

# ALTERNATE YEAR BEECHNUT PRODUCTION AND ITS INFLUENCE ON BEAR AND MARTEN POPULATIONS

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Maine's Department of Inland Fisheries and Wildlife is interested in determining the amount of beech (*Fagus grandifolia*) needed on the landscape to support bear and other wildlife populations. Long-term monitoring of Maine's black bear (*Ursus americana*) and marten (*Martes americana*) populations indicate that beechnut production may be correlated to alternate year patterns in bear reproduction and marten harvest rates. In northern Maine, 22% of the female black bears that were reproductively available reproduced following falls when beechnut production was poor. The proportion of reproducing females increased ( $P < 0.001$ ) to 80% following falls when beechnut production was high. Female bears must accumulate sufficient fat reserves to reproduce. Female bears ( $\geq 7$  yr of age) were heavier following good beechnut years. After 21 years of a consistent alternate year pattern in bear reproduction, the reproductive pattern changed in 2003. Possible explanations related to beechnut production and forestry are discussed. For marten, trapping harvests rates exhibit a strong alternate year pattern where harvest rates during odd-numbered years are double the harvest rates of even-numbered years. Marten harvest patterns are similar ( $P < 0.001$ ;  $r^2 = 0.65$ ) in northern Maine and the Adirondacks of New York, and appear to be inversely related to beechnut production. Two hypotheses have been proposed to explain the variance in harvest rates: (1) marten are difficult to attract to baited traps during years when beechnuts are abundant (2) increased energy intake from small mammals and nuts during a good beechnut year increases kit production or survival. This results in a large number of juveniles available for trapping the following fall. We conclude that more information is needed on mast production to better understand the influence of beech on northern ecological communities.