Desert Landscape Conservation Center

Appendix 3d.
Bibliography of Approaches for Incorporating Socio-economic Indicators in Conservation Planning

Transboundary Madrean Watersheds Landscape Conservation Design Report

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Frameworks for Incorporating Socio-ecological and Socio-economic Factors into Conservation Planning

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Folder of related literature:

Ambrus et al. 2014. Public values in water law: A case of substantive fragmentation? Utrecht Law Review. 10(2): 8-30.

Water is often characterized as a public good for various reasons: it can benefit large numbers of people without diminishing its quality, it is a natural resource, it serves the basic needs of individuals, and is essential for maintaining the ecosystem. The underlying idea behind these reasons is the need to ensure that certain publicly important values, i.e. public values, are respected. Although there is a general idea about what these values might be, it is still unclear what the concrete public water values are and to what extent these are actually incorporated in the various dimensions of water law (economic, environmental and social) and at the different institutional/governance levels (international, regional, sub-regional and domestic). Given these dimensions and levels of governance, water law is therefore often described as horizontally and vertically fragmented. The term 'fragmentation' is often associated with negative consequences; the general idea is that diverging approaches would lead to inconsistent, incoherent and ineffective results as well as to legal uncertainty. These negative connotations then raise the question whether institutional fragmentation negatively affects the protection of public values.

Against this background, the following research question will be addressed in this article: Is there substantive fragmentation regarding the protection of public water values across different institutional levels, and to what extent? Hence, the main purpose of this article is twofold: (1) to provide a working definition of and a theoretical framework for the identification of public values; and (2) to explore which public values are being protected at the different levels and across two main dimensions. To this end, this article will provide insights into the different levels of governance on the basis of some representative examples. In addition to exploring public values within international water law (international level), the relevant water law norms in the European Union (regional level), in the Danube River Basin (sub-regional level) and in the Netherlands (domestic level) will also be analysed. Until now, there has been no extensive and integral assessment of public values in water law across the levels mentioned.1 This article, therefore, aims to fill this gap by carrying out a comparative assessment of water law across these levels focusing on the environmental and social dimension of water law.

Azar et al. 1996. Socio-ecological indicators for sustainability. Ecological Economics. 18(1996): 89-112.

Abstract: A systematic framework of indicators for sustainability is presented. In our approach there is an emphasis on societal activities that affect nature and on the internal societal resource use, as opposed to environmental quality indicators. In this way the indicators may give a warning signal to an unsustainable use of resources early in the chain from causes in

societal activities to environmental effects. The aim is that these socio-ecological indicators shall serve as a tool in planning and decision-making processes at various administrative levels in society. The formulation of the indicators is made with respect to four principles of sustainability, which lead to four complementary sets of indicators. The first deals with the societal use of lithospheric material. The second deals with emissions of compounds produced in society. The third set of indicators concerns societal manipulation of nature and the long-term productivity of ecosystems. Finally, the fourth set deals with the efficiency of the internal societal resource use, which includes indicators for a just distribution of resources.

Albert et al. 2015. Towards a national set of ecosystem service indicators: Insights from Germany. Ecological Indicators.

Abstract: Target 2, Action 5 of the EU Biodiversity Strategy requests member states “to map and assess ecosystems and their services” (Mapping and Assessment of Ecosystems and their Services – MAES initiative). The objective of this paper is to present and discuss the preliminary outcomes of the approach taken to define indicators for implementing MAES in Germany. The paper introduces the requirements for using indicators from a perspective of nature conservation policy, in particular the need to discern the demand and supply of ecosystem services, including their potentials, actual and future use, as well as the natural contributions and human inputs to the generation of ecosystem services. An adapted, differentiated,ecosystem services terminology is presented and a first set of indicators is introduced and explained.The paper closes with an estimate of potential benefits of information produced by implementation of a national MAES for various fields of policy (e.g. local and regional landscape planning) and proposes some recommendations for further research and practical exploration.

Analysis of Socio-Ecological Systems for Community Conservation *

Provides an overview of conceptual and analytical frameworks for linking human and natural systems Several approaches are presented. Provides examples of socio-ecological systems to help illustrate key concepts.

