

DANISH REVIEW OF GAME BIOLOGY Vol. 5 no. 4

Edited by Anders Holm Joensen

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(*Vulpes vulpes* L.) in Denmark

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(Med et dansk resumé: Foreløbige resultater af mærkningen af ræve  
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COMMUNICATION NO. 68 FROM VILDTBIOLOGISK STATION

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## Introduction

As a consequence of the fact that rabies crossed the border from Germany into Denmark in February, 1964 (MÜLLER 1966, 1967), The Game Biology Station at Kalø in that year received a grant from the Danish Ministry of Agriculture for the pursuance of »game biological research in connection with the current campaign against foxes and badgers in South Jutland with a view to preventing the spread of rabies«. The investigatory work was concentrated on the fox (*Vulpes vulpes*) which must be regarded as the primary carrier of the disease among Danish game species.

Since the spring of 1964 the veterinary authorities have been conducting a campaign against foxes and badgers in South Jutland to prevent the infection from spreading northwards into other parts of Denmark if possible. It was obviously relevant in this connection to know how

far afield the fox roams, and with this aim in view the Game Biology Station commenced the marking of foxes in 1965; this paper presents some of the preliminary results obtained.

Marking will be continued, and we expect to gain further information from the marking already carried out; for this reason, and because the whole marking project is only one part of the current investigations on foxes, we have decided to defer the description of the methods of capture and marking, as well as a detailed discussion of the results obtained, until a later work. The results will be augmented during the years ahead. We do, however, believe that the results obtained so far already provide information of interest to a wider readership, particularly in view of the spread of the rabies in Western Europe in recent years.

## Catching and Marking

The catching and marking foxes very soon proved to be exacting work, and Mr. FRODE PEDERSEN, Gamekeeper, was seconded to the fox investigation in December 1964 with this as his chief task. He was responsible for the entire practical side of the work until November 1967 and, with but few exceptions, carried out all the marking work himself.

A number of methods of catching foxes have been tried out but digging out the cubs in spring has so far proved to be the only rational one.

We are much indebted to sportsmen and others in many parts of Denmark who have given us access to their land and much valuable aid, such as pointing out earths and assisting with the catch. Our thanks are also due to the hunters who have notified us when they have shot marked foxes, in many cases placing the dead foxes at our disposal for investigation.

The present paper deals only with the results obtained from the marking of cubs from 1964 to 1967, and is furthermore



Fig. 1. Fox with ear-tags. Photo P. Uhd Jepsen  
Fig. 1. Ræv med øremærker.

confined to cubs of which recapture was reported during the first year, i. e. prior to the end of February in the year after they were marked.

All cubs were caught between the last few days of April and the first days of June. They weighed between 1 and 3 kg, which means that they were between four and ten weeks old. A metal tag was affixed to each ear, and the cubs were immediately released on the site of catching. On several occasions we observed that the vixen returned to the cubs, which she then almost invariably moved to a set nearby.

### Results of Marking

During the period under discussion it was legal to hunt the fox all the year round in Denmark; under the terms of the Game Act of June, 1967, however, foxes are protected from March 1st to June 15th, although the destruction of earths during the close season is permissible, provided all cubs are killed.

By far the greater majority of marked foxes subsequently reported found had been shot and – as can be seen from Table 1 – the number of returns varies with the season. There were but few reports between June and September, which is the quiet period for hunting; the majority were shot between October and February. With a view to controlling the population of foxes in Denmark quite a number of foxes – mainly cubs – are killed each year in May and June; this, however, is not reflected in the figures (Table 1), as we naturally sought to avoid marking cubs which were liable to be shot soon after.

A total of 175 cubs were marked in 1965, 1966 and 1967, (88 males, 82 females and 5 sex undetermined). Of these, a total of 50 were recovered during their first year (28 males and 22 females), corresponding to 29 %, and so far only 5 reports of animals more than one year old have been received.

