



DRAGON RUN  
LAND USE  
POLICY AUDIT

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FOR THE MIDDLE PENINSULA  
PLANNING DISTRICT COMMISSION

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PARADIGM DESIGN

# DRAGON RUN LAND USE POLICY AUDIT

*for the Middle Peninsula Planning District Commission*

## FINAL REPORT

September 2, 2003

*Prepared by Paradigm Design; Reston, Virginia*



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## **1.0: INTRODUCTION AND CONTEXT**

### **1.1. Purpose of the Study**

This report summarizes the findings of the Land Use Policy Audit for the Dragon Run Watershed undertaken by Paradigm Design for the Middle Peninsula Planning District Commission. The Land Use Policy Audit is a component of the overall Dragon Run Special Area Management Plan for the Middle Peninsula Planning District Commission. The overall goal of the Land Use Policy Audit is to develop specific recommendations for strengthening, coordinating and integrating local land use policies that will increase their consistency and effectiveness in achieving the natural resource preservation goals of the county Comprehensive Plans, the Chesapeake 2000 Commitments and the goals of the Special Area Management Plan to yield the greatest benefit to the localities and natural resources in the Dragon Run watershed.

Within this overall framework, specific project objectives included the identification of:

1. Those local policies and regulations that have a significant impact on the environmental quality and ecological integrity of the watershed
2. Those local policies and regulations that have a significant impact on traditional uses of the watershed (e.g. farming, forestry, hunting, fishing, paddling)
3. How policies from the four watershed localities work with or against each other and whether those policies are consistent and effective in achieving the goals of county Comprehensive Plans, the Chesapeake 2000 Commitments, and the SAMP's goals
4. Specific local policies and regulations that work for and against the goals of county Comprehensive Plans, the Chesapeake 2000 Commitments, and the SAMP's goals



View of Bald Cypresses in the Dragon Run

Photo credit: MPPDC

## 1.2. Summary of the Report

The study was undertaken over a period of four months from April to August, 2003 and included a series of three work sessions with the Dragon Run SAMP Advisory Group to present interim findings and get recommendations and feedback on the progress of the study. This report summarizes the three basic components of the study:

1. Review of Existing Land Use Policies in the Watershed
2. Recommended Strategy for Policy Improvements
3. Illustrative Scenarios of Policy Recommendations

The first part of the report contains a summary of existing planning and regulatory documents for Essex, Gloucester, King and Queen and Middlesex Counties. It evaluates how well existing local plans coordinate with each other and how effectively and consistently existing plans, policies and regulations implement natural resource protection goals for the 90,000 acre Dragon Run Watershed as identified in local plans, the Chesapeake 2000 Commitments and the Memorandum of Agreement signed by the participants in the Dragon Run Special Area Management Plan (DRSAMP) effort. In addition to summarizing the initial findings of the Land Use Policy Audit, this section discusses general opportunities to strengthen existing policies and develop a more comprehensive approach to land planning in the Dragon Run Watershed.

The second part of the report describes an overall strategic framework for making land use policy improvements collectively among the four jurisdictions in the watershed over time. This section also lists examples of specific policies and standards, at both a policy and regulatory level that could be used to begin crafting a set of standards for the Dragon Run area. Finally this section also summarizes some innovative planning and land use tools that have been successfully adopted, in Virginia and elsewhere, that may be applicable to the issues of preserving traditional land uses in the Dragon Run.

The final part of the report takes the general recommendations for policy improvements and maps them on the landscape of the Dragon Run to see how they could be applied to achieve the goals of the area. The mapping is done at both a large, county-wide scale and at a small, site-specific scale in order to show the cumulative effect of individual land use policy decisions and their application on the landscape.

Together, the three parts of the report present a comprehensive analysis, strategic recommendations and illustrative examples of how land use policies may be improved to better achieve the environmental and community goals for the Dragon Run.

## 1.3. Dragon Run Special Area Management Plan

In 2001, the Middle Peninsula Planning District Commission (MPPDC) received a grant from the Virginia Coastal Management Program and NOAA to develop a Special Watershed Management Plan for the Dragon Run Watershed. The Dragon Run is a stream that flows through the Middle Peninsula of Virginia and through the counties of Essex, King and Queen, Middlesex and Gloucester. It empties into the Piankatank River, which flows into the Chesapeake Bay. The Dragon Run has been identified as a unique



and ecologically significant resource because of its pristine, largely undeveloped state and because its tidal and non-tidal cypress swamps support numerous habitats for rare and endangered plant and animal species. The Smithsonian Institute ranked the Dragon Run **the second (out of 232) most ecologically significant area in the Chesapeake Bay region**. Within the Dragon Run Watershed, the Virginia Department of Natural Heritage has so far identified one endangered animal species, five rare animal species, eight rare plant species, and five rare natural communities, although the entire area has not yet been surveyed.

Recognizing the significance of the Dragon Run as a cultural and ecological resource for the entire Middle Peninsula region and beyond, the MPPDC and the counties that surround and encompass the Dragon Run have undertaken development of a Dragon Run Special Area Management Plan. In 2002, the MPPDC and the counties of Essex, King and Queen, Middlesex and Gloucester signed a Memorandum of Agreement to participate in the development of the DRSAMP and to consider a set of specific goals and objectives intended to promote local policies that recognize the unique and distinct features of the Dragon Run. The mission, the goals and the objectives included in the Memorandum of Agreement were recommended by the Dragon Run SAMP Advisory Group to the Dragon Run Steering Committee and are summarized in **Appendix A**.



Featherfoil plants growing along the stream

Photo credit: MPPDC

#### 1.4. Chesapeake 2000 Commitments

On June 28, 2000, the governors of Virginia, Maryland, Pennsylvania, the Mayor of the District of Columbia, the U.S. EPA Administrator and the Chairman of the Chesapeake Bay Commission signed a new agreement to guide restoration in the Chesapeake Bay watershed through the year 2010. The agreement includes 83 specific "commitments" to improve water quality and protect natural resources in the Chesapeake Bay and its

tributaries with the goal of removing the Bay from the federal list of impaired waters by 2010. In addition to a number of specific commitments, there are five overriding goals:

**Living Resource Protection and Restoration** - Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem.

**Vital Habitat Protection and Restoration** - Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers.

**Water Quality Protection and Restoration** - Achieve and maintain the water quality necessary to support the aquatic living resources of the Bay and its tributaries and to protect human health.

**Sound Land Use** - Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollutant loadings for the Bay and its tributaries, and restore and preserve aquatic living resources.

**Stewardship and Community Engagement** - Promote individual stewardship and assist individuals, community-based organizations, businesses, local governments and schools to undertake initiatives to achieve the goals and commitments of this agreement.

The jurisdictions within the Dragon Run Watershed have affirmed their commitment to implementing the Chesapeake 2000 Agreement at the local level in part through their commitment to development of the DRSAMP. While all of the Chesapeake 2000 goals will ultimately depend on implementation at the local level, goals #2, #3 and #4, are most directly implemented through local land use policy and practice. These goals and related commitments from the Chesapeake Bay 2000 Agreement will be considered in this memorandum to the extent that they relate to local land use regulations and policies.



The Middle Peninsula – Detail of “A New Map of Virginia” by John Senex, 1719

From [Virginia in Maps](#) by Richard W. Stephenson & Marianne M. McKee, The Library of Virginia, 2000



### 1.5. Growth in the Dragon Run Region

The Dragon Run Steering Committee was formed in 1985 largely in response to concerns that mounting development pressure in the Middle Peninsula would threaten the unique ecological and cultural character of the Dragon Run Watershed. Over the last 15 years, the Middle Peninsula has continued to attract new residents, particularly retirees, due to its proximity to the Tidewater region and Richmond, its moderately priced housing and numerous recreational amenities, including the Dragon Run. From 1990 to 2000, three of the four counties encompassing the Dragon Run Watershed experienced growth rates exceeding the State average of 14.4%.

**Table 1: Population Growth by Counties**

County/PDC	1990 Population	2000 Population	% Growth 1990-2000
Essex	8,689	9,989	15.0
Gloucester	30,131	34,780	15.4
King & Queen	6,289	6,630	5.4
Middlesex	8,653	9,932	14.8
MPPDC	73,023	83,684	14.6

Source: U.S. Census Bureau

**Table 2: Residential Building Permits by Counties**

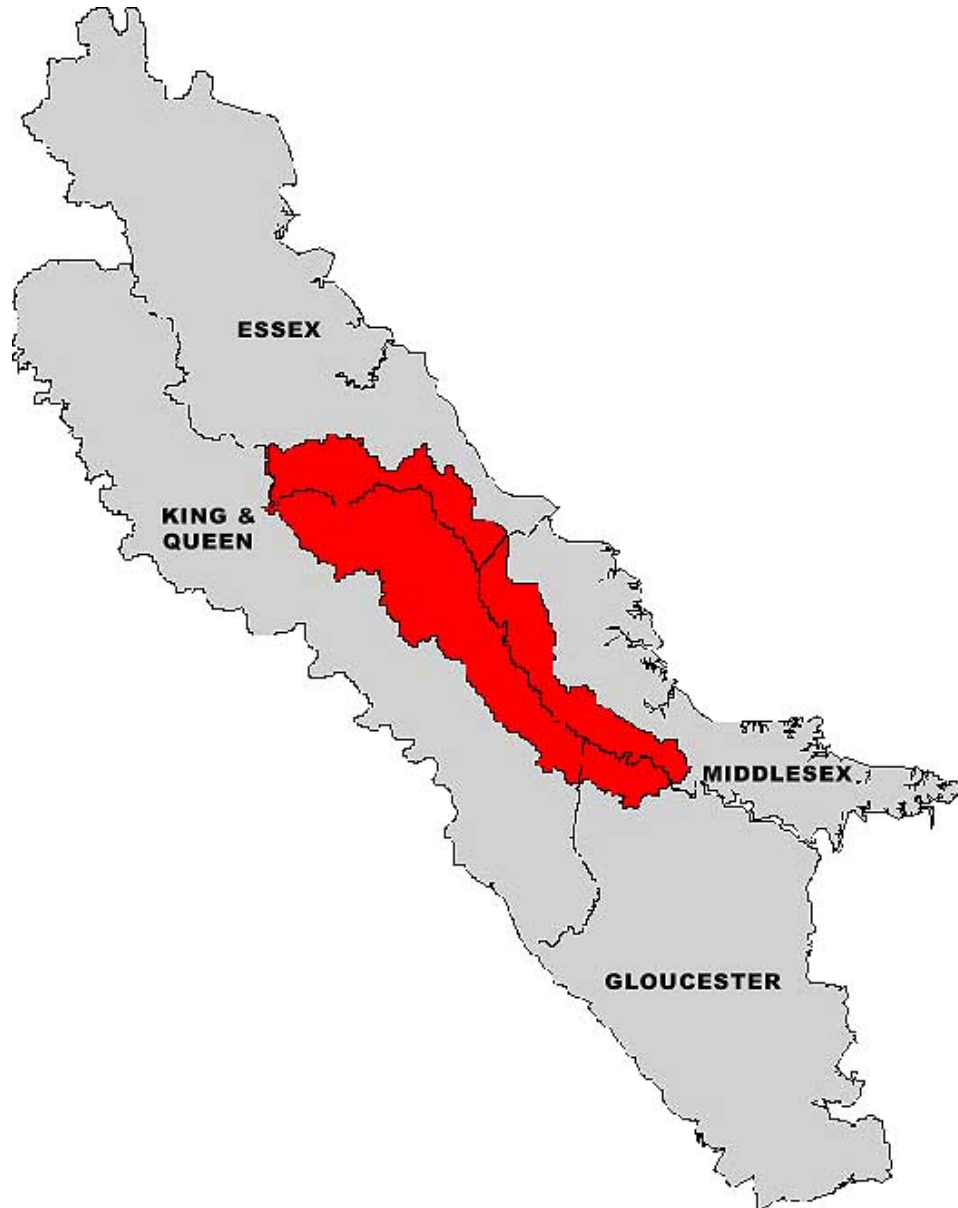
County/PDC	Residential Building Permits Issued 1997 – 2001 <sup>1</sup>				
	1997	1998	1999	2000	2001
Essex	43	49	67	41	119
Gloucester	188	204	203	183	215
King & Queen	27	26	24	24	33
Middlesex	90	82	107	71	102
MPPDC	491	543	587	484	626

Source: Weldon Cooper Center for Public Service at the University of Virginia

<sup>1</sup> Permits for new construction only, excluding data for mobile homes

The most populous county in the Dragon Run Watershed is also the fastest growing. Between 1990 and 2000, Gloucester County added approximately 4,650 new residents,

accounting for almost 45% of the total population increase in the Planning District that decade. Gloucester County has also led the PDC in issuance of new residential building permits over the past 5 years. Despite steady growth in the region, new development in the Dragon Run Watershed itself has been very limited and the area has retained its rural character. Agricultural and forestal activities, including silviculture, remain the predominant uses in the Watershed. Maintaining traditional uses like these and preserving the unique natural resources in the Dragon Run in the future will depend largely on plans, policies and regulations implemented at the local level.



**MAP 1. The Dragon Run Watershed and the Four Counties**

## 1.6. Why Change Things

The Dragon Run is clearly an area that has very low development pressure today. However, future conditions may be different and changes in economic trends, whether global or local could threaten the traditional farming and forestry economy of the area and increase pressures for more intense land uses in the Dragon Run. From 1992 to 1997, Virginia lost more than 467,000 acres of forest and farmland, at a rate more than double that of the previous 10 years<sup>1</sup>. Much of this was in suburban areas but much of it, also, was in areas that had until recently been rural and natural heartlands like the Dragon Run region. Statewide trends point toward more conversion of rural land from traditional uses to developed land.

Frequently, the jurisdictions in which this land is being converted institute changes in their land use regulations to protect farmland and forest resources from incompatible land development. However, this can be an uphill battle, especially once the local real estate market has begun to favor residential subdivisions and the pressure against changes in zoning are strongest. If the underlying zoning permits smaller residential lots (1-5 acres), a pattern of sprawl often sets up, in which the remaining rural landholdings become carved up incrementally into subdivisions that are developed "as of right" - without an opportunity for public hearings or legislative approval over the development.

While some areas within any rural region are clearly needed for economic development and may be appropriate for more intensive land uses, all four counties in the Dragon Run SAMP have, through the Memorandum of Agreement, agreed that the Dragon Run is an area where protection of farming, forestry and natural resources is paramount. In order to protect the natural resources and traditional land uses of the Dragon Run, it is important to plan proactively and implement strong land use policies now, while development pressures are still low, rather than waiting until the pressures have intensified.

The current state of land use regulation in the four counties has worked so far to maintain the Dragon Run in its relatively pristine state. However, the policies are not consistent across county boundaries; they often don't reflect a clear intent for protection of the Dragon Run and thus they are open to potential challenge in the future as development pressure grows. For example, the review of policies in the first phase of this project revealed several potential opportunities to refine the current land use policies in the four counties as they relate to the Dragon Run:

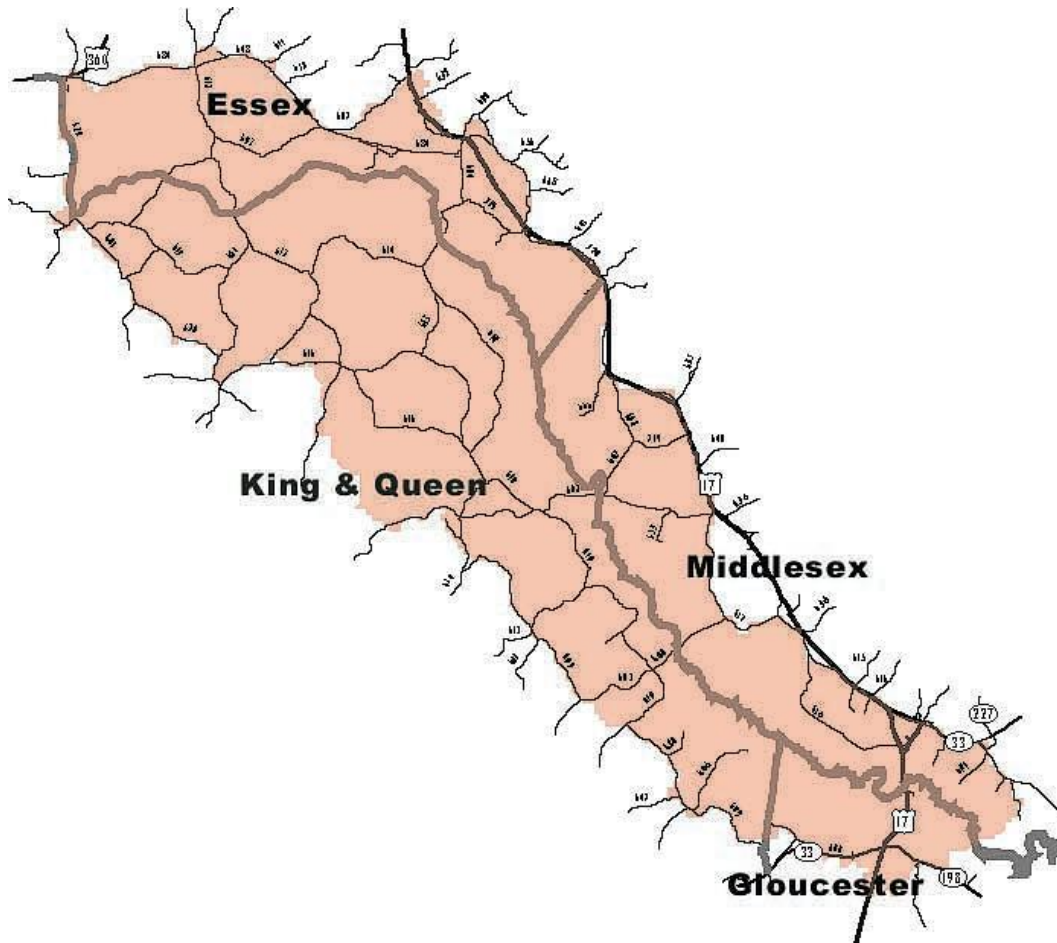
- The Comprehensive Plans don't delineate the watershed as a separate planning area and have little or no specific policy guidance for the Dragon Run.
- The zoning ordinances permit some potentially incompatible uses (such as landfill or auto graveyard), either by right or as conditional uses in the watershed, that may be more appropriately located in other parts of the counties.
- The primary restriction against large-scale residential development is a restriction against major subdivisions, listed in the Subdivision Ordinances of each county. This may be open to challenge as a form of growth management if it is not

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<sup>1</sup> Better Models for Development in Virginia, Edward T. McMahon, 2000

underscored by similar and consistent policies in the Zoning Ordinance and Comprehensive Plan.

This report goes one step further to suggest ways that land use policies in the Dragon Run watershed can be improved through a concerted effort that builds on the outstanding work of the regional partnership of the Dragon Run Steering Committee and SAMP to-date. The purpose of these recommendations is to propose a strategic course of action for strengthening and better coordinating the land use policies within the watershed so that they can maintain the character of the Dragon Run in the wake of potential future changing conditions in the region.



