



PUBLISHER'S TRANSLATION INTO ENGLISH

Antonov A.I.* (2012) On the distribution of bird species of southern genesis in the middle reaches of the Bureya River. *Far East. J. Orn.* 3: 3 — 10.

SUMMARY

Changes in species composition and range of representatives of the avifauna of southern origination were ascertained for the middle reaches of the Bureya River basin. Due to a variety of reasons, the vast majority of species have expanded their ranges within the study area over the last fifty years. Adverse changes were noted for a few species, and were mostly the result of anthropogenic factors.

The referred figures and tables are in the original article in Russian, at pages 3—10

Nearly a half-century has passed since the 1964 publication of “the border of the Chinese ornithological complex on the Bureya River“, a brief but, to a certain extent, seminal work by Ukrainian ornithologists A.B. Kistyakovsky and L.A. Smogorzhevsky. Since then, new data on the distribution of «southern» bird species in the upper parts of the Bureya River basin have been reflected in the scientific literature (Voronov, 1976, 2000; Biserov, 1999, 2007, etc.). However, there has been practically no new information in the scientific literature from the areas that Kistyakovsky and Smogorzhevsky surveyed in 1962, or specifically from the middle reaches of the Bureya River (Antonov et al., 2005). Therefore, the avifauna of the Bureya River valley (between the Verkhnebureinsky Plain in the north (which is now partly submerged by the upper extension of the Bureya Reservoir), to the river's outlet in the Bureya-Khingan lowlands in the south) are described in some detail.

Ongoing climate change in the Amur River basin (Darman et al., 2006) and anthropogenic pressure on natural systems has inevitably led to an abrupt change in wildlife populations of the Bureysky landscape. A number of southern species adapted to living in close proximity with humans

have benefited from these new environmental conditions. Intensive hydro construction in the region has further destabilized the ongoing process of faunal formation and transformation (Podolsky et al., 2005). In addition to the existing Bureya Reservoir, which covers a total area of about 740 km², a new reservoir (called Nizhnebureiskoye) is expected to be completed within the next five years. Preparations for construction have already begun upriver from the village Novobureisky. This will doubtless lead to further changes in the species composition and structure of avifauna in the study area.

MATERIALS AND METHODS

The field studies that resulted in the observations reflected in this article covered the Bureya River valley (now partly submerged) from the village of Ust'-Urgal (located near Urgal River mouth) to the mouth of the Bureya River (fig. 1). These surveys were conducted as short expeditions to various parts of the region during the breeding period (late May-June) from 2003-2011, and to the lower Bureya Reservoir widening (see fig. 1) from 2006-09. In addition, surveys based out of field stations were also conducted in autumn.

A substantial body of research was conducted out of the Nizhny Mel'gin station in the Bureya Reservoir canyon, and at the Praviye Agoli station at the lower widening of this man-made water body (fig. 1). These stations were established to monitor animal population dynamics during dam

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and reservoir construction using conventional field methods to collect information (Podolsky et al., 2004). There were several supplementary studies, including a census of plovers (*Charadrius spp.*) nesting on river beaches and spits, aural nocturnal surveys of owls, standard capture of birds using mist nets (and associated collection of morphometric data).

For the purposes of this article, the part of the study area referred to as the “middle reaches of the Bureya River” represents the area between the village of Novobureisky to the Verkhnebureinsky Plain or, in other words, from the projected location of the Nizhnebureisky dam to the upper Bureya Reservoir widening. Therefore, the data from this study are useful not only for regional ornithogeographic analysis, but also to later assess the impact that hydropower development in the region has on local avifauna and the structure of natural communities.

“Southern” species are classified as those that have their origins in China and Indo-Malaysia (following typology of Shtegman, 1938), as well as widespread Eurasian species that are associated with arid and deciduous forests (i.e., relatively southern natural systems). Russian and Latin species names follow taxonomy in Koblik et al. (2006)¹. Latin names follow the first mention of the species.

RESULTS AND DISCUSSION

Of the 48 bird species that Kistiyakovsky and Smogorzhevsky (1964) considered “Southern”, 44 were recorded on the same stretch of the Bureya River. Over the past 50 years, only four of these species have northern range limits that had not changed; the majority have extended their ranges further north. This may be the result of either better knowledge due to increased investigation, actual range expansion, or a combination of the two.

