Review

The subspecies of the common pheasant *Phasianus colchicus* in the wild and captivity

THIEMO BRAASCH[1], TOMAŠ PEŠ[2], STEFAN MICHEL[3] AND HEINER JACKEN[4]*

[1]Zoological Society for the Conservation of Species and Populations (ZGAP), Hans-Adolf-Str. 21, 24306 Plön, Germany
[2] Zoo and Botanical Garden Plzen, Czech Republic
[3] Nature Protection Team, 77 Lenin Street, Khorog 736000, GBAO, Tajikistan
[4] Conservation Breeding Group of WPA, Maarstr. 61, 41238 Moenchengladbach, Germany

*Correspondence author - heiner-jacken@gmx.de

Paper received 10 May 2010, revision requested 2 August 2011, accepted 01 September 2011.

Abstract The ring-necked pheasant *Phasianus colchicus* is common in many parts of Central Europe. It is listed as 'least concern' by IUCN and no-one would think of it as an endangered species. However, many of the 31 subspecies that are distributed from East Asia to the Caucasus Mountains and the Balkans are threatened to various degrees. The first introductions of common pheasants in Central Europe took place between 500 and 800 AD with Caucasus pheasants *P. c. colchicus* and later with Mongolian *P. c. mongolicus* and Chinese ring-necked pheasants *P. c. torquatus*. The indigenous population of the South Caucasian pheasant in Bulgaria is extinct due to hybridisations with introduced pheasants of other subspecies. Not much information exists on the four subspecies living around the Caspian Sea, but at least three of them may be threatened. Similarly, the few data on the five subspecies of Central Asia indicate that most of them are at risk, but *P. c. turcestanicus* still exists in possibly viable populations and *zerafshanicus* and *bianchii* may even be expanding their ranges. Plans to release large numbers of 'hunting pheasants' are looming threats in several areas. As there were introductions of allochthonous subspecies, the situation of green pheasants *Phasianus versicolor* in Japan needs to be clarified too. Fifteen different subspecies of *Phasianus colchicus* and *Phasianus versicolor* are kept in Europe. These populations originate from only few founder birds and inbreeding is a problem. Sixteen different subspecies of *P. colchicus* and *P. versicolor* are kept in the USA.

Keywords Common pheasant, *Phasianus colchicus*, subspecies

Introduction

The common (or ring-necked) pheasant *Phasianus colchicus* is listed on the IUCN Red List as Least Concern (BirdLife International, 2008). The scientific name *Phasianus colchicus* is probably derived from the River Phasis (today Rioni River in Georgia) and the region Colchis (an ancient name for what is now a part of Georgia) (Jelen, 2009). So far 31 subspecies have been described (see Delacour, 1977) and there are three subspecies of the closely related green pheasant *Phasianus versicolor* (McGowan, 1994). Some further subspecies of the common pheasant like *bergii* and *europaeus* and the *kigis* subspecies of the green pheasant are considered synonyms and not widely accepted.

There is surprisingly little information on the species given its wide distribution and its close association with humans (see for example McGowan, 1994). As a first step towards gathering information on this species, various formal and informal sources have been investigated and are summarised here. The aim was to gather anecdotal and other information that might otherwise be lost, and to consolidate it into one review. It is necessary therefore to scrutinise each primary source before using the information it contains.

The common pheasant in Europe originated from several subspecies and comprises hybrids between them (Harrison, 1982). The first introductions date back to 500 AD (Boev, 2000) and were of the nominate subspecies *P. c. colchicus*. In the 18th century, Mongolian *P. c. mongolicus* and Chinese ring-necked pheasants *P. c. torquatus* respectively were introduced

(Boev, 2000). The original range of the species extends from eastern Siberia to Indochina, Afghanistan, the Caucasus and the south-eastern Balkans (Hill & Robertson, 1988). In addition to Western and Central Europe the species has been introduced to, at least, North America, Hawaii, New Zealand, and Australia (Johnsgard, 1999). In some areas the common pheasant does not survive well, for example many are released in France every year, but have to be fed in the winter to sustain the population there (Jelen, 2009). This article does not deal with introduced, but with indigenous subspecies and populations of this species and their status in captivity.

