Ancient civilizations developed regimes of farming, hunting, fishing and gathering that balanced use with periods for resource recovery. These traditions incorporated recycling and population control, while maintaining the natural flow of biomass, nutrients and energy through mountain, forest, slope and lowland ecosystems. Examples of such legacies include the nomadic, slash-and-burn agriculture of indigenous South American people; the chinampas, or floating farmlands, of ancient central Mexico; the seasonal harvest of tools, implements and earthen materials from underground caves by the Mayans; and the sustained harvest of the buffalo by Lakota and other North American plains people (until the introduction of the gun and the horse by Europeans).

The division and subdivision of terrestrial and coastal ecosystems throughout the Pacific Basin (and the world), which has destroyed their integrity and holistic function, is one result of the imposition of the philosophies and laws of a "western" civilization on well-developed indigenous cultures (the established concept of "east" and "west" is ambiguous for Pacific people). Changes in the concepts of agriculture, urbanization, social responsibility and land ownership are some of the means whereby these destructive influences have been exerted. Modern land use practices in particular have caused deforestation, erosion, restriction of normal runoff and freshwater flow, unbalanced urbanization and pollution which may take centuries to reverse.

Isolated in the middle of the Pacific Ocean, Hawai‘i was one of the last areas to be reached by “western” explorers, and the last to become a part of the United States (of North America). As such, some ancient traditions were preserved in Hawai‘i well into the 19th and 20th centuries, providing an opportunity to learn from a surviving indigenous culture. Ancient Hawaiians believed that because the land, sea and everything in them were created by the gods, they must be cared for. "No one must take more than they need, and everything must be shared."

"To conserve the supply of all resources was constantly in the Hawaiian mind. When plants were taken from the forest, some were always left to replenish the supply. Replanting was done without fail at the proper time as beds of taro and sweet potatoes were used. Fishing grounds were never depleted, for the fishers knew that should all the fish be taken from a special feeding spot (ko‘a) other fish would not move in to replenish the area... At the base of this action to conserve was the belief that the gods would have been..."
displeased by greediness or waste."  

The concept of land ownership did not exist in Hawaiian culture, although land was an extremely valuable part of life. Because of its importance to them, Hawaiians had many words for the land and all its formations. The word for land 'āina had a much deeper meaning, derived from the word meaning "to eat".  

The words for the land zones (too numerous to mention) denote not only increasing distance from the mountaintop and closeness to the sea, i.e., mauka ("towards the rise (mountain))" or makai ("towards the sea"), but also the changes in vegetation due to altitude and climate.  

The largest unit of land was the island. Because they are naturally separated from one another, each of these islands could be referred to as an 'āina, but the more common term was mokupuni. The lands were not divided in ancient times but as the islands became crowded it was necessary to make additional subdivisions. These were the moku'āina (districts), kalana (similar to a moku'āina), 'okana (divisions within moku'āina or kalana) and ahupua'a. The ahupua'a were the smallest major divisions, which cut the islands into a series of pie-shaped sections oriented in a mauka-makai direction.  

Figure 1 shows a schematic representation of a moku'āina divided into ahupua'a, showing the 'ili'āina and mo'o'āina, which allotted land for farming, fishing, and the elaborate system of traditional dwellings to families and larger groups. The ahupua'a spread out at the base along the shore and were self-sufficient units, affording to the chief and people "a fishery residence at the warm seaside, together with the products of the high lands, such as fuel, canoe timber, mountain birds, and the right of way to the same, and all the varied products of the intermediate land as might be suitable to the soil and climate of the different altitudes from sea soil to mountainside or top". By defining the ahupua'a in this manner, ancient Hawaiians recognized the relationship between the land and sea, rainfall, vegetation, nutrients and runoff, and preserved the integrity of the delicately balanced ecosystem of which they were a part and upon which they relied for their every need.  

The Hawaiian philosophy and system of government promoted the fruitful and sustainable use of land and coastal areas. The chiefs had a responsibility to their king to administer the ahupua'a and ensure its productivity. This meant that the balance and abundance of other forms of life would be maintained in the mountains, forests and coastal areas, and that everyone should have a place to live, should coexist in peace, and share not only their food but also a sense of community. Of course, there were occasional periods of hunger, when seasonal changes made hunting, fishing and harvests scarce. Wise chiefs and extended families learned to plan for these eventualities and were able to live comfortably most of the time.  