Aranzabal I.D. et al. 2008. Modelling of landscape changes derived from the dynamics of socio-ecological systems: A case study in a semiarid Mediterranean landscape. Ecological Indicators. 8(5): 672-685.

Abstract: Europe's cultural landscape has undergone notable changes in the last few decades. In particular, conserving the cultural rural landscape of the Mediterranean basin constitutes a difficult task due to the fact that, on one hand, rural abandonment, and on the other, agricultural intensification, are generating a new type of landscape which is apparently less appealing than the traditional one. Indeed, this landscape depends upon the maintenance of traditional agricultural uses and their associated activities, both of which depend on local environmental conditions and on socio-economic conditioning factors. The latter are increasingly being seen as the causes of the changes. Modifications in the social structure and processes affect and alter

the rural environment, so that ecological and socio-economic information must be integrated for use as a basis for land use planning and management.

In the present paper we have applied numerical analyses which associate territorial structure with economic and socio-cultural structure, predicting new types of landscape by means of experimental scenarios of socio-economic changes. The configuration of the traditional rural landscape studied and its spatial heterogeneity depend upon the proportion of the agriculture, pasture and woodland components of the traditional systems. Formalization of this landscape–socio-economy dependence enables us to consider scenarios of socio-economic change and to deduce variations in the landscape. We simulated changes related to the promotion or abandonment of agriculture. The model developed can be considered as an effective agri-environmental indicator, as it provides most of the characteristics required for analysis and environmental appraisal at landscape level.

Bartuszevige et al. 2016. Landscape design: Integrating ecological, social, and economic considerations into conservation planning. Wildlife Society Bulletin. 40(3): 411-422.

Abstract: Landscape design is a conservation planning process, described in the landscape ecology literature, proposed to rectify the knowledge and implementation gap in planning that have limited the effectiveness of many conservation planning efforts. Use of landscape design bridges this gap through increased emphasis on the interdisciplinary nature of conservation planning and engagement of a stakeholder advisory team to create a conservation plan that resonates with biological, cultural, social, and economic realities of the area concerned. We define landscape design as a conservation planning process that integrates societal goals and values with established biological conservation goals, using science grounded in landscape ecology to describe future scenarios where specific and measurable biological goals can be attained. First, we describe a landscape design process and provide examples from the literature and partnerships such as Connect the Connecticut and the Appalachian Landscape Conservation Cooperative. We follow by discussing a case study of a landscape design effort to conserve playa wetlands to support waterfowl goals for migrating waterfowl established in the North American Waterfowl Management Plan. We further highlight characteristics of a successfully completed landscape design. We conclude that landscape design is a powerful process that goes beyond identifying high-priority conservation assets and intended to be an action-oriented process. Landscape design provides a framework for ensuring that conservation planning does not occur in a vacuum by ensuring social, cultural, and economic needs of people are recognized before valuable conservation dollars are expended. It provides a mechanism for understanding the effects of future landscape drivers on natural resources and engages stakeholders in proactive discussions regarding conservation. The final result is a commitment by a partnership to a set of actions that will achieve the stated conservation goal.

Bowen and Riley. 2003. Socio economic indicators and integrated coastal management. Ocean & Coastal Management. 46: 299-312.

The need to better understand the linkages and interdependencies of socio-economic and coastal environmental dynamics has taken on a more deliberate role in the development and assessment of Integrated Coastal Management world-wide. The analysis and establishment of indicator-driven programs to assess change in coastal and watershed systems have increasingly moved to stress socio-economic forcings and impacts. This article serves to review the need for and provide an assessment of important frameworks designed to foster such integration. It argues that the evolution of the Driver–Pressure–State–Impact–Response (DPSIR) framework, now in broad use, provides an essential contribution.

Budruk and Phillips (eds). 2011. Quality-of-Life Indicators for Parks, Recreation and Tourism Management. Social Indicators Research Series 43, Springer Science+Business Media B.V. DOI 10.1007/978-90-481-9861-0_7. 230 p.

A hefty volume looking at several ways of incorporating quality of life indicators.

Cronan et al. 2010. An assessment of land conservation patterns in Maine based on spatial analysis of ecological and socioeconomic indicators. Environmental Management. 45(5): 1076-1095.

