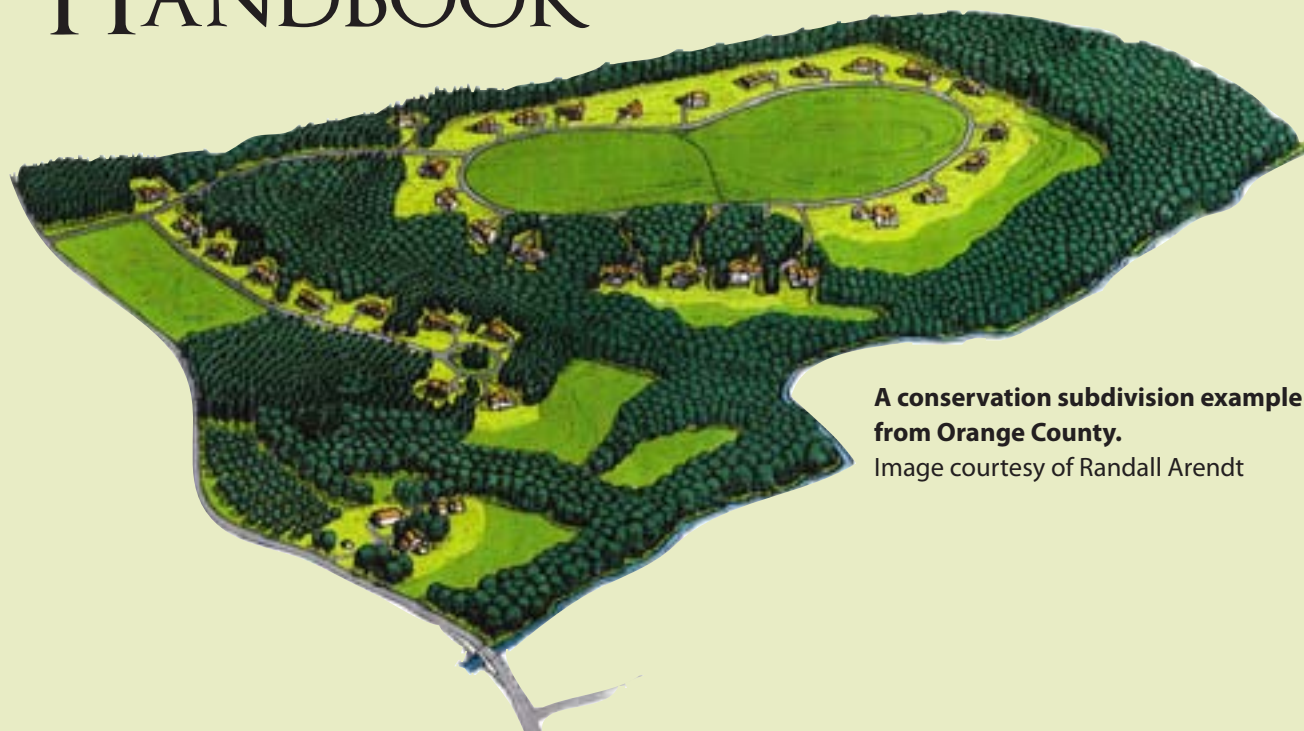
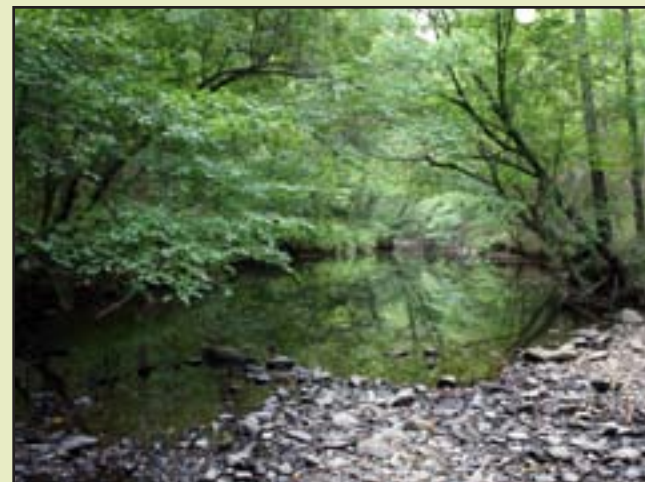


CONSERVATION SUBDIVISION HANDBOOK



**A conservation subdivision example
from Orange County.**
Image courtesy of Randall Arendt



A GUIDE FOR NORTH CAROLINA COMMUNITIES
IN THE USE OF CONSERVATION DESIGN
FOR LAND USE PLANNING



The North Carolina
Urban and Community
Forestry Program



NC State University
Forestry and Environmental
Outreach Program



WHAT ARE CONSERVATION SUBDIVISIONS?

Conservation subdivisions (CSDs) are a design strategy that attempts to preserve undivided, buildable tracts of land as communal open space for residents (Arendt et al.). In a conservation subdivision, ideally 50 to 70 percent of the buildable land is set aside as open space by grouping homes on the developed portions of the land. The process promoted by Randall Arendt begins by identifying land to be conserved and ends with drawing in lot lines for the planned homes (Arendt). These design steps occur in an order opposite that of conventional subdivisions.

1. IDENTIFY CONSERVATION AREAS

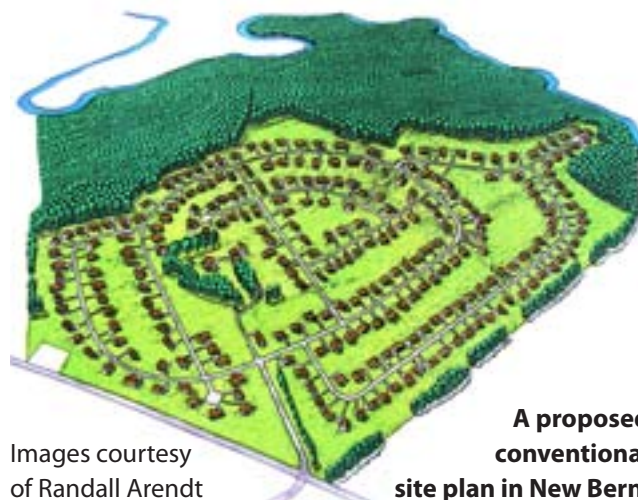
The first step is identifying areas of the property to conserve. Complete an environmental inventory to identify land that may be ecologically important. The inventory can include wetlands, mature woodlands, and other significant natural features. Consider any open space on the property that could connect to a regional network of open space to maximize the benefit to wildlife.

2. SELECT HOUSING LOCATIONS

Select housing sites to complement the location of the open space. Home values often increase with proximity to open space. Clustering homes around the open space ensures that each resident can take full advantage of the common open areas.

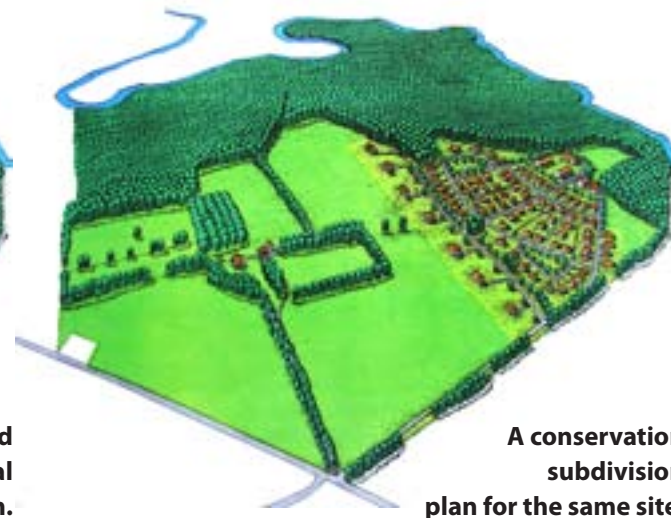
3. CONNECT THE DOTS

Draw in a network of streets and trails that connect the community to existing roads and, if possible,



Images courtesy
of Randall Arendt

**A proposed
conventional
site plan in New Bern.**



**A conservation
subdivision
plan for the same site.**

regional trail networks or public greenways.

4. DRAW IN THE LOT LINES

Finally, draw in the individual lot lines. Greater flexibility in zoning and development regulations gives landscape architects and developers more options in regard to setback requirements and minimum and maximum lot sizes. This flexibility is key to clustering homes to take advantage of the communal open space.

MAINTAINING DENSITY

Zoning regulations that give developers flexibility in lot sizes and setback requirements allow conservation subdivisions to achieve the same or higher overall density levels as conventional subdivisions (Pejchar et al.). Developers build the same number of homes while conserving open space (Mohamed). Some communities also offer incentives

such as density bonuses to encourage conservation subdivisions, making these subdivisions more economical and allowing developers to achieve the same or higher density as in a conventional subdivision by using smaller, more flexible lot sizes and relaxed setback requirements.

NORTH CAROLINA ZONING

North Carolina does not have a statewide conservation subdivision ordinance like states such as Wisconsin and Michigan (Ohm et al.). Subdivision regulations are controlled by individual counties or municipalities and vary in the amount of open space required and the approval process. Some communities allow conservation subdivisions “by right,” whereas others may require a rezoning process or a special use permit. Besides the density bonuses, some communities offer an expedited review process to encourage conservation subdivision design.

WHY IT MATTERS HERE

North Carolina is the eighth-fastest-growing state in the United States, with an estimated population of 9,222,414 (U.S. Census Bureau, 2007). The state has an overall population density of 165 persons per square mile and a median household income of \$46,574, slightly below the national median household income of \$52,029 (U.S. Census Bureau, 2010). Three of the fastest growing regions in the country occur in North Carolina. The Triangle, the Triad, and the Charlotte metropolitan area rank among the nation's top 20 sprawl centers. North Carolina is the only state with three sprawl centers in the top 20 in the United States.

LOSS OF FARMLAND: North Carolina has an agrarian history, but in recent decades many farms have been lost to development. In 1997, farmland accounted for 30 percent (9,444,867 acres) of the total land area. By 2007, this number decreased to 27 percent (8,474,671 acres), a loss of 970,196 acres in 10 years (USDA). From 2007 to 2008 the total number of farms decreased from 52,900 to 52,400, a loss of 500 farms in a single year.

WILDLIFE: North Carolina is home to more than 40 plant and animal species federally listed as endangered or threatened and over 200 state listed species. Habitat loss is the primary threat to most of these species. According to the NC Wildlife Action Plan, 8 of the top 21 most endangered ecosystems occur in North Carolina. Habitat loss and fragmentation from urban development pose the greatest threats to these ecosystems.

The emergence of conservation subdivisions as an alternative to conventional subdivisions may be a result of communities struggling to preserve natural areas and rural character in the face of unprecedented growth.

CONSERVATION SUBDIVISION BENEFITS

HIGHER HOME VALUES

Conservation subdivisions offer additional environmental and economic benefits when compared to conventional homes in a similar housing market (Milder). Research shows that homes in conservation subdivisions sell faster, sell for more, and can save on construction costs when compared to similar homes (Bowman, Thompson, & Colletti). In South Kingston, Rhode Island, lots in conservation subdivisions cost an average of \$7,400 less to produce and sold in about half the time compared to lots in conventional subdivisions (Mohamed). In 2009, researchers in Iowa determined that developers underestimated the importance that potential home buyers place on open space. Residents responded they would be willing to pay up to \$2,000 more for homes with proximity to open space (Bowman & Thompson).

REDUCED INFRASTRUCTURE COSTS

Reducing the developed land area within a subdivision can decrease the infrastructure and engineering costs of building a subdivision (Mohamed). In most current subdivision construction, almost all buildable land is cleared and graded. A conservation subdivision reduces the cleared and graded area, resulting in direct savings to the developer. Compact layouts can reduce the costs of paving, stormwater management, and other infrastructure needs by clustering development. According to the National Association of Home Builders, cluster developments cost an average of 34 percent less to develop (Pejchar et al.).

BENEFITS TO WILDLIFE

With minimal site disturbance and the protection of large habitat reserves, developers can decrease landscape fragmentation, protect stream buffers, and provide valuable habitat for wildlife (Lenth, Knight, & Gilbert). If done in conjunction with regional conservation plans, protected open space can improve connectivity between protected areas and increase the benefit to wildlife (Odell, Theobald, & Knight). A study of 12 conservation subdivisions in Massachusetts showed that CSDs did a better job of meeting environmental goals when compared to conventional subdivisions (Hamin). The open space developments provided vistas for residents while also conserving valuable wildlife habitat.

