

LIVING IN ECOSYSTEMS

This chapter traces the histories of several ecosystems and the people whose lives depend on them, whose actions have degraded them, and who hold the power to restore them. Included are the grasslands and traditions of pastoralism of Mongolia; a community-managed forest in India; mountain watersheds and downstream urban areas in South Africa; the agricultural plains of Machakos, Kenya; and the wetlands and croplands of southern Florida in the United States. These are places where the inhabitants are striving to safeguard their future, which depends so clearly on the health of their ecosystems.

Five brief stories from Cuba, the Caribbean, the Philippines, New York City, and the watershed of Asia's Mekong River complement the detailed case histories. Many of the cases and stories encompass multiple ecosystems, but for simplicity they are grouped in this chapter by the ecosystem most critical to the featured management challenge.

Together, the cases and stories capture diverse experiences from around the world—varying spatial scales, population sizes



and densities, and ethnic groups. They illuminate the driving forces and impacts of degradation and the analyses of ecosystem condition presented in the earlier chapters. They also reflect the variety of trade-offs that we face as inhabitants and managers of ecosystems. For example, South Africans planted income-generating but invasive nonnative trees, then paid a high price in terms of diminished water supply to cities and towns. Drainage and conversion of parts of the Everglades to agriculture fueled the growth of the Florida sugar industry but reduced the ecosystem's water retention and filtration capacity and threatened biodiversity. The state government was able to intensify commercial cutting of timber in Dhani, India, from the 1950s through the 1970s but at the long-term expense of local livelihoods.

Individually, some of the cases and stories address many management issues, others just a few. None offers any ready-made "fixes" for ecosystems that have been degraded, but all can encourage an exploration of questions crucial to the future productivity of ecosystems:

- What causes an ecosystem to decline? Who gains the benefits of ecosystem use and who pays the costs of decline?
- What conditions increase recognition that ecosystem misuse or overuse must be supplanted by efforts to alleviate pressures and ensure long-term productivity? What circumstances move people to concern and action?
- How do we create the public and political will to take action to restore an ecosystem?
- What mechanisms and policies can help prevent ecosystem decline or ensure long-term sustainability?
- To what extent, and over what time frame, are an ecosystem and its services amenable to restoration?

The search for answers to these questions underscores the complexities of ecosystem change—the often-surprising natural dynamics of ecosystems as well as the human management challenges. Through case studies, we can examine ecosystems and the people who live in them as constituents in larger geographical regions and social contexts. No ecosystem, even an isolated Mongolian grassland or a forest in a small community like Dhani, is managed by a single person or institution that can act unilaterally. Ecosystem management is the sum of many individuals and institutions—public and private, formal and informal—and political and economic factors. A widening network of connections further complicates management. Many ecosystem problems have local roots and local or regional consequences. But the causes of problems such as acid rain, ozone depletion, invasive species, and global warming can originate in a neighboring country—or even half a world away—and affect us all.

