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ESCAPE MOVEMENTS OF WILD BOAR PIGLETS (*Sus scrofa* L.) AFTER TRAPPING, MARKING AND RELEASING

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ABSTRACT

Since 1998, we have collected ecological and behavioural data from a wild boar population in Lower Saxony, Germany. We recorded escape movements and flight distances of 68 radio-marked wild boar piglets (11-40 kg body weight) after trapping, marking, and release. Wild boar were trapped in wire cages (300x100x100cm) and processed by hand, without the use of anaesthetising drugs. The longest flight distance after being released from a trap to a hiding place was 4.6 km (40 kg body mass), and the shortest flight distance was 0.2 km (21 kg body mass). Young piglets (11 - 25 kg body weight) fled no more than 2,2 km from a release site. Among male piglets, there was a slight, non-significant correlation between body weight and flight distance. After being trapped and released a second time, most recaptured piglets have a shorter flight distance. All of the wild boars that escaped after being trapped used hiding places within their home range areas, which we recorded. After leaving a hiding place, piglets found their family group within a short time.

Key words: escape behaviour, flight distance, *Sus scrofa*, swine-fever disease, telemetry, trapping, wild boar.

INTRODUCTION

The increasing wild boar population in Germany causes damage to agricultural crops and might result in an increase in the risk of spreading Classic Swine Fever (CSF). To limit the spread of the disease, vaccination baits are used and, in an attempt to reduce the boar population, hunting drives are undertaken. Since 1998, the Institute of Wildlife Research has studied the behaviour and movements of wild boar's before and after hunting drives in swine-fever infected areas (Sodeikat and Pohlmeyer 2000, 2002, 2003). There is, however, a suggestion that the trapping and releasing of stressed animals causes wild boar to travel some kilometres away from their own territories to those of neighbouring groups, where aggressive encounters increase the risk of spreading the CSF over a wider area.

STUDY AREA

Since 1998, the Institute of Wildlife Research has studied the wild boar's movement in an area in northern Germany, near Hanover (Figure 1).

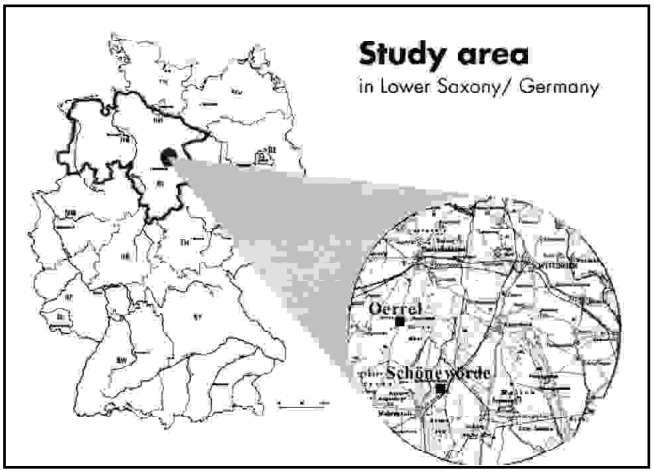

Figure 1. The location of the study area in Lower Saxony, Germany.

The study area is approximately 4000 ha and comprises about 50% forestland and 50% farmland. The central research area is on forestry commission land of approximately 1000 ha. The woodlands are covered by Scots pine (55%), spruce (10%), oak (10 %), larch (4%), beech (3 %), and other deciduous trees (17 %). Most of the bordering farmland includes meadows (70%), grain (18%), corn (3%), potato (3%), rape (3%) and sugar beet (2%). Neighbouring hunting estates, which cover 20 000 ha (about one third forest land, two-thirds farm land), were included in the research program. The research area lies inside the CSF-contaminated area and is monitored by veterinarians. Wild boar densities are not surveyed on forestry commission land. In recent hunting seasons, 4 - 5 wild boars per 100 ha were shot.

