

The Conservation Status of Woodchat Shrike *Lanius senator* in Armenia

Karen Aghababyan* and Anush Khachatryan

BirdLinks Armenia NGO (former TSE Towards Sustainable Ecosystems NGO)

87b Dimitrov, apt 14, 0020 Yerevan, Armenia

Received: November 30, 2020; Revised: December 20, 2020; Accepted: January 2, 2021

Abstract: The population of Woodchat Shrike was monitored in Armenia from 2003 to 2019. The species was found in Southern and South-eastern Armenia, inhabiting the semi-desert and the lower belt of juniper woodlands at an elevation ranging from 450 to 1500 meters above sea level. Its extent of occurrence is estimated at 4,513 km² and its area of occupancy – at 1,968 km². In 2019, the population was estimated at 5,370 – 11,100 breeding pairs. The population trend shows a moderate decline during the period 2003-2019 ($p < 0.01$), being reduced to 32% during the past decade (2010-2019). There are no direct threats to the species, but it declines in the lands transformed under horticultural needs and in the vicinities of an open-pit metal mine. The conservation status of the species is evaluated as Vulnerable according to criteria A2b+B1+B2abv. The following measures for the conservation of this species are suggested: (1) officially designate the proposed Emerald Sites and begin the development of some monitoring and management plans, (2) carefully assess every new horticultural project, which could occupy the native semi-deserts; (3) introduce new schemes in livestock husbandry for a sustainable grazing in semi-desert areas; (4) study the causes behind the species' decline in the vicinity of the mining areas, (5) raise public awareness about the species, and (6) continue with the species monitoring.

Keywords: Woodchat Shrike, *Lanius senator*, Armenia, Distribution, Population Trend, Conservation status.

Introduction

Armenia is a small (29,743 km²) landlocked mountainous country in the South Caucasus, located between the Black and Caspian Seas. The country's elevation range that varies from 375-4090 m above sea level creates varying climatic conditions, which result in different biomes that include semi-desert, juniper woodland, deciduous forest, mountain steppe, and sub-alpine. The terrain is rugged, and typically consists of variously-shaped rock outcroppings. The semi-desert, juniper woodland, and the lower belt of the tragacanth dominated mountain steppes belong to the arid types of habitat (Aghababyan *et al.* 2015, Fayvush and Aleksanyan 2016). These habitats are home to Woodchat Shrike *Lanius senator* (Adamian and Klem 1999, Aghababyan 2001), a species which is listed in the National Red Book as Vulnerable VU B1ab(iii)+2ab (iii) (Aghasyan and Kalashyan 2010). In Armenia, the species is represented by the subspecies *L.s. niloticus* (Bonaparte, 1853) (Figure 1), which is distributed across Cyprus, Southern and Eastern Turkey, east to Transcaucasia, Northern Iraq, Kuwait, and Iran (Yosef and ISWG 2020). Currently, ten years after the last assessment, it is time to review the species status, taking into consideration the plans of the Armenian Ministry of Environment regarding the publication of the next edition of the Red Book of Animals of Armenia in 2022. Therefore, the current paper is aimed at documenting the current distribution, abundance, and population trends of the Woodchat Shrike, as well as discussing the existing and potential threats in addition to the current and necessary conservation measures.

*Corresponding author:

karen.aghababyan@gmail.com



Figure 1. Female of Caucasian Woodchat Shrike *Lanius senator niloticus*. Photo by V. Petrosyan.

Material and Methods

Early Woodchat Shrike's observations in Armenia recorded in the literature were collated and summarized in Adamian and Klem (1999). Systematic data collection of the breeding birds of Armenia, including the data collected for the Woodchat Shrike began in 2003 with the start of the National Bird Monitoring Program. All of Armenia was divided into 374 100 km² squares, following the standard 10 x 10 km Pan-European Monitoring Grid (Council of Europe 2018). In total, during the period 2003-2019, the 325 squares were visited at least once during that period, and over the 147 squares, the data were collected systematically: annually or once every 2-5 years (Figure 2). The data of 2003-2019 were obtained through general observations, and through standardized transect counts of a 1 or 2 km length. All of the collected records were used to create species-specific distribution maps, and only the standardized counts were used to estimate the population size and trends.

