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### *Ad Libitum* Water Source for a Common Raven

Lawrence M. Hanks,<sup>1,5</sup> James D. Barbour,<sup>2</sup> Kim Kratz,<sup>3</sup> and William C. Webb<sup>4</sup>

**ABSTRACT.**—We report a Common Raven (*Corvus corax*) that learned to turn on a water faucet in a campground at Death Valley National Park, Inyo County, California, USA, and drink from it. *Ad libitum* availability of water has important implications for survival and reproductive success of desert birds. Ravens commonly exploit anthropogenic sources of water and food; these behaviors are of interest because ravens can be important predators of the federally-threatened desert tortoise (*Gopherus agassizii*). Our observation is further evidence of the resourcefulness of ravens and challenges involved in limiting access to anthropogenic resources for an intelli-

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Anthropogenic sources of water, whether provided intentionally or not, can influence the size and quality of habitats for birds that require free water (Fisher et al. 1972, Kotler et al. 1998, Harrington 2002, Boarman 2003). Ravens (*Corvus* spp.) commonly drink from unrestricted artificial water sources such as stock tanks (Knight et al. 1998, Harrington 2002), sewage ponds (Boarman 2003), and wildlife water catchments (O'Brien et al. 2006). Common Ravens (*C. corax*) in the Mojave Desert of North America greatly improve their survivorship and fecundity by exploiting anthropogenic subsidies (Webb et al. 2004, Kristan and Boarman 2007), which has resulted in a dramatic increase in their population size in recent years (Boarman and Berry

<sup>1</sup> Department of Entomology, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA.

<sup>2</sup> University of Idaho, South West Idaho Research and Extension Center, Parma, ID 83660, USA.

<sup>3</sup> National Oceanographic and Atmospheric Administration-Fisheries, 1201 Northeast Lloyd Boulevard, Suite 1100, Portland, OR 97232, USA.

<sup>4</sup> College of Forest Resources, Box 352100, University of Washington, Seattle, WA 98195, USA.

<sup>5</sup> Corresponding author; e-mail: hanks@life.uiuc.edu

1995, Kristan and Boarman 2007). This increase in raven abundance is of concern because Common Ravens can be important predators of the federally-threatened desert tortoise (*Gopherus agassizii*) (Boarman 2003). We observed a Common Raven that learned to exploit an artificial water source usually unavailable to wildlife: a water faucet that was intended for use of campers and travelers in Death Valley National Park where Common Ravens are abundant year round (National Park Service 2006) and the desert tortoise is present (Morafka and Berry 2002).

#### OBSERVATIONS

At ~1700 hrs PST on 9 April 2007, three of the authors (LMH, JDB, and KK) observed a Common Raven at Emigrant Campground (36° 29' 47.73" N, 117° 13' 39.26" W; elevation 656 m) in Death Valley National Park, Inyo County, California, USA. Natural sources of water were limited at the time because of low amounts of precipitation during the previous 6 months (Western Regional Climate Center 2007). The raven landed on the ground near a picnic table and walked slowly by, unsuccessfully searching for food. After a few minutes, it flew to a sign above a nearby water faucet. It then hopped down to the faucet, turned it on, and bent down to drink several times. The raven hopped back onto the sign and then flew to a tree ~30 m away. There also was a smaller raven perched in the tree, and it visited the campground, but did not drink from the faucet. The two birds were the only ravens in the vicinity of the trees at that time. We suspected the larger raven was a male and the smaller raven was its mate because male ravens are larger than females, they more readily engage in potentially risky foraging behaviors, and because the two birds were amicable and in close association (all diagnostic of mated pairs; WCW, unpubl. data). The smaller bird was probably not a juvenile, because juveniles of the current year would not yet have fledged at the time of our observation, and juveniles of the previous year would have dispersed from their natal territory by that time (Heath and Ballard 2003, Webb et al. 2004).

The larger raven returned to the sign after <30 min and again turned on the faucet and drank from it. We photographed the male dur-

ing the second visit, and also video recorded it with a digital camera (Olympus C-765 Ultra Zoom, Olympus America Inc., Center Valley, PA, USA). The faucet was a brass self-closing hose bib with a lever handle with an internal spring that shut it off automatically. It was operated by pushing down on the lever to start the flow of water, then releasing the lever to stop the flow. The raven landed with its left foot on the handle; it was not possible to identify the position of its right foot. Water began flowing immediately, the raven bent down and the flow stopped, then started again, and the raven drank for about 1 sec. The raven then straightened up, and the flow of water nearly stopped, apparently because the bird had reduced pressure on the lever. It bent down again, the flow of water increased, it drank for about 1 sec, straightened up, and the flow nearly stopped again. It repeated this sequence of behaviors (bending down and increasing the flow, drinking for 1 sec, then straightening up and slowing the flow) another four times. The entire process, from landing on the faucet to the last drink, lasted ~20 seconds. A raven of similar size drank from the faucet later that afternoon in a similar manner, but we could not be certain it was the same bird.

#### DISCUSSION

Desert birds are subject to desiccation by water loss from respiration and evaporative cooling that may be exacerbated by flight (Fisher et al. 1972, Kotler et al. 1998). Desiccation can be a leading cause of mortality of birds in lower elevation areas of Death Valley (Wauer 1962). Availability of free water has important implications for desert birds, particularly because it may be of much higher quality than water from natural desert sources (California Department of Water Resources 2004). This is especially true for diurnal species that are permanent residents (Bartholomew and Cade 1963, Lynn et al. 2006).

Ravens are capable of learning sophisticated behaviors to solve problems (Range et al. 2006, Heinrich and Bugnyar 2007), allowing them to adapt to extreme environments and obtain essential resources (Restani et al. 2001). The raven we observed may have learned to operate the faucet by individual problem-solving, imitating another raven, or by imitating human campground visitors (e.g.,

Hosey et al. 1997, Sasvári and Hegyi 1998). Ravens use a wide variety of anthropogenic resources, including those available in campgrounds (Marzluff and Neatherlin 2006). Our observation is evidence of the resourcefulness of the Common Raven and challenges involved in limiting access to anthropogenic resources for an intelligent, subsidized predator.

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