METHODS

Trapping and tagging methods

The trapping, marking, and release of wild boar took place between January 1998 and December 2002. Wild boars were trapped in automatically triggered wire traps, mainly baited with corn, which were placed along the main game paths. The trap (3x1x1 m) is large enough to capture several boars in a single trapping session.

Wild boars that weighed more than 30kg were transferred into a smaller cage that has a moveable wall to restraint the animals and to facilitate the attaching of ear tags. Animals weighed <30kg were transferred into a smaller wire cage from which they were removed by hand for marking, measuring, and weighing. The ability to process animals by hand made the use of anaesthetising drugs unnecessary and, consequently, prevented any potential negative effects of the drugs on the animals, e.g., lack of mobility and disorientation.

The wild boars were tagged with coloured, numbered plastic ear tags. Some of the larger individuals in a family group were fitted with radio transmitters (Biotrack, England). The ear-tag transmitters (mass = 40 g) had a range of 1000 m and a lifespan of about 6 months.

Telemetric observations

Radio tracking was used to record data of flight movements, flight distances to hiding places, home ranges, and the daily and nightly movements of the wild boars. After releasing the animal from a trap, we tracked the flight movements and positions of the wild boar using simultaneous cross bearings or triangulation every 10 minutes, depending on the animal's movement and position. The accuracy of the locations was estimated using an error polygon size of 1.3 ha for night time and 0.3 ha for daytime observations. In general, individuals were observed from two telemetry-equipped vehicles after releasing them from the trap to the hiding-places, where they had to remain for at least one hour. Facilitating instant tracking of movements. The amount of further observation of tagged wild boar was variable, and lasted up to 14 months.

Data analysis

To analyse data, we used the *Ranges V* software program (Kenward and Hodder 1998). Home ranges were taken as minimum convex polygons (MCP) and displayed as 100%, 95% and 60% home range areas.

Results and Discussion

From 1998 until December 2002, 68 wild boar piglets (body mass = 11- 40 kg) were captured in traps and fitted with radio-transmitter ear tags. In total, we trapped 230 wild boars, 56 % of which were male and 44 % were female. In general, captured animals acted quite calmly inside the trap. In some instances, wild boars, especially the bigger animals, tried to attack the person approaching the trap, and pushed against the trap walls, but we did not use anaesthetising drugs. We never trapped an entire family group during one session.

The weighing, measuring, marking, and release of each trapped wild boar normally lasted 10-15 min. In some cases, piglets from different family groups were captured in the same trap during one session. For example, the processing of 15 wild boars from two family groups lasted two hours. Doubtless, the trapping and handling, including weighing, measuring and marking with an ear tag transmitters, is a stressful experience for the wild boar.

The detailed observations to follow provide examples of how piglets behave after being released from a trap, which escape movement paths they use, and how quickly they find their family groups. Figure 2 shows the flight movements of five piglets from three wild boar family groups, captured in different traps at different times in one year.

