

STUDIES ON THE EUROPEAN HARE XVI.

Raymond HEWSON & Maurice TAYLOR

Movements of European Hares in an Upland Area of Scotland

[With 1 Fig & 2 Tables]

European hares *Lepus europaeus* were marked and released in an upland area of north-east Scotland comprising coniferous woodland, agricultural land and heather moorland, mostly above 180 m above sea level. Of 20 hares marked during 1966, 19 were recovered at an average distance of 1.7 km from the point of first capture. This represents a minimum individual range. There was no significant difference in the distances travelled by males and by females.

I. INTRODUCTION

Little information is available on range and movements in the European hare (*Lepus europaeus* Pallas, 1778). Andersen (1951) studied the movements of hares transplanted from islands off the Danish coast. The majority (58%) of those subsequently killed were recovered within one km of the point of release and 90% were recovered within a radius of 3 km. The distance travelled was similar in males and females. Much greater movements of transplanted European hares were recorded by Jezierski (1967) who described four cases of hares returning to the place of original capture from distances of 230 to 460 km, and Hoglund (1957) referred to a mountain hare (*Lepus timidus* Linnaeus, 1758) which travelled 200 km after being transplanted from an island off the Swedish coast. However movements of transplanted hares cannot be regarded as typical. Southern (1964) suggested for the European hare an individual range perhaps 1.6 to 3.2 km in diameter from which coursed hares were reluctant to be driven, but gave no evidence.

This paper describes a small-scale study of hare movements in an upland area of north-east Scotland. Hares caught in snares or cage traps were assumed to be at or en route for their night feeding grounds and those which were shot were considered to be at their day resting area. The short interval between marking and recovery excludes the possibility of seasonal movements.

II. THE STUDY AREA

Hares were marked and recovered in an area of about 2000 ha, between 120 and 300 m above sea level and mostly above 180 m. The boundaries of the study area were not defined but trapping and shooting were concentrated near Forestry Commission plantings (Fig. 1). About 960 ha was coniferous woodland, most less than 10 years old, another 600 ha was agricultural land used for stock raising and arable crops. Some of this farm land was rough pasture: most was worked on a 7-year rotation so that at any time $\frac{1}{7}$ had turnips, $\frac{2}{7}$ oats and $\frac{4}{7}$ temporary grassland. The rest of the study area was heather moorland and rough grazing.

Two Forestry Commission trappers were employed on 2200 ha. Hares were considered a major pest to forestry and agriculture and during the 12 months ended 30 September 1966 about 300 European hares were killed on the study area. The trappers also killed red squirrels (*Sciurus vulgaris leucourus* Kerr, 1792), foxes (*Vulpes vulpes* Linnaeus, 1758) wild cats (*Felis silvestris* Schreber, 1777), rabbits, *Oryctolagus cuniculus* (Linnaeus, 1758) and mountain hares *Lepus timidus*.

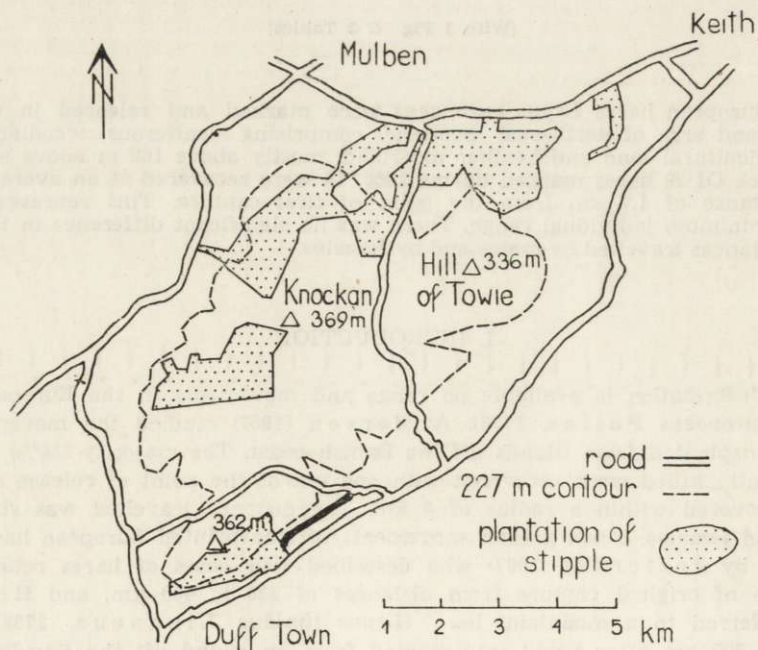


Fig. 1. The study area, showing extent of high ground and of plantations.

European hares fed mainly at night and resorted to thick cover during the day. The most favoured daytime habitat was areas of rushes *Juncus effusus* and coarse tall grasses in hill pastures, but hares also frequented heather moorland (with mountain hares higher up) and ground where ditches had been ploughed for tree-planting. During control operations they were flushed by dogs from these refuges and shot, or were snared at night.

III. METHODS

Hares were caught in »stopped« snares (Hewson, 1965) or in wire Heligoland-type traps modified from a design by Stewart (1963). The hares were marked by a serially numbered tag pinned inside the ear (Thompson & Armour 1954), weighed and released. They were recovered during shooting and trapping by Forestry Commission staff.

Estimates of a hare's individual range based upon recaptures by only one method *e. g.* snaring at night or locating marked animals at day resting areas, tend to show only part of the animal's range. Feeding and resting areas may be a mile or more apart, the former occupied mainly by night and the latter by day.

IV. RESULTS

Between January and December 1966 20 hares were marked. Fifteen of these had been caught in snares and 5 in cage traps. Nineteen hares were recovered by snaring or shooting, mostly within a short period and in no case more than 37 days later (Table 1).

Table 1.

Interval in days between marking and recovery of European hares.

Days	1-10	11-20	21-30	31-40
Number of animals recovered	8	2	6	3

Table 2.

Distance from marking place to place of recovery of European hares (km).

Up to	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	Mean
All hares (19)	—	4	2	6	2	4	—	1	1.68
♂♂ (6)	—	—	1	2	1	2	—	—	1.87
♀♀ (13)	—	4	1	4	1	2	—	1	1.60

The high proportion recovered by shooting and snaring within a short period suggests that control measures were effective. Seventeen hares were shot and two snared. Had a regular trap-line of stopped snares been maintained it is likely that hares would have been recaptured there, as is frequently the case with mountain hares.

The distance between feeding grounds (as indicated by initial capture) and day resting places (indicated by place of shooting) was on average about 1.6 km, and there was no significant difference between males and females (Table 2). Recoveries were at random distances between 0.4 and 3.2 km. As the hares when caught for marking were not necessarily at the limits of their feeding range, the distances shown represent a minimum range.

Hares were caught at altitudes of 180—300 m above sea level; 7 were recovered at greater altitudes, 7 at lower, and 4 at approximately the same altitude.

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Keith,
Banffshire,
Scotland.

Raymond HEWSON & Maurice TAYLOR

WĘDRÓWKI ZAJĄCA SZARAKA W SZKOCJI

Streszczenie

Znakowane zające wypuszczano na wyżynie północno-wschodniej Szkocji (120—300 m. n.p.m). Teren ten jest pokryty lasami iglastymi, wrzosowiskami a częściowo stanowi ziemie uprawne. Z ogólnej liczby 20 zajęcy oznakowanych w 1966, 19 złowiono ponownie w odległości średnio — 1,7 km. od miejsca pierwszego złapania. Odpowiada to minimalnemu arealowi osobniczemu zająca. Nie stwierdzono istotnych różnic w wędrówkach samców i samic.