Subspecies in the wild

The Caucasus

The western most subspecies of the common pheasant, the Caucasus pheasant, is the nominate form and was distributed throughout the Balkans in Bulgaria and Greece (Boev, 1997). In the south-east, this subspecies has commonly been found between the Maritsa River and the coast of the Black Sea until the end of the 19th century (Boev, 1997). Since the 1950s, the only place with an indigenous population is the Dolna Topchiya Reserve (Boev, 1997). The habitat of this subspecies was open deciduous riverine forests (Boev, 1997). The genetic purity of the subspecies there was lost due to hybridisations with released pheasants from breeding facilities in the 1970s (Boev, 1997). There are pheasant farms all over Bulgaria. The released pheasants spread over Bulgaria in the last 50 years and have displaced the indigenous populations (Boev, 1997). The hybrid pheasants are bigger and have larger clutches than pure Caucasian pheasants (Boev, 1997). Contrary to older information subfossils from 6000 BC prove that there was an indigenous pheasant population in the south-eastern Balkans and these birds did not derive from later introductions by ancient Greek, Roman or medieval activities (Boev, 1997). The only pure surviving population of this subspecies inhabits the Nestos Delta of northern Greece (Sokos et al., 2007).

This species was once widespread in Turkey (Turan, 1987, cited in Ogurlu, 1993) living in forest-shrubland from 0 to 400 m ASL. Due to heavy hunting pressure, loss of suitable habitat and the use of pesticides, the populations have declined (Tarhan, 1987, cited in Ogurlu, 1993). Since the 1990s, hunting has been prohibited in Turkey (Ogurlu, 1993). Six captive breeding stations were established after 1969 but according to Hus (1974, cited in Ogurlu, 1993) the birds bred there were imported hybrids between and *P .c. mongolicus,* which were then introduced to 13 areas in the species' former natural range. Breeding was subsequently recorded in these areas (Ogurlu, 1993).

Caucasus Mountains to Caspian Sea

There are four subspecies in this region: North Caucasian pheasant *P. c. septentrionalis*, Talisch Caucasus pheasant *P. c. talischensis*, Persian pheasant *Phasianus colchicus persicus* and the aforementioned Caucasus pheasant. The last subspecies was widely distributed in Transcaucasia as their main range and were common there (Jelen, 2009). The populations there have reportedly declined (Carroll, 2007). According to this source, the reasons for the declines are hunting and deforestation for cattle ranching. Furthermore, hybrid pheasants from different subspecies were released in the range of the native populations of this subspecies there. Caucasus pheasants were very common around Baku, capital of Azerbaijan, up to a few years ago (Jelen, 2009). Populations still exist in some valleys in Dagestan in the Russian Federation and in the south-eastern part of its range near to the Iranian border along the Aras river, where they are still common (Jelen, 2009).

The distribution of the Northern Caucasus pheasant is highly fragmented with remnant populations surviving in Crimea, where they are not hunted although not explicitly protected in law (Jelen, 2009). The *ex-situ* population of this subspecies is extinct (see Table 1).

There is also no reliable information on the Talisch Caucasus pheasant and Persian pheasant. The former is thought to be very rare and the latter was reported to have a population of 900 to 1000 birds in 1996 (Jelen, 2009). The Persian pheasant was formerly distributed in Iran from the river basins of Sumbar, Chandur and Atrek, the valley of Hodjakalin and in the Kopetdag Mountains (Jelen, 2009). In Turkmenistan, this subspecies was found in Sunt Hasardag Reserve and there was a breeding centre in Kara Kala (Jelen, 2009). The hunting of these birds was totally prohibited by decree of the former president of Turkmenistan, although an exemption was given to the emirs of Dubai (Jelen, 2009).

TABLE 1 Summary information on the captive populations of common and green pheasant in Europe. All juvenile numbers are approximate.

