

Use Case: Using Ecosystem Services Conceptual Models to Specify and Communicate Unique Cultural Ecosystem Services

<http://bit.ly/NI-ESCM>

CONTEXT

Cultural ecosystem services represent the nonmaterial benefits that people receive from ecosystems, including but not limited to recreation, aesthetics, spiritual connection, cultural identity, and sense of place. Additionally, for many Indigenous societies, the framework for thinking about culture and ecosystem services is as much about the services humanity provides to nature as it is services provided by nature to humans.¹ Cultural services are inherently hard to quantify, though they often represent some of the most significant services provided by a particular landscape. Due to the difficulty of quantifying and communicating cultural service importance, these services are often not fully considered in decision-making. Similarly, these cultural services are often left ambiguous in many Ecosystem Services Conceptual Models (ESCMs). With this project, we aimed to provide an example of an ESCM that explicitly incorporates specific cultural services by collaborating and co-developing a cultural services ESCM with the Heʻeia National Estuarine Research Reserve (HeNERR) in Hawaii, a site that clearly emphasizes the cultural importance of the Reserve's landscape in its mission and vision statements.² This landscape represents 1,385 acres of upland, wetland, estuarine, and marine habitats that support important terrestrial, aquatic, and marine wildlife species.³ This area is being restored as an agro-ecological landscape that supports sustainable, Indigenous agriculture and aquaculture that exists in harmony with the ecology of the site.

PROCESS

Multiple virtual meetings were held between the National Ecosystem Services Partnership (NESP) and HeNERR staff to develop a set of ESCMs that describe the ecosystem services provided by the Heʻeia landscape. Many iterations of models were built to establish communication with the developer and HeNERR that allowed for adequate representation of their social-ecological system in an ESCM. One important consideration that had to be incorporated into these ESCMs was Hawaiian cultural views about how humans and the landscape interact and are interdependent. ESCMs are traditionally linear diagrams that flow in a single direction, yet, the Hawaiian concept of the environment represents a more circular flow of benefits between people and nature. Because of the humans' connection to nature, this yields a reciprocal relationship in which nature provides services for people, and humans care for and tend the landscape in order to perpetuate and sustain the relationship. Three different versions of the Heʻeia ESCM were created to fill multiple purposes (described below), but all versions incorporate this circular understanding of ecosystem services.

Version 1 (Figure 1). This version matches most closely to ESCMs that NESP has previously built, though it does incorporate the circular understanding of ecosystem services described above.

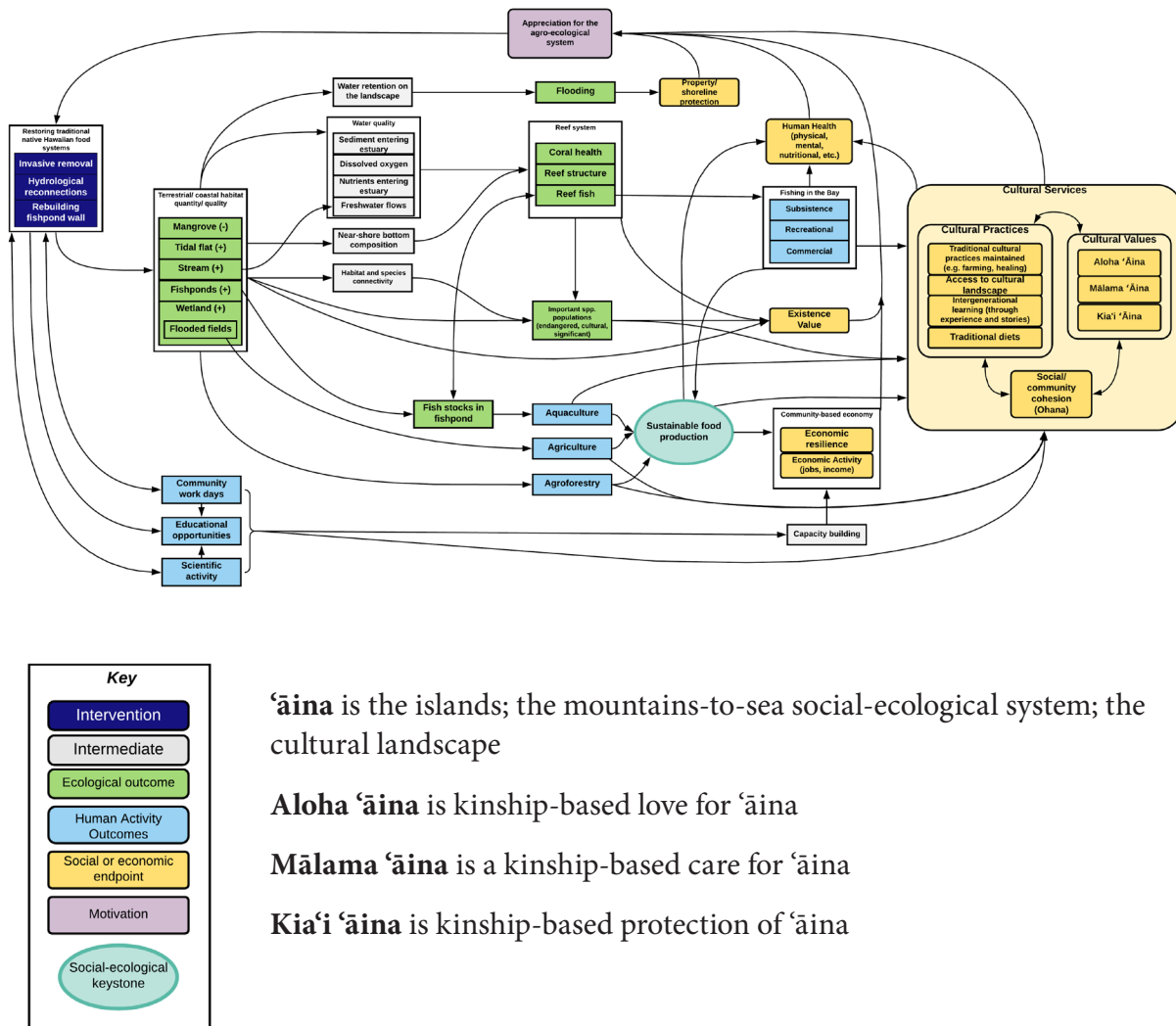
1. Comberti, C., T. F. Thornton, V. Wyllie de Echeverria, and T. Patterson. 2015.

