Opportunities for Sustainable Natural Resource-Based Development in the Dragon Run Watershed

Presented By:

Yellow Wood Associates, Inc.
228 North Main Street
St. Albans, VT 05478

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About Yellow Wood Associates, Inc.

Yellow Wood Associates, Inc. (Yellow Wood) of St. Albans, Vermont has 20 years of experience working with rural communities on issues related to community and economic development and natural resource use. Yellow Wood has gained a strong national reputation for creative problem-solving based on thorough research. The firm's research capability is enhanced by the way we work with our clients to clarify their goals and develop research questions which will yield information for more effective decision-making and productive action.

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Introduction

The overall purpose of the project is to identify and explore economic development activities and opportunities that sustain traditional land uses while enhancing the natural resource base or at least minimizing adverse impacts. To that end, Yellow Wood Associates reviewed background information pertaining to the Dragon Run Watershed and its natural resource-based economy and prepared a customized set of opportunity maps describing potential natural resource-based activities that could promote sustainability. Two Yellow Wood staff conducted an intensive site assessment over a one-week period. The opportunity maps were used as a discussion tool in over 30 personal and telephone interviews with Dragon Run residents, service providers, and government officials. We spoke with landowners, Cooperative Extension staff, farmers, wood products business owners, conservationists, recreationists, educators, foresters, hospitality providers, artists, county officials, economic developers, and small business people. Information obtained through the site visit and interviews was collated and the Dragon Run Steering Committee was presented with a wide range of possible topics on which follow-up research could be conducted.[1] From that list, the Steering Committee selected seven areas for further exploration:

1) Controlling public access; research into models
2) Biodiesel utilization (and production) for municipal vehicles
3) Estate planning program linked to rights of first refusal and/or easement purchases for Dragon Run landowners
4) Municipal recycling center for organic materials
5) Showcase for local foods and crafts with education exhibits and sales opportunities
6) Producing white oak staves for wine barrels
7) Organic produce production and Community Supported Agriculture

Separate reports on each of these topics are contained herein. Reports are of two distinct types: enterprise papers and learning papers. Enterprise papers on utilizing biodiesel, recycling organic materials, showcasing local crafts and food products, and producing white oak staves for wine barrels provide examples of enterprises that fit within the overall goal of sustainable natural resource-based economic development for the Watershed, whether carried out within the public or private sectors. The learning papers on estate planning, organic production, and controlling public access are intended to inform the Dragon Run Steering Committee and improve understanding at a conceptual level.

Each paper contains valuable information in its own right. In addition, the Steering Committee should be aware of the potential synergies between several of these activities. For example, compost produced in an organic materials recycling center would be a valuable input in local organic agriculture as well as white oak reforestation. Craft and local food products development may tie back to agriculture and forestry inputs and forward to controlled public access including events, tours, and heritage education. Local government commitment to biodiesel could offer new opportunities for local farmers as well as a cleaner environment, and open up new fuel opportunities for the private sector as well. Finally,

[1] The appendix to this report includes the complete list of ideas presented to the Dragon Run Steering Committee on June 23, 2005.

estate planning may be related to public access, securing the land base for long-term natural resource management and use, and capturing local wealth to support sustainable local development.

Considerations on the Potential Use of White Oak for Oak Stave/Wine Barrel Construction in the Dragon Run Watershed

Introduction

The Dragon Run Steering Committee (DRSC) seeks to explore ways to sustainably utilize the abundant forest resources in the watershed in order to bring added value to businesses and communities in the Middle Peninsula. Specifically, the Committee is interested in the feasibility of harvesting white oak (*quercus albus*) logs for sale as raw material in building barrels for wine and liquor production.

Adding Value to White Oak: Oak Staves for Wine Barrels

Yellow Wood set out to investigate the potential for harvesting white oak for use in the construction of wine barrels[2]. The sale of white oak for this market creates a niche market opportunity for adding value to an abundant species in the watershed, because logs for these markets fetch a premium over the standard lumber grade used for furniture, yet do not need to meet the same quality standards as veneer.

Wine making is a highly specialized trade that has evolved over centuries of practice. Through the years, oak has been one of the favorite woods in which to age wine, because chemicals in the wood itself (i.e. lactones, vanillin, phenols) impart particular flavors and odors to the wine. Some of the words that are used to describe the influence of oak on wine include: dusty, nutty, bourbon character, toasty, smoky, sawdust, and sappy.

Although there are a number of species within the white oak family, such as Chestnut and Post Oak, only the *quercus albus* species in the United States meets the requirements for wine barrel making. Some of the requirements include: porosity, strength, resilience, workability, weight and character.

Within the United States, the specific properties of white oak (*quercus albus*) differ depending on the geographic location in which it is grown. Just as the variety of the grape are important in selecting which to use for making wine, the properties of the regional varieties of *quercus albus* have become an important part of selecting which wood to use in the barrel making process. The popularity of American white oak has risen recently in the wine-making business, in part due to simple economics (barrels made from American oak cost about $270, while French oak barrels cost between $550-$650).

The majority of American white oak used for barrel construction comes from Oregon, Minnesota, Missouri, Pennsylvania, and Virginia. Each barrel maker favors oak from a

[2] The construction of wine barrels is also referred to as coopering.

particular state or region, depending on the qualities of the wood that are sought (i.e. tightness of grain vs. flavor).

Quality Characteristics of a Stave Log

Wine barrels are made from narrow strips of wood called staves. Typically, the log intended for production of staves will sell for two to three times the price of a regular saw log. A tree that is fifteen inches in diameter is an adequate size to produce a stave log. A tree of this size requires, on average, 50 to 80 years to grow to maturity. Each stave log must be cut into forty-inch sections (spoke) and quarter sawn across the grain (cutting cross-grain prevents the liquid from seeping through the wood).

Virginia White Oaks

Virginia is one of the largest exporters of white oak in the country. The variety of white oak grown in Virginia is associated in the wine industry as having flavors of coconut and vanilla. These and other characteristics have created a significant demand, both domestically and abroad, for wine barrels made from Virginia white oak.

Forest Resources in the Dragon Run Watershed

Distribution of White Oak in the Dragon Run Watershed

Yellow Wood used the United States Forest Service's (USFS's) Forest Inventory Mapmaker to investigate the distribution of white oak in the Dragon Run Watershed. Unfortunately, the database only reports information on the county level and the Dragon Run Watershed consists of portions of four counties, including Middlesex, King and Queen, Gloucester, and Essex Counties. In order to apply the USFS data on the watershed level, it is therefore necessary to first determine what percentage of the four-county area is the Dragon Run Watershed[3].

The total area of land in the four-county region is approximately 613,838 acres and the total area of the watershed is 90,000 acres. Therefore, the Dragon Run Watershed makes up approximately 15% of the four-county region. However, a better indicator for this analysis may be obtained by comparing the total forested area of the watershed to the total forested area of the four-county region.

Of this total area of the watershed, approximately 72,000 acres (80% - 90%) is forested[4]. According to the Forest Inventory Mapmaker data, this represents 18% of the total forested

[3] The Forest Inventory Mapmaker data is based on sample plots throughout the entire state. Interpolating the data for a four-county region reduces the reliability of the statistics, because the data is based on fewer samples.

[4] The State of the Dragon Run Watershed: Status of Natural Resources. December 2003. Middle Peninsula Planning District Commission. http://www.mppdc.com/projects/State_of_Dragon.pdf

area of the four-county area[5]. We will use this figure to interpolate data from the four-county region to the watershed level[6].

The USFS data groups similar tree species together. White oak (*quercus albus*) is in the category "Select White Oak," which also includes swamp white oak, swamp chestnut oak, and chinkapin (which is not common in the Middle Peninsula). Unfortunately, it is impossible to disaggregate this data to determine what percentage of each species is reflected in the total. According to 2001 data, the total net volume of sawtimber select white oak on timberland in the four-county region is 256,944,752 boardfeet. This figure represents the total volume of trees that are greater than 11" in diameter minus existing dead and/rotten trees. Based on our assumptions above, we can estimate that the total volume in the watershed is on the order of 46,250,055 board feet.

Yellow Wood also spoke with David Slack, Virginia Department of Forestry's (VDOF) Regional Forester for Tappahannock County, who provided a description of the types and distribution of tree species from his own personal observation in the field. Mr. Slack indicated that there is a mix of oak species in the white oak family throughout the watershed. Some of the species in the white oak family include swamp oak, chestnut oak and post oak. The type of species growing in a particular location is dependent on site conditions, such as soil type and hydrology, among other factors. Mr. Slack stated that the mixture of oak with other species (i.e. hickory/oak) is the predominant forest type in at least half of the watershed.

History and Ownership of Forest Lands in the Dragon Run Watershed

According to the Forest Inventory Database, approximately 98% of the property within the watershed is private, which includes corporate holdings. Originally, much of the land in the Middle Peninsula was owned by Chesapeake Corporation, which divested itself of these lands to other corporations, such as John Hancock.

Accessibility and Existing Markets in the Dragon Run Watershed

Because these lands were once actively managed by Chesapeake, there still exists an intact road network to access many of these parcels. Historically, much of the land in the watershed was managed for softwood – specifically, yellow pine. As a result, many of the local mills to this day focus on softwood species. Additional markets for white oak could help spur increased reforestation in the watershed of hardwood species, helping to diversify the forest ecosystem while providing greater opportunities for private landowners. Currently, there are a number of markets for hardwoods in the area, such as Augusta Wood Products in West Point, which focuses on higher quality hardwood products[7].

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[5] Total number of accessible forestland in the four-county region is 390,980 acres.

[6] The assumptions used in this section are only for computing gross estimates of species composition in the watershed. These figures should not be used for other purposes.

[7] For a complete list of markets, visit the Forest Products Directory link in the resources section of this report.

Cooperages and Stave Manufactures

Cooperages

Yellow Wood began by contacting existing cooperages in the United States in order to determine if there was interest in buying white oak from the Dragon Run Watershed. The results of our research are summarized below.

Yellow Wood identified six cooperages that are currently operating in the United States. These include:

- Kelvin Cooperage (KY)
- World Cooperage (CA)
- Bluegrass Cooperage (KY)
- Canton Cooperage (CA)
- Demptos Cooperage (CA)
- Seguin-Moreau (CA)

These cooperages are located in two main regions – the Midwest (Minnesota & Kentucky) and California. These regions reflect the areas in which the dominant white oak varieties used to create barrels are most commonly found. This trend toward using regional varieties of white oaks was corroborated by our research. The majority of cooperages with whom we spoke primarily drew from the states of Minnesota and Kentucky.

One of the cooperages that we initially identified, Mendocino Cooperage (CA), closed its doors in late 2004, citing "a move by many wineries to use barrel alternatives, such as oak chips or cubes, rather than aging wine in oak barrels to achieve their desired taste profile."[8]

Out of all the cooperages that we contacted[9], none were potentially interested in purchasing stave logs from the Dragon Run Watershed. Almost all of these cooperages owned their own log yards and mills and were not interested in additional sources of wood. In addition, most pointed out that they were not interested in buying outside of their designated region.

Stave Manufacturers

Yellow Wood also identified and contacted two stave manufactures, American Stave Company (OH) and Ramoneda Brothers Stave Mill (VA), in order to determine their interest in buying white oak from the Middle Peninsula.

Bob McKenzie of the American Stave Company indicated that his company was open to purchasing stave logs from the Middle Peninsula, but cautioned that the price he could offer

[8] "Brown-Forman closes California Cooperage." Business First. 4 December 2004. http://www.bizjournals.com/louisville/stories/2004/12/06/daily3.html

[9] Yellow Wood was unable to contact the Bluegrass Cooperage in Kentucky.

might not be that favorable to the seller due to transportation costs. Bob estimated that transportation costs from the Middle Peninsula to the stave mill on the Ohio/West Virginia border could cost the seller as much as 60% of the price that he could pay for one log.

Ramoneda Brothers Stave Mill is located in Culpeper, Virginia and has been in operation for over 100 years. Co-owner Vick Ramoneda indicated that they are always looking for quality stave logs and pointed out that potential sellers should go through a logging company or log broker. Vick confirmed that his company is primarily interested in only white oak (*quercus albus*) and that the minimum diameter of any stave log is 13 inches. Due to the distances involved (approximately 100 miles), the transportation costs associated with shipping the stave logs from the Dragon Run Watershed to the Ramoneda Brothers Stave Mill would be relatively low, thereby maximizing the profit for the seller.

Foreign Markets for Virginia White Oak

Clearly, the existence of a stave mill so close to the Dragon Run Watershed presents an excellent opportunity to maximize financial returns on the harvest and sale of white oak for staves. In the course of our research, Yellow Wood also identified several foreign markets for white oak that should be considered as well.

Jim Green, who is the International Marketing Specialist for the Forest Products Division of Marketing with the Virginia Department of Agriculture and Consumer Services, has been working with foreign importers of Virginia white oak for many years, including one cooperage in Spain and several in South America. Mr. Green identified a log broker near West Point, Stan Caruso of Caruso, Inc., who specializes in high quality hardwoods, including stave logs that are sold to foreign coopers (see Resources section for contact information).

Building a Value-Added Chain in Virginia: From White Oak Logs to Wine Barrels

While the South American buyers primarily use white oak in barrels built for the domestic markets in Argentina and Chile, the Spanish cooper sells many of his barrels to United States wineries, including several Virginia wineries. The fact that the final product (wine barrels) of this value-added chain (white oak logs -- wine barrels) ends up in Virginia wineries presents a unique opportunity to develop a tight cooperage manufacturing facility in Virginia. There are distinct benefits associated with keeping all value-added steps in Virginia, including the creation of a 100% "Made in Virginia" wine product (a wine made from grapes grown in Virginia and aged in Virginia white oak barrels, made locally). Indeed, there are a number of individuals who are currently working hard to see that this concept becomes a reality in Virginia.

In addition to Jim Green, Charlie Becker, who is the Utilization & Marketing Manager at the Virginia Department of Forestry, has been working on this initiative for the past ten years. Mr. Becker reported that, to date, no existing cooperages in the southeastern region of the United States have agreed to make wine barrels for this purpose. One of the main reasons

for this is that actual process of coopering is a dying art and, as a result, it is difficult to find artisans that are capable of performing this task. Mr. Green mentioned that his Spanish contact was potentially interested in setting up and delivering training in the United States on coopering. The main obstacle, however, is the funding and capital investment required to set up a new cooperage. Start-up costs are extremely high because all the machinery required to make the barrels has to be custom-made. Furthermore, according to testimony by Jim Green given to the Agribusiness Committee of the Commission on Tobacco Indemnification and Community Revitalization, a stave production facility must be built as well, because the staves manufactured by the Ramoneda Brothers would not be able to be used for this venture[10]. For more information, contact Jim Green (see Resources section for contact information).

In 2004, an application was delivered to the Agribusiness Committee of the Commission on Tobacco Indemnification and Community Revitalization on behalf of the Virginia Forest Based Economic Development Council which requested funding support for the development of a tight cooperage in Virginia. This proposal did not receive funding and the project supporters, including Mr. Green and Mr. Becker, continue to work to identify additional funding sources.

Next Steps

Creating a Cooperage

The Dragon Run Steering Committee should contact Mr. Green and Mr. Becker to express their interest in bringing a tight cooperage to the Dragon Run Watershed and to determine what types of support from the Committee would be most useful toward that end. For example, there may be an opportunity to partner with these gentlemen in raising funds for a full feasibility study and/or training program. Other steps might include inviting the Spanish cooper on a tour of the Dragon Run Watershed and/or engaging the community college as a potential training facility. Contact information is contained in the Resources section of this report.

Selling Oak Logs to Existing Markets

In the meantime, there are existing markets, such as the Ramoneda Brothers Stave Mill and Caruso, Inc., which present an excellent opportunity to capitalize on white oak resources in the watershed. Accessing these markets could help the Dragon Run Steering Committee make progress toward its goal of sustainably utilizing the abundant forest resources in the watershed in order to bring added value to businesses and communities in the Middle Peninsula.

In order to achieve this goal, the DRSC should promote the importance of properly managing hardwood forest resources on private lands within the watershed. In so doing, they will help ensure that there will be a continual supply of quality product to these and

[10] http://www.vatobaccocommission.org/Minutes/Full_Apr28_2005_Hotel%20Roanoke.doc

other markets. Yellow Wood has outlined a number of steps below that will facilitate landowners' access to these markets.

Identify Specific Quality Characteristics for Each Market

This document gives an overview of the quality characteristics that are important in selecting white oak logs for the stave/barrel market. The markets identified above may have additional requirements beyond those mentioned here. Both markets should be contacted to verify their specific standards.

Identify Interested Timberland Owners of Potential Markets for White Oak

The DRSC should undertake a public education campaign to educate timberland owners about the potential revenue sources that flow from well-managed hardwood species, especially white oak. In this process, the DRSC should encourage landowners who are interested to put their names on a sign-up list.

Conduct Forest Inventory in the Watershed

A forest inventory or *cruise* determines the location of timber and estimates its quantity by species, product potential, size, quality, or other characteristics. Given that the USFS data included in this report is not an accurate reflection of the composition and distribution of tree species in the watershed, a timber cruise could provide useful data on the quantity of white oak in the watershed that would be suitable for stave/barrel construction. A team of loggers and foresters could be assembled that could conduct timber cruises on those lands of interested landowners identified in the previous step.

Develop Relationships between Log Brokers, Concentration Yards, Stave Mill, and Foreign Buyers

Once the timber cruise has been conducted and it has been determined that there are sufficient quantities of quality white oak to justify pursuing stave/barrel markets, the DRSC should see to it that relationships between log brokers, concentration yards, stave mill, and foreign buyers are developed. This step is essential in order to make sure that prime stave logs are processed as such and not for other, lower value uses. For example, the logger/forester needs to be aware of the quality characteristics of the stave log and recognize it in the field when he/she sees it. In addition, there needs to be an established concentration yard(s) where harvested stave logs are stored before shipment to market. Finally, the stave mill or other buyer must work closely with the log broker/concentration yard to make sure that the logs meet his/her quality characteristics.

The above guidelines serve as a starting point for the DRSC in its efforts to bring added value to businesses and communities in the Middle Peninsula.

Resources

Stave Manufacturers

American Stave Company, Inc.
Bob McKenzie
1078 S. Jefferson, Lebanon, MO 65536
573-308-1592

Ramoneda Brothers Stave Mill
Vic Ramoneda
13452 Rixeyville Rd., Culpeper, VA 22701
540-825-9266

Stave Log Exporter

Caruso, Inc. (Stan Caruso)
P.O. Box 161, 18000 Eltham Road, West Point, VA 23181
804-843-4586; Fax: 804-843-4587; Mobile: 804-514-4865
Email: scaruso@prodigy.net

Virginia Forest Product Businesses

Virginia Forest Products Directory
(Virginia Department of Forestry)
Lists all forest product businesses in Virginia.
http://www.dof.virginia.gov/mgt/index.shtml

Virginia Forest Products Export Directory
(Virginia Department of Agriculture and Consumer Services)
Specifically focused on those forest product businesses that export forest products abroad.
http://www.vdacs.virginia.gov/international/export.html

Other Contacts

Jim Green
International Marketing Specialist, Forest Products Division
Virginia Department of Agriculture and Consumer Services (VDACS)
804-371-8991

Charlie Becker
Utilization & Marketing Manager
Virginia Department of Forestry
434-977-6555

Showcase for Local Foods and Crafts with Educational Exhibits and Sales Opportunities

Current Conditions
What we know of current conditions in the crafts and local foods industry in the Dragon Run Watershed is based on a one week site visit and limited follow-up and is, therefore, only a partial picture. However, information collected during the site visit indicates that, while there are individual producers of handcrafted local products of various types within the watershed, there is currently no active network of local producers. Many producers do not know each other, nor does the general public know of them. For example, when we asked whether anyone was making furniture from local resources, most people did not know of anyone; two people we spoke with each knew of one furniture-maker.

According to the people we interviewed, there is no indigenous Dragon Run furniture style, since most early furniture was imported from Britain. However, there is a wooden boat style indigenous to the area.

We also learned the Rappahannock Indian Tribe is having classes in pottery for kids to preserve the traditional skills. Alinda Uzel, of Cooperative Extension in King and Queen County, is interested in supporting microbusinesses, including craftspeople and food producers. Extension's increasing interest in community development may offer opportunities to partner in pursuing a crafts and local foods development strategy. Cooperative Extension in King and Queen County is also hosting a county-wide electronic village that could provide a platform for web-based marketing efforts in the region.

There are also several events held in or near the watershed that "showcase" local culture, including crafts. These include: the West Point Crab Festival, the Gloucester Daffodil Festival, King and Queen Community Pride Day, Dragon Run Day, and the Urbanna Oyster Festival.

Based on this information, guidance from the Steering Committee, and the overall goal of sustainable natural resource-based economic development, we have chosen to define a "showcase" not as a single event, whose success would depend on attracting people from outside the area, which is contrary to our initial charge, but rather on models for developing the local art, craft and food production sector as a whole. If a vibrant art, craft, and local food economy were developed within and around the Dragon Run Watershed, it could encourage the use of natural materials as well as local talent in creating products with appeal to customers outside the watershed, thus becoming an economic engine for the area without necessarily contributing to an influx of tourists.

Virginia's Craft Economy
The Craft Organization Development Association (CODA), which serves organizations with education and professional development to foster public appreciation and understanding of

craft, conducted a 2001 study of the craft industry in Virginia (and nationally). Craftspeople were defined as anyone who has made any portion of their income from the production and sale of crafts. The survey estimates there are 3,063 craftspeople in Virginia earning an average revenue of $56,525. Respondents to the survey numbered 246. Average revenues range from $10,000 for craftspeople working in organic materials to $220,000 for craftspeople working in leather. Almost 60% of total revenues came from retail sales with 52% of retail sales at crafts fairs, 26% at studios, and 14% from commissions (8% other). Many derive revenues from more than one source. Most craftspeople in Virginia (83.7%) are affiliated with a craft organization. The final economic impact of crafts from Virginia craftspeople was estimated to be $226,226,284, including retail markup to wholesale sales. No multiplier effects were calculated.

Nationally, the total direct impact from the sale of American craft was estimated by CODA to be $14 billion in 2000. According to HandMade in America, this is one-third the volume of shoes purchased in the U.S. and four times the value of taxi-cab rides.

Models of Regional Craft Sector Development

This report is based on two highly successful models of regional craft sector development, the Adirondack North Country Association and HandMade in America. While the geographic range of these efforts is greater than the size of the Dragon Run Watershed, the basic approach and steps to organizing the sector are applicable, and there is always the possibility of cooperation with crafters, local food producers, and related organizations outside the Dragon Run Watershed where economies of scale are an issue.

Adirondack North Country Association

The Adirondack North Country Association (ANCA), a non-profit regional economic development organization, has been encouraging the craft sector as part of a regional economic development strategy since 1985. Their support began with identifying crafters within their 14-county region who had an interest in growing their businesses, improving their skills, and reaching new markets. Not all crafters fit this description. Working with those who do is an ongoing challenge since most are artisans first and businesspeople second. Ongoing program staffing and programming is required to work with regional producers to develop business skills and practices essential to effective economic development.

ANCA's initial focus was on establishing new market venues within the region. Two steps were taken. First, ANCA developed a self-guided driving tour of craft studios in the region for distribution at visitors' centers and other tourist destinations within the Adirondack Park. This consists of a map with explicit directions to studios, contact information to call ahead and make appointments if necessary, and a description of the craft and crafter at each location. Today, ANCA has broadened the focus of the self-guided tours to include arts, crafts, and local foods handmade in the region. Bed and breakfast owners find the guide "very helpful. Guests take them along and use them as guides."

Second, ANCA created a retail store to showcase regional crafts. The store opened representing the work of 42 crafters. Initially, all sales were on consignment. However, ANCA soon learned that consignment arrangements should be limited to large, expensive one-of-a-kind products or high risk products and that all others should be purchased from producers at wholesale prices. All products were juried primarily for quality of craftsmanship. Jury requirements have changed over the years (see below). The retail store, located in Lake Placid, became so successful that it was purchased after eight years by a private couple who continue to operate it to serve local artists and craftspeople and market their work. At the time of sale, and today, the store represents the work of over 300 crafters in the 14-county region.

In 1988, ANCA developed a Made in the Adirondack North Country logo for use by crafters, artisans, artists, producers, and retailers in advertising, marketing, and other printed or Web materials. A detailed set of logo usage guidelines were also developed as the basis for contractual agreements and are available on the ANCA website (see below). The logo can be used only on products that have been fashioned from materials that originate in ANCA's 14-county region and/or have been made from imported materials but have at least 50% of their retail value added through production in the region. The logo can also be used by retailers who have 50% or more of their product line fulfilling either and/or a combination of these requirements.

To assist those craftspeople who were interested in improving their management and/or marketing skills, ANCA began to offer a series of workshops tailored to their needs on topics such as: How to establish and maintain wholesale accounts, Create a website in a day, eBay University, and Best practices in attracting visitors to and selling from a studio/shop. ANCA also directs crafters to other more generic business development support services.

Once the region had identified craftspeople with an interest in growing their markets, and knew they had the capacity to produce to high standards in sufficient quantity to support wholesale accounts, ANCA began to host a regional Buyer's Day, bringing buyers from around the country into the region to meet crafters and establish relationships. ANCA markets Buyer's Day as "the only tradeshow showcasing small producers with rustic and nature theme product lines," and has renamed it Rustic Nature Buyer Days. As with the self-guided tours, Buyer's Days have expanded to feature art, crafts, and local food. The show currently has 80 participating exhibitors, and grosses over $100,000 each year, with as much as $6,000 in sales for individual vendors. ANCA is also working with a group of crafters who have been successful at Buyer's Days and now have an interest in attending trade shows outside the region.

Jury criteria have evolved from an initial focus on product quality to a focus on how the product is made, where it is made, and what kind of value is added to it within the region. ANCA works with producers to prepare them for juries by offering workshops and guidance on preparing photos, samples, brochures, and price lists and gives detailed feedback to applicants.

Finally, to maintain communication and encourage networking, ANCA publishes a bimonthly newsletter called, "The Creative Economy" that includes congratulations on individual and business achievements, announcements of gallery openings and sales opportunities, information on resources available, and articles. ANCA also maintains an online crafts and retailer resource at www.adknccrafts.com.

Most recently, ANCA has studied 12 successful retail craft stores in their region and identified best practices in craft retailing. All 12 stores specialize in handmade crafts and related products from the Adirondack region and are supplied by area crafters.

HandMade in America

HandMade in America is a non-profit organization formed in 1994 to "celebrate the hand and the handmade; to nurture the creation of traditional and contemporary craft; to revere and protect our resources; and to preserve and enrich the spiritual, cultural, and community life of our region." One of HandMade's goals is "To implement environmentally sustainable economic development strategies for Western North Carolina that emphasize the handmade industry."

HandMade works through a series of alliances and partnerships with over 30 organizations "working to promote civic change based on sustainable development principles." (http://solstice.crest.org/environment/renew_america/97nar/97o2655.htm) HandMade has engaged in a number of activities to fulfill its mission, including:

- Producing a self-guided craft heritage trails guidebook through a 22-county region
- Constructing craft studio incubators atop a closed rural landfill, using methane to fuel kilns and glassblowing furnaces
- Establishing a weaving training program
- Establishing a loan program for craftspeople and craft support businesses
- Creating a craft registry database of artists, galleries, events, craft resources, and craft industry studies
- Sponsoring business development seminars for home-based workers
- Creating a Heritage Garden for Crafts in collaboration with the North Carolina Arboretum and the Conservation Fund. The Heritage Garden contains plants used for raw materials and to make natural dyes for fiber, basketry, broom making and paper.
- Launching a Small Communities Rural Leadership Development Initiative for communities too small to have professionally trained town managers and planners.

HandMade has gained national recognition as an innovator in the use of craft-based strategies for economic development.

Both ANCA and HandMade are succeeding through focused and sustained efforts that evolve over time (20 and 11 years, respectively) to meet the emerging needs and capabilities of producers in their areas. Sustaining these efforts has required a commitment of staff and resources on an ongoing basis, but, in each case, the economic impacts have been

measurable and positive. For example, HandMade's self-guided tour materials have resulted in 10-15% increases in sales for participants and ANCA's Buyer's Days results in over $100,000 worth of orders each year.

