В. А. Коровин

TENDENCIES IN THE DYNAMICS OF BIRDS COMMUNITY IN AGRICULTURAL LANDSCAPES OF THE STEPPE TRANS-URALS AT THE TURN OF THE CENTURY

Vadim A. Korovin

Ural Federal University
51 Prosp. Lenina, *Ekaterinburg 620002*, *Russia*
E-mail: *vadim_korovin@mail.ru*

Received 16 April 2018, revised 4 June 2018, accepted 31 August 2018

Korovin V. A. Tendencies in the Dynamics of Birds Community in Agricultural Landscapes of the Steppe Trans-Urals at the Turn of the Century. *Povolzhskiy Journal of Ecology*, 2018, no. 3, pp. 274–289 (in Russian). DOI: https://doi.org/10.18500/1684-7318-2018-3-274-289

The dynamics of the bird community in agricultural landscapes of the Trans-Urals steppe from the period of heavy agricultural intensification (1988 – 1992) until the decline of agricultural production (2000 – 2008) is considered. In the conditions of intensive agriculture, the agrophytocenosis structure and features of the agricultural cultivation technology serve as the key factors for the differentiation of bird communities in the steppe agricultural landscape. A relatively high specific richness characterizes the bird community of virgin pastures, while among field agrocenoses, i.e. in the areas seeded with perennial grass, the population is much poorer in the grain fields prevalent in the area of agricultural landscape and, especially, in the cultivated crop fields. During the period of agricultural stability, both the living conditions and the bird community structure in the agricultural landscape remained relatively constant from year to year. The economic crisis that took place at the end of the 20th century caused a deep decline in agricultural production, namely, livestock and sown land area reduction. The restorative successions of vegetation in pastures and fallow lands led to significant changes in the conditions of bird habitats. For many species these changes meant an increase in the ecological capacity of the environment and contributed to the growth of their populations (*Alauda arvensis* Linnaeus, 1758; *Motacilla flava* Linnaeus, 1758; *Coturnix coturnix* (Linnaeus, 1758); *Tetrax tetrax* (Linnaeus, 1758) et al). The opposite tendency for reduction in numbers is demonstrated by such species that avoid high closed grass stands (*Melanocorypha leucoptera* (Pallas, 1811), *Oenanthe oenanthe* (Linnaeus, 1758), *O. isabellina* (Temminck, 1820) et al.). In general, the community density in the agricultural landscape increased by 2.3 times as compared to the pre-crisis period, the number of nesting species increased by 1.3 times. For the species that had formed strong ecological connections with agriculture (primarily, Corvidae family – *Pica pica* (Linnaeus, 1758); *Corvus monedula* Linnaeus, 1758; *C. frugilegus* Linnaeus, 1758; *C. cornix* Linnaeus, 1758), the decline in the agricultural production and the reduction of functioning agrocenoses had opposite consequences and caused the decline in their numbers in the agricultural landscape.

Key words: bird community, number, long-term changes, agricultural landscape, steppe Transurals.

DOI: https://doi.org/10.18500/1684-7318-2018-3-274-289

REFERENCES

Bolnykh S. I., Vengerov P. D. Dynamics of the Fauna and the Bird Community within the Reserves of Forest Steppes and Steppes. *Belgorod State University Scientific Bulletin*, *Ser. Natural Sciences*, 2011, no. 15, pp. 81–87 (in Russian).

Borisov V. V., Scheblykina L. S., Uryadova L. P. The dynamics of species composition and bird inhabitants on abandoned arable lands with different degrees of overgrowth *Bulletin of Pskov State University*, *Natural and Phys.-Math. Sciences Line*. 2014, no. 5, pp. 12–27 (in Russian).

Vengerov P. D. *Ptitsy i maloispolzuyemyye selskokhozyaystvennyye zemli Voronezhskoy oblasti* [Birds and Underutilized Agricultural Lands of Voronezh Region]. Voronezh, *Krivichi* Publ., 2005. 152 p. (in Russian).

Vengerov P. D. Utilization of Agricultural Lands and Condition of Steppe Vertebrate Fauna in Voronezh Region after 1991. *Russian J. Ornithology*, 2015, vol. 24, express-issue 1100, pp. 327–339 (in Russian).

Vengerov P. D., Kazartseva S. N. Impact of Changes in the Utilization of Lands on the Nestling Birds in Voronezh Region. *4th Scientific Readings to the Memory of Professor V. V. Stanchinsky*. Smolensk, 2004, iss. 4, pp. 655–664 (in Russian).

