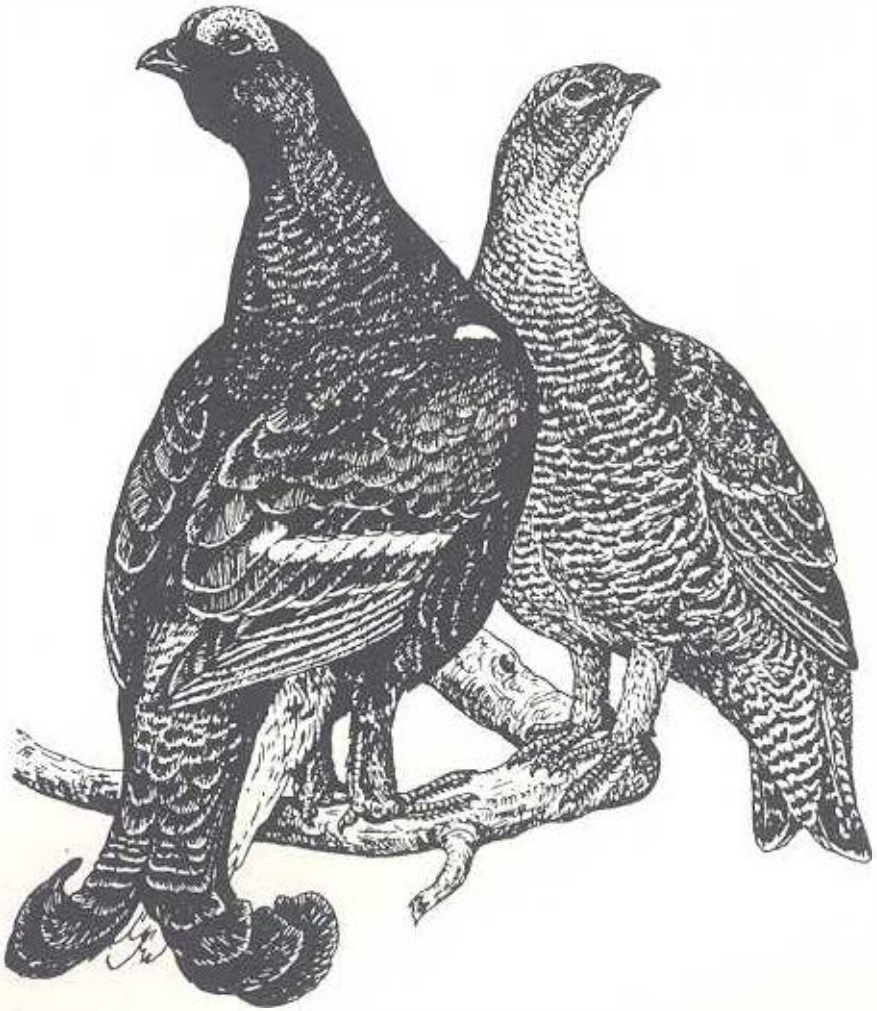
1991

Grouse News 1-10 (1991-1995)

World Pheasant Association International

Diana Lovel



GROUSE NEWS

WORLD PHEASANT ASSOCIATION

No 1

MARCH 1991

GROUSE NEWS NO 1

Editor: Diana Lovel

CONTENTS

FORTHCOMING EVENTS

1991

14-15 Mar Workshop on the Management and Modelling of black grouse populations at Grubenmore, Inverness-shire (by invitation)

1993

Autumn Sixth International Grouse Symposium, Udine, Italy

Front Cover: *Hazel hen sketch by Dr Fabio Perco*

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EDITORIAL

We hope that our first Grouse Newsletter will be well received and will stimulate you to send us any items of news, ideas and criticism you may have.

We think that we should have a competition to find a title for our newsletter. David Hancock has suggested "The Lek", "Grouse Droppings" or "Tetraonid Times". What are your suggestions? For this first issue I have allowed Jane Clacey, who has typeset and produced this for us, to call it Grouse News David also sent some useful ideas for contents headings, most of which we have incorporated into this newsletter as well as his valuable contributions We plan to produce a newsletter each Spring and Autumn, at a cost of £5 per annum, provided that you send us material.

Thank you, to all who have found time to contribute to this first publication and to those of you who have allowed us to edit and use papers and abstracts presented at Elverum. The lovely pen and ink drawings on the cover and page 10 are by Dr Fabio Perco, others are by Franz Müller

Unfortunately there has not been room in this edition to print some of the papers from Elverum without drastically shortening them with a savage editorial blue pencil.

The primary function of this newsletter is to publish short interim papers which the big international refereed journals will usually reject. This will give a rapid publishing facility, allow the airing of hypotheses and new techniques, and will not preclude eventual publication of a completed study elsewhere.

Grouse Symposium Elverum 1990 L to R Leif Kastdalen, Arto Marjakankas, Tim Lovel standing, Gus Jones, Manfred Liesser and Siegfried Klaus

TETRAONID STUDY REGISTER AND ABSTRACTING FUNCTION

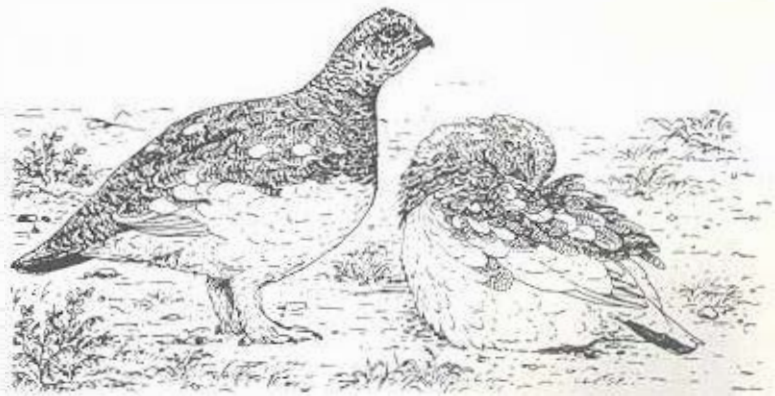
We want this newsletter to serve the needs of the tetraonid researcher. In exploring the options it has been suggested that a couple of services totally lacking for grouse researchers is a central register of who is doing what and where. True you can attend meetings to help find out, you can read Journals to see what HAS been done, but nowhere can you get a register of who is planning or initiating a project.

This Registry service could be particularly useful to institutions, agencies or students planning a project or a researcher wishing to touch bases with somebody else homing in on a common topic.

The Abstracting service, dealing with not only published papers but interim reports, could be equally valuable.

What are your thoughts? To provide this service (should it be deemed valuable by a sufficient number of people) would also necessitate considerable cooperation of the membership to make it work effectively. While we have a volunteer to initiate the coordination of projects, the word MUST be spread by members to encourage new projects to be listed. Similarly, the abstracting function is going to depend on the membership providing these abstracts.

Lets hear from you all! Please do write to the editor direct at Holywell Hall, Brancepeth, Durham DH7 8EQ, UK or via WPA HQ.



DECLINE OF BLACK GROUSE

E Strauss

Abstract of a paper on Causes of decline of Black Grouse *L.Tetrao tetrix* in Oberschwaben (Baden-Württemberg, FRG)

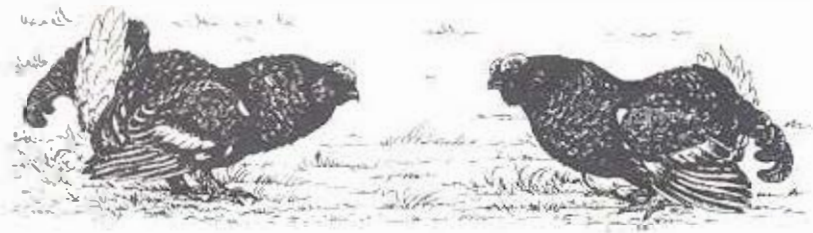
Several reasons for the decline have been studied within the scope of a black grouse - reintroduction and research project:

- changing habitats of various moors in Upper Swabia
- the diet of the black grouse
- nest predation by carrion crows *Corvus c. corone*

In 1954 circa 1/3 of the studied moor areas were undrained bog and low-yield meadow, 1/3 were utilized or former peat excavation sites with different succession stages, and 1/3 were intensively used meadow/pastureland. Between 1954 and 1986, extensive changes by human interference occurred only in the fen areas. The food spectrum of black grouse in "Wurzacher Ried" (1989) consisted mainly of plants in the drained and undrained bog areas (e.g. *Vaccinium oxycoccus*, *Calluna vulgaris*).

The undrained bog area in "Wurzacher Ried" were used intensively in May/June for feeding by carrion crows and therefore the artificial nest losses were high here. Various predators (carrion crow, red fox *Vulpes vulpes*) caused high nest losses (1990) in green plover *Vanellus vanellus* (53%), curlew *Numenius arquata* (100%) and *Tetrao tetrix* (75%).

It can be assumed, from these results, that nest predation, as well as habitat changes, plays a considerable role in the decline of the black grouse in Upper Swabia.



WORK AT GRIMSO

Jon Swenson

At Grimso Wildlife Research Station three biologists are working with grouse. I am just completing my study of social organisation and mating system of hazel grouse. I plan to defend my thesis for a PhD in zoology from the University of Alberta in Canada in June 1991. After that I will join a study with Per Angelstam and Berit Martinsson. We will be studying the effects of modern forestry on black grouse and hazel grouse, and perhaps capercaillie from a landscape ecology perspective. We want to know how much the patches of grouse habitat can be fragmented and isolated before the populations are no longer viable in the landscape. This goes beyond traditional habitat occurence. We will also look at the requirements of deciduous trees that black grouse and hazel grouse have since modern forestry practices entail removal of deciduous trees. This is Berit Martinsson's PhD project at Uppsala University in Sweden.

We have also been involved in some co-operative studies with foreign scientists. In March 1988 I was in Far Eastern Siberia to study flocking behaviour of hazel grouse with Aleksandr Andreev. Hazel grouse form flocks in winter in Siberia but not in Europe. Our comparative study suggested that the reason is protection from avian predators in the open larch/deciduous forests in Siberia, and not the abundance or dispersion of winter food.

Per Angelstam, Tomas Wesolowski and I studied the importance of forest structure to hazel grouse in oldgrowth forests of Bialowieza National Park and nearby managed forests of northeastern Poland in autumn 1989 and spring 1990. The results showed very nicely the importance of spruce undergrowth for hazel grouse.

Zbigniew Boncar and I are testing the age determination method for hazel grouse using number of spots on primary no.9. The amount of spotting is variable and appears to have limitations as a technique for determining age in the Carpathian Mountains of Poland. This is the subspecies *rupestris*, which is found in Central Europe. Interested people may contact me.

GROUSE - CAPTIVE BREEDING AND REINTRODUCTIONS

Iain Valentine

While attending the fifth International Grouse Symposium in Elverum, in August 1990, I had the distinct feeling that I was in a minority group of those with interests in the above subjects. Like everyone attending the conference I have a special interest in the grouse family and I was pleased to see so many scientists from many countries share my interests. Despite this common bond I registered a distinct anti feeling towards both captive breeding and re-introduction programmes. In defence I feel I have to say that it is both dangerous and foolish to place this group of birds on a pedestal, and claim that these kinds of experiments cannot be successfully carried out, and use badly performed previous attempts to justify this point of view.

Our own captive breeding work at Camperdown in Dundee has proved to me that grouse are special. Special in that they require a reasonably high management input, as compared with other groups of birds, in order to have success. It would be wrong and rather tedious for me to list our methods as there are so many different paths to success. It is probably more pertinent to point out that captive breeding is an acquired skill which can only be gleaned and improved by having ongoing work on captive stock.

Re-introduction experiments, on the other hand, are governed by a set of golden rules which were first produced in 1979 by the UK committee for International Nature Conservation and can be used as the model for any re-introduction programme of any species.

These are:
1. There should be good historical evidence of former natural occurrence.
2. There should be a clear understanding of why the species was lost to the area. In general only those lost through human agency and unlikely to recolonise naturally should be regarded as suitable candidates for re-introduction.
3. The factors causing extinction should have been rectified.
4. There should be suitable habitats of sufficient extent.
5. The individuals taken for re-introduction should be from a population as close as possible to that of the native population.
6. Their loss should not prejudice the survival of the population from which they are taken.

As I am from a country where the one and only truly successful re-introduction, in that country, has been with a member of the grouse family, namely the capercaillie, I believe it to be both true and fair to say that grouse re-introduction experiments have failed in other countries, judging by some of the papers given at Elverum, because one or more of the above criteria have not been met before the attempt has been made. Of course, action to correct a declining population makes any reintroduction programme unnecessary, if not invalid. It is to all the research scientists that we turn in the hope that they will provide the answers.

HOW EFFECTIVE IS THE RELEASE OF CAPTIVE BRED CAPERCAILLIE?

David Baines

Attempts at releasing captive bred capercaillie in the Black Forest in Germany have had very little success. It was reported at 1990's Grouse Symposium that of 37 poults released only two survived the first winter. The reason for this dismal failure seemed to be due to predation by foxes, martens and goshawks. In autumn 1990, the Game Conservancy monitored the survival of six capercaillie poults (three cocks and three hens) which were captive bred and released in Inverness-shire. The birds were released onto an estate where predators were controlled. Each bird was equipped with a radio transmitter.

The birds were released in mid August. Ten days later, three birds had already died. Two had flown into high tensile deer fences, the third which had been injured prior to release simply never recovered.

In mid September the only surviving hen began to disperse and by October had dispersed 25km from the release site. She stayed within her new home, a mixed scots pine/spruce plantation for a further month before moving again. Despite a thorough search, her signal has not been found. The two cocks stayed within half a kilometre of the release site until the end of September and mid October respectively. The first cock moved 4km into a scots pine plantation and was never found again. The second cock moved approximately 10km and settled on the edge of a mixed pine/birch woodland. This bird was very tame and settled amongst friends; the village hen and duck flock and became befriended by local bird watchers. Despite being in reasonable condition, he died in early December. A post mortem could find no cause.

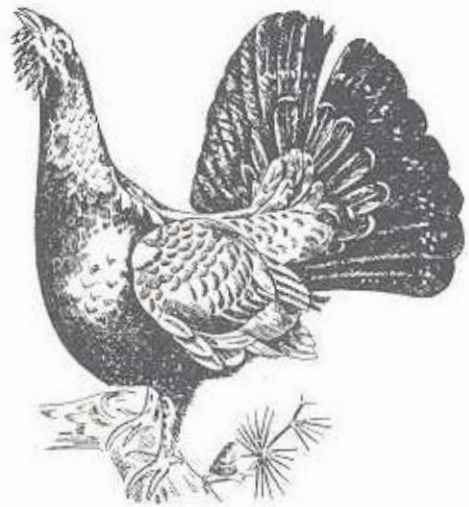
This release, even with predator control, was no more effective than that in Germany. Of the six birds released, five have probably died and the sixth has disappeared. The distances moved from the release site were extraordinarily large. With such a small sample it is difficult to say why this should be so. It could be due to social reasons or merely to unsuitable habitat.

We are not saying that there is no future for releasing captive bred capercaillie, but at the moment what little information there is suggests low or no success. However, it has been recently reported that one estate in Scotland is doing better and, if so, it is possible that much can be learnt from their techniques. The Game Conservancy are keen to further investigate the fate of released capercaillie and assess the potential of the technique for re-introducing birds into parts of their former range that are unlikely to be naturally recolonised.

Editor's note:

The best example of successful breeding and release of capercaillie that is known to us has been done in the Harz Mountains of Germany. This was described by K H Haarstick (3rd International Grouse Symposium 1984 385-400) and since then he has reported successful breeding in the wild by captive bred stock. They even have a Gasthof there called the Auerhuhn!

Hans Aschenbrenner in Bavaria has extensive experience of breeding and release in the National Bavarian Forest, and has described his methods in a book (Rauhfusshuhner; 1985: Verlag M and H Schaper: Hannover) which will soon appear in a revised English edition.



SIZE OF DISPLAY GROUNDS OF CAPERCAILLIE

E Viht

Abstract of a paper on size and forest structure of display grounds of capercaillie *Tetrao urogallus* pleskei at Alutaguse, north-east Estoria in 1979-89.

Observations were made at 5 leks in a rather flat study area of 78km of mixed Scots pine *Pinus sylvestris*, Norway spruce *Picea abies* and birch forests *Betula pubescens* where little management has taken place. The distance between permanent leks varied from 1.9 to 2.4 km. The area occupied by male territories varied according to number of males present and habitat structure. By mapping displaying cocks and roosting trees, we found that the arena size varied between 1.2-67ha. The average number of cocks in Estonian leks was 4.8 in 1985-89.

For their leks, Eslonian capercaillie preferred pine forests on marshy soils, swamp forests and bogs with pine. Trees were mostly 81-126 years old, at a height of 10-18m and with a stocking density of 600-700 trees/ha. Usually there was no undergrowth at the display grounds.

NEW CAPERCAILLIE RESEARCH IN SCOTLAND

David Baines

Information from sporting estates suggests that capercaillie have been declining in Scotland since the mid 1970's. In commercial plantations, recent forest sutveys have shown the number of forests containing capercaillie to have dropped alarmingly. These reports of decreased numbers and a succession of poor breeding seasons culminated this year in a proposal to ban capercaillie hunting.

After in-depth consultation with interested parties, the government decided that such a move would be counter productive, and instead funds should be made available to undertake research into the status and requirements of remaining capercaillie. In the meantime, it is hoped that landowners will take the lead by voluntarily stopping the shooting of dwindling stocks.

A collaborative research programme involving the Forestry Commission, Game Conservancy, Institute for Terrestrial Ecology and Royal Society for the Protection of Birds has been initiated to map the current distribution of capercaillie. This done, sample study areas will be selected and estimates of yearly changes in numbers and breeding success will be made and related to habitat type and structure, insect abundance and key predator species. This initial phase is scheduled to take three years, but it is hoped that further funds will be made available both for long term monitoring and for intensive studies of particular aspects.

RADIOTRACKING STUDY OF REINTRODUCED BLACK GROUSE

Stefan Hövel, Selpp Bauer, Egbert Strauß

Abstract of a paper on Radiotracking study of the problems in settling 41 re-introduced black grouse *L. Tetrao tetrix* in a southern Germany moorland habitat in the years 1988-90.

Habitat utilising: Most of the positions (86%) were found in raised bog areas, whereby two or more neighbouring areas with a different kind of structure (density, basal and canopy cover) were preferred. Only a few localisations were found in fen belts, intensive pastureland and patches of low-yield meadowland.

Parasites: The examination of the caecal faeces (n=62) amounted to 79% coccidial oocysts and to 63% capillaria eggs. The proportion of medium and high numbers of coccidia harboured amounted to 27% and for capillaria to 18%. Survival rate rose with a reduction in the numbers of parasites recorded. It has been observed that individual black grouse with high numbers of parasites can survive over extended periods (5 months min.) and birds with medium numbers harboured can survive for over a year.

Losses: Loss from predation amounted to 18 (272%). 13 birds (72%) were killed by foxes *Vulpes vulpes* and five (28%) by goshawks *Accipiter gentilis*. 15 of these deaths (83%) occurred during the first 10 weeks after release and the remainder in the 18th, 29th and 31st week. The losses were affected by migratory movement and familiarity with habitat patch. In the first 10 weeks after release 71% of the birds killed by predators were taken during a continuous migratory phase. The rate of predation in unfamiliar habitats were also 71%. Sutviving birds also displayed a continuous migratory phase during the first 10 weeks. During that time, however, they also frequented habitats already known to them, without suffering any losses. It follows therefore that the knowledge of the locality affects the predation rate.

DOGS CAN'T FIND MY PTARMIGAN

David Hancock

I am a firm believer in the use of dogs to find grouse or ptarmigan. When it comes to finding nests in brush or scrub country they literally find all the nests - at least I don't find them very often. But for broods a dog usually outdoes me, despite my ability to see and hear hens giving distress calls. When I recently had the pleasure of spending a day hiking the moors of the Kongsvold with Hans Christian Pedersen he said that his birds could not be detected by dogs and I was sceptical. My private thoughts were... Too bad he can't find a good dog!

After his polite explanation to my obviously raised eyebrows I now believe him. He has literally tried dozens of dogs: championship dogs, his friends' best hunting dogs, fellow ptarmigan researchers' dogs who find ptarmigan elsewhere - but none can find his Kongsvold ptarmigan. At the recent WPA Grouse Symposium post conference tours of the Kongsvold Research Centre this topic naturally received much debate when aired among such grouse dog owners. When eyebrows subsided, hypotheses grew.

But for those who didn't attend and listen to these debates I must first say that at least in my mind there is undoubtedly a population of willow ptarmigan in the Kongsvold that are undetectable by dogs - period.

How do you explain that dogs trained to find free roving ptarmigan, nests and broods in northern Norway, when brought to the Kongsvold can't find a single nest? Even police trained blood hounds, dogs trained to track any given scent, couldn't find them even when given a specific nesting female and taken near her nest. One conclusion is that this population just don't smell.

Hans Christian's theory is quite straight-forward. He feels that in the northern Norwegian islands, where there are few mammalian predators the grouse stink. In the Kongsvold, where there are many mammalian predators grouse don't smell.

To this he adds a slight wrinkle. (At least I think it was his wrinkle) - after three beers and much good evocative company maybe it was somebody else's suggestion. It could not have been more than three beers because nobody could have afforded more at Norwegian prices. This twist states that when approached by a predator the birds can 'switch off' the scent. This is a follow up on the other northern Norwegian work that showed that nesting ptarmigan can greatly

control their heart rate in response to environmental stimuli such as an approaching predator, or their return to cold eggs that need quickly heating up. Here scent is related to heart rate.

I find this 'switching off' hypothesis difficult in as much as dogs do pick up the lingering scent, that which is left behind or is being emitted and picked up down wind. If he means that the scent is switched off for the entire breeding season that makes more sense. Is this a common phenomenon in grouse and in other ground nesters? But why have only the Kongsvold birds developed this protective mechanism? David Jenkins, in his marvellously patriarchal fashion, dismissed this as 'bad dogs'.

Another interesting hypothesis that could be tested is that the ground vegetation put out some 'masking smell'. Curry and spice were not there because they were nice but because they masked the bad smelling meat. Another version offered was that the birds simply produced a masking smell that dogs didn't recognise. Maybe 'switching off' in a 'stinky place' has it.

Perhaps in the future I should be thinking more kindly to my pooch when she doesn't turn up the expected? Maybe it's because some of the birds don't smell? I'll raise a cheap Canadian to that and look forward to seeing Italian grouse at the next symposium.

Thanks for a great symposium in Norway.

RED GROUSE - THE NORTH OF ENGLAND 1990

David Newborn

The detailed long term monitoring of red grouse population fluctuations and survival rates in the north of England continued on a monthly basis, many of the sites are now entering their twelfth year of continuous monitoring. The sites range from low heath type areas in the North York Moors to high blanket bog areas in the North Pennines. Detailed monitoring consists of intensive bird density counts conducted by trained pointing dogs on areas of 1km square. The count area is also searched intensively for dead birds and their apparent cause of death ascertained. The density counts are increased in the spring when 25 additional areas are counted to assess potential spring breeding stocks, with the areas counted again in July to assess the breeding success (i.e. young to old ratio). Count areas are situated in the major ranges of red grouse in the north of England.

During the past 5 years the Game Conservancy has conducted a large amount of research into the re-establishment of heather moorland. The primary cause of this loss is due to the over utilization of the heather sward by sheep through the winter months. Via a large scale project conducted on approximately 1000 hectares in the North Pennines we have been able to conduct large scale field experiments into the re-establishment of heather swards, with special attention paid to the following:

i) manipulating grazing density and intensity
ii) impact of drainage on heather re-establishment, water table and sediment removal
iii) invertebrate production
iv) re-establishment of heather re-introducing both heather seed and heather seedlings.

The last point on the list is the most important. Many projects have been conducted into the re-establishment of heather with sheep stock removal or reduction. The real problem is in re-establishing heather where the root stock and the heather seed bank has been almost totally depleted and the seed bank/seedlings need to be re-introduced. We are at the point where large field scale reseeding of heather can be undertaken. This will enable grouse moor managers to reclaim white moor back to grouse production with the associated conservation benefits of heather moorland. Detailed findings from the grazing project will be published in the near future.

A SECOND WORKSHOP ON BLACK GROUSE

David Baines

In August 1989, research workers and representatives from other interested parties assembled in the Scottish Highlands to discuss British black grouse studies past and present. This first meeting dealt primarily with habitat requirements and how they were being measured in each study, and discussed both common and different findings in relation to basic essential needs.

The success of this first meeting has prompted the Game Conservancy and the World Pheasant Association to hold a second meeting this spring. Having drawn some preliminary conclusions on factors affecting black grouse numbers in Britain, the next step is Europe. To this end, game biologists from Sweden, France and the Netherlands have been invited to discuss the respective situations in their countries.

The two day meeting will have three main discussion themes; i) to compare and contrast key factors regulating black grouse numbers in different parts of their range, ii) to discuss the potential for producing one or more mathematical models to describe population processes iii) to further the interpretation of research findings into practical management guidelines and their subsequent implementation.

It is hoped to publish the opinions expressed at the meeting in the next edition of this newsletter. At which point, I would welcome further views and feedback on the findings.

OBITUARY

In memory of Oleg Ismailovich Semenov-Tjan-Shanskij

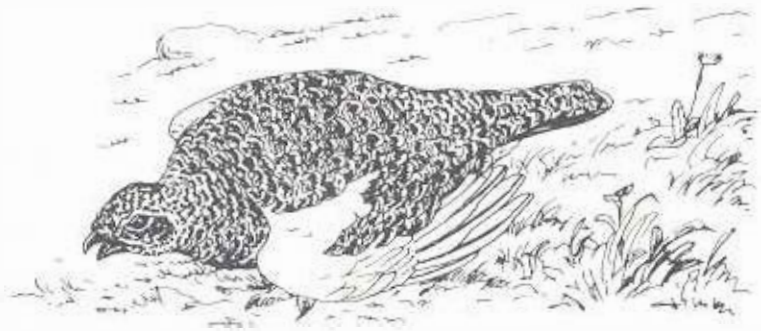
On 21 September 1990 the well known Russian ecologist and grouse worker died in his 84th year - just after a hard excursion in order to map lichens in Lapland reserve where he was working for 60 years. O.I.S. was a member of a well known Russian family of scientists. His grandfather Petr Petrovich was the great Russian geographer who discovered mainly the Tienshan and Central Asia.

Oleg Ismailovich, born in 1906, started his scientific career as autodidact. In the year of the foundation of Lapland reserve in 1930 he found his job as "scientific observer" and got a solid ecological education under the first director H M Krebs. In 1938, his first monograph "Ecology of Game birds of Lapland reserve" appeared - a collection of valuable data on grouse. His famous book "Ecology of Grouse" (in Russian, translated in German) contains an enormous amount of data and clear-cut conclusions dealing with all questions of grouse ecology - a sum of 30 years of intensive work in grouse habitats of Lapland and (after elimination of the Lapland reserve between 1951 and 1957) in the Pechora-Iljych-reserve of the Ural region. One topic of his work was breeding biology (activity rhythm of incubating hen, temperature regime), population dynamics and factors influencing breeding success in grouse. In this field he was one of the pioneers.

O.I.S. was not only a scientist - he liked very much the nature of the North and he collected thousands of photodocuments of landscapes, plants and animals of the North, illustrating his famous books (Lapland reserve 1975, 1984; Birds and Animals of Lapland Reserve, Ecology of Wild Reindeer).

Inspite of the limirations of travelling and normal scientific contacts, O.I.S. was successful in finding ways to communicate with his colleagues abroad. His excellent English was helpful on the one hand; on the other hand he liked travelling and contacts within the grouse worker family. He visited not only far regions in the USSR, he was also in Finland, Czechoslovakia and Eastern Germany - every time he was ready to help his friends and colleagues with his long time experience, with unpublished information or illustrations. We have lost a sympathetic and original person, a great pioneer of grouse research!

S.Klaus



BOOK REVIEW

The Ruffed Grouse by Dr Gordon Gullion, 1989 published by Northword Press at $19.95 in paperback. While Gullion is a well respected Don of the Tetraonid world the publication of this magnificently written work places him among the great naturalist writers. His intimacy with nature and his astute observations are complemented with his skilled talents as a writer. To have read The Ruffed Grouse one could never wander the woods without a greater awareness of what the woods offer and what our obligations are to see that ruffed grouse, as an indicator species, are always there. The book was first published under the title Grouse of the North Shore but will get the wider distribution it deserves with this more general title. The book is illustrated with 129 very find colour photographs by Tom Martinson which totally complements Gullion's gleanings of a lifetimes devotion. Somehow Gulion has summarized the biology of the Ruffed Grouse in a clear enjoyable read - a scientific milestone. A must for every outdoorsman, a beacon for tetraonid workers. Review by David Hancock

Grouse of the World - Their hiology, captive propagation and reintroduction by Dr Hans Aschenbrenner, and published jointly by the World Pheasant Association and the Wildlife Research Centre.

Germany scholars have had the advantage of Dr Aschenbrenner's German edition for several years. After much inducement the WPA and the WRC have teamed up (Dr Aschenbrenner says conspired) to have the author completely rewrite, update and greatly expand the scope of the first edition. Beyond the updating, totally new chapters on the Diseases of Grouse and the Reintroduction of Grouse to the Wild have been added. In many ways this book carries on where Paul Johnsgard's Grouse of the World leaves off.

In addition over 200 colour photographs plus many maps, and dozens of Franz Müller's fine behavioural illustrations adorn the 256 pages of this 8.5" x 11" hard cover treatise. The book will be released in August and UK residents can purchase copies from the WPA lists on the newsletter, while other customers (Europe NA etc) can get copies direct from the Wildlife Research Centre, 1431 Harrison Avenue, Blaine, WA 98230, USA (Fax 604 538-2262). The prepublication price, postage included, is $60.00 US from the WRC or £40 from WPA. In addition to the free postage, prepaid prepublication orders will also receive a beautifully, Müller illustrated, 11"x17" poster of the worlds tetraonids.

EDITORS POSTBAG

Found

Pair of Bushnellsmall binoculars in car used for trip to capercaillie farm during the Elverum symposium. Please contact Torstein Storaas, Hedmark College, Department of Nature Management, N-2475 Opphus, Norway.

Wanted Books

Copy of Hjorth,I 1970. *Reproductive behaviour in Tetraonidae, with special reference to males*. Viltrevy 7:183-596 or the reprint. Also wanted a copy of Edminster, F.C. 1947 *The Ruffed Grouse Its life story, ecology and management*. NY Macmillan. David Hancock, Wildlife Research Centre.

Scientific to popular manuscripts wanted for publication by Hancock House Publishers. These can be species, group or adventure oriented. We presently have in production an in depth treatise on the biology of NA birds of prey, two tomes on falconry, one on keeping galliformes and Dr Hans Aschenbrenner's treatise on *Grouse of the World*, mentioned elsewhere. This latter title is being released through the W.R.C., a research foundation funded by Hancock House. Regular royalties are paid on trade titles. Hancock House Publishers, 1431 Harrison Avenue, Blaine, WA 98230, USA.

Wanted Birds

Wanted to trade live European Tetraonids for North American species. I have or could collect all NA tetraonid species and would be pleased to trade for Eurasian species for comparative studies on chick and adult behaviour. I would like 4-6 pairs of all species. I would also like a diversity of blood lines so all birds don't have to come from one source. David Hancock, W.R.C.

Wanted Data

The Wildlife Research Centre is presently gathering and coordinating data on tetraonid introductions and reintroductions around the world. I would very much like to make contact with any such projects. During the past few years I have had the good fortune to visit many of the projects across Europe, the UK and North America, and be involved in captive rearing of many species of tetraonid. Our facilities or myself are available to assist any departments considering re-establishment of grouse. We have available biologists to wild trap and to rear and condition to the wild transplant stock. Please contact David Hancock, WR.C.

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David Baines, The Game Conservancy, Newtonmore, Inverness-shire, Scotland, UK.

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GROUSE NEWS

No 2

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Editor: Diana Lovel

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1993
Sept 20-24 Sixth International Grouse Symposium, Udine, Northern Italy

Front Cover: Capercaillie display by Dr Fabio Perco

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EDITORIAL

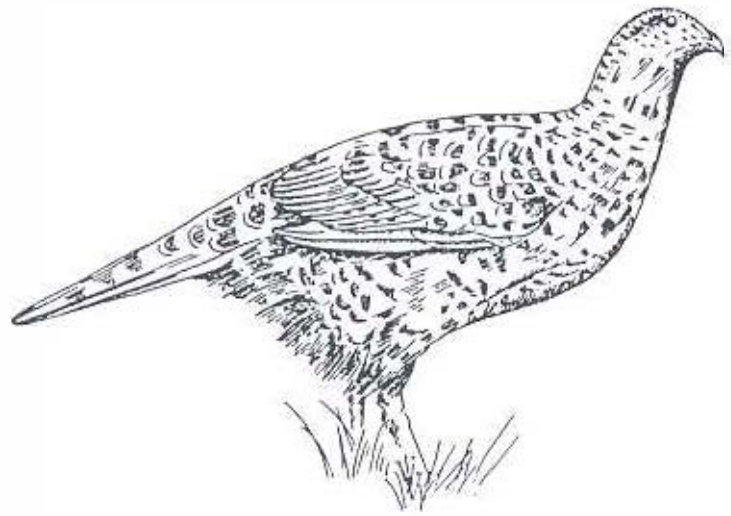
A big thank you to all who have subscribed to Grouse News, and special thanks to those of you who have contributed, and to the many who have promised to contribute articles for future editions of Grouse News. The next edition should be bursting with news!

Could all contributors please send me their text early in the New Year.

I am again using two beautiful pen and ink drawings from Dr Fabio Perco; one as the cover for this Grouse News.

Almost without exception you wanted the title of the publication to remain as Grouse News.

Plans for the Sixth International Grouse Symposium in Udine are proceeding well. Tim and I had a most enjoyable visit to the venue with Dr Fabio Perco and Professor Paolo de Franceschi. Make sure that you are able to join us for the one week when all grouse enthusiasts are together - 20-24 September 1993.



SIXTH INTERNATIONAL GROUSE SYMPOSIUM SEPTEMBER 1993

Dr Fabio Perco

During the 1990 WPA Grouse Symposium at Elverum, Norway, it was agreed to organise the next meeting in the region of Friuli-Venezia Giulia, Italy. Diana and Tim Lovel came for a general overview of the place in June 1991 and had the opportunity to visit the conference facilities at Palazzo Antonini (Udine) - which is one of the seats of the local university - and to discuss with Paolo de Franceschi (the most distinguished Grouse-biologist in Italy) Franco Musi (the director of natural parks of the regional administration) and me, the main outlines of the 1993 meeting.

Our suggestion is to schedule the Symposium for the week beginning 20th September 1993. During the conference a field trip will be organised to see the main areas for Black Grouse and Capercaillie along the Austrian/Italian border, not far from Udine.

After the congress, we will be invited to visit the impressive and scenic mountains of the province of Trento, towards the west, to give the participants the opportunity to compare the different study areas around the southern border of Grouse distribution in Europe.

Of course, as Udine and Trento are not far from Venice and other world famous historic places, there is the chance - if requested - to look at non-Grouse habitats as well; with plenty of choice between urban and non-urban areas.

The region Friuli Venezia Giulia holds a variety of different habitats besides mountains, and because of its geographic position may perhaps be considered a strategic place to lure lots of Grouse biologists from eastern Europe.

CAPTIVE BREEDING SUCCESSES OF GROUSE

Keith Chalmers-Watson

The title of this article was selected by the Editor, and as a result of the 1991 season, will be very brief!!

I am not aware of any major successes in grouse breeding this year in the UK, and would enjoy being corrected on this statement. As I am a relatively new Grouse breeder, I can really confirm that Grouse are considerably more difficult than pheasants!

One or two breeders of Capercaillie, including ourselves, have produced a limited number of chicks, but fertility remains a problem, with the most dominant male in our breeding group receiving the attention of the females, but not actually producing fertile eggs. This comment applies where female Capercaillie have free access to 2 or 3 males through the pophole system, a successful technique widely used in Norway. We have reared our first Ptarmigan this year, but would have reared more but for yolk sac infection. These extremely docile birds behave well in captivity, but need regular worming treatment.

Our last male Sharp-tailed Grouse died in March and the female laid 28 eggs. I would be pleased to know of any stock of this species in the UK. David Hancock in Vancouver reports great success with this species, and I hope to visit him in October in my quest for greater knowledge of the Grouse family.

Red Grouse remain a steady favourite with visitors, but aggression remains a problem necessitating, in my case, a division of the aviary to avoid the male killing the female. Intermittent heather seems essential and a dry sandy floor is recommended.

Black Grouse in captivity are not easy despite the male's calling and display, which in our case has lasted for four months. Greenstuffs and some fruit seem popular, but over fatness must be avoided.

We receive a number of enquiries each year for the export of Grouse, particularly Red, so there is undoubtedly room for an entrepeneur in this field. However, at the risk of repetition, Grouse really are considerably more difficult than pheasants, and not to be recommended to a beginner.

WHY DOES BLACK GROUSE DENSITY VARY IN THE NORTH OF ENGLAND?

Dr Peter Garson

Surveys involving dozens of local ornithologists in the spring months of 1987-89 have established the whereabouts and size of most of the Black Grouse leks throughout the species' range in the Pennine hills of northern England. The total count amounts to at least 500 cocks attending 50 leks in an upland area of about 2,900km^2. Some leks have already been visited for counting in five successive springs (1987-91), and the team has now settled on a sample of about 40 to count every year henceforth.

So far the population at these leks appears to be more or less constant, but the hunting fraternity considers that the Black Grouse population in this area is now at a post-war high. Gamekeepers are in general protective of the species, and perhaps especially so on estates where Red Grouse shooting is important. So for the present at least, this population, which is the last substantial one remaining in England, seems secure.

The results of this survey suggest that the population density in the southern portion of the study area (0.31 displaying cocks.km^{-2} of habitat over 200m ASL) may be as much as six times higher than that in the northern portion, which largely consists of the Northumberland National Park and adjoins the Scottish border. Part of this portion has been extensively planted with commercial

conifer plantations. Kielder Forest in the upper North Tyne valley has evidently obliterated open ground which, according to hunting records going back to the beginning of the century, used to be frequented by a very substantial Black Grouse population.

The enigma is that an area at least as large as the forest still remains as upland rough grazing land of the general type frequented by Black Grouse elsewhere in the North Pennines. My initial attempts to explain why there are so few birds in the north, and so many in the south of the survey area are reported in a paper entitled 'Black Grouse, Livestock, Breeding Waders and Carrion Crows in the North Pennines', just published in the proceedings of the Second European Forum on Birds and Pastoralism (1991. *Birds and Pastoral Agriculture in Europe*, edited by Curtis, D.J. Bignal, E.M. & Curtis, M.A. available from Publications Branch, JNCC, Monkstone House, City Road, Peterborough PE1 1JY, England. Price £12.50).

The U.K. Government's Agricultural Statistics database indicates that there is more habitat classified as rough grazing (this includes *Calluna* moorland) in the areas where Black Grouse only occur in low numbers, suggesting that habitat quantity is not the problem, but implying that its quality might be. The major impacts on grassland habitats are of course grazing and trampling damage by sheep and cattle. High stocking rates might be expected to reduce the amount of nesting and other cover used by Black Grouse (and other ground-nesting birds). In fact the Agricultural Statistics indicate that Black Grouse occur at the highest densities in areas where stock animals are also most numerous, so there does not seem to be much mileage in this line of argument, at least on the basis of this source of data!

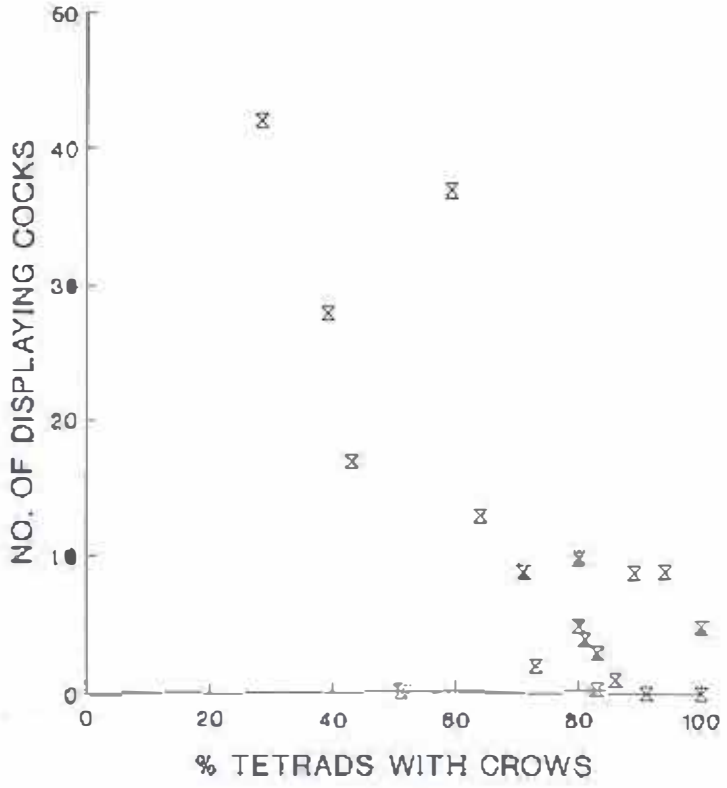
In 1990 I carried out surveys of 7 breeding wader species at 9 sites in the Black Grouse survey area. The wader densities obtained mirrored the local status of the Black Grouse: high in the south, very low in the north. As most of these waders only frequent the uplands during the breeding season, this finding suggested to me that heavy breeding losses through predation might be the cause of low populations of all these large ground nesting bird species in the north of the survey area, relative to the south.

