



Conservation Thresholds: Linking Conservation Science and Land Use Planning

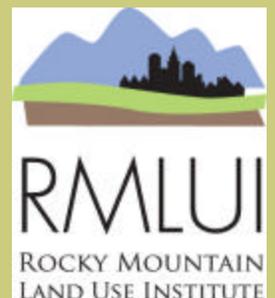
Federico Cheever

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

Federico Cheever is Director of the Environmental and Natural Resources Law Program and Professor of Law at the University of Denver Sturm College of Law. After graduating from Stanford University (B.A./M.A. 1981) and UCLA (J.D. 1986), and clerking for Judge Harry Pregerson of United States Court of Appeals for the 9th Circuit in Los Angeles (1986-1987), he came to Denver as an Associate Attorney for the Sierra Club Legal Defense Fund (1987-1989). Between 1990 and 1993, he was an associate at the law firm Faegre & Benson, in Denver, doing commercial and environmental litigation. He began teaching at the University of Denver College of Law in 1993 specializing in Environmental Law, Wildlife Law, Public Land Law, Land Conservation Transactions and Property. He is also currently also an adjunct professor at the Colorado School of Mines, teaching Environmental Law. Professor Cheever writes extensively about the Endangered Species Act, federal public land law and land conservation transactions. He has recently co-authored a natural resources casebook, *Natural Resources Law: A Place-Based Book of Problems and Cases*, with Christine Klein and Bret Birdsong (2005). Over the years, Professor Cheever has represented environmental groups in cases under the Endangered Species Act, the National Forest Management Act, the National Environmental Policy Act, the Wilderness Act and a number of other environmental laws. While in private practice he also represented regulated parties in disputes under the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Clean Air Act. Professor Cheever has been a visiting scholar at the University of London and at the Australian National University in Canberra.

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I. The Problem

Most conservation scientists agree that we are in the middle of a global extinction crisis and that crisis has been caused by human activity. As many as one third of the world's plant and animal species may disappear forever in the next half century.¹ In the United States, 30% of the nation's plant and animal species are at some risk of extinction according to the National Wildlife Federation and Natureserv, a non-profit conservation organization gathering information from natural heritage programs in all 50 U.S. states and 10 provinces and 3 territories of Canada.² According to the United States Fish and Wildlife Service's Endangered Species Bulletin, as of January 29, 2007, 1311 United States species had been listed as *endangered* (in danger of extinction) or *threatened* (likely to become endangered in the foreseeable future).

For perhaps 85% of imperiled species identified by the National Wildlife Federation and Natureserv, the loss or degradation of habitat is the principal threat to their continued existence. One of the primary elements in the continued loss and degradation of habitat is the rapid conversion of relatively natural land to rural and urban development. The National Wildlife Federation and Natureserv estimate that the current pace of low density development (in relation to population growth) over the next 25 years will consume a significant portion -- as high as 60% -- of the remaining nonfederal natural lands in the nation's fastest-growing metropolitan areas.³

The National Wildlife Federation and Natureserv's 2005 analysis shows that 60% of the nation's rarest species live within U.S. government designated metropolitan areas. Nearly one third of these imperiled species make their home in the 35 fastest-growing metropolitan areas in the United States. It is a common misconception that rare species only exist on publicly owned wildland. In fact, studies (particularly of birds) show that species diversity tends to peak roughly midway between high urban densities and relatively undisturbed wildlands.⁴ It is these lands in the "wildland urban interface" that will decide the fate of many species. These same lands are subject to low density development pressure.

In the face of the ongoing extinction crisis and the significant impact human land use will have on the habitat values so essential to the continued existence of so many species, land-use planners and conservation scientists have begun to work together to provide a scientific basis for land-use planning to preserve wildlife habitat.

The preservation of habitat through land-use planning is particularly challenging. Federal land use managers who endeavor to preserve habitat on the 28% of the

¹ Feeling the Heat, Climate Change and Biodiversity Loss, Nature 8 January 2004.

² Reid Ewing and John Kostyack, Endangered by Sprawl: How Runaway Development Threatens America's Wildlife vii (2005).

³ *Id.*

⁴ Reed Noss, Conservation Thresholds: Overview and Commentary in Lasting Landscapes: Reflections of the Role of Conservation Science in Land Use Planning 6 (2007).

