



Forest Ecosystem Services and Sustainable Community Development

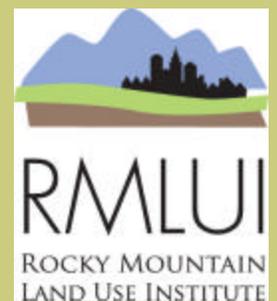
Bud Watson

The Rocky Mountain Land Use Institute

Sustainable Community Development Code

Research Monologue Series

Environmental Health



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About the Research Monologue Series

The Sustainable Community Development Code, an initiative of the Rocky Mountain Land Use Institute, represents the next generation of local government development codes. Environmental, social, and economic sustainability are the central guiding principles of the code. Supporting research for the code is represented by a series of research monologues commissioned, presented and discussed at a symposium held at the University of Denver in September of 2007. RMLUI and the University of Denver's Sturm College of Law extend its gratitude to the authors of the papers who have provided their talents and work pro bono in the service of the mission of RMLUI and the stewardship of the creation.

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About the Author

Bud Watson is the Research Director for the Model Forest Policy Program. Mr. Watson, an attorney with a natural science background, has concentrated on evaluating land development impacts on water quality and the development of effective measures to alleviate these adverse environmental impacts. He was the first director of the Chesapeake Bay Foundation's Virginia office, where he litigated water quality cases, one of which reached the U.S. Supreme Court. Also in that capacity he participated in the drafting of the Chesapeake Bay Preservation Act, and then became the first director of the Chesapeake Bay Local Assistance Department, which wrote and implemented the regulations that implemented the land use and water quality protective measures of the act. Before joining the Model Forest Policy Program Mr. Watson served as a forest policy consultant to the Dogwood Alliance. In addition to his work with the Model Forest Policy Program, he is of counsel with the Environmental Law Group, PLLC, of Richmond, Virginia and teaches courses in environmental law and environmental policy at Virginia Commonwealth University and Randolph-Macon College.

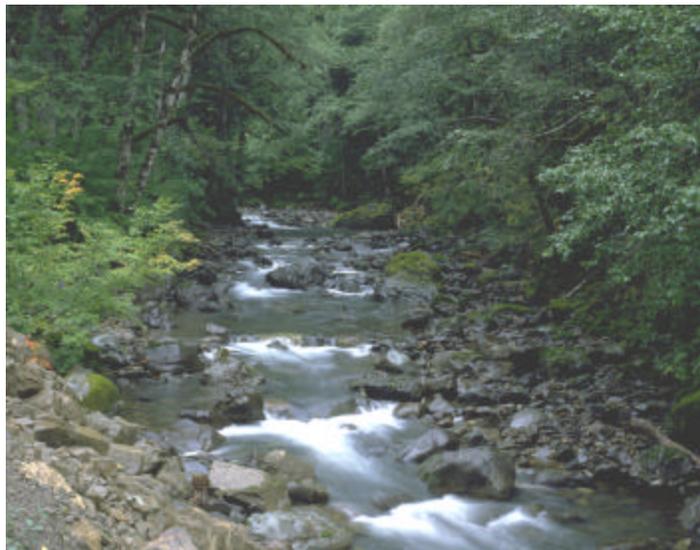


Photo: Lewis County, Washington

www.tourlewiscounty.com/pressroom/index.html

Forests provide a number of “ecosystem services,” generally defined as “the life-support and life-enhancing services of natural ecosystems.”¹ The most important from the standpoint of sustainable development are the ability of forests to: (1) protect water quality and quantity (including streamflow, source water for community drinking water supplies, and groundwater) by retarding runoff, (2) protect biodiversity by providing habitat and ability for wildlife to travel and migrate, (3) sequester carbon that moderates global warming, (4) provide wood and other products that have economic value, and (5) provide an aesthetic element in the landscape that has both important economic and spiritual values. Forest ecosystem services, as a part of the natural, “green infrastructure,” are a particularly important part of sustainable community development because of these key roles they can play in reducing the need for more costly built “gray infrastructure.”²

