

The Challenges of Incorporating Cultural Ecosystem Services into Environmental Assessment

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Abstract The ecosystem services concept is used to make explicit the diverse benefits ecosystems provide to people, with the goal of improving assessment and, ultimately, decision-making. Alongside material benefits such as natural resources (e.g., clean water, timber), this concept includes—through the ‘cultural’ category of ecosystem services—diverse non-material benefits that people obtain through interactions with ecosystems (e.g., spiritual inspiration, cultural identity, recreation). Despite the long-standing focus of ecosystem services research on measurement, most cultural ecosystem services have defined measurement and inclusion alongside other more ‘material’ services. This gap in measurement of cultural ecosystem services is a product of several perceived problems, some of which are not real problems and some of which can be mitigated or even solved without undue difficulty. Because of the fractured nature of the literature, these problems continue to plague the discussion of cultural services. In this paper we discuss several such problems, which although they have been addressed singly, have not been brought together in a single discussion. There is a need for a single, accessible treatment of the importance and feasibility of integrating cultural ecosystem services alongside others.

Keywords Culture · Environmental assessment · Ecosystem services · Decision-making · Interdisciplinary social science · Value pluralism

INTRODUCTION

You tell us to take compensation. What is the state compensating us for? For our land, for our fields. But we don’t live only by this. Are you going to

compensate us for our forest?... What is the price of this?...How are you compensating us for fields either –we didn’t buy this land; our forefathers cleared it and settled here. What price this land? Our gods, the support of those who are our kin –what price do you have for these? Our *adivasi* [tribal life] –what price do you put on it?” (Mahalia 1994).

Although it is often recognized that nature provides many intangible benefits to people, these benefits are difficult to characterize, let alone to measure. There are many things which people understandably resist pricing or trading: treasured landscapes; love and friendship; religious conviction; aesthetic beauty. Yet, these goods play central roles in our lives, and we implicitly make decisions based on their relative value to us. Natural and social scientists must therefore be careful not to exclude considerations that really matter to people from having a role in assessments and deliberations. This general point is especially relevant to environmental assessment, where focus has often been on easily measurable biophysical (e.g., total above-ground carbon stocks, hectares of habitat restored), or economic (monetary) metrics. This focus excludes much from its purview.

Suppose, for example, that policy makers are trying to measure the value that an ecosystem has for people in the context of deciding whether or not to build a road that will destabilize that ecosystem and lead to its deterioration in some respect (we leave aside here the complexities involved in the concept of “ecosystem,” which others (Pickett and Cadenasso 2002) have treated in more detail). Individuals might value that ecosystem as a place of aesthetic beauty, as habitat for rare animals, because of its sacred groves, or because it allows them to sustain a unique and cherished way of life. These considerations may not

show up in either biophysical or monetary metrics. How, then, can we factor these considerations into our assessments and ultimately into our deliberations about what to do?

The problem of how to include “cultural ecosystem services” among nature’s benefits is important to consider given that the ecosystem services approach is increasingly referenced in environmental decision-making (Goulder and Kennedy 1997; Millennium Ecosystem Assessment 2005a; EPA Science Advisory Board 2009). Ignoring the cultural services that ecosystems provide excludes considerations that often matter to vulnerable and otherwise underrepresented communities. In the introductory quotation cited above, a tribal member writes to the Chief Minister of Gujarat in India, objecting to his displacement due to the construction of a new dam. He argues that monetary remuneration cannot compensate for the loss of land that is tied to his people’s past and to his own place in the world. The difficulty of measurement in such cases, which can be exacerbated by variation in perspectives and values, may lure policy makers into the fallacy of thinking that what is not measured is not real (Handy 1995).