2. <https://heeianerr.org/about-us/>.

3. <https://heeianerr.org/about-us/>.

There are a few noteworthy elements of the model that were added to increase the applicability for cultural services. First, sustainable food production was identified as a social-ecological keystone of the system,⁴ meaning that it represents a dominant cultural service provided by the social-ecological system of He'eia Reserve. This was important to highlight as sustainable food production is the biocultural element that most strongly ties humans and nature together in this landscape. Additionally, a new node classification was added to the model: motivation. This motivation node represents an important linking point between the services that ecosystems provide to people, and the care that people provide in return to ecosystems, and the key to perpetuating that link and relationship. Finally, cultural services are specific and explicit in this ESCM diagram, providing detail about how the ecosystem and human culture interact in this system.

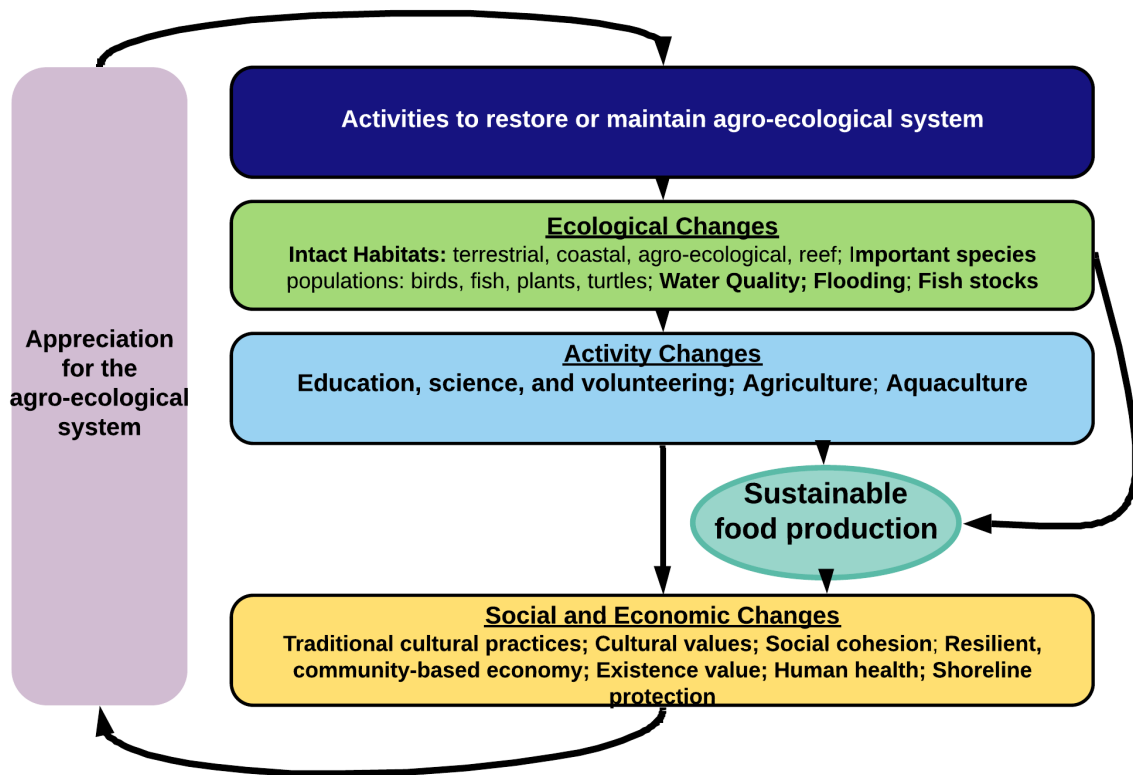
Figure 1. ESCM Developed for the He'eia Reserve Landscape



4. Winter, K.B., N.K. Lincoln, and F. Berkes. 2018.

Version 2 (Figure 2). This is a simplified version of Figure 1. It was created to be used as a communication tool by the NERR to more simply describe the flow of services between people and nature.