Some species, such as falcated duck (*Anas falcata*), Amur falcon (*Falco amurensis*), Japanese quail (*Coturnix japonica*), red-rumped swallow (*Cecropis daurica*), among others, showed a

negative trend in population size and regional distribution. It should be noted that this list may be substantially enlarged in the near future due to the widespread flooding of lowland floodplain habitats in the Bureya River basin, and the subsequent loss of habitats preferred by a number of species (Podolsky et al., 2005).

Additions to the species list (i.e., first-time encounters) of confirmed or suspected breeders along the Kistiyakovsky and Smogorzhevsky (1964) survey route were the following: great cormorant (*Phalacrocorax carbo*), ring-necked pheasant (*Phasianus colchicus*), yellow-legged buttonquail (*Turnix tanki*), Oriental honey buzzard (*Pernis ptilorhynchus*), grey-faced buzzard (*Butastur indicus*), common moorhen (*Gallinula chloropus*), long-billed plover (*Charadrius placidus*), white-winged tern (*Chlidonias leucopterus*), dollarbird (*Eurystomus orientalis*), brown hawk owl (*Ninox scutulata*), hoopoe (*Upupa epops*), gray-headed woodpecker (*Picus canus*), Daurian starling (*Sturnia sturnina*), gray-cheeked starling (*Sturnus cineraceus*), Asian stubtail (*Urosphena squameiceps*), black-browed reed warbler (*Acrocephalus bistrigiceps*), and blue-and-white flycatcher (*Cyanoptila cyanomelana*).

The focus here is not on the “southern” species whose breeding ranges (according to the new data) have expanded significantly past the northern border (between 50-51° N latitude) as defined by Kistiyakovsky and Smogorzhevsky (1964) and moved outside the Verkhnebureinsky Plain. There are about two dozen such species, including northern hawk cuckoo (*Hierococcyx (fugax) hyperythrus*), grey nightjar (*Caprimulgus indicus*), yellow-rumped flycatcher (*Ficedula zanthopygia*), Asian brown flycatcher (*Muscicapa dauurica*), eastern crowned warbler (*Phylloscopus coronatus*), pale-legged leaf warbler (*Ph. tenellipes*), grey-backed thrush (*Turdus hortulorum*), and blue rock thrush (*Petrophila gularis*). The Verkhnebureinsky Plain is not a geographical boundary for southern species such as the Oriental turtle dove (*Streptopelia orientalis*), white-throated needletail

1) Translator's note: English-language common names follow Brazil, M. 2009. Birds of East Asia. Princeton University Press, Princeton, NJ, USA.

(*Hirundapus caudacutus*), azure-winged magpie (*Cyanopica cyanus*), chestnut-flanked white-eye (*Zosterops erythropleurus*), pale thrush (*Turdus pallidus*), thick-billed warbler (*Phragmaticola aedon*) and several others. However, some of these are not formally considered breeders in the upper Bureya River basin (Biserov, 1999).

What is of interest here is descriptions of encounters with new species, and the population dynamics of “southern” species whose northern range limit is defined by the middle reaches of the Bureya River basin (species that do not go any further north than the Verkhnebureinsky Plain).

Great cormorant. This species began to expand northward throughout the Amur River basin at the end of the 20th century, and was not considered representative of the Verkhnebureinsky Plain at the end of the last century (Voronov, 1976). At the present time however, it is considered a common breeding species throughout the Bureya Reservoir.

Mandarin duck (*Aix galericulata*). A presumable breeding species observed in the Bureya River valley up to the lower Bureya Reservoir widening, however breeding possibilities are limited due to insufficient mature riparian stands due to the flooding that resulted when the reservoir was created. The northern-most broods of this species were observed at around 50°10' latitude, which is close to the species border as defined by Kistyakovsky and Smogorzhevsky (1964). Encounters with adult mandarin ducks in summer have been recorded all the way to the upper reaches of the Bureya River basin (Biserov, 1999).

Crested honey buzzard. This is a common species that was recorded along the banks of the middle reaches of the Bureya River during all floats conducted in May-June 2003 (Antonov et al., 2005), as well as during more recent surveys. It has not yet been detected above the Verkhnebureinsky Plain. This species is regularly encountered around the Praviye Agoli monitoring station, where numbers show a slight increase over time.

