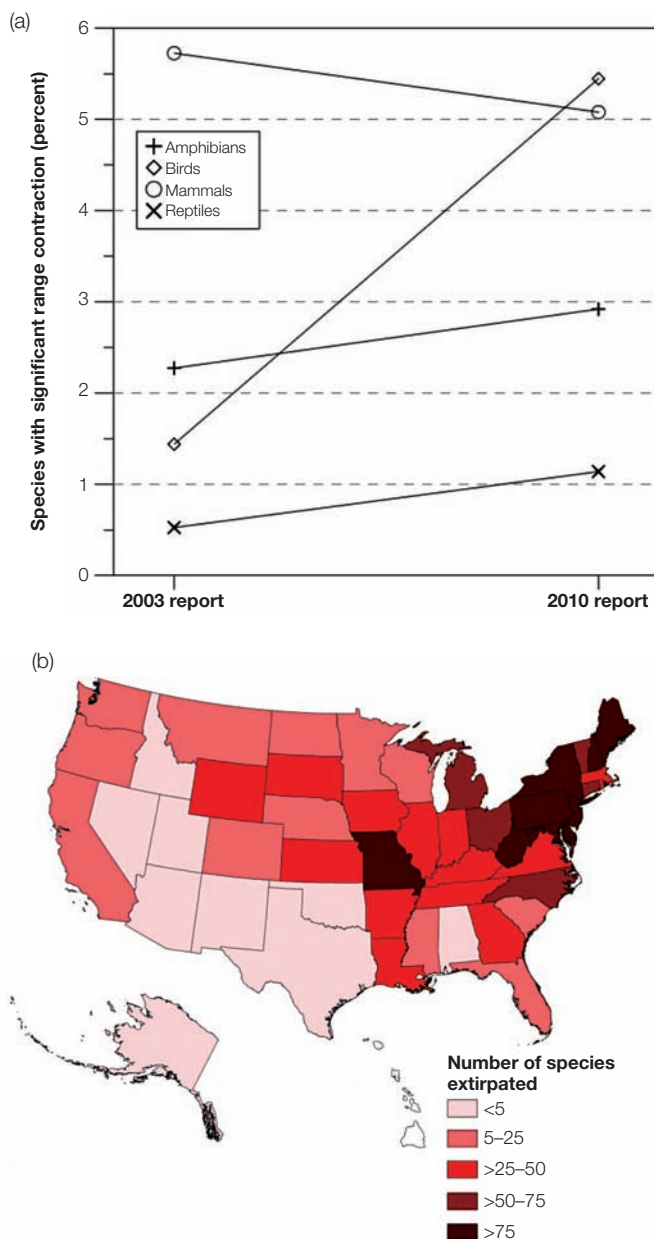


Figure 7-2. A comparison of the 2003 and 2010 reports for forest-associated terrestrial vertebrates on (a) the percentage of species that now occupy less than 80 percent for their former geographic distribution (based on State-level occurrence data), and (b) the number of species (vascular plants, vertebrates [no freshwater fish], and select invertebrates) that have been extirpated within each State. (Actual reporting dates were 2002 and 2009.)



Indicator 1.08. Population Levels of Selected Representative Forest-Associated Species To Describe Genetic Diversity.

What is this indicator and why is it important?

This indicator uses population trends of selected bird and tree species as a surrogate measure of genetic diversity. Population decreases, especially associated with small populations, can lead to decreases in genetic diversity, and contribute to increased risk of extinction. Many forest-associated species rely on some particular forest structure, vegetation associations, or ecological processes. Monitoring population levels of such representative species will indicate the status of the associations of species associated with specialized conditions. Management use of this indicator will ensure forest health conditions are being monitored and may help avoid species extinction.

What does the indicator show?

Between 1966 and 2006, about 27 percent of forest-associated bird species increased and 25 percent decreased; for nearly one-half the species no strong evidence existed for an increasing or decreasing trend. Most of 38 tree species or species groups analyzed showed increases in number of stems of greater than 50 percent for moderate to large diameter classes (greater than 12 inches in diameter) between 1970 and 2007 (fig. 8-1). State wildlife agency data indicate that populations of many big game species increased in the past 25 years, but forest-associated small game species showed mixed trends.