MAP 2. The Dragon Run Watershed



## 2.0: COMPREHENSIVE PLAN POLICIES

### 2.1. Comprehensive Plan Documents

The following analysis compares the current comprehensive plan policies that apply to the Dragon Run watershed as set forth in these county documents:

1. King and Queen County Comprehensive Plan. Dated June 13, 1994 with Planning Commission Review and Resolution July 2, 2001.
2. Essex County Comprehensive Plan, dated April 1998 and adopted June 16, 1998.
3. Comprehensive Plan, Gloucester County, Virginia, dated September 1991, amended November 2001.
4. County of Middlesex, Virginia 2001 Comprehensive Plan Update, dated December 4, 2001.

While each of the comprehensive plan documents address future land uses, natural resource protection, preferred development and the Chesapeake Bay provisions, the comprehensive plans vary in their scope and scale and their approach to guiding future development through comprehensive plan policies.

#### 2.1.1. The Dragon Run Watershed as a Planning Area

Local comprehensive plans are typically organized by geographic areas that represent communities of interest, by land use type (that may apply to several different parts of a county), or by subject area (i.e. public utilities, natural resources, etc.). Using a watershed as a basis for land use planning is a relatively new concept and one that is particularly suited to regional resources that span several jurisdictions.

At present, none of the comprehensive plans map or identify the Dragon Run Watershed as a distinct geographic planning area subject to a separate set of planning policies. Most of the documents do refer to and/or map the Dragon Run as one of several watersheds or streams in their respective counties in the "inventory" section of their plans. The text of the King and Queen County Comprehensive Plan addresses the "Dragon Run Swamp Preservation Area" as a component of its Middle and Lower District Planning Districts, but the plan does not provide a map to identify the extent of the watershed within these planning districts or describe how the preservation area designation is applied. The text acknowledges that the area will continue to require protection as wetlands because of its unique characteristics, but also states that "because of the Chesapeake Bay Protection Area, there should be no need for additional land use policies covering this feature" (p. 4:11, f.). Overall however, there is minimal discussion of the Dragon Run in the current comprehensive plans and very little specific policy guidance for the Dragon Run.

Two counties have adopted special zoning district regulations (to be discussed in greater detail in the zoning section of this memo) for at least portions of the Dragon Run Watershed. King and Queen County has a Dragon Run Protection Overlay in its zoning ordinance that limits land uses immediately adjacent to the stream. Middlesex County

has also adopted a Dragon Run Conservation District as part of its zoning ordinance. Ideally, zoning provisions are derived from comprehensive plan policies. A clear set of Dragon Run policies that emphasize the unique qualities of this regional resource would provide a defensible basis for any reasonable zoning or land use regulations that will be used by the local jurisdiction, collectively or individually, to protect the Dragon Run on a day to day basis.

Like most comprehensive plans, the comprehensive plans for the four counties address only the land within their county boundaries. As noted at the outset, regional watershed planning is a fairly new concept and the adopted comprehensive plans do not place particular emphasis on the Dragon Run as a regional resource and do not outline a consistent policy approach for the Dragon Run watershed. The ongoing SAMP process presents an opportunity to develop consistent policies for the entire Dragon Run Watershed at a time when at least two of the key counties are working on Comprehensive Plan updates. Opportunities to coordinate planning policies can range from revisions to individual plans making overall goals and policies consistent, to the adoption of a joint strategic plan for the Dragon Run that each county agrees to implement in its own jurisdiction. At the very least, there is an opportunity to highlight planning efforts for the watershed and to increase community awareness of the Dragon Run watershed as a unique regional and national resource.

***Findings: The Dragon Run as a Planning Area***

- None of the comprehensive plans map or identify the Dragon Run Watershed as a distinct geographic planning area subject to a separate set of planning policies.
- There is minimal discussion of the Dragon Run in the current comprehensive plans and very little specific policy guidance for the Dragon Run.
- The adopted comprehensive plans do not place particular emphasis on the Dragon Run as a regional resource.

### **2.1.2. Land Use Policy Guidelines**

The Dragon Run Watershed is subject to the land use policies of four different jurisdictions. The predominant future planned land uses in the watershed are agriculture and rural residential uses. These designations reflect the major land uses in the region today. However, there are areas that are planned for more intense development, particularly at the east end of the watershed and in the Route 17 corridor. The following table summarizes planned land uses in the Dragon Run Watershed by County.

**Table 3: Planned Future Land Uses in the Dragon Run Watershed**

County	Future Land Use Designations - Dragon Run Watershed	
Essex	<b>Countryside District</b>	The majority of the watershed located in Essex County is planned for rural residential development with a minimum one-acre lot size. However, development intensity is limited to one unit per 5 acres of land owned.
	<b>Rural Residential</b>	A very small portion of the watershed in Essex County is designated Rural Residential which allows for residential development on one acre lots. This designation generally recognizes existing development patterns.
Gloucester	<b>Rural Countryside District</b>	The majority of the watershed located in Gloucester County falls within this district which is intended to encourage farming and maintain rural character. Rural residential development is permitted, but is intended to be secondary to agricultural uses. A five-acre minimum lot size is recommended and clustering is encouraged.
	<b>Rural Service Area</b>	The area known as the Glens is deemed a Rural Service Area. Generally these are existing settlements or crossroads that include service uses such country stores, post offices, fire stations as well as houses. Residential development at a one-acre minimum lot size is appropriate and clustering is encouraged. The plan mentions that some light industrial or transportation oriented uses may be appropriate at Glens because of Route 17 frontage.
	<b>Resource Conservation District</b>	Land areas, including wetlands and floodplains, along shorelines and all tributary streams are included in the Resource Conservation District. Generally only passive recreation and low density residential uses are considered appropriate in these areas.
King & Queen	<b>Rural Development Area</b>	This area is planned for forests, agriculture and rural residential subdivisions. A landfill is indicated in the watershed area.
	<b>Dragon Run Swamp Preservation Area</b>	This area is not mapped but the plan's description suggests that it borders the Dragon Run/Swamp. For land use guidance, the plan defers to the Chesapeake Bay Act provisions.
Middlesex	<b>Residential Areas</b>	The majority of the watershed is designated for low density residential development, although the policies do state that preservation of prime farmland is a priority. Appropriate densities are determined by the zoning ordinance and surrounding uses.

	<p><b>Industrial Development Areas</b></p>	<p>South of Saluda ,there is an existing area of light industrial use/zoning that is planned for continued light industrial use. The plan also identifies the Route 17 corridor as an "Industrial Development Opportunity Zone", appropriate for suitable industrial activities. Exact boundaries would be determined as individual uses are approved. The south side of Route 17 is generally located within the Dragon Run watershed.</p>
	<p><b>Transitional Development Commercial Center</b></p>	<p>Saluda and the surrounding area is planned to continue as a mixed settlement of low impact commercial activities, services, and residences at low to medium density adjoining higher intensity commercial development.</p>

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Comprehensive Plans.*

Generally, less intensive land uses will better support the goals of the memorandum of agreement to maintain the Dragon Run in a natural and pristine state, because they require less monitoring and mitigation.

In addition to the planned land use map, each plan contains general land use goals and policies relating to growth management and future development. Several of the overall growth management and land use goals included in the county plans are consistent with SAMP goals to maintain traditional land uses, such as farming and forestry, within the watershed and protect natural resources. However, many of the existing goals and policies are so broad that they could be difficult to apply on a day-to-day basis. At a minimum, specific revisions to individual policies identifying which types of uses are appropriate and preferred in the Dragon Run should be considered.

Broad policies and goals provide flexibility in evaluating land development applications but can result in inconsistent decision-making. The more specific a land use plan is, the more likely it is to bring about the desired end state. Therefore, a specific set of policies for the Dragon Run should improve the likelihood that it will retain its character and quality. However, developing a set of specific land use recommendations that is acceptable to multiple jurisdictions may prove difficult since priorities and preferences tend to emerge as the planning process becomes more focused.



**Findings: Future Land Uses in the Dragon Run**

- The predominant future planned land uses in the watershed are agriculture and rural residential uses.
- There are areas planned for light industrial development in Middlesex County, particularly at the east end of the watershed and in the Route 17 corridor. There is also the potential for industrial development in the Glens area.
- Several of the overall growth management and land use goals included in the county plans are consistent with SAMP goals to maintain traditional land uses, such as farming and forestry, within the watershed and protect natural resources. However, many of the existing goals and policies are so broad that they could be difficult to apply on a day-to-day basis.

**2.1.3. Natural Resource Policy Guidelines**

Since all four of the comprehensive plans that address the Dragon Run watershed are subject to the Chesapeake Bay Preservation Act, environmental policies for features that impact water quality, such as wetlands, floodplains, slopes, soils, etc., are extensive. In most cases, comprehensive plan policies relating to preservation of water quality have been extensively implemented in the Dragon Run through zoning, subdivision, and erosion and sediment control regulations. These policies are somewhat easier to implement because there are scientific methods of measuring how effective the policy is. Another reason that these policies are so well defined is that localities were required to respond to a state mandate. Absent an outside force establishing minimum standards, it is sometimes difficult to impose new regulations on landowners, particularly in communities where landowners have a well-developed respect for individual property rights.

All of the plans address a range of other natural and cultural resources that contribute to the rural character and unique ecology that defines the Dragon Run Watershed. These include policies relating to wildlife habitat, groundwater, forest resources, prime agricultural soils, scenic, historic and archaeological resources, surface water features, etc. The Gloucester County plan even addresses the design and siting of new structures in the rural landscape. Generally, these policies are not as specific or well defined as policies relating to water quality. This may be because there is more subjectivity involved in implementing, measuring and mitigating the impacts associated with the loss of some of these resources. Additionally, developing specific policies for protection of many of these resources requires balancing public rights and private rights.

Preparing more specific natural resource policies to address the features of the Dragon Run Watershed would be easier than trying to refine or apply existing policies from the adopted comprehensive plans because the Dragon Run is a unique ecological environment. The SAMP provides an opportunity to evaluate what resources are particularly important to maintain the cultural, ecological and natural environment that defines discrete ecosystem. This process also involves working with key stakeholders

and landowners in the Dragon Run to develop natural resource policies that are more appropriate, effective, and that may proceed through a county level adoption process more easily than policies that would apply countywide.

**Findings: *Natural Resource Guidelines for the Dragon Run***

- Policies for natural features that impact water quality, such as wetlands, floodplains, slopes, soils, etc., are highly refined and relatively consistent.
- Policies addressing other natural features and cultural and historic resources vary widely from broad goal statements to specific implementation strategies, indicating that there may be different levels of commitment to resource protection and priorities in these four jurisdictions.

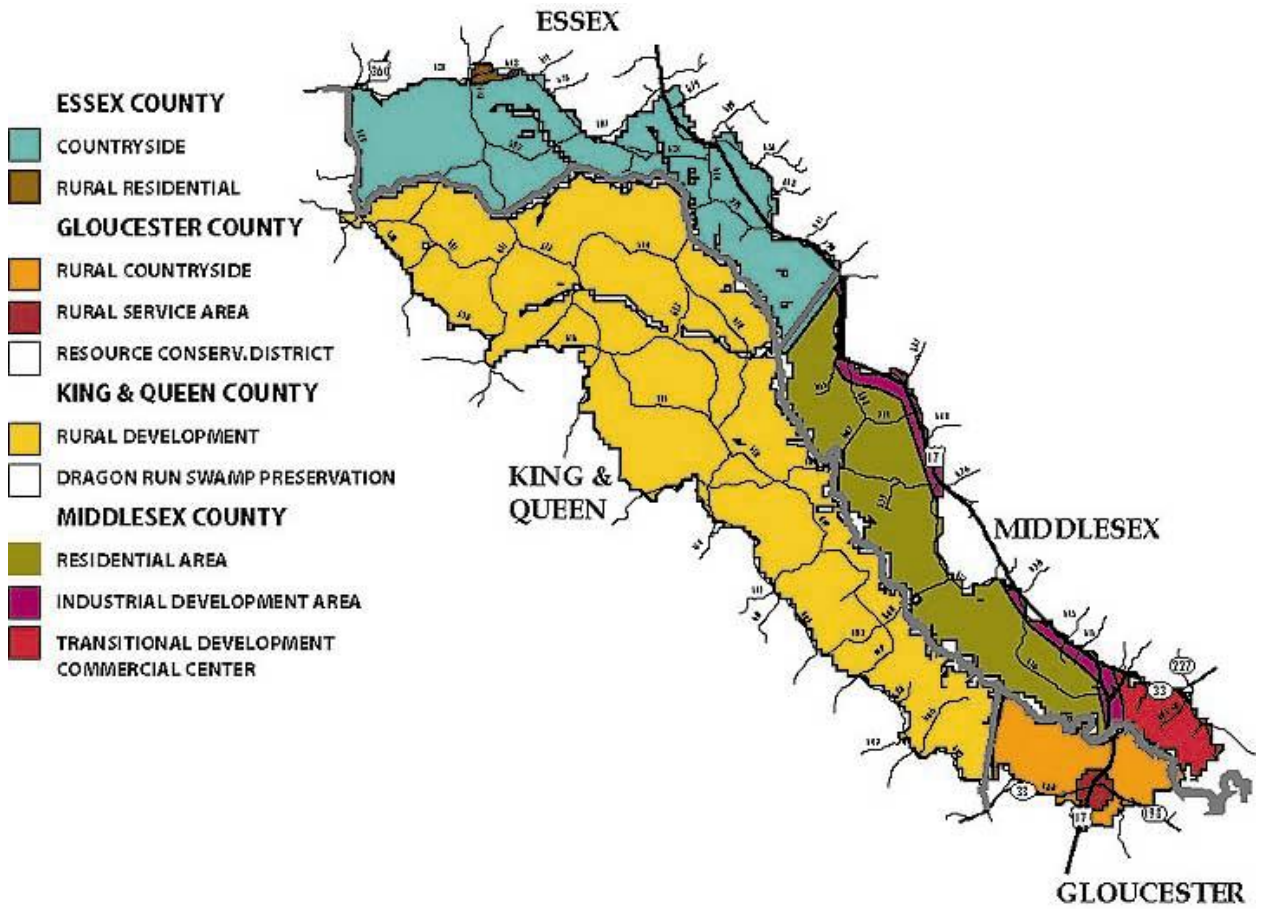
#### **2.1.4. Utility Policy Guidelines**

One significant factor that influences development and land use is the provision of utilities, particularly central sewer and/or water. The availability of public utilities allows for far more intense development than that supported by individual systems. Central sewer and water services can create demands for additional development to make their development financially feasible. Even though individual systems can act as non-point source pollutants that may threaten water quality in inferior soils, more serious threats to water quality may develop with central utilities.

There are currently no true public or central utilities within the Dragon Run watershed, although the Saluda courthouse, which is just outside the Watershed, has a public sewer system. Saluda, in Middlesex County, is served by a private water system. This is one important reason why development has been limited in the watershed. All four of the comprehensive plans discuss the possibility of central sewer and water service in the future in planned growth areas and to serve industrial development. None of the comprehensive plans call for the extension or construction of central sewer and water service into the Dragon Run watershed. Middlesex County has however, identified the Saluda area and the Route 17 Light Industrial Corridor as water and sewer study areas. Portions of these are located within the Dragon Run watershed. The issue of central utility extensions into the Dragon Run watershed should be carefully considered to ensure that potential impacts on the watershed are fully evaluated.

**Findings:      *Utility Policy Findings for the Dragon Run***

- There are currently no public or central utilities within the Dragon Run watershed. Saluda, in Middlesex County, is served by a private water system and the Saluda Courthouse (just outside the Watershed) has a public sewer system.
- Generally, planned land uses in the watershed would not require central utilities.
- None of the comprehensive plans call for the extension or construction of central sewer and water service into the Dragon Run watershed at this time.
- Middlesex County has identified the Saluda area and the Route 17 Light Industrial Corridor as water and sewer study areas. Portions of these are located within the Dragon Run watershed.



**MAP 3. Summary Map of Comprehensive Planning Districts in the Dragon Run Watershed**



### 3.0: ZONING & LAND DEVELOPMENT REGULATIONS

#### 3.1 Zoning

The following analysis compares the current zoning ordinances and regulations of the 4 counties as they relate to the area inside the Dragon Run Watershed. While there are clearly similarities in approach and general intent among the jurisdictions, there are some important differences in the ways that land uses and development are regulated in the Watershed.

##### 3.1.1. Zoning Districts

The table below summarizes the zoning districts that are included within the boundaries of the Dragon Run Watershed for each of the 4 counties:

**Table 4: Zoning Districts By Jurisdiction**

County	Zoning Districts within the Dragon Run Watershed	
Essex	<b>A-2</b> <b>R-2</b> <b>MH-1</b>	Limited Agricultural Limited Residential Mobile Home Park
Gloucester	<b>RC1</b> <b>B-4</b> <b>I-1</b> <b>H-1</b>	Resource Conservation Rural Business Industrial Historic Overlay
King & Queen	<b>A</b> <b>I</b>	Agricultural Industrial
Middlesex	<b>RH</b> <b>LDR</b> <b>VC</b> <b>GB</b> <b>LI</b> <b>DRCD</b>	Resource Husbandry Low Density Rural Village Community General Business Light Industrial Dragon Run Conservation District

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances*

From this comparison, it is evident that there is a considerable variety in the types of zones that are represented within the Watershed. While the overwhelming majority of the land area in the watershed is in relatively low-intensity zones such as conservation and agricultural, there are a number of areas in which commercial, business and industrial uses are permitted. The geographical distribution of these zones by county are

shown in the attached **Map 1**. The Relative land area in each zone within the Watershed is shown in **Appendix C**.

The zoned area in the Watershed represents **the lowest intensity zoning district** for King & Queen and Middlesex Counties. For Gloucester County, there is one lower intensity district (C-1) that is outside the Dragon Run area which allows no residential development at all. For Essex County, there is one lower intensity district (A-1) that is outside the Dragon Run area which generally restricts residential density to 1 lot per 20 acres.

**Findings: Zoning Districts in the Watershed**

- There is a considerable variety of zoning districts, including commercial and industrial zones in the Watershed.
- More intense zones such as higher density residential and non-residential zones are present but only over a relatively small land area.
- The lowest intensity zones for 2 of the counties (Gloucester and Essex) are not in the Dragon Run Watershed at all.

The Permissible Use Matrix shown in **Appendix B**, shows a comparison of permissible uses by zoning district within each county. The Matrix allows a comparison, County by County, of which uses are permitted, either by right or through some sort of conditional use permit or process.

In looking at how this list of uses either support or detract from the goals for the Dragon Run Watershed, it is important to look at two basic ways of controlling adverse impacts through zoning regulations in a rural area:

1. by USE
2. by PERFORMANCE STANDARDS

In the first case, certain uses are assumed to have some intrinsically harmful impacts in a local area and are **excluded** as uses from the particularly sensitive area, for example such as industrial or mining uses in an agricultural area. In the second case, the zoning districts are generally more **permissive** of a wide range of uses, relying instead on **performance standards** located elsewhere in the ordinance to mitigate the impacts from these more intense uses. For example, site plan requirements or conditional approval processes in an ordinance would set standards for such things as noise levels, erosion and sediment control and water quality impacts. The Chesapeake Bay Act ordinances adopted at the local level are a good example of the second case – typically addressing impacts more through performance standards than through uses within the Resource Management Areas.