To investigate this I was fortunately able to consult the freshly-collected data from all the upland tetrads (2x2km squares) visited by volunteer ornithologists as part of the Northumberland County Breeding Bird Survey (1988-90). Comparisons of an index of carrion crow abundance derived from these, with the numbers of Black Cocks displaying at leks in 19 10x10km squares in the

country, yielded a strong negative correlation ($r_s = -0.59$, $P<0.001$). Thus where carrion crows are common, Black Grouse are rare.

Carrion crows are vigorously controlled, along with mammalian predators, by gamekeepers on shooting estates. The main Red Grouse shooting grounds in this region are all in the south of the survey area, and there are significantly fewer carrion crows there than in the north. It seems probable, therefore, that predator control measures, primarily undertaken to increase the productivity of Red Grouse for shooting in the North of England, are contributing very positively to the conservation of its much more spectacular cousin.

The number of Black Cocks compared with an index of Crow abundance for 10 x 10 km squares in Northumberland (N = 19, r_s = -0.59, P < 0.001).



STATUS AND RESEARCH IN PROGRESS ON THE BLACK GROUSE POPULATION IN PROVINCE OF UDINE (EASTERN ALPS, FRIULI-VENEZIA GIULIA, ITALY)

P De Franceschi, S Mattedi & F Perco

During the past five years the Osservatorio Faunistico Friuli-Venezia Giulia has conducted many field researches in the Eastern Alps and Prealps to know the consistence and to establish the trend of the Grouse populations. The aim of this short note on Black Grouse population is to give information concerning data collected and perspectives for the future. In general the distribution of the Black Grouse in the inner Eastern Alps lies between 1350 and 1900m, at lower altitude in the Prealps (1200-1600m) and exceptionally also under 100m in the southern slopes of the Prealps (De Franceschi 1989).

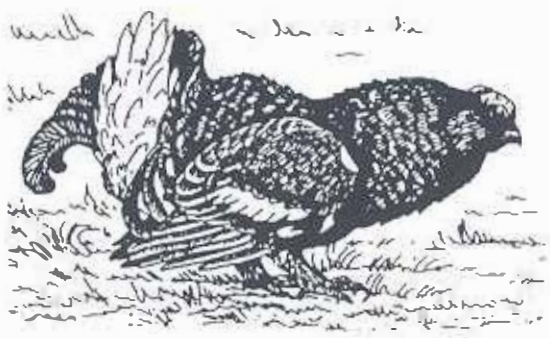
In the inner valleys the species occurs in a belt located above the timber line, in open alpine meadows covered by a discontinuous vegetation of bushes of *Alnus viridis* or *Pinus mugus* (the latter if the soil lies on a dolomitic and/or limestone bed), scattered coniferous trees (Larch, Spruce) and small widespread shrubs of *Vaccinium* sp. and *Rhododendron* sp. Other suitable habitats include edges of coniferous forest in generally rough and open areas covered by Graminaceae and more or less dense shrubs of *Vaccinium* sp., *Rhododendron* sp. and *Juniperus communis*.

In the Italian Alps, Black Grouse population seems to be affected by rather irregular fluctuations whose period is usually long (6-17 years). During 1955-1990, two heavy crashes of the population have been recorded in 1964-1965 and 1980-1981; the highest densities were found in 1955-1956, 1976-1977 and 1982-1983 years, in the inner Alpi Carniche, close to the Austrian border (De Franceschi 1982, 1988).

In the past five years spring and summer censuses were regularly performed on some sample areas and by chance on a lot of other fit habitats through the entire alpine eastern chain.

In the Region Friuli-Venezia Giulia the summer population of Black Grouse was estimated about 4500-5000 individuals at the end of the last summer censuses, more than 3/4 of which live in the Province of Udine. This value is lower (-20%) than that estimated before in the same area (De Franceschi 1986, Mattedi 1989).

Spring censuses, carried out in April-June during the past years, reveal a low density of the cocks (2.4/1000 ha, on the average) that often perform as 'soloists' (44.3%) on the leks. In Friuli-Venezia Giulia mountains, the trend of the males to display as soloists grows from the inner alpine leks (30-32%) to the prealpine areas (65-73%). On this subject, other values in the Italian Alps are known for some sample areas of the Valle d'Aosta (33%, Bocca 1987) and for the entire Lombardy (41-44%, Scherini *et al.* 1986).



Since 1984, Black Grouse population was declining on the Eastern Alps and Prealps; only in a few sample areas was an increasing trend found during the last reproductive season. But summer censuses, conducted by the same operators with pointing dogs, under good weather conditions, gave contrasting results from one valley to another, also in closed areas. In fact, the reproductive success, the number of chicks per brood and the percentage of hens with broods reached on average fairly low values, at the end of August, over the entire censused area, even if they were better than the previous years (see Table 1).

Table 1 - Reproductive success and other data concerning the Black grouse population in the Province of Udine, in 1987-1991.

Year	1987	1988	1989	1990	1991
No. brood	3.88	3.15	3.25	2.82	3.68
% of hens with broods	37.10	40.50	39.40	47.20	66.70
Reproductive success	1.44	1.27	1.23	1.33	2.46

During 1989 a radiotracking study on the movements and on the home range of Black Grouse young and adults started in the Province of Udine. During the first year only one young male was equipped with a radio-tag in the alpine area of Lanza; in 1990 in the same area, one hen (with brood) was marked in the same way; last spring (1991), another four cocks (1 immature and 3 adults) were

radiotagged, two in the previous alpine area (Lanza) and two others in a prealpine area (M. Cuar).

The female and the young male were located with the aid of a pointing dog during summer, were captured with a net, radio-equipped and immediately released. The cocks were captured on the leks during the morning activity in May (17) in the prealpine area and in June (3) in the alpine areas. Radio-tagged Black Grouse movements were monitored by searchers visiting the sample areas on an average once a week for the entire period of working of the radio-tags (3 to 6 months). All birds except the female, which lost her radio-transmitter after 2 months, gave good information about their movements from summer to winter habitats.

This research on Black Grouse will continue in the future, capturing and marking other adults on the leks and young and females during summer. If the cocks radiotagged this year survive during winter and if it proves possible to capture and radio-equip them again on their display grounds, it will be very interesting to follow them, monitoring their movements, and to obtain some other information on their habitat use.

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PINEWOODS, CATERPILLARS AND CAPERCAILLIE

Rufus Sage & David Baines

In Britain, Capercaillie are found in some scattered blocks of semi-natural pinewood and commercial forest plantations in central and eastern Scotland. A marked decline in their range and numbers since the mid 1970's has prompted concern over their future. The mechanisms causing this decline are far from fully understood and the effects of habitat loss, changes in forestry practice, climatic change, excessive shooting and increasing numbers of predators have all been implicated.

The large size of adult birds means that chick growth rates and hence insect food demands are high. One factor, as yet not investigated in Scotland, is how variations in insect numbers may cause differences in chick survival. Studies in Norway have found that the most important food for young chicks is lepidopteran caterpillars living on blaeberry *Vaccinium myrtillis*. Blaeberry is a common component of the ground vegetation in Scottish pinewoods and a sampling programme investigated what factors caused variations in numbers of caterpillars on this plant.

Two main factors that reduced caterpillar abundance were found. Firstly the intensity of grazing by Red deer *Cervus elaphus*. By comparing forests subject to different grazing pressures we were able to conclude that excessive grazing could reduce the number of caterpillars available to chicks by more than five fold. Secondly, by sampling forests on a west to east transect across Scotland, we concluded that there were longitudinal differences in caterpillar numbers, with ten times fewer animals in the west than in the east. This may be associated with higher rainfall in the west.

Simple arithmetic allows us to conclude that a chick living in a grazed forest in the west may have up to 50 times fewer caterpillars available to it than a chick in a relatively ungrazed forest in the east. Bearing this in mind, it is hardly surprising that Capercaillie were no longer present in the western forests that we sampled, but that good nuclei populations remained in the east of the country. Initial findings from a questionnaire survey on Capercaillie distribution would tend to reinforce this geographical direction of decline. There is a link between caterpillar abundance and Capercaillie distribution in our native pinewoods, but more information is required on diet, chick survival, and within and between year insect numbers before we can state that declines in insects have contributed to the demise of the Capercaillie in Scotland.

TELEMETRY STUDIES ON CAPERCAILLIE IN THE ALPS

Ilse Storch

Central European Capercaillie are in trouble: Numerous local populations disappeared during the last few decades, and others are at the edge of extinction. Large scale environmental changes such as habitat loss and fragmentation due to intensive forestry are the factors most probably responsible for the decline. Additionally, increased disturbance by humans and high predator numbers may have negative effects on Capercaillie populations.

Although the alarming decline in Capercaillie had already been noticed some twenty years ago, little has been undertaken to stop or reverse it. In Germany, hunting was banned in the early 70's. Capercaillie entered the red databooks, and people started breeding them in captivity. A few thousand Capercaillie were released in different areas of Germany without much success. However, we still lack a strategy for habitat conservation and management designed to maintain the remaining populations.

This was the background when in 1987 the Wildbiologische Gesellschaft München (WGM) in co-operation with the University of Munich initiated a research programme into habitat relationships of Capercaillie. The aim was to provide a scientific basis for conservation of Capers in the Bavarian Alps. After an initial bottle-neck (one-woman-low-budget-conditions!) the project has been supported by IBM Germany and is presently funded by the Bavarian Ministry of Agriculture. Fieldwork was started in spring 1988 in the 50km Teisenberg study area in the foothills of the Bavarian Alps, which holds a native population of 100-200 birds. Up to spring 1991 I caught and radio-tagged 16 hens and 24 cocks, and telemetry data now comprise almost 10,000 locations. GIS-programmes (Arc/Info, SPANS) are being used for habitat analysis. Although habitat requirements and spacing patterns are the focus of the project, we also look at predation, parasites, reproduction and feeding ecology.

Most data from the Teisenberg study area will be analysed during 1991/92. However, we hope that further grams will become available to intensify research into some particular aspects and to expand the studies to other parts of the Alps.

CAPERCAILLIE IN BADEN-WURTTEMBERG?

Helmut Weiss of Hofen, Germany has recently published a valuable account of the work of his group on Capercaillie (Auerwild in Baden-Wurttemberg Rattung oder Untergang 1990 Stuttgart Selbstverlag der Landesforstverwaltung Baden-Wurttemberg 179pp in German). His summary is as follows.

1) An estimate of the Capercaillie population as precise as possible is the basis for rating how endangered the species is; when carried through over a sufficiently long period of time, it may be correlated with various pertinent factors of endangerment. This way, the importance of single factors may be better analyzed, and more effective counter measures become possible.

2) Rearing in captivity and release yielded many experiences. Although not being very conducive to bring about optimism, important knowledge on the ecology of Capercaillie has been gained. There are now better concepts for future installation and operation of rearing stations, and release methods.

3) Telemetry, for the first time used with Capercaillie in the Federal Republic of Germany, brought important findings on the technique itself, and on behaviour and ecological demands of this game bird.

4) Mapping of habitat quality on approximately 22,000 hectares in the northern Black Forest, probably done in this manner for the first time, led to important suggestions as to condition, development tendencies, and possibilities on how to proceed further.

5) Analysis of causes for endangerment both confirmed experiences made until now, and in addition yielded new knowledge concerning details of the mosaic of complex relationships.

6) All results of our research and considerations are expressed in specific recommendations for action in the field of wildlife management, forest policy, and especially silviculture and forest management planning Possibilities for speedy application on forestry practice are shown, and a rough outline of objectives for future research is given.

GROUSE SNIPPETS

We asked David Baines from the Game Conservancy Black Grouse Research Project for a follow up on the releases of captive bred Capercaillie which he wrote about in the first **Grouse News**. He writes saying that there has been no follow up apart from some anecdotal information. They hope to do more of this kind of work in the future but it has been a bad year for Capercaillie breeding both in the wild and in captivity and he thinks there will be very few birds released this autumn. He has stated "Our sole surviving bird (a hen) is still alive and kicking in Glenmore Forest having spent the summer disturbing German tourists in the campsite by showing a high liking for perching on their caravan roofs'.

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Tomas Willebrand, from Uppsala University, writes that he has been very busy in the field this spring and managed to capture more than 30 female Black grouse. However, they managed to break a sad world record as no chicks were produced. Spring started out very warm but there was a cold spell in late April. Egg predation was unbelievable, there was almost no re-nesting and the chicks that hatched did not survive. Tomas believes that nutritional deficiency during egg laying was the major factor this spring.
Ed's note. Tomas has offered to write a short article on this for the next **Grouse News**.

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Helmut Weiss of Hofen writes, this September, saying that at the moment they are training the foresters in the Black Forest in silviculture convenient to Capercaillie. He hopes that will bring success in improving habitat!

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David Boag writes "We have recently moved to Vancouver Island and are enjoying the 'pleasures' of country life!" He will write on crop contents for the next **Grouse News**.

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Tor K Spidso writes, "Currently I am working on a project on Black grouse in co-operation with Olav Bjelford at the Department of Biology and Nature Conservation, Agricultural University of Norway. We look at Black Grouse foraging in winter areas sprayed with glyphosate to prevent the growth of deciduous trees. I am also working on the effect

of acid rain on wildlife. Aluminium is being released in increasing amounts with increasing acidification. The effect of aluminium on Capercaillie

chicks is investigated using captive birds. This project ends this year. If we get more money, we will start a new project on acid rain next year."

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David Hancock from Canada wrote at the end of April saying, "I have just returned home from a month in Montana studying Sage Grouse and Prairie Sharp-tails. A fantastic time.

The second night at dusk I located a lek, parked and slept in the truck. In the morning I was surrounded by 142 Sage Grouse, all hooting and displaying, some within 30 feet. I also had the good fortune to collect 10 live adult Sage and 4 plains Sharp-tails. This was a great joy as it completes my collection of all North American species. I have a permit to collect 20 more Sage and 16 Sharp-tails and will return in June for chicks. An extra bonus was that two of the Sage hens I collected laid an egg in the pen. These are now in the incubator.

I have now had the birds between two and three weeks. Their favourite foods since I do not have sagebrush are dandelion, apples, any berries and some canned (precooked) corn. I am also making available grower pellets and grains but so far few are being eaten. As you are aware these birds do not have a muscular gizzard although I found wheat and oats in wild droppings. While I expect more trouble converting the adults to aviary life than the chicks which I will be getting in June, so far they show remarkable sense in the pen. In fact some of the males began hooting within minutes of release into the pens - I guess a territorial and dominance statement in the new surroundings. The females are holding their weight perfectly while the males have dropped weight although seem to be well adapted and eating well.

Since I have had wild caught adult or yearling Blues, Ruffs, Spruce and Sharp-tails, as well as White-tails and Willow Ptarmigan all breeding in captivity, I hope I will get the wild caught Sage to breed as well as I am looking forward to rearing a bunch of chicks and then breeding them in captivity.

MESH FENCES CLUE TO RARE BIRD'S DECLINE

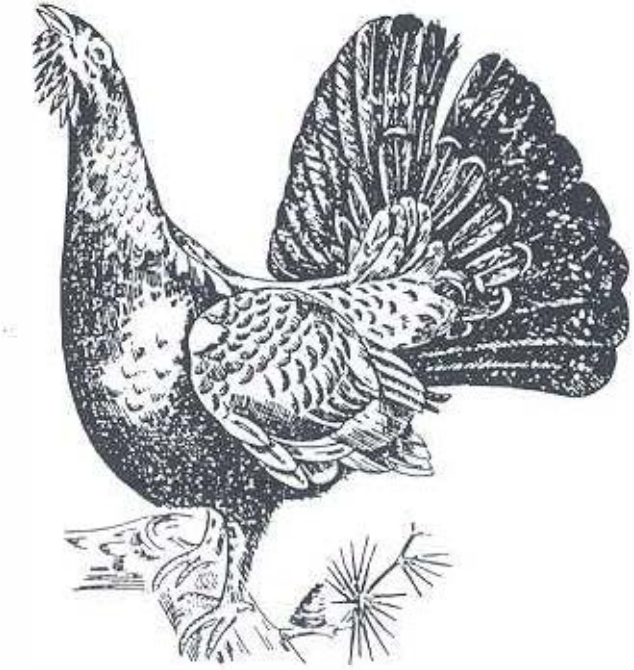
By Toby Moore, Environment Correspondent

Taken from the Daily Telegraph, Friday 15 November 1991

Part of the mystery of why one of Scotland's most endangered species is declining has been solved, The Royal Society for the Protection of Birds announced yesterday.

A study at the RSPB nature reserve at Abernethy in the Highlands has found that the Capercaillie fly into high mesh fences used to keep deer out of pinewood forests. The society has now decided to remove all internal 19 kilometres of fencing around pinewoods in its 30,759 acre reserve.

Mr Peter Mayhew, RSPB reserves manager for north Scotland, said: 'The exact size of Scotland's Capercaillie population is unknown. Numbers have been falling for years and the species has entirely vanished in some areas."



RARE GAMEBIRD FALLS AT FOREST FENCE

By Michael McCarthy, Environment Correspondent

Taken from the Weekend Times, Saturday 16 November 1991

Forest fences put up to protect trees from young deer and proving fatal for one of Britain's most endangered birds. The Capercaillie, a turkey-sized gamebird which has already become extinct in Britain once, frequently crashes into fences round Scottish pine forests and is undergoing another worrying decline.

The Royal Society for the Protection of Birds discovered from research at its Abernethy reserve in the Highlands that deer fences were deadlier than foxes, pine martens, pesticides, food shortages or any of the other threats advanced to explain the Capercaillie's drop in numbers. The collisions were also the principal cause of death of another threatened gamebird the Black Grouse, and the society has decided to remove internal fences from forests in the reserve.

Yesterday it said that its findings were in line with similar research from the Institute of Terrestrial Ecology in Deeside. However, Peter Mayhew, the society's reserves manager for north Scotland, said that the reasons for the bird's decline were many and complex. "The fence problem is just one", he said. "Our research will continue until a solution is found. We cannot let the Capercaillie vanish from Scotland."

The size of the bird's population in Scotland is unknown, Mr Mayhew said. "Numbers have been falling for years and the species has entirely vanished in some areas".

Red data Birds in Britain, the handbook of endangered species, estimates the Capercaillie's Scottish population between 1,000 and 2,000. Historically, the bird was restricted to Scotland and northern England.

It became extinct there in the mid-18th century, when it were wiped out by hunting. It was reintroduced into Perthshire in 1837 and spread throughout east and central Scotland, but has been undergoing a marked decline since the late Seventies.

The Forestry Commission has refused to let shooting rights for the Capercaillie since 1982. The felling of ancient Scots pine forests, the bird's preferred habitat, is regarded as another principal cause of its decline.

OBITUARY

SVEIN MYBERGET

We were all saddened by the untimely death of our friend Svein. Tor Spidso has written a wonderful tribute to Svein which has been published in the Elverum Symposium Proceedings. The whole volume is dedicated to Svein's memory.

The Proceedings of the Elverum Symposium have been published by ORNIS Scandinavica, just 12 months after the event. We owe a big debt to the authors for their co-operation, to the referees, to the editors of the Journal and particularly to Professor David Jenkins the editor in chief.

Participants at the Symposium will receive one copy free. Non-participants can buy copies from the WPA Headquarters, P O Box 5, Lower Basildon, Reading RG8 9PF, UK, at a price of £10 plus £2 post and packing. Copies of previous Symposia Proceedings are also available from Headquarters at the following prices; Vol. 1 Woodland Grouse, Inverness and Vol. 2 Grouse, Edinburgh £4 each plus £1 post and packing per volume. Vol. 4 Lam £10 plus £2 post and packing. Vol. 3 is obtainable direct from CIC, 15 Rue de Tehran, F 75008 Paris, France.

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GROUSE NEWS

No 3

JUNE 1992

GROUSE NEWS NO 3

Editor: Diana Lovel

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1993

Sept 20-24 Sixth International Grouse Symposium, Udine, Northern Italy

Front Cover: Capercaillie display by Dr Fabio Perco

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EDITORIAL

This is our third Grouse News and subscriptions are due for this and Grouse News 4.

I greatly appreciate so many of you becoming subscribers and am delighted that as a result of your support we are able to let our friends in Eastern Europe receive free copies of Grouse News.

We do lose money on this publication but as long as we get so many of you subscribing, WPA International will endeavour to cover the loss. Postage is very expensive and if we could find a sponsor for this our worries would be over. Maybe you know of someone or some firm who would be glad to advertise a product through our mailing list and contribute towards our postal costs? Perhaps you know of people who would pay for advertising space? Please let me know if you do.

It has been a great pleasure receiving news from so many of you. Please continue to write, if not articles just ideas, hypotheses and snippets of news, but I do need more contributions if Grouse News is to continue to be interesting. Some of you have offered material but not enough! I do hope to produce a reasonably balanced news. The success and continuation of this publication is in your hands. If you have good photographs of birds, habitat or people, preferably in black and white, or can draw please send me this material which will be credited to you.

We are committed to two Grouse News a year but cannot guarantee which months they will appear. Mrs Jane Clacey, as well as being busy with WPA News also typesets Grouse News for us thus saving costs. Therefore we need to avoid producing both at the same time. Also some months are difficult for you to produce articles for us.

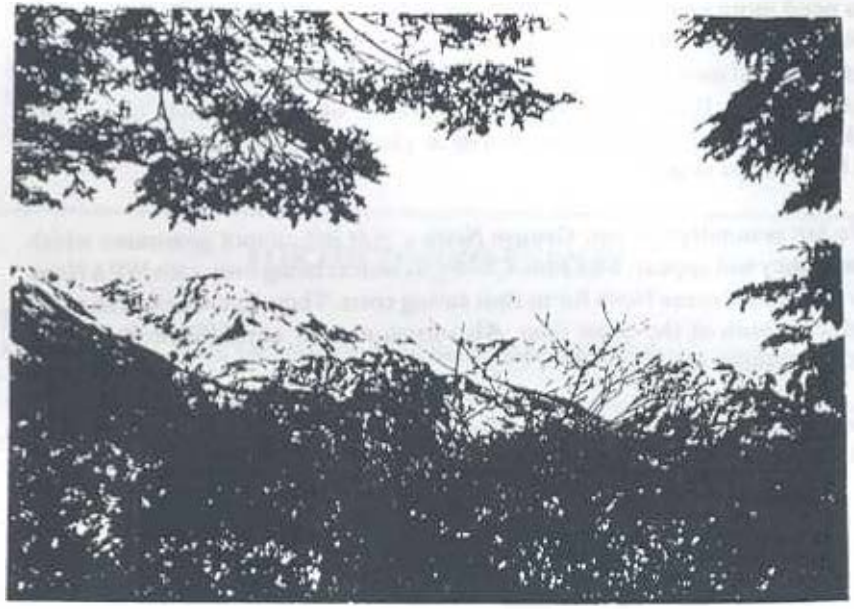
I would like to thank Mrs Clacey for all her hard work and Professor David Jenkins for his help with editing some contributions.

CURRENT STATUS OF THE HAZEL GROUSE IN CHINA

Zhao Zhengjie

There are two subspecies of Hazelgrouse in China: *Tetrastes bonasia sibiricus* and *Tetrastes bonasia amurensis*. They are distributed in Heilongjiany, Jilin, Liaoning, Hebei, Inner Mongolia, Xingjiang Province and autonomous regions. They were one of the more common forest birds in north-east forest regions of China 30 years ago in all types of forest. In recent years, their distribution has gradually diminished and has become discontinuous because of excessive hunting and because habitat conditions for Hazel grouse have deteriorated. Now they are distributed mainly in Daxinganling mountain ranges, Honghuarji, Yakesi (Jiagedaqi region), Xiao Xing Anling mountain ranges, Yichun, Wuyun, Jamosi, Mudanjiang, Shonghuajinag, (Heihe region) and Changbai mountain ranges, Yanbiang, Tonghua, Hunjiang, Linoyu (Jilin region). The distribution elevation is from 400-2000m.

Numbers of Hazel grouse have been dwindling over the lost 15 years. In investigations in 1974 over 187h from Jnnunry to December in Toudao and



Habitat of Chinese hazel grouse in Wu-yi-peng *Photo: T Nadlea*

Erdao area of Changbai mountain, 257 individual Hazel grouse were observed and the average seen per hour was 1.4 individuals when using a route count method. From August to November, average sightings per hour were 2.6 individuals. The highest population density occurred in November when the average sightings were 3.0/h.

Zhang Xinglu surveyed the same area of Changbai mountain from August to November in 1976-78 and 1982-84. He used the same route count method. Average sightings per hour were 1.24 individuals in 1976, 0.98 individuals/hour in 1977, 1.13 individuals/hour in 1978, 0.50 individuals/hour in 1982, 0.43 individuals/hour in 1983, 0.40 individuals/hour in 1984. From these counts the population density decreased by 84% between 1974 and 1984. We surveyed these areas again in 1989 and 1990, No Hazel grouse were seen. They have only appeared recently in some desolate and undisturbed forest areas.

Hazel grouse mostly inhabit poplar/birch forests, mixed forests of coniferous and broad-leaved species, coniferous forests and regenerative forests. They nest in April-July, with nests mostly under fallen wood or bushes. Only one clutch is laid in a year. The clutch is 8-14 eggs but generally 11-12. The decline in Hazel grouse population density is mainly due to excessive hunting, disturbance by humans and change in habitat. We have attempted to breed Hazel grouse in captivity and have produced a limited number of chicks each year. Survival remains a problem. A lot of chicks died in autumn and winter this year and only a few individuals survive for next year.

Ed. Note: References for the earlier work cited have been requested from Prof. Zhao Zhengjie

Sketch of threat run by male Hazel grouse illustrated by Paul Johnsgard in his book The Grouse of the World published by Croom Helm.

CONSERVATION OF HAZEL GROUSE IN GERMANY

Manfred Lieser

At the beginning of this century the Hazel grouse was widespread and locally very common in Central Europe. Since 1930 this species has been suffering a heavy decline which has lead to the extinction of many populations. In Germany the Hazel grouse has survived in the Rheinisches Schiefergebirge (Western Germany), in the Black Forest, the Alps and the Bavarian Forest (Southern Germany), and most of these populations continue to decline.

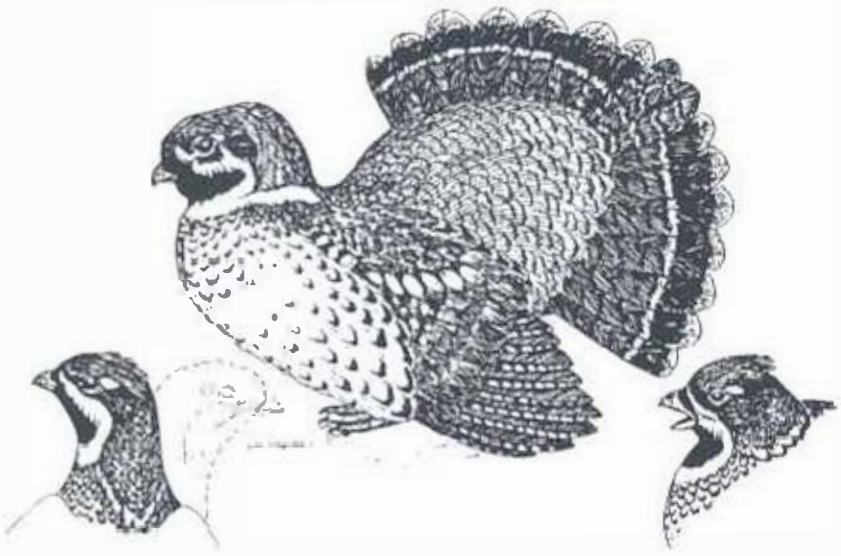
The reasons for this rapid decrease is a deterioration in Hazel grouse habitats caused by the cessation of traditional silvicultural activities such as the coppice system in deciduous forests, the conversion of coppice stands into productive coniferous forests and managing monotonous commercial forests on large economic units (elimination of food plants, pruning of conifers etc).

In several states of the Federal Republic of Germany the public administration has developed conservation strategies for Hazel grouse. In Rheinland-Pfalz the authorities for nature conservation are conducting a programme in close co-operation with the adjacent states of Hessen, Nordrhein-Westfalen and Luxembourg: censusing the Hazel grouse population, mapping the habitats and habitat management. The project is financed by the participating states. On a smaller scale the local forest administration of Saarburg and Kusel is managing Hazel grouse habitats in coppice woods which tend to be overmature: small clearcuts and regeneration of stock sprouting, planting of food trees and patches of conifers in order to increase the amount of food and cover. The money for these small projects comes from compensations paid for environmental damages and from a tax which is paid by hunters. A severe problem is the intensive browsing by roe deer and red deer which prevents the regeneration of all deciduous trees and shrubs which are not enclosed by deer fences.

In 1988 the Ministry of Agriculture and Forestry of Baden-Wurttemberg founded a working group of Hazel grouse which is composed of foresters, hunters, wildlife biologists, ornithologists and a representative of the private landowners. This working group is preparing a conservation programme for Hazel grouse in the Black Forest. Foresters will soon be educated in order to improve habitats in commercial woods. The management recommendations are based on a study of the ecology of the Hazel grouse in the Black Forest which is being conducted by the University of Freiburg. Private landowners are going

to receive compensation from the state of Baden-Wurttemberg not to convert woods inhabited by Hazel grouse into more productive forests.

In the northeastern part of France, in Luxembourg and in Belgium similar working groups on Hazel grouse were founded recently. The European Community is giving financial support to several conservation programmes for Hazel grouse in Germany, Belgium, Luxembourg, France and Greece.



Male displays of Hazel grouse from sketches by Paul Johnsgard in his book The Grouse of the World published by Croom Helm.

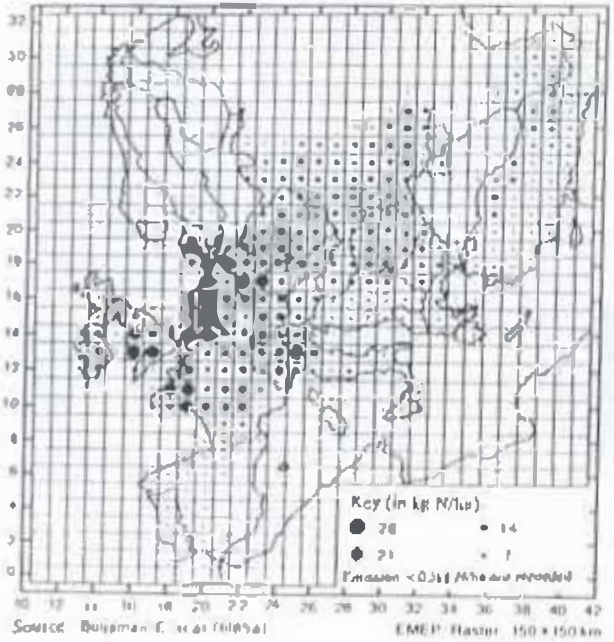
EUTROPHICATION AND ITS CONSEQUENCES FOR HABITAT, SPECIES AND CONSERVATION

Dr H Ellenberg

While inputs of acidity from air and rain can cause changes in soil chemistry in the long term, nitrogen deposition can cause changes in vegetation over both short and long periods. The distribution and phenology of plant communities are affected so that microclimates become more cool and moist at ground and herb levels. This is apparently most pronounced in late spring and early summer.

'Critical loads' at which nitrogen deposition may change ecosystems in Europe appear to be 12-15kg N/ha/year for managed conifer forests and up to 20kg N/ha/year for managed deciduous forests (Nilsson & Grennfelt 1988). 'Better growth' of plants at lower levels may be observed as nitrogen compounds are selectively absorbed by plants, via the stomata of the leaves and via the roots. For 'primeaval' forests near equilibrium, critical loads are approaching zero.

FIG 1: AMMONIA EMISSIONS FROM MAN-MADE SOURCES

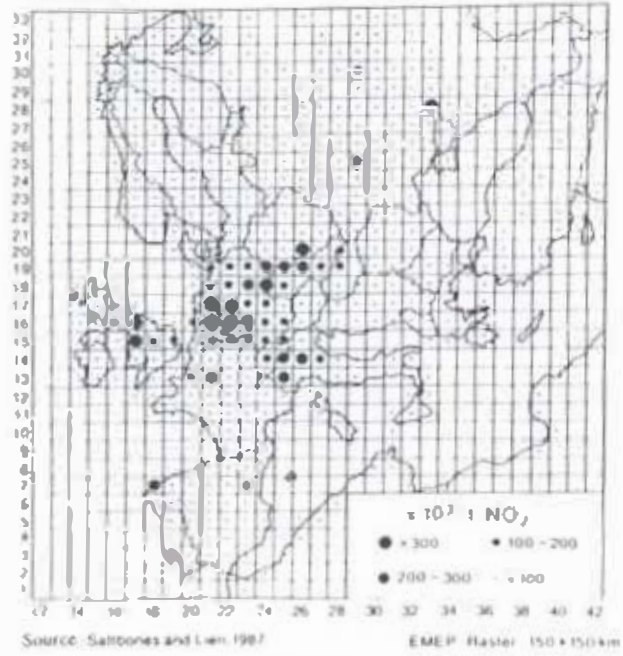


There are indications that equilibria between mycorrhiza and plants may be affected at rates of input of nitrogen lower than 2-5kg /ha/year, leading to declines in, for example, vaccinium and pyrola. Deposition loads as mentioned have been exceeded for decades at many places in Europe (see ligure 1 from Buijsman *et al.* 1987; and figure 2 from Saltbones and Lien, in Pacyna 1989). My impression is that 'eutrophications' of terrestrial ecosystems appears to be the mostsignificant problem in nature conservation in Central Europe (Ellenberg H., Ruger A., Vauk G 1989).

I invite grouse specialists to compare the population trends of 'their' species with this background information on potential ecological changes in European ecosystems. Because many soils in grouse habitats are acidic, my impression is

that acid deposition may be less important than nitrogen in causing changes in habitats which affect grouse species. The topic is more complex than can be outlined in a short contribution for this Grouse News, but at least some population treods in grouse could be associated with the depositionof N, and I look forward to your comments.

FIG 2. EMISSIONS OF OXIDES OF NITROGEN FROM MAN-MADE SOURCES



Buijsman, E., Maas, H.F.M., Asmann, W.A.H. (1987). Anthropogenic NH3-emission in Europe. *Atmos. Environ.* 21:1009-1022.

Ellenberg H., Ruger A., Vauk G (1989). Eutrophierung - das gravierendste problem in naturschutz? *Nordd. Naturschutzakad. Schneverdingen Ber.* 2,1.

Nilsson, J. & Grennfelt, P. (1988). Critical loads for sulphur and nitrogen. Rep. workshop held at Skokloster, Sweden 19-24.0.3 1988; orgauised by UNECE and the Nordic Council of Ministers, *NORD Miljoruppori 1988;* 15:1-418.

Pacyna, J.M. (1989). Atmospheric emissions of nitrogen compounds. S.92, in Malanchuk et al. The Role of Nitrogen in the Acidification of Soils and Surface Waters. Nordic Counc. Minist. *NORD 1989;* Miljo-Capp. 1989, 10.

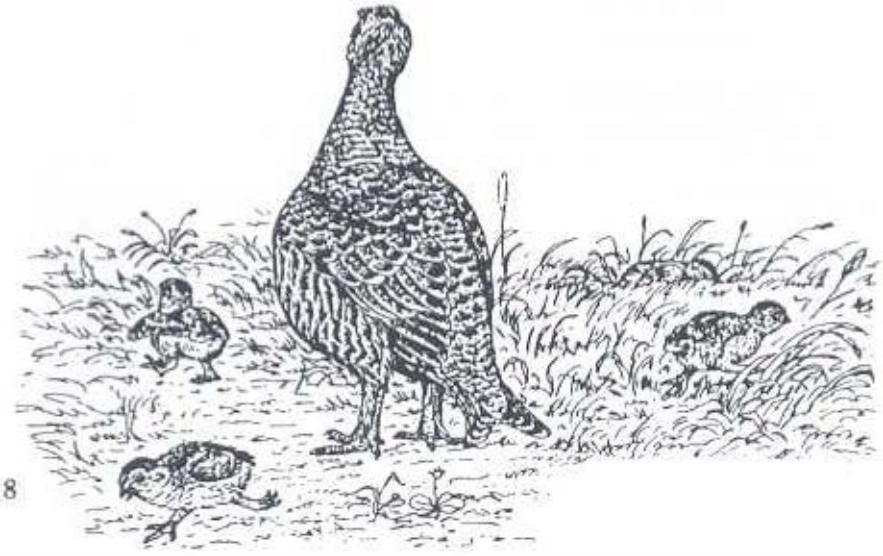
MOVEMENTS, BREEDING SUCCESS AND MORTALITY OF BLACK GROUSE HENS A RADIO-TRACKING STUDY IN FINLAND

Arto Marjakangas

I have been studying the movements, breeding success and mortality of radio-tagged female Black grouse since 1989. The study area is located in eastern central Finland at latitude 64°. The females are captured using baited traps at feeding sites during late winter. The field worker in 1990 and 1991 produced plenty of data because we were able to tag respectively 75 and 80 females with necklace radios.

The Black grouse population in the study area shows 6 to 7 year cycles. The last peak year was 1989, and the population crashed from 1990 to 1991, so there is a nice opportunity to study the importance of different factors affecting the local density during the different phases of the cycle.

Many of the yearling hens have proved to be very mobile. In spring 1991, for instance, the median straight-line distance between the wintering site and the breeding site of the yearlings was 11km; some individuals covered distances of over 30km (the record is 34km!). These birds have to be located by aircraft in spring after the dispersal season. Preliminary data suggests that the yearling long-distance and short-distance disperses do not differ significantly in mortality or breeding success.



Some adult females also move long distances, but mostly the old ones stay to breed within 5km of the wintering site. The tags used so far work for 6 to 10 months, but hopefully in the future I can afford to use tags with a longer lifespan to have a closer look at the possible seasonal movements of the females.

Egg losses have been lower than those reported for Capercaillie and Black grouse by our Norwegian and Swedish colleagues. The egg predation rate was 25% in 1990 and 33% in 1991. We are eager to see what is going to happen this year, because vole densities are increasing.

In 1990 and 1991 respectivley only 19 and 14% of the eggs produced a chick surviving till early August. This means that the chick losses have been relatively more important than egg losses. I have planned to tag chicks in late summer to study their autumn dispersal.

There is a marked seasonal variation in the mortality of adults during the early breeding season; 25-30% of the birds tagged in late winter have died during April and May. It seems that they are especially vulnerable to predation during the mating and egg-laying period, while the survival clearly increases after the commencement of incubation. During the summer months the mortality is relatively low, and in autumn hunting mortality is more important than natural mortality.

Possibly not all our readers regularly see the Japanese Journal of Ornithology or Tori. Our colleague in Obihiro, Yuzo Fujimaki recently sent us three interesting papers on Tetrastes bonasia by himself and by Hago and Takamata, and we print here the English summaries.

ECOLOGY AND BREEDING BIOLOGY OF THE HAZEL GROUSE IN CAPTIVITY

Breeding, artificial insemination and rearing control

Hago R. & Takamata S. (1986) Tori, Vol: 34, 105-125

Studies were made on breeding biology of the Hazel grouse *Tetrastes bonasia vicinitas* in captivity and in Tokachi and Kushiro districts, eastern Hokkaido, between 1983 and 1984.

1. In wild state nests were found in coniferous forests, mixed forests of coniferous and broad-leaved trees, mature larch plantations, fir plantations and bamboo grass lands.
2. The nesting period ranged from early May to late June and hatching days were concentrated in the 10 days from 15 to 26 June in 1984.
3. The clutch size varied between 4 and 9 eggs with an average of 7. Only the female incubated the eggs.
4. In artificial breeding mating behaviours such as displays, chasing female, singing and copulation were observed. Nests were built within a day. During a period of 21 days, a total of 14 eggs were laid when 2 or 3 eggs were left in the nest each day.
5. Fifty eight eggs collected from nests in fields, and 9 eggs obtained from the birds kept in captivity were incubated artificially. The hatchability in artificial incubation was 93% by using the incubator and 71.4% by using 'chabo', a domestic fowl.
6. Chicks obtained from 72 eggs were reared in captivity in 1983 and 1984. They reared up to 5 weeks of age in chick-rearing cages at 25°C. Rations of 13 to 19% crude protein were fed to them. Chick group-activities of walking, eating and resting occurred alternately.
7. The juveniles, from 6 to 15 weeks of age, were transferred to sunny rearing cages. They were reared in groups of 5 to 8 birds. A ration of 13 to 15% crude protein was fed to them. They exhibited such behaviour as preening and sand-bathing. Cannibalism also occurred often in this age.
8. The adults, from 16 weeks of age, were reared in groups of 2 or 3 birds. A ration of 10% crude protein was fed to them from October to February. From March to June, the crude protein was increased to a level between 15 and 20%. Adults at 16 weeks of age showed clear distinction between sexes, and exhibited mating behaviour such as display and singing.

