

**1995 Annual Report**

to

**City of Boulder Open Space Department**

**THE INFLUENCE OF LINEAR RIGHT-OF-WAYS ON FOOD FINDING  
BY BLACK-BILLED MAGPIES & RAVENS**

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## ABSTRACT

Road, trails and other linear alteration or structures such as power lines are thought to be used by foraging scavengers for food finding or locating prey (Knight and Kawashima 1993, Conner and Adkisson. 1976). I examined food finding efficiency by Black-billed Magpies (*Pica pica hudsonia*) and Common Ravens (*Corvus corax*) near roads, trails and in unaltered, homogenous landscapes or "Remote" areas. Bait piles (beef suet) along roads, were found sooner and utilized more than baits along hiking trails, and remote sites.

## PROJECT DESCRIPTION

### Objectives

It has been suggested that linear landscape features such as roads, trails and power lines may be used by avian scavengers to locate prey or food resources (Knight and Kawashima 1993, Conner and Adkisson. 1976). These studies were conducted by comparing sightings of Raven (*Corvus corax*) and raptors along roads, power lines, and in a contiguous-homogenous landscape or "natural areas" (Knight and Kawashima 1993).

The primary objective of this study is to test whether avian scavengers actually find food by using linear landscape features by examining recruitment to bait piles in similar settings. I substituted recreational trails instead of powerlines.

A secondary objective is to intensively examine one population of magpies in order to determine how far from nest or roost sites magpies forage and whether recruitment to bait piles is from within local nesting populations (neighbors) or roosting groups (roost-mates).

Among the members of the family *Corvidae* Black-billed Magpies (*Pica pica*) and Common Ravens (*Corvus corax*) are notable as nest predators of other passerine birds (Andren, 1992) and scavengers of road kill. Studies of the interactions between humans and Corvids suggest that habitat alterations benefit these scavengers to the detriment of other wildlife species (Angelstam, 1986; Hansen and Urban, 1992).

City of Boulder Open Space contains areas which have been altered by linear landscape features (roads, power lines and trails) and areas which are more isolated and remote. The anticipated value of this study is to determine if the effect of these landscape features on corvid foraging patterns acts to limit the area searched for food, thereby enhancing foraging efficiency. This study compliments studies by David Craig and others already underway in City of Boulder Open Space that examine the impacts of corvids on other wildlife densities and productivity.

### Hypotheses

**H<sub>1</sub>:** Scavenger recruitment to bait piles is fastest (time elapsed until bait is found) and greatest (number of birds) along roadsides, then trails, and slowest/least natural areas.

$H_0$ : Recruitment is similar among bait pile locations.

## METHODOLOGY

Five (5) pounds of beef suet were placed at locations of each type, roadside (n=8), trailside (n=3) and remote (n=8) areas for a total of 19 trials. All sites were located within 30 km of the Flatirons Vista Trailhead, City of Boulder Open Space. To control for temporal differences in foraging all trials began between 0600 and 1000 hours. Observations began immediately upon placement of the bait and continued for at three hours.

The data collected consist of the location type, the duration of time until the first scavenger found a bait pile and the maximum number of scavengers at bait piles during each fifteen minute interval until 1 hour and each hour thereafter.

Scavengers present included both corvid species, Red-tailed Hawk (1), Northern Harrier (1), Coyotes (2). Only the corvid data is presented here.

## Results

Roadside baits were found sooner (though not significantly so due to small sample sizes thusfar) than trailside or remote baits (Figure 1,  $F_{2,16} = 1.348$ ,  $p = 0.288$ ; ANOVA). Roadside baits also attracted more corvid scavengers sooner than trailside baits, and these more and sooner than remote baits (Figure 2,  $F_{2,16} = 5.63$ ,  $p = 0.03$ ; Repeated Measures ANOVA). Data continues to be collected at irregular intervals. I envision that the study will be completed by March of 1996.

## Literature Cited

- Andren, H. 1992. Corvid density and nest predation in relation to forest fragmentation: a landscape perspective. *Ecology* 73:794-804.
- Angelstam, P. 1986. Predation on ground nesting bird's nests in relation to predator densities and habitat edge. *Oikos* 47:365-373.
- Knight, R.L. and J.Y. Kawashima 1993. Responses of raven and red-tailed hawk populations to linear right-of-ways. *J. Wildl. Manage.* 57:(2):266-271
- Conner, R.N. and C.S. Adkisson. 1976 Concentration of foraging common ravens along the Trans-Canada Highway. *Can. Field Nat.* 90:496-497.

Figure 1

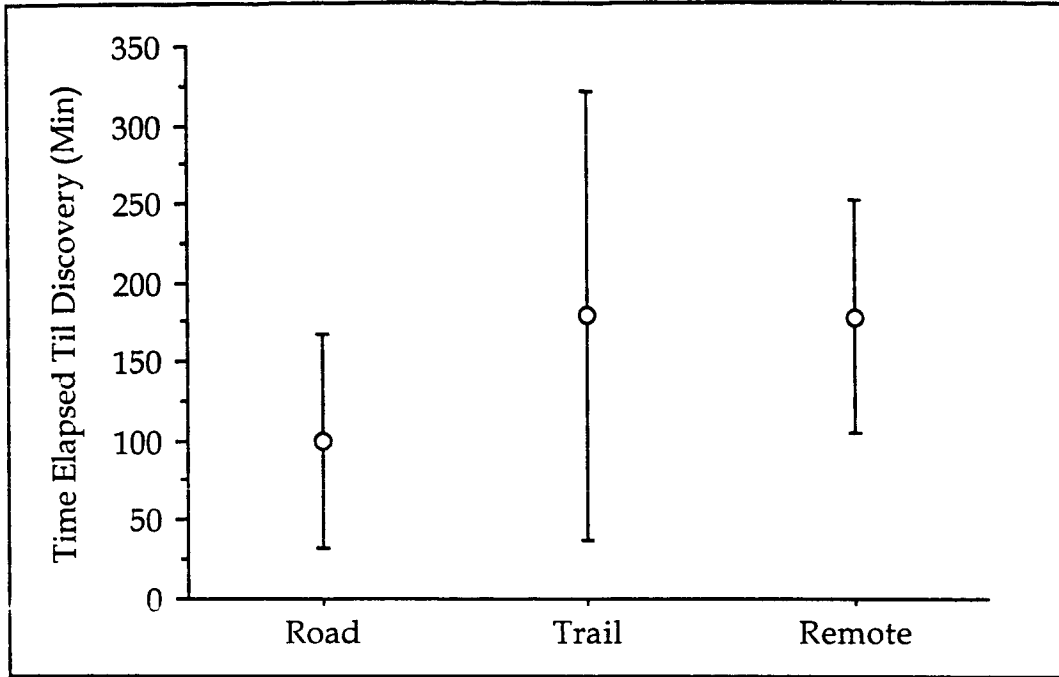


Figure 2

