Headstarting Program
by Mark Wheeler for the Desert Managers Group
961 words

A military base may seem an unlikely place to find hope for renewal of the declining desert tortoise species. After all, the military has its own very specific work to do, but if recovery of endangered species hasn't traditionally been part of the job description, it is, in fact, part of the duty routine at the Army's Fort Irwin National Training Center and at Edwards Air Force Base. It will soon appear also on the duty roster at the Marine Corps Air-Ground Combat Center.

Called the Headstarting Program, this multi-branch initiative is putting money, technology and science to work on protected base lands in the southern California region to thoroughly study desert tortoise breeding habits and infant tortoise forage and shelter behaviors. It also provides shelter conditions for egg incubation, hatching and infant growth. The overall program goal is to help increase infant survivorship in the field, and to do so with as little interference as possible.

Permitted under Section 10 of the Endangered Species Act (ESA), the program was originally established for research purposes in 1992 at Fort Irwin by Dr. Dave Morafka of the University of Dominguez Hills, just two years after *Gopherus agassizii* was officially listed as a threatened species. Edwards joined the project in 2003 with installation of its own study site.

Although the two programs operate independently of one another, they do share information back and forth on a continuous basis and pursue study objectives that are coordinated to avoid duplication of efforts. Both programs operate under the strictest of controlled-experiment protocols, and every regulation written in the ESA for working with listed species is diligently observed.

At Edwards, the program is administered by the Environmental Management Office. Mark Hagan is the Natural Resources Manager there, and is also the program's lead biologist. Working with contract biologist Mark Bratton and UCLA researcher Dr. Ken Nagy and Scott Hillard, Hagan and his team have installed facilities on a 16 square-mile safe zone on base property, which was verified as active desert tortoise habitat.

Sheltered nursery

The plan is reasonably simple in principle. Egg-carrying females are collected and relocated to sheltered enclosures. There, they can lay the eggs without interference and the developing tortoises inside will be protected against opportunistic predation. When the eggs hatch, the babies are similarly protected until they are released. In this way, it is hoped more eggs will actually develop and hatch, and also that an optimum release age can be determined for the little ones so they stand a better chance of survival in the field.

This is the plan's simple headstarting principle, but as is so often the case, implementation is a rather more complex affair.

For instance, females used in the program must be collected from the immediate environs in order to avoid problems that might result from habitat unfamiliarity. After laying, they are taken back to the location where they were found, and a small transmitter on them allows researchers to find them next year.

Enclosures have to be big enough to prevent the females from feeling confined but small enough so the little hatchlings aren't easily misplaced. Predator access from the

ground and air has to be prevented but the floors must be maintained in natural condition so females can pursue their own burrowing activities.

Leaving home

One of the program's most difficult challenges is to determine age of release for the babies. At Irwin, the original population of hatchlings was retained for six to eight years before release so the baby tortoises' shells had time to harden, a process taking about five years.

When released, researchers discovered the babies had imprinted on the enclosure location and didn't stray far from it. Realizing this could, in time, lead to a crowding problem, Edwards researchers are releasing at earlier ages. However, they realize the soft-shelled babies are at greater risk from predation.

One enclosure at the Edwards site has been receiving a minimum supply of additional water in an effort to increase the plant growth there. Hagan and his team want to explore whether improved feeding conditions will have any affect on the rate of shell calcification. If it does increase the rate, they may have another control factor to use in their plan.

"We're trying to develop techniques that effectively support desert tortoise survival but do it with a minimum amount of interference," said Hagan about his program's primary operational directive.

Delayed gratification

A significant challenge in observing such a policy, he went on to explain, is that feedback on program conditions, assumptions and practices cannot be fully evaluated until the experimental population reaches sexual maturity. "Whether we're using successful techniques or not, or whether any of this will make a difference or not," he clarified, "depends on whether the breeding population is increased." With that, he announced that desert tortoises don't reach sexual maturity for about 15-20 years in the wild.

The theory of sheltered-breeding and release has been successfully applied in the cases of many other endangered and threatened species. In an article written by Bratton on the Edwards program, he named the black-footed ferret, red wolf and California condor as three examples of species brought back from the brink of extinction by sheltered-breeding and release programs.

In its first two years of existence, the Headstarting Program at Edwards provided shelter for 114 eggs. Of that number, 69 hatched, but only a handful of the hatchlings have survived to date. Hagan and company are confident they can improve the survival rate, but are constrained to do so in a manner that will assure population survival in the wild and, at the same time, not interfere with the natural balance of wild populations. It is a head start they want to give the tortoises, not a free ride.