

Maintenance of territory in the Great Snipe (*Gallinago media* LATHAM) on the display ground.

By

L. FERDINAND and B. GENSBOEL

(Med et dansk resumé: Territoriehævdelse hos Tredækkeren (*Gallinago media* LATHAM) på spillepladsen).

APPEARANCE OF THE DISPLAY GROUND

During a stay in Jämtland in central Sweden in the latter half of June 1963 we had an opportunity to make observations on a display ground of the Great Snipe. The ground observed was situated at about 600 m above sea level in the birch region, about 100 m from a river in a very humid meadow sloping to the west towards the river. The ground was mainly grown with short grass into which were scattered dwarf birches (*Betula nana*), small willow bushes (*Salix* sp.) and cotton-grass (*Eriophorum* sp.). The south point of the display ground was grown with birches. From the northern limit of the ground the distance to the edge of the forest was about 50 m – from the eastern border about 30 m. The surface of the display ground proper was uneven with many mounds and paths in the grass.

Just east of this display ground were many old display mounds which were conspicuous due to their vigorous grass growth.

The ground therefore appeared to have been used through many years – considerably longer than the twenty years for which a local ornithologist had known it. – The mounds from which the birds displayed appeared to be greatly manured, since the grass here had a fresher green

colour than the other grass vegetation. (It may also be due to the fact that the grass on the mounds was of a different species). During the display the birds produced a relatively small quantity of excrement; we estimated that there were two or three heaps of excrement on each mound at the time, when we investigated the place.

The grass was trampled down in certain places, and by further investigation of the system of paths we got an impression of how the birds had used the mound.

Three kinds of trodden down areas could be distinguished: display ground, display hollows, and paths. These areas represented a complicated system of places and tracks, and the birds moved about only within this system during their stay on the display ground.

Fig. 1 shows the display grounds, and fig. 2 a sketch of a system of paths from the central part used by an individual bird. It may be that this particular bird moved about a somewhat larger area than usual, since the observation tent may have created disturbances in the size of the territory. We made observations at three different display mounds, and we did not see anything to refute the belief that it was the same bird which we were

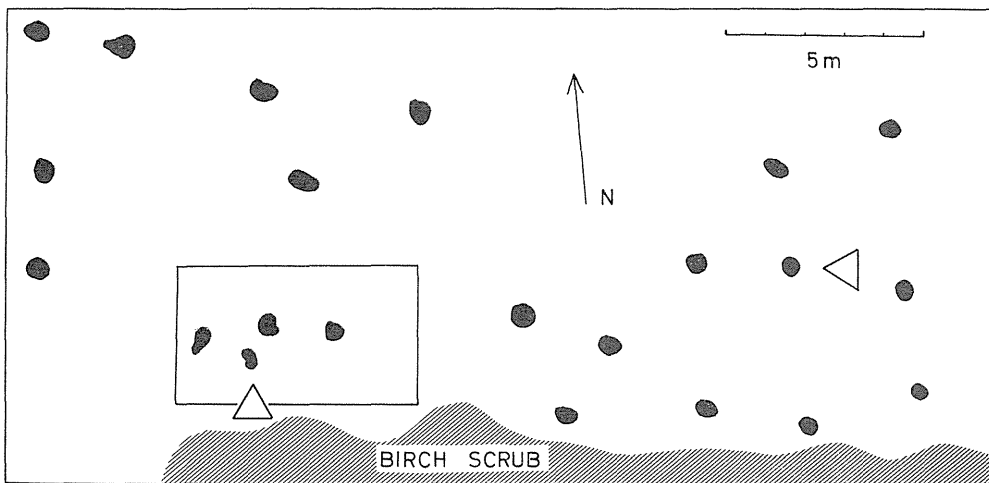


Fig. 1. Sketch of display mounds on a display ground of Great Snipe in Jämtland on 26/6.63. Ten to twelve birds used this display ground. The placing of the observation tent is indicated by a triangle, and the framed area corresponds to fig. 2.

Fig. 1. Skitse af spilletuer på Tredækkerspilleplads Jämtland 26/6 63. 10–12 fugle benyttede spillepladsen. Observations-teltenes placering er angivet med en trekant, og det felt der er indrammet, svarer til fig. 2.

watching in the same place in the different observation periods. It is however pointed out that it was not possible to distinguish the single individuals with certainty, since the plumage of the Great Snipe is very uniform from one individual to another.