Clearly, the challenges we face in measuring cultural ecosystem services do not justify excluding these services from our assessments. Nor, we hope to show, should they be considered a show-stopper, a dead end that prevents us from going any further. In this paper, we will argue that many of the difficulties in measuring cultural ecosystem services have been exaggerated or misunderstood. Even when it is impossible for researchers to generate a complete set of rankings for alternative options involving ecosystem cultural services, partial rankings of alternatives are possible. Indeed, many cultural ecosystem services can be appropriately measured in the context of more complex decision-making processes involving deliberation among the relevant parties.

Before defending our claims, we offer one caveat to our analysis: while we will try to show that many of the objections to including intangibles in evaluation are mistaken, we do not dismiss the right of people to reject attempts at measurement with respect to the things they care about most. Researchers and policy makers seeking information about such values for the purposes of aiding decision-making will need to build relationships of trust with the individuals concerned. We put aside such matters here, but they are crucially important. The aim of the remainder of the paper is to show that even in cases of value complexity we can often design ways of teasing out the relative weight people place on their concerns. We recognize that the concerns and concepts we address below have been noted before in scattered places in the literature; some of these concepts are discussed, for example, in interdisciplinary synthetic work on ecosystem services

(Carpenter et al. 2009; Daniel et al. 2012), ecological analyses (Pejchar and Mooney 2009; Rey Benayas et al. 2009), psychological analyses (Kumar and Kumar 2008), and national ecosystem services assessments (Church et al. 2011). Our goal is to bring these diverse discussions together, and to point out how they relate to the challenges associated with cultural ecosystem services in particular. We omit other concerns, for example, those concerning the disservices that ecosystems provide (Zhang et al. 2007), for the sake of focusing on defending our central claims.

WHAT IS A CULTURAL ECOSYSTEM SERVICE?

One problem with trying to include cultural ecosystem services in environmental decision-making is that there is no agreed-upon definition of what constitutes a “cultural” ecosystem service. Cultural services were defined initially as the non-material values and/or benefits associated with ecosystems. Costanza et al. (1997) defined cultural services as the “aesthetic, artistic, educational, spiritual and/or scientific values of ecosystems” (p. 254). The Millennium Ecosystem Assessment (2005b) expanded this definition to include the “the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences,” including: cultural diversity, spiritual and religious values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, and recreation and ecotourism (pp. 10–11). Such definitions seek to capture the ways that ecosystems generate knowledge and support experiences (recreational, aesthetic, social, and spiritual), but they have tended to conflate services/benefits and values. A clearer characterization of services/benefits and values can be realized if cultural services are seen as producing a large number of intangible and nonmarket benefits (e.g., social cohesion), that can in turn hold or have assigned to it different kinds of value (e.g., moral, religious, aesthetic). In other words, a given non-material benefit provided by an ecosystem can be associated with different values and those values may have different weights for the individual (see Chan et al. (2011a) for a fuller explanation of these points).

The concept of culture is much debated and differently defined. Definitions tend to treat culture as an adjective rather than a noun which then modifies particular dimensions of culture, such as belief systems, symbolic expressions, or identified assets and institutions. Frequently, this realignment shifts ‘culture’ from being a ‘thing’ to also include processes, as in the following brief set of definitions: *cultural worldviews and epistemes*—explanatory logics, knowledge systems and ‘ways of knowing’ (e.g.,

perceptual systems) different from dominant systems and including the spiritual and metaphysical properties of animate and inanimate objects (Ingold 2000; Turner et al. 2000); *cultural symbols*—the vast array of symbolic phenomena and properties (language, ritual, dances, songs, stories and oral narratives, as well as *material culture* including all forms of artistic media, totemic poles and carvings, architecture, clothing and much more) (Sahlins 1999); *cultural assets*—a set of goods marked by histories of a people (from important sites, to place names, to territories claimed or pending through Treaty, rights and title) (Basso 1996; Marsden 2002; Koehler 2007); and, finally, *cultural practices or institutions*—for example, systems of naming, marriage or descent, kinship (human and nonhuman), as well as the organization and/or cosmology of the human-natural world and the social obligations that accompany these (Roth 2008; Sahlins 2011).

