Chapter 2.1
Greenprinting Options in the Development Process

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I. Introduction

One of the keystone principles of smart growth and sustainable development practices is that new community development should "preserve open space, farmland, natural beauty, and critical environmental areas[1]." This is a fundamental aspect of creating a sense of place within a community so that it respects the natural environmental setting. According to the Smart Growth Network, open space protection is a broad concept that commits development to reserve community open space, habitat, recreational opportunities and protection of critical environmental areas. Increasingly communities see open space as an essential quality of life component and policy makers see this as an alternative to urban sprawl. In addition, consumers look at new developments which employ open space strategies as an important community value. Planning for these sustainable communities requires a thorough knowledge of the environmental setting and the utilization of a broad set of planning tools.

Most community land development regulations and the multi-jurisdictional permit system hold developers to some minimum level of natural resource protection. To varying extents, these codes restrict development along streams, in wetlands, and floodplains. Beyond these minimums, local governing bodies will often demand a higher level of protection in response to stakeholders, neighbors, or community demands seeking to curb adverse affects of urban sprawl.

Nowadays, much of the "easy" land has been developed, and remaining undeveloped lands subject to the most intense development pressures are often located in rural areas presenting a spectrum of environmental issues such as floodplains, wetlands, or the presence of protected species. In today's regulatory climate, it is not really a question of whether a large-scale development will employ innovative sustainable practices but how they will deploy them on the landscape. Development approvals have always been about specific problem solving for a range of issues on the land and increasingly approvals are focused on natural resource protection of waters, wetlands, floodplains, and habitat. When done correctly, the result can be a new community development which respects the landscape and evokes its own sense of place. This chapter looks at a number of approaches to raising the bar on natural resource protection for land development.

[1] www.smartgrowth.org/about/principles

II. Green Infrastructure.

Planning for development has always been about infrastructure. In the traditional approach, infrastructure means providing roads, electricity, water, sewer, and other services to new urban or suburban development. In the last few decades, there have been new approaches to these issues. Some call it Green Infrastructure while others call it Greenprinting[2] or Conservation Design. Regardless of its name, this method of planning and development involves a holistic, proactive approach to maximizing conservation values in the planning process. Through Greenprinting, protection of natural resources within a landscape is just as important as providing other urban services. It is an evolving process which places emphasis on planning based upon sound science and a thorough understanding of the development within the environmental setting. The late Dr. Mark Benedict published numerous articles on the subject and coined the term Green Infrastructure as "an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations."[3] Green Infrastructure incorporates natural resource protection into basic planning for new community development. It is science-based, preserves significant natural features, provides linkage to other preserve areas, and incorporates trails, open space recreation, and working landscapes into the design. These preserve areas can be wildlife corridors, landscape linkages, conservation areas, restoration sites, or open space. This chapter discusses the resources which should be considered as part of a "Greenprinting" approach and the tools which can be used to implement it.

III. Natural Resource Overview.

Greenprinting for new development begins with a science based approach to planning. When looking at land for proposed development, an important first step is employing the right team of environmental professionals who fully understand the permitting regime in the given jurisdiction and are competent to examine and inventory the full list of natural resource issues on the landscape. This examination includes identification of known water bodies (including lakes, rivers, and streams), wetlands, floodplains, soils, geological features, aquifers, contamination sites, and habitat for listed plants and animals, as well as cultural and historical sites. As a starting point, much of this information is publicly available through United States Geological Survey (USGS) maps[4], Natural Resources Conservation Service (NRCS) soil surveys[5], National Wetlands Inventory[6], and state natural heritage programs[7] which inventory significant natural areas and rare flora and fauna. Historical data can be compiled through the state historic preservation officer or the National Register of Historic Places[8]. The next important step is the on-site analysis by the professional to "flag" wetlands and other features on the ground. As the National Wetlands Inventory and other publicly available data is

[2] *Local Greenprinting for Growth*; Trust for Public Land, San Francisco, 2003.
[3] www.greeninfrastructure.net
[4] http://topomaps.usgs.gov/
[5] http://soils.usda.gov/
[6] www.nwi.fws.gov/
[7] http://www.natureserve.org/visitLocal/
[8] http://www.nationalregisterofhistoricplaces.com/state.html

compiled on a macro level using aerial surveys and other "broad-brush" approaches, an on-the-ground analysis is necessary to determine the presence and extent of natural resources. Once this information is compiled, the development's planners should digitize the information within a Geographic Information System ("GIS"). The following list highlights the specific issues a developer should consider as part of a natural resource overview.

