

ARTICLE

MAKING OTTERS COUNT: A CITIZEN SCIENCE APPROACH TO SURVEYING FOR OTTERS (*Lutra lutra*) IN NORTH EAST ENGLAND

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Abstract: The Eurasian otter (*Lutra lutra*) is the only otter species native to the UK. Between the 1950s and 1970s populations declined dramatically to the point that the species was in danger of extinction in England. Since then, and following the withdrawal from use of organochlorine pesticides and a reduction in other environmental pollutants, the otter has made a slow, gradual recovery. However, monitoring that recovery presents many challenges. Surveying for otters is notoriously difficult as they are cryptic, shy, range over large areas and are largely active at night. As a result, data on numbers of individual otters or otter territories is deficient. In 2013, Durham Wildlife Trust instigated an annual, volunteer-led otter survey taking place over a single weekend in spring which was designed to take a ‘snap-shot’ of otter activity in County Durham on one night. More than 120 volunteer citizen science surveyors have been trained in identifying otter field signs and on both mornings of the survey weekend they check a selection of ‘sites’ in an allocated ‘patch’ of watercourse. Fresh field sign found on the second day indicates otter activity the previous night. Three surveys have now been completed and the number of otter territories identified were 29 in 2013, 35 in 2014 and 36 in 2015. This can be used as baseline data for future monitoring.

Keywords: volunteer; survey; territory; field sign

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INTRODUCTION

The Eurasian otter (*Lutra lutra*) is the only otter species native to the UK. Between the 1950s and 1980s populations fell dramatically to the point that the species was in danger of extinction in England. The decline was closely linked to the use of organochlorine pesticides, such as dieldrin, which were used in high concentrations and caused widespread mortality in many species, particularly carnivorous birds and mammals at the top of the food chain (Jefferies and Hanson, 2002). The reduction in numbers was so severe that a national survey of otters carried out in England from 1977-1979 found evidence of otter presence at less than 6% of sites surveyed (Lenton et al., 1980). Dieldrin use was subsequently banned and the otter was given protected status in the UK. In the decades since then the otter has made a slow, gradual recovery (Crawford, 2011). This recovery has been largely

welcomed, but has not been without controversy arousing some antagonism amongst the angling and fish farming communities, and leading to what are likely inflated claims of otter density and abundance (pers. obs.). However, obtaining data that could counter such claims and provide information about the true abundance and/or density of the population is a difficult endeavour. Surveying for otters remains a challenging undertaking and is notoriously difficult due to their cryptic, shy behaviour, largely nocturnal activity patterns and extensive home ranges (Powell, 2012). Additionally, otters lack individual identifying features making mark/recapture or camera trapping, methodologies commonly used for estimating density and/or population size, difficult or impossible to apply (e.g. Karanth and Nichols, 1998; Kelly et al., 2012; Pollock et al., 2002). Furthermore, the use of telemetry, which can provide data on ranging behaviour, is rare for the species as it is both invasive and costly and is in any case of limited use in estimating population size (Bonesi et al., 2013). As a result, the standard method of surveying for otters utilises a presence/absence strategy, with surveys taking place on defined lengths of watercourse over extended periods (Reuther et al., 2000). While these surveys can usefully provide evidence of the extent of otter presence over a large area, they can neither provide information on numbers of individuals or their density, nor on the number of otter territories. As a result, data on otter abundance and/or numbers of otter territories is lacking. In 2013, in an attempt to address this issue, Durham Wildlife Trust (DWT) instigated an annual, volunteer-led otter survey which takes place over a single weekend in spring and aims to take a ‘snap-shot’ of otter activity across the whole DWT area on one night.

METHODS

The surveys are carried out across the entire DWT area, which follows the boundary of the 1966 Vice County, and slightly beyond. It stretches from the River Tees in the south to the River Tyne in the north, and from the border with Cumbria in the west to the North Sea coast in the east (Figure 1), and encompasses an area of around 3,000 km².

