

WP3 BIRDS

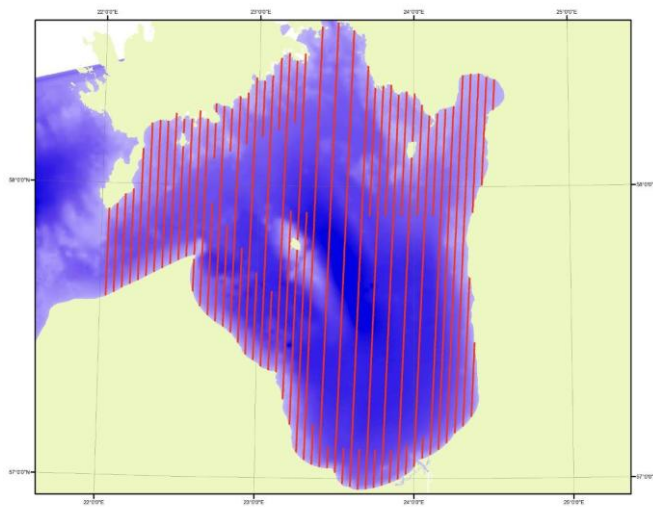
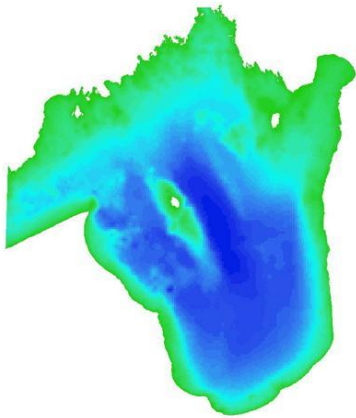
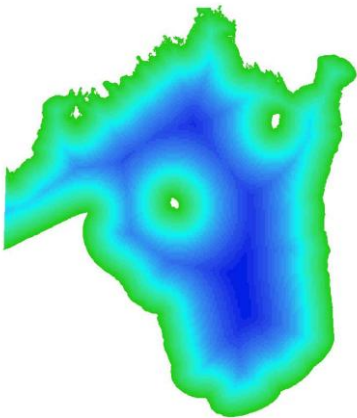
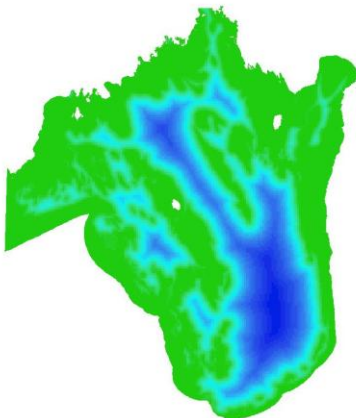


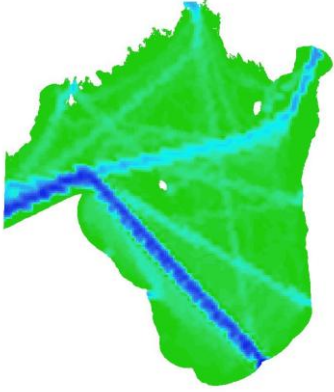
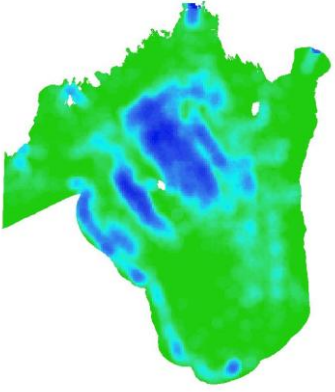



Figure 1. Bird survey transects used in GORWIND project.

Table 1. Parameters of distance belts – boundaries or distance from transect lines and angles from horizon if aircraft flies at altitude of 250 feet.