Subspecies	No. of imported birds* (importer)	No. held by 12 members of Common Pheasant Focus Group in 2009**		No. in Austria 2009***	No. of common pheasant breeders in Central Europe***	No. of common pheasants in Plzen Zoo 2009 (acc. to Annual Report)
		Breeding birds	Juvenile birds			
P. c. bianchii	?,? (via France)	7,9	30		11	1,1
P. c. colchicus	5,3 (Möller)	12, 20	120	6	306	3,3
P. c. chrysomelas	1,1 (Möller)	3,5	9	3,3	7	1,0
P. c. formosanus	?,? (via Belgium)	9,13	100	2	70	1,1
*P. c. karpowi*****	2,2(?) (Tierp. Berlin)	9,14	120	12	14	12,6
P. c. mongolicus	3,1 (Möller)	12,13	100	6	181	3,2
P. c. pallasi	2,3 (Möller)	7,11	120	1,1	20	2,2
P. c. persicus	2,3 (Möller)	5,6	20		6	
P. c. septentrionalis	3,3 (Möller)	Population extinct	-			
P. c. strauchi	?,? (private breeder)	10,15	120		13	3,2
P. c. torquatus	?,? (Zoo Moskau)	15,23	150	2	46	2,1
P. c. zarudnyi	3,1 (Möller)	9,11	40		9	6,2
P. c. zerafschanicus	2,2 (Tierp. Berlin)	5,6	40	2	8	
P. v. robustipes	?,?	12,18	150	20	104	1,1
P. v. versicolor	?,?				12	0,1

*Christian Möller pers. comm.
**According to by Erwin Burkart Co-ordinator of the WPA Germany Common Pheasant Focus Group) pers. comm. and Manfred Prasch (WPA Austria) pers. comm.
*** Siro Serena (WPA European captive census-coordinator) pers. comm.; purity of subspecies not known)
**** The purity of *P. c. karpowi* is doubtful

Central Asia

According to the Red Book of Tajikistan, the Syr Daria pheasant *P. c. turcestanicus* is almost extinct (Abdusalyamov, 1988). Imported subspecies of the common pheasant were released in its native range in the 1970s and hybridized with native birds. Birds which by phenotype could be identified as introduced or hybrids are no longer seen in the population, due to the predominance of the indigenous subspecies (Rustam Muratov, pers comm., 2009). This statement contradicts the information in the Red Book of Tajikistan (see above) and therefore illustrates the current state of knowledge. There are populations of this subspecies in Uzbekistan that are thought

to be pure and of reasonable size. Local introductions of Mongolian pheasants from Kazakhstan in small numbers have reportedly not resulted in significant hybridisations (Sergey Zagrebin, pers. comm., 2009). Stefan Michel in 2007 has seen pheasants abundantly along the Syr Daria River in Kazakhstan, which belong to the Syr Daria subspecies. No introductions of non-native subspecies are known from this area (Sergey Zagrebin, pers. comm., 2009).

The second subspecies in Central Asia is the Zeravshan pheasant *P. c. zerafschanicus*, which lives in a small area of Tajikistan in the Zeravshan valley near the border with Uzbekistan (Abdusalyamov, 1988). This subspecies is well protected in the Zeravshan-Zapovednik in Uzbekistan and its range is increasing. It also lives in Bukhara, where it may come into contact with the third Central Asian subspecies, Zarudny's pheasant *P. c. zarudyni* as a result of the construction of broad irrigation and drainage channels linking them. So far, there has not been any investigation of potential hybridisations of the two subspecies in this area (Sergey Zagrebin, pers. comm., 2009).

The fourth subspecies in Central Asia is Bianchi's pheasant *P. c. bianchii*. In the Red Book of Tajikistan, the population was estimated at 400 to 500 birds (Abdusalyamov, 1988). The subspecies lives in the floodplain forests of Amu Daria and the lower reaches of Pyanj respectively, its tributaries Kofarnihon, Vakhsh, Kizilsu and also in the Hissar Valley west of Duschanbe. This subspecies is relatively common in its core habitats, especially in the protected area "Tigrovaya Balka", and is even recovering its range in the Hissar Valley in recent times. Main habitats are floodplains with gallery forests and woodlands, but also cultural landscapes with bushes and reed along irrigation and drainage canals. Reduced use of agrochemicals and diversification of cultivated plants seem to have a positive impact on the pheasant population while poaching continues to be a threat (Saidov & Rakhimov, 2011).

