# St. Lucie County Western Lands Study






# Options and Opportunities for the Future

**Report Purpose**
*The St. Lucie County Western Lands Study: Options and Opportunities for the Future* is designed to support the decision-making process for establishing a vision and plan for St. Lucie County's western lands. It is to be used as a resource for ranchers, farmers, growers, residents, and the Board of County Commissioners in developing that vision and plan.

**The St. Lucie County Western Lands Study**
Described in more detail in the Introduction to this report, the Western Lands Study is a year and a half long effort that addresses fundamental issues regarding the future land uses of nearly 195,000 acres in the western part of St. Lucie County. The goals are to consider new and innovative land use planning tools and strategies that will protect and enhance property values, promote smart growth, foster continued agricultural production, and ensure the cost effective provision of local government services through fiscal analysis.

The premise for the study stems from St. Lucie County's commitment to smart growth and the acknowledgement that a functioning network of agriculture, open space, and natural areas is essential for regional sustainability. In recent years, the Treasure Coast and its settlement patterns have been changing rapidly due to economic weakness in the agricultural sector combined with pressures from increasing land values and demand for development. Although the latter has abated somewhat due to the country's economic turndown, in the long run growth is expected to once again become an economic driver in the Treasure Coast.

**The Consultant Study Team**
The consultants were selected for their specific expertise in a variety of fields and for their knowledge of local and regional economic and environmental trends. The Project Leader is Marie L. York, a Fellow of the American Institute of Certified Planners.

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- The farmers, ranchers, growers, and property owners in the Western Lands
- The residents of St. Lucie County

**Report Author and Special Recognitions**
This report was prepared by Jean Scott, a member of the Western Lands Consultant Study Team. The author extends a thank you to the consultant team members who reviewed the report, particularly Tom Daniels, Gene Boles, Peter Spyke, and Marie York, and to Bob Wagner, Senior Director of Farmland Protection Programs, the American Farmland Trust, who also reviewed and contributed information for the report. Earlier planning toolboxes prepared for the Committee for a Sustainable Treasure Coast and the Committee for a Sustainable Emerald Coast and *The Florida Planning Toolbox*, prepared for the Florida Department of Community Affairs by the Center for Urban and Environmental Solutions at Florida Atlantic University, served as the genesis for this tool menu approach for St. Lucie County.

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# THE ST. LUCIE COUNTY WESTERN LANDS STUDY: OPTIONS AND OPPORTUNITIES FOR THE FUTURE

This report provides an overview of options and opportunities for planning tools that can be considered as part of the broad-based planning process initiated by the St. Lucie County Board of County Commissioners to prepare a long-term plan for the future of St. Lucie County's Western Lands. The report is divided into three parts:

- *An Introduction* – Highlights the planning context for the tools contained in this report.
- *Economic Development Tools* – Describes a variety of tools that can be used to improve the profitability of agriculture by including it as a core component of the county's economic development programs, increasing public demand for locally produced food, expanding agriculture's role in the production of renewable energy sources, and growing markets for ecosystem services.
- *Land Use Tools* – Describes a variety of tools that can be used to keep land available and affordable for and compatible with farming for food, renewable energy crops, livestock, environmental services, and related agricultural uses.

*St. Lucie County's rural lands and the many public benefits that they provide have been sustained by the farmers, growers, and ranchers who own the land and have served as its stewards.*

## Introduction

### The Western Lands Study

In the fall of 2009, the St. Lucie County, Florida, Board of County Commissioners began a planning study to address the future of the county's western lands – an area of approximately 195,000 acres that has served as the heart of the county's agricultural economy. The county's intent is to use the current down cycle in development to develop a plan that provides a framework for preserving a functioning network of agriculture, open space, and natural areas while providing economically viable options for agricultural landowners both now and in the future.

A hallmark of the Western Lands Study is its emphasis on encouraging broad public, landowner, and other stakeholder involvement throughout the planning process. In order to encourage that involvement and facilitate informed decision making, the study process included the preparation of this report describing the variety of planning tools being used in Florida and around the country to retain working agriculture and healthy natural systems. In addition, a series of context reports was produced that highlight the important economic, land use, population, commuting, and residential construction trends impacting the western lands.

The applicability of the broad menu of tools contained in this report to St. Lucie County's western lands will be assessed through two public educational forums, held in January and March of 2010, and a community workshop held in April of 2010. The public feedback on the tools – the specific ones that are applicable to the western lands and how they need to be refined – will guide the recommendations coming out of the Western Lands Study.

## The Western Lands

The suite of planning tools contained in this report provide St. Lucie County with a range of options and opportunities that can be used in combination to help ensure the continuing presence of agriculture and offset the pressures for the development of productive farmland on its western lands – the infrastructure for the county's agriculture.

**A Sampling of the Benefits Provided by Agricultural Lands**

**Retaining farmland and a strong agricultural economy brings multiple potential public benefits, including possibilities to:**

- **Make a direct economic contribution through off- and on-farm job creation, purchasing local products and services, and supplying goods to food processing companies.**
- **Provide fresh, healthy local food that reduces reliance on imported food and avoids the need for transporting it long distances (helps with goals to reduce greenhouse gas emissions).**
- **Provide greater biodiversity and habitat for wildlife.**
- **Store and filter water, reduce flooding, help recharge ground water, and lead to cleaner streams, rivers, and coastal estuaries.**
- **Improve air quality and sequester carbon (an important strategy in climate change plans).**
- **Provide opportunities for agro- and eco-tourism.**
- **Serve as a source of locally produced energy to reduce reliance on imported oil.**
- **Retain the rural character and heritage that residents often enjoy and identify as important to their quality of life.**
- **Broaden outdoor recreational opportunities.**
- **Foster a stronger social structure in new and existing communities.**
- **Make farmland available for future generations.**
- **When integrated through design, add value to housing units in new compact communities and make them more competitive in the marketplace.**

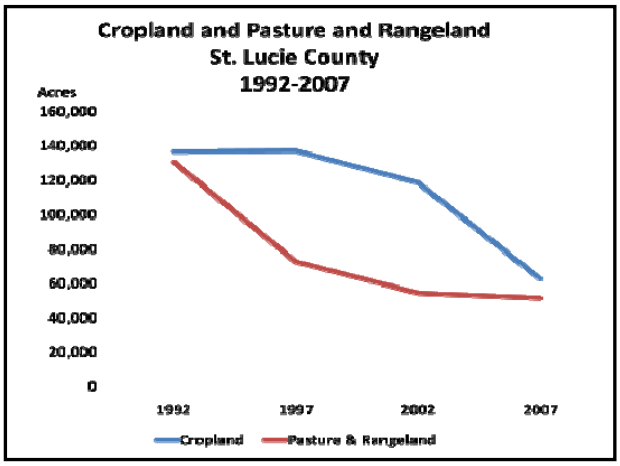
*Agriculture in St. Lucie County is at a crisis point. New planning approaches are needed if the county is to protect and restore large natural areas, contiguous expanses of open space, and agricultural lands and the multiple public services and benefits those lands provide.*

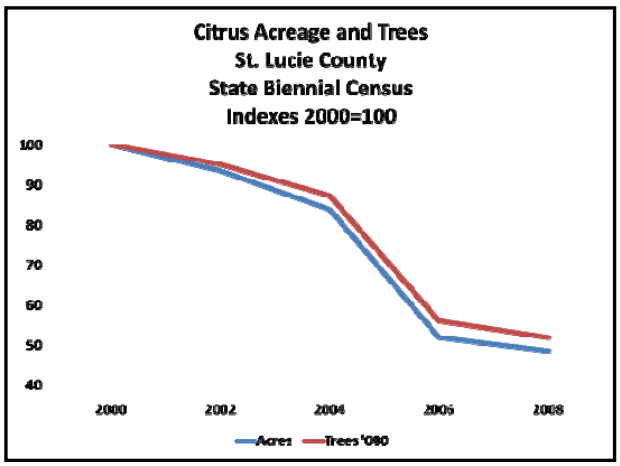
The options and opportunities recognize that:

- Viable agriculture is the backbone of maintaining a functioning network of agriculture, open space, and natural areas and providing multiple services (highlighted in the box to the right) from which the public benefits and enjoys.
- Any program to maintain agriculture must address the current pressures on farming and help prevent the switch point – when the income generated from agriculture is not sufficient to sustain farming and/or when land is more valuable for development than for agriculture.
- If development offers a higher return, agricultural land will be converted to development.

In order to avoid that switch point and bring about a more desirable future, landowners must be able to realize revenues that equal or exceed those provided by ranchette or other suburban development alternatives. Finding those new sources of revenue is all the more important given the current condition of the agricultural economy. Agriculture in St. Lucie County has been faced with a perfect storm – hurricane damage, increasing global competition coupled with rising costs, and widespread tree removal resulting from citrus canker, greening, and tristeza.

For example, from 1992 to 2007, the number of acres in farming in St. Lucie County dropped from 300,000 to 153,000 acres, almost 50 percent. For cropland, which includes citrus, the biggest decline occurred between 2002 and 2007. That decline parallels a dramatic drop in citrus production, an increase in the amount of abandoned citrus acreage (the highest amount of Florida's citrus counties), and a steady rise in the value of land for development. (Data source: *Notes on St. Lucie County Agriculture*, December 9, 2009, prepared by Dr. William Stronge, Professor Emeritus of Economics, Florida Atlantic University, for the St. Lucie County Western Lands Study.)



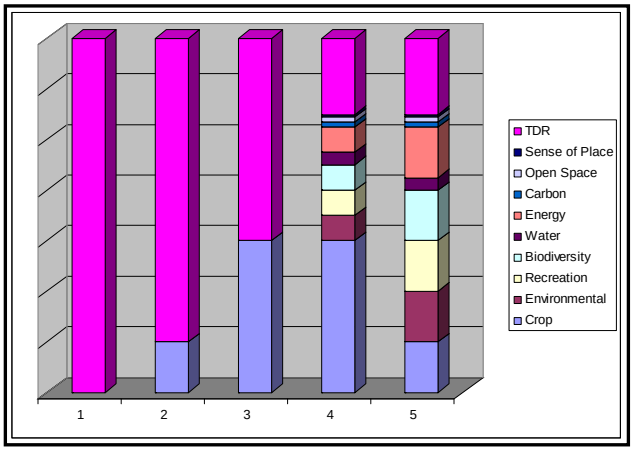

*The dramatic loss of crop, pasture, and range lands and the significant reduction in citrus acreage and trees in St. Lucie County underscore the fragility of the county's agricultural lands.*

The consequence: Owners of agricultural land have three choices: *One*, maintain their agricultural operation; *Two*, combine some limited development with continuing in agriculture; and *Three*, sell their land for development (often called the last crop). This report contains descriptions of a variety of options and opportunities that can be used to tilt an agricultural landowner's decision in favor of Options One and Two. To successfully make that tilt, landowners must have the ability to combine a number of options and opportunities in order to create the revenues they need to maintain viable agricultural operations. The single-solution approach will not work.

The size of the tract, the type of agriculture, and the natural resource features of the land all need to be considered. Who owns the land is also important. Corporate-owned land and family-owned properties have different needs. And if the land is family-owned, family composition and estate planning considerations matter. For example, a landowner who is giving up farming and one who plans to stay in farming and pass the farm to his or her children have different land and financial planning needs.

The need for a comprehensive package of economic development and land use planning techniques to help tilt a landowner's decision in favor of continuing in agriculture and avoiding the switch point is consistent with the conclusions of the Committee for a Sustainable Treasure Coast (CSTC) and its Rural Lands Subcommittee. The CSTC, created in May of 2004 by an Executive Order signed by Governor Jeb Bush, was composed of a panel of citizens and public officials who studied the challenges and opportunities facing the Treasure Coast region (Indian River, St. Lucie, and Martin counties) and recommended actions and tools that could be used to maintain a sustainable quality of life within the region.

The CSTC completed its work in September 2005 and was succeeded by a new not-for-profit organization called Sustainable Treasure Coast that is now working to implement the recommendations contained in the CSTC's final report. In that report the CSTC stressed that a combination of tools and strategies would be needed in order to retain an effective, functional, connected network of rural lands (open space, agriculture, and natural areas) and a sustainable agricultural sector that contributes to the retention of those lands.




*Increased profit from providing services and values to local residents and the environment and enhanced crop value from local and value-added marketing will reduce the value that a sale or transfer of development rights must provide to equal the value of converting agricultural land to urban development.*

The CSTC also concluded that to retain the region's rural lands, three things must happen:

- Agriculture must be profitable both now and in the future, providing farmers with sufficient revenue to remain in farming.
- A working Transfer of Development Rights (TDR) program must be implemented to maintain the value of lands remaining in agriculture.
- The combination of future revenue and TDR value must provide to the landowner a value as high as or higher than that of the ranchette or other suburban development alternative.

## Economic Development Tools

The Economic Development suite of tools is based on the premise that the best way to maintain farmland is to promote profitable farming. That means sustaining a healthy agricultural economy in tandem with land use-related strategies (discussed later in this document) that focus on discouraging incompatible development and keeping land available for farming.

The economic development tools are divided into four general categories: making agriculture a core part of local economic development programs, increasing demand for locally produced food, growing agriculture's role in the production of renewable energy, and expanding ecosystems services markets (the new agricultural crop).

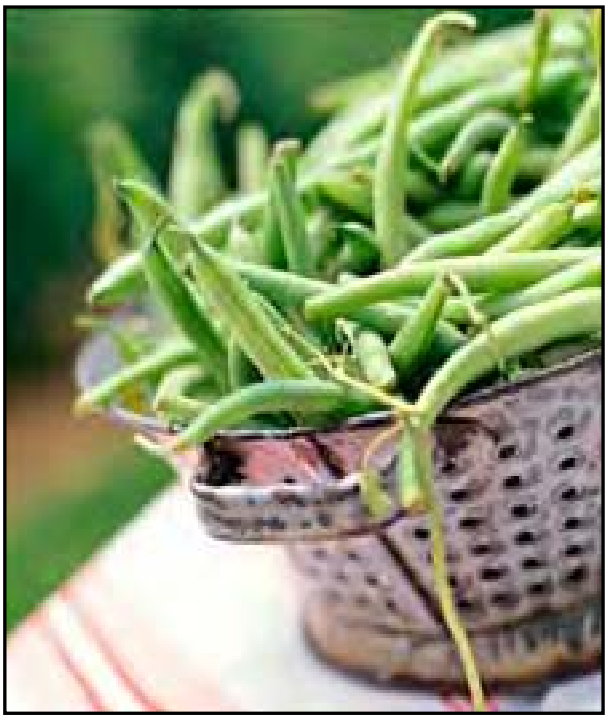


*Photo Credit: www.hillsboroughcounty.org*

## Agriculture as a Core Part of Local Economic Development Programs

Making agriculture a core part of economic development programs means targeting specific economic development incentives and services to the agriculture sector of the economy. Financial incentives and services should be designed to help agricultural businesses grow and be more competitive in an increasingly global and changing economy. It is critical, therefore, to include agriculture at the table when planning for economic development.

Incentives and services can include assigning an economic development expert to serve as a business point person, agricultural-supportive financial incentives and tax and regulatory policies, peer-to-peer assistance and networking programs, maintaining information on available land, and assistance with business planning, marketing, workforce training, product diversification, and development of high-value products. Many programs also help with permitting, provide assistance with the generational transfer of farms, facilitate policies that remove barriers to farming, and provide connections to public and private resources.

### The Hillsborough County Agriculture Industry Development Program (AIDP)

**The AIDP is a core component of Hillsborough County's Economic Development Department. A full-time Agriculture Industry Manager and Agriculture Economic Development Council work to create a business atmosphere conducive to the continuation and expansion of the county's agricultural businesses.**

**The program discourages the premature conversion of productive farmland to non-agricultural uses by easing the financial pressures on farmers, removing barriers to agriculture, and improving the economic sustainability of agriculture through increased marketing options, alternative crops, value-added processing, and capital financing opportunities.**

**From 2006-2009, the county offered landowners the opportunity to enter into Agriculture Stewardship Agreements. In return for agreeing to not convert their land from agricultural to non-agricultural use for a period of 10 years, landowners received an annual Agriculture Stewardship Grant. The amount was based on a percentage of the ad valorem taxes paid to the county in the prior calendar year on the taxable value of land classified as agricultural. In the three years of the program, 218 properties participated protecting 9,000 acres of land.**

*(For more information, go to <www.hillsboroughcounty.org/econdev/agriculture>.)*

### *Agricultural-Supportive Tax Policies and Other Financial Incentives*

Lowering operating costs through access to low-cost capital and reducing taxes and fees are two ways to help farmers and growers be more competitive, particularly in a changing economic climate that often calls for the flexibility to switch to new crops.

**Access to Capital:** Local economic development organizations or local governments can help farmers by providing access to capital that can be used, for example, to purchase equipment or land, develop new products, market products, prepare a business plan, or construct buildings. They can do that by creating loan or grant programs specifically designed for agribusinesses or opening up current economic development loan funds (typically targeted at non-agricultural industries) to agribusinesses.

Helping agribusinesses access state and federal loan and grant funds is also important. For example, Hillsborough County's Agriculture Industry Development Program (described earlier) is encouraging local farmers to take advantage of U. S. Department of Agriculture (USDA) Value-Added Producer Grants. They can be used for business planning activities, such as conducting a market analysis or developing a marketing plan to establish a value-added marketing opportunity for an agricultural product, or for working capital to establish or improve a value-added agricultural product.

**Hudson Valley Agribusiness Development Corporation**

*Photo Credit: www.hvacd.org*

As described below, TEAM Santa Rosa is establishing an agribusiness revolving loan fund to help farmers diversify from traditional crops such as peanuts and cotton to new higher value specialty crops. New equipment will be required in order to make that change. Farmers' access to capital can also be enhanced by providing guidance with regard to state and federal economic development incentives.

### Hudson Valley Agribusiness Development Corporation (HVADC)

**The HVADC focuses on enhancing the bottom line of farm businesses and the viability of the agricultural economy in the Hudson Valley region of New York State. The program features an Agricultural Economic Development Coordinator who works closely with agricultural businesses.**

**HVADC offers a full menu of agribusiness programs that includes marketing and start-up assistance for new ventures and enterprises. It also helps with processing facilities and other value-added projects and provides assistance with market expansion and improvement of distribution networks.**

**The HVADC's Virtual Agribusiness Incubator provides individualized help to new and expanding agriculture-related businesses. Services include assistance with access to capital and connections to a supportive network of agricultural entrepreneurs and how-to experts ranging from accountants and lawyers to marketing specialists.**

*(For more information, go to <www.hvadc.org>).*

**Reduced Fees and Taxes:** Reducing the tax load on farmers can be an important strategy in keeping agricultural land in production. Through differential assessments, farmland is assessed for property tax purposes at its current agricultural value, not what appraisers call its "highest and best" value that, in an urbanizing county, is often the development value. Taxing farmland at its agricultural value helps keep the costs of farming more aligned with the economic return. The reverse – taxing farmland at its potential development value – can erode profits to the point where farmers are unable to invest in or expand their operations or are forced to sell land to pay taxes, which may mean getting out of farming. Taxing land at its agricultural value also helps keep land affordable for farming and creates a more equitable alignment between the amount of taxes paid by farmers relative to the services required for agricultural land. (See the discussion of Cost of Community Services Studies on the following page.)

Genesee Agri-Business Park

## Genesee County, New York

**Agriculture's position as Genesee County's number one industry is reflected in the county's economic development and planning priorities.**

**The Genesee County Economic Development Center (GCEDC) designated agriculture as one of four target industries and makes its full range of financial assistance and incentive programs available to agribusinesses. Those services include:**

- **The Genesee Agri-Business Park, which targets food processing plants.**
- **A Revolving Loan Fund and the use of bonds for larger projects.**
- **A Payment in Lieu of Taxes (PILOT) agreement that reduces local taxes for farms making significant capital investments in productive assets. A participating farmer negotiates a pro-rata personal tax payment over a term of ten years.**

**Genesee County also supports agriculture through its Agricultural and Farmland Protection Plan and Board. Based on the premise that farm profitability is the fundamental element of agricultural protection, the plan has a dual focus – agricultural land preservation techniques and enhancing agricultural economic development opportunities.**

**Local agencies are assigned responsibility and authority for implementing appropriate priority components of the plan. Elements are integrated into the county's Comprehensive Plan.**

*(For more information, go to <www.gcedc.com/targeted/agribusiness.php> and <www.co.genesee.ny.us/dpt/planning/agfarmboard.html>).*

Another example of reducing taxes is to rebate all or a portion of the property taxes paid by a farmer. One example is Hillsborough County's Agricultural Stewardship Agreement described earlier. As outlined to the right, farmers in Genesee County, New York, are able to reduce their local tax assessment if they agree to make capital investments.

In Florida, farmers can apply to have their property classified as agricultural for property tax purposes, leading to reduced property tax bills. More information on agricultural property classification and other state services for agriculture is available from the Florida Department of Agriculture and Consumer Services (DACS) (<www.florida-agriculture.com>). The University of Florida's Institute of Food and Agricultural Sciences (IFAS) also offers information about agricultural property classification at (<http://edis.ifas.ufl.edu/FE119>).

Some states use a variation of a differential assessment called deferred tax or rollback taxation. In deferred taxation, a landowner must pay, using a time-based sliding scale, some or all of the taxes that were excused if the property is later converted to another use. Typically, the longer the property is in deferred taxation, the smaller the percentage of back taxes due.

### Indian River Fruit Brand Identity

**The Indian River Fruit brand applies to fruit from the Indian River Citrus District that comprises a narrow strip of land stretching 200 miles from the Daytona Beach area to West Palm Beach. The strip is so narrow that out of the six counties that make up the district, St. Lucie County is the only one wholly within its boundaries.**

**The district's history goes back to 1807 when Captain Douglas Dummitt, attracted by the fragrance of orange trees, decided to secure a homestead on what today is known as the north end of Merritt Island, where some of Dummitt's original trees still stand.**

**By the 1920s, the Indian River brand was so widely recognized that other growers began to use the name. Led by Will Fee of Fort Pierce, in 1930 growers successfully obtained a cease and desist order from the Federal Trade Commission prohibiting the use of the term Indian River on citrus not grown in the district.**

**Efforts to legally define the district's boundaries continued to be a point of dispute. After the elimination of a special act of the Florida legislature defining the boundary and years of relying on tradition and brand and labeling laws, growers voted to join with the U.S. Secretary of Agriculture to make the definitive boundaries legally binding.**

**Today, the Indian River Citrus League serves as the leading resource and advocate for the Indian River Fruit brand.**

*(This information is from the IRCL's website <www.ircitrusleague.org>.)*

### *Business Planning and Marketing Assistance Programs*

Making agriculture a core component of local economic development programs means tailoring business and marketing assistance programs to assist agribusinesses.

**Business Planning Assistance:** An important element of any successful industry development program is providing business planning assistance. Such a program can include assistance with financial and strategic planning, including product diversification to reduce risks and create new markets and sources of revenue. It can also include a business sector survey (for example, agribusinesses) that could be conducted in person or by mail (getting a good response rate can be a problem). The survey can be used, for example, to identify obstacles to doing business, opportunities for expansion, and needs for technical, capital, or permitting assistance. A survey can also be used to identify suppliers or other businesses that could be attracted to the community. Testimonials from satisfied businesses can also be a good way to recruit new businesses.

**Marketing Assistance:** Establishing an ongoing, well-organized, and high profile marketing program to promote local agricultural products will help expand markets and improve revenues. An important first step in a marketing program is to develop an identifiable brand and branding strategy. One of the best examples is the Indian River Fruit brand that has world-wide recognition.


Examples of marketing program activities include sponsoring events (an agricultural exposition, for example), exhibiting at trade shows, developing print and web marketing materials, and conducting a public education program. To take advantage of the resources of more than a single organization, a marketing program could be the joint project of a number of entities – for example, a local chamber of commerce, industrial or economic development organization, farm bureau, 4-H, cooperative extension service, and tourism board.

### *Dedicated Agricultural Economic Development Coordinator*

The position of an agricultural economic development coordinator can underscore a community's commitment to promoting and enhancing the economic vitality and sustainability of its agricultural businesses. The position could be housed in the economic development department of a local government, a chamber of commerce, or a local economic development organization. In Hillsborough County, for example, the position is a part of the county's Economic Development Department; in Santa Rosa County, it is a part of the local economic development organization (TEAM Santa Rosa**).**

### Miami-Dade County Agricultural Manager

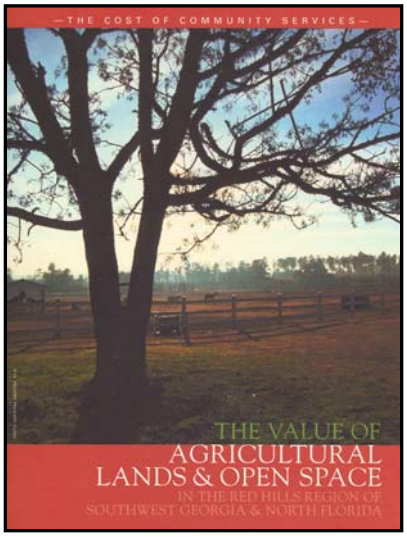
**Miami-Dade County's agricultural manager is a part of the county's Department of Consumer Services. The roles of the manager are to:**

- **Educate the community about the importance and benefits of the agricultural industry**
- **Serve as a single point of contact and liaison between the industry and the government of Miami-Dade County.**
- **Develop strategies that promote the viability and sustainability of the agricultural industry and identify key trends affecting the profitability of agribusiness.**
- **Conduct meetings with residents, farmers, and various county departments to address their concerns.**
- **Review land use issues and implement programs related to agricultural uses and rural areas.**

**In order to build county-grower relationships, the agricultural manager hosts an annual Get to Know Your Government/Grower meeting. To help maintain farmland and grow and diversify the agricultural economy, the county:**

- **Established a purchase of development rights (PDR) program in 2007. The PDR program is funded through a general obligation bond. The funds are used to purchase residential development rights from willing property owners, ensuring that the related properties remain undeveloped and available for agricultural uses. Applications are submitted to the Agricultural Manager.**
- **In 2007 directed a fact-finding mission to develop strategies to promote agritourism and find possible ways to diversify the agricultural economy.**
- **Adopted amendments to its zoning ordinance in 2010 to allow supplemental uses in agricultural zoning districts that support agritourism (described below under Agritourism).**
- **Partnered in 2009 with the Florida Department of Agriculture and Consumer Services, Publix Super Markets, and several South Florida producers to kick off the Redland Raised branding and promotion program. Publix Super Markets will promote the brand in more than 1,000 of its locations. The brand will be in line with the Fresh from Florida brand.**

*(For more information, go to <www.miamidade.gov/agriculture>.)*




The position could also be a part of or work in concert with a county's Agricultural Extension Office (<www.solutionsforyourlife.ifas.ufl.edu>). The St. Lucie County Extension Office is located in Fort Pierce (<www.stlucie.ifas.ufl.edu>) where it shares a campus with the Indian River Research and Education Center, one of 13 IFAS research and education centers. St. Lucie County Extension offers educational and training programs on a variety of topics related to agriculture and growth management.

Typical responsibilities of an agricultural economic development coordinator include:

- Developing a strong working relationship with the agricultural community
- Serving as a one-stop resource center for farmers and agribusinesses
- Helping farmers and agribusiness with local permitting and regulatory requirements and processes
- Coordinating a branding and direct marketing program for local agricultural products and value-added opportunities
- Establishing programs that connect local growers with buyers and consumers (for example, a farm-to-school or farm-to-table program)
- Providing or helping agribusinesses to connect to business planning assistance
- Monitoring proposed legislation and advocating for agricultural policy
- Facilitating research on product diversification
- Maintaining data on local agriculture and making the data easily accessible
- Educating public officials and the public as to the contributions and challenges of agriculture

### Red Hills Region COCS

**The fiscal benefit of working lands was underscored in a 2002-2003 Cost of Community Services Study (COCS) for the three-county Red Hills Region: Grady and Thomas counties in Georgia and Leon County in Florida.**

**The purpose of the study was to determine the financial impact of different land uses on each county's tax base and to help local officials make more informed land use decisions regarding when, where, and how their communities grow.**

**The study concluded that for every dollar in revenue that the three counties received from farm and forest land, they are only paying out between $0.38 and $0.67 to provide services. For residential development, the counties pay between $1.38 and $1.72 in services for every dollar of revenue received.**

**1000 Friends of Florida, the Conservation Fund, the Georgia Conservancy, and the Tall Timbers Research Station were the study sponsors.**

*(For more information, go to <www.1000friendsofflorida.org/PUBS/COCS_singles.pdf>).*

- Promoting the establishment of low interest loan and grant programs to help agribusinesses expand and diversify
- Working with local and state planning offices to establish plans that create protected areas for farming
- Ensuring that agricultural interests are represented on committees and working groups that focus on topics important to agriculture, such as planning, business development and retention, and workforce training

### *Economic and Fiscal Impact Studies*

Understanding the economic contribution of agriculture, the natural lands agriculture sustains, and the fiscal impact of agriculture are important for building a strong agricultural economy and public support for public planning and investment policies that help the agricultural industry and conserve farmland. The economic value of conserving land was recently documented by the Florida Chapter of The Nature Conservancy. That report is available from (<www.nature.org/wherewework/northamerica/states/florida>).

