



Expanding the suite of Cultural Ecosystem Services to include ingenuity, perspective, and life teaching



Rachelle K. Gould ^{a,*}, Noa Kekuewa Lincoln ^b

^a Rubenstein School of Environment and Natural Resources, University of Vermont, United States

^b Tropical Plant and Soil Sciences, University of Hawai'i at Mānoa, United States

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ABSTRACT

Cultural Ecosystem Services (CES) are a crucial but relatively understudied component of the ecosystem services framework. While the number and diversity of categories of other types of ES have steadily increased, CES categories are still largely defined by a few existing typologies. Based on our empirical data, we suggest that those typologies need updating. We analyzed data from interviews conducted in adjacent Hawaiian ecosystems—one agricultural and one forested. We found that current categories of CES do not capture the diversity and nuance of the nonmaterial benefits that people described receiving from ecosystems. We propose three new CES categories: ingenuity, life teaching, and perspective. We discuss issues of lumping and splitting CES categories, and advocate that creating categories for these emerging themes will help us to more fully capture nonmaterial benefits in ecosystem services research and policy.

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1. Introduction

The ecosystem services (ES) framework is one of the most prevalent discourses in 21st century conservation. It is found in prioritization documents for NGOs, academic literature, public media, and government policy (Ruhl, 2016). Yet the field of ecosystem services consistently marginalizes cultural and social aspects (Kunz et al., 2011). Starting with, and probably influenced by, the Millennium Ecosystem Assessment (MEA, 2005), ecosystem services research has been heavily skewed toward biophysical processes (Rey Benayas et al., 2009). Scholars have identified scores of types of biophysical services, most of which are encapsulated by the Millennium Ecosystem Assessment's categories of provisioning, regulating, and supporting services. In comparison, conceptualization and operationalization of the nonmaterial components of ecosystem services (i.e., Cultural Ecosystem Services or CES) is severely limited.

The conservation community has recognized the criticality of CES since the entrance of the ES concept into mainstream discourse; the MEA conceptualized CES as one of the three primary types of services (i.e., Provisioning, Regulating, and Cultural). Researchers, following that lead, have developed a body of CES

research that, although small in comparison to biophysical ES research, is growing. Multiple definitions of CES exist; in this paper, we follow a widely used conceptualization of CES as “ecosystems' contribution to the nonmaterial benefits (e.g., experiences, capabilities) that people derive from human–ecological relations” (Chan et al., 2011, p. 206).

In roughly a decade, scholars have produced over a dozen typologies of CES; creating typologies is complicated by many factors. Some of these factors are common to all ES, but perhaps particularly complex for CES; two such features are (1) the interdependence of many types of benefits (e.g., heritage and identity are often closely related) and (2) relationships between services, benefits, and values (e.g., is “recreation” a service, or a benefit?) (Chan et al., 2012; Gould et al., 2014b; Satz et al., 2013). Other primary challenges are unique to CES: the need for sometimes dramatically different research methods to understand CES, and the difficulty of articulating, and therefore studying, the abstract concepts encompassed by CES.

Despite these challenges, we, along with scores of other researchers and practitioners, still find it helpful to organize the body of experience and benefits encompassed by the CES concept. Fig. 1 portrays and compares some of the more commonly used typologies of CES.

Current approaches to categorization display a few patterns. First, there is notable consensus; overall, the typologies present a fairly coherent cohort of widely agreed upon CES. This consensus

* Corresponding author.

E-mail address: rachelle@post.harvard.edu (R.K. Gould).

	Costanza 1997	deGroot 2002	Mill. Ecosys. Assess. 2005	Boyd 2006	Raymond 2009	deGroot 2010	U.K. Nat. Ecosys. Assess. 2011	Chan 2012	CICES 2013	Milcu 2013
Spiritual	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Recreation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aesthetic	✓	✓	✓	✓	✓	✓		✓		✓
Artistic	✓	✓	✓		✓	✓		✓	✓	✓
Cultural heritage			✓		✓	✓	✓	✓	✓	✓
Education	✓	✓			✓	✓	✓	✓		
Social capital/relations			✓		✓			✓		✓
Sense of place			✓		✓			✓		✓
Existence				✓	✓			✓		✓
Knowledge systems			✓		✓					✓
Cultural diversity			✓		✓					✓
Identity			✓			✓		✓		
Bequest				✓						✓

