

## FEATURED PHOTO

### DO NUTCRACKERS USE AUTOMOBILES AS NUTCRACKERS?

P. ROSS GORMAN, 1630 18th St., Cody, Wyoming 82414; rossgorman@aol.com

While driving through Yellowstone National Park, Wyoming (at 44.9° N, 110.5° W, 2122 m elevation), on 22 April 2019, I came across a Clark's Nutcracker (*Nucifraga columbiana*) standing in the opposing lane of traffic. The nutcracker had a live Western Tiger Salamander (*Ambystoma mavortium*) in its bill. Intrigued by the scene, I pulled into a nearby roadway turnout and began to photograph this interaction between predator and prey.

A nutcracker preying on a salamander is not in itself unusual. After all, salamanders living in Yellowstone National Park come out from hibernation in April and migrate to ponds for breeding. An opportunistic predator like Clark's Nutcracker may take advantage of such a situation because salamanders then become accessible. In fact, several avian species that do not normally feed on vertebrates have been reported preying on salamanders elsewhere: the Tufted Titmouse (*Baeolophus bicolor*; Hendricks and Hendricks 1985), Hermit Thrush (*Catharus guttatus*; Coker 1931), and American Robin (*Turdus migratorius*; Wilson and Simon 1985). Clark's Nutcracker has been reported preying on various vertebrates, moreover, as small as tadpoles (Pilliod 2002) and as large as adult toads and ground squirrels (Mulder et al. 1978). However, what I subsequently observed was unusual:

- Before a motor vehicle came into sight, the Clark's Nutcracker placed the live salamander near the center of the traffic lane.
- The nutcracker flipped the salamander onto its back (see photo on this issue's outside back cover).
- The nutcracker then released the salamander and flew to a roadside tree.
- As a motor vehicle approached, in the same lane as the now supine salamander, the nutcracker remained perched.
- After the motor vehicle passed over the salamander without striking it, the nutcracker flew down to the road surface.
- The nutcracker repositioned the salamander near the original spot, again turning it on its back, and then flew back to its observation perch.

The nutcracker repeated this behavior over a period of approximately 5 minutes, during which motor vehicles passed three times. After the third pass, the nutcracker flew down to the road surface, retrieved the still living prey, and flew off. Each time the bird repositioned the salamander on the road surface, the nutcracker spent time standing over it. It then returned to its observation perch before the next approaching vehicle came into sight. Once a vehicle had passed, the nutcracker was quick to fly down and take possession of the salamander once again. I never observed the bird drop the salamander from height. Rather, it repeatedly *placed* the salamander on the pavement. (It is possible that the nutcracker dropped its prey prior to my observation.)

Such a sequence of behaviors might suggest that the nutcracker was employing the road's hard surface and the sporadic flow of traffic as a means to "crack open" the salamander, thereby exposing the prey's edible parts. So the question posed by this observation, which parallels the one posed by Maple (1974) in this journal 47 years ago: "Do nutcrackers use automobiles as nutcrackers?"

Some of the best documented examples of avian resourcefulness and adaptability (i.e., avian intelligence) have focused on members of the family Corvidae. Corvids

## FEATURED PHOTO

consistently demonstrate intellectual skills superior to those of many other birds, and in many cases comparable to those of primates (Emery 2004). One notable example is that of New Caledonian Crows (*Corvus moneduloides*) that fashion and then use hooks as tools to retrieve food items otherwise inaccessible (Hunt 1996). Equally impressive are reports from Japan of Carrion Crows (*Corvus corone*) that deliberately place walnuts in the path of soon-to-be moving automobiles so that the tires will crush the nut's hard shell, exposing its edible parts (Nihei 1995). Nihei and Higuchi (2001) suggested, moreover, that the use of moving vehicles as "nutcrackers" by Carrion Crows followed the precursory behavior of dropping walnuts from height onto hard surfaces to crack them open. It was then by chance that some of the dropped walnuts were inadvertently run over and cracked open by moving vehicles. Witnessing such an event might have stimulated a Carrion Crow to go from simple food-dropping to deliberately using vehicles as nutcrackers.

In Davis, California, Maple (1974) reported a single observation of an American Crow (*Corvus brachyrhynchos*) that dropped a walnut on a well-traveled street. Wondering if the crow expected a vehicle to crush the walnut, Maple (1974) asked: "Do crows use automobiles as nutcrackers?" He suggested that they do, starting a discussion as to whether or not avian species are capable of using automobiles as nutcrackers. In support of Maple's suggestion, Grobecker and Pietsch (1978) reported observing a single crow in Long Beach, California, drop palm fruit from height onto a busy residential street. Even though the palm fruit broke into two pieces upon impact with the pavement, the crow flew to an observation perch and waited for one of the pieces to be run over by a vehicle. Only then did the crow fly down to the roadway and retrieve the now shattered fruit.

To exemplify corvid intelligence by citing moving vehicles as "nutcrackers" is not without controversy. Cristol et al. (1997) contended that their own observations of crows in Davis, California, did not support Maple's (1974) and Grobecker and Pietsch's (1978) conclusions, but rather that crows' perceived use of vehicles as nutcrackers was simply an incidental byproduct of the crow's food-dropping behavior: They disagreed that crow behavior has developed beyond the level of food-dropping.