Adapting Lessons from ANCA and HandMade in America to the Dragon Run Watershed

Both ANCA and HandMade in America featured self-guided tours for residents and tourists, yet increasing tourism is not a high priority for the Dragon Run Steering Committee. Therefore, the Committee will want to formulate goals with respect to the development of the craft and local products sector that reflect their values and priorities. The craft and local products economy of the Dragon Run Watershed could be enhanced through sales to residents and tourists outside the watershed itself. There are any number of ways to achieve this that might include, but would not necessarily be limited to: forming a marketing cooperative or otherwise expanding area crafters' capacity to attend out of region trade shows; partnering with out of region retailers to sell product at wholesale; or establishing a retail venue in an appropriate location. Developing a regional logo could be part of this effort. Both ANCA and HandMade in America have succeeded by emphasizing authenticity, handcrafted, and American-made. There is a great deal of competition in the giftware industry from products made overseas.

Five steps toward strengthening the Dragon Run craft and local products economy are identified and briefly discussed below.

Step One: Clarifying Goals

- What are the goals for developing the art, craft, and local food sector in and around Dragon Run?
- What is the initial geographic focus of the effort (recognizing it may expand over time)? There may be one focus for producers, e.g. in and around the Dragon Run Watershed, and another for sales, e.g. in Richmond, Newport News, Williamsburg, and/or Washington, D.C.

Step Two: Finding Out Who's Out There

Both ANCA and HandMade in America started with an outreach strategy followed by a needs assessment to identify who the artists, crafters, and/or local foods producers were in their region, what and how much they produced, what and how much they wanted to produce, how and where they currently sold, and where they needed help. A starting point in putting together a list of producers in and around Dragon Run to contact for this inquiry would be the organizers of various events in the area (see below). Every artist, craftsperson and food product producer contacted should be asked about others who might be interested. This approach, combined with advertising and word of mouth, should help build a list of potential participants/beneficiaries. In addition, potluck meetings may be useful to build relationships among artists, crafters, and food producers and to form a core group with commitment to moving forward. People should be encouraged to bring examples of their work and describe their business goals.

A similar effort could be undertaken with retailers. Which retailers currently carry local products? What are they looking for? Who else do they know who might carry local products? Do any of them do catalog sales? Internet sales? What would they suggest to help promote local products within the region?

In addition, since tourist traffic within Dragon Run is currently fairly limited and the Dragon Run Steering Committee is not interested in attracting more "come heres," it may make sense to concentrate on developing venues for out-of-the-region sales through a permanent or seasonal retail venue in a more touristy and/or populated area like Williamsburg or Washington, D.C. The feasibility of such a venture will depend, in part, on the amount and quality of craft activities occurring within and around the watershed, and the amount of interest producers have in market expansion.

The combined outreach/needs assessment effort will help determine the focus, goals, and starting point for a Dragon Run art, craft, and local products initiative. As a result of this effort, it is important to know:

- How many craft, arts, and food entrepreneurs there are in and around Dragon Run and their exact location
- The range of products by type and price point they are producing
- The market channels already in use and those that have been attempted
- The quality of products being produced
- Producers' capacity for increasing production and/or improving quality
- Organizational affiliations within the craft industry
- The business goals of potential participants and their ideas for expansion
- Areas of need particularly with respect to distribution, marketing, and sales

This work could be undertaken by one or more volunteers, although having a dedicated staff person would be ideal. If, at the end of this task, there is a core group with enthusiasm to move forward, do so. If not, do not. Remember that not every artist, craftsperson or food products producer is an entrepreneur seeking to grow their business. This effort will have the greatest impact on the area economy if it focuses on those who are truly seeking to grow.

Step Three: Getting to Know the Local, State, and National Industry

Before the group develops a strategy, it is important to get to know the industry and the competition. Questions to answer include:

- Who else in Virginia is interested in an economic development strategy that focuses on the crafts industry and what are they doing? (see Resources for a start)
- What are the quality standards the industry adheres to and how are they achieved?
- What types of local, state, and national support services are available to crafters, artisans and food producers in the region and how are they engaged?

- What are the retailers within a reasonable drive that specialize in genuine handcrafted items?
- Which communities in the larger region are likely to be most receptive to a store specializing in genuine handmade items?
- How do other groups fund their activities?

In addition to contacting the local festival organizers and organizations listed in the resource section of this report, we recommend taking interested local crafters, artisans, and food producers to established trade shows to experience the industry in action firsthand. We also recommend visiting retail stores that specialize in genuine handmade crafts and related products. Firsthand knowledge and networking are two keys to effective implementation.

Step Four: Strategic Planning

Revisit goals with a core group and decide which one or two to focus on initially and how to go about it. Consider how you will measure progress toward your goals, and which actions are likely to be most useful.

For example, one goal might be:
Crafters, artists, and local food producers in and around Dragon Run have increased sales opportunities within and outside the region.

An indicator of progress toward this goal might be:
We know who the crafters, artists, and local food producers in the region are, what they produce, and where and how they sell their work currently. (Assuming this information is not now readily available, which it does not seem to be).

A baseline measure might be:
The number of sales opportunities currently available to and used by local crafters, artists, food producers. Over time, if this endeavor is effective, you would expect the number to increase. The baseline for each measure would be determined through the outreach/needs assessment and follow-up activities.

Step Five: Action, Reflection, Learning

As the strategy is implemented, participants will learn more and more about whom they have to work with, the resources available to them, what works and what does not in relation to the goal. To capitalize on this learning and improve strategies over time, these lessons must be recorded. Volunteers need to keep records of who they speak with about what; this information needs to be shared among the group on a regular basis. Ideally, the effort will be professionally staffed at least part-time before proceeding to implementation.

Resources

General

Craft Organization Development Association (CODA) serves organizations with education and professional development to foster public appreciation and understanding of craft. www.codacraft.org.

The Crafts Report Online has a wealth of information and resources, including answers to frequently asked questions like, "Are there any organizations that offer group health insurance for artists or one-person businesses?" The site also features a discussion board, industry information, craft artist and craft show finder, bookstore, and much more. www.craftsreport.com

Retailing Crafts

Specialty Shop Retailing: How to Run Your Own Store by Carol L. Shroeder. Available from amazon.com for $18.45

Must Read Articles for Successful Craft Retailing, The Crafts Report Bookclub. Available at www.craftsreport.com/bookclub/ for $5.95

Marketing Toolkit for Gift Shop Retailers in Rural Areas by ANCA. Reviews best practices of 12 Adirondack North Country retailers and producer retailers and includes criteria for retail critique. ANCA has developed a workshop based on this analysis and will soon be offering a publication as well. www.adkncrafts.com

Virginia Craft Organizations

Artisans Center of Virginia
The Official State Artisans Center
601 Shenandoah Village Drive
Waynesboro, VA 22980
540-946-3294
Toll free: 1-877-508-6069
Fax: 540-946-3296
Email: ACV@nexet.net
Exhibits at the Virginia State Fair, operates a 3,500 square foot retail and exhibition gallery in Waynesboro Village, offers professional development training in media technique and business practice, offers a studio tour and an outreach program to place crafters in the schools.

Peninsula Glass Guild of Virginia
4205 Victoria Blvd.
Hampton, VA 23666

757-868-5009
Fax: 757-868-5009
Email: eyecatchersglass@mindspring.com

The Peninsula Glass Guild of Virginia is a non-profit glass guild established in 1986 to promote quality art glass in the community and to provide a forum for glass artists to gather together for educational and support purposes. Membership includes both professional and non-professional glass artists.

Richmond Craftsman's Guild
Box 35224
Richmond, VA 23235-0224

Virginia Commission for the Arts
223 Governor St.
Richmond, VA 23219
804-225-3132
TT: 804-225-3132
Email: vacomm@artswire.org

Virginia Mountain Crafts Guild
Box 1369
Salem, VA 24153
540-380-4444
Email: vmcraftsguild@yahoo.com
The Virginia Mountain Crafts Guild is a 160+ member non-profit art and craft guild for Virginia and surrounding states. All exhibiting members are juried, and two arts and crafts shows are sponsored each year, and a third show is co-sponsored.

Virginia Craft Festivals

Smart Frogs maintains a list of Virginia craft festivals at www.smartfrogs.com/va.html.

VIRGINIA FINE CRAFT & ARTS FESTIVAL
October 29 - 30, 2005
The Community Cultural Center
Northern VA Community College
Annandale VA
Virginia Craft Festivals
Sharon Pierce McCullough Prom.
717-337-3060

COLONIAL CRAFTSMAN'S FAIRE
May 13 - 14, 2006
Williamsburg, VA area

Endview Plantation in Newport News, Va. will be transformed into a market square of distinguished Craftsmen, dressed in colonial clothing & demonstrating trades/arts. Revolutionary War living history reenactors exhibiting camp life & drilling with authentic weaponry.
www.ColonialFaire.com

Local Resources

West Point Crab Carnival - sponsored by West Point/Tri-Rivers Chamber of Commerce
Carnival Committee 804-843-4620, wptrcc@oasisonline.com
http://www.westpointvachamber.com/Crab%20Carnival.htm

Gloucester Daffodil Festival - sponsored by Gloucester Parks and Recreation
Debbie Kelly, Chairperson 804-693-3026
http://www.gloucesterva.info/pr/events/df/homepage.html

King and Queen Community Pride Day - 3rd Saturday in October
Julia Redd, Parade Chairperson 804-785-2822

Dragon Run Day - Oct. 8th
Karen Fuss, Event Coordinator 757-564-9629, karendave@widomaker.com

Urbanna Oyster Festival
Event coordinator, unknown

Frank Bishop is a furniture maker in King & Queen County.
804-769-0222

Alinda Uzel
Cooperative Extension Agent
King and Queen County
P.O. Box 68
King and Queen Courthouse, VA 23085
804-785-5979
auzel@vt.edu

Considerations on the Potential Adoption of Biodiesel as a Fuel Source for County and Municipal Fleets in the Middle Peninsula

General Description
Biodiesel is a domestically produced, renewable fuel that is manufactured from vegetable oils, recycled cooking grease, or animal fats. Pure biodiesel, referred to as "neat" biodiesel, contains no petroleum and is completely biodegradable. Biodiesel is most commonly blended with petroleum diesel or standard diesel for use in vehicle fleets. The blend percentage is indicated by the number after the letter "B." For example, B20 refers to a blend of 20% biodiesel and 80% standard diesel, which is the most common application of the fuel.

All biodiesel sold for on-road use must meet certain standards in order to assure vehicle operators and manufacturers of its reliability and performance. In addition, it must meet emission standards set by the U.S. Environmental Protection Agency (EPA) in order to minimize the impact of emissions on human health.

Case Studies on the Adoption of Biodiesel in Virginia
Biodiesel (B20) is currently being used as a primary fuel source in a number of municipal and county fleets throughout Virginia, including Arlington County, Westmoreland County, Northumberland County, and the City of Harrisonburg. A 2004 report, "Biodiesel Implementation – Arlington County, Virginia," details one county's experience with converting all of its diesel-powered vehicles to B20. This report is a useful starting place for local governments in the Middle Peninsula who are considering the adoption of biodiesel for use in their own fleets. The guidelines presented below are drawn primarily from Arlington County's experience.

Guidelines for Adopting Biodiesel in the Middle Peninsula
The following section is intended to help decision-makers weigh the costs and benefits of adopting biodiesel as a fuel source for municipal and county fleets.

What is the availability of biodiesel in the Middle Peninsula?
In March 2004, a biodiesel refinery opened in Eltham, Virginia. Virginia Biodiesel, LLC produces approximately 2.5 million gallons of biodiesel annually from soybeans grown in Virginia. Local communities near the refinery stand to benefit from this refinery by paying less for transportation costs associated with hauling the biodiesel to fueling stations.

Virginia Biodiesel, LLC ships biodiesel from its facility in Eltham to all locations in the state. In addition, the National Biodiesel Board's website identifies two distributors on the Middle Peninsula that distribute biodiesel. Ware Oil in Tappahannock and Thrift Oil in Urbanna have the capacity to deliver biodiesel within the Middle Peninsula (see below for costing information).

Which vehicles in the fleet should use biodiesel?

One of greatest advantages of biodiesel is that there are no modifications required to convert a standard diesel vehicle to one that will run on a biodiesel blend. In selecting which diesel-powered vehicles should use biodiesel, there are a number of considerations. First, economies of scale associated with transporting fuel in bulk quantities would indicate that it is likely more economical to use biodiesel as a fuel source if there is a relatively large fleet of vehicles that fuel from a single location. Second, emissions from diesel vehicles are particularly noxious due to high particulate concentration and, as such, pose a threat to public health if they operate in populated areas. For these reasons, communities often choose to introduce biodiesel into their bus fleets (either school buses or transit buses). Indeed, in all of the Virginia communities mentioned previously, buses are the primary vehicles using biodiesel.

Will the engine warranties of the vehicles still be valid if biodiesel is used as a fuel source?

Most major engine companies have stated formally that the use of blends up to B20 will not void warranties on their engines or parts. For more information on statements issued by various engine manufacturers regarding the use of biodiesel, please refer to http://biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtm.

What percentage of biodiesel should be used?

Selecting the appropriate blend of biodiesel for a fleet depends on a number of factors, including: the maximum biodiesel blend covered by engine warranties, relative cost of biodiesel vs. regular diesel, emission tradeoffs, and cold weather considerations. Typically, using B20 is a great starting point for new users. In fact, all of the Virginia communities mentioned earlier are currently using B20.

What action is needed to convert diesel fueling stations to biodiesel?

There are no changes required to the physical infrastructure of diesel fuelling stations (pumps, storage tanks, etc.) in order to switch to using biodiesel; however, it is advisable to take the following precautions before receiving the first shipment of biodiesel:

1. Thoroughly clean diesel storage tanks
2. Add fuel filters at dispensers, or, if dispensers have fuel filters, switch to < 10 micron filters

Because biodiesel has solvent properties, it can remove accumulated deposits within all aspects of the fuel infrastructure, including storage tanks, pipes, and vehicle fuel system. Without taking such precautionary steps, there would likely be greater incidents of clogged fuel filters in the vehicles. In Arlington, where these steps were taken before vehicles were fueled with biodiesel, vehicle maintenance personnel observed that there was no change in the rate that fuel filters had to be changed after biodiesel was introduced in the vehicles.

What are the storage considerations of biodiesel?

B20 can either be stored below ground or above ground. Storing biodiesel underground is preferred because it provides a consistent temperature during periods of cold weather. The cloud point for 100% biodiesel, or the temperature at which small solid crystals are first visually observed as the fuel cools, is approximately 10 degrees Celsius higher than standard diesel. Using a blend such as B20 minimizes this difference. Whereas pure biodiesel clouds at approximately 30-35 degrees, B20 clouds at approximately 5-10 degrees. An anti-gelling compound, such as Arctic Flow, is often added to the biodiesel by the supplier in the winter months to further reduce the cloud point.

One biodiesel supplier in Arlington recommended that biodiesel could be stored above ground only if the tank's capacity is 4,000 gallons or more. Tanks of this size help minimize gelling problems because they are more resilient to temperature fluctuations (i.e. a larger mass holds heat longer).

Biodiesel degrades faster than standard diesel. As a result, care should be taken to avoid fueling vehicles with biodiesel if they are not going to be used for more than 30 days from the time at which they were fueled. Because biodiesel breaks down more quickly and is non-toxic, it is also much safer to handle.

Do vehicles using biodiesel require additional maintenance?

As with diesel storage tanks that are switched over to biodiesel, the fuel systems of vehicles can be partially cleaned by the detergent-like properties of biodiesel. Consequently, it is advised that the fuel filter be inspected on a regular basis upon switching to a biodiesel blend. Please note that older vehicles will most likely have a greater buildup of deposits and therefore the fuel filters should be checked on a more frequent basis than newer vehicles.

In spite of this caution, in Arlington, the rate of consumption of fuel filters by biodiesel-powered vehicles remained the same as before the fuel's adoption. In addition, the mechanics who serviced the biodiesel vehicles reported that there were no changes in the types or frequency of repairs to the vehicles operating on biodiesel. In fact, they reported a slight reduction in problems requiring routine maintenance. It was speculated that biodiesel's lubricity and detergent properties may have accounted for this reduction. In Medford, NJ, a recent report indicates that the reduced costs of regular maintenance of biodiesel-powered vehicles offsets the higher cost of the fuel itself.

How does biodiesel perform compared to standard diesel?

Vehicles powered by biodiesel have logged over 15 million miles in the field, and tests have shown that biodiesel has a similar fuel consumption rating, as well as horsepower, torque and haulage rates as standard diesel. Testing with B20 indicates that there is approximately a 2% reduction in power, torque, and fuel economy. In the Arlington case study, most of the drivers reported no noticeable differences since the adoption of biodiesel.

What are the environmental benefits of using biodiesel?

Using a biodiesel blend can significantly reduce harmful emissions that are associated with standard diesel emissions. In fact, the adoption of biodiesel by Arlington County was precipitated by a number of complaints by county residents about the harmful emissions of some of the county's fleets.

The following chart summarizes some of the emissions reductions:

Table 1: Life-Cycle and Tailpipe Emissions for Biodiesel Compared to Standard Diesel

Emission	Description	Tailpipe Emissions	
		B100*	B20*
Carbon Monoxide	Poisonous gas, contributes to smog/ozone	-43.2%	-12.6%
Hydrocarbons	Contributes to smog/ozone	-56.3%	-11.0%
Particulates	Contributes to respiratory disease	-55.4%	-18.0%
Nitrogen oxides	Contributes to smog/ozone	+5.8%	+1.2%**

*Average of data from 14 EPA FTP Heavy Duty Test Cycle tests, variety of stock engines
** A fuel additive (1% DTBP by volume) can make B20 NOx neutral.
Source: Biodiesel: Handling and Use Guidelines. U.S. Department of Energy. NREL/TP-580-30004.

Carbon Dioxide and Global Warming

Soybeans and other plants that are used to make biodiesel constantly draw carbon dioxide out of the atmosphere. The combustion of biodiesel releases this carbon dioxide back into the atmosphere, creating a constant recycling of carbon between the plants and the atmosphere. Petroleum-based fuels, such as diesel, release carbon dioxide from plants that died millions of years ago, and, as a result, the carbon dioxide from these emissions accumulates in the atmosphere over time. This accumulation of carbon dioxide is one of the main causes of global warming. Burning pure biodiesel (B100) releases 78% less carbon dioxide than diesel fuel.

What are the fuel costs of biodiesel compared to standard diesel?

With the passage of the federal energy bill, a tax credit for biodiesel has been extended through 2008. The tax credit amounts to one penny per percentage of biodiesel per gallon blended with petroleum diesel (e.g. $0.20/gallon for B20). The incentive will be available to diesel excise taxpayers and other fuel distributors who purchase biodiesel and blend it into diesel fuel; the savings will be passed on to consumers in both taxable and tax exempt markets.

The cost per gallon of 100% biodiesel per gallon can be $0.50 - $1.00 higher than that of standard diesel. However, a blend of B20 minimizes the cost to the buyer, because there is a lower percentage of the higher priced fuel in the final product. Taking this and the tax credit into account, distributors of biodiesel will likely be able to offer a B20 blend at a $0.05 premium per gallon over what is currently paid for diesel, according to Chad Freckman, a biodiesel sales associate who is currently working for Virginia Biodiesel, LLC.

In addition to these factors, transportation costs are a large factor in determining the final cost to the buyer. The smaller the volume of the fuel results in a higher marginal transportation cost. These costs will be unique for each supplier depending on factors such as distance between supply and delivery location and truck size.

Virginia Biodiesel, LLC publishes current biodiesel prices for B100, B20, and B2 on its website at http://virginiabiodiesel.com/pricing.html. At the time of the writing of this report, the price of B20 was listed at $0.03 more per gallon than diesel (not including transportation costs).

Is there funding support for communities interested in adopting biodiesel as a fuel source in Virginia?

The Virginia Soybean Association awards grants to municipalities that adopt biodiesel as a fuel source for government vehicles. Communities that apply for the grant must have a long-term strategic plan for implementation of biodiesel in their fleets. The maximum grant award for a community is $3,000. These grants are available on a first-come first-serve basis. For more information or to check on the availability of the grants, contact Dick Atkinson at the Virginia Soybean Association at (757) 564-0153.

What are other potential applications of biodiesel in the Middle Peninsula?

Besides the application for on-road use, there are other potential applications for biodiesel in the Middle Peninsula that deserve mention. Biodiesel can be mixed with #1 fuel oil and used as heating fuel or can be used in off-road equipment such as tractors and construction equipment (Thrift Oil currently delivers B2 blend to a number of farms on the Middle Peninsula). In addition, the preponderance of marine-related activities on the Peninsula also presents a unique opportunity to use biodiesel blends in fishing boats, charter boats, and other types of marine craft.

Conclusion

The adoption of biodiesel for municipal or county fleets involves relatively minor changes compared to other alternative fuels, such as propane or ethanol. Implementation can be achieved quickly and requires no modifications to vehicles, infrastructure, or other enhancements. It has documented environmental and health benefits, and, consequently, is a logical choice for communities that are interested in promoting sustainability.

Promoting the adoption of biodiesel for sustainability purposes is a particularly good fit in the Middle Peninsula, as the raw material for biodiesel (soybeans) are grown extensively in the region. Given the potential quantity of biodiesel that would be purchased by local governments from the refinery, it may be possible to leverage an agreement from the refinery by which a certain percentage of soybeans would be bought from Middle Peninsula farmers. Such an agreement would serve to strengthen the local commitment to sustainability and would also likely increase the receptivity of using biodiesel as a fuel source.

Any community considering the adoption of biodiesel should carefully weigh the potential benefits described above with the potential added costs. Some of the influencing factors that should be taken into consideration include:

- *Pricing* - When compared to standard diesel, biodiesel does cost more per gallon. For current pricing information, one should contact Virginia Biodiesel or one of the distributors mentioned in this report or send an email to vbr-sales@earthlink.net that includes the blend percentage (e.g. B20), quantity and delivery location.
- *Fuel Supply Contracts* - Municipal and county fleets are large consumers of fuel and consequently may have established contracts with particular fuel supply companies. If a fuel supply contract exists, the supplier should be contacted to determine whether they would be able to deliver a biodiesel blend and, if so, if they would charge an associated premium. In addition, some fleets fuel their vehicles at third party fuel stations, which may or may not have the ability to fuel vehicles with a biodiesel blend. For example, the Middlesex County School District fuels its buses at Thrift Oil in Urbanna, which does not currently have the capacity to store biodiesel in its tanks.
- *Acceptance of Biodiesel by Drivers and Operation and Maintenance Staff* - The environmental and health benefits of biodiesel can help generate public support for adopting it as a fuel source; however, drivers, operation and maintenance staff, and other municipal/county staff may be reluctant given the natural human resistance to change. Fortunately, there are a number of biodiesel experts in the State of Virginia that have indicated a willingness to come to the Middle Peninsula and give a presentation on biodiesel and hold a question and answer session that may prove useful in facilitating acceptance of the fuel. The following two individuals have indicated a potential interest in such an event:
    - Mike Atherton of Green Virginia, a project focused on the adoption of bioenergy technologies. Mr. Atherton is also the author of the 2004 report *Biodiesel Implementation – Arlington County, Virginia.* Phone: 703-486-8497, Email: mdatherton@yahoo.com.
    - Chad Fleckman of Blue Ridge Clean Fuels located in Charlottesville, Virginia. Phone: 434-996-4473, Email: brcfi@earthlink.net

Resources

Production Facilities

Virginia BioDiesel
7475 Ready Mix Drive, West Point, VA 23180
804-843-9258; Fax: 804-843-9264
Email: info@virginiabiodiesel.com

World Energy
Corporate Headquarters
446 Main Street, Worcester, Massachusetts 01608
800-578-0718; Fax: 508-459-8101
Email: info@worldenergy.com

Distributors

Thrift Oil
Urbanna, VA 23175
Contact: Reed Kelley
800-210-8735

Ware Oil
Tappahannock, VA 22560
Contact: Douglas Faulkner
800-633-4467

Organizations

Blue Ridge Clean Fuels
Charlottesville, VA
Contact: Chad Freckman
434-996-4473
Email: brcfi@earthlink.net

Green Virginia
http://www.greenva.org/about.htm
Contact: Al Christopher, 888-276-3320
Contact: Mike Atherton, 703-486-8497

Virginia Soybean Association
Contact: Dick Atkinson
757-564-0153

Hampton Roads Clean Cities Coalition
5100 E. Virginia Beach Boulevard, Norfolk, VA 23502
Contact: Nic van Vuuren
757-873-6239
Email: info@hrccc.org

National Biodiesel Board
http://www.biodiesel.org/
Jefferson City, MO 65110-4898
800-841-5849; Fax: 573-635-7913
Email: info@biodiesel.org

Publications

Report: *Biodiesel Implementation – Arlington County, Virginia*
http://www.hrccc.org/biofuels/ArlingtonB20Study.pdf

Report: *Sysco B20 Pilot (Hampton Roads, Va)*
http://www.hrccc.org/biofuels/SyscoB20PilotC.pdf

National Biodiesel Board's Report Database http://www.biodiesel.org/resources/reportsdatab

Establishing a Recycling Center for Organic Wastes in the Dragon Run Watershed

What is organic waste?
Organic waste is waste material that contains carbon. Organic waste includes paper, wood, food waste, animal waste, fish waste, and yard waste. When recycled, organic waste is no longer "waste" that must be disposed of but usable product serving as feedstock for value-added processing.

What is <u>not</u> organic waste?
Sludge from human waste is not included in this definition for purposes of this report.

How does organic waste recycling contribute to sustainability?
Organic waste has the potential to be transformed into valuable products such as compost (humus) and mulch that can contribute to the health of plants and soils, prevent erosion, reduce the need for chemical fertilizers, and otherwise enhance the environment. In the absence of recycling, organic waste is incinerated or placed in landfills where it may take decades to decompose. Some communities are motivated to recycle organic waste to meet imposed waste reduction targets, to reduce landfill costs or to extend the life of landfills. In Dragon Run, the motivation appears to be a desire to contribute to sustainable natural resource use while encouraging new forms of sustainable natural resource-based economic activity in the watershed.

How is organic waste recycled?
The primary means for recycling organic waste is composting. Composting is the controlled biological decomposition of organic matter in the presence of oxygen into a stable humus or soil-like material. Control is what separates composting from natural rotting or decomposition that occurs in dumps, landfills, and unmanaged waste piles. Effective composting requires attention to the balance of carbon and nitrogen, moisture levels, oxygen levels, pH levels, temperature, and the absence of toxic constituents that could inhibit microbial activity. Contaminant free feedstock is essential to produce a high quality product. Regular chemical testing is required to ensure the quality of the composted product. The composting process may be as short as three months or as long as two years, depending on the type of feedstock, ambient temperature, and processing methods.

What types of feedstock can be used in organic waste recycling?
Potential feedstocks for a Dragon Run organic waste recycling facility could include:

- Residential yard waste
- Residential food waste - Potential to contract with larger, more distant communities that may have waste reduction targets to meet
- Commercial food waste (restaurants, grocery stores)
- Industrial food waste (e.g., melted ice cream, cider waste)

- Wood pallets and dunnage (wood crating used for shipping)
- Manure – horse, cow, etc.
- Yard waste from landscaping businesses
- Timber industry waste
- Crop residue
- Fishing industry waste
- Clean construction/deconstruction waste
- Christmas trees

Feedstocks that cannot be accepted include:

- chemically treated wood waste
- hazardous biological waste[11]
- grass clippings from chemically treated lawns
- plastics of any kind

The ideal ratio of carbon to nitrogen in composting is 30:1. Manure and food waste can be important sources of nitrogen for composting. Woodchips is a typical amendment used in composting. However, in a study of compost marketing in the New England region, researchers found those using bio-ash instead of woodchips as an amendment experienced increased demand for their product, because it resulted in jet black compost that looks like high quality loam. Others use sawdust or yard waste instead of woodchips to improve product consistency and eliminate wood chip residuals after rainstorms.[12] Experimentation will be required to determine the best mix of available feedstocks to produce the range of product that can be marketed within a relatively short distance of the watershed.

Where would the feedstock come from?