STORMWATER MANAGEMENT

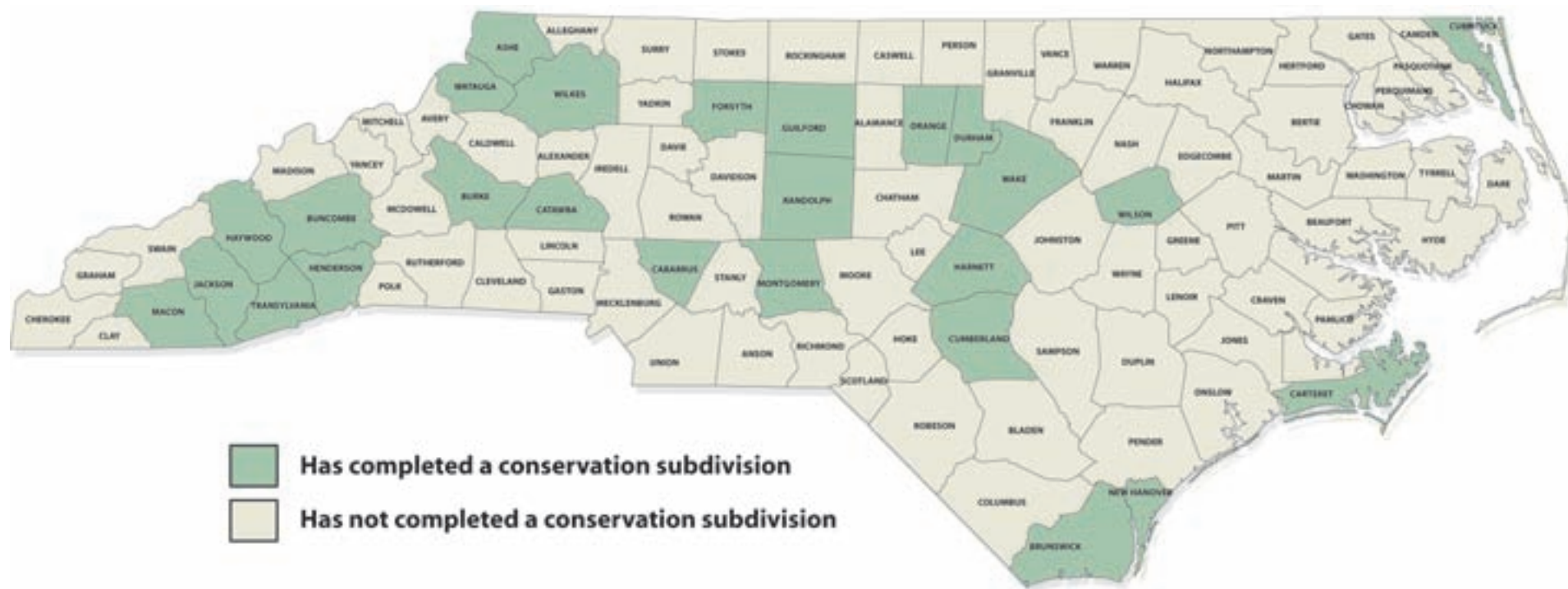
Researchers at NC State University estimated that cluster subdivisions reduced the amount of impervious surface by 31 percent and resulted in a 38 percent reduction in runoff and pollutant load. Many conservation subdivisions incorporate low-impact stormwater management practices such as roadside swales that allow stormwater to filter back into the water table.

ACCESS TO OPEN SPACE

Giving residents direct access to open space in their neighborhoods can reduce the need for city or county-run parks, reducing costs for municipalities. Communal open space also can provide safe places for children to play, areas for outdoor recreation and exercise, and connection to nature.

IT TAKES MORE THAN AN ORDINANCE

Conservation subdivisions are allowed in more than half of North Carolina's counties, but they've been built in only 26.



More than half of North Carolina's counties have conservation subdivisions in their development regulations, but only 26 counties had successfully completed a conservation subdivision by August 2010. Having a conservation subdivision ordinance alone may not be enough to convince hesitant developers to try a new strategy. The counties most successful at implementing conservation subdivisions in North Carolina also are those with a planner on the county staff specializing in conservation planning. Also, some counties and municipalities that have been successful at implementing conservation subdivisions have reworked their ordinances to favor conservation subdivisions by requiring open space to be conserved. In a survey of NC planning departments, researchers investigated the perceived barriers to implementing conservation subdivisions. "Restrictive zoning" was rated the fifth most significant barrier to implementation. The top barriers were a combination of real barriers, such as restrictive zoning or the lack of ordinance language; perceived barriers about the costs of building CSDs; and negative perceptions about smaller lots.

ADDITIONAL BENEFITS

- ▶ Reduce stormwater runoff
- ▶ Reduce development costs for the developer and home buyer
- ▶ Foster a sense of community through shared spaces
- ▶ Reduce the amount of road paving through lot clustering
- ▶ Protect significant natural resources, such as farmland, woodlands, and streams

PERCEIVED BARRIERS IN NORTH CAROLINA

We conducted a survey of 576 attendees at nine workshops promoting conservation subdivisions to investigate the perceived barriers to implementing conservation subdivisions in North Carolina. The top five responses are described here. Some barriers are practical, whereas others are merely perceived. Nonetheless, all need to be addressed.

LACK OF INCENTIVES

The lack of incentives for developers was the top barrier. Having an ordinance doesn't guarantee it will be used. Land planners, designers, and architects, followed by developers and real estate agents, rated this a higher barrier when compared to planning staff, elected officials, and conservation and land protection groups. Without an ordinance, a developer would have to go through what could be a lengthy and costly variance process to complete a conservation subdivision. Types of incentives for developers include density bonuses, flexibility in lot size requirements, and an expedited review process.

MORE EXPENSIVE TO BUILD

The perception that homes in conservation subdivisions are more expensive to build was rated as the second biggest barrier to implementation. When asked about the costs of homes in conservation subdivisions compared to similar homes in conventional subdivisions, two-thirds of respondents believed that homes in conservation subdivisions cost more.

LACK OF INTEREST FROM ELECTED OFFICIALS

The lack of interest among elected officials in changing zoning regulations was rated the third highest barrier. If open space conservation is a priority for communities, buy-in from the elected officials is needed for the effort to succeed. The process of amending the ordinance can be a controversial, often heated debate among developers, landowners, and the local government.

SMALLER LOT SIZES

Our respondents expressed a negative perception of smaller lot sizes. Many assume everyone wants a larger lot. Research shows that smaller lot sizes in conservation subdivisions don't result in lower home values or slower sales because residents have the use and enjoyment of far more land in the common open space

Perceived barriers to conservation subdivisions	Mean
Lack of incentives for developers	3.5
Perception that CSDs are more expensive to build	3.4
Lack of interest from elected officials	3.2
Smaller lot sizes	3.1
Restrictive zoning	3.1
Management of open space	2.9
Lack of consumer demand	2.9
Lack of interest by realtors	2.8
Lack of model ordinance language	2.8
Lack of resources to rewrite ordinances	2.7

Ranking barriers: Survey respondents were asked to rank barriers on a scale of 1-5, with 1 being "not a barrier" and 5 being a complete barrier to implementation.

than they would have with standard lots. In rural areas, smaller lot sizes may make it difficult for homeowners to place outbuildings on their property due to setback and repair area requirements associated with septic systems. Placing septic fields off-site in common areas or the use of communal septic fields can help overcome this barrier.

RESTRICTIVE ZONING

Restrictive zoning that prohibits conservation subdivisions or doesn't give developers flexibility in lot size and setback requirements deters developers from building conservation subdivisions. Flexibility in lot size allows developers to build the same number of houses in the development while conserving open space.

OVERCOMING POTENTIAL BARRIERS

MORE EXPENSIVE TO BUILD

Research has shown that conservation subdivisions can reduce construction costs compared to conventional subdivisions. Clustering homes on smaller lots reduces a developer's total infrastructure costs for paving and stormwater management. The National Association of Home Builders estimates that conservation subdivisions can reduce total infrastructure costs during development by as much as 34 percent. In our survey, respondents recognized the perceived higher home values associated with conservation subdivisions but failed to recognize the potential savings on infrastructure costs.

LACK OF INTEREST FROM OFFICIALS

Our study showed that the cities and counties successful at implementing conservation subdivisions are those that have the support of planning staff and elected officials. In many cases, concern from these stakeholders over the pace of development is what prompted the city or county to evaluate their land use plan and adopt conservation subdivisions as a way to maintain the area's rural character. Educating local officials about the benefits of conservation subdivisions, the reduced infrastructure costs, and the added value may alleviate some of their concerns.

SMALLER LOT SIZES

Much of North Carolina's suburban development is happening in rural areas where public water and

sewer may not be available. Minimum lot size requirements are based on the use of well and septic systems, and many of the lot size requirements in rural areas are large when compared to lot sizes in urban areas. Placing septic fields in the open space, using communal septic fields, and on-site treatment plants can allow rural subdivisions to achieve smaller lots. In urban areas, education of homeowners and developers and marketing strategies that promote the value of preserved open space can be used to alleviate concerns over smaller lot sizes.

THE ORDINANCE

The most obvious barrier to implementing conservation subdivisions is the lack of ordinance language that allows CSDs. Without ordinance language in place, a developer would have to navigate an often lengthy and costly rezoning or variance request, which usually deters applicants from pursuing conservation developments if conventional subdivisions are allowed by right.

Model ordinance language is available online, and an example written by Randall Arendt and former Orange County planning director Marvin Collins is included in this handbook along with links to examples in North Carolina communities. Ordinance language should address open space definitions, selection standards, ownership options, and management plans for the protected open space. Planning departments can amend their zoning regulations internally or hire outside consulting firms to draft the ordinance language.

TAX INCENTIVES

In some cases, state tax credits may be available for dedicating a conservation easement on the open space in a conservation subdivision. If the open space is required by the zoning or development codes, a tax credit is not available; but any land that exceeds the open space requirements may be eligible. To qualify, a land protection agreement must meet federal and state tax code requirements—essentially by providing public benefit through permanent protection of important conservation or historic resources.

To qualify as a charitable contribution for federal tax purposes, a conservation agreement must be perpetual and must do one of the following:

- ▶ conserve land for public outdoor recreation or education;
- ▶ protect relatively natural habitats of fish, wildlife, or plants;
- ▶ conserve open space, including farm and forestland; or
- ▶ preserve historically important land or buildings.

An accountant or lawyer can help determine the tax advantages that may be available from donating an easement, or you can contact the Conservation Trust for North Carolina for more information:

<http://www.ctnc.org>

NC TAX CREDIT

North Carolina has a unique incentive program to help landowners protect the environment and our shared quality of life. You may claim a credit against individual and corporate income taxes when real property is donated for conservation purposes.

For more information, contact the NC Conservation Tax Credit Program:

<http://www.onencnaturally.org/pages/ConservationTaxCredit.html>

INVOLVING LAND TRUSTS EARLY IN THE PLANNING PROCESS

Having an active land trust involved in promoting conservation subdivisions might alleviate some concerns of developers who are reluctant to try a new development strategy. An active land trust can be part of the planning process from the beginning to help select the open space to be conserved and ensure its proper long-term management.

Establishing a long-term management plan and securing the funds to cover the management costs through transfer fees, homeowners' association dues, and stewardship funds could also ease concerns of potential homeowners about management of the open space. Lack of knowledge about environmental problems and how to properly manage conservation lands can lead to conflict among homeowners, homeowners' associations, and developers. In some cases, outside experts may be needed to recommend practices for managing stormwater ponds or forests. Having a land trust actively involved from the beginning can reduce conflict, lead to the conservation of environmentally sensitive habitats, promote connectivity between other protected properties, and offer more stable, long-term management.

Find out more about North Carolina's land trusts online: <http://www.ctnc.org>



MANAGEMENT OF OPEN SPACE

The long-term management of open space can be a challenge for communities. Most ordinances require that open space be placed in a conservation easement to preserve the land in perpetuity. This easement can be held by a homeowners' association, a land trust, or conveyed to the local municipality.

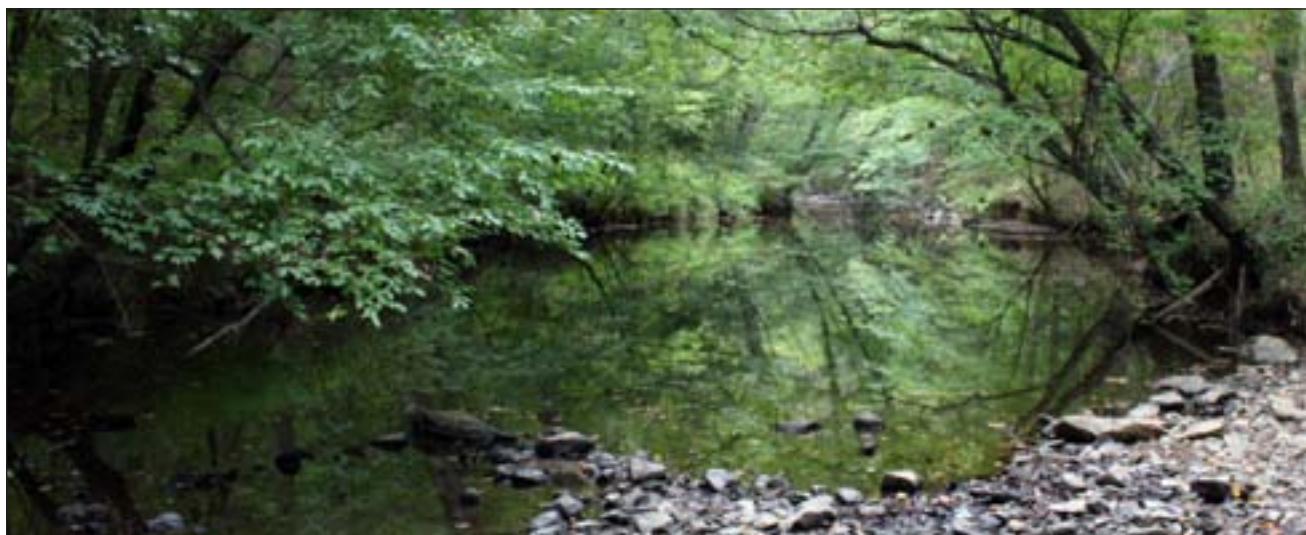
Some conservation subdivisions use homeowners' association fees to pay for open space management, while others have organized community workdays. A long-term management plan with adequate funding for open space maintenance should be developed at the beginning of the development process.

