



## **Koa Stewardship —Hamakua, Hilo, and Ka‘u**

Mike Robinson, Resource Management

Koa is alive and well in the Big Island districts of Hamakua, North and South Hilo, Puna, and Ka‘u—but barely. We often expect to find koa in a pristine native forest setting, but frequently it can also be found invading fields or in mixed stands with other trees, including non-natives. For this presentation, one federal, three state, and seven private land managers and/or owners were interviewed about their koa management strategies. Interviews were limited to those with 10 or more acres. Not all landowners could be contacted; therefore the following information is conservative in its estimations.

There are at least 250,000 acres identified in the East and South Hawai‘i koa belt, defined as elevations from 1200 ft to 7000 ft and where koa is or has been known to occur. To date only about 4000 of these acres are being managed for the commercial production of koa. An additional 4000 acres is currently planned for commercial koa management in the next 20 years. When combined, the total of 8000 acres equals about 3 percent of the identified koa land. Although no one has clearly determined the acreage needed to supply the existing koa industry, extrapolations can be made using estimates.

At the 1986 koa conference, Roger Skolmen, a since-retired U.S. Forest Service researcher, estimated a per-acre volume in a managed koa stand at 40,000 board feet per acre. Tom Loudat, in his economic analysis of koa released earlier this year, suggests volumes of 35,000 board feet per acre. These estimates may be high, at least for the first rotation or until genetics and silvicultural research catches up with management goals. Natural stand production can provide more conservative projections which, when combined with unproven yet well thought out estimates, result in a range of koa productivity on a volume per acre basis. In one stand on Mauna Kea, for example, volumes were measured at an average of 2900 board feet per acre. Discussions with loggers have resulted in a similar range of about 3500 to 5000 board feet per acre in natural stands. These are stands that have been logged before or in which mortal-

ity is high.

Under managed conditions, however, we should hope to produce at least 20,000 board feet per acre. At this level of stocking, 8000 acres of managed koa would yield the equivalent of 260 million board feet. On a 50-year rotation, this could produce a sustained yield of over 3 million board feet per year, or about six times the estimated annual cut of 1991. Even at 10,000 board feet per acre, substantial income can be generated by value-adding to koa at current levels. As a \$29,000,000 a year industry, Hawaii’s furniture makers and craftsmen turn a small amount of resource into significant revenues.

The 8000 acres planned for commercial koa management is all located on private lands, with the exception of 30 acres planned for public research and 130 acres proposed for management by the Department of Hawaiian Home Lands. Reforestation, for a variety of land uses, is currently under way on about 16,500 acres. Planting koa seedlings is the most prevalent form of active koa reforestation today, although we know soil scarification in the presence of a seed source works very well. As a fast growing species, koa can reach heights of 12 feet in just a few years. Spacing varies, but most managers are using closer spacing as a means for producing straight stems. Whether applying high-tech research techniques or backyard gardening methods, the results are usually the same: good. Other methods include fencing to remove ungulates, which allow natural seedlings and root suckers to reestablish themselves. Once ungulate pressure is removed, koa naturally invades, even in heavy grasslands.

Other land uses within the koa belt vary. Hunting, as the most popular use, was allowed on most surveyed state lands and on all private lands. The second most prominent land use was cattle grazing. Of the 46,250 identified koa acres used for cattle, 86 percent, or just over 40,000 acres, are on state lands. However, this data does not include the extensive Parker Ranch holdings on the Big Island. Those ranching operations occupy large amounts of koa belt lands in this regional reporting area. Other significant land uses include watershed,



hiking, and quiet/aesthetic use. Less prevalent uses of the koa belt range from research and cultural gatherings to aquaculture and movie sets.

All public and private land owners and managers interviewed stated their desire to manage for koa. The most common incentive was that it is the "right thing to do." All private land owners desired an economic return from their koa land, as compared to only one state agency. Only half of the private land owners sought a real property tax break for managing koa. In Hawai'i County this is most likely because low tax rates are already enjoyed for those grazing cattle, and many landowners graze cattle.

Management constraints included inadequate knowledge of silvicultural requirements and uncertain economies. Government managers had limited budgets and/or manpower while private entities were unsure of the long term returns, the maintenance costs, and the

availability of niche markets.

Government agencies at the federal and state levels expressed concern over the lack of public support for their efforts and desired higher funding levels. Private landowners sought answers to the constraining lack of detailed information about koa management and marketing.

There are individuals, organizations, businesses, and agencies committed to the perpetuation of koa in Hawai'i. Whether the effort is a few acres in size, or an attempt to reforest thousands of acres of former pasture, all efforts will pay dividends in the future. We now know that in as little as ten years koa can contribute heavily to the re-establishment of diverse forests. As we practice the art and science of planting, growing, harvesting, and utilizing koa, our knowledge base will broaden. Most importantly, the benefits of koa will continue for generations to come.

## **Koa Stewardship—Maui and O'ahu**

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I have interpreted my task as being to deliver useful information on the past, present, and projected future of koa on the Hawaiian islands of O'ahu and Maui. I'm sure that the presentation may be both limited and colored by my own personal research, experiences, and hopes, and I welcome anyone with information that may add to or correct that which I present, to please feel free to fill me in. I want to thank the people who contributed information and assisted in this effort. The Nature Conservancy generously made Shannon McElvaney, GIS technical whiz for TNC's Heritage Program, available to provide me with maps, and the Hawai'i Agricultural Research Center provided the assistance of their librarian, Anne Marsteller, who, along with Bob Osgood, steered me in the direction of materials that might be useful to this talk. Credit also goes to various authors but particularly to Roger Skolmen for his work summarizing the plantings on the forest reserves between 1910 and 1960. Landowners and resource managers on both Maui and O'ahu were enthusiastic about the report and happy to talk about their koa, or lack of it.

I had the good fortune to be born and raised on O'ahu. My parents bought land on Tantalus in 1950. I have come to realize that the koa trees on their particular property were most probably planted as much as 50 years prior, along with almost all the other trees I took for granted as being natural to the mountain during the time I was growing up. I have come to realize the speed with which koa grows, while I wonder at the ironies that inhibit its replenishment.

In a nutshell, koa has historically been, is now, and will likely continue to be a significant component of forests on both Maui and O'ahu. What is little recognized is the degree to which the pre-human koa population and range may have changed subsequent to human arrival, what man has done both to decimate and to perpetuate the species, and what measures we may take—as soon as right now—to drastically increase the population of this commercially, culturally, and ecologically important tree.

A revelation and a discovery to me, which ran contrary to my childhood perceptions that the forest had