



## ENVIRONMENTAL STEWARDSHIP

# Protecting Ecosystem Services

*In addition to natural resources, ecosystems provide goods and services like fresh air, clean water, biodiversity, open space and recreation. Farmers, land managers, and policymakers need to fully understand these benefits to make decisions that balance resource use and conservation and economic and environmental impacts. Researchers at land-grant universities across the nation are taking a closer look at how ecosystem services are affected by climate and land-use changes and developing tools and strategies to protect them.*

### EXAMPLES INCLUDE:

- The loss of deciduous oak woodlands is a major conservation concern in **California**, resulting in associated losses of wildlife habitat, traditional uses, biodiversity and other ecosystem services. An interdisciplinary research team addressed fundamental gaps in knowledge about oak woodland ecology in the north coast. Government agencies, landowners, and others have used this information to guide restoration programs. Findings also contributed directly to newly adopted state policy and funding opportunities that support oak woodland restoration and conservation.
- **Illinois** researchers found that the nearly \$15 million spent worldwide on biodiversity conservation between 1992 and 2002 prevented a 29% decline in threatened birds and mammals. Researchers also created a model that can be used to set conservation funding goals on a country-by-country basis according to threat intensity and cost.
- An **Illinois** study showed that forest management and conservation can reduce poverty.
- An online educational game created by **Iowa** scientists uses interactive simulators to teach high school students how to make decisions that balance agricultural production with environmental impacts.
- Aggressive plant pathogens are often introduced to ecosystems through infested plants used in restoration projects. These pathogens can result in failed restorations and lethal disease in nearby native flora. Researchers in **California** identified practices to curtail pathogen spread, developed cost-effective surveying and diagnostic tools (including using dogs to sniff out the pathogen), and trained workers. Implementation could save plant stock production facilities tens of millions of dollars, ensure successful restoration projects worth hundreds of millions of dollars, and prevent damage to natural ecosystems and biodiversity.

## ENVIRONMENTAL STEWARDSHIP

- Studies showed that cereal rye, the primary cover crop used in **Illinois**, is a preferred habitat for many migratory bird species whose populations have been declining. This information provides direction on how to manage farmland to protect birds.
- Many homeowners like to plant wildflowers to attract pollinators, which play a key role in maintaining healthy ecosystems. But commonly sold seed blends contain flowers that are not well-suited to **Georgia** growing conditions, are susceptible to common diseases in the state or may become invasive plants. University of Georgia scientists created a special blend of wildflowers for Georgia growers. Over 20,000 seed packets have been delivered at 4-H events, fair booths, farmers markets and conferences.
- University of **California** Cooperative Extension offered workshops for Master Gardeners from counties affected by severe tree die-off due to drought and bark beetle outbreak. Master Gardeners were able to give up-to-date advice to the public and empower landowners so that they could make informed tree removal and replanting decisions.

### VALUING ECOSYSTEM SERVICES

Unlike natural resources like timber, food and oil, ecosystem services are harder to assign monetary value. Land-grant university researchers have used new and improved methods to accurately assess the economic value of ecosystem services.

With this information, government agencies, nonprofit organizations, land managers and private landowners are able to estimate potential losses under certain land use, climate, and natural disaster scenarios and weigh the costs and benefits of management and mitigation options. Accurate value estimates also make it easier to develop business models that account for ecosystem services and design programs that use economic incentives to encourage ecofriendly actions.

In particular, members of this multistate group measured consumers' willingness to pay more for certain goods to account for the ecosystem services they provide or so that farmers can afford to use practices that protect ecosystem services. Researchers also estimated the value of biodiversity's contributions to carbon storage and pest control. Others tracked the impacts of water quality on recreation and housing sale prices. Together, these studies present a detailed and comprehensive picture of the economic value of ecosystem services.

#### ABOUT LANDGRANTIMPACTS.ORG

The Land-Grant University System is a uniquely American institution, and has operated successfully for more than a century. The [landgrantimpacts.org](http://landgrantimpacts.org) website documents and demonstrates the collective and individual impacts of the national system of joint teaching, research, and extension institutions.

*Prepared by the National Impacts Database Communications Subcommittee, supported by ESCOP, ECOP and USDA/NIFA.*

02/2019

Photograph provided by the USDA.