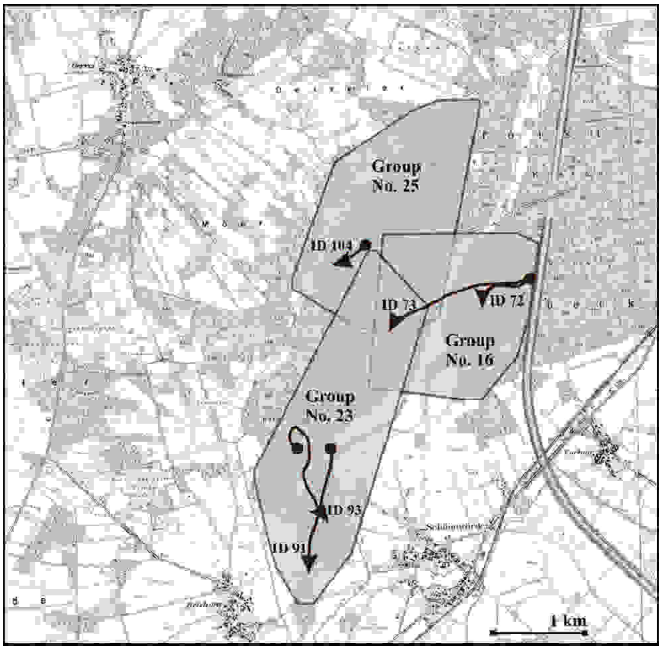

Figure 2. Escape movements of five radio-tagged wild boar piglets from release site to the first hiding place, which were captured in different traps at different times. The piglets belong to one of three wild boar family groups (group No.16: ID 72, ID 73, group No.23: ID 91, ID 93, group No. 25: ID 104). The home range (MCP) of each family group is given as 100 % area (MCP), Group No. 16: 248 ha, group No. 23: 428 ha, group No.25: 403 ha.

Group No. 23 with radio-tagged piglets ID 91 (male) and ID 93 (male)

Between June and November 2000, the home ranges of group No. 23 from were mainly situated in the southern forest areas, although there were occasional movements into neighbouring fields. During the observation period between 29 June and 27 November, the home range of group 23 was 428 ha. On 29 June, four piglets from

group 23 were trapped in the southern region of the research area, and piglet ID 91 (12 kg) was fitted with a radio-transmitter tag. After being released, the flight movement of ID 91 was 1.4 km in a southerly direction, at the border of the group's home range. On the same night, the entire group (one sow and seven piglets), including ID 91, was observed at a feeding place. On 8 August, another 3 piglets from group 23 were trapped and ID 93 (body mass = 20 kg) was fitted with a transmitter. After piglet ID 93 was released, a bearing taken in early morning showed that group 23 (including radio-tagged ID 91) was in the southern portion of its home range. At that time, the group was 900 m away from the trap in which ID 93 was captured that night. After being released, ID 93 fled in a northwestern direction before systematically turning southwards and running to the daytime resting site in a dense forest, where the rest of group 23 was located. Within 15 min, ID 93 found its family group. In other instances, we found that released piglets moving directly to the hiding places where the rest of the family group was using as a daytime resting site.

Group No. 25 with radio-tagged piglet ID 104 (male)

On 31 August, piglet ID 104 (body mass = 21kg) was trapped and marked, along with five other piglets from group 25, in the middle of their core home range. They were members of a larger group that contained one sow, two yearlings, and at least 16 piglets. Group 25 had a home range of 403.5 ha in the northern part of the research area. After being released from the trap at 12.15 h, piglet ID 104 ran 900 metres in a southwestern direction and into a dense forest stand. The piglet stayed there until 22.30 h and then found his family group.

Group No.16 with radio-tagged piglets ID 72 (female, 23 kg) and ID 73 (male, 27 kg)

In January 2000, the home range of group 16 (one sow and four piglets) was 248 ha. On 5 January, two piglets from group 16, ID 72 and ID 73, were trapped for the third time.

After weighing, marking, radio-tagging, and releasing the piglets at 15-min intervals, the first piglet (ID 72) fled into a dense forest 700 m from the trap site, and she remained there for the next two hours. The second released piglet fled 2 km out of the forest, across meadows, through a stream, and then searched for a hiding place at the border of its home range in a nearby forest. After two hours, piglet ID 73 returned to the centre of its home range.

In some cases, although the were released independently of each other, piglets fled to the same hideouts, even if the hideouts were in distant forest areas. Often, family groups used those sites as daytime resting areas. Flight movements to the same hideout by piglets released at different times could only be observed by members

of the same family group. But, if the rest of the group was also in this hideout was unknown in these cases.

After being trapped, all of the escaping wild boars used hiding places within their home range, which we recorded. Two leading sows, which were trapped separately and without their piglets, fled only a short distance (300 m and 400 m.) In both cases, the piglets were hiding in a dense forest not far from the trapping site.

