Ravens vs. Tortoises: Protected species killing endangered species

Story and photographs by Laurie Pearson, Marine Corps Logistics Base, Barstow, California

The Environmental Division is tasked with carefully balancing one protected species against one endangered species with another aboard Marine Corps Logistics Base (MCLB), Barstow, California.

A Mojave Desert Tortoise, *Gopherus agassizii*, rests near some beaver-tail cactus flowers, aboard Marine Corps Logistics Base Barstow, CA, April 15, 2019. Public domain.

The Desert Tortoise was added to the Federal Endangered Species List, as a threatened species, in 1990, due to a rapidly declining population. Their population dropped nearly 95 percent throughout their range. Ravens, on the other hand, are protected under the Migratory Bird Treaty Act, which is an international treaty between Canada, the United States of America and Mexico which was put into place in 1906. Here in the High Desert, these two species are essentially at war and the Desert Tortoise is sorely losing that battle.

"Here in the Mojave Desert, the U.S. Fish and Wildlife Service noticed that as the Desert Tortoises were declining, less and less juvenile tortoises were being observed during surveys, there is a direct correlation to an increase in raven population," said Cody Leslie, natural resource specialist for the base. "When I say direct correlation,' I mean that as the tortoises are decreasing in population, the ravens have increased by as much as 1,500 percent. That's a huge increase."

Historically, the raven population was limited in the desert due to location of food, water and natural nesting sites, such as cliff faces and Joshua trees, he explained.

"Ravens are predatory birds, with no natural enemies or predators in this area," he said.

With the increase in humans in the desert, several things changed, impacting these two species of animals. When Highways 15 and 40 were built, and power lines put in place, corridors were created offering exponentially higher numbers of places for ravens to nest.

"As humans subsidize the desert, via towns, roads, landfills, agriculture, rest areas and waste at specific sites, like food trash," he said, "it gave the ravens a way to thrive in the desert."

Ravens are both predatory and opportunistic birds, which typically eat small animals, eggs of other birds, and reptiles.

"By adding power lines alone, we created nesting sites throughout the entire range of the Mojave Desert Tortoise habitat," Leslie said. "They now are in an elevated position, with a 360-degree view and are able to see any threat, as well as any prey in the vicinity."

Although ravens are typically found everywhere, there were larger populations in areas such as the Sierra Mountains and the coastal mountains, where habitats and water are more prevalent. Humans have disrupted that balance, and now high elevation nesting options, and atypical water sources, such as sprinklers leaving puddles and man-made ponds, are now available.

"The Mojave Desert Tortoise [MDT] range from southern Utah, west of the Colorado River, down to El Centro area," Leslie explained. "East of the Colorado River, there is another species called the Sonoran Desert Tortoise. Some areas within each range are considered Critical Habitat, meaning it is prime territory for MDT to flourish and recover, and hopefully thrive."

The MCLB Barstow area belongs to the Ord-Rodman Critical Habitat Unit, which is shared with Marine Corps Air Ground Combat Center 29 Palms.

"One problem is that we've isolated our tortoise population by creating highways, which they can't cross effectively," Leslie said.

In some cases, such as when bases are looking to expand, those isolated tortoises may have to be translocated or moved to an area ideal for their survival. Before translocation can be conducted, Environmental staff must track the tortoises and even conduct blood work.

"Some tortoises have a mycoplasma making them more susceptible to Upper Respiratory Tract Disease," Leslie said. "Captive tortoises are more likely to develop URTD than wild tortoises. So, that's why they can never be released back out into the wild. They can even get tortoise

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ticks, shell lesions, and even a version of the herpes virus."

There are several factors that have contributed to the decline in the Mojave Desert Tortoise population, in addition to those mentioned above.

"They live to approximately 80 to 100 years old," Leslie said. "It takes approximately 6 to 10 years for their shells to harden, making them easy prey for ravens. In addition, it can take 15 to 20 years for them to reach sexual maturity."

Females may breed with as many as six males at a time, so for each clutch of eggs, there may be up to six "baby-daddies." This provides genetic variations as a means to increase the potential survival of the species.

"Tortoises are slow-moving, long living creatures, slow to sexual maturity so they've adapted these techniques to promote genetic survival," Leslie explained. "This also means that these promiscuous tortoises may transmit such things as viral herpes at a surprising rate. The males also fight because it is competition based mating. So they may seriously injure one another."

The males have large horns [i.e., gular scutes – Editor's note] which they can use to flip other males onto their backs making them more vulnerable to the elements and predators.

A juvenile desert tortoise shell shows deadly impact of ravens to the tortoise population on base. Public domain.

The young and the weak, or compromised tortoises are not the only tortoises attacked by ravens now.

"Now we're even finding that they're even attacking the healthy adult tortoises," Leslie said. "They attacking and killing them via their shell access points. It's pretty gruesome. The Superior-Cronese Critical Habitat staff conducted a study using dummy adult tortoises. They used cameras on the dummies and observed raven predation. During the study, 43 percent of the adult-sized dummies were attacked by ravens. Nearly half of the adults are under attack. That's a lot."

Mojave Desert Tortoise aboard MCLB Barstow. Public domain.

On MCLB Barstow there are adult, breeding tortoises, but when surveys are conducted, Leslie and the others conducting the surveys have yet to find juveniles or hatchlings in several years. This is directly attributed to the out-of-control raven population. While living and working aboard the base, there are several things that employees and families can to do help decrease the raven impact.

"Ensure that all trash is disposed of in containers with lids and that those lids are closed," Leslie said. "Remove all food, to include pet food from areas accessible by birds. Also, remove any external water sources, such as bowls of water and leaking sprinklers from around the homes and offices. Report raven nests and activity to the Environmental Division, creating a work order at [760] 577-6220, and reporting it to me at [760] 577-6744."

One of the tactics that the Environmental Division is undertaking is called "Egg Oiling," which includes handheld and drone-based oiling of eggs in nests, using a silica-based oil. The oil coats the egg, clogging pores so that air can no longer penetrate the shell. The fetus no longer develops. However, the ravens continue to sit on the eggs, for the entire breeding season and do not continue to rebreed.

"Over time, we are reducing the number of breeding ravens," Leslie explained. "When the 2009 Raven Environmental Assessment was conducted, it was shown publicly that it does not have a detrimental impact on the overall raven population. It only manages to control populations in the Critical Mojave Desert Tortoise Habitat."

As an endangered species, humans are forbidden from harassing, collecting, or touching Mojave Desert Tortoises, and this is punishable by $50,000 fines and potential jail time. If someone sees a desert tortoise on base, there are a set list of actions that must be followed.

"If found on base, stop all work in the immediate vicinity," Leslie said. "Contact the Environmental Division, and assign a monitor to watch the tortoise until someone from Environmental has arrived."

If you have questions regarding ravens or the Mojave Desert Tortoise, contact Cody Leslie at [760] 577-6744.

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