Black-breasted Hazel grouse from a sketch by Paul Johnsgard in his book The Grouse of the World published by Croom Helm.

Home range, circadian rhythm and roosting behaviour in winter in eastern Hokkaido

Haga R., Yokota S. & Takamata S. (1987) Tori Vol:35, 145-154

1. The winter habitat and behaviour of the Hazel grouse *Tetrastes bonasia* were studied at the Kyoto University Experimental Forest at Shibecha, Kushiro District, eastern Hokkaido, and in captivity between a period from February until May 1984.
2. The study area (ca. 27ha) consisted chiefly of larch plantations. The Hazel grouse preferred areas with birches in winter.
3. A pursuit of a pair revealed that they ate mainly the buds of *Betula platyphylla* and *Alnus japonica* in trees in the morning and evening, but foraged on vegetable matter (e.g. the buds of *Acer mono* and *Salix integra*) on the ground or on the snow during the daytime. At night they went to roost in snow holes.
4. Observations of the winter behaviour of males and females in captivity suggest that pairs are formed during February and March.
5. Three home ranges were found in the study area in late February and early March. Home range A was occupied by a pair and had a size of ca. 11.5ha. Home range B (ca.1.3ha) and C (ca2.5ha) were occupied by a male and a female, respectively. These home ranges decreased the size to ca. 7.8ha (home range A) or increased to ca. 5.3ha (home range B) on late March due probably to the establishment of territories, while the female of home range C disappeared from the study area.
6. The circadian rhythm of birds in captivity was similar to that observed in the wild state.

DIET OF HAZEL GROUSE CHICKS AND DIET CONSUMPTION IN CAPTIVITY

Kumiko S. & Fujimaki, Y. (1990) Tori, Vol: 39, 25-32.

The diet consumption of Hazel grouse *Tetrastes bonasia* chicks in captivity, was investigated in 1987 and 1988. Chicks were supplied with an artificial diet composed of 9.5 to 21.0% crude protein, 2.1 to 17.2% crude fat and 1.5 to 4.8% crude fibre. The gross energy of the diet ranged from 2,033.9 to 3,880.6 kcal/kg in different ages. Diet consumption in dry weight was 1.5 g/day/bird in 2 day old chicks, increasing to 24.8 g/day/bird in 46 day old chicks and averaging 22.1 g/day/bird in 50 day old chicks. The body weight just after hatching averaged

11.4g and reached 300g or more in 98 day old chicks. Forty-nine day old chicks attained 69% of adult weight, 82% of adult wing length, 95% of adult bill length, and 98% of adult tarsus length. The relationship between the age in days (X) and diet consumption per body weight (Y) is Y = -0.0941 + 15.34. The survival rate was 90% in 35 day olds and 65% in 112 day old chicks. The main cause of death after 42 days old was aspergillosis and peritonitis. A standard diet was presented based on the data for diet consumptioa.

DO CROP CONTENTS PROVIDE AN ACCURATE MEASURE OF GROUSE FOOD HABITS?

David A Boag and Tara Corcoran

Recently, De Franceschi and Boag (1991) raised the possibility that food habits of grouse, based on the contents of crops, may be inaccurate. They came to this conclusion after observing that Spruce grouse *Dendragapus canadensis*, foraging freely in the wild, were consuming relatively large volumes of foods not previously recorded as part of this species' diet, based on crop contents. Among the foods not previously found as important components of the diet were the fruiting bodies of basidiomycete fungi, a prevalent component of the forest floor community throughout the range of the Spruce grouse.

There seem to be three possible reasons for this discrepancy:

1) foods such as fungi, composed entirely of soft tissue, were liquifying in the crop and consequently were not normally recorded among the contents;

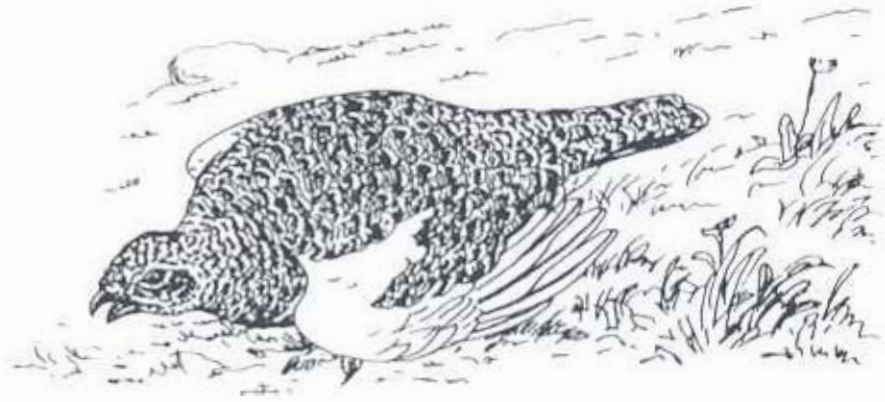
2) by being of a consistency or chemical composition different from most of their forage (leaves, green twigs, fruits), such foods were bypassing the crop (a lateral diverticulum of the oesophagus) and entering the proventriculus directly, thus not appearing among the contents of the crop;

3) the use of these foods was merely a function of availability with previous studies of food habits being based on crop contents of birds taken in places where or at time when such foods were available.

We investigated these possibilities by comparing the items observed ingested with those present in the crops of individual Spruce grouse after an observed feeding bout. Spruce grouse, located by walking slowly through suitable habitat, were approached to within a distance of easy observation, usually less than 20 meters. After an initial period of habituation, usually about 5 minutes, these

birds would resume normal activities including foraging. In so doing the birds would meander slowly about, either on the forest floor or along the branches of conifers, often moving to within about 5 meters of the observer. At distances less than 20 meters it was relatively easy to observe the number and nature of the items ingested, particularly with the aid of binoculars. Each bird was observed over a single feeding bout ($\bar{x}$ = 54.5 min., n = 10) before being captured with a noose-pole and killed with an overdose of chloroform. The crop was excised and its contents identified and counted.

We observed and collected 10 Spruce grouse during the first two weeks of August 1990 (4 adult males, 2 adult females, and 4 juveniles). The items observed ingested and those recovered from the crops are shown in Table 1. It is apparent that the agreement between these two datasets is not good.



Some items appeared in the crops in numbers greater than those seen ingested; whereas, for others the converse was true. The presence in the crop of items not seen ingested indicated that such items were consumed during a previous feeding bout and foraging. The most striking examples of this were the leaves of clover *Trifolium repens*, the needles of white spruce *Picea glauca*, the fruiting bodies of basidiomycete fungi, and the fruit of blue berries *Vaccinium scoparium*. These data raise two points. First, each of these foods tends to occur in patches; the birds probably feed heavily when such patches are discovered and in so doing tend to fill the crop, presumably after having filled the proventriculus and ventriculus. Second, by combining all the birds some information is lost because of the considerable variation, both in volume as well

as nature of the items present, among individuals. For example, of all the spruce needles observed consumed, only 80% were in fact recovered from the crops of those birds seen feeding on them.

Items seen ingested but not present in the crop had obviously bypassed it and entered directly into the pro ventriculus. Most striking in this regard were ants *Formicidae* at which about 20% of all the pecks were directed but which made up only 3% of the items in the crop. A similar situation was observed with the leaves and twigs of blue berries, and to a lesser extent with the needles of lodgepole pine *Pinus contorta* and grit (table 1). It is interesting that the items bypassing the crop were, in general, less likely to be found in patches than those found in larger amounts in the crop. They may also be less preferred and consequently were consumed in lesser amounts. Moreover, these food items were generally smaller and harder than the items entering the crop. These data provide no evidence that food items of soft composition, such as fungi, automatically bypass the crop, as suggested by Dr Franceschi and Boag (1991). Furthermore, soft foods remained intact in the span involved in these collections. This would seem to negate the possibility that such soft bodied foods were liquifying in the crop and consequently were not recorded among the contents. It is also apparent that crop contents may provide a biased picture of the food habits of grouse, certain items being consistently under-represented while others are over-represented.

De Franceschi, P.F. and Boag, D.A. (1991). Summer foraging by Spruce grouse: implications for galliform food habits. *Can. J. Zoo.* 69: 1708-1711.

Schroeder, M.A. (1986). A modified noosing pole for capturing grouse. N. Am. Bird Bander 11:42.

Table 1: Food items observed ingested by Spruce grouse and recovered subsequently from their crops. A sample of 10 birds was observed and collected between 09.20 and 20.40 hours.

FOOD ITEM	PERCENT OF TOTAL INDIVIDUAL	
	pecks directed at items	items recovered from crops
Hymenoptera *(Formicidae)*	19.46	2.92
Picea glauca (needles)	16.24	22.95
Vaccinium scoparium (leaves and twigs)	13.38	0.44
Pecks at unseen times (assumed to be insects)	9.44	4.69
Basidiomycetes (fruiting bodies)	9.23	16.96
Vaccinium scoparium (fruit)	4.43	14.91
Fragaria glauca (fruit)	3.58	4.09
Shepardia canadensis (fruit)	3.29	0.88
Pinus contorta (needles)	2.86	0.00
Trifolium repens (leaves)	0.00	19.00
Other vegetation (18 types)	16.73	13.16
Grit	1.36	0.00

TREE LOVERS ATTACK SUMMIT 'HYPOCRISY'

Toby Moore, Environment Correspondent
Taken from The Daily Telegraph Friday May 15th, 1992.

Conservationists say the Government has a nerve telling other countries to stop destroying rain-forests when native Scottish woodland has all but disappeared.

Using language associated with assaults on logging methods in Malaysia and Brazil, a consortium of conservation groups is arguing that the ancient Caledonian forest is among the most 'degraded and abused' in the world. It wants a charter of rights to protect what remains.

The Reforesting Scotland campaign says Britain can hardly insist at the Earth Summit in Brazil on preserving tropical forests when its own natural woodland of Scots pine, rowan, birch, willow, wild cherry and juniper is in such a parlous state.

Dr Adam Watson, an ecologist and an authority on woodland, said nobody should doubt the similarities between what had happened in the Highlands and what was happening elsewhere in the world.

The proposed Scottish Forest Charter seeks to restore woodland that once stretched from the Highlands to Loch Lomond, now reduced to fragments amounting to 1.5 per cent of the original cover.

"The expansion in forestry planting of fast-growing exotic conifers has, between 1950 and 1980, been responsible for the destruction of over 30 per cent of the remaining woodland in Scotland," say the backers of the charter, including the World Wide Fund for Nature and the John Muir Trust.

"These plantations have brought little benefit to local communities, many are owned by absentee landlords, pension funds and foreign companies and many have damaged wildlife sites."

Prof David Bellamy, chairman of Plantlife, is a supporter of the Reforesting Scotland campaign. "The parallels between the sad story of Scotland's deforestation and the forest destruction in other parts of the world are inescapable," he said.

GROUSE SNIPPETS

Dr Siegi Klaus writes from Jena, Germany that they are busily engaged writing the manuscript for the next edition of their Hazel grouse book. Last autumn he was working with Jon Svenson in the Hazel grouse study area in Bohemia. Siegi's new job in the agency of the Environment is hectic and he will find opportunities for grouse work only in his free time - as before! He looks forward to meeting us all again in Udine. Siegi enclosed with this letter the lovely photograph by T Nadlea of Chinese hazel grouse habitat which is reproduced in this edition of Grouse News.

Jimmy Oswald writes from Glen Tanar, Aboyne, Scotland that their Capercaillie did remarkably well last year, in his opinion because there was an abundance of moth caterpillars.

Hans Chr. Pederson writes that he has been very busy since the sad death of Svein Myberget as he was given the responsibility of taking over much of Svein's grouse work. He is in Canada for one year, from January 1992, working with Susan Hannon on Willow ptarmigan.

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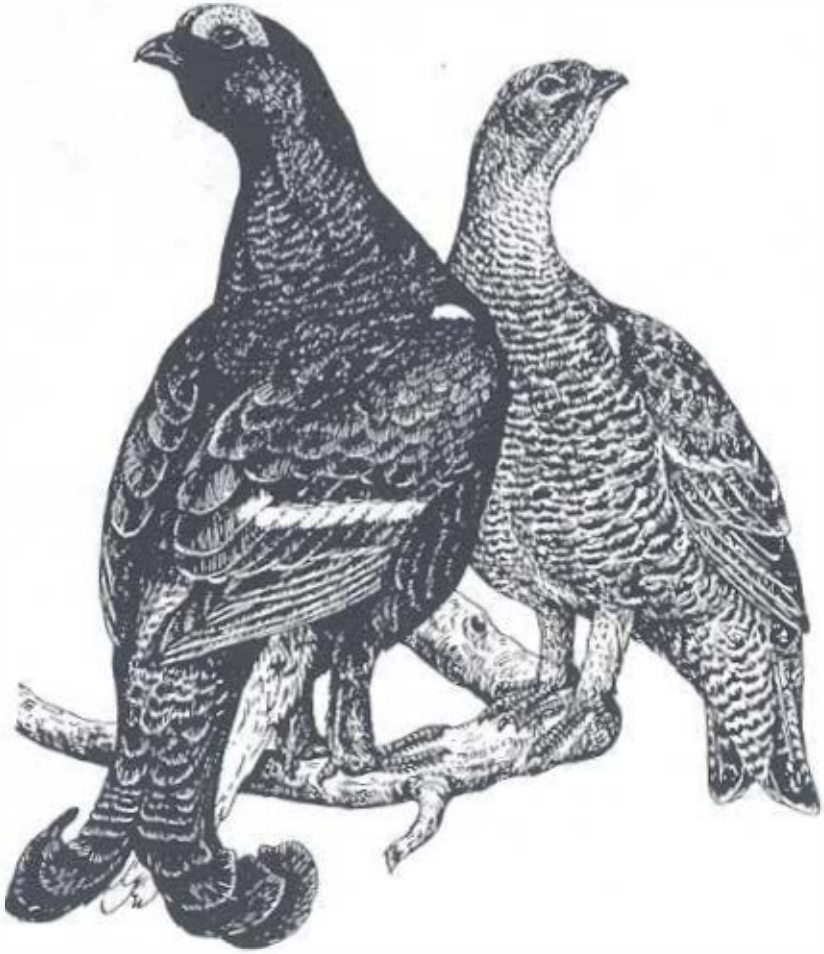

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1993

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Front Cover: Capercaillie display by Dr Fulvio Perco

Produced by: The World Pheasant Association
P ● Box 5, Lower Basildon
Reading, Berks RG8 9PF, England

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EDITORIAL

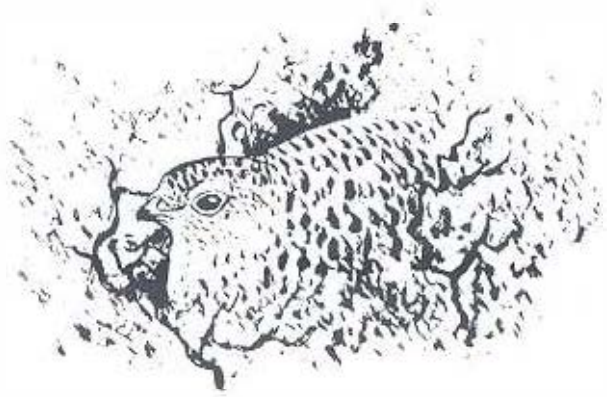
I NEED YOUR CASH!

Many of our readers have already renewed their subscriptions to Grouse News: please accept my thanks for this support. We are generously subsidised by the World Pheasant Association, but there is a limit to their ability to fund us. At present, Grouse News cost £300 a year to print exclusive of typesetting, but the postage costs a further £100. Therefore I must ask all our readers to continue to subscribe so that we can go on publishing and if possible extending the range of Grouse News. Even better, persuade some of your colleagues to subscribe too. A subscription form is enclosed - feel free to make as many photostat copies as you like!

UDINE 1993

Plans are now well advanced for the Sixth International grouse symposium in Udine, NE Italy, for 20-24 September 1993. It should be an excellent meeting of the world's grouse experts, and a worthy successor to its five predecessors. Everyone on our mailing list should have returned to us their preliminary registration form. Many of you have already done so, but if yours is still on your desk please send it back to us quickly. If you have not received the First Notice, write to us at once. A Second Notice will be distributed in the New Year.

My postbag gets heavier each week. I am most grateful to you for all the articles, news and information that you have sent me. Please keep it coming - only by your contributions will Grouse News continue to serve the perceived need for a regular publication.



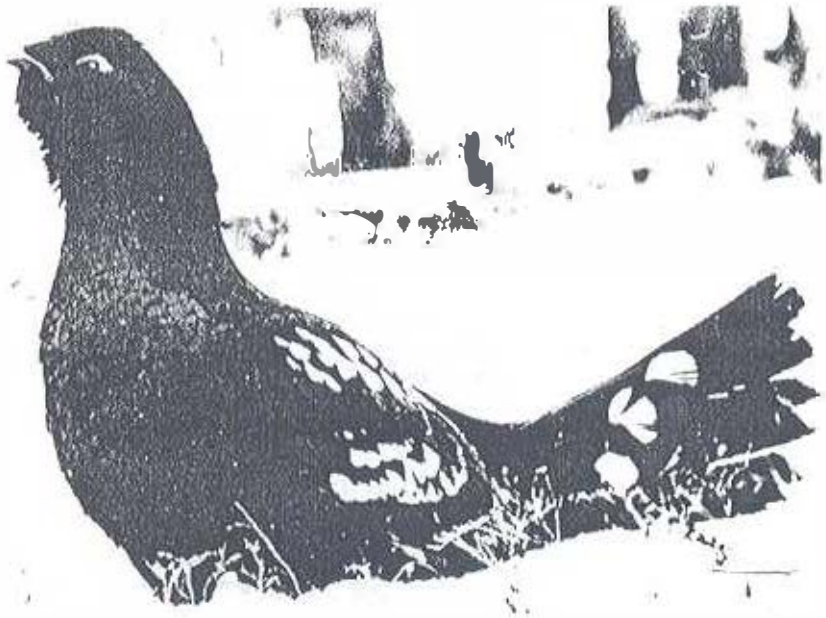
THE BLACK-BILLED CAPERCAILLIE

René Franêk

In the Tetrao family there are only two species: Common capercaillie *Tetrao urogallus*, which is well-known to many aviculturists, and Black-billed capercaillie *Tetrao parvirostris* (or also *Tetrao urogalloides*), which is unknown to most people. I think that only a few Europeans have ever seen this bird in its biotope in the Far East. It is a beautiful and impressive bird which emphazises its beauty when displaying.

Subspecies

1. *Tetrao parvirostris parvirostris* has the largest distribution from Lake Baikal to the eastern coast of the Soviet Union.
2. *Tetrao parvirostris kamtschaticus* lives in the south-eastern part of the Peninsula of Kamtschatka. It differs from the nominate subspecies by having a lighter back; its appearance is similar to that of one-year old males in the nominate subspecies.
3. *Tetrao parvirostris stegmanni* lives in the South of Siberia, its distribution extends slightly to Mongolia. It differs by having longer tail feathers.



Description

The male has a black bill, and an elegant black plumage with a green glossy breast and throat and on the tail and wings there are white spots. One year old males have white spots also under the tail. There is red skin above and behind the eye. The weight of a male is between 3350g and 4580g. The female is mostly brown with white and black ripples on her body. The combination of these colours is decorative and also it is a very effective camouflaging plumage. The weight of a female is 1700g - 2200g. The appearance of a female is clearly distinguished from the female of the common capercaillie by her black bill, which the chicks also possess from hatching.

Biotope and feeding

The biotope is represented by the taiga - Siberian forest in a mountainous landscape of volcanic origin. The taiga is formed by larch, birch, scrub birch and cedar shrubs; close to the river are alder and willow. Capercaillie eat larch all the year, even in winter when they take the ends of branches. In summer they eat green larch, green parts of plants, cranberries and other kinds of berries. Also they eat ants, mosquitos and various beetles.

Behaviour and propagation

Black-billed Capercaillie live in the cruel Siberian conditions where the temperature decreases to -50°C. In such frosts the birds hide under the snow. It is a polygamous bird. The display begins depending on the area; in the south at the beginning of April, in the north at the end of April. Females appear at the display area at the end of May. The display takes place usually in a larch forest; about 3-10 males take part. The male raises and spreads his tail, he lets his wings down and sings his song. The song is similar to a castanet. The display begins on the ground or snow, and after the females fly away the display continues for a long time in the trees. At the display place there is a dominant male who is the most active. Usually he has the least white spots, which means that he is over 3 years old. Two year old males form the second category. In a nest there are usually 5-8 eggs. The nest is hidden very well. The length of incubation is reported to be 26-28 days.

Expedition to the Black-billed Capercaillie

In 1989 I went at the invitation of the Soviet Academy of Sciences to Magadan, the city in the north-eastern part of the Soviet Union called Kolyma. There I

worked in the field with the outstanding Russian scientist A. Andreev, who has been studying capercaillie, Hazel grouse and other grouse for many years. I worked by the river Jana. My aim was to find a nest of Black-billed capercaillie. Russian scientists had only once succeeded in finding one in the last 8 years. I succeeded in finding a nest on 11.6.1989. There were 6 eggs in it, but only 2 were fertile. One of these two fertile eggs was broken by the female which had become nervous from my frequent visits. I tried to take care that the female would not run away with her chick but unfortunately this is what happened. the female was seen, but only after a third search did I succeed in finding the chick, which was well hidden. I put the chick into a box with a light lamp; electric power was generated by a petrol motor, which was working 24 hours a day. For the first 3 days the chick was fed on mosquitos and ant eggs and afterwards on a combination of these with turkey starter crumbs. I also caught several Kolyma Hazel grouse. Forestry workers brought me 3 Black-billed capercaillie which were about one month old. One capercaillie refused to eat and died within 4 days, but the other two survived. I gave them antibiotics in their water against stress. The birds were in a box 1m x 1m, with a wire floor. It was not practical to build a pen outside the house, because the chicks would be eaten by sable or other predators.

I was in the taiga for 2 months where my stay was interesting but also dangerous. It was impossible to go to the forest without a weapon. For instance one morning it was not possible to open the door as a bear was sitting at the door and hair from its hind parts were sticking into our room! During one day in the taiga I met 4 bears, however during 4 days I met only one capercaillie.

I took care of the young capercaillie in the taiga for 3 weeks, by which time they did not need heat and were able to sustain the difficult transporation from the taiga to Magadan by car, then to Moscow and Prague by air. However one capercaillie died in transit leaving me with only two males after two months of work in the taiga.

It was necessary to repeat the expedition to the Far East in 1990. I made better preparations; I hired a hunter and also brought an incubator and I leased a jeep for use when searching for eggs. However it was a big problem to find a nest this year. We had to walk 350 km before we found a nest on the 18 June, containing 5 eggs, of which 2 had been dead for a long time. I had to solve the problem when to take the eggs to my small incubator. We had found the nest far from our house, but only 25 km from a village. I wanted to take the eggs close to hatching, in which I succeeded. The same day in the evening the eggs began to

hatch. In the morning I opened my eyes and found that in the village there was no electric power, which had been switched off for 5 days. The three eggs were pipped and cold. I took the incubator with eggs and ran to the post-office, which has its own source of power. On 25.6 three chicks hatched. We put them in a hare cap and carried them to the taiga, to our wooden house, where all was prepared for them. Again there was a petrol motor there which worked for 3 weeks night and day to make electric power for the chicks. Together with the Capercaillie there were young Kolyma Hazel grouse which I had caught.

This year I have not succeeded in finding any female capercaillie with chicks in the forest. Probably this was caused by three wolves in the area; at night they tried to eat our dogs. We have found feathers from two torn female capercaillie.

Also I tried to find a nest of Harlequin duck *Histrionicus histrionicus* because several were swimming in the river Jana. In one flock I counted 11 ducks, and within one day when I was floating 60km in a little boat on the river Jana I counted 35 of them. But I did not find eggs of these beautiful ducks; it was not my main interest.

I determined the sex of the young capercaillie in advance by the shape of the eggs - sharp pointed were female, blunt pointed were male. Male chicks from the beginning fought more, they raised their tail and let their wings down more often than the females. They begin to show this already by the 7th day. By one month of age the males were 100g heavier. But the most marked diferentiation appears when the feathers over the tail begin to grow. Whenever the tip of these feathers appears, in the female the end of the tip is white, then there is a black band and then a brown band. The male has the end of this tip also white, but then it is only black. This appears after 3 weeks of age.

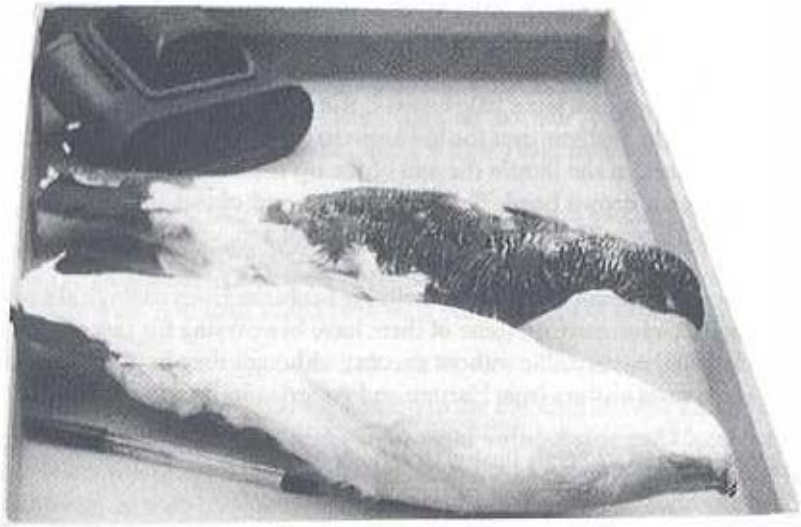
To obtain these beautiful birds is a really big problem. Even zoological gardens in the Soviet Union envy us; some of them have been trying for several years to get black-billed capercaillie without success, although they have spent heavily. These birds send visitors from Europe and America into raptures.

Luzicka 1054, 250 82 Uvaly Prahy, Czechoslovakia

DISCOVERY OF LAGOPUS MUTUS IN THE PAMIR ALAÏ MOUNTAINS (TADJIKISTAN)

Dr J Jacques Pfeffer

One of my friends, P Lombard a French Alpinist, told me he saw a ptarmigan in the Alaï Mountains in Tadjikistan. It appeared strange to me because I knew that the territory of the ptarmigan is farther north. In June 1991 I met a Russian Alpinist and we decided to go and see for ourselves. In April 1992 we were in Tadjikistan. Because of organisation and so many problems in this country, we couldn't stay in the mountains for more than one week. Unfortunately, the snow conditions and weather were very bad and because of avalanches we could only climb for two days. We found tracks of ptarmigan at 4200 m on the 20 April; we saw one on the 22 April. When returning down to the villages we asked the hunters if they knew this bird - some of them told us that the birds usually came down in winter into their fields (2,300 m high) but in summer you can find them higher than 5,000 m (the highest tetraonid in the world I think!). One of these hunters shot three birds for us, two birds in winter feathers in the begiuing of May and one female in the begining of June (see photo).



Two of these birds are now in Tashkent. The biro is 15cm long. Photo: J J Pfeffer

This new record for *Lagopus mutus* is very strange for many reasons;

i) The area of these observations lies at latitude 38° north and longitude 68° east. According to the area of ptarmigan we find in our Bird guides in Western countries, this new area lies more than 1900 k from the previously known one. But in the field guide of Birds of the USSR (printed in 1983 and that seemed more reliable) there are only 1650 km between these two areas. In any case, this is more than the distance between Scotland and the Alps, South Norway and the Alps, or Kouriles and Fujihama. Maybe there are other populations between the main area and this new area? (Tien-Shan Mountains?)

ii) This population also could be very small because Pamir is a country well known by the Alpinists all over the world and no report of Ptarmigan has been made until now.

iii) Another problem is about ecology of this species there. These mountains are very rocky and dry. Vegetation is scarce, one couldn't find any plants like *Salix* or *vaccinium* which we usually find in ptarmigan areas.

iv) Is it a new sub-species? Measurements (taken by Tadjikis) are the same as Alpine ptarmigan. Two of these birds are now in Tashkent, the Ouzbeck Army didn't allow us to bring them back.

Address for correspondence: Dr J JacquesPfeffer, Medecine Generale, 66, rue Principale, 68610 Lautenbach, France.

MONITORING GROUSE POPULATIONS IN FINLAND

Peeka Helle and Harto Lindén

Finland has a long tradition in quantitative bird census work. Among other censuses a special grouse monitoring programme was started in the early 1960s, based on late-summer censuses in optimal brood habitats. The programme was organised by the former Finnish Game Research Institute and run by volunteer hunters. Three men walked in a chain 20 m apart from each other and the census belt covered was 60 m. Relative population densities of grouse could be monitored reasonably well, but absolute numbers could not be calculated because only best brood habitats were sampled.

A new application of the old grouse census programme was launched in 1988 as a joint project of the Game Division within the Finnish Game and Fisheries Research Institute and the Hunters' Central Organisation. The new programme was initiated because the former routes covered the 'best' habitats only. Moreover, they were not permanent and could change from year to year (e.g. due to forest cutting). In the new scheme - called the wildlife triangle scheme - the routes are permanent. They are marked in the field and randomly distributed among all the main forest cover types in each area. The basic unit in the scheme is an equilateral triangle of 12 km in length (3x4 km). The number of these routes is about 1400 (see Fig 1). They are spread all over the country, and their total length is more than 15,000 km - about 9,000 voluntary hunters participate in censusing! The routes are censused twice a year. August census data are gathered in the same way as in the former programme. In addition to this, mammalian snow tracks are counted in winter censuses (January-March) along the routes.

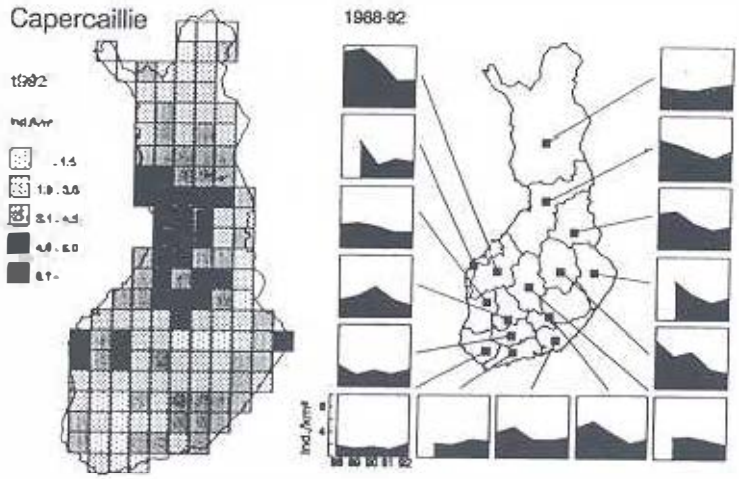


Figure 1. Distribution of wildlife triangles in Finland 1992.

Fig. 2 shows the densities of capercaillie according to the August censuses in 1992. Densities are presented by 50 x 50 km squares in the national grid. The results are similar to the absolute figures, because it is known that the census efficiency of the three-man chain used is about 80%. Small diagrams in Fig. 2

show population densities in different provinces during the period 1988-92. The basic purpose of the scheme is to provide reasonable density estimates of grouse, which are used in determining bag limits for each hunting season. The percentage of birds shot in comparison with August numbers is recommended to be 2-12% depending on the phase of the population cycle (Finnish grouse populations are markedly cyclic with an average cycle length of about six to seven years).

To run the programme efficiently requires the rapid handling of data and distribution of information. Most of the routes are censused by 20 August and the results - with bag recommendations - are available by the end of August. This is inevitable because the hunting season normally begins in early September.

An important aspect in the triangle scheme is that the same routes are censused in late summer and in winter. This allows the whole game species community to be studied. We can examine, for example, the relationship between red fox populations and reproductive success of grouse in a given area. Also other possible interspecific interactions can be analyzed using combined summer-winter data. This approach will broaden our understanding of the game animal community.

Accurate location of observations in the field allows good opportunities to study in great detail the effects of habitat

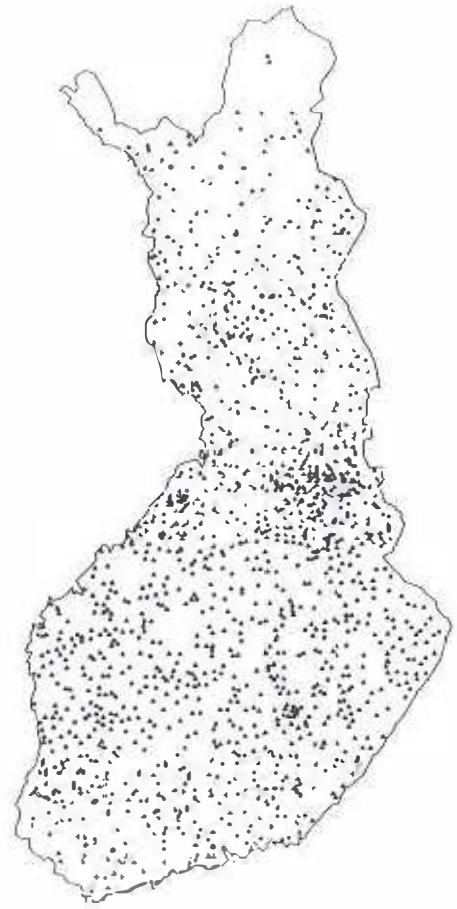
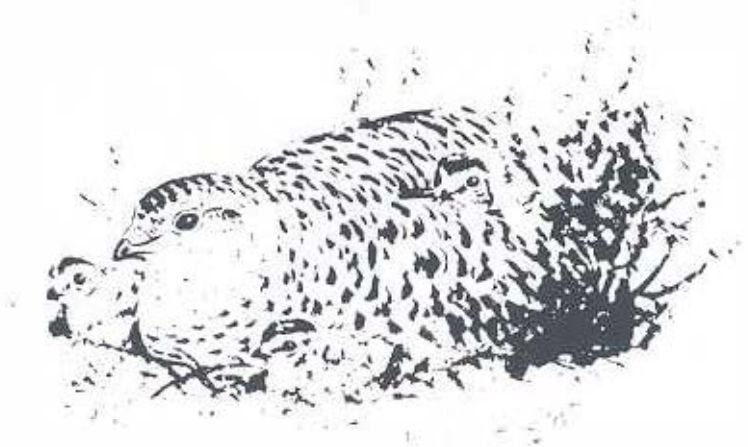


Figure 2. Density of capercaillie in Finland by 50x50km squares according to the triangle census results in August 1992, and capercaillie densities in different provinces during the period 1988-92.

structure on grouse populations. Several habitat variables used in forest inventories (e.g tree species composition, stand age, foliage height, timber volume) are available for all the stands included in the census routes. By analysing these two data bases simultaneously - i.e grouse data and forest data - a set of important questions can be addressed. For example, is the density of capercaillie dependent on the amount of old pine forests in an area, or, does the drying of pine bogs affect the reproduction of willow grouse? This kind of approach, possibly linked with remote sensing, would be analyzed by GIS-based (geographic information systems) techniques, which will make the results more easily applicable over larger scales, e.g in forestry.

Address for correspondence: Pekka Helle, Meltaus Game Research Station, Game Division, Finnish Game and Fisheries Research Institute, SF-97340 Meltaus, Finland (up to June 1993, Natural Resources Research Institute, University of Minnesota, 5013 Miller Trunk Highway, Duluth, Minnesota 55811, USA).

Harto Lindén, Game Division, Finnish Game and Fisheries Research Institute, P O Box 202, SF-00151, Helsinki, Finland.



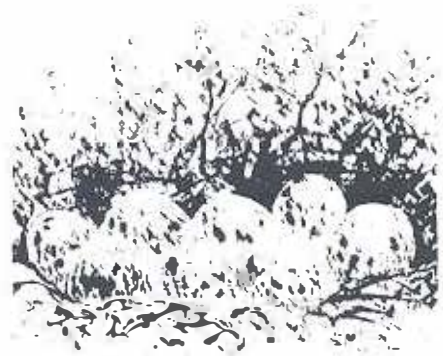
The illustration above by Richard Robjent is from the limited edition book 'The Grouse - studies in words and pictures'. The edition is limited to 300 and some copies are still available from Fine Sporting Interests Ltd, Waverley House, Letheringsett, Nr Holt, Norfolk NR25 7JD.

GREATER INTEREST IN CAPTIVE GROUSE

Keith Chalmers-Watson

There seems to be an upsurge of interest in the captive breeding of grouse by UK aviculturists, which is perhaps due to the successes of our American and European friends in making available more species at reasonable cost.

A number of techniques have been successfully developed, one of which is based on the need to avoid the ingestion of decaying organic matter. In this case, the feed trough is placed on a meshed (0.5" square) container, with a 1" or thereby drop, into which any spillage can fall and be removed regularly. This container can also be used to house waxed based, mouse bait. I have now extended this technique to cover all of our grouse, Koklas pheasants and tragopans.



My understanding of Aspergillosis is that it is a cumulative condition with death often resulting from either continual inhalation of dust, or from acute stress. Transportation of stress susceptible species can often trigger the problem which may have been lingering for months. Reduction of dust can be created by dampening the floors of the aviaries, frequent replenishment of sand in dust-baths, keeping air movement high or in many other ways.

Aggression can cause losses, and one hint which I came across in Canada, concerned the provision of a creep board, approximately 2 to 3 feet square of plywood, based on four bricks, allowing the hen bird to escape the sometimes aggressive advances of the cock. Even if he follows her under the board, he will not be able to damage her back or head.

A further thought concerns my belief that a number of grouse breeders including myself, are guilty of being too kind to their birds in winter, resulting in over fatness at the onset of the breeding season. Consider the relatively poor quality of herbage available to grouse in the wild during the winter. Perhaps a diet of oats coated in vitamins/minerals, would provide the degree of physical fitness enjoyed by those birds exposed to the rigours of highland or upland winters.

It is sad to note that there is still no public display in the UK, to my knowledge, which can boast all four species of grouse found naturally within the UK. This is the aim of the Highland Wildlife Park at Kincraig, and with a fair wind, 1993 will see all four species in extensively laid out aviaries in the heart of the Scottish Highlands.

Address for correspondence: Keith Chalmers-Watson, Fenton Barns, North Berwick, East Lothian EH39 5AN.

NOTE

The references for the paper by Zhao Zhengjie published in Grouse News 3 are as follows:

Cheng Tso-hsin, 1987. List of birds in China. - Science press of China.
Zhang Xinglu, 1985. The resources and protection of the Hazel grouse in Changbai Mountain. - Jilin Forest Science and Technology. p.2 630.
Zhao Zhengjie, 1977. Ecological studies of the Hazel grouse in Changbai Shan area. - Acta Zoologica Sinica. Vol.23, no 3, p.324-255.

GROUSE SNIPPETS

Professor Hans-Heiner Bergmann writes from Osnabruck University saying that, while on holiday in Austria, he had the pleasure to observe a summer group of *Lagopus mutus* for hours from a close distance and also managed to take many photographs of different plumages all in nice weather.

He has not yet finished the study about possible dialects in Hazel grouse. They are also having difficulties with publishing a new edition of their Hazel grouse monograph which has been published up to now with Ziemsen publishers who were in what was Eastern Germany. It is doubtful if the series will exist at all in the future. Their capercaillie and Black grouse volumes are also involved.

.....

Christian Nellemann writes from Norway. He is now working on a Ph.D. in arctic ecology and has just returned from Alaska where he has been doing field work. His wife and now one year old son accompanied him.

Last autumn, a year after he met many of us in Elverum, he worked on air pollution and forest decline as a research officer at AAS.

Torstein Storaas writes from the University of Idaho, USA where he is on a Sabbatical. He says he is reading new grouse papers, learning American, how to use some computer programmes and learn, learn, learn!

He will finish the writing up of his work based on the Varaldskogen Capercaillie data.

.....

Christian Nappee of Florac, France writes saying that Capercaillie can now be considered as reintroduced in our area in the Pare National des Cevennes. The wild population numbers between 50 and 100 (adults and subadults) estimated in early spring.

The main problem now appears to be the conservation of the habitat because the old clear pine forests are disappearing (as everywhere) under economic pressure and our National Park is still not in a position to prevent the damage.

They have another project with grouse with the reintroduction of Hazel hen in their area. he has experimented with captive breeding for three years with quite good success and a first experimental release of 33 birds last year.

