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GULLS, TERNS AND SKUAS OF THE AZOV-BLACK SEA REGION: ABUNDANCE AND SPATIAL DISTRIBUTION ACCORDING TO THE AUGUST COUNTS 2004–2021

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Gulls, terns and skuas of the Azov-Black Sea region: abundance and spatial distribution according to the August Counts 2004–2021. Chernichko, J. I., Kostiushyn, V. A., Vinokurova, S. V. — This article analyses data on the spatial distribution and abundance of gulls, terns and skuas, as recorded during counts in August from 2004 to 2021. These censuses covered 80 wetlands along the northern coasts of the Black and Azov Seas, spanning the Ukrainian part of the Danube Delta to Krivaya Spit. A total of eight gull species, eight tern species and two skua species were recorded in the region. Their numbers varied between 203,000 and 435,000 birds annually.

Key words: Azov-Black Sea coast, August Counts, gulls, terns, skuas.

Introduction

The Regional Ornithological Monitoring Programme was launched in 2004. The main idea behind ROM is to conduct simultaneous counts in all key Azov–Black Sea coastal wetlands — from the Danube Delta in the Black Sea to Kryva Spit in the Azov Sea — in order to evaluate the number of local water birds. August is the most appropriate month for this, as the nesting season has ended and concentrations of pre-migratory birds begin to form, although migration has not

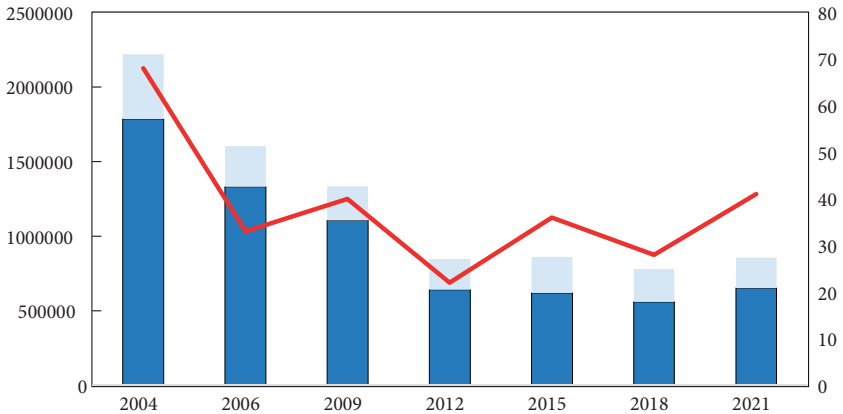

Fig. 1. The number of birds recorded during the August Counts and the number of wetlands covered by the censuses

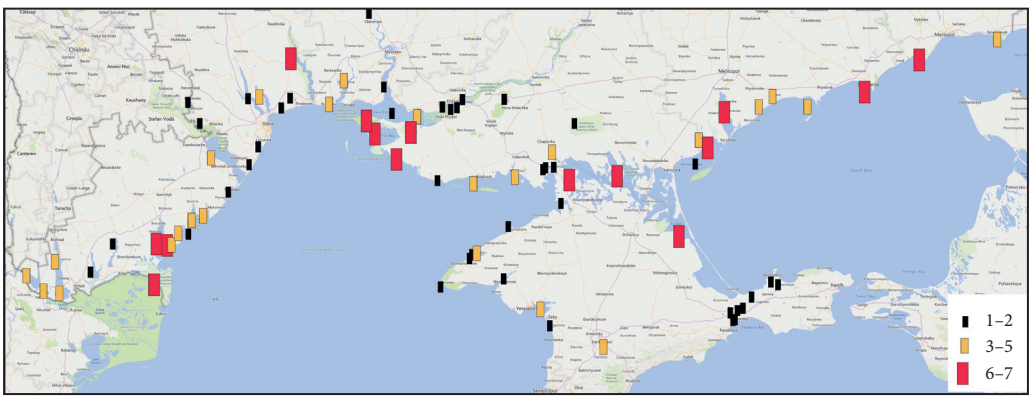

Fig. 2. The number of counts in the wetlands of the Azov-Black Sea region, where the August Counts were conducted in 2004–2021

yet started, except for some species of tern or wader. Another important reason for conducting the counts in August is to do so before the start of the hunting season, which leads to significant changes in the distribution of birds.

J. Chernichko initiated the ROM and coordinated it with S. Vinokurova. Bird counts were conducted voluntarily every three years by several dozen ornithologists working in local protected areas, universities, and research institutes. Raw count data were regularly published in the ROM Bulletin (in 2005, 2008, 2010, 2014, 2016, 2019 and 2021), but have only been partially analysed to date. The aim of this article is therefore to summarise and analyse the August Count data for gulls, terns, and skuas encountered in the region.

Material, Methods and Study Area

A total of 80 water bodies were covered by the surveys, with numbers ranging from 22 to 68 across different years. A total of 6,692,000 birds of various species were counted during all the surveys, with an average of 956,000 per survey.

Unfortunately, for objective reasons, the coverage of wetlands during the counts was very unstable. The survey of different sites ranges from 1 to 7 surveys. The location of sites and the number of counts are shown in Fig. 2.

As can be seen from the above data, the number of counts at different wetlands varied significantly. Of the 80 wetlands, 41 (51%) were surveyed 1-2 times, 24 (30%) — 3–5 times, and 15 (19%) — 6–7 times.

The taxonomy of birds is given in accordance with HBW and BirdLife International (2024).

Results

The characteristics of spatial distribution of individual bird species presented below are based on the maximum number of birds recorded at each wetland. The percentages shown on the maps below (figures 3–21) are calculated from the sum of the maximum of birds of certain species for all wetlands.

Gulls

Between 2004 and 2021, a total of 1,380,700 gulls belonging to eight species were counted across 80 wetlands. Of these, 88.4 thousand could not be identified to species level. The number of birds counted per year varied between 145,600 and 341,700, with an average of 196,000.

Distribution and numbers of gull species along the Azov-Black Sea coast:

Hydrocoloeus minutus were recorded in 43 wetlands, with numbers ranging from 1,970 to 48,157 birds per year. The highest numbers were recorded on Kuyalnytskyi Lyman — 42,450 ind., Berdyanska Spit & Bay — 22,800 ind. and Molochnyi Lyman — 8,100 ind. (Fig. 3).

Larus genei were recorded in 37 wetlands, from 8,205 ind. to 48,782 ind. per year. The greatest number of birds were recorded on Western Syvash — 19,414 ind., Central Syvash — 18,341 ind., Eastern Syvash — 13,728 ind., Utliutskyi Lyman — 9,610 ind., Molochnyi Lyman — 7,050 ind., Karkinitska Bay (southern part) — 6,267 ind. (Fig. 4).

Larus ridibundus were recorded in 74 wetlands, with numbers ranging from 71,346 to 146,582 birds per year. The highest numbers were recorded on Molochnyi Lyman — 62,513 ind., Eastern Syvash — 35,372 ind., Central Syvash — 19,106 ind., Utliutskyi Lyman — 13,738 ind. and Kryva Spit & Bay — 11,771 ind. (Fig. 5).