The fifth subspecies is the Khivan pheasant *P. c. chrysomelas,* which reportedly still survives in the Aral Sea region in pure populations (Sergey Zagrebin, pers. comm., 2009). The Committee of Environmental Protection of Tajikistan in 2009 has started captive breeding of common pheasants. For this purpose, 1000 eggs have been imported from Russia. The birds are maintained in aviaries and released for hunting outside the habitats of native birds. (Rustam Muratov, pers. comm., 2011) A reassessment of the status of all subspecies in Tajikistan has recently started with support from the Zoological Society for the Conservation of Species and Populations (ZGAP: Roland Wirth, pers. comm., 2009; Saidov & Rahimov, 2011)

Japan

The Korean ring-necked pheasant *Phasianus colchicus karpowi* was introduced on Honshu, Shikoku and Kyushu, the three main islands of Japan, around 1920, and hybridisations with the native subspecies of the green pheasant, (the northern green pheasant *Phasianus colchicus robustipes*), have subsequently taken place (Kiyosu, 1978; Kuroda & Komiya, 1987, each cited in Eguchi & Amano, 2004; Lever, 1987). These introductions were later stopped, as there were fears that the hybridisations would spread throughout the islands (Eguchi & Amano, 2004). Introductions of Korean ring-necked pheasants started around 1930 on Hokkaido, which has no native populations of green or common pheasants (Eguchi & Amano, 2004). These introductions suggest that the populations in Japan require further investigation (Fuller & Garson, 2000).

China

The common pheasant is thought to have originated in China (Wang & Yang, 1993). It is the most common galliform species, widely distributed and occurs in large numbers in several parts of China (Zhou, 1990). Nineteen different subspecies are currently listed (Qu et al., 2009). These subspecies cover a diverse range of habitats including grassland, arable land, reed ponds or even near-desert shrub land, at a range of elevations between 0 and 3000 m (Cheng, 1978, cited in Ying et al., 2009). In China the common pheasant is only absent from Qiangtang Plateau in Tibet and Hainan Province (Tang, 1990; Wang et al., 2004). The taxonomic arrangement of the 19 subspecies is based on morphological criteria such as body length, colouration, the existence of the white neck ring and white eyebrows (Johnsgard, 1999; Liu & Sun, 1992) and was first proposed by Delacour (1951). A recent investigation of the mitochondrial DNA of the subspecies did not support the morphological distinction of the subspecies (with the exception of the two subspecies Sungpan pheasant *Phasianus colchicus suehschanenis* and Yarkand pheasant *Phasianus colchicus shawi*. Further

investigations are needed to verify the genetic distinctiveness of each of these subspecies (Qu et al., 2009). Liu et al. (2010) concluded that the rapid rise of the Loess Plateau paleo-lakes caused dramatic shifts from a relatively humid climate to a more arid one. These events, in combination with climate fluctuations from a warm-humid to cold-dry climate, may have influenced the differentiation between the subspecies occurring there and in adjacent areas.

Recent information on abundance is lacking, but in general, the common pheasant is thought to be very common in the wild with no significant change in its geographic range in China (Zheng & Zheng, 1993). Rearing farms of different sizes were established in north-eastern China and reared many thousands of common pheasants to supply the increasing demand for hunting (Zhou, 1990). This demand may lead to introductions of hybrids between different subspecies or introductions of subspecies in regions, where other subspecies have indigenous populations.

The Taiwan ring-necked pheasant *Phasianus colchicus formosanus* appears to be difficult to find (Tomaš Peš, personal observation). Captive birds in Europe are considered to form two 'types', a light type in the Netherlands and a dark type in Germany, and seem likely to be hybrids. Both look markedly different from wild birds. The illustration in Wolters (1987) resembles the light captive form rather than a wild individual. This subspecies is thought to be seriously threatened by recent introductions of Korean ring-necked pheasant. All male birds in captivity in Taiwan were hybrids (Tomaš Peš, personal observation).