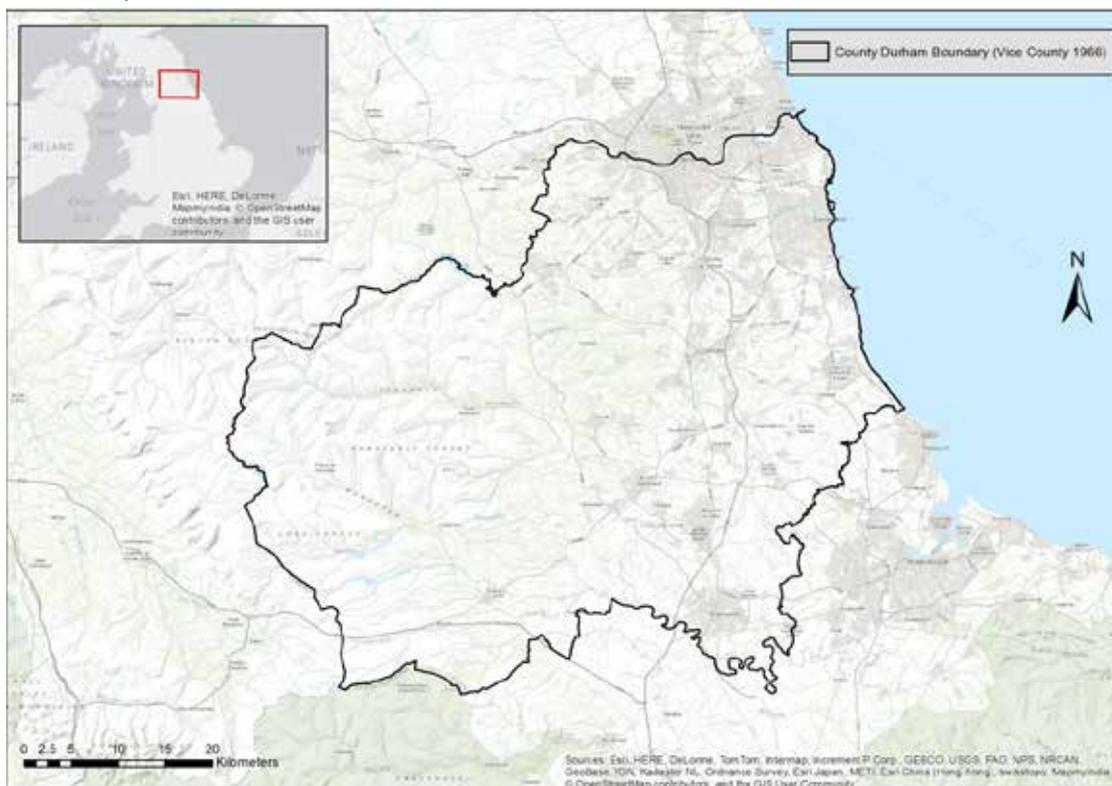


Figure 1. Map showing the border of Vice County Durham (1966) in north east England and its relative location in the UK.

Following the methodology that has been used by the Somerset Otter Group in Somerset, South West England for over two decades (Williams, 2012; James Williams pers. comm.), we have trained more than 120 volunteer, citizen science surveyors in identifying otter field signs. Each volunteer surveyor is then allocated a 'patch' of watercourse, either close to where they live or somewhere they frequent regularly. Within that 'patch' the surveyor identifies a number of 'sites' which are either known or likely spraint spots e.g. bridges, prominent rocks or the confluence of two watercourses. On the weekend of the survey the volunteer surveyors check their sites for field signs on both mornings. Spraint and/or tracks found on the first morning are recorded with a grid reference or latitude/longitude coordinates and the signs are then marked in some way, either by scuffing them up with a stick or by throwing sand or earth over them, to ensure that they are not counted twice. The same sites are then checked on the morning of the second day. Any field signs found that were definitely not there the day before indicate otter activity the previous night and are classified as a 'hit'. The data points of second day 'hits' are then mapped in ArcMap v. 10.2 GIS software (ESRI 2014) and allocated to discrete territories. Additionally, if fresh spraint is found on the first day, but not on the second, in an area that is sufficiently isolated from any other survey area/watercourse that would make it unlikely that an otter could have travelled between them in one night it is classified as a 'near miss'. Also, in some survey patches remote-capture cameras are deployed during the survey. If no fresh spraint is found in that patch but an otter is captured on camera it is classified as a 'reasonable suspicion' otter territory (providing the same criteria are met as for the 'near miss').

RESULTS

Three surveys have now been completed with a mean of 102 'patches' and 571 'sites' surveyed per year (Table 1).

Table 1. Results from three surveys conducted in 2013, 2014 and 2015

	Patches	Sites	Positives	Hits	Near miss/ RS	Adjud. territories
2013	93	517	216	59	3	29
2014	100	588	212	67	6	35
2015	112	608	260	56	9	36

In 2013, 29 otter territories were identified, in 2014 surveying a larger number of patches, the number identified was 35 and in 2015 36 territories were identified (Figure 2).