Larus ichthyaetus were recorded in 28 wetlands, from 193 to 2,198 ind. per year. The greatest numbers of birds were recorded at Kryva Spit & Bay — 1,715 ind., Eastern Syvash — 234 ind., Sasyk Reservoir — 205 ind., Central Syvash — 192 ind., Lower part of the Ukrainian Danube Delta — 180 ind., Odzhygolski Lakes — 160 ind. (Fig. 6). The species is listed in the Red Data Book of Ukraine.

Larus melanocephalus were recorded in 38 wetlands, from 9,033 ind. to 48,581 ind. per year. The greatest number of birds were recorded on Central Syvash — 17,585 ind., Bokalska Spit — 13,440 ind., Eastern Syvash — 12,240 ind., Shagany Lyman — 8,025 ind., Utliutskyi Lyman — 4,918 ind., Western Syvash — 4,670 ind., Molochnyi Lyman — 4,231 ind. (Fig. 7).

Fig. 3. Number and distribution *H. minutus* (1 — Kuyalnytskyi Lyman, 2 — Molochnyi Lyman, 3 — Berdyanska Spit & Bay)

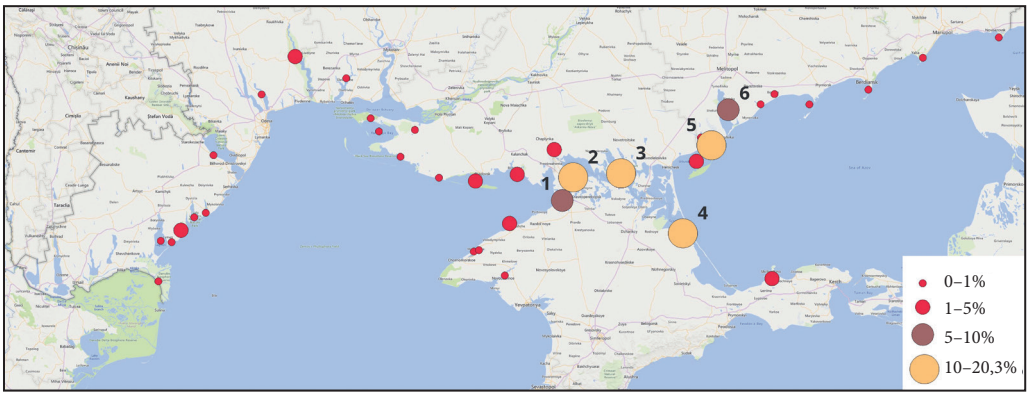

Fig. 4. Number and distribution *L. genei* (1— Karkinitska Bay (southern part), 2 — Western Syvash, 3 — Central Syvash, 4 — Eastern Syvash, 5 — Utliutskyi Lyman, 6 — Molochnyi Lyman)

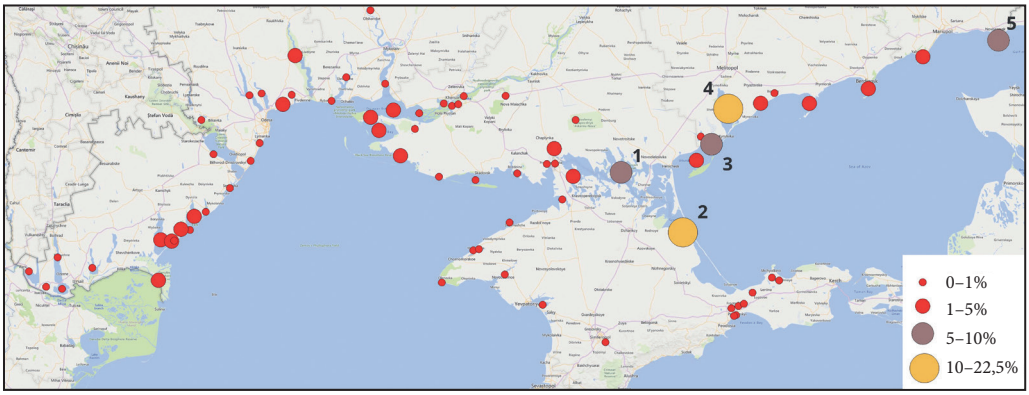

Fig. 5. Number and distribution *L. ridibundus* (1 — Central Syvash, 2 — Eastern Syvash, 3 — Utliutskyi Lyman, 4 — Molochnyi Lyman, 5 — Kryva Spit & Bay)

Larus canus were recorded in 14 wetlands, with numbers ranging from 5 to 801 birds per year. The highest numbers were recorded on Tyligulskyi Lyman — 272 ind., Dzharylgachska Bay & Dzharylgach Island — 182 ind., Burnas Lyman —140 ind., Yagorlytska Bay — 120 ind. and Western Syvash — 52 ind. (Fig. 8).

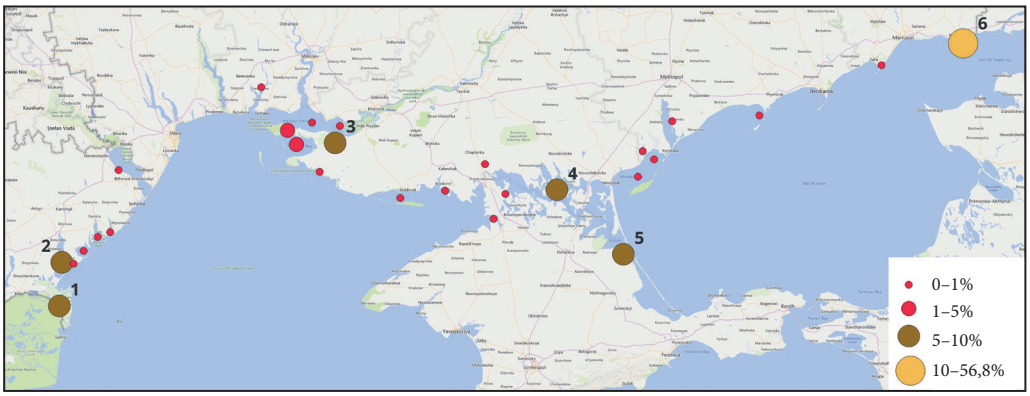

Fig. 6. Number and distribution *L. ichthyaetus* (1— Lower part of the Ukrainian Danube Delta, 2 — Sasyk Reservoir, 3 — Odzhygolski Lakes, 4 — Central Syvash, 5 — Eastern Syvash, 6 — Kryva Spit & Bay)