This is an important distinction within the Dragon Run Watershed since there is a wide range of permitted uses as a whole for the 4 counties in the watershed, including relatively intense uses such as Auto Graveyard, Manufacturing and Truck and Freight Terminal. Although these uses are in limited areas of Industrial or Commercial zoning districts, they are potentially incompatible with the goals for the watershed, especially the preservation of traditional farming and forestry industries. It could be assumed that negative impacts from these uses are controlled through **performance standards** such as those in the Chesapeake Bay ordinances, for example. Nevertheless, it is reasonable to consider whether they should be allowed within the Dragon Run Watershed at all, and whether they further the goals of the area.

The inclusion of more intense uses such as these in zoning districts within the watershed can negatively affect the local environment and traditional farm and forest uses in at least two important ways:

1. Incompatible uses exert a subtle pressure over time for "like" uses – applicants for rezonings may fairly argue that these uses are already present in an area and should be allowed to expand if there is no specific prohibition against them in the zoning ordinance.
2. Incompatible uses over time can "fragment" the traditional land use patterns in an area - even small amounts of incompatible development can alter the perception of an area and degrade its rural character unless the uses themselves are managed, not just their impacts. For example, very low-density rural residential uses can fit well with traditional uses such as forestry. However, higher-density suburban patterns, even in small quantities, are often a poor fit with forestry practices and new residents often complain about cutting, log trucks, controlled burns or other aspects of forest management.

### 3.1.2. Permissible Uses

All 4 counties have base zoning districts that permit a wide complement of agricultural and forestry uses by right. There is a considerable consistency of purpose and intent among the base agricultural or conservation districts that make up the majority of the Dragon Run watershed for the 4 counties. The following table gives a profile of the purpose and intent behind each of the zones that are predominant in the Dragon Run area in each County:

**Table 5: Purpose and Intent of Predominant Zoning Districts in the Dragon Run Watershed**

County	District	Purpose and Intent (excerpted)
Essex	A-2 Agricultural Preservation	<i>The purpose of this District is to protect existing and future farming operations and at the same time allow for low density residential uses. This district generally corresponds to areas of the County represented as the Countryside District and Rural Residential District in the County Comprehensive Plan. Generally, this district covers certain portions of the County now devoted entirely or predominantly to various open uses, such as farms, forests, parks or lakes, into which residential or other types of development could reasonably be expected to expand in the foreseeable future.</i>
Gloucester	RC-1 Rural Countryside	<i>The intent of the RC-1 district is to conserve farm and forest land and to encourage agricultural activities, thereby helping to ensure that commercial agriculture and silviculture will continue as long term land uses and viable economic activities within the County.</i>
King & Queen	A Agricultural	<i>The district is designed to protect existing farms, forests, conservation areas and other types of rural uses; to encourage future development only when it promotes the preservation of the rural qualities of the County; and to provide for supportive commercial uses, along with necessary community facilities. The use restrictions and other regulations within the district are intended to reflect the importance of [sic] agriculture and forestry to the character and economy of the County and to discourage</i>

		<i>development of other uses, except where they promote the preservation of the rural qualities of the County.</i>
Middlesex	RH Resource Husbandry	<i>The purpose of the Resource Husbandry "RH" District is to conserve and protect from competing or incompatible uses, traditional agricultural and forestry uses of large tracts which are particularly well suited for such uses by virtue of soil, topographic, and other natural conditions. The protection of large agricultural and forestry tracts is necessary to promote the general health and welfare of the County by insuring that valuable natural resources such as timber and fertile farmlands are properly managed and preserved for present beneficial environmental effects and for use of future generations.</i>
Middlesex	LDR Low Density Residential	<i>Middlesex County is predominantly rural in character and should remain so according to the Comprehensive Plan. The rural character of the County promotes the general health, welfare and safety of the citizens of the County by insuring them with a quiet, peaceful, uncluttered and safe living environment. The "LDR" District is intended to aid in the achievement of this goal by providing for a low density mixture of the primary uses of agriculture and forestry and secondary residential, recreational, and selected non-intensive commercial and public or quasi-public uses, throughout a major portion of the County.</i>

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances*

The above language from the County ordinances is important for establishing the basic intent of the agricultural and conservation zones that make up the majority of the Dragon Run Watershed area. This is a prime indication of how much the zoning ordinances support farming, forestry and resource conservation. There is a variation in the implied degree of protection for farming and forestry, as described in the statements of intent. While all the districts highlight the protection of farming and forestry as a principal intent of the zone, the LDR district in Middlesex County acknowledges residential and other uses as acceptable but "secondary". The A-2 district in Essex County states that residential uses could be expected to expand in the future in this district (although Essex and other counties control residential expansion somewhat through the subdivision requirements). King and Queen County goes somewhat farther in stating that other uses are discouraged except where they can be shown to "promote the preservation of the rural qualities of the County." Finally, Middlesex County's Resource Husbandry District has probably the strongest language by specifically stating that the zone is intended to **protect** traditional farming and forestry "from competing or incompatible uses."

<p><b>Findings: Overall Permissible Uses in the Watershed</b></p> <ul style="list-style-type: none"> <li>• Currently, permitted and conditional uses in the watershed cover a broad spectrum, including some very intense uses such as auto junkyards and manufacturing.</li> <li>• It should be considered whether these more intense uses are compatible with the goals for the watershed, specifically environmental protection and the protection of farming and forestry.</li> <li>• Performance standards, such as those in the Chesapeake Bay Act, do not completely protect against the impacts of these uses.</li> <li>• Incompatible uses exert a subtle pressure over time for “like” uses.</li> <li>• Incompatible uses contribute to a fragmentation of the traditional land use</li> </ul>
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Another indicator of how supportive the zoning is for farming and forestry is how other, potentially competing, uses are treated in the zoning. The following are examples of land uses that could potentially be incompatible with traditional farming and forestry that are currently permitted by right or conditionally in the Watershed:

**Table 6: Selected By Right Uses in Agricultural / Forestry Districts**

Use	County & Zoning District
Public Landfill	Essex (A2 District – permitted)
Golf Course / Country Club	Middlesex (LDR District – permitted)
Public Airport	Essex (A2 District – permitted) Middlesex (LDR District – permitted)

Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances

**Table 7: Conditional Uses in Agricultural / Forestry Districts**

Use	County & Zoning District
Wastewater Treatment Plant	King and Queen (A District – conditional)
Self Storage Facility	King and Queen (A District – conditional)
Commercial Racetrack	King and Queen (A District – conditional)
Dirt Dragway	King and Queen (A District – conditional)
Concrete Plant	King and Queen (A District – conditional)
Auto Graveyard	Essex (A2 District – conditional)
Mining, Sand & Gravel	Essex (A2 District – conditional) Gloucester (RC-1 District – conditional)
Public Landfill	Essex (A2 District – conditional) Gloucester (RC-1 District – conditional)

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances*

It is commonly assumed that special exception, conditional permit and other such legislative processes allow jurisdictions to pick and choose whether they allow certain uses in a particular zone. While this may be true to some extent, it is generally not the best planning practice. The intent of conditional permit processes is to allow greater scrutiny of uses that are **basically compatible with the intent of the district**. It allows boards and planning commissions to mitigate potential negative impacts from some of these uses through their legislative approvals **but it is not intended to permit uses that are incompatible with the purposes of the district**. For example, commercial stables may be considered compatible with rural character and agricultural purpose but may need additional controls to manage impacts of traffic or waste disposal. Commercial racetracks, on the other hand, could be considered incompatible in an agricultural district and would be more appropriately located in another zoning district. Aligning the list of permissible uses with the basic intent of the zones could make the zoning stronger, less susceptible to legal challenge and would better protect traditional uses in accordance with the goals of the comprehensive plans and the Dragon Run Memorandum of Agreement.



**Findings: Permissible Uses in Agricultural and Forestry Zones**

- All the counties use language that highlight farming and forestry as the **primary** uses in the zones
- However, all but the Middlesex RH District allow for varying degrees of **other** uses in the zones, with Essex County's A District indicating that residential uses could expand into the zone in the future.
- Currently, there are a few potentially incompatible or competing uses permitted "**by right**" in the agricultural and forestry districts, such as golf courses and landfills.
- There is a much greater variety of potentially incompatible uses that are permitted **conditionally** in the agricultural/forestry zones, such as concrete plants, auto graveyards and duplex residences.
- Although conditional uses allow for greater control than permitted uses, they should not be included in the districts if they are clearly at odds with the basic purpose and intent of the district itself.

**3.1.3. Residential Uses and Densities**

Modern land use trends have shown that the greatest competitive threat to farming and forestry uses in a rural area have come from widespread **residential** development. To this end, it is important to compare how the base agricultural, forestry and resource conservation zoning in each county treats residential development. All of the County zones in the Dragon Run Watershed allow some degree of residential development, both by-right and conditionally.

The general consensus from the planners and administrators interviewed in each County is that there is currently low market pressure for residential development in the Dragon Run area. However, several commentators from the Advisory Group meetings have noted that the pressure seems to be rising, based on increasing interest in, and prices for, residentially zoned land in the area. Experience in other rural jurisdictions in Virginia, such as Northampton County, Clarke County and Gloucester County as well, have shown the speed with which residential development pressure can accelerate in an area, even when it is fairly remote from major employment areas. This increased demand typically plays out in greater volume of development applications, more conversion of farmland and forestry uses to subdivisions, increased threats to the natural resources and changes to the basic rural character and way of life in an area.

Typically, counties look to strengthen their agricultural and forestry zoning only after the market changes are well established and the threats to traditional uses have become more widespread. By contrast, the lack of development interest in the Dragon Run area

allows the counties an opportunity to plan ahead and prepare their ordinances for increasing development pressure while the stakes are lower and the community is potentially less divided over these issues.

For purpose of comparison, it is instructive to look at the base residential densities in each of the County agricultural or conservation zones. The 2001 Buildout Analysis completed by Anderson & Associates analyzes the basic permissible densities by zone and allocates them geographically on the landscape to come up with a theoretical potential of 38,000 to 40,000 lots within the 90,000 acre watershed. A closer look at the specific zoning and subdivision requirements in each county, however, yields a more complex picture of how that potential compares with rules for by-right development, conditional uses, subdivision and approval requirements.

#### **3.1.3.1. "By Right" Densities & Lot Sizes**

The basic question of what residential density is allowed in the watershed is a crucial one. A fundamental distinction is between "by right" or permitted uses and conditional uses. With by right uses, review and approvals are administrative, typically made by the zoning administrator or planning director. With conditional uses, approval is subject to a public hearing process involving Planning Commission and Board of Supervisors approval, based on public and staff input and other potential levels of review.

The following table shows the permitted residential densities in the basic agricultural/forestry/conservation zones in each county:

**Table 8: “By Right” Density & Lot Size in Agricultural / Forestry/Conservation Districts**

County	Zoning Districts within the Dragon Run Watershed	Minimum Lot Size	Maximum Number of Lots Permitted “By Right”	
Essex	<b>A-2</b>	Limited Agricultural	1 ac. <sup>2</sup>	5 lots <sup>3</sup>
Gloucester	<b>RC1</b>	Resource Conservation	5 ac. <sup>4</sup>	3 lots <sup>5</sup>
King & Queen	<b>A</b>	Agricultural	2 ac. <sup>6</sup>	3 lots <sup>7</sup>
Middlesex	<b>RH</b>	Resource Husbandry	2.5 ac. <sup>8</sup>	2 lots <sup>9</sup>
	<b>LDR</b>	Low Density Rural	2.5 ac. <sup>10</sup>	6 lots <sup>11</sup>

Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances

The key finding from this comparison of “by right” potential is that only a handful of lots may be properly subdivided without legislative approval in all the predominant zones in the Watershed. For the purpose of this comparison, “by right” is defined as an **administrative approval** process (by the Zoning Administrator or similar agent). Conditional uses are defined here as being those that need some sort of **legislative or quasi-legislative approval** (Board of Zoning Appeals or Board of Supervisors).

Basically, all of the Counties have some provision that assures that major residential development in the agricultural/forestry/conservation zones must go through a legislative process. This is generally done by prohibiting **major subdivisions** in low intensity districts, thus requiring a **rezoning** to a higher intensity zone in order to allow a major subdivision. This approach is a relatively effective way to protect these traditional uses from competing residential development, especially where development pressures are low as they currently are in the Dragon Run area. Anyone who wanted to develop a larger residential project in the Watershed would have several hurdles to jump over, including rezonings, public hearings, building roads to VDOT standards and potential proffer contributions for offsetting the fiscal impact of the development on the County.

<sup>2</sup> 5 acre min. lot size if designated as “Countryside District” in the Comprehensive Plan

<sup>3</sup> Major subdivisions are not permitted in the District

<sup>4</sup> Family Transfers allow 3 ac. min. lot size

<sup>5</sup> Major subdivisions (more than 3 lots) require rezoning to a residential zone

<sup>6</sup> 2 ac. min. lot size if fronting on exist. rural roadways – 3 ac. min. lot size if on private access easements

<sup>7</sup> Up to 2 subdivided lots + “remainder” of parcel

<sup>8</sup> Family subdivision may be reduced to 1 ac. lot size

<sup>9</sup> 1 lot + remainder for parcels over 50 acres

<sup>10</sup> Family subdivision may be reduced to 1 ac. lot size

<sup>11</sup> Max. 6 lots for Minor Subdivisions – Major subdivisions are Permitted only in Residential Districts

Nevertheless, all these impediments and others beyond them, have clearly not been absolute deterrents to residential development when market forces have been sufficient to offset their costs, as evidenced by rural development examples in other parts of the Commonwealth. It is therefore instructive to look at what actions and approvals would be required in order to develop a major residential subdivision in each County, under the current ordinances.

**3.1.3.2. Potential Residential Development from Rezoning or Conditional Approvals**

The following table compares the general process under which a potential major residential subdivision could be approved in each County – i.e., what would it take to get a major subdivision approved in the Watershed?

**Table 9: Theoretical Changes Required to Permit a Major Subdivision Development in the Watershed**

County	Action Required to Allow Major Resid. Subdivision In Watershed	Review/Approval Bodies	Additional Requirements	Potential Density
Essex	<b>A-2</b> Revise Comp. Plan to Rural Residential	Plan Comm. & Board		1 unit/5acres
Gloucester	<b>RC1</b> Revise Comp. Plan to allow Residential growth - Rezone to SC-1 District	Plan Comm. & Board	VDOT road requirements – potential proffers	1 unit/1.5 acres
King & Queen	<b>A</b> Rezoning to R-R zone	Plan Comm. & Board	VDOT road requirements – potential proffers	75,000 s.f. lots
Middlesex	<b>RH</b> Rezoning to R District	Plan Comm. & Board	VDOT road requirements – potential proffers	30,000 s.f. lots
	<b>LDR</b> Rezoning to R District	Plan Comm. & Board	VDOT road requirements – potential proffers	30,000 s.f. lots

Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances

**Findings: Residential Development Potential in the Watershed**

- Generally the greatest **land use** threat to traditional farming and forestry uses in a rural area comes from fragmentation of land use patterns, partly due to large scale **suburban-style residential** development.
- All 4 Counties are already well positioned to manage large-scale residential development in the Watershed. They do this primarily by prohibiting **major subdivisions** in agricultural zones or areas.
- As a result, landowners throughout the Watershed can subdivide **no more than 2-6 lots** (depending on the County) without going through the major step of a rezoning and/or comprehensive plan amendment.
- Developing a larger scale residential development in the Dragon Run would entail many hurdles, including rezoning, construction of public roads, potential proffers and other review standards.
- Nevertheless, experience in other communities in Virginia has shown that even these hurdles are not insurmountable when the market forces for residential development are sufficiently high.
- The best way to strengthen protection of natural resources and traditional uses through land use policies is to ensure a **consistency of intent and application** through all the policy and ordinance documents, from comprehensive plan through zoning, subdivision and other ordinances.

**3.1.4. Commercial and Industrial Zoning**

Although a comparatively small portion of the watershed is in non-residential or non-agricultural zoning categories, it nevertheless amounts to over **1,400 acres** (based on data from Dragon Run Management Framework, Anderson & Associates, Inc. November 5, 2001). This amount of acreage is distributed among Gloucester (Industrial & General Business Districts), King and Queen (Industrial District) and Middlesex Counties (General Business, Light Industrial and Village Community Districts). **Appendix C.** shows the acreages by zone. Much of this area was zoned to conform to existing businesses and uses. At least part of it, though, represents a potential for new “by right” commercial or industrial development.

Additionally, most of the commercial/industrial zoning occurs toward the edges of the Watershed boundaries. The major exception to this is the Village Commercial and Light Industrial area around Saluda in Middlesex County. The other concentration of commercial/industrial zoning is the Glens area (US 17 & VA 33 intersection) in Gloucester County. These two areas, as well as the Route 17 corridor through Middlesex

County should be looked at further to understand their potential for new development and its impact on the Dragon Run.

In general, the non-residential and non-agricultural zoning is limited and well contained on the zoning maps. The major concern with these areas, however, lies in their potential to **attract like uses**. There is a potential for a "locational" pull for similar uses to expand in these areas. At the same time, there may be an opportunity for rezoning applicants in the vicinity to argue that the more intensive-use areas could be expanded somewhat and still remain consistent with the Comprehensive Plan.

**Findings: *Non-Residentially Zoned Areas in the Watershed***

- Non-residential zoning in the watershed is both limited and contained to a few areas.
- At the same time, there is a potential for the zoning districts to expand, if rezoning applicants can successfully argue that an expansion of those uses would remain consistent with the Comprehensive Plan.
- The best way to fulfill the goals of the Dragon Run SAMP in these areas is to ensure that the Comprehensive Plan designations for these areas state clearly that commercial and industrial uses should not be expanded into the Dragon Run Watershed.

### 3.1.5. The Dragon Run Conservation District

Two Counties, Middlesex and King and Queen currently have a Dragon Run Conservation District (DRCD) zone. This zoning district was an outcome of a proposal submitted by the Dragon Run Steering Committee in 1987 and was adopted at the time by Middlesex, King and Queen and Essex Counties. Essex County removed the District at the time that its Chesapeake Bay Preservation Ordinance was adopted, feeling that there was redundancy in the two ordinances. Gloucester County did not adopt the District at all due to citizen opposition to additional regulation in the area.

The DRCD is essentially a zone for the protection of natural resources along the Dragon Run watercourse. Permitted uses are strictly limited to recreation, maintenance and agriculture and forestry using Best Management Practices. No residential or other private buildings are permitted to be constructed in the District.