Abstract: Given the nature of modern conservation acquisitions, which often result from gifts and opportunistic purchases of full or partial property rights, there is a risk that the resulting mosaic of conserved resources may not represent a coherent set of public values and benefits. With different public and private entities engaged in land conservation, one would further expect that each organization would apply separate goals and criteria to the selection and acquisition of its conservation portfolio. This set of circumstances raises an important question: what is the aggregate outcome of this land conservation process? Retrospective assessments provide a means of reviewing cumulative historical decisions and elucidating lessons for improving future conservation strategies. This study used GIS-based spatial analysis to examine the relationships of private and public conservation lands in Maine to a variety of landscape metrics in order to determine the degree to which these lands represent core ecological and socioeconomic values that are meaningful to a wide cross-section of citizens. Results revealed that the gains of past conservation efforts in Maine are counter-balanced to some extent by apparent gaps in the existing fabric of conservation holdings. Conservation lands capture a representative sample of diverse habitat, provide a large measure of protection for multiple conservation values and indicators, and offer an unusual mix of outdoor recreational opportunities for residents and visitors alike. Yet, the majority of parcels are relatively small and isolated, and thus do not provide contiguous habitat blocks that offset ongoing processes of landscape fragmentation. Furthermore, the majority of area associated with many of the ecological metrics examined in this report is located outside the boundaries of current conservation holdings. The under-represented metrics identified in this investigation can be viewed as potential targets for new strategic conservation initiatives.

de Jonge et al. 2012. Integrating ecological, economic and social aspects to generate useful management information under the EU Directives' 'ecosystem approach.' Ocean and Coastal Management. 68(2012): 169-188.

Abstract: If we as scientists cannot decide upon what research, monitoring and technical tools should be used as a basis for policy making and management within the European context, then the politicians and other decision makers will continue to follow the line of 'weak' sustainability (applying monetary substitution rules to natural capital) instead of 'strong' sustainability (applying alternative rules such as the precautionary principle). Suitable integral indicators or indices matching the 'ecosystem approach' (EA) and thus covering ecological as well as socio-economic aspects are required. There is, however, a clear friction between what can be delivered in terms of useful '(integral) indicators' and what decision makers require us to deliver in terms of 'simple, cheap, easy to understand' while the real situation is extremely complex. This social, economic and ecological complexity has been an important impediment to the realisation of an EA that should guarantee 'sustainability'. What is missing since the publication of the Brundtland report is technical co-operation between the decision makers and the natural and social scientists. To achieve development of integral indicators we propose to make the Odum food web concepts functional by the application of ecological network analysis (ENA) and at a scale where socioeconomic and ecological information can be integrated, which is the 'habitat' level. At the habitat level ecological functioning (natural compartment), human activities (economic compartment) and ecosystem functions to humans (socio-ecological compartment) can be designated and measured. This process can further be facilitated by the use of the Driver-Pressure-State change-Impact-Response (DPSIR) approach.To facilitate weighing and decision making multi-criteria techniques can be used.

Ecosystems and Human Well-being: A Framework for Assessment, and other products of the Millenium Assessment Report.

Provides an overview of the MAR, describing the conceptual framework that was used. Chapter 6 might be particularly helpful as it reviews concepts of ecosystem services valuation and valuation approaches. Note that the MAR states goals for human well-being that include reducing poverty and hunger, increasing educational opportunities and gender equity, and reduced risk and exposure to diseases. In other words, the goals of the MAR may extend well out of the scope of LCD. The assessment uses scenarios to project future conditions (see box on page 15 here). Generally, human well-being indicators from the MAR are health (strength, feeling well, access to clean air and water), basic materials for a good life (adequate livelihoods, sufficient nutritious foods, shelter, access to goods), good social relations (social cohesion, mutual respect, ability to help others), security (personal safety, secure resource access, security from disasters), freedom of choice and action (opportunity to be able to achieve what an individual values doing and being). Details on the measurements they used are hard to find. Tables in the report generally report a suite of different ecosystem services types. Synthesis reports provide some more specific details, but there appears to be no comprehensive list of specific indicators used, such as table 2.2 on services provided by biodiversity in the biodiversity synthesis.

