

## Vegetation Studies in National Parks, Wildlife Refuges, and Other Protected Areas



- **The Challenge:** Forests and marshes provide critical habitat for numerous species of plants and animals. National Parks, Wildlife Refuges, and other protected areas are attempting to protect, manage, and in some cases, restore our forests and marshes, many of which provide critical habitat for declining, threatened, or endangered species, in addition to providing recreational opportunities across the U.S. These natural communities are being degraded by a variety of anthropogenic forces, including habitat destruction due to urbanization or conversion to agriculture, and the effects of invasive species, introduced diseases, and environmental contaminants. Maintaining healthy forests and marshes is important if we are to continue to provide valuable habitat for many of our native species.



- **The Science:** This research has documented the growth rates of trees and shrubs in forests in Hawaii and Texas, and the effects of herbivory on forests and marshes in Maryland and the District of Columbia. In Hawaii, we are studying montane tropical rain forest which provides habitat for endangered Hawaiian honeycreeper finches, along with many other rare and endemic species. This research has documented the age of the dominant tree species as being very old for very large trees, implying that restoration may take hundreds, if not thousands, of years. In Texas, we are studying restoration of Juniper-Oak forest, critical habitat for the endangered golden-cheeked warbler and black-capped vireo. Concerning herbivory, we have documented the effect of white-tailed deer on vegetation in various National Parks, and the effect of Canada geese on marshes in the National Capital Region.



- **The Future:** This research is a collaboration between USGS, the National Park Service, the U.S. Fish and Wildlife Service, and various private and academic partners and volunteers. Some of these studies are meant to be long term and represent valuable time series of information for studying vegetation changes in our National Parks and Wildlife Refuges in the future. After all, we will not have forest birds unless we protect and manage the forests and trees on which they depend, nor will marshes denuded by Canada geese be as productive without some form of ongoing management plan.