Box 1.14 Valuing the Invaluable

The economic values we assign to our work and the fruits of our labor are important factors in our behavior and the decisions we make about our assets. Similarly, the values we assign to *ecosystem* assets—goods and services like pollination, water purification, nitrogen fixation, and carbon storage—are an important factor in how we treat ecosystems. Yet because these services are not routinely bought and sold in markets, there's no easy way to calculate their worth. Too often, decision makers and traditional economists simply ignore their value, essentially treating ecosystem goods and services as though they will always be in profuse supply. A result is that loggers may harvest a patch of forest for the value of its timber alone, ignoring the value the forest provides in terms of flood control, water purification, or habitat for migratory songbirds.

How does one assign a monetary value to all the ecological amenities of an ecosystem? As the state of the art of economic analysis has improved, economists have identified a variety of tools to quantify direct—and even some indirect and intangible—ecosystem services.

Where possible, actual market values are used. For example, the price of fish and shellfish harvested in an estuary provides one value for direct goods provided by that ecosystem. Another way to estimate value is to calculate the cost of replacing an ecosystem service. For New York City, natural habitats in its upstate watershed were shown to provide the same water purification services as a new water filtration plant. The $3–$8 billion price tag (Ryan 1998) for the proposed filtration plant is a good base estimate of the value of the water purification service that the intact ecosystem provides—although it does not capture the value of the other watershed services including carbon sequestration, recreational opportunities, and support for biodiversity.

Similarly, the price difference between two comparable houses, one near a shoreline and one inland, is thought to capture the aesthetic value of the shore. Still another market-based method of calculating a lake's or a park's or a wilderness area's value, both as a scenic and a recreational site, is to calculate how much money and time visitors spend to travel there.

When market data are not available, or to supplement them, researchers resort to other means. They ask people what they'd pay, for example, to keep a wetland from being filled and developed or to prevent a wilderness area from being mined. Properly done, such "contingent valuation" surveys can go beyond measuring the practical benefits humans extract from nature to encompass the ethical and spiritual values they attach. But surveys can be unreliable and subject to bias, especially when people are queried about paying to minimize the effects of something as complex as climate change.

Valuation exercises can be a useful policy tool in educating audiences about the many ways we depend on and profit from ecosystem services. Ultimately, however, creating financial incentives for ecosystem conservation is more important than finding an accurate market value for any or all ecosystem services. Incentives for conservation may come from creating markets for ecosystem services where none exist, or finding other ways for landowners to gain financially from the services their land provides. Auctioning permits to emit carbon or compensating countries or companies that reforest land to sequester carbon are examples of ways to create such markets.

Ecotourism, where the beauty and unspoiled quality of an ecosystem is marketed directly, may be another incentive to conserve. In South Africa, a private enterprise called Conservation Corporation negotiated with farmers to return 168 km^2 of their land to its original habitat and stock it with big-game animals. Open for business as a safari destination, the land is now yielding $200–$300 per hectare annually from visitor fees instead of $21–$68 from ranching or farming, and providing a biologically diverse resource base to support the large game (Anderson 1996:207; Honey 1999:374). In the Maldives, a government study determined that a single live shark yields approximately US$33,500 annually in tourist revenue, compared to US$32 when caught and sold by a fisherman. This and other studies supplied the incentive for the Maldives to make sharks, turtles, and dolphins protected species (Sweeting et al. 1999:66, citing WTO 1997).

In some ways, "priceless" may be the most accurate value that we can ever place on intangible ecosystem goods and services such as a coastal area's beauty or a mountain range's spiritual importance. But used as one of many measures of an ecosystem's worth, and with recognition of its limitations, environmental economics offers a powerful ecosystem management tool in a political world. Until we fully understand ecosystem values, we are handicapped in deciding what to use and what to save.