Holmberg, J.; Karlsson, S. 1992, On designing socio-ecological indicators. In: Society and the Environment: A Swedish Research Perspective pp 89-106. https://drive.google.com/open?id=1TOHX1I67QVfSwrCyDSYjZ3DVRlhJWbbv

Abstract: There is a need for indicators which capture the essential parts of society in the maladjustments of its physical relations to nature. The socio-ecological indicators should contribute to the control mechanisms that are urgently needed if society is to be able to redirect itself to a path of development which is subordinated to sustainable interactions with nature. An analysis of various factors important to the design of socio-ecological indicators is performed here. An important aspect of the socio-ecological indicators is that they will focus on parts situated early in the cause-effect chain. This implies better possibilities for foresights when dealing with the global, complex or diffuse problems in connection to sustainability. The indicators can be useful in many situations: as a support for discussions among decision-makers and the general public, as part of an environmental impact analysis, and as a tool in the evaluation of various plans or projects.

Infield and Mugisha. 2010. Integrating Cultural, Spiritual and Ethical Dimensions into Conservation Practice in a Rapidly Changing World. MacArthur Foundation Conservation White Paper Series. 40 p.

Intro: Conservationists have long understood that community support and action are key requirements for sustainable conservation and, over the past century have attempted to integrate development issues into conservation programming in a variety of ways. In these times of rapid change, escalating threats from loss of habitat to agriculture and resource extraction, the new threat of climate change, and continuing biodiversity loss, Fauna & Flora International believes a focus on what we refer to as a “cultural values” approach to conservation, and especially to protected area management—an approach that allows representation of the different values, spiritual beliefs and moral philosophies of different cultures—affords a rallying point for targeted, sustained and more effective conservation action. Adoption of a cultural values approach provides an exceptional opportunity to forge new types of partnerships for conservation, and to make conservation relevant to a much broader cross-section of people, increasing the prospects for more meaningful and effective conservation and sustainable development in the coming decade and beyond.

López-Ridaura, et al. 2002. Evaluating the sustainability of complex socio-environmental systems. the MESMIS framework. Ecological Indicators. 2: 135-148.

Abstract: Sustainable development has become a leading target of scientific research and policy agenda. In the context of natural resource management, understanding and evaluating the performance of complex socio-environmental systems has become a challenge, and the design

of more sustainable alternatives is a driving need. In addition, there is a need to translate the general principles of sustainability into operational definitions and practices.
This paper examines key methodological issues in the selection, transformation and aggregation of economic, environmental and social indicators for sustainability analysis. Specific reference is given to the MESMIS approach, a systemic, participatory, interdisciplinary and flexible framework for sustainability evaluation. The MESMIS framework has been developed by a multi-institutional team in Mexico and validated through its application to more than 20 case studies in Mexico and Latin America.

The MESMIS operative structure is a six step cycle. The first three steps are devoted to the characterisation of the systems, the identification of critical points and the selection of specific indicators for the environmental, social and economic dimensions of sustainability. In the last three steps, the information obtained by means of the indicators is integrated through mixed (qualitative and quantitative) techniques and multicriteria analysis, so as to obtain a value judgement about the resource management systems and to provide suggestions and insights aimed at improving their socio-environmental profile.

MESMIS attempts to generate a cyclic process which, by effectively integrating the evaluation into the decision making process, improves the likelihood of success in the design of alternatives and the implementation of development projects.

MacDonald et al. 2013. An interview methodology for exploring the values that community leaders assign to multiple-use landscapes. Ecology and Society. 18(1): 26. http://dx.doi.org/10.5751/ES-05191-180129

Abstract: We report on a grounded theory research methodology to elicit the values that underpin community leaders' advice on regional natural resource management. In-depth, semi-structured in-person interviews of 56 community leaders permitted respondents to explore their values and to elucidate some trade-offs. Furthermore, analysis of the coded transcripts provides evidence of the anthropocentric nature of values, and the importance of people, communities, and physical infrastructure. As well, the relative silence by community NRM leaders on supporting and regulating ecosystem services may reveal a lack of understanding of these functions rather than a discord in values. The tested methodology provides one approach to understanding the values of important advisory groups that are increasingly being required to guide regional agencies that implement natural resource management policy. Results indicate that, in practice, the values expressed may at times be confrontingly anthropocentric, although those interviewed also expressed existence values. Greater understanding of values is a prerequisite to the design of improved natural resource management.