Monitoring agriculture's economic and land use trends is also important. That information can be used to identify problem points that might require intervention or potential opportunities (for example, increased consumer desire for fresh local food). As described to the right, TEAM Santa Rosa is engaged in a broad range of activities to increase the production and marketing of specialty crops.

A Cost of Community Services Study (COCS) is one way to understand the public costs of and revenues from different types of land uses, including agriculture. The American Farmland Trust (AFT) developed the COCS approach in the mid-1980s to provide communities with a way to measure the contribution of agricultural lands to the local tax base. Over 128 studies by AFT and other researchers demonstrate that working lands generate more in public revenues than they get back in public services, to the net benefit of community budgets.

### *Farm Link Program*

A Farm Link program (sometimes called Land Link) helps bring along the next generation of farmers by connecting those who want to get into farming with retiring farmers. The goal is to keep farmland in production by removing barriers to entering farming and facilitating the transition of farms to the next generation.

The programs are usually administered by a state department of agriculture. In Michigan, Farm Link is a program of the Farm Bureau, and in Washington, of the Cascade Harvest Coalition, a non-profit organization dedicated to connecting consumers and producers. In Florida, the West Coast Resource Conservation and Development Council is testing a pilot Florida Farm Link program (described on the following page).

### FarmLink.org

**FarmLink.org is a national online social and economic networking tool to help farmers and communities build local food connections and increase the amount of small acreages being used for production. It was developed by the Florida West Coast Resource Conservation & Development (RC & D) Council, a nonprofit organization that works to create an entrepreneurial local food and agricultural economy.**

**The site allows farmers to find a piece of land to farm, offer land for sale or lease, post a job opening, connect to needed expertise and resources, and advertise products to other growers, restaurants, and the local food community. Other council projects include the:**

- **Council-operated Geraldson Community Farm (<www.geraldsoncommunityfarm.org>), a working farm structured as a community supported agriculture (CSA) program that provides members fresh seasonal vegetables. The farm, which was purchased by Manatee County from the Geraldson family, also offers tour and volunteer opportunities.**

- **Manatee Agricultural Reuse Supply (MARS) Farm Connection Grant Program, which was established through an $8.5 million federal grant to connect eligible Manatee County farmers to a reclaimed water transmission line.**

- **Gamble Creek (<www.gamblecreekfarm.org>), a working vegetable farm that distributes its produce through a variety of methods including a CSA, u-pick, and farm stand sales. The council is developing the farm as a demonstration site for integrated water resources management as a part of the MARS program. The Center for Integrated Agriculture located on the farm provides training and technical assistance to beginning and existing farmers, and an apprentice program offers hands-on experiences in all aspects of farming that include studying the cost-benefit of different irrigation methods and best management practices.**

*(For more information, go to <www.FarmLink.org> and <www.fwcrcd.org>.)*

A matching service (generally on-line) that links exiting or retiring farmers with potential new farmers is common to all Farm Link programs. Participants register using an-online application form, one for farm owners wishing to get out of farming and one for farm seekers.

Examples of other Farm Link services that help with strategies for retiring and entering farmers:

- A comprehensive one-stop resource center

- One-on-one technical assistance and information through mentors and peer-to-peer networks

- How-to educational seminars and training workshops

- Special business start-up loans

- Websites with information about transition planning and interactive opportunities for registered farmers to share information

The National Farm Transition Network (<www.farmtransition.org>) serves as a resource for Farm Link Programs. Managed by Iowa State University's Beginning Farmer Center, the network provides a directory of Farm link programs in the U.S. and links to resource information about farm succession and hosts an annual conference.


## Increasing Demand for Locally Grown Food

*Agritourism Program*

Agritourism is an activity on a working farm, ranch, or processing facility that entertains visitors and provides income for the owner. An agritourism program provides a variety of benefits. Farmers and ranchers gain an additional source of income and greater recognition of their products, urban dwellers learn about and connect with the farms and ranches around their communities, and more tourists visit an area, thereby benefitting other businesses such as restaurants, retail stores, and hotels.

Agritourism activities often involve some type of on-farm activity, product, or entertainment. Examples include farm tours for families and school groups, u-pick operations, hands-on chores, on-farm weddings and family celebrations, horseback riding, petting zoos, hay rides, fall pumpkin festivals, paid hunting and fishing opportunities, wine tours, day camps for children, and bed-and-breakfast operations.

For such activities to work, supportive local zoning is needed (discussed in Agricultural Zoning in the Land Use-Related Tools section). Miami-Dade County, for example, recently adopted amendments to its zoning to allow agritourism-supportive activities. Examples include allowing bed and breakfast establishments; farm-related wineries, breweries, and distilleries; and a variety of permitted uses that are directly supportive of and ancillary to ongoing agriculture. A sampling of those permitted uses include farmers' markets that sell products derived directly from the area; the packing, processing, and sale of agricultural goods or products; and activities such as farm tours and meals, cooking classes, agricultural workshops, and agricultural education. Other permitted uses include the sale of farm supplies and the sale and servicing of farm machinery and implements.

### Fauquier County, Virginia, Agricultural Development Department (ADD)

**The department works to increase the economic viability of farming. Services include:**

- **A HomeGrown Program that gives consumers easy access to local fresh food and is promoted in cooperation with the county's Buy Local Program**
- **A Farm Product and Services Directory that is distributed to the public and provides farmers with free marketing and an opportunity to use the HomeGrown Program label**
- **Links to and information about opportunities for Community Supported Agriculture, Farmers' Markets, and Getaway Stops (e.g., you-pick sites, orchards, farm tours, vineyards, horseback riding, and corn mazes)**
- **A Farmland Exchange that lists available buildings, land, and hay**
- **A fall tour of farms**
- **An agricultural quick facts card**

**A voluntary Purchase of Development Rights (PDR) program (described in the Land Use-Related tools section below) is being used to protect the critical mass of farmland needed to retain the agricultural industry. Through the PDR program and donated conservation easements, the county has protected over 10,000 acres of farmland.**

*(For more information, go to <www.fauquiercounty.gov/government/departments/agdev>.)*

### The TEAM Santa Rosa Alternative Agriculture Program (AAP)

**Because agriculture is one of the largest industries in Santa Rosa County, Florida, agribusiness development and improving the profitability of farmers are a major focus of the TEAM Santa Rosa Economic Development Council. In 2005, TEAM Santa Rosa joined with other partners to initiate the AAP to identify and develop new agricultural crop and value-added products for area producers.**

**Agribusiness development activities include:**

- **Annual conferences on strategies for improving the profitability and sustainability of farming**
- **Field day events to demonstrate opportunities for growing and marketing more profitable crops**
- **The creation of the Panhandle Fresh Marketing Association (described below)**
- **A Santa Rosa County Agribusiness Baseline study every five years to monitor ag sector growth**
- **A Farmer to Vendor Handbook and model business plan coupled with free guidance from the Small Business Development Center**
- **Feasibility studies for biodiesel production and a peanut processing facility**
- **The Santa Rosa County Tourist Development Council's agribusiness program, Naturally EscaRosa, that features an interactive web-based agribusinesses list and distribution map**
- **Work with the Santa Rosa County Planning Department to develop farmland protection strategies (for example transferring development rights to areas of the county where higher densities are desired**
- **Acquisition of grants for the development of more profitable crops and the creation of a revolving loan fund to help farms transition from peanuts and cotton to specialty crops**

*(For information, go to <www.teamsantarosa.com/agri_alternative.php>.)*

State and local governments can also use tourism dollars to promote agritourism opportunities, installing wayfarer signs and producing maps and guides that direct travelers to farm businesses, and providing information about the business side of planning and managing a successful agritourism business. On-line business planning resources are available from the Agricultural Marketing Resource Center (<www.agmrc.org/commodities__products/agritourism>).

### *Community Food Enterprises*

In 2008, the Wallace Center at Winrock International and the Business Alliance for Local Living Communities issued a call for innovative examples of community food enterprises (CFE) to build the case for local ownership of food business. (A CFE is defined as the broad range of locally owned businesses involved in growing, processing, selling, and serving local food.) The CFE team selected 24 (12 in the U.S.) enterprises for case studies. The enterprises included producers, processors, grocers, restaurants, training programs and other food-related businesses.

The findings of the case studies and other information of interest, including strategies for a successful CFE, are available at the CFE website. (<www.communityfoodenterprise.org>). The study findings conclude that CFEs bring the economic advantages of local ownership, are strategic economic development tools, and can take many shapes and sizes. They are also competing effectively and going global.


*Community Supported Agriculture* **(CSA)**

The CSA approach to direct marketing is becoming more common as increasing numbers of Americans are more conscious about eating healthy food and are trying to stretch food dollars. A CSA involves a group of households who pay a farmer in advance for certain agricultural products they will receive as they are harvested. In return, the farmer either delivers the produce or the consumers pick up the produce at the farm.

The number of shares or subscriptions that a farmer offers is limited to the amount of produce that he or she can provide during the growing season. In some examples, the farmer offers other products in addition to fruits and vegetables (for example, homemade cheese or jellies, eggs, flowers, and meat). Several farmers may team up to provide additional goods.

A CSA benefits both the participating members and the farmer. Because the pledges are made prior to the growing season and are designed to cover the anticipated costs of the farm operation, a farmer has early use of the working capital, a firm price for crops, and reduced risk. Another advantage for the farmer is that marketing is done before the onset of the busy growing season. The CSA members (the consumers) benefit from the regular availability of fresh food and learning about new types of food and how food is grown. Both the farmer and members benefit from getting to know each other. Local Harvest (<www.localharvest.org/csa>) provides an on-line listing of CSAs and offers information about CSAs as well as tips for subscribers and farmers.

## Sarasota County Extension Office

**The Sarasota County Extension Office is actively engaged in supporting local farmers. It:**

- **Convenes the Sarasota Food Policy Council (a diverse group of stakeholders from the county's community foodshed sectors) to examine how the food system is operating and develop recommendations on how to expand it. The council also helps to develop agricultural policy recommendations for the county's Early Evaluation Appraisal Report and Comprehensive Plan amendments.**
- **Sponsors a Small Farm and Ranch Program that highlights food production opportunities and alternative enterprises that residents can participate in and provides assistance to experienced and beginning owners of small and mid-size properties as well as community gardens.**
- **With the Lee and Collier County Agricultural Extension Offices, convenes the Southwest Florida Small Farmers Network. Quarterly meetings at local farms provide opportunities for networking, learning, information exchange, and collaborative projects.**
- **Maintains a Local Food in Sarasota County webpage and a** *Citizen Consumer's Guide to Find Local Foods and Grow a Local Food System* **to inform consumers about locally produced foods.**
- **Supports programs that increase consumer demand for local healthy food, including a Farm-to-School program and programs that connect growers to local institutional markets, such as hospitals and restaurants.**
- **Sponsors the ReNewAbility process that facilitates local foodshed development, identifies economic opportunities for local producers, and harnesses the resources of the community to make those opportunities happen.**

*(For more information, go to <http://sarasota.extension.ufl.edu/AG/agpolicy.shtml>.)*

## *Farmers' Markets*

A farmers' market (sometimes called a green market) is a popular way for a farmer to sell products directly to local residents. To make that connection to local farmers, the Davis, California (<www.davisfarmersmarket.org>) is a producer-only market. Its market rules do not allow a middle person to buy up produce and sell it at the market.

Farmers' markets are usually held at a set time once or twice a week in a designated outdoor public space (for example, a park, central town square, a parking lot, or an indoor space). The Burlington, Vermont farmers' market (<www.burlingtonfarmersmarket.org>), for example, is located in City Hall Park in downtown Burlington.

**Collingswood Market**

*Photo Credit: www.collingswoodmarket.com*

### Collingswood Farmers' Market

**The purpose of the Collingswood (New Jersey) Farmers' Market is to bring locally farmed products to Collingswood and its surrounding communities. The market focuses on its local growers, thereby giving them the opportunity to interact with the people who eat the food they grow.**

**The market's website offers information about in-season produce and provides a list of market vendors. In addition, the market accepts WIC (Women, Infants, and Children) and Senior Farmers' Market Nutrition Program vouchers and offers gift certificates that can be used at the market. A market café allows patrons to dine and also hear local musicians.**

**Friends of the Farmers' Market, a volunteer, non-profit civic organization, provides support for the market. Its services include arranging for musicians, selling merchandise, publishing a market newsletter, and helping with special events.**

**Events include a Farm Fresh Collingswood Restaurant Week that features Collingswood by using fresh local ingredients from the Collingswood Farmers' Market, and Cooking Jersey Fresh to generate enthusiasm about preparing local foods. The highlight of Cooking Jersey Fresh is cooking demonstrations featuring some of the area's most talented chefs.**

*(For information, go to <www.collingswoodmarket.com>.)*

Many markets partner with other organizations to provide entertainment on market days. For example, the Downtown Farmers' Market of Fort Pierce (<www.ftpiercefarmersmarket.com>) teams with the Fort Pierce Jazz Society's Arts and Crafts Market. In addition to a Picnic in the Park, the Davis Farmers' Market sponsors an International Food Faire that features dinners-to-go provided by local restaurants. Two local civic clubs host the beer and wine booth that benefit local charities.

In addition to connecting farmers with customers and new sources of revenue, farmers' markets also activate downtowns, provide a public gathering place, and create economic opportunities for small businesses. In Vero Beach, the OceanSide Business Association sponsors the Farmer's Market Oceanside (<www.farmersmarketoceanside.com>) to bring potential shoppers to the Oceanside shopping district.

Farmers' markets can also go mobile – for example, a Farmers' Market on Wheels program that brings fresh produce to those who are not able to travel. They also can be located so that lower income neighborhoods have access to fresh produce as well as a community gathering place.

Greenpaths Florida (<www.greenpathsflorida.org>) and Localecopia (<www.localecopia.org>) complement one another. Greenpaths supports growing a sustainable food system for Martin, St. Lucie, and Okeechobee counties). Localecopia promotes the creation of urban farms to increase the production and consumption of local food. It is in the process of developing its first urban farm in Palm Beach County. In Florida, the DACS maintains a list of farmers' markets in the state (<www.florida-agriculture.com/consumers/farmers_markets.htm>). Several national organizations provide information on farmers' markets. They include the Farmers' Market Coalition (<www.farmersmarketcoalition.org/joinus/partners>), the Farmers' Market Online Marketplace (<www.farmersmarketonline.com>), Local Harvest (<www.localharvest.org/farmers-markets>), and the USDA (<www.ams.usda.gov/FarmersMarkets>). Project for Public Spaces (<www.pps.org>) also offers information on creating successful farmers' markets, including the publication *Diversifying Farmers' Markets: New Opportunities for Farmers, Communities and Consumers*.

### *Farm-to-School Program*


A Farm-to-School program connects schools (K-12) and local farms and foods. Features include using local products in school meals and snacks and creating curriculum and experiential learning opportunities around local foods, through school gardens, farm tours, farmer in the classroom sessions, chefs in the classroom, culinary education, educational sessions for parents and community members, and visits to farmers' markets. For students, benefits can include improved health through access to fresh healthful food and a better understanding of nutrition; for schools, healthier students and help with tight budgets through access to nearby lower cost in-season produce (no shipping required); and for farmers, ranchers, fisheries, and other food producers, a new source of income.

In Florida, the DACS provides a range of services for Farm-to-School programs. The goal is to increase the volume of locally grown products that are served in school cafeterias and dining halls and, as a result, provide a new source for farm income, help sustain farms and farmland, reduce transportation costs, and keep more food dollars in the state. The DACS maintains a website (<www.florida-agriculture.com/farmtoschool>) that provides information about the availability of fresh Florida produce, the fruit and vegetable needs of schools, and contact information for both the schools and growers. The website can be used to find participating schools and growers/producers, to join the program, to find farmers' tips on doing businesses with schools, and to ask questions. Additional information is available from (<www.farmtoschool.org>).


*Photo Credit: www.mauicounty.gov*

### *Farm-to-Table Program*

A Farm-to-Table program is another way for farmers to market their products directly to local food buyers. Potential customers could include restaurants, grocery stores, chefs, caterers, bakers, food artisans, and institutions such as hospitals, nursing homes and retirement centers, culinary programs, colleges and universities, and employers with in-house food service. Services provided by a Farm-to-Table program can include assistance with marketing to food buyers, distribution, farm-to-institution sales, and product processing.

In Virginia, the Department of Agriculture and Consumer Services, the Restaurant Association of Metropolitan Washington, and the Nation's Capital Chefs' Association help match restaurants' needs with farm output. A recent workshop brought together farmers from small, medium, and large operations, chefs, restaurateurs, and distributors to learn how to bring produce from Virginia farms to the city. Participants learned about Virginia farm products and production techniques, the needs of chefs, and the best ways to cook fresh produce.

### Maui County, Hawaii, Agricultural Program

**Because of the importance of a strong agricultural sector to the county's economy, environment, and way of life, supporting and maintaining the viability of agriculture is a focus of Maui County's Office of Economic Development (OED). That focus recognizes that the long-term viability of the island's agriculture industry is under threat from a number of challenges, including urban development pressure, the availability of affordable water for irrigation, international competition, transportation costs, and a shortage of affordable farm workers and farm worker housing.**

**To keep agriculture viable and overcome industry challenges, the OED:**

- **Promotes the agriculture industry in partnership with agricultural organizations, such as the Maui County Farm Bureau and the Maui Flower Grower Associations. As part of its buy local program, the OED partnered with the Farm Bureau's *Grown on Maui* campaign.**
- **Provided a grant to the College of Tropical Agriculture and Human Resources to conduct research, help farmers develop new products and marketing strategies, and provide opportunities for networking and education.**
- **With the Farm Bureau, sponsors an annual Agricultural Fest that features a farmers' market, educational and hands-on displays, a mini-farm, and a culinary experience put on by top Maui chefs.**
- **Serves as the management entity for the Kula Agricultural Park that promotes the development of diversified agriculture by providing appropriately sized lots at reasonable rent with long-term tenure. The 445-acre park consists of 31 farm lots ranging from 10 to 30 acres and supports 26 farmers who grow a variety of crops that include vegetables, turf grass, nursery products, flowers, bananas, and dryland taro.**

*(For more information, go to <www.mauicounty.gov/index.aspx?>.)*

*Grower Networks and Associations*

Networks and associations give farmers and ranchers a greater voice and connect them with each other, the agricultural community, and the resources they need to be sustainable and economically successful. Networks can be formed among various types of agricultural producers (organic growers, new farmers, women farmers, CSA farmers, and farmers in a particular region, for example).

Services can include:

- Educational workshops and forums to strengthen skills and fill in knowledge gaps as new technology, products, and market trends emerge
- Networking and discussion group opportunities
- A mentoring program and peer examples
- A website that profiles and links to network members and provides business information
- Joint marketing opportunities and how-to and marketing publications
- A member directory (print and/or on-line)
- A coordinated way to provide feedback to regulatory agencies on possible changes

**The Panhandle Fresh Marketing Association (PFMA)**

**PFMA was established in 2007 to assist farmers in pooling their resources and allowing them access to larger markets in the produce industry. The goal is to improve profits by adding value to farmers' products, diversifying their crop mix, and protecting their land for future generations.**

**Partners include the Team Santa Rosa Economic Development Council, IFAS, the University of West Florida's Small Business Development Center, the Santa Rosa County Extension Office, the USDA, and the Santa Rosa County Chamber of Commerce.**

**PFMA's successful partnership with Wal-Mart is an example of its work to fill the voids that farmers encounter as they transition from traditional crops (peanuts, soybeans, and cotton) to more profitable specialty crops.**

**PFMA obtained a vendor identification number to operate in 11 Wal-Mart Supercenter stores. To make the process work, PFMA matched Wal-Mart orders with producers, provided accounting and marketing services, handled receipt and payment activities, and obtained the required $3 million hold/harmless liability.**

**Future plans are to develop a distribution center that will provide one drop-off location for producers and a staging area for building and distributing orders to customers.**

*(For more information, go to <www.panhandlefresh.com>.)*

In Florida, IFAS, through its Small Farms Program (<www.smallfarms.ifas.ufl.edu>), helps with the creation of farmer networks. Two such groups are the Northeast Florida Small Farms Working Group and the Southwest Florida Small Farmers Network. In Northwest Florida, the Panhandle Fresh Marketing Association (described above) assists farmers in pooling their resources and allowing them access to larger markets in the produce industry. In 2009, IFAS joined with the Florida Department of Agriculture and Consumer Services and Florida A & M University's College of Engineering Sciences Technology and Agriculture to sponsor the first statewide Florida Small Farms Alternative Enterprises Conference.


*Photo Credit: www.panhandlefresh.com*

## Expanding Agriculture's Role in Renewable Energy Production

With Florida's extensive farm and forest acreage, the mild climate, long growing season, ample rainfall, and plenty of sunshine, the state's agriculture can play a major role in the production of renewable energy. To help grow that role and make Florida a leader in the production and distribution of renewable energy, the state legislature created the Florida Farm to Fuel® Initiative (described on the lower right).

The initiative was sparked by 25x25 (<www.25x25.org>), a national organization made up of a broad cross-section of agriculture and forestry leaders and supported by the non-partisan Energy Future Coalition (<www.energyfuturecoalition.org>). The 25x25 vision is that by 2025 America's farms, forests, and ranches will provide 25 percent of the total energy consumed in the United States, while continuing to produce safe, abundant, and affordable food, feed, and fiber.

### *Florida Bioenergy Sources*

Florida's forests and crops, agricultural wastes and residues, and other biomass offer potential new energy production markets for the state's farmers and ranchers. Sources of biomass energy (or bioenergy) include plants, trees, and agricultural crops, as well as residues from forestry and agriculture. Those residues include waste from livestock, food processing and preparation.

- Biofuel and biogas are two forms of bioenergy.
- Biodiesel and ethanol are two types of biofuel.
- Biodiesel is derived from animal fat or plant oil, such as sunflower seeds, cotton, canola, soybeans, and nuts from plants such as palms and jatropha.
- Ethanol is produced from the fermentation of grains, algae, corn, and cellulose. Sources of cellulose include wood, grasses (for example, miscanthus, elephant grass, and switch grass, which is not that common in Florida), and the non-edible parts of plants (stalks, stems, and leaves). Potential sources of ethanol feedstock, such as sugar cane, citrus by-products, and sweet sorghum, have been a focus of IFAS' research. Some of that research can be viewed at (<http://edis.ifas.ufl.edu>) and (<www.crec.ifas.ufl.edu>), the Citrus Research and Education Center in Lake Alfred.

### Florida's Farm to Fuel® Initiative

**Florida's Farm to Fuel® Initiative was approved by the Florida legislature in 2006. The goal was to promote the production and distribution of renewable energy from Florida-grown crops, agricultural wastes and residues, and other biomass, and to enhance to value of agricultural products or expand agribusiness in the state.**

**The Florida Department of Agriculture and Consumer Services was selected to conduct a statewide information and education program aimed at educating the public about the benefits of renewable energy and the use of alternative fuels. In 2006, the Department began a series of annual Farm to Fuel® summits.**

**The summits are designed to help Florida take the next steps in promoting the production, distribution, and use of renewable fuels. Participants learn about the role of agriculture and forestry in a reduced carbon economy and in producing renewable energy, thereby reducing the state's dependency on foreign oil and at the same time providing new markets for Florida farmers and ranchers. Summit PowerPoint presentations can be accessed by going to the link below.**

*(For more information, go to <www.floridafarmtofuel.com>.)*

Biogas comes from the anaerobic decomposition of biological waste. Like natural gas, biogas contains a lot of methane, which means that it can be used for heating and cooking. Biogas can come from natural sources, such as wetlands, aquatic sediments, and buried organic matter, and human created-sources, such as landfill sites, sewage sludge, and waste lagoons. It can also be produced using biogas generators or digesters that "digest" plant and animal organic matter (for example, livestock manure, residues from food processing, and plants and crops).

### *Information Resources*

Those interested in learning more about agriculture's role in renewable energy production can turn to a variety of state and national contacts.

**Florida Resource Contacts**

Information about Florida agriculture's role in renewable energy product is available from the Florida Department of Agriculture and its annual Florida Farm to Fuel® Summit (described earlier), the University of Florida, through IFAS, and the Florida Climate and Energy Commission.

### Florida Cellulosic Ethanol Facility

**Highlands County is the location of Florida's first commercial-scale cellulosic ethanol facility. The plant, a project of the Verenium Corporation and BP Cellulosic Ethanol Venture, will convert renewable grasses, rather than food crops, to fuel.**

**Through a long-term agreement with the Verenium-BP joint venture, Lykes Brothers will provide the land and farming services that will supply the biomass for conversion to biofuel. The necessary non-food feedstock will come from approximately 20,000 acres adjacent to the plant site.**

**A $7 million Farm to Fuel® grant helped make the project possible. When completed, the plant is expected to produce up to 36 million gallons of cellulosic ethanol per year and will provide an estimated 140 jobs.**

**Lykes Brothers is a multi-generational Florida agribusiness. Its 337,000-acre Lykes Ranch is an integrated cow-calf, forestry, sugar cane, and landscape operation. It is also engaged in the provision of environmental services. Lykes is one of the eight pilot ranches participating in the Florida Ranchlands Environmental Services Project (described below in Ecosystem Services Markets) and is a recipient site for gopher tortoises (a Florida threatened species).**

*(For more information, go to <www.lykesranch.com/#/operations/bioenergy>.)*

Sugar Cane

*IFAS:* The St. Lucie County Agricultural Extension Office offers information on agriculture's role in the production of biofuel. In 2009, it sponsored a biofuel workshop. Information from that workshop as well as other biofuel-related articles is available from (<www.stlucie.ifas.ufl.edu/BiofuelFeedstocks.html>). Additional information is available from IFAS (<www.edis.ifas.ufl.edu/topic_series_production_of_biofuel>) and (<www.biogas.ifas.ufl.edu/biogasdefs.htm>).

*Florida Climate and Energy Commission:* The commission, which is housed within the Executive Office of the Governor, is the primary organization for state energy and climate change programs and policies. Information about the commission is available from (<http://myfloridaclimate.com/climate_quick_links/florida_energy_climate_commission>).

Florida incentives include the Renewable Energy Technologies Grants Program that was established in 2006 by the Florida Renewable Energy Technologies and Energy Efficiency Act (Senate Bill 888) to provide matching grants for demonstration, commercialization, research, and development projects relating to renewable energy technologies. In 2008, the legislature expanded the program to include energy efficient technologies as well as renewable energy resources, including hydrogen, biomass, solar energy, geothermal energy, wind energy, ocean energy, waste heat, and hydroelectric power.

Also in 2008, the Florida legislature created an Energy Economic Zone Pilot Project to be administered by the Florida Department of Community Affairs in consultation with several other agencies, and provided for the creation of Rural Agricultural Centers, which must process and prepare for transport farm products or biomass material that could be used for the production of fuel, renewable energy, bioenergy, or alternative fuel. The centers must be located in or within 10 miles of a Rural Area of Critical Concern.

**National Resources Contacts**

Federal information contacts on renewable energy include the U.S. Department of Energy's National Renewable Energy Laboratory (<www.nrel.gov>) and the USDA. Programs within the USDA include its Economic Research Service (<www.ers.usda.gov/features/BioEnergy>) and Agricultural Library (<http://ttic.nal.usda.gov/nal_display/index.php?info_center=6&tax_level=1&tax_subject=318>).

The USDA's Farm Service Agency Administration (<www.fsa.usda.gov>) offers a Biomass Crop Assistance Program that provides financial assistance to producers or entities that deliver eligible biomass material to designated biomass conversion facilities for use as heat, power, bio-based products, or biofuels. It also offers the Flexibility Program for Bioenergy Producers that encourages the domestic production of biofuels from surplus sugar.

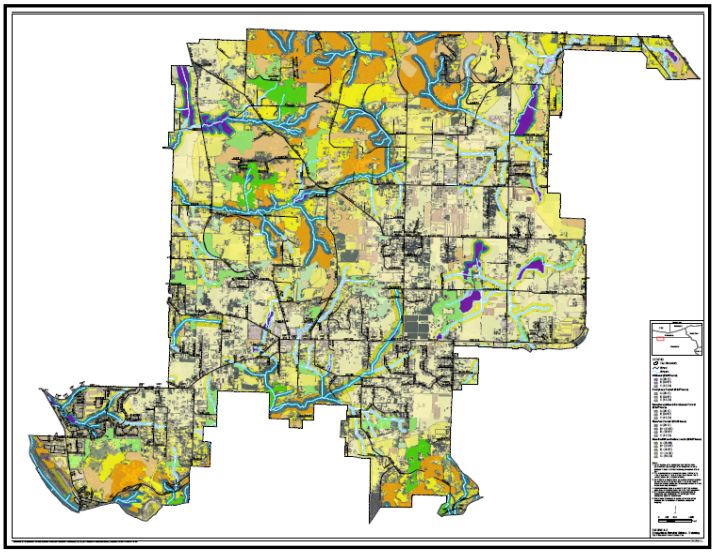
Information on agriculture's role in biofuel production is also available from the National Biodiesel Board (<www.biodieselsustainability.org>), and the Biomass Center (<www.biomasscenter.org>).