Flight distances

After being released from a trap, the average flight distance of 68 piglets from the trap to a hiding place was 1.3 km (SE = 0.9 km, range = 0.2 – 4.6 km (Table 1). The average flight distance of female piglets was 0.96 km (SE = 0.62, N = 29), and body mass and flight distance were not correlated. The average flight distance of male piglets was 1.55 km (SE = 1.06, N = 37). There was a trend (R^2 = 0.21) for heavier (typically, older) male piglets to travel longer distances than did lighter piglets (see Graph A in Figure 3).

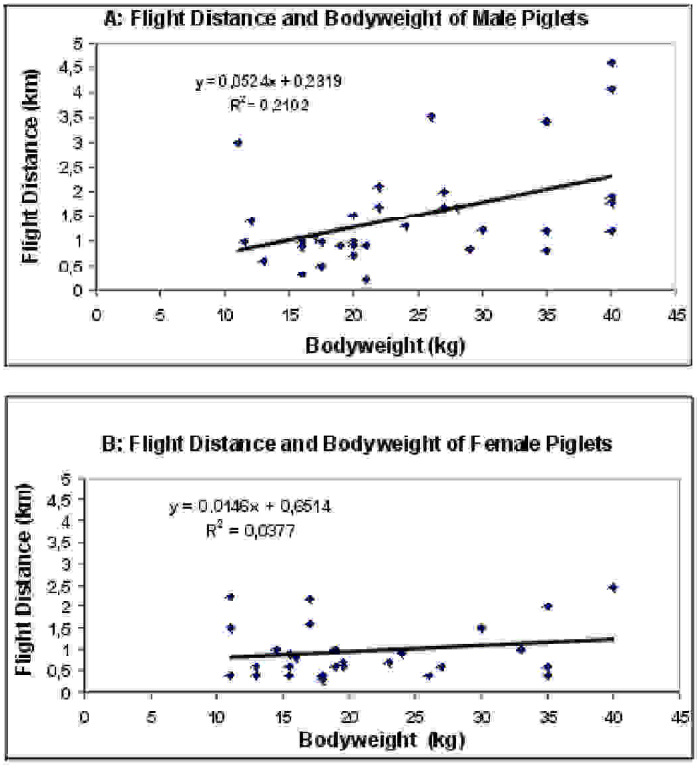

Figure 3. Relationship between body mass and flight distances of 66 wild boar piglets after being released from a trap. Each plot represents one male (Graph A: N = 37, mean flight distance = 1.55 km, SE = 1.06) or female piglet (Graph B: N = 29, mean flight distance = 0.96 km, SE = 0.62).

When piglets were assigned to weight classes (with intervals of 5 kg), the modest relationship between flight distance and body weight of the piglets (male and female) became evident.

The mean flight distance of young piglets (body mass = 11-15 kg) was 1.2 km (SE = 0.9 km, range = 0.4 – 3.0 km) from the trapping site. In older piglets (body mass = 35–40 kg) flight distances were longer than those of younger piglets (average flight distance =2.5 km, SE = 1.4 km, range = 1.2 –4.6 km). That trend is shown in Figure 4 and Table 1.

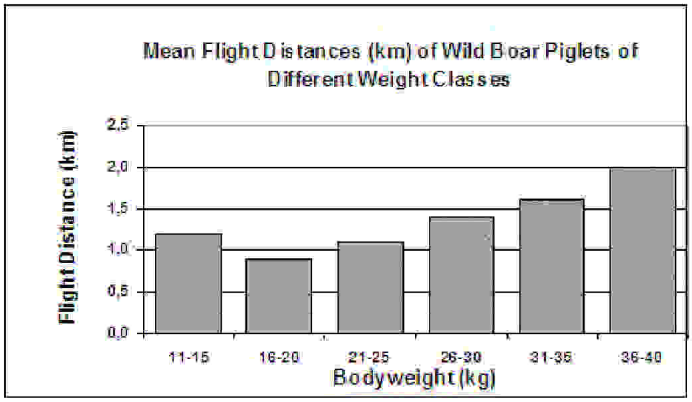

Figure 4. The relationship between average body weight of wild boar piglets (N=68), when grouped according to bodyweight class (5 kg intervals, 11 kg – 40 kg) and average flight distances following capture and release.