Grey-faced buzzard. This species has a distribution that extends north to the mouth of the Zhelunda River (50° 05' latitude), where it was

observed on 22 November, 2011. Further south, nesting has been observed on Domikansky Island (Antonov and Parilov, 2009). At the present time, no other breeding locations in the Bureya River basin are known.

Pied harrier (*Circus melanoleucos*). This species was observed up the Bureya River as far as the lock at the Bureya hydroelectric dam, where both a male and a female were alternately seen on 20 and 23 June, 2005. This species has not been observed from the Praviye Agoli monitoring station, which is situated in suitable habitat for this species.

Ring-necked pheasant. This species was recorded as far upriver as the shores of the lower Bureya Reservoir widening (more specifically, the outskirts of the village Cheugda, which is now submerged; Antonov et al., 2005). This species has not been observed around the Praviye Agoli monitoring station.

Yellow-legged buttonquail. A common species of meadow habitats around the abandoned village of Bakhirevo (50° N latitude), where a density of 3 pairs/km² was recorded in the last week of June, 2004.

Common moorhen. The first documented data regarding breeding by this species in the study area were obtained in the Doldykan River basin (~49°50' latitude), where an adult with a brood was observed on a small pond on 15 July, 2011. No moorhens have been seen further north of this location in the Bureya River basin.

Long-billed plover. Seven territorial pairs of this species were observed on a 70-km stretch of the middle reaches of the Bureya River (from the Sukhiye Protoki river tract to the village of Novobureisk) during the last 10 days of June, 2011. This included the first documentation of breeding when a nest with a full clutch was discovered (Antonov, in press). This species was previously considered a likely breeder in the Amurskaya Oblast (Dugintsov and Pankin, 1993). It probably occurred but was overlooked by Kistyakovsky and Smogorzhevsky (1964), as the commonly-occurring lesser ringed plover (*Ch. dubius*) was also not detected by them. It is likely that those observers simply did not devote much

time to investigating pebbly beaches and spits and, without searching there, the detection of these plovers is unlikely. In addition, long-billed plovers do not appear to be site fidelic (Kolomiitsev, 1988), which may further contribute to non-detections during single-survey field studies.

White-winged tern. Between 23-26 May, 2003, more than 30 of these birds were seen on the Bureya River within the Verkhnebureinsky Plain. The average index of abundance was 0.5 individuals/km², although specific attempts to confirm nesting were not undertaken.

Collared scops owl (*Otus bakkamoena*). As has been previously noted in the literature (Antonov and Parilov, 2010), it seems at least curious that Kistyakovskiy and Smogorzhevskiy (1964), in describing the avifauna of the middle reaches of the Bureya River, detected this species during their surveys, while the Oriental scops owl *O. sunia* which is now common there, was not. These two species have distinctly different vocalizations so, ignoring possible identification errors, the only conclusion is that collared scops owls have undergone severe and negative changes in regional distribution. We have never detected a collared scops owl in all of our long-term studies on either the Bureya River, or in the neighboring Arakhara River basin.

Oriental scops owl. The courtship calls of males were heard almost everywhere in the Bureya River basin study area, and an adult was also captured in a mist net at the Praviye Agoli monitoring station on 24 June, 2007. The northern-most detection in the Bureya River valley was of a similarly-captured male just above 51°, but that location has since been flooded by the reservoir. Therefore, additional study is needed to ascertain the northern extent of eastern scops owl distribution in the region.

Brown hawk owl. This species had not been recorded in the Amurskaya Oblast until 1970 (Pankin and Potorocha, 1976), after which detections began to increase in frequency. In recent years, the brown hawk owl has become a common species in the southern part of the province. It has been recorded in the Bureya River basin as far north as the Praviye Agoli Gulf (i.e., to 50° 20'

latitude) where, on 12 July 2012, two individuals were heard vocalizing, and were observed hunting insects at dusk. To the south, brown hawk owl courtship calls were heard in the Bureya River floodplain at ~50° latitude, where two individuals were heard simultaneously from the same location on 22 July, 2011. Birds were also heard on Domikansky Island (in June 2010 and June 2011.), and in the vicinity of Khingansky Nature Reserve (in June-July 2010 and 2011.). Additionally, this species was recorded in the Arkhara River basin (its left tributary, the Salokachi River; 49°43' latitude) on 4 June, 2010.

