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Adjusting policy to institutional, cultural and biophysical context conditions: The case of conservation banking in California

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ABSTRACT

This paper examines the political construction of a policy instrument for matching particular institutional, biophysical and cultural context conditions in a social–ecological system, using the case of conservation banking in California as an example. The guiding research question is: How is policy design negotiated between various actors on its way from early formulation of ideas and principles to an accepted policy solution on a state or national level? The underlying assumption is that in order for a policy instrument to be implemented, it has to be adjusted to various context conditions. That is, it has to become accepted by affected actors associated with the institutional framework, and it has to gain local validity for implementation by actors related to a particular ecological and cultural context. We assume that ideas about policy adjustments are not only functionalistic questions determined for example by the materiality of the resource it governs, but are constructed and politically negotiated because these ideas may differ among the mental models of the associated actors. These actors are stakeholders affiliated with the policy process, i.e. authorities, public and private organizations, interest groups, firms or think tanks dealing with, or being shaped by, the policy at different stages of its development.

As a result certain context conditions and related concerns such as institutional interplay or match to ecological particularities become inscribed in policy design as an outcome of power struggles, values, and interests. These in turn may vary at different stages of policy development and implementation. Each time the instrument is transferred in a new setting it is likely that the incipient policy design may be opened-up and begin a mutual adjustment process among the newly concerned actors. Thus, such policy developments are not immutable but are dynamic. In this paper, the creation of fit for policies on conservation banking to the issue of species protection in the State of California and later to the U.S. environmental governance domain, are analyzed to understand the instrument's emergence and development toward an established policy solution. The focus is on the negotiation processes among the enrolled actors and their strategies for matching the instrument to certain institutional, cultural and ecological context conditions on different scales. Changes in policy design, its underlying influences, actors' interests, conflicts and perceived effects are identified, respectively.

Introduction

In environmental governance new policy instruments and approaches such as tradable permits have gained increasing political importance for climate and biodiversity protection in the past decades. Pushed by global groups of experts through international processes like the Business and Biodiversity Offsets Program (BBOP) or the Economics of Ecosystems and Biodiversity (TEEB) initiative, their scope of application has been continuously extended. A recent example is the establishment of biodiversity credit trading systems like conservation banking. The basic idea is to quantify measures for biodiversity protection as credits that can be traded on the open market and counted as compensating for biodiversity impacts later. What started first locally in California became an accepted policy instrument for biodiversity protection on a national level. A recently published report on the "State of Biodiversity Markets" identifies 39 existing programs around the world like in the US, Australia, Brazil, or South Africa and another 25 in various stages of development or investigation, for example in the UK and France (Madsen et al., 2010).

The creation of environmental markets such as conservation banking for the trading of species credits is a new form of governance for nature conservation that offers an alternative way for adjusting social behavior which may complete or even substitute for direct interventions by the state (Haddas and Huigen, 1997; Jordan et al., 2003, 2005; Tommel and Verdun, 2008). On the one hand these tradable permit systems promise to reduce costs,

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dampen the adversarial nature of regulation, and support economic growth while still achieving regulatory and conservation goals. In addition they are collaborative, enlisting market and civic actors in the design and delivery of such policies, calling for new forms of relationships between state and non-state actors in the process of policy formulation and implementation (Paavola et al., 2009). On the other hand they may have some challenges to overcome, especially with respect to contextual variations from established large-scale, abstract market structures. A number of studies have shown how blue-print approaches failed to sufficiently embrace the diversity of local settings and the complexity of ecosystems, leading to poor natural resources management and environmental degradation (Ostrom, 2007, 2011; see also Galaz et al., 2008; Hagedorn, 2002, 2008). Instead these studies suggest that attention needs to be paid to particular resource system attributes, especially those that provide incentives and guide actions of actors within such diverse governance systems. This problem has been largely taken-up by social–ecological research which seeks to find optimal ways to better match institutions to the ecological contexts they govern (Folke et al., 2007; Galaz et al., 2008; Gibson et al., 2000; Young, 2002, 2008).

Such an understanding of institutions and the assumption that they can be matched or adjusted to particular ecological environments form the starting point for this study on the development of new policy instruments. Designing institutions appears as a matter of functional adjustments to context conditions. Significant questions remain: What is meant by adjusting an institution to particular biophysical or institutional context conditions? What design work is taking place; and what are the tradeoffs between context specificity, e.g. accounting for particular biophysical or cultural requirements on local level, and policy consistency on larger scales, e.g. having a functioning market that matches the broader institutional structure of a regime? We suggest that adding a focus on actors and their understanding of relevant institutional, ecological, socio-cultural and other context conditions as considerations for policy design and performance is helpful in social–ecological research in order to achieve a better understanding of institutional design and adjustment processes. We assert that these adjustments are negotiated and fought out in the process of instrument development. Hence we conclude that for an analysis of institutional and social–ecological fit it is helpful to include references to actors and the possibilities for them to get involved in processes of designing and administrating policies to sustainably manage social–ecological systems.

The goal of this study is to contribute to the literature of institutional policy analysis related to social–ecological systems by analyzing the political construction of a new policy instrument for nature conservation. The focus of the analysis is on the creation of the policy's match to institutional, ecological and cultural context conditions on different scales; from early formulation of ideas in concrete contexts to an accepted policy solution on a state or national level (cf. Hajkowicz, 2009). Actors and organizations, their interests, values, conflicts and power struggles concerning policy design are identified, respectively. Analysing these processes examines the tensions between adaptation needs and specificity of context on the one hand and harmonization needs for reaching common policy objectives on the other, especially across divergent agency or actor's goals (Paavola et al., 2009). Insights may serve to better understand how policy designs are directed toward particular societal demands and ecological requirements for matching social–ecological systems. The questions to be answered are:

(1) Who are the actors involved in negotiating a particular policy design for conservation banking?
(2) What adjustments between conservation banking policy and context conditions are considered important by whom and why?
(3) Which contextual conditions are significant for conservation banking policy design along its development?