United States owned by the federal government may plan and revise their plans based on the broad authority arising from federal ownership. State land managers trying to preserve habitat on state owned land have similar authority. Preserving habitat values on agricultural land is difficult, but that difficulty is limited by the facts that a single land use dominates and ownership patterns are highly consolidated.⁵ Urban and suburban land-use planners trying to preserve habitat and habitat values on the 154 million acres of urban, suburban and rural residential land⁶ in the United States must rely primarily on regulation (complemented by modest land acquisition) to achieve their goals. They must contend with a sweeping range of actual and potential land uses which may have an array of anticipated and unanticipated effects on wildlife and wildlife habitat.

Furthermore, the problems land-use planners face are compounded by the fragmented nature of local jurisdictions and the absence of any correspondence between local jurisdictional boundaries and ecosystem boundaries.

II. Toward Solutions

Conservation scientists working with land-use planners have developed the concept of "conservation thresholds" to develop planning criteria based on scientific understandings of wildlife and wildlife habitat dynamics which can provide a basis for land-use planning, enforceable zoning and other forms of local land use regulation and habitat acquisition. While this concept is still relatively new, some ideas are being considered to develop effective communication between conservation scientists and land-use planners and to create land-use plans and zoning codes that effectively preserve wildlife habitat.

Think and Work on a Landscape Scale: many wildlife habitat issues can only be dealt with effectively at spatial scales larger than the jurisdictional reach of a local land use plan. Accordingly, effective land use planning for habitat conservation, in many cases, will require regional coordination of the land-use planning process. Regional coordination must involve local land-use authorities. It can also draw in state and federal agencies, conservation groups, community groups and conservation oriented real estate developers. "Regional coordination" can encompass both the relatively modest efforts of a handful of jurisdictions which together include the territory of the seasonal migration of a deer or elk herd, to massive international coordination projects like the proposed Yellowstone to Yukon habitat corridor.

Close the Knowledge Loop⁷: effective land use planning for habitat conservation doesn't necessarily begin with conservation scientists telling land-

⁵ <http://www.ers.usda.gov/StateFacts/US.htm>

⁶ USDA, ERS Summary Report (2006)
http://www.ers.usda.gov/publications/EIB14/eib14_reportssummary.pdf

⁷ David Theobald, Challenges in Bridging Conservation Science and Land Use Planning in LAND USE PLANNING 20 (2007).

use planners what to do. Rather, it begins with land-use planners sharing their expertise about particular landscapes and assisting conservation scientists in gathering information (particularly from private land) to provide a sufficient factual basis for the scientific analysis underlying the land-use plan. Information gathering and expertise sharing should continue after a plan has been adopted to monitor the effectiveness of an initial plan and craft amendments and other modifications where necessary. For example, conservation scientists should be part of the development review process. Conditions for development approval should include authorization and funding for continued monitoring of the environmental impact of the development process.

Articulate Ambitious Achievable Goals: Bison will never again wander through downtown Denver, but land-use planning can set ambitious, achievable goals for the preservation and recovery of species and the preservation and restoration of wildlife habitat. Almost any effective conservation plan for an established community will involve cleaning up “the sins of the past.” Establishing goals helps keep the wildlife habitat planning process open to those who will pay for it and be burdened by its regulatory components.

Encourage Infill and High Density Development: One of the best things any land use plan can do to reduce impact of wildlife habitat is simply to encourage people to live closer together and to live in places where urban development has already taken place; the higher the density of human development, the lower the amount of relatively natural land that will need to be modified to accommodate a human population.

Regulate to Encourage Peaceful Coexistence: People and wildlife can coexist in very close proximity. Wildlife habitat values can be preserved on lands regularly used for a wide variety of human activities. Healthy diverse wildlife populations can coexist with relatively high densities of human population. However, increasing the probability of the persistence of a healthy wildlife population in, for example, a residential subdivision may require relatively specific regulations dictating, for example, where houses may be built, road traffic volume, outdoor lighting, and waste disposal practices.⁸ Many riparian species can be effectively protected by maintaining natural buffer strips along rivers and streams.