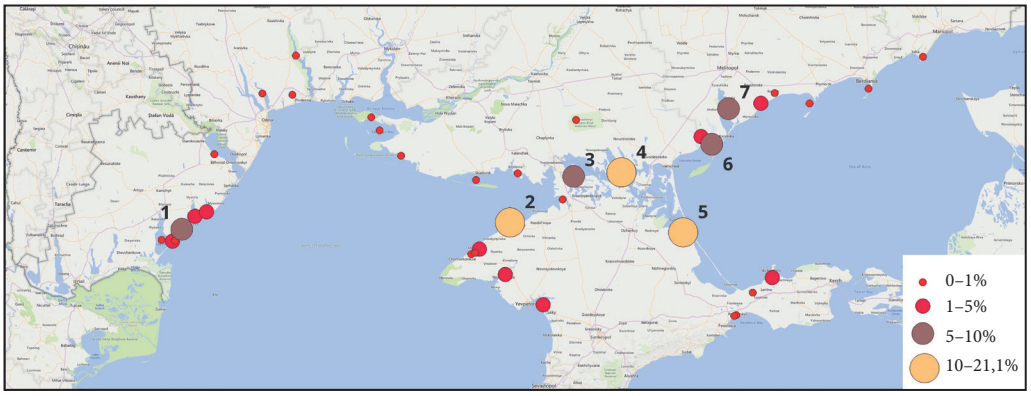

Fig. 7. Number and distribution *L. melanocephalus* (1 — Shagany Lyman, 2 — Bokalska Spit, 3 — Western Syvash, 4 — Central Syvash, 5 — Eastern Syvash, 6 — Utliutskyi Lyman, 7 — Molochnyi Lyman)

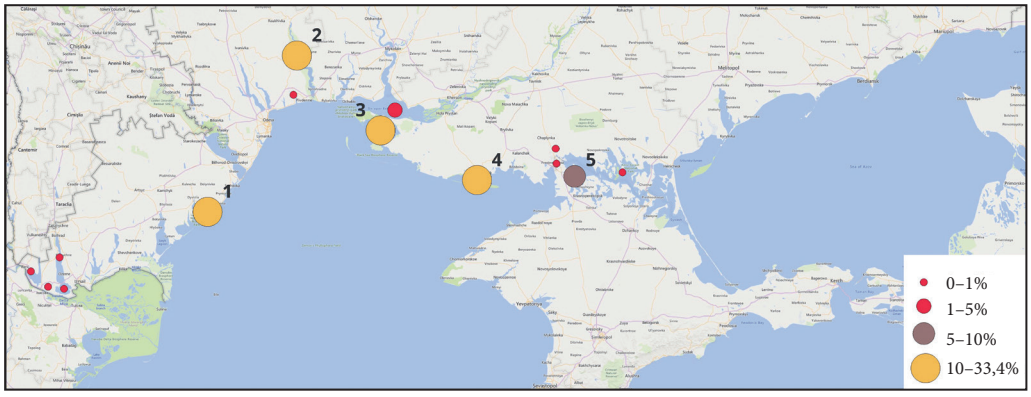

Fig. 8. Number and distribution *L. canus* (1 — Burnas Lyman, 2 — Tyligulskyi Lyman, 3 — Yagorlytska Bay, 4 — Dzharylgachska Bay & Dzharylgach Island, 5 — Western Syvash)

Single birds *Larus fuscus* was observed in three wetlands only: Kuyalnytskyi Lyman, Tendrivska Bay and Bilosaraiska Spit & Bay (Fig. 9).

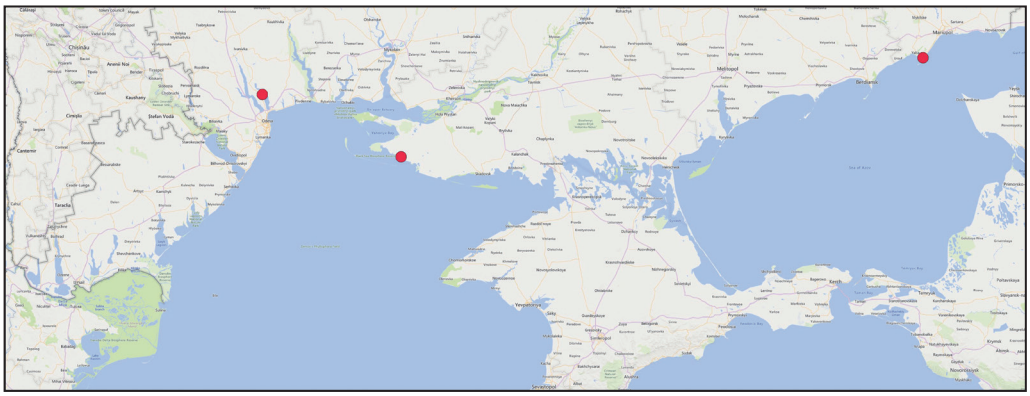

Fig. 9. Number and distribution *L. fuscus*

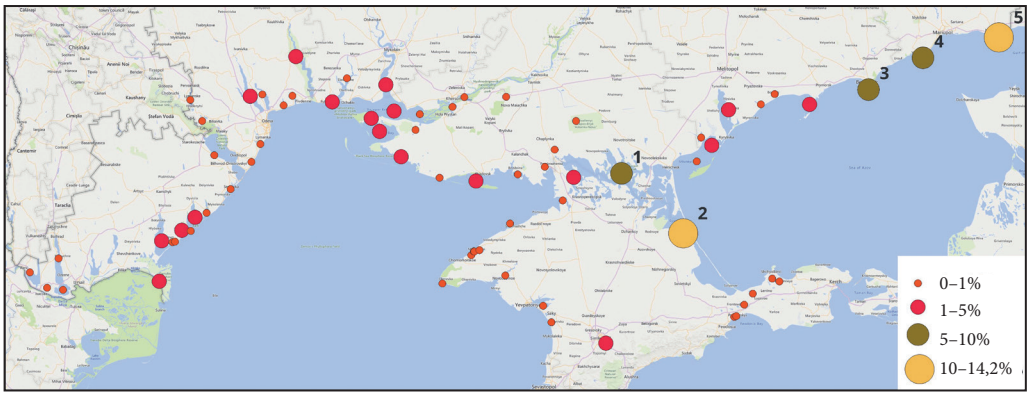

Fig. 10. Number and distribution *L. cachinnans* (1 — Central Syvash, 2 — Eastern Syvash, 3 — Bilosaraiska Spit & Bay, 4 — Berdyanska Spit & Bay, 5 — Kryva Spit & Bay)

Larus cachinnans were recorded in 71 wetlands, with numbers ranging from 14,152 to 44,284 birds per year. The highest numbers were recorded on Kryva Spit & Bay — 2,354 ind., Eastern Syvash — 10,123 ind., Central Syvash — 6,520 ind., Berdyanska Spit & Bay — 5,520 ind., and Bilosaraiska Spit & Bay — 4,976 ind. (Fig. 10).

Terns

From 2004 to 2021 a total of 419.7 thousand terns of 8 species were counted on 70 wetlands. 57.4 thousand were not identified to species level. Numbers terns varied between 34.9 thousand and 84.2 thousand birds annually, with an average of 60.0.

Distribution and numbers of tern species along the Azov-Black Sea coast:

Sternula albifrons were recorded in 32 wetlands, with numbers ranging from 282 to 2,803 birds per year. The highest numbers were recorded on Eastern Syvash — 1,946 ind., Utliutskyi Lyman — 703 ind., Molochnyi Lyman — 500 ind., Bilosaraiska Spit & Bay — 317 ind., and Kryva Spit & Bay — 310 ind. (Fig. 11). The species is listed in the Red Data Book of Ukraine.