Vietnam

Northern Vietnam is home to two subspecies: Tonkinese ring-necked pheasant *P. c. takasukasae* and Rothschild's pheasant *P. c. rothschildi* (Nguyen Cu & Eames, 1993). They have very limited distributions in the country with only few recent records. These records are north of Tonkin and east of the Hoang Lien mountains (Brickle et al., 2008). There is confirmed large population and it is not found in any protected area and so may be susceptible to hunting (Brickle et al., 2008).

In captivity

Europe

The Zoological and Botanical Garden of Pilsen, Czech Republic has 13 different subspecies: Persian pheasant, Zerafshan pheasant *P. c. zerafschanicus*, Korean ring-necked pheasant, Khivan pheasant, Chinese ring-necked pheasant, Bianchi's pheasant, Manchurian ring-necked pheasant *P. c. pallasi*, Taiwan ring-necked pheasant, Zarudny's pheasant, Strauch's pheasant *P. c. strauchi*, Caucasus pheasant, Mongolian ring-necked pheasant and northern green pheasant, some represented by a single individual. These birds originate from small imports to the formerly German Democratic Republic and are highly inbred or are almost extinct in captivity.

Overall, the situation of the different subspecies held in captivity in Europe is precarious (Vandrey, 2007: see Table 1), and consequently, World Pheasant Association-Germany (WPA-Germany) created a "Common Pheasant Focus Group" in 2006. This aims to maintain pure captive populations of the subspecies currently found in Europe and to increase interest in their captive management. Since its formation, 10 to 15 breeders meet two or three times a year (Burkart, 2008) to discuss husbandry and breeding performance. Its activities are reported in WPA-Germany newsletters and as a result attention on the subspecies has increased among members of WPA-Germany over recent years. A poster has been produced in Czech, English and German to raise awareness amongst breeders, and 2000 of them have been distributed.

The birds in Pilsen Zoo and those in private collections of the same subspecies in Western Europe (mainly in Germany and Switzerland, but also in some aviaries in Benelux, France and Austria) reportedly originate from the same source: Christian Möller's collection in Erfurt prior to German unification. He imported and bred 14 different subspecies. Overall 15 different subspecies are kept in Europe (see Table 1).

Inbreeding is evident from low fertility and poor quality of the offspring: low fertility, low survival rate and deformities of the bill. The upper mandible is much shorter than the lower one. In some extreme cases, eyes are missing. For example, both symptoms of inbreeding were found in some pairs of Bianchi's pheasant and Zarudny's pheasant in Pilsen Zoo.
However, the regular change of adult birds provides successful offspring. In Pilsen it was also observed that many adults are lost for breeding due to injuries, because they are still very wild (e.g. Zarudny's pheasants and

Mongolian ring-necked pheasants). Pilsen Zoo is breeding them in numbers even when they are losing many (especially males) after injuries.

USA

There are five main breeders of common pheasant in the USA (James Pfarr, pers. comm.). They keep 16 different subspecies: Chinese ring-necked pheasant, Taiwan ring-necked pheasant, Manchurian ring-necked pheasant, Kobdo ring-necked pheasant *P. c. hagenbecki*, Strauch's pheasant, Tonkinese ring-necked pheasant, Korean ring-necked pheasant, Caucasus pheasant, Talisch Caucasus pheasant, Bianchi's pheasant, Zarudny's pheasant, Zerafshan pheasant, Mongolian ring-necked pheasant, Kweichow pheasant *P. c. decollatus*, southern green pheasant *Phasianus versicolor versicolor* and northern green pheasant. The date of import is known for only some of these subspecies (James Pfarr, pers. comm.; Table 2).

TABLE 2 Subspecies kept in the USA (according to James Pfarr, pers. comm.). "FGD" stands for Fish and Game Department.