While we do not advocate in this paper any particular definition of culture, given the different uses of the term researchers need to be explicit about their definition of cultural services. Moreover, since there are a diversity of meanings and values at stake in environmental decision-making (as we argue below), we believe that it is crucial to maintain a *disaggregated* view of the different cultural ecosystem services that fall under any definition of culture, even the most narrow. Rather than treating all cultural ecosystem services as presenting the same issues and problems, or viewing culture as a black box, we need to examine the diversity of cultural services that ecosystems provide. Some of these services might be easier to capture using market metrics—for example, a sense of preference satisfaction provided by recreation in an urban park, while others may be less so—for example, the honoring of a way of life provided for by a religious ritual that uses native plants.

CHALLENGES, REBUTTALS, AND POSSIBLE SOLUTIONS

There are five important challenges that need to be addressed in order to make the case that cultural ecosystem services can be included in environmental assessment: how to account for interconnected benefits; incommensurability with other ecosystem services; how to deal with the plurality of values that people attach to ecosystem services; the question of the relevant unit of analysis; and finally, the worry that even if it is possible to include them in deliberation, focusing on cultural services will take us away from the ecosystem services whose protection is most important to human health and welfare. We raise each challenge and offer responses below. Unless these challenges are answered the case for integrating cultural services is considerably weakened.

Interconnected Benefits

Many of nature's services provide simultaneously material and non-material benefits. These are often hard to separate (Chan et al. 2011b; Chan et al. 2012). For example, hunting provides economic and physical sustenance (two material benefits), but it is also a distinct way of life for some people and may also be connected to religious rituals (two non-material benefits). As this example highlights a problem for calculation: multiple cultural services may simultaneously result from a single ecosystem 'input,' and conversely, some cultural services are jointly produced by more than one ecosystem 'input.' In some cases, by some ways of counting, interdependence can lead to 'double counting,' or valuing the same service multiple times.

The problem of double counting is not unique to cultural services (Fu et al. 2011). Consider the four service categories put forth in the (Millennium Ecosystem Assessment 2005a): provisioning, regulating, supporting, and cultural. One can see from this list that many of these service flows have the potential to be double-counted. For example, the value of pollination services is eventually embodied in the value of harvested crops. To minimize the danger of double counting, it is important to clearly define the services one is attempting to account for and to recognize ecosystem complexity and interconnectedness. One interesting suggestion by Jim Boyd is that we direct our attention to "final ecosystem services" that are embodied in the end product that gets valued (Boyd 2006); this approach may be more complicated for cultural ecosystem services than for other ecosystem services, but Boyd's guideline does provide a potential solution to the double-counting problem. Boyd (2006) offers the example of an angler, for whom an end product might be a "particular lake or stream or perhaps a particular species population in that water body" (Boyd 2006, p. 7). Because the angler in this example does not make choices directly about, for instance, the forest that contributes to the stream's water quality, the purification service would not be independently valued in this calculation of the stream's services to him.

Another proposal by Tallis et al. (2011), advocates "getting specific" about ecosystem services: not employing broad categories of services but rather focusing on very specific services (e.g., not "hunting", but "religious rituals satisfied by hunting").

Incommensurability

It is sometimes argued that cultural values cannot be compared with other values. In the introductory quotation, the tribal member can be interpreted as arguing that no amount of money can be equal to the value that the land has for him as an inheritance from his ancestors. If we

generalize his stance to metrics other than money and if there is additionally no way that we can rank the way he values land in comparison to other goods, then it will be difficult to incorporate his evaluation into our decision-making. In its strongest sense, to say that a value A is *incommensurable* with a value B is to say that A and B cannot be compared: we cannot say when confronted with the choice between these two values that one value is better, worse or the same as the other (Raz 1986). In such cases, incommensurability is thought to entail incomparability. Some people seem to think that truly incommensurable values—values understood as completely incomparable—defeat the possibility of rational decision-making. If we really cannot compare two values at all, then it might seem that all that is left for us to do is flip a coin. In such cases, it would seem, our particular choices cannot be justified. If the values people attach to cultural services are incommensurable with other values, then cultural values would seem impossible to include in our overall assessments of an ecosystem's value.