## Growing Ecosystem Services Markets for Agricultural Landscapes

Agricultural lands provide a broad range of ecosystem services that benefit the public. In an ecosystem service market, landowners are compensated financially or accrue other benefits, such as tax or regulatory relief, for the environmental actions, products, and performances that result in the desired service. When monetized, those services provide another source of revenue for farmers and ranchers, and crops and livestock are viewed as only one aspect of the benefits supplied by agriculture.

## *What Are Ecosystem Services Markets?*

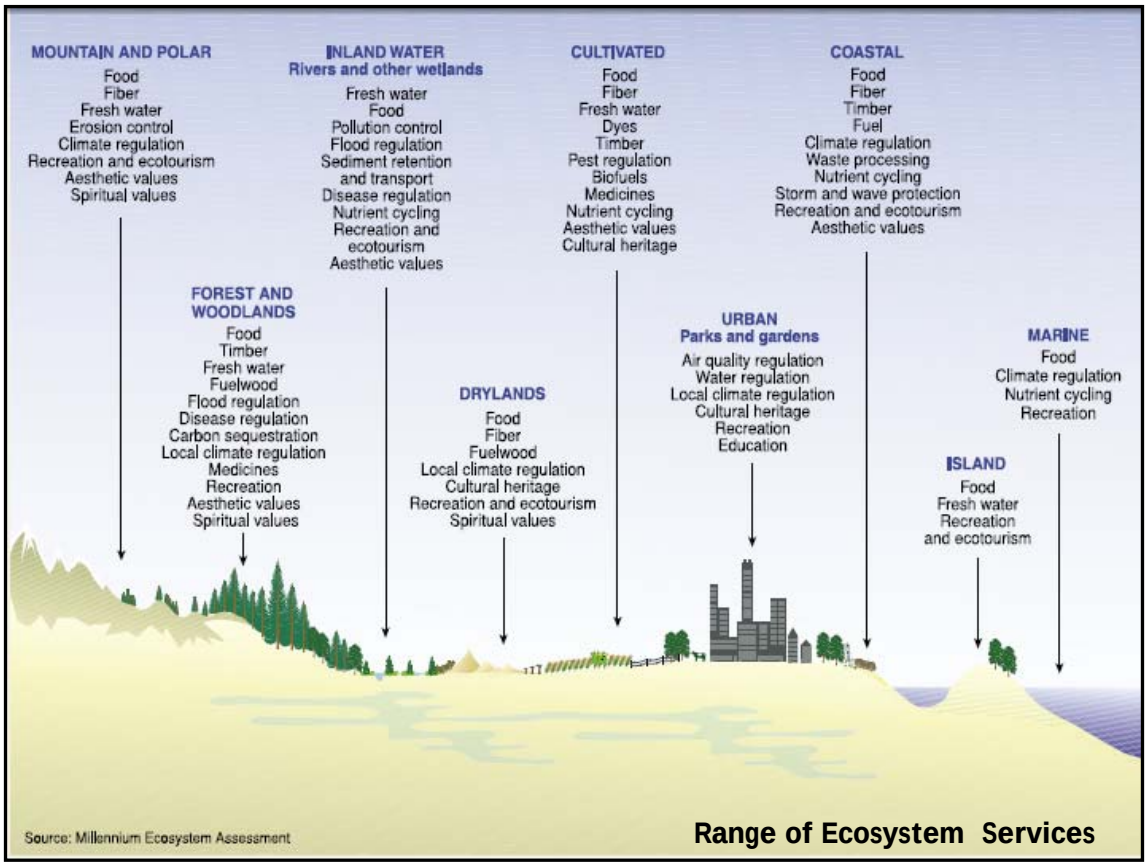
In an ecosystem service market:



*Ecosystems Services Map— Damascus, Oregon*

- The sellers are the agricultural landowners who can provide environmental services such as water storage and purification, cleaner air, wildlife habitat, and sequestration of carbon. The public benefits from those services but usually takes them for granted as being provided at no cost.

- The buyers are entities (for example, local government, a water treatment or management utility, a power plant, or a developer) that need to satisfy policy or regulatory requirements (e.g., for air emissions, water supply and quality, or habitat replacement) or to meet conservation and community character objectives or public relations goals.



In an agricultural ecosystem services market:

- Public and private sector entities requiring an environmental service (for example, storing and purifying water to prevent flooding and meet water quality standards) would first look to agricultural landowners to provide those services through conservation management practices and restoration activities. The entities benefiting from the service would use some type of payment, financing mechanism, or other incentive to compensate the landowners who provide the desired environmental service.

**Millennium Ecosystem Assessment: Four Principal Categories of Ecosystem Benefits**

- **Provisioning – food, freshwater, wood and fiber, fuel, and other goods such as medicine**
- **Regulating – climate, water, disease, and pollination**
- **Supporting – nutrient cycling and soil formation**
- **Cultural – recreation, tourism, education, and aesthetics values**

- Providing ecosystem services through conservation practices becomes a part of a farmer's or rancher's business plan. By adopting certain conservation measures (restoring wetlands, changing tilling or fertilizer practices, or altering grazing patterns, for example), and enhancing the on-farm or ranch natural systems, a landowner could provide multiple environmental benefits.

As described on the following page, New York City decided to turn to farmers and communities in the Catskill Mountains to meet U.S Environmental Protection Agency (EPA) water quality requirements. As a result, the city:

- Cleaned up its water supply for 80 percent less than the original estimate by avoiding the multi-billion dollar cost for a new filtration plant and helped keep farmland protected from future development.

- Preserved just under 17,000 acres of farmland (90 farms) through conservation easements.

**The Millennium Ecosystem Assessment (MA)**

**Initiated in 2001 at the request of the United Nations, the MA's objective is to assess the consequences of ecosystem change for human well-being. Its findings are contained in a series of technical reports that provide a scientific appraisal of the conditions and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve, or enhance the sustainable use of ecosystems.**

*(For more information, go to <www.millenniumassessment.org>.)*

- Reduced or avoided the flow of agricultural runoff into farm streams through Whole Farm Plans. Some 95 percent of all large farms have a Whole Farm Plan in place.

The New York City agreement highlights the public-private win-win that can be created by turning to agricultural landowners to provide needed ecosystem services and benefits.

**Public Benefits:** Public benefits from an ecosystem services market approach include:

- A healthier environment because of the multiple benefits that occur from conservation practices that produce ecosystem services (for example, restoring wetlands to store water also creates habitat for fish and wildlife).
- Environmental services provided at a lower public cost, thus stretching already limited public dollars. (Environmental services can usually be provided by natural ecosystems at lower financial and environmental impact costs than man-made systems.)
- More expedient solutions to environmental problems because of the lower cost.

The potential to reduce a reliance on public funding for conservation because of market-based payments for conservation and enhancement.

**Farmers and Ranchers:** Agricultural landowners also receive multiple benefits, including:

- A new set of publicly valued products to "grow" on the land. A by-product of those new environmental products is a greater connection to agricultural lands for the broader community.


New York City Watershed

## New York City Watershed Agreement

**The EPA's Surface Water Treatment rules sparked New York City's eight-county watershed approach that avoided the need for a multi-billion dollar filtration facility to address increasing concerns about water contamination from nonpoint sources. In the late 1980s the facility was estimated to cost $4 to $6 billion to build and approximately $250 million annually to operate.**

**In 1993, the EPA issued a waiver of the filtration requirement on the condition that the city take steps to maintain and protect the water quality of the Catskill/Delaware reservoir (the primary source of the city's drinking water). To get started, a multi-stakeholder group was convened to negotiate a watershed program to protect the city's water supply while avoiding the multi-billion dollar costs of the filtration plant.**

**In 1997 all the parties signed a Memorandum of Agreement (MOA) and the city began to invest in preserving the rural upstream Catskill environment where the pollution problems were occurring. Watershed strategies include:**

- **A land acquisition program to acquire fee title or conservation easements from willing sellers in water quality sensitive areas.**
- **A partnership program that involves the voluntary participation of farmers in the development and implementation of Whole Farm plans that put in place practices to protect water quality while maintaining farming as a preferred land use in the watershed. Farmers receive free assistance to prepare a plan; once it is completed, they are eligible to receive grant funds to help implement the plan and sell a conservation easement.**
- **Good neighbor payments to the participating watershed municipalities.**

**The city paralleled the watershed initiative with significant reductions in water consumption.**

*(For more information, go to <http://cfpub.epa.gov/safewater/sourcewater/sourcewater.cfm?action=Case_Studies&view=specificre> and <www.nyc.gov/html/dep/html/watershed_protection>.)*

### City of Damascus, Oregon, Ecosystems Approach to Public Facilities Planning

**The City of Damascus's Public Facilities Plan (an element of its Comprehensive Plan) incorporates an ecosystem services approach to the provision of public facilities. That approach will provide for property equity and avoid future infrastructure costs by protecting natural systems and the services they provide that benefit the public.**

**With the support of a grant from Oregon's Department of Land Conservation and Development, the city is looking at the demand for public services as well as identifying demand reduction policies that would conserve resources and reduce costs – an analysis that includes an assessment of the city's ecosystem services.**

**Ecosystem services are described as the benefits that the city's forested and undeveloped lands provide, such as clean water, clean air, reduced stormwater flows, and flood control. While those services are not usually quantified or valued, their loss would typically result in higher city facility and regulatory costs. To correct that problem the city is developing a three-tier GIS model to assess the values that ecosystem services provide. The model moves from the Tier 1 landscape level (used to develop the Public Facilities Plan) to the more detailed Tier 2 and Tier 3 site specific levels.**

**The Tier I database of ecosystem services values by land parcel and a wall map (shown above) that depicts the range of values by ecosystem type will help guide policy decisions. Tier development relied on data from the county's Natural Features Inventory and the county. The more detailed Tier 2 and 3 data will be developed in partnership with landowners, developers, and other agencies as the need arises.**

**Next steps include developing an implementation program with a refined analysis of the Tier 1 evaluation that incorporates values for wildlife habitat and water quality, public facilities (stormwater, wastewater, drinking water, parks, trails, and sustainable communities) and identifying a pilot project to test and refine the program.**

*(For more information, go to <www.ci.damascus.or.us/departmentscommunitydevelopmentdraftcompplanmapinformationandmap.aspx>.)*

- A new source of income, important to often cash-strapped agricultural operations. In an ecosystems services market, a portion of an agricultural landowner's income would come from providing environmental services that benefit the broader community.

- The ability to receive value for conservation practices that traditionally have been viewed by the public as being provided at no cost.

- An opportunity to keep land in agricultural uses because farming and ranching become more profitable by combining revenue from the production of ecosystem services with that from traditional food and fiber products.

Features to think about when considering an ecosystem services strategy are outlined below. They represent ideas from resource organizations such as the:

- Agricultural Development Economics Division of the Food and Agricultural Organization of the United Nations (<www.fao.org/ES/esa/pesal/AgRole.html>)

- American Farmland Trust (<www.farmland.org>)

- Ecosystem Marketplace (<www.ecosystemmarketplace.com>)

- World Wildlife Fund (<www.worldwildlife.org/pes>)

### *The New Ecosystem Services Currency: How It Works*

In an ecosystem services market, a landowner receives some type of financial reward or benefit for providing environmental services through conservation practices. That income or cost reduction – often called a payment for environmental or ecosystem services (PES) – becomes part of a farmer's or rancher's business plan.

In its work to identify new and innovative private landowner conservation incentives (described to the right, a Florida Fish and Wildlife Commission-convened working group on land-related incentives concluded that looking to landowners to provide ecosystem services could serve as a meaningful incentive to conserve priority land. To make the approach work, the group agreed that state, regional, and local land use and public facilities and services planning processes will need to recognize and identify ecosystem services and the conservation management strategies that would result in the sustained provision and improvement of those services.

In Florida, a Regional Planning Council's Strategic Regional Policy Plan and a local government's Long Range Land Use Plan and Public Services and Capital Improvement Plan would recognize, systematically identify and assess, and contain strategies to protect and enhance the areas providing the needed ecosystem services and benefits.

Ecosystem services buyers and sources of funding can come from public, private, or a combination of sources.

**The Cooperative Conservation Blueprint Working Groups on Private Landowner Conservation Incentives**

**In 2008 and 2009, the Florida Fish and Wildlife Conservation Commission (FWC) and the Century Commission for a Sustainable Florida convened three statewide working groups to identify new or innovative private landowner conservation incentives in the areas of land, water, and carbon markets. Participants came from different parts of the state, had varied areas of expertise, and represented a wide variety of views.**

**The working groups focused on incentives ideas that were voluntary, non-regulatory, market- or public-private partnership-based and would result in having important conservation land viewed as an asset. Several important themes have emerged from the working groups' investigations.**

- **Now is the time to put meaningful private landowner conservation incentives in place while development pressures are down, significant natural areas are intact, and large parcels are still in single ownership.**
- **Understanding ownership, uses, and intentions on priority lands is important. To produce the added value needed to make conservation work and to augment state acquisition funds, landowners will require a broad set of options that can be tailored to their individual needs and used in combination. Different incentives will be needed for various types of land ownership, uses, geographic areas, and planning timelines.**

**The three working groups also came to the common conclusion that incentives for providing ecosystem services (greenhouse gas reduction, renewable energy production, clean air, native biodiversity, and clean, abundant, and reliable water, for example) should be an important part of the financial incentive mix.**

**The incentive focus is a component of the FWC's Cooperative Conservation Blueprint process to create a vision of what Florida would look like by incorporating wildlife habitat needs as well as social and economic priorities. The Blueprint builds on the Century Commission's Critical Land and Waters Identification Project (CLIP), which shows the state's critical environmental resources in a database that can be used as a decision-support tool for collaborative statewide and regional conservation and land use planning.**

*(For more information, go to <http://myfwc.com/WildlifeHabitats/Legacy_CCB.htm>.)*

## The Florida Ranchlands Environmental Service Project (FRESP)

**Launched in 2005, FRESP is a five-year pilot project to design and field test a Payment for Ecosystem Services (PES) program in which state agencies (the buyers) would pay participating ranchers (the sellers) for the documented provision of water-related environmental services that will help address water quantity and quality problems facing Lake Okeechobee and the Northern Everglades region. The goal of FRESP is to design a program that is cost effective for government, feasible to administer, and profitable for ranchers. The program would also reduce the nutrient loads going into Lake Okeechobee and alter the quantity, phasing, and timing of rainfall reaching the lake.**

**The PES program that FRESP is developing will include competitive, fixed-term contracts that specify payments for documented water-related environmental services. State agencies would request proposals from landowners. The proposed water management projects would be selected based on the best opportunity for providing the desired service outcomes. Because of the unpredictable and variable nature of rainfall, payment will be based on verification that the landowners met contract provisions consistent with that year's rainfall.**

**Monitoring equipment installed at each of the eight volunteer participating ranches is designed to field test feasible and credible (to agency-buyers and rancher-sellers) methods for documenting the environmental services provided. The demonstration projects vary in type and include rehydrating drained wetlands, raising the height of the water table in the ranch soil profile and drainage network, and pumping water from a nearby public canal through existing ranch wetlands and back into the public canal.**

**In addition to the eight ranches, FRESP members include the Florida Department of Agriculture and Consumer Services, the South Florida Water Management District, the Florida Department of Environmental Protection, the USDA Natural Resource Conservation Service, the World Wildlife Fund, and research scientists from the University of Florida IFAS and the MacArthur Agro-Ecology Research Center. The FRESP team is looking to the future when the program can be scaled-up in the Northern Everglades to include more ranchers.**

*(For more information, go to <www.archbold-station.org/abs/maerc/MAERC%20docs/FL%20Enviro%20Ser%20Project> or <www.worldwildlife.org/what/globalmarkets/agriculture/FRESP.html>.)*


*Photo Credit: G. Hendricks, USDA NRCS*

**Public:** A public buyer is usually a local, regional, state, or federal governmental entity that is seeking a service desired by its constituents or necessary to comply with the requirements of an environmental regulation or policy (to improve water quality, for example). A government agency would offer a cash payment or tax/regulatory benefit to landowners who agree to engage in conservation practices that provide the needed services. The USDA's Wetland Reserve Program, administered by the Natural Resources Conservation Service (NRCS), is an example of a direct payment. In Florida, some 60 ranchers have enrolled approximately 200,000 acres in the program, resulting in public offsite benefits.

Another example is the South Florida Water Management District's (SFWMD) decision to look at three approaches to its Northern Everglades and Estuaries Dispersed Water Storage and Treatment Program: cost-sharing, acquisition of easements, and payment for water storage and treatment services. Issues to be resolved before moving to implementation include how to comply with the requirements for threatened and endangered species, wetland expansion, and pricing and activities over and beyond existing requirements for Best Management Practices.

**Private:** A private sector buyer can be a business that is required by regulations or public policy to mitigate or offset environmental impacts or that, for reasons of corporate value, chooses to mitigate or offset impacts. The company would purchase some type of ecosystem service credit (to offset carbon emissions for example) or make a direct payment to the landowner providing the service (for example, a water bottling company that pays upstream farmers to follow sound management practices).

Non-profit organizations (a land trust or environmental organization, for example) are another potential buyer of ecosystem services, such as biodiversity. Funding can also come through a market-based trading system that determines a value for the service and establishes a structure to buy and sell those services in the form of credits. A trading market can be voluntary or regulated.

- The Chicago Climate Exchange is an example of a voluntary greenhouse gas emission reduction and trading system. It is a membership-based cap-and-trade system. Members join voluntarily and sign up for its legally-binding reductions policy. Emissions reductions requirements vary by membership category.

- In a cap and trade system, a governmental entity places a cap on the amount of environmental impact that is allowed in a specified geographic area. Any emissions or impacts (for example, air emissions, habitat destruction, or water pollution discharge) above that level must be offset through mitigation or by purchasing credits from another source. The net result must not exceed the mandated cap.

### State of Oregon Ecosystem Services Legislation

**In 2009 the State of Oregon enacted legislation defining and recognizing the importance of ecosystem services and markets as a way to help landowners diversify their income, improve the ecological functions of their land, and pass their land and its associated benefits to future generations. The bill defines:**

- **Ecosystem services as the benefits, such as clean air, clean and abundant water, and fish and wildlife habitat and other values, that are generally considered public goods and that human communities enjoy as a result of natural processes and biological diversity.**

- **Ecosystem services markets as a system through which providers of ecosystem services can access financing to protect, restore, and maintain ecological values. Payment for ecosystem services is defined as arrangements through which the beneficiaries of ecosystem services pay back the providers of those services.**

**The bill encourages state agencies to support the maintenance, restoration, and enhancement of ecosystem services and use ecosystem services markets as a way to meet mitigation needs. Mitigation strategies should recognize the need for biological connectivity and landscape-scale restoration rather than giving an automatic preference for on-site, in-kind mitigation.**

**The bill also created an ecosystem services markets working group. By January 2010, the group is to:**

- **Study and propose goals to guide the development of integrated ecosystem services markets in the state that are efficient, coordinated, and designed to produce positive ecological and economic outcomes with reasonable administrative costs to all participants.**

- **Address the need for a consistent methodology to describe and quantify ecological values.**

- **Make recommendations concerning the development of appropriate ecological evaluation and accounting systems.**

- **Identify the most appropriate entities to guide and implement an ecosystem services market in the state and consider the appropriate role of government.**

*(For more information, go to <www.deq.state.or.us/regulations/legbills/proposedLegislation.htm>.)*

Private sources of funding are emerging to participate in ecosystem services markets. For example, the Eco-Products Fund, a $100 million private equity fund, will be jointly managed by Equator Environmental LLC and New Forests Inc. The fund is being used to make investments in and monetize the value of wetlands mitigation, endangered species conservation, carbon sequestration, water quality, and other ecosystem-based projects.

The Ecosystem Marketplace, a project of Forest Trends, is a source of information about markets and payments for ecosystem services. Its services include a marketwatch web page that provides links to current ecosystem services market information and bids and lists carbon, water, and biodiversity buyers.


### *Important Start-Up Steps to Consider*

Ecosystem services markets are just now emerging and are the subject of a broad range of research and pilot projects. One such pilot (the FRESP initiative described earlier) is being staged in the Lake Okeechobee watershed. Although every project will have its own unique features, the experiences to date suggest a number of important considerations to keep in mind when designing a project that involves paying agricultural landowners for providing ecosystem services. Some of those considerations are listed below. The list is intended to highlight features that might need to be considered in an ecosystem services approach; it is not meant to serve as a how-to guide.

**Balance of Supply and Demand:** As in any successful market, the demand for the ecosystem services should be in place with sufficient funding to pay a landowner to engage in the proven conservation management practices that will provide the desired results.

**Site Potential:** An early step in the process is to inventory and assess the potential of a site or area to provide ecosystem services. Typically areas are targeted that have the greatest potential to provide the desired ecosystem services. Site information should include quantifiable baseline documentation.

**Beneficiaries:** Another early step involves identifying and reaching out to current and potential future beneficiaries of the targeted services. Beneficiaries can be those who gain directly from a service and those who might indirectly benefit. Outreach to beneficiaries can include providing information on the cost and environmental benefits of investing in ecosystem service solutions.

**Intent, Rules, and Roles:** As with any planning process, agreement among participants on clear, measurable, fair, and realistic goals, objectives, and policies is critical. Also important is agreeing to clearly defined roles, responsibilities, and procedures.

### The Willamette Partnership

**The Willamette Partnership was founded in 2004 to develop market-based tools that can combine with regulatory controls to deliver broad conservation benefits at lower costs and with reduced conflict in the Willamette River Basin. It builds on the earlier work of a Willamette Basin Task Force to develop mechanisms for the protection and restoration of the Willamette River Basin.**

**The Partnership is focusing on three core areas: developing an integrated and strategic investment in ecosystems, a business model to move beyond compliance-based projects to stewardship of ecosystems, and a fair, trusted, and transparent system for people to buy and sell environmental restoration benefits.**

**In November 2008, the Partnership initiated its two-year Counting on the Environment Program to:**

- **Obtain Oregon's first multi-stakeholder agreement to use a shared accounting system for quantifying impacts and benefits to ecosystem services for application to ecosystem markets.**
- **Lead pilot projects that demonstrate the environmental benefits of the Partnership's functions-based accounting system and compare its results with those of other approaches.**
- **Develop the tools that farmers, foresters, and other land managers need to evaluate and participate in four emerging ecosystem service markets (water quality improvements, wetland restoration, habitat conservation, and carbon sequestration).**

**The work of the Partnership was enabled through grants from the U.S. Environmental Protection Agency's Watershed Grant Program and the USDA's Natural Resources Conservation Service's Conservation Innovations grant program. It is currently pilot testing an Ecosystem Credit Accounting system of protocols, tools, and resources that allow buyers and sellers to trade in various types of ecosystem credits.**

*(For more information, go to <www.willamettepartnership.org>.)*

**Policy and Regulatory Framework:** An ecosystem service project benefits from a supportive, predictable policy and regulatory framework that will:

- Facilitate the process and accommodate unforeseen events.
- Create a market (a demand) for the ecosystem services through, for example, the development of voluntary or regulatory markets.
- Reward landowners for conservation practices that provide the services.

## USDA Ecosystem Services Resources

**The USDA is an active player in facilitating the participation of agricultural landowners in ecosystem services markets.**

**The 2008 Farm Bill called for creation of a new USDA Office of Ecosystem Services and Markets (<www.fs.fed.us/ecosystemservices/Farm_Bill/index.shtml>). It also established a federal government-wide Conservation and Land Management Environmental Services Board that will assist the Secretary of Agriculture in adopting technical guidelines to assess ecosystem services provided by conservation and land management activities.**

**The guidelines will focus on scientifically rigorous and economically sound methods for quantifying carbon, air and water quality, wetlands, and endangered species benefits. The goal is to encourage the participation of farmers, ranchers, and forest landowners in ecosystem markets.**

**The USDA has also partnered with the EPA to offer a new program called the Agriculture and Food Research Initiative - Enhancing Ecosystem Services from Agricultural Lands: Management, Quantification, and Developing Decision Support Tools. One of the first grant recipients was a collaborative Florida team from the Archbold Biological Station, the University of Central Florida, and the University of Florida. The title of the award is Assessing Trade-Offs among Ecosystem Services in a Payment-for-Water Services Program on Florida Ranchlands.**

**The grant program supports research on ecosystem services in agricultural settings, including both agricultural ecosystems and ecosystems that are impacted by agriculture. The goal is to quantify those services, identify risks from various ecosystem stressors, and develop strategies to reduce negative environmental impacts while enhancing ecosystem services provided by working lands. Initial applications, which are submitted to EPA, were due in February 2009 (<www.nifa.usda.gov/fo/enhancingecosystemservicesafri.cfm>).**

**EPA's Office of Research and Development also has an Ecosystem Services Research Program to advance ecosystem services research (<www.epa.gov/ecology>).**

That framework could be one that already exists, such as wetland mitigation banking, or one that could be developed in the future, such as a climate cap-and-trade program.

**Partnership Team:** Because of the complex, interdisciplinary, and multiple agency nature of most ecosystem services projects, a collaborative partnership approach creates a strong leadership team to oversee the project. New partners may be added at different stages. In some projects, an intermediary can oversee and shepherd the process from the beginning design stages through implementation and ongoing monitoring and course correction as needed. The intermediary could also serve as a liaison between the seller(s) and buyer(s). The intermediary can be a single organization, for example, or a committee of all the main organizations involved in and responsible for the project.

**Valuation System:** The way the ecosystem services are valued is a critical part of any ecosystem services project. A valuation system needs to be transparent and should use a generally accepted and recognized method that quantifies the economic benefits of the services to the public, along with potential risks. It should also be practical to use and affordable. Some valuation systems take into consideration the replacement cost of the service (the cost to be born by the public if the services were lost and needed to be replaced with human-designed and engineered systems).

**Ongoing Monitoring and Verification:** Monitoring and verifying the results of an ecosystem services project is critical for long-term success. Beneficiaries need to see that their investment is achieving the desired result. Therefore, measurable performance standards and transparent documentation are important. Continuous monitoring can also be used to identify needed changes in conservation management practices. In FRESP, monitoring equipment was installed at each participating ranch to test cost-effective methods for measuring and documenting the environmental services provided.

**Incentives:** Identifying the most appropriate incentives is generally very collaborative and involves working with agricultural landowners. The goal is to find the suite of incentives that would prompt landowners to conserve and improve the natural resources that provide the needed ecosystem service. Incentives could include direct payments, tax incentives, and other approaches such as the sale of development rights. Landowner service providers should be able to layer or bundle incentives for ecosystem services – i.e., produce and sell credits from the same land parcel and management practices which would require coordination among buyer agencies (store water, reduce phosphorous, sequester carbon, and restore habitat, for example).

**Predictability:** A level of certainty is important in ecosystem services markets. Service sellers need certainty that the incentives will be forthcoming and service buyers need a comfort level that the credits will be there in the future. Both sellers and buyers need to know that the rules will not change in mid-stream (similar to the U.S. Fish and Wildlife Service's Safe Harbor Agreements, described more below, that provide participating landowners with assurances that no additional restrictions will be imposed as a result of their conservation actions).

**Application-Agreement Process:** A cumbersome and costly application process can be a barrier to landowner participation. Ways to reduce the cost of entry include some type of pre-qualification, clear criteria for participation, and a simpler, more streamlined application process. Technical assistance in completing the applications is another way to reduce entry costs. To avoid the pitfall of high application costs, FRESP collaborators have been working with federal and state regulatory agencies to simplify the application process.

**Public Education and Decision-Making:** Because ecosystem services markets are relatively new, educating landowners, elected officials, and the public about the potential benefits is critical. Also important are a framework and methodology that 1) help decision-makers understand how their goals and actions could directly or indirectly impact the ecosystem services that they depend on and 2) enable them to evaluate the trade-offs of providing necessary public services.

### *A Sampling of Ecosystem Services Markets*

To date, most ecosystem services initiatives have focused on three topic areas: carbon sequestration, incentive-based conservation, and water management.