By counting the number of trodden down mounds and the number of birds

in the area we found that there were about two mounds per bird on average. On several occasions we thus counted 10–12 displaying birds in the place, and there were about 23 mounds (all of them were not equally distinct).

The display mounds were small tussocks with a trodden down area at the top, they rose to 10–20 cm above the surrounding area. From each mound two to four paths issued. These partly led to nearby mounds and partly to places in the periphery. Several of the latter ended blindly in the outermost parts of the area. In many places the paths were like burrows in the grass, and when the birds stayed there, it was in most cases impossible to see them.

On many of the paths particularly trodden down parts were seen, as a rule quite near the mounds; we called these display hollows. According to our experience these were used equally often as the mounds for display, particularly late in the afternoon and in the first half of the evening, and possibly also in the morning.

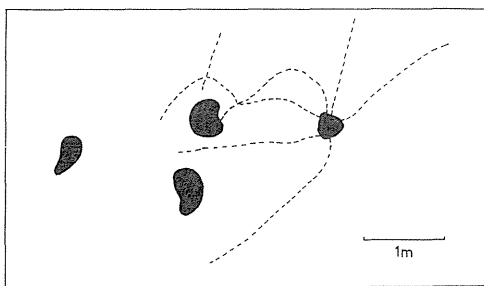


Fig. 2. Sketch of the paths and mounds used by the bird which was nearest to the observation tent on 26/6.63 on the display ground of the Great Snipe in Jämtland. The area corresponds to the framed area in fig. 1. Only the most distinct paths have been drawn.

Fig. 2. Skitse over de stier og tuer den fugl anvendte der var nærmest ved observationstellet 26/6 63 på tredækkerspillepladsen i Jämtland. Arealet svarer til det indrammede område på fig. 1. Kun de tydeligste stier er indtegnede.

BEHAVIOUR OBSERVED ON THE DISPLAY GROUND

In this place display of the same nature as seen in Lapland was observed (FERDINAND 1966), but the view of the place in Jämtland was much better so that we could observe more details and watch more birds at the same time during the display.

On the display ground in Jämtland was observed eight different forms of behaviour:

- 1) "The display" with its sounds, postures and stereotyped movements.
- 2) Vertical ascent.
- 3) Short flight over the display ground of a single bird.
- 4) Two birds "sparring" with bills.
- 5) "Fight" on the mound.
- 6) Preening breast feathers.
- 7) Sleeping posture between displays.
- 8) Behaviour in case of disturbance on the display ground.

1. "*The display*" with its sounds and stereotypic movements has been described by FERDINAND (1966). The display took place on the mounds about midnight, and before that time in the display hollows. These activities distinctly activated display in birds being close by. Each bird was only seen displaying within an area of a few sq. metres. Except from this were only short periods, when birds were observed in the areas of others. The display was by far the most common activity on the mound, and in most cases the birds were staying either in their own display hollow or on their own mound during this behaviour. On a few occasions we saw that the display formed part of other activities (those described under 4 and 5). The birds then displayed after vertical ascent, after sparring and after a "fight situation". On a single occasion fragments of the display were uttered by a bird during a short flight over the display ground.

2. *A vertical ascent* during which one or

two birds flew vertically upwards at the same time, one to one half metres above the ground, was observed 5–6 times. This ascent was only seen when the display was at its maximum, and only in the central part of the place. On three occasions the birds were observed on the ground immediately after such ascent, and on all three occasions they were seen displaying immediately after having settled on the ground again.

These ascents were much noisier than the other ascents described – a difference which the birds on the ground seemed to perceive – as they responded with silence to ascent when being flushed, while the display intensity by vertical ascent was uninfluenced or perhaps increased.

By the vertical ascents the birds often changed their place on the display ground, and the observations indicate that this change was most frequently made in the direction towards the central part of the ground.

3. *Horizontal flights of single birds towards the central part of the display ground* were observed several times, and these flights appeared to be made only by birds which were displaying in the periphery of the ground. A flight of this kind apparently could be distinguished by the other birds from a "common" or "vertical ascent", since it released a vivid display activity, both from the birds staying round the place of ascent and from the area, on to which the bird descended.