A. Wetlands.

The initial Greenprinting step is to protect wetlands. The represents a fundamental change in development planning because for most of our nation's history, wetlands were looked upon as "wastelands" and often classified as such. Dredging and filling of America's wetlands were fundamental aspects of the development of major cities such as Washington, Miami, New Orleans, New York, and San Francisco. In some low-lying areas, the filling of wetlands was part of a larger war on mosquitoes and the spread of disease. For 150 years, wetlands destruction was part of a greater federal policy of agricultural protection, flood control, or construction of dams. According to the USGS nearly half of America's wetlands were destroyed by the first half of the 20th Century. In six states, as much as 85% of historic wetlands were ditched, drained, or filled[9].

Beginning in the 1960's, concepts of environmental awareness began to change public policy. The National Environmental Policy Act of 1969[10] required environmental impact statements for the issuance of permits for certain federal projects. In 1971, the Ramsar Convention was adopted as an intergovernmental treaty identifying wetlands of international importance. In 1972, the Endangered Species Act[11] was adopted which began a listing process which documented the number of wetland dependent species in need of special protection. The most significant advance for wetlands protection came with the adoption in 1972 of the Federal Water Pollution Control Act[12] (P.L. 92-500) commonly referred to as the Clean Water Act. Section 404 of the Act established a program to regulate the discharge of dredged and filled materials into "waters of the United States," which included "wetlands." The act generally defined wetlands as "areas that are inundated or saturated" by water to the extent that they will support vegetation adapted to life in saturated soils. In other words, wetlands are lands which predominantly support wetland vegetation.

Wetlands are known locally, colloquially, and sometimes scientifically as swamps, marshes, deltas, bogs, wet meadows, prairie potholes, vernal pools, and bottomlands. Protection efforts grew out of a lengthy policy debate where citizens were becoming increasingly aware that wetlands were important for habitat, flood protection,

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[9] California, Iowa, Missouri, Illinois, Indiana and Ohio. See, Dahl, T.E., History of Wetlands in the Coterminus United States, USGS Water Supply Technical Paper 2425. http://water.usgs.gov/nwsum/WSP2425/history.html

[10] P.L. 91-190.

[11] P.L. 93-205.

[12] P.L. 92-500.

water quality, and water storage. In the 1989 State of the Union address, President George H.W. Bush announced a policy of "no net loss of wetlands" which has continued as a goal of the federal government and often found its way into emerging state and local policies as well.

The fundamental aspect of Section 404 of the Clean Water Act is that a permit is required by the Army Corps of Engineers to dredge wetlands or fill wetlands. The permit cannot be issued unless there is evidence that steps have been taken to avoid wetlands, minimize impacts to wetlands, or compensate for remaining unavoidable impacts. Since 1977, a wide body of federal, state, and local laws has been put into place to protect wetlands. These provisions may have different definitions for wetlands, different jurisdictional standards, and different permitting and enforcement mechanisms which a development team must investigate and understand. In addition, many state and local regulations require protection of upland buffers around protected wetlands[13].

Effectively, the beginning point for Greenprinting a potential development is a thorough identification of wetlands and how those wetlands are protected in the particular jurisdiction. First, the development team should look at the National Wetlands Inventory interactive map web site, which highlights known wetlands on USGS quad maps. Then, the team should review local soil maps to detect the presence of hydric soils. In many areas, locally known wetlands have been mapped as part of a community planning effort or by local regulatory bodies. Next, the team's natural resource professional should perform an on-site analysis to flag wetlands on the ground. Sometimes, this involves professional judgment and, as a result, the final determination of a wetland's location might not be as precise as one would like. Ultimately, the jurisdictional determination will be made in the field with the team's environmental professional and the local permitting authority "flagging" the location of the wetland.

Once the actual location of wetlands is known, the initial planning exercise should be to design a community development which avoids wetlands impacts by both isolating them from development and buffering against impacts. Where impacts cannot be avoided, planning should focus on how to minimize those impacts and/or how to mitigate for those impacts by preservation or restoration on site. The initial fundamental step in a Greenprinting development approach is to plan for "no net loss" of wetlands function.