BOOK REVIEW

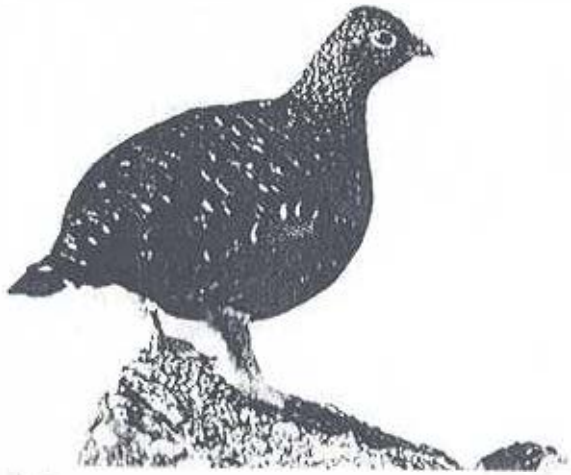
GROUSE IN SPACE AND TIME

The population biology of a rnnnaged gamebird. Hudson P. J. 1992. The Game Conservancy Ltd pp. 244 Reviewed by Dr Tim Lovel

Seven years painstaking work in the field, the laboratory and the computer room are brought together here in a magisterial reviewof the biology of Britain's Red grouse *Lagopus lagopus scoticus*. Of great economical importance to the uplands of Scotland and northern England, both for the human inhabitants, for the other fauna and for the flora, this species has been the subject of research ever since Lord Lovat and his colleagues wrote their report on 'Grouse Disease' in 1911.

In 1986 Hudson wrote his earlier book after field studies in North Yorkshire, but now he draws together his entire corpus of knowledge, not only to tell scientists, hunters and conservationists what goes wrong with the populations of this species, but also what can be done about it to manage the bird to best advantage.

The first section of the book deals with the biology and economics of grouse shooting. It is calculated that almost 500,000grouse per annum are shot in Great Britain, with a crop of grouse per km^2 that can vary from less than 25 in Scotland



Young hen Red grouse. *Photo: The Earl Peel*

to more than 100 in England, giving net revenue to the owner of moorland that can vary from +£1,200 to £1,500 per km^2. Next the regional variations in population are analysed, the role of predators is reviewed, both unchecked and controlled by game keepers, upland birds and blue hares which occupy the same biotope are surveyed, and the tendency of grouse populations to cycle up and down, sometimes dramatically, is exhaustively discussed. There follow reviews of mortality in Red grouse both in high and low density populations, dispersal patterns, winter predation and social behaviour. The pressure exerted by Hen harrier *Circus cyaneus* has three chapters, and the trichostrongyle worm merits a whole section of 40 pages, followed by a review of the importance of the sheep tick *Ixodes ricinus* and the flavivirus which it carries and which causes louping ill in sheep and an encephalopathy in Red grouse.

Finally the flora is considered, first and foremost the heather *Calluna vulgaris* on which the bird depends for food and protection. "Understand the plant and you will understand the bird" said Gordon Gullion at one of our grouse symposia, and although he was talking of his special love, the Ruffed grouse, the same dictum applies equally here.

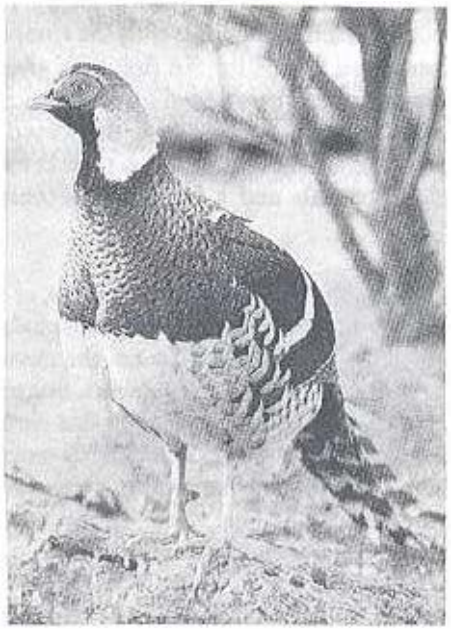
In every section, analysis of what goes on is followed by practical measures to maximise beneficial factors and to reduce harmful ones. It is truly the complete management of Britain's national game bird that is for the first time given a sound scientific basis, and such management can be audited for its efficacy or lack of it by use of these methods. The book is sturdily underpinned by references; five books lie to the credit of the author and his team, together with 38 primary references in top scientific journals and a further 29 secondary publications.

Does it matter? To the bird under discussion the answer is clearly yes, as it is for all the rural economy which depends on it. To workers in other grouse habitat and species, it is also most important since the questions posed, the answers sought and the management methods deduced are directly relevant. But to all those who seek to study gamebirds it must be a sobering thought that each of the 250 odd species probably has a population biology as complex, or more so than that of the Red grouse which is here analysed. How can we hope to conserve an endangered pheasant species on the other side of the world when we do not know 1% of the biological detail which is here so ably presented?

Grouse in Space and Time is available from WPA HQ, the UK price is £25 plus £1.50 postage and packing.

PHEASANTS OF THE WORLD THEIR BREEDING AND MANAGEMENT
Keith Howman

- Keith Howman is one of the world's most successful rare pheasant breeders, and as past Chairman and Director General of the World Pheasant Association, he has travelled the world championing the pheasant's cause.
- After twenty-six years raising these beautiful birds, he has brought this experience into a clear and concise treatise.
- Photographs feature the life works of Jean Howman, Kenneth W Fink and many others, selected from over 8,000 submitted.
- An indispensable reference work to guide and stimulate newcomers and a valuable refresher course for the experienced.



Elliot's Pheasant. *Photo: Kenneth W Fink*

- Keith Howman also brings together his keen behavioural observations from aviary and worldwide pheasant expeditions.

Hen Rothschild's Peacock Pheasant. *Photo: Kenneth W Fink*

Please supply copies of 'Pheasants of the World, Their Breeding and Management' at £35 plus £3.50 postage and packing (UK only). Available from WPA International, PO Box 5, Lower Basildon, Reading, Berks RG8 9PF, UK. Tel No: 0734 845140 Fax No: 0932 253793 Overseas enquiries to Hancock Wildlife Research Centre, 3431 Harrison Avenue, Blaine, WA 98231, USA.

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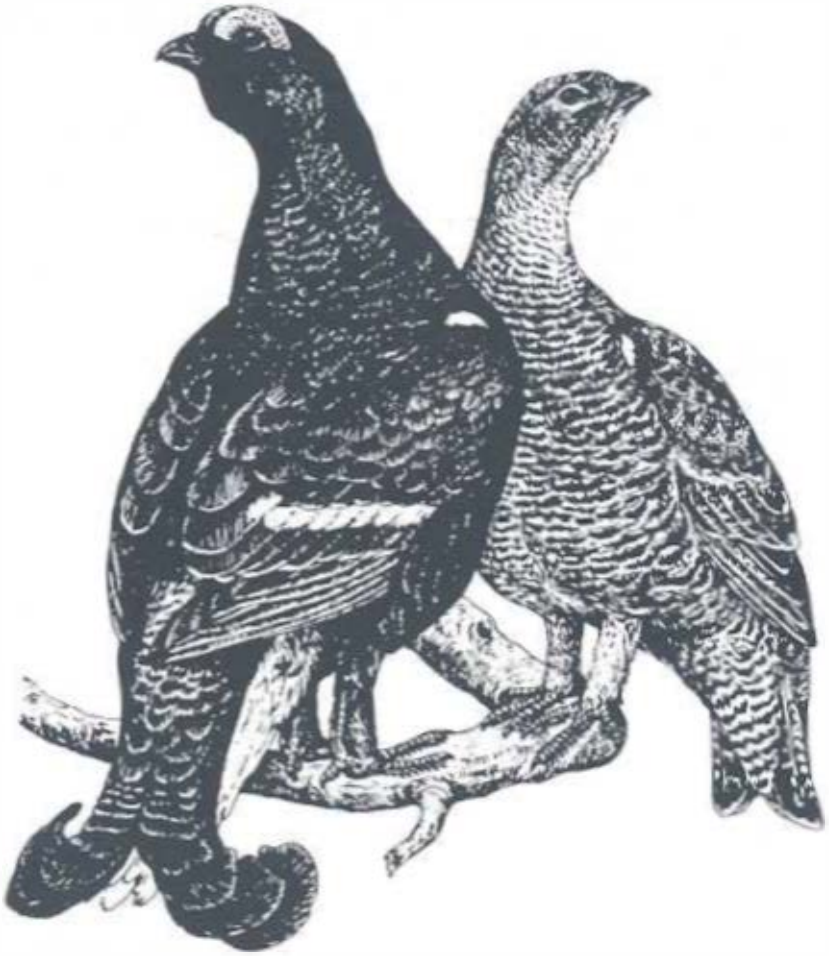

GROUSE NEWS

WORLD PHEASANT ASSOCIATION INTERNATIONAL

No 5

JUNE 1993

GROUSE NEWS NO 5

Editor: Diana Lovel

CONTENTS

FORTHCOMING EVENTS

1993
Sept 20-24 Sixth International Grouse Symposium, Udine, Northern Italy

Front Cover: Capercaillie display by Dr Fabio Perco

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EDITORIAL

Grouse News 5 comes to you with a request form for subscriptions which are now due for 1993. I do hope that you will continue to support this publication.

It is such a pleasure hearing from you and I welcome the smallest pieces of news as well as short papers.

We aim to publish Grouse News in June and December each year. These months fit nicely around the production and publication of WPA News and make it possible for a very busy Jane Clacey to type-set for me. She also keeps and updates the mailing list and does the Grouse News mail out; her help is greatly appreciated.

If Grouse News is to continue I must have more contributions from you. Please think about what you can write and send it to me as soon as possible.

In this country we have all been very busy with the next Grouse Symposium and are most grateful for all the help we have received from our Italian friends. The response to the first notice was tremendous and we much look forward to meeting many of you in Udine this September. It should be a good week.

SIXTH INTERNATIONAL GROUSE SYMPOSIUM

UDINE, ITALY 20-24 SEPTEMBER 1993

By now, plans for this meeting are well advanced. All subscribers to Grouse News should have received the Final Notice and Registration Form, which needs to be returned to us as soon as possible. If by chance yours did not arrive, please inform us at once.

There will be three plenary speakers, Professor Paolo de Franceschi, Professor Susan Hannon and Dr Peter Hudson. Most other papers will be presented as posters, but each author will speak about his poster and there will be ample time for discussion of each one. There will also be workshops on the three main themes of the symposium - population dynamics, behavioural ecology and habitat management.

In February, WPA co-sponsored a Conservation Assessment workshop for three of its Specialist Groups (pheasants; partridge, quail and francolin and megapodes). The report of this workshop will form the basis of three Action Plans to be published by the Species Survival Commission (SSC) of the World Conservation Union (IUCN). The Cracid Specialist Group plans a similar exercise at its next symposium and it is essential that the newly constituted Grouse SG has equivalent conservation data available to advise WPA, BirdLife International (formerly ICBP) and SSC. Therefore on the last day at Udine, Philip McGowan of WPA will attempt to collate relevant conservation data in advance of the meeting. This should ensure that the short time available in Udine will be spent most beneficially. Our objectives will be to assess the conservation status of species and subspecies (and possibly national populations) and then to propose future action.

Please therefore bring to Udine all available information about your national populations of grouse ssp.

The proceedings of the symposium will be published, after peer review of each paper, by the Instituto Nazionale per al Fauna Selvatica-Bologna. The editor will be Professor David Jenkins. Each participant at the symposium will receive one free copy.

Your support for this meeting is important if we are to keep an International Grouse Symposium so we look forward to seeing you in Italy.

Capercaillie *Tetrao urogallus*

GAME BIRD FEED POSSIBLY CONTAMINATED

David Hancock

Partially prompted by a disastrous outbreak of Quail Disease or Ulcerative Enteritis (probably *Clostridium perfringens*) in the fall of 1991 that wiped out nearly 300 of my captive bred and reared grouse I undertook an extensive review of our internal procedures and feeding programme.

Our cleaning regime already involved the daily removal of all dropping and food remains from the pens and minimal entry of keepers through the 50 breeding enclosures covering an area approximately 45 by 450 feet. Feed was a low protein maintenance game bird pellet with daily garden vegetables and fruits.

The initiation and repeated dispersal of the clostridial disease was quite shocking. Seventy-eight birds died the first night with no signs of a problem the previous day. Penicillin V Potassium was administered in the water immediately that morning as birds were sent off for analysis. The analysis confirmed the Clostridial organism. No further birds died and the drug was removed after seven days. Four days later another 70 birds died. This time we had on hand bacitracin methylene disalicylate (Solu-Trac in 50) which was administered for eight days. Four days later we lost another 80 birds. This time the birds were left on Bacitracin full treatment for seven days and then the dosage was reduced to prophylactic levels and left there for four months. We were beat!

The dead birds were of ten tetraonid species (all three Ptarmigan, Blue, Spruce (Canada and Franklins), Sage, Black and Sharp-tailed grouse, capercaillie, and Greater prairie chickens) and from almost all pens. We also had on the premises 76 Ruffed grouse and not a single bird died from the eight pens. In two other pens we had nine specimens of Plains Sharp-tails *T.p.jamesi* and none of these died though we lost almost 50 of the Columbian race in adjacent aviaries. It is interesting to speculate that the two tetraonid species with the greatest affinity to farm houses appear to be immune. Maybe some of the regional die-off of these species were less cyclical and just responses to these farmyard diseases which they have now through selection overcome.

I had not just had the birds analysed but I had several vets to the centre to try and sleuth out the problem. Four days prior to the first outbreak we had been host to 100 out of town visiting aviculturists. Our vets all concluded that they must have picked up the bacteria on their feet and moved it to our premises.

from a previous tour stop. Then we assumed that our two keepers had walked it into the pens from the outside aisles where the visitors had been. Possibly they had, assisted by rodents in moving it pen to pen. Our feeding procedures and daily cleaning schedule were exemplary. This seemed the only logical explanation. It was not until a year later that a much more logical explanation as to how the rapid and complete spread of the disease through the aviaries was possible.

As a further precaution a group of our local breeders contacted a local feed mill about milling us a special pellet. The first procedure was to submit to them two national and one regional feed that we had been using. This was analysed and was to be compared to special formulas that were developed by Dr Aschenbrenner in Germany and Francy Hermans in Belgium for the high fibre requiring grouse.

To our incredible surprise we found out that two of the three feed pellets analyzed, utilized as an animal protein source - now get this - chicken feathers. Yes chicken feathers! The nutritionist said that this is a common practice in the industry. The nutritionist was quick to point out that their company would not use any avian by-products in their bird feeds but would use it in cow feeds. It was pointed out that most processing companies did pass the ground up feed through a heat cleaner that would, if it was working well, the rate of passage slow enough, the staff paying careful attention, assuming that they turned it on in the first place etc. possibly kill most bacteria.

From my point of view as a grouse and rare pheasant breeder, I was horrified that poultry products came anywhere near my feed - let alone were put into it on purpose. Naive eh! However we now had a much more likely candidate for the disease introduction than the dirty feet hypothesis. The rapid few hour total dispersal of the disease almost begged the contaminated feed hypothesis but nobody considered it seriously enough to bother analyzing the feed. And indeed one year later we have no idea what feed was on hand. Also we have not had a repeat of *Clostridium*.

Apparently *C. perfringens* has little effect on chickens, which can act as carriers and even little effect on pheasants but, as the name implies, it decimates quail, and as I found out does the same with grouse. Harry Hardy, one of our feed group cooperators has also had it show up in his tinamous and while the source is unknown we at least now have a suspicion. And of course the one to two month feed initially on hand had now been used up! I am not sure of the vulnerability

of other avicultural species but I will never use this food source again without finding out about the pellets contents.

Just this week (24 December 1992), I received comments from Dr Aschenbrenner pointing out that in free-living capercaillie the presence in the gut of aerobically growing bacteria is very minimal and there is no evidence of *Clostridium perfringens* but both are very common in the gut flora of captive capercaillie fed on commercial pellets. He suggests that the high protein captive diet results in a changed pH that is highly conductive to the proliferation of the bacteria and particularly the clostridial group. He reports that for two years he has been feeding exclusively a natural diet and has not lost a grouse.

But back to commercial feeds - as they are probably a necessary evil for most of us. One good point is that a simple low power microscope will enable the viewer to see the broken up parts of the feather vanes barbs and barbules. If it is possible for this bacteria to pass through this routing to our birds what about other bacteria, viruses, parasites etc?

The nutritionists caution that the purification of the feather-feed could not be relied on is good enough for me. I shall never use gamebird, chicken or turkey crumbles or pellets again without examining for feather parts. Now I suppose that somebody will tell me they also incorporate chicken entrails - from the healthy and unhealthy ones - into the pellets - with full gut bacteria, parasites and all! Yes I know that they do this for dog and cat feeds but surely not for bird feeds! (Since this was reviewed by others in this field I am informed that indeed all poultry waste products are recycled into feeds. This includes the chicken droppings which are commonly recycled into cattle feed to extract that last usable protein!) Somewhere common sense and basic hygiene seems to have been left out of the companies feed development equations. Or perhaps they just don't care about grouse and quail!

Another related aside to come from these analyses and discussions was that cracked corn is the major carrier of aspergillis spores which are just waiting the right environment to develop - yes, our birds. Also because of the high energy and protein content of corn the grouse and ornamental pheasants are probably better off without it. It has now come out of our formulations!

Hancock Wildlife Research Centre, 1431 Harrison Avenue, Blaine, WA 98231, USA.

THE RE-INTRODUCTION OF CAPERCAILLIE IN THE HARZ MOUNTAINS HAS BEEN SUCCESSFUL!

Karl-Heinz Haarstick

The re-introduction of capercaillie in the Harz started in autumn 1978 after breeding a very promising number of capercaillie, in the years from 1975 to 1978, in the breeding station of Lonau.

This experiment began in October 1978 with the release of 36 capercaillie from two aviaries in the highlands of the Harz. Over the years, 1992 included, it was possible to release 682 capercaillie bred in captivity. Now there is an established population of capercaillie in the Harz again after 60 years absence. The last capercaillie was observed in the Harz in 1930. After that there were no more capercaillie in the Harz with the former indigenous population having died out.

It is still important to conserve the new population by releasing captive bred capercaillie for the next five to eight years.

Footnote: The Editor asked for evidence of breeding and for references which Karl-Heinz has supplied and are as follows.

From 1981 we have each year observed females with their chicks bred in the wild. We have also been able to observe an unrung female, and therefore bred in the wild, with chicks she herself had bred. We have also found nests in the wild with eggs and I think that we now have sufficient evidence of successful re-introduction.

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Forstamtsrat a D., Erfurter Str.16, 3420 Herzberg/Harz, Germany.

Taken from The Times, Monday 29 March 1993

WINGS OF CHANGE FOR TWELFTH

John Young

The Glorious Twelfth may never be the same. When the guns head north in August for their annual massacre, they could be celebrating the start of the Willow ptarmigan season.

Proposals are in hand to change the names of several familiar British birds in the interests of global harmony. But will the race to bring the first Willow ptarmigan to the restaurant tables of London engender quite the same excitement? Might not even the staunchest shooter feel that the Red grouse had been transmogrified into something altogether more innocent and vulnerable?

Nor does it stop there. At a conference this weekend at Swanwick, Derbyshire, it was suggested that the Dunnock, a name admirably suited to a supremely plain, brown bird, should be known as the Hedge accentor. The Skylark, the blithe spirit which the poet Shelley suspected for not being a bird at all, would be the Sky lark, which somehow is not the same. In Spain, the Andalusian hemipode would be relegated to the status of a Small button quail.

The changes have been proposed by the British Ornithologists' Union, with the support of the magazine British Birds, in the cause of the late twentieth century passion for harmonisation. They will be pecked over at the International Ornithological Congress in Vienna next year and, if approved, will be ratified in 1998.

Not all those attending the conference approved of the changes. "We don't want standardisation, we want diversity," one delegate, who had clearly cut his teeth on Maastricht, shouted. Particular scorn was reserved for the suggestion that the oyster catcher should be known as the Eurasian oyster catcher.

Bill Oddie, the ornithologist and television personality, suggested that money for conservation could be raised by naming birds after wealthy places and people.

"We could, perhaps, have the Kensington kite or the Richard Branson tit."

THE STUDY OF HAZEL GROUSE DISPLAYS

Professor Roald L Potapov

It is perhaps surprising that the reproductive behaviour of the Hazel grouse *Bonasa bonasia*, one of the commonest and most widespread members of the grouse family *Tetraonidae*, long remained practically unstudied and has attracted the attention of specialists only during recent decades. The main reason for this is in fact the bird's secretive habits; even during the peak period for courtship, and other displays, males are unobtrusive and difficult to observe. Little wonder therefore that the most detailed observations were made on captive Hazel grouse (Hoglund 1957; Scherzinger 1978). The lack of information on courtship behaviour was clearly shown in the important monography by Hjorth (1970) which focused on the reproductive behaviour of the Tetraonidae and brought together the scattered and scanty information available in the literature up to that time.

In 1966, this paucity of information stimulated the author to begin a study of reproductive behaviour in wild Hazel grouse and to encourage colleagues, with an interest in tetraonids, also to research the problem. Results obtained hitherto may be briefly summarized as follows.

All the main elements of reproductive behaviour characteristic of tetraonid birds are also to be observed in Hazel grouse: vocal and instrumental signals, active movements and static display postures (Potapov 1985). On the other hand, we have yet to record the kind of complex displays comprising many elements performed repeatedly in a strict sequence which are typical of other members of the Tetraonidae.

Sounds given during courtship display

Six such sounds are known: whistle (song); hissing; loud wing-beats (sometimes developing into a drumming or whirring noise); foot-stamping, and grumbling. Most important among these generally and certainly in association with courtship displays is undoubtedly the whistle; this is the characteristic and familiar song which consists of two long whistles followed by a series of shorter ones. Among all the members of the family *Tetraonidae*, only Hazel grouse and Severtsov's Hazel grouse *Bonasa sewertzowi* have this type of vocalisation. Once it was established that the Hazel grouse gives the whistle with bill widely open (Figure 1), it became obvious that the sound is produced by the syrinx, and is thus more correctly termed a squeak rather than a whistle. It is interesting that the much louder and more melodious whistle of snowcocks *Tetraogallus* (family *Phasianidae*) is produced in the same way - a rare case of similarity in courtship vocalisations between representatives of two separate families. Another similarity between the families is in so-called grumbling - a series of quite melodious grumbling sounds lasting about four seconds.

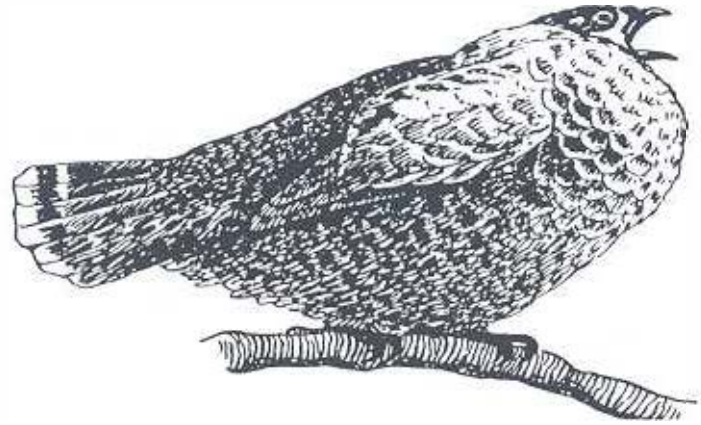

Figure 1. Posture of whistling (singing) male.

Another sound, given in a special posture (Figure 2), is a loud hissing, which has been noted hitherto only in males of eastern populations (Krechmar et al. 1978), though captive western males sometimes give it in a less pronounced form. Other typical acoustic signals include the loud wing noise produced during the wing-beat display, and foot-stamping (noted only in captive birds) (Scheringer 1978). It is of great interest that males of western populations quite often perform the wing-beat display in an erect posture, beating the wings and creating a loud whirring noise, yet only

Figure 2. Posture adopted by hissing male

making as if to take off, rather than actually fluttering up. This is the same kind of wing-whirring (drumming) as described for the Ruffed grouse *Bonasa umbellus*.

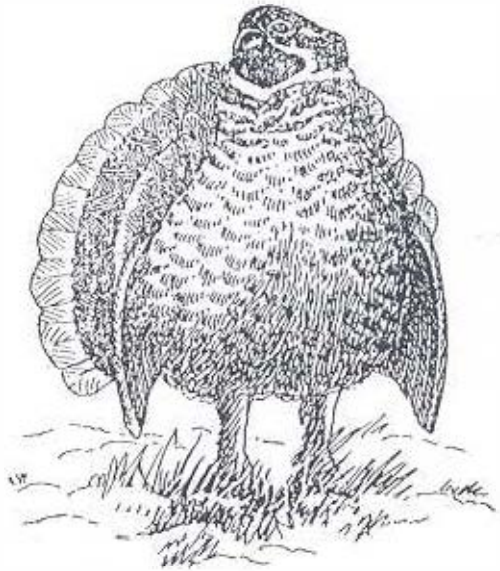

Figure 3. Posture of male in front of female - fanned tail turned towards female, head to opposite side

Characteristic dynamic elements in the displays of male Hazel grouse include the straight display-flight from tree to tree accompanied by loud noise produced by the slowly beating wings, display take-offs (wing noise audible up to 100 m away); circling female with tail fanned, turning the fanned tail towards the female, quite often while simultaneously turning the head away from her (Figure 3); and finally, synchronous nodding by male and female (with simultaneous horizontal turns of the head, but male and female in opposite directions). It is noteworthy that a similar display is very typical of Ptarmigan *Lagopus mutus* and, to a lesser extent, Spruce grouse *Falcipennis (Dendragapus) canadensis* and Willow grouse *Lagopus lagopus*

In my view, the most interesting of the features mentioned above is the difference in courtship behaviour between different populations, about all the westernmost and easternmost. The Hazel grouse occupies a huge range (Figure 4), the extreme parts of which differ significantly in climate and vegetation. This leads to differences not only in life cycle, but also in morphology. It is enough to mention that even the most characteristic morphological feature of the genus Bonasa (partly feathered tarsi) is subject to variation, and in the harsh taiga adjoining the Sea of Okhotsk birds have been recorded with fully feathered tarsi (Potapov 1985). It is also remarkable that in Eastern Siberia and the Far East

(i.e. in the eastern part of the range) Hazel grouse spend the winter in flocks like Black grouse *Lyrurus tetrix* or Willow grouse. The emergence of differences in courtship behaviour between different populations is therefore not surprising, and yet this fact is of great evolutionary significance in marking the start of separation into two new species. In this connection it would be most interesting to compare the courtship behaviour of Hazel grouse and Severtsov's Hazel grouse whose isolated range is located in the montane taiga of Southern China, but Severtsov's grouse is, unfortunately, little studied.

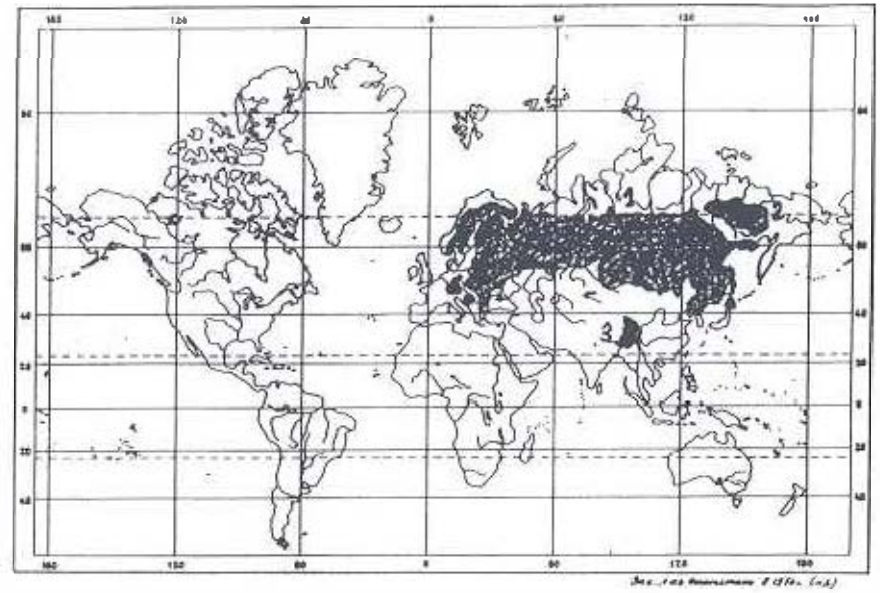

Figure 4. (1) Breeding range of Hazel grouse *Bonasa bonasia L*; (2) range of subspecies *Bonasa bonasia kolymensis Buturlin*; (3) breeding range of Severtsov's Hazel grouse *Bonasa sewerzowi Przew.*
All figures from Potapov (1985).

From a report by the discoverer of the species, Colonel N M Przhevalsky, it is known that Severtsov's Hazel grouse whistles like the familiar Hazel grouse. However, a recent publication on *B. sewerzowi* by Chinese ornithologists (Wang et al. 1987) encourages the hope that its courtship behaviour will be investigated in the near future. Furthermore, there is of course, an urgent need for detailed observations on courtship behaviour of the Hazel grouse in different parts of its range.

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Zoological Museum, Russian Academy of Sciences, Universitetskaya Nab. 1, St Petersburg 199034, Russia

THE FATE OF A CAPERCAILLIE MALE WHICH CHOSE TO SETTLE IN THE ADLER MOUNTAINS

J Porkert

In the early 1960s, capercaillie became extinct as a sedentary gamebird in the Northern part of the Adler Mountains (Orlicke Hory, NE Bohemia). In May 1989, however, a male capercaillie turned up suddenly at a former lek. He was observed by the local forester, and in the course of my checks I found, up until spring 1990, droppings and feathers in an area covering at least 144 ha of the secondary mountain ridge at 800-1500 m altitude (ASL), which has suffered comparatively little immission damage. The nearest remnant populations are in Poland, in the Riesen Mountains and the Altvater Mountains and the capercaillie males there resident show little inclination to change their territory. The appearance of this individual male is therefore probably due to the following.

In autumn 1988, 42 capercaillie, predominantly males, were released from the Rychory breeding station in the Eastern part of the Riesen Mountains (Krkonoše). This station is located at a (flight) distance of approx. 50 km from the place where the sightings took place, with the flight path extending over ground which is partly devoid of forests; interestingly over the same period, droppings were also found in the sandstone rock area near Adersbach.

There are two good reasons for assuming that the capercaillie male which chose to settle in the Adler Mountains, emanated from the birds reared at Rychory. (1) In its territory in the Adler Mountains, this individual showed a preference for mixed beech/spruce woodland containing some major stands of sycamore (similar to the immediate surroundings of the Rychory breeding station). (2) The manner in which the bird seems to have died. When doing my round on 22 April 1990, I checked a patch where some branches had been piled up and burned. This kind of spot is often used by capercaillie and Black Grouse for dusting. On this particular site I found droppings (obviously deposited several weeks previously) which contained a piece of wire coated in some red insulating material. The case of death can therefore be attributed, either directly or indirectly, to unintentional damage. The bird presumably mistook the piece of wire for a worm and ingested it. On 19 April, the local forester found feathers bitten off from a capercaillie indicating that it had either been killed or scavenged by a fox.

This example of a capercailtie presumably reared and released by a breeding station is an indication of two possibilities: (a) capercaillie can have extremely long migration routes in their search for a suitable habitat to settle in, and (b) intake of unnatural food by tetraonids in unsuitable habitats. The latter observation coincides with my previous observations in droppings of various by-products of civilization, as e.g. silver paper, plastics or other components suggesting lack of calcium and protein in the locally available diet (eggshells, skeletal remnants of microtines, soricides and passerines/passeriformes) which I found in the droppings of Black grouse from the Adler Mountains (Porkert 1972, 1981 and other partly unpubl. data).

The inference is that in reintroducing tetraonids (cf. the statements and issues raised by Baines, 1991) greater consideration should be given to the relationship of the diet available in the release area and the protein demand of released birds which are accustomed to the relatively protein rich diet they were reared on. This factor does not seem to have been sufficiently considered in the past. I am grateful to Revierforster B. Orner for giving me the benefit of his observations.

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NA Skalpi 12, 12800 Praha 2, Czechoslovakia

GROUSE SNIPPETS

Jon Swenson is changing jobs in August and will then be working for NINA in Trondheim, Norway. His work will be 75% on bears and 25% on grouse.

****

Jan Perkert has just finished his work as an "osteologic preparator" after 39 years. From October he will spend more time as a pensioner in Adlergebirge (Eagle Mountains). He hopes to continue sampling freezing fog deposits and other data for documentation on dying forests.

****

Tomas Willebrand writes that last autumn he started a large project around a new management system for Willow Grouse shooting in Sweden. Changes in population parameters were compared between hunted and unhunted areas using radio-tagged birds. He now has a PhD student from Scotland, Adam Smith, who is attached to the Edward Grey Institute in Oxford.
Tomas himself will soon take up a position as Research Director of the Hunters Association and so will be moving to the Agricultural University in Uppsala again. We congratulate him on this appointment.

****

Our friends in Russia are struggling financially so we shall look forward to welcoming some of them at the Symposium in Udine this September.

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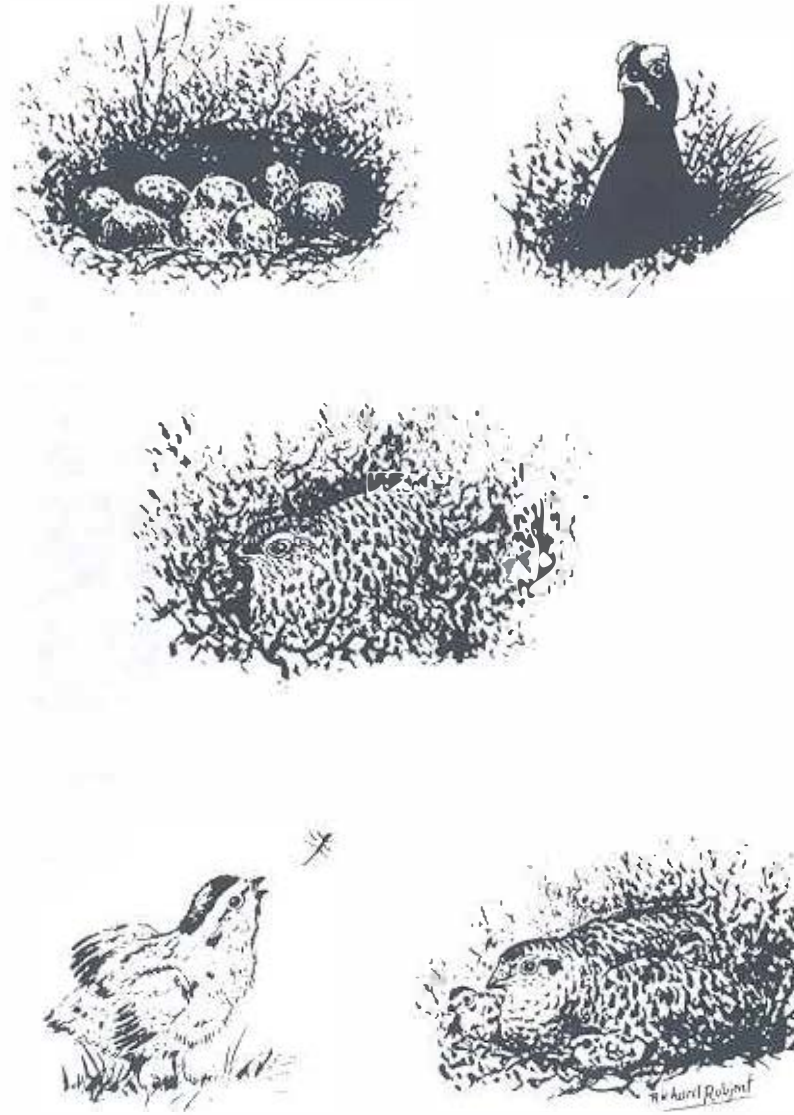
The illustration opposite by Richard Robjent is from the Limited Edition book **'The Grouse - studies in words and pictures'**. This edition is limited to 300 and some copies are still available from Fine Sporting Interests Ltd, Waveney House, Lethering-settt, Nr Holt, Norfolk NR25 7JD, UK.



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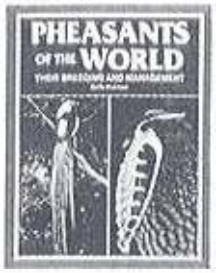

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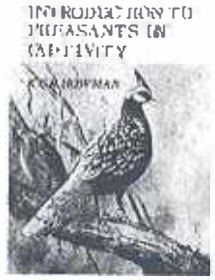

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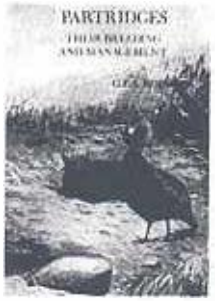

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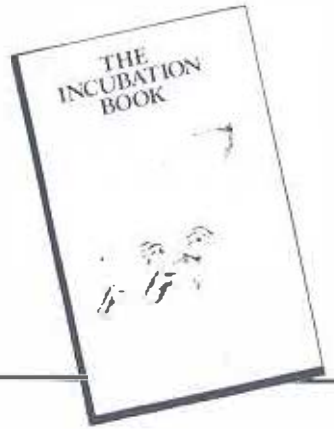

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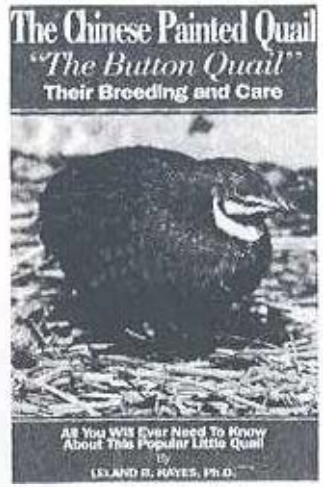

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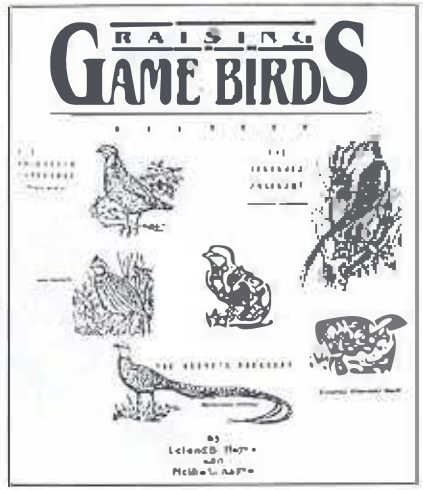

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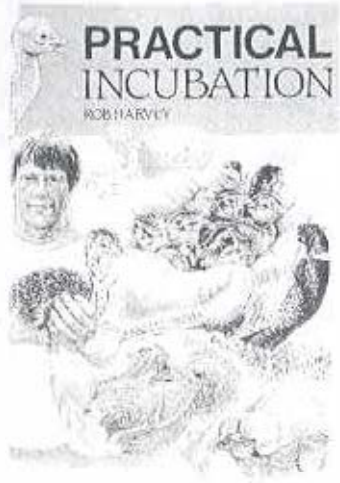

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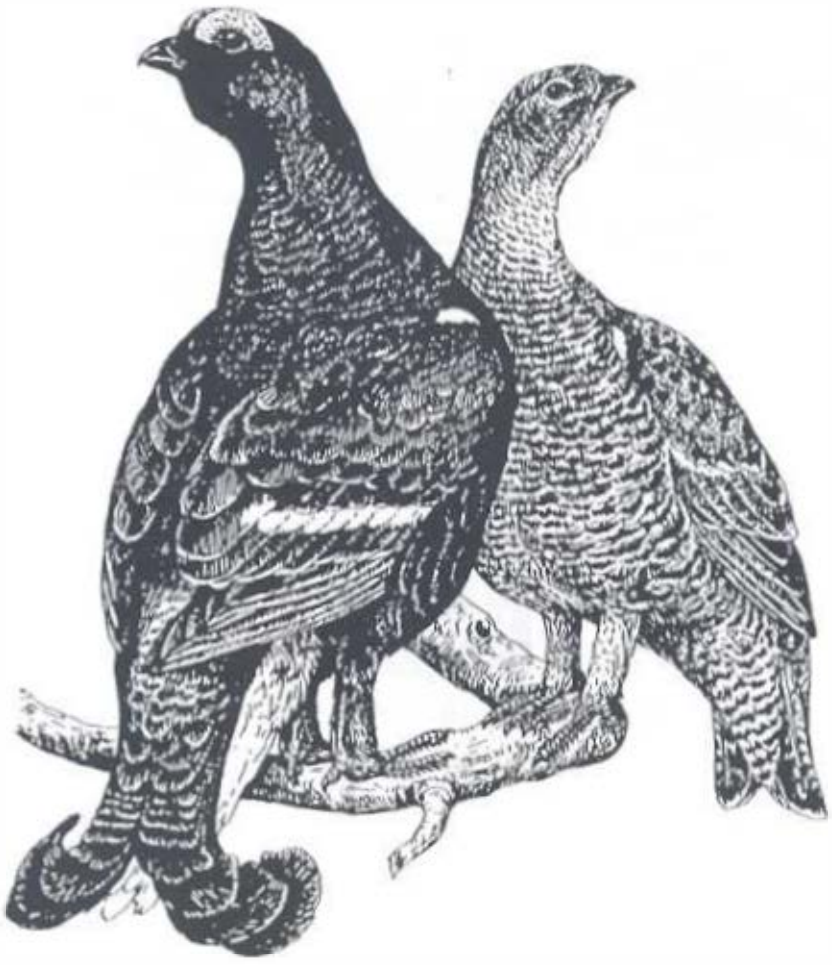

GROUSE NEWS

No 6

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Editor: Diana Lovel

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FORTHCOMING EVENTS

1994	
29-31 July	Game Fair, Cornbury Park, Nr Burford, Oxon
Sept	Third International Cracid Symposium, Houston, USA
1 Oct	WPA International AGM
1996	
January	Pheasant and POF Symposium, Malaysia
	VII International GrouseSymposium, N.America

Front cover: Capercaillie display by Dr Fabio Perco
Back cover: Black Grouse by Dr Fabio Perco

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THE WPA SPECIALIST GROUP ON GROUSE

Tim Lovel

Since its formation in 1975, WPA has been responsible for all the Galliform species, and was appointed in 1978 as the specialist advisor to IUCN and ICBP (now BirdLife International). This year WPA was requested to form specialist groups to deal with all the main families of gamebirds, and these have now been set up to cover pheasants, megapodes, partridge, quail and francolin and cracids, and now grouse. At the recent symposium in Udine, it was agreed to form such a group, with myself as Chairman and with David Baines, IlseStorch and Jon Swenson as committee members. This step has now been officially approved by BirdLife International.