There are three problems with drawing this hasty conclusion. First, this argument assumes that comparisons must be direct, complete, and made in the same currency. Many decisions, however, require only that relative and incomplete assessments be made, and whether we admit it or not, we make these kinds of comparative assessments all the time. For example, a person may prefer both spending time hiking and meditating more than she prefers going to the supermarket without being able to say how much more she prefers each of the first two activities or how these two activities compare with each other. In short: we can sometimes compare things that we cannot fully commensurate.

Second, some incomparability is due to practical problems and so does not rule out the possibility of commensurability in more ideal circumstances. For example, while it may be practically impossible to say whether one patch of red is redder than another, this does not mean that the two patches are incommensurable with each other (Broome 1997).

Third, this argument assumes that if A and B are incommensurate there is no aspect of A and B that can be compared. But this is often not true: we can frequently assign values to components or characteristics of a thing without being able to assign an overall value to the thing. It is more feasible for an accident victim to assign value to an injury of his arm than to the arm itself. The real difficulty is when there is no way to judge any dimension of two options as better or worse in any respect. Such cases are a serious worry, but it is actually hard to generate many real examples of such cases.

For illustration, below we discuss two ways in which there may be stronger or weaker degrees of incomparability

between money and land. Our categories are drawn from Griffin's (1986) work on incommensurability.

Trumping

One form of incommensurability involves some comparability where one value always trumps another value, no matter what quantity of the latter value is given. That is, value A trumps value B when any amount of A is more valuable than any amount of B. In the epigraph to this paper, the tribal member objects to equating his land with any amount of money: the land trumps money in value.

Sometimes people interpret the trumping relationship in terms of infinite value. When economists asked people how much they would want in compensation for power plant pollution that would damage the visibility of the scenic Southwest, more than half the respondents rejected the question or demanded infinite compensation (Rowe and Chestnut 1982, p. 10). Nevertheless, we think that the idea of "infinite value" is misleading as a way to understand the trumping relationship, in part because it is recognized that values only trump in specific contexts, and in part because a value can be a great deal more important than another without having infinite weight. Consider what is one of the most promising candidates for having infinite worth: human life. Even here state policies routinely trade off lives: for every 10 miles per hour that we increase the speed limit, we know that a certain number of additional people will die, but no one seriously proposes setting the highway speed limit at 30 miles per hour. Colyvan et al. (2010) expand upon the concepts underlying this example, pointing out many theoretical and practical problems with infinite values.

Instead of thinking of values as having infinite worth, we might think about the different ways that different values enter into our deliberations. Some values enter as commitments and not mere preferences. For example, through the Geneva conventions societies express their commitment to not considering unarmed civilians as legitimate targets in a war, even when the costs of honoring this commitment are high. In setting the highway speed limit, states express their commitment to human life by taking due care in regulating highway use, and providing emergency road and hospital services. With the Endangered Species Act of 1973, the United States government recognized the importance of protecting non-human species independently of the economic costs of doing so (Wilderness Society for the Endangered Species Coalition 1992; Brown and Shogren 1998). Commitments, however, do not have infinite value either. We can see this when we have to reorder our commitments in the face of conflict among two or more values. For example, a person for whom the value of land seems incommensurable with other

things might agree to sell his land to buy medical care that saves his child's life.

