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FROG COLLECTION WITH SPECIAL REFERENCE TO CORNWALL

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BACKGROUND

In Britain, our amphibians and reptiles receive varying degrees of protection under the Wildlife and Countryside Act, 1981. The Common Frog *(Rana temporaria),* Common Toad *(Bufo bufo),* Smooth Newt *(Triturus vulgaris),* Palmate Newt *(T. helveticus)* and Adder *(Vipera berus)* receive protection only under section 9(5) of the Act. In effect, this means they cannot be sold without a licence from the Department of the Environment. The Common Lizard *(Lacerta vivipara),* Slow Worm *(Anguis fragilis)* and Grass Snake *(Natrix natrix)* receive the same protection and in addition it is illegal, without a licence, to kill these species intentionally. The remaining four endangered or vulnerable species receive the full protection of the Act: Natterjack *(Bufo calamita),* Crested Newt *(T. cristatus),* Sand Lizard *(L. agilis)* and Smooth Snake *(Coronella austriaca).*

While there has been no trade during the 1980s in wild-caught specimens of the last four species, the Nature Conservancy Council has not sought to limit internal trading in any arbitrary fashion for the remaining eight widespread species. Dealers are required to submit returns to DOE on a six monthly basis stating numbers of animals sold and their origins; NCC has therefore monitored trade with a view to identifying hot spots for collection. The intention for hot spots was to determine the impact of collection and to monitor trends in collection pressure. If conservation problems were encountered, recommendations could be made during a Quinquennial Review of the Schedules to amend the Act. The extra protection (against intentional killing) afforded to the Common Lizard, Slow Worm and Grass Snake resulted from recommendations in the Quinquennial Review of 1986.

One hot spot that has been identified already is Cornwall, where frog collection is the greatest in Britain. Accordingly an enquiry was organised by NCC in 1985 to investigate the fortunes of Cornish frogs (Cooke, 1985). This revealed that although there had been frog losses in the Cornish countryside in the early 1980s, these had been compensated for by gains in gardens. There was no evidence that collection had resulted in any observable impact on frogs in Cornwall, but there was nevertheless concern in the County about collection in the future. Therefore, five years later, NCC has reappraised the situation. This has been done by examining sales data to determine whether numbers collected from Cornwall have decreased or increased. Also as some information has now been collected on frog density, it is possible to estimate the proportion of frogs collected in order to assess likely impact. Finally, details have been sought from local experts on changes in the frog population in Cornwall.

FROG SALES, 1983-1988

Information on reported frog sales in Britain, 1983-1988, on the place of origin of frogs sold and on the vendors is given in Table 1. It should be noted that details for 1984 given by Cooke (1985) were provisional and have been adjusted. Total reported sales showed a significant decrease during the period under study. This was due to a highly significant decrease in the number of frogs collected from Southern Ireland for sale in Britain. Collection in the United Kingdom increased overall, but the trend was not significant. In Cornwall, collection pressure tended to decrease, but again this was not significant; the sudden decrease in 1988 may be attributed to the death of a well-known local collector and organiser of other collectors (Mrs. S. Turk, personal communication). The number of licensed vendors showed signs of an increase probably because of the increasing effectiveness of the scheme. However, there was a significant decline in the mean number of frogs sold per vendor.

PERCENTAGE OF FROGS COLLECTED

Swan and Oldham (1989) provided information on the density of non-garden frog populations at county level in the late 1980s and also estimated the number of non-garden populations in Britain. Information from complete and thorough surveys of areas was used to determine the density of frog populations. Unfortunately only 3km^2 were surveyed in Cornwall, indicating 1.3 frog ponds/km^2. However, 1-2 frog ponds/km^2 is the typical range for south west England, so the figure for Cornwall is probably a reasonably accurate estimate despite the relatively small area surveyed.

At 1.3 ponds/km^2, there would be roughly 5,000 ponds in Cornwall. Using unpublished information collected by Leicester Polytechnic on number of clumps per pond in Cornwall and assuming 2 adults per clump, the non-garden frog population in Cornwall may number 500,000. Average annual collection was about 12,000 adults (Table 1), representing less than 3% of the estimated non-garden population. While we are not aware of published articles on sustainable yield on this species, such a level of collection is an order of magnitude less than the expected natural annual mortality for adult frogs (eg see Heusser, 1970) and would be most unlikely to cause population declines at county level. This does, however, ignore frogs that were collected but not reported or that died before being sold and so are not represented in the statistics in Table 1. The extent of such losses remains unknown.

The number of non-garden frog ponds in Britain was estimated at 67,000 (Swan and Oldham, 1989); again by using data on number of clumps per pond and assuming 2 adults per clump, an adult population of 8,000,000 is indicated for Britain. The average number of frogs collected in the UK was 20,000 per annum (Table 1). If one assumes that all of these frogs were collected in Britain, the rate of collection was less than 0.3% per annum. There were signs that outside Cornwall, collection may have increased, but on average this amounted to only 0.1% per annum. This level of collection was therefore more than an order of magnitude less than that in Cornwall.

TABLE 1

Total number of frogs sold in Britain, 1983-1988, their place of collection and number of licensed vendors. Correlation coefficients and levels of significance are shown for each data set.

	Total sold in Britain	Place of collection: Southern Ireland	United Kingdom	(Cornwall)	Number of licensed vendors	Mean number sold per vendor
1983	59743	42794	16949	(14183)	11	5431
1984	56564	36032	20532	(15267)	14	4040
1985	45510	30140	15370	(9284)	19	2395
1986	53467	29908	23559	(15683)	25	2139
1987	49278	22398	26880	(11886)	18	2738
1988	39033	20481	18552	(6497)	22	1774
	-0.83	-0.98	0.45	(-0.62)	0.76	-0.86
	P<0.05	P<0.001	Not sig	(Not sig)	Not sig	P<0.05

FROGS IN CORNWALL, 1985-1989

Questionnaires were completed by Mr. Jim Wright, Amphibian and Reptile Recorder for Cornwall and by Mrs. Stella Turk of the Cornish Biological Records Unit. Both reported no appreciable change in Cornish frog populations 1985-9 and neither was aware of collection having had even local effects.

CONCLUSIONS AND SUMMARY

The demand for frogs by laboratories in Britain has fallen considerably over the last few decades (Cooke, 1985). Evidence is presented here of a further significant decrease from 1983 to 1988. Imports from Southern Ireland decreased by about 50%, but numbers collected in the UK remained fairly stable. The total from Cornwall was especially low in 1988, perhaps because of the death of one of the main collectors.

Average collection loss in Cornwall was estimated at less than 3% of the non-garden adults per annum. There was no evidence of recent population changes in Cornwall.

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