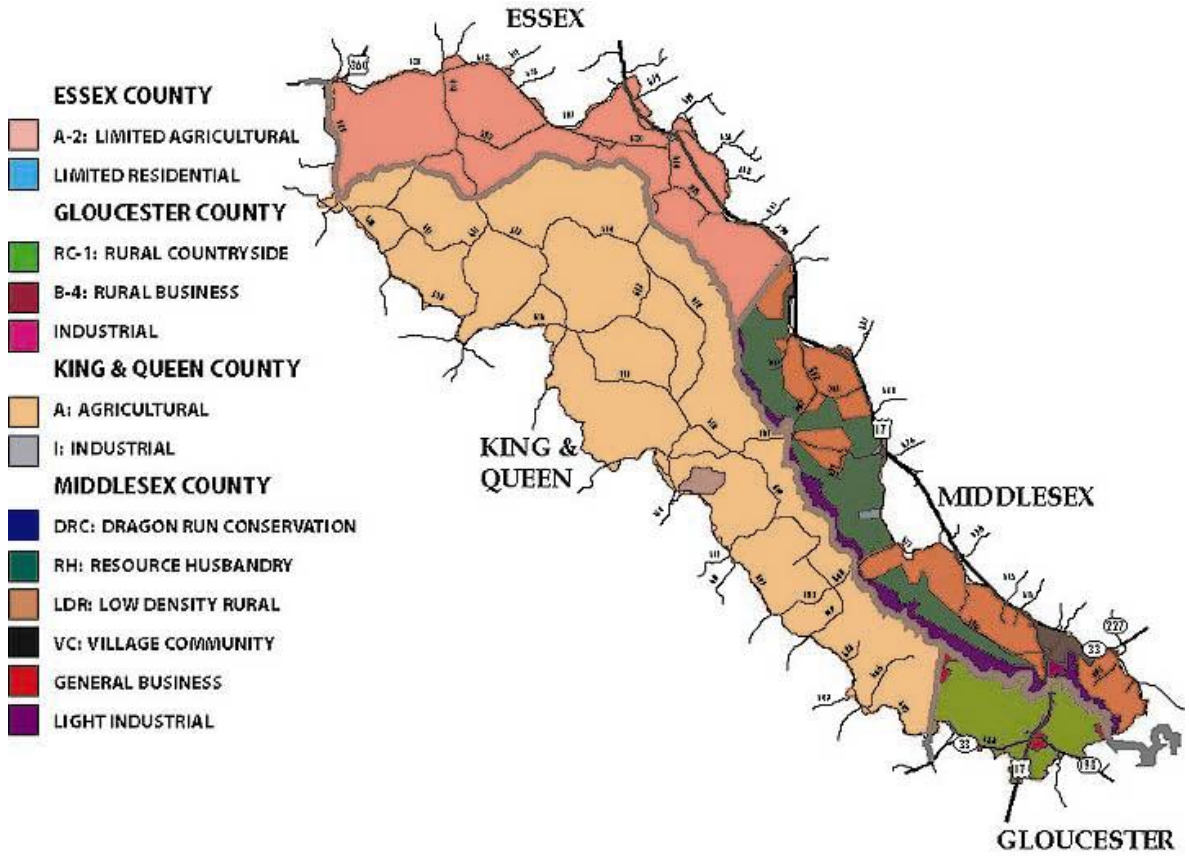
The DRCD is defined by soil types, as being the areas within Fluvaquent and Subaquent soils along the County boundary (Kinston-Bibb and Pocaty soils in Middlesex County) plus a 100-foot buffer along those soil types (reduced in some areas of steeper topography). Middlesex County has mapped the DRCD on their official zoning map while King and Queen has not. Comments have been made that it is a difficult zone to administer because of the boundaries being complicated and that it is somewhat duplicated by the Chesapeake Bay ordinances.

The DRCD is generally more restrictive than other applicable ordinances in the area. Other applicable restrictions that would also limit development in the same general area as covered by the DRCD would come from normal floodplain and wetland restrictions and the Chesapeake Bay ordinances. The DRCD is theoretically more restrictive than the Chesapeake Bay ordinances in that it limits all development (and agriculture and silviculture without BMP's) in an area that could extend beyond the typical Resource Management Area(RMA) designated by the Chesapeake Bay ordinance. In practice, however, the DRCD is not very different from the areas normally protected by the RPA, floodplain and designated wetlands restrictions in Middlesex County. To determine if this is also the case in King and Queen County, the DRCD would have to be mapped and compared to the other protected areas.

**Findings:      *The Dragon Run Conservation District (DRCD)***

- The DRCD, in place in Middlesex and King and Queen Counties is an effective measure of protection for the most sensitive areas along the Dragon Run watercourse. It is defined by soil types and buffers along the soil boundaries.
- Its geographic extent in Middlesex County is similar to the areas that are also protected by wetlands, floodplain or Chesapeake Bay restrictions. In King and Queen County, the DRCD has not been mapped.
- The DRCD is basically a "**streamside**" protection measure and does not address protection of the Dragon Run **watershed**.





MAP 4. Summary Map of Zoning Districts in the Dragon Run Watershed

### 3.1.6. The Chesapeake Bay Protection Ordinances

All 4 counties in the watershed have recently adopted protection ordinances in accordance with the requirements of the Chesapeake Bay Act (Section 15.1-489 of the Code of Virginia). They are generally similar in their requirements, in accordance with the provisions of the State legislation, except for the determination of their respective Resource Management Areas (RMA's):

**Table 10: Definition of Resource Protection Areas and Resource Management Areas**

County	Definition of RPA	Definition of RMA
Essex	100 ft buffer from designated environmentally sensitive areas	Floodplains, highly erodible or permeable soils, non-tidal wetlands & areas necessary to protect State waters (outside the RPA)
Gloucester	100 ft buffer from designated environmentally sensitive areas	All areas of the County outside the RPA
King & Queen	100 ft buffer from designated environmentally sensitive areas	A minimum of 250 distance ft. landward of the RPA and any areas of highly permeable, erodible and/or hydric soils (outside the RPA)
Middlesex	100 ft buffer from designated environmentally sensitive areas	A minimum of 150 distance ft. landward of the RPA and any areas of 100-year floodplain, highly permeable and erodible soils, slopes greater than 15% and nontidal wetlands connected to tidal wetlands, tributary streams or tidal waters (outside the RPA)

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Zoning Ordinances*

In general, the Chesapeake Bay Protection ordinances strictly limit activities, both by type of activity and by **land use** in the RPA, while in the RMA they regulate development practices for environmental impact, while leaving the **underlying zoning** as the basis for determining permissible uses. The RMA requirements include a comprehensive set of regulations that help to protect sensitive areas such as the Dragon Run Watershed, ranging from agricultural and forestry BMP's and management plans to development, clearing and grading and revegetation requirements for new development. Complaints about the difficulty of **enforcement** of the regulations at the local level, however, limit their potential environmental benefit. Moreover, the inconsistency of application of RMA's in the 4 Counties in the Watershed further limits the degree to which the Chesapeake Bay ordinances can ensure long-term protection of the Dragon Run.

**Findings: Chesapeake Bay Protection Ordinances in the Dragon Run**

- The Chesapeake Bay Protection Ordinances enacted by all 4 Counties foster protection of natural resources in the Dragon Run, primarily through the strict **land use and activity** restrictions in the RMA and the **development performance standards** in the RPA.
- However, the ordinances do not control land use outside the RPA and do not protect traditional farming and forestry from competing uses, which is only done through the underlying zoning districts.
- The inconsistent application of the RMA's in the 4 Counties leave the majority of land area in the watershed **exempt** from the development requirements and other protection standards contained in the ordinances.

### 3.2. Subdivision Ordinances

In general all 4 Counties have subdivision standards that follow standard planning practice and control, among other items, the procedures and practices for the subdivision of land. Design standards built into the subdivision requirements are generally limited to lot, block and street design and access provisions. The subdivision requirements do not typically effect any additional measures of protection within the Dragon Run Watershed, with the one significant exception of **major and minor subdivision determinations**, mentioned above. None of the ordinances require or encourage **conservation design** in the layout of lots or improvements and specific environmental provisions are generally absent from the minor subdivision standards.

**Findings: Subdivision Regulations**

- The only major impact on the Dragon Run from subdivision regulations in the 4 Counties lies in their prohibition against **Major Subdivisions** in agricultural zoning districts.
- The subdivision regulations impose no significant other environmental standards and do not encourage **conservation design**-based principles in the layout of lots or improvements in **minor subdivisions** which would apply in the watershed.
- This restriction on Major Subdivisions in agricultural zones is not the best way to guard against large scale residential development in these areas. It would be more effective for the **Zoning Ordinance** to also reinforce the restrictions on scale of development, specifically in the description of permitted uses and residential densities.

### 3.3. Other Land Development Regulations

In addition to the zoning and subdivision requirements listed above, other types of ordinances that typically can be used to protect natural resources and traditional uses in a rural area include those that control:

- Wetlands
- Erosion & Sediment Control
- Storm Water Management
- Groundwater Protection
- Stream Corridor Protection
- Landscaping or Revegetation
- Design Guidelines

The 4 Counties in the Dragon Run Watershed have a limited number of these supplemental development ordinances as follows:

**Table 11: Supplemental Land Development Ordinances**

County	Supplemental Ordinance or Code
<b>Essex</b>	Screening and Buffers for Major Routes (in Zoning Ordinance)
<b>Gloucester</b>	Floodplain Management Ordinance
	Erosion & Sediment Control
	Site Plan Review
	Wetlands Zoning Ordinance
<b>King &amp; Queen</b>	Erosion & Sediment Control Ordinance
	Site Plan Review (in Zoning Ordinance)
<b>Middlesex</b>	Site Plan Review (in Zoning Ordinance)
	Wetlands Ordinance
	Erosion & Sediment Control Ordinance

*Source: Essex County, Gloucester County, King & Queen County and Middlesex County Ordinances and Codes*

As expected, there is a wide range between the number of supplemental ordinances and overall degree of regulation in ordinances between the more and less populous Counties in the Watershed. However, this is of comparatively little impact on land development in the Dragon Run area. For example, most of the Erosion and Sediment Control plans exempt the building of single family houses that are not part of a subdivision, unless they

are also included in a Chesapeake Bay ordinance RPA or RMA. In addition, single family houses are also exempt from the site plan review procedures (except those that fall under the Chesapeake Bay ordinance). Supplemental ordinances for erosion control, wetlands or floodplain protection or site plan review are significant for protection of the Dragon Run only if they address the type of **small scale single family subdivisions** that are the only type of development permitted under current zoning rules in the Watershed.

One particular area that was lacking in the ordinances was some sort of **illustrative design guidelines** for the types of small-scale residential subdivisions that are permitted in the agricultural zones. Gloucester County has a good discussion of how rural character and farming uses can be protected with sensitive house siting and construction. However, this is located in their Comprehensive Plan rather than in the Zoning or Subdivision requirements and none of the other Counties appear to have any type of design guidance for the small farm subdivision.

Two other important issues that have been raised repeatedly in discussions about land use regulations in the Watershed are **enforceability** and **user friendliness**. The more rural counties are especially challenged to enforce a relatively complex set of interacting regulations with **limited staff and resources**. Moreover, the complexity of the regulations makes **voluntary compliance** by landowners difficult, when they cannot easily understand how the rules are applied on their land. Both Gloucester and Middlesex Counties have informational materials to help landowners navigate through the network of land regulations but they only address specific topic areas such as Chesapeake Bay enforcement or Erosion Control. According to discussions among the Advisory Group members, some sort of landowner's **stewardship manual** would be very helpful to assist property owners, in understanding both the important land use issues in the Dragon Run and the regulations and standards that apply to their property.

**Findings: Supplemental Ordinances in the Watershed**

- There is a wide range between the number and degree of supplemental ordinances and regulations among counties in the Watershed.
- Most of the supplemental regulations (other than the Chesapeake Bay ordinances) don't address design practices for the type of small-scale, single family development that is the only development type permitted in the Watershed.
- Supplemental ordinances could be beneficial in meeting the Dragon Run protection goals especially if they addressed small scale development areas in the Watershed that are outside the Chesapeake Bay ordinance provisions (those areas outside RPA's and RMA's).
- Some Counties have published topical brochures to help landowners understand certain aspects of the existing regulations but there is no **comprehensive landowner manual** that explains the applicable regulations in the Watershed.

## 4.0: CONCLUSIONS AND OPPORTUNITIES

Among the goals and objectives of the Dragon Run Memorandum of Agreement are to *“Establish a high level of cooperation and communication between the four counties within the Dragon Run Watershed to achieve consistency across county boundaries”* and to *“Achieve consistency across county boundaries among land use plans and regulations in order to maintain farming and forestry and to preserve natural heritage areas by protecting plants, animals, natural communities, and aquatic systems.”* By analyzing the various land use policies and ordinances across the four Counties in the Watershed and placing them on an equal-terms comparison, a broad picture emerges of the current state of land use policy and regulation in the Dragon Run area. From this comparison a number of opportunities emerge as potentials for bringing the four counties into closer alignment along similar goals and policies in the Watershed, while preserving fundamental property rights and traditional uses.

### SUMMARY CONCLUSIONS

#### 4.1 COMPREHENSIVE PLANS

##### Findings:

- In general the County Comprehensive Plans call for **agricultural and rural residential** uses as future land uses in the Watershed.
- However, the Plans tend to have minimal discussion of the Dragon Run Watershed and little or no **specific policy guidance** for the Dragon Run.
- While the Comprehensive Plan designations generally call for the preservation of traditional uses as a **primary** objective, they typically do not call for excluding uses that may be incompatible or competitive with traditional farming and forestry resources.

##### Opportunities:

- Developing more comprehensive guidelines and specific land use policies that are **specific to the Dragon Run Watershed** within each County's Comprehensive Plan.
- Developing a **model plan designation and language** for adoption by each County that would make their goals and policies consistent within the Watershed

## 4.2 ZONING

### Findings:

- The Zoning Ordinances for the 4 Counties generally support the traditional land use pattern and intent of the Comprehensive Plans within the area of the Watershed.
- However, the Zoning Ordinances also show a range of potentially incompatible uses that are permissible in the Dragon Run area and may be more appropriate in other parts of their jurisdictions.

### Opportunities:

- Refining the **permissible uses and development parameters** for those zoning districts within the Watershed in each County so that they better meet the objectives in the SAMP and County Comprehensive Plans
- Developing some form of **overlay zoning** for the Watershed to bring greater consistency to the implementation of land use and development regulations among the Counties.

## 4.3 SUBDIVISION

### Findings:

- All the Counties have very effectively managed widespread residential development in the Watershed through limitations on **major subdivisions**.
- However, the basic purpose and intent of this subdivision provision to **limit residential development** could be strengthened and reinforced by following it through and implementing in other regulatory documents (such as the Zoning Ordinance).

### Opportunities:

- Reinforcing the basic intent of limiting residential development in the Watershed through **revisions to the Zoning Ordinances** of each County that would control the density and intensity of residential uses for each County.

## 4.4 CHESAPEAKE BAY PROTECTION

### Findings:

- The Chesapeake Bay ordinances adopted by the Counties generally provide effective protection of **streamside** development impacts.
- However, only one of the Counties extends that protection to the entire area in the **watershed**.



**Opportunities:**

- **Extending the RMA's** in each County to encompass the entire Dragon Run Watershed area, thus allowing all development in the Watershed to have similar review standards for water quality and environmental protection.

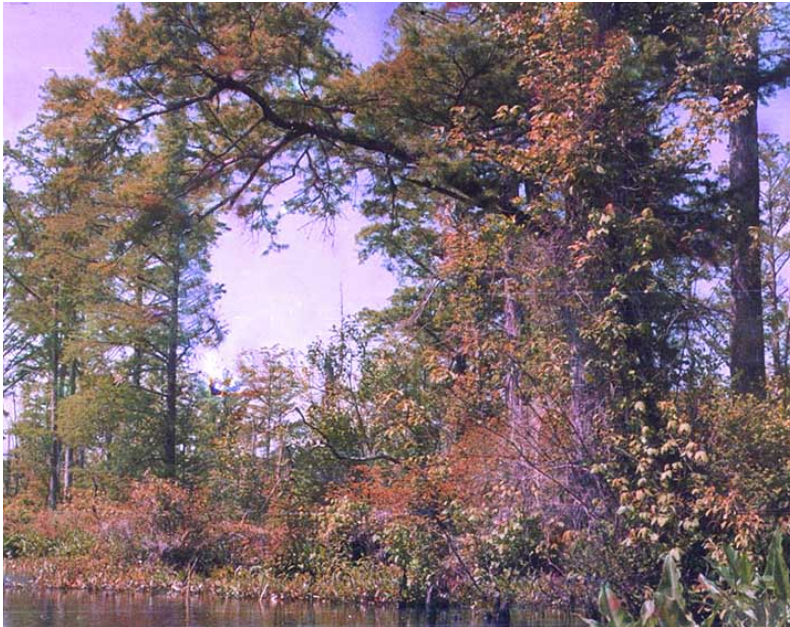
**4.5 OTHER ORDINANCES AND POLICIES**

**Findings:**

- Most of the supplemental ordinances and regulations in the 4 Counties do not significantly influence the type of **small scale residential development** that is currently the only type permitted in the Watershed.
- Two major issues of the difficulty of **enforcement** and the **complexity of the current regulations** have not been adequately addressed through comprehensive manuals or publications for landowners in the Watershed.

**Opportunities:**

- Develop a comprehensive **Stewardship Manual** for the Dragon Run, with design guidelines and examples, to assist landowners in understanding and voluntarily complying with the land use policies and regulations in the Watershed.



Cypresses along the Dragon Run

Photo credit: V. Gavrilovic

## 5.0: RECOMMENDED STRATEGY AND APPROACH

### 5.1. Overview of The Recommended Strategy

The goals of protecting traditional uses, rural character and natural resources in the Dragon Run are shared by all four counties that encompass its watershed. Nevertheless, each county has its own existing planning and regulatory context and its own unique political sensitivities and issues. The objective of achieving better coordination of land use policies among the four counties needs to be pursued through a careful strategy that takes into account the needs and constraints of each individual jurisdiction.

For this reason, this report proposes a phased implementation strategy for the DRSAMP Advisory Group to consider. Three basic phases of an overall process are proposed below, each of which entail different levels of implementation, coordination and regulatory change.

#### **LEVEL 1: Adoption of the SAMP Watershed Management Plan as an Addendum to the County Comprehensive Plans**

Each County would adopt the Dragon Run Watershed Management Plan (to be finalized by the Dragon Run Steering Committee) as an addendum to their comprehensive plans. This could be done as a simple paragraph that is added to the land use or environmental policy section of each county's comprehensive plan. The paragraph would state the purpose of adopting the Watershed Management Plan and reference it as an addendum to the Comprehensive Plan that would be adopted by means of a Comprehensive Plan amendment.

This action presupposes the expansion of the current Land Use section of the Watershed Management Plan into a more detailed set of policies that are appropriate for adoption throughout the Watershed. By adopting the Watershed Management Plan, each county would also be adopting a uniform set of land use policies for the Dragon Run watershed and furthering the goals of the SAMP.

In addition, the policies could specifically recommend an approach to limiting incompatible development in the Watershed. Even though the counties' existing policies and regulations already control some of these issues to varying degrees, this would be an opportunity to underscore a unified approach and intent for the watershed as a whole. Recognizing the varying state of land use regulations among the four counties, the Watershed Management Plan could propose general standards that would be common to all 4 counties for open space protection and limiting large-scale development in the watershed.

The main advantage of this approach is that the four counties in the watershed would be better prepared to address potential change or development pressure in the Dragon Run area in the future. An important distinction with this scale of implementation is that the counties would not amend their future land use maps- that is, there would be no change in the official land use map and district designations for each jurisdiction. Although general analysis maps would be included in the Watershed Management Plan, it is not

anticipated that it would contain a “proposed land use map” for the four counties. Thus, the only land use changes that the counties would be recommending by adopting the Watershed Management Plan at this stage would be in the form of a comprehensive set of policies to be pursued and a clear statement of intent for the Dragon Run. This would provide an opportunity for a more far-reaching effort, such as the adoption of a new unified Dragon Run Planning Area, as described below in Level 2.