Gelochelidon nilotica were recorded in 36 wetlands, from 869 ind. to 3,436 ind. per year. The greatest number of birds was recorded on Eastern Syvash — 1,820 ind., Central Syvash – 1,672 ind., Utliutskyi Lyman — 1,097 ind., Yagorlytska Bay — 444 ind. (Fig. 12).

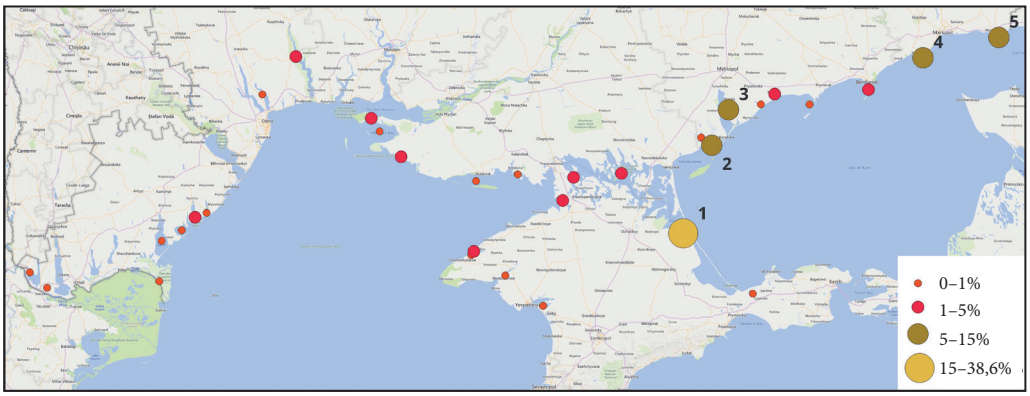

Fig. 11. Number and distribution *S. albifrons* (1 — Eastern Syvash, 2 — Utliutskyi Lyman, 3 — Molochnyi Lyman, 4 — Bilosaraiska Spit & Bay, 5 — Kryva Spit & Bay)

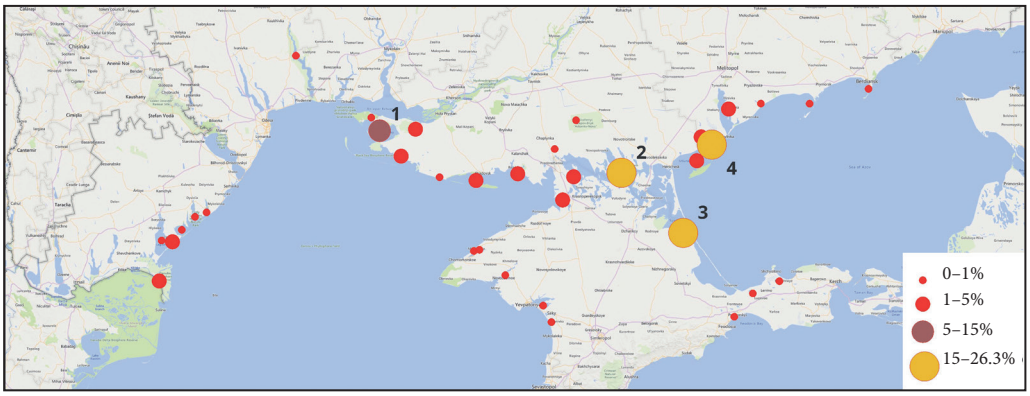

Fig. 12. Number and distribution *G. nilotica* (1 — Yagorlytska Bay, 2 — Central Syvash, 3 — Eastern Syvash, 4 — Utliutskyi Lyman)

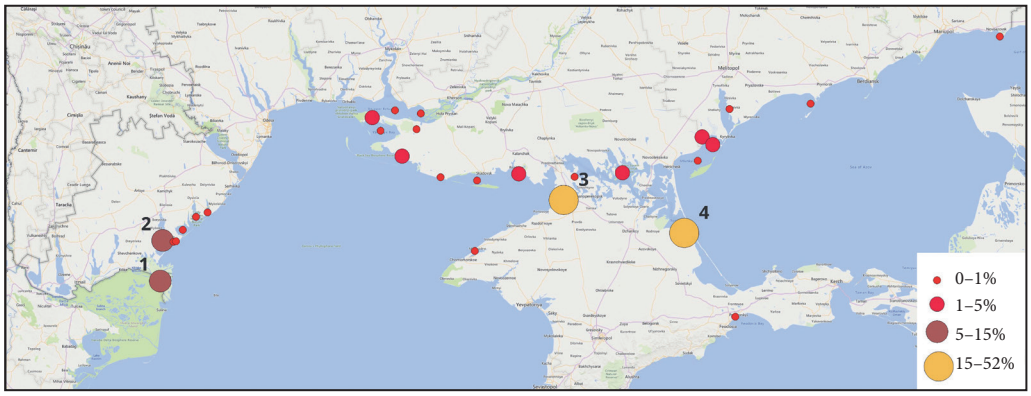

Fig. 13. Number and distribution *H. caspia* (1 — Lower part of the Ukrainian Danube Delta, 2 — Sasyk Reservoir, 3 — Karkinitska Bay (southern part), 4 — Eastern Syvash)

Hydroprogne caspia were recorded in 28 wetlands, with populations ranging from 142 to 1,725 birds per year. The highest numbers were recorded at Eastern Syvash — 1,115 ind., Karkinitska Bay (southern part) — 401 ind., Sasyk Reservoir — 170 ind. and the Lower part of the Ukrainian Danube Delta —125 ind. (Fig. 13). The species is listed in the Red Data Book of Ukraine.

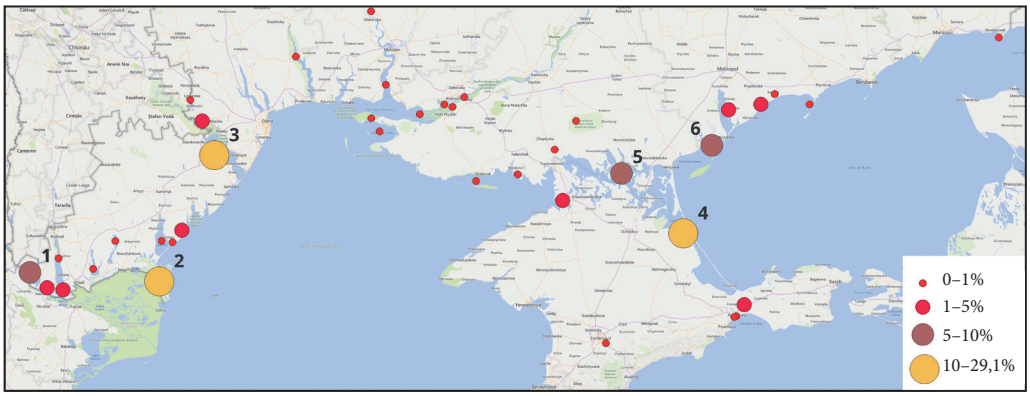

Fig. 14. Number and distribution *Ch. hybrida* (1 — Kahul Lake, 2 — Lower part of the Ukrainian Danube Delta, 3 — Dnistrovskyi Lyman, 4 — Eastern Syvash, 5 — Central Syvash, 6 — Utliutskyi Lyman)

