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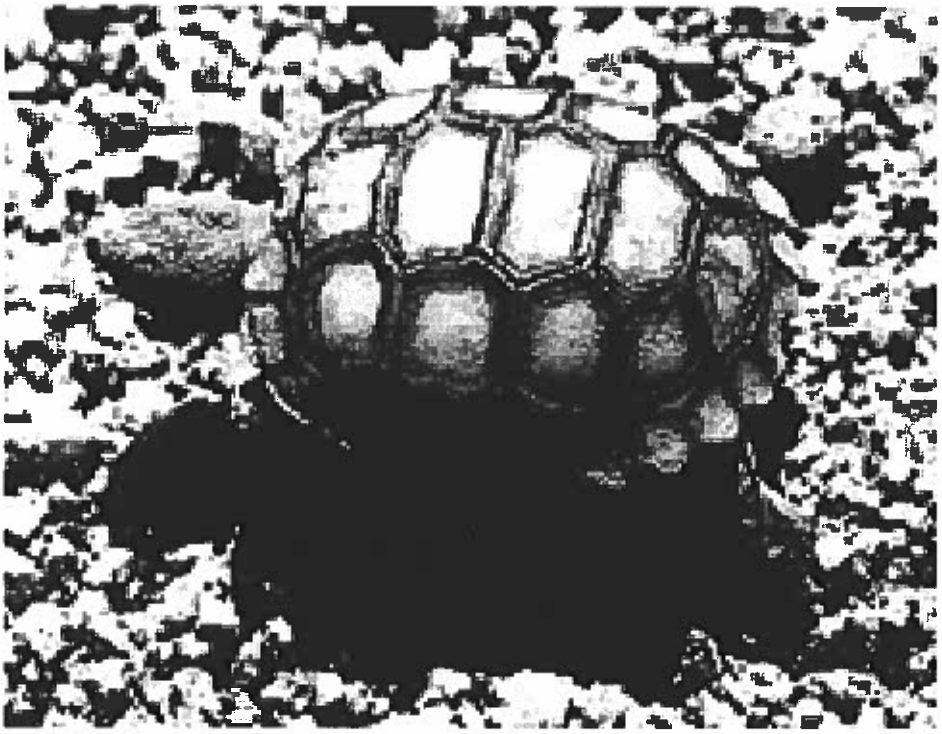
Expedition Report

'A Search for the Elusive Desert Tortoise'



In 1990, the US fish and Wildlife Service listed the Mojave populations of the desert tortoise* (Gopherus agassizii) *as threatened under the Endangered Species Act. In spite of this special federal status, large gaps still exist in our understanding of the desert tortoise, its density and distribution. Tortoise populations have proved to be difficult to monitor, as they tend to occur in localised areas and they spend most of their time underground. To continue the current monitoring program, volunteers were invited to assist in collecting data on demographic positions and density estimates on the tortoise population in Joshua Tree National Park.

Joshua Tree National Park, about 30 miles from the town of Palm Springs, California, spans nearly 800,000 acres of both Colorado and Mojave (Mo-ha-ve) desert. The park is characterised by the Joshua tree (*Yucca brevifolia*), occurring above 3,000ft, but below this level, the desert is dominated by the creosote bush. Adding to this, were mile square stands of cholla cactus and ocotillo cactus, and field of wild flowers. In the afternoons when the sun was overhead, insects and lizards and hummingbirds were abundant.

There were four main components to the project: **distance sampling, radio telemetry, vegetation surveys and a fecundity study.**

Distance sampling.

A computer-generated model was used to identify different vegetation zones in the park. Each was to be sampled to identify tortoise signs, to determine tortoise densities in different habitats. The model uses a correction factor to determine the number of animals undetectable on the transect, and this will be used to help calculate density estimates for tortoises in any sample year, even in periods of low rainfall when tortoises are harder to detect.

The method for a distance sampling was to walk out to the computer generated spot, with a GPS (global positioning system) and walk one kilometre either due north or due south. One member of the team stood in the spot, while another took a tape measure and a compass and walked for 100 metres. The third member walked the line looking for tortoises, their burrows or any signs. This was done ten times. Data was recorded on any tortoises found and vegetation plots, a quick survey on the vegetation type in the area, were done. The GPS unit helped us locate our position and it was also used to store the position of any tortoises found on the transect.

One the first distance sample we did, no sign of tortoises, or their burrows or scats (faeces) on our line was found, but two tortoises and an old bleached dead tortoise shell we found as we made our way back to the truck. On our third sample line, we came across an unmarked tortoise. This tortoise had not been found before. Super glue was used to stick a small identification number to its shell, and household putty epoxy was used to attach a radio transmitter. These meant that if the tortoise was encountered again, we had a record of its

original position, and we could determine how far the tortoises moved around an area. The data collected was to be put into a computer model to determine in what areas, and in what vegetation type the tortoises were most likely to be found.

Radio tagged tortoises were tracked weekly using **radio telemetry** to locate the animals. Holding the radio receiver vertically gave a long-range signal, and horizontally gave a more directional signal. The transmitters on the tortoises give out a constant click and it was this we were listening for. When the clicks became louder and more frequent, we knew a tortoise was close and it was just a case of scanning the ground, for either it, or the burrow it could be in. Tracking the tortoises collected information on home range, burrow usage, survivorship and long term health status. The data was also very important for correcting the distance sampling data collected. All tortoises found had to be checked for disease. Tortoises can have shell disease or an upper respiratory tract disease, which makes them wheeze and have blocked noses. Plastic disposable gloves were used to avoid spreading disease from tortoise to tortoise, and if it was the first time that particular tortoise had been found this year, it was also weighed and measured. Data was also taken on the position of the tortoise when found and it's activity; for example, feeding, walking, resting or basking. We not only tracked tortoises in the desert, but also on a second study site on a wind farm. The tortoises there lived in contrasting conditions to those in the desert: it was windy, cold and the terrain was very steep.

Tagged female tortoises were x-rayed to discover how many eggs they had, how large the eggs were and at what point they had started to lay these eggs. A portable x-ray machine was set up in the field for this purpose, and I was lucky enough to be allowed to take several x-rays. Once the tortoise had been found, the position of the burrow was flagged, so the tortoise could be returned to its original position after the x-ray.

For the **vegetation sample**, we joined members of the Mojave Vegetation Mapping team, who have been working for six months all over the Mojave Desert. One site we sampled was high up in the Black Rock Canyon Mountains to the south west of the Park, and another was an old salt lake in the centre of the park. Aerial photographs had been flown over the park, and we wanted to correlate what was on the pictures to what was on the ground. GPS units were used to confirm our position and to help us locate the site to be sampled. Once there, A 50m² plot was measured out, and a description of the site was taken along with a record of all the species found in the plot.

Most of the tortoises found were outside their burrows feeding on the lush vegetation that the El Niño rains had helped flourish. This had helped them put on weight, and the tortoises were surprisingly heavy for their size. The plentiful food supply had also helped in their reproductive capacity, as the females had a larger number of larger eggs than previous 'drought' years. This would potentially help increase the tortoise population. Information on the upper respiratory tract disease was important as it determined which tortoises had the disease, how long they had had it and whether it was reducing their life expectancy.

The desert was beautiful and I'm so glad that I was able to go. This project also gave me a chance to do some work that will truly help tortoises, and hopefully ensure their survival in future years.