First reported case of abnormal behaviour of a male Hazel Grouse *Tetrastes bonasia* in the wild

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Erster dokumentierter Fall eines "balztollen" Haselhahns Tetrastes bonasia

In den Südtiroler Alpen attackierte ein männliches Haselhuhn menschliche Besucher in seinem Revier. Das Verhalten erinnerte an die typischen Verhaltensweisen bei innerartlichen territorialen Konflikten: Imponierlauf, aufgestellte Haube, Springen auf Felsen oder Baumstämme, Verstecken hinter Bäumen, begleitet von aggressivem Gesang. Die Attacken gegenüber Menschen entsprachen dem Verhaltensmuster bei innerartlichen Auseinandersetzungen: Sprünge, Schnabelhacken und Schlagen mit den Flügeln bei gespreizten Schwanzfedern.

Der Vogel war nicht beringt, jedoch kann aufgrund der Reviertreue, Zahmheit und individueller Merkmale darauf geschlossen werden, dass es sich immer um dasselbe Individuum gehandelt hat. Es erreichte das für freilebende Haselhühner hohe Alter von neun Jahren. In einigen Jahren war der Vogel verpaart, Bruten fanden statt. Die Gründe für das abweichende Verhalten sind unklar, möglicherweise ist es ähnlich wie bei "balztollen" Auerhähnen auf einen ungewöhnlich hohen Testosteronspiegel und/oder Fehlprägungen zurückzuführen.

Key words: Hazel Grouse *Tetrastes bonasia*, tame, aggressive behaviour to humans, habitat choice, survival

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Introduction

The Northern Hazel Grouse Tetrastes bonasia is a cryptically coloured forest bird, adapted to young, dense forest stages but also to multi-layered and old growth forests with gaps and rejuvenation spots (for reviews see Bergmann et al. 1996, Klaus and Bergmann 2020). At small to larger scales, such mosaics of different successional stages may result from forest disturbances such as fire, windthrow, snow damage or bark-beetle infestation (Scherzinger 1976, Swenson 1995). Generally, the close vicinity of dense coniferous cover and deciduous food trees of the genera Betula, Salix, Alnus, Sorbus, and Corylus delivering buds and catkins as the main food in winter seem to be crucial for this small, monogamous forest-dwelling grouse (Bergmann et al. 1996, Ludwig and Klaus 2017). Conifers of the genera *Picea, Abies, Pinus* and to a lesser extent *Larix* (in NE Siberia) provide cover, lowering the predation risk to Hazel Grouse by numerous predator species. Hazel Grouse are very shy and effectively use dense cover to hide in and avoid predators or humans. Here we report on the first case of abnormal (both tame and aggressive) behaviour in a male Hazel Grouse in the North Italian Alps.

History of occurrences

In August 2009, the owner of a mountain cabin in the North Italian Alps was cutting wood near the cabin when an adult male Hazel Grouse approached him. The cabin was located at 1890 m a.s.l. on a subalpine meadow, surrounded by mountain forests. The cabin owner was surprised by the tameness of this normally shy bird. The first photos he took showed an adult male with combs that were tiny or almost missing, also in spring and autumn. Sometimes, the male even went into the cabin and pecked for ants at the entrance. Several times it was attracted by loud noises, such as when about 30 persons gathered around the cabin for a party. Without any signs of timidity, the male moved on the ground along and between the visitors. Later, the male's centre of activity changed from the vicinity of the cabin downhill to a steep slope, 500-700 m away, covered by closed mountain forest between 1800 and 1900 m a.s.l. The most curious observation occurred in 2013, when about 200 visitors celebrated a party around the cabin. The male flew directly into the groups of people, landed, and walked around - a crazy situation. Loud noise and human assemblies seemed to attract this male.

One of the authors (JW) observed this Hazel Grouse for the first time on August 21, 2011. On this date and on 30 subsequent visits up to June 2014, the male was found 26 times. The cock approached when the observer used a whistle imitating Hazel Grouse song nearly all year round, with the exception of the period of intensive moult from mid-June to the end of July. After fresh snowfall, the male often disappeared and could not be detected. Many controls in every year followed. Only in 2017, the presumed last year of his life, the male preferred to hide and the searches were often negative. During six controls in autumn 2017 the male was found on October 15, 2017 for the last time, suggesting a very long survival of a minimum of nine years for this wild male Hazel Grouse! His behaviour was documented by photos and videos over the years.

Habitat

The male's territory was located in a multi-layered mountain forest, about 60–100 years old, dominated by cedar pine *Pinus cembra* (370 stems/ha), spruce *Picea abies* 130/ha, a few mountain ash *Sorbus aucuparia*, rejuvination of these tree species, dead standing trees 120/ha, lying dead trees 120 /ha, structured by many gaps and rocky areas. The forest floor was dominated by bilberry *Vaccinium myrtillus* and rhododendron *Rhododendron ferrugineum* (50% cover), grass (30%),



Fig. 1. The habitat of the Hazel Grouse *Tetrastes bonasia* male in a subalpine cedar pine-spruce forest at 1850 m a.s.l. in the North Italian Alps. – *Habitat des Haselhuhns* Tetrastes bonasia *im subalpinen Zirben-Fichten-Wald auf 1.850 m Seehöhe in den Südtiroler Alpen.* Photo: S. Klaus



Fig. 2. Man and wild Hazel Grouse male. – Mensch und freilebender Haselhahn. Photo: S. Klaus

and bare ground without vegetation (20%). In the same type of habitat healthy populations of Capercaillie *Tetrao urogallus* and Black Grouse *Lyrurus tetrix* (near the timberline) exist at an altitude of 1800–1900 m a.s.l. We noted Goshawk *Accipiter gentilis*, Red Fox *Vulpes vulpes*, Pine Marten *Martes martes* and Golden Eagle *Aquila chrysaetos* as potential predators.