Within the watershed

Residential and Commercial

There are approximately 2,300 residents in the Dragon Run Watershed. If we assume an average household size of 2.54 (Virginia's state average), there are an estimated 905 households. Approximately 40-45% of household waste is organic. If we assume the Environmental Protection Agency's (EPA's) 2003 estimate of average per capita waste production at 4.5 pounds per day, Dragon Run residents produce roughly 10,350 pounds of solid waste, of which approximately 4,140 pounds is organic. One ton is equal to 2,000 pounds. Therefore, Dragon Run residents produce on the order of two tons of organic

[11] According to the EPA, research within the past few years has found composting process to be an inexpensive and technologically straightforward solution for managing hazardous industrial waste streams (solid, air, or liquid). Composting has been found to successfully remediate soil contaminated with toxic organic compounds (such as solvents and pesticides) and inorganic compounds (such as toxic metals). The focus of this report, however, is on composting of non-hazardous materials. More information on composting of hazardous materials is available through EPA's Analysis of Composting as an Environmental Remediation Technology at www.epa.gov/compost/pubs.htm.

[12] Mark E. Lang and Ronald A. Jager, Regional View of Compost Marketing, The Biocyle Guide to the Art and Science of Composting, Biocycle Journal of Waste Recycling, JG Press, Inc., Emmaus, PA, 1991.

waste per day. It is unlikely that all of this waste is available for centralized recycling since some is no doubt already recycled by residents. The cost of setting up a system to collect this relatively small amount of waste is likely to be prohibitive, even if participation was 100% which is unlikely. Likewise, there are very few commercial enterprises in the watershed likely to generate enough feedstock to justify a centralized system of composting. One exception to this might be the race track.

Timber industry

The timber industry remains active in the watershed. Once wood is delivered to local wood processors, all waste is used either as energy or product. Therefore, waste available for composting would be the brush and tree tops that are probably now being left in the woods to decompose. Several questions should be answered before promoting removal of slag from the woods for the purposes of composting. First, what impact would this have on the health of the forest (i.e. what proportion of wood waste could be removed without negative impacts on forest health)? How would the impact be moderated if forests were fertilized with the resulting compost? What are the economics involved?

Outside the watershed

Residential

The towns nearest the watershed include: Tappahannock: with a population of 2,144 and 946 total housing units in 2000 (857 occupied); West Point with a population of 2,986 and 1,151 total housing units in 2000 (1058 occupied); and Urbanna with a population of 543 and 354 houses. Of these, only Tappahannock has a door-to-door solid waste collection system. Most households in the vicinity of Dragon Run self-haul their waste or dispose of it themselves on site. Using the same benchmarks as above, residents in towns surrounding the watershed generate an estimated 10,211 lbs. (or approximately 5 tons) of organic waste per day, only a portion of which would be available to a recycling facility as feedstock.

Commercial and Industrial

Available resources do not allow a comprehensive analysis of commercial and industrial feedstock availability. However, major manufacturing employers in each county that may be in a position to benefit from a recycling facility include: Whitney Peanut Factory, J &W Seafood of Virginia, Inc., and Shores & Ruark Seafood. Other sources include colleges, municipal offices, grocery stores, restaurants, farmers, loggers, and smaller scale manufacturers of agriculture, wood, aquaculture and natural fiber products.

A full feasibility study would be required to determine the minimum feedstock volume and mix needed to support an organic waste recycling facility.

Is organic waste recycling already available in the region?

While yard waste recycling options are available in the region, there is no organic waste recycling facility that accepts a full range of organic feedstock.

Gloucester County is served by a solid waste management facility (landfill) managed by Waste Management, Inc. They receive and compost yard waste but they do not have a

collection program. Yard waste is delivered by subcontractors or self-haulers and accepted for a tipping fee. Tipping fees for commercial haulers are $28/ton for yard waste, $36/ton for brush, and $4/ton for woodchips. Fees for non-commercial haulers are $28, $45, and $5 respectively. The compost facility is located in Glenns in Gloucester County.

The Virginia Peninsula Public Service Authority's (VPPSA's) Regional Solid Waste Management plan applies to Essex, Middlesex, and King and Queen Counties. Essex County has contracts with two commercial landfills, 30 and 36 miles away. VPPSA manages a yard waste composting facility in York County but the Middle Peninsula counties do not participate due to hauling distance. The VPPSA has not considered adding food waste due to odor concerns. The yard waste composting facility serves York County, and the cities of Hampton and Poquosin. In 2004, the facility took in 34,100 tons of yard waste. The facility produces mulch, compost, and soil blend, which is then sold to the general public, commercial landscapers (in bulk), and sometimes to the West Point paper mill for boiler fuel. Fiscal year 2005 sales were $396,000. The facility employs 7 to 8 full-time equivalent staff, uses two grinders, and has a total operating budget of $1,069,913 including debt service ($220,000), salaries ($208,450), equipment maintenance/repair ($110,000), fuel ($34,000), lab fees ($2,500), host fees (paid to the county for the use of the 22-acre facility), benefits and other miscellaneous costs.[13]

Essex County has looked into an organic waste recycling facility, but, without food or animal processing facilities, there is concern that the volume of feedstock may not be sufficient to support a facility.

On our site visit, we encountered one privately owned wood waste recycling business in the watershed that was moving out of the watershed to the Northern Neck due to local government permitting issues.

How would you collect organic waste/feedstock?

Within the rural context of Dragon Run, self-hauling and hauling of feedstock by subcontractors at the expense of producers is going to be more economical than a municipally or privately run facility-based collection system. A hybrid system in which municipalities provide mobile drop-off centers, and/or incentives to drop off at fixed centers can increase participation rates.[14] In some cases, the facility may charge a tipping fee; in other cases, the facility may pay to acquire feedstock, particularly if its composition has been chemically analyzed.

What would you need to produce compost?

A. Knowledge of how to compost

[13] Tracy Elsass, Recyling Coordinator, Virginia Peninsulas Public Service Authority, 8/26/05, personal communication.

[14] Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities, EPA, February 1994, p. 30.

Composting is both an art and a science. While the basic idea of combining organic feedstock into windrows and turning them regularly seems simple, an experienced and well-trained staff is essential to ensure a high quality operation and avoid potential problems with odor, leaching, contamination or inconsistent product. There are a number of organizations, including the U.S. Composting Council, which offer training in composting. For more information, pleases see the Resources section of this report.

B. An appropriate site

According to the Pennsylvania Department of Environmental Protection, each acre of land will have a maximum processing capacity of 3,000 cubic yards of organic waste. In general, sites should have a slope of at least one percent, but not more than five percent. Sites cannot be located in wetlands or within one-quarter mile up-gradient or 300 feet down-gradient of any water source. There should be at least a 50-foot buffer around the site's perimeter, even in a rural area. Erosion controls should be in place to divert surface water away from the composting site. Also, leachate productions should be minimized by diverting surface water run-off from the up-slope sides of the pile. To further reduce leachate, compost piles may be placed under a roof. The site should be located with access roads to accommodate drop-off and pick-up vehicles, and to restrict site access.[15] Note that these requirements pertain primarily to yard waste processing using windrows.

State of Virginia siting requirements for composting facilities are as follows:

1. Solid waste composting facilities shall not be sited or constructed in areas subject to base floods.

2. No facility shall be closer than 50 feet to any regularly flowing stream.

3. Composting facilities shall be adjacent to or have direct access to roads which are paved or surfaced and capable of withstanding anticipated load limits.

4. A facility shall not be located within 200 feet of any residential area, a health care facility, school, recreational park area, or similar type public institution.

5. Sites shall allow for sufficient room to minimize traffic congestion and allow for safe operation.

6. No composting unit shall extend closer than 50 feet to any property line.

7. Acceptable sites must have sufficient area and terrain to allow for proper management of leachate.

[15] Guide to Municipal Yard Waste Composting, Commonwealth of Pennsylvania, Department of Environmental Protection, October 2000.

8. Type B facilities shall not be located in areas which are geologically unstable or where the site topography is heavily dissected.

9. A Type B facility shall not be located in any area where the seasonal high water table lies within two feet of the ground surface.

Type B facilities are those that employ the windrow or aerated static pile method. If the process requires materials to be stabilized or curried in piles, such facilities are classified as Type B facilities even if the composting is performed in an enclosed vessel.[16] Processing of a full range of organic waste may require additional site features including space for receiving, mixing, and windrowing. Different approaches to composting, such as anaerobic digestion, will have other site considerations as well.

Other site selection criteria include: zoning, ease of permitting, and the opportunity cost to the municipality associated with alternative uses.

C. Equipment

Equipment needs vary by the scale of the operation, the level of technology preferred, and the key characteristics required by buyers. Choose equipment that meets the needs of what you will collect and how you will market it. There are low, medium, and high technology systems for organic waste composting. Low technology systems are the most labor intensive and produce the coarsest product. Medium and high technology systems produce more consistent, higher quality end products, but require more equipment to do so. For example, in a low tech operation, windrows might be turned by hand, while a front end loader might be used in a medium tech operation and specialized turning equipment with augers, paddles, or tines might be used in a large scale high tech operation. Basic equipment requirements for a medium technology system include:

- Excavator, front end loader, backhoe or bobcat to move feedstock materials and turn compost piles (windrows)
- Screener to remove non-compostable material and reduce to appropriate particle size for the end user. Sprinkler system to add moisture as needed
- Bagger, if you are going to sell compost and/or mulch in bags
- Appropriate-sized loaders to match customer vehicles (are you going to need to load it into pick-up trucks or large industrial vehicles?)
- Shredder and chipper, if you are going to accept wood waste and brush or produce mulch
- Grinder if you wish to produce compost from wood waste

In addition, a quality compost operation will require access to a chemical laboratory for regular analysis of feedstock and products.

[16] Virginia Department of Environmental Quality, Chapter 80, Section 330, Compost Facilities.

D. Labor
The amount of labor required will depend on the scale of the operation and its capital intensiveness. For example, a low tech facility in Bowdoinham, Maine with an input of 2 tons per day employs two people while a larger scale, more technologically advanced facility in Montgomery County, Maryland employs 9 workers and processes 100 tons per day.

E. Office space
Indoor office space, ideally on-site, will be required for recordkeeping, marketing, billing and receiving and other administrative tasks.

What are the potential markets for recycled organic waste?

There are a variety of potential markets for recycled organic waste, including compost, mulch, and soil amendments. A municipal facility may choose to give away product to its residents and use it in municipal projects. A private facility may offer some product for free to local residents while selling the majority of its product to government and private users. Every facility finds it own mix of markets with requirements that match the compost and related products they are able to produce.

Some specific proven markets include:

- *Reforesters.* Researchers at the University of Florida found that a pine plantation treated with recycled composted organic wastes (including 76 percent household waste and sewage sludge) experienced a 70 percent increase in total pine stem wood biomass (dry weight) over a 16-year period when compared with an untreated control group.[17] The EPA found that compost mulching is consistently superior to straw mulching for revegetating severely disturbed soils.[18] It's entirely possible that locally produced compost could contribute to hardwood and softwood regeneration in the watershed as well.
- *Natural and conventional landscapers, large and small land reclamation contractors.* Compost is helpful in landscape restoration, particularly in restoring wetlands using original (native) wetland plants.[19] Landscapers use mulch and compost in bulk quantities.
- *Government agencies such as the Department of Transportation that do landscaping and construction and have responsibility for erosion control.* The Texas Department of Transportation COMPOST program found compost promoted quick vegetation with lower costs, less water, less maintenance and fewer headaches than conventional topsoil seedbeds using mineral soil. Use of compost minimized or altogether avoided erosion and significantly reduced nonpoint source pollution from soil runoff. Use of compost grew from over 100,000 yards of compost in 2001 to over 400,000 yards in

[17] Webb, R.S. et al, Recycling Composted Organic Wastes on Florida's Forest Lands,University of Florida, IFAS Extension, http://edis.ifas.ufl.edu/FR026.
[18] EPA, The Effects of Composted Organic Materials on the Growth Factors for Hardwood and Softwood Tree Seedlings, www.epa.gov/compost/pubs.htm.
[19] EPA Innovative Uses of Compost: Reforestatation, Wetlands Restoration, and Habitat Revitalization, www.epa.gov/compost/pubs.htm.

2003.[20] The EPA, in cooperation with the Composting Council Research and Education Foundation and the U.S. Composting Council, has produced "Compost Use on State Highway Applications" to promote use of compost by transportation departments. Local governments could also benefit from access to locally produced compost, mulch and soil amendments for construction, park, and road projects.

- *Nurseries and greenhouse growers use compost as a growing medium.*
- *Farmers.* Compost is an essential component used in organic farming and sustainable agriculture. Research has shown that, in addition to improving soil fertility, compost helps suppress diseases and ward off pests, thus reducing the need for pesticides, insecticides and conventional fertilizers[21]. A local source of compost for farmers in the Dragon Run Watershed would provide one component needed in the transition from conventional to organic farming.
- *Cemeteries, office parks, sports facilities.* All use mulch and compost in landscaping.
- *Home builders and other construction contractors with a responsibility to limit erosion and revegetate sites quickly.* If Dragon Run had a composting facility, there might also be co-marketing opportunities for native plant nurseries and/or seedling farms in the watershed.

It is unlikely that a composting facility in the Dragon Run watershed would benefit significantly from an on-site retail operation due to low population density. However, if wholesale buyers were found that preferred bagged compost and mulch rather than bulk delivery, the facility could consider adding bagging capacity.

Intervale Compost Products in Burlington, Vermont, began as a small-scale lawn and yard waste recycling operation in 1988 and has grown into a 20,000 ton per year facility. Wayzata, Minnesota and Hennepin County piloted a program to add organic waste to their recycling efforts. They began by collecting waste from 1,200 households and composted 189 tons over about a two-year period. It makes sense to start small and experiment with various recipes and techniques before committing to composting on a large scale. There are several Indiana county organic waste recycling facilities that took in 60 tons of feedstock or less in 2003.

What are the key differences and similarities between a municipal and a private facility?

Motivation

Municipalities view an organic waste recycling program as a public good. Municipalities are likely to consider the options when it:

- Matches the values of the community

[20] US Department of Transportation, Federal Highway Adminstration, "Environmental Stewardship in Construction and Maintenance," June/July 2003, FHWA Resource Center Success Stories, www.fhwa.dot.gov/resourcecenter/success/successstories/vol2iss04.cfm.

[21] EPA, Innovative Uses of Compost: Disease Control for Plants and Animals, www.epa.gov/compost/pubs/htm.

- Lowers overall cost of waste disposal
- Helps meet regulatory requirements (e.g. waste reduction targets)
- Supports related community goals (e.g. organic farming, erosion control)

Private owners view organic waste recycling primarily as a business (though they often have stewardship values as well). It will only make sense to a private entrepreneur if the financial numbers work, while a municipal facility may choose to simply cover its costs or even operate the facility itself at a financial loss with benefits achieved elsewhere (e.g. road maintenance, lower landfill costs, etc.).

The table below, adapted from EPA's Decision Maker's Guide to Solid Waste Management, summarizes some of the other important advantages and disadvantages of a public versus a private organic recycling venture.

	Public	Private
Collection	Municipality directly controls the number and types of materials targeted. If collection is through self-haul, the burden is reduced.	Municipalities can control the number and types of materials targeted through contracts. Municipalities do not have to oversee the logistics of collection, which reduces administrative overhead.
Processing	Municipalities incur costs and take responsibility for finding markets.	Municipalities do not have to oversee processing, which reduces costs. Municipalities may have to pay tipping fees.
Marketing	Municipalities retain control of the materials and how they are used. Municipalities retain control of revenue from sales. Municipalities are more likely than private facilities to give significant portion of product away to local residents.	Municipalities have less control over end markets. Municipalities have no responsibility for inventory control or market fluctuations. Private operations often give less than 10% of product away.
Efficiency	Municipal employees may be less efficient than private sector workers, unless incentives are offered.	Private sector workers may be more efficient due to profit incentive.
Labor	Public crews tend to be larger than private crews.	Private crews tend to be smaller than public crews.
Financing	Municipalities may have better access to capital for equipment and to appropriate sites.	Municipalities do not have to incur equipment costs. These may be passed on in tipping fees.

Profile of a Private Facility: Intervale Compost Products

Intervale Compost Products is located in Burlington, Vermont. It began as a leaf recycling operation, offering compost coupons to residents to encourage them to bring in their leaves. In 2003, Intervale Compost Products accepted 5,140 tons of yard and garden waste and 4,707 tons of food scraps from Burlington and surrounding areas and businesses, as well as animal manure from local farms, about 750,000 gallons of spoiled ice cream from Ben & Jerry's in St. Albans, and other waste from food processors.

All feedstock is delivered to the site, by individuals, private contractors, and the Chittenden County Solid Waste District. Intervale Compost Products does not have its own collection program. Feedstocks vary in value. Intervale accepts some for free, some they pay for, and some others pay them to take. Industrial food waste is in the last category.

Although Intervale Compost Products is a private operation, it started as a way to support the Intervale Foundation and farms in the Intervale. Goals at inception included: refertilizing the Intervale; supporting local farmers; reducing the waste stream; and supporting the Intervale Foundation. The operation is profitable, with profits allocated to paying down debt and supporting the Intervale Foundation.

About 12,000 cubic yards of compost is produced each year on a ten-acre site. Windrows of 400 to 800 feet in length sit on a concrete compost pad. Initially, less expensive asphalt was used, but the raw compost "oxidized the carbon in the black top and it became a loose-grain aggregate pad." The site, which has no slope, is being remediated to a 3% slope to control drainage. Windrows are turned using Volvo excavator, essentially a giant backhoe, which does a better job than the commercial compost turner originally purchased. "It ruffles rather than pulverizes the compost and provides better passive aeration." Intervale employs 5-10 people depending on the time of year. Employment is lowest in winter. Capital expenditures are estimated between $250,000 and $500,000 with the screener being the most expensive piece of equipment purchased.

Intervale Compost Products mixes material at a rate of 27-28:1 carbon to nitrogen (for a finished product that is about 15-16:1), maintains a moisture content of about 63%, and a center-of-pile temperature of 132 degrees Fahrenheit for a consecutive 72 hours between turns. Intervale compost has been approved for use on certified organic farms and gardens by the Northeast Organic Farming Association of Vermont (NOFA-VT). Wood waste goes to the MacNeil Power Station, a wood-fired electric utility in the Intervale.

Compost is provided to farmers in the Intervale and sold in bulk to area farms and residents. Bagged and screened compost is sold to retail outlets such as Gardener's Supply. Compost is screened to 3/8 of an inch. Bulk compost sells for $32 a cubic yard; a 20-quart bag retails for $4.95. Seventy percent of sales occur within a six-week window in the spring. The market area is larger than the feedstock supply area. The market area includes all of Vermont into

New York and New Hampshire, and they have a distributor selling bagged product nationally.[22][23]

Profile of a Municipal Facility: Fennimore, Wisconsin[24]

The Town of Fennimore, Wisconsin is a small community in southeastern Wisconsin, with a population of approximately 2,500. Fennimore has a municipal yard waste composting program, which is a part of their Department of Public Works. The program picks up leaves, grass clippings, and garden waste from Fennimore residents. The volumes depend on the time of year.

Their two-acre site is a dirt site with three stages of compost. One stage is new compost. Another stage is compost from this year, which is not turned often. Finally, there is a stage of older compost, which is turned often. This final stage is the one from which residents may take compost home for free. The compost is rotated from stage to stage. The Department of Public Works, which manages the composting, employs three staff people who are responsible for garbage, recycling, and composting.

Profile of a Municipal Facility: Martin and Faribault Counties[25]

In the late 1990s, it became harder in Martin and Faribault Counties, Wisconsin to site landfills and many of the older landfills were full and closing. Originally four counties got together to discuss building a facility; in the end, two counties, Martin and Faribault, cooperated to build a facility.

Prairieland is a state-of-the-art multi-feedstock composting facility and the first in the United States to use the patented *Siloda* composting process developed in France. A totally enclosed facility, Prairieland features a computer-controlled environment to maintain ideal conditions for the accelerated transformation of garbage to high-quality compost. The facility will handle up to 100 tons of municipal solid waste per day. The facility is located on 25 acres of land in Truman, Minnesota, of which less than a third is taken up by buildings.

Construction of the facility began in July 1990. Seres Systems, the Waste Management Subsidiary of Ryan Construction Company of Minnesota, Inc., built Prairieland, which was operational by the summer of 1991. Construction of the Prairieland Facility cost approximately $6,900,000; Prairieland was awarded a two million dollar grant from the State of Minnesota to help pay for the facility. Faribault and Martin Counties financed the remaining costs through bonds, which will be paid off by 2010.

In 1998, the two counties entered into voluntary contracts with waste haulers to take in the municipal solid waste stream, with some presorting of large items. The system employs a grinder as well as a mechanical separation system, which separates out the organics. The

[22] http://www.newfarm.org/features/1204/intervale/compost/index.shtml
[23] Eric Van Valandren, personal communication, August 24, 2005.
[24] John Murphy, Director of Public Works, personal communication, September 22, 2005.
[25] Mark Bauman, Prairieland Director, personal communication, September 22, 2005.

organics are separated and sent to a composting hall, with 10 windrows. A wheel (sort of like a paddlewheel) goes down through the bunkers and moves compost from one windrow to the next at a very slow rate to help the process of biodegradation and to keep the odors to a minimum. A forced aeration system is used. During this process, temperature, moisture and oxygen content are monitored closely to maximize efficiency and rate of biodegradation. This process takes about 27-29 days, during which the compost is moved 5 times. At times, the temperature in the compost can reach well over 140 degrees Fahrenheit. The temperature needs to stay above 131 degrees for two weeks for pathogen destruction.

After this process, the compost goes to a larger refining and finishing building, to further cure the compost and wait for it to be shipped to a location where it can be used. At this station, the compost sits 30 days and is moved 6-7 times. Here the temperature starts dropping to an ambient temperature of 50 to 113 degrees Fahrenheit, where Mesophilic Bacteria thrive. The entire process from collection to finished product takes approximately 120 days.

The market for compost in this area of Wisconsin is mostly for farmers. Prairieland gives the compost away to those in the two counties. Outside of the two counties, the users would need to pay for Prairieland to haul it to them. Approximately 3,000-4,000 tons of compost are produced per year, from 15,500 tons of waste per year. This waste comes from residents and businesses in the two counties (population 50,000). Haulers charge residents to haul their garbage to Prairieland. Then, Prairieland charges the haulers tipping fees of $75/ton. Prairieland does some delivery to local farmers within a 5 mile radius of the facility. Prairieland pays to haul the compost to local farmers, contracting to load it directly onto spreader trucks, which then help spread it on the farmers' fields.

The compost has some nitrogen, but is not fertilizer value compost, as it does not have a lot of nutrients. This compost is carbon-rich and is advertised as a soil conditioner, good for returning moisture to sandy soils and helping to break up clay soils.

The facility is funded through tipping fees and through a line item on tax statements in the two counties.

What are Virginia's regulations regarding organic waste recycling?

Virginia's regulations governing organic waste recycling are in Chapter 80 - Solid Waste Management Regulations and Section 330- Compost Facilities. State regulations include criteria for categories of feedstock, facility siting, design and construction, operations (including detailed standards for testing), maintenance, and closure.

In addition to meeting state regulations, any facility will need to meet the permitting requirements of the municipality in which it is located. If hosting an organic waste recycling facility is a priority of the region, it will be important to review permitting requirements in advance to ensure that they do not present an obstacle to facility siting and operation.

Cost Information

The costs of composting vary tremendously based on scale, method, and degree of efficiency. If we assume no cost for collection, the relevant costs are capital costs and operating costs for the composting operation. Capital costs for composting range from under $1,000 to over $1,000,000. Some operations, particularly municipal operations, require minimal capital investment if equipment and machinery can be borrowed or adapted from other programs. Purchasing used equipment also substantially lowers capital costs. In addition, if a municipality already owns a suitable site, capital costs are reduced.

Operations and maintenance (O&M) costs for composting also vary. For programs handling about 150 tons of feedstock per year, O&M costs per ton are around $13 (in 1990 dollars). For sites handling around 2,000 tons of feedstock per year, costs range from $2 to $17 per ton at medium technology sites. Small sites have relatively higher per ton costs due to a greater reliance on manual labor. Larger, higher technology sites substitute capital for labor. However, O&M costs at high technology sites may be as high as $27 per ton. Programs that do not include a collection component are significantly less expensive than those that do.[26]

What are the next steps in determining the desirability and feasibility of an organic waste recycling facility in the Dragon Run Watershed?

Address concerns and outdated ideas about composting

It is entirely likely that some people, including people with decision-making authority, have concerns about composting based on outdated ideas. For example, while odor can be an issue, it does not have to be. Composting operations successfully co-exist even in residential areas. The best way to help decision-makers assess the appropriateness of an organic waste recycling facility for the watershed is to identify successful facilities in the region (or in a similar climate zone) and go visit them.

Feasibility study

Once the determination to pursue the idea of an organic recycling facility is made, it will be important to conduct a full feasibility study. Such a study would include, at a minimum:

- Analysis of feedstocks available within a 30-mile radius (or whatever trade area is deemed appropriate)
- Analysis of local, state, and regional markets for composted products
- Comparison of four approaches to composting including windrow, aerated static pile, in-vessel and anaerobic, given feedstock and markets
- Consideration of bio-energy options through anaerobic digestion or other means
- Break-even analysis based on capital requirements and projected operating expenses
- Consideration of public versus private approaches
- Linkages between composting and other economic development opportunities

[26] Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities, Chapter Eight: The Costs of Composting and Recycling.

A positive feasibility analysis would logically lead to identifying the entrepreneurial entity, municipal or private, and preparing a business plan and plan of operations. Such a plan should include resources for public education as well as start-up, operations, and marketing.

Resources

General

US Composting Council
4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741
631-737-4931; Fax: 631-737-4939
Email: admin@compostingcouncil.org
http://www.compostingcouncil.org/

National Recycling Coalition. Searchable electronic library at
http://www.recyclelibrary.com/

"**Decision Maker's Guide to Solid Waste Management**," Volume II. U.S. Environmental Protection Agency. Contains technical and economic information to assist solid waste management practitioners in planning, managing, and operating municipal solid waste programs and facilities. Includes suggestions for best practices when planning or evaluating waste and recycling collection systems, source reduction and composting programs, public education, and landfill and combustion issues. Chapter 7: Composting is downloadable at www.epa.gov/epaoswer/non-hw/muncpl/dmg2.htm

Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities, U.S. Environmental Protection Agency, Solid Waste and Emergency Response, EPA530-R-92-015, February 1994.

Biocycle Magazine
http://www.jgpress.com/BCArticles/2002/020240.html

Mid-Atlantic Composting Association
http://www.midatlanticcompost.org

Recycler's World
Buy/sell/trade listings in Recycler's Exchange in municipal waste collection category.
www.recycle.net/Waste/municipal

Composting for Municipalities: Planning and Design Considerations
Designed for use as a home study guide or a textbook for classes and workshops, this publication was written to help municipal planners decide whether composting fits their waste management goals and objectives. Seven chapters cover: composting methods and technologies; planning a municipal compost facility; siting a new facility; obtaining feedstock

for composting; making compost; marketing compost; and managing a facility for long-term success. Includes eight planning and contract documents and other tools. Author: Mark Dougherty, 1998. Published by NRAES, 136 pp., $18 plus shipping and handling. Publication code NRAES-54. Contact Natural Resource, Agriculture and Engineering Service Cooperative Extension, Cornell University. 607-255-7654. May be out of print…call to inquire.

Profiles

Intervale Compost Products
http://www.intervale.org/compost/index.html

Fennimore, Wisconsin
John Murphy, Director of Public Works
860 Lincoln Ave., Fennimore, WI 53809
608-822-6119

Prairieland Compost Facility
Prairieland Director, Mark Bauman mark@prairielandcompost.com
Prairieland Compost Facility
801 East 5th Street North, P.O. Box 100, Truman, MN 56088
507-776-3232
Fax 507-776-3288
http://www.prairielandcompost.com/

Equipment

Recycling Resource. Trade publication for recyclers. Good source of information on equipment and other technical matters.

Virginia

Pat Hadden, Ukrop Supermarket, Director of Technical Services, phadden@ukrops.com. They have the most organized food composting program in the state, just outside of Richmond. Use windrows.

Carolyn Peterson, Quality Assurance Manager, James River Correctional Facility, Goochland County, 804-784-3551 x2512. Regional jail in Northern VA uses in-vessel composting for food waste.