B. Floodplains.

Recent extraordinary weather events and active hurricane seasons have brought development in flood prone areas to the front page. Federal Emergency Management Agency (FEMA) policy and stricter local government standards essentially require most new development to be out of floodways and floodplains. The National Flood Insurance Program requires FEMA to develop Flood Hazard Boundary Maps which identify floodways and floodplains. To qualify for protection under the program, local governments are required to adopt floodplain management regulations to protect floodways from encroachments and elevate new development to a base elevation within

[13] See EPA Model Ordinance for wetland protection. www.epa.gov/nps/ordinance/mol1.htm

the 100-year floodplain. Maps are maintained by the FEMA Map Service Center. Recent history suggests that FEMA maps are not always accurate predictors of what will happen in a storm event. For that reason, many local governments require additional level of documentation as to the flood risk posed by a particular development and many prohibit subdivisions within a 100-year floodplain. Planners should engage engineers early in the process to help understand the proximate location of floodways and floodplains so that development can be planned around those areas. In many areas, there is a significant overlap between wetlands and floodplains because wetlands by definition are areas that are periodically saturated with water.

C. Soils.

Soils are an important indicator of wetlands and other rare ecological communities. Hydric soils (i.e., soils characterized by an abundance of moisture) are an indicator of wetlands. Xeric soils (i.e., soils characterized by minimal moisture) are an indicator of some rare upland habitats. In addition, soils can be an overall indicator of suitability for development. For instance, soil types will often dictate whether in-ground septic tanks can be utilized or whether new development must require central sewer system or elevated septic systems. Soils may also be an indicator of erosion potential, subsidence, or the presence of some other subterranean feature. Accordingly, engineers recognize various soil types as having corresponding limitations for development potential. The Natural Resources Conservation Service (NRCS) has performed soil survey maps for 95% of the United States. These maps are readily available in print and digitized GIS formats. Utilizing soil maps is an important data tool in understanding the natural resources of a given landscape.

D. Habitat.

Every landscape has some potential as habitat for wildlife. From a sustainable development perspective, the developer must consider whether sufficient natural habitat will be preserved to support wildlife, or whether habitat can be created or restored to enhance local ecosystems. In analyzing habitat, the developer must first consider the schedule maintained by the U.S. Fish and Wildlife Service (USFWS) of species listed for protection under the Endangered Species Act (ESA)[14]. Separate USFWS field offices maintain species lists for each of the counties within their area of service. The species list will provide an overview of target species which could be on the landscape. As part of this analysis, the developer should determine whether any lands have been designated as critical habitat under the ESA. These lands have special regulatory requirements because they have been deemed essential to conservation of a particular species. Next, the developer should determine whether the property is within a "consultation area" under the "standard local operating procedures"(SLOPES) of the USFWS field office. As part of the consultation process, the developer may be required to demonstrate that the property is habitat for a candidate species or that it is not the proper habitat for the target species within the consultation area. It is also important to check whether the applicable state maintains its own separate list of protected species, as certain species not under the

[14] http://www.fws.gov/endangered/

jurisdiction of the ESA may have statewide protection. As a next point of analysis, the developer should look to the state's heritage program. Often called Natural Heritage Programs, these are data collection agencies which are either part of a state agency, public university or conservation group. These heritage programs catalogue the location of known rare flora and fauna. Lastly, it is important to check with local governments and local conservation organizations to learn whether there are local regulations or whether there are particular wildlife issues associated with the property. Local Audubon Society chapters or field scientists for The Nature Conservancy or a local land trust can be an important resource for understanding the habitat values of a particular site. Many local Audubon Society chapters have been doing bird counts for decades and may well know more than any regulatory agency on the habitat values of a particular site.

Once species and habitat information is collected, planners should consider the impact of a proposed project. In some cases, it may be sufficient to set aside a specific area for a particular species. This is often the case for Bald Eagle management, and there are many examples of development projects around the country that have protected a specific Bald Eagle nesting site. Sometimes it is important to preserve a particular habitat type, such as wetlands or a particular tree canopy. In other situations, the habitat is not particularly important but serves as a vital landscape linkage between nesting and foraging sites of various species. Preserving these wildlife corridors can be an important part of the design of a project. The USFWS has adopted recovery plans for each of the species on its protected lists and works to reach conservation agreements with landowners (generally known as habitat conservation plans, consultation agreements or safe harbor agreements) to provide some minimum level of protection. The key point in this discussion is that the developer consider the protection of wildlife and habitat as part of the overall design of the project, and include habitat conservation or creation as an integrated part of the planning process.