Disparate Scales

A weaker sense of incommensurability involves the possibility of measurement but along different scales, as may be appropriate when people perceive a fundamental difference in the underlying values (value pluralism): in the context of cultural values people may find a given increase along the scale of certain cultural values as more important than a given increase along the scale of economic benefits. A small improvement in land quality might be worth more than the economic increase in the worth of the land associated with this improvement. Multiple scales, however, need not lead to an inability to compare values. For example, people may be unable to quantify the intangible benefits of a nearby wetland in order to compare it to the economic value of the water purification services that the wetland provides. However, they might be able to rank scenarios in which different levels of different services (e.g., water purification, recreation, aesthetic value) are varied. Indeed, some quantitative methods for making such comparisons have been developed and implemented (White et al. 2012). We discuss the ranking of scenarios below.

Recognition of plural values, as described above, complicates the measurement problem. While the strength of some values for a person might be amenable to willingness-to-pay metrics, contingent valuation or other ways of pricing goods in the absence of explicit markets, other values might not be. Consider some of the diverse cultural ecosystem services that can matter to people: those that contribute to a sense of individual well-being, to a sense of agency, or to practices which express reverence and respect for nature or which honor important community traditions. It may well be a mistake to think all these diverse things can be *completely* ranked against one another. A ranking is complete when for any two alternatives X and Y, either the agent prefers X to Y or the agent prefers Y to X or the agent is indifferent. But even when an individual cannot find a single ordering relationship of all the values in play, she may be able to generate a partial ordering of those values. In a partial ranking, two people may agree that A and B are superior to C while disagreeing on the ranking of A and B. For example, if people always reject outcomes that lack an ecosystem service that is connected to their cultural traditions, then we might rank that service above the others in importance. This approach would permit different ecosystem scenarios to be ranked by people in terms of a diversity of values that these ecosystems support. One could imagine scorecards that allow people to give grades to an environmental scenario along various

evaluative dimensions. For example, we might ask people to rank two potential scenarios regarding the use of a wetland in terms of its contributions to their economic well-being, religious traditions, and community life. We can then assess whether one scenario is preferable to another on one or more of the dimensions, and if there is disagreement on the rankings of different dimensions, we can use the suite of rankings to identify trade-offs. The rankings that emerge from these report cards may be the most accurate measurement we can make for some cultural ecosystem services.

Value Construction, Dynamism, and Deliberation

Obtaining an accurate measurement is further complicated because many factors—such as contemplation, deliberation, framing, and overall context—can lead people to change how they value different services and how they express those values (Peterson and Flanders 2002). Sometimes a person's values may change in response to listening to the views and concerns of others. A person who values a natural resource only for its economic benefits may be moved by hearing the value that this resource has for others (Spash 2008b).

The prevailing ecosystem services approach to environmental assessment has been to value services in monetary terms using diverse calculation metrics or to avoid market valuation by using biophysical metrics, which move us beyond the need for actual market prices of these services. Contingent valuation, for example, might ask how much a person would be willing to pay to prevent the loss of some particular object. It is addressed to each individual as a single purchaser who is asked to value goods in terms of his or her own preferences.

However, many environmental evaluations involve the question: what should *we* do (with respect to this service)? As Sagoff (1998) has discussed, this is a very different question than: what should *I* do? For example, even though a person may place no individual value on artistic or recreational activities, she may place value on having these as options available in her society. When one frames a decision from the perspective of a responsible citizen, one invokes different considerations than when one frames a decision from the point of view of a market agent.

With respect to decisions that involve people thinking from the point of view of the collective or “we,” methods such as discussion and deliberation may be used to bring out a group's valuation or judgment (Wilson and Howarth 2002; Spash 2007, 2008a). However, discussion and deliberation—as well as survey methods—should be undertaken carefully. Such processes are vulnerable to framing effects (even the order questions are asked can make a difference with respect to evaluation), endowment

effects (which privilege the status quo), manipulation, adaptation to unjust circumstances, and unequal power in the decision-making group and between the group and outsiders. Some voices may be marginalized—others, like those of future generations, may be completely absent. Thus, policymakers seeking to utilize such instruments must be very aware of the potential problems and guard against them (Gregory et al. 1993). Examples of successful processes for group discussion include: aggressive steps in recruiting participants who might otherwise opt out (Ryfe 2002); random representative sampling (Fishkin 1995); employment of clear rules of civility, equality, and inclusivity in discussion (Schudson 1997); and linking deliberations to outcomes in which there are clear stakes (Fung 2004).