Return flights towards the periphery were never seen, so we suppose that the bird sneaked back to its original stand by the paths on the ground, since a short time after such horizontal ascent a displaying bird could be heard from this place.

During these flights the bird may pass over one or several displaying birds.

A particular bird whose display mound was outermost at one corner of the ground attracted our special attention. This bird made several flights towards the centre of the ground. Its vitality in this respect was amazing.

4. *Sham fights with bills between two birds* were seen less often than the hitherto mentioned forms for activity on the display ground. This may be due to the fact that these fights seem to occur in the lower part of the area which was therefore less easy to watch. These sham fights lasted only a few minutes, and took place in the way that the birds stuck their bills into eachothers' feathers on the fore throat. This fighting was only seen distinctly two or three times.

5. "*Fight*" on the mound. This form of behaviour is especially associated with the activity mentioned under 3. The observations were made in the periphery of the ground, where the tent was placed in one of the three nights of observation.

On a prominent mound, right in front of the observer, after the birds had begun to display, a bird had been standing, whose behaviour was very little aggressive. This bird was the next outermost one in this part of the ground. A few times the outermost bird tried to penetrate into its area, but intensive display activity forced it back.

This particular bird did not, like several of the other birds – notably those near the centre – run from one mound to another displaying, but remained almost constantly on the same mound throughout the night.

Suddenly a bird with a stand closer to the centre was seen to ascend, fly a couple of metres and land about 25 cm from the bird standing on the prominent mound. (A normal response to such intrusion would be intense display, but such a behaviour was not released).

"The owner" of the mound instead lay flat down, extending its neck and bill along the ground. It remained in this attitude for about five seconds. – The intruder remained passive. "The owner" then tried a short attack. With its bill extended it ran towards the other bird. This one did not respond at all, and the owner receded a little. Both birds now began preening their breast feathers.

After a short while the owner of the mound disappeared. It postured a couple of metres away – towards the periphery – apparently waiting; at any rate it did not make further attempts to defend its territory.

The conqueror walked up on the mound, remained there for a moment, and then went back to its stand, and a moment later the chased bird was again on its mound.

Some time later this bird was again attacked. Whether the attack was made by the same bird as before cannot be said, although it is probable: at any rate it came sneaking from the place from where the other bird had disappeared. This time the owner did not at all put up a defence – it only left its mound. Not until the intruder had retired about 3 m towards its own stand did the owner move. – In this place the attacker stopped and began to display, and the owner responded to this from its withdrawn post.

Once again the owner had a visit, and its response was quite different. It remained at its mound, but let the intruder stand at the top. The two birds moved round in a slow, trancelike gait, quite different from the birds' normal walk. During this walk the birds often pecked the ground (food seeking movements). That they were two males was seen when the intruder receded somewhat, as both birds began to display.

6) In the silent periods between the displays the birds were often seen to preen their breast feathers on one side.

7) *In the sleeping posture* the bird on the mound was seen with the bill placed in the angle between the upper- and under-arm and with open eyes. This behaviour was only seen early in the morning at a time when the display was clearly coming to an end and there had been no activity on the place for some time.

If one of the neighbours to a roosting bird however began to display, the "sleeping bird" would give a start. As a rule, it would at once adopt its display posture.

8) *Behaviour in case of disturbance on the display ground.* By moving cautiously we could approach the displaying birds to a distance of 10–15 m. Often the birds would then leave the mounds and begin to display from the hollows. Only when we walked right on to the ground did the birds fly up, and in that case only singly. If a bird had been flushed, the display on the ground would stop at once. The same happened when a scolding Fieldfare (*Turdus pilaris*) flew over them.

THE DISPLAY INTENSITY

The display intensity on the ground in Jämtland was at its maximum from about 11 p.m. to 2 a.m. During a visit to the ground at 6 p.m. one day no birds were present, but during other visits single males have been heard displaying already late in the afternoon. In the period at the end of June when we made the observations, the display always started at 9 p.m., and between 9 p.m. and 11 p.m. the activities increased successively. When the maximum was reached at 11 p.m. all the birds were standing on the top of the mounds.