Are there important regional differences?

The South has the greatest proportion of physiographic regions with higher numbers of bird species with significantly decreasing trends compared to bird species with significantly increasing trends (fig. 8-2). For tree species, the Pacific Coast Region has a greater number of tree species or species groups showing declines in large diameter classes compared to other regions (fig. 8-3).

What has changed since 2003?

Most forest-associated bird species with significantly decreasing population trends between 1966 and 2003 also had decreasing trends between 1966 and 2006. Bird species associated with early successional and wetland habitats are among those with declining population trends; populations of some generalist bird species and some favored by burning have increased (fig. 8-4a). Most tree species showed relatively small changes in stem numbers since 2002, although a few species such as black walnut had increases greater than 15 percent and other species such as jack pine decreased by greater than 25 percent (fig. 8-4b).

Why can't the entire indicator be reported at this time?

Population data are lacking for taxa other than trees, birds, and a small subset of hunted species. We need systematic strategies

for monitoring population levels of other taxa and an objective approach for selecting a minimum subset of species that will adequately represent the status of genetic diversity across the full biota.

Figure 8-1. Number of tree species or groups of species in the Forest Inventory and Analysis (FIA) database by percent change in stem numbers (a measure of tree population size), by FIA diameter class mid-points, for trees greater than 5 inches in diameter breast height, between 1970 and 2006.

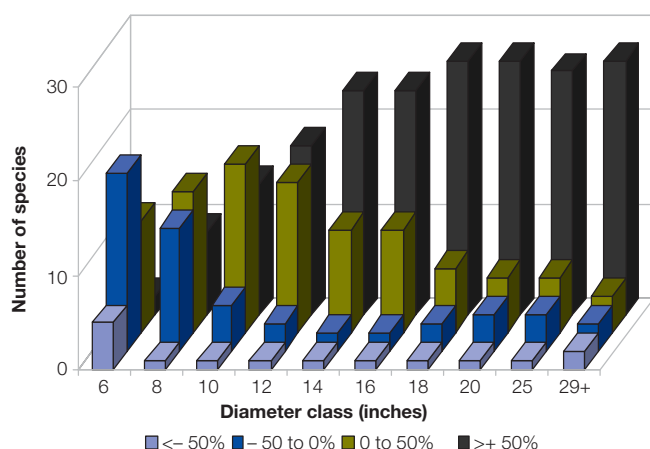


Figure 8-2. Difference (D) between the number of forest bird species with significantly (P is less than 0.1) increasing and decreasing population trends, by physiographic region, between 1966 and 2006, calculated from the U.S. Geological Survey Breeding Bird Survey database.

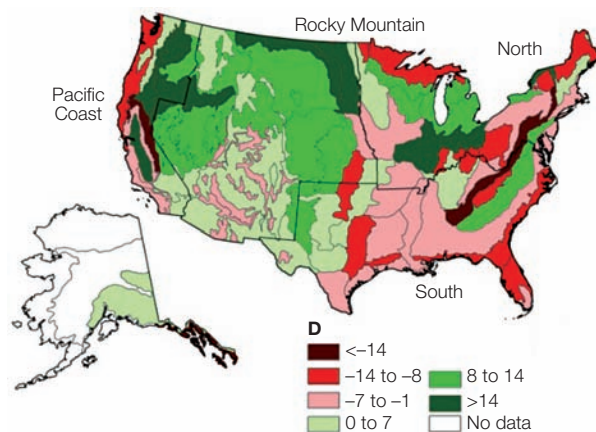


Figure 8-3. Number of tree species or groups of species in the Forest Inventory and Analysis (FIA) database by percent change in stem numbers, by FIA diameter class midpoints, for trees greater than 5 inches in diameter breast height (dbh), between 1970 and 2007, by region: (a) Pacific Coast, (b) Rocky Mountain, (c) North, and (d) South.

