SECONDARY EFFECTS OF BT SPRAY ON AVIAN PREDATORS: THE REPRODUCTIVE SUCCESS OF CHESTNUT-BACKED CHICKADEES – 1987

Philip K. Gaddis
Northwest Ecological Research Institute
NERI Report 87-02

ABSTRACT – Chestnut-backed Chickadees (*Parus rufescens*) and their relatives make extensive use of caterpillars as a food resource for their growing nestlings. *Bacillus thuringiensis* (BT) is lethal to many caterpillars. When used for control of the Gypsy Moth (*Lymantra dispar*), spraying of BT could adversely affect reproductive success of chickadees by reducing populations of Lepidopterans. Because there is variation in chickadee nest success in different years, the 1986 study of the potential secondary effects of BT spraying was repeated in 1997. A total of 173 nest boxes at 11 sites around Portland, Oregon were used to monitor chickadee nest activity in 1987. Nestlings were weighed and visual diet samples collected before and after BT spraying occurred at five of the sites. Of the 32 Chestnut-backed Chickadee nests studied, eight were in the treatment areas. The proportion of caterpillars was significantly lower in diets of chickadees nesting in sprayed areas, but there was no difference in the percentage of eggs hatched or in nestling weights. However, non-predation related nest failures were significantly higher in the treatment areas, with all nest failures occurring suddenly within one week. Dead nestlings were at normal weights and tested negative for several chemical pesticides, but it was not possible to test for direct effects of BT or other possible causes. Several nests in the non-treatment sites also died from unknown causes. Aside from the nest failures from unknown causes, spraying for Gypsy Moth control with BT did not result in any detectable adverse secondary effect in the parameters of Chestnut-backed Chickadee reproductive success that were investigated.