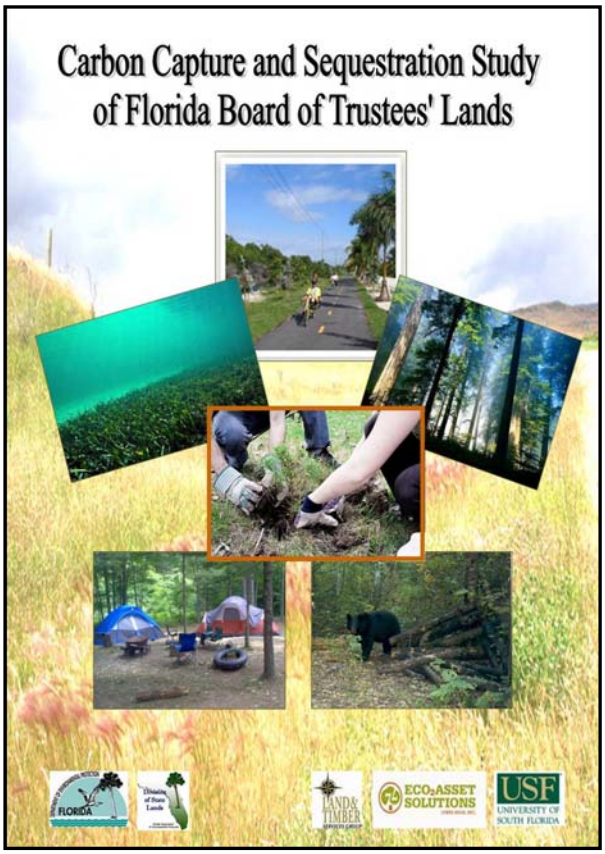



*Photo Credit: www.dep.state.fl.us*

**Carbon Sequestration**: Agricultural landowners can play an important role in Florida's climate and energy future. The state's soils, trees, and vegetation store large amounts of carbon, and reducing greenhouse gas emissions is a priority for the state.

In 2007 Governor Charlie Crist signed three Executive Orders aimed at addressing global climate change, reducing greenhouse gases, and increasing the state's energy efficiency. He also executed the multi-state compact for the national Climate Registry, which will enable Florida to sit at the table with other leading states in crafting emission reporting guidelines for industry.

In 2008 and 2009 those goals were furthered through a series of legislative actions that included the establishment of the Florida Energy and Climate Commission, an Energy Economic Zone Pilot Program, and new local planning requirements related to energy efficiency and greenhouse gas reduction.

Those actions recognized that Florida is uniquely vulnerable to the most severe impacts of climate change. The state is edged by 8,400 miles of low-lying tidal coastline and surrounded by hurricane-prone waters on three sides. Some 80 percent of residents live in coastal areas, and entire ecosystems could be at risk from sea level rise and more extreme weather events.

The important role of agriculture was underscored by Dr. Stephen Mulkey and his University of Florida co-authors of the April 2008 report, *Opportunities for Greenhouse Gas Reduction through Forestry and Agriculture in Florida* (<www.snre.ufl.edu/research/greenhouse.htm>): "Florida has the opportunity to help structure emerging carbon markets because it is uniquely endowed to participate through forestry and agriculture. The opportunities for forest management, afforestation, biofuels production, and soil carbon sequestration are greater in Florida than in most other regions of the U.S., giving Florida an advantage in carbon markets."

A recent report by the Pew Charitable Trusts, *Agriculture's Role in Greenhouse Gas Mitigation* (<www.pewtrusts.org/our_work_report_detail.aspx?id=20396&category=350>), also discusses the potential of agriculture in climate change mitigation. Sequestering carbon and producing biofuels could become a source of new income for farmers and ranchers and reduce their costs, the report concluded. To make that happen, agricultural producers will need access to financing, and changes must be made to economic technologies, economies, and policies.

In a carbon market, farmers and ranchers would be paid for management techniques that would reduce and prevent the amount of carbon dioxide in the atmosphere. Those techniques could include:

- Planting grasses. In Florida, the warmer climate supports grasses that sequester more carbon than temperate grasses. Grasslands could potentially be used in rotation with crops.

- Switching from plowing to no-till or conservation tillage techniques that leave the soil largely undisturbed and trap carbon in the ground instead of releasing it in the atmosphere. Florida soil is very high in carbon content, so it is important to protect the carbon in the soils and increase the capacity to sequester more carbon.

- Increasing the amount of forested land area through reforestation and afforestation (planting trees on land not currently in forest use) and following tree management practices to reduce carbon emissions (longer tree rotations, for example).

Other approaches could include changing the way manure is managed in order to reduce the amount of methane created, creating a waste-to-fuel market, and changing fertilizer practices (for example, nitrogen emissions can be reduced by changing the timing or type of fertilizer applied or better matching the application amounts to those that plants can absorb using new precision farming technologies). Fertilizer can be used to increase the soil carbon sequestration by increasing plant growth.

### Carbon Capture and Sequestration Study

**In response to Florida 2008 SB 542, the Florida Department of Environmental Protection (DEP) commissioned a study to examine the value of potential carbon offset projects on Board of Trustees-owned or co-owned conservation lands. State conservation lands are those acquired under Preservation 2000 and Florida Forever and total some 4.7 million acres.**

**The results of the study are contained in** *Carbon Sequestration and Sequestration Study of Board of Trustees' Lands***, which was produced for DEP by EcoAsset Solutions (<www.ecoassetsolutions.com>), a subsidiary of Lykes Bros. Inc. The report concluded that:**

- **The state's conservation lands are a net carbon sink. They reduce or seclude approximately two million Metric Tonne Carbon Dioxide Equivalent ($MtCO_2e$) annually and have potential offset opportunities in carbon markets.**

- **More scientific research is needed, and it should focus particularly on soil carbon, fire, and aquatic systems and filling in data gaps.**

**Carbon offset projects, the report noted, provide a variety of values:**

- **Environmental – reduced GHG emissions and improved air and water quality and wildlife habitat**

- **Social – better quality of life, and improved health, state pride, and leadership**

- **Economic – potential revenue streams, green jobs, and attraction of new businesses and residents**

*(For more information on the DEP study, go to <www.dep.state.fl.us/lands/files/carbon_sequestration.pdf>.)*

To qualify as a carbon offset, the offset amount must be in addition to the amount of carbon captured or stored under current practices (called additionality), as documented by baseline data. The offset amount must take leakage into account and provide for the potential risk that the offset will be reversed (because of a forest fire, for example). Other features of an offset program are third party verification and monitoring throughout the life of a project to quantify the amounts of benefit actually achieved and ensure that all additionality, measurement, leakage, and permanence requirements are being met.

### Pilot Carbon Sequestration Projects

**Florida has been the focus of a number of initiatives to understand the state's carbon sequestration capacity. Examples include:**

*A pilot carbon sequestration project of the Florida Forestry Association (FFA) and the nonprofit Environmental Defense Fund.* **Begun in 2007, the pilot is using a privately-owned 16,000-acre flatwood forest tract in Dixie County to develop a framework for paying landowners for growing trees and sequestering carbon that can be sold as carbon credits. With the assistance of Natural Resources Planning Services, FFA is examining optimal timber harvest management and rotation regimens that would be profitable in a carbon market and maximize carbon sequestration capacity.**

*A Florida Farm Bureau project with the AgraGate Climate Credits Corporation.* **Carbon credits can be accumulated through no or minimally tilled crops and converting row crops to seeded grass. The land must remain in continuous no-till, strip-till, or grass for five years. Afforestation (planting trees on land not currently in forest use) and established or replanted forests that are managed for carbon sequestration are other ways to accumulate carbon credits. Both forestry contracts are for 15 years. AgraGate has approximately 90,000 acres in Florida under 15-year commitments.**

*(For more information, go to <www.floridaforest.org/managing_your_forest.php>, <www.floridafarmbureau.org/carbontrading>, and <www.agragate.com>.)*

Without a mandatory limit on carbon emissions (which would happen under cap-and-trade legislation), the trading of carbon in Florida has been voluntary and conducted through private party markets such as the Chicago Climate Exchange (<www.chicagoclimatex.com>). To date, carbon market prices have been volatile, varying from less than $0.50 per ton to more than $7 per ton, depending on what commitments are being sold. (The higher priced tons usually have commitments to keep the carbon sequestered for much longer periods of time and require that the sequestration would not have happened except for the offset project.) A commonly held view is that a yield of $6.00 to $7.00 per ton is needed in order to be profitable and worthwhile.

Other mechanisms for carbon trading include the Voluntary Carbon Standard (<www.v-c-s.org>), Gold Standard (<www.cdmgoldstandard.org>), the Climate Registry (<www.theclimateregistry.org>), and the Climate, Community and Biodiversity Standard (<www.climate-standards.org>). The latter includes interests ranging from the Nature Conservancy and Conservation International to Weyerhaeuser and BP that have developed voluntary standards to help design and identify land management activities that simultaneously minimize climate change, support sustainable development, and conserve biodiversity. The University of Florida Carbon Resources Science Center (<www.carboncenter.ifas.ufl.edu>) offers useful information on carbon market research.

**Incentive-Based Conservation:** Incentive-based conservation (<http://myfwc.com/Conservation/Conserv_Progs_Spp_Conserv_incentivebasedconservation.htm>) is used by the Florida Fish and Wildlife Conservation Commission (FWC) to encourage voluntary, non-regulatory approaches to conservation by offering financial incentives to private landowners to conserve and manage for imperiled species and wildlife habitat; those activities must be compatible with agriculture and silviculture. The intent is to promote good stewardship on private lands, which not only conserves at-risk wildlife and habitats but also protects their larger natural ecosystems.

Conservation mitigation banking is an incentive-based tool frequently used to promote the creation and sale of credits when wetlands or certain species are negatively impacted by development or other damaging actions. The income from conservation mitigation banking can be incorporated in the business plans of farmers or ranchers.

The process is like a biodiversity cap-and-trade system as it allows for the sale and purchase of endangered species credits, for example, to offset negative impacts in a different location. Conservation banking is enabled by the Endangered Species Act (ESA) of 1973. The U.S. Fish and Wildlife Service (USFWS) the principal agency that administers the ESA with respect to terrestrial and freshwater species, oversees and provides federal guidance for conservation banks.

In a conservation bank, the credits are established for protecting listed species on a site. The land protected can include one or more parcels. A Conservation Banking Agreement is used to place the property into a permanent conservation easement. The agreement includes a science-based species and habitat management and maintenance plan and requires third party oversight, usually by a non-profit organization or government agency. A portion of the payment for the credits is invested by the bank for continuing management of the site to benefit imperiled species. To sell a credit, the bank must be able to show that the species are being conserved.

### Florida Panther Conservation Bank

**As depicted in the image above, the Florida Panther Conservation Bank (<http://pantherconservation.com>) is using a combination of large-scale planning and restoration to preserve and protect large contiguous and strategically placed tracts of land essential for the continued survival of the Florida panther and other federal and state listed threatened and endangered species. The 1,930-acre site is located in Hendry County.**

**Purchasing conservation credits (called Panther Habitat Units or PHU) from a certified and approved conservation bank is one way to mitigate the impact of a project on Florida panther habitat. The USFWS must approve the credits; that process is carried out through a conservation bank agreement. Allowed uses must be non-intensive, such as cattle grazing and recreational.**

**Several actions are required before the conservation credits are earned and released for sale: recording a conservation easement; completing the initial restoration, monitoring, and reporting; and establishing an interim management account to fund five years of operation and maintenance expenses.**

**The creation of a perpetual trust account is also required. The interest earned by the trust pays for perpetual care and maintenance of the land for the benefit of the panther and other protected species. The end result is that the land is preserved and protected in perpetuity without taxpayer support.**

**Two other USFWS-approved banks are the 151-acre Scrub Conservation Bank in Highlands County established in 2008 for Florida scrub jays and the recently established 4,000-acre Panther Passage Conservation Bank for the Florida Panther in Hendry County.**

**Panther Conservation Bank**

*Photo Credits: Mike Myers*

In exchange for permanently protecting the banked lands, the bank sells habitat credits to developers, landowners, and government agencies that need to compensate for the environmental impacts of a project. The credits can be for internal mitigation, sale to others, or both. The area in which the bank may sell credits (called a service area) is defined by the bank and the USFWS. The boundaries are usually based on physical and ecological attributes such as a watershed or the distribution of a species.

A bank may have more than one service area for different types of credit buyers. Buyers could be a government agency, a nonprofit organization, a landowner, or a private business. In addition to banks selling the credits, private landowners and companies specializing in mitigation bank creation are becoming involved in the market.

The conservation bank approach creates a win-win for the seller, buyer, and the public:

- The landowner/seller benefits from the income and, in some instances, reduced taxes for conserving his or her land and the ability to keep large tracts of land together.

- The buyer benefits from the ability to make a one-time purchase of credits, having the regulatory certainty of pre-approved compensation lands, and avoiding the cost and delays that can accompany on-site protection (all of which can save time and money). Conservation banks are also useful when it makes more sense to purchase conservation credits than to protect part of the area being developed (for example, when on-site conservation would result in small, isolated sites).

- The public benefits from the long-term protection and management of habitat and the avoidance of piecemeal mitigation for individual project impacts that can result in little connection with the surrounding ecosystem. Maintaining the conserved land in a large reserve (instead of in isolated, smaller areas) is less costly to manage per acre and more likely to ensure ecosystem functions and connectivity. The public also benefits from stretching limited funds through public-private partnerships.


Bluefield Ranch Mitigation Bank

Two other FWC incentive-based conservation tools for landowners are the Landowner Assistance Program and the Safe Harbor Program.

- The Landowner Assistance Programs (LAP) offers educational and technical assistance to landowners interested in developing wildlife habitat management plans on private lands. The FWC's Habitat Conservation Scientific Services section (approximately 30 biologists) provides wildlife-related assistance with land-use planning and habitat management. The LAP website (<www.myfwc.com/Conservation/ConservationYou_LAP_index.htm>) is designed to provide a "one-stop-shop" for landowners needing habitat management assistance. It includes information on developing conservation goals and management, land assessment, habitat management, and related techniques.

- The Florida Safe Harbor Program (<www.myfwc.com/Conservation/Conserv_Progs_Spp_Conserv_SafeHarbor.htm>) is a voluntary conservation incentive plan for private landowners who want to manage their lands to provide habitat for state-listed imperiled species. The Florida program is modeled after the federal Safe Harbor Program that was created in 1995 by the U.S. Fish and Wildlife Service as a conservation tool to provide private landowners with assurances that they will not be penalized by endangered species laws, when they manage their land to conserve listed species.

### The Bluefield Ranch Mitigation Bank

**The Bluefield Ranch Mitigation Bank offers wetland and other environmental mitigation for impacts in a 120-square mile area of east central Florida that includes St. Lucie, Martin, Okeechobee, and Indian River counties. The bank, which is located in St. Lucie and Martin counties, has:**

- **Been awarded 1,240 State Mitigation Banking credits and 1,520 Federal Mitigation Banking credits for areas classified as forested or herbaceous wetlands.**
- **Completed all ecological restoration and is permanently managing and protecting its 2,675-acre mosaic of wetland and upland systems.**
- **Restored the bank's hydrology to its native historic condition, which has resulted in the retention of water that previously flowed into the St. Lucie River.**
- **Implemented Habitat Conservation Plans for 16 listed animal species.**
- **Provided mitigation for freshwater wetland impacts and, on a case-by-case basis, mitigation for species-specific wildlife impacts (for example, gopher tortoises, indigo snakes, wood storks, and caracara) as well as impacts to upland systems.**
- **Launched new initiatives such as carbon sequestration and native pollinator mitigation in response to a growing demand for those services.**

**The bank is perpetually protected by a conservation easement and managed according to an ongoing, comprehensive long-term stewardship plan that incorporates daily maintenance and the use of advanced management techniques such as fire ecology.**

*(For more information, go to <www.bluefieldranch.com>.)*

**The Southwest Florida Water Management District (SWFWMD) Facilitating Agricultural Resource Management Systems (FARM) Program**

**The FARM program is a cost-share reimbursement program developed by the SWFWMD and the Florida Department of Agriculture and Consumer Services to implement water conservation, water efficiency, and alternative water source projects with existing agricultural operations. The goal is to improve water quality and reduce groundwater withdrawals from the Upper Floridan aquifer.**

**The program involves a voluntary public-private contractual partnership between the district and an agricultural entity. The district shares the cost of implementing production-scale agricultural BMPs. Project cost-share rates are generally capped at 50 percent for projects with BMPs that will provide either water quality or water quantity benefits, and at 75 percent for projects that incorporate both water quality and quantity benefits. The agreements last from five to 20 years.**

**District staff work closely with individual farmers and farm corporations to help them develop appropriate BMPs. Staff also monitor and document the effectiveness of the BMP performance and coordinate the program with state and federal agencies.**

**As of January 2009, 69 FARM projects had been approved, resulting in an estimated groundwater offset of 14.2 million gallons per day (mgd) of the overall offset goal of 40 mgd of groundwater by the year 2025.**

*(For more information, go to <www.swfwmd.state.fl.us/agriculture/farms/>.)*

**Watershed Protection:** Agricultural management practices can play a major role in regulating the quality and supply of water. Working with farmers and ranchers, water providers around the country are improving water quality at lower costs than engineered solutions and, at the same time, providing farmers and ranchers with much-needed new sources of income and enhancing fish and wildlife habitat.

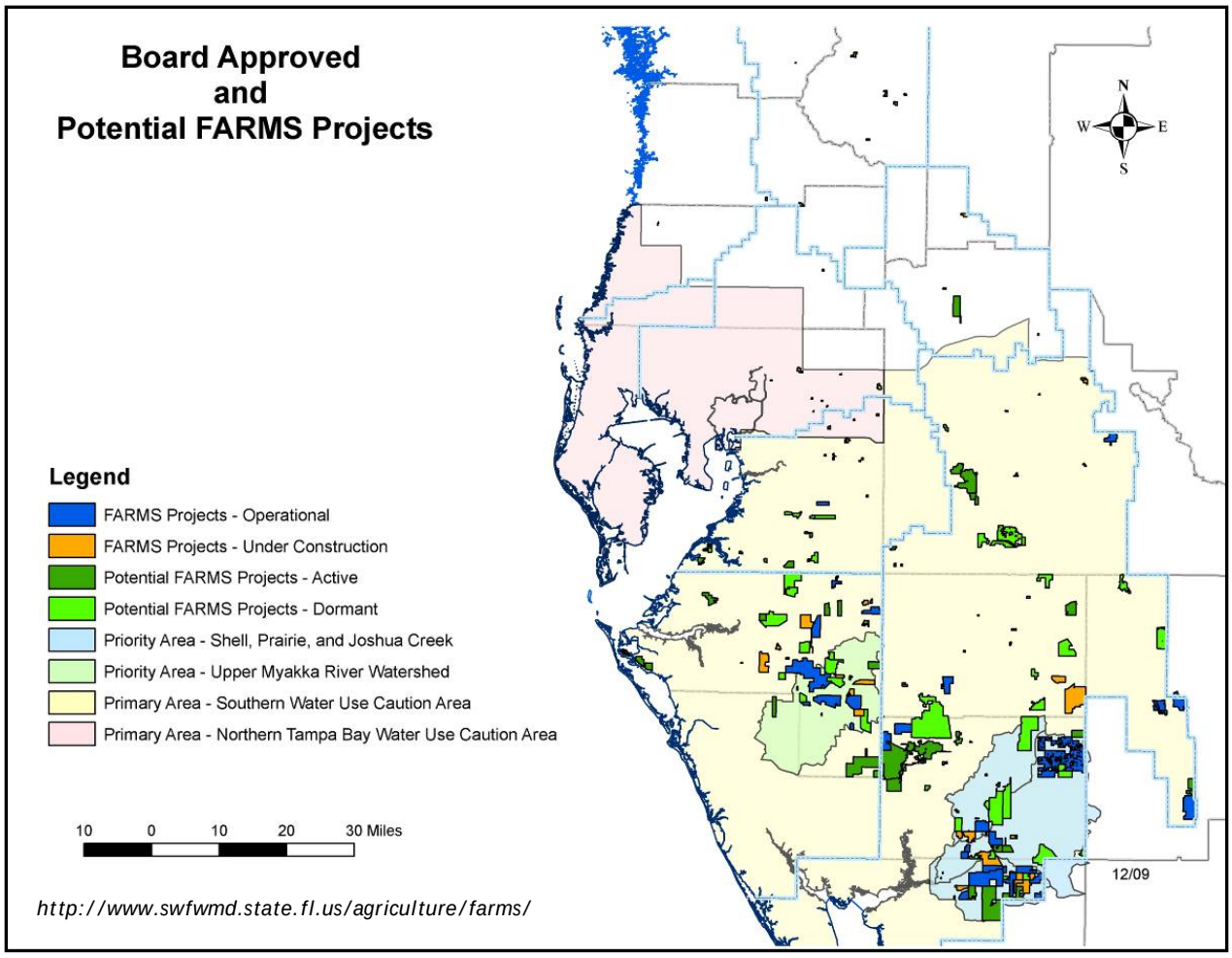
The strategies in use can be grouped in the three areas that are included in the American Farmland Trust's (AFT) Water Quality Campaign:

- Expanding agricultural best management practices.
- Creating water quality trading markets that provide farmers and ranchers with a revenue source for protecting water quality.
- Establishing policies and supportive funding programs that encourage conservation practices and reward environmental stewardship.

The goal of AFT's campaign is to help remove the barriers to farmers and ranchers being rewarded for practices that improve quality of water to the benefit of the public. Some of those barriers are farmer-rancher concerns about costs, loss of yield, and a lack of technical assistance and economic incentives.

*Expanding agricultural best management practices* – Conservation tillage and nutrient management are increasingly being used to improve water quality. The focus is on reducing soil loss and preventing nutrients used by farmers and ranchers from leaving the farm. Both strategies can improve the environment and an agricultural landowner's bottom line. Programs that address the concerns of farmers and ranchers about the potential risks of using less fertilizer or reduced tillage provide one way of encouraging those practices.

AFT's pilot Best Management Practices (BMP) Challenge program provides a good example. At harvest time, AFT pays farmers cash if yield and income are reduced while participating in the BMP Challenge. Performance guarantees allow farmers to try conservation practices on their own land, observe performance over time in side-by-side comparisons, and evaluate economic impact without risk to income due to yield loss. Farmers in California, Delaware, Idaho, Iowa, Illinois, Indiana, Maryland, Michigan, Minnesota, Missouri, New York, North Carolina, Nebraska, Ohio, Pennsylvania, Virginia, or Wisconsin who grow corn for grain and silage are eligible for the program.



A sampling of incentive-based programs to protect water quality includes:

- The Watershed Agricultural Council (<www.nycwatershed.org>) that is working to support the economic viability of agriculture and forestry through the protection of water quality and the promotion of land conservation in the New York City watershed. The council is funded by the New York City Department of Environmental Protection (as part of the New York City Water Agreement described earlier), the U.S. Department of Agriculture, the U.S. Forest Services, and other federal and foundation sources.

- A city of San Antonio partnership with the Green Spaces Alliance, the Nature Conservancy, and the Trust for Public Lands to protect the Edwards Aquifer, the city's primary source of drinking water (<http://greenspacesalliance.org/ conservation/landowners>).

- The Great Miami River Watershed Water Quality Credit Trading Program has funding for agricultural management practices that reduce nutrient discharges into rivers and streams in the Great Miami River (Ohio) Watershed (<http://newserver.miamiconservancy.org/water/documents/GMRTradingProgramRFP0609.pdf>).

- The state of Pennsylvania's REAP program that allows farmers and businesses to earn tax credits in exchange for implementing best management practices to enhance farm production and protect natural resources (<www.cbf.org/Page.aspx?pid=794>).

### Chesapeake Bay Nutrient Credit Trading Program

**Nutrient credit trading is a component of Chesapeake 2000, a multi-state, multi-agency agreement for the restoration of the Chesapeake Bay. Efforts to clean-up the Bay started in the 1970s when marine dead zones were first identified. Water quality protection and restoration is one of five categories of action strategies outlined in the agreement.**

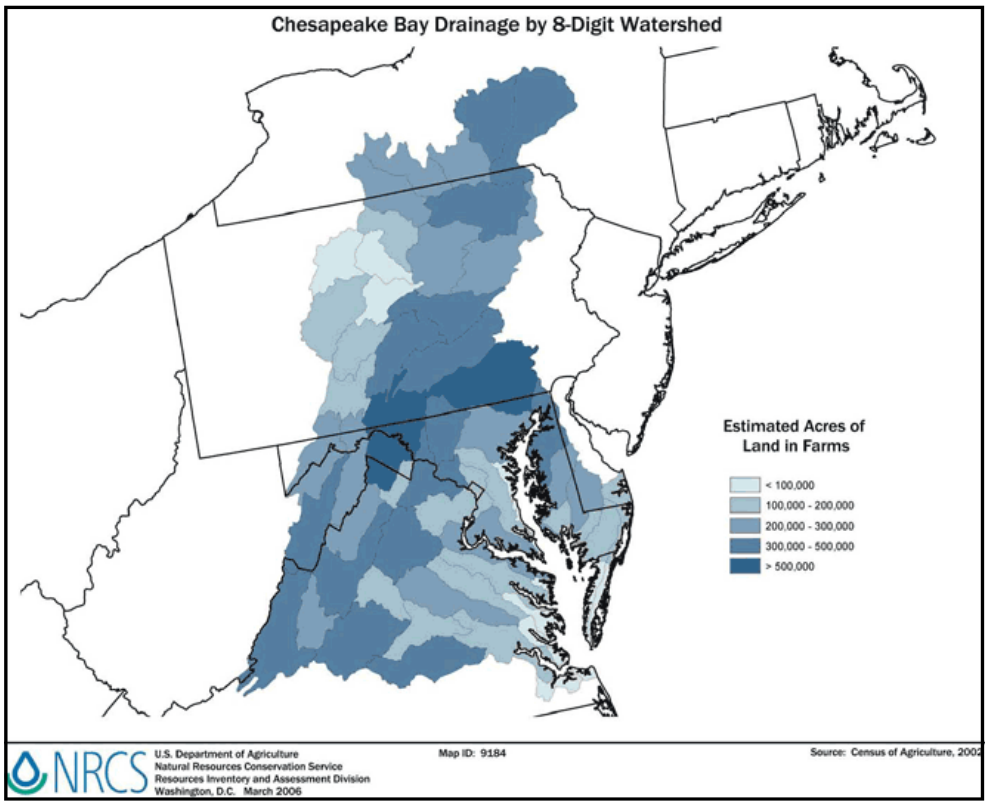
**Recognizing that more than 150 rivers and streams drain into the Bay, one of the water quality actions is the Chesapeake Bay Tributary Strategy that calls for reductions in nutrient and sediment loading. The strategy provides for nutrient credit trading to help wastewater treatment plants comply with nutrient loading requirements.**

**In that arrangement, water treatment plants can purchase nutrient credits from landowners who voluntarily reduce the amount of nutrients going into the water. The approach created a win-win for all parties. The need to upgrade wastewater treatment plants was reduced, farmers received a new source of income, and water quality was improved at a lower cost to the public.**

**The American Farmland Trust, which worked with Bay area farmers to help them generate nutrient credits, notes several lessons learned:**

- **Buyers need some comfort that that the credit providers will be there (i.e., if the farm generating the credits is sold).**
- **Some type of aggregating or brokering institution is needed to facilitate the sale of credits.**
- **Verification of the services provided is important.**
- **Rules need to be clear and based on scientific evidence.**
- **Regulations are the driving force in making the trading market work. As permitted discharges are lowered and treatment costs go up, trading will be a good option.**

*(For more information, go to <www.chesapeakebay.net/tribtools.htm> and <http://dnrweb.dnr.state.md.us/bay/res_protect/c2k/index.asp>.)*




Other techniques to enhance water quality include improving management of livestock waste (the use of methane digesters, for example) and precision irrigation. Strategies to improve water supplies include soil moisture monitoring, planting more water efficient crops, precision irrigation, and use of wastewater in agricultural operations.

*Creating water quality trading markets that provide farmers and ranchers with a revenue source for protecting water* – Because the flow of water does not recognize county or other jurisdictional lines, the current regulatory frameworks stress a watershed-landscape-scale approach to protecting water resources. A watershed is commonly defined as the geographic area that water flows through across the land and drains into a common body of water, such as a stream, lake, estuary, wetland, aquifer, or the ocean. Because the use and management of the land impact the flow and quality of that water (the stormwater runoff), a landscape approach is needed. As a result, everyone in the watershed benefits since water added upstream ends up downstream.

In a watershed protection ecosystem services approach, agricultural landowners who engage in conservation practices that maintain and/or improve watershed services would receive payment for the watershed benefits they provide. Those services can include purifying water as part of a water quality trading market (sometimes called nutrient or pollution trading). In that case, entities, such as sewage treatment plants, that discharge nutrients such as nitrogen and phosphorous into waterways purchase nutrient credits from farmers and ranchers who adopt practices to reduce such discharges.

