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Landscapes Shaped by People and Place Institutions Require a New Conservation Agenda

DAVID J. BRUNCKHORST

Formal protected area systems will always be insufficient to sustain biodiversity and ecosystem processes. The largest proportions of endangered ecosystems and rare species remain outside public conservation areas on private land, and the political and financial costs of strategic acquisitions of these areas for conservation estate are becoming unaffordable. Although biologists quite rightly continue to call for development of more comprehensive and representative reserve networks, the reality is that the coverage, connectivity, and size of protected areas will remain inadequate (Shaffer et al. 2002). Many authors and participants, as well as the conclusions, of the very comprehensive 30-year review of the Endangered Species Act (Scott et al. 2006) noted the continuing challenge and urgency of extending the conservation agenda more comprehensively across natural and working landscapes (matrix lands), most of which will remain outside any formal reserve system. New integrative approaches are needed.

Landscape patterns provide a multiscalar "theater" in which human-ecological interactions play out. The regional landscape context in which a new conservation agenda might be developed recognizes the fragmented matrix as a variety of patterns of not just ecosystems but human communities with various private lands or resource tenures, including agricultural and other working landscape elements. Each element of the mosaic influences other elements. Scientists from diverse disciplines are now recognizing that human history and policy are critically entwined with ecosystems and should be examined as social-ecological systems. Human institutions influencing resource use (e.g., accepted behavior, property concepts, decisionmaking, policy, rules, and governance) shape landscape patterns, processes, and perceptions, and subsequent human and societal responses (Brunckhorst et al. 2008). In practice, all human activities, including conservation actions and resource management, combine with ecological functions as dynamic processes that cross boundaries. Landscapes and institutions change together over time dynamically and responsively, and in doing so create meaningful contexts that local residents closely identify with and relate to as their place. This spatial context of place identity is also important to local people if policy-relevant representation is to forge sustainable resource use and novel conservation futures (Cheng et al. 2003).

A revised conservation agenda that focuses on synthesis studies and opportunities beyond formal reserve networks, and on the rural communities of private citizens that will likely remain the landholders and guardians of the majority of biodiversity, provides several advantages: (a) a broader segment of society has ownership of and (place-based) commitment to the conservation enterprise; (b) both landscape and social connectivity within and among traditional reserve areas are increased; and (c) species and ecosystem protection are more spatially and temporally integrated with local social systems, increasing adaptive capacity and resilience. Past efforts to engage with private landholders and citizens have often met with limited success because of a lack of understanding of local communities of interest and the landscapes with which they identify. Conservation science and policy must begin meeting people in their own place and space. To do so requires an approach to delineating regional-landscape frameworks to integrate conservation outside formal protected areas with the human-dominated, working landscape matrix. We need to map the scales of local-to-regional frameworks acceptable to local residents and appropriate to conservation science. Policies and incentives can then be designed to integrate sustainable agriculture, acknowledge landholder rights, and provide new options to conserve endangered species and ecosystems outside of formal reserves.

New understandings can emerge from syntheses of multidisciplinary theory and information and can create new opportunities for novel policy, adaptation, and citizen engagement. If conservation science and policy are to work effectively in this new environment, they need to become more sophisticated in their syntheses of social and community characteristics when planning and implementing biodiversity protection across multiple tenures. Likewise, landscape ecology needs to meld with environmental sociology to more seamlessly understand the spatial and temporal dimensions of human institutions interacting across "places"—spaces with meaning to local residents for civic engagement—termed "eco-civic" regions (Brunckhorst et al. 2006, 2008).

Eco-civic landscapes and regions

An interdisciplinary approach to the synthesis of spatial data on landscape patterns, the function of social systems (within resident communities), and ecological systems could help shape a new conservation agenda. The social-ecological interactions and feedback responses that structure landscapes and regions also shape operational contexts in which to integrate ecological patterns and processes with the cross-scale interplay of community identity and civic engagement, property rights and resource use, and agency jurisdictions and policy. I suggest an eco-civic approach to identifying multiple scales

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of socially and ecologically meaningful landscape contexts through which to engage citizen landholders and their environment in an expanded conservation agenda.

Several characteristics are essential to the design of resilient, cross-scale resource and conservation management systems. Clearly defined spaces, actors, access rights, responsibilities, and rules are important. Residents' identification with a "place" context is necessary for civic engagement. Meaningful community engagement is further motivated when local people believe that the information communicated to them is valid, relevant, and trustworthy. Local economies, rural towns, social groups, recreation, land use, vegetation, topography, landscape amenity, and ecosystem health are some of the emergent properties of social-ecological systems interactions that create identity and define a place for resident community stakeholders (Cheng et al. 2003).

To understand the dimensions of regional landscape contexts that might assist the integration of conservation and natural resource management, three defining characteristics are necessary (Brunckhorst et al. 2006, 2008). First, as in ecoregional approaches, the biophysical characteristics of the local-to-regional landscape should possess a relatively high level of homogeneity. Second, the regional boundaries must represent the local area of greatest interest to residents, including their place of meaning and identity, their community, and where they want to be represented and involved as citizens. There is greater likelihood of citizen engagement in conservation actions if the ecosystems or species occur in the area of residents' community of interest (Cheng et al. 2003). Third, to manage (social and ecological) externalities of planning and policy community decisions about resource use and conservation management, the regional landscape framework requires a multi-scaling capacity; in other words, a hierarchical nesting to scale up and down geographic scales and institutional levels of decisionmaking and action that might create externalities affecting other places or people. These three principles have been operationalized as an eco-civic regionalization technique and have been used to define nested spatial frameworks for integrating natural resource management, conservation planning, and related government service delivery and administration (Brunckhorst et al. 2006, 2008). The approach optimizes the social-ecological landscape contexts with which local residents (including private landowners) and their communities identify, and therefore would be more likely than other approaches to engage residents in conservation actions.

Interdisciplinary synthesis is crucial for finding new solutions to social-ecological sustainability problems. Experience from development, testing, and application of eco-civic regionalization techniques—not just scientific peer review but feedback from communities and policymakers—suggests a novel approach to reconnect fragmented conservation landscapes. Across a nation, for a group of states of broadly similar social-ecological character, the suggested approach is to undertake research synthesis and mapping toward an eco-civic regionalization, identifying a spatially nested hierarchy of landscape contexts in which to engage local communities of private landowners in conservation actions in the places of most interest and concern to them. Once eco-civic regions are identified, conversation can begin with like-minded landowners of eco-civic places, and new conservation arrangements can be implemented across private and public tenures. Interested landholders will identify others through their communities of interest and social networks for building consensus and trust, identifying appropriate private conservation actions and rewards (e.g., conservation easements, conservation banking, conservation stewardship, etc.). New knowledge and understanding built from an eco-civic regionalization and conservation strategy across several states would be a valuable step toward the implementation of a new off-reserve conservation agenda across the nation. An eco-civic regionalization of the contiguous United States would provide an integrative framework for coupling conservation policies and actions across scales of human institutions and ecosystems.

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