Find out more about creating management plans for open space: <http://www.natlands.org/handbook>

Management of the open space may require residents' involvement and their consensus on how to properly manage the open space (Austin). However, residents may not have the proper education, training,

or environmental knowledge to contribute to management decisions (Austin). A survey of residents in conservation and conventional subdivisions in Florida showed that conservation subdivisions do not necessarily attract residents with more environmental knowledge than the general public (Hostetler & Drake). This reinforces the need for an active homeowners' association or a local land trust to ensure proper maintenance of the conserved open space in conservation subdivisions.

The long-term management of open space was cited as a concern among the NC land trusts we surveyed. A strong homeowners' association was identified as one way to overcome this challenge, as well as educating homeowners at the time of sale and maintaining a relationship with an active homeowners' association with a primary contact person.

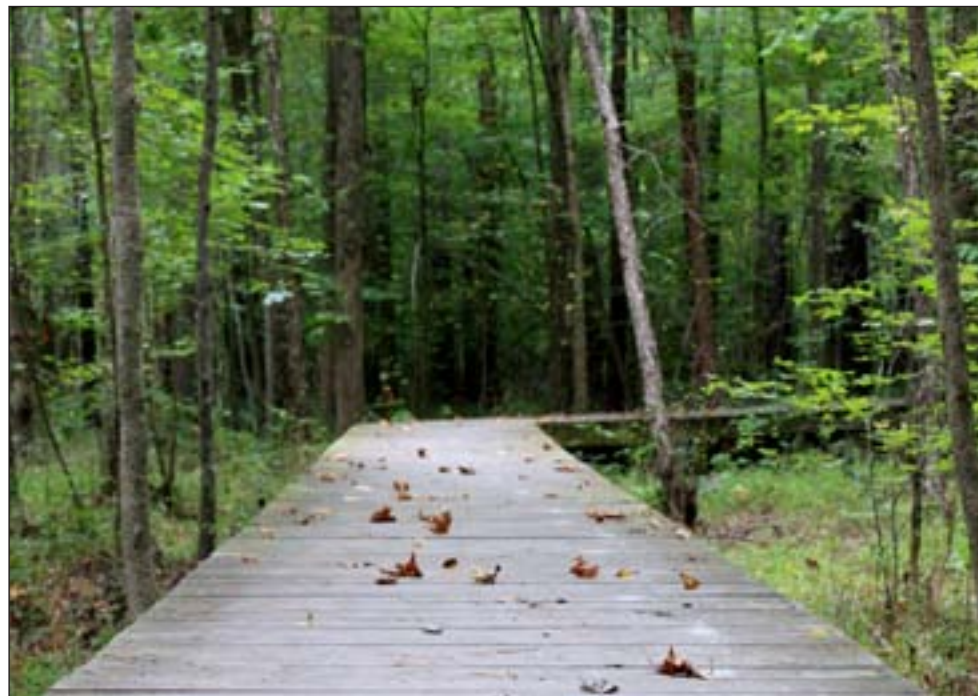


Protecting streams and upland areas improves water quality and provides valuable wildlife habitat.

MANAGEMENT OF OPEN SPACE



The Woodlands at Davidson features butterfly meadows and crabapple orchards.



The trails at Creek Wood join a trail network maintained by the Triangle Land Conservancy.

WHAT TO DO WITH THE OPEN SPACE

The open space doesn't have to be mature woodlands or riparian forests for protecting wetlands. With much of development occurring in rural farming communities, developers are literally starting with blank, flat slates—former agricultural fields. For example, the Prairie Crossing community in Illinois has over 165 acres of restored prairies that have been planted in native grasses. In North Carolina, some developments have incorporated other uses for the open space that preserve the rural and agricultural heritage of the area by converting the former agricultural fields into horse pastures or vineyards for a local winery. In agricultural districts, the land can be put under deed restrictions that allow the leasing of the land for farming. Land-banking farmland as conservation meadows mowed once a year is another good approach when farming is not an immediate option. When large, undisturbed tracts of land are developed, mature woodlands usually are preserved. Walking trails can be incorporated into the site design to give residents, and in some cases the public, access to nature trails. Some communities offer density bonuses if public access is granted to a development's walking trails.

WHY USE NATIVE PLANTS

Using native plants in landscaping attracts more wildlife, saves on maintenance costs by using plants that are adapted to an area, and avoids the use of invasive exotic species. NC State University has a "Going Native" online guide about urban landscaping for wildlife with native plants. The site has a plant guide to help you select trees, shrubs, vines, and grasses native to North Carolina, and a list of vendors in the state that sell native plants:

<http://www.ncsu.edu/goingnative/>

PROMOTING CONSERVATION SUBDIVISION DESIGN

NC communities have taken these steps to successfully encourage the use of conservation subdivisions.

REQUIRE TWO SKETCH PLANS

Orange County currently requires submission of two subdivision plans for each proposed development. The first is a conventional subdivision plan with no open space requirement (sometimes called a “yield plan”), and the second is what Orange County defines as a flexible development that has a 33 percent open space requirement. The conventional subdivision plan is optional if the developer prefers to build a flexible development, but a developer who wants to build a conventional subdivision is required to submit both plans for review. Another advantage of yield plans is that they dispel the myth that CSDs result in fewer lots for the developer.

REZONING

Henderson County changed their subdivision approval process to favor conservation subdivisions over conventional subdivisions. The new regulations allow conservation subdivisions by right but require a conditional zoning process for conventional subdivisions. This zoning process could increase the time and expense for a developer to receive approval for a conventional subdivision and make CSDs easier to implement.

DENSITY BONUSES

A density bonus is a commonly used tool to allow a developer to build more homes than would normally be allowed under traditional zoning

regulations. Density bonuses can be given for the protection of environmentally sensitive areas, the inclusion of greenways, or conserving more than the required amount of open space. Randolph County offers density bonuses if environmentally sensitive areas are protected.

With a density bonus, the developer usually achieves more lots than would be allowed in a conventional subdivision. Bonuses are typically in the 10 to 15 percent range, enough to interest developers, but not enough to spark local opposition.

CHANGE THE APPROVAL PROCESS

In Orange County all proposed subdivision plans are reviewed by the planning department, which makes a recommendation to the planning board. The planning board members then make an advisory recommendation to the Orange County Board of Commissioners, which makes a final decision. This approval process lets the board of commissioners determine which developments to approve instead of using an administrative approval process (by staff) that may approve all developments (conventional or conservation) as long as they meet development standards.

INFORMAL MEETINGS

Randolph County and the town of Davidson overcame some developer resistance to conservation subdivisions by requiring a design charrette for each

new subdivision. The charrette, an informal and participatory design process, gives everyone a chance to voice their concerns, thoughts, and constructive ideas as to how the property could be developed so that the sketch can be shaped to reflect the best suggestions, increasing buy-in and usually smoothing the way for broad-based acceptance and project approval. This gives all parties the chance to identify the most important parts of the property to conserve.

ENVIRONMENTAL INVENTORIES

Several local governments have incorporated an environmental inventory that goes beyond state requirements into their development ordinances. The town of Davidson requires a site assessment, paid for by the developer, to identify significant natural features on the site. All trees with more than 10 inches in trunk diameter are to be marked and protected whenever possible during the construction phase. Orange County has created an Environment and Resource Conservation Department (ERCD) that is a part of the subdivision review process. A representative from the ERCD performs a site visit and identifies the natural areas that need to be preserved in a proposed development.

EXPEDITED PERMITTING PROCESS

An expedited review process for conservation subdivisions can reduce the time and money spent by the developer on the subdivision approval.

CASE STUDY: ORANGE COUNTY

This county uses environmental inventories and its flexible development ordinance to preserve 33 percent open space.

Orange County

Ordinance adopted: 1997

Open space requirement: At least 33%

Lot size requirements: Flexibility in lot sizes for developments on public water and sewer. Minimum 2-acre lot size in rural buffer where well and septic are used.

Approval process: Final decision on major subdivision approval is given by the county board of commissioners.

Creek Wood and North Field

Development: Creek Wood and North Field

Developer: Heffner Properties Inc.

Number of lots: 73

Total acreage: 450 acres

Open space: 260 acres (57%)

Open space management: Triangle Land Conservancy holds a conservation easement on the open space and is responsible for the long-term management of the open space.

From the developer:

"Every time we walk on the trails in the Johnston Mills . . . I'm reconvicted, if I ever had any doubts, that it was the right thing to do, to set aside those areas. . . . You walk along and you see areas that are so pretty and so nice that you know that if you'd done a conventional subdivision that you wouldn't be walking back there."

– Developer Tom Heffner

Orange County adopted a "flexible development regulation" in 1997. Prior to that, developers were required to submit two sketch plans to the planning board and board of commissioners for each proposed subdivision. The planning staff and board of commissioners would make a recommendation to the developer, but the final decision on which one to build was still the developer's. Developers chose to build conventional subdivisions. In 1997 the approval process was changed, giving final sketch plan approval to the board of commissioners, based on recommendations from the planning staff.

The approval process now favors flexible development because developers are required to submit a flexible development or open space plan but are not required to submit a conventional plan. The flexible development plan requires at least 33 percent open space to be permanently protected through deed restrictions or a conservation easement. The open space can be managed by a homeowners' association, or in the case of Creek Wood and North Field, placed in a conservation easement with a local land trust. Triangle Land Conservancy owns the 260 acres of open space in Creek Wood and North Field and has linked it to other property to create the Johnston Mill Nature Preserve. As part of the development agreement, there are two public access points to trails maintained by the homeowners' association.

Much of Orange County is outside of what has been designated as their rural buffer. Hillsborough, Carrboro, and Chapel Hill have agreed not to extend



Creek Wood and North Field have walking trails for residents and incorporate roadside swales instead of curbs and gutters to control stormwater runoff.

water and sewer services into the rural buffer, which will help maintain the county's rural character based on findings of the county's "Rural Character Study." The rural buffer has a 2-acre minimum lot size; with the 33 percent open space requirement, this means each lot is basically 3 acres with a third of the lot devoted to preserved open space. Where water and sewer are available, the minimum lot size can be reduced from the 20,000 square foot (.45 acre) minimum down to 14,000 square feet (.32 acre).

Orange County also requires an environmental review for each new subdivision. The Environmental Resource Conservation Department is part of the review process and makes recommendations about which portions of the property are the most valuable for conservation.

CASE STUDY: RANDOLPH COUNTY

This county's rezoning process for all new residential development raises residents' awareness through informal meetings.

Randolph County

Ordinance adopted: 1988

Open space requirement: At least 50%

Conservation subdivisions completed: 5

Incentives for developers: Density bonus if sensitive environmental areas are protected

Creek's Crossing and Greenwood Plantation

Developer: Stan Byrd

Creek's Crossing: 190 acres total

Number of lots: 160

Open space: 100 acres (53%)

Home prices: \$140,000–\$200,000

Lot size: 20,000 square feet

Greenwood Plantation: 40 acres total

Number of lots: 40

Open space: 20 acres (50%)

Home prices: \$250,000–\$300,000

Lot size: 20,000 square feet



Photo courtesy of Stan Byrd
Creek's Crossing preserves scenic views for residents.

In the late 1980s Randolph County was experiencing rapid growth that resulted in a housing market boom. The increase in major residential development in the county was diminishing its rural character. To address this problem, the county changed the subdivision approval process in 1988 to require that all major subdivisions go through a rezoning process. This rezoning process brings the proposed subdivision into the public arena in the form of hearings about the proposed development. Prior to the change, subdivision approval required only that the development undergo a technical review, meet ordinance requirements, and receive approval from the planning board or the planning staff. Adding rezoning to the approval process gives residents a forum in which to voice their opinions on how they want their community to look.

Randolph County requires that 50 percent of the proposed development be set aside as open space, making it one of the few counties that meets Randall Arendt's 50 percent threshold for rural conservation subdivisions. Randolph County is divided into three growth areas: rural, secondary, and primary. The lot size requirements vary by growth area, but the conservation subdivision option gives developers flexibility in lot sizes to encourage the conservation of open space.

In the rural growth area, the minimum lot size for a major subdivision is 3 acres, but the conservation subdivision option allows the developer to bring the lot size down to 1.5 acres. In the secondary and



Photo courtesy of Stan Byrd

Greenwood Plantation was designed to give residents easy access to the walking trails that run through the woodlands and the common areas.

primary growth areas, the minimum lot size for a conventional subdivision is 40,000 square feet (.92 acre), but the requirement for a conservation subdivision is 20,000 square feet (.45 acre), allowing the developer to achieve the same density as with a conventional development.

DENSITY BONUSES

Randolph County allows density bonuses if the developer meets the required standards. Developers can add one additional lot for each of the following:

Please see **Randolph**, Page 15

CASE STUDY: TOWN OF DAVIDSON

The town uses environmental inventories and open space requirements to help maintain its rural character.



Some of the open space in The Woodlands at Davidson is placed at the entrance to the subdivision, preserving the scenic views from the main road.