This manuscript is structured as follows: in Section "Theory", the conceptual understanding of policy adjustment in social–ecological systems is recapitulated and an analysis framework developed for capturing the political aspects of policy design and development processes. The analysis will focus on the particular concerns of actors and their understanding of adjustment needs which they bring into the policy process. A procedure is then sketched out in Section "Methods" for identifying actors and interests, interactions and interdependencies related to policy design work. An empirical study on the emergence and development of policies for conservation banking is described in Section "Results". It reconstructs the establishment of conservation banking as a policy instrument, and the various processes for its establishment. Ideas and interactions of actors are analyzed as well as their understanding of the instrument's match to context conditions that got inscribed in policy design. Section "Discussion" discusses our insights from policy design negotiations with respect to social–ecological research, and we draw final conclusions in Section "Conclusion".

Theory

To analyze adjustment processes of policies to context conditions, we draw on a comprehensive literature on social–ecological systems (SES) and environmental governance that has developed in recent decades. Since the discourse on the human dimensions of global environmental change started (Young and Underdal, 1997) social systems are seen as being embedded and intricately linked to ecological systems (Anderies et al., 2004; Berkes et al., 1998, 2000; Ostrom, 2005, 2007, 2011). In this perspective, institutions function as an interface between social and ecological systems by regulating resource use, overuse and effects such as pollution (Young, 2002). Hence designing and adjusting institutions stand out as crucial for creating tailored policy solutions to environmental problems.

Institutions are defined as constellations of rights, rules, and relationships that guide social practices and interactions among those who participate in them (Young and Underdal, 1997). Policy instruments are one form of formal institution with a normative force that guide the ways in which targeted actors are going to behave; privileging certain interests and excluding others; setting possibilities and constraints, and driving certain representations of problems forward (Lascoumes and Le Gales, 2007). Often, formal institutions are supplanted by informal forces, like traditions, habits, identity, and cultural values. Formal and informal institutions together, intentionally or otherwise, influence the behavior of actors in a pertinent context (Paavola et al., 2009). They are seen as persistent features of the political landscape and one of the central factors pushing policy development along specific paths (Collier and Collier, 1991; Pierson, 1993).

The concept of fit between a governance system and an environmental problem as originated by Young (2002, 2008, 2010) offers us a first useful heuristic for analyzing institutional designs and their match to context conditions. Coming out of the tradition of "new institutionalism" (e.g. March, 1989; March and Olsen, 1984; Olson, 1965; Ostrom, 1990; Scott, 2001) it builds on the idea that for institutions to be effective, they must be based on a recognition of the character of environmental problems and feature the introduction of behavioral mechanisms crafted to address these problems. Therefore it is essential to reach agreement on an appropriate structure of rights, rules, and decision-making procedures

(Young, 2008). Problems of fit in general, are defined as the failure of an institutional arrangement to take adequately into account the nature, functionality, and dynamics of the specific ecosystem it influences (Ekstrom and Young, 2009). Problems of fit have been addressed by several research studies in recent years, notably those on institutional dimensions of global environmental change (e.g. Ekstrom and Young, 2009; Young, 2002; Young and Underdal, 1997), on the resilience of social–ecological systems (e.g. Berkes et al., 2000; Folke, 2006; Folke et al., 2007) and on common pool resources (Ostrom, 1990, 2002).

For analytical purposes three categories of fit are distinguished: spatial, temporal and functional (Folke et al., 2007; Galaz et al., 2008; Paavola et al., 2009). Spatial mismatches occur where institutional and ecological boundaries do not coincide. A mismatch of temporal scales is involved when social systems respond too rapidly or too slowly to changing environmental conditions; and a functional mismatch is a result of ignorance about the cascading effects on other levels or domains. Behind these differentiations are questions for scaling up and down institutional structures while still seeing similarities in both design and performance of governance systems.

We will focus on the "fit" of institutional arrangements to ecological systems and also the relationship of an institution to, and interactions with, one or more other institutions in place. Such institutional interplay has been identified as an important element for increasing institutional effectiveness and the resilience of social–ecological systems (Folke, 2006; Folke et al., 2007; Galaz et al., 2008; Young, 2002, 2010). Problems of institutional interplay occur when institutions have not considered impacts on related institutions and their performance over time. Interplay is analytically distinguished between linkages among distinct institutional arrangements at the same (horizontal) level of social organization and (vertically) across levels; i.e. across international, national, regional and local levels (Young, 2002; see also Pahl-Wostl, 2009). The interplay between institutions can also be seen as a result of their functional interdependencies in terms of social or ecological relations or as politically created interdependencies formed by political design for strategic purposes.

The general presumption underlying the concept of fit and the ways in which social–ecological interactions and governance performance is understood is that the physical characteristics of particular ecosystems are compatible with different designs of social organization (Young, 2008). However, other authors have challenged some of the assumptions underpinning the early ideas on fit. They criticize the concept as being too narrowly focusing on natural boundaries, thereby ignoring the political, socioeconomic or cultural geographies of an environmental resource which will lead to incomplete assumptions and inadequate recommendations for policy formulation (e.g. Cox, 2011; Moss, 2012; Treib, 2008). More particularly, the concept lacks a focus on actors and their understanding of social–ecological systems and needs for institutional design (DeCaro and Stokes, 2008). As for instance Farrell (2007) has elaborated, both resources and institutions are subject to interpretation and must be understood as products of social construction. They are socially constructed in regard to what is deemed to be useful as a resource, and in regard to how it is used in practice which reflects not only the materiality of the resource but also the social institutions and mental models of the users. Hence, creating a well-fitted institution is not only about ecosystem dynamics and priorities concerning these, but also about human interactions and motivations that depend on institutions (Vatn, 2005, 2009).

