Incorporating Local Knowledge into Ecological Restoration Assessments – Case Studies in Louisiana

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Ecological restoration and other activities that interact with environmental systems have typically relied on scientific analysis to predict the impacts of these projects, and have operated on the assumption that good science could reveal and remedy potential problems (Colten and Hemmerling 2014). The scientific literature has extensively covered the development of large-scale environmental monitoring plans (Williams et al. 2009), particularly with respect to detecting change in ecological systems (Field et al. 2007, Gitzen et al. 2012, Wagner et al. 2013) and identifying ecological indicators for monitoring (Fennessy et al. 2004, Hershner et al. 2007, Nicholson and Jennings 2004). Because environmental management is fundamentally a human activity, however, effective predictions of human impacts demand equal attention to the social, political, cultural, and economic systems in which environmental management takes place (Ludwig et al. 1993). Despite the fact that monitoring of social indicators has long been a crucial component of Social Impact Assessments and is required for projects having an environmental impact on human communities (Interorganizational Committee on Principles and Guidelines for Social Impact Assessment 2003, Kusel 1996, Machlis et al. 1997), few large ecosystem-level socioeconomic monitoring plans have been implemented to date (Charnley and Stuart 2006, Hijeuelos and Hemmerling 2015, Jackson et al. 2004, Sommers 2001). It can be challenging to develop monitoring techniques that reflect the broad social impacts of ecological restoration, especially when extending monitoring beyond assessment of baseline demographic information (e.g., U.S. Census data).

In order to assess local understanding of environmental and social change resulting from ecological restoration projects, our research group recently piloted several mixed-method and multi-disciplinary monitoring strategies in coastal Louisiana. This region has historically experienced globally high rates of wetland loss due in part to a combination of sea level rise, subsidence, saltwater intrusion, and reduced sediment inflow. Between 2016 and 2017, we developed and implemented research methods framed around recent natural and human-induced changes in the region with the goal of characterizing local community members' understanding of what ecological restoration has historically achieved, as well as a suite of potential short- and long-term outcomes of emerging ecological restoration projects identified by residents.

Understanding Where and Why Ecological Restoration Matters – Utilizing Participatory Mapping Techniques

Community members everywhere possess valuable local environmental knowledge - in-depth understandings of the environment derived from life experiences, family, or other cultural traditions outside of formal school-related education and training - that is often geographically explicit and exerts powerful influences on behavior (Curtis et al. 2017). Participatory mapping techniques aim to encourage community member participation in sharing knowledge and perceptions of a given area. In our case, the information gained with these techniques is used to determine the geographic specificity of local perceptions and develop a community-informed prioritization tool for future ecological restoration projects in coastal Louisiana. To that end, a multi-disciplinary team consisting of anthropologists, ecologists, and geographers utilized participatory mapping techniques and focus group research to structure participant responses that were specific to different ecosystem types. Previous research (Bethel et al. 2014) has shown that participatory mapping techniques can provide an effective means of incorporating local environmental knowledge into a coastal protection and restoration framework.

We began with preliminary mapping workshops in 2016 involving 12-17 participants organized through coordination with a community liaison to select groups of residents representing a wide array of backgrounds, demographics, and interest in restoration activities in their particular area (Figure 1). We presented participants with an ecological transect of their region and asked them to identify the cultural significance as well as restoration function of each ecosystem. Next, we presented participants with local and regional maps of the area and asked them to identify sites of personal and shared cultural significance, places they feel are at risk of negative environmental impacts such as flooding and coastal erosion, and areas they would prioritize for ecological restoration, wherein they also described restoration techniques they felt would be successful. We collected hand-mapped features and annotations created by participants and transposed them using GIS to create several hot-spot maps to visualize the significance and prioritization for future restoration projects. Our research group hosted additional mapping events in public festival settings, with the intention of capturing a wider array of participants and information. Researchers set up and staffed mapping tables where they asked participants to mark and map areas of prioritization for restoration and describe what they feel are effective ecological restoration strategies. These participatory mapping techniques allowed the project team to collect a range of local knowledge that could inform key issues and concerns for the future monitoring of projects in coastal Louisiana.

Figure 1. Participatory mapping workshop in Delcambre, Louisiana (Photo: Monica Barra).

We used the data collected during these participatory mapping exercises to create a geospatially explicit baseline dataset allowing researchers to incorporate local knowledge into an assessment of ecological restoration projects (Figure 2). The outputs of this research were incorporated into a series of ecosystem-specific graphics and charts reflecting the input of residents on the potential value of ecological restoration efforts across the coast and paired with peer-reviewed research on the various protective, socio-cultural, and economic values of each ecosystem (Carruthers et al. 2017). The suite of methodologies used in this research can be translated into a longer-term monitoring program, tracking where and how local groups interpret the changes that accompany restoration projects over time. Empirically derived information on residents' perceptions of the values - positive, negative or otherwise - of restoration projects grounds anticipated social impacts (estimated by social costs-benefits analyses) in the material experiences of the residents themselves. These methods are a tangible way to evaluate the outcomes and shortcomings of ongoing projects against projected results, and make adjustments that respond to the real-time needs of impacted communities.