Fig. 1. Coverage of existing typologies of CES. Included are nine sources that present lists, or typologies, of CES categories. Sources used slightly different categories for names; the [Appendix](#) provides the exact wording used in each source for each category.

almost certainly does not result from convergent evolution of thought, but rather from scholars building on and modifying previous theory. The prevalence of specific categories may offer insight as to what are widely considered core CES: recreation and spirituality are included in all typologies, and aesthetic and artistic services in all but one typology. After these four, inclusion is quite variable. Cultural heritage and education are in roughly half of the typologies. The remaining categories (e.g., cultural diversity, sense of place, bequest) are included in two, three, or four typologies (Fig. 1). Typologies also condense categories in different ways, which speaks to the interrelatedness of services and the somewhat poor agreement as to which services deserve their own categories and which are subsets of other categories. Further, some constellations of related services are described by different terms, or only partially addressed in individual typologies; in some cases we have lumped categories with different names, but this may be inappropriate. The concepts of knowledge, education and science provide one example of a set of ideas that are related but distinct.

This paper uses data from two independent studies on adjacent land use types in the same region to ask the question: do current categories adequately capture individuals' expression of CES? Below we describe our two studies and how we combined and compared results. We then present our findings, which merge insights from both studies. We conclude by discussing how our emergent categories are situated within existing interdisciplinary literature and why the addition of distinct CES categories might be useful.

2. Methods

2.1. Study site and projects

This paper arises from two research projects that explored CES and human–environment relationships in the same geographical area, but focusing on adjacent ecosystems: one agricultural and the other forested. Both projects took place on the leeward side of Hawai'i Island, in the district of South Kona. Both studies initially chose this region because of the diverse socio-cultural makeup of the area. The region was settled over a millennium ago by voyaging Polynesians who, over centuries of interaction with the land, became a distinctly native Hawaiian population. Native Hawaiians hold a familial relationship with the land; plants and animals are

kin. Hawaiians intensively developed the Kona landscape for agriculture below ~850 m elevation. Hawai'i was connected to the Western world with the landfall of Captain James Cook in 1778. Subsequently, a small number of Europeans and Americans moved to Hawai'i as Hawaiian nationals who swore allegiance to the Hawaiian monarchy and way of life. These immigrants brought with them new tools and ways of thinking that incorporated economic opportunities, a concept foreign to the natives. They promoted ranching and plantation agriculture, which further altered to landscape up to ~1500 m. This new wave of agriculture also required a large labor force, which led to immigration from the Philippines, China, and Japan. In 1893, the United States claimed Hawai'i as a territory (illegally overthrowing the Hawaiian monarchy), and in 1959 it became the 50th state. With Statehood, Hawai'i changed rapidly. In particular, the state has seen huge shifts in demographics over the last 30 years. Today Hawai'i is home to a diverse population; in Kona, people identify with multiple backgrounds, most notably Native Hawaiian descent (~20%), Asian descent (~25%), and European descent (~80%), among other ethnicities (~15%) (U.S. Census Bureau, 2011).

2.2. Data collection

We collected our two data sets independently. Table 1 summarizes relevant characteristics of both sets of respondents.

Agricultural lands project: The interviews that supplied the data for this paper comprised part of a project focused on relationships between farmers' personal values, sense of place, and farming practices. We conducted on-site verbal surveys with 128 individuals between June 2010 and February 2011. Surveys lasted 45–210 min and consisted of several open-ended questions that allowed for detailed and contextual explanations. We recorded and transcribed all dialogue. We recruited participants by attendance at community events (e.g., community meetings, farmer's markets, farmer education events) and through telephone contact with a random selection of individual farmers. The first 100 surveys were administered to all willing farmers within the study area. The final 28 participants were selected to account for gaps we identified in the initial sample through mapping and demographic analysis. In this second set we targeted, for example, Native Hawaiians and other ethnic minorities, as well as geographic areas that were underrepresented in our initial sample.

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