In the mid-1990s, Davidson was experiencing unprecedented growth from the Charlotte-Mecklenburg region. Town officials realized they couldn't stop the growth from coming and formed a land planning committee to shape growth in a way that would maintain the town's values and rural character. During this time the town had a moratorium on new subdivisions while they evaluated their land use plan. The proposed changes met with resistance from the development community and property owners who feared they

would lose some of their property value with the proposed changes. To alleviate some of the fears of developers and property owners, the town held multiple meetings and workshops and brought in Randall Arendt to speak about the benefits of open space conservation in subdivisions. The current ordinance has been in place since 2001 and includes several options for developers and property owners. It requires the conservation of at least 42 percent of

Please see **Davidson**, Page 15

Town of Davidson

Ordinance adopted: 2001

Open space requirement: At least 42%

Conservation subdivisions completed: 10–15

Lot size requirements: Flexibility in lot sizes for developments on public water and sewer. Requires a variety of lot sizes. No more than 50% of the lots can be the same size. Also requires 12.5% of all residential units to meet the town's affordable-housing standards. Allows up to 90% of the required open space to come from an off-site location.

Density bonus: The ordinance allows a density bonus for public access to trails in the development.

The Woodlands at Davidson

Developer: John Robbins

Number of lots: 56

Total acreage: 80 acres

Open space: 36 acres (45%)

Open space management: Open space is owned and managed by the homeowners' association.

Wildlife Friendly: The Woodlands at Davidson is currently the only development in the state certified as a "Wildlife Friendly Development" by the North Carolina Wildlife Federation. Each backyard is a certified wildlife habitat, and each homeowner receives a membership to the North Carolina Wildlife Federation. The subdivision is also landscaped with native plants, and a list of recommended native plant species is provided to each new resident. The developer has also placed more than 30 nest boxes throughout the subdivision.

CASE STUDY: CITY OF HICKORY

A Habitat for Humanity community provides an affordable, environmentally friendly option for low-income residents.

City of Hickory

Ordinance adopted: 2000

Open space requirement: At least 20%, up to 50%

Conservation subdivisions completed: 14

Incentives for developers: Flexibility in lot sizes for developments on public water and sewer

Blue Sky Acres

Developer: Habitat for Humanity

Number of lots: 34–36 when completed

Total acreage: 17 acres

Open space: 3.62 acres (21%)

Open space management: Open space is managed by Habitat for Humanity.

From the developer:

“It’s nice that they have a place to do this. Typically our kids are coming out of really low-income neighborhoods or trailer parks; they’re coming out of public housing, and so the idea that there are woods across the street that they can play in that feel relatively safe is a new thing as well.”

—**Mitzi Gellman, executive director for Habitat for Humanity of Catawba Valley**



The city of Hickory added conservation subdivisions to its development regulations in 2000 after focus groups consisting of residents identified the need for more open space. The ordinance and the current land-use plan were developed by a national consulting firm.

The open space requirements vary by zoning district. The R-1 zoning district is a more rural residential district where more land is available for development, and it has a 50 percent open space requirement for conservation subdivisions. All other zoning districts have a 20 percent open space requirement for conservation subdivisions.

The conservation subdivision option allows for a 50 percent reduction in lot size and a 25 percent reduction in setback requirements as a density bonus to encourage use by developers. The ordinance calls for the preservation of sensitive areas on the property if any are identified. These would include wetlands, mature woodlands, and other significant natural features.

Blue Sky Acres is an open space development built by Hickory’s Habitat for Humanity of Catawba Valley that will have 34 to 36 homes when completed. The

Please see **Hickory**, Page 15



Blue Sky Acres in Hickory combines affordable housing from Habitat for Humanity of the Catawba Valley and environmentally friendly development strategies that conserve open space and reduce stormwater runoff.

CASE STUDIES

Davidson

Continued from page 13

a proposed development as permanently protected open space.

Davidson has six development options in its rural planning area: conservation easement subdivision, low-impact subdivision, farmhouse cluster, residential subdivision, and conventional neighborhood. Each option has an open space requirement, and the density depends on which option is chosen.

The conservation easement option requires 50 percent of the lot to be placed in a conservation easement. The farmhouse cluster is meant to maintain the rural character of Davidson's

farmland while preserving open space. The low-impact subdivision option preserves viewsheds by requiring the placement of structures behind ridges or tree stands. The lots in low-impact subdivisions have no minimum lot size or width.

A conservation easement is required on the open space in all development types, but it doesn't have to be held by a local land trust. The Davidson Land Conservancy is active in promoting conservation subdivisions in Davidson, but the easement may also be held by the homeowners' association or the town.

ENVIRONMENTAL INVENTORY

An environmental inventory is required for all development proposals and is meant to be the

guiding factor for the development. The inventory is paid for by the developer. Its goal is to identify significant natural areas, sensitive wildlife habitat, wetlands, and existing vegetation.

PUBLIC CHARETTE AND SITE VISIT

Davidson requires a notification of residents before the public charettes and site visits for developments. The notification process is similar to rezonings that require mailings to residents and business owners. The length of the charettes and site visits vary depending on the size of the proposed development. Minor subdivisions require a 4-hour charette and site visit. Master planned communities of over 100 acres require 40 hours of meetings and a site visit.

Hickory

Continued from page 14

project was a collaborative effort with Habitat, Hickory, and Lenoir-Rhyne University's Reese Institute for the Conservation of Natural Resources. The development uses low-impact design techniques, such as roadside swales, to handle stormwater from the site. The extension of water and sewer lines in the area allowed Habitat to cluster homes on smaller lots and conserve almost 20 percent of the property as communal open space. The lots in Blue Sky Acres average about 8,000 square feet (.18 acre). Mitzi Gellman, executive director for Habitat for

Humanity of Catawba Valley, said the community quickly became the most popular of the Habitat for Humanity communities in Hickory. The open space management is funded by Habitat for Humanity and covers the mowing expenses during the summer. Most of the open space consists of mature woodlands that require little maintenance. There are plans to include walking trails and more extensive landscaping once construction of the homes is complete.

Gellman said the neighborhood is unique because it gives residents an alternative to the low-income urban settings many come from and offers children in the development a natural playground many wouldn't have in the more urban communities.

Randolph

Continued from page 12

- ▶ Each additional 5% of open space preserved
- ▶ Preservation of a county-designated "Natural Heritage Site"
- ▶ 200-foot-setback for each 500 feet of existing road frontage maintained as open space
- ▶ Maintenance of forest and natural buffers along parcel lines
- ▶ An approved forest management plan
- ▶ Development and maintenance of connector trails to a designated "County Greenway Plan"

CASE STUDIES: WHY WERE THESE COMMUNITIES SUCCESSFUL?

These keys to successfully implementing conservation subdivision design were used in the NC case study communities.

WHY DID OPEN SPACE MATTER?

All four case study communities were experiencing rapid growth when they looked at conservation subdivisions as a way to help conserve open space. Randolph County, Orange County, and the town of Davidson are located in or bordering three of the fastest-growing regions in the country. The Triad, the Triangle, and the Charlotte-Mecklenburg metro area are all in the top-20 sprawl centers in the United States. These communities recognized that growth was coming and was threatening their rural character. They knew they couldn't stop growth, but they could shape it in a way that maintains their rural character, preserves property rights, and conserves open space.

THE PLANNING DEPARTMENT

In Orange County, Randolph County, and the town of Davidson, the planning department developed CSD ordinance language. The city of Hickory hired a firm to develop their land-use plan. In each case, the devotion of time and money to reworking the ordinance highlights the importance of conserving open space. It's not an overnight process. There must be a commitment from the planning staff to spend time amending development regulations, and elected officials must be willing to devote the resources. Success with implementing CSDs also may require more time from the planning department to meet with developers, review preliminary sketch plans,

KEYS TO SUCCESS

- ▶ Support from elected officials
- ▶ Willingness to devote additional time and money to amend zoning and development regulations
- ▶ Educating developers and the public on the benefits of conservation subdivisions
- ▶ Ordinance that allows the use-by-right of conservation subdivisions in residential zones and provides examples of open space definitions, selection standards, ownership options, and management plans
- ▶ Incentives for developers to encourage the use of conservation subdivisions
- ▶ Land trust or stable homeowners' association with a stewardship fund to pay for long-term management of open space

perform site visits, and work with developers and residents to come up with an approvable plan that conserves quality open space. In many counties, if a plan meets the regulations of the ordinance, it is approved. The willingness of the planning department to spend this extra time is a key part of these communities' successes. These additional costs should be weighed against the value of the protected open space. Typically the payback is huge, given that the cost of preserving land through public purchase is often about \$25,000 per acre.

THE ROLE OF ELECTED OFFICIALS

Each of these communities had the support of their planning boards and boards of commissioners. In most cases, these elected officials were the ones pushing for the change in the land-use policy. The informal meetings and charettes offer the public venues in which to ask questions, get answers, and work out their concerns before the proposed development comes before the planning board or the board of commissioners.

Phil Kemp of the Randolph County Board of Commissioners said that adding the neighborhood meeting requirement resolved many of the issues and concerns from neighboring landowners:

"We were doing it at our board of commissioners meeting. By the time it got there, we were having to do the things that took forever for a particular request, where they could eliminate 50 to 75 percent of that stuff in a neighborhood meeting."

INVOLVING THE PUBLIC

Local residents also play a role in the success of CSDs. These are the people who will be selling land, and they are the people who will be buying homes. Each community dealt with concerns from landowners and developers about the perceived loss in property value. In Randolph County and Davidson, involving the public early and often in the process helped eased the fears of some of the neighbors where new developments were proposed.

WHAT RESOURCES WOULD BE MOST USEFUL?

Our survey respondents were asked what resources would be most useful to promote conservation subdivisions in NC communities. Their responses are described below.

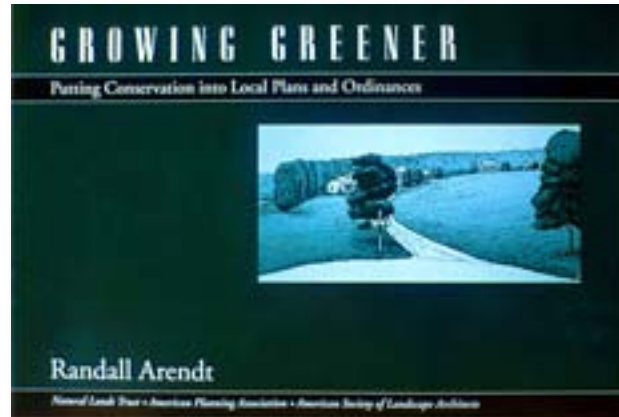
CASE STUDIES

Case studies of communities that have successfully implemented CSDs were listed as a resource that would be helpful. We've provided four examples of communities that have successfully implemented conservation subdivisions in North Carolina. The online resources section contains links to the zoning and development regulations and to some of the subdivisions mentioned in this handbook. There also are links to some of the more successful conservation subdivisions in other states and conservation resources from NC agencies.

MODEL ORDINANCE LANGUAGE

Model ordinance language was listed as a resource that would be helpful in implementing conservation subdivisions. Model language is available online. We've provided a copy of the model ordinance language developed by landscape planner Randall Arendt (page 18). In the online resources section of this publication, there are also links to model language from the University of Wisconsin, Randall Arendt's website, and individual city and county ordinances from North Carolina. The UNC School of Government also has a listserv for NC planning professionals.

Model language from the Growing Greener: Conservation by Design ordinances written by



Randall Arendt is available from the Natural Lands Trust in Media, PA: <http://www.natlands.org/>

BUILD-OUT MAPS

Build-out maps or growth-plan maps are used to determine developable land area for residential, commercial, and industrial zoning districts. These maps show the possible locations for streets and residential developments on buildable land in a community. Build-out maps can show what a community would look like if all buildable land was developed under current zoning regulations. As North Carolina continues to grow and development pushes into more rural areas, it is important for people to identify how and where they want their community to grow. Through zoning, the establishment of rural buffers, and urban growth zones, communities can shape their growth and maintain rural character. The online tools in the resources section of this handbook can provide the data needed to begin developing build-

out maps for NC communities.

Find out more about build-out maps:

http://www.epa.gov/greenkit/build_out.htm

MAPS OF CONSERVATION LANDS

Respondents indicated that maps of potential conservation lands would be useful in planning and promoting conservation subdivisions. In the online resources section of this handbook, we've included links to several sites that can assist communities in assessing potential conservation lands. The Green Growth Toolbox, the One North Carolina Naturally Conservation Planning Tool, and the Biodiversity and Wildlife Habitat Assessment are available for identifying priority lands for conservation.

<http://www.onencnaturally.org/pagesConservationPlanningTool.html>

INCENTIVES FOR DEVELOPERS

Incentives for developers to encourage conservation subdivisions were cited as useful by most respondents. The types of incentives available are mentioned earlier in the handbook, and include density bonuses, flexibility in lot-size requirements, and expedited review processes. These incentives have to be incorporated into the zoning and development regulations, and developers need to be educated about how to take advantage of these incentives. Many incentives are already built into the design process. For example, when 40 to 50 percent of the land remains undisturbed, costly site grading is significantly reduced.

MODEL CONSERVATION SUBDIVISION ORDINANCE

This model ordinance is courtesy of landscape planner Randall Arendt; Marvin Collins, former Orange County planning director and coauthor with Arendt of *Open Space Design Guidebook: Albemarle-Pamlico Estuarine Region*; and the North Carolina Association of County Commissioners.

The Model Ordinance presented in this appendix is based on the open space design approach described in the narrative portion of this guidebook. It is also very closely related to the model contained in *Open Space Design Guidebook: Albemarle-Pamlico Estuarine Region*, published by the North Carolina Association of County Commissioners in 1996, written by Randall Arendt and Marvin Collins, former Orange County planning director.

The wording here presents a mandatory approach, wherein conventional subdivision plans that divide an entire property into lots and streets would no longer be acceptable. Instead, all new subdivision plans must be prepared using the open space design approach.