## Upper Kissimmee Basin (UKB) "Just Add Water" Forum

**In September 2009, the Ocean Research & Conservation Association convened a forum at the Florida Cattleman's Association Kissimmee headquarters. The goal was to start a dialogue with agricultural landowners about public-private partnership solutions that would reduce the flow of fresh water from the UKB into Lake Okeechobee and ultimately the St. Lucie River and southern Indian River Lagoon.**

**In the "Just Add Water" approach, the UKB's historic hydrological conditions would be recreated by storing water on large tracts of private lands now in ranching and farming and contiguous public lands located near or on contributing waterways. Collectively those lands could retain, slow down, and improve the quantity and quality of fresh water flowing into and from the Lake.**

**That solution would help correct the current problem: Water and the phosphorus, nitrogen, and silt it transports flows unimpeded from the land into Lake Okeechobee and, from the Lake, to coastal estuaries where the detrimental impacts are evident. Those problems began in the 1960s when the Corps of Engineers drained some two-thirds of the Basin's floodplains and built dikes, canals, and pump stations to get stormwater out as quickly as possible.**

**The approach would bring multiple benefits: a new revenue source for ranchers, healthier habitat and coastal estuaries, and a cost-effective way to attain Total Maximum Daily Load (TMDL) requirements and provide a significant portion of the some one million acre-feet of water storage that the SFWMD is seeking in the Lake Okeechobee watershed. Forum participants also discussed a range of near-, mid-, and long-term issues that should be addressed in order to develop a program that will work for landowners.**

*(For more information, go to <www.teamorca.org> and click on Special Events.)*


*Photo Credit: www.sfwmd.gov*

The Florida Department of Environmental Protection (DEP) notes that water quality trading allows facilities facing higher pollution control costs to meet their regulatory obligations faster and at lower cost by purchasing environmentally equivalent (or superior) pollution reductions from another source, thus achieving the same water quality. The conditions that create a strong market for water quality trading include:

- The presence of a driver that motivates facilities to seek pollutant reductions, usually a Total Maximum Daily Load (TMDL) or a more stringent water quality-based requirement. TMDL is a water quality regulation that establishes limits for the total amount of pollutants that a water body can assimilate in a given time period without exceeding water quality standards that protect human and aquatic health.
- Facilities within a watershed would have significantly different costs to control the pollutant of concern.
- The necessary levels of pollutant reduction in a watershed will result in enough surpluses to sell or purchase.

Watershed stakeholders and the state regulatory agency are willing to try an innovative approach and engage in trading design and implementation issues.

DEP has established a Pollutant Trading Policy Advisory Committee to help the department develop a water quality credit trading program and rule for Florida. DEP's watershed website (<www.floridadep.org/water/watersheds/ptpac.htm>) has links to resource material regarding water quality trading programs. In 2008, the Florida legislature, as part of an act relating to water pollution (<www.floridadep.org/water/watersheds/docs/ptpac/403_067_fs.pdf>), authorized the trading of water quality credits and specified that a water quality credit trading pilot project be limited to the Lower St. Johns River Basin. The pilot is described in the *2008 Lower St. Johns River Basin Management Action Plan* (<www.floridadep.org/water/watersheds/docs/bmap/adopted-lsjr-bmap.pdf>).

EPA's website (<www.epa.gov/owow/watershed/trading.htm>) also offers information related to water quality trading, including a *Water Quality Trading Toolkit for Permit Writers*, a *Water Quality Trading Assessment Handbook*, and a new publication, *Getting Paid for Stewardship: An Agricultural Community Water Quality Trading Guide*. An additional resource is the Environmental Trading Network (<www.envtn.org/About_ETN.html>), a national non-profit clearinghouse for information on market-based approaches to improving water quality, air quality, and wildlife habitat.

*Establishing policies and supportive funding programs that support conservation practices and reward environmental stewardship* – The 2008 federal Farm Bill is a good example of using policies and supportive funding to promote conservation practices. In addition to establishing a new office of Ecosystem Services and Markets at the USDA, the bill includes changes in the Farm and Ranchlands Protection Program (now called the Farmland Protection Program <www.nrcs.usda.gov/programs/frpp/>), that allow greater flexibility at the local level and raise the funding level from $97 million to $200 million a year in 2012. The program provides matching funds (up to 50 percent of the fair market value of the conservation easement) to help purchase development rights to keep productive farm and ranchland in agricultural uses.

Other conservation-related Farm Bill provisions (<www.nrcs.usda.gov/programs/farmbill/2008/index.html>) include the: Agricultural Management Assistance Program, Cooperative Conservation Partnership Initiative, Conservation of Private Grazing Land Program, Conservation Reserve Program, Conservation Stewardship Program, Environmental Quality Incentives Program, Agricultural Water Enhancement Program, Conservation Innovation Grants, Healthy Forest Reserve Program, Small Watershed Rehabilitation Program, Wetlands Reserve Program, and the Wildlife Habitat Incentives Program.

Those programs are in addition to ones in the Farm Bill that encourage the purchase of food grown locally and support farmers and small rural businesses in developing clean energy technologies.

# Land Use-Related Tools

The land use and land conservation tools described below are designed to keep land available, affordable, and compatible with farming. The tools listed in the box to the right can be used in combination with each other and with economic development tools as part of a comprehensive approach to maintaining a viable agriculture industry and the value of agricultural lands. As noted in this report's introduction, the single-solution approach generally will not work. Agricultural landowners should be able to combine a number of options and opportunities in order to tilt decisions in favor of continuing to farm.

## Agricultural Zoning

Agricultural zoning is used to protect farmland through a supportive regulatory environment. In a comprehensive approach to maintaining farmland, both an Agricultural Buffer Zone and an Agricultural Protection Zone may be needed.

**Menu of Land Use and Land Conservation Tools**

- **Agricultural Zoning**
- **Conservation Easements and Organizations**
- **Florida Rural and Family Lands Protection Act**
- **Green Infrastructure Planning and Greenprinting**
- **Growth Boundaries and Management Strategies**
- **Purchase and Transfer of Development Rights**
- **Rural Lands Stewardship Program**
- **Rural Residential Development and Conservation Design Communities**

### *Agricultural Buffer Zoning*

A buffer zone is used to create a transition area that separates more intense urban and suburban land uses from land areas designated and zoned for agriculture production. The intent is to help ensure the long-term integrity of working agricultural lands through compatible adjacent land uses that minimize conflicts between landowners.

A buffer zone can be used, for example, to protect farms from trespassers (human as well as domestic animals). It also helps reduce the impacts of commercial farming (for example, spraying pesticides and herbicides, applying fertilizers, operation of machinery, and controlled burns to manage habitat) on non-farming residential areas. As a result, a buffer zone helps protect a farmer from nuisance complaints from nearby residential areas.

Allowed uses within the buffer zone might include some open space recreational uses, supportive agricultural commercial uses such as a processing plant or distribution facility, and agricultural-related low density and rural lifestyle residential uses. Examples include a horse farm or small farm produce operation that caters to nearby urban areas.

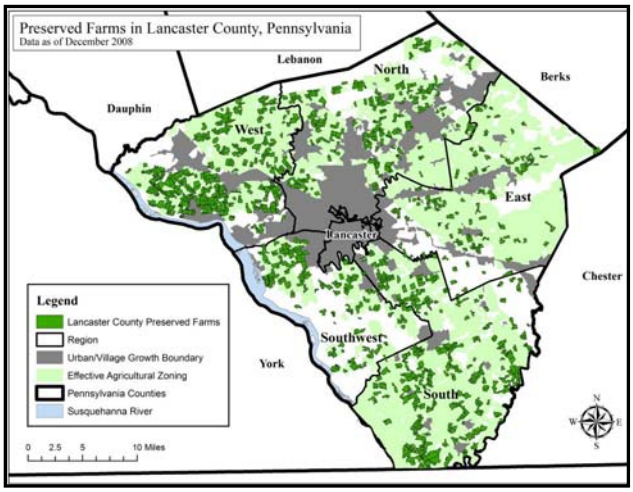



*Photo Credit: www.co.landcaster.pa.us*

A concept called Agriburbia™ (<www.agriburbia.com>), an agriculture-based form of development that started in Colorado, could also be used in an agricultural buffer zone. Typically, a larger central farm is surrounded by homes with small farm plots in their yards. Located near Greensboro, North Carolina, the planned community of Farmstead (<www.thefarmstead-nc.com>) is an example of how the Agriburbia™ concept can work. When completed, Farmstead will feature approximately 15 acres of bio-intensive, professionally farmed land that will provide fruits and vegetables to the surrounding neighborhoods and the broader region. Proceeds from those sales will provide a source of revenue for the Homeowners' Association.

Buffer zones can also be the focus of a number of the land conservation techniques described below – the purchase or transfer of development rights and the sale or donation of conservation easements.

### *Agricultural Protective Zoning*

Agricultural zoning is used to maintain and stabilize a critical mass of agricultural land by requiring that the type and intensity of land uses within the agricultural zone are compatible with agricultural operations.

## Lancaster County, Pennsylvania, Agricultural Protection Program

**Lancaster County's farmland preservation program is one of the most successful in the country. It was established in 1980 in response to the loss of farmland to rural residential development and expanding suburban growth. The goal was to preserve a critical mass (278,000 acres) of farmland in perpetuity.**

**Three factors were important to the program's success. It began with and still involves the farming community; it combines zoning and growth boundary regulations with financial incentives; and it uses a comprehensive approach in which each element reinforces the other. Those elements include:**

- **Agricultural zoning that allows only one house per 25 acres. House lots cannot exceed two acres. Of the county's 41 townships, 39 have adopted agricultural zoning that protects 350,000 acres of farmland, more than half the county's 600,000 acres.**
- **Voluntary agricultural security areas that help protect farmers from nuisance suits and eminent domain actions.**
- **A voluntary Purchase of Development Rights program aimed at preserving large contiguous blocks of farmland.**
- **Use of Urban Growth Boundaries to promote compact development and limit the extension of sewer and water lines and the spread of development into farming areas.**
- **In a few townships, Transfer of Development Rights programs to move development from farming areas to those within designated UGBs.**

**The county's Agricultural Preserve Board has also been important to the program's success. It has preserved 64,506 acres of farmland on 745 farms, and the non-profit Lancaster Farmland Trust has preserved 300 farms and more than 19,000 acres. In addition, three-quarters of new development is occurring within Urban Growth Boundaries.**

**The Lancaster County Chamber of Commerce also supports local agriculture. In 2009 its Agricultural Committee sponsored an agricultural summit that highlighted the important role that agriculture plays in the county. The importance of agriculture is reinforced by the county's new green infrastructure plan, Greenscapes.**

*(For more information, go to <www.co.lancaster.pa.us/lanco/cwp/view.asp?a=371&Q=384772>.)*

## Sarasota County Agricultural Reserve (AR) Resource Management Area (RMA)

**Sarasota's 2050 Plan provides a tiered approach that moves from the urban west to the rural Agricultural Resource (AR) zone in the eastern part of the county. The objective of the AR zone is to strengthen the agricultural economy and protect agricultural resources. It:**

- **Limits nonagricultural land uses to those that directly relate to permitted agricultural uses (for example, a range of small-scale agricultural production and farm- and agritourism-related activities such as roadside stands and bed and breakfast enterprises). Allowed densities vary from one dwelling unit per 160 acres to one dwelling unit per 10 acres.**
- **Allows the transfer of existing development rights (discussed later in this section) while preserving agricultural production rights.**
- **Prohibits the inclusion of the AR in the county's Urban Service Area and the construction of major public infrastructure (including central sewer, water, and highways) within the AR, other than for public safety.**

**A 2006 plan amendment further supported agriculture as an essential function of the AR by:**

- **Requiring that land management activities associated with agriculture take precedence over other activities and that any proposed development must be evaluated for compatibility with adjacent small and large farms.**
- **Supporting the implementation of a sustainable agriculture program through the promotion of specified sustainable agriculture practices on private and publicly owned lands.**

*(More information, go to <www.scgov.net/PlanningandDevelopment/CompPlan/TOC.asp>.)*

**Features of a Successful Agricultural Protective Zone:** To be successful, an agricultural protective zoning ordinance should be:

- Carefully drafted with the active involvement of the farming community in both the design of the zone and in monitoring implementation.
- Designed not to impede farming operations but also to provide farmers with the flexibility to change the type of agriculture in response to changing economic conditions and new technologies.
- Coupled with incentive programs, such as Purchase or Transfer of Development Rights programs (discussed later in this section), that help landowners realize the development value of their land that is currently permitted under local zoning.
- Supported by agricultural economic development programs (such as those discussed in the first part of this report) that help enhance the business of farming and provide new sources of income.

Reinforced by the adoption of an Urban Growth Boundary (described below) and a Capital Improvement Plan that limit annexations and the spread of development and the extension of sewer and water lines into working agricultural areas, and that promote more compact, cost efficient development patterns.

**Sarasota County Rural Land Area**


*Photo Credit: www.cues.fau.edu/toolbox*

**Typical Zone Provisions:** An agricultural protection zone typically defines permitted uses (for example, in addition to agricultural and forestry activities, a new barn, farm dwelling, and greenhouses or nursery) and other uses that are allowed by conditional approval (for example, a roadside stand for farm products, housing for farm workers, a bed and breakfast operation, or other agritourism activities). The density of residential development is generally limited to a larger minimum lot size (typically of 20 or more acres) that represents the land base needed for sustainable agriculture production. An agricultural zone may specify a number of non-farm building lots each with a maximum lot size, such as 2 acres. An agricultural protection zone may also contain site and review guidelines (for example, setbacks for farm buildings). Right-to-farm provisions and an agricultural nuisance disclaimer can be used to alert buyers that a residence or business is located in an active agricultural area.

**Types of Agricultural Zones**: There are two general types of agricultural zoning: nonexclusive and exclusive.

- In a nonexclusive agricultural zone, agricultural production-related and -compatible uses are allowed to enhance the profitability of farming. Examples include livestock feed stores, farm implement dealers, retail nurseries, greenhouses, food processing and distribution facilities, and feed mills. Some nonfarm uses, such as schools or churches, that support farming families may also be allowed under certain conditions. Nonexclusive agricultural zoning is less restrictive than exclusive agricultural zoning and is used more often.

- Exclusive agricultural zoning is more restrictive. It generally permits only farm buildings and farm-related housing (residences for family or farm workers). It is found in Hawaii and Wisconsin.

**Benefits and Downsides:** Benefits of agricultural zoning include:

- A demonstrated local commitment to retaining a strong agricultural industry and large areas of farmland.

- Keeping agricultural land affordable for farming and free from incompatible uses.

- Preventing sprawl into rural areas and reducing infrastructure costs (see Cost of Community Services Studies in the Economic Development section above).

The downside of agricultural zoning is that, like any zoning, it is not permanent, which is why many communities also promote the purchase or transfer of development rights and the sale or donation of agricultural conservation easements in agricultural areas.

### *Useful Resources*

Useful publications related to agricultural zoning and the other land conservation planning tools (for example, the purchase and transfer of development rights) covered in this toolbox include:

- *Holding Our Ground: Protecting America's Farms and Farmland*, by Tom Daniels and Deborah Bowers (available from Island Press)
- *The Purchase of Development Rights, Agricultural Preservation and Other Land Use Policy Tools – The Pennsylvania Experience*, by Tom Daniels (<www.farmfoundation.org/1998NPPEC/daniels.pdf>)
- *Saving American Farmland: What Works, available from the American Farmland Trust (<www.farmland.org>). The American Farmland Trust also publishes numerous fact sheets on agricultural conservation planning tools.*

**Florida Statutes, Chapter 704**

**Chapter 704 of the Florida Statutes provides the legal framework for the creation, acquisition, and enforcement of perpetual conservation easements. In June 2009, in response to the voters' approval in 2008 of Amendment #4, the Florida legislature approved HB 7157 that changed the state's conservation law.**

**Applicable to property tax assessments made on or after January 2010, HB 7157:**

- **Provides for full exemption for land dedicated in perpetuity and used exclusively for conservation purposes and partial ad valorem tax exemption for lands dedicated for conservation purposes, but with less than perpetual application.**
- **Requires that best management practices be used for certain agricultural lands and owners of property encumbered by conservation easements must comply with marketable record title requirements to preserve the easement in perpetuity.**

*(For more information, go to (<www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=42126&SessionId=61>.)*

## Conservation Easements and Organizations

### *Conservation Easements*

A conservation easement is a voluntary, legally recorded document that landowners can place on their property to limit the land to uses consistent with the purpose of the easement and protect it from future development. An easement agreement between a landowner and a qualified public or nonprofit (typically a land trust) conservation organization details the uses that are allowed and not allowed. The entity(ies) that holds the easement is responsible for monitoring and making sure that the terms of the easement are followed.

Once a conservation easement is placed on a property, the land is still private property. Landowners continue to own and use their land and may pass it on (with the easement) to their heirs or sell it to someone outside the family (also with the easement). Landowners can also continue to use their land as loan collateral and be eligible for any state or federal farm programs that they were eligible for before entering into the conservation easement. Public access is not required, although the organization that holds the easement will need to enter the property (typically once a year) for monitoring purposes.

A conservation easement is a flexible document tailored to needs of the individual landowner and the characteristics of the property to be protected by the easement. For example, an easement may cover an entire parcel or portions of a property, and it can be used to protect environmental resources, such as wildlife habitat, ground and surface water, scenic views and historic sites as well as farmland.

An agricultural easement is crafted to allow continued farming and should provide the flexibility needed for a landowner to use improved technology and introduce new products that help keep the land in productive uses and generate new sources of income. The value of an agricultural conservation easement is generally the fair market value of the property minus its restricted value.

A landowner can sell (described later in this section under Purchase of Development Rights) or donate an easement. The value of the donation is the difference between the land's value with and without the easement. If an easement meets certain criteria established by Section 107(h) of the Internal Revenue Code, it may qualify for income and estate tax benefits. Two key criteria are that the easement is donated to a qualified tax exempt organization and benefits the public by permanently protecting conservation resources.

The estate tax benefits of a conservation easement can make a significant difference for landowners who want to pass their land intact to the next generation. By removing all or most of the development potential, the easement lowers the land's market value, which in turn lowers the amount of estate taxes due. The more that development is restricted and the greater the development value of the land, the higher the deduction. In addition to a landowner placing an easement on his or her land, the executor of the estate has the discretion to donate a "testamentary easement."

### *Conservation Organizations*

Land Trusts and Community Stewardship Organizations (CSO) are two entities with protecting and managing conserved land as their primary focus. A major difference between the two is that a CSO is typically created by a developer of a conservation designed community and its funding is tied to the associated conservation development.

**Land Trust:** Land trusts work to conserve land (farmland or scenic, recreational, or environmentally significant areas, for example) valued by a community. Five important ingredients to consider in creating a successful land trust are its 1) roles, 2) board membership, 3) funding, 4) how it will design and enforce the conservation easements it holds, and 5) how it will ensure proper land stewardship through a conservation management plan. As described below, those ingredients are typical of most land trusts and are consistent with the findings of an April 2006 workshop designed to identify the important features of a land trust for St. Lucie County.

**Common Land Trust Roles**

**Typical land trust roles include:**

- **Conserving, restoring, and managing natural resources.**
- **Providing educational programs on the values of conserved lands.**
- **Conducting outreach programs that connect area residents with the natural environment and farmland.**
- **Developing and overseeing, through monitoring, a conservation management plan.**
- **Conducting research on and documenting conservation practices.**
- **Involving the community in celebrating successes.**

## Indian River Land Trust (IRLT)

**The IRLT's programs to promote the preservation and conservation of natural resources and agricultural lands in Indian River County fall into four areas:**

- *Land Conservation* – **A variety of land protection methods, including acquisition in fee and the purchase and donation of conservation easements, are used to meet individual landowner conservation goals. A Land Protection Fund enables the IRLT to secure important parcels of land that become available for sale.**
- *Stewardship Outreach* – **Two examples are the 1,600-acre Padgett Creek Ranches project composed of two working cattle ranches (Long Shadows Ranch and Triple S Ranch) and the 462-acre Treasure Hammock Ranch that is the first property in Florida to have a conservation easement specifically designed to protect agriculture. All three ranches are protected by county-held conservation easements and are important for maintaining the availability and quality of the county's water supply and providing wildlife habitat. The IRLT assisted in reaching out to the ranches and provides public educational tours of the properties each year.**
- *Planning and Partnerships* – **The IRLT partners with private landowners, state and local governments, and other non-profit conservation organizations to manage and provide public access to conservation areas in Indian River County.**
- *Technical Assistance and Landowner Services* – **The IRLT helps landowners develop the baseline documentation of existing conditions required for selling or donating a conservation easement, monitoring the easement, and research grant opportunities to protect conservation lands.**

**The IRLT also offers a Local Growers Guide, weblinks to farms and ranches offering tours, and a web-based Keep It Local Pledge. It has developed a *Greenprint for the Future*, a map that shows environmentally sensitive lands in the county and is used as a reference by planners when working on growth management issues.**

*(More information on the Indian River Land Trust is available at <www.irlt.org>.)*


*Photo Credit: Indian River Land Trust*

*Roles.* A primary role of most land trusts is to help interested landowners find ways to protect their land. A land trust typically protects the land through conservation easements that may be donated by a landowner or acquired by the land trust. Acquisition in fee is often used to protect a strategic property in perpetuity or to protect a property that is for sale until a conservation buyer can be found.

Other land trust roles may include providing education and outreach services, working with government agencies to assess open space needs and develop open space conservation plans, helping shape development plans through site and land use planning assistance and design review, promoting local agriculture, and restoring, monitoring, and managing conserved land.

*Board Membership.* Who serves on a land trust's board of directors is important and is often the reason a land trust succeeds. Board members should represent a variety of professional skills needed by the land trust (for example, lawyers, bankers, accountants, realtors), have good community and landowner contacts, be respected by their peers and trusted in the community, and bring a commitment to the goals of the land trust. Government representatives can be included, generally as ex-officio members. To augment its skills, a land trust could create a technical advisory committee made up of respected scientists and environmentalists who can bring technical knowledge to the board and assist with monitoring conserved lands.

*Funding.* The hard part in creating a successful land trust is sustaining it in perpetuity so the trust can monitor and defend the conservation easements it holds. The funding of the land trust should be thought through early in the process. To help with funding, most land trusts require an endowment as part of accepting an easement. Revenues from the endowment are used to monitor and enforce the easement. Funding is also needed if a land trust is to restore environmentally sensitive lands or engage in education and public outreach. In addition to endowments, funding sources often include seed grants from local governments to help pay for initial staff, private grants, fundraising events, memberships, and fees from developers.

*Conservation Easement Design and Enforcement.* Important in establishing a land trust is the ability to design and enforce the conservation easement, which ties to the need for long-term funding. A conservation easement must be carefully crafted to achieve the desired conservation goals, spell out permitted land uses, and contain clear, measurable monitoring standards. A land trust can arrange for other qualified organizations as backup holders of an easement. Any organization holding the conservation easement should be a government agency or a 501(C)(3) charitable organization and have the conservation of land in its natural state as the primary charitable purpose. It must also be able to demonstrate an adequate endowment or other financial resources that will enable the organization to monitor, enforce, and defend conservation easements in perpetuity and that it conforms to broadly accepted land trust standards, such as adoption of the Land Trust Alliance's publication, *Land Trust Standards and Practices.*

*Conservation Management Plan.* A conservation management plan is needed to ensure that management activities over time are consistent with the goals and vision for the conserved land. A conservation management plan typically documents and maps the existing baseline conditions and outlines the long-term goals and vision for the protected lands. It also spells out the guiding policies, the specific management strategies that will be used, and measureable, science-based monitoring standards and protocols to evaluate how the management strategies are working. Management plans need to be flexible to allow for changing conditions identified through monitoring and for new and improved management practices. In Florida, a management plan may need to address specific local issues such as the use of prescribed burns.

In 2007 several St. Lucie County residents came together to create the St. Lucie Land Trust (<www.stlucielandtrust.org>). Its mission is "the identification, acquisition, and stewardship of environmentally significant lands, agricultural lands, waterways, and archaeological sites for the purpose of preserving natural areas, open space and greenways."

For more information on creating a land trust, go to the Land Trust Alliance (<www.lta.org>), the Trust for Public Land (<www.tpl.org>), and the American Farmland Trust (<www.farmland.org>).

### The Santa Lucia Conservancy

**The Santa Lucia Conservancy is a nonprofit organization created in 1995 to ensure in perpetuity the presence of a strong, stable, and independent resource protection entity for the Santa Lucia Preserve located in the Santa Lucia Mountains overlooking the Big Sur area of California. The preserve concept was the result of the Rancho San Carlos Partnership's proposal to develop a community within the Santa Lucia Preserve, originally Rancho San Carlos.**

**Under the plan for the area, 18,000 of the 20,000 acres of the Santa Lucia Preserve will be left undeveloped. The remaining 2,000 acres contain an approximately 300-lot community created as a result of the Rancho San Carlos Partnership's proposal. Each lot is composed of two pieces: a building envelope called Homelands, which constitutes approximately 10 percent of the lot, and conserved lands, which are 90 percent of the lot. The conservation lands, known as Openlands, total 6,000 acres, and are protected by a conservation easement held by the Conservancy. The Openlands and 12,000 acres of fee title lands (Wildlands) held by the Conservancy compose the 18,000 acres of undeveloped land.**

**To ensure nature-compatible development, design guidelines require that the homes be subordinate to the landscape. For example, if a house is located on a wooded lot, the trees must be retained; and, if a home is located on a steep slope, it has to step with the topography. Sales and marketing staff helped ensure that potential buyers matched the site limitations.**

**The Conservancy, which is a supporting organization of the Sonoran Institute under the Internal Revenue Service tax code, carries out its mission through four main program areas: natural resource monitoring, natural resource management, habitat restoration, and scientific research. They all share the common goal of promoting community-based strategies that preserve the ecological integrity of the protected lands.**

**The Conservancy's interpretive programs provide opportunities for residents and local youth and adult groups to explore the natural landscape and learn about its unique resources. Cooperative programs with other conservation and research organizations and educational institutions provide opportunities for mutually beneficial scientific study. The Conservancy also manages some 1,800 acres for cattle grazing in order to avoid taking land out of cattle production and to restore native grasslands.**

**Funding for the Conservancy comes from an endowment created by the developer. The funds used to create the endowment were derived from an increment of the sales price of the initial lots.**

*(For more information, go to <www.slconservancy.org>.)*

**Community Stewardship Organization:** A community stewardship organization (CSO) is a non-profit organization that can be established to address the conservation of a significant portion of the land in a new community. A CSO is typically created by a developer of a conservation designed community and its funding is tied to the associated conservation development. The CSO allows developers to integrate permanent conservation, natural systems restoration, and community-building into their developments through agreements with local stakeholders. It also enables community leaders, developers, and conservationists to work together to assure that the development is environmentally sound and that the conserved lands are properly managed and valued by nearby residents.

A CSO provides multiple benefits to developers, the community, and homeowners. Those benefits include significant amounts of preserved open space that minimize the impacts of development on natural areas and farmland, and higher real estate value because of the strong market for conservation-oriented communities. Advantages to residents of the new development and the broader community include a greater connectivity to the protected open space, a wider variety of lifestyle opportunities, and a greater sense of place. A CSO can complement other conservation programs as well as Homeowners' Associations or Community Development District activities.


*Photo Credit: www.slconservancy.org*

A CSO is usually funded through some type of agreed upon revenue-generating deed restriction that binds current and future homeowners and businesses to provide revenues through the creation of long-term dedicated funding. Examples of funding sources include fees (real estate transfer, commercial occupancy, golf course, etc.), monthly assessments, or other recurring revenues. Because a CSO's funding is from a permanent, recurring revenue source tied to the development rather than to the developer, it can continue to benefit the community even after the development is completed.

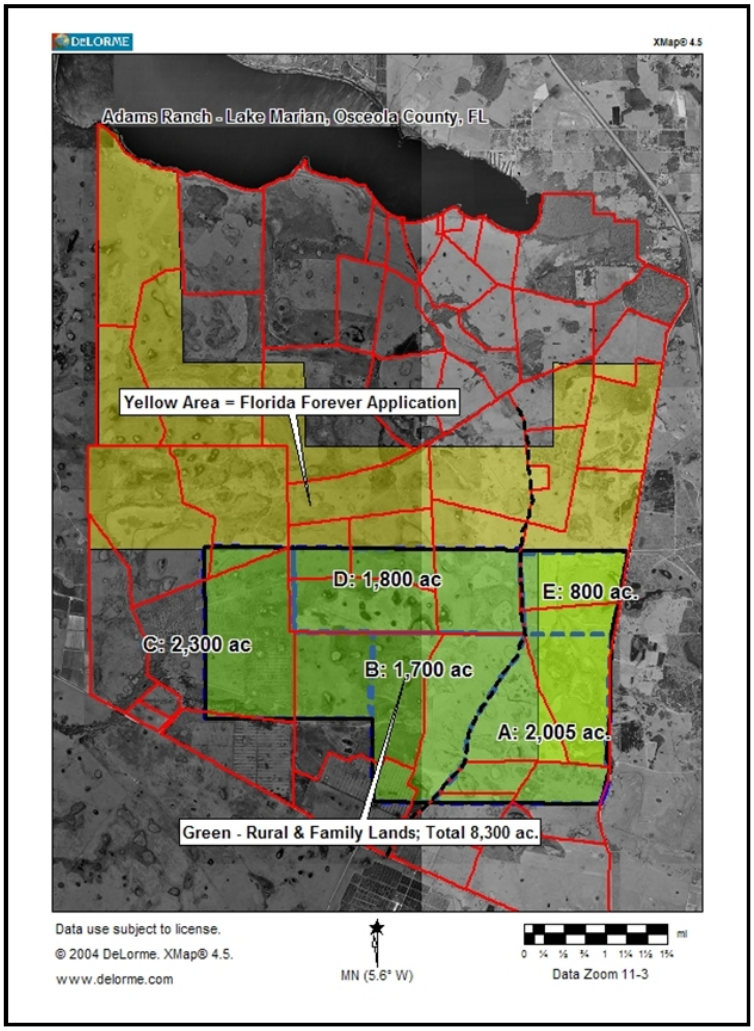
The Sonoran Institute (<www.sonoran.org>) serves as a source of information for CSOs. Resources include *Honoring the Land: A Manual for Establishing Community Stewardship Organizations*.