### **Summary of Level 1:**

- Adopt the SAMP Watershed Management Plan as an Addendum in the Comprehensive Plans of all 4 counties.
- Include a comprehensive set of General Land Use Policies for the Dragon Run watershed in the Watershed Management Plan
- No change to the Proposed Land Use Maps of the Comprehensive Plans and no other regulatory changes.

### **LEVEL 2: Adoption of a Unified “Dragon Run Planning Area” Designation in the County Comprehensive Plans**

Level 2 goes one step further in achieving the shared goals for the Dragon Run area. It does this by creating and mapping a specially designated planning area within the proposed Land Use Map and Land Use Element of each county’s comprehensive plan. This is an important step for two reasons. First, it geographically designates the watershed of the Dragon Run as a special district that is clearly tied to a set of policies. Second, it allows for more detailed land use policies guiding such key issues as permitted uses, development density and utility service applicable to a distinct area in each county.

Technically, there is no legal distinction in the status of the land use policies in either Level 1 or Level 2. Whether they are adopted by reference, as an addendum to the comprehensive plan, or whether they are adopted under a new district within the main body of the comprehensive plan, they have the same status as policy guidelines in the planning process. However, by putting the recommendations in the main body of the plan text and by attaching them to an official mapped district that is part of the plan, they more strongly emphasize the protection of the Dragon Run area as a key priority in the county. They also constitute a much better platform for further implementation of the policies through zoning and other regulatory changes, as described in Level 3, below.

### **Potential Characteristics of the “Dragon Run Planning Area”**

- A mapped geographic area for the district that corresponds to the portion of the Dragon Run watershed (as designated by the DCR as unit code #CO2) within each county
- A statement of purpose and intent for the district that is based on the goals of the DRSAMP Memorandum of Agreement signed by each county

- A brief summary of inventory and analysis data for the Dragon Run watershed, describing the important physical and environmental characteristics of the land, existing patterns of land use and current regulatory context
- A list of general goals for the watershed as a whole, based on the goals of the joint Memorandum of Agreement
- A list of specific policies being established for the county that are central to meeting the goals and objectives for the watershed as a whole
- Suggested implementation actions for the county to pursue that address each of the policies of the Dragon Run Planning Area

The specific goals, policies and actions would be summarized in a proposed "Model Comprehensive Plan Amendment for the Establishment of the Dragon Run Planning Area." This proposed model language should be based on a thorough review and analysis by the DRSAMP Advisory Group and Steering Committee. It is important that any model language pass under an established review and recommendation methodology that is the most acceptable one to all the counties involved. The process used for adoption of the Memorandum of Agreement is a good example of this and could be used as a basis for recommending the model comprehensive plan district.

The general land use policies under this option may not differ from the policies described in the Watershed Management Plan in Level 1. Both efforts would require the development of a clear and effective set of land use policies for application in the Watershed. However, since this option also establishes a geographically defined Dragon Run Planning Area, there is also an opportunity to include more specific policies that address issues such as residential density, permissible uses, etc.

One main difference assumed in this level is that it actually maps an area for the application of the policies. By doing so, it makes the watershed an effective and formally defined planning unit that can be used by the county for further development and implementation of the policies in its comprehensive plan. This approach is especially important in addressing the current variations and inconsistencies in land use policies across jurisdictions in the watershed. The following level (Level 3.) recommends an approach for coordinating land use regulations into a uniform zoning overlay district. It is important to note, however, that developing any such overlay zoning district needs to be preceded by and predicated upon the approach recommended in this stage, that is to first adopt a Dragon Run Planning Area under each county's comprehensive plan.

### **Summary of Level 2:**

- Each county adopts a model "Dragon Run Planning Area" designation in its Comprehensive Plan.
- The Dragon Run Planning Area, which consists of the portion of the Dragon Run watershed in each county, is adopted as part of the official land use map of each county by a Comprehensive Plan amendment.

- The mapped area is also linked to a specific set of land use policies that set guidelines for permissible uses, residential density, utilities and development standards in the Dragon Run Planning Area.

### **LEVEL 3: Adoption of a Dragon Run Protection Zone in the County Zoning Ordinances**

The final level of implementation is probably the most complicated from a technical standpoint, but also represents the most comprehensive approach to furthering the shared goals for the Dragon Run. At this level, each county would adopt a model Dragon Run Protection Zone within its current zoning ordinance for the portion of the watershed that lies inside its jurisdictional boundaries. This would entail both a zoning map amendment and zoning text amendment. Also, as noted above, this step would only be taken after, or in conjunction with, corresponding map and text revisions in the county's comprehensive plan.

This is analogous to the effort undertaken in 1987 with the adoption of the initial Dragon Run Conservation District by three of the four counties in the watershed. This option, however, has some key differences in approach from the 1987 ordinance.

#### **Key Differences from the 1987 Dragon Run Conservation District**

- This new proposed district would apply more comprehensively to the whole watershed, rather than being defined by soil types or stream buffers, as was the 1987 district.
- The new district would be based on a clear statement of intent and findings that would be based on the goals of the DRSAMP Memorandum of Agreement and the Watershed Management Plan.
- The new zoning district would also be based on, and preceded by, a comprehensive plan amendment in each county that clearly sets the policy context for the Dragon Run area and the new protection zone.
- The regulatory framework of the new district would be more comprehensive and better integrated into existing county regulations - for example, it would include standards for land use, density, development and stewardship practices, and it would be coordinated with Chesapeake Bay Protection regulations and other county regulatory policies.
- The new district would be adopted with a map amendment to clearly delineate its legal boundaries within each county.

The process for adopting this type of uniform protection zone would be much the same as described above for adopting a comprehensive plan designation and district. In this case, it is especially important to get active participation from the landowner community and any other parties that would potentially be affected by zoning changes in the Dragon

Run area. Multiple levels of review and refinement of the ordinance are suggested, similar to the way that the SAMP planning work has proceeded to date.

**Suggested Public Review and Approval Process for the Protection Zone:**

- Initial development of the draft district language by the DRSAMP Advisory Group
- Review, refinement and approval of a draft ordinance by the Advisory Group
- Recommendation to the Dragon Run Steering Committee
- Review, refinement and approval of draft ordinance by the Steering Committee
- Recommendation to each county's Planning Commission, planning staff and Boards of Supervisors
- Review and refinement by each county and its citizenry as part of their normal public hearing and approval process
- Check-in with the Dragon Run Steering Committee for final reconciliation of differences among the four counties
- Final adoption of the proposed zoning district by each county's elected governing body

In addition, the process should be accompanied by a comprehensive outreach and public information effort to help residents in the area understand the changes that are being proposed to the land use regulations for the Dragon Run.

A key consideration in the development of this type of overlay zoning district is regulatory integration. It is crucial that any proposed zoning district for the Dragon Run take into account the full regulatory context of the area and be designed to integrate into it accordingly. For example, as discovered in the first phase of this Land Use Policy Audit, there are important differences among the four counties' regulatory policies within the watershed. The Resource Management Area of the Chesapeake Bay Protection ordinances is differently applied in the watershed by the four counties. The counties also have varying levels of subdivision, erosion control and storm water management regulations. Most significantly, the counties all have different underlying residential densities and permissible land uses within the watershed. A careful, integrative approach is required to effectively design a zoning district that would take the current regulatory context and transform it into a unified set of standards that would best meet the DRSAMP goals. Furthermore, it is important that the standards in the new zone be comprehensive - that they account for all the major land use and development considerations that can have an impact on the Dragon Run.

For this reason, an "overlay zone" approach is not recommended as the best way to achieve regulatory integration in the watershed. With an overlay zone, there would be a number of potential conflicts with the underlying zoning districts in the watershed, including density, permitted uses and subdivision standards. By contrast, a new zone

could be written so that it established a comprehensive set of criteria that did not conflict with the regulatory policies of any of the four watershed jurisdictions. For example, it could set new density standards, new criteria for minor and major subdivisions and even call for the application of the Chesapeake Bay RMA standards throughout the watershed. Such an undertaking, however, will take considerable detailed study of the best development standards to apply and continual checking with the staff and elected officials of the respective counties for feasibility of individual provisions.

The specific design of performance standards in the proposed zoning district could include a number of elements:

**Potential Components to be Included in a Protection Zone:**

- Purpose and Intent
- District Boundaries
- Administration and Enforcement
- Permitted Uses and Use limitations
- Lot Size and Lot Coverage requirements
- Setback and Location standards
- Development Density and Intensity requirements
- Supplemental standards for Waste Disposal, Erosion or Sediment Control
- Maintenance and Stewardship requirements
- Procedures for periodic review & Amendments

**Summary of Level 3.**

- Each county adopts a new Dragon Run Protection District that covers the portion of the Dragon Run watershed within its jurisdiction.
- The new district requires both a zoning map and zoning text amendment and includes a set of land use and development standards that clearly implement the comprehensive plan policies adopted under Level 2.
- The new district's definitive list of permissible uses, acceptable densities and development standards is integrated with the existing regulatory context of each county.



## 5.2 Potential Land Use Policy Changes And Innovative Land Use Tools

The strategic approach outlined above implies careful progress towards a common goal, within the context of an open, collaborative public process. The progress of the Dragon Run Steering Committee through the DRSAMP has been characterized by the free discussion and critique of innovative ideas among local officials, landowners, planners and technical experts. Many specific ideas for policy changes and improvements have already been brought up by the Steering Committee and its Advisory Group and have been discussed relative to their local applicability.

The purpose of the following lists of specific policy recommendations is not to suggest a definitive set of policy changes that are ideally suited for each county in the watershed at this time. Any such final policy changes should grow out of a full review process among the local communities in the watershed, as supported by the Dragon Run SAMP process. Instead, the following examples provide a starting point for the focused discussions to develop the specific policies. They are based on the opportunities for coordinating overall land planning in the watershed, as brought out in the first phase of this Land Use Policy Audit and summarized in the preceding Technical Memorandum. Whether or not these individual components would be finally adopted by each county would be decided by the extensive review process proposed above and would ultimately be based on the collective goals for the Dragon Run, balanced with each county's political sensitivity and regulatory framework.

### 5.2.1 Sample Land Use Policies and Standards

#### Level 1: Examples of General Land Use Policies for Including in the Dragon Run Watershed Management Plan

- Recognize the overall value of maintaining the traditional rural character and forested and farmed landscape of the Dragon Run.
- Recognize the specific benefits of the Dragon Run watershed for the production of food and forestal products, as a valued natural resource, for wildlife habitat, for maintaining water quality, as well as for scenic and aesthetic purposes
- Continue to protect the exceptional environmental setting of the Dragon Run
- Maintain the integrity of the Dragon Run watershed for its biological functions and drainage
- Protect the integrity of large areas of forested and farmed land from fragmentation and conversion to extensive residential and commercial development
- Actively promote and support voluntary measures to protect agricultural and forestry resources and landowner stewardship of these resources

- Seek effective ways to protect open space in the watershed while preserving landowner rights to maintain an economic return from their property
- Integrate natural resource protection and pollution control efforts with other programs, policies and Comprehensive Plans of jurisdictions within the watershed
- Promote a comprehensive public educational effort to help spread understanding and stewardship of the Dragon Run's unique resources, including the publication of a "Dragon Run Landowner Stewardship Manual"

**Level 2.           Examples of Specific Land Use Policies for a Model "Dragon Run Planning Area"**

- Limit rezoning of parcels in the Dragon Run Planning Area to more intense uses in order to protect the rural character and integrity of farming and forestry resources in the watershed
- Limit extension of public utilities and central water or sewer provision in the Dragon Run Planning Area
- Discourage overall development densities in the Planning Area that exceed one dwelling unit per 25 acres as incompatible with protection of the traditional farming and forestry land uses and the natural resources of the Dragon Run
- Promote a low-density, clustered pattern of development for any new residential development in the Planning Area to protect open space and critical natural resources
- Adopt buffer standards from wetlands, surface waters and important natural areas that are integrated with Chesapeake Bay Protection buffers and fulfill the goals of protecting critical natural resources in the Dragon Run area
- Adopt and enforce standards for site development, construction and maintenance that minimize any adverse impacts to environmental resources on the site

**Level 3.           Examples of Regulatory Standards for a Dragon Run Protection Zone**

- Limit incompatible land uses (such as landfills, reservoirs or intensive residential, commercial or industrial uses) within the watershed through a table of permitted and conditional uses for the Dragon Run Protection Zone
- Create a "sliding scale" for permitted residential density in the Protection Zone that will yield an overall development density of no more than one dwelling per 25 acres - a sliding scale allows variable densities, based on parcel size with smaller parcels typically having higher permissible densities than larger parcels

- Limit the expansion of non-conforming uses in the Protection Zone that are incompatible with the goals and intent of the zone or require additional mitigation measures for the expansion of those uses if they impair the natural systems in the watershed area
- Require mandatory clustering (or a formula for provision of private open space) as part of any minor subdivision
- Limit impervious cover to no more than 10% - 25% of a developed lot, depending on lot size, in order to protect groundwater, maintain natural drainage patterns and reduce flooding potential.
- Restrict the use of natural features on a site, such as wetlands or floodplain, from being used in density calculations for development so that density is calculated on a "net usable area" basis (similar to recommendations made by the Dragon Run Steering Committee in the draft 1996 Watershed Management Plan)
- Apply the Resource Management Area (RMA) of the Chesapeake Bay Preservation Protection ordinance throughout the watershed
- Require design guidelines for development of permitted streamside recreational structures, such as boardwalks, screen houses, boat docks and marinas to ensure that they preserve the natural and scenic qualities of the stream banks



Paddling the Dragon Run

Photo credit: V. Gavrilovic

## 5.2.2 Examples of Innovative Land Use Tools from Other Jurisdictions

Although the Dragon Run is an unusually pristine natural resource within a uniquely beautiful landscape, it also represents one of a number of “treasured places” in Virginia that local communities have cared about and taken steps to protect from degradation. The following examples from Virginia and elsewhere on the East Coast represent inspirations and potential models of how other communities have used innovative planning tools to protect natural resources, traditional land uses and rural character.

### Regional Agreements

**The Southern Watersheds Area Management Plan (SWAMP) in Virginia** is the result of agreements between the Cities of Chesapeake and Virginia Beach to preserve farmland and open space in the undeveloped, southern portions of their jurisdictions.

**Albemarle County, VA** developed a citizen petition, sponsored by the Board of Supervisors to use the State’s “Exceptional Water” designation to protect Moorman’s River’s unique environmental setting.

**South Carolina’s** Charleston Harbor Project is an ecosystem-based regional planning effort for a large watershed. It involves coordinating planning and zoning regulations across portions of eighteen municipalities and three counties within the watershed.

**The Pinelands Reserve** encompasses over a million acres and portions of seven counties in southern New Jersey with almost 700,000 residents. Land uses are managed by a Comprehensive Management Plan adopted in 1981 that is considered one of the most advanced regional management plans in the country.

**The ACE Basin** in South Carolina is a multi-jurisdictional regional partnership to protect the Ashepoo, Cumberhee and Edisto River watersheds and support compatible economic development in the region.

**Fourteen Counties** in North and South Carolina have developed a “Strategic Regional Open Space Network” and are working on a broad-based planning effort to implement regional open space preservation agreements.

### Comprehensive Plan Policies

**Northampton County, VA** is developing a new method of analyzing environmentally sensitive resources and wildlife habitats using GIS-based “gap analysis”. This data will be incorporated into a series of “sensitive natural area” overlays as the basis of new plan and zoning designations in the county.

**Clarke County, VA** has a separate Groundwater Protection Plan as part of its comprehensive plan, that describes groundwater resources in the county and institutes land use policies to protect them from degradation.

**Essex County, VA's** comprehensive plan states a policy of not allowing major subdivisions ( more than 5 lots) within its "Countryside" zone (including portions of the Dragon Run watershed).

**Albemarle County, VA's** comprehensive plan includes policies for creation of a countywide "biodiversity committee" and development of an action plan and educational process to "protect areas of significant biological resources."

### **Zoning and other Regulatory Tools**

**Fauquier County, VA** has a sliding scale for its RA and RC zones ranging from 1 lot permitted on parcels less than 1 acre, up to 10 lots for parcels 205 acres and above in size (plus one additional lot for each additional 50 acres).

**Fauquier County, VA** also provides that division of land into lots 50 acres or greater is exempt from subdivision requirements.

**Middlesex County, VA** has a "Resource Husbandry" district in portions of the Dragon Run watershed that has strict standards controlling residential development, such as allowing only minor subdivisions of 1 lot for tracts over 50 acres, only with Board of Supervisors approval, and only based upon a finding that the land is unsuitable for farming or forestry use.

**Northampton County, VA's** sliding scale "Bonus Lot" provisions (A-2 Zone) allow 2 lots for parcels of 7 to 9.9 acres and go up to 8 lots for parcels of 160 acres or greater. Bonus lots must be a minimum of 20,000 square feet and the remainder of the parcel can be developed at a density of 1 lot per 20 acres.

**Isle of Wight County, VA** has a Rural Preservation District that requires 50% of the land in a subdivision be protected. **Fauquier County's** zoning requires 85% of the property be permanently protected in its designated rural areas.

**Northampton County, VA** also has mandatory "Open Space Ratios" in its conservation and agricultural zones. For example, in the A-2 zone, 75% of the property must remain open and undeveloped in order to limit fragmentation of prime farmland. This land may be either non-common or common open space but must have deed restrictions placed on it to restrict further development.

**Clarke County, VA** has a "Stream Protection Overlay District" that is designed to apply special regulations to the riparian buffer area no less than 100 feet wide on each side of perennial streams and wetlands adjacent to those streams.

**Clarke County, VA** also has separate ordinances or zoning districts that control specific environmental resources, such as a Septic System Ordinance and a Spring Conservation Overlay District.

**Albemarle County, Isle of Wight County and Bedford County** all use a form of "Conservation Lot" zoning that limits the total number of lots that can ever be subdivided

from a given parent parcel. This can function similarly to the Minor Subdivision limitations on maximum number of lots but is more defensible because it is reinforced in the zoning ordinance.

**Pennsbury Township in Chester County, PA** has an “Open Space Design Option” in its zoning ordinance that permits density bonuses if a subdivision plan includes permanently protected open space (requires a conditional use permit).

**Clarke County, VA** uses a form of mandatory rural clustering by incorporating a “maximum lot size” into its sliding scale zoning standards. The maximum lot size of 2 acres within an average permitted density of 15 acres per unit mandates the majority of the tract to be in open space, rather than private lots.

**Bedminster Township in Bucks County, PA** has Environmental Performance Zoning that excludes natural features on a site from being used in calculating allowable densities under the ordinance.

**Frederick County, MD** requires that a “Forest Conservation Plan” be submitted with any minor subdivision in order to specify how forestry resources will be protected from degradation under the plan of subdivision.

### 5.3 Selected Key Policy and Regulatory Issues

A number of issues that are of particular importance to the Dragon Run area and the four counties in its watershed are discussed below. These and other issues will need to be addressed further in the Steering Committee and Advisory Group and local sensitivities and considerations need to be factored in. The summaries below offer potential starting points for those discussions.