Where an optional approach is preferred, the local government may wish to consider the use of disincentives to discourage the use of conventional subdivision plans and encourage open space development plans. As an example, a developer might be permitted to create only a certain percentage (such as 60 to 70 percent) of the allowable number of building lots if he/she elects to use the conventional approach (imposing a 30 to 40 percent “density penalty”). On the other hand, the use of the open space design approach would permit the developer to achieve the maximum allowable density.

Another approach involves designating open space designs as by-right permitted uses and conventional cookie-cutter plans as conditional uses. The condition for approving conventional submissions would be a clear and compelling case by the applicant that dividing all the land into house lots and streets, with little or no open space, better implements official municipal or county policies, as contained in an adopted comprehensive plan (such as for agricultural preservation or woodland habitat protection), compared with open space designs. This approach enables local governments to remain true to their comprehensive plans when processing applications for new development.

It might be instructive to note that when Orange County first adopted open space design in its ordinances, it did so as an optional, voluntary approach. After several years of experimentation, during which very few developers chose open space design (largely due to their conservative reluctance to try new ideas), the county adopted standards requiring subdivision applicants to follow the open space design approach – which is actually the design approach that is most consistent with the county’s official comprehensive plan of land-use policies for protecting environmental resources. In other words, developers are, for the first time, really complying with key policies in the county’s comprehensive plan and attaining full density in very attractive and marketable subdivisions that preserve significant buildable upland habitat and farmland.

Deciding which approach to use is an example of the choices that each local government has in implementing an open space design process. Another example stems from the very character of the Albemarle-Pamlico estuarine region. Counties located in the NC piedmont or headwaters section may have a much different list of natural and cultural resources than counties of the NC coastal plain, where rolling hills give way to flatter terrain, vast scenic vistas, and more expansive floodplains and wetlands. Likewise, decisions regarding the resources that make up primary and conservation areas may lead to other decisions regarding the percentage of open space to preserve and whether that percentage applies to the total tract or only to the unconstrained, buildable portion of the site.

The very character of the resources to be preserved will also have an impact on ordinance provisions. Alternative approaches such as the use of “conservancy lots” and “neotraditional town planning” principles can be blended with conservation design to protect irreplaceable resources. For this reason, supplemental standards for an “estate” or conservancy lot option and a neotraditional “village” option have been included with the model ordinance.

The model ordinance represents a starting point. And regardless of the provisions ultimately adopted, they too should be viewed as a beginning. To acquaint landowners, developers, surveyors, and land planners and designers with the open space design process, a series of education workshops should be held either before or immediately after ordinance adoption. As subdivision plans are approved, they should be evaluated to determine if the goals of open space design are being achieved, particularly where an “optional” or voluntary approach is pursued. As conditions warrant, the ordinance provisions may be “fine-tuned” to achieve the desired result.

Open space subdivision design

Section 1 General

1.1 Purposes

The purposes of Open Space Subdivision Design are to preserve agricultural and forestry lands, natural and cultural features, and rural community character that might be lost through conventional development approaches. To accomplish this goal, greater flexibility and creativity in the design of such developments is encouraged and required. Specific objectives are as follows:

- To preserve areas of the county with productive soils for continued agricultural and forestry use by preserving blocks of land large enough to allow for efficient operations.
- To encourage the maintenance and enhancement of habitat for various forms of wildlife and to create new woodlands through natural succession and reforestation where appropriate.
- To minimize site disturbance and erosion through retention of existing vegetation and avoiding development on steep slopes.
- To preserve open land, including those areas containing

Model conservation subdivision ordinance

unique and sensitive features such as natural areas and wildlife habitats, steep slopes, streams, wetlands, and floodplains.

- To preserve scenic views and elements of the county's rural character, and to minimize perceived density by minimizing views of new development from existing roads.
- To preserve and maintain historic and archaeological sites and structures that serve as significant visible reminders of the county's social and architectural history.
- To provide for the active and passive recreational needs of county residents, including Implementation of the Recreation & Parks Plan.
- To provide greater efficiency in the siting of services and infrastructure by reducing road length, utility runs, and the amount of paving for development.
- To create compact neighborhoods accessible to open space amenities and with a strong identity.

1.2 Applicability

Open Space Subdivision Design is permitted in all residential zoning districts, but only upon approval of a Preliminary Subdivision Plat by the Board of County Commissioners. All Open Space Development subdivision plats shall comply with the requirements and standards specified herein and in all respects with other applicable codes and ordinances to the extent that they are not in conflict with these provisions.

Open Space Subdivision Design shall also be required in the following zoning districts, and/or within the following overlay districts: [to be completed by each county].

Potential Alternative Wording (allowing conventional design as a Conditional Use):

Authorization to develop a tract in a conventional manner, without open space (conventional development), rather than utilizing Open Space Design, may be granted by the Board of County Commissioners as a Conditional Use pursuant to Section _____ pertaining to conditional uses, provided that the applicant clearly demonstrates, at a Public Hearing,

compliance with the standards and criteria contained in that Section and, in addition, establishes the following:

A. That conventional development setting aside little or no open space for permanent protection would preserve environmental resources, natural and scenic features, historic sites, and historic resources to a degree equal to or greater than development utilizing Open Space Design principles would permit. The applicant may be required to protect such features, sites and resources from further development with appropriate covenants running with the land.

B. That the applicant has achieved the open space preservation goals set forth in this ordinance by conveyance of a perpetual conservation easement to a recognized nonprofit corporation established for that purpose, or to an agency or department of county, state, or federal government specifically charged with protecting environmental resources.

Section 2 Open space standards

2.1 Minimum Required Open Space

At least fifty percent (50%) of the unconstrained (buildable) land area in the Open Space Development shall be set aside as protected open space. Unconstrained lands are lands that do not lie within "Primary Conservation Areas," as described below. Unconstrained lands also exclude the rights-of-way of high tension electrical transmission lines, and the rights-of-way of existing or proposed streets, which therefore may not be counted toward meeting minimum open space requirements. Except under the "Estate Lot" provisions, this open space shall remain undivided, and may not be incorporated into individual houselots. [Note: In areas with very low rural density, say more than two acres per dwelling, open space percentages greater than 50% are easily achievable and highly recommended. On the other hand, in serviced locations with public water and sewer, where densities might be several dwellings per acre, open space percentages might dip to 35 or 40%.]

2.2 Types of Open Space

The types of open space conserved through Open Space Development shall be consistent with the following standards:

A. Open space shall be comprised of two types of land: "Primary Conservation Areas" and "Secondary Conservation Areas," and shall be configured to create or maintain interconnected networks of conservation lands, to the greatest extent that is practicable.

B. Primary Conservation Areas form the core of the open space to be protected. They are the first type of open space to be designated on an Open Space Development Plan to satisfy the minimum open space requirement and consist of the following site features:

- **Wetlands**, including, but not limited to, streams, creeks, ponds, reservoirs, and adjoining land areas identified as part of:

- The National Wetlands Inventory maps prepared by the U.S. Fish and Wildlife Service;

- Soil maps published by the County Soil Survey prepared by the USDA Natural Resources Conservation Service (where "very poorly drained" soils can be considered as a proxy for wetlands);

- A required Environmental Assessment or Environmental Impact Statement; and/or

- A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner.

- **Floodplains** (100-year) and alluvial soils identified as part of:

- A Flood Insurance Study prepared by the Federal Emergency Management Agency; and

- The County Soil Survey prepared by the USDA Natural Resources Conservation Service.

- **Steep slopes**, defined as those greater than 25 percent, identified as part of:

Model conservation subdivision ordinance

- A County Soil Survey prepared by the USDA Natural Resources Conservation Service; and/or

- A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner and calculated using topographic maps from an actual surveyor from the U.S. Geological Survey.

C. Secondary Conservation Areas consist of unconstrained land that would otherwise be suitable for building and include the following site features:

- **Woodlands**, including forest land for the planting and production of trees and timber, where management practices such as selective timber harvesting and wildlife enhancement are employed. Such woodlands may consist of hardwood, pine, and/or mixed pine-hardwood forests identified as part of:

- A site analysis conducted by a registered engineer, land surveyor, landscape architect, architect or land planner using aerial photographs and/or satellite imagery;

- A required Environmental Assessment or Environmental Impact Statement; and/or

- An independent site study conducted by a trained botanist and/or forester.

- **Farmland**, whether actively used or not, including cropland, fields, pastures, and meadows.

- **Natural areas** and wildlife habitats and corridors identified as part of:

- An Inventory of Natural Areas and Wildlife Habitats as prepared by a state agency, the Nature Conservancy or a local land trust;

- A required Environmental Assessment or Environmental Impact Statement; and/or

- An independent site study conducted by a trained botanist and/or biologist.

- **Slopes** of 15% to 25% which require special site planning due to their erosion potential, limitations for

septic tank nitrification fields, and terrain or elevation changes. Such areas may be suitable for building but higher site preparation and construction costs are to be expected.

- Historic and/or archaeological sites, including, but not limited to, sites listed on the National Register of Historic Places or included on the State's National Register study list, designated as a local historic landmark or district, and/or designated as having a high potential for archaeological remains. Such sites are generally identified as part of

- A local architectural survey;

- A local archaeological survey;

- A required Environmental Assessment or environmental Impact Statement; and/or

- An independent site study conducted by a trained architectural historian or archaeologist.

- **Public and/or private recreation areas and facilities, including:**

- "Active recreation areas" such as public recreation areas, including district and community parks as identified in the Recreation and Parks Plan; and private recreation facilities, including golf courses, playing fields, playgrounds, swimming pools, and courts for tennis, basketball, volleyball, and similar sports, and commercial campgrounds.

Active recreation areas represent a kind of development in which natural lands are cleared, graded, and managed for intensive uses, thereby reducing the wildlife habitat or natural resource area that add to an area's ecological well-being.

For this reason, only half (50%) of the land in this category may be credited toward meeting the minimum open space requirement.

- "Passive recreation areas" such as pedestrian, bicycle, and equestrian trails, picnic areas, community commons or greens, and similar kinds of areas, whether public or private. Land in this category receives full credit toward meeting the minimum open space requirement.

- **Scenic views**, especially of natural and cultural features from designated scenic road corridors, including "views from the road" as well as views outward from potential home sites.

2.3 General Location Standards

A. Undivided Preserves. Both Primary and Secondary Conservation Areas shall be placed in undivided preserves which adjoin housing areas that have been designed more compactly to create larger conservation units that may be enjoyed by all residents of the subdivision. Such undivided open space shall be accessible to the largest number of lots within the development. To achieve this, the majority of houselots should abut undivided open space to provide residents with direct views and access. Safe and convenient pedestrian access to the open space from all adjoining houselots shall be provided, except in the case of farmland or other resource areas vulnerable to trampling damage or human disturbance.

When the "Estate Lot Development Option" is used, up to 85 percent of the Secondary Conservation Area may be incorporated into estate lots not smaller than six acres.

Where undivided open space is designated as separate non-contiguous parcels, no parcel shall consist of less than three (3) acres in area, nor have a length-to-width ratio in excess of 4:1, except such areas that are specifically designed for neighborhood commons or greens, playfields, buffers adjacent to wetlands and watercourses, wildlife corridors, or trail links.

B. Interconnected Open Space Network. As these standards are implemented, the protected open space in each new subdivision should be consciously designed to adjoin each other, so that they may ultimately form an interconnected network of Primary and Secondary Conservation Areas across the county.

Model conservation subdivision ordinance

2.4 Ownership and Protection of Open Space

Conservation land within an Open Space Development may be owned and/or administered by any of the following methods, either individually or in combination. All open space shall be permanently restricted from further subdivision through permanent conservation easements recorded in the County Registry of Deeds. These easements should be held by land trusts or conservation agencies of the state or local government, and are not recommended to be held by the elected officials of the county or municipality. Ownership options include:

- Fee simple dedication to the County, another unit of local government, the State of North Carolina or a private nonprofit land conservancy.

- Ownership by a homeowners association where specific development restrictions and maintenance requirements are included as part of its bylaws. Such land shall also be protected through permanent conservation easements, as described below.

- Within Open Space Subdivisions designed according to the "Estate Lot Development Option," all of the open space may be incorporated into the estate lots themselves. This open space shall consist of all land lying outside the building envelopes within each estate lot, and shall be permanently protected through conservation easements, as described below.

- Up to 85 percent of the conservation land within an Open Space Subdivision may be "non-common open space" that is designated for individual private ownership, such as by the original farmer or landowner, the developer, or another private entity that maintains the open space for the uses permitted in this ordinance (such as a nursery business or commercial equestrian operation). The remaining conservation land shall remain undivided for the enjoyment of the residents, and this remainder shall consist of land that is not wet or submerged, not steep (i.e., with slopes less than 25 percent), and not within the rights-

of-way of high-tension electrical transmission lines.

- All conservation land shall be permanently protected through conservation easements dedicated to the County, another unit of local government, the State of North Carolina or a private non-profit land conservancy. Such easements shall apply to land owned by a homeowners' association, individual lot owners within Estate Lot Developments, land owned by other private entities managing the land for open space purposes, and land dedicated to units of local government. (Land dedicated to units of local government shall be eased to a private land trust or conservancy organization because, over time, the conservation and development philosophies of elected officials are subject to change.)

2.5 Maintenance of Open Space

Natural features shall be maintained in their natural condition, but may be modified to improve their appearance, functioning, or overall condition, as recommended by experts in the particular area being modified. Permitted modifications may include:

- Reforestation;
- Pasture or cropland management;
- Buffer area landscaping;
- Stream bank protection; and/or
- Wetlands management.