## Florida Rural and Family Lands Protection Act and Rural Land Area Stewardship Program

In 2001, the Florida legislature created two new land conservation programs: the Rural and Family Lands Protection Program and the Rural Land Area Stewardship Area Program

### *Rural and Family Lands Protection Program (RFLPP)*

The goal of the RFLPP is to help maintain Florida's agricultural land base and continue the economic viability of agriculture. The idea for the program, which had the support of both agricultural and environmental organizations, came out of a Growth Management Working Group.



### Adams Ranch RFLPP

**Adams Ranch, which is the 15th largest cow-calf ranch in the country, is a fourth generation cattle business headquartered in Fort Pierce. The ranch has operations in St. Lucie, Okeechobee, and Osceola counties in Florida.**

**In March 2009, Adams Ranch submitted 8,000 acres of its Osceola County Ranch to be considered for an agricultural easement under the RFLPP. Because of RFLPP funding limitations, Adams Ranch proposes to place 800 (area "E" on the map above) of the 8,000 acres ( green area on the map) under easement now and plans to place the remaining portions of the ranch under easement as more RFLPP funds become available.**

**Under the terms of the proposed easement, which is in the final stages of review by the Florida Department of Agriculture and Consumer Services (DAC), Adams Ranch will continue to run the agriculture operation. The ranch will also have the right to do more intensive agriculture in the future, such as row crops, as part of the DAC's goal to maintain agricultural production in the state.**

**Under the RFLPP, Adams Ranch was able to select the areas that would be retained as special nature areas (SNA). The easement requires that the SNAs be kept in natural use. No new improvements can be added, with one exception. The ranch has reserved the right to maintain or reconstruct, but not expand, existing agricultural improvements in the SNAs, including but not limited to buildings, roads, fences, and drainage structures.**

**The first easement acquired through the RFLPP is on a 690-acre portion of Evans Ranch, an aquaculture, cattle, and timber agricultural operation that extends into both Volusia and Flagler counties. The portion under easement is located in southwest Flagler County. The purchase of the easement represented a joint DAC-St. Johns River Water Management District project.**

*(For more information on Adams Ranch, go to <www.adamsranch.com>.)*

In contrast to the state's Conservation and Recreation Lands Program, which focuses on protecting and preserving natural areas and providing nature-based recreational opportunities, the RFLPP focuses on maintaining working agricultural landscapes and ensuring opportunities for viable agricultural activities. The idea is to promote agriculture, not restrict it.

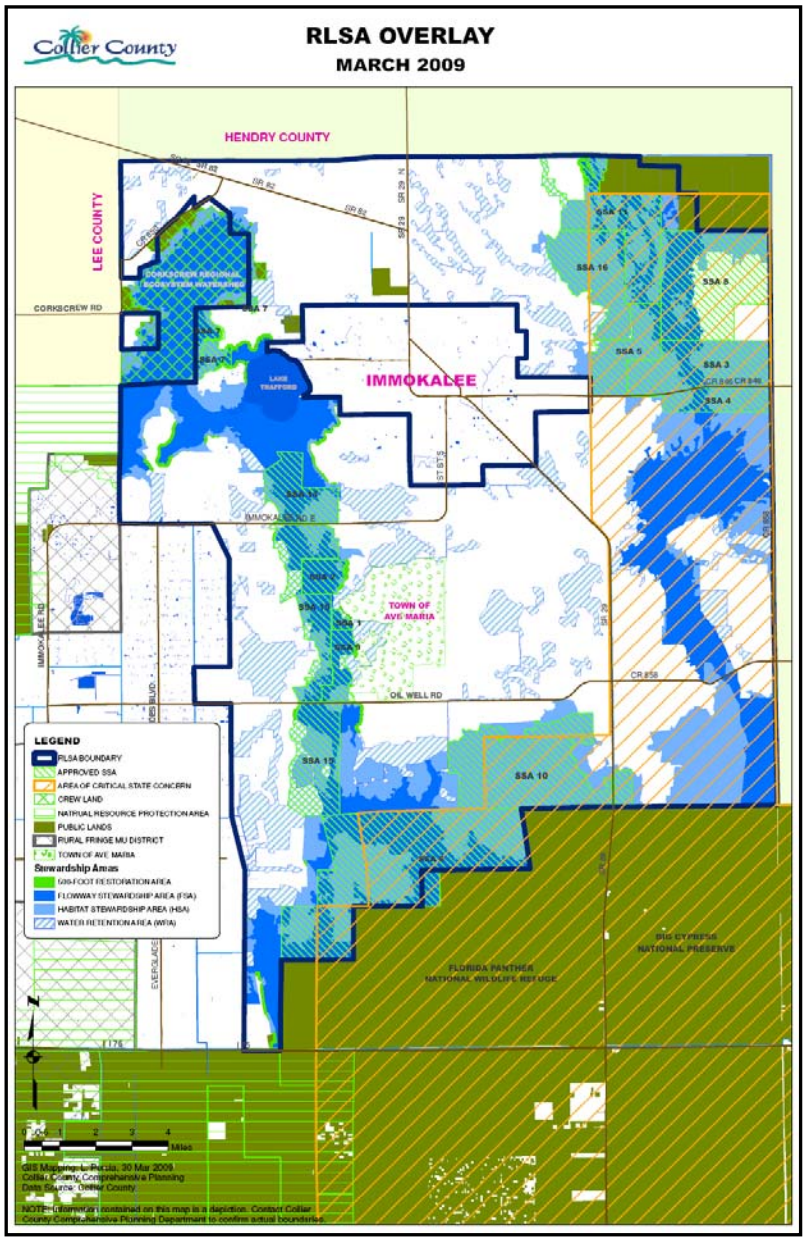
The RFLPP conserves agricultural land by acquiring development rights in the form of permanent conservation easements from qualified and willing agricultural land owners. The primary focus is on ranch and timber lands, although crop lands are considered. Because most of the growth pressures in the state are in urban areas, the program targets agricultural lands on the urban fringe and gives priority to those landowners willing to enhance or protect environmental resources. The first funding for the program was provided during the 2008 legislative session as part of the re-authorization of the Florida Forever Program.

The application process includes reaching agreement on allowed and prohibited uses. Permitted uses are structures and unpaved roads necessary for agricultural operations. Prohibited uses include subdividing the property, dumping on the site, and activities that negatively affect the natural hydrology of the land, water conservation, erosion control, soil conservation, and fish or wildlife habitat. During or after the purchase of the easement, a management and stewardship plan is required. The value of the easement is based on a fair market appraisal of the land with and without the easement.

More information about the RFLPP is available from the Department of Agriculture and Consumer Services' Division of Forestry (<www.fl-dof.com/forest_management/rural_family_lands_index.html>), which administers the program.

## *Rural Land Stewardship Area (RLSA) Program*

The RLSA Program is an optional planning approach that can be used in the unincorporated areas of a county outside of any municipal or established urban growth boundary. Counties may designate rural land stewardship areas that include all or portions of lands classified in the future land use element as predominantly agricultural, rural, open, open-rural, or a substantively equivalent land use. The RLSA must contain a minimum of 10,000 acres.




The approach is intended to encourage local governments and landowners to preserve environmentally sensitive lands, agricultural lands, and other natural resources in return for enhanced development rights that can be used on an appropriate part of the property. Multi-county RLSAs are possible in order for counties to work together on regional growth issues. A local government initiates the RLSA process, and must adopt an RLSA plan as an amendment to the local comprehensive plan. Final approval for an RSLA plan depends on a favorable review by the Department of Community Affairs.

The RLSA program operates similar to a transfer of development rights program (described later in this section) except that the credits are awarded on the basis of environmental protection and productive agriculture. The process involves designating a stewardship area and dividing that into credit sending areas (areas with environmentally sensitive land and active agriculture) and credit receiving areas (areas where development is appropriate). The credits from the sending area, which are assigned value based on the environmental resources protected and active agriculture maintained, are transferred to the receiving area. The credits are used in the receiving area to enable the proposed development to be built. The transfer of credits between the sending and receiving area involves a transaction between a willing seller and a willing buyer.

### Collier County RLSA

**The Collier County RLSA program, which was adopted in 2002, covers a 195,000-acre area. The goal is to preserve 90,000 acres of environmentally sensitive land and maintain an additional 65,000 acres of agricultural lands, in exchange for allowing 45,000 acres of compact development.**

**The stewardship credits are based on the natural resource value of the land (such as wildlife habitat), with the amount of credits driven by the land characteristics that the public values most. The credits are transferred to receiving areas that are designated for development. The development is to be in the form of compact new towns and villages based on traditional planning principles.**

**Because of the approach, the overall development footprint is one-fifth of the prior comprehensive plan, and natural resources are protected through market-based incentives. To date, the program has led to 55,000 acres of protected lands in stewardship sending areas and 5,000 acres approved or in process in stewardship receiving areas. Ave Maria University and the Town of Ave Maria are the first of the receiving areas.**

*(For more information, go to (< www.colliergov.net/Index.aspx?page=1515>.)*

St. Lucie County's RLSA amendment was the first approved in the state. The 11,369-acre Adams Ranch was the sending area and Cloud Grove was the receiving area. Under the proposed formula, the ranch generated 35,888 credits (an average of 3.16 units per acre) to be used in the development of Cloud Grove. While the St. Lucie County RLSA program remains in place, both the Cloud Grove and Adams Ranch applications were put on hold in 2008 and the Cloud Grove application was subsequently withdrawn.

More information about the RLSA is available from the Florida Department of Community Affairs (<www.dca.state.fl.us/fdcp/dcp/RuralLandStewardship/index.cfm>), which administers the program.

## Green Infrastructure Planning and Greenprinting

Both green infrastructure planning and greenprinting focus on creating viable systems of connected natural lands. Both approaches can be used to avoid the common practice of applying a left-over, piecemeal approach to deciding what land is conserved instead of taking a comprehensive, long-term view. Green infrastructure planning and greenprinting begin, rather than end, with a vision for the land that should be conserved for agricultural and natural uses and how that can be achieved. If viable connected systems of natural lands and working agriculture are to be maintained, individual local government land use decisions need to be made within the context of their cumulative impact on the long-term vision.

### *Green Infrastructure Planning*

The practice of green infrastructure planning uses the same strategic approach that a community uses to plan for its gray and social infrastructure (roads, sewers, water lines, hospitals, and schools, for example). That means planning in advance where green infrastructure should be located, designing it, connecting it, and deciding how to fund and manage it.

As highlighted in the definition on the right, a community's green infrastructure may include a variety of landscapes such as working agricultural lands, greenways, trails, parks, and public and privately-owned natural areas such as wetlands, woodlands, waterways, and wildlife habitat. To sustain an over-arching green network, green infrastructure planning should occur at a number of levels – from the broad landscape level scale to the county, city, and individual parcel or site scale.

*"Green infrastructure is strategically planned and managed networks of natural lands, working landscapes and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations. The foundation of green infrastructure networks are their natural elements – woodlands, wetlands, rivers, grasslands – that work together as a whole to sustain ecological values and functions. Healthy functioning natural or restored ecological systems are essential to ensure the availability of the network's ecological services."* **(The Conservation Fund)**

**The General Approach:** In a green infrastructure planning approach, the areas are strategically planned and managed in order to maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life of people and wildlife. As shown in the principles to the right, green infrastructure planning should be grounded in sound science, involve and respect the needs of landowners and stakeholders, and be planned and funded prior to drafting any plans for development.

**10 Principles of Green Infrastructure Planning**

1. **Connectivity is the key.**
2. **Context matters.**
3. **Green infrastructure should be grounded in sound science and land-use planning theory and practice.**
4. **Green infrastructure can and should function as the framework for conservation and development.**
5. **Green infrastructure should be planned and protected** *before* **development.**
6. **Green infrastructure is a critical public investment that should be funded up front.**
7. **Green infrastructure affords benefits to nature and people.**
8. **Green infrastructure respects the needs and desires of landowners and other stakeholders.**
9. **Green infrastructure requires making connections to activities within and beyond the community.**
10. **Green infrastructure requires long-term commitment.**

*(From Benedict, M.A. and E.T. McMahon, 2006, Green Infrastructure: Linking Landscapes and Communities. Island Press, Washington, D.C., p. 37, as highlighted on EPA's Green Communities website <http://epa.gov/greenkit/green_infrastructure.htm>.)*

**The Steps of the Process:** EPA offers a five-step planning approach to green infrastructure planning. That approach is based on broad stakeholder involvement, recognizing that as with any sustainable planning effort, getting knowledgeable and interested parties involved at the beginning will ensure a successful process.

The EPA process includes four steps:

*Step One – Where Are We Now?* – inventory, map, and assess the existing and potential conditions that will support (or detract from) green infrastructure planning.

*Step Two – Where Are We Going?* – develop a scenario that predicts the future based on a continuation of current trend if nothing is done to intervene.

*Step Three – Where Do We Want To Be?* – develop the green infrastructure vision that can be used to focus community energies and resources toward common goals and provides the foundation for the action plans to be developed in Step Four.

*Step Four – How Do We Get There?* – develop a green infrastructure action plan that contains goals and objectives, identifies issues and concerns, lists recommended actions, and assigns responsibility for the work to be done. Timeframes may be set for priority actions. The action plan may also include estimated financial costs and resources needed for implementation.

*Step Five – Let's Go!* – bring together the right tools and the people with the range of expertise, knowledge, and skills needed to implement and monitor the green infrastructure strategy.

**Benefits:** Green infrastructure planning provides multiple benefits, including: the retention of productive farmland, cleaner air and water, protected natural and water resources, parks, and greenways. Through an ecosystem services approach (described earlier in this toolbox), green infrastructure can also provide urban services more efficiently and at a lower cost (for example, retention and treatment of stormwater).

By laying out in advance the lands to be protected, how they are to be protected, and the best locations for development, farmers, ranchers, the public, and developers benefit from greater certainty and predictability about where development can (and cannot) go. Developers, landowners, and buyers also benefit from developments that provide open space amenities.

### Cecil County, Maryland, Green Infrastructure Plan

**Cecil County, Maryland's Green Infrastructure Plan was developed by The Conservation Fund in 2007. The plan is based on the approach outlined in *Green Infrastructure: Linking Landscapes and Communities* (Benedict and McMahon, 2006).**

**An important finding was that the county's green infrastructure's contribution to clean air and water, flood protection, and similar criteria provided the county with an estimated $1.7 billion in ecosystem services each year. Since less than one-quarter of the natural network was protected and much of the remaining land was in areas designated for growth, the Fund recommended a menu of tools to protect more of the green infrastructure network.**

**Those tools focus on four strategic areas:**

- **A green infrastructure network design that identifies and prioritizes the areas of greatest ecological importance within the county's natural ecosystems and provides a scientifically defensible framework for green infrastructure protection countywide.**
- **A water quality maintenance and environmental analysis that examined the relationship between land cover, impervious surface, and water quality and concluded that the county's green infrastructure network is a major source of clean water. The Fund developed models to identify the protection and restoration opportunities that would enhance water quality and recommended strategies for inclusion in the county's comprehensive plan.**
- **An ecosystem services assessment that involved a comprehensive identification of ecosystem services provided by the county's green infrastructure network. Examples include clean air and water, carbon sequestration, water supply and hydrologic regulation, flood protection, and stormwater management, in addition to significant cost savings in the provision of community services.**
- **An implementation quilt analysis that provides a set of strategies and policies to advance the protection and enhancement of the county's green infrastructure. Examples include leveraging state and federal conservation programs, incorporating green infrastructure analysis into landscape and site level land use decisions, developing a green infrastructure tracking and reporting system, educating the public about green infrastructure, and establishing a new county department focused on the protection of green infrastructure, water quality, and water resources.**

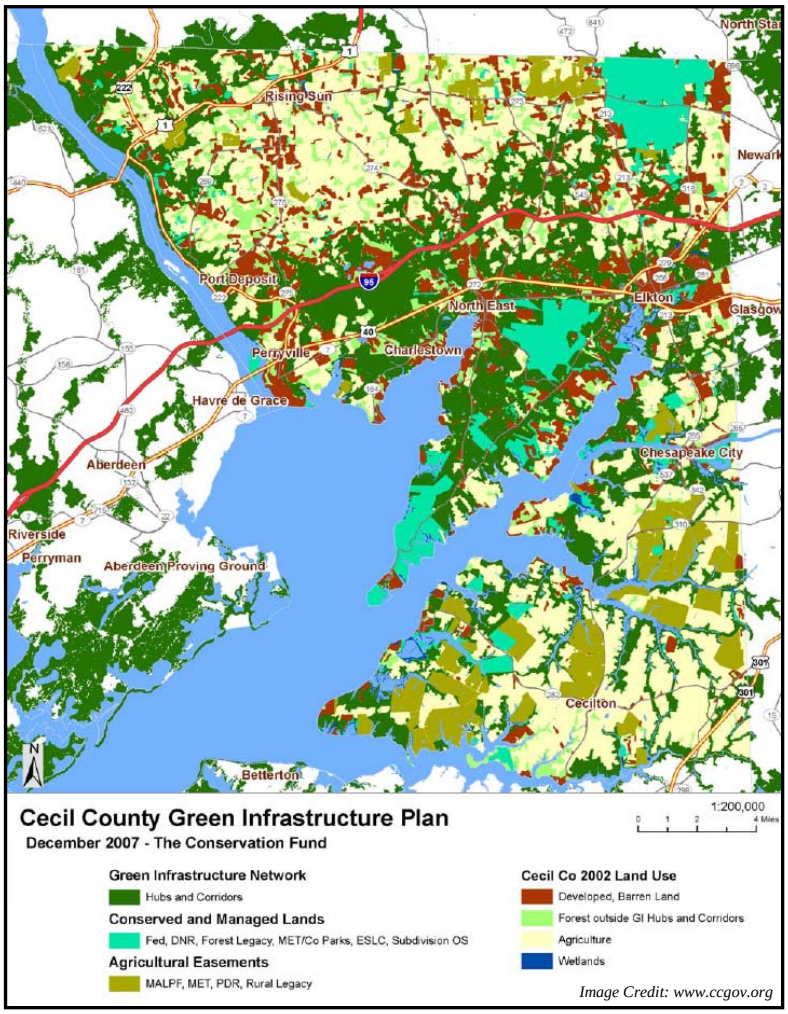
*(For more information, go to <www.conservationfund.org/project/cecil_county>, <www.ccgov.org/dept_planning/DocsForms.cfm>, and <www.epa.gov/healthywatersheds/examples/landscape_condition.html>.)*

**Primary Sources of Information:** Useful sources of information about green infrastructure planning include the following.

- The Conservation Fund (<www.conservationfund.org>)
- *Green Infrastructure: Linking Landscapes and Communities*, by Mark A. Benedict and Edward T. McMahon, published in 2006 by Island Press
- The green infrastructure website (<www.greeninfrastructure.net>), sponsored by the Conservation Fund and the U.S. Department of Agriculture Forest Service
- The green infrastructure website (<http://cfpub.epa.gov/npdes/home.cfm?program_id=298>), sponsored by the Environmental Protection Agency

### *Greenprinting*

Greenprinting is a GIS spatial analysis technique used by the Trust for Public Land (TPL) Conservation Visioning Service to help a community map its conservation priorities, make informed decisions about land conservation and growth management priorities, and catalyze support for conservation goals. Greenprinting uses a transparent mapping and modeling process to engage local residents in a thoughtful place- and community values-based planning exercise focused on short term actions and a long term vision.




The TPL's workbook, *Local Greenprinting for Growth*, provides a guide for communities seeking to create a greenprint conservation program. Published in partnership with the National Association of Counties, the workbook contains four volumes: Volume I, Using Land Conservation to Guide Growth and Preserve the Character of Our Communities; Volume II, Defining a Conservation Vision; Volume III, Securing Conservation Funds; and Volume IV, Acquiring and Managing Park and Conservation Land. More information on greenprinting is available from the Trust for Public Land (<www.tpl.org>).

### *Florida Green Infrastructure Planning and Greenprinting Resources*

Florida organizations and agencies offer many useful resources for green infrastructure planning and greenprinting. A sampling includes:

- 1000 Friends of Florida (<www.1000fof.org>), which in 1995 partnered with the Conservation Fund to publish the *Apalachee Greenways Report*. The report outlines the framework for a system of green infrastructure in the Apalachee Region of north Florida. As noted earlier, 1000 Friends of Florida also published the resource book, *Wildlife Habitat Planning Strategies, Design Features and Best Management Practices for Florida Communities and Landowners*, which provides an overview of landscape planning and can be accessed on-line at (<www.Floridahabitat.org>).

- The Florida Fish and Wildlife Commission (<www.myfwc.com>) offers a host of information about planning for the state's fish and wildlife and the habitat that they depend on. That information includes the *Florida Wildlife Conservation Guide* (<http://myfwc.com/conservation/fwcg.htm>), an on-line searchable compendium of guidance and reference materials related to wildlife, land use planning, and conservation. Information on the Commission's Cooperative Conservation Blueprint initiative and the Critical Lands and Waters Identification Project may be found at (<www.myfwc.com/WILDLIFEHABITATS/Legacy_CCB.htm>).

- The U.S. Fish and Wildlife Service's Peninsula Florida Landscape Conservation Cooperative (<www.fws.gov/southeast/LCC/PeninsularFlorida/FloridaLCCFactSheet.pdf>), an applied conservation science partnership among federal, state, and local agencies, tribes, non-governmental organizations, universities, and other stakeholders to benefit fish and wildlife and their habitats.

- The University of Florida's GeoPlan Center's *Florida Conservation Atlas* (<www.geoplan.ufl.edu>) contains conservation-oriented spatial datasets that can be used in different scales of conservation planning.

- Conservation nonprofit organizations with Florida offices, including the Nature Conservancy (<www.nature.org/wherewework/northamerica/states/florida/preserves/art16204.html>), the Conservation Fund (<www.conservationfund.org/southeast/florida >), and Florida Audubon (<www.audubonflorida.org>).

## Growth Boundaries and Management Strategies

Growth boundaries are used to contain urban development within an urban envelope where basic services such as sewer and water facilities, schools, and police and fire protection are in place. An urban growth boundary can be used to prevent urban- and suburban-scale development from extending into rural areas with high natural resource or agricultural value, encourage more compact and cost-efficient development patterns, and promote redevelopment.

## Miami-Dade County's Urban Development Boundary (UDB)

**The Miami-Dade County UDB distinguishes where urban development may occur and where it should not occur through 2015. An Urban Expansion Area Boundary is used to delineate the area where current projections indicate that further urban development beyond the UDB is likely to be warranted sometime between the years 2015 and 2025.**

**The county reinforces the UDB by focusing public expenditures for urban services and infrastructure improvements within the UDB to accommodate the intended land uses within the boundary. It also controls any future changes to the UDB through interlocal annexation agreements with municipalities.**

**In the designated agricultural lands outside the UDB, the county limits business and industrial uses and restricts residential development to a density of no more than one unit per five acres. As described earlier in this toolbox, the county also promotes agriculture through its Agricultural Manager, a purchase of development rights program, a branding marketing program, and zoning provisions that allow supplemental uses that support value-added agriculture and agri-tourism.**

*(For more information on the Miami-Dade County UDB, go to <www.miamidade.gov/planzone/cdmp.asp>.)*

A growth boundary is often coupled with other growth management strategies such as limiting urban services and public facilities to the urban envelope and requiring minimum residential densities within the boundary to achieve compact development and reduce the need to consume more open space. An additional approach is to offer incentives that promote development within the urban boundary.

The growth boundary should also be coupled with programs aimed at conserving farmland and natural resources outside the boundary. As discussed elsewhere in this toolbox, examples include an agricultural economic development program, agricultural and buffer zoning, and a purchase and/or transfer of development rights program. In Lexington, Kentucky, (the site of the first urban service boundary in the country in 1958), the local government adopted a rural land management plan featuring agricultural zoning and purchase of development rights to provide a comprehensive approach to conserving the county's agricultural land.

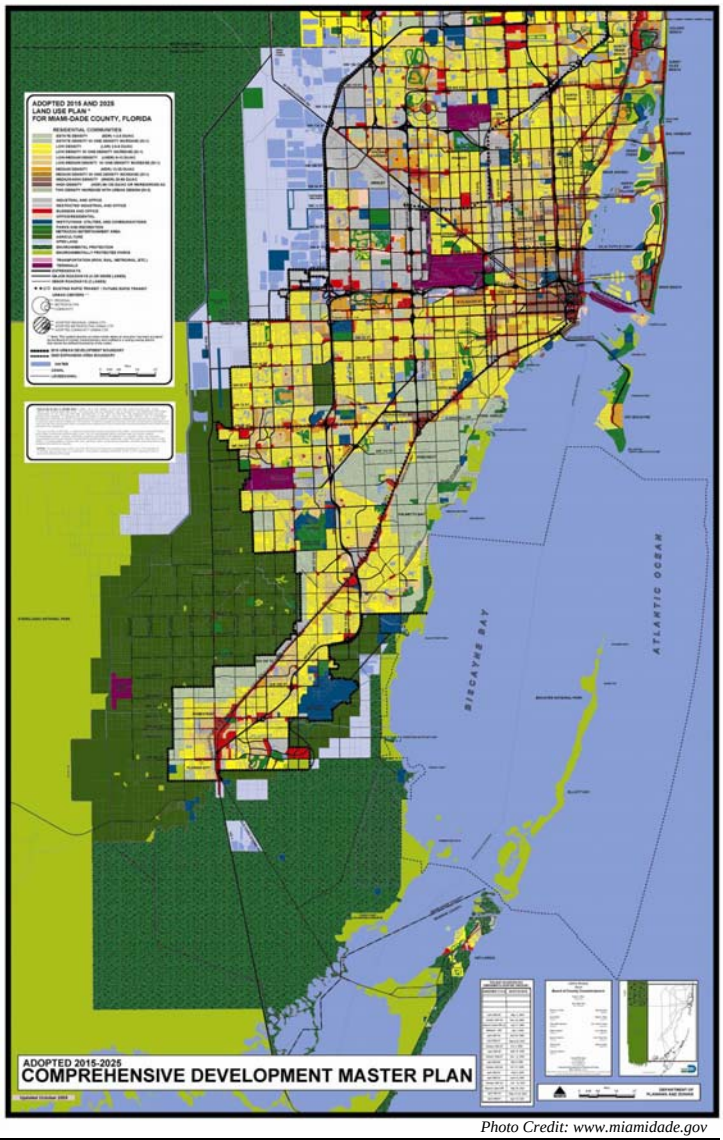



*Photo Credit: www.miamidade.gov*

Other features of a growth boundary should include maintaining an adequate supply (usually for a 20-year period) of buildable land in order to accommodate future population growth and avoid driving up land prices and, in turn, housing costs. Clear standards are needed for expanding the boundary when necessary.

In order for an urban growth boundary to be effective, it should be supported by a complementary capital improvement plan (CIP) that directs public facility investments into the urban envelope. The CIP should also limit the extension of public facilities (for example, sewers and major road arterials) and institutions (a post office, hospital, or educational facility, for example) into the areas designated for conservation. In most communities the boundary approach should be coupled with supportive annexation policies that may require interlocal agreements between a county and its constituent cities. An interlocal agreement might also be necessary when a county and city have separate planning and zoning boards.

Information on urban growth boundaries and other growth management strategies can be obtained from the American Planning Association (<www.planning.org>), the Smart Growth Network (<www.smartcommunities.ncat.org>), and Smart Growth America (<www.smartgrowthamerica.org>).

## Purchase and Transfer of Development Rights

A purchase of development rights (PDR) and a transfer of development rights (TDR) program share a common approach: removing development rights from areas designated for agriculture and/or natural resource conservation. In a PDR program, the development rights are purchased and retired; in a TDR, the development rights are transferred to an appropriate location for development. Both programs are voluntary on the part of the landowner, and they maybe used in combination (using the PDR program, for example, to protect strategic properties). Both also provide a financial benefit to landowners that they can reinvest in the farm or use for other purposes.