Subspecies	Importer	Date of import
P. c. talischensis	Private breeder	≤10 years
P. c. colchicus	Private breeder	≤10 years
P. c. zarudnyi	Private breeder	≤10 years
P. c. mongolicus	Private breeder	≤10 years
P. v. versicolor	Private breeder via Hogle Zoo, Salt Lake City, Utah	≤10 years
P. c. zerafschanicus	Private breeder via Zoo San Diego, California	1987
P. c. strauchi	Michigan FGD	1987
P. c. bianchii	Oregon FGD	1980
P. c. colchicus	Idaho FGD	1980
P. c. pallasi	MacFarlane's Pheasant Farm, Janesville, Wisconsin	late 1950s until 1960

A population of Bianchi's pheasant exists in southern New Mexico, which was established by the Fish and Wildlife Department and they survive well in the very dry conditions there (James Pfarr, pers. comm.).

Conservation implications

The future of several subspecies of common and green pheasants seems to be bleak in the wild. Having collated all the information about the subspecies of common and green pheasant in the wild and in captivity in Europe and USA the authors conclude that several measures need to be initiated:

1. A survey of remote regions in the Balkans and in Turkey with suitable pheasant habitat to find any existing indigenous populations of the Caucasian pheasant.

2. Confirmation of the population in the Nestos Delta in northern Greece and assessment of its population size.

3. Assessment of the population status of the Talisch Caucasus pheasant.

4. Continuation of the surveys of the Central Asian subspecies as started by one of the authors (SM).

5. Further investigation of the status of the green pheasants in Japan.

6. Clarification of the Chinese subspecies delimitations and their population status.

7. Augmentation of the pure subspecies kept in Europe and USA, and investigations to find other facilities where pure subspecies are kept.

8. Exchange of information and birds between the different breeding facilities to avoid inbreeding.

Acknowledgements

The authors thank Christian Möller, James Pfarr, Erwin Burkhart (Coordinator of Common Pheasant Focus Group of WPA-Germany), Roland Wirth and Manfred Prasch for information about the populations of common pheasant in captivity. We also thank Rustam Muratov (Director, Institute of Forestry) and Nurali Rakhimov, both of Duschanbe, Tajikistan and Sergey Zagrebin (Tashkent, Uzbekistan) for information about range, in situ-populations and introductions in Central Asia. Finally, thanks to Michael Braun and Philip McGowan for help with literature and anonymous reviewers for comments on an earlier version of the manuscript.

References

ABDUSALYAMOV, I. (ED.) (1988) *Red Data Book of the Tajik SSR*. Donish Press, Dushanbe. [In Russian]

BIRDLIFE INTERNATIONAL (2008) *Phasianus colchicus*. IN: IUCN 2009. IUCN Red List of Threatened *Species*. Version 2009.1. <www.iucnredlist.org>. Downloaded on 12 July 2009.

BOEV, Z. (1997) Wild Galliform and Gruiform Birds (Aves, Galliformes and Gruiformes) in the Archaeological Record of Bulgaria. *International Journal of Osteoarchaeology* 7: 430-439. Available at http://e-ecodb.bas.bg/zb/sci/106_boev_1997_bg_galliform_gruiform.pdf.

BOEV, Z.N. (2001) Late Pleistocene and Holocene avifauna from three caves in the vicinity of Tran (Pernik District - W Bulgaria). Pages 98-106 in DELCHEV, P., SHANOV, S.T., BENDEREV, A. (eds) *Proceedings of the 1st National Conference on Environment and Cultural Heritage in the Karst.* Sofia, 10-12 November 2000. Earth and Man National Museum. Association of Environment and Cultural Heritage in Karst, Sofia. Available at http://e-ecodb.bas.bg/zb/sci/153_boev_2001_tran_avifaunas.pdf.

BRICKLE, N.W., DUCKWORTH, J.W., TORDOFF, A.W., POOLE, C.M., TIMMINS, R. & MCGOWAN, P.J.K. (2008) The status and conservation of Galliformes in Cambodia, Laos and Vietnam. *Biodiversity and Conservation* 17: 1393-1427.

BURKART, E. (2008) Neues von der Edelfasan-Gruppe. *WPA-Germany Rundbrief* 104(1): 25.

