

# Indicator 1.05:

## Number and status of native forest-associated species at risk, as determined by legislation or scientific assessment

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### What is the indicator and why is it important?

Indicator 1.05 provides information on the number and status of forest-associated species at risk or in serious decline. This is done by monitoring the number of native species that have been identified by conservation science or mandate to be at risk of global extinction. As the number of species considered to be rare increases, the likelihood of species extinction also increases. As populations become smaller, demographic and environmental events such as failure to find a mate, disease, disturbance, habitat loss, and climate change interact to increase extinction risk. Since important ecosystem functions (e.g., productivity, nutrient cycling, or resilience) and non-use values (e.g., existence values) can be degraded with the loss of species, there is concern that the goods and services humans derive from ecological systems will become diminished as more species become rare. For this reason, tracking the number and percent of at-risk species is a measure of forests' ecosystem health, their ability to support species diversity, and their capacity to provide benefits to people.

### What does the indicator show?

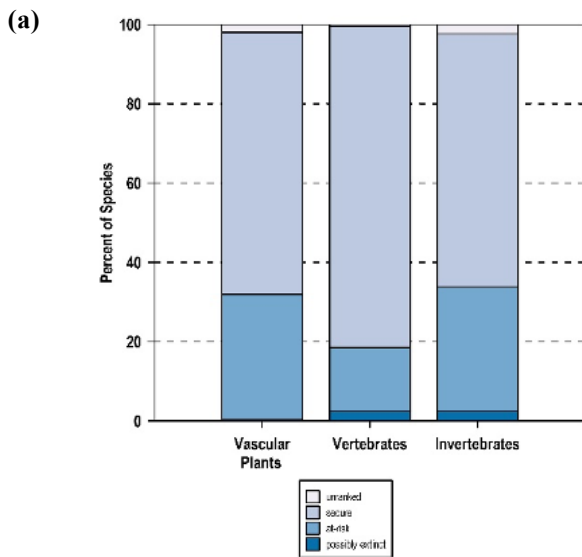
Among forest-associated species (vascular plants, vertebrates, and selected invertebrates), 111 (1 percent) were determined to be presumed or possibly extinct, 5,328 (31 percent) were determined to be at-risk of extinction (includes species assessed as critically imperiled, imperiled, or vulnerable to extinction), and 12,025 (69 percent) were determined to be apparently secure or were unranked. The number of possibly extinct and at-risk species is proportionately greatest among vascular plants (32 percent) and selected invertebrates

(34 percent)—nearly double the percentage observed among vertebrates (19 percent) (fig. 5-1a). Within forest-associated vertebrates, the greatest proportion of possibly extinct and at-risk species is found among amphibians (37 percent). Although birds (16 percent), freshwater fishes (13 percent), mammals (12 percent), and reptiles (14 percent) have lower percentages of at-risk species, they also need conservation concern.

### What has changed?

Since the 2010 Sustainability Report, a combination of actual change, revised accounting of species habitat associations, and updated records has affected total numbers of native forest-associated species (Indicator 1.04), and numbers of those species considered possibly extinct or at risk of extinction (shown here). The percent of at-risk species increased from 28 percent in 2010 to 31 percent in 2020 across all taxa. While 3 percent represents a small difference in percentage points over one 10-year period (especially when considered against uncertainty of estimates), in relative terms, the 2020 percentage of at-risk species is 11 percent larger than the 2010 percentage. Furthermore, cumulative impacts of small changes over multiple decades can be substantial. Within taxonomic groups, the percentage of species considered possibly extinct or at risk of extinction during 2010 and 2020, respectively, were 28 and 32 percent for vascular plants, 16 and 19 percent for vertebrates, and 32 and 34 percent for selected invertebrates (fig. 5-2a).

Every vertebrate taxon has shown slight increase since 2010 in numbers of species thought to be extinct or at risk of extinction (fig. 5-2b). The increases (percentage points) were 2.7 for amphibians, 2.2 for birds, 0.9 for mammals, 3.4 for reptiles, and 1.5 for freshwater fishes.



Vertebrates comprised of amphibians, birds, freshwater fishes, mammals, and reptiles.  
 Update of 2015 Indicator 5 Figure 5-1a.  
 Source: FINAL\_SAVRS\_Chinkill\_VorPill\_Domestic\_V1\_09062020.XLSX (https://www.doi.gov/eis/2015/09062020.XLSX)  
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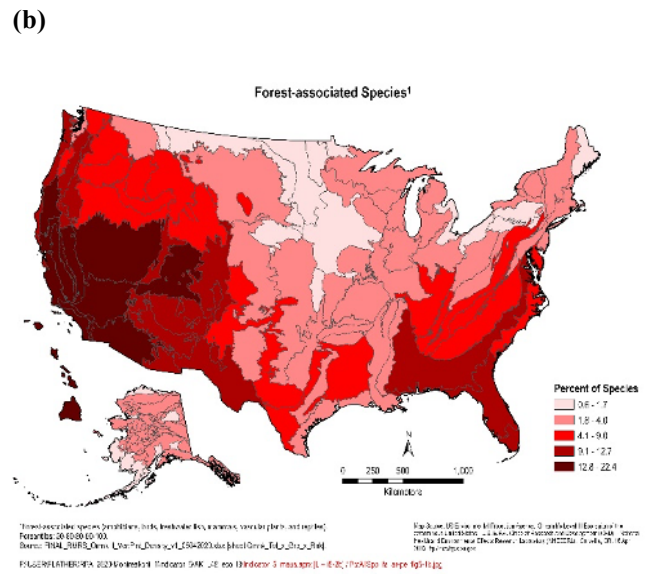


Figure 5-1—(a) The percent of vascular plant, vertebrate, and select invertebrate species associated with forest habitats determined to be possibly extinct, at risk of extinction, secure, or unranked. (b) The percentage of forest-associated species (vascular plants and vertebrates) occurring in each ecoregion determined to be at risk of extinction (does not include species classified as “possibly extinct”). Class upper thresholds represent 20, 60, 80, 90, and 100th percentiles.  
 Source: Data provided by NatureServe.