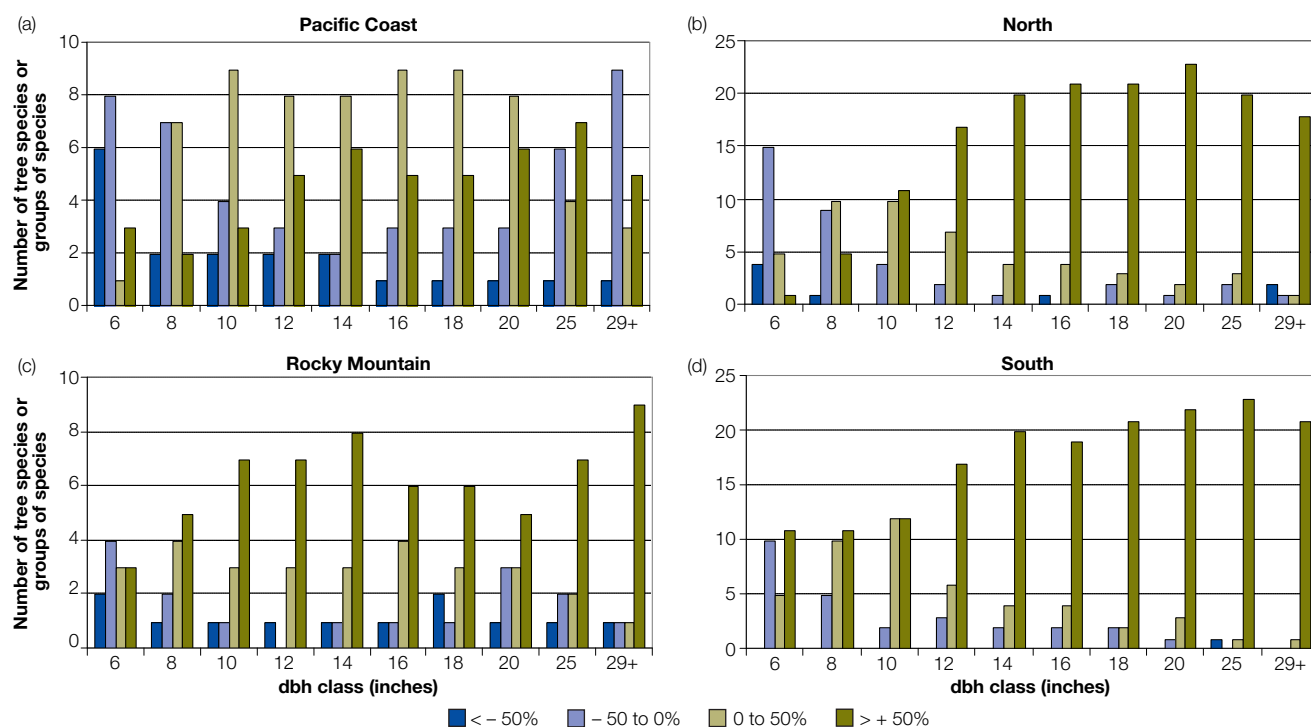
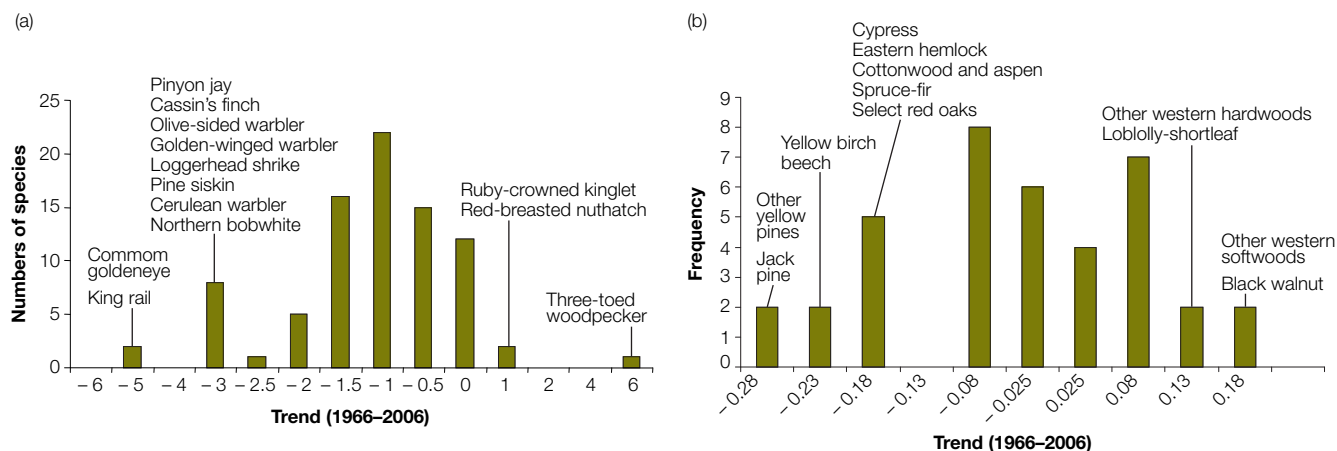