General forest protection measures and the practice of sustainable forestry are basic to and underlie evolving ecosystem services development efforts. In addition, water quality and quantity ecosystem services utilize strategic buffering of sensitive areas such as streams, wetlands, lakes, reservoirs, and critical groundwater recharge zones, such as aquifer recharge areas and karst zones. Wildlife habitat ecosystem services emphasize connecting areas of contiguous forest, particularly along stream corridors. Carbon sequestration ecological services can be obtained by: (1) preserving forests as intact, nature managed ecosystems, (2) maintaining standing timber and promoting afforestation in sustainably managed forests, and (3) reforestation of non-forested (usually marginal agricultural) areas. Forest resource utilization ecological services can go hand-in-hand with carbon sequestration if both stand protection and stand utilization are made priorities in the forest management system employed. Landscape and viewshed ecological services rely on roadside and property line visual buffers and ridgeline and viewshed ordinances, as well as conservation easements and strategic land purchase or development acquisition.

Both regulatory and market-oriented measures have been proposed to protect and allow beneficial utilization of these ecological services, and to a limited extent some of these measures are already at least partially in place in some jurisdictions. Thus, the law and policy of forest ecosystem services is evolving despite some major obstacles, which are described below.

Regulatory Protection and Utilization of Forest Ecosystems

In the regulatory category are forest protection and forest practice statutes and ordinances.³ One of the best examples of this approach of working from the state level down through the local level is found in Maryland, where protection for forests (though not specifically for the ecosystem services they provide) is mandated at both the state and local government levels.⁴ The Maryland Forest Conservation Act of 1991⁵ requires any application for a subdivision, grading permit, or sediment control permit on areas of 40,000 square feet or greater to submit a *forest stand delineation* and *forest conservation plan* to the Maryland Department of Natural Resources Forest Service. The Baltimore County Forest Conservation Ordinance⁶ was enacted to implement the requirements of the state act at the local level. The ordinance does an excellent job of incrementally inventorying forest cover through the forest stand delineation and attempting to retain on-site forest cover by a series of minimum forest cover

requirements tied to specific land use categories. However, a general inventory of forest resources in the jurisdiction would be a better first step in a comprehensive forest ecosystem services protection and utilization program.

Unfortunately, the Baltimore County ordinance exempts commercial logging or timber harvesting operations, agricultural activities, utility rights of way, surface mining, and highway construction activities. While it may be important to allow the logging and limited deforestation associated with such activities to occur, from a sustainable development point of view the existing resources should be quantified and entered into a jurisdiction-wide inventory of forest cover and the impacts of that activity should be minimized, so that the ecosystem services provided by the forests in the jurisdiction can be accurately assessed – as well as hopefully protected and utilized. Otherwise, the ordinance seems to be a model starting point for developing a comprehensive forest element for a sustainable community development code.

Maryland, like a number of other states, attempts to fill this regulatory gap by requiring that forestry be practiced in compliance with what are called “best management practices” (BMPs). But while all states have developed forestry BMPs, not all states make them mandatory, particularly in the Southeastern states. A minority of states have more robust “forest practice acts,” which prescribe more extensive regulatory requirements for logging and other forest practices than simple mandatory compliance with forestry BMPs.

Nonregulatory Protection and Utilization of Forest Ecosystems

Nonregulatory, market-oriented incentive programs also have an important role to play in a sustainable community development code process by providing a means of making it possible to compensate landowners for the ecological services associated with their forest lands. These programs have been developed at the federal and state level and both types of programs can provide support for protection and appropriate payment for and utilization of forest ecosystem services.

A number of federal incentive programs developed under the various Farm Bills, particularly those passed since the early 1980s, continue to have the potential to advance the protection and utilization of ecosystem services. Perhaps the most relevant to sustainable development is the Forest Legacy Program (FLP), designed to encourage the protection of privately owned forest lands.⁷ FLP is an entirely voluntary program. To maximize the public benefits it achieves, it focuses on the acquisition of partial interests in privately owned forest lands, and helps states develop and carry out forest conservation plans. It encourages and supports acquisition of conservation easements, which restrict development, require sustainable forestry practices, and protect other values.