On the basis of these critical reflections a number of ways forward have been suggested. The general tenor is that there is a need to go beyond simply institutional panaceas to more flexible, integrative and context sensitive solutions which reflect the complexity of fit (Galaz et al., 2008; Ostrom et al., 2007). In this regard our objective is to focus on the political aspects of policy adjustment processes in terms of institutional interplay and (local) match to socio-cultural and biophysical context conditions, especially the interests that actors bring into the policy process on different application levels and the struggles over needs and demands for policy formulation. The analysis of the political negotiation processes should bring up the value judgments and tradeoffs by disclosing the positions of actors that have and have not been considered in the policy process. Overarching the analysis is the idea that negotiation of policy design is taking place as an interactive modulation process where actors and context conditions mutually shape each other in terms of social–ecological adaptation. This then opens questions for participatory forms of policy formulation, including who to include and who to exclude.

Table 1
List of interviewees for the California conservation banking case study.

Agency	Representative role and function
Fish and Wildlife Service (USFWS)	Federal banking coordinator, member of the multiagency banking team
Fish and Wildlife Service (USFWS)	Regional banking coordinator
California Department of Fish and Game (CDFG)	Deputy Director, State level
California Department of Fish and Game (CDFG)	Statewide banking coordinator + Habitat Conservation Planning Branch
California Department of Fish and Game (CDFG)	Regional banking coordinator
Endangered Habitats League (EHL)	Executive Director
Vulcan Materials company (Vulcan)	Mitigation in-house specialist, planning and approval
Scientist UC Davis (Science)	International mitigation banking specialist
Scientist US Forest Service (USDAFS)	Botanist, Ecologist

Methods

Accounting for social construction processes in policy making requires interpretive research methods (Schneider and Sidney, 2009). Three methods are applied in this analysis: first, we present a literature review that focuses on the development of conservation banking. This covers literature on broader political trends, the policy instruments involved in species conservation and impact mitigation, as well as on related problems and issues. Second, we review the relevant statutes, agency reports, position papers, protocols and evaluations of instrument performance for identifying arguments for or against the use of certain instrument designs in a particular context. This leads to a better understanding of the various positions and relations of the concerned stakeholders. The objective is to identify various actor positions concerning the relevancy of particular context conditions that are considered in policy design. Third, we carry out problem-centered interviews with actors involved in the design and implementation of conservation banking policy to shed light on the strategies for instrument adaptation and use.

The range of actors included in the analysis need to represent a variety of heterogeneous perspectives who might affect the outcome on the design and use of conservation banking. An added concern was that as the social construction processes of policy designs are analyzed, the researchers own knowledge-production processes need to be critically reviewed and differentiated from rationales in use by stakeholders to influence policy design (Laranja et al., 2008).

Nine semi-structured, problem-centered interviews were conducted in July 2011, with an average length of 1.5 h (Table 1). They were transcribed and analyzed with ATLAS.ti6.

Results

Conservation banking – a form of governance for species habitat protection

Before analyzing how conservation banking emerged and how its design has been negotiated along its development, it is important to understand how conservation banking works and how it differs from other approaches. In the US, it is required that project impacts on natural resources be mitigated as specified in two statutes. One of these statutes is the Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA), which is designed to minimize damage to water quality and wetlands. It is administered by the US Army Corps of Engineers (USACE) and the US Environmental Protection Agency (EPA). The other statute is the Endangered Species Act (ESA) of 1973 which conserves ecosystems upon which listed species depend. The US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA-F) are responsible for its implementation. In either context specific permissions and reviews are inscribed. At their core, both acts are intended to maintain particular ecosystems and require mitigation for projects that have unavoidable impact on wetlands (CWA section 404) or listed species (ESA section 7, 10). Unavoidable impacts lead to the application of a mitigation hierarchy by the overseeing agencies with the possibility of offsetting losses directly as the last option. It is considered when other "softer" impact reduction strategies like avoidance or minimization are not practicable.

As conventional case-by-case compensation was often carried out without any coordination, it resulted in numerous small, spatially disconnected mitigation parcels that caused problems in providing ecological functions and effective management (Mead, 2008). Alternatively, the possibility to bank for future use either wetlands (referred to as mitigation banking) or species habitat (referred to as conservation banking) were similarly conceived as concepts where public–private partnerships might offer better flexibility in site selection and facilitate conservation objectives. In its original form a conservation bank is a parcel of privately or publicly owned land that serves as a stock of species habitat to offset for habitat impacts elsewhere. In exchange for managing their land for species and habitat conservation, or restoration, the bank owner is granted 'credits' by the responsible wildlife agency which can be traded, i.e. by using or selling species credits to parties who need to satisfy legal mitigation requirements to compensating for the environmental impacts of development projects (Fox and Nino-Murcia 2005; Mead, 2008). Conservation banking hence operates as a free market enterprise that allows for the sale, purchase or trade of species habitat, as represented by species credits. The specific credit ratio is negotiated with the agency; and prices are influenced by market demands and the costs to manage the bank (Bauer et al., 2004; Mead, 2008). Once all of a bank's credits are sold, the land is managed as a preserve in perpetuity, and financed by an endowment fund. The endowment is an interest-bearing account in a sufficient amount to generate an income to fund the management of the conservation bank that should be "non-wasting", i.e. meaning that only the interest is available for use (US Fish and Wildlife Service, 2009). Ideally, conservation banking sustainably adds private land to the otherwise public preserve system. This sort of land conservation is by design a kind of market-based conservation strategy that is highly place specific (Roth and Dressler, 2012).