Volkovskaya-Kurdyukova E. A., Kurdyukov A. V. The Results of Ornithocomplexes Study in the Underutilized Agricultural Lands of the South of Primorye. *Bulletin of Orenburg State University*, 2008, no. 6, pp. 129–137 (in Russian).

Gavrilenko V. S. Impact of the Economic Recession on the Number and Distribution of Birds in the Southern Steppes of the Ukraine. *Contemporary Issues of East-European and North-Asian Birds Study and Protection*: *Proceedings of International Conference* (*11th Ornithology Conference*). Kazan, Izdatelstvo "Matbugat yorty", 2001, pp. 157–159 (in Russian).

Galushin V. M., Belik V. P., Zubakin V. A. Birds' Responses to recent social-economic Transformations in Northern Eurasia. *Achievements and Problems of Ornithology of Northern Eurasia on a Boundary of Centuries. The Works of the International Conference* "*Urgent Problems of Birds' Study and Protection in East Europe and Northern Asia*". Kazan, Izdatelstvo "*Magarif*", 2001, pp. 429–449 (in Russian).

Koblik E. A., Red'kin Ya. A., Arkhipov V. Yu. Checklist of the Birds of Russian Federation. Moscow, KMK Scientific Press Ltd., 2006. 256 p. (in Russian).

Korovin V. A. Dynamics of the Steppe Agricultural Landscape Bird Communites in connection with Changes of Land Exploitation Intensity. *Achievements and Problems of Ornithology of Northern Eurasia on a Boundary of Centuries. The Works of the International Conference* "*Urgent Problems of Birds' Study and Protection in East Europe and Northern Asia*". Kazan, Izdatelstvo "*Magarif*", 2001, pp. 469–477 (in Russian).

Korovin V. A. *Ptitsy v agrolandshaftakh Urala* [Birds in agricultural landscapes of the Ural]. Ekaterinburg, Izdatelstvo Uralskogo universiteta, 2004. 504 p. (in Russian).

Korovin V. A. Dynamics of the Number of the Myophagus Birds of Prey in the Trans-Ural Steppes Taking into Account the Recession in the Agricultural Activities. *Study and Protection of the North-Eurasian Birds of Prey: Proceedings of the 5th International Conference on the North-Eurasian Birds of Prey*. Ivanovo, Izdatelstvo Ivanovskogo gosudarstvennogo universiteta, 2008, pp. 105–106 (in Russian).

Korovin V. A. Contemporary state of the Demoiselle Crane population in the steppe Transurals. *Povolzhskiy J. of Ecology*, 2009, no. 4, pp. 296–304 (in Russian).

Korovin V. A. Little Bustard population restoration in the northern steppe Trans-Urals. *Povolzhskiy J. of Ecology*, 2013, no. 1, pp. 51–60 (in Russian).

Korovin V. A. Dynamics of bird community of the agricultural landscape in the Middle Urals caused by wide-spread occurence of fallow lands. *Izvestia of Samara Scientific Center of the Russian Academy of Sciences*, 2014, vol. 16, no. 5 (1), pp. 340–343 (in Russian).

Korovin V. A. Long-Term Changes in the Community of Birds of the Agricultural Landscape in the Middle Urals. *Contemporary Problems of Ecology*, 2015 *a*, vol. 8, iss. 2, pp. 227–231.

Korovin V. A. Corvidae in the Windbreakers of the Trans-Ural Steppes. *Russian J. Ornithology*, 2015 *b*, vol. 24, express-issue 1178, pp. 2924–2927 (in Russian).

Korovin V. A. Environmental Implications of the Agricultural Crisis for the Birds Populations and Community within the Cultivated Lands of the Trans-Ural Steppes. *Russian J. Ornithology*, 2017, vol. 26, express-issue 1486, pp. 420–425 (in Russian).

Melnikov V. N., Khrulyova O. B. Post-technogenic successions of the ornithocomplexes of the Eastern Upper-Volga region. Part II. Bird population dynamics in the course of overgrowing of neglected arable lands. *Povolzhskiy J. of Ecology*, 2011, no. 4, pp. 532–536 (in Russian).

Mishchenko A. L., Sukhanova O. V. Dynamics of the Number of Birds during the Seral Changes in the Agricultural Lands of the Central Russia. *Dynamics of the Number of Birds in the Terrestrial Ecosystems*: *Proceedings of the Russian National Scientific Meeting*. Moscow, A. N. Severtsov Institute of Ecology and Evolution of RAS, 2007, pp. 133–142 (in Russian).

Oparin M. L., Oparina O. S. Population dynamics of ground nesting birds during fallow land succession of vegetation in the turf-cereal steppes of the Trans-Volga region. *Povolzhskiy J. of Ecology*, 2006, no. 2–3, pp. 154–163 (in Russian).

