

## NOTES

### FORAGING BEHAVIOR OF A CROSS-BILLED NUTCRACKER

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Bill morphology is adapted to feeding niche in many avian species (e.g. Myton and Ficken 1967, Newton 1967). Consequently bill deformities, depending on their severity, may reduce an individual's longevity and reproductive success. For species with broad foraging niches, i.e. generalists, individuals with abnormal feeding structures may compensate somewhat by restricting their efforts to whatever alternative foraging patterns or prey sizes are available.

The behavior and morphology of the Clark's Nutcracker (*Nucifraga columbiana*) are adapted to a specialized diet of fresh and stored pine seeds (Bock et al. 1973, Vander Wall and Balda 1977, Tomback 1977, Tomback 1980). Yet, like other corvids, nutcrackers opportunistically forage on berries, bird eggs, picnic and trash scraps, insects and spiders, and scavenge and prey upon rodents, nestlings, and other small vertebrates (Tomback 1977 and references therein, Giuntoli and Mewaldt 1978, Mulder et al. 1978).

On 23 August 1980 we saw a nutcracker foraging on Deer Mountain Trail, ca. 100 m from Deer Ridge Junction, elevation ca. 2590 m, Rocky Mountain National Park, Colorado. The upper and lower mandibles of the nutcracker were overgrown by about 1 cm. Possibly, the extra length forced the normally slightly decurved upper mandible to cross down and to the left of the lower mandible. The lower mandible was twisted out of alignment distally so that the dorsal and ventral surfaces near the tip were nearly lateral. When the bird vocalized (Regular Call, Mewaldt 1956), it opened its mandibles in normal fashion.

From 1015 to 1038 and from 1045 to 1053 the nutcracker foraged on the ground for large, black ants (*Formicidae*) and other insects. Two foraging patterns were used: the nutcracker either probed the gravel substrate with its closed bill or gleaned from the substrate surface. Most of these foraging efforts were concentrated on or around an ant nest and appeared successful. Before and between foraging bouts, the nutcracker perched on a fallen log or in a Ponderosa Pine (*Pinus ponderosa*). Observations terminated when the nutcracker flew off at the approach of horses and riders.

Except that it lacked the left five, white rectrices, the nutcracker seemed in fair condition. The bird was molting body plumage, which was typical at that time for the species (Mewaldt 1958). As suggested by the patches of buffy feathers on the lateral, upper dorsal region, the nutcracker had reached an advanced stage of postjuvenile molt somewhat earlier than usual.

Several factors suggested that the foraging behavior of the nutcracker represented an accommodation to an aberrant bill morphology: At this time of year 1) nutcrackers eat primarily ripening pine seeds, and 2) most nutcrackers are at subalpine elevations (Tomback 1977). No other nutcrackers responded to this individual's locational calls (Tomback, unpubl. data), nor did we observe other nutcrackers during the 2 hrs we spent in the vicinity. It is unusual for nutcrackers to be solitary at any time of year, and especially so for a recently-independent juvenile.

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It was doubtful that the nutcracker was capable of harvesting and manipulating pine seeds, which requires complex motor skills (Tomback 1977). However, despite its handicap, the nutcracker had apparently sustained itself by foraging opportunistically. In contrast, on 29 August 1973, Tomback (unpubl. data) observed a juvenile whose lower mandible was broken off at the base. At least a week after other juveniles were foraging independently, this bird continually begged for food and pursued a parent. The parent was not observed to feed the persistent youngster and repeatedly attempted to evade it.

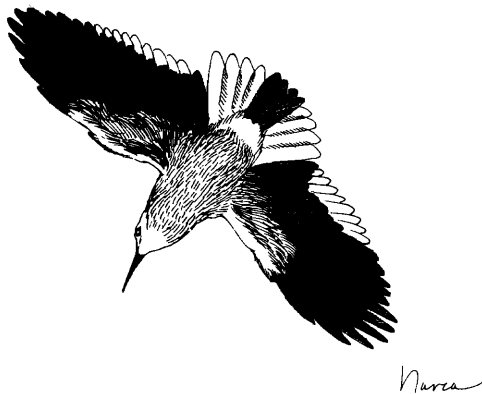
### ACKNOWLEDGMENTS

We thank L. Richard Mewaldt for his comments on the manuscript.

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*Accepted 2 November 1981*



Clark's Nutcracker

*Sketch by Narca Moore*