Dollarbird. On two occasions, solitary individuals of this species were observed in the middle reaches of the Bureya River valley; first in the Sukhiye Protoki river tract on 2 July 2010, and second in the Irkun river tract, on 23 June 2011. This species had not been previously been recorded in the middle Bureya. There is evidence that this is a true range expanding (as opposed to a perceived one based on non-detection in previous years' surveys), as this species is always detected when it is present, irrespective of local population size.

Hoopoe. A pair of this species was encountered near the village of Chekunda on 25 May, 2003, prior to the area being flooded by the creation of the reservoir. There are no known records further north.

Grey-headed woodpecker. This species has been recorded in the Bureya River basin as far as the Obdergan and Nizhny Melgin Rivers (in the canyon portion of the Bureya Reservoir). It is also not considered rare along the shores of the lower reservoir widening, although direct evidence of breeding has not been confirmed.

Grey-cheeked starling. This starling is considered a common species in the study area up to the lower Bureya Reservoir broadening. In the Bureya floodplain from 50° and lower downstream, it is one of the dominant species in the local avifauna.

Daurian starling. This species is a sporadic nester in riparian forests north to the Irkun river tract. On 24 June, 2011, nestlings were observed being fed in the cavity of a snag, located on an

island in the Bureya River's main channel. Neither this nor the above-mentioned starling species had previously been recorded by in the study area.

Blue-and-white flycatcher. This species was observed north through the Bureya River valley to Sukhiye Protoki river tract, where it was heard vocalizing on 21 June, 2011. It is observed evenly but rarely further south; on the 70 km stretch of the Bureya River from Sukhiye Protoki to Novobureisk in summer 2011, only three pairs were detected. Moreover, in two of these cases detections were based on vocalizations, and in one case, a female was visually detected, but vocalizations were neither heard in the morning nor in the evening. In all cases, detections were made exclusively along rocky outcroppings of the Bureya River.

Asian stubtail. This species is only reliably seen downstream of the Bureya hydroelectric dam, north to 50° latitude. There have been reports of this species vocalizing in the canyon portion of the Bureya Reservoir (the Obdergan River) that require confirmation.

Black-browed reed warbler. Biserov (1999) considered this species to be a vagrant above the Verkhnebureinsky Plain. Within the Bureya River valley, the northern-most enclave of breeding birds was found on 22 June 2005, in a forest cut near the Bureya hydroelectric dam. Previous researchers working in the middle Bureya River basin did not detect this species.

Elegant bunting (*Cristemberiza elegans*). Biserov (1999) encountered this species much further north than its previously-known breeding range. During line transect surveys based out of the Nizhny Melgin in June 2005 and 2006, this species was regularly encountered, and density was estimated at 3 pairs per km² in mixed forest dominated by birch and larch. At the Praviye Agoli monitoring station, this species' nesting density ranged from 1-5 pairs per km², and in September, a considerable number of these birds were captured in mist nets. These were exclusively local birds with low fat reserves, and often exhibiting an incomplete molt of body feathers.

Tristram's bunting (*Ocyris tristrami*). One of the more common breeding species found on

slopes and along the watershed divide in spruce-fir forests of the canyon area of the Bureya Reservoir. Surveys in June 2005 and 2006 determined a density estimate of 9 pairs per km² there. Further north, this species was observed once in a spruce riparian forest near Ust'-Urgal from 21-23 May, 2003. There have been no other recorded encounters in the Verkhnebureinsky Plain.

Oriental greenfinch (*Chloris sinica*). This species has been detected up to the Yanyr River basin, in the upper Bureya Reservoir widening, where two birds were seen on 25 May, 2003, during a 20 km survey route. Further south, this species becomes more common, and below 50° latitude, in some places it is considered one of the dominant species in riparian forests along the Bureya River.

Long-tailed rosefinch (*Uragus sibiricus*). Similar to the preceding species, this bird's northern range limit is the Verkhnebureinsky Plain, and apparently does not go any further north (Biserov, 1999). The distribution of **ashy minivet** (*Pericrocotus divaricatus*) north through the Bureya River valley is also limited by the Verkhnebureinsky Plain (Biserov, 1999) but this species, in contrast to the long-tailed rosefinch, has been recorded in this area in the past (Voronov, 1976).