At about 9 p.m. the number of displays counted for the whole ground was 8 per minute on average. At about 10 p.m. the number had risen to 9. From 11 p.m. to 2 a.m. there were 18 displays with 25 as maximum heard in one minute.

It was characteristic of the display later in the night (after 2 a.m.) that it varied greatly in intensity. Most common were long periods with little activity, but now and then the intensity suddenly increased to a level which was not less than that of the maximum performance from 11 p.m. to 2 a.m.

FLIGHTS TO AND FROM THE DISPLAY GROUND

The birds arrived singly at the display ground after about 4 p.m., and the number of birds thereupon rose successively till the display started at about 9 p.m. – A few displays have however been heard already at 5 p.m., both on the display ground and in its vicinity. On two occasions we could for some hours check the arrival of the birds at the display ground, and although we had not seen any flying

birds arrive at the place, some birds were nevertheless present on the ground. We have not observed any birds flying to the place, but we have often seen them leave the place on the wing. We are therefore of the opinion that the birds walk to the display ground in the vegetation, which is also supported by the fact that paths lead to the periphery and from there disappear in the surrounding vegetation.

DISCUSSION

On basis of the above observations we are of the opinion that the individual birds during their stay on the display ground defend a territory of a few sq. meters. We base this view in the first place on the fact that the individual bird throughout the observation period remained within a definite area – and that no other birds were seen in this area – apart from the few moments described above. Besides, this theory – about maintenance of territory – is supported by other activities observed and pertaining circumstances, as they are described under points 1, 2, 3, 4, and 5, since they can all be interpreted as activities protecting the occupied area, or as attempts to conquer new ground. Whether the display itself also has another function than to maintain the territory, is probable, not least – as described by Russian authors (KOZLOVA 1962) – when females appear on the display ground.

Several of the activities observed – which we interpret as an attempt to conquer a new territory – indicate that the central and most crowded part of the display ground was the most preferred. This was in the first place distinct by the vertical and horizontal flights and also because the birds in this place showed a more aggressive behaviour in their protection of the territory. Fight and vertical flights were thus observed only in this place.

Also the behaviour under point 5 seems to show that the birds which have their territories at the periphery of the display ground are “weaker” than those which have occupied more “central” territories.

The pecking-the-ground-behaviour described under point 5 in a strongly emotional situation and the preening (described under point 6) seem to indicate displacement activities, while the sleeping posture, according to our experience, appears to be a response to fatigue.

Evidently, the display may be brought to an end for several reasons which all tend to show that the birds respond to certain sounds, e.g. a flushed bird or a passing scolding Fieldfare.

This silence lasts for 15–20 minutes, if only one bird has been flushed from the display ground, and can only be interpreted as a response to disturbance on the display ground – if one is threatened, one is silent –. Since the birds are well hidden among the vegetation this silence appears to be a very adequate means of protection.

Unfortunately, these observations on the behaviour of the Great Snipe on the display ground are incomplete in many respects, and in the future additional and more systematic observations should be made on the display ground. We therefore refrain from a detailed discussion in this respect, but we wish to point out certain relations between the display of the Great Snipe and similar behaviour in the Ruff (*Philomachus pugnax*) and the Black Grouse (*Lyrurus tetrix*).

All seems to indicate that the behaviour of the Great Snipe on the breeding ground in certain respects is similar to the behaviour of these birds in the breeding areas. Probably in all the species no pair-formation takes place, and the males do not share in the rearing of the young. The males gather daily on the display grounds, and these are used through many years. On the display ground they defend a territory (BANCKE and MEESENBURG 1951).

If we compare the behaviour of the Great Snipe in the breeding season with what is known about the behaviour of its nearest relatives we are immediately surprised at the great difference in the behaviour of the males, since in all the species mentioned below: *Gallinago gallinago*, *G. minutus*, *G. stenura*, *G. megala*, *G. hartwickii*, *G. solitaria* (JOHANSEN 1961 and

HARTERT 1912–21) a song flight has been described which presumably is performed exclusively by the males above the breeding territory.

The form of the flight and the voice during this flight are different from one species to another. Nothing definite is known about the occurrence of ground display in these birds, and there is no information in the literature, which indicates that they do not form true pairs. However, for the Common Snipe (*Gallinago gallinago*) a ground display associated with feeding has been described—with movements of neck and bill (BAGNALL-OAKLY 1955). H. LIND (pers. comm.) has observed similar postures, so Snipes may have certain postures on the ground.

