

# Feral Wild Boar and Deer in the Forest of Dean

## Survey and Population Projections in the Public Forest Estate 2016

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## Introduction and Methods

The populations of feral wild boar and deer were surveyed in the forest of Dean to assess changes in numbers since 2015. The survey was effectively a repetition of previous surveys, which have now been carried out annually since 2013. The total forest area surveyed this year was 74.7 km<sup>2</sup> (CF 75.6 km<sup>2</sup> in 2015). Surveys were carried out at night between the 7<sup>th</sup> March and 8<sup>th</sup> April 2016.

An assessment of the fertility of sows obtained during the cull is currently being carried out. Results are however not yet available and so population projections have been based on results obtained in previous years.

Population densities of Wild Boar were estimated using distance sampling (Buckland *et al* 2001). Initially, observations were made with a FLIR Recon BF20 thermal imager, with distances to each group of animals estimated from apparent body size. However this developed a fault on the 10<sup>th</sup> March and subsequent fieldwork was completed using a FLIR BHM-XR (65 mm) thermal imager with a laser rangefinder. (Laser rangefinder was not part of the thermal imager)

## Results

### ***Thermal imaging survey***

#### *a) Wild Boar*

In total, 155 sounders were detected during the survey, in contrast to 76 in 2015. Mean group size, of 3.4 boar per sounder, was close to the mean number of 3.3 recorded in 2015.

The estimated number of boar was 1562 (20.9 Km<sup>2</sup>) with a 95% confidence interval ranging from 1095 to 2296. In comparison, the 2015 estimate was 1018 (95% ci 696 to 1486).

The central part of the forest (42.6 Km<sup>2</sup>) has been included in all previous surveys and may therefore yield a more consistent measure of increase. In this area, estimates of boar numbers increased by 48%, from 17.4 km<sup>-2</sup> to 25.8 from 2015 to 2016. Trends in the estimated number of boar are indicated in figure 1.

#### *b) Deer*

The number of deer estimated during this survey was 1063 (95% confidence interval 822-1376), a small (but not significant) increase from 2015 (1038; 95% confidence

interval 854-1262). However, in the central area, estimated density declined a little from 17.0 km<sup>-2</sup> in 2015 to 15.1 km<sup>-2</sup> in 2016.

### **Wild Boar population projections**

The fecundity figures (number of embryos per sow) and known mortality were used to calculate the expected growth rate and model the population growth, as we have done in previous years (Gill and Ferryman 2015)

The following additional assumptions were made in using this model:

- a The birth sex ratio is 50:50;
- b The sex ratio amongst culled animals is also 50:50;
- c Peri-natal mortality rate is 25%;
- d Adult mortality rate is 19% per year. This figure includes animals killed on roads (RTA's). The RTA data suggest that it amounts to 5-10% of population size. However some additional losses can be expected due to unrecorded mortality.
- e The initial adult population structure was assumed to be the same as the structure of the culled animals.

The model indicates that a cull of 56.5% of the population is needed to stabilise the population, which equates to a cull of 712 animals, if equal numbers of males and females are culled, in addition to RTA's.

## Comments and Conclusions

The population estimate of 1562 this year is substantially higher than last year's estimate of 1018 which is disappointing given that the culling effort was intended to contain the increase. There are a number of possible reasons why this has occurred:

- *The cull of 422 was below the target of 460 which was estimated to be sufficient to contain population increase.*

The difference is sufficient to account for approximately 20-25% of the increase in population.

- *The census was started a little later in the season resulting in more piglets being included.*

Approximately 23.2% of the animals detected in 2016 were piglets in contrast to 17.5% in 2015. This would account for 15% of the increase in estimated numbers.

- *The confidence intervals around each annual estimate are wide enough to suggest that at least part of the difference in population estimates are due to chance.*

This is plausible although true population values are more likely to lie closer to the estimate than near the limits of the confidence interval.

- *The previous survey was an underestimate and/or the current survey an over-estimate.*

There are indications in the census data that distances to groups of boar have been over-estimated in some cases. This can yield an under-estimate of population density. This is a common problem in distance sampling but errors can be minimised with care. Both the 2015 and 2016 surveys were carried out by inexperienced field teams and improvements should be possible with experience.

- *Other mortality (i.e. animals dying from causes other than culling) has been over-estimated.*

Estimating natural mortality rates is very difficult however there appears to be no particular reason why this should have confounded population predictions any more this year than previous years.

- *Movements in and out of the forest have affected estimates.*

Some areas outside the forest were included in the 2015 survey. However they did not reveal many wild boar so it appears unlikely that temporary movements away from the forest in 2015 yielded an under-estimate.

- *Population modelling has under-estimated the culling requirement.*

The model treats mortality, culling and farrowing as discrete events whereas in reality they are partly concurrent. This may result in the model making calculations on inappropriate population compositions.

In conclusion, it appears that the increase in population estimates between 2015-16 is due to a combination of reasons however survey technique could be improved and the performance of the model and predictions based on it should be investigated carefully.

## References

Buckland, S.T. Anderson D.R. Burnham, K.P., Laake, J.L. Borchers, D.L. Thomas, L. (2001) *Introduction to Distance Sampling*. Oxford University Press, Oxford.

Gill, R.M.A. and Ferryman, M. (2015) *Feral Wild Boar and Deer in the Forest of Dean. Survey and Population Projections in the Public Forest Estate 2015*. Forest Research Report.

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**Figure 1. Trends in numbers of wild boar culled, killed on roads (RTA's) and census estimates, 2008-2016.**