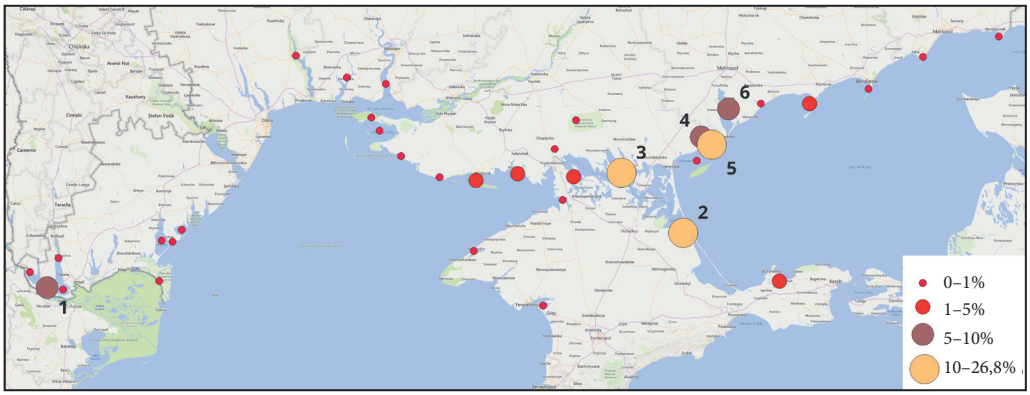

Fig. 15. Number and distribution *Ch. leucopterus* (1 — Kartal Lake, 2 — Eastern Syvash, 3 — Central Syvash, 4 — Bolhradskyi Syvashyk Lyman, 5 — Utliutskyi Lyman, 6 — Molochnyi Lyman)

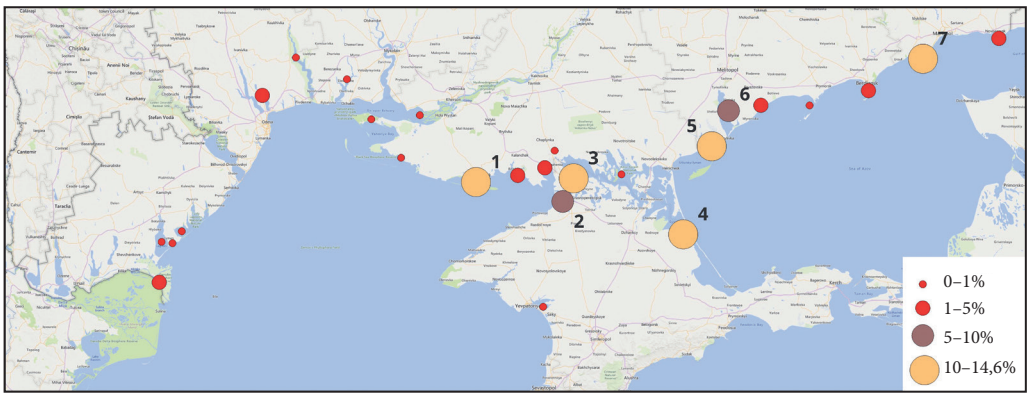

Fig. 16. Number and distribution *Ch. niger* (1 — Dzharylgachska Bay & Dzharylgach Island, 2 — Karkinitska Bay (southern part), 3 — Western Syvash, 4 — Eastern Syvash, 5 — Utliutskyi Lyman, 6 — Molochnyi Lyman, 7 — Bilosaraiska Spit & Bay)

Chlidonias hybrida were recorded in 39 wetlands, from 1,347 to 9,152 birds per year. The greatest number of birds was recorded on the Lower part of the Ukrainian Danube Delta — 5,296 ind., Dnistrovskyi Lyman — 2,070 ind., Eastern Syvash — 2,336 ind., Utliutskyi Lyman — 1,340 ind., Kahul Lake — 1,200 ind., Central Syvash — 1,116 ind. (Fig. 14).

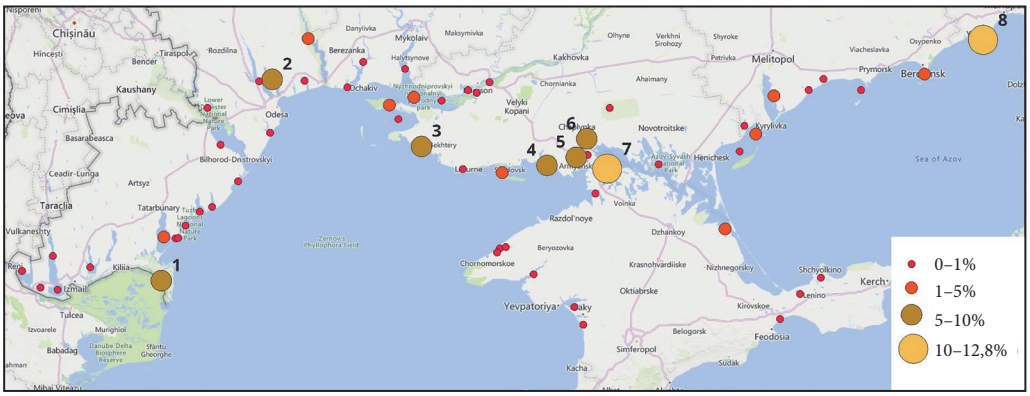

Fig. 17. Number and distribution *S. hirundo* *(1 —* Lower part of the Ukrainian Danube Delta, *2* — Kuyalnytskyi Lyman, *3* — Tendrivska Bay, *4* — Karkinitska Bay (nothern part), *5* — Ponds near Stavky Village, *6* — Shpindiyar Area, *7* — Western Syvash, *8* — Bilosaraiska Spit & Bay)

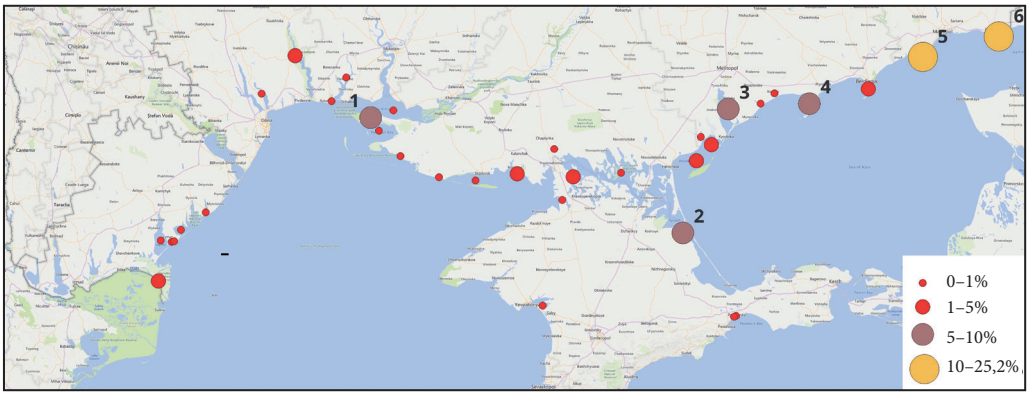

Fig. 18. Number and distribution *T. sandvicensis* (1 — Kinburnskyi Peninsula (sea coast and inner lakes), 2 — Eastern Syvash, 3 — Molochnyi Lyman, 4 — Obytichna Spit & Bay), 5 — Bilosaraiska Spit & Bay, 6 — Kryva Spit & Bay).