Under this system, the eight main Hawaiian Islands sustained a population estimated at from 250,000 to nearly one million people, depending upon the source. The upper limits of ancient population estimates are comparable to the number of modern Hawaiian residents. Fishponds are a form of Hawaiian agriculture still existing today that exemplifies the balance between multiple land uses, which was the way of life of ancient Hawaiians. The ponds were set off from the sea by walls of huge stones, expertly packed according to their size and shape without any form of cement. These sturdy walls were permeable, allowing an interchange of water with the sea. Through this interchange, the balance of brackishwater in the ponds was maintained; and since water flowed around and through the walls, rather than just pounding against them, the fishponds were resistant to the destructive forces of erosion and wave action. Although they were not expressly designed for these purposes, fishponds also served as settling ponds, thereby reducing the loss of soils to the ocean and protecting the reefs from siltation. Building and maintaining fishponds was a group effort that drew the Hawaiian people together, and provided a source of food as well as a means of viewing fish up close where they could be appreciated. The keepers of the fishponds were powerful spiritual leaders who held a special understanding of the seasons and their changing relationship to sources of water and energy (waves, nutrients, etc.) from land and sea.  

Fishpond construction required sustained and intensive periods of labor, during which time farmers, fishers, woodsmen and others would cooperate to produce the structures that sustained an entire ahupua'a. This work was coordinated through the bond to the chiefs, who guided the well-being of the ahupua'a for the benefit of all.  

Harvesting large schools of fish was another task which required great effort and cooperation. The konohiki (land agents) with domain over the portion of reef directly makai of the ahupua'a directed fishing activity in this area. Fishing, like all other activities, had its strictly observed kapus (prohibitions or rules). These included rotating closed seasons and places for fishing, the reservation of certain fishes to the ali'i (upper classes) during all or part of the year (which had

Fig. 1. Schematic view of a mokupuni (Island) subdivided into ahupua'a.
an effect comparable to that of modern quota systems), and the responsibility to lend a hand (kokua) in some way when fish were abundant.

It was each chief’s responsibility to see that his people were provided for through timely and cooperative planting, harvesting, fishing and construction. Healthy and well-fed people, well-tended crops, and abundant hillides and fishponds were a source of pride. Skill and knowledge of traditional methods of planting and fishing were handed down through chants, songs and dance.

Modern parallels to this ancient system are broken and irregular. Their structure can be traced to the gradual erosion and takeover of the sovereignty of the Hawaiian nation. The power of the kings and chiefs in a mauka-makai direction. Along a typical mauka-makai transect, ownership and jurisdiction is now interspersed between private, City and County, State and Federal agents. State Government is composed of separate Offices, Departments and/or Divisions which manage Forestry and Wildlife, "Water" Resources (wateronly), Aquatic Resources (living organisms, including fisheries), Land Management, Transportation, Boating, Harbors, (Native) Hawaiian Affairs, State Planning, (Human) Health, Business and Economic Development (including tourism), Agriculture, etc. Boundaries run at all angles to the mountain, within which there are patches varying in ownership; but more often than not, jurisdiction is zoned along and interagency cooperation to maintain successful management and ecological balance. Elaborate networks of commissions, boards and committees have been established to oversee the various jurisdictions.

Although steps are being taken to remedy the present situation, Hawai‘i now ranks among the highest in the nation for its levels of pollution, endangered species and disappearing habitats. These problems will require a concerted and enduring effort over several decades if endemic ecosystems are to be revitalized and restored. More and more, the model for improved management is being sought in the revival of ancient traditions that were once silenced by a culture that failed to listen and learn from the wisdom of the Hawaiian people.

Further Reading


M.K. SMITH is from the Division of Aquatic Resources, Department of Land and Natural Resources, 1151 Punchbowl Street, Rm. 330, Honolulu, Hawaii 96813, USA, and M. PAl is from Kona Aquatic Research, P.O. Box 3507, Kailua Kona, Hawaii 96745, USA.