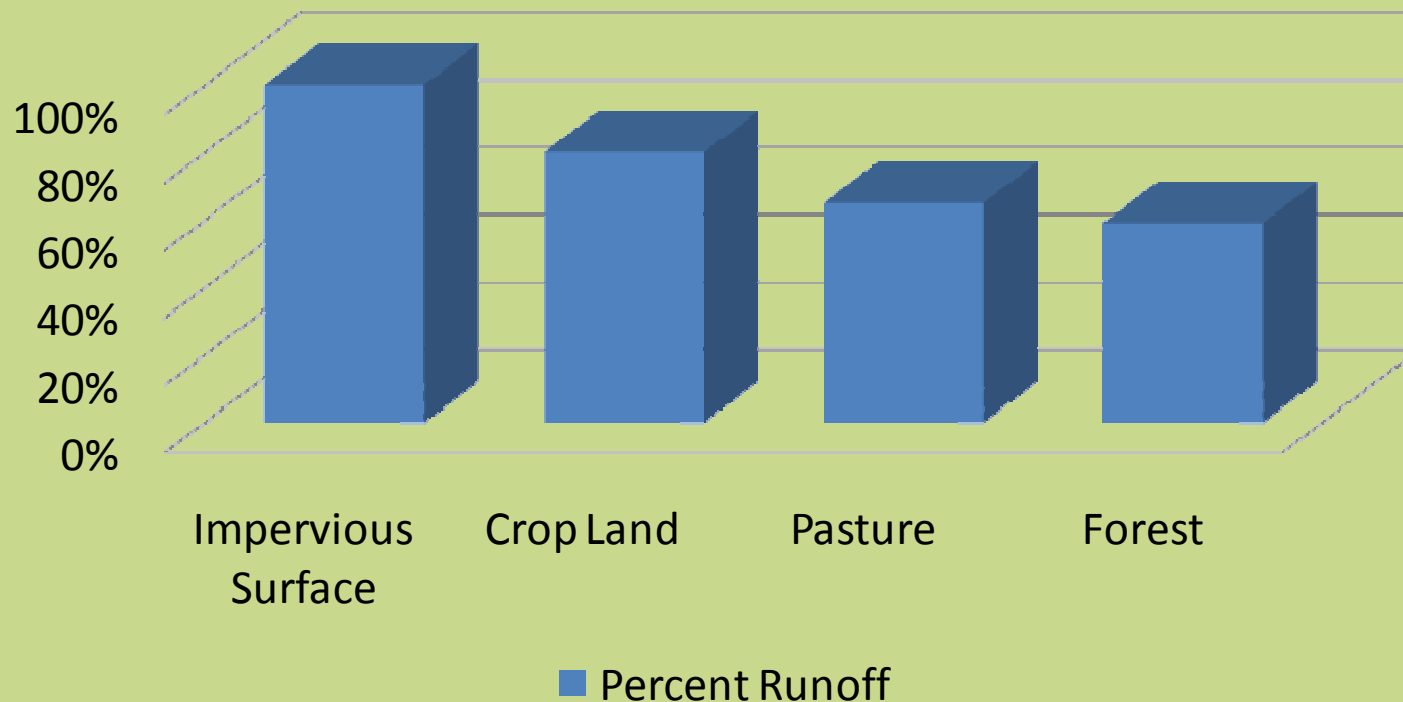
- Trees on slopes reduce pollution and sedimentation of mountain streams by filtering pollutants and removing particulates from stormwater before they reach surface waters.
- Up to 25% of total rainfall is intercepted and retained by trees, allowing what falls to more effectively recharge the groundwater supply (Source: American Forest Magazine)
- Bioretention instead of piped stormwater and sand filters saved \$250,000 along Anacostia River in Washington, DC (Source: NC Cooperative Extension “Low Impact Development – an economic fact sheet”)
- Replacing curb, gutter and stormwater sewers with roadside swales saved one developer \$70,000 per mile, or \$800 per residence (Source: NC Cooperative Extension “Low Impact Development – an economic fact sheet”)

Economic Benefits, Continued

Reduced Storm Water Infrastructure Costs, Continued

- Preserving the maximum native tree and vegetation cover (as forest communities) is by far the most cost efficient and effective measure stormwater control measure. Functioning forest communities include:
 1. Mature overstory canopy
 2. Immature and understory trees
 3. Smaller plants, groundcover, leaves and woody debris.
- Relevant land features affecting stormwater management and water quality include soil types, percent slope, localized average rainfall and site-specific conditions.

Precipitation runoff from various land surfaces



Forests generate the lowest percentage of runoff compared to other land uses. (Source: Vermont Agency of Natural Resources)

Economic Benefits, Continued

4. Reduced Erosion control Measures

Currently, significant expenditures are borne by homeowners, government entities, contractors and developers due to the lack of sufficient guidelines for development on ridge tops and steep slopes.