CARROLL, J.P., FAIRCLOTH, B.C, & MACHAIDZE, R. (2007) Observations on the Common Pheasant Phasianus Colchicus in the Alazani River Valley, Republic of Georgia. P 49 in: *4th International Galliformes Symposium, Chengdu, Sichuan, China* – 14-21 October 2007, Abstracts.

CHENG, T.H. (1978) *Fauna Sinica*. Aves. Galliformes, vol. 4. Science Press, Beijing, China.

DELACOUR, J. (1951) *Pheasants of the World,* Country Life Limited, London.

DELACOUR, J. (1977) *The Pheasants of the World,* 2nd edition, Spur Publications published in conjunction with The World Pheasant Association. P. 262 – 299.

EGUCHI, K. & AMANO, H.E. (2004) Invasive birds in Japan. *Global Environmental Research* 8(1): 29-39.

FULLER, R.A. & GARSON, P.J. (EDS.) (2000) *Pheasants. Status Survey and Conservation Action Plan 2000–2004*. WPA/BirdLife/SSC Pheasant Specialist Group. IUCN, Gland. Switzerland and Cambridge, UK and the World Pheasant Association, Reading, UK. vii + 76 pp.

HARRISON, C.J.O. (1982) *An Atlas of the Birds of the Western Palearctic*. Princeton University Press, Princeton, New Jersey, 1-332.

HILL, D. & ROBERTSON, P. (1988) *The Pheasant: Ecology. Management and Conservation*. BSP Books, Oxford

HUS, S. (1974) A*v hayvanlari ve avcilik.* - Istanbul Üniversitesi Orman Fakültesi yayinlari, I.Ü. yayin no: 1971, O.F. yayin no: 202. Kutulmus Matbaasi, Istanbul.

JELEN, E. (2009) Die Edelfasane (1). *Aviornis International*. Deutsche Ausgabe 3(15): 5-17.

JENKINS, D. (ED.) (1993) *Pheasants in Asia 1992*. World Pheasant Association, Reading, UK

JOHNSGARD, P.A. (1999) *The Pheasants of the World*. Smithsonian Institution Press.

KIYOSU, Y. (1978) *The Birds of Japan*. Kodansha, Tokyo, 1002 p. (in Japanese).

KOZYRENKO, M.M., FISENKO, P.V. & ZHURAVLEV, Y.N. (2009) Genetic Variation of Manchurian Pheasant (*Phasianus colchicus pallasi*) Rotshild, 1903) Inferred from Mitochondrial DNA Control Region Sequences. *Russian Journal of Genetics* 45(4): 460–468.

KURODA, N. & KOMIYA, T. (1987) Taxonomy of Phasianinae. In: KURODA, N. & MORIOKA, H. (eds.) *Animals of the World*, pp. 66-126, Dobutsusha, Tokyo..

LEVER, C. (1987) *Naturalized Birds of the World*. Longman, London, 615 p.

LIU, N.F. & SU, H.Y. (1992) The geographic variance and classification of *Phasianus colchicus strauchi*. *J. Lanzhou Univ.* 28, 135–139.

LIU, Y., ZHAN, X., WANG, N., CHAN, J. & ZHANG, Z. (2010) Effect of geological vicariance on mitochondrial DNA differentiation in common pheasant populations of the Loess Plateau and eastern China. *Molecular Phylogenetics and Evolution,* 55(2): 409-417.

MCGOWAN, P.J.K. (1994) *Family Phasianidae (Phesants and partridges)*. In DEL HOYO, J., ELLIOT, A. & SARGATAL, J. (1994) Handbook of the Birds of the World. Volume 2. New World Vultures to Guinea Fowl. Lync Edicions. Barcelona, Spain.

MÖLLER, C. (2005) *Fasane, Pfauen, Perlhühner.* 11., überarbeitete Auflage. Oertel und Spörer Verlags-GmbH & Co. Reutlingen, Deutschland.

NGUYEN, C.U. & EAMES, J. C. (1993) T*he distribution and status of pheasants in Vietnam.* Pp20-27 in: JENKINS, D. (ed.) *Pheasants in Asia 1992*. World Pheasant Association, Reading, UK.