Band	Band boundaries in m (perpendicular to transects)	Angle from horizon
	0-44 dead zone (birds can not be counted)	
A	44 – 163	60 – 25
B	164 – 432	25 – 10
C	433 – 1000	10 – 4
D	> 1000	< 4

Figure 2. Examples of environmental factors used in modelling density distribution of marine birds:

		
A - depth	B - distance from coast	C - distance to sandy bottom
		
D - proportion of gravel bottom	E - proportion of muddy bottom	F - shipping intensity in 2011
		
G - intensity of fishing activities during previous year	H - proportion of ice in late January 2012	

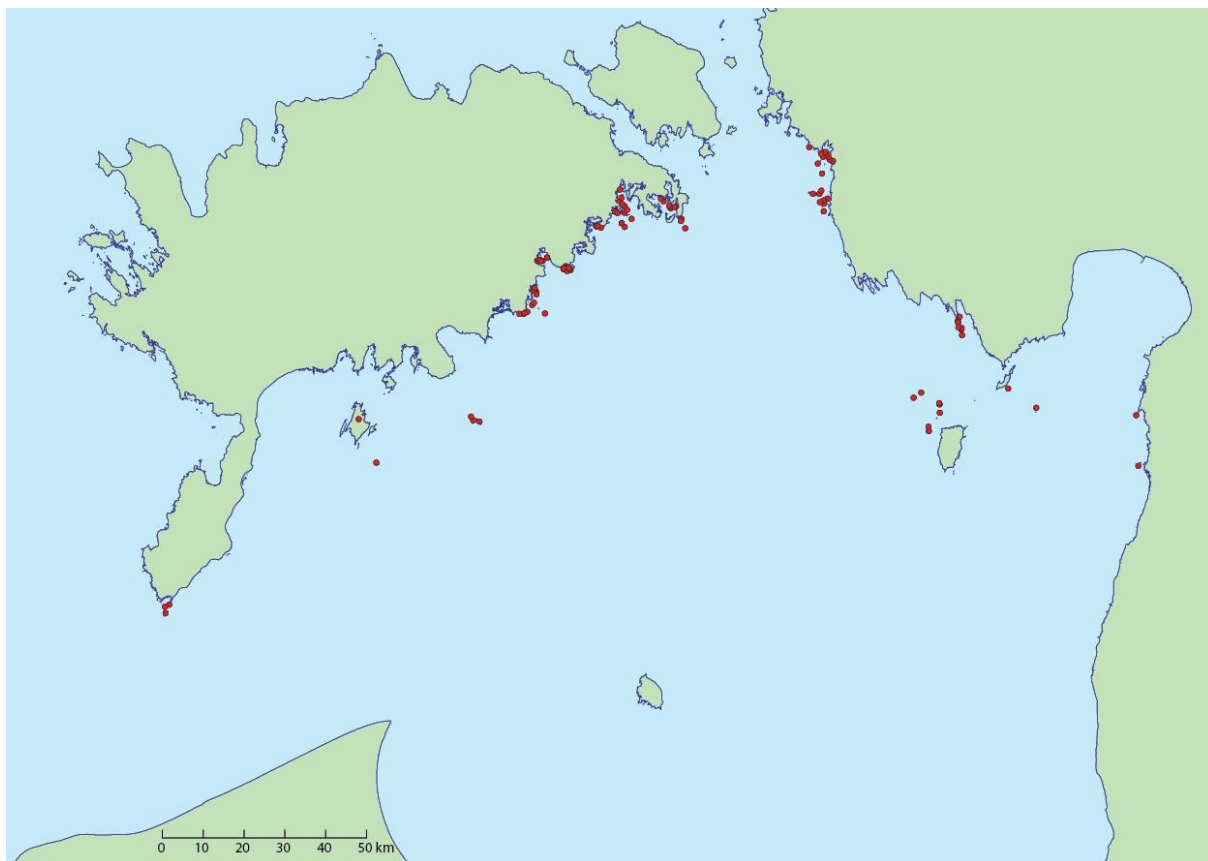
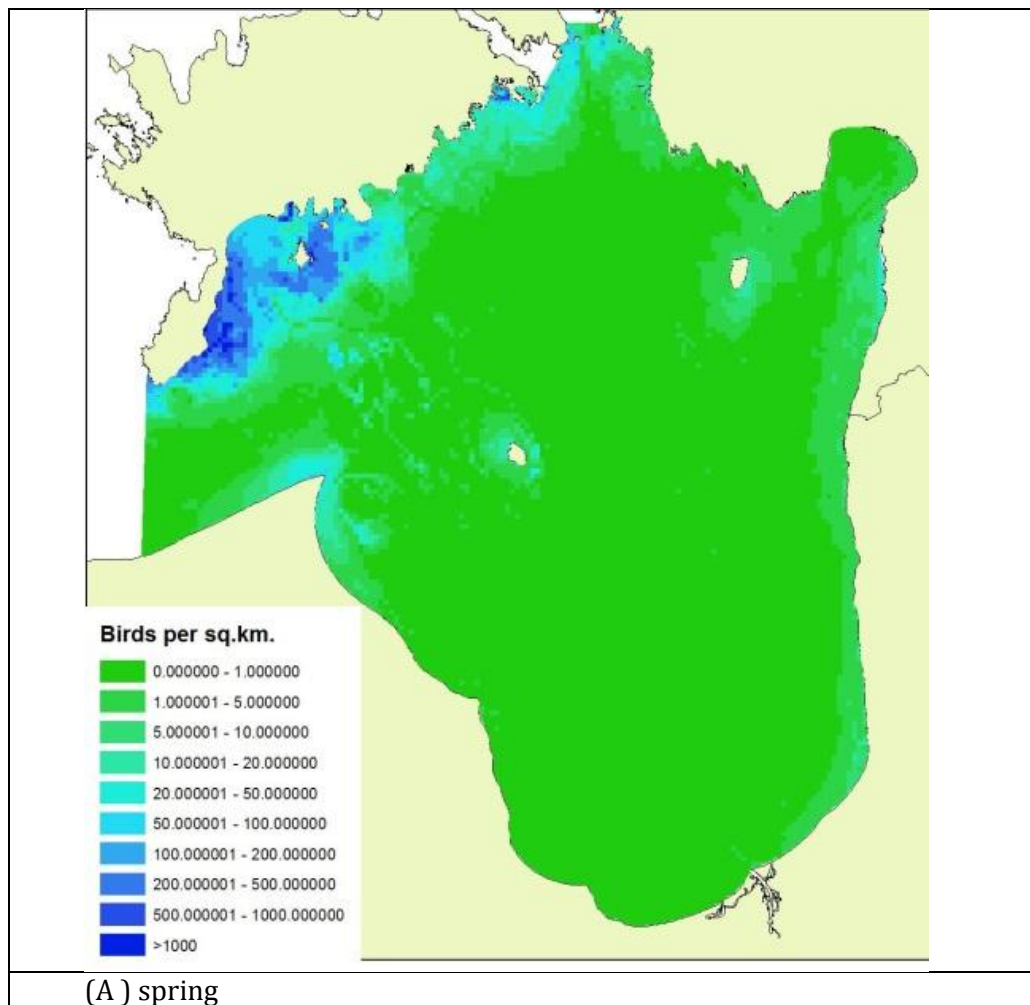
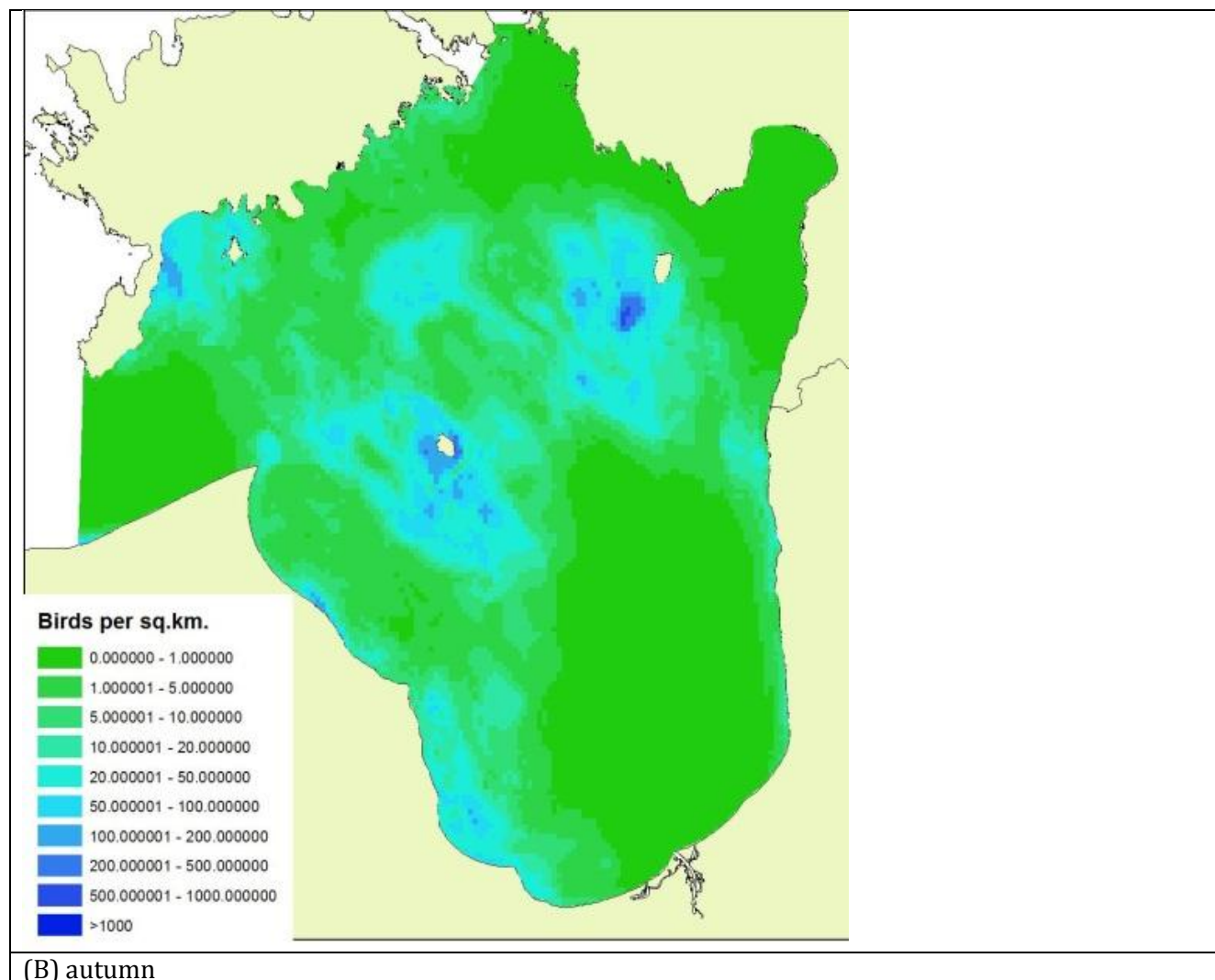