Bobby Clark, raclark@vt.edu, Cooperative Extension agent who gave a presentation on organics recycling. Mentioned in his presentation a VA Organics Recycling and Composting Directory. Also try other extension agent, Greg Evanylo, gevanylo@vt.edu

Virginia Recycling Association, Post Office Box 18155, Richmond, Virginia 23226, 1-888-867-1923 (toll free), http://www.vrarecycles.org

Yard Waste Composting. Virginia has 11 yard waste composting programs. http://www.epa.gov/epaoswer/non-hw/muncpl/mswdata.htm#item3 (but is in the minority of eastern states that does not have a yard waste ban)

Mid-Atlantic Composting Association,
Virginia Board Members
Bob Kerlinger
Innovative Environmental Systems, Inc.
20 Roberts Landing Drive, Poquoson, VA 23662
757-868-3779; Fax: 757-868-3805
Email: bkerlinger@widomaker.com

Dr. Rosalie Green
US EPA
109 Kent Drive, Manassas Park, VA 20111
703-308-7268; 703-368-2956; Fax: 703-308-8686
Email: Green.Rosalie@epamail.epa.gov

Clara Mills (2004-2006)
Spotsylvania County

Active Solid Waste Facilities in Virginia's DEQ Piedmont Regional Office (near the Dragon Run Watershed)
http://www.deq.virginia.gov/waste/pdf/apro.pdf
Facility Name (Permit Number): Middle Peninsula Sanitary Landfill and Recycling Center (572)
Type: Sanitary Landfill
County/City: Gloucester
Telephone: 804-693-5109
Year Permitted: 1994
Mail Address: Gloucester County, Box 329, Gloucester, VA 23061

Facility Name (Permit Number): Middle Peninsula Transfer Station (PBR037)
Type: Transfer Station
County/City: Gloucester
Telephone: 804-693-5109
Year Permitted: 1993
Mail Address: 3714 Waste Management Way, Glenns, VA 23061

Facility Name (Permit Number): Middle Peninsula Yard Waste Composting (PBR125)
Type: Yard Waste Composting Facility
County/City: Gloucester
Telephone:

Year Permitted: 1997
Mail Address: 3714 Waste Management Way, Glenns, VA 23061

Facility Name (Permit Number): Saint Laurent Paper Products Corp. Landfill (543)
Type: Captive Industrial Landfill
County/City: King William
Telephone: 804 843-5525
Year Permitted: 1992
Mail Address: Saint Laurent Paper Products Corp., 19th & Main St., West Point, VA 23181

Facility Name (Permit Number): VPPSA – Essex, Middlesex, King William County Transfer Station (PBR016)
Type: Transfer Station
County/City: Essex
Telephone: 804-728-2062
Year Permitted: 1993
Mail Address: VPPSA, 2 Eaton St., Suite 502, Hampton, VA 23669

Training Programs

U.S. Composting Council
4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741
631-737-4931; Fax: 631-737-4939
Email: admin@compostingcouncil.org
www.compostingcouncil.org

Producing and Selling Organic Products in the Dragon Run Watershed

Introduction

The Dragon Run Steering Committee seeks to explore ways to sustainably use the natural resources of the watershed in order to strengthen the local economy. Ultimately, the Committee aims to help landowners find ways to earn enough from the land to pay their property taxes and resist increasing pressure to suburbanize the landscape. To this end, the Committee has asked Yellow Wood Associates, Inc. to explore what is required to grow and market organic vegetables as a potentially profitable enterprise that is compatible with the Committee's desire to maintain the rural character and ecological integrity of the watershed.

This guide is written for landowners and entrepreneurs, farmers and non-farmers alike, looking for a way to generate or augment income from the land. Landowners who have no interest in farm work themselves may nonetheless wish to consider hiring a farm manager to operate the farm or renting land to someone else who wishes to farm. Those who are already farming may wish to consider converting to organic production and/or adding a Community Supported Agriculture (CSA) component to their operation (described below). This is not a complete handbook, but merely a starting point. Those wishing to start an organic vegetable farm should expect to undertake additional research to develop farming and marketing plans.

We were asked to focus on produce, but other types of organic agricultural products, such as grains, meats, eggs, fruit, and dairy, may also be good options for Dragon Run enterprises. In particular, certified organic grain production may present a tremendous opportunity for the watershed, because two large, national organic milk producers have recently started operations in the region, stimulating a demand for certified organic livestock feed in Virginia.[27] Dragon Run farmers already have experience growing grain, so they are well-positioned to take advantage of this opportunity. However, growing grain organically is significantly different than growing grain conventionally, and growers committed to making the transition will likely require technical assistance. Due to the resource limitations of this study, we cannot further explore this opportunity here; however, some of the information contained herein will also be applicable to producing and marketing grains and other organic agricultural products. In addition, we have identified three organic grain producers in the

[27] Horizon Organic recently opened a milk processing plant in Dayton, Virginia, that will serve as their East Coast flagship facility, while Organic Valley recently started a plant in North Carolina. According to Virginia Department of Agriculture's Certification Specialist Catherine Cash, demand generated by these plants has greatly outpaced the regional supply of certified organic raw milk; therefore, there is a big effort underway in Virginia to start more organic dairies. Currently, organic livestock feed for these operations is being trucked from Western states. Escalating fuel costs would put Virginia certified organic grain producers at a great competitive advantage. See Womack, Rocky, "Strong demand spurs organic dairying in Virginia, the South," Rodale Institute at http://www.newfarm.org/features/2005/0805/virginiadairy/organic.shtml

vicinity of Dragon Run. Their contact information is included in the Resources section of this report.

Current Agricultural Status of the Dragon Run Watershed

Of the 90,000 acres in the Dragon Run Watershed, roughly 17 percent, or 15,300 acres, is farmland, containing a great deal of prime agricultural soils. Most of the farms in and near the watershed produce conventionally grown grain crops such as wheat, corn, and soybeans. Because they sell on the commodity market, where U.S. farmers have a competitive disadvantage, most of these farms are not very profitable. None of these grain crop farms is certified organic. There is currently little vegetable production in the watershed, though the soil and climate would allow for growing a wide range of vegetables.

What Does "Organic" Mean?

"Organic" refers to the methods by which a crop is produced. The concept of growing crops organically comprises a range of practices designed to mimic natural ecosystems and maintain and replenish the fertility of the soil. These practices generally bar use of synthetic chemical pesticides and fertilizers, genetically engineered seeds, irradiation, and artificial preservatives.

Because attitudes vary as to which specific practices may be considered "organic," a national set of standards has been developed. Anyone marketing a product as "organic" must comply with these standards. Certification systems have been developed to verify compliance.

Why Go Organic? Growing Demand, Premium Prices, and Environmental Benefits

It is widely recognized that consumer demand for organic produce is growing rapidly, particularly in urban areas, and the location of the Dragon Run Watershed provides relatively easy access to market opportunities in Williamsburg, Richmond, Fredericksburg, and Washington, D.C.

Sales of organically grown food in the U.S. have been increasing by 20 percent or more a year for more than a decade, and industry analysts expect this growth to continue at 9 - 16 percent at least through 2010.[28] The fresh produce sector constitutes the largest share of the industry and, while not as fast-growing as the dairy sector, accounts for a large share of that growth. The *Nutrition Business Journal* estimated U.S. sales of organic foods in 2003 at $4.3 billion and predicts that it will reach $8.5 billion in 2010.[29]

Furthermore, organic crops often command significantly higher prices than conventional crops. This is, in part, because consumers of organic produce generally believe that organic crops are better for human health than conventionally grown crops. (Consumers also cite concern for the environment and a desire to support local farmers as reasons for purchasing organic food.) Depending on the type of crop, prices for organic produce can be more than

[28] Oberholzer, Lydia, Carolyn Dimitri, and Catherine Greene, "Price Premiums Hold On as US Organic Produce Market Expands," USDA Economic Research Service, May 2005.
[29] Ibid.

twice the price of a conventionally grown one.[30] A note of caution: As supplies of organic produce increase, price premiums may fall off somewhat; however, the negative impact of this effect on producers may be at least partially offset by the further increase in demand spurred by lower prices.[31]

Additionally, for a variety of reasons, organic farming can be expected to have a more benign or beneficial impact on the ecological health of the watershed than conventional farming techniques. One major reason for this is organic farming's emphasis on Integrated Pest Management (IPM) in lieu of reliance on synthetic pesticides. IPM is an approach that combines a number of techniques to control pests based on knowledge of the habits and life cycles of specific pests. These techniques include selection of pest-resistant varieties, inter-planting and crop rotation, mechanical and biological pest control, close monitoring and, to a limited extent, the selective, targeted use of pesticides.

The prospective organic grower should also be aware of some additional challenges inherent in organic farming. One major consideration is that organic production is relatively labor-intensive. Furthermore, effective IPM may take a while to master. Also, costs of organic seeds and soil amendments will be higher than conventional alternatives; although, over time, fewer inputs will be needed because of the improvements in soil quality that result from organic farming techniques.

What is Required to Market a Product as "Organic"? Organic Certification System

Prior to 2002, organic certification was offered by a patchwork of private and state entities that reviewed farm plans, conducted onsite inspections, and provided consumers with the assurance that products bearing the certifier's "organic" label were produced in conformity with specific standards; however, these standards varied from one certifier to another. Moreover, producers could call their products "organic" without going through any certification process or conforming to any particular standard at all. In December 2000, the U.S. Department of Agriculture's (USDA's) National Organic Program issued new regulations to standardize use of the term "organic."[32] State and private certifiers now become accredited by the USDA, and all apply the National Organic Program's standards.

Growers who sell more than $5,000 per year of organic produce and wish to label it "organic" must be certified annually by an accredited entity. The certification process includes onsite inspections, periodic testing of soil, water and produce, and submission and approval of a detailed organic system plan. (More information about the certification process can be found below.) Growers who sell less than $5,000 worth of organic produce a year may call products "organic" without going through the certification process or preparing an

[30] For price comparisons, see The New Farm Organic Price Index at http://newfarm.org/opx/ or Organic Farmgate and Wholesale Prices, August 2005, is a USDA Economic Research Service publication available online at http://www.ers.usda.gov/data/OrganicPrices/

[31] Ibid.

[32] These regulations, which went into effect on October 21, 2002, were issued pursuant to a directive in the Organic Food Production Act of 1990.

organic system plan so long as they comply with the rest of the standards. They cannot, however, use the USDA organic seal.

The National Organics Standards require that a farmer maintain or improve soil quality, generally accomplished through the use of cover cropping and the periodic addition of organic matter and other non-synthetic soil amendments. As a general rule, all natural (non-synthetic) substances are allowed in organic production and all synthetic substances are prohibited. Exceptions to this are listed in the regulations. To be marketed as organic, a crop must be grown in a field to which no prohibited substances have been applied during the three years immediately preceding harvest. Additional basic rules include prohibitions against using:

- most conventional pesticides;
- petroleum-based fertilizers;
- sewage sludge-based fertilizers;
- genetically engineered seed; and
- ionizing radiation.

To become certified, a farmer must submit an Organic System Plan that details how the farm will comply with all aspects of the regulations including record-keeping procedures. Records must be kept detailing, among other things, substances used in production. There are other requirements as well, such as the requirement to use organic seeds if available (attempts to source such seeds must be documented) and to prevent commingling of organic and non-organic products. The full 50-page text of the regulations can be found on the web at http://www.ams.usda.gov/nop/NOP/standards/FullRegTextOnly.html. Particular attention should be paid to Subpart C, Sections 200-206, which detail organic crop production requirements and can be found in the Appendix to this report section.

The Certification Process

The first step in the certification process is selecting a certifier. Any accredited certifier can legally work in Virginia, but some have self-imposed geographical limitations. Certifiers that have experience working in the state include Quality Insurance International (California), Global Organic Alliance (Ohio), Quality Certification Services (Florida), Indiana Certified Organic, North Carolina Crop Improvement Association, Oregon Tilth, and Stellar Certification Services (Oregon). The Virginia Department of Agriculture and Consumer Services (VDACS) does not maintain a certification program, nor are there private certifiers located in the state.[33] There are, however, independent inspectors in Virginia who subcontract with certifiers to conduct the required onsite inspection, which can cut down on the expense of using an out-of-state certifier.

Factors to consider when selecting a certifier include price, responsiveness, and the type and scale of farm the agent is accustomed to certifying. An excellent guide to selecting a certifier

[33] The department does not intend to develop a certification program. Rather, it finds it more cost-effective to let other entities do the certifying, according to Catherine Cash, VDACS Organic Certification Specialist.

is available on the Rodale Institute's website at http://www.newfarm.org/ocdbt/index.php. This site offers free access to a database containing profiles of the 97 accredited certifiers in the U.S. and provides side-by-side comparisons and the ability to search by specific criteria.

The next step is submitting an application, which includes an Organic System Plan. The plan must detail all aspects of the farm's operation, describing how the National Organic Standards will be met. While the standards explicitly require or prohibit certain practices (as listed above), other requirements are stated in more general terms, leaving a good deal of latitude to the certifying agent to define specifics appropriate to the scale and type of farm. For example, many small-scale organic farmers shy away from the certification process because they fear the record-keeping demands will be too onerous, but according to VDACS Certification Specialist Catherine Cash, a notepad and a shoebox may suffice to contain all the records required of a small producer.

The certifier will also send an inspector to verify the practices described in the farm's Organic System Plan. After reviewing the System Plan and the inspector's report, the certifier may require some adjustments to the plan. According to Cash, the vast majority of applications pass after resolving "minor non-compliances" such as the lack of systems to record harvest volume, retain receipts for inputs purchased, or document attempts to find sources of organic seed. The process takes between 2 and 6 months.

Certification must be renewed annually. The cost varies depending on the certifier, the number of acres, and the volume of sales, but is generally in the range of $500 to $1,000. All or most of this cost can be recouped via VDACS's certification cost-share program. Once successfully certified, a farmer can apply for reimbursement of 75 percent of the cost of certification or $500, whichever is greater. The cost-share program will cover annual re-certification fees as well.[34]

The Under $5,000 Exception

Those selling less than $5,000 worth of organic produce annually can market their product as "organic" without going through the certification process or creating an Organic System Plan. They will still be required to comply with the rest of the regulations, including the record-keeping requirement.[35] This approach saves the small producer the time and expense of going through the certification process. The disadvantages are that it imposes a revenue ceiling at $5,000 a year and precludes use of the USDA certified label.

Pros and Cons of Certification

The decision to go through the formal certification process should follow an assessment of the extent to which it will increase one's marketing prospects. Many small producers who have personal relationships with their customers decide not to go through the certification process even if they are using organic methods, because certification adds little value to their

[34] Catherine Cash, VDACs Organic Certification Specialist.
[35] A civil penalty of up to $10,000 can be levied on any person who knowingly sells or labels as organic a product that is not produced and handled in accordance with the National Organic Program's regulations.

product. Their customers already trust that the farm is doing its best for the health of both the customer and the environment. Even if they can get the cost of the certification process reimbursed, they do not wish to go through the trouble of writing an Organic System Plan, submitting to inspections, and potentially having to increase their record-keeping systems.

On the other hand, the process of writing an Organic System Plan can be helpful to a farmer, resulting in a more thorough understanding of how the farm needs to operate to succeed. Additionally, record-keeping procedures required by certifiers are not as onerous as many small farmers fear, as discussed above. And lastly, growers who cite certification fees as a reason to opt out may not be aware of the VDACS certification cost-share program.

Since the National Organic Standards took effect in 2002, the term "organic" has become more familiar to consumers. Because they can now trust that "organic" has a standardized meaning, they may increasingly ascribe value to products bearing an organic label. For this reason, certification may increase a producer's market, particularly among customers who do not know the producer personally. For larger producers, certification may significantly expand the opportunity to market to processors of value-added certified organic products or to large retailers who sell organic produce.

Other Options to Certification

Some farmers opt out of organic certification because they are not exclusively using organic methods and prefer to have more flexibility in choosing their farm management practices. Such producers cannot legally use the term "organic," but they can use other words to convey an environmentally friendly ethic. Those who do not comply with all the requirements of the National Organic Standards may market their product using language such as "natural," "produced without pesticides or fertilizers," "sustainable," or "produced using organic methods." There are no particular requirements for use of these terms, although an effort is underway within some farming organizations to define them.

These producers face some peer pressure from organic farmers, particularly where language is used carelessly or deceptively to imply that practices are environmentally friendly when they are not. As a response, the Virginia Association for Biological Farming offers those seeking an alternative to the National Organic Program standards the opportunity to take their Ecological Production Pledge. The pledge is intended as a means to assure customers that the farmer is striving to produce food in an ecologically sound and sustainable manner, with minimal synthetic pesticides, herbicides and fertilizers.

Produce Marketing Systems

Before starting a farming enterprise, one should develop a marketing plan. Larger-scale organic producers may find opportunities to sell to retailers of organic food or to processors who use certified organic produce to make value-added certified organic products. The Marketing Division of VDACS is increasing its work on organics and can sometimes be

helpful in linking growers to purchasers.[36] Smaller-scale organic vegetable producers typically market directly to restaurants, at farmers markets or farm stands, via Community Supported Agriculture (CSA) or using a combination of these marketing approaches. While CSA is not a familiar term to most people, it is an effective method of marketing produce that offers stability to smaller-scale farms. The remainder of this section explains what a CSA is and how it works.

What is a CSA?

Community Supported Agriculture (CSA) is a system in which members of the community buy annual shares in a farming enterprise and receive in return a portion of the harvest. The CSA creates a direct commitment between the farmer and the consumer and provides the farmer assurance of a market for the crop before planting begins. The shareholder becomes a "member" of the farm and typically receives family-sized portions of 6-10 types of produce once a week throughout the growing season.

CSAs first started in Europe and Japan and began to appear in the U.S. in the mid 1980s. CSAs do not have to be certified organic, although most use organic growing methods. Right now there are approximately 1,500 CSAs nationally, and this number is increasing at a rate of about 90 per year. There are approximately 32 CSAs in Virginia.[37]

Advantages of the CSA System

Because the member makes a commitment prior to the beginning of the farming season and usually pays up front, the farmer has a guaranteed market for the year's harvest and a guaranteed income. Farmers therefore are protected from price fluctuations and have money up front to purchase seeds and equipment, hire employees, and cover other operating costs. Moreover, the members share with the farmer the risks inherent in farming, providing insurance against crop failure. For example, if disease blights a tomato crop one year, the members receive fewer tomatoes that season.

CSA members also reap many benefits. They know where their food comes from and the people who produce it. Throughout the growing season, they receive a changing assortment of produce, usually picked the same day they receive it. When crops are bountiful, they share in the surplus. Prices are generally the same or lower than comparable produce purchased at a grocery store. An intangible but important additional benefit to both member and farmer is the community building aspect of CSAs. Members often take great interest in the farm operation and help with planting and harvesting. They can also help advertise the CSA and bring in additional members.

[36] Contact Tom Sleight, Director, Division of Marketing, Virginia Department of Agriculture and Consumer Services (VDACS).

[37] A listing of all the CSAs in Virginia, together with profiles and contact information, can be obtained at www.LocalHarvest.org.

Many Variations
Most CSAs are initiated by landowners, some who are already actively farming and many who are not. Other CSAs have been started by core groups of consumers who come together, rent or purchase land, and hire a farmer. A community land trust is one way a group can purchase land together and ensure that it will remain available to the CSA over the long term.

Some CSAs have members pick up their weekly share at the farm, while others deliver to central drop-off points near where members live or work. Some assemble the shares in grocery bags or boxes, while others leave this job to the members, simply listing on a blackboard how much of each item a member should take. (Many have a swap box for produce members choose to leave behind.) CSAs with on-farm pick-ups sometimes invite members to do some of their own harvesting. This saves greatly on labor costs and rewards the member with additional produce and the pleasure of a hands-on experience.

CSA farms vary greatly in size from less than an acre to hundreds of acres. It is recommended to start small, learn from the successes and failures of the early years, and then perhaps grow into a larger operation. Many farms can supply at least 20 shares per acre, but determining the optimum number of shares to sustain the enterprise is more complex. The availability of labor and the degree of mechanization as well as the existence of other sources of farm income are factors in this equation. Generally farms two acres and greater require the use of mechanical equipment. One estimate suggests that a CSA needs to sell 100 shares to generate sufficient income to sustain a single farmer if the CSA is the only source of income. The price of a CSA share is generally in the range of $300-$600 per year.[38]

Building a Shareholder Base
Finding people interested in CSA shares has not been difficult for existing CSAs. Locating members begins with friends and neighbors and often proceeds largely by word of mouth. Shareholders can also be recruited through local non-profit community organizations, civic groups and land trusts, churches, schools and daycare facilities. Friends, neighbors, and shareholders who work outside the local area can recruit members at their workplaces, and the workplace can become a drop-off site. Ideally, membership should be geographically clustered to make delivery efficient.

Additionally, ads can be placed in newspapers; signs can be posted on public bulletin boards and on the road by the farm; and brochures can be placed in offices, stores and community centers. Attracting local media coverage can also be a good way to recruit members.

Many CSAs also produce informal newsletters to help members feel connected to the farm. Inviting members to potlucks, planting and harvesting parties and other on-farm events strengthens members' sense of ownership and tends to increase member retention rates.

[38] Henderson, Elizabeth with Robyn Van En, *Sharing the Harvest: A Guide to Community-Supported Agriculture*, Chelsea Green Publishing Company, 1999, p.49.

Some CSAs are organized to serve relatively distant markets. We have identified three such CSAs, two in Virginia and one in California. For producers in Dragon Run considering serving metropolitan markets, these producers may be able to provide important insights.

1. LivePower Community Farm
   25451 East Lane, Covelo, CA 95428
   Steve and Gloria Decater
   707-983-8196
   The Live Power Farm offers a total of 90 shares, 50-60 in San Francisco and 30-40 in Covelo and throughout Mendocino County more than 3 hours away.

2. Olin-Fox Farms
   236 Chesapeake Beach Road, Reedville, VA 22539
   Ann & John Cooper
   804-453-4125
   Olin-Fox Farms serves Alexandria, Virginia, about 3 hours away.

3. Bull Run Mountain Vegetable Farm
   4362 Highpoint Lane, The Plains, VA 20198
   Bates/Hauter Family
   farm@bullrunfarm.com
   Bull Run Mountain Vegetable Farm serves Arlington, Alexandria, Falls Church, Fairfax, Prince William and Washington, D.C. communities about an hour away and is sold out of shares for 2005.

Other CSAs serve local markets. One example in the region is Dayspring Farm in Cologne, Virginia. Dayspring offers on-farm pick-up as well as delivery to the Williamsburg and Middle Peninsula areas. They have been in business for 15 years and have 120 members who pay $440 a year for a full share and $250 a year for a half share. For more information, contact:

4. Dayspring Farm
   942 Buena Vista Road, Cologne, VA 23181
   Charles and Miriam Maloney
   804-785-9401

Financial Considerations

The farm budget should include salaries, seed and soil amendments, equipment, utilities, advertising, postage and office supplies, taxes, and insurance. To determine the price of a share, the total annual cost of the operation is divided by the anticipated number of shares. A share is generally sized to serve two adults and two children.

Labor is generally a CSA's greatest expense. According to one study, CSAs need one farmer (and one acre) for every 20-40 shares produced. Farms with 100 or more shares required

three or more workers.[39] Many farms take on seasonal apprentices or interns who work for room, board, a small stipend, and the educational experience. Many CSAs also rely significantly on help from members and other volunteers.

CSA income generally does not cover major start-up costs, such as investments in refrigeration, irrigation, farm equipment (such as tractors and delivery trucks), and greenhouses. For startup costs, new farmers either obtain bank loans or start small and make large purchases as they become possible within the farm budget. Most use second-hand or homemade equipment.[40]

Growers should consider obtaining two types of insurance: liability insurance and property insurance. Liability insurance will protect the grower if a product turns out to be defective. The cost of liability insurance will depend on the size of the operation, the value of the product, and the grower's loss record. Property insurance protects the farmer from loss due to damage to buildings and equipment used in production and may be required if a lender is involved. Property insurance rates are based on the value of buildings and equipment as well as the way they are used.

Like many small businesses, unfortunately, CSAs often do not provide health insurance to employees, despite emphasizing sustainable living. This may not be an issue for a landowner who has health coverage through outside employment. If health coverage is a necessity, it should also be factored into the share price.

Conclusion

The growing demand for organics provides a promising economic opportunity for the Dragon Run Watershed, enhanced by the watershed's proximity to several major consumer markets and two major organic milk processing plants. The addition of a CSA component to a vegetable farm can add needed stability to an industry buffeted by global market pressures. Nonetheless, all farming is hard work and requires a long-term commitment to the land. It should not be undertaken without thorough planning. Below is a list of people, publications, and organizations that can assist a prospective farmer in further exploring this possibility.

[39]"Managing a CSA Farm 1: Production, Labor, and Land." University of Wisconsin-Madison Center for Integrated Agricultural Systems Research Brief #40, March, 1999. http://www.cias.wisc.edu/

[40]"Managing a CSA Farm 2: Community, Economics, Marketing and Training." University of Wisconsin-Madison Center for Integrated Agricultural Systems, Research Brief #41, March, 1999. http://www.cias.wisc.edu/

Resources

General

LocalHarvest
Santa Cruz, California
831-475-8150
www.localharvest.org
LocalHarvest maintains a public nationwide directory of small farms, farmers markets, and other local food sources, helping consumers find sources of sustainably grown food. Small farms can market themselves directly through the LocalHarvest website.

University of Wisconsin-Madison Center for Integrated Agricultural Systems (CIAS).
CIAS is a sustainable agriculture research center. Their website offers numerous helpful publications, such as Managing a CSA Farm 2: community, economics, marketing and training. (Research Brief #41, March, 1999). http://www.cias.wisc.edu/

Appropriate Technology Transfer for Rural Areas (ATTRA). www.attra.org
ATTRA is the National Sustainable Agriculture Information Service operated by the National Center for Appropriate Technology under a grant from the Rural Business-Cooperative Service, U.S. Department of Agriculture. The ATTRA website provides a wealth of information about sustainable farming, including publications on production practices, certification, and marketing.

Future Harvest-Chesapeake Alliance for Sustainable Agriculture (MD); 301-405-8762;
http://www.futureharvestcasa.org/
Future Harvest-CASA is a network of farmers, agricultural professionals, landowners and consumers living and working in the Chesapeake region. Future Harvest-CASA promotes profitable, environmentally sound and socially acceptable food and farming systems that work to sustain communities.

Economic Research Service
http://www.ers.usda.gov/briefing/Organic/
Site presents economic analyses about the growth in U.S. organic farmland during the 1990s, channels for organic food marketing, consumer demand for selected organic foods, and other topics.

Organic Farmgate and Wholesale Prices August 2005.
http://www.ers.usda.gov/data/OrganicPrices
This is a USDA Economic Research Service publication available online that provides farmgate and wholesale prices for select organic and conventional produce items for the Boston and San Francisco markets for 1995-2004.

The New Farm Organic Price Index
http://newfarm.org/opx/

Regional

Bio-Dynamic Farming and Gardening Association (PA); 888-516-7797;
http://www.biodynamics.com/csa.html

Organic Trade Association; 413-774-7511; http://www.ota.com/index.html

Pennsylvania Association for Sustainable Agriculture; 814-349-9856;
http://www.pasafarming.org

Pennsylvania Certified Organic; 814-364-1344; info@paorganic.org;
http://www.paorganic.org/

Robyn Van En Center, Wilson College (PA); 717-264-4141 ext. 3352;
http://www.csacenter.org

Southern Sustainable Agriculture Working Group http://www.ssawg.org/
SSAWG
The Southern Sustainable Agriculture Working Group, or Southern SAWG, is a regional umbrella organization created to enhance the impact of the sustainable agriculture movement in the South. It provides a vibrant network linking many individuals and over 100 constituent organizations like VABF throughout the Southern region. Its annual Conference on Practical Tools and Solutions for Sustaining Family Farms provides a great opportunity for producers, educators and advocates gather to learn new techniques, exchange ideas and information, and build lasting connections. In addition, Southern SAWG offers innovative learning opportunities like the Experienced Organic Farmers' Network, the Farm-Based Enterprise Development network, and an Internet-Based Services project to develop markets via the Internet.

Southern SAWG has just received funding to provide free technical assistance to growers or others who are seeking to establish elements of community food systems, from farmers markets and CSAs to farm-to-school program and buy-local campaigns. They also provide capacity building assistance for constituent organizations, and education on farm policy issues related to sustainable agriculture.