E. Historic and Cultural Sites.

Sometimes a site may contain an ancient secret or remnant in the form of archaeological, cultural, or historical artifacts. On other occasions, the site itself has an historical context as part of a trail or battlefield or scenic vista within an historical site. These historical resources should be part of the overall plan of development, and a project's professionals need to understand the site or context and its significance. In most cases, an historical site has not been designated for legal protection because it is not known and properly documented. In these cases, it is up to the landowner to use good stewardship to protect and properly record the artifacts on the site, and legal protections may attach once the once an artifact becomes known. The first step in examining the historic resources which may be associated with the site is to go to the National Register of Historic Places. Within each state is a state historic preservation officer who may maintain a list of other historic sites. Local governments may have an historic preservation component of a comprehensive plan or a local historic preservation ordinance. These lists and the preservation framework will help determine the extent of the analysis required or the preservation or interpretation which might go forward in the

development. The National Trust for Historic Preservation[15] works with local communities, stakeholders, and land owners to develop smart growth strategies for historic preservation. The Civil War Preservation Trust[16] actively works to preserve Civil War battlefield sites, while the National Park Service is authorized by the American Battlefield Protection Program Act of 1996[17] to work with stakeholders to protect battlefield sites from all wars on American soil.

F. Working Landscapes and Scenic Vistas.

In many rural areas, local agricultural practices have been part of the landscape for decades. These ranches, farmlands, vineyards, orchards or groves are an important part of the local economy and deeply rooted in the culture of the community. In these situations, the planners and developers need to work sustainable agriculture into the overall plan and context.

In addition, agricultural areas include pastoral settings and scenic vistas different from the urban form. Keeping these lands in production, and thereby preserving the rural landscape, is considered by many to be preferable to suburban development. When a community has come to appreciate rural and scenic vistas of the region, the use of setbacks from roads or plantings to conceal development may be an important consideration. Throughout the country, National Scenic Byways and Scenic Highway programs are an important part of roadway beautification, and voluntary standards have been developed for landowners to work to contribute to the scenic vista. Each by-way is required to adopt a Corridor Management Plan which sets forth the goals and policies for protecting the intrinsic qualities of a viewshed of the particular corridor[18]. Developments within that corridor should consult the applicable Corridor Management Plan to help design setbacks, buffers, or other strategies to protect the scenic vista.

G. Proximate Public Lands.

Landowners and planners need to step back and look at a landscape in light of public lands, recreation areas, and environmental infrastructure which may be adjacent or proximate to the site. This may be important in terms of protecting similar or connected environmental features such as rivers, lakes, streams or wildlife corridors. In these situations, the developer can plan the project to accommodate connectivity to public lands, recreation areas or protected habitat.

IV. Tools for Greenprinting.

There are many planning tools which have been employed across the country to implement a Greenprinting approach to development. Some local jurisdictions have specific policies and programs in place to work with landowners or provide incentives for

[15] http://www.nationaltrust.org/
[16] http://www.civilwar.org/
[17] Public Law 104-333
[18] http://www.bywaysresourcecenter.org/topics/corridor-management/

conservation design while others do not. In other cases, the planner will need to work with the local government to establish policies either within a policy framework or within the context of a specific development to achieve the needed result. Greenprinting within the context of a specific development will often involve a negotiated agreement between the landowner/developer and local government as part of the development approval process. This section outlines commonly used Greenprinting tools.

A. Existing Federal Programs for Landowners

One of the most successful long term conservation efforts is the Conservation Reserve Program (CRP) administered by the United States Department of Agriculture (USDA) through the Farmer Service Administration on behalf of the Commodity Credit Corporation. Under this program soil and water conservation is achieved through a rent program to the farmer to take lands out of production. This achieves the important public policy objectives of soil and water conservation, sediment control, protection of streams, and restoration of native grasses and habitat. Not only has this been a boon to duck populations, but the CRP program in the "prairie pothole" regions of the Dakotas has significantly enhanced grassland bird populations. According to Ducks Unlimited, the CRP program has led to restoration of nearly 5 million acres of habitat from 400,000 farms enrolled in the program.

In recent years, Congress has provided funding directly for landowner conservation efforts. In 2006, Congress appropriated nearly $100 million for cooperative payments through the Landowner Incentive Program within the Department of Interior. This program is designed to provide grants to establish or supplement landowner initiatives that protect and restore habitats on private lands, to benefit Federally listed, proposed or candidate species or other species determined to be at-risk, and provide technical and financial assistance to private landowners for habitat protection and restoration. Funds must be used to acquire development rights, conservation easements, perform restoration work, and provide technical assistance for conservation plans. Significantly, this appropriation greatly exceeded the amount of funds Congress appropriated for additions to national parks, forests, and wildlife refuges in the same federal budget.