#### 5.3.1 Family Subdivisions

All four counties in the watershed permit a “by right” subdivision of land for family members that is not counted toward the maximum number of lots permitted as a Minor Subdivision. This is an important provision that should be maintained in any future zoning for the Dragon Run watershed. This provision allows a relatively simple way for landowners to ensure that future generations and family members can continue to live on family land. It is of considerable value to landowners who are trying to maintain traditional use patterns on their land. However, it is also important to ensure that the Family Subdivision provision does not become a way of getting around the intent of the subdivision ordinance, for those who seek to develop their land and sell lots to those outside their family. Other jurisdictions have taken steps to ensure against this possibility by adding a few safeguards to the Family Subdivision provisions such as the following:

- Limiting Family Subdivisions by type of relation, such as immediate family, children, grandchildren, etc. (Essex, Gloucester, Middlesex and King & Queen counties)

- Requiring a “holding period” so that lots subdivided under these provisions cannot be resold to non-family members for a specified number of years subsequent to the initial subdivision. (Essex County – 1 year holding period).
- Keeping a database of all Family Subdivisions and the dates of approval to ensure that repeated subdivisions over time are consistent with the original provisions and not used to add more lots than were originally permitted for the parent tract.

In addition, the same type of simple site planning guidelines that could be recommended for Minor Subdivisions can be applied to Family Subdivisions to ensure that they are consistent with good site planning practice and sensitive to the natural resources in the watershed, such as:

- Siting development away from prime farm and forest land and environmentally sensitive areas
- Preserving existing farm buildings and farmsteads, when practical
- Preserving existing vegetation, including both large trees and secondary growth, where it forms interconnected wildlife corridors on the site
- Enhancing on-site vegetation by extending hedgerows and buffers to increase wildlife habitat and improve filtering of overland runoff
- Aligning drives and roads to avoid significant stands of vegetation and using shared driveways with porous surfaces to minimize impervious area.

It is important, however, to avoid making the review process for Family Subdivisions too complex or lengthy. The standards above may work best as voluntary guidelines, combined with staff outreach and assistance to keep these type of land subdivisions simple and practicable for local landowners.

### 5.3.2 Density Policies for Protecting Traditional Uses

As described above, one of the recommendations of this report is that some form of unified density policy be adopted by the four counties for the watershed area. This is important because the current density policies in the watershed vary. In addition, the underlying permitted densities in the agricultural zones over large portions of the watershed allow for 1 unit per 5 acres or less (down to 1 unit per acre). These densities are generally not achievable “as of right”, however, since most of the areas also don't allow for Major Subdivisions in agricultural zones, thereby greatly reducing the effective density far below one unit per five acres.

It is recommended that the explicit density policies (in levels 1 and 2, above) or zoning standards (in level 3, above) be adopted that are consistent with the stated intent of preserving traditional land uses in the watershed. In the examples of standards listed above, a density policy of one unit per 25 acres is listed as a starting point for discussion. Counties throughout Virginia have adopted a variety of density policies in their agricultural areas in an attempt to preserve open space for farming, ranging from 10 acres in Powhatan, Prince William and Hanover Counties, to 25 acres in Rappahanock County to 50 acres in Loudoun County.

It is difficult to define an absolute standard for densities that will protect sufficient open space to maintain a viable farming use. Average farm sizes in the watershed are typically quite large, with Middlesex County having an average farm size of 273 acres and Essex County, of 540 acres (see Table 12, below). However, most working farm operators lease or own a patchwork of land that adds up to a great deal more. Rules of thumb for grain farming suggest land assemblages of 750 to 3,000 acres needed to support a family by farming alone. On the other hand, some specialty farming of fruits or vegetables that is close to appropriate markets can support a family farming operation on 20 acres or less.

**Table 12: Farm Size by Counties (in acres)**

County/State	Median	Average
Essex	220	540
Gloucester	58	215
King & Queen	156	400
Middlesex	103	273
Virginia	92	273

Source: USDA Census of Agriculture, 1997

In addition, viable parcel sizes for forestry practices are similarly variable. In times of poor timber markets, the larger tracts are obviously more economically viable. In poor timber markets, however, tracts of as little as 5 acres can provide a good return, if they are next to larger timber tracts. In both cases, however, the contiguosness of the open spaces that are managed for timber improves their economic viability.

The best approach for determining the optimal density policy in the watershed will be to balance the very low densities that are optimal for farmland and forestry protection with the practical desires of the landowners in the area and the local landowner perceptions for appropriate density standards that would maintain their traditional way of life. In addition, more research could certainly be undertaken to assess what other counties in Virginia have done to set density policies and how well they have served to maintain traditional uses within their jurisdictions.

### 5.3.3 Mandatory Rural Clustering & Open Space Preservation

One key recommendation for protecting open space in the watershed is for the four counties to adopt some form of "mandatory rural cluster" provision (as part of the level 3. strategy, discussed above). This approach is similar to a conventional cluster "option" in a zoning ordinance, except that it mandates a certain percentage of the tract that



must remain in permanent open space, whether in private or common ownership. For example, in Hanover County, a rural cluster is mandatory in order to achieve the maximum permitted density. Under their provisions, sixteen lots are permitted for every 100 acres and 70% of the tract must be preserved as open space. A non-clustered development option is also permitted but only at reduced densities.

Another way to achieve this objective is by specifying maximum lot size in a cluster. Clarke County uses a maximum of 2 acre lots with a sliding-scale zoning density that typically averages one unit per 15 acres, thereby preserving a significant portion of the tract in open space. Northampton County requires that 75% of a parcel in it's a-2 zone be preserved in open space and remain "open and undeveloped."

A common issue with rural cluster ordinances is how to ensure that the open space created is not subject to future rezoning and resubdivision, if zoning standards are relaxed at a later date. Typically counties that have used this option also require that some sort of permanent conservation easement be recorded on the open space parcel that is created to protect it against future development or subdivision. Northampton County, for example, allows the open space to be either "common" (owned in common by a homeowners association), or "non-common" (owned privately as a large lot or homestead). In either case, they require a conservation easement to be recorded on the open space portion to prevent further development. The conservation easement may be to a land trust or conservation organization but must also include the county as a secondary conservation easement holder. The tax implications of the open space created under this type of provision are also important to consider. For common open space owned by a homeowner's association, it is possible to make the open space parcel non-taxable and add its assumed value to the owners of each lot in the homeowners association. In most cases, however, the open space parcels are assessed against the homeowner's association or against the parcel's private owner. In either case, the exclusion of further development on the parcel should greatly reduce the tax burden on the owners.

The mandatory cluster approach is not without its disadvantages, such as concerns about the market demand for smaller lots and additional design and technical effort required to lay them out. However, it is a very effective tool for ensuring that open space is protected in large enough components for viable farming and forestry operations, especially on larger tracts. Properly applied, mandatory rural clusters can avoid the type of large-lot "rural sprawl" pattern that has occurred, even in counties that have applied some relatively low-density zoning provisions. An example of this approach and how it could apply to the landscape of the Dragon Run is further explained in the illustrative scenarios below.

## 6.0 ILLUSTRATIVE SCENARIOS OF POLICY RECOMMENDATIONS

The following maps and site plans suggest some potential scenarios of how land use policies can affect the landscape of the Dragon Run over time. They presume that low-density rural residential development will happen eventually over time in the watershed and that the character and pattern of that development can be shaped by the prevailing land use policies in the jurisdictions at the time. Overall, the scenarios illustrate the "Potential Impact of Current Land Use Policies and Regulations on the Watershed Over Time." They are at two scales:

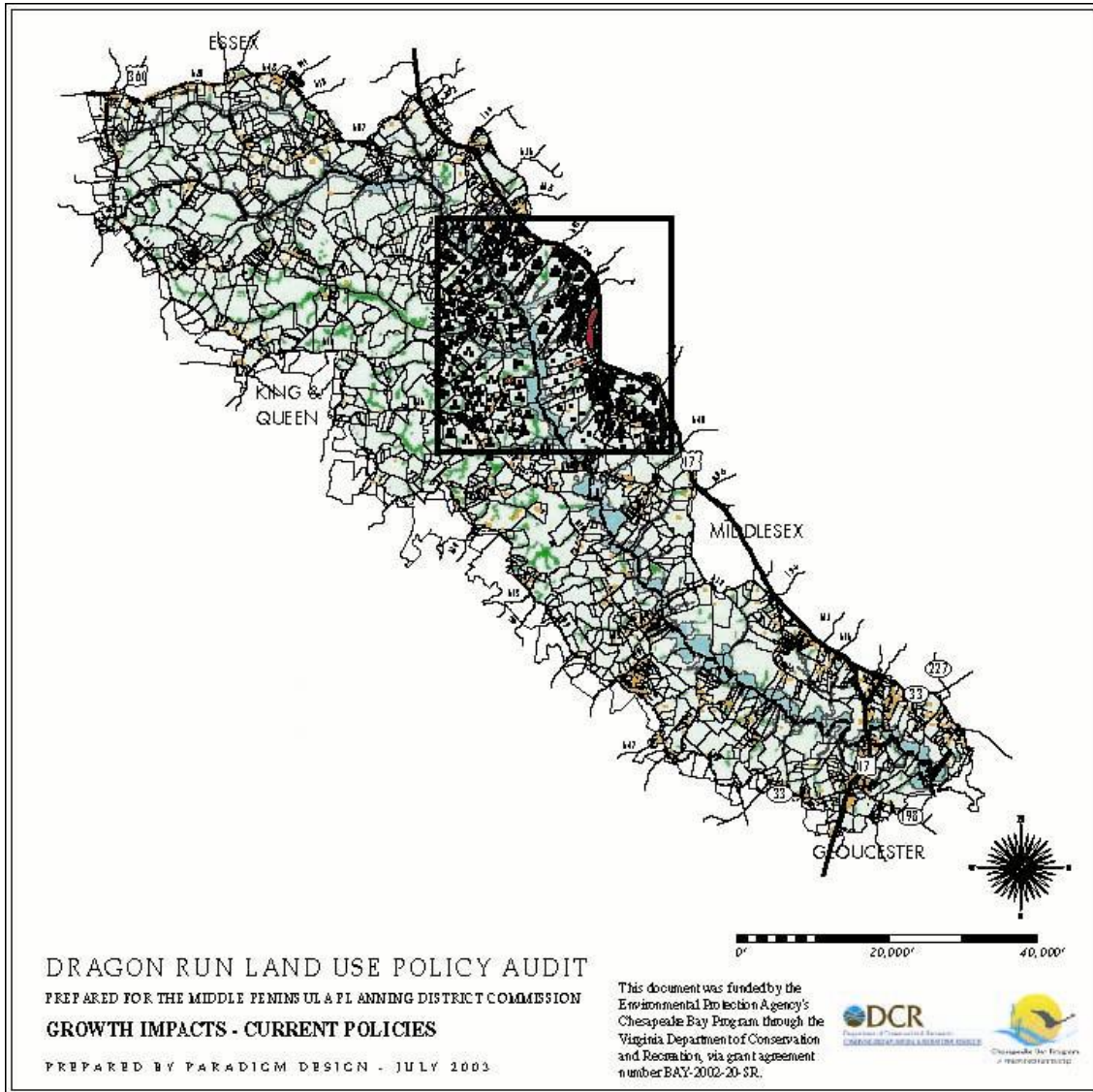
1. Watershed Scale (detail of the central portion of the watershed)
2. Individual Site or Landholding Scale (typical 100-acre farm site)

The purpose of these maps is to better analyze how current inconsistencies in land use policies and regulations across the watershed could affect the pattern of traditional uses in the wake of potential future development pressures.

### Map 5. Study Area

Map 5 shows the area that was selected for a more detailed study of growth impacts and policy implications in the subsequent scenarios. The area represents a segment of the watershed incorporating portions of three counties and totaling approximately 16,000 acres. It is a fairly typical portion of the Dragon Run area that includes both large and small landholdings and a variety of parcel configurations.

This study area was enlarged to a scale of 1"=5,000' for the subsequent analysis (maps 6 and 7) to show potential impacts in detail. These maps also show the existing 100-year floodplain and existing wetlands in the area. All the base data is from the Middle Peninsula Planning District Commission's Dragon Run Management Framework, (January 2002).



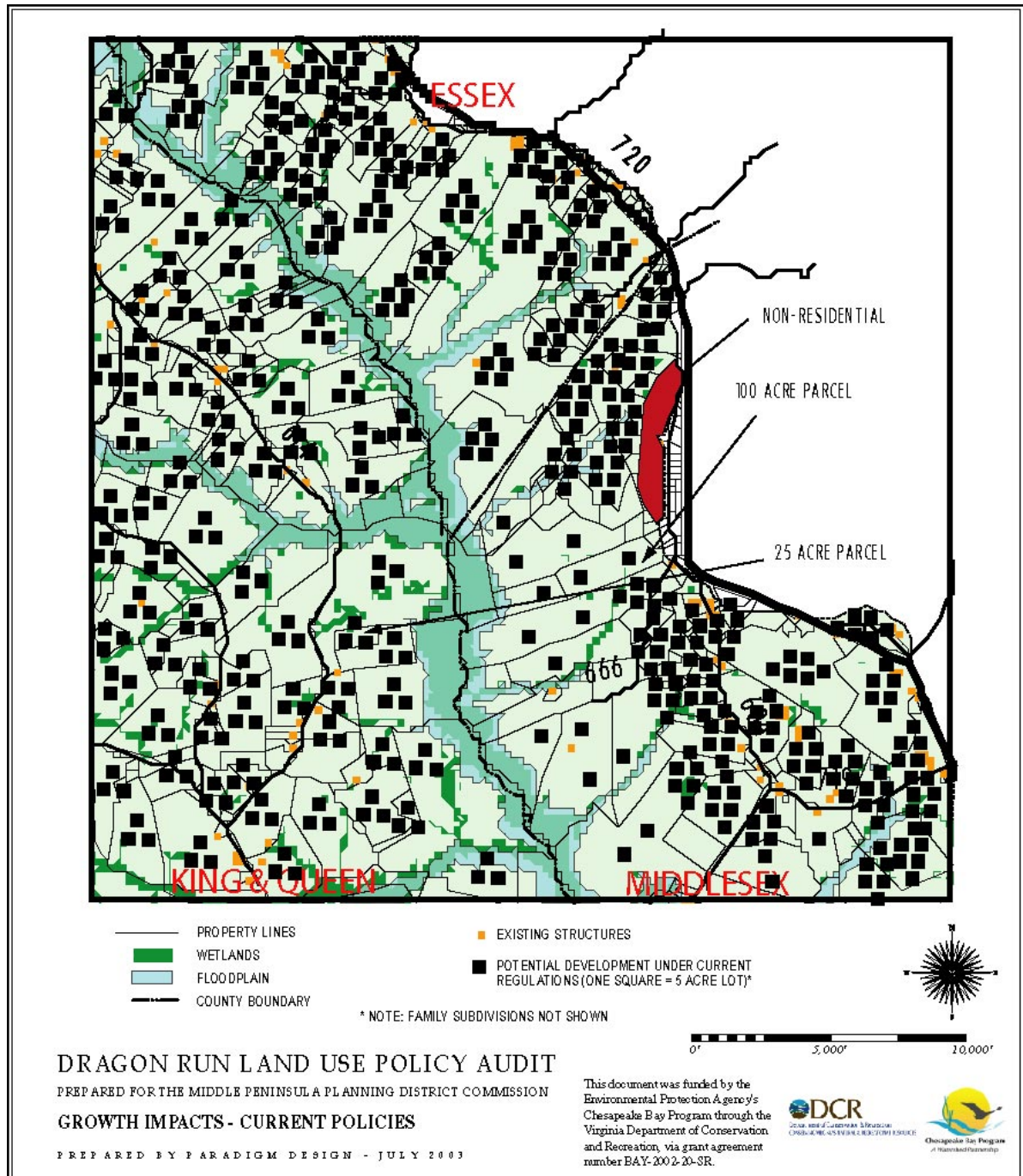
Map 5. Key Map of Study Area

## Map 6. Growth Impacts – Current Policies

Map 6. shows a potential scenario for the building out of a portion of the watershed under the current land use policies of each county. Following are some assumptions that went into the design of this scenario:

1. Development is shown as 5-acre residential building lots. Five acres was chosen as a typical average lot size that is permitted in all the zoning districts in the area, with the exception of the Dragon Run Conservation District and the Resource Husbandry District, both in Middlesex County.
2. The development is shown “as of right” – that is, within the permitted subdivision requirements for “minor subdivisions” in each of the jurisdictions (6 lots in Middlesex, 3 lots in King & Queen and 5 lots in Essex). The potential for additional “as of right” development of Family Subdivisions is not shown. All four counties permit Family Subdivisions to be developed in addition to the Minor Subdivision provisions but these are not shown in these scenarios since no recommendations are being made for changing this provision.
3. In reality, only a portion of the 5-acre lots would be developed with a house and improvements and the remainder would probably remain open. However, the main purpose of this scenario is to show potential fragmentation of the farm and forested land in the watershed. Because of this, each lot is shown as a solid 5-acre block, to emphasize how this pattern would fragment the large blocks of farm or forest around it.
4. The lots are located in a generally random pattern, without any specific criteria for clustering or preserving open space. They are generally clumped together, rather than fully dispersed, however, under the assumption that the development would happen in such a way as to minimize road or driveway costs.

As shown in the map the potential buildout under the current land use policies, although very low in total density, still has the potential to disrupt the rural character of the region and fragment the large blocks of forested and farmed land in the watershed.