General observation data were collected by experienced birders and consisted of the observation dates, species, geographic coordinates of sighting, or if not known, the 10 x 10 km block, the nearest landmark (a human settlement, mountain, or historical site), the breeding condition if detectable, and the names of observers and their contact information. Standardized counts of the Woodchat Shrike were conducted from May to June in the morning, when birds were most active, and consisted of walking slowly along a 1 or 2 km fixed transect route, which usually took from one to two hours (Voříšek *et al.* 2008). The birds were detected with the naked eye, and when necessary, were identified using 8X or 10X binoculars. All the seen individuals within a 200 m stripe were recorded in the data collection protocols, and were later transferred into the single database for processing. The detailed information about each transect included: date, beginning and ending time, beginning

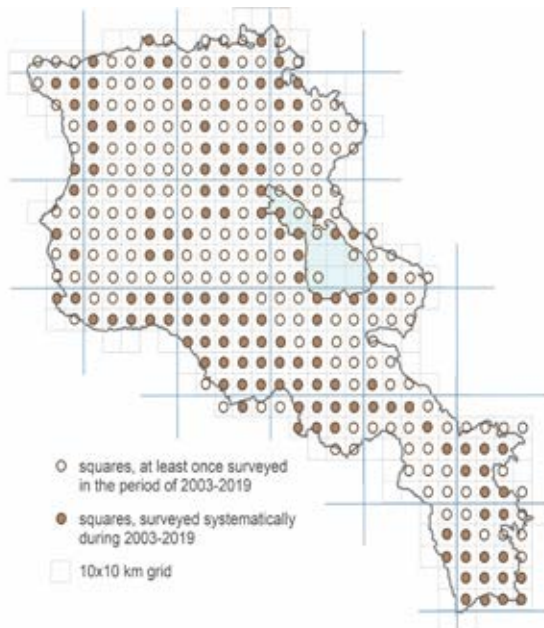


Figure 2. Surveys of breeding birds, conducted in Armenia in 2003-2019.

and ending geographic coordinates, whether individuals were seen and/or heard, and all observers. Initially, the transects have been selected randomly within a core type of habitat and were then fixed, to be counted once per annum. Because the number of bird counters has continued to grow since 2003, the number of transects also increased gradually. In total, during the period 2003-2019, the 281 transect counts in the habitat of the Woodchat Shrike have been implemented, starting with thirteen transects between 2003-2007 and ending with eighteen transects during the period 2008-2019.

The analysis of population trend was implemented using TRIM 3.0 software (Van Strien *et al.* 2004). A Collated Index of abundance was calculated, then the deviations from the Index were calculated and analyzed over time using log-linear Poisson regression, and were graphed as a linear function to reveal the population changes in the period 2003-2019 (Figure 5). The TRIM output identifies six possible population trends: strong increase, moderate increase, stable, moderate decline, steep decline, or uncertain (Pannekoek and van Strien 2005). The ArcGIS 10.0 software was used to map species distributions within Armenia. The area of species occupancy (AOO) and the

extent of the species' occurrence (EOO) were computed using IUCN guidelines (IUCN Standards and Petitions Committee 2019). To compute the AOO, the researchers have multiplied the number of occupied cells by the area of an individual cell, taking 4 km² (2x2 km) cells as the reference scale. To compute the EOO, the rule of minimum convex polygons (the smallest polygon in which no internal angle exceeds 180° and which contains all the sites of occurrence) was applied for the species' AOO, excluding discontinuities and disjunctions within the overall distribution inside the borders of Armenia.

To assess threats to the species, interviews were conducted with local farmers and government employees within National Park Arevik and State Inspectorate for Nature Protection and Mineral Resources. The interviews with the farmers were semi-structured and were implemented as face-to-face questioning using questionnaires that contained the following questions: (1) Do they know about the existence of the Woodchat Shrike in the vicinity of their orchards; (2) Are they aware that the Woodchat Shrike is included in the Red Book; (3) Are they aware of any of the possible threats facing this species, and if so, what are those threats? (4) Are they aware that the new orchards can potentially harm the red-listed species. The interview with the State Inspectorate was conducted in a free manner, without specific questions prepared in advance, and was aimed at discovering the efforts of the Inspection in the conservation of the species and its major habitats, the main issues, which the Inspection has revealed, and the appropriate measures, which have been, or could be, undertaken to mitigate the identified issues.