Virginia

Virginia Association for Biological Farming
www.vabf.org
P.O. Box 1003, Lexington, VA 24450
VaBioFarming@hotmail.com

Publishes quarterly journal, *The Virginia Biological Farmer*; back issues available on line. They hold an annual conference and trade show in Feb.
Richmond Chapter: Patricia Stansbury, Epic Gardens, 7800 Epic Rd., Bon Air, VA 23235
804-272-1475, LaHerona@juno.com
Tidewater Chapter: Charlie Maloney, HCR 74, Box 2885, Cologne, VA 23037
804-785-9401

Virginia Organic Producers & Consumers Association (VOPCA)
Mimi Dale Stein - Director
www.VOPCA.org
P.O. Box 1863, Middleburg, VA 20118
540-687-6866
A non-profit trade organization, the Virginia Organic Producers & Consumers Association (V.O.P.C.A.), whose mission is to help farmers transition to organic and find markets for their value added products. Activities include fielding organic farming questions referred by the VA Dept. of Agriculture, maintaining a directory of organic farmers and resources on their website, and at least monthly educational seminars on all sustainable practices. They feature seminars for consumers and non-commercial producers as well.
Alternative Farming Systems Information Center
Organic Farming and Marketing
Organic Farming Research Foundation
Organic Materials Review Institute
Organic Production Practices

Andy Hankins, VA Biological Farming Conference Coordinator
Virginia State University, Box 9081, Petersburg, VA 23806
804-524-5962 (w); 804-966-7129 (h); *ahankins@vsu.edu*

Catherine Cash, VA Dept of Ag, Organic Certification 540-333-9945 cell; 540-377-9945

Countryside Natural Products
1688 Jefferson Highway, Suite 104, Fishersville, VA 22939
Reid Putney
888-699-7088
www.countrysidenatural.com
Sells certified soil amendments, animal feeds, pest control products and seeds. Very knowledgeable. Have drop-off points around the state. Owner Reid Putney is very knowledgeable about organics scene in the state. Also serves as a middleman for organic crop marketing.

Seven Springs Farm
462 Jerry Lane NE, Check, VA 24072
Ron Juftes 540-651-3228 or Polly Hieser 540-651-3226
7springs@swva.net
Offers organic farming and gardening supplies, a CSA, and an apprenticeship program.

Organic Seed Sourcing Project
http://www.savingourseed.org/
Last fall, the Carolina Farm Stewardship Association (CFSA), in conjunction with the Southern Exposure Seed Exchange in Mineral, VA (SESE) http://www.southernexposure.com/ and eight other partners, received a SARE grant to develop a network of organic seed producers in the states of Virginia, North and South Carolina, and Georgia. Thus the Save Our Seed (SOS) project was launched. The project's main objective is to begin laying the groundwork for meeting the new demand for organic seeds in the southeast generated by National Organic Program (NOP) requirements that certified organic growers obtain and plant organically-produced seeds whenever feasible. A second goal is to maintain heirloom and locally adapted crop varieties from this region.

Community Supported Agriculture

Sustainable Agriculture Research and Education's (SARE) list of Virginia CSA's is at http://www.sare-va.vt.edu/csa.html

Henderson, Elizabeth with Robyn Van En, *Sharing the Harvest: A Guide to Community Supported Agriculture*, Chelsea Green Publishing Company, 1999. Robyn Van En started the first CSA in the U.S., and this book is one of the best guides to setting up a CSA, full of nuts and bolts information, real-life examples, and personal reflections. Paperback. Out-of-print, but copies are available through Amazon.com, the Robyn Van En Center at http://www.csacenter.org, or the Community Bookshelf: http://bookshelf.ic.org/books/sharing-the-harvest.html. A revised edition is expected in 2006.

CSAs Across the Nation: Findings from the 1999 CSA Survey
http://www.cias.wisc.edu/pdf/csaacross.pdf

Community Supported Agriculture (CSA).
This U.S. information resource is a cooperative effort between the Cooperative State Research Education and Extension Service (CSREES) and the National Agricultural Library (NAL) of the U.S. Department of Agriculture (USDA). General information, state-by-state listing of CSA farms, CSA resources for farmers, sustainable agriculture resources, nutrition and health, organic recipes, web and other resources, books and recent articles and more.
http://www.nal.usda.gov/afsic/csa/

The **Biodynamic Association** provides a list of all CSAs in the U.S. and Canada. Also has brochure: "Introduction to Community Supported Farms and Farm Supported Communities."
http://www.biodynamics.com/csa.html

"Farms of Tomorrow Revisited: Community Supported Farms, Farm Supported

Communities" by Trauger M. Groh, revised 1997, Biodynamic Farming and Gardening Association, ISBN 0-938250-13-2
"Farming is everyone's responsibility, and has likewise to be accessible for everyone," says the author. Most people have never met a farmer or seen a potato in the ground. Explains why society needs smaller farms that care for the land and their communities and produce a bounty of healthy produce for the consumer. Ten examples of CSA (Community Supported Agriculture) farms with first-hand information and advice from the farmers themselves. Valuable to anybody interested in the CSA movement in the United States (or the world), or to farmers wishing to start their own CSA program. Helpful appendices on getting started, acquiring land, sample budgets, and typical CSA shares are included. From Powell's Books:
http://www.powells.com/biblio/125000-125200/0938250132.html
From Chelsea Green:
http://www.chelseagreen.com/DP/FarmsTomorrow.htm

"Rebirth of the Small Family Farm" by Bob and Bonnie Gregson, 1996
"A first-person account of a rewarding second career in Community Supported Agriculture. A great introduction to subscription farming." From Alternatives for Simple Living:
http://www.simpleliving.org/catalog/
BuildingComm.html#RebirthoftheSmallFamilyFarm

"Creating a Market -- Getting started in Community Supported Agriculture" by Sarah Milstein, Mother Earth News, Feb/March 1999.
Clear view of the CSA option, focus on one farm family's experience, good advice on how to proceed, do's and don'ts. Start small and grow slowly -- plan ahead. And the rewards: "Four or five members are coming up from the city tomorrow to plant garlic with us. It's amazing to me that people are going to take the time and expense to help out because they care about next year. That level of commitment has been very reassuring for us. It makes us step back sometimes and appreciate our farm and what we do."
http://www.motherearthnews.com/gardening/gar172.csa.middle.html

Certified Organic Grain Producers Near Dragon Run

HILLSBOROUGH FARM, INC.
Todd Henley
636 Hillsborough Lane, Walkerton, VA 23177
804-769-2987

BELVEDERE PLANTATION
M.R. Fulks
1601 Belvedere Lane, Fredericksburg, VA 22408
540-899-2828, fax: 540-899-6570
www.**belvedereplantation**.com/
Certified organic soybeans, corn and wheat

COUNTRYSIDE NATURAL PRODUCTS
Reid Putney
1688 Jefferson Highway, Suite 104, Fishersville, VA 22939
540-932-8534, fax: 540-946-8534
Email: trek75@msn.com

Appendix A: National Organic Program Regulations (Excerpted)

Requirements for Organic Crop Production

Subpart C - Organic Production and Handling Requirements

§ 205.200 General. The producer or handler of a production or handling operation intending to sell, label, or represent agricultural products as "100 percent organic," "organic," or "made with organic (specified ingredients or food group(s))" must comply with the applicable provisions of this subpart. Production practices implemented in accordance with this subpart must maintain or improve the natural resources of the operation, including soil and water quality.

§ 205.201 Organic production and handling system plan.

(a) The producer or handler of a production or handling operation, except as exempt or excluded under § 205.101, intending to sell, label, or represent agricultural products as "100 percent organic," "organic," or "made with organic (specified ingredients or food group(s))" must develop an organic production or handling system plan that is agreed to by the producer or handler and an accredited certifying agent. An organic system plan must meet the requirements set forth in this section for organic production or handling. An organic production or handling system plan must include:

(1) A description of practices and procedures to be performed and maintained, including the frequency with which they will be performed;

(2) A list of each substance to be used as a production or handling input, indicating its composition, source, location(s) where it will be used, and documentation of commercial availability, as applicable;

(3) A description of the monitoring practices and procedures to be performed and maintained, including the frequency with which they will be performed, to verify that the plan is effectively implemented;

(4) A description of the recordkeeping system implemented to comply with the requirements established in § 205.103;

(5) A description of the management practices and physical barriers established to prevent commingling of organic and nonorganic products on a split operation and to prevent contact of organic production and handling operations and products with prohibited substances; and

(6) Additional information deemed necessary by the certifying agent to evaluate compliance with the regulations.

(b) A producer may substitute a plan prepared to meet the requirements of another Federal, State, or local government regulatory program for the organic system plan: Provided, That, the submitted plan meets all the requirements of this subpart.

§ 205.202 Land requirements.

Any field or farm parcel from which harvested crops are intended to be sold, labeled, or represented as "organic," must:

(a) Have been managed in accordance with the provisions of §§ 205.203 through 205.206;

(b) Have had no prohibited substances, as listed in § 205.105, applied to it for a period of 3 years immediately preceding harvest of the crop; and

(c) Have distinct, defined boundaries and buffer zones such as runoff diversions to prevent the unintended application of a prohibited substance to the crop or contact with a prohibited substance applied to adjoining land that is not under organic management.

§ 205.203 Soil fertility and crop nutrient management practice standard.

(a) The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion.

(b) The producer must manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials.

(c) The producer must manage plant and animal materials to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances. Animal and plant materials include:

(1) Raw animal manure, which must be composted unless it is:

(i) Applied to land used for a crop not intended for human consumption;

(ii) Incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or

(iii) Incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles;

(2) Composted plant and animal materials produced though a process that

(i) established an initial C:N ratio of between 25:1 and 40:1; and

(ii) maintained a temperature of between 131 F and 170 F for 3 days using an in-vessel or static aerated pile system; or

(iii) maintained a temperature of between 131F and 170F for 15 days using a windrow composting system, during which period, the materials must be turned a minimum of five times.

(3) Uncomposted plant materials.

(d) A producer may manage crop nutrients and soil fertility to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances by applying:

(1) A crop nutrient or soil amendment included on the National List of synthetic substances allowed for use in organic crop production;

(2) A mined substance of low solubility;

(3) A mined substance of high solubility, Provided, That, the substance is used in compliance with the conditions established on the National List of nonsynthetic materials prohibited for crop production;

(4) Ash obtained from the burning of a plant or animal material, except as prohibited in paragraph (e) of this section: Provided, That, the material burned has not been treated or combined with a prohibited substance or the ash is not included on the National List of nonsynthetic substances prohibited for use in organic crop production; and

(5) A plant or animal material that has been chemically altered by a manufacturing process: Provided, That, the material is included on the National List of synthetic substances allowed for use in organic crop production established in § 205.601.

(e) The producer must not use:

(1) Any fertilizer or composted plant and animal material that contains a synthetic substance not included on the National List of synthetic substances allowed for use in organic crop production;

(2) Sewage sludge (biosolids) as defined in 40 CFR Part 503; and

(3) Burning as a means of disposal for crop residues produced on the operation: Except, That, burning may be used to suppress the spread of disease or to stimulate seed germination.

§ 205.204 Seeds and planting stock practice standard.

(a) The producer must use organically grown seeds, annual seedlings, and planting stock: Except, That,

(1) Nonorganically produced, untreated seeds and planting stock may be used to produce an organic crop when an equivalent organically produced variety is not commercially available, Except, That, organically produced seed must be used for the production of edible sprouts;

(2) Nonorganically produced seeds and planting stock that have been treated with a substance included on the National List of synthetic substances allowed for use in organic crop production may be used to produce an organic crop when an equivalent organically produced or untreated variety is not commercially available;

(3) Nonorganically produced annual seedlings may be used to produce an organic crop when a temporary variance has been granted in accordance with § 205.290(a)(2);

(4) Nonorganically produced planting stock to be used to produce a perennial crop may be sold, labeled, or represented as organically produced only after the planting stock has been maintained under a system of organic management for a period of no less than 1 year; and

(5) Seeds, annual seedlings, and planting stock treated with prohibited substances may be used to produce an organic crop when the application of the materials is a requirement of Federal or State phytosanitary regulations.

§ 205.205 Crop rotation practice standard.

The producer must implement a crop rotation including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions that are applicable to the operation:

(a) Maintain or improve soil organic matter content;

(b) Provide for pest management in annual and perennial crops;

(c) Manage deficient or excess plant nutrients; and

(d) Provide erosion control.

§ 205.206 Crop pest, weed, and disease management practice standard.

(a) The producer must use management practices to prevent crop pests, weeds, and diseases including but not limited to:

(1) Crop rotation and soil and crop nutrient management practices, as provided for in §§ 205.203 and 205.205;

(2) Sanitation measures to remove disease vectors, weed seeds, and habitat for pest organisms; and

(3) Cultural practices that enhance crop health, including selection of plant species and varieties with regard to suitability to site-specific conditions and resistance to prevalent pests, weeds, and diseases.

(b) Pest problems may be controlled through mechanical or physical methods including but not limited to:

(1) Augmentation or introduction of predators or parasites of the pest species;

(2) Development of habitat for natural enemies of pests;

(3) Nonsynthetic controls such as lures, traps, and repellents.

(c) Weed problems may be controlled through:

(1) Mulching with fully biodegradable materials;

(2) Mowing;

(3) Livestock grazing;

(4) Hand weeding and mechanical cultivation;

(5) Flame, heat, or electrical means; or

(6) Plastic or other synthetic mulches: Provided, That, they are removed from the field at the end of the growing or harvest season.

(d) Disease problems may be controlled through:

(1) Management practices which suppress the spread of disease organisms; or

(2) Application of nonsynthetic biological, botanical, or mineral inputs.

(e) When the practices provided for in paragraphs (a) through (d) of this section are insufficient to prevent or control crop pests, weeds, and diseases, a biological or botanical substance or a substance included on the National List of synthetic substances allowed for use in organic crop production may be applied to prevent, suppress, or control pests, weeds, or diseases: Provided, That, the conditions for using the substance are documented in the organic system plan.

(f) The producer must not use lumber treated with arsenate or other prohibited materials for new installations or replacement purposes in contact with soil or livestock.

Estate Planning, Conservation Tools and Community Foundations

Introduction

The Dragon Run Steering Committee seeks to preserve large, contiguous tracts of land in their current undeveloped state. Forests now dominate the watershed but conditions that once supported such land use now conspire against it as increasing land values have introduced development pressure. The Committee has asked Yellow Wood to recommend strategies that both preserve forest and supplant development pressure with practical alternatives for landowners. Based on its research, Yellow Wood's suggestion is for the Committee to launch a strategy of forest preservation by establishing a homegrown program of estate planning and charitable giving to a community foundation. The recommendation is based on models utilized by The Nature Conservancy (TNC) and Home Town Competitiveness (HTC). This document is meant to guide the Committee in devising a program to meet its goals, describing a general framework, exploring options within that framework and highlighting ingredients for successful implementation.

Opportunity Identification

The Dragon Run Watershed has been called one of Virginia's most pristine. Of its 90,000 acres, 80 - 90% is covered by forests and wetlands (Dragon Run Steering Committee, 2003). Its 58,000 acres of forest contain 6,800 acres of hardwoods, 14,000 acres of pine and 37,000 acres of mixed woodland stands.

Most of these pristine lands are privately owned. In 2001, there were over 3,000 privately owned parcels in the watershed; the largest, owned by John Hancock Life Insurance Company, is 26,000 acres. The College of William and Mary owns 121 acres and VA Department of Transportation (DOT) owns some property in fee simple and prescriptive easements for roads (ROWs), and the Middle Peninsula Chesapeake Bay Public Access Authority owns the 274-acre Browne Tract. A small percentage is conserved through easements and includes 235 acres held by the Virginia Outdoors Foundation, 72 by Friends of Dragon Run and 32 by the Chesapeake Bay Foundation.

Since 1985, Middlesex County alone has lost 1,500 acres of forestland [41]. Several factors play a role. It is likely true, as it is in Essex County, that a large proportion of watershed landowners are over 60 years of age[42]. The aging demographic portends increased rates of property transfer in the region as estates are settled. Customarily this entails a split of the estate into smaller parcels for its heirs. At the same time, the watershed's beauty and seclusion lure many second-home owners to the region. This demand increases land values and development pressures. Therefore, the next decades will most likely bring changing

[41] Middlesex County, Virginia: Comprehensive Plan Update 2001. Middlesex County Planning Commission.
[42] Essex County, Virginia: Comprehensive Plan. April 2003. Essex County Planning Commission.

ownership of many existing parcels with possibly dramatic changes in parcel size, land use and management practices.

The combined threat of forest and parcel fragmentation has raised concern and generated efforts to redirect change and protect the unique qualities of the watershed. Parcel fragmentation poses threats to the continued efficient harvest of timber. Forest fragmentation caused by housing developments, road building and other land use changes can impair environmental services provided by the watershed. Hunting, fishing and other recreational uses may be affected. Likewise, the buffering capacity of forests is diminished by fragmentation. Land uses that replace forests typically discharge more stormwater and nutrients and lead to water impairment both within the watershed and further down in the Chesapeake Bay.

While the transfer of ownership affected by estate settlement creates an opening through which development pressures are exerted, it also creates opportunities to redirect the forces of change, to preserve existing and future economic opportunities and to create legacies for future generations by preserving the character that makes this watershed unique.

Definitions

Estate Planning

Estate planning begins with the identification of all the assets and liabilities of the estate. Its purpose is to leave detailed instructions pertaining to the distribution of assets and settlement of liabilities after the owner's death. An effective plan should carry out the owner's intentions and objectives. Moreover, the process of planning itself may reveal unforeseen alternatives and opportunities as well as obstacles.

Estate planning is versatile and may use various instruments and strategies depending upon the needs and circumstances of the estate. The goals need not be limited to asset distribution and tax avoidance. The wealth of an estate may used to achieve other specified objectives: education, start-up capital for a new business, donation to community or charitable organization. Goals may encompass broader horizons such as preserving a certain character to the land, certain uses and management regimes.

Conservation Easements

An easement is a permission or restriction that attaches to a property in the form of deed covenants. It represents the permanent, legal conveyance of an agreed upon set of property rights to another party. A common permissive easement would be the right of a utility company to run cable across one's property. A restrictive easement might preclude a property owner from further subdividing their land. A conservation easement may prohibit or limit certain land use activities such as residential development to preserve wildlife habitat. Conservation easements are flexible and can be structured to meet the goals of both the landowner and the party to which the easement is being granted. The use restrictions contained in the easement are permanently attached to the title otherwise ownership is

unaffected. As with any property, it may be sold, bequeathed or donated to charitable causes. All uses permitted by zoning and not restricted by the easement may continue (see Appendix A).

Life Instruments

These are easements or deed restrictions that come to force after the owner's death or some other specified time. The current owner may continue to live on and use the property.

Right of First Refusal

A legal document entered into by the landowner and a second party whereby notice is given to the second party when the landowner intends to sell property or change land use. The second party may exercise the right to purchase the land at market value or refuse this right. This instrument serves primarily to notify and preserve purchase or lease options for the second party. There is no diminishment of land value or other cost associated with this instrument (see Appendix B).

Community Foundations

These are 501(C)3 non-profit corporations that may receive charitable gifts, invest, manage and distribute them for community improvement.

Models

Based upon the Committee's objectives, two models are offered for consideration. One focused on estate planning and conservation easements and the other on estate planning and charitable contributions. The two could be combined to provide a powerful approach to shaping the future of the Dragon Run Watershed.

One model that may be useful for the steering committee to examine is that used by The Nature Conservancy (TNC) for its land and easement acquisitions. It encourages individuals to create a plan for their estates that meets their particular needs and circumstances and to include charitable giving in the plan.

The model works well for two reasons. First, estate planning is, in its own right, valuable to landowners and second, it provides many options for charitable giving that may not otherwise be available.

A clear and detailed estate plan can help ensure an owner's wishes are carried out. Without it, unintended consequences can and often do arise. Estates lacking clearly stated intentions and instructions may land in probate where decisions are left to a judge and to standard formulae that govern asset distribution, foreclosing opportunities for creative alternatives and exposing the estate to additional and unnecessary expense.

A reduced tax obligation is another common benefit to estate planning. Contrary to perception, many landowners, even if cash poor, have over time become land rich as property values for scenic and secluded oases have risen. Thus, when assets are distributed,

large estate tax bills catch many families by surprise, often forcing them to sell land to pay the tax. Charitable gifts are often designed into estate plans to reduce the value of an estate that is subject to taxation.

Charitable giving strategies are diverse and may include a straightforward gift of real estate, trusts, retained life estates or conservation easements. Trusts are sometimes created to divide estates. To illustrate, under the Unified Gift and Estate Tax rules, a husband and wife may be viewed as separate taxpayers. Thus, by dividing the estate into trusts for each spouse, exemptions on the taxable estate can be claimed twice, once for each trust, dramatically reducing and potentially eliminating heirs' tax obligations. The estate planning process may uncover means for reducing other taxes as well. By restricting future development, a conservation easement may lower property taxes by reducing the current taxable value of real estate. Finally, estate planning combined with charitable giving can be structured to provide annuity payments to the landowner while avoiding capital gains, income and federal estate taxes.

Finally, families often postpone conversations pertaining to death and the potentially sensitive task of distributing assets among survivors; therefore, by initiating a discussion centered on the personal benefits of estate planning, this strategy creates the opportunity to open discussions on charitable giving.

Home Town Competitiveness

The Home Town Competitiveness (HTC)[43] program in Nebraska aims to help rural communities build their own capacity to shape brighter futures. One of its activities is the establishment of community foundations and endowments that may be used to fund projects for community betterment. *Mindful of the cash poor, land rich condition of most rural communities, endowment building has identified land as the source of wealth from which betterment projects can be supported. To this end, HTC has used transfer of wealth analysis to show community leaders the extent to which wealth will be siphoned from the community as an aging demographic of landowners passes it to children who often migrate to urban centers outside the state.*

To reverse this trend, HTC advocates a local effort to build and sustain a program of local giving. The first step is to create a task force on charitable asset giving to oversee the program. The task force should include a diverse group of men and women of all ages who have a history of charitable giving or who may be potential donors. It should include media contacts, members of local civic organizations, local school alumni and financial planners such as bankers, brokers, life and real estate agents and funeral home directors. Members must be enthusiastic and willing to meet with potential donors. Much needed credibility can be achieved when members demonstrate their own personal financial commitment to the goals.

[43] Home Town Competitiveness Community Workbook, 2004. The Heartland Center for Leadership Development, the Center for Rural Entrepreneurship, and the Nebraska Community Foundation.

The program operates through a 501(C)3 foundation capable of receiving and distributing funds through an endowment for community improvement projects. A fund advisory committee is recruited to manage, reinvest and distribute funds. Funding priorities are established through general criteria and guidelines describing eligible projects based on community needs and desires. The HTC approach emphasizes community capacity building, programs that build local entrepreneurship and leadership, K-12 education, recruitment and retention of volunteers and youth groups; however, the use of funds can be tailored to community priorities including, for example, land conservation.

Two key components of a successful program are education and personal donor visits. Education of current and former residents on the benefits of a community foundation is essential. Potential donors must identify with the urgent needs of their community and with the funding priorities established to meet them. Local media and public meetings are used to create interest and commitment to the program's overall goals. Task force members also receive ongoing education to improve fundraising skills and perfect the technique of personal donor visits.

HTC finds the model of personal donor visits most effective. A potential donor is more likely to give to someone they know and trust and who represents an organization regarded for its credibility and fiscal responsibility. Individuals who are active in the community, serve on boards and commissions, and who are well-regarded and influential help create the necessary trust. Effective personal donor visits emphasize 'home town' and appeal to the donor's sense of place, where their children were raised and where their friends and neighbors live, and to the pride of knowing your commitment can make a difference. Success stories from other communities can help illustrate the achievability of the goals.

Next Steps

Craft an Approach

While the goals of TNC and HTC may be different, their instruments are compatible and could be knit into an effective approach by the Dragon Run Steering Committee. By combining elements of each model, the steering committee can create a custom-made approach to achieve its goals. Specifically, the menu of estate planning and conservation tools used by TNC is quite suitable to the steering committee's goals for the watershed. Whereas HTC's aspirations are somewhat different, it employs a very successful approach to achieving them, focusing on personal contact and a hometown appeal.

TNC	HTC
Estate planning tools	Home town appeal
Conservation tools	Personal donor contacts
	Public relations
	Task force training
	Community Foundation

Because the overall goal of protecting forest cover and preventing parcel subdivision will require a sustained effort, it can be achieved in incremental steps using a variety of tools.

Identify Range of Relevant Tools

Some landowners may at first be reluctant to foreclose on future economic opportunities associated with their properties. Thus, the range of options available to them should be made clear at the outset.

Right of First Refusal

Although the ultimate goal may be to secure conservation easements or outright purchase of properties, obtaining rights of first refusal can be a useful first step. Relative to the goals of the program, they provide an alert system to contemplated real estate activity in the watershed and an opportunity to make a first offer should owners decide to enter the market. By offering a right of first refusal, the landowner will have signaled a willingness to at least consider the broader shared community interests in preserving the character of the watershed and can do so without any sacrifice.

Conservation Registry

Through the establishment of a Conservation Registry, a list of participating landowners, their commitment could be recognized and appreciated by the presentation of a plaque or framed certificate that could also serve the aims of the larger public relations effort to build momentum and strengthen the sense of community interest.

Conservation Easements

The next level commitment might involve agreements to place conservation easements on properties. Because of the flexibility of this tool, it can be structured to match a landowner's commitment and willingness to sacrifice personal interests. For example, conservation easements may be devised to exclude portions of properties to allow future residential construction for the children. They may recognize the necessity of current income and allow continued, sustainable timber harvesting. Furthermore, the easement may be accompanied by full or partial monetary compensation or represent an outright donation depending upon the landowners needs. No matter what level of commitment is ultimately obtained, each contact with landowners should stress the voluntary nature of the effort.

Public Relations and Education

An important first step in this program is to establish within the community a shared sense of its goals. A public relations campaign that explains the opportunity to direct the course of future change is recommended. Landowners should be recognized and commended for the stewardship that has thus far preserved this regional treasure. At the same time, all should know that in the absence of an invigorated community effort, the operation of market forces would exert pressure and bring serious change. Again, the cooperative nature of the effort should be made clear very early on to avoid unnecessary resistance. The public relations

campaign should serve the additional purpose of reaching and motivating non-landowning citizens to commit their time, effort and funding.

Donor Visitation Team

Composition

A Donor Visitation Team appointed by the steering committee and comprised of individuals with estate planning, legal and fundraising expertise would conduct personal donor visits. These may include individuals with financial planning and insurance expertise, accountants, lawyers, estate planners and those with experience in major donor fundraising. The steering committee should also consider establishing a partnership with TNC and the Middle Peninsula Land Trust because they are already committed to the goal of preventing forest fragmentation and possess the ecological expertise to identify lands most critical to this goal. It may be useful to include well-respected and influential locals whether or not they posses estate planning expertise. From these, donor visitation teams would be assembled.

Training

Before landowner visits begin, task force members should receive training/mentoring sessions on effective fundraising techniques. Identifying donors, creating a message, matching messengers to donors and effective support/follow-up should all be part of taskforce-training courses coordinated through agencies on a rotating ongoing basis.

Donor Identification

After creating the setting through a public relations campaign and assembling contact teams, landowner contacts could begin. This will require a roster of landowners and their contact information. County Clerks' offices should have 'tax maps' that define and identify parcels. Parcel numbers can be cross-referenced with information in the lister's office where property values and assessments are filed. This list will have owner and contact information for each parcel.

When complete, the landowner roster should be refined so that the first visits concentrate on donors in whom lay the greatest likelihood of success. Early successes may help future contacts by creating public momentum and belief in the achievability of the overall goal. The potential donor list may include individuals who:

- have a history of charitable giving
- are over 60
- have lived in the community most of their adult life
- are involved in the community
- live a comfortable yet modest lifestyle.

Further identification of potential donors could be achieved by offering informational workshops where the personal advantages of estate planning are stressed and the community benefits of charitable giving are introduced. Free workshops could be conducted by the task force or in partnership with one of a number of organizations offering estate-planning

workshops such as Virginia Cooperative Extension, Estate Planners Association, AARP and others.

Resource Identification and Supporting Institutions

Landowners might be motivated to take the next step of actually preparing an estate plan if a number of planners would pledge to offer reduced-fee services. A list of these would be distributed to all who attend the workshops. Ultimately, the landowner will choose the professional to conduct the estate planning process and settle all details pertaining to the estate. During this phase, continued contact and reinforcement is advised. The landowner should continue to receive support and follow-up from members of the task force.