In nearly half a century of ornithological observations in the middle reaches of the Bureya River, no significant latitudinal shifts in the northern border of the following species have been observed: **band-bellied crane** (*Porzana paykullii*), **Indian cuckoo** (*Cuculus micropterus*), **Richard's pipit** (*Anthus richardi*), and **meadow bunting** (*Emberiza cioides*). The **Amur falcon** has shown a significant reduction in range within the study area. This is perhaps a reflection of the general decline in the global population of the species due to mass destruction on its wintering grounds in Africa and migration route through India (eg, <http://www.conservationindia.org/campaigns/amur-massacre>). In addition, the local Amur falcon population decline may be a result of the human abandonment of the valley between the Bureiskaya hydroelectric dam and the village of Novobureisk, which was previously densely populated, and now not a single village remains. This resulted in a significant reduction in the local

common magpie (*Pica pica*) population, which the falcon relied on for providing suitable nesting substrate. Restoring this falcon to its former range in the Bureya River valley is unlikely, as most suitable habitat for this species of plains and valleys has been made unavailable due to flooding.

The **red-rumped swallow** is another semi-synanthropic species that has apparently disappeared from the middle Bureya River following the region's abandonment by humans. The population decline of **Japanese quail** is likely related to the reduction of agriculture at the end of the last century, as well as the flooding of optimal habitat at the beginning of this century.

Similar to the findings of Biserov (2007), **falcated duck** and **Oriental reed warbler** (*Acrocephalus orientalis*) were not found in the Verkhnebureiskii Plain (or anywhere in the middle reaches of the Bureya River up to the village of Novobureisky), although both of these species were recorded by previous authors. The **chestnut-eared bunting** (*Emberiza fucata*) was similarly not detected, although Kistyakovskiy and Smogorzhevskiy (1964) indicated that their distribution in the study area reached 50°05' latitude. The eastern **spot-billed duck** (*Anas poecilorhyncha*) was only recorded once in all the years of study, on 21 June 2011, when a pair of birds was observed on the Bureya River's main channel, near the Sukhie Protoki river tract.

Additionally, it is worth pointing out a few species that are currently found in the lower parts of the Bureya River basin and, if current trends of natural and anthropogenic environmental changes continue, are potentially pre-adapted to colonize aquatic and coastal habitats in a northerly direction. These species are **little grebe** (*Tachybaptus ruficollis*), **great crested grebe** (*Podiceps cristatus*), and (to a lesser degree) the **black-necked grebe** (*Podiceps nigricollis*), **purple heron** (*Ardea purpurea*), **great white egret** (*Casmerodius albus*), **Oriental stork** (*Ciconia boyciana*), **black-winged stilt** (*Himantopus himantopus*), **whiskered tern** (*Chlidonias hybridus*), **black-naped oriole** (*Oriolus chinensis*), **European starling** (*Sturnus vulgaris*), and **azure tit** (*Parus cyanus*).

CONCLUSION

The general lack of regional and local faunal studies in parts of the Russian Far East has resulted in an information deficit that makes retrospective analysis difficult. Not all new faunistic discoveries can be interpreted as a clear reflection of the settlement process by species new to the region. It is difficult to determine which of these new findings are species that were previously present (but undetected), and which are truly new. However, for a number of species that have evident species-specific characteristics that make them highly detectable in the wild, one can come to the conclusion that substantive changes in species distribution are occurring, even when other information is lacking.

The level of detectability is relatively high for most bird species, especially non-passerines, but also for songbirds with loud and expressive vocalizations, and as a rule they can be detected even during short surveys. The reliability of data increases with multi-year studies, whereas the interpretation of single-survey results inevitably involves some risk, as results of analysis are more likely to be speculative than robust. Given these circumstances, the factual data in this article adequately characterize the northern limits of "southern" avifauna in the study area.

Coupled with data collected by previous researchers, and related information from neighboring regions, an estimation of avifaunal trends can be reached that should be used as efficiently as possible to continue tracking the spatio-temporal dynamics of bird populations.

