

## EFFECT OF VEGETATIVE COVER ON FORAGING SITE SELECTION BY SWAINSON'S HAWK

MARC J. BECHARD

**ABSTRACT.**—Foraging bouts of male Swainson's Hawks (*Buteo swainsoni*) were observed using radio-telemetry to determine the effect of plant cover on the selection of foraging sites. Home ranges consisted of varying amounts of cultivated and uncultivated habitats. Cultivated fields were the most abundant and they supported large amounts of prey, but were not hunted until crop harvest reduced the density of their plant canopy. A negative correlation between estimates of plant cover and foraging suggested that habitat differences such as vegetative cover were of greater importance than prey density in the selection of hunting sites. A correlation between foraging and prey biomass after it had been adjusted for vegetative concealment indicated that models relating prey abundance with raptor foraging should consider the effect of such a habitat difference on the availability of a hunting site's food supply.

The efficient selection of hunting sites is critical for foraging birds. Because physical features vary among habitats, it is logical to assume that these differences would influence the availability of food and a bird's hunting success. Discussions of avian foraging have begun to emphasize the importance of such factors as plant cover, distance of travel, and weather in the selection process (Goss-Custard 1970, Royama 1970, Hassell 1971, Smith and Dawkins 1971, Zach and Falls 1976a, b, Kushlan 1979, Eiserer 1980, Fitzpatrick 1980). Although descriptions of habitat use by foraging raptors are limited, they indicate that, for species such as hawks and owls, plant cover and weather may have a greater effect than prey abundance on the suitability of their foraging habitats (Southern and Lowe 1968, Wakeley 1978, Stinson 1980). If this is true, predator-prey models that assume a direct relationship between hunting and prey density (MacArthur and Pianka 1966, Emlen 1968, Simons and Alcock 1971, Alcock 1973, Poole 1974) would need to be reconsidered when applied to raptors.

I report here the results of a study I conducted to determine the effect of plant cover on the availability of Swainson's Hawk (*Buteo swainsoni*) prey. I predicted that, if plant cover limited the productivity of potential hunting sites, a reduction in a habitat's cover would increase its use by foraging hawks. Birds nesting in farmland of southeastern Washington were ideal to study because crop harvest reduced plant cover in large portions of their nesting habitat. Using estimates of plant cover together with estimates of prey density, I compared the distribution of foraging efforts before

and after harvest for a possible correlation between a habitat's use and its vegetative cover.

### STUDY AREA

The study was conducted in two areas within Whitman County, Washington. Area 1 was located about 5 km southwest of Pullman and included most of the Washington State University Experimental Dairy Farm. It contained the home ranges of three nesting male Swainson's Hawks, designated Males 1, 2, and 3. Male 1 was followed in 1978 and Males 2 and 3 were followed in 1979. Area 2 was located approximately 11 km southwest of Pullman and included the home range of one nesting male Swainson's Hawk, designated Male 4. This bird was followed in both 1978 and 1979.

I observed foraging during the nestling stage of the nesting season when males provided most of the food for brooding females and developing young. In addition to their mates, Males 1, 2, 3, 4 (1978), and 4 (1979) supported broods at hatching of 4, 3, 2, 2, and 2 young, respectively. Nests of Males 1 and 4 were constructed 10.2 and 9.7 m above the ground in black locust (*Robinia pseudoacacia*) trees and those of Males 2 and 3 were located 8.8 and 4.8 m up in cherry (*Prunus* sp.) and hawthorn (*Crataegus douglasii*) trees, respectively.

This area of Washington has been classified as a shrub-steppe region (Daubenmire 1970) and has open, rolling terrain, currently being used for wheat and pea cultivation. I selected the two areas so that the presumed ranges of males contained different amounts of land being cultivated and planted in either of these crops. Harvesting of pea fields began after 20 July and was completed by the first week of