Though I did not witness the nutcracker dropping its prey, it might have done so prior to my observation. But dropping this soft-bodied prey from height would have been ineffective at "cracking" it open, given the tough, pliable skin of a salamander. Dropping prey from height onto a flat surface such as a roadway may be an effective means to stun or stress soft-bodied prey, but employing such behavior to expose the innards would be futile. In addition, even though such behavior has been documented in at least two dozen avian species, including at least nine of *Corvus* (Cristol and Switzer 1999), I'm not aware of a previous report of *Nucifraga* engaging in such behavior.

Certainly a nutcracker's bill can puncture a salamander's skin. But, lacking a hooked bill adapted for tearing flesh, a nutcracker might not be able to tear the skin sufficiently to expose the edible parts. The weight of a motor vehicle would surely do the job, however messily. And an automobile's quick dispatch of a salamander would also substantially reduce the amount of toxins a salamander might excrete if a nutcracker continued to toy with it. (I identify the whitish droplets evident on both the salamander and the nutcracker as excreted toxin; see photo on this issue's outside back cover).

One possible explanation for the behavior observed is that this particular Clark's Nutcracker had previously witnessed salamanders crossing this section of road and, consequently, getting "cracked open" by passing vehicles. Perhaps this particular Clark's Nutcracker had even fed on such serendipitously available prey. That experience might have stimulated this bird to purposely place the salamander supine on the road surface in an attempt to convert a chance event into a determined one—a conjecture I recognize is derived from a single and all-too-brief field observation.

## FEATURED PHOTO

At minimum, my report adds to a long-running conversation about birds' use of artifacts as tools. But if future observations or studies of nutcrackers confirm this capability, then this observation becomes another record of what Maple (1974:98) eloquently described as “an ingenious adaptation in response to the intrusion of man's technology.” And it does so for a member of the family Corvidae yet to be acknowledged as capable of such an adaptation.

I acknowledge Ed Pandolfino and Daniel D. Gibson for their useful comments and suggested edits to a draft version of the manuscript.

## LITERATURE CITED

- Coker, C. M. 1931. Hermit Thrush feeding on salamanders. *Auk* 48:277; doi.org/10.2307/4076824.
- Cristol, D. A., and Switzer, P. V. 1999. Avian prey-dropping behavior II: American Crows and walnuts. *Behav. Ecol.* 10:220–226; doi.org/10.1093/beheco/10.3.220.
- Cristol, D. A., Switzer, P. V., Johnson, K. L., and Walke, L. S. 1997. Crows do not use automobiles as nutcrackers: Putting an anecdote to the test. *Auk* 114:296–298; doi.org/10.2307/4089172.
- Emery, N. J. 2004. Are corvids “feathered apes”? Cognitive evolution in crows, jays, rooks and jackdaws, *in* *Comparative Analysis of Minds* (S. Watanabe, ed.), pp. 181–213. Keio Univ. Press, Tokyo.
- Grobecker, D. B., and Pietsch, T. W. 1978. Crows use automobiles as nutcrackers. *Auk* 95:760–761; doi.org/10.1093/auk/95.4.760.
- Hendricks, P., and Hendricks, G. T. 1985. Probable predation by a Tufted Titmouse on a salamander. *J. Field Ornithol.* 56:418.
- Hunt, G. R. 1996. Manufacture and use of hook-tools by New Caledonian Crows. *Nature* 379: 249–251; doi.org/10.1038/379249a0.
- Maple, T. 1974. Do crows use automobiles as nutcrackers? *W. Birds* 5:97–98.
- Mulder, B. S., Schultz, B. B., and Sherman, P. W. 1978. Predation on vertebrates by Clark's Nutcrackers. *Condor* 80:449–451; doi.org/10.2307/1367199.
- Nihei, Y. 1995. Variations of behaviour of Carrion Crows (*Corvus corone*) using automobiles as nutcrackers. *Japanese J. Ornithol.* 44:21–35; doi.org/10.3838/jjo.44.21.
- Nihei, Y, and Higuchi, H. 2001. When and where did crows learn to use automobiles as nutcrackers? *Tohoku Psychologica Folia* 60:93–97.
- Pilliod, D. S. 2002. Clark's Nutcracker (*Nucifraga columbiana*) predation on tadpoles of the Columbia Spotted Frog (*Rana luteiventris*). *Northwest. Nat.* 83:59; doi.org/10.2307/3536907.
- Wilson, A. G, and Simon, E. M. 1985. *Plethodon vandykei idahoensis* (Coeur d'Alene salamander) predation. *Herp. Rev.* 16:111.

Accepted 7 November 2020



“Featured Photo” by © P. Ross Gorman of Cody, Wyoming: Clark's Nutcracker placing a salamander on its back in the middle of an active roadway, 22 April 2019, Yellowstone National Park, Wyoming. Note on both the salamander and the nutcracker the whitish droplets of toxin excreted by the salamander, suggesting that the salamander's skin had already been pinched or pierced. But the salamander is otherwise intact and actively defending itself.

