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OTTERS *Lutra lutra* KILLING MOUNTAIN HARES *Lepus timidus*

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Abstract: During the winter, otter *Lutra lutra* were found to be kill mountain hares *Lepus timidus* in the Scottish highlands. The possible method of killing is discussed. Hares and other mammals are an important part of otter' diet during winter.

During the 1989-90 winter, dead mountain hares *Lepus timidus* were regularly found along the banks of the Water of Nocht, Ernan Water, Spearach Burn and Folly Loch in Aberdeenshire, north-east Scotland. These burns are fast flowing mountain streams which mostly flow through open heather moorland, with grass and rush/sedge along their banks before entering the River Don near the village of Strathdon (Grid Reference NJ 346124). The Burn of Nocht also has extensive areas of mature coniferous woodland along its bankside. The Folly Loch is near the headwaters of the Spearach Burn. All the carcasses were found between 300 and 500 metres above sea level. On one visit, nine of 11 dead hares, were found within two metres of the water's edge or on islets/rocks in the burns, near places where otters *Lutra lutra* regularly defaecated (spraint sites).

In January and February 1990, 14 carcasses were examined along a 2.5km length of the Spearach Burn and the Burn of Nocht. Extensive areas of fresh blood in the snow near most of the bodies, suggested that at least 12 of the hares had been killed, rather than having died there, and been eaten as carrion. Of 25 faeces (spraints) examined from the area, 21 (84%) included hare remains (hair), while of 15 spraints from the larger River Don nearby, 10 (67%) contained mammal remains, including hare. Fish remains were found in all the spraints analysed from the River Don, but in only 17 from the study area, the remaining eight had only hare remains.

Carcasses were found along a section of riverbank over a period of two to three weeks, then on other parts of the burns, either upstream or downstream, suggesting that the predator was systematically using the watercourses. No bodies were found between March and October. During this period, the riverbanks were covered with snow, making the examination of animal tracks in the area relatively easy to follow and identify.

Otters were considered being responsible for the deaths because:

- i. all bodies were near the waters' edge; searches of the adjacent hillside found no hare carcasses;
- ii. most of the sites with bodies
 - a. were used on more than one occasion - for example on Folly Loch, at least 15 carcasses were found at the same place during the winter;
 - b. coincided with areas of sedge/ visited by hares at night where they fed near the waters edge, or, in some instances on vegetation growing in the water;
 - c. had evidence of otter presence, prints in the snow/mud of fresh spraint.
- iii. although foxes *Vulpes vulpes* and mink *Mustela vison* live in the area, no signs of these predators were found in the snow near the dead bodies;
- iv. there was no evidence of birds of prey, which also occur in the valley, visiting the carcasses;
- v. there is therefore no evidence that any other predator killed these animals;
- vi. during an early afternoon in March 1990, a keeper watched an otter feeding on a freshly killed hare near Folly Loch. The event was observed for about ten minutes, after which the otter disappeared.

How did the otters manage to kill the hares - the latter being a relatively alert and swift animal, the former more cumbersome and slower on land? In fact, CHANIN (1985) wrote *Otter are not sufficiently agile to catch many species of mammals, which do not, therefore, feature prominently in the diet.*

We would argue that it would not be too difficult for otters to catch hares. Although swift, and at times timid animals, they can also be naive, relying on keeping perfectly still rather than taking flight at the approach of a predator. DC has watched foxes prey on hares. On the appearance of the predator, most hares run, however, a few sit tight and the kills, with one exception, were achieved by the fox pouncing from a few feet away. If the hares were resting and sheltering in the vegetation at the water's edge, and were up wind, otters could thus catch them by emerging quietly from the burn.

We have no idea of how many otters are involved, but footprints in the snow in January 1990 suggested at least two individuals. The upper reaches of the two burns where most of the carcasses were found are separated by only a few hundred metres of relatively flat ground, so it is possible that the same animals used both burns.

An examination of literature shows that in most studies of otter diet, mammal remains are found at low frequencies, to about 10%, more usually around 5% (see MASON and MACDONALD, 1986 for details). The most common species recorded is rabbit *Oryctolagus cuniculus* - nearly 50% of the mammalian prey caught in Scotland, and about 75% in Devon - and most are caught near the water edge (REY et al., 1979; WISE et al., 1981; MASON and MACDONALD 1986).