B. Land Acquisition Programs.

Across the country, state and local governments have approved land acquisition programs to provide public funds to acquire environmentally sensitive lands, conservation areas, and sites for outdoor recreation. According to the Trust for Public Land, in 2006, voters in 23 states approved 104 ballot measures providing $6.4 billion in funds for land acquisition[19]. These programs are among the 1500 programs approved in all 50 states which total over $40 billion in funds for environmental land acquisition. If a property contains significant natural, cultural or historic features, the first task should be to determine whether the property or a portion of it could qualify for some land acquisition funding. Each state and local program has its own rules and procedures, so it

[19] http://www.tpl.org/tier3_cd.cfm?content_item_id=12010&folder_id=2386/

is important to fully understand that before proceeding. Working with a national conservation organization such as The Nature Conservancy, Trust for Public Land, or The Conservation Fund, or a local land trust can help a landowner/developer better understand whether property could ultimately be acquired for conservation or open space.[20] Effectively working with partners under these programs could transfer more significant natural resources into permanent conservation, while the sale or donation provides a financial return to the owner.

C. Purchase of Development Rights.

A number of state and local programs allow for the purchase of less than fee simple interest in real estate. Sometime called purchase of development rights (PDR) or sale of a conservation easement, these plans allow the purchase of a portion of the "bundle of rights" associated with a parcel. Under this scenario, negotiations are entered into with the private landowner where the public agency or conservation organization determines which rights they would like to acquire and the rights that the landowner would like to retain. Typically, this involves severing the right to develop or to more intensely develop a parcel of property. Once this agreement is reached, the parcel is made subject to a recorded conservation easement with restricts these rights in perpetuity. An important public policy reason for this approach is that it is less expensive than the purchase of the full fee, and it results in the landowner continuing to manage the property and typically using better stewardship than the public agency. The purchase of development rights can be a very effective tool for a parcel which has been in a single family for many years or a farm or timber tract which can continue to generate agricultural income.

D. Transfer of Development Rights.

Transfer of development rights (TDR) programs are very different from PDR programs. Under a TDR program, a local government establishes sending areas and receiving areas and the density for each area is frozen in place. The sending areas are those areas in which a local government wants to limit development and encourage conservation, open space, agricultural operations, or scenic vistas. The receiving areas are those areas in which the local government wants to encourage development. Typically, local governments seek to encourage infill development in receiving areas, or the receiving areas are adjacent to urban service areas and are sufficiently compact to allow for efficient delivery of urban services. Under a TDR approach, a landowner in the receiving area cannot increase the established density without acquiring a credit from a sending area. This causes the sending area credits to be a form of currency. These sending area credits can be traded, bought, and sold to those in need of them to pursue development in the receiving area.

The most famous example of a successful TDR program is Montgomery County Maryland (a suburban county near the Washington DC Metro area). This TDR program was a component of the Master Plan for the Preservation of Agriculture and Rural Open

[20] http://www.ltanet.org/findlandtrust/ provides links to local land trusts.

Space was successful in protecting over 51,000 acres of lands designated as Agricultural Reserve, while encouraging new urban development in appropriate places. The effect of this program has been to limit sprawl and protect agricultural property[21]. Boulder, Colorado also has a successful TDR program which has protected scenic vistas and encouraged development in targeted areas[22]. The Pinelands region of New Jersey is an example of how a TDR program can work on a regional basis[23]. In this successful example, over 40,000 acres have been preserved in TDR credits over a seven county area. The TDR program also worked in concert with a PDR program where a public agency was actively acquiring credits.

While there are a number of successes around the country, a number of TDR programs have been established without success. The most common reason for a TDR program's failure is that the local government administering the program grants zoning or land use relief without the need to acquire a sending area credit. Once a developer has received approval to build to the desired density, there is no reason to purchase a sending area credit. The establishment of receiving areas tends to be more controversial than the establishment of sending areas. Increases in density in receiving areas tends to increase public opposition over time. In order to implement a successful TDR program, . sending areas must be able to remain economically viable despite the density limitations. While TDR programs have a mixed track record of success and involve a number of challenges, they remain an important tool of smart growth when exercised in the appropriate areas and market conditions.

E. Rural Lands Stewardship.

A innovative statutory scheme in Florida is gaining attention across the country because of the manner in which it allows incentives for development in rural areas that achieves higher conservation goals. Florida's Rural Lands Stewardship Program (RLSP) is part of the Growth Management Act, and allows a private landowner with greater than 10,000 acres to petition the state and local governments establish an RLSP area[24]. Much like a traditional TDR program, the local government approves sending areas and receiving areas, with the latter being those areas deemed appropriate for development. Within the receiving zone, development must utilize innovative planning techniques and form consistent with the rural area, specifically providing for:

> "adequacy of suitable land to accommodate development so as to avoid conflict with environmentally sensitive areas, resources, and habitats; compatibility between and transition from higher density uses to lower intensity rural uses; the establishment of receiving area service boundaries which provide for a separation between receiving areas and other land uses within the rural land stewardship area through limitations on the extension of services; and connection of receiving areas with the rest of

[21] Montgomery County Maryland Farmland Preservation Annual Report FY2007.
[22] Boulder County Land Use Code Article 6.
[23] State Transfer of Development Rights Act (N.J.S.A. 40:55D-137 et seq.).
[24] Sec. 163.3177(11)(d)(1), Fl. Stat.