Before any land or easement is purchased or accepted as donation, the steering committee must identify organizations that may own and sell land or hold conservation easements. As a political subdivision recognized by the Virginia Commonwealth, the PMMDC has been authorized to hold title or easements; however, it has yet to exercise this authority. MPCBPAA has the same authority and does hold one conservation easement; however, as Middlesex County has not agreed to membership, it cannot hold title or easements on land in this county. IRS approved conservation organizations such as TNC could also fill this role, as could the Middle Peninsula Land Trust.

The most desirable outcome of the approach adopted by the committee would be the acquisition of title or easements to critical lands within the watershed through outright donation. Short of this, some funding mechanism will be necessary. A community foundation of the sort promoted by HTC could, in the interim, receive and later convey land or easements to the final authority. It could also receive cash donations from both landowners and others, which could then be used directly for acquiring land and easements or indirectly for easement enforcement, property maintenance and offsetting the cost of estate planning for land rich/cash poor residents. The community foundation would also lend a legal and substantial presence to the effort.

Resources

Funding

Local

In kind donations or shared costs for estate planning services

- Donations of land /conservation easements
- Cash donations from Community

State

The Commonwealth of Virginia maintains two funds: "Reforestation of Timberlands State Fund" and "Protection and Development of Forest Resources of the State Fund." Although it could be argued that the Committee's objectives meet the general purposes of this fund, 23VAC10-350-90 specifies uses and does not include those contemplated for the Dragon Run Watershed. Advocacy for amendments to 23VAC10-350-90 could create a new funding source (See Appendix C)

Virginia Land Conservation Fund (VLCF)
VLCF is used to conserve open spaces, parks, natural areas, historic areas, and farmland and forest preservation.
See: **www.dcr.virginia.gov/vlcf**
Contact: John Davy, Virginia Department of Conservation and Recreation, 203 Governor St., Richmond, VA 23219, 804-786-1119.

Virginia Open-Space Lands Preservation Trust Fund (VOSLPTF)
Landowner assistance to cover cost of conveying conservation easements and to purchase all or part of the value of the easements. Easements may be used to preserve farmland, forestland, and natural and recreational areas. Reimbursable costs include: legal costs, appraisal and other costs and all or part of the easement's value.
See: http://www.virginiaoutdoorsfoundation.org/ptf.html
Contact: Tamara Vance, Virginia Outdoors Foundation, 302 Royal Lane, Blacksburg, VA 24060, and 540-951-2822

Water Quality Improvement Fund (WQIF)
The purpose of WQIF is to provide grants to local governments, soil and water conservation districts and individuals. Eligible projects include point and non-point source pollution prevention, reduction and control for water quality improvement. This includes riparian, open-space and conservation easements.
See: http://www.dcr.virginia.gov/sw/wqia.htm
Contact: Jody Aston, Virginia Department of Conservation and Recreation, 203 Governor St., Richmond, VA 23219, 804-371-8984.

Federal

The Wilderness Society

"Conservation Capital: Sources of Public Funding for Land Conservation"
Electronic publication and helpful resource on many federal sources of funding.
See: http://www.wilderness.org/Library/Documents/ConservationCapital-PublicFunding.cfm

Land and Water Conservation Fund

To purchase land for recreation, conservation, and historic value, source of funds for many federal agency acquisitions and matching grants for state and local government. See: http://www.nps.gov/lwcf/ or http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml

Forest Legacy Program

To protect environmentally important forest areas threatened by conversion to non-forest uses. Administered by U.S. Forest up to 75% of acquisition costs for fee or easement purchase by FS, states or local governments
See: http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml

U.S. Fish and Wildlife Service

Info on various programs http://www.fws.gov/grants/

North American Wetlands Conservation Act

See: http://www.fws.gov/birdhabitat/NAWCA/grants.htm

Department of Agriculture

Wildlife Habitat Incentives Program (WHIP)

Cost-share and technical assistance to landowners to manage and restore nearly all habitat types including forests.
See: http://www.nrcs.usda.gov/programs/whip/

Forest Land Enhancement Program (FLEP)

Reforesting or creating forestland, forest stewardship plans, protecting fish and wildlife habitat, forest health.
See: http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml

EPA

Clean Water State Revolving Fund (CWSRF)

Acquisition of land and easements to reduce Non-point source pollution and estuary protection.
See: http://www.epa.gov/owm/cwfinance/index.htm

Healthy Forests Reserve Program

Recovery of threatened and endangered species, promotes biodiversity and carbon sequestration with easement acquisitions for specified periods of up to 99 years.
See: http://www.nrcs.usda.gov/programs/HFRP/ProgInfo/HFRPProgramInfo.html

Online Catalog of Federal Funding for Watershed Protection

The Environmental Protection Agency (EPA) provides the Catalog of Federal Funding Sources for Watershed Protection. Lists Federal funding sources to help fund various watershed-related projects.
See: http://www.epa.gov/watershedfunding.

Technical Assistance

Local

The Nature Conservancy

Andrew Lacatell
Chesapeake Rivers Program
Richmond, VA
Phone: 804-644-5800
http://nature.org/wherewework/northamerica/states/virginia/preserves/art15028.html

Middle Peninsula Land Trust

Mary Helen Morgan, President
P.O. Box 585, Mathews. VA 23109
questions@mplandtrust.org
http://www.vwebstudios.com/mplt/

Estate Planning

The Nature Conservancy

General information on estate planning
http://nature.org/joinanddonate/giftandlegacy/
Andrew Lacatell
Chesapeake Rivers Program
Richmond, VA
Phone: 804-644-5800

Virginia Cooperative Extension

They have conducted workshops in the recent past.
Contact Karen Munden,
Family and Consumer Sciences Extension Agent
757-427-4769
2449 Princess Anne Road, Bldg #14, Municipal Center, Virginia Beach, VA 23456-9002
For general information see: "Managing Prosperity: Estate and Retirement Planning for All Ages Use of Conservation Easements in Estate and Conservation Planning"
http://www.ext.vt.edu/pubs/agecon/448-094/448-094.html

Appendix A

Sample of Conservation Easement

CONSERVATION AGREEMENT

This Grant of Conservation Agreement (hereinafter "Conservation Agreement") is made this the ___day of , 2001 by , whose address is_____ and whose social security number/tax identification number is _____ (hereinafter "Grantor") and CONSERVATION TRUST FOR NORTH CAROLINA, a North Carolina nonprofit corporation, with an address of Post Office Box 33333, Raleigh, NC 27636-3333 (hereinafter "Grantee"). The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter pronouns as required by context.

RECITALS

A. The Grantor is the sole owner in fee simple of the property ("Property"), legally described in Exhibit A, attached hereto and incorporated by this reference, which consists of approximately _____ acres located in _____ County, North Carolina, and is generally known as _____ .

B. The Grantee is a nonprofit corporation, operated primarily for conservation purposes, including protection of environmentally valuable and sensitive land for charitable, scientific, educational, and aesthetic purposes. Grantee is a tax exempt public charity under Section 501(c)(3) and 509 (a)(2) of the Internal Revenue Code, is authorized by the laws of the State of North Carolina to accept, hold and administer interest in land including conservation Agreements, is willing to accept this Conservation Agreement under the terms and conditions hereinafter described, and is a "qualified organization" and an "eligible donee" within the meaning of Section 170(h)(3) of the Internal Revenue Code and regulations promulgated thereunder.

C. The Property is a significant natural area that qualifies in its present condition as a " ... relatively natural habitat of fish, wildlife, or plants, or similar ecosystem," as that phrase is used in P.L. 96-541, 26 USC 170(h)(4)(A)(ii), as amended, and in regulations promulgated thereunder. Specifically the Property is habitat for .... [elaborate on natural habitats, native plants and animals, ecological significance].

[If applicable, the Property provides land areas for outdoor recreation by, or the education of, the general public, specifically ....[elaborate].]

[If applicable, Preservation of the Property is for the scenic enjoyment by the general public and will yield a significant public benefit, specifically ... [elaborate].]

[If applicable, Preservation of the Property is pursuant to federal, state, and local governmental conservation policy and will yield a significant public benefit, specifically ... [elaborate].]

[for example]

(1) importance to the United States Department of the Interior, National Park Service of the preservation of Property from development because of its location adjacent to and within the viewshed of the Blue Ridge Parkway (buffering preserve/park), including public hiking trails located within feet of the Property;

(2) protection of similar and nearby lands in public ownership in the vicinity of and interconnected with the Property, including the (name of preserve/park);

(3) the qualification of the Property for the special use ad valorem property tax assessment for lands used for silvicultural, agricultural or horticultural purposes, set forth in N.C. Gen. Stat. 105.277.3 et. seq.;

(4) Article XIV Section 5 of the Constitution of the State of North Carolina which states "It shall be the policy of the State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a property function of the State of North Carolina and its political subdivisions to acquire and preserve park, recreational, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this state its forests, wetlands, estuaries, beaches, historical sites, openlands, and places of beauty;"

(5) the Clean Water Management Trust Fund, N.C.G.S. 113-145.1 et seq., which recognizes the importance of protecting riparian buffers in protecting and conserving clean surface water;

(6) the special North Carolina Conservation Tax Credit Program that encourages contributions of land that provides habitat for fish and wildlife and other similar land conservation purposes set forth in N.C.G.S. 105-130.34 and 105-151.12 et seq;

(7) the Farmland Protection Policy Act, P.L. 97-98, 7 U.S.C. Section 4201, et seq., whose purpose is "to minimize the extent to which Federal programs and policies contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government and private programs and policies to protect farmland;"

(8) North Carolina General Statute 139-2 et seq. Which provides that "it is hereby declared …that the farm, forest and grazing lands of the State of North Carolina are among the basic assets of the State and the preservation of these lands is necessary to protect and promote the health, safety and general welfare of its people… it is hereby declared to be the policy of the legislature to provide for the conservation of the soil and resources of this State;"

(9) North Carolina General Statute 106-583 et seq. Which states that "It is declared to be the policy of the State of North Carolina to promote the efficient production and utilization of

the products of the soil as essential to the health and welfare of our people and to promote a sound and prosperous agriculture and rural life as indispensable to the maintenance of maximum prosperity;"

(10) Article 17 of the North Carolina General Statutes NCGS 113A-240-241, entitled Conservation, Farmland and Open Space Protection and Coordination, otherwise known as the Million Acre Initiative which states "The State of North Carolina shall encourage, facilitate, plan, coordinate, and support appropriate federal, State, local, and private land protection efforts so that an additional one million acres of farmland, open space and conservation lands in the State are permanently protected by December 31, 2009."

D. The characteristics of the Property, its current use and state of improvement, are described in a report entitled Baseline Report on _____. dated _____ prepared by Grantee for the Grantor, of which a summary is attached as Exhibit B to this Conservation Agreement. The Grantor worked with the Grantee to ensure that the report is a complete and accurate description of the Property as of the date of this Conservation Agreement. It will be used by the Grantor and Grantee to assure that any future changes in the use of the Property will be consistent with the terms of this Conservation Agreement. However, the Baseline Report is not intended to preclude the use of other evidence to establish the present condition of the Property if there is a controversy over its use.

E. The Grantor and Grantee have the common purpose of conserving the above-described conservation values of the Property in perpetuity, and the State of North Carolina has authorized the creation of Conservation Agreements pursuant to the terms of the North Carolina Conservation and Historic Preservation Agreements Act, N.C.G.S. 121-34 et seq., and G.S. 160A-266 to 279, which provide for the enforceability of restrictions, Agreements, covenants or conditions "appropriate to retaining land or water areas predominantly in their natural, scenic or open condition or in agricultural, horticultural, farming, or forest uses," and which provides for tax assessment of lands subject to such agreements "on the basis of the true value of the land and improvements less any reduction in value caused by the agreement"; and the Grantor and Grantee wish to avail themselves of the provisions of that law.

NOW, THEREFORE, the Grantor, for and consideration of the facts recited above and of the mutual covenants, terms, conditions and restrictions contained herein and as an absolute and unconditional gift, hereby gives, grants and conveys unto the Grantee, its successors and assigns, forever and in perpetuity for the benefit of the people of North Carolina, a Conservation Agreement over the Property of the nature and character as follows:

1. PURPOSE. The purposes of this Conservation Agreement are to ensure that the Property will be retained forever predominantly in its [e.g., natural, scenic, forested, and/or open space] condition; to protect native plants, animals, or plant communities on the Property, while allowing traditional uses on the property that are compatible with and not destructive of the conservation values of the property such as [limited residential

construction, selective timber harvesting, grazing and farming of existing pastures and fields, and hunting]; and to prevent any use of the Property that will significantly impair or interfere with conservation values or interests of the Property.

Grantor will not perform, nor knowingly allow others to perform, any act on or affecting the Property that is inconsistent with the purposes of this Conservation Agreement. However, unless otherwise specified below, nothing in this Conservation Agreement shall require the Grantor to take any action to restore the condition of the Property after any act of God or other event over which Grantor had no control. Grantor understands that nothing in this Conservation Agreement relieves them of any obligation or restriction on the use of the Property imposed by law.

2. PROPERTY USES. Any activity on, or use of, the Property inconsistent with the purposes of this Conservation Agreement is prohibited. The Property shall be maintained in its natural, scenic and open condition and restricted from any development that would significantly impair or interfere with the conservation values of the Property. Without limiting the generality of the foregoing, the following is a listing of activities and uses which are expressly prohibited or which are expressly allowed. Grantor and Grantee have determined that the allowed activities do not impair the conservation values of the Property. Additional retained rights of Grantor are set forth in Paragraph 3 below.

2.1 Subdivision. The Property may not be divided, subdivided or partitioned, nor conveyed except in its current configuration as an entity.

2.2 Construction. Grantor shall have the right to construct and maintain [complete]_____ _____ _____

_____.

Grantor may construct driveways, utilities and a well to serve the new building [inclusion optional]. The new construction shall be sited as to cause the least disturbance to the conservation values of the Property. The location and design of the new construction shall be subject to the approval of the Grantee; Grantee agrees that if the location and design of the new building meets the above standards its approval shall not be unreasonably withheld. [Or the new construction shall be located on in an approved site as defined by Exhibit B to this Conservation Agreement]. No other structures may be placed or constructed on the Property. Furthermore, there shall be no constructing or placing of any recreational court, airplane landing strip, billboard or other advertising display, utility pole (other than those necessary to service the Property's improvements), utility tower, conduit or line on or above the Property. Outdoor lighting shall be placed and shielded so as to minimize the impact on surrounding areas.

2.3 Existing Improvements. Grantor shall have the right to maintain, remodel, and repair existing structures, water tanks, water wells, fences, header dams, utilities, and other improvements, and in the event of their

destruction, to reconstruct any such existing improvements with another of similar size, function, capacity, location and material.

2.4 Agricultural Use. [Co-ordinate this paragraph with 2.5 Timber Harvesting and 2.6 Grazing]. Grantor shall have the right to i) breed, raise, and pasture livestock in existing fields on the Property, ii) to breed and raise bees, fish, poultry and other fowl in existing facilities on the Property, iii) to plant, raise and harvest crops in existing fields on the Property, and iv) to perform primary processing, store and sell, including direct sales to the public, of crops and products (excluding timber) harvest and produced principally on the Property. Grantor may not establish or maintain any commercial feedlot on the Property, which is defined for the purpose of this Agreement as a confined area or facility within which the land is not grazed or cropped at least annually and which is used to receive livestock that has been raised off the Property for feeding and fattening for market.

2.5 Timber Harvest. [Grantor shall have the right to harvest timber from the Property in order to provide firewood for residences allowed on the Property and for maintaining allowed structures and improvements on the Property, such as residences, barn, fences, etc. No additional timber harvesting shall be allowed]. or

[Grantor shall have the right to harvest timber from the Property pursuant to a Forest Management Plan, to be updated at least every _____ years, that is prepared by a registered professional forester and [reviewed or approved] by Grantee and that is designed to insure the maintenance of good quality, native growing stock of _____, while protecting soil stability, water quality and other conservation values of the Property, including without limitation, riparian and wildlife habitat and scenic values.]

[Selective timber harvest, uneven-aged timber management and other management practices may continue on the Property for the following purposes, including the construction and maintenance of timber roads for management access thereto:

1. maintaining and restoring, insofar as possible, old-growth forest and preservation of same where it already exists;
2. maintaining the plant community and the _____ forest community, including the removal of any trees or other vegetation encroaching upon the plant community;
3. removal of dead wood or trees as necessary to control or prevent imminent hazard, disease or fire; and
5. prohibiting the spread of non-native plants and the disturbance of any plant community habitat except as otherwise allowed.

All timbering activities shall be conducted only in accordance with Best Management Practices guidelines for timber harvest and management as the same may be promulgated by law or regulation in the state of North Carolina and as adopted by the North Carolina organization of professional foresters,

as amended from time-to-time and provided further that all such activities shall be either specifically approved by the Grantee or shall be in accordance with a Forest Management Plan which shall be in writing and approved by Grantor (and grantee), and may be amended from time-to-time and provided further that all timber roads shall be constructed of permeable materials and shall be no wider than ten (10) feet.]

2.6 Grazing. [Grantor shall not graze or pasture domestic animals on the Property for commercial purposes. This shall not prevent the grazing or pasturing of animals for Grantor's or his guests recreation, or used in connection with activities expressly allowed on the commercial purposes. This shall not prevent the grazing or pasturing of animals for Grantor's or his guests recreation, or used in connection with activities expressly allowed on the Property.] or

[Grantor shall have the right to graze and pasture animals pursuant to a grazing plan, to be updated at least every _____ years, and [reviewed or approved] by the Grantee, and that is designed to ensure the maintenance of a good quality mix of_____ grasses, while protecting soil stability, water quality and other conservation values of the Property.]

2.7. Home Business. Any business that is conducted by and in the home of a person
residing on the Property is allowed.

2.8 Recreational Use. Grantor shall have the right to engage in and permit others, whether or not for consideration, to engage in recreational uses of the Property, including, but not limited to, hiking, camping, picnicking, horseback riding, non-motorized bicycling, lawful hunting and fishing, and other recreational uses that require no buildings, facilities, surface alteration or other development of the land. Pursuit of wildlife by any form of motorized transportation is not allowed. [Grantor may also construct and maintain fences, camp sites, mobile radio repeaters, transmitters or other communication devices, horse trails or foot trails incidental to such purposes and may lease or license any portion of the Property for such recreational purposes.] Grantor reserves the right to promulgate and enforce reasonable rules and regulations for all activities incident to recreational use of the Property, including but not limited to the right to prohibit any recreational use that would permit destruction of other significant conservation value of the Property.

2.9 Excavation. There shall be no filling, excavation, dredging, mining or drilling; no removal of topsoil, sand, gravel, rock, peat, minerals or other materials, and no change in the topography of the land in any manner except as necessary to allow the construction of the improvements allowed above, the maintenance of existing roads, hiking and horseback trails and for the purpose of combating erosion or flooding.

2.10 Destruction of Plants. Grantor shall have the right to cut and remove diseased trees, shrubs, or other plants, and to cut firebreaks, subject to prior

approval by the Grantee, except that such approval shall not be required in case of emergency firebreaks. Grantor shall also have the right to cut and remove trees, shrubs, or other plants to accommodate the activities expressly allowed under this Agreement. There shall be no additional removal, harvesting, destruction or cutting of native trees, shrubs or other plants. Except for use around improvements or in gardens there shall be no planting of non-native trees, shrubs, or other plants on the Property. Furthermore, except to accommodate the activities expressly permitted in this Agreement, there shall be no use of fertilizers, plowing, introduction of non-native animals, or disturbance or change in the natural habitat in any manner.

2.11 Water Quality and Drainage Patterns. There shall be no pollution of surface water, natural water courses, lakes, ponds, marshes, subsurface water or any other water bodies, nor shall activities be conducted on the Property that would be detrimental to water purity or that could alter the natural water level or flow in or over the Property. Other than the construction of a well to served allowed improvements, there shall be no alteration, depletion or extraction of surface water, natural water courses, lakes, ponds, marshes, subsurface water or any other water bodies on the Property. Diking, draining, filling or removal of wetlands is prohibited. [Disruption of natural drainage patterns is prohibited; except a) for the purpose of maintaining and/or restoring a , and except b) that Grantor reserves the right to have access to and use of water, including the construction and maintenance of flues, from any existing springs and creeks on the protected Property and the right to drill wells on the protected Property to provide water incident to the exercise on any reserved rights set forth herein or for use on adjacent property owned by Grantor.]

2.12 Signage. No signs or billboards or other advertising displays are allowed on the Property, except that signs whose placement, number and design do not significantly diminish the scenic character of the Property may be displayed to identify trails and the conservation values of the Property, to identify the name and address of the Property and the names of persons living on the Property, to give directions, to advertise or regulate permitted uses on the Property and proscribe rules and regulations for recreational use of the protected Property, to advertise the Property for sale or rent, and to post the Property against trespassers.

2.13 No Biocides. There shall be no use of pesticides or biocides, including but not limited to insecticides, fungicides, rodenticides, and herbicides, except as approved by Grantee to control invasive species detrimental to the conservation values of the Property, and except as needed around improvements on the Property and in existing agricultural fields.

2.14 No Dumping. There shall be no storage or dumping of trash, garbage abandoned vehicles, appliances, or machinery, or other unsightly or offensive material, hazardous substance, or toxic waste on the Property (except the short term storage of household garbage and waste). There shall be no changing of the topography through the placing of soil or other substance or

material such as land fill or dredging spoils, nor shall activities be conducted on the Property or on adjacent property owned by Grantor, that could cause erosion or siltation on the Property.

2.15 Predator Control. Grantor shall have the right to control, destroy, or trap predatory and problem animals which pose a material threat to livestock and/or humans by means and methods approved by the Grantee. The method employed shall be selective and specific to individuals, rather than broadcast, nonselective techniques.

2.16 Commercial Development. Any commercial or industrial use of or activity on the
Property, other than those relating to [agriculture, silviculture, recreation, or home businesses] as permitted herein is prohibited.

2.17 Development Rights. With the exception of buildings permitted above, Grantor conveys to Grantee all development rights that are now or hereafter allocated to, implied, reserved or inherent in the Property, and the parties agree that such rights are terminated and extinguished, and may not be used on or transmitted to any portion of the Property, as it now or hereafter may be bounded or described, or to any other property.

3. ADDITIONAL RIGHTS RETAINED BY GRANTOR. Grantor retains the following additional rights:

A. Existing Uses. The right to undertake or continue any activity or use of the Property not prohibited by this Conservation Agreement. Prior to making any change in use of the Property, Grantor shall notify Grantee in writing to allow Grantee a reasonable opportunity to determine whether such change would violate the terms of this Conservation Agreement.

B. Transfer. The right to sell, give, mortgage, lease, or otherwise convey the Property subject to the terms of this Conservation Agreement.

4. GRANTEE'S RIGHTS. To accomplish the purpose of this Conservation Agreement, the following rights are granted to Grantee by this Conservation Agreement:

4.1 Right to Protect. The right to preserve and protect the conservation values of the Property and enforce the terms of this Conservation Agreement.

4.2 Right of Entry. Grantee, its employees, representatives, and agents and its successors and assigns, have the right, after prior written notice to Grantor, to enter the protected Property at reasonable times for the purposes of: (a) inspecting the protected Property to determine whether the Grantor, its representatives, assigns, heirs and successors are complying with the covenants and purposes of this Conservation Agreement; and (b) monitoring and research as described below.

4.3 Monitoring and Research. The right, but not the obligation, to monitor the native plant and wildlife populations, plant communities and natural habitats on the Property. Grantor agrees that all monitoring activity, inventory and assessment work or other natural resource research conducted by the Grantor or others shall be reported to the Grantee.

4.4 Management of Exotics and Invasive Species. The right, but not the obligation, to control, manage or destroy exotic non-native species or invasive species of plants and animals that threaten the conservation values of the Property. Grantee will consult with Grantor prior to implementing control activities.

5. RESPONSIBILITIES OF GRANTOR AND GRANTEE NOT AFFECTED. Other than as specified herein, this Conservation Agreement is not intended to impose any legal or other responsibility on the Grantor, or in any way to affect any existing obligation of the Grantor as owner of the Property. Among other things, this shall apply to:

(a) Taxes - The Grantor shall be solely responsible for payment of all taxes and assessments levied against the Property.

(b) Upkeep and Maintenance - The Grantor shall be solely responsible for the upkeep

and maintenance of the Property, to the extent it may be required by law. The Grantee shall have no obligation for the upkeep or maintenance of the Property.

6. ACCESS. No right of access by the general public to any portion of the Propertis conveyed by this Conservation Agreement. However, the public has the right to view the Property from adjacent publicly accessible areas such as public roads and waterways.

7. ENFORCEMENT. The Grantee shall have the right to prevent and correct violations of the terms of this Conservation Agreement.

A. With advance written notice the Grantee may enter the Property for the purpose of inspecting for violations. If the Grantee finds what is a violation, it may at its discretion take appropriate legal action. Except when an ongoing or imminent violation could substantially diminish or impair the conservation values of the Property, the Grantee shall give the Grantor written notice of the violation and sixty (60) days to correct it (or begin good faith efforts to correct in the event the violation is something which cannot be reasonably corrected in sixty (60) days, before filing any legal actions. If a court with jurisdiction determines that a violation may exist or has occurred, the Grantee may obtain an injunction to stop it, temporarily or permanently. A court may also issue an injunction requiring the Grantor to restore the Property to its condition prior to the violation. The failure of the Grantee to discover a violation or to take immediate legal action shall not bar it from doing so at a later time.

B. Nothing contained in this Conservation Agreement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Property caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good

faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, damage to property or harm to the Property resulting from such action.

8. TRANSFER OF AGREEMENT. The parties recognize and agree that the benefits of this Agreement are in gross and assignable. The Grantee shall have the right to transfer or assign this Conservation Agreement to any qualified organization that is at the time of transfer, is a "qualified organization" under Section 170(h) of the U.S. Internal Revenue Code, and the organization expressly agrees to assume the responsibility imposed on the Grantee by this Conservation Agreement. If the Grantee ever ceases to exist or no longer qualifies under Sec. 170(h) or applicable state law, a court with jurisdiction shall transfer this Agreement to another qualified organization having similar purposes that agrees to assume the responsibility.

9. TRANSFER OF PROPERTY. Any time the Property, or any interest therein, is transferred by the Grantor to any third party, the Grantor shall notify the Grantee in writing at least thirty (30) days prior to the transfer of the Property, and the document of conveyance shall expressly refer to this Conservation Agreement.

10. RIGHT OF FIRST REFUSAL. In case of any contemplated sale of the subject property or any portion thereof by the Grantors or any successor in title thereto, first refusal as to any bona fide offer of purchase must be given to the Grantee, its successors or assigns. If Grantee so decides to purchase, it shall notify the then owner of its willingness to buy upon the same terms within thirty (30) days of receipt of written notice of such bona fide offer. Failure of Grantee to notify the then owner of its intention to exercise this right of first refusal within such thirty (30) day period shall free the owner to sell pursuant to the bona fide offer. Provided, however, that if there are any outstanding deeds of trust or other encumbrances against the property, any right to repurchase shall be subject to said deeds of trust or encumbrances, and they shall either be satisfied or assumed as part of the purchase price.

11. AMENDMENT OF AGREEMENT. This Agreement may be amended only with the written consent of Grantor and Grantee. Any such amendment shall be consistent with the purposes of this Conservation Agreement and shall comply with Sec. 170(h) of the Internal Revenue Code, or any regulations promulgated in accordance with that section. Any such amendment shall also be consistent with the Uniform Conservation and Historic Preservation Agreements Act, N.C.G.S. Section 121-34 et. seq., or any regulations promulgated pursuant to that law. The Grantor and Grantee have no right or power to agree to any amendment that would affect the enforceability of this Conservation Agreement.

12. TERMINATION OF AGREEMENT. If it is determined that conditions on or surrounding the Property have changed so much that it is impossible to fulfill the conservation purposes set forth above, a court with jurisdiction may, at the joint request of both the Grantor and Grantee, terminate this Conservation Agreement.

If condemnation of a part of the Property or of the entire Property by public authority renders it impossible to fulfill any of these conservation purposes, the Conservation Agreement may be terminated through condemnation proceedings.

At the time of the conveyance of the Conservation Agreement to the Grantee, this Conservation Agreement gives rise to a real property right, immediately vested in the Grantee. If the Agreement is terminated and the Property is sold or taken for public use, then, as required by Sec. 1.170A-14(g)(6) of the IRS regulations, the Grantee shall be entitled to a percentage of the gross sale proceeds or condemnation award (minus any amount attributed to new improvements made after the date of the conveyance, which amount shall be reserved to grantor), equal to the ratio of the appraised value of this Agreement to the unrestricted fair market value of the Property, as these values are determined on the date of this Conservation Agreement. The Grantee shall use the proceeds consistently with the conservation purposes of this Conservation Agreement.

