A R T I C L E

HOW STANDARD IS THE STANDARD TECHNIQUE OF THE OTTER SURVEY?

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(Received April 4th, 1997, accepted November 3rd, 1997)

ABSTRACT

Many studies of otter distribution describe the method used as “standard” or “British” field survey. Surprisingly few studies in fact follow all the recommendations set by the early British field surveys. Many researchers propose some modifications to improve the efficiency of otter detection (additional spot checks and extended searches of river banks) or to reduce the amount of field work to reasonable time span by selecting fewer sites per 10 km square or fewer squares within a study area. All the modifications of field techniques and especially in the study design result in uncontrolled variation of results, that may range from 3.5-12% improvement in the otter detection when spot checks and extended searches are implemented, to several fold difference in results when single positive sites are referred to squares of increasing size. Since it seems impossible to set stricter criteria for the “standard” survey of otters, it is recommended that researchers show understanding of the consequences of any modifications in the study and that they describe in details the method used rather than call it “standard”.

Keywords: otter, *Lutra lutra*, survey, method

INTRODUCTION

The field survey method, based on the search of otter signs, has been widely used in many studies of otter distribution (for references see Macdonald and Mason, 1994; Brzeziñski et al., 1996). It is often referred to as the “British” method since it was developed for three parallel studies of otter distribution in Great Britain, coordinated by the Nature Conservancy Council (Crawford et al., 1979, Green and Green, 1980; Lenton et al., 1980). The technique is also called the standard method because it was recommended to serve as such by members of the European Section of the Otter Specialist Group (Macdonald, 1990). It is broadly accepted that although the technique does not identify every stretch of river used by the animals, it is adequate for studying otter distribution over large areas (Crawford et al., 1979; Green and Green, 1980). There is also a substantial amount of evidence that the data collected in field surveys could be used as an index of broad population status of otters in the area, and as such the method is of primary interest for otter conservation (Mason and Macdonald, 1987).

One of the reasons behind the wide acceptance of the method is that “it represents the best compromise yet achieved between the necessities of accuracy and practicality” (Green and Green, 1980). However being this sort of compromise, the technique is often modified “to suit available time and financial support” (Macdonald, 1990). Many authors have given special attention to ways of improving the efficiency of the field technique, especially in areas with low numbers of otters and/or low numbers of otter signs (e.g. Lenton et al., 1980; Romanowski et al., 1996). We discuss how modifications of the study design and presentation of data additionally lead to significant variation in results of national surveys.

STUDY DESIGN

In a recent distribution of otters in Brittany (France) “more than one hundred people took part, most of them observing the standard survey method described by Macdonald (1990)” (Lafontaine, 1993). Such an approach in fact does not follow the recommendations of the standard survey, which “should be carried out by as few surveyors as possible in order to reduce any biases due to differing skills” (Lenton et al., 1980). Volunteers without great experience are likely to overlook the often very discrete signs left by otters e.g. small smears. Employment of only experienced, full-time workers (Macdonald, 1990) however sets limits to the number of sites that can be surveyed within reasonable time and requires decisions about coverage of the study area. As an example, Green and Green (1980) surveyed almost the entire area of Scotland and visited 4636 sites (average of 5.3 sites for each 10x10 km square) between 1977 and 1979. Such a detailed study is hardly possible in every case, especially for larger areas, and researchers will rather make a choice of: 1) selecting only part of the area with the aim of surveying many sites in each 10 km square; 2) investigating large areas at the cost of reducing the number of sites per 10 km square. Lenton et al. (1980) study of England is an example of the first approach, where approximately two 50 km squares in each 100 km square of the national grid were surveyed, with a mean of 6 sites per 10 km square. In later studies in Hungary and Denmark smaller number of sites (approximately 2 per 10 km square) were surveyed only in areas with otter habitats: lakes, rivers and streams (Kemenes, 1991; Madsen and Nielsen, 1986). In a recent study of Poland (over 310 000 km^2) only 1 site was surveyed in each 10 km square containing aquatic habitats (Brzeziñski et al., 1996).