Figure 3. Islands and islets covered by breeding bird surveys in 2011.



(A) spring



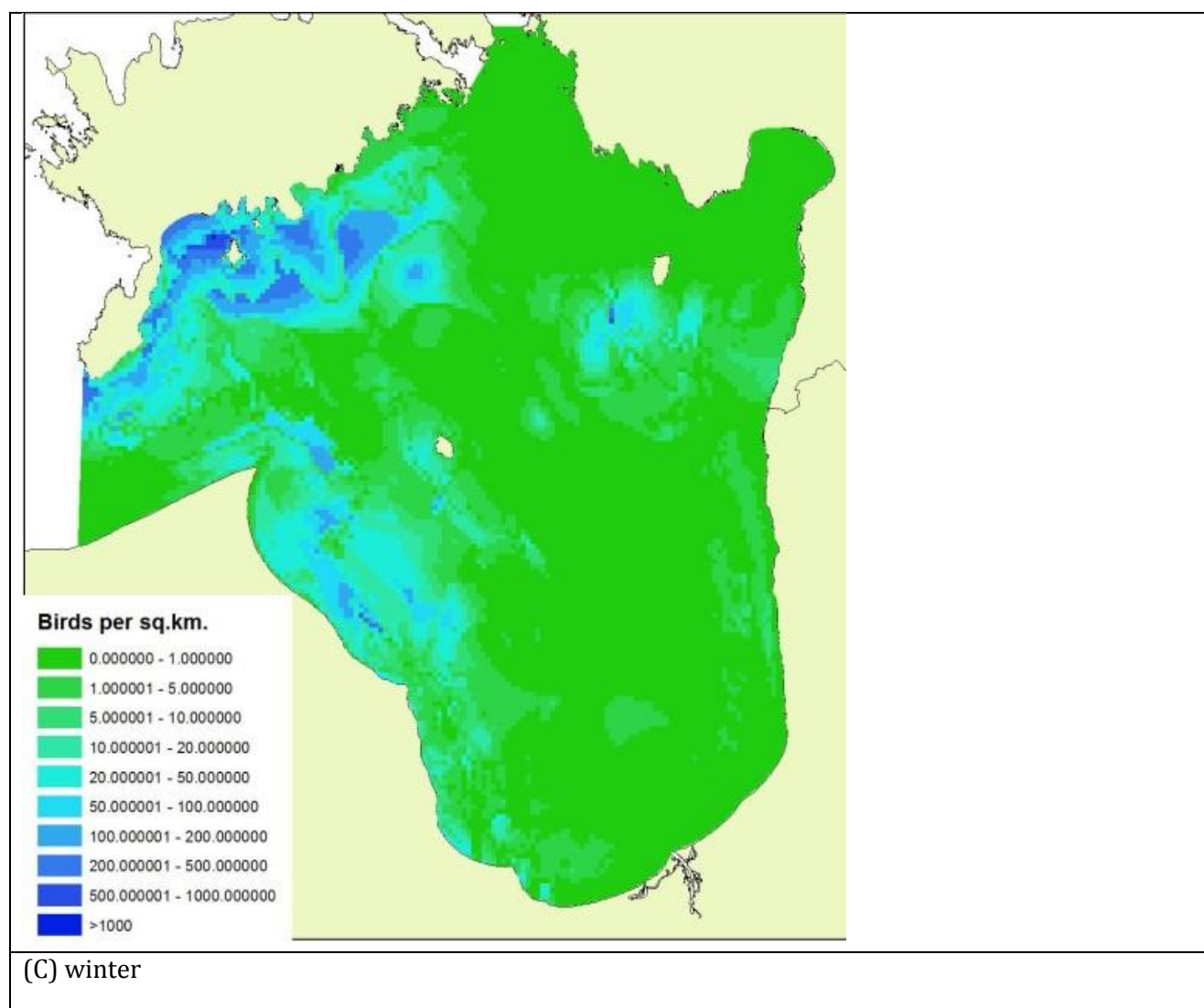


Figure 4. Distribution of Long-tailed Duck *Clangula hyemalis* in spring (A), autumn (B) and winter (C). Species does not occur in the Gulf of Riga in summer.