Muñoz-Erickson et al. 2007. Linking ecosystem health indicators and collaborative management: A systematic framework to evaluate ecological and social outcomes. Ecology and Society. 12(2): 6. [online] URL: http://www.ecologyandsociety.org/vol12/iss2/art6/

Abstract: Collaborative management has gained popularity across the United States as a means of addressing the sustainability of mixed-ownership landscapes and resolving persistent conflicts in public lands management. At the same time, it has generated skepticism because its ecological and social outcomes are seldom measured. Evaluating the success of collaborative efforts is difficult because frameworks to assess on-the-ground outcomes are poorly developed or altogether lacking. Ecosystem health indicators are valuable tools for evaluating site-specific outcomes of collaboration based on the effects of collaboration on ecological and socioeconomic conditions. We present the holistic ecosystem health indicator, a promising framework for evaluating the outcomes of collaborative processes, which uses ecological, social, and interactive indicators to monitor conditions through time. Finally, we draw upon our experience working with the Diablo Trust, a community-based collaborative group in northern Arizona, USA, to illustrate the development of an indicator selection model generated through a stakeholder-driven process.

Nelson, E. et al. 2009. Modeling multiple ecosystem services, biodiversity conservation, commodity production, and tradeoffs at landscape scales. Frontiers in Ecology and the Environment. 7(1): 4-11.
https://esajournals.onlinelibrary.wiley.com/doi/10.1890/080023

Abstract: Nature provides a wide range of benefits to people. There is increasing consensus about the importance of incorporating these “ecosystem services” into resource management decisions, but quantifying the levels and values of these services has proven difficult. We use a spatially explicit modeling tool, Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST), to predict changes in ecosystem services, biodiversity conservation, and commodity production levels. We apply InVEST to stakeholder-defined scenarios of land-use/land-cover change in the Willamette Basin, Oregon. We found that scenarios that received high scores for a variety of ecosystem services also had high scores for biodiversity, suggesting there is little tradeoff between biodiversity conservation and ecosystem services. Scenarios involving more development had higher commodity production values, but lower levels of biodiversity conservation and ecosystem services. However, including payments for carbon sequestration alleviates this tradeoff. Quantifying ecosystem services in a spatially explicit manner, and analyzing tradeoffs between them, can help to make natural resource decisions more effective, efficient, and defensible.

Norman et al. 2010. Developing an ecosystem services online decision support tool to assess the impacts of climate change and urban growth in the Santa Cruz watershed; where we live, work, and play. Sustainability. 2: 2044-2069. doi:10.3390/su2072044

Abstract: Using respective strengths of the biological, physical, and social sciences, we are developing an online decision support tool, the Santa Cruz Watershed Ecosystem Portfolio Model (SCWEPM), to help promote the use of information relevant to water allocation and land management in a binational watershed along the U.S.-Mexico border. The SCWEPM will include an ES valuation system within a suite of linked regional driver-response models and will use a multicriteria scenario-evaluation framework that builds on GIS analysis and spatially-

explicit models that characterize important ecological, economic, and societal endpoints and consequences that are sensitive to climate patterns, regional water budgets, and regional LULC change in the SCW.

Perrings et al. 2011. Ecosystem services, targets, and indicators for the conservation and sustainable use of biodiversity. Frontiers in Ecology and the Environment. 9(9): 512-520.

After the collective failure to achieve the Convention on Biological Diversity's (CBD's) 2010 target to substantially reduce biodiversity losses, the CBD adopted a plan composed of five strategic goals and 20 “SMART” (Specific, Measurable, Ambitious, Realistic, and Time-bound) targets, to be achieved by 2020. Here, an interdisciplinary group of scientists from DIVERSITAS – an international program that focuses on biodiversity science – evaluates these targets and considers the implications of an ecosystem-services-based approach for their implementation. We describe the functional differences between the targets corresponding to distinct strategic goals and identify the interdependency between targets. We then discuss the implications for supporting research and target indicators, and make several specific suggestions for target implementation.

Reyers et al. 2013. Getting the measure of ecosystem services a socio ecological approach. Frontiers in Ecology and the Environment. 11(5): 268-273.