Results

Distribution, population, and threats in Armenia

During the period 2003-2019, the Woodchat Shrike was recorded in Southern and South-eastern Armenia (Figure 3), inhabiting various types of semi-deserts and the lower

belt of juniper woodlands at the elevation range of 450 to 1500 meters above sea level (Figure 4). The main characteristic of the chosen habitats is the existence of relatively tall (at least 1.5 m) bushes, mainly represented by Christ's thorn (*Paliurus spina-christi* Mill.), Pallas' Buckthorn (*Rhamnus pallasii* Fisch. & C.A. Mey.), and sometimes, the wild rosehip (*Rosa* sp.), where the species makes nests, and uses those as posts for searching prey.

The extent of occurrence of Woodchat Shrike in Armenia is estimated at 4,513 km² and the area of occupancy is estimated at 1,968 km². In 2019, the population was estimated at 5,370–11,100 breeding pairs. The population trend shows a moderate decline during the period 2003-2019 ($p < 0.01$; Wald-Test = 14.29, df = 15, $P = 0.5040$; overall slope parameters: additive = -0.0241, standard error = 0.0067, multiplicative = 0.9762, standard error = 0.0065 (Figure 5). According to the calculated trends, the difference between the trend's value in 2010 and in that of 2019 makes 32%, which indicates a reduction of the population over the past decade. There are no direct threats listed facing the Woodchat Shrike in Armenia. However, the species definitely declined in the lands transformed under agricultural needs – orchards and arable fields, as well as in the vicinities of open-pit metal mines.

Discussion

The species shows no changes in its historical distribution at the 10x10 km resolution, but in some sites of the Ararat Plain and Meghri district, it disappeared at the spots where new orchards and new fields for livestock fodder have been intensively developed over the period between 2003 and 2015. The new fields either destroy the initial semi-desert habitat, or transform it into orchards with large trees, or into monocrop legume fields with no bushes in the surroundings.

Meanwhile, the Woodchat Shrike shows a population decline, which is not directly linked to the occupation of the lands by the arable lands. Such decline could be explained by the following factors.



Figure 3. Distribution map of Woodchat Shrike in Armenia.



Figure 4. Typical habitat of Woodchat Shrike in Ararat Province of Armenia. Photo by K. Aghababayan.

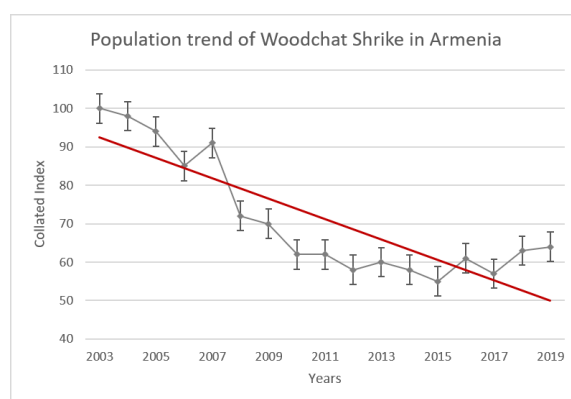


Figure 5. Population trend of Woodchat Shrike in Armenia during 2003-2019.

The semi-desert areas, which are already scarce in herbal vegetation, are grazed quite heavily; this causes a change in plant composition, and accordingly – the elimination of insects, as was demonstrated in a recent study of Armenian

butterflies (Aghababyan, unpublished). Insects are the main food of the Woodchat Shrike (Adamian and Klem 1999, Aghababyan 2001, Yosef and ISWG 2000), and their elimination could lead to the decline of the Shrike as well. Also, the Shrikes' decline was recorded in the vicinity of a copper and molybdenum open-pit mine in Agarak, but the link between the operation of the mine and the species decline remains uncovered. Also, the pairs which breed next to the orchards can potentially suffer under the use of persistent pesticides, which can become accumulated through the food chains, but for the time being, there is no evidence on that.

Currently, a portion of the Woodchat Shrike's population is protected in Khosrov Forest State Reserve and National Park Arevik, but the majority of the population remains unprotected. Some areas of its distribution (Vanand, Metsamor, Noravank, Jermuk Gorge, and Arevik) have been identified as candidate Emerald Sites (Fayvush *et al.*, 2016), but the areas are not yet officially recognized; therefore, no management plans for those sites have been developed.