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REFERENCES

- Antonov A. I. (2012) Long-billed Plover *Charadrius placidus* (Charadriidae) is the nesting species of Amursk region. *Bulletin of the North-East Scientific Center, FEB RAS* . 1: 122-124. (In Russian)

- Antonov A.I., Bylkov A.F., Kastyrykin V.A., Podol'sky S.A. (2005) Data on the ornithofauna of the middle Bureya river basin // Inventory, monitoring and protection of IBS of Russia. Issue 5. Moscow: SOPR. Pp. 4-9. (*In Russian*)
- Antonov A.I., Parilov M. P. (2009) To the assessment of the current status of protected bird species at the east of Amurskaya oblast // *Amurian Zoological Journal*. I (3): 270-274. (*In Russian*)
- Antonov A.I., Parilov M. P. (2010) Cadastre of the bird species of Khingansky State Nature Reserve and Bureya-Arkhar lowland. Khabarovsk: FEB RAS. 102 p. (*In Russian*)
- Biserov M.F. (1999) About species-representatives of Chinese ornithocomplex in the upper reaches of Bureya River // Proc. of State Nature Reserve "Bureinsky". Khabarovsk. Vol.1. Pp. 55-58. (*In Russian*)
- Biserov M.F. (2007) Influence of anthropogenic changes on fauna and bird communities of taiga forests of Khingano-Bureinskoye highland // Proc. of State Nature Reserve "Bureinsky". Khabarovsk. Vol. 3. Pp. 7-19. (*In Russian*)
- Darman Yu.A., Kokorin A.O., Minin A.A. (2006) Climate change impact on ecosystems of the Amur River basin. Moscow: WWF-Russia. 128 p. (*In Russian*)
- Dugintsov V.A., Pan'kin N.S. (1993) Checklist of the Birds of Upper and Middle Priamuriye within the administrative borders of Amurskaya oblast // Problems of ecology of Upper Priamuriye. Blagoveshensk. Pp. 120-140. (*In Russian*)
- Kistyakovskiy A.B., Smogorzhevskiy L.A. (1964) About the margin of Chinese ornitho-faunal complex at the Bureya River // Scientific accounts of Higher School. Biological Sciences. No. 3. Pp. 26-29. (*In Russian*)
- Koblik E.A., Red'kin Ya.A., Arkhipov V.Yu. (2006) Checklist of the Birds of Russian Federation. Moscow: KMK Scientific Press Ltd. 256 p. (*In Russian*)
- Kolomiytsev N.P. (1988) To the ecology of Long-billed plover // Waders in the USSR: distribution, biology and conservation. Moscow, Pp. 62-67. (*In Russian*)
- Pan'kin N.S., Potorocha V.I. (1976) Brown Hawk-Owl at the Zeya-Bureya Plain // *Ornithologia*: 12:242. (*In Russian*)
- Podol'sky S.A., Ignatenko S.Yu., Antonov A.I., Ignatenko E.V., Kastyrykin V.F., Parilov M.P. (2005) Ecological consequences of the Bureya hydro-electric facility construction // Evaluation of the impact of the superficial water regime changes on terrestrial ecosystems. M: Science. Pp. 214-251. (*In Russian*)
- Podol'sky S. A., Ignatenko S.Yu., Darman Yu.A., Antonov A.I., Ignatenko E.V., Kastyrykin V.F., Bylkov A.F., Parilov M.P. (2004) Problems of conservation and studying of the wildlife in mountainous reservoirs constructions by the example of Bureya hydro-power complex. Moscow: RASKN. 132 p. (*In Russian*)
- Shtegman B. K. (1938) The basics of ornitho-geographical division of the Palearctic. // Fauna of USSR. The Birds. Moscow-Leningrad: RAS. Vol. 1(2). Pp. 1-76. (*In Russian*)
- URL: <http://www.conservationindia.org/campaigns/amur-massacre>
- Voronov B.A. (1976) Ornithofauna of the Verkhnebureinskaya plain // Wildlife and hunting service of Russian Far East. Khabarovsk. Pp. 136-140. (*In Russian*)
- Voronov B.A. (2000) Birds at the new-developing regions (by the example of Northern Priamuriye). Vladivostok: Dal'nauka. 170 p. (*In Russian*)