Abnormal behaviour in the presence of humans

When a whistle was used to imitate the territorial song, the male approached us on the ground, never flying. He ran and circled around, hiding sometimes behind a tree, often uttering a highpitched aggressive song apparently not yet described in the literature (Bergmann et al. 1996) and approached step by step. As in fighting behaviour his crest was erected, the wings somewhat spread, and the tail in horizontal position. Aggressive behaviour increased when humans remained longer in his territory and when imitating the aggressive song, culminating in sudden attacks: pecking against the observer's hands or shoes, accompanied by strong and repeated wing beats with spread tail. As in a 'mad' (hyper-aggressive) male Capercaillie, the behaviour was typical for territorial defence against a neighbouring male. This individual was obviously able to discriminate between humans. The owner of the cabin and one of the authors (IW) seemed to be known to the bird and identified as rivals. The presence of other observers sometimes resulted in effective retiring and hiding, after which the male could not be found even during a longer search. As is usual in Hazel Grouse, territorial behaviour culminated in spring (April-early June) and in autumn (September-end of October). During the peak of moult in summer and after fresh snowfall the male hid and could not be found.

Territorial song (whistling) and flutter jumps, typical components of Hazel Grouse territorial behaviour, were common only in periods of declining aggressiveness, in most cases after the observer had left the territory. Sometimes the cock followed the human visitor up to a forest road, the assumed border of his territory.



Fig. 3 (left). Aggressive behaviour, just before an attack. – *Aggressives Verhalten, kurz vor dem Angriff* (from video by S. Klaus).

Fig. 4 (right). Pecking and wing-beating by the attacking male – the same behavioural pattern as in real combats in Hazel Grouse. – *Hacken und Flügelschlagen des angreifenden Hahnes – Verhaltensmuster aus innerartlichen Kämpfen* (from video by S. Klaus).

Additional observations

Pair-formation was observed in 2010–2013, 2015, and even in 2017, presumably the last year of his life. In all cases, the females were shy. In some years successful breeding was recorded.

Several times we found signs of predator attacks or even collisions. In 2009, the male survived a collision with a wire fence near the cabin. On November 18, 2016, we found lots of feathers on the ground in his territory, possibly after a raptor attack (fright moulting) or from fighting with rivals, which the male survived. Feeding was observed on the ground - leaves and flowers of bilberry, grasses, and rhododendron in spring and the nuts of cedar pine in autumn, spread by Nutcrackers Nucifraga caryocatactes on the forest floor. Interestingly, the male discriminated well between full and empty nuts, and only the former were eaten. Sometimes, when aggressiveness was low, the bird took nuts from the observer's hand. On trees we noticed feeding on mountain ash leaves in spring and fruits in autumn.

In 2017, the aggressiveness of the male dropped, perhaps due to his high age and probably declining hormone levels. During most of the control visits in 2017 the male was hidden and our search was negative. On October 15 (2017), the male was observed for the last time within his territory.

Discussion

The cause of its tameness and eccentric behaviour is unknown. In 'mad' male Capercaillies, an enhanced level of testosterone and/or changes in the imprinting pattern have been discussed as contributing factors in such behaviour (Höglund and Porkert 1992), resulting in humans not being regarded as enemies, in contrast to mammalian or avian predators.

Sometimes, humans were attacked when visiting the Hazel Grouse male's territory. The typical behaviour resembled territorial conflicts between Hazel Grouse males: running on the ground in a horizontal position with erected crest feathers, jumping on rocks or logs, sometimes hiding behind trees, accompanied by an aggressive song, audible only at a short distance (10-20 m). Attacks were performed as is usual in Hazel Grouse fights. The male was not banded but we assume it was always the same individual, based on his tameness, absence of combs, and appearance in the same territory and selection of preferred sites over many years. In addition, a second case of a 'mad' Hazel Grouse male from Fennoscandia was filmed by Chantiny (2013), while a third male aggressively pecking at the shoes of an observer was been recorded on video in Switzerland (Mollet, pers. comm). Studies on both birds are unknown. In contrast to these aggressive birds, some wild Hazel Grouse were trained over a longer period of time by Jani Ylikangas (pers. comm.) to behave tamely towards him, but they were never aggressive and always shy of other people. In Ruffed Grouse, several cases of aggressive behaviour against humans and machines have been described (Lee Rue III 1973).

Eccentric abnormal behaviour in Capercaillies is a well-known phenomenon, increasingly ob-



Fig. 5. Male Hazel Grouse with nut of cedar pine. – *Männliches Haselhuhn mit Zirbelnuss*. Photo: J. Wassermann



Fig. 6. Male Hazel Grouse in an area of flowering Erica carnea, Vaccinium vitis-idea and V. myrtillus. –
Männliches Haselhuhn in blühender Schneeheide, Preisel- und Heidelbeere.Photo: S. Klaus

served in most parts of the species' range (Klaus et al. 1989, Mollet 2001, Milonoff 2005). Males behave aggressively, defending territory, whereas females can become tame, visiting settlements and showing precopulation behaviour in the presence of humans. In hyper-aggressive male Capercaillies, an enhanced level of testosterone has been found (Klaus et al. 1989, Milonoff 2005). Alternatively, changes in the imprinting pattern during chick development have been discussed as contributing factors (Höglund and Porkert 1992). If broods were never confronted with humans during their growth, imprinting by warning calls (alarm) of the mother will not take place. As a possible result, humans will not regarded as enemies, in contrast to mammalian or avian predators. Nevertheless, many open questions remain.

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