Chlidonias leucopterus were recorded in 35 wetlands, from 2,434 to 33,841 birds per year. The greatest number of birds was recorded on Central Syvash — 14,837 ind., Eastern Syvash — 12,687 ind., Utliutskyi Lyman — 7,925 ind., Bolhradskyi Syvashyk Lyman — 3,970 ind., Kartal Lake — 3,000 ind., Molochnyi Lyman — 2,905 ind. (Fig. 15).

Chlidonias niger were recorded in 27 wetlands, from 14 to 2,780 birds per year. The greatest number of birds was recorded on Western Syvash — 723 ind., Utliutskyi Lyman — 677 ind., Eastern Syvash — 606 ind., Dzharylgachska Bay & Dzharylgach Island — 532 ind., Bilosaraiska Spit & Bay — 522 ind., Karkinitska Bay (southern part) — 406 ind., Molochnyi Lyman — 300 ind. (Fig. 16).

Sterna hirundo were recorded in 62 wetlands, with numbers ranging from 6,567 to 22,243 birds per year. The highest numbers were recorded in Western Syvash — 7,663 ind., Bilosaraiska Spit & Bay — 7,390 ind., Ponds near Stavky Village — 5,000 ind., Karkinitska Bay (northern part) — 4,857 ind., Tendrivska Bay — 4,026 ind., Lower part of the Ukrainian Danube Delta — 3,600 ind., Kuyalnytskyi Lyman — 3,535 ind. and Shpindiyar Area — 3,350 ind. (Fig. 17).

Thalasseus sandvicensis were recorded in 35 wetlands, from 8,665 to 23,298 birds per year. The greatest number of birds was recorded on Bilosaraiska Spit & Bay —

15,564 ind., Kryva Spit & Bay — 11,000 ind., Eastern Syvash — 5,663 ind., Molochnyi Lyman — 5,517 ind., Obytichna Spit & Bay — 4,330 ind., Kinburnskyi Peninsula (sea coast and inner lakes) — 4,220 ind. (Fig. 18).

Skuas

Distribution and numbers of skua species along the Azov-Black Sea coast:

Stercorarius parasiticus were recorded in 8 wetlands, with numbers ranging from 3 to 34 birds annually, for a total of 59 birds. The highest numbers during a single survey were found on the Kinburn Peninsula (sea coast and inner lakes) — 29 ind., Shagany Lyman — 7 ind., Tendrivska Bay — 3 ind. and Utliutskyi Lyman — 5 ind. (Fig. 19).

Stercorarius pomarinus were found on Eastern Syvash (1 ind., 2004) and Molochnyi Lyman (13 ind., 2015) (Fig. 20).

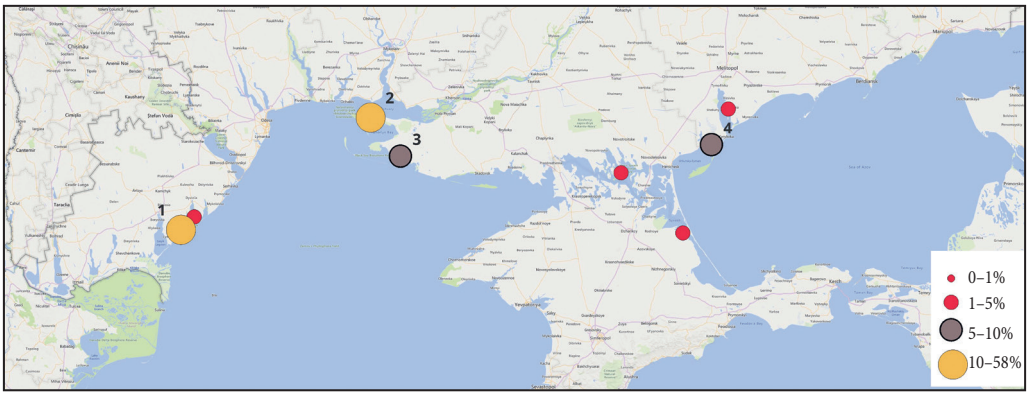

Fig. 19. Number and distribution *St. parasiticus* (1 — Shagany Lyman, 2 — Kinburnskyi Peninsula (sea coast and inner lakes), 3 — Tendrivska Bay, 4 — Utliutskyi Lyman)

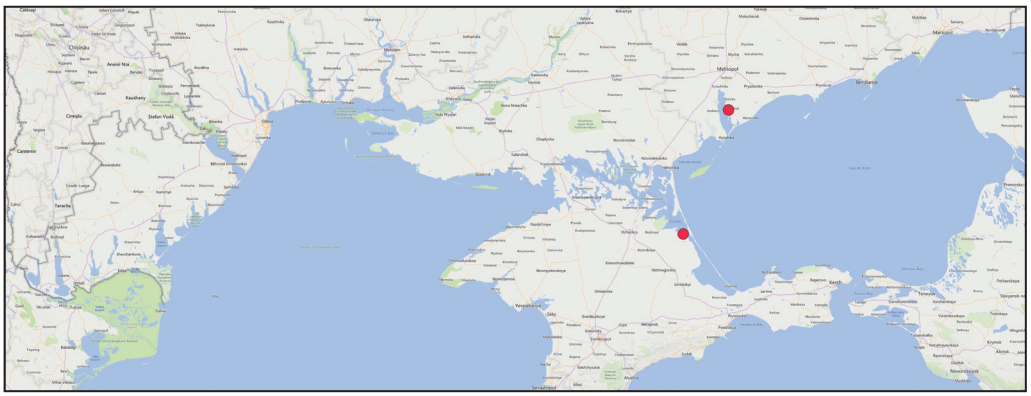

Fig. 20. Finding locations of *St. pomarinus*

Discussion

In total of eight gull species, eight tern species and two skuas have been recorded in the Azov-Black Sea region. Their numbers varied between 203 and 435 thousand birds annually, averaging approximately 26% of the total number of waterbirds in the region, ranging from 20% to 39% (Fig. 1).

The most numerous gull species was *L. ridibundus*, accounting for 46% of the total number of all gulls, for *L. genei*, *L. melanocephalus* and *L. cachinnans*

ratio of each species was about 12%. *H. minutus* accounts for about 10%. The numbers of the remaining species were significantly lower (Fig. 21). *L. canus* and *L. fuscus* do not nest in the Azov-Black Sea region, appearing there only during migration or wintering, so their numbers in August are very low.