Although it is the last of the five groups to be formed, we are in a sense the pioneers. The very first GrouseSymposium that we held, back in 1978, was really the beginning of a working group on grouse which has reviewed the status of most of the sixteen species and monitored work that has been done. Regular updating of results and positive criticism of research methods has been ongoing.

One might ask what difference will it make having a grouse group. We feel that the strong links being forged with BirdLife International and with the other conservation bodies will greatly benefit both the birds themselves and the quality and nature of research being done, particularly when it bears directly upon the conservation of endangered populations. A formal action plan will be elaborated, for by using our many contacts we can take the advice of every specialist on grouse in the northern hemisphere. Therefore a communication network will be developed, using both the inner core committee and also a much wider ring of corresponding members, to obtain all the information we require.

We already have the example of the pheasant group and of the partridge, quail and francolin group, both of which have produced draft action plans. Unlike them we do not have large numbers of species which are globally endangered, but we do have species which are divided into numerous sub-species and local or national populations and these certainly are threatened with extinction in many of their former territories. One only has to look at the Black Grouse in southern and central Europe to see how over the past 100 years it has steadily been retreating. Populations have become broken up, isolated, reduced and eventually extinct. Unless we are to say, in the case of Black Grouse, that because

of the large reserves of stable population in Scandinavia and Russia, that we don't care about losing it elsewhere, then action clearly must be taken.

A modest budget has been applied for to cover essential activities of the grouse group and we are confident that by developing this activity considerable benefits will result. By the time we meet all our North American colleagues in 1996, we should have a great deal more to talk about, with far more detailed and documented knowledge about the status of the grouse of the world.

ITALIAN HOSPITALITY

Diana Lovel

Warm weather and equally warm Italian hospitality greeted the 100 participants from 20 nations in the VI International Grouse Symposium who travelled to Udine last September for a week of grousing together. Many paid a visit to nearby Venice before the serious scientific work began; the unique panorama of the Grand Canal, the Piazza of St Mark, and the gondolas plying for hire brought on such romantic feelings in some that a cognac seemed to be an essential component - but romantic feelings were dispelled by the financial equivalent of a cold shower, a bill for 20 pounds each.

"Brought on such romantic feelings in some", Maria Grazia Bellio thanking Tor Spidsø
Photo: Diana Lovel

The four days of work were divided into plenary sessions to hear major review papers and shorter communications, and workshop and poster sessions which gave the opportunity for every scientist to present his work for appraisal and criticism from his peers. The middle day was spent

on a field excursion to the high Alps above Tarvisio, on the Austrian border with Italy. Led by Prof Paolo de Franceschi the party reached over 6,000 ft above sea level to see the study area where Paolo has conducted his researches on Capercaillie and Black Cock for many years.

The Italian hunters' organisation gave an alfresco reception at the foot of the mountains, where a feast was laid out. Keen appetites, sharpened by the alpine air, made short work of the quantities of barbecued meats and the wines of the Province of Friuli Venezia Giulia.

This by no means exhausted our hosts' kindness, for the next evening they gave a banquet to the symposium in the Hotel Astoria, back in Udine. The Senator for the region was guest of honour, and gave an elegant speech of welcome. We were able to present bouquets of flowers to the two lovely girls, Nicla Tiburzio and Maria Grazia Bellis, who had worked hard before and during the symposium to make it so successful and so enjoyable.

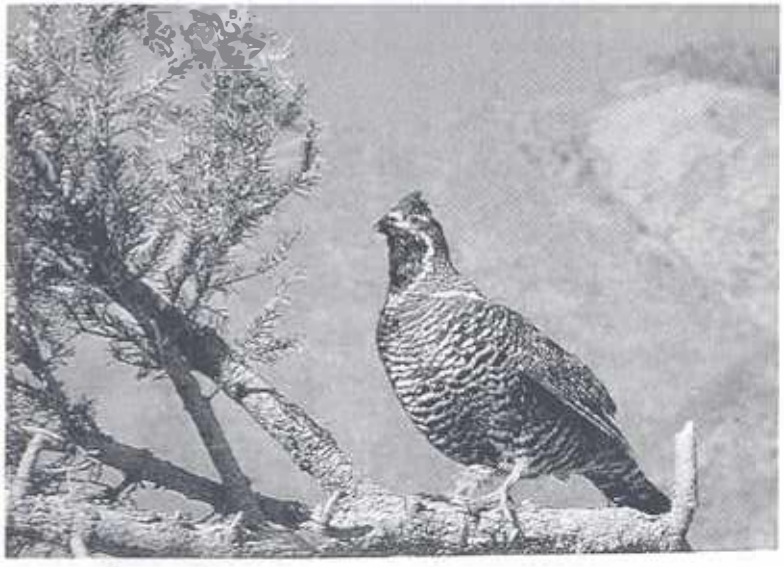
On the final day, as by now has become traditional, the scientists were asked where they wished to meet next time. By unanimous consent it was decided that in 1996 the VII International Grouse Symposium should be held in North America. For all of us it was the greatest pleasure to meet up with so many old friends and to make new ones.

Professor de Franceschi explaining the habitat to Helmut Weiss and Diana Lovel. *Photo: Tim Lovel*

NOTES ON BLACK-BILLED CAPERCAILLIE, BLACK GROUSE AND HAZEL GROUSE IN NORTH EAST CHINA

Gao Wei, Xiang Gui-guan

From January 1984 we studied the distribution of grouse species at more than 100 sites at the Great Xingan Mountain, the Small Xingan Mountain and the Changbai Mountain in north east China. There are five species of grouse in north east China: Black-billed Capercaillie *Tetmo p. parvirostris*, Black Grouse *Lyrurus tetrix*, Hazel Grouse *Bonasa bonasia*, Willow Ptarmigan *Lagopus lagopus* and Siberian Spruce Grouse *Dendragalus falcipennis*, but we did not study Willow Ptarmigan or Siberian Spruce Grouse. The distribution of the other three species is different from previous records. Formerly, Black-billed Capercaillie were found at the north east of the Great Xingan Mountain, Erzuoqi, Xiguituqi and the north of the Small Xingan Mountain. Occasionally it could be found in Xinglong county of Hebei Province in winter (Zheng Zuo-Xin 1978). Now, we found it only over the northern part of the Great Xingan Mountain to the north of 48-50° north latitude, at Shangkuli, Yakeshi, Chuoer heketu, Xinganli forest farm, Qinnjin forest farm, Talie, Shibazhan, Hunia and Heihe, but not in the northern part of the Small Xingan Mountain.



Siberian Spruce Grouse. *Photo reproduced from 'The Rare and Endangered Gamebirds in China' by Lu Tai-chun*

Black Grouse were formerly distributed over the Great and the Small Xingan Mountains, Zhangguangcai Mountain, especially the Aer Mountain, Zhalantun and the forest areas of the Great Xingan Mountain to the west of Wuerqihan (Zhen Zhoxin 1978). Now it occurs over the forest areas to the north of 40° north latitude, as far as the Aer Mountain, Honghuacrji, Shangkuli, Genhe, Huzhong, Fayuan, the Wanda Mountain and the Changbai Mountains, Huangsongbao and Qianchun. Its distribution is not continuous.

The distribution of the Hazel Grouse is wider. The boundary of its range is from Honghuacrji, Qiqihaer, Zhanhe, Ticli, Yilan, Tonghe, Jilin and Huinan to the north of Xinoin, Hengren and Kuandian of Liaoning Province, but it is not distributed over the Songnen plain and the Sanjiang plain to the north.

Nest with chicks of Black Grouse. *Photo reproduced from 'The Rare and Endangered Gamebirds of China' by Lu Tai-chun*

The range of the Black-billed Capercaillie in the Great Xingan Mountain is rather narrow. The range of the Black Grouse is wider, but it is discontinuous. Both Black and Hazel Grouse are in danger of overhunting, although the distribution of the Hazel Grouse is the widest. All three species live in forests, and are scarce, especially the Black-billed Capercaillie, with only 1-1.6 birds/100km^2 and the Black Grouse with 3.5 birds/100km^2. The Hazel Grouse is much commoner at 177 birds/100km^2. A nature reserve is essential for protection of the Black-billed Capercaillie, perhaps at Huzhong Nature

Reserve in taiga forest outside the zone of perma foost. Research on captive breeding Black-billed Capercaillie aims at increasing its population and thus saving this endangered species.

It is also important to protect the discontinuous habitat of the environment for Black Grouse. For example, in the pine *Pinus sylvestris var. mongolica* forests of Honghuaerji in the southern part of the Great Xingan Mountain, there are many Black Grouse (0.5 birds/ha), because this Forestry Bureau gives priority to managing forests, and provides the forest environments in which Black grouse thrive.

We suggest that a nature reserve for the Black Grouse should be established in this commercial forest. The Hazel Grouse is distributed widely and in large populations, but in recent years, hunting of the birds of this species has been extremely serious. Its numbers will inevitably decrease in a few years. We should reduce hunting by law. The Hazel Grouse can also be reared in captivity and perhaps released to augment wild populations.

Courtship behaviour, activity patterns and breeding habits of these three species were studied. Courtship is basically similar in all three species, especially in the case of Black-billed Capercaillie and Black Grouse. They display at dawn and evening on regular dancing grounds where they run around showing rectilinear chasing, or dance in a tree. Courtship display in these two species is different from that of the Hazel Grouse which is monogamous and displays in cover. The male Hazel Grouse displays around the female or chases her. In all three species, the male is not involved with nesting or rearing the young. The Black-billed Capercaillie nest is the biggest, and the Hazel Grouse smallest. Building nests takes 1-2 days. Black-billed Capercaillie build nests and lay in the first ten days of May, and Black Grouse and Hazel Grouse in the middle or last ten days of May. After the nest is complete, the females produce eggs at once.

The mean number of eggs per nest is 8-9, with a few more eggs laid by Black-billed Capercaillie and least by the Hazel Grouse. The incubation period lasts 23 days in the case of Hazel Grouse, 26-27 days Black Grouse, and Black-billed Capercaillie 23-25 days. They usually begin to incubate from the first egg and as incubation progresses the females become increasingly reluctant to leave their nests.

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LATE RENESTINGS IN FEMALE BLACK GROUSE

Arto Marjakangas

Grouse hens may lay a replacement clutch after having lost the first one. The probability of successful breeding may decline with the advancement of season, because the time for reproduction is short, in the north in particular. Thus those hens whose first clutches are predated during late incubation period would possibly not attempt to renest at all. This might be the principle, but of course there are exceptions, such as the following case.

In 1991 my research group found nearly 50 first clutches laid by radiomarked Black Grouse hens in the study area in central Finland (see Grouse News 3/1992). An adult female with nine eggs in the clutch had started incubating on 18 May (estimated using egg flotation and backdating method), and the expected hatching date was 12 June. On 7 June, however, we found that she had abandoned the nest, because seven of the eggs had been taken by an unknown predator about two days before. There were normally developed foetus in the two intact eggs.

The hen was tracked intensively after the nest loss, and on 20 June she was flushed from a renest with seven eggs, 200m distant from the first nest. We estimated that she had begun incubating on 22 June, and the clutch should hatch on 17 July. For comparison I can tell that the mean hatching date for the first clutches in 1991 was 16 June and in 1989-93 it was 14 June, and broods mostly break up in early September. This is indeed the latest breeding attempt recorded during these years.

Unfortunately the eggs never hatched. On 15 July we found that the female had abandoned the clutch a few days earlier. Examination of the eggs showed that she had incubated the eggs after our previous visit on 4 July, and that there would really have been only a few days left to hatching. Presumably the female had lost her motivation (controlled by hormones) to incubate. She stayed in the area and survived until the next spring. There was relatively more variation in timing of reproduction between hens in 1991 than in the other four years of study, and four more females started renesting relatively late. The one starting to incubate on 18 June abandoned her clutch, the clutches of the two starting on 10 June were predated, and only the one starting on 7 June managed to nest successfully.

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THE SWEDISH WILLOW GROUSE PROJECT

Adam Smith

The project

This project, which is now in its second field season, aims initially to examine the dispersal, overwinter mortality, and harvesting of a Willow Grouse population in the Swedish central mountains. A major role is to consider the impact that hunting has on this species in this area, particularly in light of a new hunting system. The aim is to develop a strategy which will allow hunting to continue on a sustainable basis through the development of a harvest model. Two important considerations will therefore be the nature of the timing and dispersal of the population and whether shooting pressure is additive or compensatory to natural mortality.

The principal research method is one of the most comprehensive radio-tagging programmes of Willow Grouse currently being undertaken. An area known for its hunting has been subdivided into four further areas. Two have controlled shooting of Willow Grouse and two act as controls with no shooting. A planned 50 radio-tagged birds, approximately 10% of the local population, will be followed each field year in order to gather data from hunt and non-hunt areas. As many birds as possible will be wing tagged and leg banded and hunters asked to return wings from all birds they shoot. This will provide comprehensive bag statistics to complement known radio bird deaths.

In late summer each year, before the hunting season, an intensive period of catching in nets to collect physiological data, tag and radio-tag birds is undertaken. The project aims to supplement this catching effort with birds caught during the winter by lamping. The grouse population of the study area is censused every spring in April and summer in August. This is done using two forms of line census technique. The first, used during spring to limit reindeer disturbance, was developed by Scottish grouse researchers who use transect lines to flush all birds in a given area. The second is a true line census, the whole 77km^2 study area being covered by line transects 500m apart.

Commentary

We believe that the breeding season in 1992 was particularly good and that this contributed to a large numbers of birds present at the start of the hunting that year. Our censuses suggested that there was 13.8 birds/km^2 on the hunting area and 9.6 birds/km^2 on the control area. During the whole season last year 128 birds were shot, 22% of the census population. Of these, 5 birds had radio transmitters which was 23% of the radiotagged population.

The spring census in 1993 showed a general decrease in the density of the population over the winter to between 5.2 and 17.5 birds/km^2 over the whole study area. The 1993 summer census has provided some evidence that we may be witnessing a population decline. There seems to have been a poor breeding year in 1993 associated with bad weather. Associated with this is a decline in numbers and groups of birds associated with the hunting area. The line transects indicate 5.6 birds/km^2 on the hunt area and 9.0 birds/km^2 on the control area. Less than half way through the hunting season 140 grouse have been shot in all, 6 of those carrying radio transmitters. Further analysis is clearly needed into what may be an example of additive mortality affecting population structure.

Contacts

Led by Tomas Willebrand of the Swedish Sportsman's Association, Adam Smith, a doctoral research student from Oxford University and Gert Ollsson from Uppsala University are the principal researchers on the project team. We can be contacted through Tomas Willebrand, Svenska Jagarforbundets, Backlosa, Uppsala, Sweden or Adam Smith, Edward Grey Institute, Zoology Department, Oxford University, UK.

ABNORMAL CAPERCAILLIE BEHAVIOUR OWING TO IMPRINTING DISTURBANCE

Nils H Hoglund & Jan Porkert

Even the literature of the early 1900s contain reports on Capercaillie *Tetrao urogallus* which, rather than displaying fear, displayed aggressive behaviour towards humans (Brehm 1822, Lloyd 1867, and others). This behaviour, which is brought about by hormone imbalance, has been interpreted variously (Viht 1984, Klaus et al. 1986, Linden & Pasanen 1990, Hoglund & Pokert 1992, and others). It is manifested above all during times of sexual and territorial activity, but will however disappear a few days after capture and cageing of birds caught in the wild (Borg 1960 and personal communication, Hoglund & Porkert 1992).

On the basis of the senior author's experience of over 60 years with rearing Capercaillie, as well as literature (Hoglund & Porkert 1992) and observations of a male Blackbilled Capercaillie *T. urogalloides* bred by R Franck (Porkert 1992), the disturbances during the phase of chick imprintation have been because of hormone imbalance in adult birds. We invite discussion and experimental examination of this interpretation, which we base on the following arguments (for details cf. Hoglund & Porkert 1992, Porkert 1992):-

1) Capercaillie chicks hatched in an incubator and imprinted on man are able to differentiate between human individuals. Presumably on account of the human voice which is either the first or the most intensely perceived voice during imprinting, adult Capercaillie reared in captivity will behave in a friendly way towards the person whose voice they know, and as though they were facing a breeding partner, whereas they display territorial or aggressive behaviour vis-a-vis other human beings.

2) Consequently, territorial and aggressive reactions of abnormal Capercaillie towards human beings or animals or other objects as a result of non-specific acoustic or visual trigger mechanisms may be attributed to other sensitive disturbances (e.g. the loss of brooding warmth from the hen bird during imprinting). Conflict situations in which the bird may hear the hen bird's warning or aggression calls (cf. Porkert 1992) seem to further an aggressive response. The same is true for Capercaillie living in the wild. There have always been plenty of disturbances and opportunities for close contact with man in former times, when woodlands were maintained by means of manual labour, often in close proximity with human settlements, and nowadays where severely

fragmented forests are managed according to modern maintenance methods (cf. Hoglund & Porkert 1992 p. 168).

3) The lack or rarity of reports on abnormal Capercaillie in regions where the species has been used as a food source by the local population or where Capercaillie have been hunted, can be attributed to the food or trophy value of the bird to its observer (Hoglund & Porkert 1992). This would account for the absence of reports on abnormal Blackbilled Capercaillie and other rare tetraonids.

Acknowledgements

We thank Mrs Brigitte Geddes for translation into English.

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BRIEF REVIEW OF STUDIES ON HAZEL GROUSE IN JAPAN

Yuzo Fujimaki

In Japan the first report about Hazel Grouse is a study on its food habits based on crop contents of birds collected on Hokkaido and Sakhalin (Hatsumi 1932). After that little was done on the species before intensive studies on Hazel Grouse were initiated by Dr R Haga and his students in 1983.

Distribution

Blakiston (1862) reported for the first time that Hazel Grouse occurred in Hokkaido. The distribution maps in breeding and non-breeding seasons were shown by Environment Agency (1979, 1988) based on nationwide censuses in the summer of 1978 and the winter of 1984/85. However, these maps were incomplete due to insufficient data. After that a virtually complete distribution map was shown by Fujimaki (1993) based on questionnaire data.

Abundance and population density

Yoshimura (1971) reported a density of 10.8 birds/100 ha in a deciduous broad-leaved forest in Shibecha, eastern Hokkaido. In studies of forest bird community conducted by the spot mapping method, densities of Hazel Grouse varied from 2-6 pairs/100 ha (Fujimaki 1986, 1988, Fujimaki & Hikawa 1982). These figures, however, do not show densities very accurately because study plots of about 25ha were too small to estimate the density of medium-sized birds such as Hazel Grouse. Relative abundance of the species was obtained in various localities by counting the number of birds in transects. The numbers of birds counted in June and July ranged from 0-3.8 birds per 10km (Abe et al. 1970, Fujimaki 1970, 1976, 1980, Masaromi 1976). As for long-term population trends, there are national hunting statistics, which indicate a decrease in annual harvests in recent years (Fujimaki 1993).

Habitat

Cheke (1967) reported that Hazel Grouse was common in deciduous broad-leaved forests, but did not occur in conifer forests in the Akan National Park. According to Yoshimura (1971) and Haga et al. (1987), Hazel Grouse prefer deciduous broad-leaved forests, but not larch plantations, except those mixed with deciduous broad-leaved trees in Shibecha. In Tonakomai, southern

Hokkaido, more birds were counted in deciduous broad-leaves forests than in broad-leaved forests mixed with conifer plantations or mixed plantations of larch and evergreen conifer trees (Fujimaki 1975). Censuses of Hazel Grouse conducted in different areas in 1987-93 indicated that Hazel Grouse were recorded in 50% of natural forests but not in larch plantations (Fujimaki 1993).

Home range size

Home range sizes were measured by tracking birds in late February and early March. A home range occupied by a pair was 7.8-11.5 ha, and other home ranges were 1.3-5.3 for a single male and 2.5ha for a single female, respectively (Haga et al. 1987).

Breeding biology

Hazel Grouse nest mainly on the ground under bamboo grass or at the root of a tree in various types of forests; conifer and mixed forests, and larch and fir plantations. The egg-laying period ranges from late April to early June, and the incubation period from mid-May to late June. The clutch size varies between 4 and 9 eggs with an average of 7.0. A female incubating eggs left the nest twice a day in early morning and evening for 20-40 minutes. Hatching is concentrated in the 10 day period from 15-26 June in the field (Haga & Takamata 1986). The incubation period was 25 days and the hatchability was 93% using an incubator and 71.4% using a domestic fowl in captivity (Haga & Takamata 1986). The fresh egg weight is estimated by using an equation; weight (g)=0.527 x length (cm) x breadth $(cm)^2$ (Sasaoka 1988).

Growth and development

Body weight was 11.4-12.9g just after hatching, then increased to 350g by the age of 16 weeks. Wing, tarsus and bill lengths were 26.0-29.5, 17.1-19.7 and 3.8-4.8mm respectively, just after hatching and tail feathers began to appear from 7 days old. Wing and tail lengths attained adult size by 16 weeks of age and tarsus and bill lengths by 6 weeks (Haga & Takamata 1986, Sasaoka & Fujimaki 1990). The survival rate of chicks was 65-75% to 16 weeks of age in captivity. The main cause of death after 6 weeks of age was aspergillosis and peritonitis (Haga & Takamata 1986, Sasaoka & Fujimaki 1990).

Food habits and diet consumption

Crop content analyses indicated that in autumn and winter Hazel Grouse ate buds of *Salix, Betula, Alnus, Sorbus, Crataegus, Euonymus, Tilia* and *Quercus*,

fruits of *Vitis*, *Celastrus* and *Euonymus*, and seed of *Rhus* (Hatsumi 1932). In winter Hazel Grouse ate mainly buds of *Betula* and *Alnus* in the tree canopy and buds of *Salix* and *Acer* on the ground in deciduous broadleaved forest in Shibecha (Haga et al. 1987). Diet in captivity was mash for quail, boiled yolk, skim milk, fish meat, chick feed, hen feed and dog food for chicks up to 12 weeks of age, and dog food, hen feed and fish meal for adult birds (Haga & Takamata 1986, Sasaoka & Fujimaki 1990). In captivity diet consumption of chicks (dry weight) was 1.5g/day/bird at 2 days old, increasing to 24.8g/day/bird at 46 days old and averaging 22.1g/day/bird after 50 days old (Sasaoka & Fujimaki 1990). In a preference test for herbs, Hazel Grouse preferred *Taraxacum officinale*, *Rumex obtusifolius* and *Trifolium repens*, but not *Phleum pratense*, *Cryptotaenia japonica* and *Plantago asiatica* (Fujimuki & Watanabe in press).

Hazel Grouse, male. *Photo: Hans Aschenbrenner*

Behaviour and activity

Walking, flying, eating and preening accounted for 50-60% of daytime activity of captive Hazel Grouse. Female activity in the egg-laying period differed from those in other periods of the breeding season, with the active phase accounting for 70% of daytime. Females incubated for 90% of daytime (Haga & Takamata 1986). Winter daily activity in captive birds was similar to that in the field: resting, moving and eating accounting for 48-51, 30-33, 13-20%, respectively. Night roosting in snow burrows was observed from February to mid-March

when snow cover was 26-66.5cm in depth (Haga et al. 1987). As for daily activity of chicks, resting time decreased from 67% of daytime at 3 weeks of age to 25% in 6 weeks of age, then was similar to that for adult by 20 weeks of age (Haga & Takamata 1986).

Study methods

Hazel Grouse killed during the hunting season from 1 October to 31 January were classified into birds less than 8 months old and those over 8 months old based on skull ossification (Che & Fujimaki 1993) and birds over 1 year old were aged by the number of layered structures in the mandible (Mitani & Fujimuki 1992).

In April, May and September male Hazel Grouse in captivity responded significantly to the hunter's whistle (Higuchi & Fujimaki 1993). This result indicates that usage of a hunter's whistle is effective to census Hazel Grouse in spring and autumn.

In addition to these works, Kiyosu (1978) summarized the morphology and biology of Hazel Grouse.

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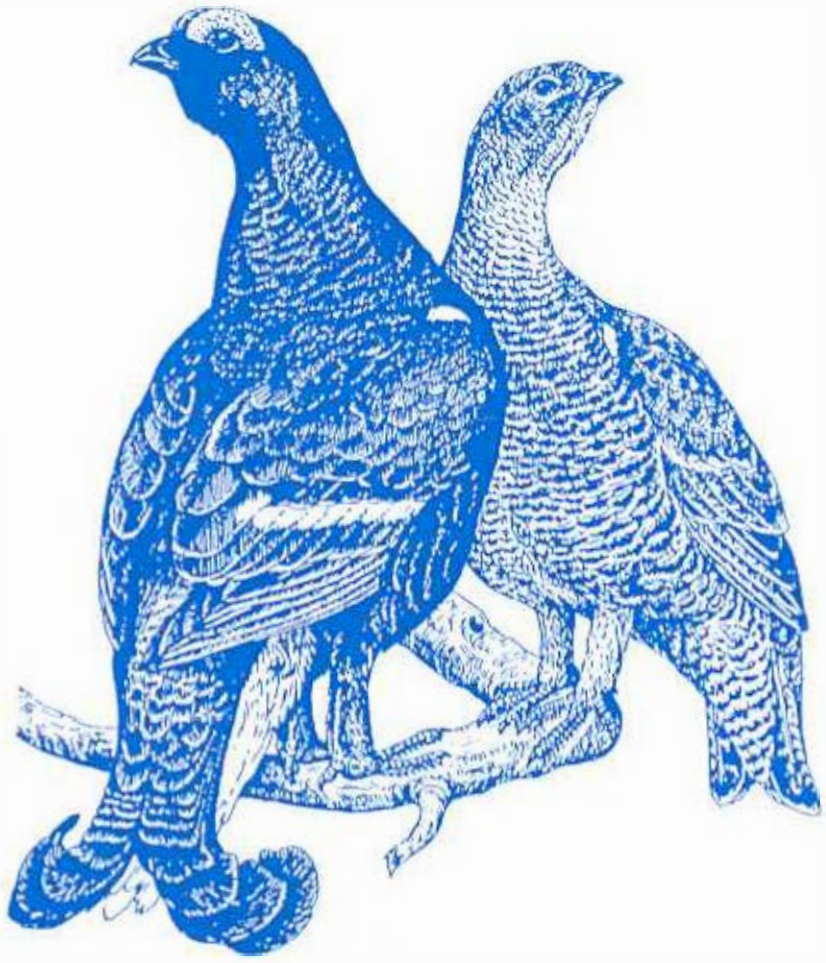

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GROUSE NEWS

WORLD PHEASANT ASSOCIATION INTERNATIONAL

No 7

JUNE 1994

GROUSE NEWS NO 7

Editor: Diana Lovel

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Back cover: Black Grouse by Dr Fabio Perco

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THE GROUSE SPECIALIST GROUP

Dr Tim Lovel

Establishment of Specialist Groups (SG) for different families and subfamilies of birds is a fairly new development in conservation and in the organisation of knowledge. These SGs are autonomous bodies, having as joint parents the Species Survival Commission (SSC), BirdLife International (formerly ICBP) and a specialist organisation such as WPA for the Galliformes. Many other Specialist Groups have now been formed. They are modestly funded by their parents, according to budgeted need and the availability of resources.

1. To develop and maintain an international network of experts on its species.
2. To collect together information on the distribution, status, ecology and behaviour of all its species both in the wild and in captivity.
3. To collate and summarise this information in order to identify conservation priorities and to produce five year action plans detailing the most urgent projects.
4. To encourage organisations and individuals to implement priority projects for its threatened species and to promote the sustainment used by others through wise management.
5. To appraise research proposals and assess the results of research projects which relate to the conservation of many of its species.
6. To give objective scientific advice to international organisations, national governments, non governmental orgnisations and individuals in connection with any of its species or their habitat.
7. To organise meetings such as training workshops and symposia which facilitate the above activities.

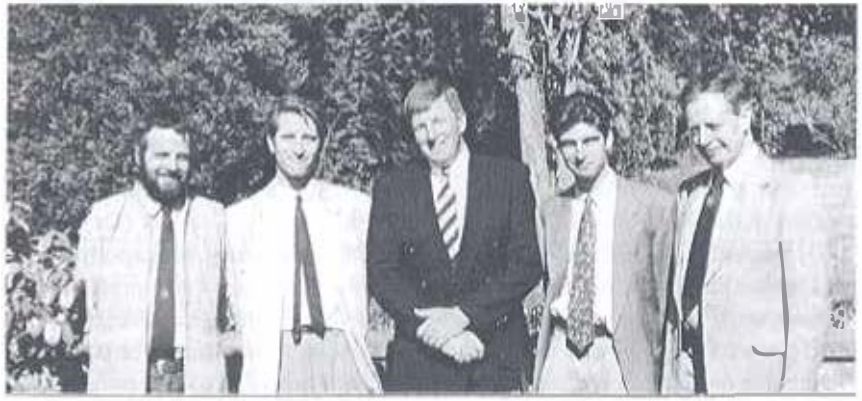
Over the past two years, WPA has now set up five such SGs covering respectively the Pheasants (Chairman Dr Peter Garson), Cracids (Dr Stuart Strahl), Partridge, Quail and Francolin (Dr Simon Dowell), Megapodes (Dr Rene Dekker) and now the Grouse. A core committee which I chair consists of Jon Swenson, Ilse Storch and David Baines; because of the expense of travel we intend to work largely by post but at least one meeting a year should be possible. An extensive circle of corresponding members will be asked to advise us about the populations of grouse in their own National study areas so that a comprehensive data base can be compiled both for present use and as a benchmark for the future.

From this can be derived a Conservation Assessmeut and Management Plan (CAMP) which will identify species, sub species or isolated populations which require special investigation or action. The draft CAMP should be ready to present to the Seventh International Grouse Symposium at Fort Collins, Colorado in 1996, for detailed comments and further refinement by all the participants at that meeting.

Earlier action is, of course, possible if indicated. A recent PHVA on the Attwater's Prairie Chicken indicated that urgent conservation action is required, and as the Heath Hen is already extinct and the Lesser Prairie Chicken is believed to be also threatened no time should be lost.

Apart from all this activity the Grouse SG reports to the Scientific Advisory Committee of WPA indicating when appropriate the need to initiate research or management. Also it has the power and authority delegated to it by its three parents (trisomy is not always a biological disaster!) to give its approval and endorsement to research projects on grouse submitted to it. This does not automatically ensure funding, unhappily, but it should help to obtain funding from other sources. Colleagues wishing for such endorsement should therefore submit four copies of their research proposals to me: we shall endeavour to reply promptly, and confidentiality will, of course, be observed.

Grouse News will continue to be our means of communicating with all our colleagues working with or interested in Grouse. We look forward to receiving your contributions, comments or criticisms; any ideas on the major topics to be discussed at Fort Collins in 1996 will be particularly welcome.



The five BirdLife International/WPA Specialist Group Chairmen all met together for the first time on 4 May 1994. L to R: Dr Peter Garson (Pheasants), Dr Rene Dekker (Megapodes), Dr Stuart Strahl (Cracids), Dr Simon Dowell (PQF) and Dr Tim Lovel (Grouse). *Photo: Keith Howman*

THE GAME FAIR

Dr Tim Lovel

For the past 30 years the Game Fair has toured Britain, putting on a three day show of country pursuits, activities, occupations and hobbies. It is always in the last week of July. Usually there are two in England, one in Scotland, two in England and one in Wales over a six year cycle. The Fair is always situated in the park of a grand country house, where there is water for fishing activities, space for safe clay pigeon shooting, 50-60ha! for the show itself and the essential car parking, camping site and adequate roads so that huge traffic jams do not result. This is a vital factor, for over 100,000 people come every year to this festival of rural life.

Ever since our foundation, the WPA has taken part in this show, building from scratch an increasingly complex stand to show to the world what we do and why it is important. As a result many people with little or no knowledge of game bird biology or conservation have become first interested and then deeply involved in our Association. Not a few are keen hunters, passionately devoted to their sport, who see no inconsistency in shooting the common pheasant (10 million a year are reared in Britain alone) or red grouse, whose densities in a good year can reach 2,000/km^2 on the best moors, and yet supporting the conservation of a rare or endangered pheasant species in far off S.E. Asia.

This year the Game Fair is at Charlmry near Oxford from July 29-31. The Grouse Specialist Group has been allocated a generous amount of space to present the range of its commission, suitably illustrated with photographs of as many as possible of the 16 grouse species. Thanks to generous sponsorship by The Famous Grouse Whisky - and what could be more appropriate or enjoyable? - we should be able to put on a very educational exhibit, which can also be reused on later occasions.

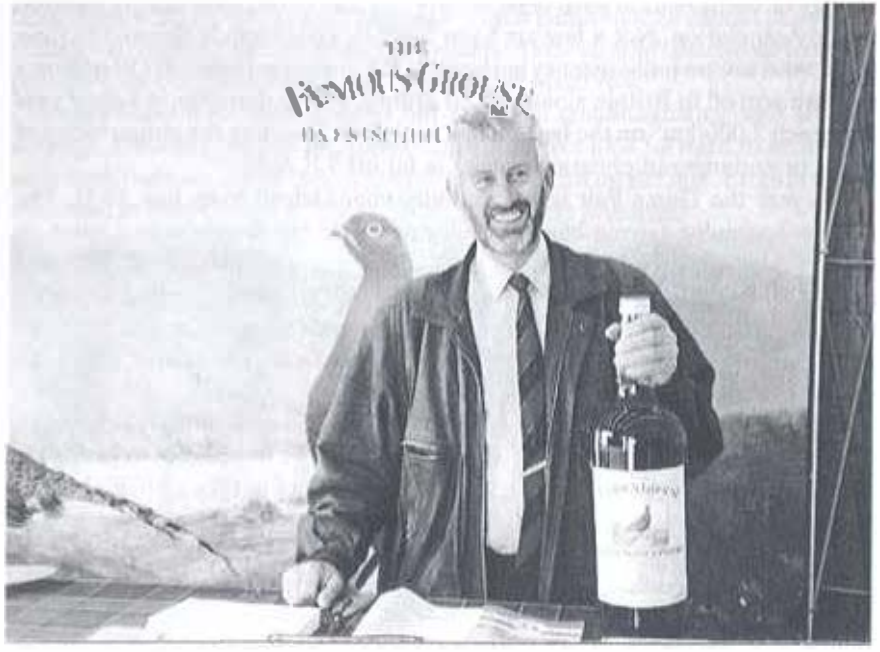
Such an event is not immediately profitable. Indeed without the sponsorship from The Famous Grouse and other firms it would be impossible to justify the cost of materials alone. Labour comes free, for many of us take a week's holiday to build, staff and take down the WPA stand; our children have grown up with the annual Game Fair week, and are now strong enough to drive posts into the iron hard clay of a duke's park while we parents manage, supervise, and test the quality of our sponsor's product.

The value therefore to WPA is not profit - if we are lucky we break even - but in the enormous public relations benefit and awareness which results. Our visitors are largely anonymous but they come in their thousands, and go away (hopefully) impressed. Indeed we know they do: when we applied to one big

philanthropic trust for money to support a project, the nobleman who heads it exclaimed "Oh! the WPA - I know them - they are the people who put on that marvellous display at the Game Fair every year!".

THE FAMOUSE GROUSE SPONSORS GROUSE AT THE SCOTTISH FAIR

The enormous interest in the WPA exhibit of grouse viewed through one-way glass at last years Game Fair at Gosford Park, led to a request by the Game Conservancy Trust for the same exhibit to be shown at their Scottish Fair near Perth in July this year. Perth is home to The Famous Grouse Finest Scotch Whisky, and we were delighted when very appropriately, they agreed to sponsor our stand there. Keith Chalmers Watson kindly supplied the Capercaillie, Ptarmigan, Black Grouse and Red Grouse in the display.



Mike Don from Matthew Gloag & Son Limited, the makers of The Famous Grouse, clutching a gallon bottle of 'our sponsor's product' at the Scottish Fair.

Photo: Jean Howman

VISIT TO PECHORAILLYICH, MAY 1994

David Jenkins

One of the more unusual papers presented at the 1993 Udine Grouse Conference was by Alexei Blagovidov and his colleagues. These people have been working on Capercaillie for more than 40 years in north-central Russia. A preliminary analysis of their results was presented by Olav Hjeljord, who has visited their study area near Yaschea several times and has helped with their study. The work was done in the Pechora-Ilychsky Zapovednik which covers 7,123 km^2 in the Komi Republic.

This Zapovednik (broadly equivalent to nature reserve or group of reserves) was created to preserve native forest ecosystems of the northern Ural area. Two reserves are located in the upper reaches of the R. Pechora (62°N, 57°E), in a pristine area remote from industrial centres. It is hoped that a third reserve may be established in the headwaters of the river. Important animal migration routes, particularly for elk, cross the Zapovednik's territory from the sub-arctic Ural mountains along tributaries of the R. Pechora to relatively slightly warmer forests a few hundred kilometers further south. The landscape of the Zapovednik consists of lowlands, mountains and subterranean caves.

The existence of this Zapovednik is endangered because local authorities threaten to close it and residents violate its regime due to a lack of adequate protection mechanisms and little ecological awareness in the community. Assistance is urgently needed to publicise the unique value of the habitats in the reserves and to obtain adequate international funds to provide the necessary equipment and training for conservation measures. The development of eco-tourism could help to stimulate international interest in the area and its reserve (R. Moss and J. Oswald have some ideas for this).

At present, the two parts of the Zapovednik consist of a small isolated reserve of 15,800 ha, together with an adjacent area of uncut forest totalling c. 20,000 ha, plus a main reserve of c. 705,000 ha which lies within a continuous belt of virgin forest. This extends for c. 3M ha along the western slopes of the Ural mountains. Particularly around the small reserve, logging started in the 1950s, and became more intensive after 1970. There are now extensive areas of clearcut deforestation around the small reserve, though much of the foothills of the Urals remain in a still pristine state.

Estimates (by route transects) of the numbers of Capercaillie and Hazel Grouse were conducted annually in both reserves in August-September from 1953-1992, providing an unbroken 40-year data set. In general, these results, which are described in more detail in the proceedings of the Udine conference,

show a crash decline in 1968 leading to a decrease in the autumn Capercaillie population (but not of Hazel Grouse) in the small reserve but no long term change in the populations of Capercaillie or Hazel Grouse in the larger reserve despite temporary fluctuations. The Capercaillie population of the small reserve has not recovered since 1968.

At Udine, I was very interested in this story and particularly in the native boreal habitat described. So I asked Olaf Hjeljord and Alexei Blagovidov if it would be possible for a few western biologists to visit their study area and discuss their results in this almost unique habitat. This idea was received enthusiastically and Profs Romanov and Potapov agreed to receive a party. In the event, neither turned up and nor did Hjeljord, but a western group consisting of David Jenkins, Robert Moss, Dave Baines, Emmanuel Menoni, Ilse Storch and Jimmy Oswald eventually collected in Moscow on 19/20 May 1994.

We flew to Syvryikar where we met our kindly translator and guide Irina Pokrovskaya who cared for our every wish and movement during the next 10 days. A 15-hour train journey took us to Troitsk, and then an incredible huge and most uncomfortable ex-army 6-wheeled bus drove us along sandy bumpy roads for 120km to Yaksha. We stayed in n barracks, fed in a canteen and enjoyed everywhere the most incredible kindness and friendliness imaginable from the local Komi people, who are truly wonderful.

Cabin in pine forest *Photo: D Jenkins*

Yaksha proper is a 'wild-west' timber town, mostly with Siberian-type housing with domestic livestock in the streets but with apparently modern school buildings and excellent cooking facilities in the canteen. Our biologist hosts lived in new houses across the River Pechora, accessible by a 5-minute journey in a motor boat. We spent three nights in near- and far-Yaschca and one night in the forest. We won't easily forget our 2-day walk there. Robert Moss described it as the greatest educational experience of his scientific career, and Jon Swenson had previously written that every western biologist should visit the area.