As to the Woodcock (*Scolopax rusticola*) a song flight is also known, but the male does not share in the rearing of the young, and a display between the male and the female on the ground with postures and display notes is known. It is not known whether pair-formation takes place. Much the same features are found in the American Woodcock (*Rubicola minor*) as in the European Woodcock, apart from the fact that in this species the male shares in the rearing of the young, and the bird is monogamous (BENT 1927).

Many investigations are needed to form a complete picture of these activities in

order to give well founded comparisons of the species.

The Great Snipe is thus distinguished from the other species of Snipes thereby that the display of the males takes place on the ground, and that they here defend a small territory, and congregate within a display ground, further thereby that the utterances of the bird seem to be more varied than those of the other species which are less compound, and finally, because males and females probably do not form pairs.

Although the breeding behaviour of the Great Snipe thus is completely different in several respects from that of its nearest relatives, the species have the following points of resemblance: (BENT 1927, WITHERBY 1946).

- 1) Only the male participates in the song flight or the display.
- 2) The display or the song flight has its highest intensity in the dusk.
- 3) The utterances during these displays and the pertaining movements (flight or display) are fixed (ritualized).
- 4) The display or the song flight is a phenomenon serving to advertise and defend the territory.
- 5) The display or the song flight is performed over a very long period in the breeding season, and e.g. not as for many waders before incubation commences.

SUMMARY

At the end of July 1963 the authors visited a display ground of about 12 Great Snipes in Jämtland in Sweden.

By studying the trampled down grass, the way in which the birds used the ground could be ascertained. Three different kinds of trodden down areas were observ-

ed: paths, display hollows, and display mounds.

The paths connected the mounds and the hollows in a complicated system, but they also led from the periphery to the central area. The display hollows appeared as conspicuous trampled down areas quite

close to the display mounds. The display mounds were used when the display was not at its maximum in the lighter hours (in the beginning of the evening and late in the morning) – at its maximum (from 11 p.m. to 2. a.m.) it took place from the mounds.

The following forms of behaviour were observed:

1) The ritualized display (described by FERDINAND 1966). Each bird normally displayed only within a definite area, covering a few sq. metres.

2) Vertical ascent: One or two birds flew simultaneously one to one-half metre vertically above the ground. Immediately after landing the birds would display.

3) Horizontal flight towards the central part of the ground: Birds placed near the periphery would fly singly towards the centre. In all cases they seemed shortly after to be at the starting point. No return flight was observed. This kind of flight released a vivid display activity from the birds standing close by.

4) Sham fights with the bill: Two birds would stick their bills into eachothers' feathers on the foreneck.

5) "Fight" on the mound: A bird standing at the periphery of the ground was "attacked" three times by a bird standing nearer the centre. The attack was merely an intrusion – on one occasion, however, the two birds walked in a trancelike gait round eachother. Active defence was only observed the first time.

6) Preening breast feathers. In the silent periods between the displays the birds would often preen their breast feathers of the neck.

7) Sleeping attitude. Observed only late in the night, when the activity was dragging to its close.

8) Disturbances: Slight disturbances induced the birds to display from the hollows or the mound. Flushing of birds from the ground caused silence for a long period of time.

The birds arrived at the ground after 4 p.m. From about 9 p.m. the birds would display regularly, and by that time all seemed to be at their stands. No birds were seen to arrive, it is therefore assumed that the birds walk into the ground by the paths from the periphery. Departures were however observed.

On the basis of these observations the authors would maintain that the birds keep and defend a territory in the place. Besides, the central part of the place seems to be most preferable, that part which is occupied by the strongest and most vital individuals.

Finally, differences in and similarities to displays in other species, e.g. the Ruff and other species of Snipes, are mentioned.

We thank Dr. HANS LIND most cordially for reading the manuscript and for valuable help with its preparation, and Mrs. AGNETE VOLSØE for translating the manuscript.