The most numerous terns were *T. sandvicensis* — 26% of the total number of recorded terns, *S. hirundo* — 24%, *Ch. leucopterus* — 21%, and *Ch. hybrida* — 8%. The numbers of the remaining species were significantly lower (Fig. 22). Different species of gulls, terns, and skuas had varying coverage across the 80 water bodies where surveys were conducted. The greatest coverage was observed for *L. ridibundus* — 93% (Fig. 23), *L. cachinnans* — 89%, and *S. hirundo* — 78%. The coverage of water bodies by other nesting species of gulls and terns ranged from 34 to 54%. The lowest coverage of water bodies was observed for species that are mainly attended the region only during migration or wintering periods, or as vagrants: *L canus, L. fuscus, St. pomarinus, St. parasiticus* — 3–18%.

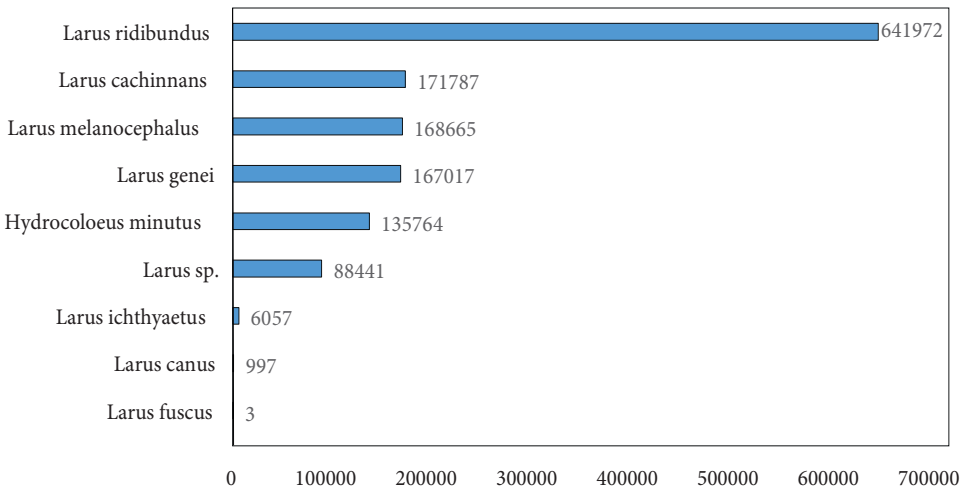

Fig. 21. Total number of gull species based on the results of 2004–2021 August Counts

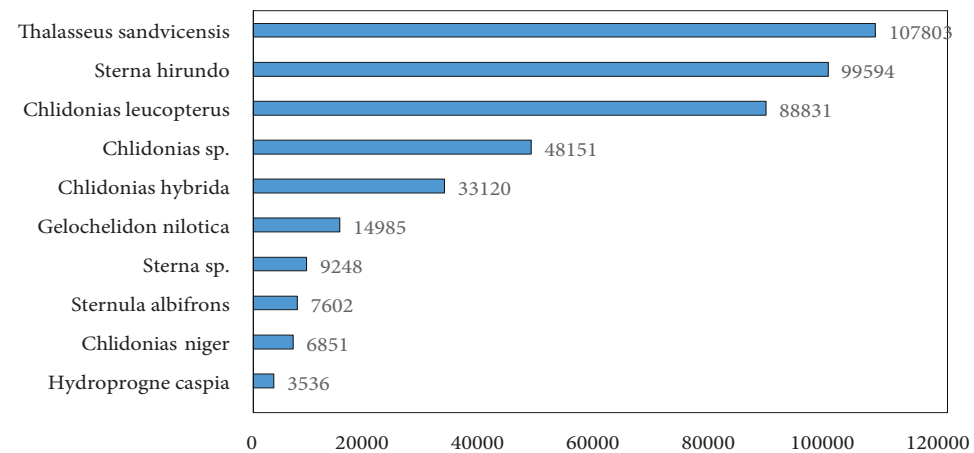

Fig. 22. Total number of tern species based on the results of 2004–2021 August Counts

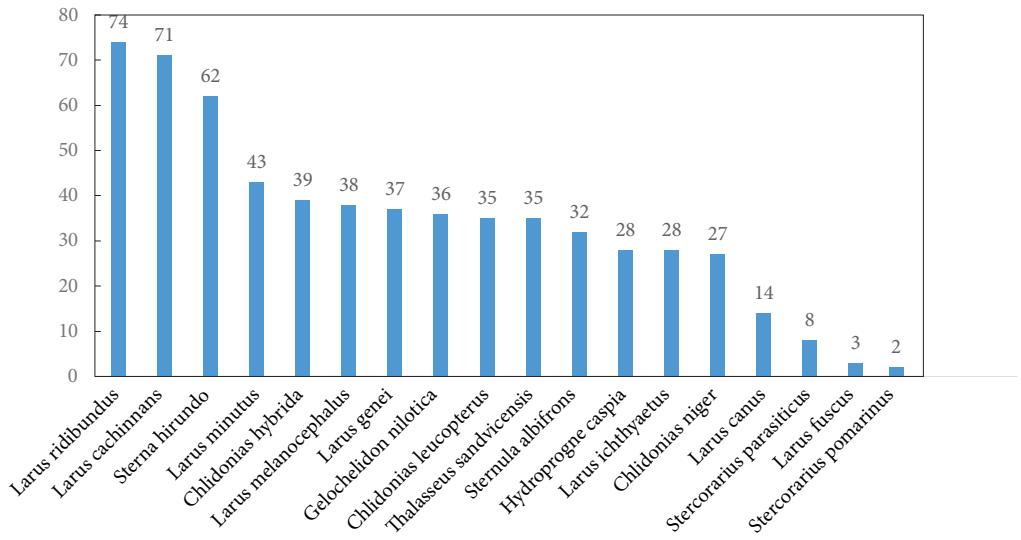

Fig. 23. The number of water bodies where various species of gulls, terns and skuas were recorded

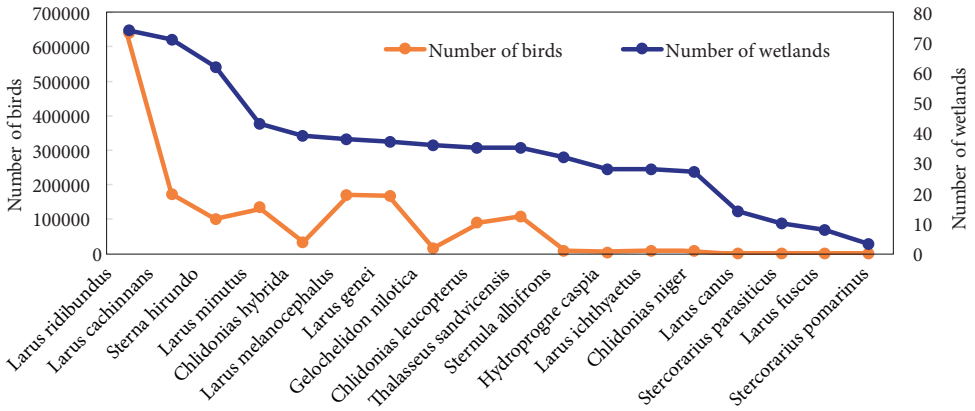

Fig. 24. Relation of the abundance of different bird species and the number of wetlands in which they are found

There is a reliable correlation (Pearson R = 0,71, p = 0,0005) between the abundance of different bird species and the number of water bodies where they are found (Fig. 24).