Educate the Community and Make Wildlife as Accessible as Possible to the Largest Possible Number of People: the long-term success of any wildlife preservation program (local, state or federal) depends on developing political constituencies that will support it. The more people who understand the unique wildlife qualities of their community and have regular opportunities to enjoy wildlife (through viewing, fishing or hunting) and the more people have an

⁸ See David Theobald, Challenges in Bridging Conservation Science and Land Use Planning in LAND USE PLANNING 21 (2007).

opportunity to enjoy the natural beauty of preserved habitat, the more likely they are to support the regulations and public financial commitment necessary to support a successful wildlife preservation program. In some circumstances, access to wildlife and habitat must be restricted to preserve wildlife or human safety or privacy. Such restrictions should, however, be imposed as rarely as possible.

Acquire Habitat Wisely and Maintain it Well: Many effective wildlife preservation programs will require that maintaining habitat values be the dominant land use in some "core areas." These areas will provide relatively undisturbed breeding, feeding and sheltering habitat to wildlife populations. While some wildlife programs will be able to rely largely on federal or state wildlife areas or private reserves, many will need to acquire property rights for some habitat land. Property rights to preserve wildlife habitat should be purchased on the basis of the best scientific understanding of the ecosystem services the habitat provides. Wildlife habitat should also be purchased with the understanding that habitat values are dynamic and will shift over time. Providing money to purchase land with habitat value will also discourage landowners to destroy habitat to avoid state and federal regulation.

Conservation easements can be used to ensure the preservation of habitat values at relatively low cost. The purchaser of a conservation easement can negotiate with the possessory land owner to preserve only land possessing habitat values (as opposed to the entire parcel). The purchaser of an easement can also reduce the cost of the easement by allowing the possessory owner of the land to engage in economic activities which do not affect the habitat values the purchaser wishes to preserve.

Habitat, particularly in rural and suburban areas, will not take care of itself. Preserving habitat values will require active maintenance by scientifically informed stewards.

Develop a Consistent, Adequate Source of Funding: Applying scientific expertise to the planning and development review process, monitoring the environmental impact of development, acquiring habitat and managing habitat requires funding. Appropriating resources on a crisis by crisis basis is inadequate. The jurisdictions wildlife conservation program should be supported by some regular funding source.

Make Developers Pay Their Share: The destruction and degradation of wildlife habitat by a development process is a negative impact on the local community. The costs of mitigating this impact should be imposed, to the degree possible and equitable, on the parties who benefit from the development. In many cases, the value of an intact wildlife community to the residents and users of the new development will exceed the costs of preserving that wildlife community.

III. Sustainability Measures:

- Percentage of habitat on Federal and State owned lands
- Proportionate level of high density and infill development relative to “greenfield” development
- Percentage of people with easy (walking or biking distance) access to wildlife
- Level of funding for wildlife conservation programs
- Number and area extent of conservation easements and natural buffer zones
- Purchase of property rights to preserve wildlife habitat

IV. Code Strategies

A. Remove Obstacles

1. In designated high impact areas eliminate large lot zoning--with minimums of 1 to 40 acres--and other forms of density restrictions that serve to fragment the landscape over large areas”.

B. Provide Incentives

1. Provide for an ongoing land and development rights purchase program.
2. Encourage conservation easements
3. Encourage cluster or “conservation” development in low density “low impact” areas.
4. Permit density bonuses under clearly defined conditions for development in exchange for permanent conservation of wildlife habitat.

C. Regulations

1. Protect riparian buffer zones around biologically significant (or potentially significant) waterways
2. In designated high impact areas establish very large lot minimums—for example 160 acres
3. Impose overlay zones to protect essential habitat of significant local species
4. Discourage house construction within habitat areas
5. Outright restriction of development in areas of critical habitat
6. Require wildlife friendly fencing
7. Establish impact fees for wildlife
8. Establish lighting standards that minimize night time lighting and eliminate glare through shielding

9. Require conservation biologist participation in the development review process

D. Strategic Success Factors

1. Regional coordination among jurisdictions and stake-holders
2. Accessibility to wildlife through programs and natural area preservation
3. Discourage road traffic in migratory areas
4. Articulate goals in biological terms
5. Management
 - a) Mandate habitat mapping and regular habitat impact monitoring at regular intervals
 - b) Mandate active management of preserved habitat areas on both public and private land
 - c) Build structures and obtain conservation easements or other land use restrictions or use rights to facilitate access for wildlife viewing, etc.
 - d) Maintain a waste management program to discourage wildlife feeding.