The potential for a public safety hazard also exists whereby our region has experienced landslides that could cause physical harm to residents below the developments on the slopes and ridge tops.

Available Alternatives

1. **Protected Ridge and Hillside Overlay** – This approach addresses tree and vegetation preservation from a more targeted and comprehensive approach. As a result, this approach supports storm water management, water quality, flood prevention and more.
2. **Limiting Percentage of Development Disturbed** - Counties which are predominantly wooded, such as Buncombe County, typically address tree and vegetation preservation by limiting the percent disturbed.
3. **County-Wide Tree Ordinance** – This method is utilized in several counties in the southeastern United States (ex: Greenville County, SC and Cherokee County, GA). Many municipalities utilize a tree density factor method, implemented and enforced by a county arborist or planning department staff

EAB Recommendations

1. Establish Mandatory Pre-Applications
2. Conduct Slope Analysis
3. Establish Protected Ridge and Hillside Overlay
4. Support and Promote Conservation Programs
5. Perform a Cost-Benefit Analysis

Recommendation #1:

Establish Mandatory Pre-Application Consultations

The Problem:

A fundamental problem currently exists in the approval process. Increasingly, developers (primarily out of state developers) are presenting applications and plans to the Planning Department without adequate consideration given to the unique challenges and responsibilities of developing in our mountainous terrain. Having already incurred significant design costs at this point they are less willing to amend their design to create a more responsible development.

Recommendation #1:

Establish Mandatory Pre-Application Consultations

The Solution:

Establish MANDATORY Pre-Application Consultation

- Conducted by planning staff
- Applicable to major and minor subdivisions only
- Help planning staff guide the process before developers have incurred unnecessary design expenses.
- Provide proper planning and potential incentive discussions at the earliest possible stage.
- Aid the recently created technical review board in its productive evaluation of the technical aspects of proposed developments.

Recommendation #2:

Conduct Slope Analysis

The Problem:

While current steep slope development planning limits (1) the number of units/ acre, and (2) the percentage disturbed and impervious, it does not address the need for proper placement of the units and infrastructure. It addresses “how much” but not “where is best”.

The Solution:

Pre-design consultations should include a **Slope Analysis**. Mapping sources include N.C.D.O.T. LIDAR, aerial or field shot topography. This should be used during the Pre-Application Consultation to determine the most suitable building envelopes and infrastructure locations. Excessive vegetation removal, cuts and fills, and overall land disturbance can be greatly reduced by incorporating these approaches early in the design process.

Recommendation #3:

Establish Protected Ridge and Hillside Overlay

Issues unique to ridge and hillside development such as appropriate levels of tree/vegetation protection can best be managed under an overlay.

Designation of the overlay should be based on the following:

- Average slope (as defined in the Hillside Development Standards)
- Elevation Range (< 2500 feet, 2500 – 3000 feet, and > 3000 feet)
- Location of land form (Designated ridge tops and hillsides)

Designated ridge tops - all ridges and secondary ridges. The designated ridge top area should be defined as all land within 100 vertical feet below the crest, and at least 200 feet above an adjacent valley floor.

Designated Hillsides – areas having an average slope of 25% or more.

Recommendation #3:

Protected Ridge and Hillside Overlay

Include development standards and incentives for developments falling within the Protected Ridge and Hillside Overlay.