In the small reserve where we walked, there were two main habitats. These are dry pine forest on poor soils and spruce/deciduous forest on richer, damp soils near streams. We flew over the big reserve which was mostly mixed spruce/larch forest but with some pine. In both reserves, the woodlands were mainly even-sized, except at the ecotones. There were many bogs of varying sizes, both in but especially outside the reserves, some possibly resulting from an effect of clear-cutting large areas which may cause changes in the water balance of the soils (R.Moss/A.Blagovidov).

What had we expected? In the UK, the archetypal ancient forests are characterised by 'granny' trees with enormous trunks and broad crowns, in woods where it is fashionable to lament the absence of deciduous trees. At Pechora-Illych, there were no granny trees and usually no hardwoods. Birch could not compete with pine in the drier south, and where it occurred it bowed over hoop-like at about 6-7m, presumably due to the weight of snow. Aspen and a few other hardwoods intermingled with spruce at the damper, richer stream and bog edges, and the forests near the Urals were apparently mixtures of spruce and larch.

The pinewoods were characteristically even-sized, with the oldest trees about 150-200 years, and with clearings with smaller, younger trees in areas where light could penetrate. A predominant characteristic of this woodland was its lichen floor, consisting mostly of three greyish species growing up to 10cm high and appearing white in bright sunlight and an almost greenish transparency in the setting sun. These lichens have achieved long-term stability in the face of two numerous major mammal grazers, elk and reindeer, particularly reindeer of which numbers are clearly in balance with their food supply. Fire has produced an even-sized fire climax in the pine.

The abundance of young trees was limited by fungus which appeared cyclically in the melting snow about every eight years, killing off most sub-snow pines so that the only survivors were those whose leading shoots were clear of the snow level when the fungus struck. Fire and fungus and competition for light were said, over the long term, to produce a relatively even-sized forest, but with many openings. There was a good seed fall every year and three main cycles: death of

appropriate-sized young trees under the snow from fungus about every eight years, with trees above the snow surviving, ground (usually) fires (i.e not killing big trees) every 40-60 years, producing clearings, and death of big trees around 200 years old. Then slow rot. (Serious windblow is rare, but does happen occasionally.) I don't properly understand, but there is a basis for modelling and the end product in the pine areas is quite different from a so-called natural forest in Scotland. A very important difference was the presence at Pechora of criss-cross patterns of a multitude of dead trees on and in the forest floor, in every stage of rot from recently fallen snags to long strips of lichen- and moss-covered dusty litter. Through such rot, the fertility of the forest is maintained.

I did not have time to study the spruce habitats in the wetter areas, though Robert Moss took measurements for later analysis. Cursory looks suggested that the spruce areas were more mixed in age, perhaps due to a lower frequency of fire in damp areas, and with a greater diversity of ground cover, including especially Vaccinium species and Labrador tea *Ledum palustre*. The ecotones were held to be good Capercaillie brood sites and the lek site which we were shown was in a damp area. Broadly, Capercaillie occurred in the pine and pine/spruce ecotones, Hazel Grouse in the mixed woodland in wet places and Black Grouse in big clearings.

This quick essay written immediately on my return takes no account of my colleagues' analyses. These may appear more fully later. The multitudinous fallen trees above all gave understanding of the life pattern of this enormous forest. It is on a scale beyond the life span of man - far beyond in fact, putting into proper perspective the puny efforts of western foresters in managing our native forests; in my opinion, many of those in nature reserves should be left alone to establish natural balances, with minimum interference from foresters and conservationists, however well-meaning except to achieve natural balances between grazing mammals and the vegetation. The use of fertilizers and pesticides or a scarifier should be anathema. Trees must be sufficiently far apart to permit light to reach the forest floor. Dead trees must be left to fall and rot. A visit to Pechora-Illyich will illustrate a time-scale which few may have previously considered.

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Author's note:
David Baines and I were only able to visit Pechora-Illyich due to the generous support of British Airways Assisting Conservation, run by Rod Hall MBE, and the Duke of Atholl's Charity Trust.

A HAZEL GROUSE EXPEDITION IN CHINA (BONASA BONASIA AND B. SEWERZOWI)

Jon E Swenson and Sun Yue-Hua

We met at the grouse symposium in Udine, Italy in September 1993. As we had both studied Hazel Grouse with radiotelemetry, we had a common basis for many interesting discussions. Sun and his co-worker Fang Yun had had much success in catching and marking Hazel Grouse in deciduous-dominated forests in Jilin Province, northeastern China. However, they had problems with their radio-telemetry equipment, some of which was home-made. The study area in China was an area where Hazel Grouse form flocks in winter. Swenson had been to Siberia to study this phenomenon with Prof A V Andreev, and was intrigued with the idea of studying flocking Hazel Grouse with radiotelemetry. We corresponded after the symposium and decided to enter a cooperative agreement. In this agreement, Sun received radiotelemetry equipment from Swenson, who has finished with his field work. Also, we decided to try to visit each other's study areas. This spring, Swenson visited China as the first part of this exchange. Here is a brief report of the expedition. We also visited a potential study area for Chinese Hazel grouse, which Sun hopes to study when he is finished with his Hazel Grouse study.

Swenson arrived in Beijing on the morning of 15 March 1994. The expedition got off to a quick start. After two delicious meals at Sun's parents and a nap, we started that evening for Er Dao Bei He (The Second Fork of the White River). It was 38 hours away by train, and we arrived at 0630 on 17 March. The study area is within the Changbai Shan (Usually White Mountains) Nature Reserve, which borders North Korea. The reserve was started in 1961 and encompasses 190,000 ha. Most of it is pristine forests, never logged, although wood gathering for household use is quite common near the roads. Some of the area was logged by the Japanese during the occupation of Manchuria 50 years ago. These young deciduous forests have very high densities of Hazel Grouse (>15/100 ha). The deciduous forests are dominated by an amazing diversity of deciduous trees at the lower elevations (ca. 500 m). In the pristine forests, there are huge (dbh of 50-100 cm) old Mongolian Oaks, Manchurian Ash, and Korean Pine forming a canopy 30-40 m high. Hazel Grouse densities are lower there, 'only' 4-5 pairs per 100 ha. At higher elevations, the forests are dominated by spruces and larches (20-25 m), with several layers of cover, and about 5% deciduous trees, mostly white birch, poplars, willows, and maples. These forests have lower Hazel Grouse densities than the second-growth forest. Higher yet is a subalpine forest of Erman's birch, only used by Hazel Grouse in the snow-free period. The

highest peak on the Chinese side of the border in this area is Mt Baitou, a volcano 2691 m high. We visited a beautiful waterfall (mostly ice at that time of the year), and a hotspring. This is truly a gorgeous area.

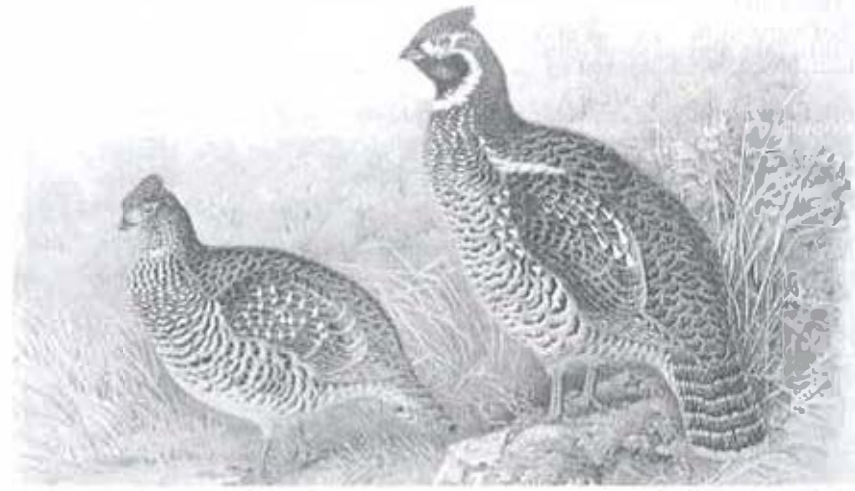
We tracked and trapped grouse using chicken-wire cages baited with red berries. Sun and Fang have caught 22 Hazel Grouse in two years. True to the Peter Principle, they did not catch any grouse in the early winter after the receiver and transmitters arrived. However, they did get winter data on four grouse. We have made a preliminary analysis of the data. In Sweden Hazel Grouse are strongly territorial against members of the same sex in winter, but in China the home ranges of birds of the same sex overlapped considerably. However, they were alone more than they were in groups. We have quantified the amount of winter food and cover available in these habitats to compare with the situation in Sweden.

We left Changbai Shan on 30 March to return to Beijing, arriving on 1 April. On 2 April we took an airplane to Lanzhou, Gansu Province, ca 1500 km west southwest from Beijing. There we were met by Professor Liu Naifa who has studied the Chinese Hazel Grouse for many years. On 3 April, Easter Sunday, Swenson held two lectures at the University of Lanzhou and 40 students and faculty came to hear. The next day, we drove to the Lianhua Shan (Lotus Flower Mountain) Provincial Nature Reserve with Professor Liu and a student. It is located 200 km south of Lanzhou. Lanzhou and the area surrounding it is semi-arid; certainly not where one would expect to find Hazel Grouse.

We arrived at the reserve and found that most of it was deforested. It is about 12,000 ha in size and was established in December 1983 as one of the 29 provincial reserves in Gansu. We were surprised to learn that it was not until 1987 that Chinese Hazel Grouse were discovered on this reserve. They are found in the remnants of pristine forest located highest in the mountains at elevations of around 2900 m. As most of the reserve was deforested in the 1960s, during the Great Leap Forward, the major objectives of the reserve are to protect the small remnants of pristine forest from tree-cutting and to reforest the area. It is a big job, but they are working earnestly towards those goals. This reserve also holds Blood Pheasants, Blue Eared-pheasants, Common Pheasants, wolves and even a few leopards.

On 5 April, we saw our first *Bonasa sewerzowi*. It was very similar to the common Hazel Grouse, but one immediately notices the rust-red crest and top of the head and the darker breast. The breast is not black, however, and the name Black-breasted Hazel Grouse is not appropriate, in our opinion. The tail is quite different, black with narrow white bands, although one does not notice that when it flies. The Chinese common names differentiate between these birds on the basis of the different tails. The next day we found many (may be seven)

Chinese Hazel Grouse in the vicinity of a field station at the end of a road. This is a perfect area for Sun to study this fascinating species if he gets the chance. The forests are dominated by spruces and firs, with a perhaps 10-15% deciduous trees, mostly willows and birches. Shrubs and bamboo grass are common on the forest floor, forming a dense cover. But some areas were less exotic and looked just like a Swedish Hazel Grouse spruce forest. The Chinese Hazel Grouse we encountered were quite tame. Swenson whistled with his Hazel Grouse whistle and the first grouse appeared to respond with flutter jumps and flutter flights. Unfortunately, he lost it (the last one left) before he could try it on other birds.



Blackbreasted Hazel Grouse. *Painting by H Jones*

It appears that the Lianhun Shan area is a good area to study the ecology of Chinese Hazel Grouse. This study should also include a landscape ecology aspect, as the habitats of Chinese Hazel Grouse are patchy and perhaps isolated from each other due to open, dry south and west slopes and deforested areas separating them. Thus, both natural and man-caused factors are involved. The climate has become drier with the uprising of the Tibetan Plateau and the ending of the last Ice Age. We left on 7 April. This trip to China was fantastic in all respects. Now we hope Sun will be able to visit Hazel Grouse habitats in Scandinavia this autumn. If so, we will analyze our Hazel Grouse winter behaviour data. We are grateful to the Norwegian Institute for Nature Research and National Natural Science Foundation of China for funding our expedition.

NINA, Tungasletta 2, 7005 Trondheim, Norway

BLACK GAME IN NORTH CUMBRIA

The Earl of Carlisle M.C. DL. FRICS

One of my favourite birds is the Blackcock. I consider he is a magnificent bird and extremely interesting. I have long thought that a census should be done of what Blackgame are left in this area which is North Cumbria. It was a comparatively common sight in my youth and one could always guarantee to see them in the autumn if one drove from Naworth to Bewcastle via Askerton Castle. I have been told that Blackcock used to perch on Askerton Castle walls. Now they are very rare and it is a 'Red Letter Day' when one sees them. The reasons for this are not hard to discover as about 80% of their territory has now gone under Conifer forest, both planted by the Forestry Commission and Forestry Syndicates.

Black Grouse *Photo: P Johnsgard*

Between the two wars my Father and his friends used to get great enjoyment in planning how to shoot a few Blackcock - they were comparatively common. Bags of thirty in a day were not unusual. Studying a game book kept by Mr Gamble, the Keeper to Lord and Lady Henley who owned the area from Askerton to Bewcastle (Lady Henley was my Great Aunt born Lady Dorothy Howard), one reads of a typical day's driving on High Grains and Pottsloan on 10 September 1935 - 7 guns driving - grouse 89, black 21, snipe 2, duck 1 - total 113. Comment: Plenty of birds and a good day for driving. Here is another entry

dated 5 September 1933 - 7 guns walking and driving - grouse 1, black 12, rabbits 30, hares 5, partridge 17, snipe 6 - total 71 - with an additioa 'found one partridge and Grey hen 2'. Another entry on High Grains and Pottskian dated 25 August 1936 reads - grouse 74, black 10, snipe 4, hare 1, rabbit 1 - total 90. These were bags made on the area due north-west from Spadeadam Waste and sometimes by Father and Lord Henley who had combined shoots. It can be seen that the Blackgame were very common even as late as 1939. My Father would have a similar sort of bag on the Spadeadam area due south.

After the war a great deal of this area was planted by the Forestry Commission and Forestry Syndicates. The same thing applies to the area north of Bewcastle belonging to the Grahams. Their shooting box was called 'The Flatt' and they would shoot similar amounts of Blackgame, but it must be said that neither of the estates overshot.

Wherever possible, it is to be hoped now that areas that have been felled or blown down will be planted with more congenial trees such as birch, rowan and sycamore and small areas left which Blackgame might recolonize. It might be possible to reintroduce birds to a suitable area. The great problem then would be how to deal with the predators of which there are an enormous number, namely carrion crows, foxes and now goshawks and hen harriers. It is, I am afraid, a rather daunting problem.

St Mary's Vale, Lanercost, Brampton, Cumbria CA8 2HL.

AGE DETERMINATION OF YOUNG CAPERCAILLIE CHICKS

Tor K. Spidsø and Odd H. Stuen*

An accurate technique for determining the age of Capercaillie *Tetrao urogallus* chicks up to the age of 3 weeks is described based on wing length measurements. Wing length increased linearly with age, and coefficient of variation decreased with age. When tested on wild birds of known age, 93% were within ±1 day of the calculated age. Body weight proved to be a poor indicator of age in Capercaillie.

Norwegian Institute for Nature Research, PO Box 64, N-1432 Ås-NLH, Norway.
**Fylkesmannen i Oppland, Miljøvernavdelingen, Statsetatenes Hus, N-2600 Lillehammer, Norway.*

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AUSTRIAN-GERMAN-RUSSIAN EXPEDITION TO THE SIBERIAN SPRUCE GROUSE AREA (28 APRIL - 18 MAY 1994)

Siegfried Klaus

Siegfried Klaus addressing the Sixth International Grouse Symposium. Photo: D Jenkins

Under the leadership of Sasha Andreev and his colleagues from the Institute of Biological Problems of the North, Magadan, a group of Austrian and German grouse biologists W. Engländer, F. Hafner, S. Klaus, M. Lieser, F. Möllers, K.H. Schindlatz and R. Schant) visited the study area in the taiga near Gorin river (NE of Komsomolsk/Amur), where earlier studies of this rare endemic species the Siberian Spruce Grouse (Red Data Book of Russia) were carried out by A.V.A. and S.K. Travelling to the Russian Far East became much more complicated compared to 1990 (lack of gasoline caused delay from Moscow to Komsomolsk and also on our return flight). Nevertheless, our stress was compensated by the impressive nature and presence of the birds of interest at an unusually high density this spring (13 individuals of Spruce Grouse/km^2 and about 40 individuals of Hazel Grouse/km^2 were counted).

Due to late snow melting (snow cover in forests and heavy snowfalls up to the middle of May) the high season of the display of the Siberian Spruce Grouse and of Hazel Grouse was delayed by about 10 days.

The following results were obtained during our studies:

1. Five males and five females of the Spruce Grouse were caught, measured and banded with colour rings. Five of these birds (one subadult male, four females) were marked with radios and followed during lekking and at the beginning of breeding. Adult males were displaying solitarily (mean distance between six lekking males - 800m, mean distance between centres of home ranges of six females -600m).

2. The territorial system of the Siberian Spruce Grouse seems to be primitive compared with Capercaillie or Black Grouse; old males seem to occupy a preferred lek but visit females up to 1km away from the lek. On the other hand, females visit cocks on their lek. Courtship behaviour and copulations were observed both in the male and female territories.

3. The species is more mobile than assumed before: individual males or females fly over distances of 2-3km during the lekking season and return to their old home ranges.

4. Continuous observations of individual birds and video recordings were used to analyse quantitatively their activity and behavioural patterns (territorial and courtship behaviour, at the first time - three copulations (between May 7 and 12) were observed. At the first time nest building behaviour and the start of egg laying was observed. In addition to aggressive behaviour between males, locomotion, feeding and comfort behaviour were recorded. Comparative analysis with the behaviour of the North American Spruce Grouse should be carried out.

5. 40 Hazel Grouse territories were localized and mapped relative to the Spruce Grouse distribution. An extraordinary high density (20 pairs/km) in spring was recorded. This may be caused in part due to small scale cutting activities by forestry (road systems, small scale clearcutting).

6. Characterisation of forest composition and forest structure: using Swenson's method, habitats of the Siberian Spruce Grouse were characterised in the so called 'dark needle taiga' (primeval forests composed of Ajan Spruce *Picea ajanensis* or Siberian fir *Abies nephrolepis*, where Hazel Grouse has a lower density. Following forest fire or clearcutting, larch *Larix gmelini* mixed with birch, aspen and willow grows up. Highest densities (up to 20 pairs/km in spring) of Hazel Grouse were observed in these succession stages of forest development. The same is true for clearcut areas and forests near to roads, where grass and Rubus species are favoured. About 70% of the landscape is dominated by primeval larch forests. Spruce and fir are growing up under the cover of larch, forming a second layer which is about 50 years younger than the larch stands. When spruce, the dominating cover and winter food of the Spruce Grouse, is more than 5m high, the Spruce Grouse is able to immigrate into these forests. This was a new finding which indicates that the habitats of the Siberian Spruce Grouse are more extended than assumed before. By this means, the species could overcome extended losses of its primary spruce-dominated habitat due to forest fire and to the so called 'dry illness' of spruce and fir leading (by unknown reasons) to totally dead areas.

At the end of our stay, a lek with displaying Siberian Capercaillie was detected and these impressive birds were observed at the border of a large open bog in a Larix-Ledum forest.

Thüringer Landesanstalt für Umwelt, Prüssingstr. 25, D-07745 Jena, Germany.

THE PRESENT SITUATION OF CAPERCAILLIE IN THE BLACK FOREST

Helmut Weiss

For decades, the population of Capercaillie has been declining in the Black Forest Mountains. In the 60s and 70s, that development was so frightening that total extinction seemed possible. Three working groups - foresters, hunters and ornithologists - tried to find out the reasons and made suggestions on how to react. The Hunters-Association founded circles, to care for these animals and the Forest Administration set up an information-programme for its employees to perform 'Capercaillie-convenient' methods of silviculture.

It is not proven what caused a change fromdecline nor is it sure if this change is permanent, but we now observe an increasing number of male capercaillie on the leks. Every spring, hunters count the displaying cocks - in the southern part of the Black Forest, this is done as simultaneous counting on two or three fixed days on every lek, to avoid wrong data, caused by vagabonding young cocks.

In 1988, about 500 cocks were estimated as the total male population, and about 400 hens, but their number is much more difficult to estimate.

Since 1989, a positive tendency seems to have been indicated - at first byvery small rates of increasing numbers of cocks on some leks. Fortunately this developmentt has continued. In 1993, a total population of 550-600 cocks were estimated and some leks with more than 10 cocks were observed. In 1994 it appears so far that this tendency is continuing. Also the number of hens is increasing, even when losses caused by a dense population of goshawk are high.

10-20% more birds in five years - Is that enough for new hope? It is not enough to stabilize the population for future years but what is important is the change after a 70year long decline! Of course, our main question is: What is the reason?

There is no certain unswer until now, and there may be different main reasons in different areas. There is no doubt that habitat quality was improviag in the last few years. Forestry is no longer only orientated to timber-production to the last square meter (which was an understandable goal after the war!), and ecological points of view become more and more important. The dense, closed (highly productive) forests become lightened here and there, and the natural succession of flora in certain areas is part of a modern 'nature near forestry'. Storm and snow damage cause the forests in higher altitudes (above 800-900m) to change more quickly - and just there, we observe the most evident increment of Capercaillie population. The big storm in spring 1990, which brought down more than 80 million cubic meters of wood in middle Europe gave additionally a great push by creating a lot of edge lines, the preferred biotope areas in Capercaillie habitats.

It is perhaps too early to analyse the details, but that will be done and we hope the increasing tendency may continue and we also hope to know how to continue improving or creating Capercaillie habitats.

Forstamt Wildbad, Olga Str.64, 75323 Wildbad, Germany.

EFFECT OF ACID RAIN ON PINE NEEDLES AS FOOD FOR CAPERCAILLIE IN WINTER

T.K. Spidsø, H. Korsmo

The effects of long-range air pollution on the chemical composition of needles of Scots pine *Pinus sylvestris* and consequences for Capercaillie *Tetrao urogallus* feeding on the needles were studied. Samples of pine needles were studied. Samples of pine needles from localities receiving different amounts of acid rain were taken in early March. Concentrations of nitrogen and phosphorus were highest in needles from the most acidified areas, and nitrogen concentration was 35% higher in the most heavily polluted area than in the least polluted. Secondary chemicals decreased significantly with increasing acidification. Concentrations of cadmium in pine needles were closely correlated with the acid deposition levels, with highest concentrations in the most polluted area. Aluminium concentration also increased with increasing acidification. These results provide evidence that acid rain increases the nutritive value of pine needles through a fertilizing effect. Enhanced levels of certain metals are considered too low to be directly toxic to Capercaillie. However, behavioural anomalies cannot be excluded.

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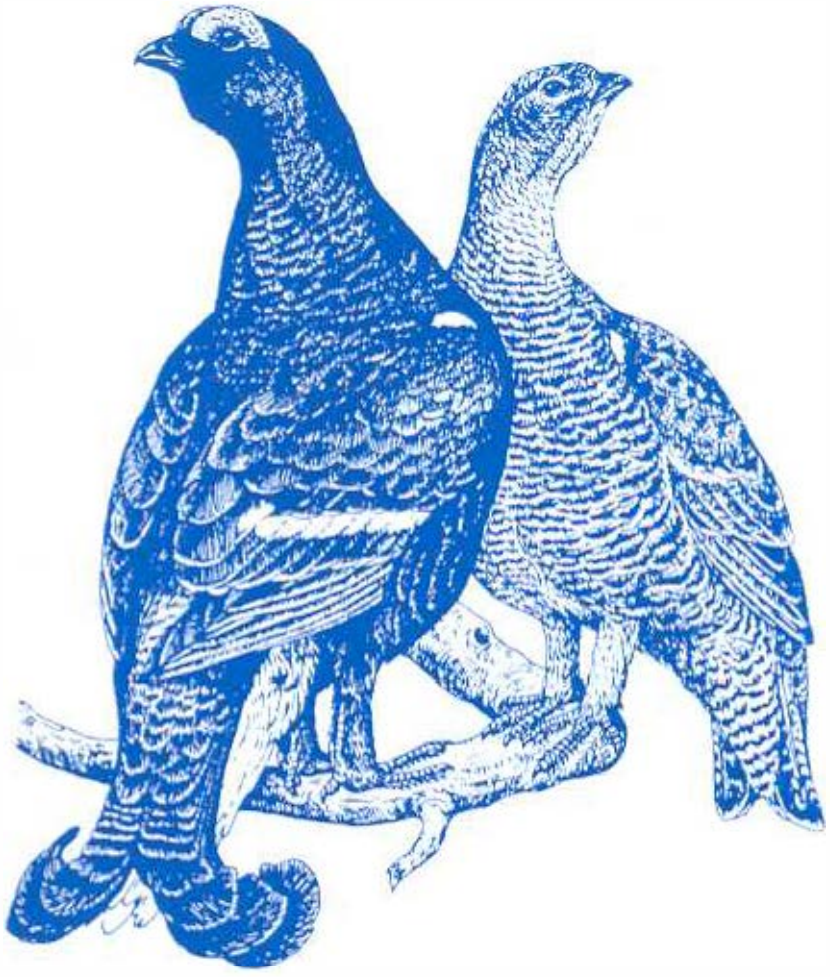

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WORLD PHEASANT ASSOCIATION INTERNATIONAL

No 8 DECEMBER 1994

GROUSE NEWS NO 8

Editor: Diana Lovel

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FORTHCOMING EVENTS

1996

January Pheasants and PQF Symposium, Malaysia

August VII International Grouse Symposium, N.America

Front cover: Capercaillie display by Dr Pablo Perco
Back cover: Black Grouse by Dr Pablo Perco

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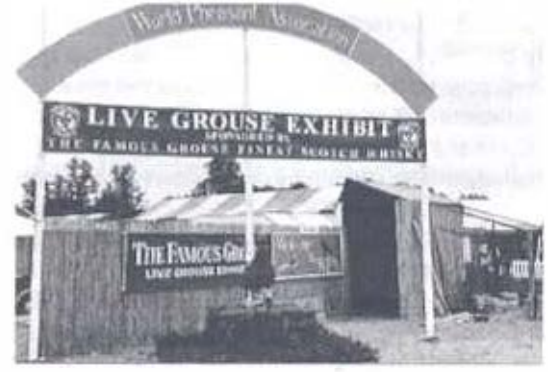
THE GAME FAIR

Tim Lovel

In our last edition (no 7) I described the British Game Fair and how for the past 18 years WPA has built and manned a stand to demonstrate conservation activities to the public generally and to the hunters in particular.

This year we were at Chatsbury, near Woodstock, Oxfordshire and the great Blenheim Palace, which was given to John Churchill, Duke of Marlborough by a grateful nation. Sir Winston Churchill was born in the palace in 1874. Though more modest in size, Chatsbury House is still a fine mansion, with a lovely park and estate. It is also an important hunting area, particularly for pheasants which are reared and released annually in tens of thousands.

The WPA exhibit was again one of the largest at the fair. It takes a week to build, and all is done by volunteers. The grouse exhibit, which showed live Capercaillie, Black Grouse, Ptarmigan, Red Grouse and Sharp Tailed Grouse to the public, was particularly popular, and indeed was crowded in each of the three days. Grouse are difficult to show because of the great stress caused by so many people, the inquisitive children and their dogs. Our solution was to build a dark tunnel through which the public walked, and which gave a view of the five aviaries through one-way glass. The birds were totally unaware of the multitude, and behaved so normally that even their owner was impressed "I have never seen them act like this", he exclaimed. Famous Grouse Whisky generously spon-



Part of the Grouse S G exhibit at the 1995 Game Fair being constructed.
Photo: Diana Lovel

sored both this and the exhibit which illustrated the work of the Grouse Specialist Group.

The organisers of the fair must also have been impressed, for on the last day it was announced that WPA had again won the prize for the best exhibit. This is the third occasion on which WPA has been so honoured - nobody else has won it twice. We congratulate everybody concerned, and particularly Keith Howman, the Director General, who masterminded the entire exhibit.

CAPTIVE GROUSE - MOVING FORWARD

Keith Chalmers-Watson

Prior to writing these notes, I took the opportunity to re-read what I wrote in No 2 Grouse Newsletter in December 1991. Happily, the 1994 version is less pessimistic in that I believe that those of us involved in the captive breeding of grouse feel that we have made some progress. Some of the mystique has been removed and the birds are living and breeding longer. Our original pair of Rock Ptarmigan have completed their fifth breeding season.

Traditionally, we have kept our grouse in covered aviaries, in dry, sandy conditions in order to minimise worm infestation from dampness. The advent of the drug Flubenvet (Janssen) has changed all that, in that this product can be used all the year round (2-3 monthly) and removes all worms successfully.

Furthermore, the provision of adequate amounts of both grante/quartz and oyster shell grit all the year round is more important than we used to believe. Without it, the birds have no teeth!

One entirely different yet connected aspect of the above apparent breakthrough in captive management of grouse involves the possibility of re-introduction. Great scientists and moorland owners have dedicated experience and funds to this concept and have largely been unsuccessful.

Following the mid-winter conditions experienced on many grouse moors in May 1993, we experienced in the UK the largest decline in young Red Grouse in recent times. On some moors there were virtually no young from the first clutches, and shooting was cancelled.

In 1994, some recovery was reported but still some Scottish Estates have not shot grouse for the second successive season. The economic impact on Estate income is serious, and this fact has again raised the hopes of some owners that perhaps modern technology would permit some form of re-introduction, hitherto unsuccessful.

An etching by Tim Greenwood of Red Grouse available through WPA

In his article published in Grouse News No 1, Ian Valentine listed the golden rules governing re-introduction experiments, as produced by IUCN. None of these have changed, but there is a need for further work in this area.

For five years or so, we have supplied a well known Perthshire Estate with between 1000 - 2000, 7 week old Grey Partridges, which have been released in small groups on the heather fringe. These have substituted Red Grouse for the Estate's American visitors with great success. Bags of 40 to 60 brace are the norm.

Consider this scenario. If the surviving population of Grey Partridges which should nest in the area of release were used as foster parents, we may have a possible method of re-introduction. This would not be dissimilar to the method used 150 years ago, when Scandinavian eggs of the Capercaillie were brooded under Black grouse in Scotland, and thereby successfully re-introduced.

The task of the Estate owner would be, under these circumstances, to locate the nests. The task of the captive breeder would be to deliver to the Estate fertile Red Grouse eggs - to order - in a portable incubator. This approach may appear naive or over-simplistic but it goes without saying that such a programme could only be envisaged with excellent keepering.

However, I believe that in recent years we have made such progress as to remove the word 'NEVER' from the concept of Red Grouse re-introduction.

An excellent paper on captive breeding and re-introduction is available from Dr Julie Trenholm, c/o the Economics Department, Scottish Agricultural College, 881 King Street, Aberdeen (cost £10 plus postage and packing).

Fenton Barns, North Berwick, East Lothian EH39 5BW, Scotland

BIRDS IN TROUBLE FROM THE TREES

Michael Wigan

Reproduced with the kind permission of Mr Michael Wigan from the Weekend Telegraph

Another bad grouse season means more forestry - with serious implications for the Scotland uplands.

Two weeks into the season, the Scotish grouse moors are again deathly quiet. It is the third year in a row that many moors have remained unshot. But while the tweedy lairds in their turrets glumly count the cost of yet another season without any revenue, others will be rubbing their hands with glee.

The people who stand to gain are the forestry companies which are hunting for land at affordable prices, on which to plant conifers. For them, bad grouse seasons are good news - and that has serious implications, both economic and ecological, for the Scottish uplands.

Dr Peter Hudson of the Game Conservancy's Grouse Research Project is particularly alarmed by the fact that the grouse slump has coincided with a significant shift in Government policy on tree-planting. Last month, in the first statement on forestry grants since the Budget changes of 1988, the Government swung financial incentives away from small-scale native woodland schemes back towards large-scale conifer planting. This will significantly affect the Scottish uplands, where more than 95 per cent of British conifer planting took place in the past three years.

All new conifer plantings, regardless of size, now attract grants of £700 per hectare, replacing old rates which were higher for small areas but only £615 per hectare for areas over 10 hectares. The Government's stated aim is to increase the amount of new planting.

This appals Dr Hudson. Conifer plantings in the uplands reduce the habitat available for rare, ground-nesting birds (of which Britain has a large percentage of the European population), eradicate grouse moors and make grouse moor management more difficult because of the boom in foxes and other vermin in forestry. Conifers also lead to the acidification of upper catchments for fisheries, limiting the range of salmon and sea trout.

For the moment, however, the threat of more plantations remains on the horizon. The immediate problem is the shortage of grouse. Although some key grouse areas - Perthshire, Deeside, Angus - have had a reasonably good nesting in 1994, managers on many of the moors feel that the stock is too feeble to permit shooting.

Some East Grampians estates are in an unprecedented trough which has persisted for six years. In the Scottish Borders the breeding has also been satisfactory but shooting seasons of around 35 days are being cut by half. Revenue is yet again reduced, while the costs of gamekeeping - wages, vehicles, housing, sporting rates (due for abolition in 1995) - have to be met.

A typical example is the 7,000-acre estate of Remony in Perthshire. James Duncan Miller, the owner, has cancelled shooting and lost more than £24000 in shooting rent. With an earlier average bag of 450 brace, worth £55 per brace in rent, the hole in his estate accounts is critical.

This year, luckily, a woodland crop of sage and timber sales will help counter grouse losses and pay the gamekeeper's wage. Next year there will be no fallback. For a family estate of this sort on which the owner relies for a living, the consequences of another poor year would be disastrous.

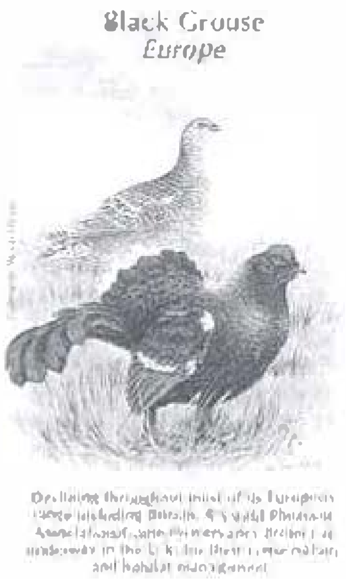
The reasons for long-term grouse decline are not properly understood. The reduced area of moorland, corresponding with the increased afforestation and improved sheep grazing, is one factor. Another may be the impact of protected raptors, which prey on grouse; this is being currently studied by a consortium of bodies at the Duke of Buccleuch's moors, at Langholm in Dumfriesshire.

When populations get very low, the Game Conservancy has identified a 'predator trap', which the continued predation by raptors threatens to push stock below recovery levels. The Langholm-based researchers will report in a year.

The Black Grouse provides the most alarming example of population shrinkage. In the Black Grouse heartland of north Perthshire the Royal Society for the Protection of Birds describes the population decline, in only three years, as 'massive'. In most places there has been a moratorium on shooting both Black Grouse and Capercaillie, for some time. "Shooting is unlikely to have had much, if anything to do with the population decline," says RSPB officer David Mitchell. "It could be the result of several breeding seasons with bad weather at a critical time. Too little is known about the population dynamics."

In the case of Capercaillie, this year's successful breeding on the RSPB's estate at Abernethy is the first since the estate changed hands in 1988. This may be connected to the decision to start fox control. Present day thinking on Capercaillie is that with their potential lifespan of over 20 years, successful breeding every year is not vital.

Red Grouse, however, live for only three years so three bad breeding seasons in succession means the stock can die off. The only way it could be restored is by immigration from other moors, a chancy business. In north-east Scotland, usually a strong grouse area, there is talk of suspending grouse moor management.



Reproduction of the front of the British Airways Assisting Conservation wallet calender for 1995. Some 25,000 are being distributed.

The consequences of this happening alarms everyone concerned with moorland ecology. Already the two other sources of income for moorland owners are being squeezed. Both the Government organisations, Scottish Heritage and the Red Deer Commission, issued recent policy statements on red deer culling for further reductions in population levels. In the absence of grouse, moorland owners had partially compensated with stalking rents and venison receipts. The smaller the deer population, the more these shrink.

Grouse moors were the high-revenue earners which could, in good years, remedy slack returns in other areas. The Fraser of Allender Institute report of 1991 calculated the value of grouse-shooting tenancies and let days in Scotland at £5.4 million. Around 1,500 jobs are involved in producing the sport and in grouse-related activities.

The alternatives to grouse management do not please ramblers, conservationists or sportsmen. "The grouse shortage," says Simon Fraser, director of the Scottish Landowners' Federation, "constitutes a threat to jobs, land management, and all the conservation benefits that stem from a well-run grouse moor."

BLACK GROUSE MANAGEMENT EVENING

David Baines

Research by the Game Conservancy Trust over the last five years has examined the dietary and breeding requirements of Black Grouse at a range of upland sites

throughout Scotland and northern England. Whilst this research has been conducted, Black Grouse numbers have declined by about 50%.

It is obvious, now that the first phase of the research has been completed, that there is a need to bring together the findings into a comprehensive package in an attempt to restore numbers. The first step towards this goal was accomplished in July, when a special Black Grouse management evening was held in Perthshire. Perthshire remains the stronghold for Black Grouse in Britain, but here too numbers have declined and it was felt fitting that a first meeting was held here.

The meeting, organised by the Game Conservancy Trust in conjunction with the Perthshire Black Grouse Study Group, was held at Dunalastair Estate in Perthshire and hosted by Captain Ian de Salles la Terriere. Habitat loss and degradation is considered to be the main cause of declining numbers and hence field demonstrations of habitat creation and improvement were the focus of the event. Invitations were primarily directed towards land managers whether of sporting estates, commercial forests or farms. Despite rather forbidding looking weather, almost 70 people attended. This alone was a success as only 45 were expected.

Presentations were given on the status of Black Grouse both nationally and regionally, likely causes of the decline, habitat requirements of Black Grouse including issues such as overgrazing of brood habitats and planting of new woodlands as winter feed, hazards of deer fences to grouse and grants available for habitat improvement. Speakers included, not only Fiona Leckie and myself from the Game Conservancy Trust, but also speakers from the Royal Society for the Protection of Birds and Farm Wildlife Advisory Group. In addition, each attendant was given a draft copy of a specially prepared handbook giving guidelines regarding Black Grouse management. A fully fledged edition of this handbook will be available in late-autumn, when it is envisaged that a copy will be sent, free of charge, to all land managers within the British range of Black Grouse.

Favourable comments afterwards would suggest that the meeting was a success. However, in the harsh reality of dawn, the real success of the meeting can only be gauged by the number of land managers who take up our advice and ultimately by improvements in numbers of Black Grouse. The latter may take some time but a start has been made.

The Game Conservancy, Crabenmore Lodge, Newton Moor, Inverness-shire.

CAIRNGORM CONSERVATION POLICY

Tim Lovel

In England and Wales we have had National Parks for 30 years. But in Scotland there has been nothing comparable until now, when a Cairngorms Natural Heritage Area has been designated. The role of the Cairngorms Partnership Board will be to conserve these mountain areas, manage the visitors - it is the main ski-area in Scotland - and plant two new forests. The area is important also for Ptarmigan on the mountain tops, Red Grouse on the uplands, and particularly for Capercaillie in the surviving Caledonian forest fragments, as well as for waders such as Dotterel *Charadrius morinellus*.

The Board has not yet started its work, but has already been cursed for having insufficient power to be effective and for being too dependent on the goodwill of the landowners!

OBITUARY

THE EARL OF CARLISLE

It is with the greatest sadness that we report the sudden death of the 12th Earl of Carlisle at the age of 71.

Lord Carlisle wrote a short article about Blackgame in North Cumbria for our last Newsletter, no. 7. He was hoping to find suitable habitat for the re-introduction of Blackgame in that area.

I wish I had met him personally, but we talked frequently on the telephone and corresponded. He was always informative and amusing.

Lord Carlisle lost a leg while serving his country during the Second World War where he won the Military Cross for extremely courageous actions.

He was a brave man and a devoted conservationist.

Ed.

PROFESSOR DAVID JENKINS DSc, FRSE

Tim Lovel

Very soon after our foundation it was agreed by the WPA Council that we needed expert scientific advice. A Scientific Advisory Committee was therefore formed, and as its head as Chairman, we were fortunate to acquire David Jenkins. Ever since then he has been our chief scientific adviser, and every project put forward has run the gauntlet of his formidable experience and critical intellect. As Editor of innumerable publications he has literally applied the highest scientific tests, with the typescripts returning to their authors again and again, running with red ink, until David was satisfied.

In his time he has infuriated all of us with his astringent criticism, not usually softened to please the recipient unduly! A supply of asbestos paper for him was once humorously proposed, and when one luckless correspondent complained about the directness of a critical letter from David, he was advised to frame it and hang it on the wall as the nicest thing to a compliment that Professor Jenkins had ever issued!

But he has been good for us, a professional among amateurs, and a critic among enthusiasts. We owe him a great debt, now that he has retired as Chairman of SAC, in order to concentrate on being the Editor of the WPA Annual Review, we thank him warmly for all his work. We are fortunate that he will still be with us to exert all his experience on our behalf.

His successor as SAC Chairman has not yet been chosen, for the time being Dr Peter Carson will be acting as Chairman.

Tim Lovel presenting David Jenkins with a decanter from WPA. Photo: Keith Howman

IUCN/SSC GROUSE SPECIALIST GROUP

Minutes of First Meeting on 16th to 17th July 1994

Present: Dr Tim Lovel, Chairman
Dr Ilse Storch
Dr Jon Swenson
Dr David Baines
Dr Philip McGowan

1. The Chairman welcomed members of the Group to the First Meeting and presented the format of the work to be done which was agreed.