Table 1 shows the distances at which foxes less than one year old were recovered during the month of the year. The greater majority (35) died within 5 km of the marking locality; 10 had covered distances of 5–25 km, while only 5 were found more than 25 km away (27, 30, 35, 40, and 112 km respectively).

The conclusions which can be drawn from the scant data available are, of course, limited, but certain main trends do already seem to be apparent.

It appears that cubs remain in the vicinity of their place of birth until October, since all 12 recoveries between June and

## Marking of foxes in Denmark

Distance of recovery <i>Gennemdelingsafstand</i>	Month of recovery . <i>Gennemdelingsmåned</i>										Total		
	June ♂ ♀	July ♂ ♀	Aug. ♂ ♀	Sept. ♂ ♀	Oct. ♂ ♀	Nov. ♂ ♀	Dec. ♂ ♀	Jan. ♂ ♀	Feb. ♂ ♀	♂	♀	♂+♀	
< 5 km	2 1	4	1	1 3	5 6	1 4		2 4	1	16	19	35	
5-10 km						1	1 1	2		4	1	5	
10-25 km					1		1	1	1 1	4	1	5	
> 25 km					2	1			1 1	4	1	5	
Total	2 1	4	1	1 3	8 6	3 4	2 1	5 4	2 3	28	22	50	

Table 1. Month and distance of recovery for 50 foxes marked as cubs and recovered within their first year.

*Table 1. Gennemdelingsafstand og -måned for 50 ræve mærket som hvalpe og gemmeldt i deres første leveår.*

September came from within 5 km of the site of marking. In October and November, 5 of the 21 foxes recovered had travelled 5 km or more from the site of marking, while between December and February the following year 10 out of the 17 foxes recovered had covered 5 km or more.

It is significant that only three vixens were shot more than 5 km from where they had been marked (6, 24, and 112 km respectively). Between October and February reports were received of altogether eight dog foxes and fifteen vixens found within 5 km of the site of marking, while twelve dogs and only three vixens were found more than 5 km away. Thus young vixens appear to be considerably

less prone to roaming than young dog foxes.

In this respect one vixen (No. 3349-249) comprised a remarkable exception. She was marked on May 15th, 1967, on the north side of the estuary of Mariager Fjord, and shot on February 17th, 1968, near Struer in western Jutland. The distance as the crow flies between the marking and recovery sites is 112 km i. e. nearly three times as great as the second largest distance notified, 40 km. This fox had unfortunately been destroyed before the letter of notification reached The Game Biology Station, but the ear tags were received, and there is no reason to doubt the reliability of the marking or the subsequent report.

## Discussion

In any assessment of the above results it must be remembered that they refer only to foxes in the first year of their life, when they become sexually mature and seek a place to settle. We do have no information yet as to whether older foxes, which have already reproduced one or more times, tend to roam or stay in the same

area. But cubs make up such a large proportion of the fox population that their dispersal is of the greatest significance to the distribution of the population as a whole.

There are few and scanty references to the marking of foxes to be found in the literature (ABLES 1965, BEHRENDT 1955,