13. INTERPRETATION. This Conservation Agreement shall be interpreted under the laws of North Carolina, resolving any ambiguities and questions of the validity of specific provisions as to give maximum effect to its conservation purposes.

14. INDEMNIFICATION. Grantors agree to indemnify and hold Grantee harmless from any and all costs, claims or liability, including but not limited to reasonable attorneys' fees arising from any personal injury, accidents, negligence or damage relating to the Property, or any claim thereof, unless due to the negligence of Grantee or its agents, in which case liability shall be apportioned accordingly. In addition, Grantors warrant that Grantee is a named insured on Grantors' Property insurance policies covering the Property.

15. TITLE. The Grantor covenants and represents that the Grantor is the sole owner and is seized of the Property in fee simple and has good right to grant and convey this Conservation Agreement; that the Property is free and clear of any and all encumbrances, including but not limited to, any mortgages not subordinated to this Conservation Agreement, and that the Grantee shall have the use of and enjoy all the benefits derived from and arising out of this Conservation Agreement. NOTE: If any mortgages exist, they must be subordinated.

16. NOTICES. Any notices required by this Conservation Agreement shall be in writing and shall be personally delivered or sent by first class mail, to Grantor and Grantee, respectively, at the following addresses, unless a party has been notified by the other of a change of address.

To Grantor: To the Grantee:
_____ Conservation Trust for North Carolina
_____ P.O. Box 33333
_____ Raleigh, NC 27636-3333

17. ENVIRONMENTAL CONDITION. The Grantor warrants that it has no actual knowledge of a release or threatened release of hazardous substances or wastes on the Property.

18. SEVERABILITY. If any provision of this Conservation Agreement is found to be invalid, the remaining provisions shall not be altered thereby.

19. PARTIES. Every provision of this Conservation Agreement that applies to the Grantor or Grantee shall also apply to their respective heirs, executors, administrators, assigns, and all other successors as their interest may appear.

20. RE-RECORDING. In order to ensure the perpetual enforceability of the Conservation Agreement, the Grantee is authorized to re-record this instrument or any other appropriate notice or instrument.

21. MERGER. The parties agree that the terms of this Conservation Agreement shall survive any merger of the fee and Agreement interest in the Property.

22. SUBSEQUENT LIENS ON PROPERTY. No provisions of this Conservation Agreement should be construed as impairing the ability of Grantor to use this Property as collateral for subsequent borrowing, provided that any mortgage or lien arising from such a borrowing would be subordinate to this Conservation Agreement.

23. EXHIBIT AND DOCUMENTATION.

A. Legal Description. Exhibit A, Legal Description of the protected Property is attached hereto and made a part hereof by reference.

B. Documentation Report. The parties acknowledge that the Conservation Agreement Baseline Report dated , a copy of which is on file at the offices of the Grantee, accurately establishes the uses, structures, conservation values and condition of the protected Property as of the date hereof.

24. ENTIRE AGREEMENT. This instrument sets forth the entire agreement of the parties with respect to the Conservation Agreement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Agreement. If any provision is found to be invalid, the remainder of the provisions of this Conservation Agreement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

25. ACCEPTANCE AND EFFECTIVE DATE. As attested by the Seal of the Grantee and the signature of its authorized representative affixed hereto, the Grantee hereby accepts without reservation the rights and responsibilities conveyed by this Conservation Agreement. This Conservation Agreement is to be effective the date recorded in the _____ County Registry of Deeds.

TO HAVE AND TO HOLD, this Grant of Conservation Agreement unto the Conservation
Trust for North Carolina, its successors and assigns, forever.

IN WITNESS WHEREOF, the Grantor and Grantee, intending to legally bind themselves, have set their hands and seals on the date first written above.

GRANTOR:

_____ (Seal)

Accepted:

GRANTEE:

_____

By:

_____President

Attest:

By_____

_____ Secretary

(Corporate Seal)

Acknowledgments

STATE OF NORTH CAROLINA

COUNTY OF_____

I, , a Notary Public in and for said County and State do hereby certify that personally appeared before me this day and duly acknowledged the execution of the foregone Conservation Agreement.

WITNESS my hand and notarial seal, this Day of ,20__. .

_____(Seal)

Notary Public

My commission expires:

.

(Notary Seal)

NORTH CAROLINA

WAKE COUNTY

I, _____, a Notary Public of _____ County, North Carolina do hereby certify that D. Reid Wilson personally appeared before me this day and acknowledged that he is the Secretary of The Conservation Trust for North Carolina, a non-profit corporation, and that by authority duly given and as act of the corporation the

foregoing instrument was signed in its name by its ____President, sealed with its corporate seal and attested by himself as its secretary.

Witness my hand and notarial seal this the ____ day of _____, 20___.

_____(Seal)
Notary Public

My commission expires:
_____

(Notary Seal)

STATE OF NORTH CAROLINA
_____ COUNTY
The Foregoing (or annexed) Certificate(s) of _____
_____
Notary(ies) Public (is)(are) Certified to be correct.
This instrument was filed for Registration on the Day and Hour in the Book and Page shown in the First page hereof.

_____
, Register of Deeds

EXHIBIT A. LEGAL DESCRIPTION
EXHIBIT B. BASELINE DESCRIPTION REPORT (SUMMARY)

Appendix B
Sample Right of First Refusal
Source: http://www.ontarionature.org/pdf/Append2B.PDF

To secure an interest in a property which the owner expects not to sell either in the immediate future or even in their lifetime, the land trust may pursue a registered Right of First Refusal. This securement tool is registered against the landowner's title, usually for a specified period of time, and a Right of First Refusal provides the land trust with the first option against the purchase of the property. It permits the land trust access before the property moves into the market. This is a case where an eventual sale is desirable to the vendor, but the timing is not known and the proposed sale will occur at an unknown time in the future.

1. If, during the period of years from the date of this Agreement (Right of First Refusal):
(a) [owner's name] receives an offer or offers to purchase all or part of the Property which he/she is prepared to accept; or
(b) [owner's name] makes an offer to sell the property or any part thereof, or grants an option to purchase the Property to any party subject to the right of the [name of land trust] hereinafter set out and accepted by the offeree or grantee; [owner's name] will forthwith advise the [name of land trust] in writing of all terms and conditions contained in such offer, offers, or options, and the [name of land trust], during a period of twenty (20) business days after the receipt of such written advice, shall have the right to be exercised by written notice to [owner's name] to purchase the Property at the price and subject to the terms and conditions contained in the offer, offers, or options.

2. The agreement of purchase and sale constituted by the exercise of the Right of First Refusal herein contained shall be subject to compliance with Section 50 of the Planning Act, R.S.O. 1990, c. P. 13, as amended from time to time.

3. The parties hereto may by mutual consent agree to extend from time to time the period of years referred to in paragraph 1.

4. Any notice or other communication required or permitted to be given hereunder shall be in writing and shall be given either by delivering the same to the recipient or mailing the same to the recipient.

5. This agreement shall enure to the benefit of and be binding upon the parties hereto and their respective executors, administrators, successors, and assigns.

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and seals.

Appendix C
Virginia statutes on Forest Products Tax

23VAC10-350-30. Levy of tax for forest conservation.

The forest products tax is levied upon and collectible from every manufacturer or shipper as defined in 23VAC10-350-20, **for the purpose of furthering the conservation of the natural resources of Virginia by protecting and developing the forest resources** and by the reforestation of the forest lands. The tax is applicable to any forest products severed from land located in Virginia whether owned privately, by the Commonwealth, or the United States...
Statutory Authority
§§58.1-203 and 58.1-1602 of the Code of Virginia.

23VAC10-350-90. Payment, collection and disposition of tax.
B. Disposition of tax. The tax collected by the Department of Taxation shall be paid into the State Treasury and the specific amounts as listed below for pine shall be credited to a special fund titled "Reforestation of Timberlands State Fund," and shall be used for reforesting the privately owned pine timberlands of the state. The remainder of the tax as regulated in 23VAC10-350-50 shall be credited by the Comptroller to the "Protection and Development of Forest Resources of the State Fund**." Taxes credited as special revenues for protection and development of forest resources shall be used for the purpose of raising, planting and propagating seedling trees, both hardwood and softwood. In addition, the protection and development funds will be used for forest fire protection, forestry education of the public in the use of forest harvesting methods, and rendering forestry service to the timber landowners of the state.**

23VAC10-350-110. Allocation of tax to localities,
At least 50% of the forest products tax collected from any county or city shall be allocated and subsequently expended in such county or city for carrying out the purposes of the forest products tax. Any allocated county or city forest products funds, unexpended within a two-year period, shall be credited at the end of each fiscal year, as special revenues for expenditure on a statewide basis for reforestation purposes.
Statutory Authority
§§58.1-203 and 58.1-1611 of the Code of Virginia.

Public Access Considerations for the Dragon Run

Introduction

The Dragon Run Steering Committee seeks to explore ways to sustainably use the natural resources of the watershed in order to strengthen the local economy. Ultimately, the Committee aims to help landowners find ways to earn enough off the land to pay their property taxes and resist pressure to suburbanize the landscape. To this end, the Committee has asked Yellow Wood to explore issues of public access on both private and public lands as they relate to the Dragon Run River.

The Law of Rivers establishes all rivers, including the Dragon Run River, as owned by the state and held in trust for the people by the state for their use. Access to the river may be over public land or private land. When public access is provided over public land, the public owner has a responsibility to provide information to users regarding how they are to enter and leave the property and how they are expected to behave while on site. Rivers are similar in this regard to highways or other transportation arteries. Signage, driver training, and rules of the road are required to keep users safe. It is the responsibility of the public sector to develop and enforce these rules, to establish, in effect, a code of conduct.

Private landowners with land adjacent to the river have an ever-present right to access the river. Whether, when, and how they choose to share this right with others is up to each owner. Owners who choose to provide access to and through their property will want to establish their own codes of conduct for users and inform users of public codes of conduct pertaining to public resources.

Public access is not an "all or nothing" proposition in which owners must choose between unlimited public access or no public access at all. A variety of techniques for *managing or controlling* public access are discussed in this report. With intention, access can be managed in such a way as to work for all parties. Controlled access can also provide new opportunities for natural resource-based economic development in the Dragon Run Watershed.

This guide is written for landowners and public sector representatives looking for answers to questions relating to public and private access. This is not a complete handbook, but merely a starting point. Those wishing to take the next steps in terms of developing a public access plan, or code of conduct, or assembling a committee, staff or volunteers to manage public access should expect to undertake additional research.

Current Conditions

The Dragon Run Watershed possesses both public and private access to the Dragon Run River; however, there is typically a great deal more private than public access. One of the top issues of public access in the Dragon Run Watershed is the lack of land-based public access to the Dragon Run River, including only a handful of documented access sites.

While the Dragon Run River is pristine, the issue of access as related to economic development concerns not only the river, but also the greater watershed. Existing limitations to public access include: limited public parking opportunities, limited access points (entry and exit) to the river (long distances between), lack of signage, maps, codes of conduct, etc.

Public Access

The main public access point for the Dragon Run River is from 602 to 603. The public access at 602 is in poor condition, lacking parking or space. The Friends of the Dragon have a nicer access with larger parking areas at 603. However, the biggest limitation on the Dragon Run River, in terms of public recreational access, is water – there is not enough water for paddling most of the time. Canoeing and kayaking are appropriate uses for the area, with relatively low impacts on the resource and people. Many people appreciate the run between Route 602 and Route 603 because it has an easy put-in and take-out, it is convenient, public lands provide access on both ends, and the shuttle distance is short. This represents an example of a public/private partnership in which a non profit organization, Friends of the Dragon, purchased property to improve what would otherwise be limited public access across public property.

Another piece of property recently acquired and open to the public is the 274-acre Browne Tract[44]. The Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA) purchased the Browne Tract with grants from the Virginia Coastal Program at the Department of Environmental Quality, in order to protect coastal resources and provide public access within the Dragon Run watershed, a tributary of the Chesapeake Bay. Of the 274 acres, 137 acres straddling the boundaries of Essex and King and Queen Counties in eastern Virginia will be managed for public access, while the remaining 137 acres in Essex County will be managed by the Department of Forestry. In developing the management plan for the Browne Tract, MPCBPAA staff attempted to group suggested uses into three alternatives: ranging from a focus on recreational usage and infrastructure development to a greater emphasis on natural resource preservation. In the end, they blended the alternatives in such a way to offer balanced recreational use with conserving the area's unique natural and ecological characteristics. Some characteristics of the plan include:

- Recreational use zones to geographically separate activities that have a high potential for conflict.
- Expand existing trail networks and create a limited number of new trails to establish linkages and accommodate compatible uses.
- Install interpretive and directional signs and kiosks to enhance the recreational and educational experience of visitors and control visitation in high-use areas
- Regulate maintenance of trails and facilities.

[44] *Browne Tract Management Plan.* Middle Peninsula Chesapeake Bay Public Access Authority.

- Construct a footbridge across the Dragon Run to replace an existing structure and manage access to a particular parcel.
- Establish one or more multi-purpose, water access sites.
- Establish larger "resource protection zones" and "special management areas" to demonstrate best management practices for managing timber and other natural resources in the area.
- Create corridors and open areas for wildlife movement.
- Maintain forested buffers along streams.
- Identify areas that contain important natural resources and limit recreation in these areas.

The College of William and Mary owns 121 acres, and Virginia Department of Transportation owns some property in fee simple and prescriptive easements for road and rights of way.

Private Access

In addition to its historic patterns of limited public access, the Dragon Run Watershed is owned mostly by private concerns (3,073 parcels in 2001). The largest parcel sizes are in King and Queen County with 52% of the land area. The watershed encompasses a total of 90,000 acres. Land cover is approximately 80-90% forested and wetlands, 17% agricultural, and 1% commercial/residential (about 1.3% impervious cover).

Certain forms of private access are well-established in the area of the river, specifically related to hunting. Seventeen hunting clubs lease 42,000 acres or 46% of the land in the watershed to hunt deer, turkey, and waterfowl. John Hancock Life Insurance Company is the largest single owner in the watershed with 26,000 acres; this is timber land mostly leased to hunting clubs. With regard to hunting[45], approximately $300,000 was generated by hunting in 2002.

Nonprofit organizations and private businesses help to provide public access to the Dragon Run River as well. The Friends of the Dragon and Mattaponi Canoe and Kayak lead paddling trips along the river and, in the case of Mattaponi, rent canoes and kayaks and provide shuttles for those who would like to paddle it on their own. Meanwhile, the Friends of Dragon Run is an organization whose mission is to preserve and protect the river and the watershed, which is done by buying land, acquiring easements, and educating landowners and the public about why it is worth saving. The Friends of Dragon Run now owns 5 properties of about 300 acres, and hold conservation easements on another 50-60 acres. The group is currently in the process of acquiring 165 acres, in two parcels, from The Nature Conservancy. As an example of their public education efforts, they take about 200 people down the river each year to show them why it is important to protect the river.

[45] *Dragon Run Watershed Management Plan*. November 2003. Dragon Run Steering Committee, Middle Peninsula Planning District Commission.

The trend of increased public and non-profit ownership is opening up new opportunities for public access; demand for public access typically increases as population grows. While individual groups such as Friends of the Dragon Run and the Middle Peninsula Chesapeake Bay Public Access Authority have adopted codes of conduct pertaining to their individual parcels and/or activities, so far there is no well-established, publicly supported code of conduct for the Dragon Run River as a whole. Once such a code of conduct is established for public access in the area of the river, private landowners may want to adopt some aspects of this code of conduct to pertain to access on their own lands.

Techniques and Structures for Controlling Public Access

Techniques and structures for controlling public access to public lands can be grouped into barrier approaches, permit/reservation approaches, and information and education approaches. Some of these techniques can be useful in controlling and managing access to private lands as well.

Barrier Approaches

Gates, Fencing and/or Other Barriers or Designated Entry Points
Gates, fencing or other barrier methods can be used to permit closure of public access points. Reasons for closure could include: trail construction, major repair, seasonal maintenance; seasonal periods of usage; critical habitat for species of wildlife; fire threat; periods of flooding or wet weather which could render access dangerous or damaging; where overuse would severely impact resource conditions; special events. Such closures could be for all uses of the area or based on specific circumstances.

Designated entry points can limit access to fewer entrances, so potential entry impacts (parking, etc.) can be minimized.

Parking is another way of managing and/or controlling access to public and private access sites. Parking, access points, restrooms, trails and rest stops provide infrastructure where you want to promote access. These types of infrastructure can be used to encourage, discourage, or limit use of a particular public access site, directing people and impacts to particular areas that can withstand the traffic, and not to areas that are particularly sensitive. Access can be managed through the sizing of facilities. For example, Kahn Ranch, in the Monterey Peninsula Regional Park District, has an access management plan that calls for a parking area to have a particular number of parking spots (10) and to be established with a pervious surface material to both control access and address environmental concerns.

Permit/Reservation Approaches

Use Permits
The Monterey Peninsula Regional Park District's Kahn Ranch Public Access Management Plan restricts access to the ranch using a permit system. These permits restrict access for a particular entrance to 10 vehicles only per day (no walk-ins, equestrians, or bicyclists), as well as days of the week (Saturday, Sunday, and Wednesday). On non-use days, the gate is locked and posted. The number of permits would be determined by the carrying capacity of the area. Currently, no one knows the exact carrying capacity of the Dragon Run River, so it would be useful to start out with conservative allowances and increase them gradually as long as monitoring results are acceptable. This will allow public access managers in the Dragon Run Watershed to keep usage adaptive to conditions on the ground.

Reservations
A reservation system is another form of restricting use. Users would have to make reservations to use specific public access areas. A seasonal reservation system can also be effective, with proper enforcement.

Rules and Regulations
Rules and regulations can be used to control public access, as well as etiquette of different types of users. However, they must be posted or easily accessible if they are to be followed. In addition, rules and regulations must be enforced. Enforcement necessitates staff or volunteers to patrol the area. Fines at Kahn Ranch vary from $50-200. Within the Dragon Run watershed, there seems to be concern about motor boats coming up the river from the Piankatank. Rules could be developed and tested to limit the type of boating activity, speed of vessels, etc. to accommodate these concerns. To prevent introduction of invasive species, rules and facilities for washing of horses hooves may be considered as part of any equestrian trail development that might emerge as part of a watershed plan.

Uses
A public access code of conduct should deal with appropriate uses of public access lands. Activities such as equestrian, hiking, bicycling, off-road vehicles, motorized boating, non-motorized boating, fishing, hunting, etc. should be determined to be appropriate or not, based on environmental conditions. In addition, usage by commercial groups (such as hotel/resort sponsored recreation, outfitters, etc.) should be discussed. A plan should identify differing degrees of public access for different parcels and types of uses of the land.

Public Information/Education Approaches

Those in the Dragon Run Watershed see their region as unique in many ways, not least its natural resources, scenic beauty and recreational opportunities. As a result, one important

goal for the Dragon Run Watershed is to educate the public about this uniqueness, in an effort to protect and keep those elements that contribute to its uniqueness intact. Increased public access is one way of allowing those within and outside of the watershed to acquire knowledge about the region and its importance. Interpretive trails, guided experiences, and tape recorded messages at special locations are among the many tools available to raise public awareness of the uniqueness of the river and its watershed and the steps being taken to protect it.

Signs and Maps

The usage of public access and private property signs is a mechanism for keeping access limited to appropriate areas. A trail map is another way of accomplishing this goal. Such signs and maps could be sited at appropriate locations to remind people of local laws and ordinances relating to public access, as well as any special circumstances associated with the particular site, including proper use and use restrictions, "share the trail" messages, notice of local leash laws, restrictions to public access, identification of unlawful or hazardous uses, respect for natural areas and hazards, precautions and sensitivity of particular wildlife habitat areas and other natural areas, visibility and vegetation management, etc.

Seasonal Controls

One way of controlling access and/or minimizing impacts of access on natural resources is through seasonal controls, or creating designated time and areas available for public access. For example, in the Citizens Forest Management Plan for the Three Southern Utah National Forests,[46] the Forest Service "seasonally closes areas to boating and other activities during the occupancy season of bald eagle, or other listed species, where these activities have the potential to conflict with nesting or reproductive behaviors."

Seasonal controls do not have to be connected to endangered or listed species, however. In some cases, seasonal controls may be concerned with the most appropriate times of year to participate in particular recreational activities, such as boating, horseback riding, bicycling, or hiking, so that natural areas are minimally impacted. For example, hiking at high altitude alpine locations is typically discouraged in early spring as it can impact the sensitive flora found there. Also, horseback riding or mountain bicycling may be discouraged after heavy rains (or in early spring after snowmelt) so as not to unduly impact the trails.

Some seasonal controls may be developed in an effort to curb soil erosion. In Victoria, Australia, [47] for example, many four wheel drive tracks in Bunyip State Park are currently

[46] www.redrockforests.org/Recreation_Desired_Conditions.html

[47] Department of Sustainability & Environment and Parks Victoria. Draft Recreation Framework for Bunyip Public Land – Public Discussion Document. http://www.parkweb.vic.gov.au/resources/mresources/bunyip_rec/bunyip_draft_fmwork.pdf

seasonally closed between mid June and the end of October each year, in order to protect track surfaces, water quality and the environment, and public safety. Tracks subject to seasonal closure are determined on the basis of gradient, aspect and soil capability. Tracks with a sustained gradient of more than 15% or 8.5 degrees are seasonally closed, for example. This seasonal control reduces the impact on the environment, in terms of less soil erosion, sediment runoff and turbidity.

Event Planning

Event planning can be another way of controlling and directing public access. Whether it's horse trails or a regional craft show, an access plan can help ensure that all the region's businesses and landowners are properly notified and have an opportunity to participate (or not) and benefit as appropriate. (For example, landowners interested in opening up their properties for overnight guests or for parking during an event could be given that opportunity.) The Dragon Run Festival may be a way of not only controlling and directing public access, but also educating and promoting public access that is not disadvantageous to the river or the watershed. Northhampton, Virginia has a bird festival which promotes the excellent birding that can be done there. Giles County, Virginia has instituted a bird and butterfly festival.

Safety

Codes of conduct should speak to issues of public safety, including conflicts between different forms of recreation (motorized vs. non-motorized, hunting vs. hiking, etc.). Where motorized vehicles are permitted, operators should be asked to proceed with caution of others. Speed limits could be posted and/or enforced. Glass containers could be prohibited from access areas.

First aid and emergency procedures should also be spelled out in a public access code of conduct. Depending on the access site, call boxes and mileposts may be necessary or useful to facilitate such procedures, making it easier for emergency and rescue personnel to respond to emergencies.

Maintenance

The better maintained an area is, the better it is likely to be maintained by the public. The public will treat an area more respectfully if it is well-maintained. Therefore, it is important for the staff (or volunteers) of any public access management initiative to have a plan for maintaining public access sites on a regular basis.

Monitoring

Monitoring of usage and condition of access sites will help to determine the value of such sites. Pre-public access data would be useful to know as a baseline; such data could include photographs and a comprehensive assessment of conditions, in order to determine impacts on such sites. Collection of public access and use data could be collected on a monthly basis. In addition, it would be useful to revisit the resource data with photographs and condition assessment.

Having a one year trial period is one plan for monitoring. The Kahn Ranch in the Monterey Peninsula Regional Park District is trying their public access management plan for one year. At the end of this year, the District will conduct a formal review and public hearing to consider continuation, revision or termination of future public access. Monthly written reports are submitted to the Board on public access and public resource issues.

Developing a Code of Conduct for Public and Private Access

Interests

Interest in public access along the Dragon Run River necessarily involves numerous parties, including non-profit owners, and the public sector and public sector owners.

Public sector owners and managers as well as non-profit owners are interested in promoting and managing public access, while preserving the resource and supporting the economy. Public access can have significant impacts on the economy, including attracting people (day visitors, residents or tourists) to the area to spend money in the local economy. The key to success in dealing with public access is managing the varying expectations and needs of all of these different interests, while protecting the environmental quality and integrity of the watershed.

Goals

The first step in coming up with a code of conduct pertaining to the Dragon Run River and adjacent lands is to clarify goals shared by all the players in the region. For example, an overriding goal for a public access code of conduct may be to manage lands for multiple objectives while preventing resource degradation, and as a tool for economic development, by using natural resources to generate income in order to allow people to hold onto their land. Another goal of such a plan may be to develop public education and information about the river in an effort to preserve its uniqueness, protect its health and allow for safe public access. Providing education and information about public access in the Dragon Run Watershed has important connections with craft development and the local economy and can be used to help promote sales of locally-produced goods and services.

Defining Constraints

The second step in coming up with a code of conduct is to consider the constraints within which the plan should operate, and how these will be defined. For example, are there some activities that should be barred from the watershed regardless of whether they occur on public or private land? Based on historic trends, how much growth in access should be targeted and over what period of time? How will the impacts of increased access be assessed? What baseline information is available in each of these areas? What are the areas that should be eliminated for public access due to environmental sensitivity, landowner preference, etc.?

Data

Some information about the Dragon Run Watershed, such as information about endangered species, existing access points, and natural resource inventory, is already known. It is important for those undertaking a public access management planning process to know what data they already have and what data would be helpful to acquire. For example, it would be useful to know what additional access points would be useful or necessary to increase public safety along the river. In addition, the Dragon Run Watershed needs to develop access points that are accessible by disabled people, whether they exist or need to be created.

Developing a Plan

Once the goals and constraints are identified, the code of conduct needs to be developed. A plan would address where access will be, what access means, what types of conduct are expected, what it would look like, what kinds of infrastructure (for example, parking) would be needed, and how access would be acquired, whether through easements or outright purchase. One important feature of the plan should be the rate at which additional access will be opened up.

One model is from the Grand River Conservation Authority. Extensive biophysical studies were conducted on the natural characteristics (including species and habitat interactions), geological characteristics (such as river structure), and the human characteristics and activities along the river, including recreational activity. In addition, the public was consulted about their thoughts about public access on the Grand River. As a result of the studies and public consultation, an Access Management Plan was created, which deals with managing access to the river, while also protecting the natural environment along it.

Some components of the plan include:

- Fishing regulations, including a zone specifying the types of equipment and techniques that can be used, and a season for fishing.
- Access points for canoeists, anglers and hikers.
- Code of ethics for river users, encouraging best practices in and around the river, such as disposing of garbage, respecting private property, following fishing regulations and abiding by trail rules. This code will be posted on kiosks as well as in marketing materials.
- Guardian program, which is a team of trained volunteers who are ambassadors for the river, promoting proper public use of the reach; and, to encourage compliance with the regulations by patrolling the area and reporting violations to the Ontario Ministry of Natural Resources.
- Public awareness program, which is promoted through posters, pamphlets, information kiosks, media coverage and other means.
- Monitoring program for changes in use, water quality and other matters.

A code of conduct should create a clear understanding of the partners' roles in managing the resource. Memoranda of Understanding and Cooperative Agreements can be a part of such a plan.

Staffing

Another critical feature of a plan is staffing, whether professional or volunteer. At a minimum, there should be some point of contact for public access in the watershed available and known to landowners, guides, and users. The point of contact should be able to direct people to appropriate resources and service providers, answer questions with respect to rules, regulations and enforcement, and train volunteers. An access management plan without a point person or persons weakens the effort at managing public access and makes it highly unlikely that the access site will be managed effectively. Staff, whether a department, committee, or single person, are necessary to address landowner complaints, organize events, and be the point person for maintenance, enforcement and monitoring. This person or people can also serve as the gatekeeper to outside agencies that could potentially be involved in public access, such as ambulances, fish and wildlife departments, police and fire departments, etc.

Management and Monitoring of Access and Impacts on Resource Quality

A committee or person needs to be responsible for management and monitoring of access and impacts on resource quality. This would be spelled out in the code of conduct. Depending on the amount of public access to manage, more than one person may be necessary. Providing a personal point of contact with landowners, conservation and access interests and the local community is the key to making people feel involved in the process. This contact would be responsible for troubleshooting and resolving disputes.

Degradation of natural resources can be addressed by instituting a monitoring process. By creating a baseline condition, and monitoring that condition regularly, the body charged with managing public access will be able to determine what the impacts on resource quality are of public access in the watershed. Once those impacts are known, changes in management can be made.

