



ScienceWatch – Clever Crows

“We had occasionally seen birds using stick tools at our two breeding facilities, but hadn’t thought much about it.” – B. Masuda

In college I learned that humans were special in many ways. One such trait was the ability to use tools. But in 1964 the primatologist Jane Goodall shattered our self-centered sense of superiority by showing that chimpanzees were also tool users. Since then many animals have been observed using tools in the wild and birds are no exception. Indeed, the second tool-using animal Goodall documented was the Egyptian vulture (*Neophron percnopterus*) using rocks to break open ostrich eggs.

Aesop’s fable, “The Crow and the Pitcher,” demonstrates that crows have long been regarded as highly intelligent tool users. The fable, in which a thirsty crow raises the water level in a partially filled pitcher by dropping in stones until it can get a drink, was found to be fact for New Caledonia crows (*Corvus brachyrhynchos*) (<http://www.hras.org/sw/swoct09.html>), which are also capable of sophisticated tool-making that rivals the crafting of tools by early humans (<http://hras.org/sw/swjan08.html>).

Now a new study adds a second crow species to the tool-user list. Writing in the September 13, 2016 issue of *Nature*, a team co-headed by Christian Rutz, University of St. Andrews, St. Andrews, UK, and Bryce Masuda, Institute for Conservation Research (ICR), San Diego Zoo Global, Volcano, Hawai‘i, shows that the Hawaiian crow (*Corvus hawaiiensis*) is an innate tool-maker.

The Hawaiian crow or ‘Alalā (pronounced: ‘a-la-lah) evolved from the common raven in Hawai‘i where it is endemic. Sadly, by 2002 this rarest corvid was extinct in the wild. As of September 2016, the entire world’s Hawaiian crow population comprised 131 birds, all of which are kept in two ICR facilities, on Hawai‘i Island and Maui. The ICR has been conducting a captive breeding program for ‘Alalā in Hawai‘i and is planning to release birds into the wild this year.



Masuda and others noticed the birds occasionally using stick tools, but since tool use had been well-documented in the New Caledonia crow, they paid it little mind. Meanwhile, Rutz, who studied the New Caledonia crow, was looking other crow species with similar features—straight bills and large, mobile eyes—that should enable them to manipulate tools. The Hawaiian crow looked like a good candidate so he contacted Masuda. Learning of his observations, Rutz decided to examine the tool-using skills of ‘Alalā under controlled conditions, and so the St. Andrews and San Diego groups joined forces.

The researchers provided adult birds with a log containing several drilled holes, each with bait (usually a waxworm) and an assortment of sticks (longer, shorter, straight, and curved). Bait was

also placed on the log to encourage exploring it. The birds were tested one at a time and each test lasted about an hour. The scientists tested 104 out of 109 'Alalā and found that 78% of birds spontaneously picked up sticks left by the researchers and used them as tools to probe and retrieve the out-of-reach bait. Many of the birds also shortened the sticks as needed and some even made their own tools by cutting sticks from bushes just as New Caledonia crows do.

'Alalā and New Caledonia crows split off from each other about 11 million years ago. So the authors believe tool use evolved independently in the two species, an example of convergent behavior. "It is striking that both species evolved on remote tropical islands in the Pacific ocean that lack woodpeckers and ferocious bird predators—perfect conditions, apparently, for smart crows to become accomplished tool users," said Rutz.

The scientists also tested seven naïve juvenile 'Alalā that had never seen an adult use a tool. These birds were given assorted sticks and a wooden platform containing food-baited vertical and horizontal holes and crevices. Within a few days the youngsters began carrying sticks in their beaks, probing with them and getting the bait. According to Rutz, "Using tools comes naturally to 'Alalā. These birds had no specific training prior to our study, yet most of them were incredibly skilled at handling stick tools, and even swiftly extracted bait from demanding tasks. In many regards, the 'Alalā is very similar to the New Caledonia crow, which my team has been studying for many years."

This study shows us how important it is to save every species. We had never seen 'Alalā use tools before they became extinct in the wild. Saving them allowed us to learn what a few crows on the brink of extinction can do. Let's hope they will be released successfully back into the wild.

William Beebe, the first curator of birds at the Bronx Zoo, once said, "The beauty and genius of a work of art may be reconceived, though its first material expression be destroyed; a vanished harmony may yet again inspire the composer; but when the last individual of a race of living beings breathes no more, another heaven and another earth must pass before such a one can be again."

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