The emergence and development of conservation banking in California

Conservation banking emerged at a time when the political climate in the US was in favor of flexible regulations, especially for environmental issues. At the beginning of the 1980s, the US government's objective under president Ronald Reagan was to reduce the scope of governmental regulations, to shift responsibilities to the states, and to rely on the private sector. Neoliberal arguments, which advocate economic free trade, open markets and at times privatization and deregulation, dominated the political agenda, which in turn led to claims that market-based solutions would deal efficiently with environmental problems (Castree, 2008; Kraft and Vig, 2006).

In California at that time regional land-use planning systems were non-existent or ineffectual and conflicts over land use dominated the agenda of resource managing agencies. Because jurisdiction over land use rests largely with local governments, the only common restrictions are the ones required by federal and state legislation that demand impact mitigation, overseen by the wildlife agencies, the EPA and the USACE. In particular the enforcement of the Endangered Species Act was rigorous (Ten Kate et al., 2004) with severe consequences for non-federal land owners. For instance, when threatened or endangered species are detected, landowners are prohibited from developing their land before obtaining an incidental take permit from the responsible agency. They are required to prepare a Habitat Conservation Plan (HCP), containing a detailed description of the anticipated impacts and how those impacts will be minimized and mitigated; a time consuming and costly process. As the urban, industrial and agricultural development increased, especially in southern California where large urban expansion comes into direct conflict with many endangered species, many municipalities faced dead-lock situations when impacts needed to be mitigated, resulting in project delays and lawsuits. Following national initiatives, some permitting agencies began experimenting to make the mitigation processes more flexible.

The USACE was the first agency (in 1986) that allowed a private land owner to sell credits to the Department of Transportation to mitigate their project impacts. In return, the owner restored a wetland and put a conservation easement on it. With this step the central idea of a mitigation bank was born (Marsh et al., 1996). Soon afterwards, the USACE began approving further mitigation banks. These were non-commercial ventures created by state agencies to satisfy their own compensation needs (Carroll et al., 2008; Hough and Robertson, 2009). Although this mechanism applied for wetlands, no flexible mechanism existed for impacts on endangered species besides the existing project-by-project mitigation practice, which often resulted in small and scattered nature parcels.

To improve large-scale conservation planning, the State of California passed the Natural Community Conservation Planning Act in 1991. Using ecological assessments, the Act dictates that Natural Community Conservation Plans (NCCP) be prepared on regional level, and that they map habitat conditions for species listed under the Endangered Species Acts and identify areas for their preservation along with those for economic development. Taking these assessments as a basis, collaboration among stakeholders from the private sector, local government and wildlife agencies is initiated in order to reach consensus on preservation and development objectives and strategies. NCCP plans thus are expected to provide a platform for stakeholders to negotiate their land use interests, while ensuring the compatibility of preserved lands with ESA legislation, and for its ecological soundness. After plan enactment the designated land-uses are binding, overseen by the USFWS or the California Department of Fish and Game (CDFG), independently of other land managers in the preserve system. Besides the expected ecological advantages for preserve planning, the processing of individual incidental take permits for listed species is eased as the NCCP balances impacts and their mitigation on regional scale. A limitation of NCCP plans is that their establishment is voluntary, relying on initiatives of local governments.

However, this form of conservation planning was not without some difficulties. Whereas the first NCCP plan enactment in Orange County was a smooth process – largely because just one government entity had jurisdiction over land use – a similar implementation in San Diego County was more difficult. The region is characterized by a high number of small property holders and the general interest regarding conservation issues was low. This changed when the California gnatcatcher (*Polioptila californica*) was proposed for ESA listing in 1993 by the Fish and Wildlife Service. Much of the Gnatcatcher habitat that needed to be protected was located on private property. As explained by one interviewee who was a regional banking coordinator of CDFG: "*For a voluntary program like the NCCP to work you need the threat of the listing.* (. . .) *What happened after the government wanted a species enlisted as threatened, that's when people really got interested in being part of the planning process. That kicked it off. They saw the promise of the NCCP program to allow that some development could continue while the bigger plan was developed.* (. . .) *Listings a lot of times are political not biological, unfortunately.*"

Because forcing land owners to dedicate their private land to species conservation was not politically feasible and carried substantial legal issues, the question became how to enlarge the preserve system as indicated by NCCP plans. In particular, a mechanism for the dedication of private land to conservation purposes was missing. In order to give owners an incentive to act California needed to find a new way of financing the conservation of gnatcatcher habitat.

