



## Natural Capital Project in Hawai'i

Mapping a sustainable future on the island of O'ahu

With a rapidly growing population and intensifying pressures on land and water, Hawai'i is a microcosm of forces at play globally. This island state is grappling with major challenges of food and energy security; unemployment and rural decline; and the imminent threat of climate change. Leaders in public and private sectors recognize the urgent need for new approaches. The Hawaiian state government passed a House Concurrent Resolution on Ecosystem Services in 2006 and a Climate Bill (the second in the U.S.) in 2007.

In support of these policies, the Natural Capital Project was invited to assess alternative business models for making agricultural production more sustainable in both economic and biophysical terms, while meeting the state's ecosystem service goals and, specifically, its carbon emissions targets. We convened large landowners, the Hawaiian Electric Company, the state water utility, conservation organizations, and other stakeholders to develop and analyze practical scenarios involving reforestation and payments to landowners for carbon sequestration and other services. We presented these to the Hawai'i State Legislature in 2009.



Meanwhile, the state's largest private landowner, and the largest trust in the United States, Kamehameha Schools, became interested in applying the approaches we were developing together to their iconic landholding on the North Shore of O'ahu. We engaged in a 2-year, iterative process of community involvement, analysis, and decisions by Kamehameha Schools, that culminated in a very innovative plan, and swift action to implement it.

### Landowners seeking smart, sustainable business models

Development pressure is leading to rising land prices. Landowners in farming, ranching, and forestry are looking for new business models that are financially viable and ecologically sustainable to secure the long-term value of their land for future generations. Creating financial incentives for ecosystem services is key to diversifying rural economic opportunities and securing natural capital. We brought together buyers and sellers for a pilot carbon offset project to achieve state-mandated emissions reductions. This effort focused on restoring native koa forest, for its suite of economic, ecological, and cultural values, including carbon sequestration, water supply benefits, biodiversity conservation, and high-value timber.



### Results

- **Developed business models for conservation** to enable private ranchers to restore native forests while attracting revenue and sustaining livelihoods.
- **Mapped and valued ecosystem services**, using our software tool InVEST, we worked with the Land Assets Division of Kamehameha Schools, the largest private landowner in Hawai'i, to help them create a land-use plan that balanced their economic, educational, environmental, cultural and community related objectives.
- **Award-winning development:** Our analysis and InVEST outputs for Kamehameha Schools contributed to its receipt of the 2011 *National Planning Excellence Award for Innovation in Sustaining Places* by the American Planning Association. Development on O'ahu island was recognized for its land-use and inclusive decision-making.
- **Initiated the design of a state carbon sequestration program** focused on the restoration of native forest. The program brought together potential buyers and sellers from across the state in the context of Hawaii's climate bill and had the added benefit of protecting endangered species and ecosystems services.



## Hawai'i's Natural Capital

### Food, Energy & Natural Security

Hawai'i is confronting a land crisis, with economic, demographic, environmental forces driving unsustainable changes that make people more vulnerable to inevitable shocks. The state imports over 90 percent of its food. The islands have, at any moment, a seven-day food supply for a resident population of 1.3 million and 6.5 million visitors annually. The same vulnerability exists in energy, with imported oil (and coal) comprising nearly 95 percent of consumption. The state has experienced great losses in natural capital, with more endangered species lost than any other in the U.S.

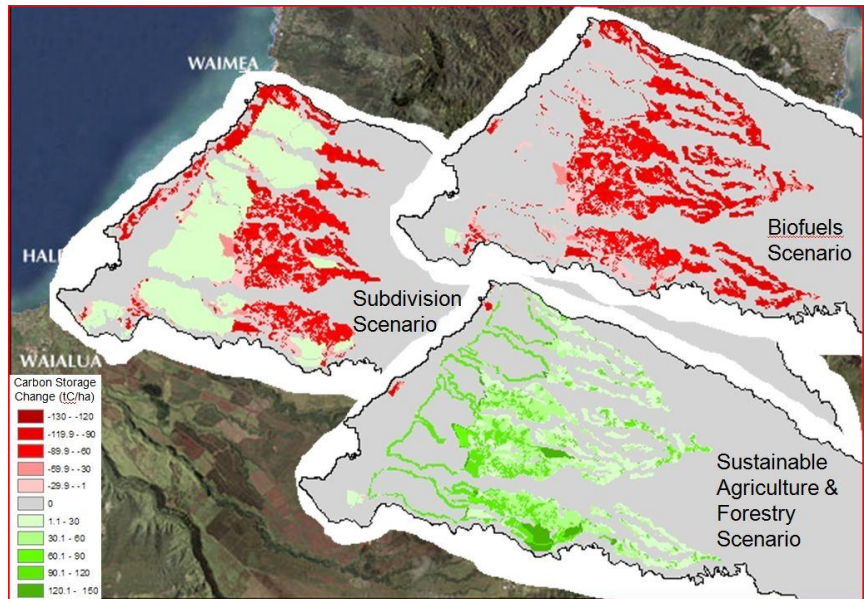
### Private Farms and Ranchlands

Opportunity exists for securing natural capital, and enhancing food and energy security, on private lands. Grazing lands, for example, comprise nearly a quarter of the State's land area. If well managed, grazing lands reduce the risk of wildfires, control sedimentation, recharge groundwater, sequester carbon, and suppress the establishment and spread of invasive species while supporting native wildlife. Farms and ranches are vital to food and potentially energy security, while also preserve scenic beauty, tourism, and cultural heritage values.

### Innovative Approaches

How can Hawai'i integrate natural capital values for food, energy and environmental security into attractive business models supported by policy? The approaches being pioneered in this state offer important lessons globally.

## Alternative Development Scenarios for the North Shore of O'ahu



### Using InVEST to Create a Balanced Approach to Development

Leaders increasingly call for integrating ecosystem service values into important societal decisions, yet there remain few demonstrations of this approach in practice. We quantified ecosystem service values to help the largest private landowner in Hawai'i, Kamehameha Schools, design a land-use development plan that balances multiple private and public values on its 10,600 ha land holding on the North Shore of O'ahu.

We used the InVEST software tool to evaluate the environmental and financial implications of seven planning scenarios. Qualitative observations were also incorporated to account for the myriad cultural services of this iconic island landscape. The scenarios encompassed contrasting land-use combinations to achieve greater security in food and energy and other benefits, and included biofuel feedstocks, food crops, forestry, livestock, and residential development. All scenarios had positive financial return relative to the status quo. However, tradeoffs existed between carbon storage and water quality, as well as between environmental improvement and financial return. Based on this analysis and community input, Kamehameha Schools is implementing a plan to support diversified agriculture and forestry.

The formal mission of Kamehameha Schools is to balance environmental, economic, cultural, educational, and community values. Yet, despite the best-in-practice methods, the trust was not finding it easy to turn this mission into something tangible. "Intuitively, you know what will be good for the environment, but that was all just based on faith, said the regional asset manager for the trust, Giorgio Caldarone. We couldn't really quantitatively understand the trade-offs."

In many cases there isn't an easy win-win solution. The analysis we conducted made tradeoffs explicit so that purposeful decisions could be reached. The ultimate plan received the American Planning Association's 2011 National Planning Excellence Award for Innovation in Sustaining Places. The property is now a thriving food farm, with construction of a wind farm underway, along with small scale forestry and biofuels projects in the works.