Map 6. Growth Impacts – Current Policies

## Map 7. Growth Impacts –Recommended Policy Changes

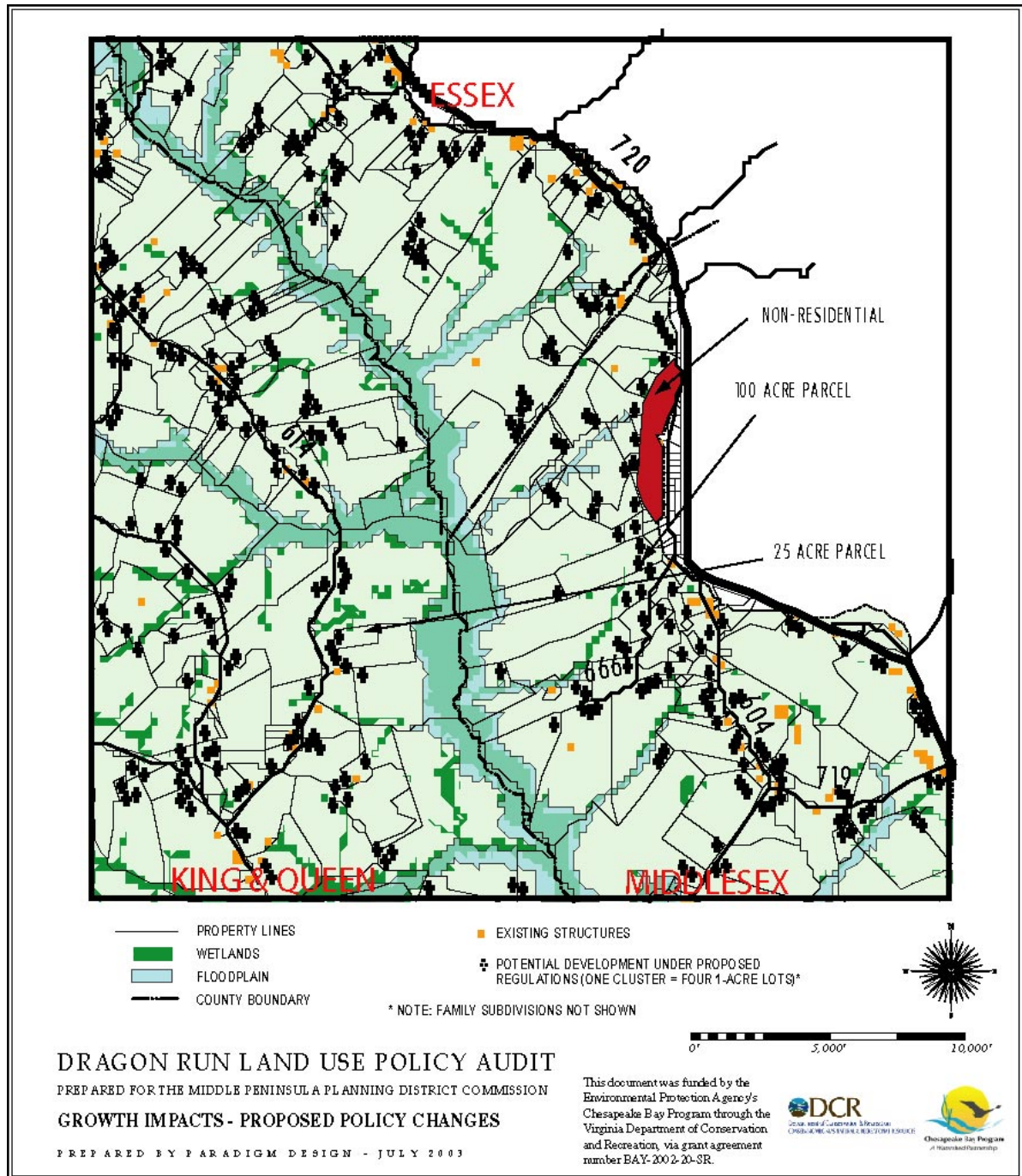
Map 7 shows how the buildout potential for the study area could be improved by potential changes in the land use policies and regulations. The map shows a development pattern based on a number of proposed new land use policies:

1. Development regulations have been made consistent for all counties in the watershed
2. The area is zoned for open space conservation – a maximum density of 1 unit per 25 acres is permitted and there is a mandatory clustering of development with a requirement for the majority of the developed tract to be reserved as permanent open space.
3. Minor subdivisions are permitted “as of right, ” provided they are designed under the provisions for clustering and preserving open space. The maximum number of lots permitted for a minor subdivision is four, with some incremental increases for very large parcels (over 200 acres).
4. There are criteria in the regulations that call for clustering, connecting open space with adjacent parcels, avoiding sensitive areas and protecting wildlife habitat.
5. Development typically occurs in clusters of four 1-acre lots, according to the criteria in the zoning ordinance and subdivision regulations.

The scenario shown in Map 7 has several benefits over that shown in Map 6. These include the preservation of large blocks of farm and forested land, reduced visual impact through the use of clustered development, protection of wildlife corridors and habitat and a conservation of the open rural character of the region.

While the scenarios in both of the above maps are somewhat abstracted and simplified for the purposes of analysis, they show the potential for dramatic impacts of land use regulations when applied at the scale of a whole landscape. While specific proposals for land use regulations can vary, it is useful to keep in mind their potential for landscape-scale change when applied to a fragile environment like that of the Dragon Run.





Map 7. Growth Impacts –Recommended Policy Changes

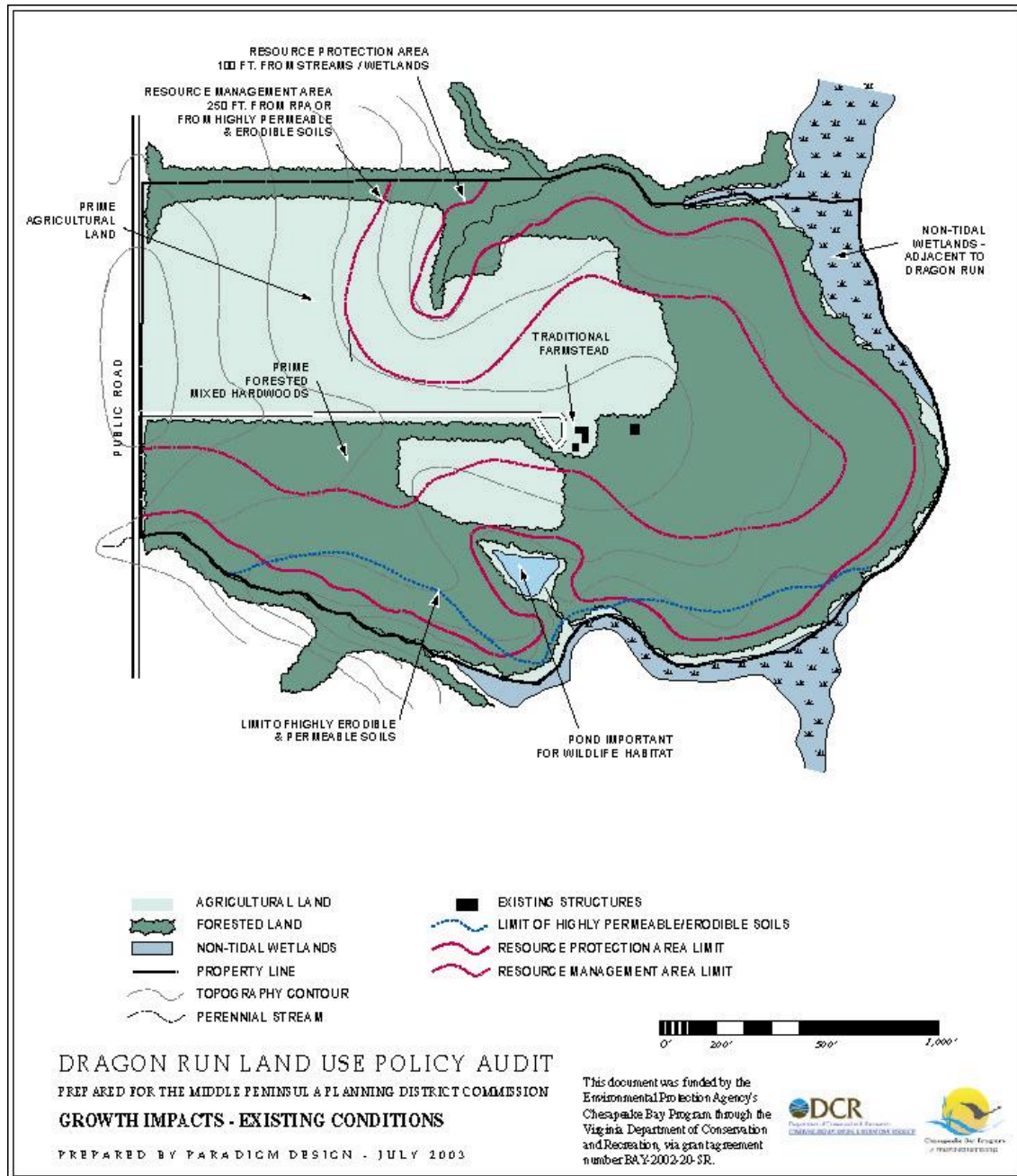
### **Map 8. Growth Impacts –Existing Conditions**

The following three maps deal with the impacts of land use policies at the site scale. The first map in this series shows a prototypical farm in the Dragon Run area. It consists of 100 acres of prime forested land and farm land bordered by a non-tidal wetland area that is part of the Dragon Run stream system.

There is a traditional farmhouse and farm buildings on a localized ridge line in the center of the farm, accessed by an unpaved farm road. This typical situation represents the traditional land use in the watershed – one that is responsible not only for the rural character and the resource-based economy of the region, but also for its scenic and unspoiled rural quality as well.

The subsequent maps show the impacts of land use regulations on the potential development of this typical farm.





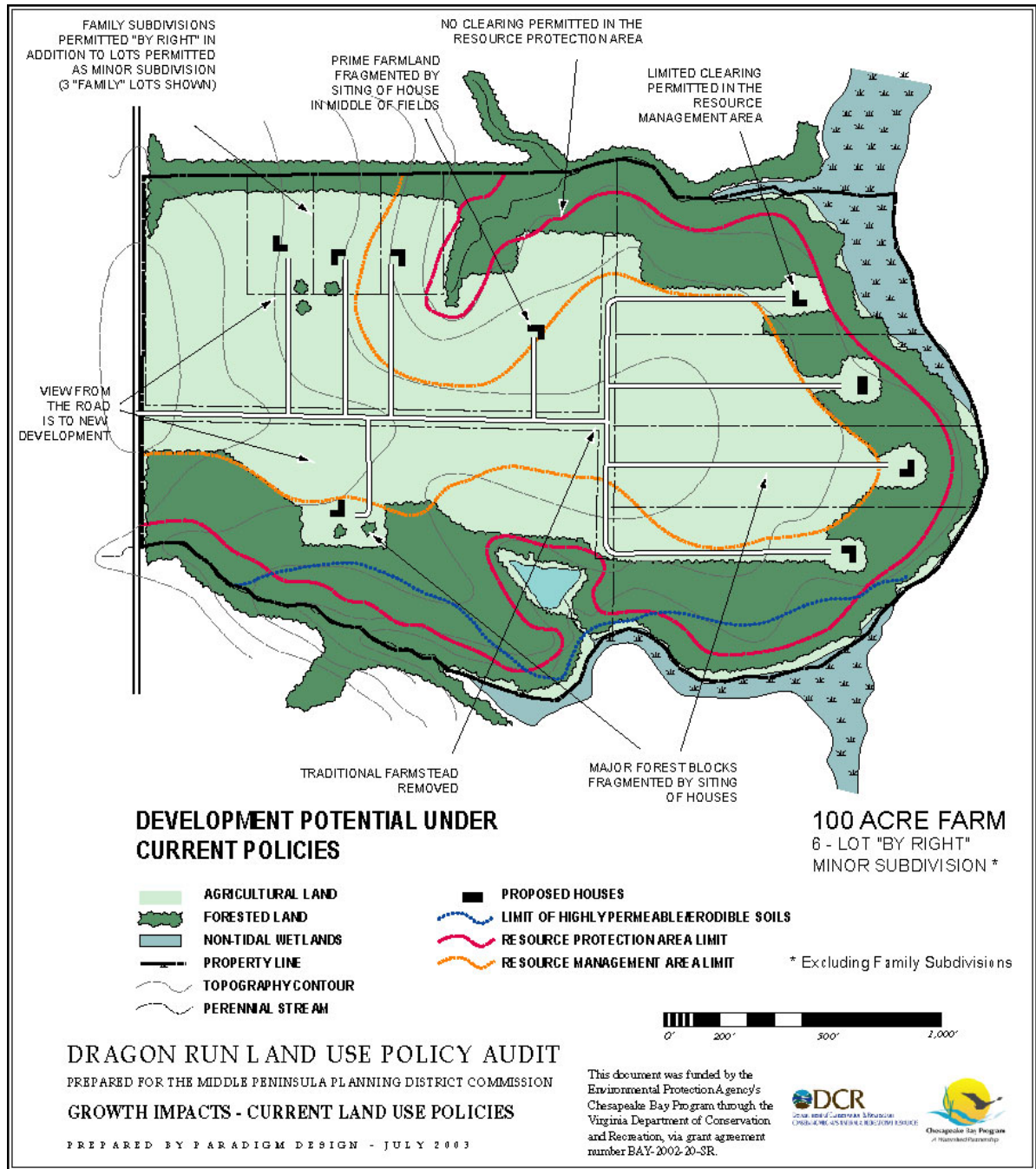
Map 8. Growth Impacts –Existing Conditions

## **Map 9. Growth Impacts –Current Land Use Policies**

This scenario shows the potential development of the typical farm under the general land use policies that prevail in the watershed. Although it is not meant to be representative of any specific county zoning ordinance, the site plan assumes the following land use regulations as typical of the kinds of policies found among the area jurisdictions:

- Minor Subdivision permitting 6 lots “as of right” – The site plan shows four “waterfront lots” of 5-10 acres each and two “farm lots” of 20-30 acres each.
- Family Subdivision showing three potential “family” lots, generalized under the provisions of the Family Subdivision requirements of the four counties in the watershed.
- No development permitted in the Resource Protection Area – residential development and limited clearing permitted in the Resource Management Area. The areas that are not covered by the Chesapeake Bay Protection ordinance have been cleared by the new owners, not for farming or silviculture but to be converted into extensive front lawn areas.
- No specific development guidelines or criteria for Minor Subdivisions have been required – the development can be located anywhere on the property other than areas prohibited under the Chesapeake Bay Protection ordinances.

The resulting site plan shows some of the drawbacks of conventional low-density development patterns. Although the overall development “footprint” is low in this scenario, the original farm and its natural resources have been parceled off into a series of private lots that are too small for effective farming or silvicultural practices. The existing farmstead has disappeared and the traditional rural “view from the road” has been replaced by a more modern view of conventional large lot development. Moreover, the wildlife value of the site has been reduced – wooded habitats have been reduced and disconnected, meadows have been converted to lawns and the extensive wooded buffers to Dragon Run have been greatly reduced.



Map 9. Growth Impacts –Current Land Use Policies

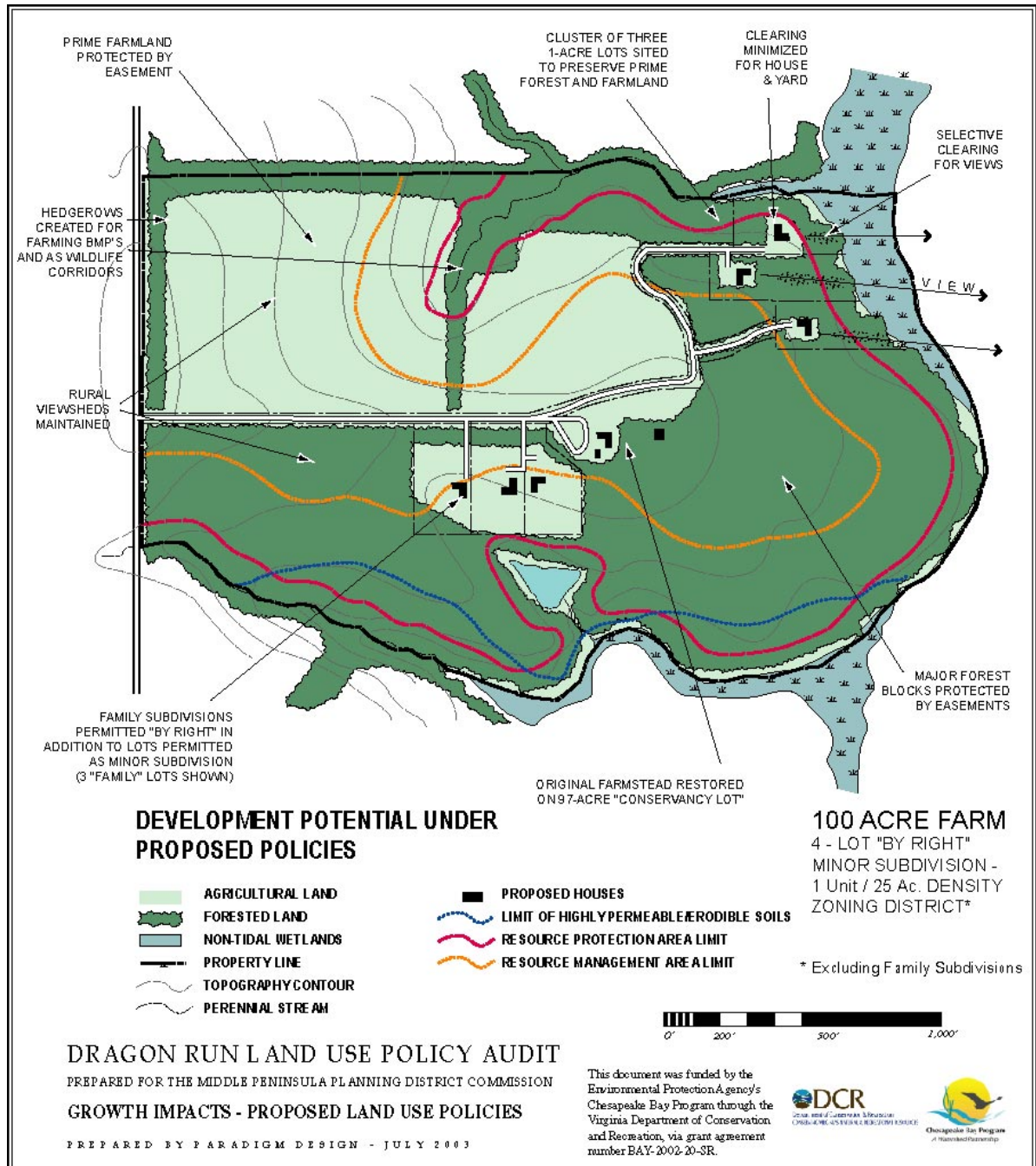
## Map 10. Growth Impacts –Proposed Land Use Policies

The final map shows an alternative development scenario, based on a strengthened set of land development policies and practices. The site plan shown is illustrative only and is not based on a specific ordinance. However, it serves to illustrate a more sensitive development pattern based on innovative land use policies. Some of the policies illustrated include:

- Minor Subdivision with a maximum of four lots “by right.” The underlying zoning is also very low density (1 unit per 25 acres), which underscores the intent of the comprehensive plan policies which call for very low development in the Dragon Run area.
- Family Subdivision rights are preserved. The opportunity for “by-right” subdivisions for family members with a minimum of procedural complexity is preserved as an important right for ensuring that future generations can continue to live on traditional farmsteads in the area.
- The Minor Subdivision requirements call for a mandatory open space provision, with 3 of the 4 permitted lots clustered in 1-2 acre lots and the remaining large lot preserving over 80% of the land in open space.
- The subdivision ordinance also has guidelines that encourage the preservation of land for farming and forestry uses, as well as sensitive house siting and environmental protection, in general. These include:
  - Siting development away from prime farm and forest land and environmentally sensitive areas
  - Preserving existing farm buildings and farmsteads, when practical
  - Preserving existing vegetation, including both large trees and secondary growth, where it forms interconnected wildlife corridors on the site
  - Enhancing on-site vegetation by extending hedgerows and buffers to increase wildlife habitat and improve filtering of overland runoff
  - Aligning drives and roads to avoid significant stands of vegetation and using shared driveways with porous surfaces to minimize impervious area.

In general, the site plan illustrates some of the improvements in development patterns that are possible by implementing a carefully designed set of land use policies and development standards at the level of minor subdivisions. While the standards illustrated generally add to the current set of subdivision regulations in each county, they can be designed so that they are not overly complicated.

In addition, there is an opportunity to provide more “user-friendly” diagrams and simple guidelines than are currently used, in order to make the new standards easier to implement. Overall, they show a relatively simple set of good development practices that preserve landowners’ rights to develop portions of their properties while protecting the special qualities that have made the Dragon Run such a valued local resource.