Transferring principles of wetland banking for species habitat conservation

The idea to adapt banking to the conservation of species habitat started to come about two years earlier as an initiative of headquarter employees of the USFWS, the CDFG, and the California Resource Agency (CRA), all of which were in charge of the first NCCP implementations. The former deputy director of CDFG describes the situation: "*It was only after the NCCP program started coming along. We were trying to mold all these things into one bigger vision of where we thought the state needed to go with conservation of species' habitats and what are the tools that you might use to get there.* (. . .) *And we always thought that mitigation banking would be one of the tools that we would use to encourage conservation that would allow for preservation of important habitat and income of landowners, either from a tax credit standpoint or from the standpoint of being able to sell credits for the conservation. And that was really meant to fit into the context of those NCCP plans.*"

It is notable that this exemplifies an instance where the "fit" of conservation banking to context conditions was specifically intended to ensure its interplay with the horizontal and vertical institutions in place, i.e. to the state and federal Endangered Species Acts and their legislative requirements for conservation planning. Having this in mind, the three agencies started a test on how to build on the banking mechanisms from wetland banking and transfer them to NCCP implementation. In this case it was a gas driller who needed to mitigate for recent development and, at the same time had property that could contribute to fill a NCCP identified lack of habitat. Habitat credits were negotiated between them, and the CDFG and CRA to preserve some land they did not require for drilling. As higher level agencies came into play, some vertical institutional interplay concerns were addressed. Nearby in San Diego County, due to the threat of an ESA listing and related NCCP implementation problems, establishing conservation banks became an opportunity for wildlife agencies to demonstrate how to turn a listing into an asset for property owners and to push forward the NCCP plan. As the CDFG deputy director further explains: "*It was a sort of an experiment in a large scale and it was not only an experiment for the state but also for the US Fish and Wildlife Service who were partnering with us in this whole process because they were the ones who listed the gnatcatcher as threatened. To meet their regulatory requirements they worked with us through the NCCP program and because of this high profile we got a lot of attention in Sacramento and also from Washington D.C. And it got a lot of money directed here to do planning. So it was high profile.*"

A project close to the city of Carlsbad was authorized by the USFWS and CDFG to preserve gnatcatchers' coastal sage scrub habitat. The property was owned by the Bank of America and had only limited development potential. To mitigate its own project impacts on gnatcatcher habitat the California Department of Transportation paid the Bank of America to put a conservation easement on their land. "Carlsbad Highlands" became the state's first conservation bank. And others followed, set up as public–private partnerships which often involved local negotiations. As reported by one official from the CDFG: "*We had regular stakeholder meetings which [were] open to the public. It was meant to be an open process, although I would say in the end a lot of the individual negotiations that [made] the plan work really were between the wildlife agencies and the local jurisdictions and then sometimes individual property owners.*"

The first official policy on conservation banks

Pointing to the first conservation banking examples that helped to establish NCCP plans, the group of headquarter employees issued the first "Official policy on conservation banks" in 1995, under patronage of the CRA and the California Environmental Protection Agency (CEPA) (Wheeler and Strock, 1995). Conceptual and procedural impetus came from the "Federal Guidance for the establishment, use and operation of mitigation banks" that had been issued earlier that year jointly by the USACE, EPA, NOAA-F, USFWS, and the Natural Resources Conservation Service (NRCS) (Mead, 2008). The policy's intention was to promote the agency's idea of conservation banking. However, it was not specific or minutely prescriptive at all; rather it was a broad sketch of precepts. According to the CDFG statewide banking coordinator: "*We wanted it to be useable and set a vision for what conservation ought to be in the State of California: how should you think about it, what is the role of conservation banking, what are the kind of lands you should look at from a conservation standpoint. . . . It needs to be pieces that make some biological sense for conservation or it could be a little piece because it connects two bigger pieces . . . It really set what the vision was for how conservation banking ought to be done when you start developing individual agreements.*"

At this point, it was the vision of a few agencies primarily concerned with how conservation banking might contribute to better preserve and land-use planning while fulfilling the legal mitigation requirements. The new policy aimed to give substance and results to the broader, existing nature conservation regime that hitherto consisted mainly of use regulations on state lands. Underlying this vision was an assumption that such institutional interplay almost automatically ensures the match of the policy to local ecological conditions as banks are intended to cover ecologically valuable habitat for endangered species. And to make this more explicit, a supplementary policy was issued shortly afterwards (US Fish and Wildlife Service and California Department of Fish and Game, 1996).

The supplemental policy for explicating conservation banking functions

A year after the launch of the first policy, CDFG and USFWS formulated the 'Supplemental policy regarding conservation banks within the natural community conservation planning (NCCP) area of southern California' in January 1996. The policy closely linked

conservation banking to NCCPs as a mechanism for creating a regional preserve system. The idea was that wildlife agencies should direct bank creation to valuable habitat indicated by NCCP plans. A regional banking coordinator from CDFG explains: "*It works best when you have a larger context to put the bank in, in terms of ecological context, like preserve design or a whole string of already conserved lands that you are building off to create a bank. It doesn't work as well [when] you are starting in a sort of pristine banking area where you don't have any guidance or planning of what you want the final regional reserve to look like.*"

Further, CDFG and USFWS intended to fill the lack of technical policy guidance regarding the bank's match to local ecological conditions: bank size, functions, credits and service area need to be specified proving the land's suitability for preserving endangered species. Not only were these adjustments directed to match the needs of endangered species and to emphasize the linkage of banks to conservation structures, they were also issued to adjust agency staffs' needs and expectations. And again the ecological goals had to be closely fit with economic principles. According to the regional banking coordinator, the agency staff developed a sense of ownership that supported their reliance on market forces. In this regard the emerging policy subsequently adjusted agency and bank sponsor understandings of responsibility, stating that 'The number of conservation banks that are established will be regulated by the free market and willingness of landowners to participate, not by the wildlife agencies' (§2, US Fish and Wildlife Service, 2003).