DISCUSSION

This method of surveying for otters provides a non-invasive means of obtaining an estimate of the number of otter territories across a wide area and should allow any future declines in the otter population to be picked up relatively early. However, it does have some limitations. There will inevitably be considerable variability in the competence of volunteer surveyors to correctly identify otter field signs, but some steps can be taken to minimise the number of false positives recorded. For example surveyors are encouraged to take a sample of spraint deposits they locate and these can then be assessed by an expert, this has the added advantage of providing a considerable amount of spraint that can be analysed for content to provide a

comparison of diet across catchments. Additionally, all surveyors are encouraged to photograph the field signs they locate so that, even without a physical sample, a degree of critical objectivity can be applied to the data. There is also a certain level of subjectivity inherent in the adjudication process whereby second day ‘hits’ are allocated to discrete territories. However, a conservative approach is used so the resultant estimates are likely to be on the low side, and we can be reasonably confident that we are estimating a minimum number of territories. It is important to emphasise that the method does not enable the calculation of absolute numbers of otters, nor provide data from which abundance estimates can be made, as the fresh spraint found on the second day of the survey could have been left by more than one animal i.e. a female with cubs. There is also the added uncertainty of the possibility of adverse weather conditions affecting the visibility of field signs on the designated survey weekend. The logistics of mobilising such a large number of volunteers means that it is not possible to rearrange at short notice. However, the weather was very wet in many places across the survey area for the first two surveys and enough signs were still visible for a meaningful volume of data to be collected.

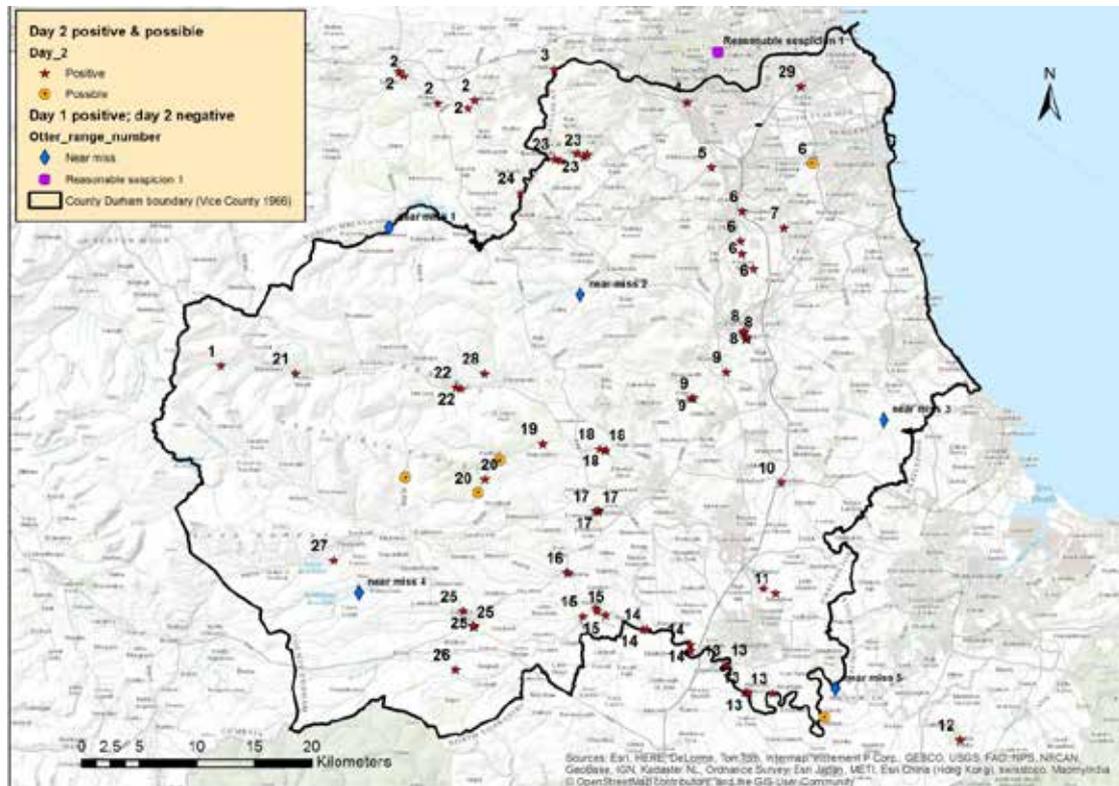


Figure 2. Map showing the locations of second day ‘hits’ from 2014 survey and the ‘territory’ to which they are allocated