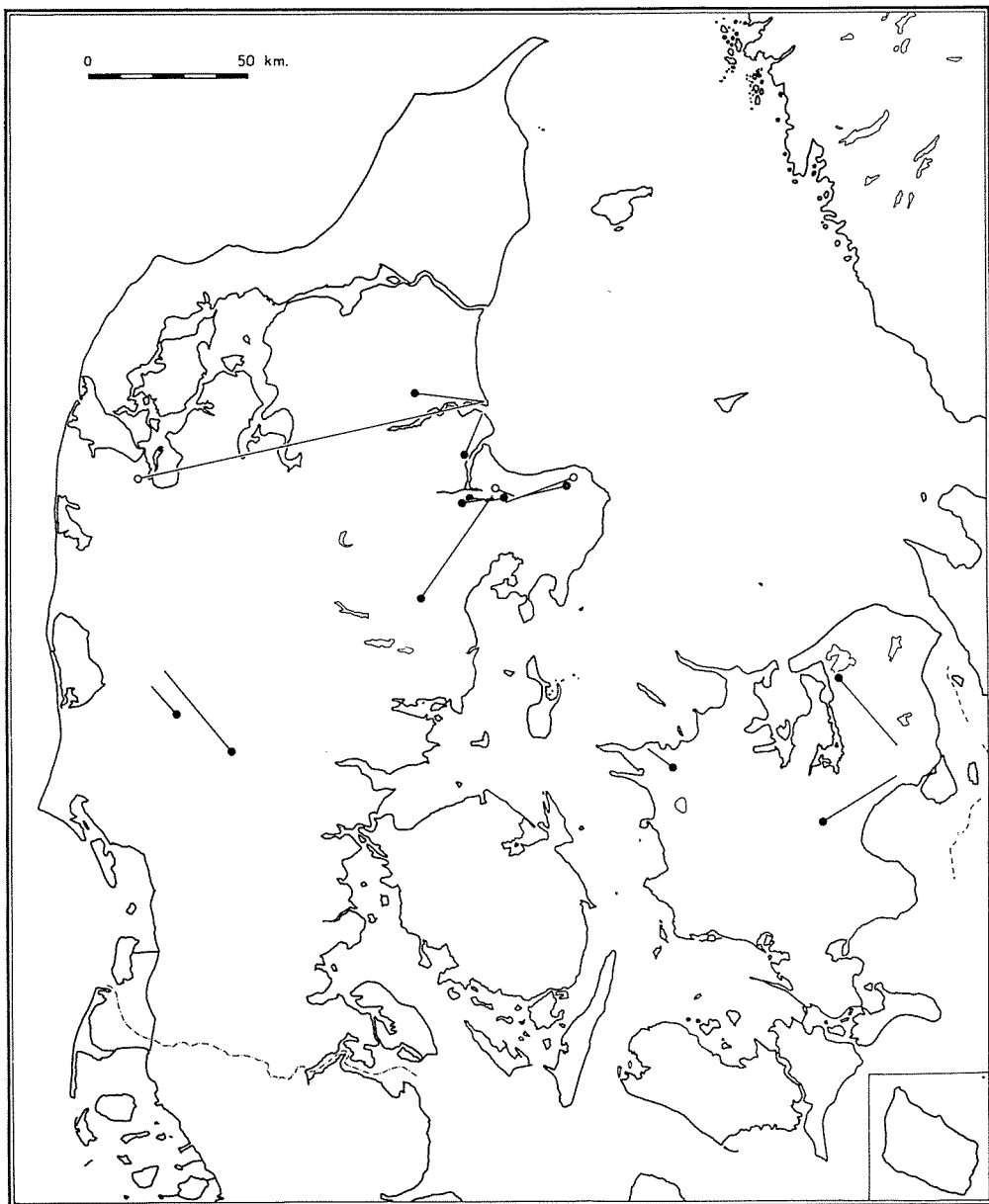


Fig. 2. Recoveries of 15 foxes marked as cubs and recovered within their first year 5 km or more from the site of marking.

● indicates place of recovery for males, ○ for females.

Fig. 2. Gennemmeldinger af 15 ræve mærket som hvalpe og gemmeldt i deres første leveår 5 km eller mere fra mærkningsstedet.

● angiver gennemmeldingssted for hanræve, ○ for hunræve.

ERRINGTON and BERRY 1937, LUND 1967, MARCSTRÖM 1967, SHELDON 1950, TCHERIKOVA 1955). Results obtained in other countries are, in the main, concordant with the Danish results. In particular our results seem to agree with Russian material (TCHERIKOVA 1955) comprising 126 cubs marked in the Ukraine. Of these, 26 (21 %) were subsequently recovered. Nine of the cubs were reported the same summer as they had been marked, 16 during their first winter, and 1 after a year and a half. The young dogs were found at distances of up to 35 km from where they had been marked, while the vixens had covered but a few kilometres. However, the Russian material, like the Danish does contain an exception to this general picture, in that one vixen was reported 120 km away six months after she had been marked.