There are a few references to otters eating hares, but none list them as an important component of diet. STEPHENS (1957) reported the remains of brown hare *L. capensis* in spraints, and that in November. BATTEN (1953) refers to leverets being eaten, while ST. JOHN (1893) reported that *in severe frosts, etc., the otter..... catches and eats rabbits, hares and any animals it can surprise...*

Our observations suggest that during the winter months, when fish prey might be difficult to find, mountain hares can form an important part of the diet of otters, and catching them is not necessarily restricted to period of cold weather. This is further supported by results from a more detailed survey of otter in north-east Scotland. On three rivers, including the River Don, which flow through the upper parts of the Grampian mountains, there is an increase in the number of mammal remains recorded in spraints collected during the winter months (JC pers. obs.)

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Resumen: Nutrias *Lutra lutra* matando liebres de montaña *Lepus timidus*

Se encontró que durante el invierno nutrias *Lutra lutra* mataban liebres de montaña *Lepus timidus* en las tierras altas de Escocia. Durante el invierno de 1989-1990, se encontraron liebres de montaña a lo largo de los bancos de Water of Nocht, Ernan Water, Spearach Burn y Folly Loch en Aberdeenshire, al NE de Escocia. Todas se encontraron entre los 300 y 500 m sobre el nivel del mar. En una visita 9 de 11 carcasas fueron encontradas a menos de 2 metros del agua o en rocas o islotes en el agua, cerca de los lugares donde las nutrias defecaban regularmente. Catorce carcasas fueron examinadas en Enero-Febrero de 1990 en Spearach Burn y Burn of Nocht. Rastros de sangre fresca en la nieve cerca de la mayoría de los cuerpos sugieren que al menos 12 de las liebres fueron matadas y que estas no fueron consumidas como carroña. De 25 fecas examinadas en el área, 21 (84%) tenían restos de liebres, mientras que 10 de 15 (67%) colectadas en un río cercano contenían restos de mamíferos, incluyendo liebres. Se encontraron restos de peces en todas las fecas colectadas en el río, pero sólo en 17 de las colectadas en la zona de estudio, las otras 8 sólo tenían restos de liebres. Las carcasas se encontraron a lo largo de una sección del banco del río por un período de 2 a 3 semanas, y luego en otras partes del mismo, lo que sugiere que el predador usaba sistemáticamente los cursos de agua. No se encontraron cuerpos entre Marzo y Octubre. Se considera a las nutrias responsables de las muertes debido a que: i) todos los cuerpos se encontraron cerca de la orilla; ii) la mayoría de los sitios con cuerpos fueron usados en más de una ocasión, coinciden con áreas visitadas por las liebres durante la noche, donde se alimentan cerca de la orilla o dentro del agua, y en la mayoría se encontró evidencia de la presencia de nutrias (aunque la zona está habitada por zorros y visones, no se encontraron signos de estos predadores cerca de los cuerpos; tampoco se encontraron signos de las aves de rapiña que también habitan la zona); y iii) en Marzo de 1990 se observó a una nutria comiendo una liebre recién muerta en Folly Loch. Las nutrias pueden haberse arreglado para cazar a las liebres emergiendo cuidadosamente del agua cerca de estas mientras descansaban refugiadas en la vegetación de la orilla. No está claro cuantas nutrias estaban involucradas, pero huellas encontradas en Enero de 1990 sugiere que al menos 2 individuos. En la mayoría de los estudios de dieta de nutrias, los restos de mamíferos se encuentran en bajas frecuencias (alcanza el 10%, pero es más frecuente alrededor del 5%). La especie más común es el conejo *Oryctolagus cuniculus*, que representa alrededor del 50% de los mamíferos consumidos en Escocia, y el 75% en Devon, y es mayormente cazada cerca de la orilla. Hay unas pocas referencias de nutrias comiendo liebres, pero ningún estudio las lista como componente importante de la dieta de las nutrias. Nuestras observaciones sugieren que durante los meses de invierno, cuando los peces pueden ser difíciles de encontrar, las liebres de montaña pueden volverse un componente importante de la dieta de las nutrias, aunque su caza no está restringida necesariamente a los períodos de clima frío.