The obvious consequence of different study designs is that while Lenton et al. (1980) aimed at proportional coverage of all habitats within England, the other researchers reported above increased the probability of finding otter signs by selecting suitable habitats. The decision on the number of sites surveyed in each 10x10 km square additionally influences the results of the study. The 10 km squares do not offer an unlimited number of sites with many otter signs. The best otter habitats are always the first to be selected for the survey. Lower efficiency of the technique in habitats with low numbers of otters or potential sprainting sites (Lenton et al., 1980; Romanowski et al., 1996) results in decreased chances of finding otter signs in several out of e. g. 10 sites in 10 km square (as recommended by Lenton et al., 1980). So aiming at detecting otters in almost every river stretch improves the chances of recording its presence in a 10 km square, but paradoxically leads to a decrease in the overall percentage of positive sites recorded. This situation is illustrated with the results of the English and Danish surveys, where 5.8% of positive sites (with 6 sites visited per 10 km square) and 9.2% of positive sites (2.4 sites per 10 km square) resulted in a similar abundance of otters expressed as a percentage of positive squares (14.5 and 14.1 respectively, Lenton et al., 1980; Madsen and Nielsen, 1986).

PRESENTATION OF RESULTS

The studies typically present index of otter distribution in the form of a percentage of positive sites recorded among sites surveyed. However, depending on study design, “sites surveyed” may include only suitable habitats, or a representation of all habitats surveyed. In fact in a majority of studies in continental Europe only potential otter habitats were investigated, and such studies tend to report higher percentage of positive sites among sites surveyed, which does not enable direct comparisons with “classic”, pioneer British studies. Many studies additionally report the percentages of positive 10 km squares. Results presented in this form report substantially higher otter abundance compared to percentages of positive sites (as already illustrated in the example of English and Danish surveys). This is due to the fact that each 10 km square is assumed positive if at least one of the sites within it is positive. An even higher percentage of positive squares is reported for 50 km squares, again as the consequence of the assumption that even one 10 km unit makes a 50 km square positive. The difference is striking in the case of reports with lowest numbers of positive sites, e.g. in the study of England, where the result of 5.8% positive sites corresponds to 60.7% of positive 50 km squares (Lenton et al., 1980). Obviously the application of a 50 km grid generates a false picture of too high otter abundance. It is worth noting that the 50 km grid was chosen for presentation of distribution ranges in Atlas of European Mammals. It may be thus expected, that the Atlas will report too optimistic a range of the otter, since a 50 km square marked positive on a distribution map might have only one positive site in 2500 km^2.

CONCLUSIONS

In the case of many studies of otter distribution, especially those of a pilot character or covering rather small areas, the authors simply refer to the method used as “standard” and eventually stress that 600 meters of banks were searched for otter signs (e.g. Lafontaine, 1993). The technique from the very beginning was subjected to various modifications to improve the reliability of the survey in habitats with low numbers of otter signs. Spot checks at additional bridges, extended searches of river banks, or repeat visits produced some increase in the number (3.5 - 8%) of positive results in surveys of Wales, Scotland, England and Poland (Crawford et al., 1979; Green and Green, 1980, Lenton et al., 1980; Romanowski et al., 1996). In several studies extending the search over 600m resulted in the increase of the number of positive sites by about 6-12% (Mason and Macdonald, 1987).

Intense discussions on surveying otters were also provoked by questions on whether spraints could be used as indicators of habitat quality, otter numbers or activity (Macdonald and Mason, 1983; Jefferies, 1986; Kruuk et al., 1986; Kruuk and Conroy, 1987; Mason and Macdonald, 1987; Green and Green, 1997). Surprisingly little attention however was paid to the importance of study design and to the variation that is generated by different ways of presenting results. While modifications of field techniques may result in an estimated 3.5-12% improvement in the reliability of the method, selecting the size of the grid could alone result in several fold difference in results. Direct comparisons of field surveys are possible only if similar study designs were applied, since studies with more sites investigated per 10 km square tend to report lower percentages of positive sites (but are more efficient in detecting presence of otters in 10 km squares), and surveys of only squares with aquatic habitats tend to report higher otter abundance. Examples of several national surveys mentioned above show also that every time the single positive record of otter is related to larger geographical unit (e. g. 10 and 50 km squares), this results in the increase of reported otter range and abundance. It is not possible to judge at this point whether percentage of positive sites or positive squares serves as a better index of otter abundance in the area. It is possible that the percentage of positive sites is more directly associated to otter numbers. On the other hand results related to 10 km squares give an opportunity to estimate the coverage of the study area.

It is not possible to set stricter criteria for the “standard” survey of otters and it is the surveyors responsibility to fully understand all the recommendations of the method. It is also of great importance that researchers are aware of the consequences of any modifications in the study design i.e. surveying only selected squares and surveying a different number of sites per square. Describing the study design in more details rather than just calling it “standard” or “British” method and reporting results in the form of percentage of positive sites as well as squares greatly improves the possibilities of comparing results of different surveys.

ACKNOWLEDGMENTS

We would like to thank: C. Walkland for her efforts in correcting the style, and two anonymous reviewers for valuable comments on the manuscript.

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