2. Conservation Assessment and Management Plan (CAMP)

PMcG introduced this subject, and outlined how similar workshops have proceeded in dealing with other gamebird species. He stressed that captive breeding had been a strong emphasis because of the importance placed upon it by the Captive Breeding Specialist Group (CBSG) which is largely funded by North American Zoos. WPA however, favoured conservation assessment and therefore aimed first at field biologists and habitat managers rather than captive breeding.

IS asked how the Specialist Group are linked to other Groups and to IUCN and enquired how the database would be handled. PMcG explained the structure of the Groups (which have parentage jointly from IUCN, SSC and WPA) and how the databases of WPA would be computerised.

TL emphasised the autonomy which each Group has and that it has authority to approve projects, produce conservation assessment and management reports, publications, organise symposia etc, PMcG confirmed that the guidelines laid down by SSC allow flexibility for Specialist Groups to set their own objectives.

JS remarked that literature searches for old world and new world grouse have been published and are available to us and there is also the USSR Red Data Book available.

IS said that Conservation Management Plans were not always capable of scientific evaluation but TL felt that they should be. Much conservation had in the past been condemned by scientists as being poorly designed, badly executed and even more poorly evaluated. IS asked what was to be done with all the data collected and to what detail they should be acquired. PMcG said that the

data would allow us to assign IUCN threat categories (which superseded the Mace-Landie criteria) to each species or sub-species. It would allow us to produce projected rates of decline, and quantitative analysis on population genetics and on demography. A threatened species was believed to be one where there was a 20% chance of extinction in 100 years. We would also need to compile projected rates of habitat loss and the geographical extent of the current range of the species.

JS reiterated that what we needed first was a perspective of the existing knowledge of each species, sub species and national population and their ranges with maps. We would look first at the summaries of what is already known and collate these. Only then could we send questionnaires to national "experts" and invite them to cascade the questionnaires to others, possibly unknown to us, who would have scientific data, references or opinions that would be of value.

The return of the questionnaires should supply us with new information and also correct old information that is by now out of date or erroneous. He said that we need to know population size in orders of magnitude, their legal status, the population trends and the sources for statements given, distribution maps, habitat information with evidence of recent fragmentation, whether artificial or natural, degradation and loss and trends of habitat together with present and potential threats to the habitat. Only then could we derive the IUCN status for each population of bird under consideration.

The following was suggested as authorities on population and distribution:

North American Birds for Blue Spruce, White Tail Ptarmigan and Plumbed Grouse - The USA Fish and Wildlife Service, Literary Review Series which emphasis Habitat.
The Population Habitat Assessment on Attwater's Prairie Chicken published this year by Dr U Seal.
European Union status of Grouse reports with the European United by Ellison, Klaus, Francesch and Menoni.
Finland, Norway and Sweden have each produced bird atlases with trends of populations.
Eastern Russia - Red Data List and work from Potapov and from Tim Stanislaski.
Britain - the Bird Atlas published by the British Trust for Ornithology, second edition, has been published by Poyser.

National Experts:

It was agreed that we should look first at what gaps exist and then we should

identify and write to national experts particularly to find out whether they agree with the published authorities.

Headings for the Questionnaire were agreed as follows:

Status and threats to Grouse Population
Name of Correspondent:
Address:
Species:
Sub species:
Legal Status: Hunted/Not Hunted/Regulation of Hunting/Limited bags/
Sexes shot/Seasons for Hunting/Red Data List?/Endangered Category.
Population Size: Source and reliability
Population Trends: Time period and sources
Geographic Distribution:)
Distribution Trends:) Maps welcome as large scale as possible
Rate of Change:)
Suggestions on habitat status (IUCN Categories):
Suggestions on habitat threats and opportunities:
Responsible bodies for Conservation:
Who is active in research or conservation in your country;
What research needs exist:
What funds are available
What publications have recently been made.
Reprints and photocopies of recent work would be welcome

3. Membership of the Grouse Specialist Group

It was agreed that it was necessary to keep the group small in order to make best use of scarce financial resources and that therefore, although it would be desirable to have at least one North American member, at present the membership of the group would be kept unchanged.

5. Publication of Activities

It was agreed that Grouse News would be the direct vehicle for publication of the Group's activities and that normally all items minuted could be reported by the Editor if she considered them of sufficient interest. Only if matters were considered confidential by the Members of the Group would they not be published.

6. Seventh International Grouse Symposium, Fort Collins, Colorado 1996

The action taken so far in accepting the invitation from Dr Clait Braun to Fort Collins in August 1996 was agreed although DB felt that for many Grouse workers August was too busy a month in the field for them to be able to spare time. The Group agreed that this should be discussed with Dr Braun further.

It was agreed that Dr Braun and Dr Cathy Martin should be invited to be joint convenors of the Symposium and to take part in the Scientific Planning as well as the domestic arrangements. The group felt that there should be no over all theme for the Conference since papers could only be received when work had actually been done. The first call for papers should be an open one and then we should derive themes from what papers had been submitted.

Workshop Topics and Session Topics were suggested as follows:-

- Predation
- Hunting
- Conservation plans and priorities of the specialist group for different species
- Translocation and reintroduction techniques, objectives and outcomes
- Habitat management
- Regulation of Grouse populations
- Taxonomy
- Behavioural Ecology

Timing of the Symposium - it was felt that the Symposium should run over a weekend and that perhaps Thursday and Friday would be good for working days with an excursion over the weekend and Monday and perhaps Tuesday for the final two day session.

Workshops - it was agreed that these should have goals and should lead to a result eg. when are translocation or re-introduction experiments justified? A workshop with no structure and no outcome was felt to be less useful.

Posters — it was agreed that posters were valuable but that should not be all important. Poster sessions should allow each person showing a poster to speak to it for five minutes showing a few key slides. A fierce Chairman would be required to prevent the giving of a complete paper. This would allow participants to say that they were giving oral presentations and therefore help with their travel grants.

8. Future Meetings

Date of next meeting to be decided later, probably in the Summer of 1995.

GROUSE SNIPPETS

We were delighted last month, to receive a letter from our President Prof Tso-hsin Cheng and his wife Lydia. Prof Cheng writes:

"Sun Yue-hua has recently returned to Beijing. He came to see me and spoke highly of your kindness in making possible his unexpected visit to England. He has been much inspired by your encouragement and advice. He has recently been given a grant of 75000 Chinese dollars (by the China National Science and Technology Foundation) which will enable him to continue his work on grouse for three more years. Outside of Sun, most of the grouse workers are quite aged and will soon retire. We need to cultivate younger field workers on grouse, especially along the Altai range in Xinjiang Autonomous Region. It will be of much interest to make comparisons of Xinjiang species and grouse of the Amur-Region.

(There followed a couple of paragraphs of kind flattering things about Tim and then continued)

I am sending under separate cover, copy of 'Checklist of Species and Subspecies of Chinese Birds', which may be of interest to you. As for myself, I have been working almost full-time in the morning but not so regularly in the afternoon. I've found the Ginseng pills to be particularly effective in keeping my heartbeat in good order....."

Prof Tso-hsin and Lydia Cheng

RETURNED PURSE

Some of you may remember that Ilse Storch's purse was stolen at the last Grouse Symposium held in Italy during September 1993. Ilse tells me that the purse was returned in December minus the Italian and German money but with the Austrian money intact. Were the thieves trying to tell us something about the Austrian Schilling?

SUN YUEHUA

The meeting in Vienna of the International Ornithological Congress brought together scientists from all over the world. Among them was Sun Yue-hua, known to many of us for his presentation of work on the Chinese Hazel Grouse at Udine last year. While in Europe he took the opportunity to visit Norway and Sweden, hosted and escorted by Dr Jon Swenson.

Sun Yue-hua

He then enjoyed a WPA travelling bursary to visit Britain, studying working methods of grouse research with Dr David Baines at the Game Conservancy's study area in Scotland, and also visiting WPA headquarters, the great pheasant collections of Michel Klat and Keith Howman and, escorted by Tom Gardiner, examining grouse skins at the Natural History Museum in Tring and visiting BirdLife International and the Ornithological Club in Cambridge.

We were delighted to welcome him to our home in County Durham even though when he came thick fog preceded by torrential rain made all our local moorland and its birds invisible!

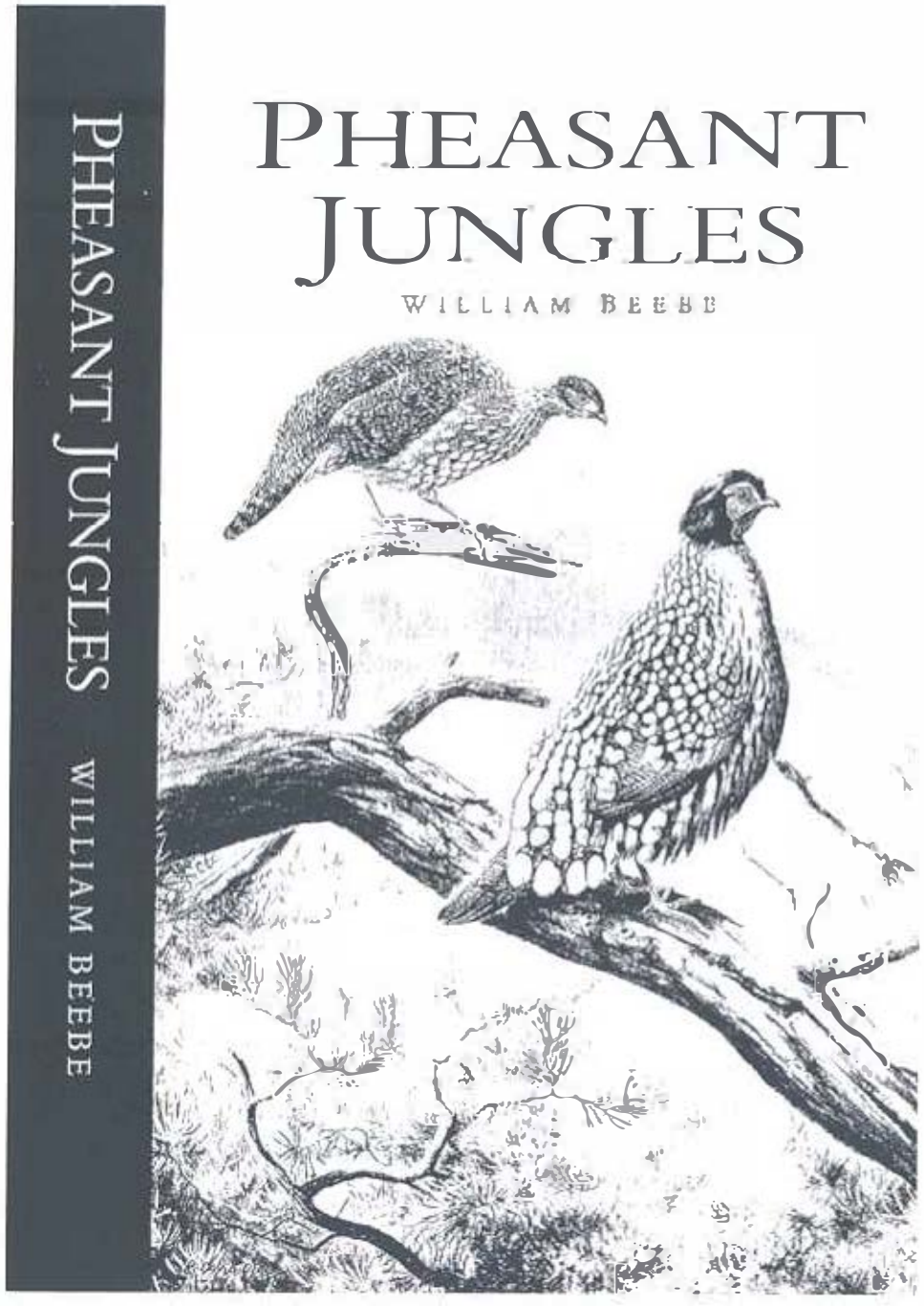
TOR SPIDSO

Tor Spidso writes to say that he has moved from Asto to Steinkjer which is situated 120km north of Trondheim.

We offer our warmest congratulations to Tor who has been appointed Associate Professor in Steinkjer in the Department of Applied Environmental Sciences. His appointment entails part-time teaching of students and the rest of the time for research. His new address is: Nord-Trondelag College, Department of Applied Environmental Studies, N-7700 Steinkjer, Norway.

TRAGOPAN

The first issue of "Tragopan" has been received. It is the publication of the Pheasant Specialist Group which like the Grouse Specialist Group shares WPA, the Species Survival Commission and BirdLife International as its joint parents. Dr Peter Garson is the Chairman of this group and editor of the newsletter.



PHEASANT JUNGLES

Pheasant Jungles is a selection of Beebe's pheasant-tracking memoirs and experiences during a seventeen month pheasant hunting trip. Capturing the excitement of the solitary pursuit of these scarce and secretive birds, it also offers insight into the (sometimes dangerous) experience of Asian travel at a time when wild places remained largely untouched by the ravages of development. The characters' hunters, trackers, porters, cooks and servants he met along the way receive lively attention and his musings during long days alone in the field are candidly revealed.

Whilst the text of this reprint is identical in format to the original it is supplemented by Ron Digby's lovely printing of Cabot's Tragopan as a cover plate and eight stunning new pheasant paintings by Timothy Greenwood.

The standard edition of this book costs £19.95 plus £1.50 postage & packing in the U.K. and $30.00 plus $7.00 postage & packing overseas (except in North America).

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GROUSE NEWS

WORLD PHEASANT ASSOCIATION

No 9

JUNE 1995

GROUSE NEWS NO. 9

Editor: Diana Lovel

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FORTHCOMING EVENTS

1995	
28-30 July	CLA Game Fair, Harewood House, Leeds
23 Sept	WPA Annual Convention, Harewood, Leeds
1996	
20-25 Aug	7th International Grouse Symposium, Fort Collins, USA

From cover: *Capercaillie display by Dr Fabio Perco*

Produced by: The World Pheasant Association
P O Box 5, Lower Basildon
Reading, Berks RG8 9PF, England

Registered Charity No 271203

Editorial

Diana Lovel

I enjoy hearing from so many of you. Please continue to write and give us your news both at work and at play! It would be interesting to hear of future work projects also. It is your newsletter. To quote Jim Bendell from the suggestions part of the subscription form "Get people to describe project, define needs, pose questions and seek answers".

Jim has promised a paper for the next edition of Grouse News. It is quite difficult to fill sixteen pages so please send me your contributions, if possible by the end of September for the December edition.

As you will read further on in Grouse News, Matt Ridley has taken over the chair of the Grouse Specialist Group from Tim. We are so lucky to have Matt as chairman and he is already working very hard and efficiently on the group's behalf. Thank you Matt.

The World Pheasant Association celebrates the 20th anniversary of its foundation this year and its council is planning to mark the anniversary at the Game Fair, July 28th-30th, which will be held in the lovely grounds of the Earl of Harewood, one of our Patrons.

In September we return to Harewood House on the actual anniversary day where the Earl of Harewood is hosting a fundraising banquet in the magnificent State Dining Room for WPA members, guests and supporters.

Review - Management of Forests for Capercaillie in Scotland

Forestry Commission Bulletin 113 *by R Mossurd N Picozzi*

Both the range and numbers of capercaillie in Scotland are less than in the 1970s. This publication examines the possible reasons for this decline and makes recommendations for the management of forests for capercaillie.

The association between capercaillie and old semi-natural Scots Pine forests is well known and the authors suggest that this is due more to the open nature of such forests, which encourages the growth of heather and blaeberry, than to the species of trees found in them. Guidelines are given for encouraging the growth of blaeberry and the bulletin also covers such topics as the impact on capercaillie populations of changing climate, predators, red deer and human activities. The publication is available from WPA HQ priced £6 plus £2 postage and packing.

Grouse Specialist Group

Matt Ridley

I have recently taken over the chair of the Grouse specialist group from Tim Lovel, who did so much to get it underway but has found himself under increasing pressure of work. Tim remains a member of the group, I am glad to say. Anne Westerberg, who did her PhD on black grouse at Newcastle University, has also joined as secretary of the group.

We plan to prepare conservation plans for the grouse of the world, encourage and assist projects on threatened grouse species, and in particular, coordinate the next grouse symposium in Colorado in 1996. Under the chairmanship of Dr Clait Braun of the Colorado Division of Wildlife and Dr Kathy Martin of British Colombia, this meeting will be held in Fort Collins, Colorado from 20-25 August 1996. There will be two days of meetings and two of field excursions on which we will see five species of grouse. Please mark the date in your diary; further details will be available soon. We hope to be able to raise some sponsorship money to help people attend the conference from Eastern Europe.

Matt Ridley - Grouse Specialist Group Chairman

Matt Ridley received a DPhil from the University of Oxford in 1983 for studies of the evolution of polygamy in pheasants. He also worked on a number of wildlife conservation projects in India, Pakistan and the Arctic. He then joined the Economist as a science correspondent, and worked for the magazine for eight years as science editor, Washington correspondent and American editor. He is now a newspaper columnist (Sunday Telegraph), freelance writer and businessman. He lives near Newcastle upon Tyne.

He is the author of two books *Wars and All* (1989) and *The Red Queen* (1993); a third book *The Origins of Virtue* will be published in 1996.

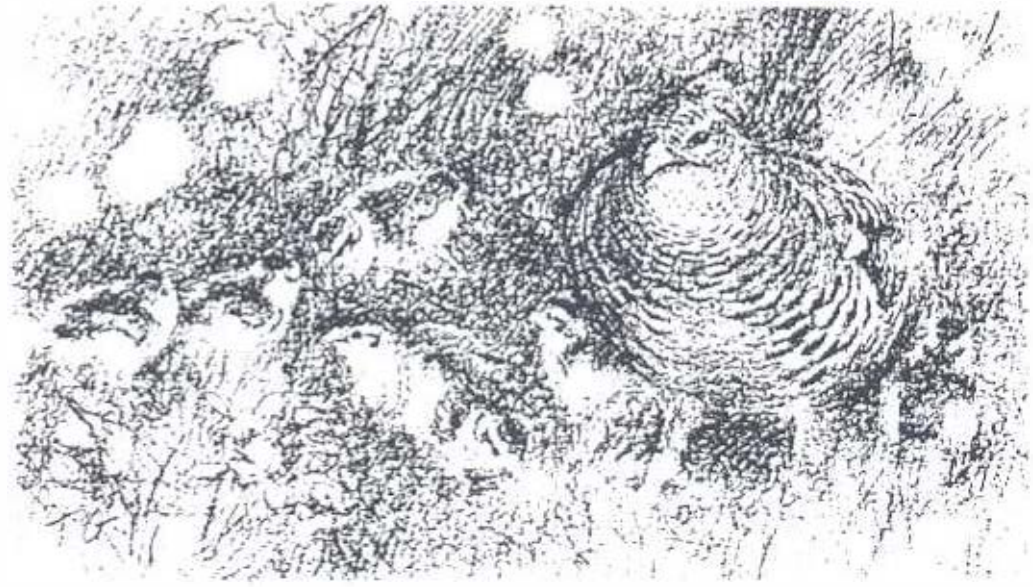
He is married to a lecturer at the University of Newcastle and has one son.

Forest ditches - pitfalls for young grouse chicks?

Arto Marjakangas

Many European grouse populations have drastically declined, and some have died out, during this century. Declining grouse numbers have been reported even in Fennoscandia, where populations are still considered 'healthy'. In Finland, for instance, the numbers of capercaillie and black grouse have dropped by about half during the last 50 years. A major explanation for the decline of our forest grouse is the change in the extent and quality of important habitats. In particular, changes in tree species composition, age structure and fragment size, caused by modern forestry, have been discussed.

While looking at the human impact on tree stand and fragmentation, researchers have focused less attention on what has happened on the forest floor. To increase wood production, intensive forest draining was started in Finland in the beginning of the 1905s. Areas drained annually were highest, about 300 000 hectares, during the late 1960s, and then started to decline. Now more than half of the total bog area (about 9 million hectares) has been drained for forestry. Thus, most of the bogs have considerably changed in appearance (Fig. 1).



Grey hen and chicks *Sketch by T J Greenwood*

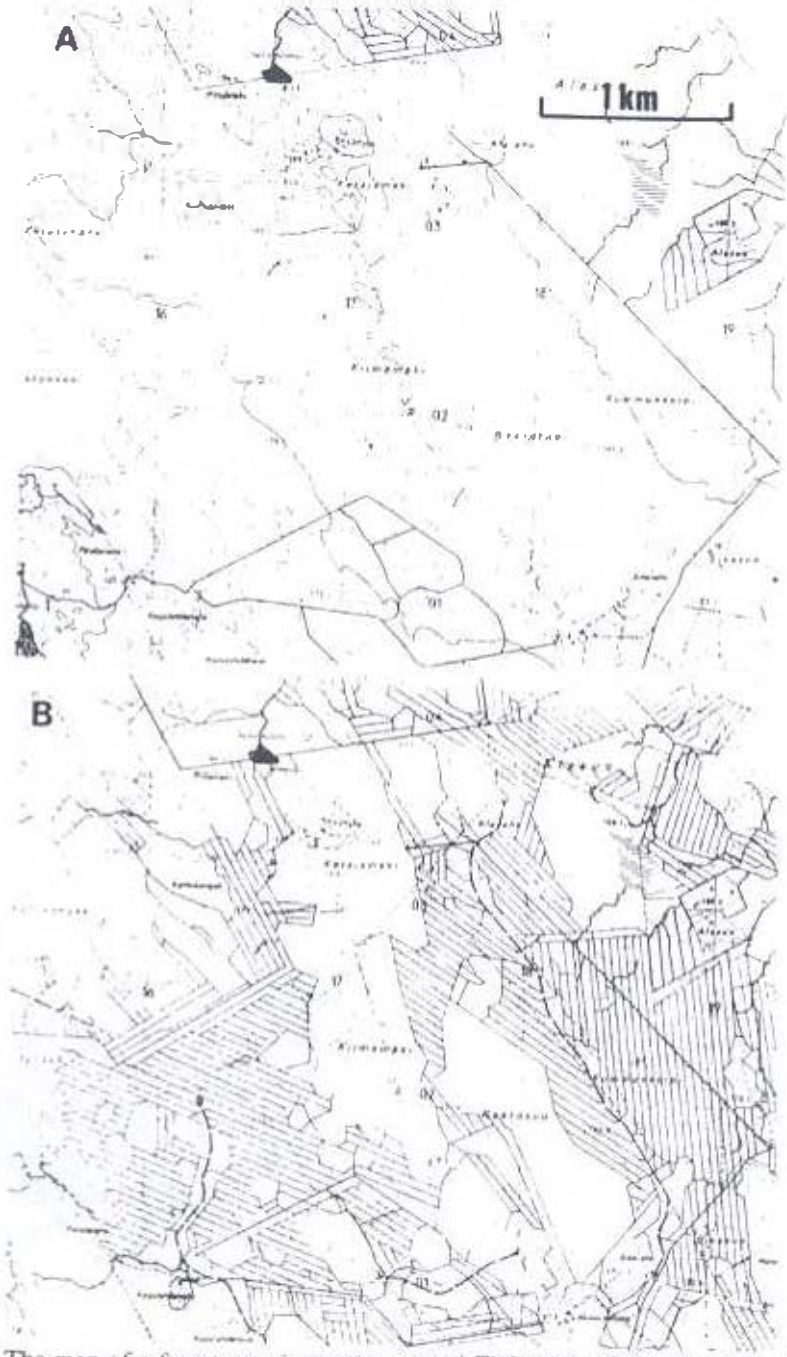


Fig 1. The map of a forest area in eastern central Finland in 1966 (A) and in 1988 (B). Forest ditches (straight solid lines) are now a striking feature of the landscape.

Draining mainly involved pine bogs and spruce-hardwood swamps which are important breeding habitats for our forest grouse, especially black grouse, capercaillie and willow ptarmigan. Intuitively, one may list a number of effects of draining on grouse, especially on chicks. The density and height of some dwarf shrubs, such as dwarf birch *Betula nana*, often increase considerably. Consequently, small chicks may have difficulties moving and in rainy weather they may easily get wet. Typical bog plants are often also replaced by others, such as heather *Calluna vulgaris*. Draining and subsequent changes in field layer vegetation may decrease the amount of invertebrate food available for chicks. Thermal conditions are also affected during clear summer nights, ambient temperature on drained bogs falls lower than on similar intact bogs. Draining, together with fertilisation, improve the growth of the trees, and hence a semi-open bog will gradually change to a forest.

However, before any of the indirect changes listed above start to influence, young grouse chicks should cope with something to which they have not adapted, i.e. the ditches. They are usually ploughed 25-40 m apart (Fig. 1), mostly more than one metre deep, with steep slopes, and contain water in June when the chicks hatch. Thus there is hardly any doubt that ditches constitute a severe risk for young chicks unable to fly. They may drown, and I have my own observations about this. Once two black grouse chicks hatched in a nest close to a ditch were found dead in the water. This was in 1990, when 30% of the nests of our radio-tagged black grouse females (see Grouse News 3) were located on drained pine bogs. In 1991, eight chicks hatched from a nest, and on the next day the female was flushed (by accident) 80 m away. The brood had crossed a ditch full of water, and there was only one chick left. Once I flushed a pair of willow ptarmigan with newly hatched chicks. Some of them rushed into an adjacent ditch, one was able to swim and climb up, but the others had to be helped up. In a case like this, even though a chick would be able to climb up from the water, it could die of chilling after getting wet.

These are only specific observations, however, and much more data is needed. As a first step, we are going to compare the survival of black grouse broods from nests on drained and undrained bogs. There is also a need for an experimental study using broods bred in captivity. I am not saying that forest draining would be the only or even the main factor explaining the declining grouse numbers. Yet studies on this topic might help us to understand better the impact of man on grouse populations.

Department of Ecology, University of Oulu, POB 333, FIN-90571 Oulu, Finland

Diet of Hazel grouse and diet intake in captivity

Y Fujimaki

The diet intake of hazel grouse adults was investigated in captivity in 1988 and from 1991 to 1993. During the study birds were kept under temperature similar to natural conditions, average temperature from -10.8 to -6.1°C in February and from 18.2 to 19.5°C in August. Birds were fed on a mixture of commercial poultry rations and pet food with a supplement of fish meal from April to September. In addition, fibrous diets *Taraxacum officinale* or *Rumex obtusifolius* from April to October and cabbage from November to March were supplied.

The mean (±SD) intake of diets in dry weight ranged from 17.0 ± 2.2 to 20.9 ± 2.7 g/bird/day for males and from 12.0 ± 3.4 to 20.6 ± 2.6 g/bird/day for females. The energy intake estimated based on diet intake and gross energy in diets ranged from 310.4 ± 41.2 to 366.7 ± 47.9 kJ/bird/day for males and from 220.7 ± 63.3 to 379.2 ± 48.6 kJ/bird/day for females. On average, both diet and energy intake increased in winters and decreased in summers except for females in May and June. The increased energy intake of females in May might be related to the increased requirements for egg laying, and the decrease in June to egg incubation.

The mean body weight changed seasonally in both sexes, ranging from 344 ± 7 g in May to 383 ± 9 g in January for males and from 356 ± 20 g in June to 412 ± 31 g in May for females. The body weight of females was similar to that of wild birds killed in winter, 382 ± 24 g (n=10). On the other hand, the body weight of captive males was significantly less than that of wild birds killed in winter, 401 ± 21 g (n=11). When 80% of given diet was eaten by birds, the amount of food given per bird per day (in wet weight) is 42g of mixed diets and 30g of *Taraxacum officinale* from April to October and 48g of mixed diets and 10g of cabbage from November to March.

Black-breasted hazel grouse sketch by Paul Johnsgard from The Grouse of the World

Laboratory of Wildlife Ecology, Obihiro University of Agriculture and Veterinary Medicine, Inada, Obihiro 080, Japan

Capercaillie decline and air pollution

Siegfried Klaus

Summary of poster presentation (XXI International Ornithological Congress, Vienna)

The capercaillie *Tetrao urogallus* is dramatically declining in Central Europe. In the complex of negative factors (habitat loss, predation, human disturbance) air pollution is often discussed, but studies of possible influences are scarce. In pine forests of the reserve Ohlsträcher Heide (Thuringia) capercaillie decline was compared with long-term effects of air-borne pollution caused by an iron factory.

In this long-term study (1956-1994), emission-caused changes of forest health and ground vegetation were analyzed and compared with the capercaillie numbers. Ericaceae delivering food and cover, especially *Vaccinium myrtillus*, play an important role for capercaillie. Their replacement by grass and nitrogen-dependent forbs diminishes habitat quality. In addition, this effect of eutrophication is assumed to enhance also the predation risk of capercaillie, because the density of small rodents and - as a consequence - the density of fox, wild boar and marten increases.

The study area

The reserve involves secondary pine forests of the Thuringian Saale-Sandstone-Plateau near Saalfeld (eastern Germany). The area is characterized by the following parameters: altitude 400-450 m asl, mean temperature of the year 7-8°C, precipitation 600-700 mm per year, natural vegetation *Luzulo -Fagetum*; today dominance of pine *Pinus sylvestris* mixed with spruce *Picea abies* and beech *Fagus sylvatica*, soil types podsol, brown soil or podsol-gley.

The iron and steel factory Maxhütte Unterwellenborn was established about 100 years ago, SW of the study area. The maximum level of emissions was recorded in the 1970s. This resulted in a soil pH gradient between 5.8 in the vicinity of the factory and 2.7 (measured in H_2O) 10 km away from the pollution source.

Ground vegetation was studied from 1956, capercaillie numbers and reproduction were recorded from 1970. More complex analysis of soil microbiology, mycorrhiza frequency and species composition of fungi was started in 1990.

Main results

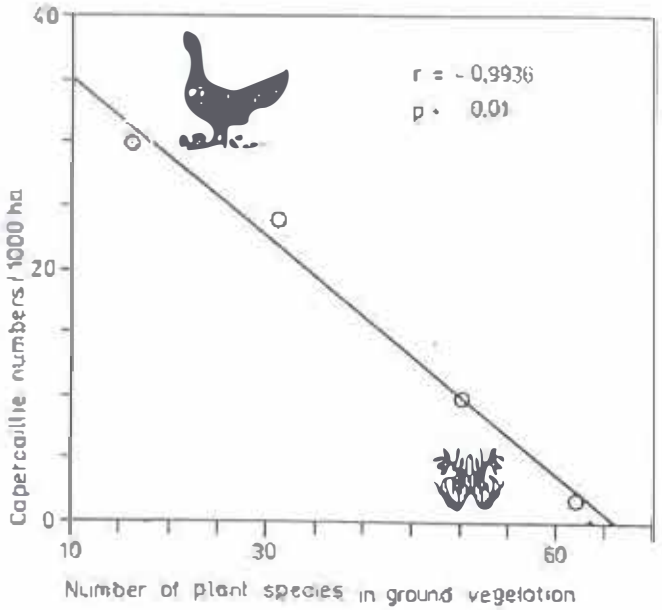
1. Long-term emissions of calcium-containing dusts from the iron factory influenced soil-pH, eutrophication, pine-dependent mycorrhiza, numbers of soil actinomycetes

and forest health in the study area.

2. Dramatic changes of the ground vegetation were observed in time (method of BRAUN-BLANQUET used at the same plots in 1956, 1965, 1983 and 1992/93) and along the pH-gradient: near to the continent the mean number of plant species have increases since 1956 from 15 to 65. Ericaceae *Vaccinium myrtillus, V. vitis-idea, Calluna vulgaris* essential to capercaillie as food and cover were replaced by *Senecio fuchsii, Digitalis purpuea, Dactylis glomerata, Calamagrostis epigeios, Galium rotundifolium, G. aparine, Agrostis div.spec., Urtica dioica, Rubus div. spec.* etc.

3. The decline of capercaillie was correlated with these eutrophical effects of the emission (as measured by the increase of plant species diversity).

4. Increasing plant species diversity may favour also small rodents and thereby predator density (fox, marten) as indicated by the increasing hunting bag. Therefore, enhanced predation on capercaillie nests, chicks and adults, as observed in the study area, could be a secondary effect on air-borne pollution.



Thüringer Landesanstalt für Umwelt, Prüssingstr. 25, D-07745 Jena & Joachim Huhn, Bad Klosterlausnitz, Thüringen.

Status and protection of Capercaillie in Estonia

Ene Viht and Tor K Spidsø

The Republic of Estonia is a small country on the Baltic coast with an area of 47549 km2, of which 2000 km2 is still occupied by Russia. The mean elevation of the county is 50 m, and the highest point is 318 m. At present agricultural land constitutes 32.5% of the land area, forests 40.1% and fens, bogs and swamps 21.5%. The forest is a mixture of coniferous and deciduous forest. According to the vegetational characteristics, Estonia is located in the northern part of the mixed conifer-hardwood forest, and represents the west-Eurasian taiga and the boreo-nemoral zone.

The capercaillie is mainly located on the mainland of Estonia. Only a few birds are found on Hiiumaa, one of the big islands on the west coast. Large areas of natural landscape dominated by forest intermixed with bogs is the habitat where capercaillie are most commonly found. The most preferred habitats are old pine forests surrounded by bogs. The pine forest in these areas is 80 years old or older, and mostly situated on poor soil. Also the areas are little disturbed by people. In these big natural landscapes covering 1/3 of Estonia, about 70% of all capercaillie leks are situated.

The spring population of capercaillie in Estonia is at present 4500-5000 birds. The autumn population has fluctuated during the years 1978-1994. Throughout this period, the August population of capercaillie has been estimated to 1.4-3.9 birds km^{-2} of forest land, with a mean of 2.4 km^{-2}.

As in most of its range including Scandinavia, the capercaillie population in Estonia has declined. The long-term decline in the number of capercaillie started at the turn of the century. From 1939 to 1985 the population declined to 50% of the 1939 level. After 1985 the population of capercaillie has been relatively stable.

The population of capercaillie is not yet at a dangerous low level. However, in organizing the conservation strategies to save capercaillie from declining to very low levels or extinction in Estonia, the principle that there is a greater chance to successfully conserve a species if in viable populations compared to populations close to extinction has been taken into consideration. Therefore different counteractions have been made to try to stop the capercaillie population from further declining to a level that makes the species more vulnerable to extinction.

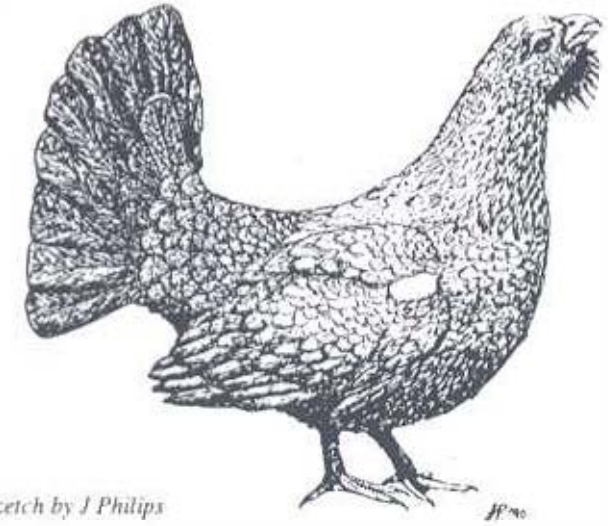
In previous times hunting for capercaillie cocks at the lekking grounds in spring was very popular as in many other countries in Europe including Scandinavia. This hunting for cocks in spring in Estonia has been reduced and reached a very low level in 1980. In Estonia, hunting for capercaillie has always required a special licence.

From 1980 only a very limited number of this special licence was given for capercaillie shooting. In 1990 the hunting for cocks in spring was totally prohibited.

In December 1994 capercaillie were brought under the nature protection laws. In accordance with these laws it is possible to establish reserves to protect habitats important to this species. To protect capercaillie habitats, the display ground has been the basis for the reserves and includes the lek and the surrounding areas within 1 km radius from the lek. All the reserves consist of two different zones where forest management is different. At the lek and adjacent areas suitable for capercaillie to display, clear-cutting is not allowed except necessary removal of certain trees. Scrub and dense understory may be cut to improve the visibility to 30-40 m.

Outside the lek area, but within the distance of 1 km from the lek, forestry is allowed on certain conditions. The basic demand is that logging shall not do any harm to the capercaillie population. Clear-cuttings may be used if they are scattered, relatively small with a maximum size of 0.8 ha, and not wider than 30 m. At least 50-70% of the forest within this area should be 60 years or older, depending to some degree on the number of displaying cocks. Forestry should not have any negative effect on the field layer. Both at the lek and the area within 1 km of the lek, no forestry should occur outside the period from 1 September to 31 January.

Since 1991 Ene Vihi has been responsible for the estimation of the lek population and status of the main capercaillie habitats, and for making suggestions for establishing new reserve areas for the conservation of this species.



Capercaillie sketch by J Philips

Ene Vihi, Metsakatsejaam, Jõgevamaa, EE 2350, Estonia. Tor K Spidsø, NordTrøndelag College, Department of Resource Sciences, PO Box 169, N7701 Steinkjer, Norway.

Studies of the Chinese hazel grouse in Gansu Province, Central China

Siegfried Klaus, Wolfgang Scherzinger and Sun Yue-hua

Encouraged by the experience of Jon Swenson in the last year (see Grouse News), and favoured by the organisational talent of Sun Yue-hua, we visited the Lianhua Shan Provincial Nature Reserve in April 1995 as official guests of the Chinese Academy of Sciences, Beijing. After holding lectures at the Zoological Institutes of Beijing and Lanzhou universities, we arrived at a small station (2800 m a.s.l.) in the centre of the reserve on 8 April, and conducted field work during the next eight days. Some characteristics of the reserve were described by Jon Swenson and Sun Yue-hua and will not be repeated here. While we were there, snow had melted on the southern slopes but the northern slopes were still covered with 60-70 cm of old and fresh snow. The northern slopes were covered with mixed coniferous forests - the main habitat of the Chinese hazel grouse. This snow caused some difficulties in our locomotion and unfortunately, caused a delay in the peak of territorial activity of the hazel grouse this spring. Nevertheless, we made interesting observations, and, for the first time ever, obtained photographs, video recordings and sound recordings.

The main results can be summarised as follows:

1. 18 territories of the Chinese hazel grouse were mapped in an area of 2 km² near the station. Four males were caught, colour handed, measured and equipped with radios. Telemetry will be continued by Sun and his colleague Fang Yun. Our preliminary results seem to indicate the existence of rather small, constant territories with a mean size of about 10 ha.

2. *Bonasa sewerzowi* was found at altitudes between 2700 and 3200 m a.s.l. We did not visit the upper limit of the forest border around 3400 m. About 3000 ha of the mixed conifer forests on the reserve seem to provide adequate habitat for the Chinese hazel grouse. Thus, an isolated metapopulation of 100-300 pairs could live in the forest reserve of Lianhua Shan. There are no habitat connections to other forest islands surrounding the area we visited.

3. It was most surprising to discover that the Chinese hazel grouse has developed its own repertoire of vocalisations in the course of about 1.6 million years of isolation from *B. bonasia* since the Pleistocene. Neither males or females reacted to imitations of the territorial song of males or females of *B. bonasia*. Noisy instrumental sounds

uttered during territorial flights and flutter jumps seem to be the main element of territorial behaviour (Liu and Geng 1994). The rhythm of sound production during the flutter jump is also different from *B. bonasia*. A special call is uttered from males during combat. On the basis of our recordings of this aggressive call, a special whistle will be constructed which will hopefully stimulate male Chinese hazel grouse to react.

5. The optimal habitats of Chinese hazel grouse are characterised by the close vicinity of conifer forests (mainly *Picea crassifolia, Abies zimba*) with a shrub layer of different species (bamboo grass, shrub birch, *Berberis, Lonicera, Rhododendron, Rosa, Viburnum, Crataegus, Spirea, Cotoneaster, Rubus*) providing cover, and groups of deciduous trees (willows, birch, rowan, different shrubs) providing food in winter. Feeding was observed mainly on different willow species (buds and thin twigs) and less frequently on buds of *Rubus, Hippophae rhamnoides, Sorbus, Alnus*). The grouse also used extensive shrub areas in the border of closed forests and meadows up to 70 m from conifers.

6. In order to compare DNA sequences of the three *Bonasa* species, blood samples were taken from three captured cocks.

7. Potential predators of the Chinese hazel grouse in the reserve are fox, wild cat (Zibet cat), goshawk, sparrow hawk and Ural owl. Predation of the grouse by Ural owl and goshawk was actually observed. The exceptional high spring density of this grouse indicates that predation seems not to be a serious problem.

8. An interesting relationship between a phasianid, the blood pheasant *Ithaginis cruentus* and the Chinese grouse, which share the same habitat type, should be followed in the future. The co-evolution of both species could be one possible reason for the development of the very different vocalisation of the Chinese grouse, because the blood pheasant's song is of similar frequency (about 8 kHz) as the territorial song of the Eurasian hazel grouse.