### *PDR Program*

The following contains a basic description of how a PDR program works, how it can be funded, some optional tax strategies, and the program's benefits.

*Photo Credit: www.co.ho.md.us*

**How It Works:** In a PDR program a landowner voluntarily sells a conservation easement to a designated private conservation organization or a governmental agency to protect the land from development. A deed of easement is attached to the landowner's deed and runs with the land. The term of the easement, which may be in perpetuity or for a specified period of time, is described in the easement document. In return for the restrictions placed on the land, the landowner receives financial compensation. A professional appraiser usually determines the value of the easement, which is the difference between the fair market and the agricultural or conserved value of the land.

Under a PDR program, the landowner retains title to the property, has the right to use the land for agricultural purposes, and may restrict public access. In addition, landowners selling their development rights may use the land as collateral for a loan or sell their property and continue to be eligible for state or federal farm programs that they were eligible for before entering into the conservation agreement.

**Funding for PDR Programs:** PDR programs can be funded in a variety of ways. The most common funding sources at the local level are through the sale of general obligation bonds, some type of dedicated tax (for example, a local real estate transfer or sales tax), or general appropriations. The most successful programs are supported by both the general public and local government with a long-term commitment to making the program work. Qualified staff is needed to handle the purchase of the development rights and conduct the monitoring needed to ensure that the land remains in agricultural or open space uses. Landowners selling their development rights also need the assurance that the program will be around to build a critical mass of protected land that will support working agriculture.

**Some Optional Tax Strategies:** An Installment Purchase Agreement or a 1031 Like-Kind Exchange may be used to facilitate a PDR program. Before moving forward with either approach, landowners should discuss the tax consequences with their tax advisors.

*Installment Purchase Agreement*
A PDR program can include an option for an installment purchase agreement (IPA) whereby the government agency purchases the development rights over time. The arrangement can have financial and tax advantages for both the landowner and the governmental agency.

**Howard County, Maryland, PDR Program**

**Howard County, Maryland, located in the high growth area between Baltimore and Washington DC, pioneered the use of installment purchase agreements (IPA) to fund the purchase of easements when the land was available. In addition, the agreements were structured so that tax benefits made the offer to purchase the easement more competitive with those of developers.**

**The IPA allowed the landowner to defer capital gains and collect an annual stream of tax-free interest on the full value of the easement purchase price. The easement is permanent and runs with the land. However, the IPA can be separated from the land, securitized, and sold on the bond market if cash is needed. County-issued zero coupon bonds fund the balloon payments at the end of the agreement's term.**

**The use of IPAs allowed the county to escalate its PDR program, and to date, 20,500 acres have been preserved. As depicted in the image above, the county created a roadside display sign so participating property owners could show that their farms are preserved. The county constructs the sign and does the installation at no cost to program participants.**

**Montgomery County, Maryland, couples its TDR program (the most successful in the country, protecting over 50,000 acres to date) with a PDR program and an active agricultural economic development program.**

*(For more information, go to <www.co.ho.md.us/DPZ/agriculture.htm>.)*

For the landowner, payments are spread out, allowing him or her to receive semi-annual, tax-exempt interest over a number of years (typically 20 to 30). The principal is due at the end of the contract term. A landowner may also sell an IPA contract at any point to realize the outstanding principal. The benefit to the local government is the ability to stretch what are often limited funds and purchase development rights while they are still available and affordable. A fact sheet on IPAs may be obtained from the American Farmland Trust (<www.farmlandinfo.org/documents/27752/tafs-ipa.pdf>). Installment purchases, as well as 1031 Like-Kind Exchanges, are described in *Holding Our Ground: Protecting America's Farms and Farmland* by Tom Daniels and Deborah Bowers, published by Island Press.

### Warwick Township, Lancaster County, Pennsylvania, TDR Program

**A unique feature of Warwick's TDR program is that the TDRs are sold for the purpose of increasing lot coverage in the township's Campus Industrial Zone (the receiving area). The sending area is the township's agricultural zone.**

**One transferable development right is assigned for each two gross acres of farmland. The TDRs are purchased from farmers who wish to preserve their farmland. The purchase price is based on the fair market value of the farmland at the time the TDRs are sold.**

**To ensure sound land use practices, the maximum lot coverage within the Campus Industrial Zone is 10 percent; however, for each transferable development right acquired, an additional 4,000 square feet of impervious surface (includes buildings, parking lots, and roads), up to a maximum of 70 percent coverage. The number of TDRs needed is based on the size of the project and the size of the tract where the project would be located.**

**The funds generated by the sale of the TDRs are used to preserve additional farmland within Warwick Township. Some 20 farms have been protected to date, achieving the dual goals of preserving prime agricultural area and directing development to designated growth areas. Warwick also has a TDR bank, as do a number of other communities, including King County, Washington, and Burlington County, New Jersey.**

*(For more information, go to <www.warwicktownship.org/warwick/cwp/view.asp?a=3&q=565106>.)*


*Photo Credit: Tom Daniels*

*1031 Like-Kind Exchange.* The Internal Revenue Service has treated a conservation easement and a fee interest in real estate as like kind under Sec. 1031 of the Internal Revenue Code. That means if the sale of a conservation easement is properly structured and the landowner uses the easement payment through an intermediary such as a bank or attorney to purchase other agricultural land, a business, or investment property, the arrangement is treated as a like-kind exchange. Under that approach, the capital gains taxes that would be due from the sale of development rights are deferred. That can be important for landowners who have owned their farms for a long time and have very little basis left. (In general, Section 1031 provides that no gain is recognized on an exchange of property held for productive use in a business (e.g., land used for agriculture) or for investment solely for "like kind property" also held for productive use or for investment.)

**Program Benefits:** A PDR program benefits both communities and landowners. For a community, a PDR program meets public goals to enhance the business of farming and to protect farmland, open space, and environmentally important lands. By protecting farmland outside urban growth boundaries, a PDR program can also help achieve a more cost-efficient form of development. Landowners can receive multiple benefits. Selling development rights allows landowners who are often land-rich and cash-poor to convert some of the wealth tied up in their land into cash while still retaining ownership and productive use of the land. A PDR program can also provide an alternative to selling land for development. By selling the development rights, the remaining market value is reduced, thus making the land more affordable for other farmers and facilitating the transfer of the land to children (discussed earlier under Conservation Easements).

*Transfer of Development Rights*

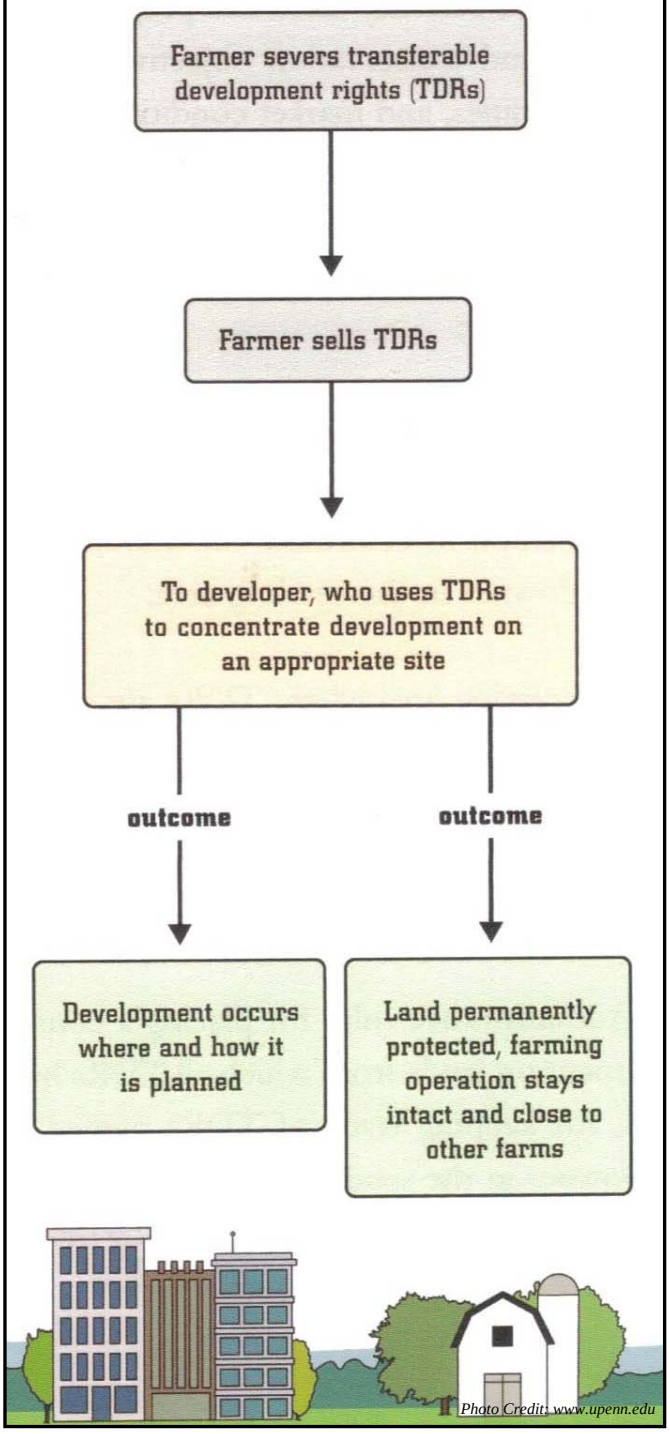
A TDR program enables landowners to transfer the development potential either within the same property or to another property in a designated growth area. Ideally, the transfer shifts development from agricultural and environmentally sensitive areas (sending areas) to locations with full municipal services and that are appropriate for more intense development (receiving areas). Since TDRs are market-driven, the key to making a program work is a strong demand from developers for the TDRs. Both seller and buyer must see a financial benefit.

**Getting Started:** To establish a TDR program, a local government identifies and maps the sending and receiving areas and adopts amendments to its comprehensive plan and zoning regulations. To create a market for the development rights, the local government:

- Assigns development rights to landowners in the sending area (for example, one TDR per five acres). A permanent conservation easement is used to restrict the land after the development rights are transferred.

- Establishes a process in which developers who wish to build at increased densities in the receiving areas must first purchase a certain number of development rights credits from the landowners in the sending areas.

**TDR STEPS:**
**Farmer To Developer**




**How it Works:** The sale of development rights involves a transaction between a private landowner and a developer. The price of the development rights is determined through negotiations between the landowner who is selling the development rights and the developer who is buying them. Participation is voluntary and involves a willing seller/willing buyer transaction.

The developer documents the purchase and severing of the development rights from the sending property through a deed. A conservation easement (described earlier in toolbox) is placed on the sending property. Once the program is set up, the government's role is to record the transaction and the easement, keep track of how many TDRs are held by landowners, and monitor compliance with the conservation easement. As described on the next page, a government may need to prime the TDR market by purchasing and selling TDRs through a TDR bank.

**Sending and Receiving Areas:** The details of planning the sending and receiving areas are important to the success of TDRs. Both areas should be clearly defined.

*Sending Area.* The sending area should be reinforced through the use of urban growth boundaries, policies that prevent the extension of major public facilities into the sending area, and agricultural zoning that prevents more intense development and allows uses that help agriculture diversify. As described earlier in this toolbox, economic development programs aimed at improving the profitability of agriculture are also important. Use of both a TDR and PDR program in the sending area will enable strategic acquisitions to prevent actions undermining the TDR program.

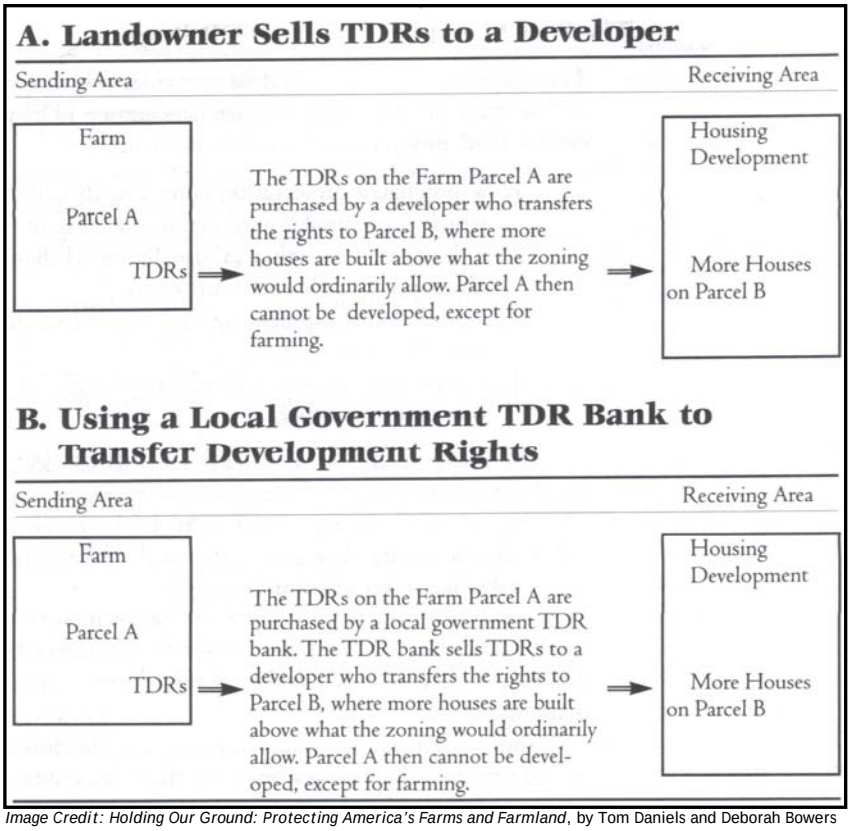


*Image Credit: Holding Our Ground: Protecting America's Farms and Farmland*, by Tom Daniels and Deborah Bowers

*Receiving Areas.* Receiving areas should be well-planned, clearly defined, have the necessary infrastructure, and allow high densities with TDRs. Receiving areas must also be viewed as desirable from both the planning and development perspectives. Without a strong market for the TDRs, the program will not work and will not create the value needed for the sending landowners. The general rule is that there must be twice as many places to use TDRs in the receiving areas as there are TDRs to send from the sending areas.

**The Density Rule:** For a TDR program to work, the local government must be committed to not giving density away through rezoning and not granting density bonuses without requiring that the developer purchase and use TDRs. Simply put, TDRs should be the only way that a developer can achieve higher than current densities. Many TDR programs fail because developers can obtain all the density they need either through the current zoning or rezonings without buying a TDR.

## An Overview of TDR Programs in Florida

**The following underscores the fact that the one size fits all rule does not apply when it comes to designing a TDR program. Each community needs to figure out the TDR structure that best meets its needs. In Florida, TDR programs are being used to conserve productive farmland, promote compact development patterns and a clear edge between urban and rural, and restore, link, and preserve environmentally sensitive areas. In some communities, TDRs are used in combination with a PDR program.**

- *Alachua County (<www.growth-management.alachua.fl.us>)* **– using TDRs as part of a Planned Development that involves two or more tracts of land and the transfer of units of density from designated conservation sending areas. The receiving area is evaluated for its viability to support increased development. A minimum of 50 percent of the combined area of the two parcels must be set aside as open.**
- *Charlotte County (<www.charlottecountyfl.com/GrowthManagement/PlanningZoning/TDU>)* **– using a TDR variation called Transfer of Development Units (TDU) to preserve environmentally sensitive land and address substandard platted lands. Density is permanently severed and transferred to locations more appropriate for urban development. No increase in entitlement density is permitted without the TDU.**
- *Collier County (<www.colliergov.net/Index.aspx?page=270>)* **– employing TDRs to protect environmentally sensitive land (the sending lands composed of 45,000 acres) within its Rural Fringe Mixed-Use Land Use District. Receiving areas (22,000 acres) are those lands with less environmental value. Density bonuses are given for enrolling early, implementing a restoration and maintenance plan, and conveying land to a public agency as a gift. Collier County also has a PDR program.**
- *Lee County (<www3.leegov.com/dcd/PlanAmendments/PA2008-2009/CPA200806A5.pdf>)* **– using TDRs to protect farmland and natural systems in southeast Lee County's groundwater resource area. The initial receiving areas will be four new mixed-use communities near Lehigh Acres where the purchase of TDRs will be required to develop at urban intensities. Additional receiving areas will include transit corridors and other urban sites in participating municipalities.**
- *Marion County (<www.marioncountyfl.org/Planning/farmland.aspx>)* **– using TDRs to protect farmland and designated conservation lands (the sending area). The receiving area is the Ocala Urban Reserve where TDRs are required to achieve urban densities. Close to 3,000 acres of farm and timber land have been protected under the program.**
- *Osceola County (<www.osceola.org/index.cfm?IsFuses=Department/GrowthManagement>)* **– requiring that a TDR must be purchased when a development comes in below a target density of five units per acre. Sending areas are conservation, agricultural, and habitat lands outside the county's Urban Growth Boundary (UGB). Receiving areas are those inside the UGB that do not meet the minimum density threshold.**
- *Palm Beach County (<***www.pbcgov.org/pzb/Zoning/fri.htm***>)* **– used its TDR program (currently under a moratorium) to preserve 35,000 acres in the sending areas (agricultural, environmentally sensitive, and rural residential lands) and its Agricultural Reserve and has combined TDRs with PDRs to protect 21,000 acres. Receiving areas are lands within the Urban Services Area, with greater credits for more urbanized locations.**
- *Sarasota County (<www.scgov.net/PlanningandDevelopment/CompPlan/CompPlan.asp>)* **– using TDRs to conserve environmentally sensitive and active agricultural sending areas. The largely undeveloped areas that the county's 2050 Comprehensive Plan calls for being hamlets and villages are the receiving areas. Over 8,000 acres have been protected.**
- *St. Lucie County (<www.stlucieco.gov/growth/tvc.htm>)* **– through its Towns, Villages, and Countryside Plan (described later in this report) uses TDRs to shape future development into well-defined towns and villages with clear edges and, in turn, preserve environmentally sensitive and agricultural lands.**
- *Volusia County (<www.volusia.org/growth/planning.htm>)* **– plans to use TDRs to protect conservation and agricultural sending areas, with an emphasis on environmentally sensitive areas. Receiving areas have not been designated.**

### Common Features of Successful TDR Programs

**A TDR program should:**

- **Have clear intent, goals, and rules. Keep it simple.**
- **Understand and reflect the local context.**
- **Involve landowners and developers in its design.**
- **Make sure that TDRs are worth something to both the landowners and developers. Participation is voluntary.**
- **Remember that TDR programs are market driven. That means having twice as many receiving sites for TDRs as TDRs from the sending areas.**
- **Include a policy that prevents giving away density in a re-zoning. Require the purchase of development rights in return for an upzoning.**
- **Minimize uncertainty for sellers and buyers.**
- **Select receiving areas where density is publicly and politically supported.**
- **Use design guidelines that help ensure that density will be accepted.**
- **Have the long-term commitment of local government.**

**The TDR program should also be:**

- **Supported by a public that understands why the program is necessary (to protect farmland and highly valued natural resources).**
- **Coupled with outreach and education programs. In short, market the program to key users and the public.**
- **Reinforced by a comprehensive package of supportive planning tools, such as zoning and growth boundaries.**
- **Supported by knowledgeable staff that can provide technical assistance as well as run the program.**
- **Celebrated as successes occur.**

A local government must also be willing to support the additional density in the receiving area. Developers need to know that they can use the TDRs in a timely process. They will be reluctant to participate in a TDR program if they see a long process to have their TDR-related projects approved. Design guidelines and form-based codes can be used to help ensure that the density is visually pleasing and compatible with existing development and will be accepted by the public. Government can help through supportive infrastructure investments.

**Stimulating a TDR Market:** A local government can use a variety of techniques to facilitate a TDR program. It can allow developers to make a payment in lieu of the actual transfer of development rights and maintain public lists of TDR sellers and buyers. Another approach is a TDR bank that buys development rights with public funds and sells them later to developers. Typically the TDR bank purchases the development rights from landowners who are not able to sell them otherwise, which helps ensure a market and a base price for the development rights. A TDR bank can also serve as a center of contact between landowners and developers, facilitating sales and reducing transaction costs for participants.

**Benefits:** Landowners benefit by the infusion of cash received when selling the development rights. They also benefit from keeping farmland prices affordable for agricultural uses and avoiding land uses that impede farming. The public benefits because private sector funds are used to purchase the development rights, thus avoiding large public expenditures. As with a PDR program, the public also benefits through the protection of farmland and environmentally sensitive areas. In addition, since development occurs in suitable areas, the result is more efficient public services. Designated receiving areas mean that developers benefit from greater certainty about where they can develop.

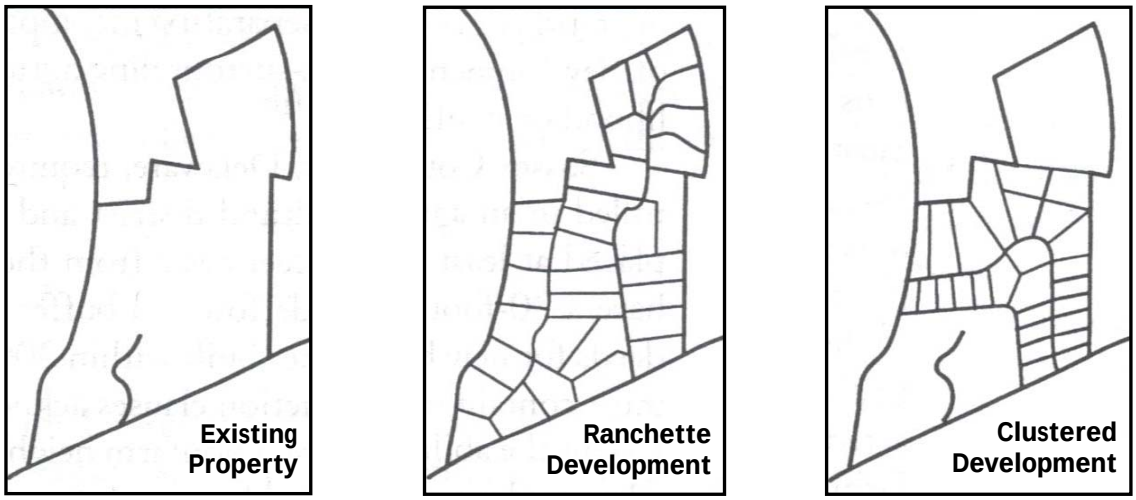
*PDR and TDR Resources*

The American Planning Association (<www.planning.org>) and the American Farmland Trust (<www.farmland.org>) are two of the principal organizations that provide information on PDRs and TDRs.

- "Zoning for Successful Transferable Development Rights Program," by Tom Daniels and published by *Zoning Practice,* American Planning Association, December, 2007
- "Saving Farms and Farmland: Ag Land Preservation Has Reached Maturity," by Tom Daniels, *Planning*, Aug.-Sept. 2009
- "What Makes Transfer of Development Rights Work? Success Factors from Research and Practice," by Rick Pruetz and Noah Standridge and published in the *Journal of the American Planning Association*, Winter, 2009
- "Transfer of Development Rights in U.S. Communities: Evaluating Program Design, Implementation, and Outcomes," by Margaret Walls and Virginia McConnell, Washington, DC: Resources for the Future, 2008

## Rural Residential Cluster Development and Conservation Design Communities

Rural residential cluster development and conservation design communities are two ways to retain some agricultural land, promote connected natural systems, and retain rural character. The primary difference between the two is that the term rural residential cluster development is used only when residential dwelling units are involved; the term conservation design communities connotes a development that contains the mix of uses found in a compact, complete community (described below in Design Considerations).




*As depicted above in the drawing of a 100-acre farm, rural residential cluster development and conservation design communities allow at least some, if not most, of the land to remain open rather than chopping it into a checkerboard of ranchette developments.*

*Image credits: Holding Our Ground: Protecting America's Farms and Farmland, by Tom Daniels and Deborah Bowers, published by Island Press*

### Volusia County
### Land Cluster Development

**In Volusia County, the cluster or conservation development program is designed to provide a preferred alternative to large lot ranchettes. At least 60 percent of the site must be permanently protected open space (for example, to preserve ag lands and protect habitat and wetlands) and must link to an integrated conservation network. Design standards are used to achieve the desire cluster results.**

**To encourage the cluster choice, a density bonus is awarded if certain resources are protected and the property is placed under a conservation easement and subject to a conservation plan. Filing fees are also adjusted, and approval procedures are less onerous than for Planned Unit Developments.**

**The cluster provision is a component of the county's Smart Growth Initiative that has as its central feature the protection of its environmental core (nearly 300,000 acres of must save lands). Those lands are mapped in an Environmental Core Overlay (ECO) (depicted above), a part of the Future Land Use Map series.**

**In addition to clustering, the transfer of development rights may be used to move development out of ECO lands and into less sensitive areas. The use of practices such as green building design, water conservation, low impact development, and other measures to reduce development impacts are also encouraged.**

**The county also has its Volusia *Forever* land conservation program that was created in 2000 when Volusia County voters agreed to tax themselves .2 mills over 20 years to protect the county's natural biodiversity. To date, over 32,000 acres (fee-simple and less-than-fee) have been preserved.**

*(For more information, go to <www.volusia.org/growth/Planning.htm>, <www.volusia.org/smartgrowth>, and <http://volusiaforever-echo.com/forever>.)*

In both cases, the focus is on preserving open space in the form of working farmland, wildlife habitat, or passive recreational uses by concentrating development in a much smaller footprint than that allowed by traditional minimum lot size zoning. Ideally, a significant portion of a site (at least 50 percent and even as much as the 80 percent range) remains as undivided, protected, and dedicated open space, and the development is concentrated on only a portion of the site, using smaller lots to accommodate the development on less space. The protected lands should have high value natural resources, while the lands to be developed should have lower resource value and, therefore, are more appropriate for development.

### *How the Approach Works*

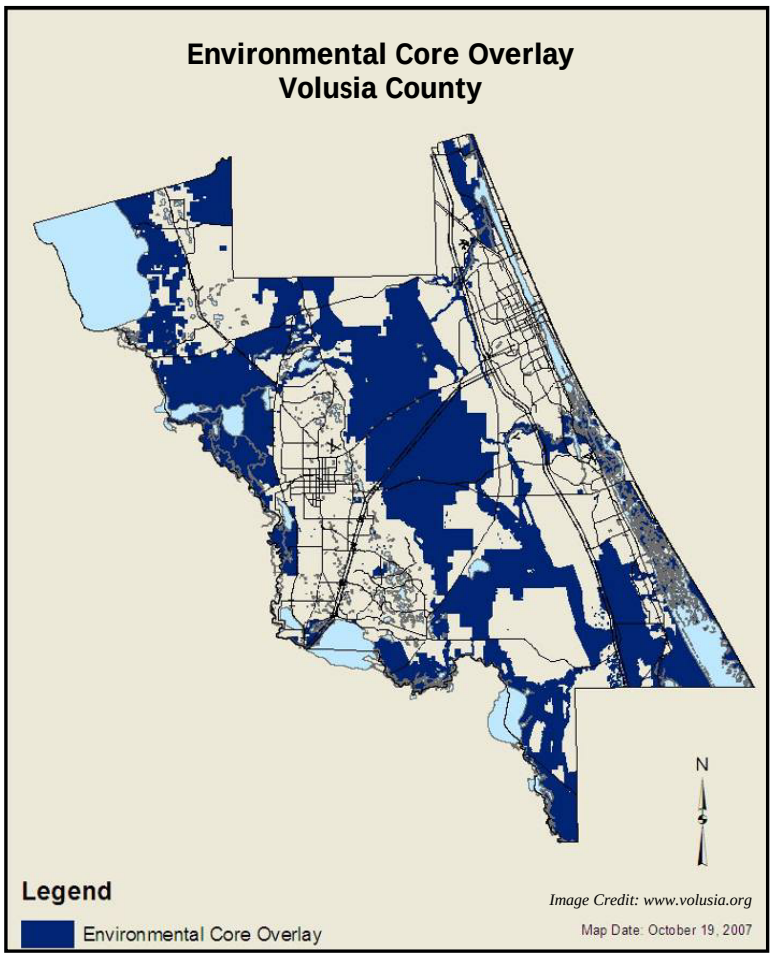
Imagine a 100-acre parcel of agricultural land with a zoning designation that allows an owner to develop the land at a maximum density of one residential dwelling unit for every five acres of land (the zoning for the majority of St. Lucie County's western lands). As illustrated in the top image above, over time the land could be carved up into a patchwork of 20 five-acre ranchettes, each with its own driveway and large yard. In the rural residential cluster development alternative (depicted in the bottom image above), those same homes could be on smaller lots and grouped on a smaller portion of the total available land. The remaining land, which would have been allocated to individual home sites, remains open for farming uses, habitat or water resource protection, or some other form of open space.