Another adjustment directed agencies' interactions. The policy's first paragraph states that USFWS and other agencies do support conservation banking. Because the first policy was written by the CRA in response to the California Environmental Protection Act it was important to highlight "(. . .) *that it was very clear to the agencies that were involved whether it would be Fish and Game or the regional or the state boards, that this was a policy that was clearly supported at the top-end of the state and did not leave them the flexibility to say, no, we are not going to do it*" as highlighted by the deputy director of CDFG in the interview. Hence, interplay was partially codified: a mandatory policy of all-agency involvement should ensure conservation banks' horizontal and vertical interplay with other institutions and organizations in place. With this decision conservation banking became an official, if unproven, element in the "toolbox of policy instruments" for habitat protection.

So far, no other interests had been included in the overall policy process, even though some concerns came from environmental organizations like the Endangered Habitats League, fearing the loss of habitat as a tradeoff for development. But as early banks were covered by NCCP programs no doubts about the ecological appropriateness and match of conservation banks to ecological conditions arose; even though concrete banking procedures were largely undefined. Conservation banking was seen as an integrated tool for building-up NCCP preserves. Agency staff responsible for NCCP plans was largely the same as for organizing conservation banking processes. The policy's horizontal and vertical interplay should thereby ensure the achievement of its ecological objectives.

Conservation banking goes federal

After the launch of conservation banking policies, largely heterogeneous implementation processes were observed. Only a few banks were strictly modeled after the policies, with most banks being established under individual Memoranda of Agreement, Memoranda of Understanding or other agreements between agencies and bank sponsors. The interests of actors involved in conservation banking seemed very diverse and that noticeably prevented reaching the policy's initial intention to support an ecologically sound preserve establishment. It was on the one hand a problem of finding agreements between agencies and bank sponsors that often resulted in an ecological mismatch of conservation banks and habitat preservation goals in the NCCP plans. A regional banking coordinator of CDFG summarizes his observations: "*This has become an issue over time in that some of what has been going on veers sharply from what the policy said.* (. . .) *Suddenly, it became very profitable and what we started to have then was bankers going out and looking at properties and saying I am going to get a really good deal on this property, can I push the agencies to accept this as mitigation or conservation banking lands, and they had already looked at the profit they could make on it and did not want to have to deal with how does it fit into a vision of preserve systems or how is it linked. And they pushed hard enough in some places where people didn't have any experiences.*" While the initial, central motivation of agency staff to push forward the idea of conservation banking was its contribution to ecosystem outcome goals, now also economic considerations of an emerging service sector played a role for why and where to locate conservation banks, which is consistent with a growing neoliberal orientation.

As in any market system there is no need for the motives and interests of the participating actors to be all alike; it is a matter of properly designing the market mechanisms to ensure efficient habitat protection. But so far there was procedural inconsistency, or organizational mismatch, between USFWS and CDFG, and also within the agencies to commonly apply banking policies caused by their decentralized organizational structures. CDFG for example is subdivided into six regions, each having a regional manager who meets with the bank sponsor to discuss the process. All interviewed banking coordinators on state and regional level state that the decision-making processes can differ among the regions. This became especially an issue after budgets for policy implementation had been given directly to the regional managers in the late 1990s and were not centrally administered from a policy advisory group in Sacramento any more. Setting up banks had an inter- and intra-agency performance problem, resulting in significant inconsistency in bank establishment that impeded achievement of policy objectives.

In an attempt to streamline banking processes, the USFWS issued the "Guidance for the Establishment, Use, and Operation of Conservation Banks" (US Fish and Wildlife Service, 2003) in 2003 to define mitigation requirements under the ESA. The procedure builds on the principles of the California policies and is largely similar to wetland mitigation guidance. Like California's banking policies, it was released without invitation for the public to comment, and took effect immediately (Bauer et al., 2004). Subsequently, conservation banking became institutionalized at the federal level. Negotiation and agreements over various specific issues led to more coordinated and hence consistent organizational procedures.

Broadening its administrative scope, the agencies were forced to better cooperate with each other to consistently guide banking processes. Experiences from past years needed to be bundled and coordinated for policy design. An Inter-Agency Review Team was formed under the patronage of the USACE to facilitate collaboration. The team consisted of staff from the Sacramento, San Francisco, and Los Angeles Districts of the USACE, along with representatives from the USFWS, CDFG, CRA, NOAA-F, EPA, and NRCS. In 2006 under a Memorandum of Understanding they worked on a national standard to document the establishment and operation of mitigation banks as a combined and coordinated approach. It aimed to assist bank sponsors in submitting proposals and agency personnel to evaluate them. Two years later, the team issued a Banking Enabling Instrument (BEI) template, a Conservation Easement (CE) template, management plan templates and various checklists. These agreements between the bank sponsor, property owner and overseeing agencies, were to be based on a description of local context conditions in the form of "exhibits" (appendices) that

could be evaluated by all parties. While previous policy design work was intended to ensure the policy's match to other institutions and its related agencies, these templates sought to directly target the banks match to local ecological and socio-cultural context conditions. Detailed maps, management documents, real estate records, biological and cultural resource assessments, as well as a market analysis for credit sales were requested from bank sponsors to assess the pending agreements. Hence the revised templates aimed to streamline the bank's procedural requirements, and at the same time ensure their ecological and socio-cultural match at a local level (US Army Corps of Engineers, 2009).

Policy templates – an issue of wording, agency cultures and context particularities

The BEI template and its appendices closely determine the outcomes of a conservation bank as a basis for agency evaluation. But as the administrative procedures were addressed actions meant to better ensure a bank's match to local ecological and socio-cultural context conditions became an inter-agency negotiation process on juridical issues. Agency lawyers bargained about definitions of endowment funds, conservation easements and credit types, and less about the ecological or socio-cultural requirements for sound bank establishment. As a regional CDFG banking coordinator summarized the outcome of template development: "*I would say when we were first starting this we had more ability to negotiate flexibilities, credits and other things.* (. . .) *These agreements were just sort of put together as best as we could, not being lawyers. But as more banks came into being and problems arose, people tried to script the rules around it became what I would call more bureaucratized.*" Adjustment possibilities for interests other than the participating agencies were again not foreseen.