Ravkin E. S., Chelintsev N. G. *Guidelines for the Integrated Route Census of Birds*. Moscow, All-Union Research and Development Institute for Nature Conservation and Reserve Management and Studies, 1990. 33 p. (in Russian).

Sviridova T. V., Volkov S. V., Grinchenko O. S., Zubakin V. A., Kontorshchikov V. V., Konovalova T. V., Koltsov D. B. Agricultural Activities' Intensity Impact on Birds within the Cultivated Lands of the Northern Moscow Region. *Development of the Contemporary Ornithology in the Northern Eurasia: Proceedings of the 12th International Ornithology Conference of the Northern Eurasia*. Stavropol, Izdatelstvo Stavropolskogo gosudarstvennogo universiteta, 2006, pp. 371–397 (in Russian).

Chelintsev N. G. Techniques of Route Census of Animals. In: *Ecological Principles of Wildlife Protection.* Moscow, 1985, pp. 74– 81 (in Russian).

Aebischer N., Potts G. T. Spatial changes in grey partridge (*Perdix perdix*) distribution in relation to 25 years of changing agriculture in Sussex U.K. *Gibier Faune Sauvage*, 1998, vol. 15, spec. no. 1, pp. 293–308.

Chamberlain D. E., Fuller R. J., Bunce R. G. H., Duckworth J. C., Shrubb M. Changes in the abundance of farmland birds in relation to the timing of agricultural intensification in England and Wales. *J. of Applied Ecology*, 2000, vol. 37, iss. 5, pp. 771–788.

Dombrowski A., Golawski A. Changes in numbers of breeding birds in an agricultural landscape of east-central Poland. *Vogelwelt*, 2002, vol. 123, no. 2, pp. 79–87.

Dombrowski A., Golawski A. Znaczenie odlogow w preferencjach srodowiskowych wybranych gatunkow legowych ptako w krajobrazie rolniczym srodkowej Polski. *Notatki Ornitologiczne*, 2004, vol. 45, no. 2, ss. 83–90.

Fischer S. Corn Buntings *Miliaria calandra* profit by set-asides in agricultural landscapes. *Ostrich*, 1998, vol. 69, iss. 3–4, pp. 283–284.

Fuller R. J. Responses of birds to organic arable farming: mechanisms and evidence. *Proceedings of the 1997 Brighton Crop Protection Conference-Weeds*. Farnham, British Crop Protection Council, 1997, pp. 897–906.

Genghini M., Avoni F. "Cover crops" faaunistiche e gestione dei terreni a set-aside pluriennale (5 – 20 anni). *Suppl. Ric. Biol. Selvaggina*, 1997, vol. 27, pp. 547–552.

Granval P., Arnauduc J. P., Havet P. Jachères environnement et faune sauvage: où en est-on?. *Bulletin mensuel de l'Office National de la Chasse*, 1999, no. 245, pp. 16–19.

Henderson I. G., Cooper J., Fuller R. The usage of set-aside land by birds within intensive farming landscapes. *Ostrich*, 1998, vol. 69, iss. 3–4, pp. 211.

Jenny M., Lugrin B., Regamey J. L. Habitat restoration programme for agricultural-land breeding birds in Switzerland. *Gibier Faune Sauvage*, 1998, vol. 15, spec. no. 1, pp. 547–554.

Neumann H., Koop B. Einfluss der Ackerbewirtschaftung aud die Feldlerche (*Alauda arvensis*) im okologischen Landbau. Untersuchungen in zwei Gebieten Schleswig-Holsteins. *Naturschutz und Landschaftsplan*, 2004, Bd. 36, no. 5, S. 145–154.

Pessa J. Liminganlahden suojelu ja hoito. *Linnut*, 1997, vol. 32, no. 3, pp. 14–21.

Sterbetz I. A Delkelet-Magyarorszagi bibic-(*Vanellus vanellus*) populacio harminceves vizsgalata. *Aquila*, 1995, no. 102, pp. 41–52.

Wilson J., Evans J., Browne S., King J. Territory distribution and breeding success of skylarks Alauda arvensis on organic and intensive farmland in southern England. *J. of Applied Ecology*, 1997, vol. 34, no. 6, pp. 1462–1478.

Wilson J., Evans J., Chamberlain D. Distribution, breeding success and habitat use of Eurasian Skylarks *Alauda arvensis* on organic and conventional farmland. *Ostrich*, 1998, vol. 69, no. 3–4, pp. 212.

Turtola A. Improving grey partridge (*Perdix perdix*) habitats by set-aside management in Finland. *Gibier Faune Sauvage*, 1998, vol. 15, spec. no. 1, pp. 555–562.