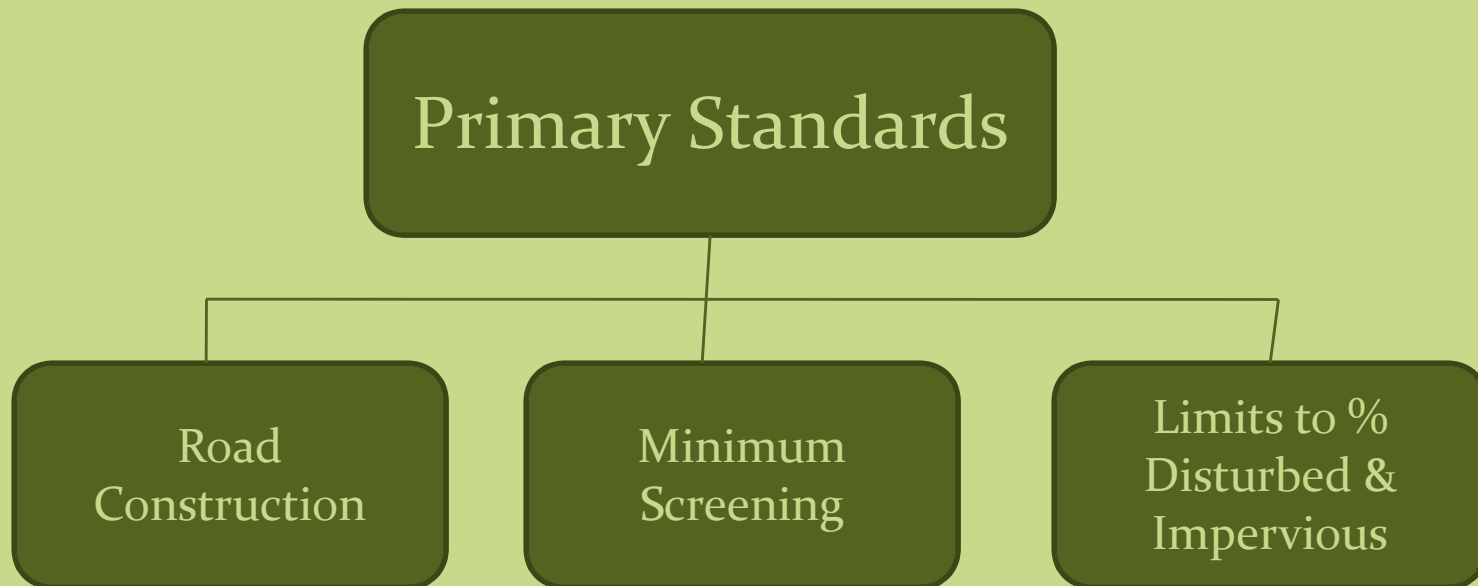
Primary issues addressed:

- a) Road Construction (establishment of maximum vertical and horizontal road corridors)
- b) Minimum Screening Guidelines
- c) Maximum % Disturbed and impervious (See attached Protected Ridge top and Hillside Overlay criteria table)

Existing Hillside Development Standards would remain in place, with the exception of updated guidelines and limits (such as the proposed criteria table outlining maximum % disturbed and impervious based on Slope, Elevation Range, and Site Locations)

Recommendation #3: Protected Ridge and Hillside Overlay

Primary Development Standards for the Overlay should include:



Overlay Standard: Road Construction

1. Extensive road cuts and fills have been a primary cause of excessive tree/vegetation removal, resulting in erosion, landslides and reduction in scenic quality.
2. Excessive vegetation removal will be reduced by creative road designs (such as loop roads and pullouts) and wise road placements based on slope analysis and proper implementation of maximum % disturbed/ impervious limits.
3. Corridor Width: Roads/streets constructed in ridge line and mountain side areas shall be contained within a corridor that
 - a) Does not exceed 90 feet in width along 80% of the total continuous length of the road. Up to 20% of the total continuous length of the corridor may be cleared and graded to a maximum of 135 feet if approved by Buncombe County officials
 - b) Maximum height of corridor: The sum total of the vertical heights of the cut and fill slopes for a single road shall not exceed 60 feet.

Overlay Standard: Minimum Screening

1. Selective cutting for views or picture framing through the trees is allowed. Selective cutting for the purpose of this report is synonymous with partial screening and would be further defined as follows:
Natural on-site vegetation should be retained sufficient to partially screen buildings (along 50% of the down slope building face, or screening that achieves 50% opacity of more along the down slope building face)
2. Clear cutting for views should not be permitted under any circumstances.

Recommendation #4:

Promote Existing Conservation Programs

Buncombe County should continue to support and promote existing land conservation and tree preservation programs. These include:

- Present Use Value
- Private conservation easements
- Land Conservation Advisory Board
- Farmland Preservation Programs

Buncombe County has been a regional and national leader by providing support that enables conservation easement and farmland conservation in our landscape.

Environmental Advisory Board Conclusions

Ridges and hillsides in Buncombe County constitute a unique and significant natural resource asset of the community. Excessive native tree and vegetation removal during the development process directly threatens to our economic stability, public health and safety, water quality, scenic quality and general welfare.

The Environmental Advisory Board presents this analysis in response to the resolution put forth by the County Commission to improve the quality and impacts of development in our communities.

Protected Ridge Top and Hillside Overlay Development Criteria Table

Natural Slope	Hillside below 2500'		Hillside 2500'-2999'		Hillside 3000' & above		Ridge Below 2500' elev.		Ridge 2500' -2999'		Ridge 3000' & above	
	% dist	% imp	% dist	% imp	% dist	% imp	% dist	% imp	% dist	% imp	% dist	% imp
0-25%	40	20	40	20	35	17.5	35	17.5	30	15	25	15
25-30%	35	15	30	15	30	15	30	17.5	25	15	20	12.5
30-35%	30	15	30	15	20	10	25	15	20	10	15	7.5
Above 35%	20	12.5	15	8	15	8	15	8	15	8	12.5	7.5