Unless accepted for dedication or otherwise agreed to by the County, another unit of local government, the State of North Carolina or a private non-profit land conservancy, the cost and responsibility of maintaining open space and any facilities located thereon shall be borne by the property owner and/or homeowners' association.

Management Plans are required for all open space within Open Space subdivisions specifying who is responsible for which maintenance responsibilities and on what schedule. Guidelines for management can be found in the Stewardship Handbook for Natural Lands, published by the Natural Lands Trust <http://www.natlands.org/services/for-land-owners/stewardship-handbook/>

Section 3 Design standards

3.1 Two Options for Calculating Maximum Permitted Density

The maximum number of lots in a Conservation Subdivision shall be determined by either of the following two methods, at the discretion of the Applicant:

1. Yield Plan: The maximum number of lots reasonably achievable on the property, based on a conventional subdivision design plan consisting of lots meeting or exceeding the minimum dimensions required for lots in conventional subdivisions, conforming to the County's regulations governing lot dimensions, land suitable for development, and street design. The Yield Plan shall be prepared by the applicant, showing how the tract of land could be subdivided to yield the maximum number of buildable residential lots. Although the Yield Plan does not have to meet formal requirements for a site design plan, and is not intended to involve significant engineering or surveying costs, the design must be realistic and economically capable of being constructed, given site features and all applicable regulations. Potential building lots and streets must not be shown in areas that would not ordinarily be permitted in a conventional plan. For example, Yield Plans would include, at minimum, basic topography, wetland locations, 100-year floodplains, and slopes exceeding 25 percent in defining areas unsuited for development. For additional details, see Section 8.4.

2. On sites not served by public sewerage or a centralized private sewage treatment facility, soil suitability for individual septic systems shall be demonstrated. In areas of the site considered to be marginal for such systems, typically where the most challenging site conditions exist with respect to seasonal high water tables, or shallow depth to bedrock or restrictive soil layers, a small percentage of lots (10%) shall be tested. The local government shall select the lots for such testing. If tests on the sample lots pass the percolation test, the applicant's other lots shall also be deemed suitable for septic systems for the purpose of calculating total lot yield. However, if any of the sample lots fail, several others shall be tested, until all the lots in

Model conservation subdivision ordinance

a given sample pass.

3. Formulaic Approach: Because they represent sensitive environmental features and/or significant cultural resources considered unbuildable in a legal or practical sense, Primary Conservation Areas receive only partial credit toward meeting the minimum open space requirement. Specifically, the maximum number of lots is determined by dividing the area of the tract of land by the minimum conventional lot size specified in the underlying zoning. In making this calculation, 50% (fifty percent) of the following two land types shall be included in the density calculations:

A. Slopes over 25% of at least 5000 square feet contiguous area;

B. The 100-year floodplain.

In addition, 10% (ten percent) of land within rights-of-way for high-tension electrical transmission lines shall be counted.

Furthermore, 5% (five percent) of wetlands meeting the definition of the Army Corps of Engineers pursuant to the Clean Water Act, or land that is submerged for more than three months of the year shall be included in the density calculations.

No density credit shall be given to bodies of open water over 5000 square feet contiguous area, or to land lying within the rights-of-way of existing or proposed streets

Note: In these calculations, density credit may be applied to certain other unconstrained parts of the site, such as land used for onsite sewage disposal, including nitrification fields and fields used for “spray irrigation” (sometimes called “land treatment”). Unless specified otherwise, these lands may also be counted toward meeting the minimum open space requirements for Open Space Subdivisions.

3.2 Existing Features/Site Analysis

Since it forms the basis of the open space design process, an Existing Features/Site Analysis Map analyzing each site’s special features is required for all proposed subdivisions. The Map shall identify, at minimum, those natural, historic, and cultural features listed in Sections

2.2.B and 2.2.C without distinction as to whether they are Primary or Secondary Conservation Areas.

3.3 Design Process

Open Space Development subdivisions shall be designed around both the Primary and Secondary Conservation Areas, which together constitute the total required open space. The design process should therefore commence with the delineation of all potential open space, after which potential house sites are located. Following that, access road alignments are identified, with lot lines being drawn in as the final step. This “four-step” design process is further described below.

• **Open Space Designation:** During the first step, all potential Conservation Areas, both Primary and Secondary, shall be identified, using the Existing Features/Site Analysis Map. Primary Conservation Areas shall consist of those features described in Section 2.2.B above. Secondary Conservation Areas shall comprise at least half of the remaining land and shall include the most sensitive and noteworthy natural, scenic, and cultural resources as described in Section 2.2.C above.

Guidance as to which parts of the remaining land to classify as Secondary Conservation Areas shall be based upon:

- On-site visits;
- The Open Space Standards contained in Section 2 above; and
- The Evaluation Criteria contained in Section 4 below.

• **House Site Location:** During the second step, potential house sites are tentatively located. The proposed location of houses within each lot represents a significant decision with potential impacts on the ability of the development to meet the Evaluation Criteria contained in Section 4 below. Generally, house sites should be located no closer than 100 feet from Primary Conservation Areas. Such sites may be situated 50 feet from Secondary Conservation Areas to permit the enjoyment of scenic views without negatively

impacting Primary Conservation Areas.

• **Street Alignment and Trail Networks:** The third step consists of aligning proposed streets to provide vehicular access to each house in the most reasonable and economical manner, and of laying out a network of informal trails connecting neighborhood areas with open space features within the conservation lands. When lots and access streets are laid out, they shall be located in such a way that avoids or at least minimizes impacts on both Primary and Secondary Conservation Areas. To the greatest extent practicable, wetland crossings and streets traversing slopes over 15 percent shall be strongly discouraged, unless such streets link one buildable portion of a site with another when no other means of access is available.

Street connections shall generally be encouraged to minimize the number of new cul-de-sacs to be maintained and to facilitate easy access to and from homes on different parts of the property and on adjoining parcels. Where cul-de-sacs are necessary, those serving six (6) or fewer homes may be designed with “T-turnarounds” facilitating three-point turns. Cul-de-sacs serving more than six homes shall generally be designed with a central island containing indigenous trees and shrubs, either conserved or planted. All cul-de-sacs should provide trail access to the open space and/or other nearby streets. The creation of single-loaded residential access streets is encouraged to maximize the number of homes in new developments that may enjoy views of open space. To make this approach economical, narrower lots as well as flag lots, both of which help to make the street system more efficient, are permitted in Open Space Developments.

• **Drawing in the Lot Lines:** The fourth step consists of drawing in lot lines around potential house sites. Each lot must contain a buildable area of sufficient size to accommodate a single-family detached dwelling and customary accessory uses, including, but not limited to, storage buildings and garages, patios and decks, lawns, and driveways. Individual wells and septic systems, where these are to be provided, may be located within

Model conservation subdivision ordinance

the undivided conservation lands if sufficient space is not available on the lots.

Note with Respect to Village Design: For open space subdivisions submitted under the Village Development Option, the sequence of steps is: conservation areas; streets, squares, and trails; house sites; and lot lines. In this denser development form, the location of streets and squares becomes elevated in importance, after the identification of Primary and Secondary Conservation Areas. House positions are of lesser importance, as they become the supporting elements within a larger streetscape. Squares and greens shall be generally laid out so that they form “terminal vistas” at the ends of streets, or at the ends of the sight-lines which are terminated by bends in the streets.

3.4 Dimensional Standards

Provided the arrangement, design, and shape of house lots is such that lots provide satisfactory and desirable sites for building, and contribute to the preservation of designated Primary and/or Secondary Conservation Areas, minimum lot area, lot width, and setback requirements may be reduced as set forth below.

- Minimum lot area requirements may be reduced by up to sixty percent (60%) but shall be no smaller than 5000 square feet.
- Minimum lot width requirements may be reduced by forty percent (40%) but shall be no less than forty (40) feet.
- Minimum front setback requirements may be reduced by fifty percent (50%) but shall be no less than fifteen (15) feet.
- Minimum rear and side setback requirements may be reduced by fifty percent (50%) but shall be no less than five (5) feet. Side setbacks may be combined on one side provided that at least two (2) feet of setback remains on the other. Such combinations are permitted in lot layouts where this pattern is repeated with homes located off-center on their lots but evenly spaced between buildings on adjoining lots.
- Minimum lot frontage requirements may be reduced to twenty (20) feet, to allow for a driveway extension on a flag lot.

Section 4 Evaluation criteria

For any given site, resources may vary widely in importance; e.g., a natural area compared to a historic site. Likewise, for each type of resource, there may be examples of greater or lesser significance; e.g., a notable example of local vernacular building traditions compared to a much altered older home. Priorities for conserving such resources should therefore be based upon a thorough site analysis and an understanding of what is more special, unique, environmentally sensitive, and or historic as compared with other similar features or different types of resources.

In evaluating the layout of lots and open space, the following criteria will be considered as indicating design appropriate to the site’s features and meeting the intent of the Flexible Development standards. Whereas diversity and originality in lot layout are encouraged, it is recognized that not all objectives may be achieved on a given site. Each applicant must therefore strive to achieve the best possible relationship between development and preservation objectives.

In evaluating the relative significance of different categories of site features, or of individual features within certain categories, applicants shall consider recommendations by the Planning Department, during and after the On-Site Visit which precedes submission of the Concept Plan.

4.1 General Criteria

The following criteria apply to all Open Space Development projects:

- Protect and preserve all wetlands, floodplains, and steep slopes from clearing, grading, filling, or construction except as may be approved by the Board of Commissioners.
- The shape of the open space shall be reasonably contiguous, coherently configured, and shall abut existing or potential open space on adjacent properties. Long, narrow segments must be avoided except in the case of trail or stream corridors, or landscape buffers adjoining street rights-of-way and/or neighborhood boundaries.
- The pedestrian circulation system shall be designed to

assure that pedestrians can walk safely and easily on the site, between properties and activities or special features within the neighborhood open space system. All roadside footpaths should connect with off-road trails, and link with existing or potential open space on adjoining parcels.

- Landscape common areas (neighborhood greens), cul-de-sac islands, and both sides of new streets with native species shade trees and flowering shrubs with high wildlife conservation value.

4.2 Forest Land/Natural Areas Conservation

Where the goal of the Open Space Development project is to conserve forest land and/or natural areas and wildlife habitats, the following criteria apply:

- Dwellings should be located in unwooded parts of the site away from mature forests, natural areas, and/or wildlife corridors.
- To the greatest extent practicable, development should be designed around existing hedgerows and treelines between fields or meadows. The impact on larger woodlands (greater than five acres), especially those containing mature trees, natural areas, and/or wildlife corridors, should be minimized.
- When any woodland is developed, care shall be taken to locate buildings, streets, yards, and septic disposal fields to avoid mature forests, natural areas, and/or wildlife corridors.

4.3 Farmland Conservation

Where the goal of the Open Space Development project is to conserve farmland, the following guidelines apply:

- Locate building lots in forested areas away from existing pastures, cropland, feedlots, and similar uses.
- If development must be located on open fields or pastures because of greater constraints on other parts of the site, dwellings should be sited in locations at the far edge of a field, as seen from a public road.
- Identify the most productive portions of existing pastures and cropland, and locate building lots on less productive land.

Model conservation subdivision ordinance

- Buffers shall be provided between houselots and cropland or pastures, to reduce the potential for conflict between residents and farming activities. Such buffers shall generally be 75 feet in width and shall be managed to encourage the growth of successional woodland.

4.4 Conservation of Scenic Views

Where the goal of the Open Space Development project is to conserve scenic views, the following guidelines apply:

- Leave scenic views and vistas unblocked or uninterrupted, particularly as seen from public roadways. Consider “no-build, no-plant” buffers along public roadways where views or vistas are prominent or locally significant. In wooded areas where enclosure is a feature to be maintained, consider a “no-build, no-cut” buffer created through the preservation of existing vegetation.

- Where development is located in unwooded areas clearly visible from existing public roads, it should be buffered from direct view by a vegetative buffer or an earth berm constructed to reflect the topography of the surrounding area, or located out of sight on slopes below existing ridge lines.

- Protect rural roadside character and vehicular carrying capacity by avoiding development fronting on existing public roads; e.g., limiting access to all lots from interior rather than exterior roads.

- Protect rural roadside character and scenic views by providing conservancy lots (e.g., six acres or more in size) adjacent to existing public roads.

- Avoid siting new construction on prominent hilltops or ridges, or so close to hilltops and ridges that rooflines break the horizon (unless such buildings can be effectively screened or buffered with trees).

4.5 Historic and Archaeological Features

Where the goal of the Open Space Development project is to conserve historic and archaeological sites and structures, the following guidelines apply:

- Design around and preserve sites of historic, archaeological or cultural value so as to safeguard the character of the feature(s), including fences and walls, farm outbuildings, burial grounds, abandoned roads, and earthworks.

- New streets, driveways, fences, and utilities must be sited so as not to intrude on rural, historic landscapes. Wherever possible, streets and driveways are to follow existing hedgerows, fence lines, and historic farm drives.

- New developments must include plantings which reflect natural and historic landscape materials, and are in harmony with the character of the area.

- Building designs and styles used in new construction should be compatible with the architectural style of historic buildings located on or adjacent to the site, especially in terms of scale, height, roof shape, and exterior materials.

4.6 Recreation Provision

Where the goal of the Open Space Development project is to provide recreation and parks facilities for neighborhood residents and/or the general public, the guidelines contained in Section _ shall apply.