After the review team negotiated policy content and issued the BEI templates for ensuring institutional interplay bank approval seemed to be eased. The agencies had directions how to proceed and it seems they concluded that no additional coordination was needed among them. However, when the BEI templates were introduced into practice they caused some unintended problems with local, non-governmental actors that become shaped by the policy and which hadn't been heard in the policy design process.

The interviewees from FWS and CDFG working on regional level stated that bank owners and nongovernmental organizations complained about the new and heavy bureaucracy of establishing banking agreements with agencies as the most problematic hurdles. In addition the regional agency staff described that bank sponsors also regularly re-negotiated template design and changed template wording. Of particular concern for them were issues like quantifying credits and timing of their release; both being the monetary incentives to put a conservation easement on their land. While negotiating a credit ratio and thus defining the quantity of species credits is in the hand of the regulating agencies, the determination of credit prices was left to the market. Other points for discussion were conservation measures that ought to be taken by the bank sponsor, such as fencing, invasive species removal, and other activities proposed by agencies to reach the lands ecological, i.e. habitat preservation, purposes. As they need to be realized by the bank owner, and financed by the endowment fund, conservation measures are the most costly part in establishing and maintaining the banks, and thus the share of responsibility became a crucial point for discussion.

Continuous design work

Continuous changes in policy design were needed to adjust the policy to local biophysical and socio-cultural context conditions and to insure its institutional interplay to reach the policy's main objective: sustainable species habitat protection. Most of these policy changes were not anticipated by the agencies when starting design work. The underlying reasons mentioned by interviewees were diverse. One reason for change was that the comments on the templates emerge over time and were occasionally taken up as a matter of policy learning. Another reason was that new players came into the mitigation game. For instance, in 2008 the State Water Resources Control Board joined the interagency review team because they are in charge of certifying the USACE permits. They promoted the consideration of their agency's legal concerns so that templates needed to be revised accordingly to further ensure institutional interplay.

But also new market actors – as part of a new banking-related service infrastructure – had an interest in changing policy design. Due to the demand for comprehensive local ecological and economic assessments as part of bank establishment, specialized for-profit consultancies and managers emerged as a service for bank sponsors. These business models engendered new problems for the administrative processes and the policy's match to ecological context conditions. The former CDFG deputy director highlights the lobbying power of market actors in this regard: "*Some private organizations spend a lot of more time pushing through the political channels and processes what they would like to have. Just to give you an idea, right in the last two years there has been a mitigation banking group, they hired both an ex-director of Fish and Game and an ex-office field supervisor of Fish and Wildlife Service to do the political pushing inside the agencies to get their banking agreements move more quickly and try to get what they want.* (. . .)". The intentional embedding of banks into larger conservation strategies were undermined by new market players that emerged out of the agencies' scope and influence. A regional banking coordinator of FWS additionally explains: "*They go out and locate the properties; we don't tell them where to go. We can point them in certain directions if we know a willing seller.* (. . .) *But it is not our law. We can just consult on it. We can just coordinate on it. But Fish and Game can't require mitigation on the California Environmental Quality Act; only make recommendations. It's a private market thing* (. . .)."

In addition to the above mentioned reasons some cases of bank mismanagement prompted agencies to revise templates as the statewide banking coordinator of CDFG noted: "*The biggest example was a land management private group* (. . .) *which had a number of small properties.* (. . .) *They ended up basically mismanaging their endowment money* (. . .) *and eventually went bankrupt. Because of that one failing a whole mass of new regulation requirements came crushing down to us in Sacramento trying to prevent that something like this could ever happen again.*"

Due to such procedural failures and ecological mismatch of conservation banks, repair work that goes beyond the recent adjustments to policy design seemed necessary. Additional regulations were demanded to readjust conservation banking to its original objective of coordinated species habitat protection. As the former deputy director of the CDFG closes the interview: "*There needs to be some regulation on the program in order to get some consistency over time. And that won't generally happen internally in an agency's policy. There is way too many politics that go on between administrations and who thinks what's important, who knows who, to not have it done through regulations versus just straight policy.* (. . .) *there is a lot of money out there and the more profit there is the greater the political pressure is going to be. I mean that is just reality.*"

While early policy design attempted to match the known structural conditions of species and habitat protection, its observed ecological mismatch resulted from the emergent and negotiated realities of the various state and non-state actors' involved. As more and new actors joined the policy process, economic interests for species habitat conservation prevailed over the initial ecological interests of agencies. The transformation to a market system largely

restricts the deciding agencies to the right to consult with the market actors rather than to enforce certain ecological considerations for the establishment and use of conservation banks. This promotes more flexibility in instrument use and aligns to bank sponsors' needs. Yet at times this is problematic as it may be antithetical to the longer term provision of valuable species habitats if the market mechanisms as well as the possibilities of agencies to correct market failures are not sustainable, as they seem to.

