

Steenhof, K. and M.N. Kochert. 1988. Dietary responses of three raptor species to changing prey densities in a natural environment. *Journal of Animal Ecology* 57:37-48.

(1) Diets of three nesting raptor species were evaluated from 5939 prey items collected from nests in south-western Idaho during a 10-year period that included a complete jack rabbit population cycle and an unusual ground squirrel population crash.

(2) Jack rabbits were the principal prey of golden eagles; Townsend's ground squirrels were the main prey of prairie falcons and red-tailed hawks. Prairie falcons had the most specialized diets, and red-tailed hawks the most diverse. None of the three raptor diets reflected the relative abundance of prey types in the environment.

(3) Diet diversity of each of the three raptor species expanded as the abundance of their main prey declined. Ground squirrels and birds were alternate prey for eagles; gopher snakes, kangaroo rats, and rabbits were alternate prey for red-tailed hawks. Prairie falcons had no single important alternate prey species.

(4) Yearly frequencies of main prey in each of the three raptor diets were correlated with the annual abundance of that prey in the environment. Frequencies of alternate prey were correlated not with their own abundance but inversely with the abundance of the principal prey.

(5) Eagle preference for jack rabbits was strong and unaffected by changes in prey densities. Red-tailed hawk selectivity for jack rabbits was inversely related to ground squirrel abundance, suggesting 'switching' behaviour. Prairie falcon selectivity for ground squirrels did not vary with ground squirrel densities.

(6) Prey choice was generally consistent with predictions of the original optimal diet model, but red-tailed hawk prey selection appeared to depend on relative prey densities. Degree of diet specialization and plasticity are probably related to a raptor's life-history characteristics, and may influence a raptor's effects on its prey populations.