Section 5 Water supply and sewage disposal facilities

5.1 Alternative Options

Water supply and sewage disposal facilities to serve Open Space Developments may be provided through the use of various alternatives, including:

- Individual wells and septic tanks located either on each lot or in off-lot locations within undivided open space areas designated for such uses on the Final Plat, and protected through recorded easements; or

- A community water supply and/or sewage disposal system designed, constructed, and maintained in conformity with all applicable state, federal, and local rules and regulations; or

- Connection to a water supply and/or sewage disposal system operated by a municipality, association, or water or sewer authority. System extensions are permitted only in accordance with applicable water and sewer, and land use

policies and shall be sized only to serve the Open Space Development for which the system is extended; or

- A combination of the above alternatives.

Section 6 Density bonuses

The maximum number of building lots or dwelling units in an Open Space Development shall not exceed the number that could otherwise be developed by the application of the minimum lot size requirement and/or density standard of the zoning district or districts in which the parcel is located. However, increases in the number of building lots or dwelling units are permitted through one or more of the following options:

6.1 To Encourage Additional Open Space

A. A density increase is permitted where more than fifty percent (50%) of the unconstrained land area in an Open Space Development is designated as permanent, undivided open space. The amount of the density increase shall be based on the following standard:

For each additional acre of protected open space provided in the Open Space Development, one (1) additional building lot or dwelling unit is permitted.

B. In lieu of providing additional open space in the Open Space Development, the applicant may purchase in fee simple or less than fee (e.g., development rights) land separate from the Open Space Development which is comprised of Primary and/or Secondary Conservation Areas as defined in Section 2. Land purchased in fee may be dedicated to the County, another unit of local government, the State of North Carolina, or a private non-profit land conservancy.

C. For land purchased in less than fee, a conservation easement shall be recorded which restricts the development potential of the land. The conservation easement shall be dedicated to the County, another unit of local government, the State of North Carolina, or a private non-profit land conservancy.

Model conservation subdivision ordinance

6.2 To Encourage Public Access

Dedication of land for public use (including trails, active recreation, municipal spray irrigation fields, etc.), in addition to any public land dedication authorized under the state enabling statutes, may be encouraged by the County, which is herein authorized to offer a density bonus for this express purpose. This density bonus, for open space that would be in addition to the basic public land dedication mentioned above, shall be computed on the basis of one dwelling unit per three acres of publicly accessible open space. The decision whether to accept an applicant's offer to dedicate open space for public access shall be at the discretion of the County, which shall be guided by recommendations contained in existing and future recreation plans, particularly those sections dealing with trail connections, greenway networks, and/or recreational facilities.

6.3 To Encourage Maintenance Endowments

The County may allow a density bonus to generate additional income to the applicant for the express purpose of endowing a permanent fund to offset continuing open space maintenance costs. Spending from this fund would be restricted to expenditure of interest, in order that the principal may be preserved. Assuming an average interest rate of five (5) percent, the amount designated for the Endowment Fund should be twenty (20) times the amount estimated to be needed on a yearly basis to maintain the open space. On the assumption that additional dwellings, over and above the maximum that would ordinarily be permitted on the site, are net of development of development costs and represent true profit, 75 percent of the net selling price of the lots should be donated to the Open Space Endowment Fund for the conservation lands within the subdivision. Such estimates should be prepared by an agency or organization with experience in open space management acceptable to the County. This fund shall be transferred by the developer to the designated entity with ownership and maintenance responsibilities, such as a homeowners' association, a land trust, or a unit of local government.

6.4 To Encourage Affordable Housing

A. A density increase is permitted where the Open Space Development provides on-site or off-site housing opportunities for low- or moderate-income families. The amount of the density increase shall be based on the following standard:

For each affordable housing unit provided in the Open Space Development, one (1) additional building lot or dwelling unit is permitted Affordable housing is defined as units to be sold or rented to families earning 70 to 120 percent of the County median income, adjusted for family size, as determined by the U.S. Department of Housing and Urban Development.

B. In lieu of providing affordable housing units in the Open Space Development, the applicant may donate to the County land separate from the Open Space Development with suitable soils or access to public water and sewer for the purpose of developing affordable housing. The donated land shall contain at a minimum the land area needed to develop the total number of bonus units in accordance with the zoning requirements of the district in which the donated land is located, together with a minimum of twenty (20) percent open space land, at least half of which is suitable for active recreation.

Section 7 Procedures for application and approval

7.1 Concept Plan

A. Pre-Application Review: To promote better communication and avoid unnecessary expense in the design of acceptable subdivision proposals, each subdivider is encouraged to meet with the Planning Department prior to filing an application for Concept Plan approval. The purpose of this informal meeting is to introduce the applicant to the provisions of this Ordinance and discuss his/her objectives in relation thereto.

B. On-Site Visit: Prior to the submission of a Concept Plan, the applicant shall schedule a mutually convenient time to walk the property with the Planning Department

staff. The purpose of this visit is to familiarize the Planning Department staff with the property's special features, and to provide them an informal opportunity to offer guidance to the applicant regarding the tentative location of Secondary Conservation Areas, and potential house locations and street alignments.

Prior to scheduling the on-site visit, the applicant shall have prepared the Existing Features/Site Analysis Map as required in Section 8.3 below. If the on-site visit is not scheduled before the Concept Plan submission, it should occur prior to the Public Information Meeting described below.

C. Application Requirements: Applications for Concept Plan approval shall be submitted to the Planning Department prior to the submission of a Preliminary Plat and shall contain the following information:

- A County Tax Map showing the location of the parcel to be subdivided.
- Fifteen (15) copies of a Concept Plan of the proposed major subdivision prepared in accordance with the specifications for Concept Plan drawings as contained in Section 8 of this Ordinance. A Concept Plan shall consist of three parts, including:

- An Existing Features/Site Analysis Map;
- A Yield Plan; and
- An Open Space Development Plan.

• A Concept Plan application form as prescribed by the Planning Department in a form which provides a checklist identifying consistency with applicable design guidelines, the goals of the County's Comprehensive Plan, and the stated purposes of the zoning district within which the development is to be located.

• Stamped envelopes addressed to each owner of property within 500 feet of the property proposed to be subdivided. The names and addresses of property owners shall be based on the current listing as shown in the County Tax Office or Land Records System.

Model conservation subdivision ordinance

D. Public Information Meeting: Upon receipt and acceptance of the Concept Plan application, the Planning Department shall schedule a Public Information Meeting and mail notices of the meeting to each owner of property within 500 feet of the property proposed to be subdivided. The Public Information Meeting shall be held within 15 days of acceptance of the application, and notices shall be mailed by first class mail at least ten (10) days prior to the date of the meeting.

At the meeting, the Planning Department staff will explain the County's subdivision approval process, and the applicant will be available to answer questions about the proposed subdivision.

E. Planning Department Review Procedures: Within thirty (30) days of the date of the Public Information Meeting or within such further time consented to in writing by the applicant, the Planning Department shall submit to the Planning Board its recommendation, including a written analysis of the Concept Plan; its general compliance with the requirements of this Ordinance, the Comprehensive Plan, and other applicable codes and ordinances; and the concerns of citizens expressed at the Public Information Meeting. If the Planning Department fails to prepare a report to the Planning Board within the specified time period, or extension thereof, the Concept Plan is recommended without conditions.

F. Planning Board Review and Approval Procedures: After receiving the Planning Department's report or, if applicable, after the expiration of the time period prescribed in Section III-D-1-b, the Planning Board shall consider the Concept Plan and take action on the proposals. The Planning Board shall base its action on its findings as to the conformity of the proposals with all applicable regulations and shall:

- Approve the Concept Plan;
- Approve the Concept Plan subject to conditions; or
- Deny the Concept Plan.

If the Planning Board approves the Concept Plan subject to conditions, such conditions shall be reasonable and shall

seek to ensure compliance with applicable regulations. If the Planning Board denies the Concept Plan, the reasons for such decision shall be stated in writing to the applicant and entered into the minutes of the meeting at which such action was taken.

The Planning Board shall take action within forty-five (45) days of the meeting at which the Planning Department's report is submitted to it or within such further time consented to in writing by the applicant. If the Planning Board fails to take action within the specified time period, or extension thereof, the Planning Board shall be deemed to recommend approval of the Concept Plan without conditions.

G. Action Subsequent to Approval: If the Concept Plan is approved or approved with conditions, the Planning Board Chair shall endorse his/her approval on two (2) copies of the Concept Plan. One (1) copy of the Concept Plan shall be retained by the Planning Department, and one (1) copy shall be returned to the subdivider or his/her authorized agent.

From the date of approval of the Concept Plan by the Planning Board, the applicant shall have one (1) year in which to prepare and file an application for Preliminary Plat approval. If a Preliminary Plat for the subdivision has not been submitted within the specified time limit, the Concept Plan shall become null and void.

H. Appeal Procedures: The decision of the Planning Board regarding the Concept Plan may be appealed to the Board of Commissioners. If appealed, the Concept Plan shall be placed on the next regular meeting agenda of the Board of Commissioners. The Board of Commissioners shall have final approval authority, and, where applicable, all Concept Plans shall contain information and/or conditions approved by the Board of Commissioners.

The Board of Commissioners in all such appeals shall make findings of fact in support of its decision. The applicant shall be notified, in writing, of the Board of

Commissioners' decision within ten (10) days after said decision is made.

Section 8 Specifications for concept plans

8.1 Components of Concept Plans

The Concept Plan required by Section 7 shall consist of three parts:

- An Existing Features/Site Analysis Map;
- A Yield Plan; and
- An Open Space Development Plan.

The Concept Plan shall be prepared according to the "four-step" process for designing open space subdivisions described in Section 3.3 above. In addition, the Concept Plan shall be prepared by a team including at least a civil engineer or registered land surveyor, plus either a landscape architect or a land use planner experienced in open space design.

Each map or plan shall be drawn in black ink or pencil to a scale of not less than two hundred (200) feet to the inch. The scale chosen shall be large enough to show all required detail clearly and legibly.

8.2 General Information

Each map or plan required in Section 8.1 above shall contain the following general information:

A. A sketch vicinity map showing the location of the subdivision in relation to the existing street or highway system;

B. The plotted boundaries of the tract from deeds or maps of record and the portion of the tract to be subdivided;

C. The total acreage to be subdivided, including tax map, block and lot number reference;

D. The name, address and telephone number of the subdivider or owner and the person responsible for the subdivision design;

E. Scale, approximate north arrow and date of plat preparation; and

F. Name of subdivision.

Model conservation subdivision ordinance

8.3 Existing Features/Site Analysis Map

As determined from readily identifiable on-site inventories, aerial photographs, maps of record, State/Federal resource maps, and local planning documents and inventories, the Existing Features/Site Analysis Map shall contain the following information:

A. Primary Conservation Areas: Identification of physical resources associated with the site which restrict its development potential or contain significant natural and/or cultural resources, including:

- Topographic contours at ten-foot intervals, showing rock outcrops and slopes of seven and one-half percent (7.5%) to fifteen percent (15%), and more than fifteen percent (15%).
- Soil type locations and characteristics relating to seasonal high water table and depth to bedrock.
- Hydrologic characteristics of the site, including drainage tributaries, surface water bodies, floodplains, and wetlands.

B. Secondary Conservation Areas: Identification of significant site elements on buildable portions of the site, including:

- Vegetation of the site, defining approximate location and boundaries of woodland areas, and, wherever possible, vegetative association in terms of species and size. Information from aerial photographs shall be acceptable at the Concept Plan stage.
- Current land use and land cover (cultivated areas, pastures, etc.), existing buildings and structures, and burial grounds.
- Natural areas and wildlife habitats and corridors.
- Historic and archaeological sites, especially those listed on the National Register of Historic Places or included on the State's National Register study list, designated as a local historic landmark, and/or located in a local historic district.
- Scenic views onto the site from surrounding roads as well as views of scenic features from within the site.

C. Transportation and Utility Systems: Identification of facilities associated with the movement of people and goods, or the provision of public services, including:

- Railroad and street rights-of-way.
- Easements for vehicular access, electric and gas transmission lines, and similar uses.
- Public and private water and sewer lines, and storm drainage facilities.

8.4 Yield Plan

The Yield Plan shall contain the following information:

A. In addition to basic topography, the location of areas unsuited for development, including wetland locations, 100-year floodplains, and slopes exceeding 25 percent;

B. The proposed arrangement of lots, including size and number, and streets within the subdivision, including right-of-way widths; and

C. The location of soils suitable for individual septic systems as determined by:

- A map based on the medium-intensity soil survey for the County, published by the USDA Natural Resources Conservation Service, showing the location of soil types suited for septic systems. This map shall be prepared in consultation with the Soil Scientist of the Environmental Health Division of the Health Department.
- In reviewing the soils data in relation to the layout of the proposed lots, the County Planning Department may require the applicant to present the results of the preliminary soil suitability analyses conducted on a 10% to 15% sample of the proposed lots as required in Section 3.1.

8.5 Open Space Development Sketch Plan

1. A Sketch Plan shall be submitted by the applicant as a diagrammatic basis for informal discussion with the County Planning Commission regarding the design of a proposed subdivision or land development. It shall be drawn by a landscape architect, or by a physical planner experienced in conservation subdivision design. One of the purposes of the Sketch Plans is to help applicants and

officials develop a better understanding of the property and to help establish an overall design approach that respects its special or noteworthy features, while providing for the density permitted under the zoning ordinance.