TABLE 1
Flight distances of wild boar piglets released from traps in Lower Saxony, Germany. Piglets (N=68) were assigned to one of six bodyweight classes.

Bodyweight Classes	11-15 kg	16-20 kg	21-25 kg	26-30 kg	31-35 kg	36-40 kg	Total
N Piglets	10	24	7	12	8	7.0	68
Mean Bodyweight (kg)	12.1	17.8	22.4	27.9	34.8	40.0	23.5
Standard Deviation SE	1.2	1.6	1.3	1.6	0.7	0.0	8.9
Mean Flight Distance (km)	1.2	0.9	1.1	0.4	1.6	2.5	1.3
Standard Deviation SE	0.9	0.4	0.6	0.8	1.2	1.4	0.9
Flight Distance Min. (km)	0.4	0.3	0.2	0.4	0.4	1.2	0.2
Flight Distance Max. (km)	3.0	2.2	2.1	3.5	3.4	4.6	4.6

Nine of the 11 recaptured piglets had shorter flight distances the second time they were caught. Two piglets were caught three times, but, after being caught a third time, their flight distances were longer than both of their previous captures (Figure 5).

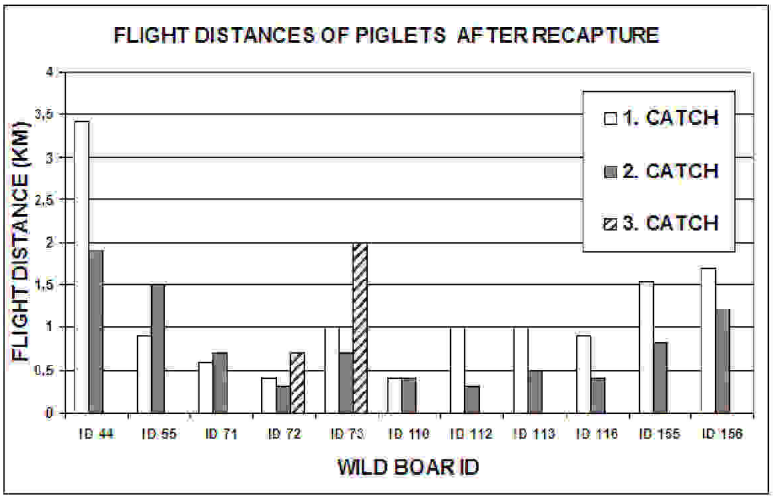

Figure 5. Flight distances of recaptured wild boar piglets (N=11). Two wild boar piglets (ID 72 and ID 73) were recaptured three times.

We were able to measure the amount of time 48 piglets spent in hideouts and the mean residence time in a hideout was 6.4 h (SE = 4.1 h, range = 1–22 h). One piglet left a hiding place after one hour and another left after 22 h. In 20 cases, the movements of the trapped and marked boar were observed in the first night following capture. The mean distance moved was 2.43 km (SE = 2.30 km, range = 0.2 - 6.73 km). During telemetric observations, we did not observe aimless wanderings or flights out of the original home range. Piglets always behaved as if their aim was to find their family group as quickly as possible.

Conclusions

This study provides a first impression of the escape behaviour of wild boar piglets following trapping, processing, and release. The reaction of wild boar piglet to the experience is highly variable, and escape behaviour is obviously influenced by factors that we could not investigate in our study. For example, factors such as the handling situation after trapping (weighing, measuring, marking), sex, weight, and other physical attribute of the piglets, the location of the trap-site within the animal's home range (periphery, centre, distance to preferred hiding places), trapping situation (e.g., time spent in a trap, whether alone or with members of its group).

The telemetric data demonstrate that the piglets, after leaving their hiding places, use well-known pathways and found their family group within a short time. The results show that wild boars escaping after being released from traps stay within

their home range, which suggests the trapping and release of wild boar for scientific purposes does not increase the risk of spreading the swine-fever-disease beyond swine-fever disease-contaminated areas.

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