In the end, however, it must be admitted that there will be cases in which we are not able to come to a determinate value judgment about a set of options even in the presence of deliberation and partial rankings. While this may be true for even a single agent it is especially true in the case of different people: plural and conflicting yet legitimate ideals tell people to value different things and different kinds of lives. In that case, we must appeal to negotiation and compromise, or if that fails, other mechanisms such as majority decision. Partial rankings, incompleteness, and value pluralism complicate our measurement problems but they do not defeat rational decision-making.

Cultural Ecosystem Services to Whom?

The quandary of whose opinions should count in a decision complicates all decision-making—and it is especially relevant to decision-making involving cultural ecosystem services. In the case of these intangible services and benefits, people who are geographically or temporally distant from an ecosystem may benefit from it; thus, how do we decide where to draw the boundaries? Consider that millions of Americans may derive benefit from the existence of the Arctic National Wildlife refuge, even though they will never come within a thousand miles of it. The valuations of future generations, as the most salient example of the temporal complications, must of necessity be a matter of conjecture since there is no way to determine them empirically.

This boundary problem is not unique to cultural ecosystem services. There is no beneficent, omniscient decision-maker who will weigh all costs and benefits to make a decision that will then be honored by everyone and there is no single answer to the question of whose interests should be counted. Indeed, it is not always the role of an ecosystem services analysis to decide whose voices should count; the role of the analysis, instead, may be to simply help all stakeholders affected by a decision express the

impacts they face—especially those stakeholders who are disempowered and might otherwise lack sufficient means to express the risks they face (Chan et al. 2012); obviously this aid will only help future generations to the extent that current generations will speak for them.

In some cases there is an explicit need to decide whose voices to include in a cultural ecosystem services analysis. There are various methods for describing whose interests are at stake and including them in decision-making (Reed 2008). In addition to identifying the main categories of affected parties (workers, recreation users, inhabitants, etc.), it is important to involve the parties whose participation is crucial to the project's success; who will be required to comply with the decision once enacted; who may have important information including knowledge about the local culture (Meffe et al. 2002). In all cases, the researcher needs to be explicit as to what she is doing, and ensure that her methods of determining the boundaries of inclusion are subject to scrutiny and criticism by others.

Are Cultural Ecosystem Services “Luxury” Goods?

A final problem with the incorporation of cultural ecosystem services is neither about conceptual nor about implementation; rather, it concerns an objection that some have to the very project of promoting the importance of cultural values. In a world in which the material benefits that development provides are very weighty for the extremely poor, it might seem that a focus on the intangible values of nature is ill-placed: people struggling to meet their basic needs don't have the 'luxury' of caring about intangible values. Maslow (1943) provides one well-known and early articulation of this idea; in more recent years others have addressed this concern (Martinez-Alier 1995, 2002; Marvier et al. 2006). To that legitimate concern, we offer three responses. First, a good deal of empirical literature shows that above a threshold level of economic well-being, additional economic benefit adds little to a person's overall well-being. Hedonic studies continually find that the most important factors contributing to human well-being above this threshold have to do with other goods: human relationships, work, a sense of meaning in one's life (Helliwell and Putnam 2004).

Second, arguing that cultural ecosystem services should be included in decision-making does not imply any a priori ranking of the relative importance of cultural and other values. It simply opens us to the consideration of such values. In our decision-making this kind of openness is crucial: we are always in danger of being parochial and partial in our judgments about value.

Third, many cultural values are held to be crucially important in populations with very low levels of income and wealth. These values play a significant role in peoples'

sense of their own lives. Remote existence values may be luxury goods, but other kinds of cultural values—spiritual, identity, legacy, participatory, and community, values that have been built up over many centuries of interactions between people and their environment—are anything but (Turner 2005).

