

Trade and the Mediterranean Tortoises

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In 1969 an investigation supported by the FPS/WWF Revolving Fund established that there had been wholesale collecting of tortoises *Testudo graeca* throughout Morocco. The three exporting dealers reported that tortoises were very sparse in the Casablanca region, their exporting centre; only in the Oued Souss valley of south-west Morocco were they to be found in any numbers.¹ The total Moroccan population in 1969 was estimated to be about five million, occupying an area of approximately 162,000 sq km at a mean density of around 30 per sq km. Because so few were found (only 23), comparisons in abundance between different regions were made only in relative terms; the effects of bulk trade collection on population size and structure could not be pinpointed. Routine size/weight measurements were made in relation to age, sex and maturity; air temperature measurements were recorded in relation to activity and time of year.

Since the UK 1964 Restriction of Animals Importation Act, statistics have been kept by the Department of the Environment, and we know that the numbers of tortoises imported annually into Britain by the wholesale trade between 1965 and 1976 averaged 168,500, most of them from Morocco. Except 1969 (77, 713), values ranged from 151,756 in 1968 to 399,576 in 1967. Only in 1973 and 1974 since then have numbers been lower (68,550 and 44,098 respectively), and that was after 1971 restrictions which limited imports to April, May and June to give time for acclimatisation before the winter.

In 1974, 11,250 *T. hermanni* were imported from Yugoslavia; in 1976, 25,000 *horsfieldii* came from south-western USSR, and in addition, licence applications were made to the DOE to import 245,026 *graeca*. In fact only 90,306 *graeca* were imported of which, in an attempt to satisfy demand, 40,000 came from Turkey. The difference between the total applied for and the total actually imported may have been partly due to insufficient numbers in Morocco coupled with poor organisation in Turkey. This may have stimulated a better organisation in Turkey and an investigation of the trade there seemed worthwhile.

In May 1978, the RSPCA made such an investigation in Turkey. They found that tortoises are collected from European Turkey (Thrace) and from Antalya in Anatolia, and exported in refrigerated trucks by a single Istanbul dealer, about 40,000 to a load. In Morocco, only tortoises within the plastron length range of 10-15 cm (4-6in) are exported; they are stacked in baskets and shipped, being too heavy for air freight—3000 weigh about a ton. They are de-ticked prior to packing; in Turkey all sizes are washed prior to boxing.

In September 1977 I made a private field investigation into the state of the wild populations in Antalya and Thrace; both regions, I later learned from the RSPCA, had been subjected to bulk collection for the trade over the previous two or three years. Forty-seven tortoises seen in Antalya gave a sighting frequency (as a measure of abundance) of 3.28 per man-hour; in Thrace (sites at Tekirdag and Eceabat) 34 tortoises seen gave the remarkably similar figure of 3.25 per man-hour, despite different conditions.

The next year in May/June 1978, the RSPCA sponsored me for a four-week visit to Algeria and Morocco to continue work on the effect of the trade on field populations. Morocco had by then stopped all tortoise exports, and this was the first year in which the ban took effect. In Algeria bulk collection had taken

place in the Oran region for shipment to France via Marseilles. In May a search in north-west Algeria in the Monts de Traras region, north of Tlemcen, produced only one tortoise in nearly 10 man-hours of searching, a sighting frequency of 0.11 per man-hour. North-west Algeria is also a heavily cultivated region with large, very dry areas, and tortoises may be very localised. In April 1969, sightings frequency in the Nador/Berkane region of north-east Morocco amounted to 0.20 tortoises per man-hour (10 man-hours of searching), a value about twice that of north-west Algeria just across the frontier. This could, however, be due to the more favourable conditions in Morocco. Bulk collection has been going on in both areas until recent years.

Near Algiers itself, a research worker in the University investigating the cycle of sexual activity, found that tortoises were common. She was able to collect animals for research purposes at rates of between 4 and 10 per man hour, as her precise records showed. Certainly the values of 3.25 and 3.28 for the two collected areas in Turkey the previous September were in the same order of magnitude. This suggests that it is not unreasonable to make comparisons between tortoise populations in these two areas of the Mediterranean despite the difference in seasons, subspecies and climates. These factors are unlikely to outweigh completely the evidence from the different studies based on sighting frequency alone, particularly by the same field observer.

Sighting frequency for Moroccan localities in the Forêt de la Mamora, near Rabat, for many years an area heavily collected by the trade, amounted to 0.56 per man-hour (8 tortoises). For the Rommani area, another heavily collected region, the figure was 0.41 per man-hour (6 tortoises); for this western part of central Morocco, in June it was 0.54 per man-hour (29.63 man-hours of searching). Nine years earlier, in March/April 1969, the figure for central Morocco between Fez and Rabat had been 0.41 (6 tortoises), a value in the same order of magnitude. For my two investigations, totalling 43.63 man-hours of searching, the figure for Central Morocco was 0.46—a heavily collected area.

The similar order of magnitude for sighting frequencies in 1969 and 1978, the latter being slightly greater, may partly be accounted for by seasonal variation in addition to the greater field experience of the observer. Little change is in fact indicated, and this may be due to a reflection of the reduced exports in the rate of recruitment through breeding, partly also to the enforcement of field collection size restrictions and the introduction of regional collection permits in Morocco after 1970, and partly also to UK restrictions since 1971 on import times.

The overall sighting frequency for the two regions of Turkey investigated, where some collection in the previous two or three years had taken place, was 3.26 tortoises per man-hour. Comparing this value with the heavily collected area of central Morocco, the relative abundance was 7.1 times less even than two partly-collected areas of Turkey, and it is tempting to suggest that in Morocco the effect of bulk trade collection over the last eighty or so years has been to reduce tortoise abundance by not less than 86 per cent, about one per cent annually. One can only hope that the complete ban on tortoise exports from Morocco in 1978 will allow populations to build up again reasonably quickly. Certainly, very small, mature and immature tortoises can still be found amongst wild populations, while large, old tortoises are scarce.

References

1. LAMBERT, M. R. K. 1969. Tortoise drain in Morocco. *Oryx* 10, 161-166.