Analysis of data on the average long-term numbers of gulls, terns and skuas in the Azov-Black Sea region showed that the most important wetlands for them are the Eastern Syvash - the average number of birds is 36.9 thousand birds (10.1% of the total average number of gulls and terns), and the maximum number of birds of these taxonomic groups is 97.3 thousand individuals (Fig. 25).

In second place is Molochnyi Lyman - an average of 33.5 thousand birds (9.2%) and 65.8 thousand birds. In third place is Central Syvash — an average of 32.3 thousand birds (8.9%), with a maximum of 58.2 thousand birds. Next in descending order are: Kuyalnytskyi Lyman — 20.6 thousand birds (5.7%) and 43.6 thousand birds, Utliutskyi Lyman — 18.7 (5.1%) and 36.8, Kryva Spit & Bay — 16.0 (4.40%) and 21.0, Karkinitska Bay (southern part) — 12.8 (3.5%) and 12.8 (there was only one

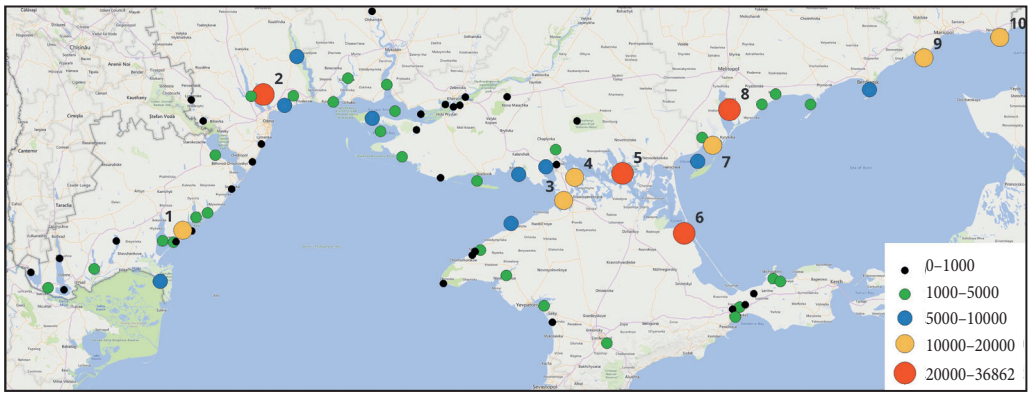

Fig. 25. Average total number of gulls, terns and skuas according to the August Counts 2004–2021 (1 — Shagany Lyman, 2 — Kuyalnytskyi Lyman, 3 — Karkinitska Bay (south part), 4 — Western Syvash, 5 — Central Syvash, 6 — Eastern Syvash, 7 — Utliutskyi Lyman, 8 — Molochnyi Lyman, 9 — Bilosaraiska Spit & Bay, 10 — Kryva Spit & Bay)

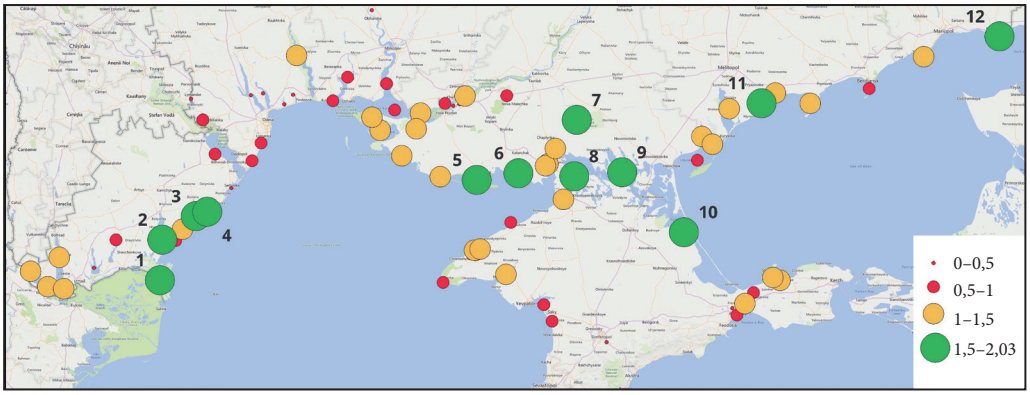

Fig. 26. Shannon index values (1 — Lower part of the Ukrainian Danube Delta, 2 — Sasyk Reservoir, 3 — Alibei Lyman, 4 — Burnas Lyman, 5 — Dzharylgachska Bay & Dzharylgach Island, 6 — Karkinitska Bay (northern part), 7 — Velykyi Chapelskyi Pid, 8 — Western Syvash, 9 — Central Syvash, 10 — Eastern Syvash, 11 — Tubalskyi Lyman, 12 — Kryva Spit & Bay)

count), Western Syvash — 12.4 (3.4%) and 39.5, Bilosaraiska Spit & Bay — 12.1 (3.3%) and 29.9, Shagany Lyman — 11.7 (3.2%) and 20.2.

It should be noted that some large wetlands were divided into sections for easy of surveying, so the collected data was analyzed and evaluated for each section separately: Syvash — western, central, and eastern; Karkinitska Bay — northern and southern. However, if the significance of Sivash is assessed as a whole, it undoubtedly ranks first in terms of the number of bird species and their abundance. Karkinitska Bay is also considered to be of greater significance.

The Shannon index (Fig. 26) provides a somewhat different picture of the importance of wetlands for gulls, terns, and skuas. The list of the most valuable wetlands identified using this index largely mirrors that compiled using only average abundance, but also highlights the importance of some other wetlands, taking into account species richness, abundance, and its evenness.

Conclusions

The August Counts from 2004 to 2021 enabled a detailed analysis of the spatial distribution and abundance of 18 species of gull, tern and skua across a large area of the northern coast of the Black and Azov Seas, from the Danube Delta to Kriva Spit. Fourteen of them nest in the Azov-Black Sea region, four of them (2 gull species and 2 skuas) are mainly present there only during migration and wintering or as vagrants. Only three species — *L. ichthyaetus, S. albifrons* and *H. caspia* are listed in the Red Data Book of Ukraine.

Due to the irregular counts in many of the region's wetlands (see Fig. 2), calculating species abundance trends is significantly complicated. Therefore, we will not address this issue in this publication, but plan to do so in a separate one. However, based on data on the total number and spatial distribution of species, it can be concluded that gulls and terns in the study region are generally not under strong anthropogenic pressure leading to a significant decline in numbers. It should be emphasised once again that the birds counted in the Azov-Black Sea region during the August Counts primarily nest in this region.

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