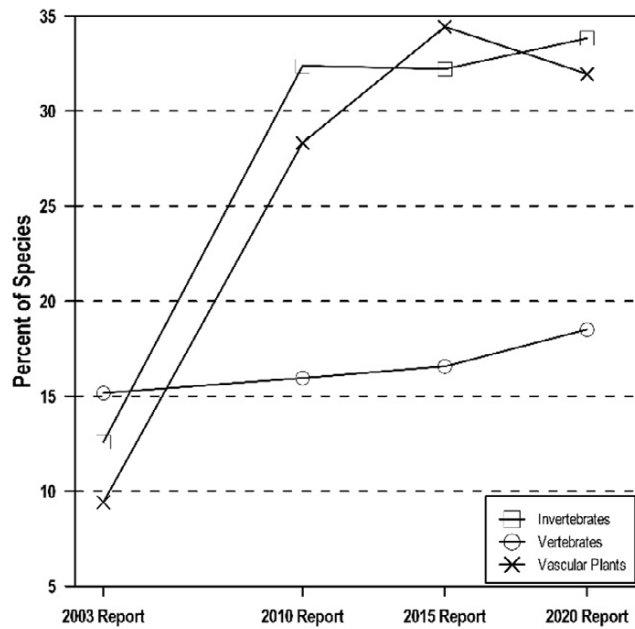
## Are there important regional differences?

At-risk species associated with forest habitats are concentrated geographically in Hawaii, the arid montane habitats of the Southwest, the chaparral and sage habitats of Mediterranean California, and in the coastal and inland forests of northern and central California (fig. 5-1b).

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

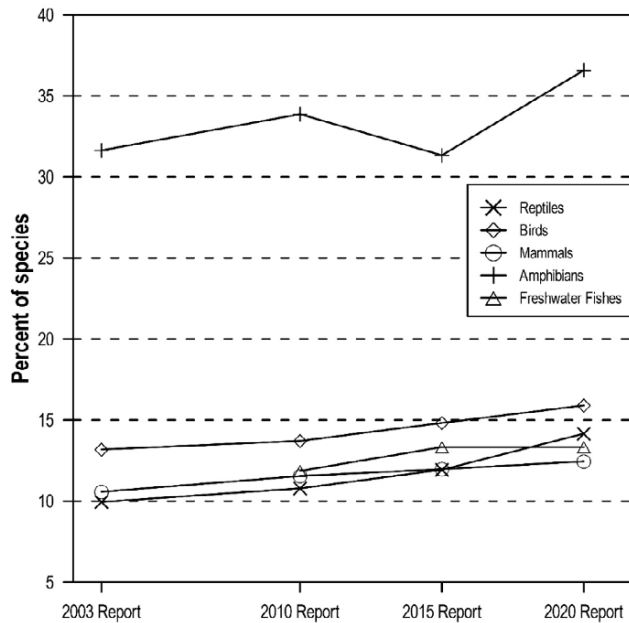
Information on the conservation status of obscure species is lacking in many cases. Among 17,464 forest-associated species analyzed for this report, 334 (1.9 percent) were not assigned a conservation status category nor a habitat affinity, ranging from 0.5 percent unranked vertebrates, to 2.0 percent unranked vascular plants, to 2.4 percent unranked invertebrates. Compared to the previous report, the percentage of unranked species has decreased substantially for invertebrates, only slightly for vascular plants and vertebrates, which were already low during the last report. Trends in the number of at-risk forest-associated species need to be interpreted cautiously as ranking efforts continue.

(a)



Vertebrates comprised of amphibians, birds, freshwater fishes, mammals, and reptiles.  
Update of Indicator 5 Figure 5-2a.  
Source: FINAL\_RMRS\_OmnkIll\_VertPInt\_Density\_v1\_05042020.xlsx [sheet Figure 5-2a]  
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(b)



Update of Indicator 5 Figure 5-2a.  
Source: FINAL\_RMRS\_OmnkIll\_VertPInt\_Density\_v1\_05042020.xlsx [sheet Figure 5-2b]  
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Figure 5-2—A comparison of the percent of forest-associated species that have been determined to be possibly extinct or at risk of extinction between the 2003, 2010, 2015, and 2020 Reports among (a) vascular plants, vertebrates, and select invertebrates, and (b) among the relatively well-known mammal, bird, reptile, amphibian, and freshwater fish species groups. The conservation status of forest-associated freshwater fish species ( $\Delta$ ) was unavailable for the 2003 Report. Data provided by NatureServe.  
Source: Data provided by NatureServe.

# Supporting Data for Indicator 1.05

Ecoregion maps from: Omernik's Level III Ecoregions of the conterminous United States. Corvallis, OR: U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory. Accessed: 16 April 2013. <ftp://newftp.epa.gov>.

Species data from: NatureServe. October 2020. Anne Frances and Jason McNees. 2020. Biodiversity Datasets for the National Report on Sustainable Forests.