The Swedish material (MARCSTRÖM 1967) comprises 59 recoveries, but 35 of these refer to foxes which, after being caught and marked, were released at distances varying from a few km to over 100 km from the place of capture. The di-

stances these foxes travelled between their release in an unfamiliar district and their subsequent recovery, were generally greater than those covered by foxes released where caught. It is noteworthy that of the Swedish foxes removed before release, it was a vixen which covered the greatest distance; she was marked in December, and recovered 2 months later, 125 km from the place of release.

Although in general dog foxes travel much farther than vixens, there are some females which cover quite considerable distances. The world record is, however, that of an American dog fox which was marked in Wisconsin in August 1962 at the age of about five months and was reported found in Indiana in May 1963 having covered a distance of 245 miles (just under 400 km) – (ABLES 1965).

Such examples of great distances covered by foxes, though interesting, are quite exceptional. The indications from the Danish material are that the majority of foxes never range as far afield as 10 km, while possibly only one in ten ever strays farther than 25 km from its place of birth.

### Dansk resumé

Foreløbige resultater af mærkningen af ræve (*Vulpes vulpes L.*) i Danmark

1) I 1964 modtog Vildtbiologisk Station en bevilling fra Landbrugsministeriet til »vildtbiologisk forskning i forbindelse med den igangværende bekæmpelse af ræve og grævlinger i Sønderjylland til forebyggelse af spredningen af rabies«, og undersøgelserne blev koncentreret om ræven.

2) Som et led i ræveundersøgelserne er der siden 1965 fanget og mærket ræve med metaløremærker. Det er langt overvejende hvalpe på ca. 1-3 kg, der er blevet

mærket mellem slutningen af april og begyndelsen af juni.

3) Af 175 hvalpe mærket i 1965-67, er 50 blevet genmeldt i deres første leveår, d.v.s. inden marts året efter mærkningen, og hidtil er kun 5 genmeldt som ældre end 1 år.

4) Genmeldingsafstandene for hanner og hunner i de forskellige måneder fremgår af tabel 1. I alt er 35 genmeldt mindre end 5 km fra mærkningsstedet, medens 14 er vandret fra 5 til 40 km, og en enkelt er



gået 112 km. De 15 genmeldinger 5 km eller mere fra mærkningsstedet er afsat på kortet fig. 2.

5) De unge hunræve er gennemgående

væsentlig mere stationære end de unge hanræve. Den længste afstand (112 km) er dog tilbagelagt af en hun.

#### Резюме на русском языке:

#### Предварительные результаты пометки лисиц

(*Vulpes vulpes* L.) в Дании.

В 1965 году, Станция Исследования Биологии дичи (The Game Biology Station, Kalø) начала производить пометку лисиц (*Vulpes vulpes* L.) металлическими метками по ушам (фиг. 1). Подавляющее большинство было помечено, будучи еще лисятами, в мае месяце. В 1965–1967 г. было помечено 176 лисят. Из них, в течение первого года жизни, то-есть до 1-го марта года после пометки, приняты извещения о 50-и.

Табл. 1 показывает расстояния находок, распределенных по самцам и сам-

кам, и по месяцам года. В летние месяцы, лисята держатся вблизи места их рожления. В течение осени, поступает больше и больше сообщений о молодых лисицах, найденных в расстоянии более 5 км от места пометки.

35 лисиц найдены в местностях, отдаленных от места пометки менее 5-и км. 15 найдены в местностях далее 5 км от места пометки (фиг. 2). В общем, самцы бродят дальше, чем самки. Однако, самое большое расстояние (112 км) пройдено самкой.

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