Discussion

The case of conservation banking illustrated that developing and adjusting policies to contexts is a dynamic process. Adjustments oscillate between intentional design set-ups and ad-hoc repair work due to unanticipated reactions of the (changing) implementation context as well as changes in participants, and their motives over time. At the beginning of policy development, concerns for the embedding conservation banking into existing institutional structures were in the forefront of design considerations by affected parts of the agencies involved. The policy's main objective was to help the creation of a preserve system consistent with state and federal legislation for species and habitat protection. The initial coverage of conservation banking by regional conservation plans (NCCP) lead to the assumption of a quasi-automatic ecological match of banks so that its horizontal and vertical interplay with institutions like Endangered Species Acts is ensured. Therefore, an inter-agency driven policy design process seemed sufficient. Other actors' concerns and interests were negotiated elsewhere, outside the design negotiations for conservation banking, mostly in the course of NCCP planning on a regional level, or for policy implementation, e.g., setting up banking agreements on local level.

Policy performance seemed to work fine as long as bank establishment was part of NCCP process, and was carried out by personnel who know what is needed. However the banks' institutional interplay became muted because their embeddedness in larger conservation plans remained a voluntary process in the hands of local governments, and after the policy's up scaling of application scope, it necessarily also broadened the range of concerned actors. As an effect, many banks were not automatically part of larger conservation plans, but established in locations with alternative selection and localized permitting logics.

Because mandatory enforcement of NCCP coverage of conservation banks was not an option, the solution for agencies was to streamline the banking establishment and permitting process in a way to ensure that conservation banking leads to good habitat protection, independent of the actors diverging interests and motives. Therefore agencies started to coordinate their work for consistently guiding the banking processes to prevent differences in policy implementation. The following inter-agency negotiations and policy adjustments became a matter of the agencies' attorneys and bureaucrats, backgrounding ecological and socio-cultural considerations. The results were mixed: on the one hand a unified procedure for bank approval was established that eased the inter-agency coordination and reduced uncertainty on parts of the agencies of the permitting process. On the other hand bank establishment became long and time consuming for bank sponsors who had to fulfill the various agency demands, with difficulties in accounting for particular local needs and demands. Moreover, a need still exists for coordination of bank establishment that contributes to the idea of filling gaps and creating corridors in a larger, connected preserve system.

The primary task of a regulatory authority is to oversee policy implementation and to design rules for sound set-up. But the established market structures seemed to be insufficient for directing bank location to the most ecologically valuable sites. The establishment of conservation banking as a new policy instrument for habitat protection has created a market-oriented milieu where entrepreneurs can create and sell certain ecosystem services for profit. In such a setting, a service infrastructure for biodiversity offsets and banking developed with only limited control of the regulatory agencies. This became problematic as the applied market logics and lobbying efforts of market actors about why and where to set up conservation banks eroded the proper design of conservation banking. One of the main problems seems to be the lack of agency control for locating banks. Hence, agencies generated the demand for biodiversity credits but have neither foreseen nor overseen the profit-oriented thinking of the involved actors, creating mismatch between the policy and ecological and social–cultural context conditions (Fox and Nino-Murcia, 2005; Moon and Cocklin, 2011). This causes the need for continuous policy adjustments with iterative repair work that make additional regulations and oversight necessary. At times the ecological reasoning for policy design has been successively displaced by economic or private landowner interests (e.g. Higgins et al., 2012; Lockie and Higgins, 2007). This may raise a serious problem of giving up state authority over protecting natural resources with a reliance on economic institutions. In addition, the provision of further ecosystem services like extending conservation areas for climate change mitigation, outdoor recreation, or hydrological balance becomes even more marginalized (cf. Wissel and Wätzold, 2010).

With reference to the conceptual framework and issues of fit, scale and institutional interplay underlying the analysis, it appears that concerns for adjusting the instrument to the horizontal and vertical institutional structures so that there is a match to local ecological context conditions played a crucial role for policy design. The analysis revealed that these calibration processes were triggered by diverse and in parts conflicting interests of involved actors associated with different levels, especially among agency staff on the state and national level and private bank sponsors on the local level. This became obvious when emergent reactions to the policy occurred that were not anticipated beforehand by agencies. Agencies were forced to readjust policy design as a matter of changing context conditions caused, by new demands of market players, different agency cultures, or changing organizational structures. These adjustments cannot be explained solely as functional adjustments but as result of political issues of power, interests and conflicts being subjects for negotiations (cf. Mauerhofer, 2012). For the governance of conservation systems, ecosystem services or social–ecological systems in general, it seems therefore important to take the various social meanings that stakeholders attach to a (new) policy and the resource it governs into account for policy design and application.

Conclusions

Adding a political dimension to the analysis of a policy's match to social–ecological context conditions provides valuable insights into real-world policy design work and moreover, some suggestions about how to improve it. It demonstrated what happens when a successful new policy approach as adopted in one (local) place to align social and ecological systems is applied more broadly, i.e. on national level. Such an up-scaling of policy application in California caused, in part, a policy failure as local preservation needs were not taken adequately into account. In order to reduce the risk of policy failure, the institutional structure of the implementation context needs to be carefully analyzed. This includes not only an identification of crucial fostering or hindering institutions (ideally done ex-ante) but also the identification of interests and power structures of the concerned stakeholders that become shaped by the policy (Amblard and Mann, 2011). Based on these insights targeted guiding, coordinating, and enforcement mechanisms can

be developed. In addition, careful matching of interests across political and neoliberal processes also seems to be necessary.

Increasing participation possibilities for a wider set of concerned stakeholders' interests at an early stage of policy formulation can lead to more dynamic learning/adaptive approaches that may prevent some of the secondary repair work after policy enactment. These insights become especially relevant when facing an increasing trend for establishing permit markets for conservation, taking the California banking policy as a role model for other countries (Madsen et al., 2010, 2011; Ten Kate et al., 2010). Learning from policy adjustments, and acknowledging possible shortcomings, can help to design more robust and socially embedded, hence more sustainable policy solutions.

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