Figure 8-4. (a) Number of forest bird species by population trend. Classes between 1966 and 2006 for the subset of species that had significantly (P is less than or equal to 0.1) decreasing population trends between 1966 and 2003, calculated from the U.S. Geological Survey Breeding Bird Survey database. (b) Frequency of tree species or groups of species in the Forest Inventory and Analysis database by relative change classes in total stem numbers between 2002 and 2007.



Indicator 1.09. Status of Onsite and Offsite Efforts Focused on Conservation of Genetic Diversity

What is the indicator and why is it important?

This indicator describes the extent of onsite and offsite conservation efforts for native species at the genetic level. Onsite efforts are those conducted in the field, such as efforts to increase populations of endangered species. Offsite efforts are conducted in laboratories, greenhouses, arboreta, seed banks, seed orchards, and similar facilities. Sustainable forest management requires a commitment to conserve locally or regionally adapted populations of native species using a combination of onsite and offsite approaches.

What does the indicator show?

Onsite conservation of genetic diversity is provided by parks and other protected areas, genetic and ecological conservation areas, reserved forest areas, and through planned natural regeneration. Onsite conservation efforts for genetic diversity of plants and animals vary greatly in spatial extent and intensity of management. Many public forests include genetic conservation for common species as a primary management goal and are managed intensively for species that are rare, threatened, endangered, or of special concern. Some private forests also are managed to conserve genetic diversity. These onsite efforts to conserve genetic diversity largely overlap with efforts to conserve species diversity that are described for Indicator 1.06, and that material is not duplicated here.

Offsite genetic conservation efforts tend to be intensive and are often focused on breeding programs or archival programs. These measures are sometimes undertaken, for example, to ensure that seed used for replanting after harvest has sufficient genetic diversity. Offsite genetic conservation occurs at zoos, seed banks, seed orchards, clonal archives, arboretums, and similar facilities. These are summarized in table 9-1. Institutions differ in the proportion of total effort that is focused on forest species. Some institutions work on global and domestic forest genetic diversity conservation.

What has changed since 2003?

This indicator was not reported in 2003.

Are there important regional differences?

Many broadscale, onsite efforts to conserve genetic diversity are associated with public forest land and protected areas. Much public forest land is managed to conserve species diversity and genetic diversity as part of a multiobjective management strategy. Public forest land and protected forests in all ownerships are concentrated in the Western United States (see Indicators 1.02 and 1.06).

Offsite programs for conservation of genetic diversity are widely dispersed. Zoos, arboretums, and seed banks often work on global and national issues associated with genetic conservation. Facilities such as seed orchards, clonal archives, and provenance tests that grow plant material are constrained by the climate where they are located, but they also can participate in international efforts to conserve genetic material.