The poor are relatively discounted by monetary metrics because of their smaller ability to pay. While inclusion of cultural ecosystem services in decision-making might not always enhance equity, consideration of these intangible values can be a critical mechanism for inclusion of the poor's perspective.

ALTERNATIVE ROLES FOR ECOSYSTEM SERVICE VALUES IN DECISION-MAKING

So far, we have argued that it is possible to improve assessment by identifying and characterizing ecosystem service values, including intangible, cultural service values. There remains an important question regarding the role of that assessment in decision processes.

Decisions can be evaluated in substantive or procedural terms. Decisions are substantively justified when they are rational in terms of some particular concrete goal: for example, when they maximize an agent's overall preferences. Decisions can also be justified in procedural terms—by how they came about, regardless of whether or not they conform to some substantive value (Simon 1978). The first approach examines decisions in terms of substantive objectives such as promoting sustainability, promoting human well-being, or achieving better management of a resource. The second approach examines the procedures that were involved in the decision-making process itself, focusing on public processes of inclusion and deliberation (Lee 1993; Norton 2005).

If we understand decision-making as aimed at achieving given objectives by maximally efficient means, it is tempting to treat ecosystem services as providing more data on actual costs and benefits associated with actions, data that “fills in” gaps in standard economic methodology, and gives a more complete picture of the economic facts (Costanza et al. 1997). Nevertheless, viewing ecosystem services as a contributor to a bottom-line analysis may not be a good strategy for enhancing the role of cultural ecosystem services in decision processes—since as we have shown there are some serious problems with measuring some cultural services in standard economic terms. And even the best assessment information may be ignored or down-played in decisions. Sometimes, for example, economic factors are so emphasized that cultural values are slighted; in other cases, powerful forces benefit from, and will protect, the status quo.

At the same time, ecosystem service calculations and estimates may prove helpful as inputs into more deliberative processes of decision-making. When limited to a specific geographic and cultural context, it is possible to discuss cultural and other ecosystem services in ways that are meaningful to local residents and to stakeholders. Consider a hypothetical example: suppose upstream and downstream residents of an important river have begun negotiations; the downstream participants demand cessation of upstream forestry to protect in-stream water quality, while upstream participants believe they have a traditional right to engage in forestry activities and demand compensation if they are to be asked to alter their practices. At this point, in a particular context with particular decisions at stake, ecosystem services, and especially cultural ecosystem services, can be cited as support for a negotiation that might include not just economic issues, but also a careful inventory of sacred places and other places of great cultural valence. If the goal is to have an appropriate process for decision-making, and if cultural ecosystem services involve important values that must be taken into account, they are more likely to receive due attention if they are sought and articulated at a local level, with specific possible actions and interventions on the table. In such situations, sensitive study of local cultural values can provide important inputs into negotiations, allowing participants to compare pluses and minuses of various options (Gould et al., unpubl.; Klain et al., unpubl.). As we have suggested, report cards can sometimes be generated which allow participants to rank different scenarios according to different values.

CONCLUSION

In this paper, we have argued that while the incorporation of cultural ecosystem services into environmental assessment has faced certain challenges, these challenges are not insurmountable. Although there is a plurality of values associated with these complex and multi-faceted services, many of these values may be partially ranked against each other. Value pluralism does not entail that some things have infinite value and it does not mean that making trade-offs is impossible. Although cultural values are intangible, we can design ways to deal with the problem of overcounting them. Finally, some cultural values can be more or less adequately captured in economic terms (such as recreation), while others will likely require other metrics and tools.

We have not defended any single view of how to weigh the differing considerations involved in environmental policy. Nonetheless, we hope that we have shown that it is possible to integrate considerations that resist simple

economic measurement into our assessment and, ultimately, into decision-making.

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