9. For the first time, quantitative parameters of this unique mountain forest relict were obtained by the method developed by J. Swenson for grouse habitats. On 30 sample plots distributed over six different Chinese grouse territories, we counted a mean of 474 ± 327 spruce trees, 301 ± 358 firs, 185 ± 129 birches, 306 ± 197 willows and 13 ± 25 rowans per ha. Dead trees were extremely rare, even in the primary conifer forests, due to illegal timber poaching. Probably because of this, we observed an extreme rarity of woodpeckers in the whole reserve.

The future work of Sun will be concentrated on spacing and habitat use of Chinese grouse using telemetry. Activity patterns, displaying behaviour, breeding biology and mortality will also be documented. As pointed out earlier by Jon Swenson and Sun Yue-hua, the study also should include a landscape ecology aspect, as the habitats of this species are patchy and surely isolated from each other by dry, open grasslands on southern and western slopes and increasing deforested areas separating them. It would be also of interest to test if and when the newly created plantations could support the existence of the Chinese hazel grouse in the future. The international co-operation in hazel grouse research should support the promising work of Sun during the next years. In addition, the very complicated fight of the staff of the reserve to prevent illegal cutting activities in one of the last virgin mountain conifer forests also needs international support. Therefore, this paper should also be addressed to WPA and WWF authorities, because international interest and help is needed to preserve the last Chinese mountain conifer forests with their unique communities of forest birds including phasianids like the blood pheasant, the blue eared-pheasant *Crossoptilon auritum* and the common pheasant sharing the habitat with the Chinese hazel grouse.

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Figure 1. With respect to its main winter food, willow twigs and buds, the Chinese hazel grouse resembles the willow ptarmigan (photo S. Klaus).

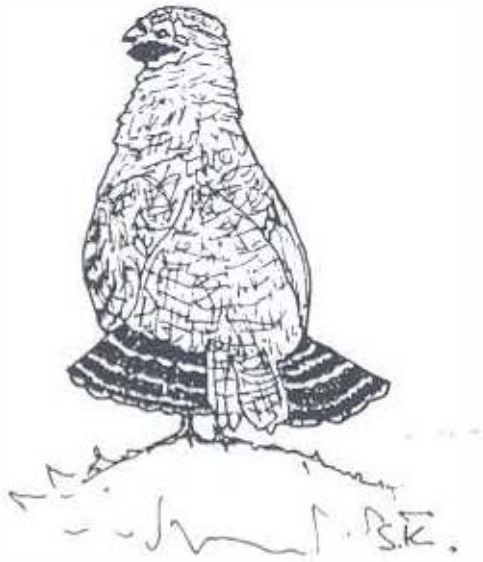

Figure 2. Male Chinese hazel grouse defending his territory (low intensity): neck feathers are ruffled and the black, white-banded tail feathers are spread and folded (drawing S. Klaus).

Figure 3. Typical habitat of the Chinese hazel grouse in the Lianhua Shan Reserve with spruce *Picea crassifolia*, fir *Abies sinba* and different willow species (photo S. Klaus).

Siegfried Klaus, Thüringer Landesanstalt für Umwelt, Prüssingstr. 25, D-07745 Jena & Joachim Huhn, Bad Klosterlausnitz, Thüringen, Germany.

Grouse snippets

Arto Marjakangas who has written an article for this edition of Grouse News tells me that he has finished his fieldwork on the population dynamics of radio-tagged black grouse and now has large and valuable data on nearly 300 individuals to be processed. He is fortunate in having four students making their graduate studies on the data, which means that he does not have to do everything himself!
We offer Arto and his wife our congratulations on the birth of a daughter who is keeping her parents very busy.

• • • • •

Jim and Yvonne Bendell have moved to RR2, Clayton Lanark County, Ontario K0A 1P0.

• • • • •

Captive rearing

Gordon Rowker

As I have recently taken employment with the Game Conservancy as research assistant for the Welsh Grouse Project - a partnership initiative with Countryside Council for Wales, I should make it quite clear that my activities with the captive rearing and release of red grouse are an entirely separate matter at this time, and do not imply any connection with any other body. This is something which I have been personally working on for some years, with the intention of developing techniques which might be required in future years, where landowners have the ability and will to actively manage heather moorland, but where viable breeding stocks of red grouse are absent. I hope to be in a position to supply birds to give the moor a 'kick-start' in regenerating this fascinating species. This year I have 22 hens as my breeding stock, which includes six wild caught captives.

I am not a scientist but am attempting to keep fairly detailed records of these activities, which might be of interest to readers, in order to submit an informal report for the magazine at the end of the season. I hope to detail the level of success in egg laying, hatching, fertility, chick survival, sex ratio of chicks per hen, and later release onto selected moors where some monitoring of later survival can be undertaken.

We have used a halogen floodlight to increase daylight to 16 hours per day - the first egg was laid on the 9th April. To date, 4th May, we have collected 190 eggs. (The 'wild' hens are not laying yet.)

Nddyn Barwn, Llanderfel, Bala, Gwynedd LL23 7RH, UK.

Review of the proceedings of the 6TH INTERNATIONAL GROUSE SYMPOSIUM

Matt Ridley

Over the years WPA's symposia on grouse, organised by Tim Lovel and edited by Lovel, Hudson and latterly by David Jenkins, have come to represent the principal world forum for discussing these birds. The Udine meeting in September 1993 was no exception. The papers in this volume cover studies from Ontario to Sichuan, from Turkey to Norway, and topics range from population dynamics to the effect of cadmium on parental behaviour in willow ptarmigan.

Three species, however, got the lion's share of attention at the meeting: the three European woodland grouse (black grouse, capercaillie and hazel grouse). In some ways the most important papers, therefore, are the summaries by Baines, Storch and Swenson of three workshops, on the habitat requirements of each species in turn. All three are in some kind of general decline throughout Europe for reasons that look all too local and particular on the ground, but are not at all.

That is why a volume like this is so useful. By bringing together the stories of declining black grouse from Danish heaths, Finnish forests and British moors, it emphasises the common themes - the loss of good brood-rearing habitat, namely damp, herb-rich, undergrazed, obstacle-free bogs. Whether it is commercial forestry in Finland or sheep in Britain that is damaging the heather, the problem is essentially similar.

Swenson makes the same point about hazel grouse, arguing that although the habitats and problems of hazel grouse look very different on the ground in different localities, in practice there are common themes. In particular, hazel grouse are birds of secondary forest succession in gaps created by small-scale disturbance to old-growth forest.

International meetings are not just enjoyable excursions for the participants. They are also places where common themes emerge to the vital assistance of science and conservation. There is much valuable information in this superb volume.

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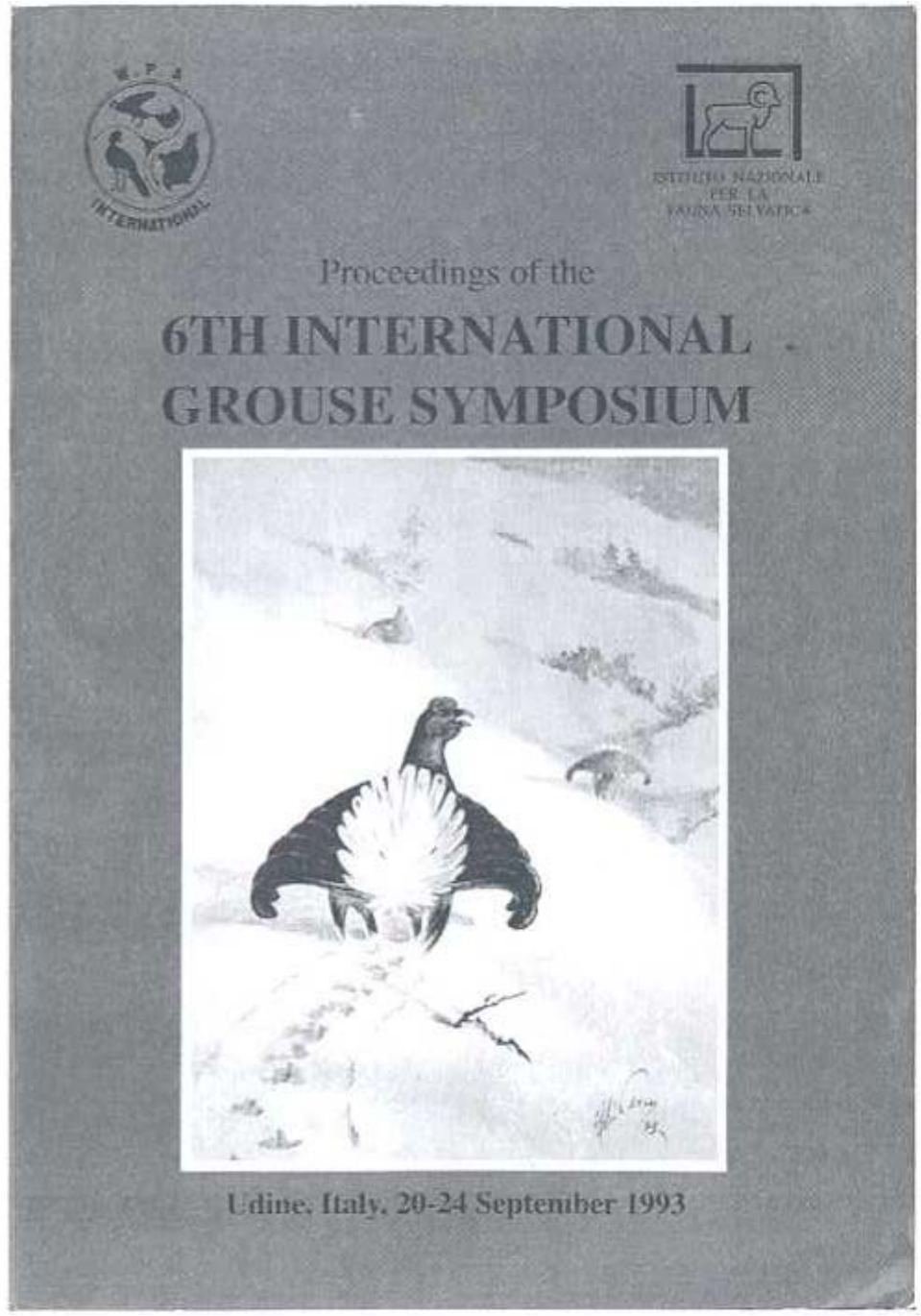

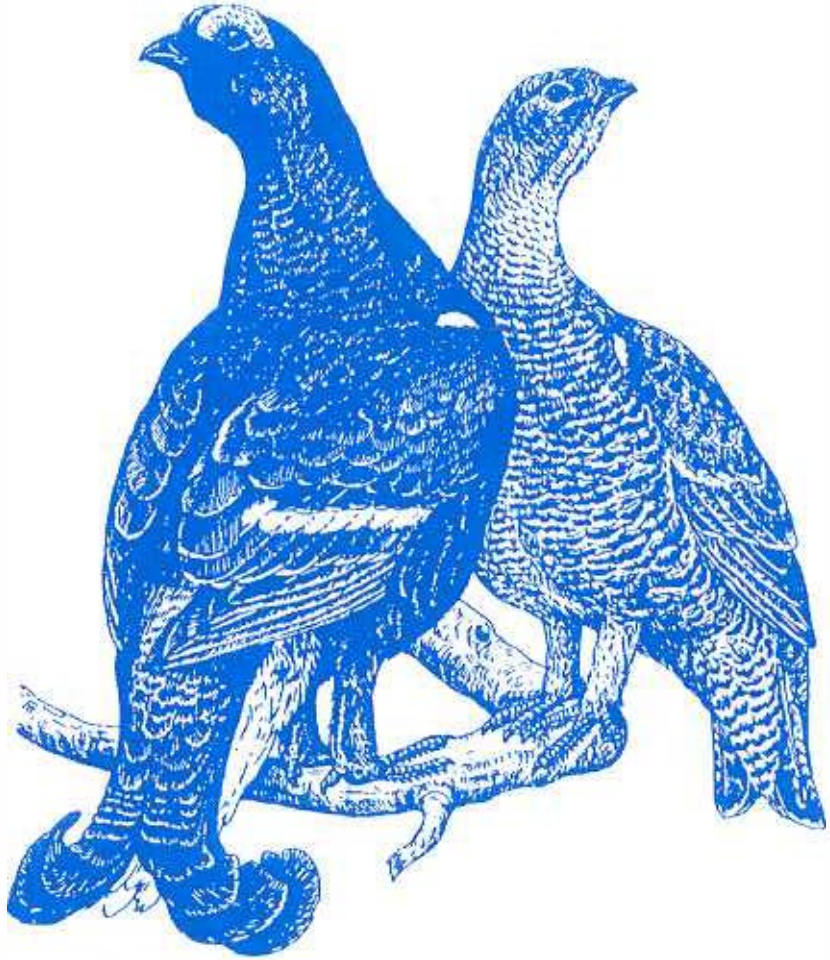

GROUSE NEWS

WORLD PHEASANT ASSOCIATION

No 10 December 1995

GROUSE NEWS NO. 10

Editor: Diana Lovel

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FORTHCOMING EVENTS

1996

20-24 Aug 7th International Grouse Symposium, Fort Collins, USA

Front cover: Capercaillie display by Dr Fabio Perco
Back cover: Franz Milller

Produced by: The World Pheasant Association
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Editorial

Diana Lovel

It has been a busy year for the World Pheasant Association especially with the Game Fair and the 20th Anniversary celebrations.

The Game Fair, masterminded as always by Keith Howman, was a huge success. The live grouse exhibit viewed through one way glass had queues of people waiting to look at these beautiful birds behaving naturally in their splendidly gardened aviaries.

For the first time I have more than enough articles for Grouse News, a wonderful situation to be in, but nearly all are from Britain. Please think now about what you can send me for the next issue. Any news item would be welcome: you do not need to write a long article but we do want to know what you are all doing. The publication of interim research results is particularly welcome, and does not preclude later presentation in other journals.

I look forward to receiving lots of news from you for Grouse News 11.

Tim and I take this opportunity to wish all our many Grouse friends a very happy Christmas and prosperous New Year.

Cheviot Black grouse Seminar - Summary of proceedings

Objectives of the Day

- To bring together those involved or interested in Black grouse in Northumberland and to share knowledge and experience.
- To inform those who attend about the current research initiatives.
- To highlight current thinking on current habitat requirements for grouse.
- To give specific information on the availability of grants for habitat management for Black grouse.
- To have a critical look at habitat management examples.

Presentations

The participants were welcomed to College Valley Estate by Charles Baker Creswell and the scene set for the day by Mau Ridley. It was agreed that the situation for Black grouse is similar to that of otters ten years ago, namely that populations are

poor but that it is not yet too late to take action.

Papers were presented by Dr David Baines of the Game Conservancy and Dr Peter Garson and Anne Westerberg of Newcastle University. In summary the papers made the following observations:

* The current Black grouse population is still declining rapidly.
* The situation can be reversed because there is considerable knowledge about the species and its requirements.
* There is a commitment amongst landowners and conservationists to see action taken to restore populations.
* It is chick survival that is the key to the future; chicks are not surviving because of predation, absence of high quality food at the critical stage of growth, and absence of cover.
* Adult populations are declining due to lack of recruitment, predation, damage to sheep fencing.
* Adults make use of different parts of the habitat at different times of year, it is necessary to maintain a mosaic of heather moor, white moor and in-bye land.

Discussion and Actions

* Habitat improvements that are needed are:

An increase in wet flushes and of associated species which will provide food for adults (eg cotton grass) and young (insects). Halting of drainage measures on moorland. An increase in scrub wood areas (especially birch, thorns, & alder) to give cover and a variety of food supply. Reduction of sheep numbers on moors to increase heather cover on high moors and the variety of herbs on white moor or in-bye land. Exclusion of stock from important flushes or woods. Opening up of conifer woodland.

* Predator control is needed as follows:

Control of crows. Co-operation is required between landowners/managers. Forest Enterprise is a key agency. A co-ordinated approach to the management of foxes and raptors.

* Other issues:

Co-operation between landowners/managers and available resources is already being facilitated by the National Park over other issues. The model will be applied to Black grouse. The provision of oats as a supplementary food either by growing on land adjacent to moors or by feeding. It is important to monitor and share successes or failures. Grants are currently not normally available to managers of shoots.

Black Grouse revival in the North Pennine Hills, England

David Baines

The range of Black grouse has shrunk dramatically this century. Once common through many of the southern counties of England (Gladstone 1924), they are now extinct. In Wales, fewer than 150 males remain (RSPB pers comm.). There are only six males in the Peak District and a similar situation exists in the rest of the S.Pennine hills and the Lake District. Almost three-quarters of the current estimated English population of 500 males in spring are confined to parts of the N.Pennine hills, yet even here, numbers have halved since 1989 (Baines and Hudson 1995).

Several theories have been suggested to explain the decline, and include:

i) increased predation following reductions in numbers of gamekeepers (Baines 1991),
ii) lower chick survival through overgrazing of hill margins reducing numbers of preferred invertebrates (Baines in press),
iii) increased winter mortality of adults following losses of preferred birch and willow scrub (Baines 1994).

Causes of the decline probably vary between regions. In the Pennine hills, management for Red grouse ensures that predators are still widely controlled. However, post-war increases in sheep numbers (Anderson and Yalden 1981) have reduced habitat quality and probably chick survival, whilst losses of birch and heather used in winter may form an additional mortality source, particularly during prolonged deep snow cover.

Over the last six years, the Game Conservancy Trust (GCT) have developed Black grouse management prescriptions combining predation control, reductions in sheep numbers to increase chick survival, and planting small native woods to provide winter food. These recommendations have been adopted on trial moors in Scotland, where subsequent increases have already been observed. This contrasts with continued declines on 'control moors' with no targeted management.

We now intend to implement 'Black grouse friendly' management on ten demonstration moors in the northern Pennines, provide free advice to land-owners on Black grouse management throughout the Pennine region, and to monitor habitat changes and Black grouse numbers on both demonstration and control moors. This work will parallel similar management experiments in forest and moorland habitats

m the Scomsh Highlands. Continued research by the GCT m Scotland will attempt to extend our current knowledge and refine the management prescriptions.

The North Pennines

Most moorland in the area is traditionally managed for Red grouse shooting. However the moorland margins are frequently overgrazed by sheep. Many such areas lie within the designated North Pennines Environmentally Sensitive Area (ESA), bitt prescriptions and payments for sympathetic Black grouse management are inadequate to encourage wider uptake by farmers.

Only on land where the prime concern is game shooting, and where the owners have control of the grazing, are sheep numbers regularly reduced to promote game. For this project to succeed, stock reductions are essential. Hence there is a clear need for revision of the scope of prescriptions and payments within ESAs and other government grant schemes to provide for more environmentally friendly options. To be widely adopted these must provide better financial incentives than prevailing levels of sheep subsidy. Giving advice based on scientific findings to such consultation reviews will be an important objective of this project (see b dow).

Objectives

i) To promote and implement the necessary management prescriptions aimed at stabilising and enhancing Black grouse numbers in the uplands of northern England.
ii) To help reinstate the mixed land use patterns of moorland edge, rough grazings and woodland preferred by Black grouse.
iii) To provide landowners, land managers, shooting managers and grant giving bodies the information and advice necessary to create the conditions for establishment of a thriving Black grouse population.
iv) To develop and implement, in collaboration with others, a population monitoring scheme.
v) To establish a level of co-operation between land managers, farmers, shooting interests, conservation and grant giving bodies to achieve the above.

Timetable

This advisory project is timetabled over five years to allow sufficient time for habitat restoration at the demonstration sites and a recovery in Black grouse numbers. Fund raising is progressing well and it is hoped that the project will start in spring 1996.

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The Game Conservancy Trust, Crubenmore Lodge, Newtonmore, Inverness-shire, PH20 1BE.

Seasonal habitat use and diet of Black grouse in the Pennine Hills of Northern England

Anne Westerberg

The habitat and dietary preferences of Black grouse were studied intensively in the north Pennine hills from 1988 to 1991. The study area formed a natural basin, approximately 17km^2 in extent, lying within an altitudinal range of 390 to 670m. This area, typical of the Pennine uplands, is largely devoid of tree cover. Heather moorland (mainly ling *Calluna vulgaris*) dominates above 450m and grades downhill into unimproved sheepgrazed rushy acid grasslands, with more intensively grazed, and in part fertilized, marginal fields (inbyeland) below. Winters can bring severe conditions, although these are rarely prolonged.

Habitat preferences were assessed primarily using radio-telemetry by monitoring the movements of 19 marked individuals, 13 hens and 6 cocks. Dietary studies proceeded by means of faecal analysis, with samples collected from both radio-collared and unmarked birds. Chick faecal material was obtained by locating the night roosts of brooding radio-tagged hens.

Main findings

Adult birds

In autumn and winter (September to February) birds of both sexes were located mainly in heather moorland, with 43% and 51% of radio-locations of cocks and hens respectively recorded there. Acid grasslands bordering the heather moor were the next most utilized habitat (some 25% of radio-fixes of both sexes), although cocks

were as frequently located in marginal fields. Only rarely were birds encountered in woodlands, feeding on the ground within the small stands of young, open canopy spruce plantations present in the study area.

The diet of birds at this time closely reflected the complement of plants present, frequently the most abundant species, within their occupied habitats. Ling heather was the major constituent (65%) of both cock and hen diet in autumn (September to November), and formed up to 90% of cock diet in winter (December to February). In late winter, however, hens took a relatively small proportion of heather (< 20% of the diet) in preference for the newly emerging flower shoots of sedges, particularly hare's tail cotton grass *Eriophorum vaginatum*, and fresh green herbaceous growth. This protein-rich food intake is a reflection of the high nutritional requirement of hens prior to egg formation.

In spring and summer (March to August), the majority of birds spent little time in heather moorland, instead occupying the acid grasslands and marginal fields. An exception was hens which had failed to lay or had lost their clutch during early incubation. These remained largely within the heather areas, feeding predominantly on heather leaves, seeds of heath rush *Juncus squarrosus* and berries of crowberry *Empetrum nigrum*. Breeding hens and cocks in grassland habitats fed mainly on the leaves, flowers, fruits and seeds of grasses, sedges, rushes and herbs as these became seasonally available. The main plants taken included buttercup *Ranunculus* sp., common catsear *Hypochaeris radicata* and similar composites, common mouse-ear *Cerastium fontanum*, common sorrel *Rumex acetosa* and heath rush (almost exclusively its seeds). The diet of breeding hens and cocks was largely similar at this time.

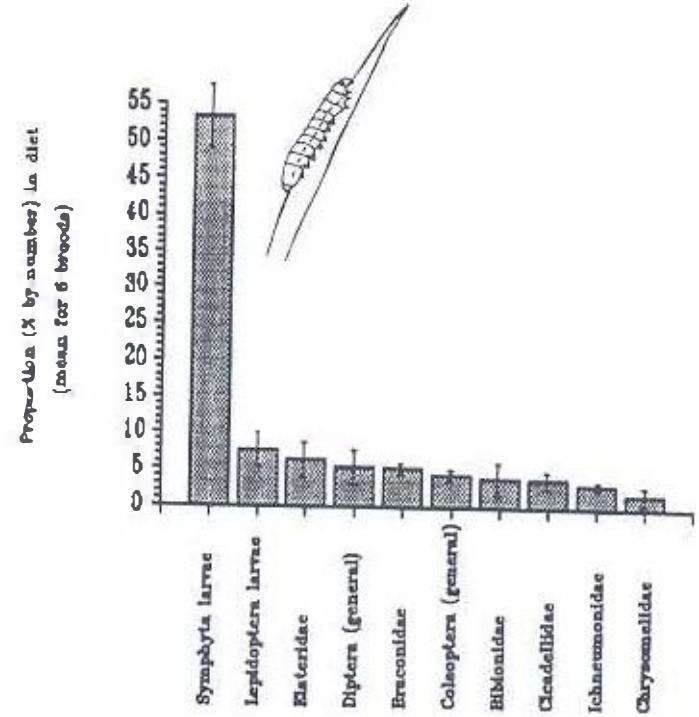
Chicks

Black grouse chicks within the north Pennine hills, as elsewhere in the species' range, feed predominantly on invertebrates during their first two weeks after hatching. The habitats and diet of broods of six radio-tagged hens which survived to at least two weeks of age are considered here.

Newly-hatched chicks were led immediately by the hen into dense vegetation, mostly (five of six broods) to dense stands of soft rush *Juncus effusus*. One brood instead occupied tall dense grass/herb meadows where soft rush, although present, occurred at only low density. Chick dietary preferences were found to be closely linked to the presence of this rush in brood habitats. The larvae of one invertebrate group, sawflies (*Symphyta*), constituted by far the greatest proportion of the diet (a mean for the six broods of > 50% of total invertebrates by number) in the first two weeks, with all other groups individually making up < 8% of the total (Figure 1). Most sawfly larvae identified in droppings were of the genus *Selandria*, the host plant of one British member of this genus, *S. serva*, is known to be soft rush.

Comparison of the availability within the environment of the various invertebrate groups identified in chick faecal material indicated that chicks actively searched for sawfly larvae, which (according to the efficiency of the invertebrate sampling methods used) appeared relatively infrequently in chick habitats. A number of other invertebrates taken by chicks were also selected, with particular preference being shown for bibionid flies, click beetles (elaterids) and other Coleoptera, Lepidoptera larvae, sawfly adults and predatory wasps (particularly proctotrupids, ichneumonids and braconids). Notably, ants (Formicidae), common in chick diets in forested habitats, were of little importance in the diet of chicks occupying these largely treeless English uplands.

Figure 1. Proportion (by number) of invertebrate groups in chick diet during their first two weeks of life in the Pennine hills of northern England (mean for 6 broods ± 1 S.E.). Only the ten most numerous invertebrate groups in the diet are shown.



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Black grouse in second rotation plantation forests in Scotland

David Baines

Numbers of Black grouse in Britain are in serious decline. The decline is part of a much larger international decline linked to habitat loss, degradation and increasing fragmentation of remaining suitable habitat patches. Surveys by the Game Conservancy Trust suggest that the decline has been particularly severe on moorland areas which have been overgrazed by sheep and red deer. Populations on moorland margins may have been bolstered, probably temporarily, by recent increases in afforestation plantations, where grazing is restricted.

In the short-term, young forests form an excellent habitat, but tree canopy closure after ten to twelve years results in losses of heathers and bilberry and Black grouse numbers rapidly fall. The long-term equilibrium between forest management and Black grouse numbers is unknown. Many of Scotland's older plantation forests have reached maturity, and are currently undergoing phased clearfelling and restocking. These restructured forests should provide a continual source of habitat patches for Black grouse whose locations will change spatially and temporally in relation to felling patterns and subsequent forest succession.

The Game Conservancy Trust are about to commence a three-year project within these second generation forests that has the following objectives;

i) To assess the habitat requirements and area required by Black grouse within recent forest restocks.
ii) To determine the effects of differing scales of clearfell mosaic on occupancy rates of suitable restock habitat patches.
iii) To develop a management model for forest restructuring that will incorporate the sustainable long-term management of Black grouse populations.

Black grouse presence will be assessed by searching for leks in spring and will be related to the size of the clearfell area, the distance of the clearfell area from other clearfells or alternative habitat such as heather moorland, the presence of potential forest corridors allowing movement between the patches, and the nearest other Black grouse populations.

In addition, it is planned to capture and equip a sample of birds with radio transmitters, to investigate habitat requirements and movements between habitat patches within one or two sample forests. It is hoped that the findings from this study will be relevant on a landscape scale for forest managers and that a greater understanding of the scale of management and inter-habitat patch distances needed by Black grouse in second generation commercial forests and forest nature reserves will be provided.

The Game Conservancy Trust, Crubenmore Lodge, Newtonmore, Inverness-shire, PH20 1BE.

Annual home ranges and spacing patterns of Capercaillie in Central Europe

Ilse Storch

Abstract
The Capercaillie *Tetrao urogallus* is endangered in Central Europe; knowledge of its spatial requirements is vague but important for conservation. I radio tracked 40 capercaillie during 1988-92 in the Bavarian Alps, Germany, to study annual range use patterns and to identify habitat needs for capercaillie conservation. Annual home ranges of females (n = 7) and males (n = 19) were not different in size (P = 0.56), diameter (P = 0.41), or vegetation (P > 0.15). Home range size varied between 132 and 1,207 ha, and averaged 550 ha (SE = 52 ha). Home range size was inversely related to availability of bilberry *Vaccinium myrtillus* (P <0.001) and late stages of forest succession (P < 0.01) within the home range. Both sexes tended to occupy the same annual and seasonal home ranges in consecutive years. None of 7 females and 10 of 20 males used distinct, nonoverlapping midwinter and midsummer home ranges. Throughout the year, distances of females from the leks they attended in spring averaged 1.3 km (SE = 0.1 km). In winter and spring, males aggregated within a 1-km radius of the lek, but dispersed within a 3-4-km radius during summer. Males returned to leks between August and December. Timing of movements from the lek to the summer range was age related (P <0.001), and >5-year-old males were the last to leave. Movements of males to summer ranges could not be explained by food sources and may be related to predator avoidance. In the course of a year, birds of 1 lek may use a 30-50 km² area. Therefore, maintaining leks and habitat within 3-4 km of the lek centre should be emphasised in capercaillie conservation.

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Munich Wildlife Society, Linderhof 2, D-82488 Ettal, Germany

The Seventh International Grouse Symposium, Fort Collins, Colorado, USA 1996

Matt Ridley

Please remember that you have only a few weeks left to submit a proposal to give a paper at the Fort Collins symposium next August. You should all have had registration forms to fill in. It is vital that we have a good attendance from Europe and Asia at the meeting, which is a unique opportunity to exchange scientific information on grouse with colleagues from around the world. Nobody should be put off by the expense of travelling to the meeting. WPA is looking into ways to get sponsorship of the costs of accommodation and attendance fees for those from countries of East Europe. All that is needed at this stage is an abstract of the paper you propose to give. Full registration will follow in January 1996.

Remember, too, that the meeting will be followed by two days of field trips, during which there will be a chance to see no less than five species of grouse, all of them endemic to North America: Sharp-tailed grouse, Greater Prairie chicken, Sage grouse, Blue grouse, White-tailed ptarmigan.

If you need registration forms or further information please contact Matt Ridley (fax: +44-1670-789235), or Clait Braun (+1-970-490-6066).

Upcoming meeting in Colorado

Jim Bendell

Thanks to Clait Braun and Kathy Martin, we will have the first meeting of the International Grouse Group held in North America. If people want to visit my study area for Spruce and Ruffed grouse or any nearby place in Ontario, I would be pleased to accompany them, providing we can make satisfactory arrangements. Let me know what you would like to do and what dates are available. I am sure other North American grousers would do the same.

What do you know about grouse eggs?

Jim Bendell

Can you help me understand the moisture requirements of grouse eggs in nature? Is it possible soil temperature and moisture may determine the local and global distribution of species of grouse? What do I measure in the shell of grouse eggs to determine temperature and moisture requirements? I am familiar with the work of Cynthia Carey and the authorities she cites. What key reference should I know about?

We have been putting out domestic chicken eggs in our forests where we study Spruce and Ruffed grouse. The forests are as described in the Udine Symposium volume. The aim is to measure predation but we weigh the eggs when put out and collected at the estimated start of laying and peak of hatch. We make dummy nests of three eggs, each nest placed 100m apart on a line through the forest. We also place eggs in old Spruce grouse nests.

Much to our surprise, eggs gained weight in some forests and the forests differed in the way eggs changed in weight (Table 1). The abundance of grouse in the forests is better explained by change of weight of eggs than amount of predation. Note Spruce grouse are in the 25 and 50 year old jack pine but not in the 15 years old pine, and mixed forest. Where Spruce grouse were absent more eggs lost weight. Hence, these forests are too dry for eggs of Spruce grouse, and so no Spruce grouse.

It is comforting that eggs in old nests in pine were similar in weight change to our dummy nests in pine. Other (impossible?) conclusions could be drawn from the data but I will leave it at that. We will repeat the experiment next spring and incorporate suggestions you might make.

We have measured the water loss of fresh chicken eggs and unincubated Spruce grouse eggs in a room in our home. I would like to get unincubated eggs of other species of grouse to measure. Other people may like to do their own and we can compare results. I keep eggs for months in still air, out of direct sunlight, in an open egg carton, at temperatures: mean 16°C, range 12-20°C, and relative humidity mean 56%, range 52-75%. I weigh them to .01 grams at about 3-5 day intervals. Under these conditions eggs lost weight at a remarkably constant rate, and Spruce grouse eggs lost weight at a slower rate than chicken eggs despite the fact they were half the size and weight. The weight of chicken eggs can be held or increased by keeping them in a damp environment.

Since it is relatively easy to obtain egg shells of different species of grouse, and the shell is the main factor affecting water loss, the study of shell structure and function may be rewarding. What do you think?

Table 1. Change in weight and predation of chicken eggs placed in dummy and old Spruce grouse nests in forests of different age and composition and abundance of grouse, May 15 to June 15, 1995.

Forest	No. eggs	% change wt. 0	+	-	No. nests	% predated	Abundance of grouse Spruce	Ruffed
Jack pine 50 yr	59	3	94	3	20	5	low	none
Jack pine 25 yr	53	2	94	4	21	24	high	none
Jack pine 15 yr	36	6	61	33	20	40	none	low
Conifer-deciduous 60 yr	51	8	25	67	20	15	none	medium
Old nests in 25 yr Jack pine	25	8	76	16	14	31		

0 = no change, + = increase, - = decrease in weight

RR2, Clayton, Ontario, K0A 1P0, Canada

Grouse snippets

Arto Marjakangas writes that he has attended the Congress of Game Biologists held in Sofia, Bulgaria. There were not many contributions on grouse. However, visiting the country was quite an experience.

*****

Dear Editor,

Good to hear from you! You are right, time flies, and so much happened since we met at Holywell Hall. I have been travelling a lot: five exciting weeks in summer assisting with a friend's giant otter project in Manu NP in Peru, two more months with the Siberian Tigers in autumn, five weeks looking for tigers in India in spring, another six weeks in Russia in early summer, and last week I returned from three interesting weeks in China, where I evalluated a Chinese grant application to the German Government for Giant Panda conservation.

In between I am directing several research projects with Munich Wildlife Society which are mostly done by PhD students. In terms of grouse, not much to report, but I just submitted an application for a caper conservation project in the Bavarian Alps, which aims to introduce some of my research results into forestry practices. Keep your fingers crossed! If I should get the grant, I hope to be able to include some research into the project.

So, at least for the time being, I am quite happy with the combination of a homebase with at least some research perspectives (which I hope will improve again) and international consultancy jobs. It is vital to leave the narrow alpine valleys once in a while, in order to prevent inbreeding (of all sorts).

Ilse Storch

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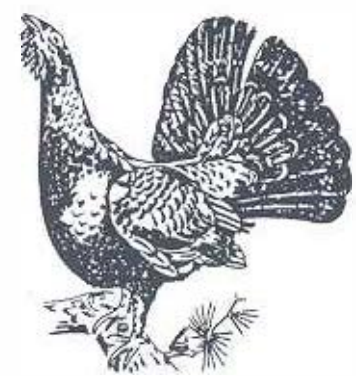
I am particularly grateful to Anne Westerberg who wrote her article just before going into hospital for the delivery of her first baby. We look forward to hearing of the baby's safe arrival.

Editor



Move to end bird of prey protection

Auslan Cramb. Scottish Correspondent

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Total protection for birds of prey should be ended with landowners being allowed to control their numbers on moorland estates, the Government will be told today.

Graeme Gordon, convenor of the Scottish Landowners' Federation, is making the call to the Scottish Office because he believes that the birds are seriously damaging grouse numbers. The sparrowhawk, peregrine falcon and hen harrier should not be protected at all costs while other predators, such as the fox and the crow, can be killed legally, Mr Gordon said.

The demand will be made at a conference in Perth on countryside sports, and reflects a growing concern among landowners that persistent low grouse numbers are damaging the rural economy. Mr Gordon said: "We must look into this problem of the balance of nature ... with a great deal more common sense and lack of prejudice than presently exists."

Mr Gordon said he did not intend to suggest how birds of prey should be controlled, but said the work might be carried out by estate gamekeepers. The speech amounts to the most controversial stance adopted by the SLF, which represents 4,000 landowners, on any countryside issue in recent years. Another speaker, landowner Lord Ramsay, whose 50,000-acre Invermark estate has cancelled its grouse shooting for the past six years because of low numbers, said birds of prey eggs could be killed or captured and released elsewhere. *(sic)*

Some landowners claim golden eagles are a problem on west coast estates, but Mr Gordon identified sparrowhawks as the 'chief culprits' on low ground, and hen harriers and peregrine falcons as the problem species on high ground.

He added: "We have got to control predation, it really doesn't matter where that is coming from if it is damaging the ability to manage the countryside."

Roger Crofts, head of the government environment agency Scottish Natural Heritage, rejects Mr Gordon's argument. Low grouse numbers, he said, were "nothing to do with birds of prey", but were linked to mismanagement of moorlands and over-grazing by deer and sheep. Stuart Housden, Scottish director of the RSPB, said there was no scientific evidence to justify the control of birds of prey. Most species were only slowly returning to their former numbers before decades of illegal persecution and poisoning by pesticides.

The British hen harrier population stands at some 600 pairs just below golden eagle numbers, peregrine falcons have risen to 1,200 pairs from 900 in the 1930s, and the sparrowhawk is the commonest raptor at around 30,000 pairs.

Landowners attacked for plea to kill birds of prey

Auslan Cramb. Scottish Correspondent

Landowners who want to kill birds of prey to protect grouse on sporting estates were accused yesterday of airing outdated prejudices. They were told to improve land management techniques instead of blaming the birds. The rebuke follows a call from the Scottish Landowners' Federation for an end to the total protection of birds of prey.

The SLF, which represents 4,000 landowners, wants permission to kill or remove birds of prey on moorland estates where they are eating large numbers of grouse. However, at a conference in Perth, Magnus Magnusson, chairman of Scottish Natural Heritage, said the real task for landowners was not to single out a scapegoat but to ensure that the land was properly stewarded.

"I really do wonder if blame for lack of sporting success is being apportioned to the protected predators much too freely," he said. "We need to look closely at how the land could be managed better to sustain birds of prey, game birds and other wildlife - and thereby the working population in small rural communities."

He told landowners and managers that they should improve heather-burning practices, exercise stricter control of grazing sheep and deer, and concentrate on controlling crows and foxes.

Publications

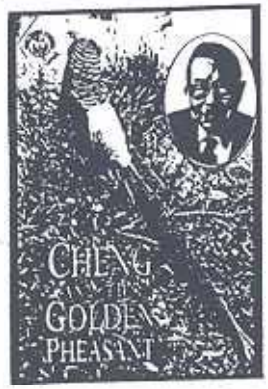
Two publications from the Forestry Commission are of interest

Research Information Note 264
Assessment of Fence Collisions by Grouse Species in Scotland
by Steve J Peay

Black Grouse and Forestry: Habitat Requirements and Management
by John Cayford - price £3

Enquiries relating to the above publications should be addressed to: The Research Publications Officer, The Forestry Authority: Research Division, Alice Holt Lodge, Wrecclesham, Farnham, Surrey GU10 4LH.

Cheng and the Golden Pheasant



China's vast area, covering both the Palearctic and Oriental geographic regions, is rich in natural resources and wildlife. Although China has over 1100 of the world's 9000 bird species - almost equal to those of Europe and Australia combined, no scientific research into them had been undertaken by a Chinese scientist until Professor Cheng Tso-hsin. A graduate at 19, a doctor and professor at 23, Cheng has dedicated his life to the study of China's avifauna. It is little wonder that he is so revered in bird conservation circles both in his own country and internationally.

It is something special, for not only has Professor Cheng's life spanned war, civil war, the emergence of the People's Republic of China, but also what he calls 'the cowshed years' of the Cultural Revolution during which he had to go through much hardship.

As becomes clear on reading his biography, few people have achieved so much for all to see: hundreds of papers, articles, books, wildlife reserves established on the basis of his and his colleagues' fieldwork, shaping government policy, not to mention the wealth of the scientifically-trained talent that China now has following in the footsteps of the master.

This very special biography of our President's fascinating life has just been published. One hundred copies only will have a special book plate signed by Professor Cheng Tso-hsin included and will go at no extra charge to the first one hundred members who apply for them - price £19.95 plus £3.00 p&p (UK and overseas surface).

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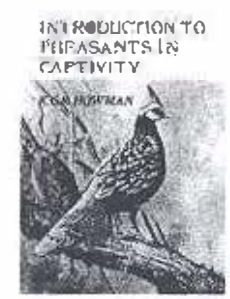

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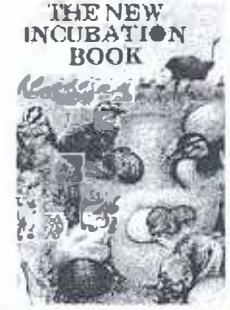

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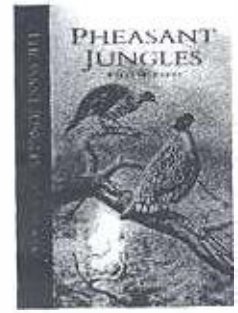

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