A number of other incentives-based approaches potentially available at the federal and/or level can help achieve goals for improved forestry at lower cost. These “tools” include information-based programs, income tax deductions, lower property tax assessments, other cost-share programs (beside those listed above), tradable forest rights, mitigation banking, and conservation easements. By providing information and technical assistance, for example, state forestry agencies can reduce landowners’ costs of gathering and applying information about environmentally preferable forest practices

– presumably those would achieve the goals set forth in regulation. And financial incentives, either in the form of cost sharing or income and property tax reductions can help to align forestry improvements with landowners' short-term financial interests by providing compensation for presently unrecognized ecosystem services.

Obstacles to the Protection and Utilization of Forest Ecosystem Services

However, against these protective and incentive measures stands a major stumbling block to effective utilization of forest ecosystem services in the sustainable community development process, the historic emphasis of our legal system on *private* rather than *public* property rights. American property law is not neutral to private property rights in ecosystem services “but downright hostile to them, making it no wonder that neither finds much stock in the marketplace.”⁸ This is largely because protecting ecosystem services so they can be utilized frequently requires restricting property uses, particularly development activities.

The problem of providing this protection is highlighted by *Lucas v. South Carolina Coastal Commission*, which held that compensation for a regulatory taking would be due if a regulation does “more than duplicate the result that could have been achieved in the courts by adjacent landowners (or other uniquely affected persons) under the State’s law of private nuisance, or by the State under its complementary power to abate nuisances that affect the public generally” unless a particular situation “may present such unique concerns for a fragile land system that the State can go further in regulating its development and use than the common law of nuisance might otherwise permit.”⁹

Providing More Effective Protection and Utilization of Forest Ecosystem Services

Thus some form of “balancing” of *public* and *private* property uses is necessary if the *Lucas* test is to be passed, particularly if the ecosystem service in question does not occur on the same property where it is to be used (a very common situation). The important point is that the laws involved in this process were not intended to provide legal standards for natural capital and the ecological services that flow from it and, as many authors have pointed out, in practice they usually do not do so. In stark contrast is how the political process recognizes the value of more traditional forms of economic capital. Since the Depression, financial capital has been protected by disclosure laws that ensure investors receive accurate data on the risks, by various laws that require exercise of fiduciary duties on behalf of beneficiaries, and by governmental institutions such as the Federal Reserve and the Treasury Department that support the solvency of currency and promote dependable transactions where financial capital is involved. Development of a similar market-oriented data compilation and disclosure approach for natural capital has been proposed.¹⁰

In today’s antiregulatory political climate, such state and local “forestal ecosystem services programs” would be largely applied at the local government level, primarily through tax, incentive, and other market-oriented programs that would affect many elements of the local economy. Thus the relationship between state government and local governments is very important if this type of state-local-private is to prosper. Currently available legal mechanisms provide little support and protection and utilization of the ecosystem services that forests provide. Better utilization will largely depend on a

greater understanding of their importance and value in the marketplace to the individual landowner and to society as a whole. In the current political climate market-based incentive approaches are more likely to bring about this understanding than regulatory approaches. But in any event, more information on the quality, quantity, and geographic distribution of these ecosystem services will be necessary for them to take what seems to be their logical place in our market-oriented culture. Cooperation between all levels of government and the private sector should be stressed.

Potential sustainability measures:

- The percentage of forest cover in the jurisdiction or watershed in comparison with the percentage of developed area.
- The amount of carbon sequestered in standing timber and how much will be sequestered by various forest management techniques (need usable carbon accounting system to determine this).
- Linkages between significant areas of forest (contiguous forest analysis).

Land Use Code Strategies:

Removing Obstacles

- Limit continued development growth in substantially forested areas (see *e.g.*, Baltimore County regulations below)

Incentives

- Transfer of development rights (TDRs) and purchasable development rights (PDRs) as methods of allowing greater development density in “to be developed” areas of the jurisdiction.