Map 10. Growth Impacts –Proposed Land Use Policies



## **7.0 CONCLUSION**

### **7.1 Summary**

Overall, the illustrated development scenarios, the recommended policy improvements and the strategic actions proposed above represent a coordinated approach to achieving the goals for the Dragon Run area. The three strategic levels that have been described are presented in an ascending order of potential impact and complexity. Level 1., adopting the SAMP Watershed Management Plan by addendum is the simplest, in terms of implementation and procedural steps. Level 2., adopting a new comprehensive plan district and designation represents an intermediate approach whereby general planning policies are adopted but not implemented directly through regulatory revisions. Level 3., adopting a wholly new zoning district is the most complex and politically sensitive, in that it requires a zoning map and text amendment with the potential to alter the regulatory context for several hundred current landowners in the area.

Each level is presented as a strategic approach only and many details would need to be further developed in order to bring any of them to completion. The main objective in presenting these strategic levels is to give the DRSAMP Advisory Group and the Steering Committee an adequate basis of information to decide on an effective strategy to pursue over the coming months.

In addition, the samples of potential land use policies that have been provided are coordinated with the three levels of strategic implementation. Finally, the illustrative development scenarios present a snapshot of how these improvements could help protect the traditional landscape of the Dragon Run over time.

### **7.2 Looking Ahead**

Many variants of the basic ideas and recommendations in this report have been discussed and some have been partially implemented in the course of the Dragon Run Steering Committee's work over the past 15 years. The pioneering work of the Dragon Run Steering Committee in establishing a process for regional cooperation on the shared resource of the Dragon Run will undoubtedly get more complex over time. As analyzed in this study, there are currently disparities in land use policies between counties across the Dragon Run watershed. Moreover, there are disparities within the counties, in some cases, between what the comprehensive plans and the zoning ordinances say about development in the watershed. Finally, there are some general disparities between the goals that have been agreed to by the four counties in the Dragon Run Memorandum of Agreement and some of the current land use policies on the books in each county.

One important reason for the counties to act proactively in correcting these disparities in the near term is to better prepare each individual jurisdiction in the wake of future economic changes and potential development pressures in the Dragon Run. These types of current policy disparities not only lead to potential land use conflicts between

jurisdictions, they can also open any of the counties up to challenges from those seeking to amend zoning ordinances to allow a particular development within its jurisdiction.

Common sense often argues for fixing problems while they are small – while the solutions are simpler and more manageable. Any major change of land use policies is a slow and often challenging process, especially across a multi-jurisdictional region. Experience across the nation and across the Commonwealth has shown, however, that these types of changes become much more complex and challenging once development pressures have intensified in a region. In many cases, the arrival of development pressures from speculative outside investors has precluded the opportunity to make those policy changes to reverse the trend and the natural resources, rural ways of life and character of the landscape are altered irrevocably as a result.

The foresight of the counties within the Dragon Run watershed has already led to a framework that can work toward the long-term protection of the traditional character of the Dragon Run area. The regional partnership that is being developed in the Dragon Run holds real promise of working concertedly to define a preferred future for the region through a coordinated approach to land use policies across the individual counties. This study presents a comprehensive approach for bringing all the land use components together into a coordinated strategy and provides a “road map” of how to get there over time in order to keep the momentum of the Dragon Run’s landmark regional partnership and planning process going in the future.



Arrow Arum on the banks of the Dragon Run

Photo credit: V. Gavrilovic

**APPENDIX A.**  
**MISSION, GOALS & OBJECTIVES OF THE DRAGON RUN MEMORANDUM  
OF AGREEMENT**

**MISSION:** To support and promote community-based efforts to preserve the cultural, historic, and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed.

**GOAL I**

*Establish a high level of cooperation and communication between the four counties within the Dragon Run Watershed to achieve consistency across county boundaries.*

*OBJECTIVE A*

*Develop a plan to address the inevitable future development pressure to change the traditional use of land in the Dragon Run Watershed.*

*OBJECTIVE B*

*Achieve consistency across county boundaries among land use plans and regulations in order to maintain farming and forestry and to preserve natural heritage areas by protecting plants, animals, natural communities, and aquatic systems.*

*OBJECTIVE C*

*Provide ongoing monitoring of existing plans and planning tools in order to assess traditional land uses and watershed health and take action necessary to preserve the watershed.*

*OBJECTIVE D*

*Comprehensively implement Best Management Practices (BMPs) for water quality, wildlife habitat, and soil conservation.*

**GOAL II**

*Foster educational partnerships and opportunities to establish the community's connection to and respect for the land and water of the Dragon Run.*

*OBJECTIVE A*

*Encourage experience-based education consistent with the Stewardship and Community Engagement goals of the Chesapeake 2000 Agreement.*

*OBJECTIVE B*

*Promote the community and economic benefits of the Dragon Run derived from its natural characteristics and traditional uses such as farming, forestry, hunting and fishing.*



**GOAL III**

*Promote the concept of landowner stewardship that has served to preserve the Dragon Run Watershed as a regional treasure.*

**OBJECTIVE A**

*Address the potential dilemma of preserving the watershed's sense of peace and serenity by protecting open space and reducing fragmentation of farms, forests, and wildlife habitat versus the landowners rights in determining or influencing future land use.*

**OBJECTIVE B**

*Educate landowners about the regional importance of the Dragon Run.*

## APPENDIX B. MATRIX OF PERMISSIBLE USES IN THE DRAGON RUN WATERSHED

	<b>Essex</b>	<b>Gloucester</b>	<b>Middlesex</b>	<b>King &amp; Queen</b>	<b>Notes:</b>
Accessory Apartment, Residence			<b>P (LI)</b>	<b>P (A)</b>	1,2 (King & Queen, Middlesex)
Accessory Uses/Structures	<b>P (A-2, R-2)</b>		<b>P (RH, LDR, VC, LI)</b>	<b>P (I)</b>	
Adult Bookstore, theater		<b>C(I-1)</b>			
Adult Day Care		<b>C(RC1), P(B-4)</b>			
Agriculture/Crop Cultivation/ Horticulture	<b>P (A-2, R-2)</b>	<b>P(RC1)</b>	<b>P (RH, LDR, LI)</b>	<b>P (A)</b>	More limited in R-2 (Essex)
Agricultural Products, Storage & Processing	<b>P (A-2)</b>	<b>P,C(B-4)</b>		<b>P (A)</b>	1(Essex), When raised on premises (K&Q) Feed and Grain Mills only by right in B-4 (Gloucester)
Airport, public	<b>P (A-2)</b>	<b>C(RC1)</b>	<b>P (LDR)</b>	<b>P (I)</b>	
Airport, grass strip or private strip			<b>C (LDR)</b>	<b>C (A)</b>	
Animal Raising, bird, poultry, fish	<b>P (A-2)</b>			<b>P (A)</b>	1(Essex)
Animal Shelter				<b>C (I)</b>	
Apartments			<b>P (VC), C (GB)</b>		1(Middlesex)
Aquaculture			<b>P (LDR)</b>		
Astrology Reading	<b>C (A-2)</b>				
Auction House			<b>P (LDR)</b>		
Auto Graveyard	<b>C (A-2)</b>				
Auto Service Station	<b>C (A-2)</b>	<b>P(B-4, I-1)</b>	<b>P (VC, GB)</b>		
Auto/Truck Sales (new)	<b>C (A-2)</b>	<b>P(I-1)</b>	<b>P (VC, GB)</b>	<b>P (I)</b>	
Auto/Truck Sales (used)	<b>C (A-2)</b>	<b>P(I-1)</b>		<b>P (I)</b>	
Auto/Truck Service, Repair	<b>C (A-2)</b>		<b>C (LDR, VC) P (GB)</b>	<b>P (I)</b>	
Auto/Truck Storage Lot					
Auto Racetrack			<b>C (LDR)</b>		
Bakery, retail					
Bed and Breakfast		<b>C(RC1) P(B-4)</b>	<b>P (RH, LDR)</b>	<b>C, P (A)</b>	Depends on Size (King & Queen)
Boat Docks, private	<b>P (A-2, R-2)</b>			<b>P (A)</b>	
Boat Landing, public	<b>C (A-2)</b>			<b>C (A)</b>	
Boat Yard	<b>C (A-2)</b>		<b>C (LDR)</b>		

Boat/Boat Trailer Sales & Service					
Bus Shelter, school	P (A-2)			P (A)	1(Essex)
Business or Technical School			P (LI)		
Campground	C (A-2)	C(RC1)	C (LDR)	C (A)	Youth Only (Essex)
Car Wash, attended or self-serv			C (VC,GB)		
Catering Establishment					
Cemetery	P (A-2)	C(RC1)	P (LDR)	C (A)	
Child Care Center	C (A-2, R-2,MH-1)	P,C(RC1), P(B-4)	P (VC)	C (A)	In home by-right only in RC-1 in Gloucester
Church, Places of Worship	P (A-2, R-2)	P(RC1, B-4)	P (LDR, VC, GB)	P (A)	
Commercial Recreation, indoor					
Commercial Recreation, outdoor					
Communication facility, radio or Television stations or towers	C (A-2)	P, C (RC1), P,C (B-4, I-1)	C (LDR, VC, GB, LI)	C (A)	1(Essex, Gloucester)
Concrete Plant				C (A)	
Contractor's Storage Yard/Office		P(I-1)	P (LDR,VC,GB, LI)	P (I)	
Convenience Store		P(B-4)	C (LDR, VC, GB)		
Correctional Facility, Local				C (I)	
Data Processing Center					
Dredge Spoil Sites		C (RC1)			
Dirt Dragway				C (A)	
Drive- In Facility (not otherwise mentioned)					
Dry Cleaners					
Eating Establishments/Restaurants		P(B-4)	P (VC)		
Eating Establishments with drive-in		P(B-4, I-1)			
Electrical Supply Sales					
	<b>Essex</b>	<b>Gloucester</b>	<b>Middlesex</b>	<b>King &amp; Queen</b>	<b>Notes:</b>
Farm Equipment Sales, Service, Repair		C(RC1, B-4)	C (LDR), P (GB)	P (I)	
Feed, Seed, Fertilizer Sales			C (LDR)		
Financial Institution, Bank		P(B-4)			
Financial Institution without drive			P (GB)		
Fire/Rescue Station	C (A-2)		P (VC, GB)	P (A,I)	
Food Processing Plants			P (LI)		
Forestry	P (A-2, R-2)	P(RC1) P(B-4,I-1)	P (RH, LDR)	P (A)	

Funeral Home/Mortuary			P (GB)		
Garage, parking or storage					
Golf Course/Country Club		C(RC1)	P (LDR)	C (A)	
Greenhouses, commercial, wholesale, retail/Nursery	C (A-2)		P (RH, LDR, VC)	C (A)	
General/Country Store	P (A-2)	C(RC1), P(B-4)	C (LDR)	C (A)	4,000 s.f. or less (Essex, King and Queen); 5,000 or less in Middlesex
Grocery Store			P (VC)		
Group Homes		C(RC1)	C (VC)	P (A)	1 (King & Queen)
Guest Houses & Country Inn		C(RC1) P(B-4)			
Health Clubs					
Home Business/Occupation	P (A-2)	P, C(RC1)	P (VC)	P (A)	1(Gloucester)
Hotel, Motel, Motor Lodge		P(I-1)			
Hunting, Fishing, Clubs (private)	P (A-2)	P(RC1)	P (LDR)	C (A)	1(Essex)
Hospital	P (R-2)		P (GB)		
Institutional Use - educational, philanthropic					
Junkyard			C (LDR)		
Kennel, commercial	P (A-2)	C(RC1,B-4)	P (LDR ), C (VC)	C (A)	1(Essex)
Kennel, private	P (A-2)			P (A)	1(Essex)
Landfill, public (county)	P (A-2)	C(RC1)	C (RH.)	C (I)	
Laundries, Laundromat				C (A)	
Lawnmower/Equipment, sales, rental, repair		P(B-4)			
Library		P(RC1)		P (A)	
Livestock, Auction & Market		C (RC1, B-4)		P (A)	
Livestock Feed Lot		P(RC1)			
Livestock, Intensive Dairy, Poultry	P (A-2)	P(RC1)		P (A)	
Lumber and Building Supply			P (GB, LI)	P (I)	
Manufactured Home	P (A-2, MH-1)	P(RC1,I-1)	P (RH, GB)	P (A)	1(King & Queen)
Manufactured Home and trailer		P(I-1)			

Manufacturing	C (A-2)	C(RC1) P(I-1),	P (GB, LI)	P, C (I)	Limited to heating units, burial vault in Essex; Wide variety of manufacturing uses allowed King & Queen County; Limited to Light Manufacturing, Food Processing, Cabinet, Furniture and Upholstery Fabrication under 5,000 s.f. in GB and Light Manufacturing, Extractive Manufacturing, and Cabinet, Furniture and Upholstery Fabrication in LI in Middlesex County; Light Manufacturing Only in RC-1 and Light to Medium, Fiberglass molding and construction and Cabinet, Furniture and Upholstery Fabrication by right in I-1 in Gloucester, Extractive Manufacturing with Conditional approval in I-I in Gloucester
Marina	C (A-2)		C (LDR)	C (A)	
Microbrewery		P(I-1)			
Mining, Surface			C (RH, LDR)		
Mining, Sand, Gravel, Stone	C (A-2)	C(RC1)			
Mobile Home Park Office Building /Service Buildings	P (MH-1)				
Modular Home	P (A-2)				
Monument Works		P(I-1)			
Motorcycle Sales & Service					
Museum		P(RC1), P(B-4)	C (GB)		
Nursing Home/Home for Elderly	C (A-2) P (R-2)	P(B-4)	P (LDR, VC)		
Nursery School	C (A-2)				
Office, Business, Professional, Administrative	C (A-2)	P(B-4,I-1)	C (LDR, VC, LI)	C (A)	Professional Occupations (Middlesex)
Office, Medical, Dental		P(B-4,I-1)	C (LDR, VC, GB)	C (A)	Professional Occupations (Middlesex)
Office, Public/Government	C (A-2)	P(B-4)	P (GB)	P (A)	
Office, Temporary				P (A,I)	
Parks and Playgrounds	C (A-2,R-2)	P(RC1)	P (LDR, VC)	P (A)	
Personal Service Establishment					
	<b>Essex</b>	Gloucester	<b>Middlesex</b>	<b>King &amp; Queen</b>	<b>Notes:</b>
Plumbing Supply Sales					
Police Station				P (A)	
Post Office	P (A-2)	P(B-4)	P (GB)	P (A,I)	

Printing, Commercial/Newspaper			P (GB)		
Private Club, Lodge		C(RC1) P(B-4	C (VC)	C (A)	
Private School, College, University					
Public Uses (governmental)					
Public Utilities	P (A-2, R-2,MH-1)	P(RC1,B-4,I-1)	P (RH,LI)	P, C (A), P (I)	Electric and Telephone Transmission facilities only in RH district in Middlesex;
Racetrack, Commercial		C(RC1			
Radio Station, Studio					
Radio Tower					
Research Institutions, Labs			P (LI)		
Recreation Center					
Recreation Facility, outdoor				C (A)	
Recreation, Noncommercial			P (RH)		
Recreational Use or Facility, private, Civic, or commercial	P (A-2)	P, C(RC1,B-4		P (A)	
Rental or Sale of trailers, camper, pick-up caps					
Rental Establishment (household items)					
Rental Storage Facility					
Repair Service Establishment				P (I)	
Residence, Single Family Detached	P (A-2, R-2)	P(RC1, B-4	P (RH, LDR, VC)	P (A)	
Residence, Duplex			P (VC)	C (A)	
Residential Cluster				P (A)	7 lot maximum (K&Q)
Retail Sales Establishment		P(B-4	P, C (VC); P(GB		Less than 5,000 s.f. by right (Middlesex)
Retreat/Meeting/Assembly Facility			C (LDR		
Rifle, Pistol Range		C(RC1	C (LDR	C (I)	1 (King & Queen)
Rural Occupation	C (A-2)		P (RH, LDR)		Rural Home Occupation in Middlesex;
Sawmill	C (A-2)	C(RC1	C (LDR) P (LI)	P (I)	
Sawmill, Portable or Temporary	P (A-2)	P(RC1		P (I)	1,2(Essex)
School, Public	C (A-2,R-2)	P(RC1	P (LDR, VC)	P (A)	
School, Private	C (A-2,R-2)	P(RC1	P (LDR, VC	P (A)	
Seafood Processing Plant		C(RC1	C (LDR)		
Seawall	P (A-2, R-2)				
Self Storage Facility			C (LDR, VC, GB)		Less than 5,000 s.f. in VC (Middlesex)
Septic Lagoon				C (I)	1 (King & Queen)
Service Business		P(I-1)	P (GB),C (LDR,LI)	P (I)	
Solid Waste Transfer, public				C (I)	
Special Use Facility				C (I)	
Stable, commercial	P (A-2)	C(RC1		C (A)	1(Essex)

Stable, private	P (A-2)		P (LDR)	P (A)	
Studio, music, dance			P (GB)		
Single Family Dwelling					
Taxidermist					
Television Station/Studio					
Television Tower					
Temporary Sales, stand or area					
Theater			P (GB)		
Travel Trailer	P (MH-1)				
Truck and Freight Terminal		P (I-1)			
Vehicle Repair, light					
Veterinary Clinic or Hospital		P(B-4 C(RC1	P (LDR, GB)	C (A)	
Warehouse, Wholesale Distribut			P (GB, LI)	P (I)	
Wastewater Treatment Plant				C (A,I)	
Water Pumping Station				C (A), P (I)	
Water Treatment Plant				C (A,I)	
Wayside Stand		C(RC1), P(B-4	P (RH, LDR, GB LI)		
Wholesale Businesses		P(I-1)	P (GB,LI)		
Wildlife Preserve, Reserve	P (A-2)	P(RC1	P (RH, LDR)	P (A)	
Yacht Club		C(RC1	C (VC)		

1 Subject to standards

2 In conjunction with another use

\* Includes only those Zoning Districts in the Dragon Run Watershed Study Area

## APPENDIX C. LAND AREA BY ZONING DISTRICT IN THE DRAGON RUN WATERSHED

COUNTY	ZONE	Total Acreage / Zoning Type	Minimum Lot Size / Zoning Type
<b>ESSEX</b>	Limited Agricultural District (A-2)	18,439.0	1.0
	Limited Residential District (R-2)	28.0	0.5
	Mobile Home Park (MH-1)	27.0	1.0
<b>GLOUCESTER</b>	Historic Overlay District (H-1)	23.0	0.0
	Industrial (I-1)	16.0	1.0
	Rural Business (B-4)	129.0	30.0
	Rural Countryside District (RC-1)	5,585.0	5.0
<b>KING AND QUEEN</b>	Agricultural	45,934.0	2.0
	Industrial	411.0	5.0
<b>MIDDLESEX</b>	Dragon Run Conservation	3,545.0	0.0
	General Business	63.0	5.0
	Light Industrial	125.0	50.0
	Low Density Rural	8,542.0	2.5
	Resource Husbandry	6,181.0	100.0
	Village Community	658.0	1.0
<b>TOTAL</b>		<b>89,706.0</b>	

Source: Dragon Run Management Framework, Anderson & Associates, Inc. November 5, 2001