

Status of Desert Tortoise Populations In the California Deserts

by

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The desert tortoise population in California appears to be in rapid decline in the West Mojave, East Mojave and Colorado deserts. Even populations that were thought to be stable or increasing in the early 90s are now also in decline.

In the 1970s and 1980, 27 desert tortoise study plots were established in California. Fifteen of these became part of the long-term monitoring program for the tortoise. All of the fifteen study plots are either in or adjacent to DWMAs. Plots were monitored every 4 years until 1993 when the project shifted and most of the funding was diverted away from this project. There are still a couple of plots that are up to eight years behind. These plots are invaluable because they give us 20+ years of data sets to analyze demographic attributes of tortoises, health and disease in tortoises, changes in vegetation and anthropogenic impacts. Results mentioned for this year are still preliminary findings from Dr. Berry's work.

Four of the six recovery units are within California, which makes up ~75% of the total critical habitat with Joshua Tree National Park and the Desert Tortoise Natural area included.

The first large population decline was found in the West Mojave between the 1970's and mid 1990s with an up to 90% decrease in some populations. Higher than normal losses or mortality rates were attributed to many causes, such as illegal collecting, vandalism, habitat loss, habitat fragmentation, upper respiratory tract disease, predation by common ravens, crushing by vehicles both on and off roads, and trampling by livestock. Plots in the Desert Tortoise Natural area were surveyed again this year. Since 1996/97, there has been about another 50% decline in population. In the western Mojave Desert, most study plots surveyed during the 1990's and in the last two years have showed increasing signs of vandalism, i.e. tortoise being shot, burrows dug up, and tortoises missing appendages and shell damage from feral dog attacks. Dog attacks are becoming an increasing problem throughout the Mojave Desert.

By 1990, stable and/or increasing population trends on study plots were limited to sites in the eastern Mojave and northern Colorado deserts. The Upper Ward Valley plot was surveyed in 1991 and 1995, between which time the population had declined 41%. Many of the dead and live tortoises had shell lesions. The Upper Ward Valley plot was surveyed again this year. 17 live tortoises and 109 shells were found, this amounts to about an 80% decline since 1995.

Chuckwalla Bench began declining in the early 1980's and declines were correlated with shell disease. By 1992, the bench population had declined about 70% and further declines were recorded in 1996. It was also noticed in 1996 that the sex ration was heavily biased in favor of males. (Jacobson et al.,1994).

In 1999, the Chemehuevi Valley plot was resurveyed. It had previously been surveyed in 1988 and 1992 where numbers of tortoises were 257 and 235 respectively. During the spring survey 38 live tortoises were found and 327 dead, over 55% of those had appeared to die in the last four years and most (if not all) had died since the plot was last surveyed. The decline between 1992 and 1999 was 84%. As with Ward Valley, many of the dead tortoises and remaining live ones had severe shell lesions.

The Goffs plot was surveyed in 2000 after not being visited since 1994. Between 1980 and 1994, 220 to 296 tortoises were registered on the plot in each of the three sample years. In the spring of 2000, only 30 live tortoises were found and about 393 remains of dead tortoises. There had been about a 90% die off since this area was last surveyed.

Shadow Valley was surveyed again this year. The last survey was in 1992 and 50 tortoises were found. This year 7 live and parts of about 30 shells were found. It is a projected decline of 80-85% in the last 10 years. This study site has had in the past and continues to have grazing.

Ivanpah Valley was also surveyed again this year after not being sampled since 1994. In 1994 numbers and densities of live tortoises were lower than during the previous survey in 1990, about 120 live individuals. In 2002, 58 tortoises were found. Seventy-three shell-skeletal remains were located, as well as many additional fragments, some of which may constitute new individuals. Projections here are approximately a 50% decline since 1994. Of note, field workers report that approximately 15 juveniles killed by ravens were found near the transmission line towers; these numbers will be checked during analysis of shell-skeletal remains. In 2001, 14 live tortoises were tested for herpesvirus and mycoplasmosis, one was positive for herpesvirus.

Lucerne Valley, which was last surveyed in 1994, was visited for a few days this year and a short-term intensive survey technique study was complete. In May of 2002, 0.2 square miles of the 1.0 square mile plot were surveyed. Fourteen tortoises were found. Clinical signs of upper respiratory tract disease (URTD) or herpesvirus infection were seen in 7 of the 14 tortoises. An important note here is that 12 of the 14 live tortoises found appeared to have been attacked and chewed by dogs. They had the same extensive gnawing and damage to scute and bone seen on tortoises at Fremont Valley and Sand Hills, 29 Palms.

In summary, tortoise populations in California are still in a downward trend. Populations are so low in some areas, they should be examined to determine if populations are still viable. Of particular concern now are the very low densities of breeding tortoises, particularly the females. At some sites the sex ratios are skewed in favor of males, and at most sites, many individual tortoises have clinical signs and/or positive laboratory tests of one or more diseases (mycoplasmosis, herpesvirus, cutaneous dyskeratosis, and shell necrosis). Tortoises that were necropsied from Goffs and Chemehuevi Valley also had elevated levels of heavy metals or other potentially toxic elements.

Blood and nasal samples were collected from desert tortoises in May and early June of 2002 as part of intensive health profile surveys at six long-term permanent study sites for desert

tortoises: Desert Tortoise Research Natural Area - Interior, Desert Tortoise Research

Natural Area-Interpretive Center, Lucerne Valley, Shadow Valley, Ivanpah Valley, and Upper Ward Valley. Additional sites were also surveyed on the Marine Corps Air Ground Combat Center at 29 Palms and at sites where tortoises with fitted with radio-transmitters for the line-distance sampling project: Fremont-Kramer, Superior-Cronese, Ord-Rodman, Ivanpah Valley, Eastern Mojave, and Chocolate Mountains/Chuckwalla.

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The results for the Elisa test, showed one positive out of 7 samples from Lucerne Valley and Two out of 20 samples at the DTNA and one suspect (low positive) out of 8 from MCAGCC-Lavic. Results from the cultures and PCR's are not back yet.

A cautionary note about interpreting results of the tests. First and foremost, samples were not representative of the tortoises occurring on the sites. They captured the "easy to capture" tortoises and were not able to get many that were deep in burrows. Second, not all the captured tortoises provided blood samples. The tortoises that were not captured or that did not provide blood samples may well be the ill tortoises or have a higher proportion of ill tortoises. It is important that you all know that there are two species of Mycoplasma out there and possibly more. One is Mycoplasma agassizii and the ELISA was developed for this species. The second species is mysterioso and no ELISA test has been developed for this species. So some of the tortoises could be positive for Mycoplasma mysterioso but have negative ELISAs.