Regulations

- Local forest preservation ordinances (*e.g.*, Baltimore County’s Forest Conservation Ordinance, which).
 - Applies to land development in excess of 40,000 square feet
 - Exempts logging where development is certified not to be anticipated for five years
 - Requires a “forest stand delineation” and “forest conservation plan” for all regulated activity
 - Establishes a “forest conservation threshold” for all land use categories ranging from 50% for agricultural and resource areas to 15% for mixed use development, PUD, and commercial and industrial use areas
 - Allows specific variances for “unwarranted hardships”
 - Establishes a “forest conservation fund” to receive “contributions” from such hardship cases to preserve, afforest, and reforest lands in the County
 - Gives County the authority to enjoin and to assess monetary penalties for violations

Strategic Success Factors

- Encourage participation of citizens, homeowners, large landowners, and developers in a discourse on sustainable forestry practices in the jurisdiction
- Increase community education about precautionary measures to limit harmful impacts to forests and trees in the jurisdiction

- Carbon credits for permanent protection of existing forests, sustainable forestry management (e.g., under the provisions of a forest certification system such as the Forest Stewardship Council system), and reforestation of agricultural and other previously cleared land.
- Existing federal and state forest preservation incentive programs (e.g., federal Forest Legacy Program).
- Tie reduced land use tax rates for forest lands to preservation of forest ecosystem services.
- State forest practices acts (e.g., California's Z'Berg- Nejedly Forest Practice Act of 1973) and forest conservation acts (e.g., Maryland's Forest Conservation Act).

- Suggestions to improve forest preservation ordinances include:
 - Conduct jurisdiction-wide inventory of forest resource base ecosystem service potential and identify key contiguous forest areas
 - Set jurisdiction-wide forest cover goals and targets
 - Coordinate state regulated or overseen timber harvest practices with achievement of jurisdiction-wide forest cover goals
 - Tie reduced land use tax rates for forest lands to preservation of forest ecosystem services
 - Tie TDR and PDR programs to achieving forest cover goals
 - Promote carbon trading and other ecosystem services incentive payment programs

Notes

1. See: Geoffrey Heal, *Nature and the Marketplace, Capturing the Value of Ecosystem Services*. (Washington DC: Island Press, 2000) p. 1-2; See also: Gretchen C. Daily, ed., *Nature's Services: Societal Dependence on Natural Ecosystems* (Washington DC: Island Press, 1997); J.B. Ruhl, et al., *The Law and Policy of Ecosystem Services* (Washington, DC: Island Press, 2007).
2. See: Mark A. Benedict and Edward T. McMahon, *Green Infrastructure* (Washington, DC: Island Press, 2006).
3. EPA lists eight states that have "comprehensive statewide forest practices acts" (Alaska, California, Connecticut, Maine, Massachusetts, Nevada, Oregon, Washington) and lists a number of other states "imposing forest standards."
<http://www.epa.gov/OWOW/NPS/elistudy/nonpoin3.html>
4. A good description of the Maryland law and its application through the Baltimore County ordinance can be found in Chris Duerksen, *Nature-Friendly Communities: Habitat Protection and Land Use Planning* (Washington, DC: Island Press, 2005), p. 152-73.
5. *Maryland Code*, Natural Resources Article 5-1601-1613.
<http://michie.lexisnexis.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp=>
6. *Baltimore County Code*, Title 6, Forest Conservation, §§ 33-6-101 through 33-6-122.
[http://www.amlegal.com/nxt/gateway.dll/Maryland/baltimore_co/article33environmentalprotectionandresou/title6forestconservation?f=templates\\$fn=altmain-nf.htm\\$q=forest%20\\$x=server\\$3.0#LPHit1](http://www.amlegal.com/nxt/gateway.dll/Maryland/baltimore_co/article33environmentalprotectionandresou/title6forestconservation?f=templates$fn=altmain-nf.htm$q=forest%20$x=server$3.0#LPHit1)
7. <http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml>
8. J.B. Ruhl, Steven E. Kraft, Christopher L. Lant, *The Law and Policy of Ecosystem Services* (Washington, DC: Island Press, 2007), p. 109.
9. 505 U.S. 1003 at 1029, 1035 (1992).
10. Geoffrey Heal, et al., Protecting Natural Capital Through Ecosystem Services, 20 *Stan. Envtl. L.J.* 333, 342-44. See also: Ruhl, *supra* note 1 at p. 161-63.