REFERENCES

- BAGNALL-OAKLY, R. P., 1955: Display of Snipe. – British Birds **48**: 279–280.
- BANGHE, P. og MEESENBURG H., 1952: A Study of the Display of the Ruff (*Philomachus pugnax*). – Dansk Ornith. Foren. Tidsskr. **52**: 98–109.
- BENT, A. C., 1927: Life Histories of North American Shore Birds, New York, part I.
- FERDINAND, L., 1966: Display of the Great Snipe (*Gallinago media* (LATHAM)). – Dansk Ornith. Foren. Tidsskr. **59**: 14–34.
- HARTERT, E., 1912–21: Die Vögel der paläarktischen Fauna, Berlin **2**: 1660–1663.
- JOHANSEN, H., 1961: Die Vogel Fauna Westsibiriens, Journal für Ornithologi **102**: 59.
- KOZLOVA, E. V., 1961–62, Charadiiformis, Fauna USSR, Bind 11.
- WITHERBY, H. F., 1947: The Handbook of British Birds **4**: 193–197.

DANSK RESUMÉ

Territoriehævdelse hos Tredækkeren (Gallinago media LATHAM) på spillepladsen.

Forfatterne besøgte i slutningen af juli 1963 en spilleplads for omkring 12 Tredækkere i Jämtland, Sverige.

Ved at betragte det nedtrådte græs kunne fuglenes måde at anvende pladsen på konstateres. Der iagttoges tre forskellige slags nedtrådte partier: stier, spillehuller og spilletuer.

Stierne forbandt tuerne i et kompliceret system, men førte også fra pladsens periferi ind mod den centrale del. Spillehullerne fandtes som særlig nedtrådte partier lige ved siden af spilletuerne. Spilletuerne anvendtes, når spillet i de lysere timer ikke var på sit højeste (først på aftenen og sidst på morgenen) – i sin maksimale udfoldelse (fra kl. 23–2) afvikledes det fra tuerne.

Følgende adfærdsformer blev iagttaget:

1) Det ritualiserede spil: (beskrevet af FERDINAND 1966). Hver fugl spillede normalt kun inden for et bestemt, få kvadratmeter stort område.

2) Lodret opflyvning: En eller to fugle fløj samtidig en til en halv meter lodret op over pladsen. Umiddelbart efter landingen spillede fuglene.

3) Vandret flugt mod pladsens centrale del: Yderligt placerede fugle på pladsen fløj enkeltvis mod dens centrum. I alle tilfælde synes de kort efter atter at befinde sig ved udgangspunktet. Tilbageflugt sås ikke. Opflyvning af denne art udløste voldsom spilleaktivitet fra nærstående fugle.

4) Skinfægtninger med næbbet: To fugle stak næbbene ind i hinandens fjer på forhalsen.

5) »Kamp« på tuen: En fugl i pladsens periferi blev tre gange »angrebet« af en fugl med plads nærmere centrum. Angrebet bestod blot i en indtrængen – en enkelt gang gik de to fugle dog i en tranceagtig gangart omkring hinanden. Aktivt forsvar sås kun første gang, hvor »tueejeren« med fremstrakt næb for frem mod indtrængereren. I de andre tilfælde veg den.

6) Pillen i brystfjerene: I de tavse perioder mellem spillene pillede fuglene sig ofte i brystfjerene på den ene side af halsen.

7) Sovestilling: Sås kun sent på natten, hvor aktiviteten var ebbet ud.

8) Ved forstyrrelser: Svage forstyrrelser bragte fuglene til at spille fra tuerne. Opjagning af fugle fra pladsen bragte tavshed i længere tid.

Fuglene ankom til pladsen efter kl. 16. Fra kl. ca. 21 spillede fuglene regelmæssigt, og alle syntes da at være på deres pladser. Ingen fugle sås ankomme, så det antages, at fuglene spadserer ind på pladsen ad stierne fra periferien. Bortflyvning blev derimod set.

På grundlag af disse iagttagelser vil forfatterne hævde, at fuglene opretholder og forsvare et territorium på pladsen. Desuden synes den centrale del af pladsen at være den mest attråede, den del der rummer de stærkeste og mest vitale individer.

Der omtales til sidst forskelle og ligheder med spil hos andre arter, bl. a. Brushane og andre bekkasinarter.

Manuskriptet modtaget 24. maj 1964

Forfatterens adresse: Lorenz Ferdinand, Jonstrupvangvej 4, Ballerup.