Elements of a Model

There are many models of public access. The key is to find models that are not only of an appropriate scale to the Dragon Run Watershed, but with a similar context. Elements of a model that would be useful to the Dragon Run would include:

- Seasonal and spatial controls
- Liability protocols
- Monitoring
- Staffing
- Rules and regulations

- Approved uses
- Public safety
- Enforcement
- Timing
- Trial period
- Signage and mapping
- Parking
- Regulatory jurisdiction
- Provisions for commercial users (outfitters, hotels, etc.)
- Potential impacts and ways to mitigate
- Managing and/or mediating conflicts between users
- Fees and fines
- Maintenance
- Public education

Local Resources
Resources that can help with issues relating to managing public access include recreation departments; outdoor clubs for hiking, biking, hunting, fishing, etc.; local universities with programs in environmental sciences or recreation management; watershed groups; etc.

Next Steps
A process for developing a code of conduct and access plan involves the following steps:

Public Education – This is necessary in order to alert the public about the process of developing an access plan and a code of conduct, and the public's role in providing input to that plan.

Development of Management Goals and Objectives – Goals and objectives need to be developed in order to determine the direction of the plan.

Assessment of Existing Conditions (Public survey, public task force meeting, etc.) – Prior to initiating a plan, it is useful to assess the existing conditions of areas of public access. This establishes a baseline condition so that impacts to the resource can be monitored.

Identification of Public Desires for the Area – By involving the public, whether private citizens, private landowners, recreationists, business owners, and others, the public desires for the area can be discovered. This will help to guide the development of the code and the plan.

Development of Code and Plan – The code should reflect behaviors required to meet the access goals. The plan should address the areas mentioned on page 107 and 108.

Promotion and Education – For the code and plan to be followed, the public and private sectors must be educated about what it means for them.

Monitoring and Evaluation – Periodically, the state of public access needs to be monitored and compared with the baseline in order to determine if these areas are being unnecessarily and negatively impacted. Based on this determination, changes may need to be made to the code and/or the access plan.

Issues Around Private Land Access

The dominant form of private land access in the Dragon Run Watershed today is through hunting leases. Opportunities exist to expand the uses of private lands to include such activities as hiking, biking, horseback riding, camping, educational services, sports lodges, etc. Landowners frequently express a variety of concerns with regard to opening their land up to use by others.

Landowner Concerns

Landowners as well as non-landowners are concerned about degradation of the resource (the river). Landowners are also worried about disrespect of their own land through overuse or misuse (e.g., trash, fires) resulting from "unrestricted" public access. One interviewee explains, "Taking care of land means roads, access for fire trails, harvesting, reforesting, enjoying it, keeping it clean of trash, we do that ourselves. We don't want the Dragon opened up to public access. Once you do that, you're putting a liability on me, even if the land is posted. They'll ruin the Dragon if they open it to the public. We've let people use it who contact us, to take canoes. The cub scouts, the boy scouts and other groups. We controlled who's on our land." Many private landowners are opposed to increased governmental presence with regard to the river, as they feel that they have been stewards of their own land for generations.

Responding to Landowner Concerns

Landowners often have concerns about public usage of their land, whether for hiking, biking, horse back riding, hunting, fishing, etc. Alberta TrailNet provides some interesting ways of involving landowners in the process of public access management.[48] One idea is to hold workshops inviting landowners, trail users, and interest groups. Workshops could focus on concerns such as liability, rules and regulations, etc. Public sector representatives around the issue of access can also attend meetings of landowners to hear their concerns firsthand. It is not enough to hear concerns, however; another purpose of reaching out to private landowners is to solicit solutions to the issues faced. The Dragon Run Watershed may need to initiate a public access stakeholder group, of which private landowners would be a part, along with users, managers, etc. This group

[48] Alberta Trailnet, www.albertatrailnet.com

would be responsible for developing an access management plan, along with the codes of behavior and rules and regulations essential to such a plan's success. Representatives of the stakeholder group could also meet one-on-one with landowners adjacent to particular public access areas to hear their specific concerns and explore compromise solutions to individual property owners' problems. Dialogue is key.

Landowners may want to create a landowner cooperative, especially if, for example, an interconnected trail system is developed that crosses more than one private landowner property. Such a scenario would necessitate landowners cooperating with each other to ensure that such a system would not impact them and maybe would benefit them economically.

Landowner complaints relating to a particular user or group of users on their property should always be addressed and followed up on. Periodic surveys of affected landowners should be conducted to assess their needs and complaints and how they're being addressed. Funds should be set aside for damage mitigation for landowners. The stakeholder group or public access manager should help landowners repair damage, collect debris and clean up pollution left by recreational users.

Rewarding landowners for their generosity in allowing public access on their lands is one way of decreasing the tensions around landowner relations. Tax breaks or discounted license (hunting or fishing) fees are two ways of providing incentives to landowners. Other ways of showing deference to landowner concerns include: public education, better enforcement of laws, assisting landowners with legislation, educating sportsmen, not over-regulating, providing fisheries/wildlife management assistance, requiring mandatory written permission of users, assisting in cleanup, public ceremony of recognition, etc.

Opportunities for Public and Private Partnership in Economic Development Based on Public Access

There are many opportunities for public and private sectors to cooperate in provision of public access. For example, private companies or landowners could contribute to call boxes to assist with public safety. Public agencies could assist in enforcement and education relating to the Dragon Run River; the public sector could provide grants to support private enterprise development tying back into the health of the river. University students could assist in the necessary monitoring of the access sites on private lands. The county governments could report on what the river is for, how it is used, how it is protected, and monitoring. Citizen monitoring groups, such as Friends of Dragon Run, could monitor the river for impacts of access. Below is an example of a private landowner/hunting lodge that is providing public benefit in terms of public education for young people as well as through stewardship of the natural resources of the land.

Addieville East Farm

In Mapleville, Rhode Island, Addieville East Farm[49] is one of the oldest farms in America, now a center for pheasant hunting, trout fishing, dog training and trials, and clay shooting. At Addieville, Geoff Gaebe employs land and forest management techniques for wildlife enhancement including creating areas for nesting, cover, feeding, and rearing young birds. This involves planting the right grasses, planting feed (corn), creating lots of edge, and managing forests of different ages. Mature forest forms the barrier between one hunting area and another because birds do not favor mature forests. Mr. Gaebe's 900 acres is managed to allow five hunting parties on the land at the same time without the risk of running into one another. Mr. Gaebe raises and releases approximately 35,000 pheasants on the property annually. As a result, Mr. Gaebe is concerned about soil acidity and is interested in ways to combat the effects of acid rain, by planting trees that naturally lower the acidity of the soil. In addition to catering to paying guests, Addieville hosts a number of activities for young people free of charge to teach shooting, hunting, fishing and dog handling skills. However, while he does teach these skills, Mr Gaebe explains that the hardest thing to teach is the love of the outdoors.

[49] Addieville East Farm, 200 Pheasant Drive, Mapleville, RI 02839; (401) 568-3185; http://www.addieville.com/

Resources

Dragon Run Watershed Management Plan. November 2003. Dragon Run Steering Committee, Middle Peninsula Planning District Commission.

National Organization for Rivers
212 West Cheyenne Mountain Blvd.
Colorado Springs, CO 80906
719-579-8759. Fax 719-576-6238.
nationalrivers@email.msn.com
http://www.nationalrivers.org/us-law-who-owns.htm

A Landowner's Guide to Working With Sportsmen in Virginia,
http://www.ext.vt.edu/pubs/forestry/420-035/420-035.html#L2

Citizens Forest Management Plan for the Three Southern Utah National Forests
www.redrockforests.org/Recreation_Desired_Conditions.html

Department of Sustainability & Environment and Parks Victoria. Draft Recreation Framework for Bunyip Public Land – Public Discussion Document.
http://www.parkweb.vic.gov.au/resources/mresources/bunyip_rec/bunyip_draft_fmwork.pdf

Alberta Trailnet
www.albertatrailnet.com

Addieville East Farm
200 Pheasant Drive, Mapleville, RI 02839
401-568-3185
http://www.addieville.com/

Kahn Ranch Public Access Management Plan
Monterey Peninsula Regional Park District
60 Garden Court, Suite 325, Monterey, California 93940-5341
831-372-3196.
info@mprpd.org
http://www.mprpd.org/krmgtplan.html

Grand River Conservation Authority
400 Clyde Road, PO Box 729, Cambridge, Ontario Canada, N1R 5W6
519-621-2761; Fax 519-621-4844
http://www.grandriver.ca/

Appendix A: River Law

In discussing public access relating to a river such as the Dragon Run, it is important to understand river law. What follows are some basic tenets of river law from the National Organization for Rivers:

Law of Rivers[50]

A discussion of public access issues should begin with a solid understanding of the legal framework in the law of rivers. The U.S. Supreme Court has held that rivers have been public since ancient times of Greece and Rome. To this day, state constitutions affirm public ownership of all running waters. They typically say that "every natural stream" or "all surface waters" are owned by the state, for use by the public. Various state courts have upheld public access to running waters, calling it an "easement," and saying, for example, "The capability of use of the waters for recreational purposes determines their availability for recreational use by the public. Streambed ownership by a private party is irrelevant. If the waters are owned by the State and held in trust for the people by the State, no private party may bar the use of those waters by the people." Public access to streams, and trails along streams, is further supported by the legal doctrines of custom and prescription. *Willow River Club v. Wade*, 100 Wis. 86, 76 N.W. 273 (1898). *Taylor v. Commonwealth*, 102 Va. 759, 47 S.E. 875, 102 Am.St.Rep. 865 (1904). *Day v. Armstrong*, 362 P.2d 187 (Wyo. 1961). *People v. Mack*, 97 Cal. Rptr. 448, 19 Cal. App. 3d 1040 (1971). *Montana Coalition for Stream Access v. Curran*, 210 Mont. 38 (1984).

Which rivers are owned by the public?

The U.S. Supreme Court has held that the bed and banks under all rivers, lakes, and streams that are navigable, for title purposes, are owned by the states, held in trust for the public. Title in this context means ownership. This public-trust ownership extends up to the ordinary high water line, (or ordinary high water mark,) encompassing what is commonly referred to as the submerged and submersible land, as opposed to the upland. This type of navigability is called title navigability.

What can the public do on rivers that are navigable for title purposes?

The three activities that the courts have traditionally mentioned are navigation, fishing, and commerce. But the courts have ruled that any and all non-destructive activities on these lands are legally protected, including picnics, camping, walking, and other activities. The public can fish, from the river or from the shore below the "ordinary high water line." (Note that the fish and wildlife are owned by the state in any case.) The public can walk, roll a baby carriage, and other activities, according to court decisions.

What public activities can government agencies lawfully restrict?

They can and must prohibit or restrict activities that conflict with the Public Trust Doctrine. What is known as "responsible recreation" must be allowed, but offensive or destructive

[50] Taken from the National Organization for Rivers website: http://www.nationalrivers.org/us-law-who-owns.htm

activities can be limited to certain areas or prohibited altogether. Leaving trash, building fires, and making noise can and should be limited or prohibited as appropriate for the area.

State and local restrictions on river use have to be legitimately related to enhancing public trust value, not reducing it. Rivers cannot be closed or partially closed to appease adjacent landowners, fishermen who want to dedicate the river to fishing only, or to make life easier for local law enforcement agencies.

Can state governments expand public rights to visit rivers?
Yes. In many states, state courts and legislatures recognize a **floatage easement,** a public right to navigate even on rivers that might not qualify for state ownership for some reason. This floatage easement is a legal right to run a river even if it is assumed that the bed and banks of the river are private land. In some states such easements cover all waters in the state, except things like stock ponds and swimming pools.

Note that this floatage easement is a matter of state law that varies from state to state, but the question of whether a river is navigable, for title purposes, and therefore owned by the state, is a matter of federal law, and does not vary from state to state. This has caused much confusion. Even on rivers that are navigable for title purposes, many people mistakenly believe that there is only an easement for public passage, not actual state ownership of the bed and banks. Conversely, many people mistakenly believe that unless a river is navigable for title purposes, there is no public right to visit it, where in fact the state may confer a floatage easement on all rivers, regardless of their navigability for title purposes.

Note that a state floatage easement is something that comes and goes with the water: When the water is there, people have a right to be there on it, and when it dries up, people have no right to be there. But rivers that are navigable for title purposes are public land up to the ordinary high water line, so that even when the river runs dry, people still have the right to walk along the bed of the river.

What about walking briefly on private land while in the process of navigating a river?
Federal court decisions seem to allow for this but have not been conclusive. Some state courts have found that the public has the right to walk on the river bank, either as part of navigation or for other reasons. Also, some state laws allow certain trespasses under certain urgent conditions. If you are unable to proceed down a river due to unique circumstances or due to an emergency of some sort, state law may allow what would otherwise be a trespass.

What about getting to and from the river?
Normally there is no right to cross private land to get to or from a river (except perhaps in extreme cases as mentioned above.) For example, there is no right to walk across a farmer's field to get from a public highway to a river.

However, the state has a duty to maintain public access routes to rivers under certain conditions, as part of its public trust duties. Courts have found it unlawful for a state to close off an existing public access route when there are not other public access routes nearby.

A common problem involves highway bridges over rivers. The river, if navigable for title purposes, is public land up to the ordinary high water mark, and the highway is public out to the edge of its right-of-way. Usually there is enough space to legally park next to the highway near the bridge. But the adjacent landowner may build an impassable fence up to the bridge abutments and post "No Trespassing" signs on the fence, so people can't get from the highway down to the river. This is unlawful; there is a right of passage from the highway to the river. Courts have ruled that when one public route meets or crosses another, there is a right to proceed between the two.

What about motors on rivers?
People tend to think that the right to navigate includes a right to navigate with a motorized watercraft, but the courts see it differently. Recall that much of navigability law predates the invention of motors. The courts have held that state government agencies can allow motors in some areas and prohibit them in others. So while people have every right to navigate the navigable rivers of the nation, on many of those rivers they may do so only in human-powered craft (such as canoes, kayaks, rowboats, non-motorized rafts, etc.) There is no right to use motors in places where motors are prohibited. Simply put, motors have no legal rights.

Depending on the state, the decision to allow or disallow motors on a waterway usually must be made at the state level--local government agencies may need state approval to prohibit motors. Federal agencies, too, may need state government agreement to prohibit motors on a waterway in a state.

Of course, there is often great political support for motorized use, so state government agencies are often politically pressured to allow motors. The main problems with motorboats relate to their noise and to their speed, especially within the confines of a river. On navigable rivers, adjacent landowners are legally obligated to tolerate navigation, but not necessarily motor noise, which inherently migrates from the river to the adjacent private land and can be quite intrusive.

In considering whether to allow motors, agencies should keep in mind that there is no legal obligation to allow them, and, on the other hand, there is a legal obligation under the Public Trust Doctrine to conserve river resources for a whole range of uses, not just motorboats. Therefore agencies should only allow motorboats at times and places where they are not a major impact on other uses. One legally valid solution is to only allow the kind of quieter motors made possible by new technology. Another is to only allow motors at certain times.

What about commercial river trips?
People tend to think that under the free enterprise system, businesses should be able to operate commercial trips anywhere. But the courts see rivers as public resources, and state and federal courts have upheld the authority of government agencies to limit commercial river trips on waterways or prohibit them altogether. Note that the courts view this authority as arising from the government's general authority to control commercial operations, not from an authority to control or prohibit river navigation per se--the courts have rejected

government agency attempts to prohibit noncommercial navigation, although noncommercial navigation may be limited under certain conditions related to the public trust.

What about mining in river beds, for gold, gravel, etc.?
Courts have upheld government authority to regulate or prohibit mining in rivers, because of the damage it can do to publicly-owned river resources.

What about construction and bulldozing along a river?
The U.S. Army Corps of Engineers grants "section 404" permits for alteration of riverbeds. A number of rural landowners have paid hefty fines for bulldozing along rivers to build dikes and other structures, mistakenly thinking that they were bulldozing on their own land.

What about river pollution?
State and federal regulations limit or prohibit water pollution. Hefty fines can apply, even to city utilities departments and other public agencies.

In 1972, Congress passed the Clean Water Act. Before the Act, river conservationists had to claim injury and sue polluters to prevent them from polluting waterways. Since the Act, however, it has become a felony to discharge wastes into waters without acquiring government permits that follow set guidelines. The Safe Drinking Water Act was passed in 1974 to require states to comply with federal safety guidelines.

What about ownership of the water itself?
The water itself may be allocated by water courts to various users such as farmers and city utility companies that divert the water from the river. But the higher courts have ruled that public ownership and the Public Trust Doctrine must also be considered in water use regulation. Courts have specifically rejected the argument that public trust values on rivers were "subsumed" into water rights allocations. Courts have held that the public trust applies to natural water resources regardless of their navigability. (Flowing water is a public resource in any case.) This public trust extends to even very small streams.

How do I determine if a certain river is public, and what public uses should be allowed on it?
You call the State Lands Office, and the State Attorney General's Office. (The official name of these two offices may vary from state to state.) State law may say that all waters in the state are open to navigation, and may also grant permission to walk along the shore under certain circumstances. If state law allows the uses you are concerned about, then you don't need to look further. If it doesn't, then the question becomes whether the river meets the federal test of navigability for title purposes. If a river appears to be navigable per the federal test, but riverside landowners, or a government agency, or the state legislature says that the river is not navigable, (or if they restrict public uses in ways that conflict with navigability and the public trust doctrine,) then you have a problem, which you can help resolve mainly by educating people about navigability and public ownership of rivers, as discussed below.

Appendix B: Landowner Questions and Answers

As a landowner, how do I prevent usage of my land by recreationists?

A sure way for landowners to prevent people from using their land, if that's their decision, is to post their boundaries. Other options include restricting vehicular access to remote boundaries using fences, gates, trees or hedgerows. Landowners can also notify local game wardens, recreation commissions or sheriffs that their lands are closed to recreational uses.

As a landowner, how do I manage access to my land?

If landowners decide to allow public access to their lands, there are ways of managing access so it does not become unwieldy. Landowners should determine the location and extent of access, as well as who may have access and for what activities. For example, providing limited roadside parking discourages uninvited parties, littering, and vandalism and encourages reasonable distribution of recreationists.

One option includes allowing open public use or not posting the land. Users would need at least verbal permission from the landowner; however this is difficult to enforce. It is possible to charge user fees for access to unposted land, but practically, this is difficult to do.

Another option for landowners who want to manage access to their land is to post the land, while issuing written permission cards to those allowed to use the land and prosecuting trespassers. Landowners can require users to check in and check out before and after they use the property. Permits can be limited in number or by valid days and times.

A third option, already widely used in the Dragon Run Watershed, is to lease recreational access to clubs or associations. Such landowners usually charge, at a minimum, enough to pay taxes. Several neighbors with smaller tracts of land can band together to attract a hunting club for example. Lease agreements should spell out the responbilities of club and landowner. Clubs would be required to pay in advance for the lease, provide a current certificate of insurance, post the property, pick up all litter, stay off roads in wet weather, help put out fires, keep a record by species of each year's wildlife harvests, and obey all game laws. The landowner would be released from liability for the safety and actions of the sportsmen, but would remain liable for willful or malicious failure to warn against hazardous conditions, uses, structures, or activities.

Yet another option is permitting daily use by the public for fees. This option may make more sense in the case of hunting activities. The landowner would post and patrol his own land, prosecute violators, and issue permits in exchange for fees. This set-up requires more infrastructure than most landowners would be willing to initiate.

Forming a landowner cooperative with neighbors is an option for sharing recreational opportunities with neighbors and friends and perhaps others for a fee.

Landowners interested in encouraging public access to their land, especially if it has access to the river, can donate or sell an easement to a local land trust. These conservation easements

can specify who is allowed to use the land and for what purposes, what parts of the land are open for users, responsibilities of the landowner to maintain access, situations in which access would be retracted, etc.

As a landowner, what is my liability with regard to users of my land?

Many private landowners are concerned about legal liability for recreationists who use their land; this often prevents private landowners from sharing access to their land. The Virginia General Assembly has addressed this concern in Virginia Code Section 29-130.2, as amended in 1982. Paragraph (b) of the code states:

A landowner shall owe no duty of care to keep land or premises safe for entry or use by others for hunting, fishing, trapping, camping, participation in water sports, boating, biking, hiking, sightseeing, hang gliding, skydiving, horseback riding and bicycle riding, collecting, gathering, cutting or removing firewood, nor shall a landowner be required to give any warning of hazardous conditions or uses of, structures on, or activities on such land or premises to any person entering on such land or premises for such purposes except as provided in (d) hereof.

Report Appendix A:
Enterprise Opportunities of Interest
Presented to the Dragon Run Steering Committee
June 23, 2005

FOREST ENTERPRISE OPPORTUNITIES

Short Term Prospects

- Nursery transplants, particularly oak, if site is properly restored. Also hickory, sycamore, holly
- Handcrafted Folk furniture, high quality – would require dry kiln for mixed species; pecky cypress (expensive products from imperfect wood – character wood)
- Wood turning and carving – happening on a very small scale now
- Xmas trees
- Wood shavings for horse stables
- Wood mulch
- White oak staves for wine barrels – uses small diameter wood **XX -- SELECTED**
- Wood oils
- Waste wood into charcoal **X**
- Forestscaping service for people with small acreages – small scale equipment, personal approach (like landscape services, only for forests).
- Filtration materials made of wood – erosion control mats
- Medicinals if the natural supply isn't depleted
- Huckleberries
- Bundled firewood for wholesale markets
- Expand the use of biodiesel to lumber operations in the area
- Mistletoe (added during meeting; suggested by Willy Reay)

Medium Term Prospects

- Carbon sequestration credits – no market yet, but study of eligible lands in Dragon Run is completed
- Fence posts, flower and tree boxes, decorative landscape timbers, pond walls and retaining walls from treated yellow pine, garden timbers (added "garden timbers" during meeting)
- Engineered wood products
- Ethanol and chemicals from wood **X**
- Veneer (added during meeting)

Longer Term Prospects

- Cypress cultivation for traditional boats (Chesapeake Bay deadrise), rot resistant furniture and decking, crafts from knees, insect resistant mulch.Black locust, catalpa, red cedar also naturally rot resistant
- Japanese holiwood paulownia (already found in local area)

Forest Enterprise Opportunities NOT of Interest (Concerns expressed)

Greenery/wreaths – possible depletion of natural stock
Pine straw – requires more longleaf pine than there is in DR

AGRICULTURE

Enterprise Opportunities of Interest

Short Term Prospects

- Cut flowers and Everlasting flowers, preferably organically grown (holly added during meeting) -**XX –** originally selected, then replaced in favor of organic produce
- Asparagus and season extending crops **X**
- Cultivated mushrooms
- Honey- environmentally important for the bees
- Llamas and other exotic animals
- Herbal farm

Medium Term Prospects

- Organic produce with drip irrigation ("what does it mean to be organic?" added during meeting)
- Native and heritage nursery products – growing native plants for environmental restoration projects – may require intensive use of water **X**
- Vineyards **X**
- Identity preserved grains
- Greenhouse flower production
- Organic grains for livestock feed
- Sod- profitable but not exciting from a biodiversity and soils impact standpoint. Better than residential development, though
- Horse farms (horse-oriented residential community, equestrian center)
- Organic/grassfed meats (including chicken), as long as fenced out of streams, and slaughterhouse
- Still on the Dragon (tourism?)
- Community supported agriculture (there's one in K&Q) **X**
- On-farm dairy processing – goats
- Growing heritage food crops for Williamsburg restaurants
- Selling small farm equipment (no-till) (eliminated during meeting)

Agriculture Enterprise Opportunities NOT of Interest (Concerns expressed)
Hops may not grow well here
Orchards – require too much labor
Free range eggs – mixed reception due to perceptions of demand ("chickens" added during meeting)
Some concern about animal agriculture near the river

AQUACULTURE

Enterprise Opportunities of Interest

- Fish farms – warm water game fish -- bass, crappies. Concerns about catfish and deliberate or accidental introduction of farmed fish into native waters. Requires aeration and energy. Could combine with hydroponics, using fish waste for fertilizer **X X**
- Smoked fish

RECREATION

- Birding **X**
- Interpretive hiking (especially on private lands in conjunction with Brown tract and adjacent state land), private fee-based nature preserves **X**
- Nature-based education programs
- Ballooning
- Paddling trips – limited as now
- Bank fishing access and instruction – if limited (naturally limited because there aren't many high banks to fish from along the Dragon)
- Boat fishing access and instruction
- B &B safari – tent camping with breakfast and outdoor solar showers provided (Elder Hostels)
- Bicycle touring – concerns about safety **X (eliminated during meeting)**
- Horse trail system – not on steep slopes, and with procedures to avoid introduction of invasives (hoof washing).
- Campgrounds
- Agricultural Harvest watching/lumber company tours
- Mountain bike trails
- Summer camps, Environmental/ag/forestry camps for kids
- Auto tourism with maps and signage
- Leasing land for canoe or kayak access to a delivery service
- B & B for King & Queen County

OTHER

- Glass if the sand is the right kind

- Boatbuilding of traditional boats **X**
- Jewelry from native resources
- Mobile/catered food service for government workers (featuring local products?)
- Clay products on a small scale – Rappahannock Indians are developing this, teaching their children traditional designs **X**

NOT diatomaceous earth – mining

INFRASTRUCTURE

Short Term Prospects

- Virtual business/micro business development center for the region, including assistance with product development and test marketing, and transitioning from conventional to organic farming (bring in speakers on this), market research and market planning specialist, Assistance with sales and pricing. Include library of how-to materials for various enterprises **X**
- Estate planning linked to rights of first refusal for purchase and/or easements – outreach to landowners, possibly led by Soil & Water Conservation, VA Tech Coop Extension **X X X X --selected**
- Recycling Center for organic materials, including wood, agriculture and fisheries wastes (Gloucester is doing some of this) **X X X -- selected**
- Marketing and distribution assistance; development of a regional brand for forest, food, and craft products from Dragon Run, and retail outlet **XX**
- Environmental compliance circuit riders for small businesses – to help them comply
- County websites – see K &Q Community Village county site www.kginfotrail.net . Cost $12,000 plus $3000 a year for maintenance
- Buy local program for local restaurants
- Hands-on education for adults, e.g. wild mushrooming
- Hay clearinghouse
- Directory of natural resource based businesses in the watershed (goods and services) and TA resources

Longer Term Prospects

- Organic certification capacity in the region for agriculture and forest products (VA Dept of Ag has resisted certification)
- Address need for high speed internet access
- Farmers markets on Routes 33 and 360 – should be grower only – there are already farmers markets in Tappahannock, Irvington, Whitestoen, and Kilmarny that coordinate with each other
- Intergenerational farm/forest transfer program – matching would-be farmers with farmers getting ready to retire ("Farm Link, VA Farm Bureau" added during meeting) **X X**

- Energy from waste, including methane from landfills; Wood chips for heating, cooling, and possibly energy; Solar if it would work;Low head hydro if it would work; wood waste to ethanol (also household waste)
- School-based natural resource enterprise (REAL), Gloucester has a greenhouse at the school
- Call before you Cut program
- Master Forester program (similar to Master Gardener) – VA Tech was looking into it
- Forest landowner cooperative for smaller landowners
- Research on no-till without defoliant and cover cropping
- Vegetable growers cooperative
- History and heritage center with crafts for sale
- Code of the Country with new owner mentoring program for farmland and forestland owners, and owners along the Dragon **X**
- Sustainable agriculture program at Community College
- Possible small business incubator site in K&Q in old school building
- Possible tie into methane distributed from private landfills to paper plant
- Value added for agricultural commodities, e.g. wheat
- Biosolids research related to septic tank pumping **X X**

MUNICIPAL OPPORTUNITIES

- Biodiesel utilization (and production) – municipal vehicles **X X X X --selected**
- Showcase for local foods, crafts, etc. with educational exhibits and sales opportunities **X X X X --selected**
- Work closely with TNC on acquisitions and how they fit with long term vision and economic opportunities for Dragon Run watershed
- Design and zoning for low impact development, using green building technologies
- Negotiate with urban areas to subsidize resource protection in the Dragon Run (no direct connection to drinking water, but other values could be emphasized, e.g. air quality, flood control, etc.)
- County forests

ISSUES & OPPORTUNITIES

Summary posted during meeting (for details, see list below):

- Regulatory Barriers
- Labor Supply **X**
- Land Taxes **X**
- Use of Severance Tax
- Controlled Public Access **X X X X—selected**

X represents areas of interest or concern to multiple respondents.