OGURLU, I. (1993) *The status of Ring-necked Pheasants in Turkey.* Pp. 152-153. In JENKINS, D. (ed.) *Pheasants in Asia 1992*. World Pheasant Association, Reading, UK.

QU, Y., LIU, N., BAO, X. & WANG, X. (2009) Phylogeography of the ring-necked pheasant (*Phasianus colchicus*) in China. *Molecular Phylogenetics and Evolution*, 52: 125-132.

SAIDOV, A. & RAHIMOV , N. (2011) *Report on the assessment of the current status of area and population of the Tajik subspecies of common pheasant (Phasianus colchicus bianchii) in Tajikistan.* Nature and Biodiversity Conservation Union of Tajikistan, Dushanbe. [In Russian]

SOKOS, C.K., BIRTSAS, P.K. & PLATIS, P. C. (2007) *Status and conservation of endangered blacknecked pheasant in Hellas.* In: SJÖBERG, K. & ROOKE, T. (eds.) Book of Abstracts of the International Union of Game Biologists XXVIII Congress, Uppsala 2007.

TAN, C.-Z. (1990) *The distribution of pheasants and partridges in China.* Pp 16-17. In: HILL, D.A., GARSON, P.J. & JENKINS, D. (eds.) *Pheasants in Asia 1989*. World Pheasant Association, Reading.UK

TARHAN, S. (1987) *The works of animal protection propagation and management of hunting.* In: Wildlife Fauna in Turkey and in the Balkan Countries, International Symposium, 16-20 September 1987. Semih Ofset Matbaacılık Ltd. Şti., İstanbul, Turkey, 1-211.

TURAN, N. (1990) *Türkiyenin av ve yaban hayvanlari.* – Kuslar, OGM Egitim Dairesi Baskanligi Yayin ve Tanitma Sube Müdürlügü Matbaasi, Ankara, 1990.

VANDREY, W. (2007) Edelfasan-Alarm – Es ist 5 vor 12. *WPA-Germany Rundbrief* 103(3): 33-34.

WAN, J. & YANG, X. (1993) *Population densities of ring-necked pheasants in nature reserves in Shanxi Province*. Pp148-149. In: JENKINS, D. (ed.) Pheasants in Asia 1992. World Pheasant Association. Reading. UK.

WANG, N, ZHANG, Z.W, ZHENG, G. M. & MCGOWAN, P.J.K. (2004) Relative density and habitat use of four pheasant species in Xiaoshennongjia Mountains, Hubei Province, China. *Bird Conservation International* 14: 43-54.

WOLTERS, J. (1987) *Edelfasane. Die Arten der Jagdfasane. Spezies in Farbe.* Josef Wolters, Bottrop, Germany.

ZHENG, G.M. & ZHANG, Z.W.Z. (1993) *The distribution and status of pheasants in China* Pp 15 – 19. In: JENKINS, D. (eds.) *Pheasants in Asia 1992*. World Pheasant Association. Reading.UK.

ZHOU, Z.J. (1990) *The breeding ecology of Ring-necked Pheasants.* Page 80-81. In: HILL, D.A., GARSON, P.J. & JENKINS, D. (eds.) *Pheasants in Asia 1989*. World Pheasant Association, Reading.UK.

Biographical sketches

THIEMO BRAASCH holds a diploma in biology and is a member of the scientific advisory board and head of the working group on the island of Java in the Zoological Society for the Conservation of Species and Populations (ZGAP) in Germany. Tomaš Peš is Curator of the Zoological and Botanical Gardens of Plzen in the Czech Republic. His focus is the breeding of common pheasant subspecies. Stefan Michel is a zoo animal breeder and biologist working in Central Asian countries for over fifteen years. Currently he works with a Tajik NGO and advises a project on hunting management, focussing on wild sheep and goats. Heiner Jacken has kept pheasants for around 50 years. As a founder member and council member of WPA Germany his interests progressively developed towards conservation breeding. He is active in focus groups for common and silver pheasants, as chapter coordinator for *Lophura* studbooks and in ECBG.