The Politics and Practice of Watershed Restoration: Insights from the Russian River Watershed, Northern California

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Watersheds are ecologically and socially dynamic and restoration efforts that fail to recognize the importance of the social context will fail to address the sources of degradation.

Over the last two decades California has allocated billions of dollars to watershed restoration activities through legislation and voter-approved bonds. Yet, the implications of restoration remain ambiguous since there has been little examination of restoration accomplishments and almost no analysis of the political context of restoration. This research addresses these gaps, utilizing a case study of the Russian River in Northern California.

We identify trends that shed light on both the ecological and political implications of restoration at a basin scale by examining a database of 787 restoration projects implemented in the Russian River basin since the early 1980s. Although over $47 million has been spent on restoration in the basin, dominant forms of restoration are limited in scope to small scale projects that focus on technical solutions to site-specific problems.

Sixty-two percent of all restoration projects are devoted to road repair, riparian stabilization, and in-stream structures. These types of projects do not address the broader social drivers of watershed change such as land and water uses. We suggest that restoration can become more effective by addressing the entire watershed as a combination of social and ecological forces that interact to produce watershed conditions.

Conservation and restoration are as much about social processes as physical ones, however social factors are not subjected to the same analysis as technical ones under prevailing analytical frameworks. We argue that watersheds are ecologically and socially dynamic; and that restoration that does not recognize the social context will fail to address the sources of degradation.

To explore these larger issues, we examine a case study of the Russian River watershed, asking**:** *How do social relations influence the practice of watershed restoration?* This research provides an analysis of the institutional framework of restoration, addressing several sub-questions including:

- What are the landscape-scale and site-specific characteristics of watershed restoration activities (types of work done, total cost, organizations involved, measures of success)?
- How do shifts in federal and state policies regarding water resources influence the practice of watershed restoration?
- What policy interventions are likely to address sources of watershed degradation?
- What are the linkages between this case study and current patterns of watershed restoration throughout California?

The Russian River watershed is an ideal location due to the concentration of restoration activities and on-going studies conducted by the University of California Cooperative Extension offices in the area. After decades of conflict between competing resource users, the river's once meandering path has been forced into a narrow channel for flood control and farming; native steelhead and salmon species have been listed as endangered; and the river has the dubious distinction of being named one of the twenty most threatened rivers in the United States by American Rivers two years in a row (1996 and '97).

Our research examines where restoration happens, how it happens, and who benefits. In examining where restoration happens, the results show that restoration projects are over-represented on timberland, rural residential land, and vineyards. This indicates that restoration dollars disproportionately benefit segments of the population involved in resource extractive and intensive activities like timber production and agriculture. In examining how restoration happens, our research reveals distinct preferences in the types of projects funded by three major funding institutions in the basin, demonstrating the dominance of site-specific in-stream, riparian, and road related improvements. Therefore other objectives in publicly funded restoration programs, such as water quality and quantity, and education, are not widely addressed by current restoration practices.

Modified hydrologic conditions, in addition to habitat alteration, can greatly impact anadromous salmon runs (Moyle 2002). Current land and water uses in the basin have greatly modified hydrologic conditions. Large dams for urban use and the cumulative effect of small-scale water projects for agriculture and rural development have altered natural flow regimes. Fish recovery will require changes in water management including more natural flow regimes for dam releases and increased winter storage in the upper part of the watershed where vineyards are currently relying on surface and subsurface stream flows in the dry season.

Improving the efficient use of water in the Russian River requires participation and coordination among agriculture and urban users to identify future alterations that could increase efficiencies. Water rights are also under investigation and it will be necessary to provide incentives to generate alternatives to the use of historic rights that when exercised can result in impacts to stream habitat critical for salmon recovery. With increased recognition of the cumulative effects of groundwater use in California, increased regulation has been proposed and while this may be necessary in some cases, integrated solutions developed by coordinated stakeholder decision making processes may be more sustainable in the long run. Also, rural residential expansion has resulted in an increase in the number of domestic wells that can draw down upland stream flow levels upon which juvenile salmon rely for over-summer survival and can result in increased sediment levels in downstream spawning gravels (Lohse et al., submitted). Therefore reducing sprawl into wildlands would both reduce the demand on water and protect remnant upland habitat. Part of the solution to sprawl is to increase urban densities, which will need to be accompanied by water conservation.

Changes in policy and management to foster restoration need to be managed adaptively; monitoring the coupled human and natural system is an essential part of restoration. Our research clearly shows how little we currently invest in monitoring restoration outcomes which in the end will prevent us from improving our restoration outcomes. It is our intent to evidence, rather than explain, how and why restoration is not only an ecological activity, but also an inherently social one. Only through understanding and analyzing natural resource management in an integrated manner can sustainable solutions be found.

Publications

Langridge, R., J. Christian-Smith, and K. A. Lohse. 2006. “Access and Resilience: Analyzing the Construction of Social Resilience to the Stress of Water Scarcity.” *Ecology and Society* 11 (2): 18. Online at: www.ecologyandsociety.org/vol11/iss2/art18/

Christian-Smith, J. (Dissertation) 2006. The Politics and Practice of Watershed Restoration: Insights from the Russian River Watershed, Northern California. UC Berkeley.

Collaborative Efforts

Our lab has a collaborative relationship with researchers at the Hopland Research and Extension Center, which houses a GIS lab with extensive spatial data analysis resources.

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