Abstract: Despite growing interest and investment in ecosystem services across global science and policy arenas, it remains unclear how ecosystem services – and particularly changes in those services – should be measured. The social and ecological factors, and their interactions, that create and alter ecosystem services are inherently complex. Measuring and managing ecosystem services requires a sophisticated systems-based approach that accounts for how these services are generated by interconnected social–ecological systems (SES), how different services interact with each other, and how changes in the total bundle of services influence human well-being (HWB). Furthermore, there is a need to understand how changes in HWB feedback and affect the generation of ecosystem services. Here, we outline an SES-based approach for measuring ecosystem services and explore its value for setting policy targets, developing indicators, and establishing monitoring and assessment programs.

Rodríguez-Loinaz et al. 2015. Multiple ecosystem service landscape index: A tool for multifunctional landscapes conservation. Journal of Environmental Management. 147: 152-163.

Abstract: The contribution of ecosystems to human well-being has been widely recognised. Taking into account existing trade-offs between ecosystem services (ES) at the farm scale and the dependence of multiple ES on processes that take place at the landscape scale, long-term preservation of multifunctional landscapes must be a priority. Studies carried out from such perspective, and those that develop appropriate indicators, could provide useful tools for integrating ES in landscape planning. In this study we propose a new integrative environmental indicator based on the ES provided by the landscape and named “multiple ecosystem services

landscape index" (MESLI). Because synergies and trade-offs between ES are produced at regional or local levels, being different from those perceived at larger scales, MESLI was developed at municipality level. Furthermore, in order to identify main drivers of change in ES provision at the landscape scale an analysis of the relationship between the environmental and the socioeconomic characteristics of the municipalities was carried out. The study was located in the Basque Country and the results demonstrated that the MESLI index is a good tool to measure landscape multifunctionality at local scales. It is effective evaluating landscapes, distinguishing between municipalities based on ES provision, and identifying the drivers of change and their effects. This information about ES provisioning at the local level is usually lacking; therefore, MESLI would be very useful for policy-makers and land managers because it provides relevant information to local scale decision-making.

Santa Cruz Watershed Ecosystem Portfolio Model

The Human Well-Being submodel of the Ecosystem Portfolio is being developed. It is based on a Modified Socio-Environmental Vulnerability Index (M-SEVI) that uses determinants from binational census and neighborhood data for large-scale planning.

Scolozzi et al. 2014. Ecosystem services-based SWOT analysis of protected areas for conservation strategies. Journal of Environmental Management. 146: 543-551.

Abstract: An ecosystem services-based SWOT analysis is proposed in order to identify and quantify internal and external factors supporting or threatening the conservation effectiveness of protected areas. The proposed approach concerns both the ecological and the social perspective. Strengths and weaknesses, opportunities and threats were evaluated based on 12 selected environmental and socio-economic indicators for all terrestrial Italian protected areas, belonging to the Natura 2000 network, and for their 5-km buffer area. The indicators, used as criteria within a multi-criteria assessment, include: core area, cost-distance between protected areas, changes in ecosystem services values, intensification of land use, and urbanization. The results were aggregated for three biogeographical regions, Alpine, Continental, and Mediterranean, indicating that Alpine sites have more opportunities and strengths than Continental and Mediterranean sites. The results call attention to where connectivity and land-use changes may have stronger influence on protected areas, in particular, whereas urbanization or intensification of agriculture may hamper conservation goals of protected areas. The proposed SWOT analysis provides helpful information for a multiple scale perspective and for identifying conservation priorities and for defining management strategies to assure biodiversity conservation and ecosystem services provision.

Sterling et al. 2017. Culturally grounded indicators of resilience in social-ecological systems. Environment and Society: Advances in Research. 8(2017): 63-95.

Abstract: Measuring progress toward sustainability goals is a multifaceted task. International, regional, and national organizations and agencies seek to promote resilience and capacity for

adaptation at local levels. However, their measurement systems may be poorly aligned with local contexts, cultures, and needs. Understanding how to build effective, culturally grounded measurement systems is a fundamental step toward supporting adaptive management and resilience in the face of environmental, social, and economic change. To identify patterns and inform future efforts, we review seven case studies and one framework regarding the development of culturally grounded indicator sets. Additionally, we explore ways to bridge locally relevant indicators and those of use at national and international levels. The process of identifying and setting criteria for appropriate indicators of resilience in social-ecological systems needs further documentation, discussion, and refinement, particularly regarding capturing feedbacks between biological and social-cultural elements of systems.

de la Torre. 2002. Assessing the Values of Cultural Heritage. Research Report. The Getty Conservation Institute, Los Angeles. The J. Paul Getty Trust. 120 p.