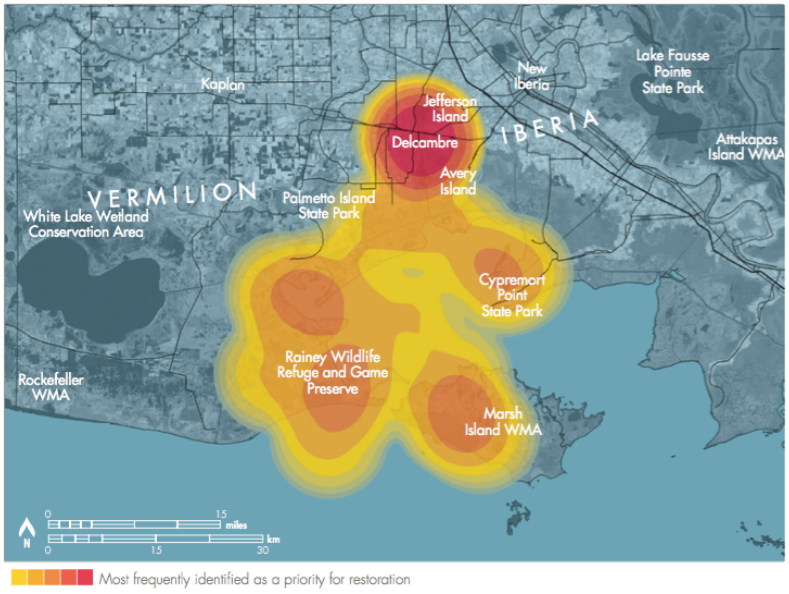

Figure 2. Hotspots of community-identified locations for restoration, indicated by residents of Delcambre, Louisiana (Carruthers et al. 2017).

Understanding What Changes – Locally Grounded Valuation Techniques

Ecological restoration projects deliver variable costs and benefits to Louisiana coastal communities and the economies they depend upon, especially navigation and fisheries (Caffey et al. 2014). Residents impacted by these projects have recognized these variabilities, valuing some projects as vitally important and highly desirable, while questioning or opposing others (Colten 2014). In order to quantify these locally-specific values and develop a framework amenable to monitoring social and environmental change resulting from ecological restoration, our research group conducted an in-depth analysis of the anticipated and actual outcomes of two reforestation projects in the Mississippi River Alluvial Valley, utilizing qualitative data derived from focus groups, surveys, and one-on-one interviews with a selection of key stakeholders (Table 1 (/resource/resmgr/sernews/SERNews_31-3/Table_1_Hemmerling.png)). The final product of this research was an empirically-grounded forecast and retrospective assessment of the social, economic, and ecological values of the reforestation projects (Hemmerling et al. 2017b, 2017a).

We based our assessment of the social value of the reforestation projects on the Social Return on Investment (SROI) framework developed by Social Value International (http://socialvalueint.org/), a non-profit group based in the UK. The SROI framework emphasizes grounding assessments of social value in the words and experiences of stakeholders and local residents which, in the case of analyzing ecosystem services, requires conducting interviews or focus groups with participants impacted in some way by ecological restoration activities. We used qualitative research methods to assess the economic, recreational, cultural, educational, and ecological values – positive and negative – of the reforestation projects on numerous stakeholder groups, including hunters and fishers, local Native American communities, environmental managers,

educators, and local conservation groups. Interviews, survey methods, and focus groups centered around these discrete topics to develop a consistent analysis across groups and a framework for future research and monitoring. We recorded, transcribed and analyzed conversations to determine which qualities or concerns were important to participants as well as how they weighted different social and environmental values derived from the reforestation. The SROI framework explicitly requires researchers to account for outside activities or factors that might impact measured outcomes to avoid over-claiming the impacts of the project on communities. The framework also incorporates a plan for disseminating results to participants and continuing, in the case of a forecast, to monitor the progress of the project over time. Finally, the SROI model developed for this study accounted for the value of the ecosystem services provided to surrounding and downstream communities in addition to the social and monetary values acquired by volunteers and corporate sponsors who invested time and money in the reforestation projects (Figure 3).

Figure 3. Volunteers planting cypress trees in the Pointe aux Chenes Wildlife Management Area, Louisiana (Photo: Restore the Earth Foundation).

CONCLUSION

Qualitative data analysis successfully classifies differences in the ways stakeholder groups potentially impacted by ecological restoration projects engage with the project sites, and identifies a suite of outcomes unique to each stakeholder group (Hemmerling et al. 2017a, 2017b). Identifying these outcomes is integral to defining both the specific objectives and variables needed to develop a comprehensive monitoring framework. Ensuring that key stakeholders are identified and consulted early and often in the ecological restoration planning process will allow decision-makers to identify the most socially beneficial courses of action for local, regional, and national interests (Interorganizational Committee on Principles and Guidelines for Social Impact Assessment 2003). Qualitative research can enable planners to refine their practices holistically as a set of relations between social and ecological systems. The methods presented here represent advances in rigorous, replicable, and accessible forms of collecting local knowledge to assess and monitor the social value of ecological restoration, providing information to agencies and communities about social and cultural factors that need to be considered in the restoration planning process.

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