By applying the same planning principle, a conservation design community occupies a much smaller footprint than most conventional new town developments while still allowing landowners to develop the same amount of housing. The smaller footprint means that more of the rural character and functions are retained, and the impacts of development on important ecological systems and water resources are minimized.

### *Benefits of the Cluster Approach*

When designed properly, the rural residential cluster and conservation design approach can retain rural character, provide recreational areas for people and habitat for wildlife, create higher housing values because of the proximity and access to conserved open space, and reduce storm water runoff and provide cleaner water by naturally filtering storm water and requiring less grading. Other advantages may include lower site development costs and greater connectivity of environmental corridors.

A major downside of rural residential cluster and conservation design developments is that they put more non-farm people in the countryside. And, particularly in the case of conservation design developments, they can be more expensive if measures are not taken to provide for a mix of housing types and costs. In addition, the developments tend to rely heavily on cars.




Other potential downsides of rural cluster residential development and conservation development design may be addressed through the design and planning process. Examples of those downsides include the creation of conflicts with working agriculture or habitat quality, fragmentation of natural systems, poor maintenance of the conserved open space, and problems with how waste water is managed, especially in the case of smaller lot developments.

### *Common Features to Consider*

both the rural residential cluster development and conservation design community alternatives are established through the local planning process. To achieve the desired outcome of both approaches, first step is to use a science-based, long-term view methodology to identify the important areas to be conserved in order to avoid the "left over" approach (when the development is planned first and the open space is what is left over). Examples of the long-term view approach include Volusia County's Environmental Core Overlay (described on a previous page) that identifies critical areas that must be saved, and the Farmton Plan, described on the following page.

## The Farmton Plan

**Farmton Tree Farm is a 59,000-acre silviculture operation that straddles Volusia and Brevard counties. Faced with dwindling returns from silviculture and pressures to develop, Farmton's owner, the Miami Corporation, began to look for an economically viable option that would sustain the best of the ecological resources and retain the land in single ownership.**

**The result is the 50-year, conservation design-based Farmton Plan that, if approved by the Florida Department of Community Affairs, will eliminate the currently allowed rural ranchette development that would fragment the land with incremental, piece-meal development. Instead, under the Farmton Plan 75 percent of the 59,000 acres will never be developed.**

**The heart of the plan is the GreenKey, a connected network of protected natural systems and open space that was identified and designed through a science-based process called greenprinting. The GreenKey will be protected by a conservation easement and will have a conservation management plan. The GreenKey plan was developed at the beginning of the planning process so that no development was planned there. The conservation areas form a missing link in a potential wildlife corridor that connects more than a million acres from the St. Johns River to the Ocala National Forest.**

**The plan also reserves Sustainable Development Areas (SDA) that will be master planned and placed in locations suitable for future development. The SDAs will be compact in order to increase the amount of land that can be conserved and to encourage energy- and cost-efficient infrastructure. They will include a mix of uses within close proximity so that residents can walk or bike from home, work, or school to the grocery store and other daily needs.**

**Performance standards will ensure that future development attains the highest benchmarks for sustainability, including those for water quality and the number of homes that may be built in relation to the number of jobs created (a ratio of one job for each home).**

*(For more information, go to <www.farmtontreefarm.com>.)*

**Farmton Conceptual Land Use Plan**

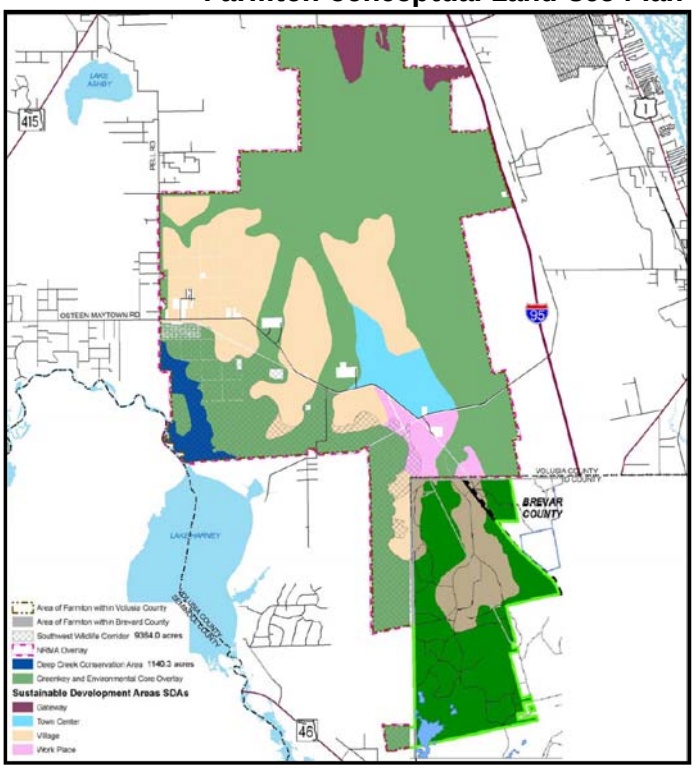



*Photo Credit: www.farmtontreefarm.com*

By identifying the must-save places first, the areas to be conserved can become the organizing framework for planning the development and ensuring that it enhances, rather than degrades, the protected lands. The purpose and use of the open space that is to be protected must be ascertained. Different approaches might be needed if the protected open space is to be used for agricultural production, wildlife habitat, water resource protection, greenways, trails, or some form of passive recreational uses.

### *Design Considerations*

A central feature of a successful rural residential cluster development or conservation design community is equal attention to the details related to the design of the greenprint (the land to be conserved) and the design of the development. All too often the public views a plan as failing because of greater emphasis on one side of the plan – for example, a lot of attention to planning the natural systems and not the development, or visa-versa.

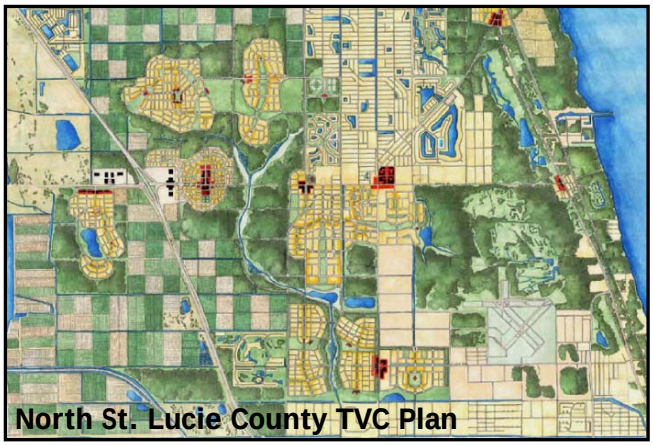



*Image Credit: www.stlucieco.gov*

**The Lands to be Conserved:** Following the Farmton example, the planning process should start with working collaboratively with experts, conservation organizations, and other stakeholders to map, document, and evaluate the lands – the green infrastructure – that should be conserved. The mapping of the conservation areas should be based on sound scientific analysis coupled with thorough groundtruthing.

The resources identified and mapped may include working agricultural landscapes and natural features such as slopes, soils and ground cover, important wildlife species and core habitat and corridors, and forests and mature tree stands. Also important are wetlands, drainage ways, streams and other surface water areas, and areas that, if restored, would establish or reestablish functioning connected natural systems as part of a larger green infrastructure system. Geeenways and natural trails are another potential greenprint component. For example, the Farmton greenprint includes nearly 13 miles of the 52-mile section of the East Central Regional Rail-Trail and is an important link in creating a protected regional wildlife corridor.

## North St. Lucie County Towns, Villages, and Countryside Plan (TVC Plan)

**The TVC Plan and form-based code overlay for the 28-square mile area of north St. Lucie County replaced the previous planning instructions that resulted in sprawling development with a new model that uses urban design and place-making strategies to shape future growth into sustainable towns and villages. The plan was adopted in 2006 after an extensive public involvement process that included the North County Charrette held in 2004.**

**As illustrated in the image above, the TVC Plan uses the market forces of growth as a tool to:**

- **Encourage a pattern of development that retains large areas of the countryside and preserve and promote agriculture.**
- **Provide for future growth in the form of sustainable towns and villages.**
- **Mitigate the environmental impacts of new development.**
- **Comprehensively plan for water management.**
- **Address traffic and infrastructure needs.**
- **Accommodate the next 50 years of growth in a predictable manner that ensures residents' quality of life.**

**Using the principles of Traditional Neighborhood Design, the sustainable growth pattern is characterized by a mix of uses, building types, and housing costs in order to accommodate a mix of income levels. Pedestrian-friendly blocks and a highly connected street network are also important features.**

**A TDR program is a core component of the TVC Plan. The TDRs are used to change the pattern of settlement by enabling landowners to transfer density from the countryside that is to be protected to the towns and villages where development is encouraged.**

**In 2006 St. Lucie County and the Treasure Coast Regional Planning Council received the 2006 Award of Excellence from the Florida Chapter of the American Planning Association.**

*(For more information, go to <www.stlucieco.gov/growth/tvc.htm>.)*

## Serenbe, Georgia

**Serenbe is a 1,000-acre community located in Chattahoochee Hill, a 40,000-acre city southeast of Atlanta Georgia, that is a part of the 65,000-acre Chattahoochee Hill Country. Consistent with the goals of the city's land use plan, Serenbe's master plan concentrates development in mixed-use hamlets and conserves over 70 percent of the site as greenspace.**

**To design with nature, the Serenbe master plan:**

- **Clusters buildings in a series of interconnected omega-shaped hamlets that are carefully fitted into natural landscape positions. Each hamlet features lower densities at the edge and transitions to higher densities and mixed uses in the center.**
- **Conserves energy by positioning homes to maximize energy efficiency and natural heating and cooling. All structures are built to the green building standards mandated by EarthCraft Homes and are positioned to cause minimum disturbance of the land. Green outdoor lighting allows a view of the stars at night.**
- **Promotes connectivity through a system of connecting pathways that encourage walking.**
- **Conserves water through water-smart appliances, reused water for irrigation, and stormwater treatment through natural systems. Native plants and organic landscaping techniques eliminate the need for chemicals.**
- **Promotes healthy eating through the 25-acre Serenbe Farm that provides organic produce to the community and broader region through Community Supported Agriculture and Farm-to-Table programs.**
- **Encourages social interaction through design features such as front porches and central post boxes and numerous community events. The Serenbe Institute for Art, Culture, and the Environment works to involve residents in the community and create a sense of place.**

**Serenbe was awarded the first Sustainability Award from the Atlantic District Council of the Urban Land Institute and was honored as a Development of Excellence by the Atlantic Regional Commission.**

*(For more information, go to <www.sernbecommunity.com>.)*


*Photo credit: www.serenbecommunity.com*

To ensure that all important resources are identified, the initial mapping and data collection could be the subject of an outside, objective scientific peer review (a step that Farmton took). In the Farmton example, the peer review experts focused on a number of topics, including the hydrology of the area and the composition, width, location, and connectivity of the wildlife corridor. A peer review process could also be applied to the preparation of a conservation management plan and the plan for the areas to be developed.

Also important is deciding how the areas to be conserved are to be owned and managed. For example, in a rural residential cluster development the conserved space could continue to be owned and farmed by the landowner or held in common by the individual homeowners (for example, through a homeowners' association or similar organization) and used as common open space or some other use, such as equestrian facilities or a community garden.

**The Lands to be Developed:** A variety of measurable planning techniques and standards can be used to create development that enhances, rather than detracts from, the natural environment and compliments the areas to be conserved. They will also help achieve the energy conservation requirements called for in Florida House Bill (HB) 697 (<www.dca.state.fl.us/fdcp/dcp/EnergyGHG/index.cfm>). Effective July 2008, HB 697 established new local planning requirements relating to energy-efficient land use patterns, transportation strategies to address greenhouse gas reductions, energy conservation, and energy efficient housing.

As illustrated in the Farmton, Prairie Crossing, Serenbe, and Restoration examples, those tools include the following design elements.

*Compact, Environmentally Sensitive Development.* In both a rural residential cluster development and a conservation design community, the development is designed to enhance, rather than damage, the natural environment. A more compact development pattern is used to reduce the development footprint and allow more natural lands to be preserved. The reduced development footprint also lowers the per-unit development costs, reduces utility and road costs, results in more greenspace to absorb urban heat and carbon and store and filter stormwater, and, because of the close proximity of uses, creates a more walkable community. In existing communities, compact development can be promoted through incentives that promote infill and redevelopment and reshaping lower density, single-use development into compact mixed-use centers. For new development, more compact developed can be achieved through minimum density and intensity standards or impervious pavement coverage standards.

*A Mix of Uses and Multi-Modal Transportation Options.* A conservation design community is compact, has higher densities, and provides a balanced mix of uses that include opportunities for living as well shopping, employment, recreation, and entertainment in close proximity. The mix of uses should offer a variety of housing types and price levels that serve residents of all ages and incomes. It should also create a jobs-to-housing and services ratio that reduces the need to drive to work or to destinations for other daily needs. Mixed-use development can be horizontal (next to or nearby each other) or vertical (on top of each other, such as housing or offices above retail).

**A Sampling of Conservation Development Elements**

- **Compact, environmentally sensitive development**
- **A mix of uses in the case of a conservation design community**
- **Multi-modal transportation options**
- **Energy-efficient, place-based development and site planning**
- **Water conservation**
- **Interconnected systems of complete, walkable streets, and greenways**
- **Design that encourages social interaction and creates a sense of place**
- **Attention to making edges compatible with conserved land**
- **Mutually beneficial rural-urban partnerships**

### Prairie Crossing

**Prairie Crossing, a 677-acre conservation community in Grayslake, Illinois, is designed to preserve over 60 percent of the site as open space and agricultural land. Instead of the 2,400 homes originally proposed for the site, the community contains 359 single-family homes and 36 condominiums that are concentrated in an area called Station Square.**

**Amenities include a community gathering place in a renovated barn, a charter public elementary school that emphasizes natural environment experiences, a farm market, access to commuter rail, and a connected system of horseback riding, walking, biking, and ski trails. Because of a site design that filters stormwater runoff through the prairies and wetlands, a lake is now pure enough for swimming and was selected as a site for stocking endangered native minnows.**

**Homes are designed with a sense of place and energy in mind. Houses are in the Midwestern Vernacular architecture style and painted in the colors of the native landscaping. The single family homes were constructed to the standards of the U.S. Department of Energy's Building America program, each of the condominium units has been individually certified by Energy Star, and the community is planned to encourage walking and biking.**

**Landscaping uses native prairie plants and the community has more than 165 acres of restored prairies, 20 acres of restored wetlands, and 16 acres of historic hedgerows. The native plants also help clean stormwater, prevent flooding, and require less water and labor than traditional lawns.**

**A Homeowners' Association is responsible for community amenities, design review, and other aspects of community life. Volunteer stewardship activities are organized by the Liberty Prairie Conservancy.**

*(For more information, go to <www.prairiecrossing.com>.)*

**Prairie Crossing**

*Photo Credit: Prairie Crossing, Grayslake, Ill. // © Prairie Holdings Corporation*

Combined with more compact development, the mix of uses promotes opportunities for transit and provides a living environment in which people of all ages are able to live within walking or biking distance of work, shopping, entertainment, public gathering places, and other services. In the Treasure Coast, Indian River County's proposed mixed-use planned development policy (<www.irccdd.com/Planning_Division/CP/Drafts/DRAFT_Future_Land_Use.pdf>) provides a good description of mixed-use development.

*Energy-Efficient, Place-Based Development and Site Planning.* Building design and site planning should be sensitive to the local climate, topography, history, and building practices for both rural residential cluster developments and conservation design communities. They should also put enhancing the natural environment and energy efficiency at the forefront. An example is the design for Prairie Crossing (described to the right).

Site location selection and building design and orientation are important for respecting the natural environment and gaining greater resource efficiency through, for example, natural methods of heating and cooling. Building techniques, colors (for example, white to reflect the sun), and materials are important. Other methods might also include positioning buildings to capture breezes and maximize energy from the sun, preserving trees to provide shade and sequester carbon, and employing green design techniques that produce and use renewable energy sources and conserve water.


*Photo Credit: Joe King*

A high standard for planning a green design development is the LEED® Design for Neighborhood Development (<www.cnu.org/leednd>), a rating system that integrates the principles of smart growth, urbanism, and green building. The standard was developed by the U.S. Green Building Council, the Congress for the New Urbanism, and the Natural Resources Defense Council.

*Water Conservation.* Water practices that conserve water and have the potential to provide for water neutrality (no new water supply source required) are essential in a water-limited world. Use of native and xeriscape landscaping, water efficient appliances, and re-used water for irrigation and watering lawns can make a big difference. Also important are rain gardens designed to hold and clean stormwater, protecting water sources (for example, through a water resource protection overlay zone), and requiring low impact development (LID).

LID (illustrated to the left) provides an alternative to conventional development practices that often alter natural hydrological systems in order to dispose of rainwater. Instead, LID focuses on managing and reducing stormwater runoff where it originates by maintaining or re-creating natural hydrologic systems that allow rainwater to soak naturally into the ground where it is filtered, stored for reuse, and utilized by plants.

### River Forest LID

**River Forest is a 26-home neighborhood located in Manatee County, Florida. It received the Outstanding Development Award from the Florida Planning and Zoning Association and a Leadership Award from the Council for a Sustainable Florida. The developer used low impact development techniques to ensure that River Forest was compatible with the surrounding pine forest and adjacent river.**

**Site conditions were viewed as an asset, not a constraint:**

- **By maintaining the existing natural slope of the land, native soils, and understory plants, natural hydrological functioning continues post-development.**
- **A network of small scale sand-filter treatment swales was used instead of large stormwater ponds. A series of planted basins and vegetated open swales (shown in the image above) slows down the water and allows it to be filtered through plant roots and the sand bed under drain to a collecting system.**
- **The existing tree canopy was preserved to shade the houses to keep them cooler, sequester carbon, provide wildlife habitat, and moderate rainfall. The homes are designed and placed to preserve trees and are positioned to maximize the use of solar energy and take advantage of natural breezes.**
- **To reduce stormwater runoff, the connecting road is narrow and has a recycled concrete base to reduce the amount of impervious surface. The road also meanders to fit around the native trees.**
- **The required use of native plants reduces the need for fertilizer and expensive landscaping maintenance.**

**To create a conservation culture, the developer educated buyers about the neighborhood's natural resources and low impact practices. The River Forest Homeowners' Association continues to make natural stewardship and maintaining the developer's concept and performance goals a shared neighborhood priority.**

*(For more information, email Joe King at joe@kingarch.net.)*

## Restoration Florida

**Restoration is a master planned conservation design community located on 5,187 acres located west of I-95 in Edgewater, Florida. Shown in the images on the following page, the approved plan for Restoration follows the principle of conservation design by clustering resource efficient development on smaller lots and preserving 73 percent (3,872 acres) of the site. It replaced an earlier plan that would have resulted in development and roads dispersed throughout the site.**

**Both plans provided for 8,500 residential units (20,000 people), but the similarities ended there. The units, which are designed in the Old Florida style and will provide for a range of housing and lifestyle options, will now be clustered in a compact, mixed-use form. All homes will meet energy-efficient design standards (Florida Water STAR and Energy Star). A transect-based planning approach is used to provide an urban to rural pattern that arranges development harmoniously in the natural landscape.**

**To meet requirements for internal trip capture and reduce greenhouse gas emissions**

- **All residents will live within a 10 minute walk of a fixed rail trolley system that runs on a multiway corridor connecting the Town Center, schools, and workplaces. Mixed-used development that contains residential, retail, and office uses will flank the corridor.**
- **An estimated 7,600 jobs ranging from entry to the technical level will provide a jobs-housing balance that reduces the need to travel out of the community for employment. The plan also provides for school sites, a full-purpose sports complex, and a range of public gathering spaces.**

**Important environmental features include the restoration and maintenance of native uplands and wetland prairie communities and three miles of natural trails that weave through the site. To reduce daily household water consumption by 50 percent, the plan minimizes turf areas and uses drought tolerant plants, native plant species, and state-of-the-art soil moisture sensors for irrigation.**

**The community will also use a complete stormwater re-use system for non-potable water needs and will supply four water wells that add to the City of Edgewater's potable water supply. In addition, stormwater basins will be ecologically enhanced, and water will be treated in the retained natural areas. The result will be much lower roadway, stormwater management, and earth moving costs.**

*(For more information, go to <www.restorationfl.org>.)*

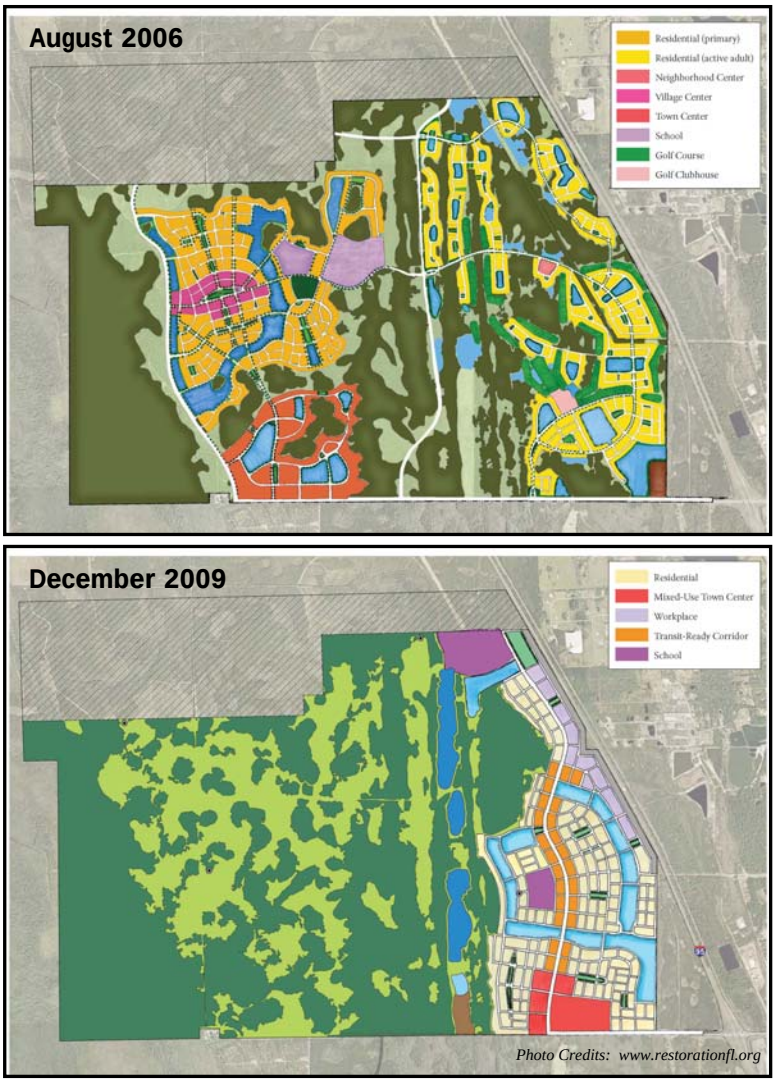
*Interconnected Systems of Complete, Walkable Streets, and Greenways*. Street design plays a huge role in the livability of a small development or larger community. Streets should be designed to fit in with and enhance the surrounding neighborhood or community context. They also should be complete, which means that they are safe for all transportation modes, including walking, biking, cars, and transit, offer a comfortable and interesting environment for pedestrians, and configured to encourage walking.

Streets should also be part of an interconnected system. An interconnected network of streets disperses traffic by providing multiple routes to reach a destination and makes walking and biking easier because of more direct routes between destinations. The multiple routes and dispersal of traffic also create an opportunity to design narrower roads with more pedestrian-friendly traffic speeds. For emergency workers, they provide more options for reaching the scene of an emergency.

The benefits of an interconnected system of complete streets and a complementary system of bike and walking trails and greenways include less time stuck in traffic and driving to destinations, less air pollution, and fewer local trips on already overburdened arterial roads. Another benefit is a reduction in the vehicle miles of travel (a major contributor to greenhouse gas emissions in Florida).

*Design that Encourages Social Interaction and Creates a Sense of Place.* Design features that encourage social interaction and create a sense of place are important elements of place-making. They include safe, pleasant, and interesting central community gathering places and events and opportunities for lifelong learning.

Another facet of place-making focuses on achieving the desired form and character of the built environment. That includes the physical character of buildings and how they relate to one another and to the appearance and quality of the public realm (squares, streets, and sidewalks, for example). Form-based codes and design standards and guidelines are two ways to regulate the visual form and quality of the built environment. They provide an alternative or supplement to conventional land use regulations that focus on controlling the use of land.




**Florida Restoration — Master Plan Comparison, Edgewater, Florida**

*Attention to Making Edges Compatible with Conserved Land.* When designing a rural residential cluster development or a conservation design community, the edge where the built and natural environments meet requires careful design and site planning attention. Any development in the edge area should enhance, and not interfere with, the neighboring natural environment or working agricultural lands. Buffer and transition zoning (discussed earlier) are examples of strategies to create a complementary edge between rural and urban. Specific edge techniques may include requiring less intense land uses, larger lot sizes, and building setbacks.

*Mutually Beneficial Rural-Urban Partnerships.* Important to the success of a rural residential cluster development or a conservation design community are the economic, social, and environmental connections between their residents and the neighboring countryside. A number of strategies can be used to build strong town-countryside partnerships that are mutually beneficial. Examples include community supported agriculture and farmers' markets, farm tours and special events, community use of biomass and other renewable energy sources produced by agricultural landowners, and water storage and purification on agricultural lands. Selling environmental services, such as excess energy and water, could become a part of the business plans of the community and the agricultural landowner.

## A Sampling of Useful Publications Related to Conservation-Friendly Communities

**A sampling of useful publications includes:**

- *Environmental Planning Handbook for Sustainable Communities and Regions* **by Tom Daniels and Katherine Daniels, published by the American Planning Association**
- *Water Resources with Higher-Density Development*, **published by the U.S. Environmental Protection Agency**
- *Conservation Design for Subdivisions: A Practical Guide To Creating Open Space Networks*, **by Randall G. Arendt, published by Island Press.**
- *Nature-Friendly Communities: Habitat Protection and Land Use Planning*, **by Christopher Duerksen and Cara Snyder, published by Island Press**
- *Sustainable Urbanism: Urban Design with Nature*, **by Douglas Farr, published by Wiley**
- *Place Making: Developing Town Centers, Main Streets, and Urban Villages*, **by Charles C. Bohl, published by the Urban Land Institute**
- *Visualizing Density*, **published by the Lincoln Institute of Land Policy and available in both print and interactive formats**
- *Growing Cooler: The Evidence of Urban Development and Climate Change*, **by Reid Ewing, Keith Bartholomew, Steve Winkelman, Jerry Walters, and Don Chen. Published in 2007 by the Urban Land Institute**

**In Florida, recent publications include:**

- *Greenhouse Gas Reduction and Energy Conservation: Development Impacts Under Florida's HB 697*, **published in 2009 by the University of Florida's Program for Resource Efficient Communities**
- *Lessons Learned? The History of Planning in Florida*, **by Earl Starnes and Richard Rubino, published in 2008**
- *Wildlife Habitat Planning Strategies, Design Features and Best Management Practices for Florida Communities,* **published by 1000 Friends of Florida**

### *Other Important Considerations*

Also important in creating a rural residential cluster development or conservation design community option is deciding if:

- The rural residential cluster development or conservation design community option is to be required or voluntary.
- Incentives are to be used in the case of a voluntary program.
- A recorded conservation easement (described in more detail later in this report) is going to be required to protect the remaining open space. If an easement is required, settle on the specifics as to the organization(s) that holds the easement and monitors compliance (described later in this report as part of the description of conservation easements).
- A conservation management plan is to be required (also described later in this report as part of the description of conservation easements).

Examples of incentives include allowing additional densities according to a set of carefully developed and tested performance standards, reducing fees, and/or expediting permitting. Incentives can also be used to encourage several landowners to join together to avoid fragmenting natural systems and conserve landscape scale connections. Those connections could include areas that could be restored to fill in gaps and protect water resources. Charlotte County's cluster development regulation, for example, targets those lands that connect natural systems. To encourage the protection of agricultural and environmentally sensitive lands, Martin County allows the use of a planned unit development (PUD) zoning district. The PUD application must be accompanied by a Comprehensive Plan amendment that changes the land use on the portion of the property to be developed or removes the density from the property to be developed.

To allow an alternative to the 20-acre minimum lot size in the county's agricultural area, both the amendment and the PUD zoning district must be approved by the Martin County Board of County Commissioners. To qualify, a property must be a minimum of 500 acres and create a public benefit by setting aside in perpetuity at least 50 percent of the property as contiguous open space, environmentally sensitive land, and/or agricultural lands uses. The PUD zone, which cannot involve development on unique, threatened, or rare habitat or other environmentally sensitive lands that are critical to the support of listed plant or animal species, must also be fiscally neutral and not require expansion of the county's primary or secondary urban service boundaries.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