

SOD-Induced Changes in Foraging and Nesting Behavior of Insectivorous, Cavity-Nesting Birds.

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Sudden Oak Death (SOD) is a tree disease caused by a recently described pathogen, *Phytophthora ramorum*. The disease affects dozens of plant species, but its effects are particularly pronounced in stands of coast live oak (*Quercus agrifolia*), often resulting in large stands with dead canopies and many downed trees. Such disease-induced habitat changes may impact bird populations by altering their resource base. For example, forest dieback can result in changes to insect populations, which subsequently impact insectivorous birds by forcing them to switch prey items, change foraging substrates, or increase foraging time. This can ultimately impact the nesting success of these birds. The goal of this study is to examine the effects of SOD-induced changes in oak woodlands on insectivorous cavity-nesting birds, particularly oak titmice (*Baeolophus inornatus*) and chestnut-backed chickadees (*Poecile rufescens*). We have been examining the impacts of SOD on the population ecology of these birds by studying nest box use, and the behavioral ecology by studying foraging behavior and diet composition. We established study plots in the San Francisco Bay area in several stands that represent a gradient from high to low impact from the disease. Preliminary data indicate that birds may show increased use of nest boxes in high-SOD areas, and that nestling survival may be higher in less-affected areas. Our diet analyses indicate that foliage-dwelling Lepidoptera are particularly important to both bird species during the breeding season, and that oaks harbor considerably more insect prey than California bay-laurel (*Umbellularia californica*). Our foraging observations show that coast live oak is the primary foraging substrate for oak titmice, while chestnut-backed chickadees prefer to forage on a diverse range of tree species. Both species avoid bay trees for foraging. In heavily affected stands, birds tend to switch to a variety of other trees and shrubs as foraging substrates, rather than feed more heavily on remaining oaks. As a result, the loss of oaks may be particularly detrimental to oak titmice, as they are forced to switch to sub-optimal foraging locations. Chickadees may be better able to adjust to the loss of some oaks, due to their more flexible foraging niche. These results indicate that sudden oak death may affect insectivorous birds through a number of different pathways, including loss of nest sites, prey reduction, and loss of foraging substrates. We suggest that any management related to sudden oak death recognizes the importance of protecting healthy coast live oaks while promoting diverse stands in affected areas.