On the plus side, it is relatively inexpensive to carry out (although labour intensive) and it engages people with otters and other wildlife in their area and gives them a sense of involvement in research and monitoring. Furthermore, the longer the surveys continue the more confidence there can be that the data are reflecting the true picture of the otter population in the survey area. The methodology would certainly benefit from calibration with a similar survey carried out on a known population. However, such populations are rare and opportunities to survey them equally so.

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RÉSUMÉ

Comptage De Loutres : Une Approche Scientifique Citoyenne Pour Surveiller Les Loutres (*Lutra lutra*) Au Nord Est De L'angleterre

La loutre européenne (*Lutra lutra*) est la seule espèce de loutre originaire du Royaume-Uni. Entre les années 1950 et 1970 leur population a dramatiquement déclinée au point d'avoir mené l'espèce au bord de l'extinction en Angleterre.

Depuis lors, et suite au retrait de l'utilisation des pesticides organochlorés et à la diminution d'autres polluants environnementaux, les loutres ont réalisé un lent et progressif rétablissement. Cependant, surveiller ce rétablissement présente de nombreux défis. La surveillance des loutres est notoirement difficile car elles sont cryptiques, timides, distribuées sur de larges zones et sont majoritairement actives la nuit. Il en découle que le nombre de données sur des loutres individuelles ou sur leurs territoires est insuffisant. En 2013, le « Durham Wildlife Trust » a instigué une surveillance annuelle des loutres basée sur le volontariat ayant lieu sur un weekend au printemps qui a été sélectionné en tant qu'état des lieux de l'activité des loutres dans le comté de Durham sur une nuit. Plus de 120 volontaires citoyens ont été entraînés à l'identification d'indices laissés par les loutres sur le terrain, et au cours des deux matinées du weekend de surveillance ils vérifièrent les sites sélectionnés dans des parcelles allouées avec des cours d'eau. De récents indices ont été trouvés au cours du second jour indiquant l'activité de loutres au cours de la nuit précédente. Trois surveillances ont été accomplies et le nombre des territoires identifiés des loutres

étaient au nombre de 29 en 2013, de 35 en 2014 et 36 en 2015. Ceci peut être utilisé comme donnée de référence pour de futur suivi.

RESUMEN

HACIENDO QUE LAS NUTRIAS CUENTEN: UNA APROXIMACIÓN DE CIENCIA CIUDADANA AL RELEVAMIENTO DE NUTRIAS (*Lutra lutra*) EN EL NORESTE DE INGLATERRA

La nutria eurasiática (*Lutra lutra*) es la única especie de nutria nativa en el Reino Unido. Entre los 1950s y los 1970s las poblaciones declinaron dramáticamente hasta el punto en que la especie estaba en peligro de extinción en Inglaterra. Desde entonces, y luego del retiro del uso de pesticidas organoclorados y una reducción en otros contaminantes ambientales, la nutria ha tenido una recuperación lenta y gradual. Sin embargo, el monitoreo de esa recuperación presenta muchos desafíos. Relevar o prospectar nutrias es notoriamente difícil ya que son crípticas, tímidas, se mueven a través de grandes áreas y son principalmente activas de noche. Como resultado, los datos sobre cantidad de nutrias individuales o cantidad de territorios de nutrias, son deficientes. En 2013, el Durham Wildlife Trust instigó la realización de un relevamiento anual, llevado a cabo por voluntarios, durante un único fin de semana en primavera, que fue diseñado para tomar una “foto” de la actividad de la nutria en el Condado de Durham, durante una noche. Fueron entrenados más de 120 voluntarios (relevadores ciudadanos) para identificar signos de nutria, y en las dos mañanas del fin de semana del relevamiento chequearon una selección de “sitios” en un determinado “tramo” o “parche” de curso de agua. Los signos frescos encontrados durante el segundo día indican la actividad de la nutria durante la noche anterior. Se han completado hasta ahora tres relevamientos, y el número de territorios de nutria identificados fue de 29 en 2013, 35 en 2014 y 36 en 2015. Esto puede ser usado como datos de línea de base para futuro monitoreo.