> the rural land stewardship area using rural design and rural road corridors."[25]

The goals, policies, and objectives of the receiving area must be part of a comprehensive plan amendment and land development regulations. The statute specifically requires that the receiving area regulations protect habitat for listed species.

The innovation of RLSP is its reliance upon transferable rural land stewardship credits, rather than transfer of development rights. The credit system is not based upon traditional density transfers, but on heightened innovation and environmental protection:

> Transferable rural land use credits may be assigned at different ratios of credits per acre according to the natural resource or other beneficial use characteristics of the land and according to the land use remaining following the transfer of credits, with the highest number of credits per acre assigned to the most environmentally valuable land or, in locations where the retention of open space and agricultural land is a priority, to such lands.[26]

Credits must reflect the ultimate vision of the overall project over a 25 year or greater time horizon. Credits can only be used within the RLSA receiving area and not in any other part of the county. Two projects in Florida have now been approved as Rural Land Stewardship Areas. Gaining national attention is the Collier County project near the western edge of the Everglades, which uses the credit system to protect agricultural lands and significant habitat for the endangered Florida Panther.[27] The RLSP has also allowed the development of a new community called Ave Maria that includes a new college as the centerpiece of the community.[28]

F. Conservation Easements.

A conservation easement is a conveyance of an interest in land from a landowner to a public agency or non-profit organization which limits the use of land in perpetuity. The framework for conservation easements is established in Section 170(h) of the Internal Revenue Code, which provides an income and estate tax incentive to the donor of a conservation easement[29]. To be effective, the easement must be a "qualified interest in real estate" which is donated to a tax exempt non-profit organization for "conservation purposes" such as protection of open space, habitat, outdoor recreation, or historic preservation. Most states have established a statutory framework for conservation easements, and each jurisdiction has its own approach. Some states treat the grant of a conservation easement similar to a deed, while other states treat a conservation easement akin to an agreement between the landowner and holder of the easement. Some states

[25] Sec. 163.3177(11)(d)(4)(a), Fl. Stat.
[26] Sec. 163.3177(11)(d)(4)(j), Fl. Stat.
[27] http://www.colliergov.net/Index.aspx?page=1515
[28] http://www.avemaria.com/
[29] 26 USC 170 (h)

have specific restrictions on what organizations or agencies can hold an easement. For instance Virginia requires that a conservation organization must be in business for five years before it can hold an easement. Maryland has established a quasi-public agency, called the Maryland Environmental Trust, to hold conservation easements. In most jurisdictions, a conservation easement is typically held by a public agency or a qualified federally tax exempt public charity, a local land trust or national conservation organization such as The Nature Conservancy.

Generally, the easement establishes what rights are maintained by the fee simple landowner and which rights are extinguished on the property. Typically, this transfer operates as a burden on the real estate in perpetuity, though some states permit the easement to be modified over time. Easements can be either donated or sold. If donated consistent with IRS regulations, the landowner can quality for a significant tax deduction. Some state tax programs allow deductions or credits on state taxes as well. Other state and some local government ad valorem tax regulations allow for deferential treatment of properties subject to a conservation easement.

Conservation easements are a very popular means of private conservation. According to the Land Trust Alliance, over 6 million acres have been placed under conservation easement since 2000. The popularity of conservation easements can be attributed to their flexibility, and the landowner's ability to retain significant rights (including the general right to limit access to the property). Conservation easements are an effective tool of tax planning and estate planning, and reward good stewardship of land. The downside of conservation easements is their term is usually in perpetuity, which requires the landowner and easement holder to attempt to anticipate changes in the landscape and management needs over a very long time horizon. Another downside is the long term financial needs to maintain the property subject to the easement. From a development perspective, easements are an effective and enforceable means to ensure conservation, and give assurance to public agencies and stakeholders that property will be adequately protected in perpetuity.