Taking into account the declining population trend of the species (over 30% in the last decade) and the EOO (3,907 km²), as well as the AOO (1,967 km²), the species remains in the same category, Vulnerable, for the next issue of the Red Book of Animals of Armenia; however the criteria should be modified into: VU A2b+B1+B2abv (IUCN Standards and Petitions Committee 2019). To protect the species, the following conservation measures are suggested: (1) officially designate the proposed Emerald Sites and begin the development of monitoring and management plans for those Sites, (2) carefully assess every new horticultural project, which presumes the occupation of the native semi-desert landscape; (3) review the policy of livestock husbandry and introduce new schemes, which can secure sustainable grazing in semi-desert areas; (4) further study the causes of the species' decline in the vicinity of mining areas, (5) increase all means of raising public awareness regarding this species, and (6) continue with the species'

monitoring to track its further population trend and the efficiency of the undertaken conservation measures.

Acknowledgements

The monitoring of this species in Armenia was supported by members of the Armenian Birdwatching Association. Data collection was supported by the Observation Foundation. Over the period 2015–2017, this survey was also supported by the European Bird Census Council (EBCC) via a grant from the MAVA Foundation for the European Breeding Bird Atlas EBBA2. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH supported Environmental Programme contributed to the data analysis. Administrative support during the study of this species was provided by the Ministry of Environment of RA, Khosrov Forest State Reserve and the Arevik National Park.

References

- Adamian, M and Klem, D. 1999. **Handbook of the Birds of Armenia**. American University of Armenia, California.
- Aghasyan, A and Kalashyan, M. 2010. **The Red Book of Animals of the Republic of Armenia**. Yerevan, Ministry of Nature Protection.
- Aghababyan, K. 2001. **Some Peculiarities of the Vertical Distribution, Breeding Biology and Ecology of Birds in Meghry Region of Armenia**. PhD thesis, National Academy of Sciences of the Republic of Armenia, Institute of Zoology. [in Russian]
- Aghababyan, K, Ter-Voskanyan, H, Tumanyan, S and Khachatryan, A. 2015. First National Atlas of the Birds of Armenia. *Bird Census News*, **28 (2)**: European Atlas News 52–58.
- Council of Europe. 2018. Transfer of National Data to Pan-European 10x10 km grid for Non-EU contracting parties to Bern Convention (Guidance Document). European Topic Centre on Biological Diversity. Strasbourg, 27 September

2018. T-PVS/PA (2018) 14. 42 pp.
- Fayvush, G and Aleksanyan A. 2016. **Habitats of Armenia**. Zangak, Yerevan.
- Fayvush, G, Arakelyan, M., Aghababyan, K., Aleksanyan, A., Aslanyan, A., Ghazaryan, A., Oganesyanyan, M., Kalashyan, M and Nahapetyan, S. 2016: In: **The “Emerald” Network in the Republic of Armenia**. Baloyan S. (Eds), Yerevan. Ministry of Nature Protection.
- IUCN Standards and Petitions Committee. 2019. **Guidelines for Using the IUCN Red List Categories and Criteria**. Version 14. Prepared by the Standards and Petitions Committee. 113 pp.
- Pannekoek, J and van Strien, A. 2005. **TRIM 3 Manual (Trends and Indices for Monitoring data)**. Statistics Netherlands. Retrieved from <https://www.ebcc.info/art-13/> on 16th of Dec 2019.
- Van Strien, A., Pannekoek, J., Hagelmeijer, W and Verstrael, T. 2004. **A Loglinear Poisson Regression Method to Analyse Bird Monitoring Data**. In: Anselin, A. (Eds.) Bird Numbers 1995, Proceedings of the International Conference and 13th Meeting of the European Bird Census Council, Pärnu, Estonia. Bird Census News 13 (2000): 33-39.
- Voříšek, P., Klvaňová, A., Wotton, S and Gregory R.D. 2008. **A Best Practice Guide for Wild Bird Monitoring Schemes**. First edition. RSPB/CSO.
- Yosef, R. and ISWG International Shrike Working Group. 2020. Woodchat Shrike (*Lanius senator*), version 1.0. In: **Birds of the World**, del Hoyo J., Elliott, A. Sargatal, J. Christie, D.A and de Juana, E. (Eds). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.wooshr1.01>