Figure 2. Simplified Version of the He'eia ESCM, to Be Used for Communication Purposes



Version 3 (Figure 3). This version of the model has been adapted to correspond to the Polynesian piko symbol (Figure 4). The piko represents a circular connection through space and time to the past and the future, as well as the notion of being centered. Designing the diagram in this format allowed us to encapsulate and convey the importance of past and future in the relationship of humans to their ecosystem, which is a central construct in Hawaiian culture. The perpetuation of the spiritual, physical, and mental nourishment that humans derive from their land is centered on the humans being part of that circle and processes in that land.

Figure 3. He'eia ESCM Adapted to Take the Shape of the Piko Symbol

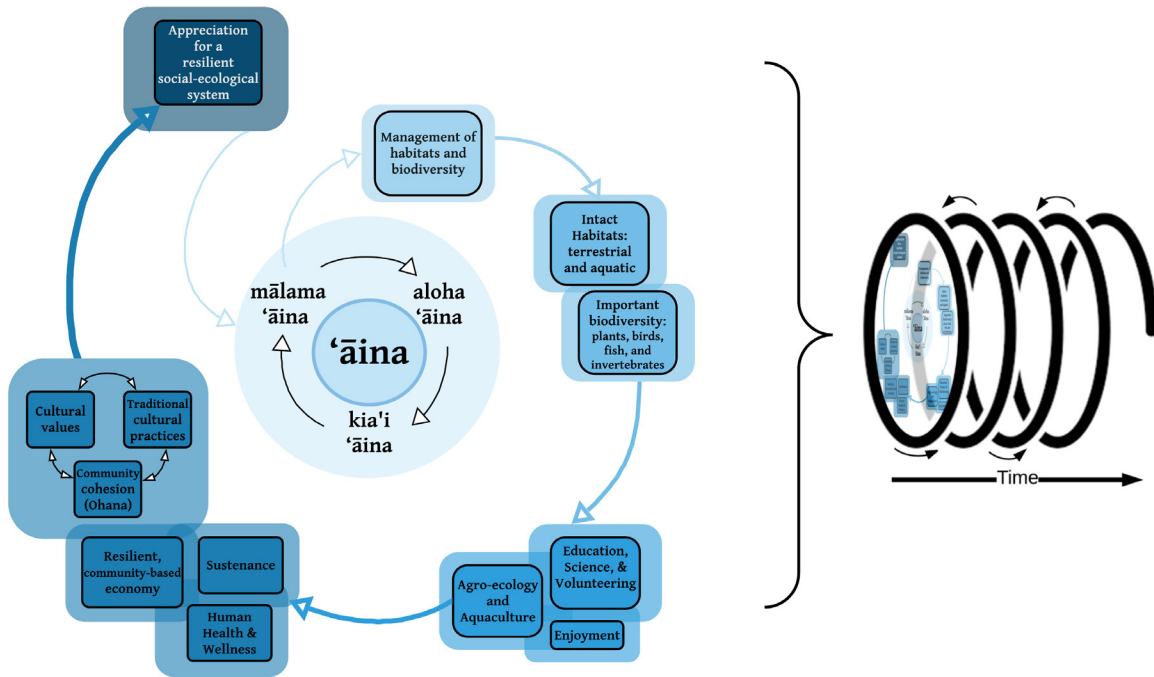


Figure 4. Piko Symbol



Source: Makau Nui Carvings

APPLICATIONS

Communication about Hawaiian cultural services. These models can be used to illustrate the importance of ecosystems to Hawaiian cultural identity and the vital connections between people and the environment in systems like He'eia. Multiple model formats enable sharing this information with different types of audiences.

Applicability to cultural ecosystem services at other sites. We learned from this process that culturally explicit ESCMs are unique and place-based, and that it would be difficult to create cultural ESCM templates that would apply to each reserve, ecosystem, or location. Though the ESCMs shown here are therefore not widely applicable, the models provide an example that we hope others can follow to help make the importance of cultural services more easily recognized. It is recommended that model developers spend considerable time building relationships and connections with those who are familiar with a site to co-develop relevant ESCMs.

ADDITIONAL RESOURCES

Comberti, C., T.F. Thornton, V. Wyllie de Echeverria, and T. Patterson. 2015. "[Ecosystem Services or Services to Ecosystems? Valuing Cultivation and Reciprocal Relationships between Humans and Ecosystems.](#)" *Global Environmental Change* 34 (September): 247–62.

Winter, K.B., N.K. Lincoln, and F. Berkes. 2018. "[The Social-Ecological Keystone Concept: A Quantifiable Metaphor for Understanding the Structure, Function, and Resilience of a Biocultural System.](#)" *Sustainability* 10(9): 3294.