G. Habitat Conservation Plans.

Section 9 of the Endangered Species Act prohibits the "take" of a listed species and defines the term to include actions which would otherwise harm, harass, trap, or kill the species. When listed species are documented on site, the landowner should consider entering into a habitat conservation plan (HCP) with the appropriate agency. HCPs are authorized by Section 19 of the ESA, which allows an "incidental take" of a listed species under certain conditions. HCPs have become a popular way for landowners to proactively and holistically deal with wildlife species under an agreement that will give the landowner a "safe harbor" from the sanctions of the ESA. In establishing this program, Congress intended to establish a procedure that would integrate federal and non-federal development and land use activities with conservation goals and establish a means to cooperate with landowners.

HCPs are an important tool for large landowners who can work to develop conservation plans to protect particular habitat or undertake activities which might benefit specific species, while leaving other property for development or more intense agricultural practices. Some of the potential benefits of HCPs include shifting the focus from single species management to multi-species and habitat management; coordination of landowners and local governments in conservation planning efforts; the provision of benefits to species that are not listed; and the promotion of long-term conservation strategies. Not surprisingly, conservation easements are often a specific tool for protecting areas subject to an HCP. According to the USFWS, nearly 300 HCPs have been approved, covering more than 8 million acres of land and working to protect 200 species.[30]

H. Local Government Zoning and Subdivision Controls

1. Comprehensive Plans.

A number of states have requirements for comprehensive planning by local government entities, which can and should establish the local government's goals and objectives for the conservation of natural resources. Generally speaking the comprehensive plan is the legislative act of a local government in setting land use and infrastructure standards, while traditional zoning and subdivision controls implement the comprehensive plan. To varying degrees, a regional or state planning agency may have involvement with a local government's comprehensive planning process. Comprehensive plans not only have standards for land use, but also typically include conservation goals and objectives. Through including conservation goals and objectives in a comprehensive plan, the local government entity can provide the basis for the later adoption of specific zoning and subdivision controls promoting those goals and objectives. In addition to planning for a specific community's growth, comprehensive planning has been used for regional planning purposes, planning which crosses jurisdictional borders, and specific overlay planning to meet specific land use and conservation objectives. Some programs have specific subsets of comprehensive planning to allow extensive stakeholder involvement in setting goals, policies, and objectives in comprehensive plans. Oregon[31] and Washington[32] pioneered comprehensive planning. Florida created its own process with an emphasis on "concurrency" (i.e., requiring facilities and services to be available with the impacts of development)[33], while Maryland has become the best example of implementation of smart growth principles within comprehensive planning processes[34].

[30] The USFWS maintains an onlie database of habitat conservation plans. http://www.fws.gov/endangered/hcp/index.html
[31] Chapter 197 Oregon Revised Statutes 2007.
[32] Chapter 36.70A RCW
[33] Sec. 163.3180, Fl. Stat.
[34] Sec. 9-1405 Maryland Code

2. Cluster Development.

Cluster Development is a means of promoting open space, conservation of natural resources, and/or agriculture within a subdivision development. In a cluster development, smaller lots than would otherwise be allowed in the zoning district are permitted so long as a significant percentage of the development (e.g., half) remains protected or in open space. Around the country, this approach has been termed open space development, conservation development, hamlet style, farm village, or clustering. It is sometimes confused with "new urbanism," because many so-called "new urbanist" developments have used the cluster approach. The terms are not, however, synonymous.[35]

Under typical land use and zoning regulations, property is assigned a density and a landowner is allowed under various zoning procedures to subdivide property so as to achieve (but not exceed) that density. Under this scenario, a 100 acre parcel with a land use of 1 dwelling unit per acre could produce 100 ranchette lots. A cluster subdivision generally concentrates lots on smaller parcels than would otherwise be allowed by the zoning ordinance, and converts the remainder to some form of shared open space. Thus, a cluster subdivision would allow 100 lots on 50 acres with the remainder in open space. Typically, cluster subdivisions are density neutral, meaning there is no increase in density than what is otherwise provided by the land use plan. Cluster subdivisions have been used to maintain the rural character of areas, protect historic sites, protect scenic vistas, provide open space for a community, and to preserve imported natural areas including wetlands, floodplains and wildlife habitat. Proponents of clustering believe that clustering reduces sprawl, reduces costs associated with development of infrastructure, and allows greater private contribution to protection of open space.

Local governments can encourage cluster development as a tool for protection of open space, scenic vistas, historic sites, rural landscapes, agricultural lands, and environmentally sensitive lands through the following approaches:

- Cluster developments should be allowed "as a matter of right" through approval of a "binding development agreement" that does not increase underlying density, protects substantially all wetlands, and places 50% of the project under a conservation easement held by the public agency or an entity approved by the public agency.