Focuses on methods of identifying, articulating, and establishing cultural significance. *Cultural significance* is used here to mean the importance of a site as determined by the aggregate of values attributed to it.

Thiault et al. 2017. Mapping human-nature dependencies through a socio-ecological vulnerability lens can greatly benefit local policy and management decisions. Conservation Biology. 32(2): 447-457.

Abstract: An overarching challenge of natural resource management and biodiversity conservation is that relationships between people and nature are difficult to integrate into tools that can effectively guide decision making. Social–ecological vulnerability offers a valuable framework for identifying and understanding important social–ecological linkages, and the implications of dependencies and other feedback loops in the system. Unfortunately, its implementation at local scales has hitherto been limited due at least in part to the lack of operational tools for spatial representation of social–ecological vulnerability. We developed a method to map social–ecological vulnerability based on information on human–nature dependencies and ecosystem services at local scales. We applied our method to the small-scale fishery of Moorea, French Polynesia, by combining spatially explicit indicators of exposure, sensitivity, and adaptive capacity of both the resource (i.e., vulnerability of reef fish assemblages to fishing) and resource users (i.e., vulnerability of fishing households to the loss of fishing opportunity). Our results revealed that both social and ecological vulnerabilities varied considerably through space and highlighted areas where sources of vulnerability were high for both social and ecological subsystems (i.e., social–ecological vulnerability hotspots) and thus of high priority for management intervention. Our approach can be used to inform decisions about where biodiversity conservation strategies are likely to be more effective and how social impacts from policy decisions can be minimized. It provides a new perspective on human–nature linkages that can help guide sustainability management at local scales; delivers insights distinct from those provided by emphasis on a single vulnerability component (e.g., exposure); and demonstrates the feasibility and value of operationalizing the social–ecological vulnerability framework for policy, planning, and participatory management decisions.

Weber, M., T. Meixner, AND J. Stromberg. Valuing ecosystem services of an impacted waterway in the Southwestern US. ACES - A Community on Ecosystem Services, Washington, DC, December 08 - 12, 2014. Can't find an actual publication

The results of the survey will provide information on the recreational and ecological value the effluent-dominated reaches of the Santa Cruz River represent to the public. The project is an interdisciplinary effort combining natural science modeling regarding the impacts of changing river flows on riparian vegetation, and social modeling quantifying the value of preserving such areas of perennial flow and tree cover. Several comparisons will be permitted in the results: public interest in river reaches at varying distances of the household from the river, river reaches of varying riparian forest quality, and ecological versus safe water contact attributes. The survey is the first known example of a stated preference valuation survey being conducted in-house by the Office of Research and Development of the USEPA.

Yangfan et al. 2014. Applying the concept of spatial resilience to socio ecological systems in the urban wetland interface. Ecological Indicators. 42: 135-146.

Abstract: Resilient socio-ecological systems (SESs) can handle negative environmental changes well without regime shifts. In this study, we introduce the concept of spatial resilience and apply it to the assessment, planning, and ecosystem-based management of the urban wetlandinterface in the Taihu Lake watershed in China. From the assumption that spatial indicators in patterns and processes affect SES resilience, spatial resilience in this case focuses on the importance of ecological sensitivity, water quality, and vegetation cover. We consider two criteria in this study, protection and recovery, which are further categorized into general and specific types, to examine four resilience scenarios, namely, key protection, general protection, general recovery, and key recovery. Spatial resilience is assessed with an indicator-based system, multi-criteria evaluation method, and spatial visualization based on a geographic information system (GIS) to create zones. Spatial zonings are evaluated in the context of different degrees of spatial resilience. Results are integrated with indicators of ecological sensitivity, water quality and vegetation cover, are assessed to determine the practical application of spatial resilience. Zoning maps that show water quality, vegetation cover, and corresponding plans are generated on the basis of spatial resilience assessment, social indicators, and the existing administrative region. These maps can be used by authorities in protection or restoration activities for ecological services in wetlands.