2. To provide a full understanding of the site's potential and to facilitate the most effective exchange with the Planning Commission, the Sketch Plan should include the information listed below. Many of these items can be taken from the Site Analysis Map, a document that must in any case be prepared and submitted no later than the date of the Site Inspection, which precedes the Preliminary Plan. The diagrammatic Sketch Plan shall be prepared as an overlay sheet placed on top of the Site Analysis Map, both maps therefore being drawn to the same scale.

3. Sketch Plans shall be prepared by a landscape architect or by a physical planner with experience designing Open Space Subdivisions. Civil engineers and surveyors may also be added to the design team at this stage. However, their role does not become preeminent until the Preliminary Plan stage.

4. The Open Space Development Sketch Plan shall contain the following information:

A. The proposed arrangement of lots within the subdivision, including size and number.

B. The proposed street layout within the subdivision, including travelway and right-of-way widths, and connection to existing streets.

C. The location, type, and area of the open space proposed in the subdivision, including open space to be preserved:

- In a separate lot or lots under the ownership of a homeowners' association.
- As part of individually owned lots through a conservation easement applicable to multiple lots.
- In a separate lot or lots through dedication for public use, such as a park site, to a unit of local government, state government or a private land conservancy.

D. The location of proposed water supply and sewage disposal facilities, including:

- Well sites for individual and community water

Model conservation subdivision ordinance

systems.

- Nitrification fields and land application areas for community sewage disposal systems employing subsurface disposal and spray irrigation, respectively.

- Nitrification fields and land application areas for individual on- and off-lot sewage disposal systems employing subsurface disposal and spray irrigation, respectively.

Public water and sewer lines, where such facilities are available or capable of being extended.

5. Sketch Plan Submission and Review: Copies of a diagrammatic Sketch Plan, meeting the requirements described above, shall be submitted to the Commission's Secretary during business hours for distribution to the Planning Commission, the County Planner, the County Engineer and applicable advisory boards at least seven (7) days prior to the Planning Commission meeting at which the Sketch Plan is to be discussed. The Sketch Plan diagrammatically illustrates initial thoughts about a conceptual layout for Open Space lands, house sites, and street alignments, and shall be based closely upon the information contained in the Site Analysis Map. The Sketch Plan shall also be designed in accordance with the four-step design process herein.

The Planning Commission shall review the Sketch Plan in accordance with the criteria contained in this ordinance and with other applicable ordinances of the County. Their review shall informally advise the Applicant of the extent to which the proposed subdivision conforms to the relevant standards of this Ordinance, and may suggest possible plan modifications that would increase its degree of conformance. Their review shall include but is not limited to:

- A.** the location of all areas proposed for land disturbance (streets, foundations, yards, septic disposal systems, storm water management areas, etc.) with respect to notable features of natural or cultural significance as identified on the applicant's Site Analysis Map and on the County's Map of Potential Conservation Land, in its Comprehensive Plan;

- B.** the potential for street connections with existing streets, other proposed streets, or potential developments

on adjoining parcels;

- C.** the location of proposed access points along the existing road network;

- D.** the proposed building density and impervious coverage;

- E.** the compatibility of the proposal with respect to the objectives and policy recommendations of the County Comprehensive Plan; and

- F.** consistency with the zoning ordinance.

The Commission shall submit its written comments to the applicant and the Board. The diagrammatic Sketch Plan may also be submitted by the Board to the County Planning Commission for review and comment.

8.6 Management Plan.

1. Applicants shall submit a Plan for Management of Open Space and Common Facilities ("Plan") that:

- A.** allocates responsibility and guidelines for the maintenance and operation of the Open Space and any facilities located thereon, including provisions for the frequency of specific ongoing maintenance activities and for long-term capital improvements;

- B.** estimates the costs and staffing requirements needed for maintenance and operation of, and insurance for, the Open Space and outlines the means by which such funding will be obtained or provided;

- C.** provides that any changes to the Plan be approved by the Commission; and

- D.** provides for enforcement of the Plan.

2. In the event the party responsible for maintenance of the Open Space fails to maintain all or any portion in reasonable order and condition, [the jurisdiction] may assume responsibility for its maintenance and may enter the premises and take corrective action, including the provision of extended maintenance. The costs of such maintenance may be charged to the Homeowner's Association, or to the individual property owners that make up the Homeowner's Association, and may include administrative costs and penalties. Such costs shall become a lien on all subdivision properties.

8.7 Legal Instrument for Permanent Protection

1. The Open Space shall be protected in perpetuity by a binding legal instrument that is recorded with the deed. The instrument shall be a permanent conservation easement in favor of either:

- 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 in the event the organization becomes unable to carry out its functions; or

- a governmental entity with an interest in pursuing goals compatible with the purposes of this ordinance. 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.

2. The instrument for permanent protection shall include clear restrictions on the use of the Open Space. These restrictions shall include all restrictions contained in this article, as well as any further restrictions the Applicant chooses to place on the use of the Open Space.

8.8. Tax Assessment of Open Space

Once a legal instrument for permanent protection has been placed upon the Open Space, the County tax assessment office shall be directed to reassess the Open Space at a lower value to reflect its more limited use. If the Open Space is used purely for passive recreational purposes and the terms of the instrument for permanent protection effectively prohibit any type of significant economic activity, then the assessment shall be at a value of zero.

ONLINE RESOURCES

NC Green Growth Toolbox

The Green Growth Toolbox is an online guide developed by the North Carolina Wildlife Resources Commission to provide counties and towns with the resources they need to foster nature-friendly development practices. The Toolbox has links to various datasets that can be used to identify potential land for conservation. <http://www.ncwildlife.org/greengrowth/>



NC conservation data downloads

http://www.ncwildlife.org/greengrowth/Conservation_Data.htm

Conservation Planning Tool

The Conservation Planning Tool is intended to provide easy-to-access information regarding the state's highest-quality ecosystems. Highlighting the location of unique and irreplaceable natural resources will help guide decisions for land use planning and conservation. <http://www.onencnaturally.org/pages/ConservationPlanningTool.html>
One North Carolina Naturally also has a list of statewide and regional resources. http://www.onencnaturally.org/pages/CPT_Other_Planning_Efforts.html

NC Biodiversity and Wildlife Habitat Assessment tool

The Biodiversity and Wildlife Habitat Assessment is one of six GIS assessments that make up the One North Carolina Naturally Conservation Planning Tool mentioned above. The Conservation Planning Tool was developed to inform decision makers, landowners, and land-use planners of the importance of conservation planning as population growth and development in North Carolina continue to skyrocket.

Conservation Buffer Guidelines

The USDA National Agroforestry Center's *Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways* publication is a comprehensive guide to designing and planning vegetative buffers. The publication is available online in PDF format and also has a companion website.

http://www.unl.edu/nac/bufferguidelines/docs/conservation_buffers.pdf

Conservation Design Strategy Report

The Chicago Metropolitan area's conservation subdivision guide. <http://www.goto2040.org/ideazone/forum.aspx?id=748>

Greener Prospects



Randall Arendt's website includes downloadable brochures, case studies, and links to books he has published on conservation subdivision design. <http://www.greenerprospects.com>

Wisconsin Model Ordinance

<http://urpl.wisc.edu/people/ohm/consub.pdf>

Beginning with Habitat

Beginning with Habitat, a collaborative program of federal, state, and local agencies and nongovernmental organizations, is a habitat-based approach to conserving wildlife and plant habitat on a landscape scale. <http://www.beginningwithhabitat.org>

Smart Communities Network

A comprehensive guide to conservation subdivisions including case studies and ordinance workbooks. <http://www.smartcommunities.ncat.org/greendev/subdivision.shtml>



River Basin Center

The River Basin Center website has information on tools for sustainable growth. <http://www.rivercenter.uga.edu/service/tools/tools.htm>

Model ordinance language

http://www.rivercenter.uga.edu/service/tools/subdivisions/con_sub_model_ord.pdf

National Examples

Harmony, Florida: <http://www.harmonyfl.com/>

Tryon Farm: <http://www.tryonfarm.com/>

Prairie Crossing: <http://www.prairiecrossing.com>

North Carolina Examples

The Woodlands at Davidson:

<http://www.thewoodlandsatdavidson.com/>

RiversEdge, Currituck County:

<http://www.riversedge-curr.com/default.htm>

North Field and Creek Wood, Chapel Hill:

<http://www.chapelhillnc.com/>

REFERENCES

- Arendt, R. (1999). *Growing Greener: Putting Conservation into Local Plans and Ordinances*. Washington, DC: Island Press.
- Arendt, R. et al. (1996). *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*. Washington, DC: Island Press.
- Austin, M. E. (2004). Resident perspectives of the open space conservation subdivision in Hamburg township. *Landscape and Urban Planning*, 69(2-3): 245-253.
- Bowman, T., and J. Thompson. (2009). Barriers to implementation of low-impact and conservation subdivision design: Developer perceptions and resident demand. *Landscape and Urban Planning*, 92(2): 96-105.
- Bowman, T., J. Thompson, and J. Colletti. (2009). Valuation of open space and conservation features in residential subdivisions. *Journal of Environmental Management*, 90(1): 321-330.
- Hamin, E. (2007). *Do Bylaws Matter? Evaluating Conservation Subdivision Design*. Cambridge, MA: Lincoln Institute of Land Policy.
- Hostetler, M., and D. Drake. (2009). Conservation subdivisions: A wildlife perspective. *Landscape and Urban Planning*, 90(3-4): 95-101.
- Lenth, B. A., R. L. Knight, and W. C. Gilbert. (2006). Conservation value of clustered housing developments. *Conservation Biology*, 20(5): 1445-1456.
- Milder, J. C. (2007). A framework for understanding conservation development and its ecological implications. *Bioscience*, 57(9): 757-768.
- Mohamed, R. (2006). The economics of conservation subdivisions. *Urban Affairs Review*, 41(3): 376-399.
- Odell, E. A., D. M. Theobald, and R. L. Knight, 2003. Incorporating ecology into land use planning. *Journal of the American Planning Association*, 69(1): 72.
- Ohm, B. W., C. Hirsch, J. Lagro, and T. Rogers. (2000). *An Ordinance for a Conservation Subdivision*. Madison, WI: University of Wisconsin Extension. Online: <http://urpl.wisc.edu/people/ohm/consub.pdf>
- Pejchar, L., P. M. Morgan, M. R. Caldwell, C. Palmer, and G. C. Daily. (2007). Evaluating the potential for conservation development: Biophysical, economic, and institutional perspectives. *Conservation Biology*, 21(1): 69-78.
- U.S. Census Bureau. State & county quickfacts. Select a state. Washington, DC: U.S. Census Bureau. Online: <http://quickfacts.census.gov/qfd/index.html>

U.S. Census Bureau. Population estimates: Cumulative estimates of the components of resident population change for the United States, regions, states, and Puerto Rico: April 1, 2000 to July 1, 2009 (NST-EST2009-04). Washington, DC: Population Division. Online: <http://www.census.gov/popest/states/NST-comp-chg.html>

U.S. Department of Agriculture (USDA). State fact sheets: North Carolina. Washington, DC: USDA-Economic Research Service. Online: <http://www.ers.usda.gov/Statefacts/NC.htm>

Case study interviews

Byrd, S., developer, Randolph County. Personal communication. 2009.

Davis, R., county planner, Orange County Planning Department. Personal communication. 2009.

Heffner, T., developer, Orange County. Personal communication. 2009.

Holtz, P., county planner, Orange County Planning Department. Personal communication. 2009.

Johnson, H., planning director, Randolph County Planning Department. Personal communication. 2009.

Kemp, P., Board of Commissioners, Randolph County. Personal communication. 2009.

Krider, K., planning director, Town of Davidson Planning Department. Personal communication. 2009.

Robbins, J., developer, Town of Davidson. Personal communication. 2009.

Planning department surveys

We conducted a mixed-mode (telephone and e-mail) survey of 100 county planning departments to determine which counties have adopted conservation subdivisions in their zoning and development regulations.

Land trust surveys

We conducted a mixed-mode (telephone and e-mail) survey of North Carolina's land trusts to determine which land trusts had easements in conservation subdivisions and what the major concerns from land trusts were regarding the long-term management of open space in subdivisions.



Funding for this project was provided in part through an Urban & Community Forestry Grant from the North Carolina Division of Forest Resources, Department of Environment and Natural Resources, in cooperation with the USDA Forest Service, Southern Region.



Published by North Carolina Cooperative Extension Service

Prepared by

Steve Allen, M.S. candidate, North Carolina State University

Susan Moore, Extension Associate Professor and Director of Forestry & Environmental Outreach Program, North Carolina State University

Leslie Moorman, Urban Forestry Program Coordinator, North Carolina Division of Forest Resources

Chris Moorman, Associate Professor and Coordinator of the Fisheries, Wildlife, and Conservation Biology Program, North Carolina State University

Nils Peterson, Associate Professor, Fisheries, Wildlife, and Conservation Biology Program, North Carolina State University

George Hess, Associate Professor, Department of Forestry and Environmental Resources, North Carolina State University

2,000 copies of this public document were printed at a cost of \$2,608 or \$1.30 per copy

Distributed in furtherance of the acts of Congress of May 8 and June 30, 1914. North Carolina State University and North Carolina A&T State University commit themselves to positive action to secure equal opportunity regardless of race, color, creed, national origin, religion, sex, age, veteran status or disability. In addition, the two Universities welcome all persons without regard to sexual orientation. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.