- Cluster developments should be encouraged by granting a density bonus for projects which place more than 50% of the project under a conservation easement, protect environmentally sensitive lands, wetlands, water features, or recharge areas, scenic vistas, or contribute to an integrated system of protected natural areas.

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[35] Arendt, Randal, *Growing Greener Putting Conservation into Local Plans and Ordinances*,
Island Press Washington, DC 1999

- Cluster developments should protect working landscapes, agricultural practices or continued forestry operations.

- Within certain geographically defined environmentally sensitive areas, only cluster developments would be allowed where conservation areas would link to an integrated conservation network.

- Filing fees for cluster developments should be adjusted so as to not penalize clusters.

- Procedures should be adapted which treat cluster developments differently and less onerous than PUDs.

- Design standards should be adopted which could be incorporated into cluster development agreements to encourage the conservation result.

3. Community Stewardship Organizations.

A Community Stewardship Organization (CSO) is similar to a homeowners association, but it is organized like a land trust for the specific purpose of managing the conservation plan for the particular community. Promoted by the Sonoran Institute[36] CSOs hold conservation easements and raise revenues to undertake ongoing activities under the adopted conservation plan of the community, including both management as well as restoration projects. CSOs can also provide an environmental education function by providing ongoing training for community residents on how to maintain the conservation values in a community. In particular, local governments may wish to promote CSOs in connection with cluster developments establishing significant protected open space, through the same processes the local government uses to approve and regulate the establishment of homeowners association in a "typical" subdivision.

4. Planned Developments.

In the context of this chapter, a planned development is an agreement between a landowner/developer and the local government to establish particular standards for a specific development. In different jurisdictions it is called planned development, planned unit development (PUD), master planning, or contract zoning. In some jurisdictions, contract zoning is specifically prohibited but a planned development is specifically allowed. A planned development is different from traditional zoning in that the landowner/developer executes a detailed development agreement that the local government adopts or ratifies as a specific change to the zoning map. Under this approach, specific conservation goals and objectives can be incorporated into an agreement to provide for a balance between development and conservation goals. Planned developments typically permit variances or waivers from otherwise applicable

[36] http://sonoran.org/

zoning and subdivision requirements as part of the planned development process, and therefore may provide necessary flexibility to implement conservation objectives.

V. Stakeholder Involvement.

In each of the tools listed in this chapter, it is important to consider the extent of stakeholder involvement. First, for any given development, both the landowner/developer and governmental entities involved in the project need to identify the "real" stakeholders. For instance, sometimes the interested stakeholders are public agencies who are interested in the outcome of a project but do not have the direct jurisdictional control over it. Often stakeholders are national, state, or local conservation groups who routinely engage in monitoring development activity and provide comments and sometime vigorously oppose projects. Many times, the stakeholders are individual citizens or grassroots citizens groups organized because of their opposition to a particular project. Stakeholders can be engaged informally or through varying processes such as visioning (i.e., determining stakeholder preferences for various development or conservation scenarios), charrettes (i.e., brainstorming/design sessions intended to quickly explore various development approaches), or other means. In any number of the tools listed above, stakeholder involvement is an important value added to any sustainable development approach and is an important principle of smart growth. Obtaining stakeholder involvement in creating a conservation community can decrease opposition, facilitate public approvals, and help the landowner/developer discover solutions that all parties can view as a "win-win."

VI. Conclusion: Toward Market Based Conservation.

Approximately 70% of America's lands are in private ownership, and there will never be enough public money available to acquire environmentally sensitive lands, recreational areas, scenic vistas, and historical sites. A recurring theme for policy-makers is that the next phase of land conservation must be market-based, providing incentives and flexibility for landowners to conserve lands while also permitting the extraction of value. Market-based solutions require some level of faith in private landowners to act as good stewards of the land, and reflect the belief that markets can effectively allocate resources for the common good. Some aspects of emerging market-based conservation approaches include:

- Use of tax deductions for conservation easements;
- Development of PDR and TDR programs;
- Providing incentives for TDRs and rural cluster development;
- Encouragement of Habitat Conservation Plans;
- Use of monetary and non-monetary incentives;
- Authorization of conservation and mitigation banks; and
- Sale of carbon credits.

While some of these are emerging concepts, they are all generally based on the time-honored public policy of rewarding good stewardship. As more jurisdictions seek to

implement sustainable development principles, public pressure will increase to implement Greenprinting in the development process. Policy frameworks which provide incentives for conservation objectives provide the greatest opportunity for sustainable development on a national scale, and the creation of economically viable solutions protecting natural resources and a community's character.

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