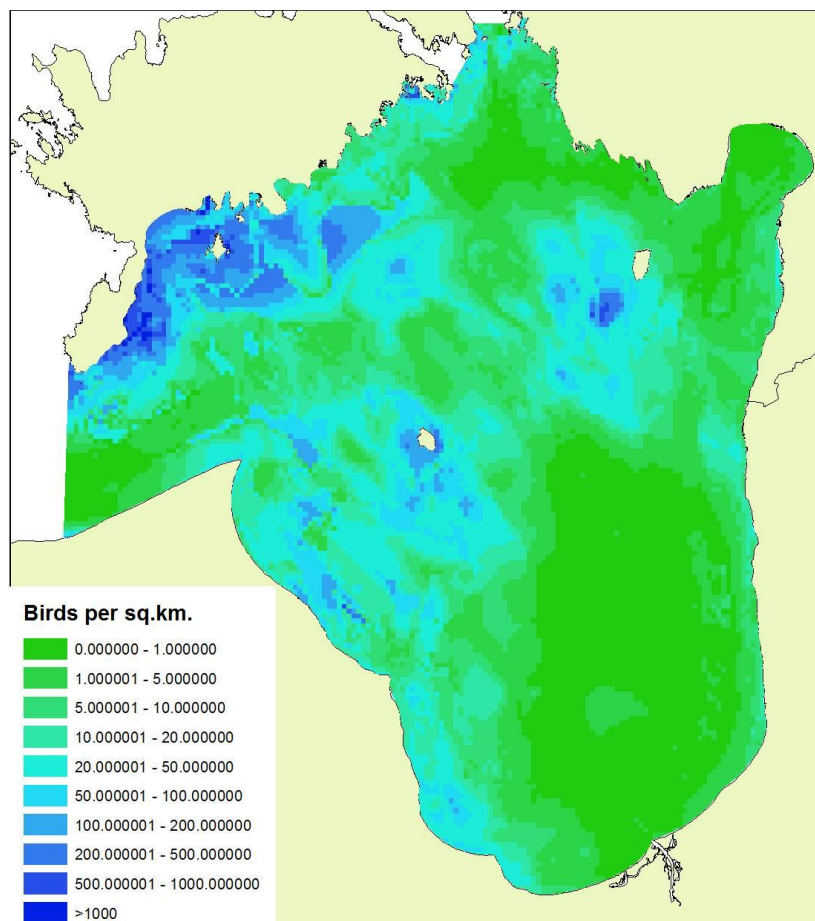
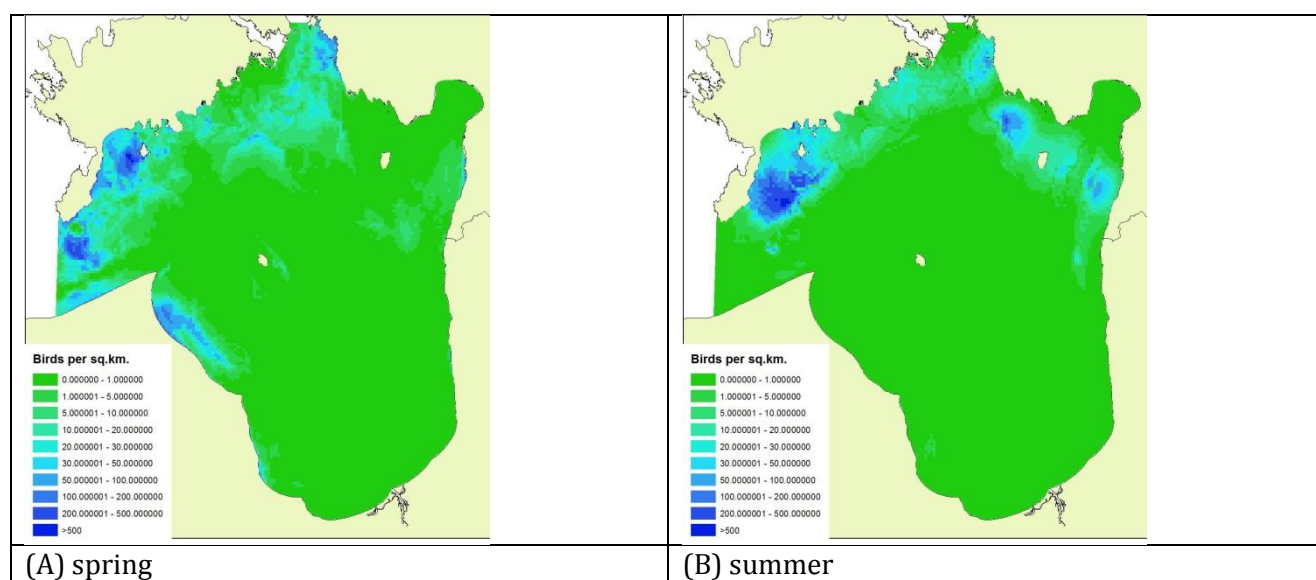


Figure 5. Maximum densities of Long-tailed Ducks *Clangula hyemalis* in the Gulf of Riga



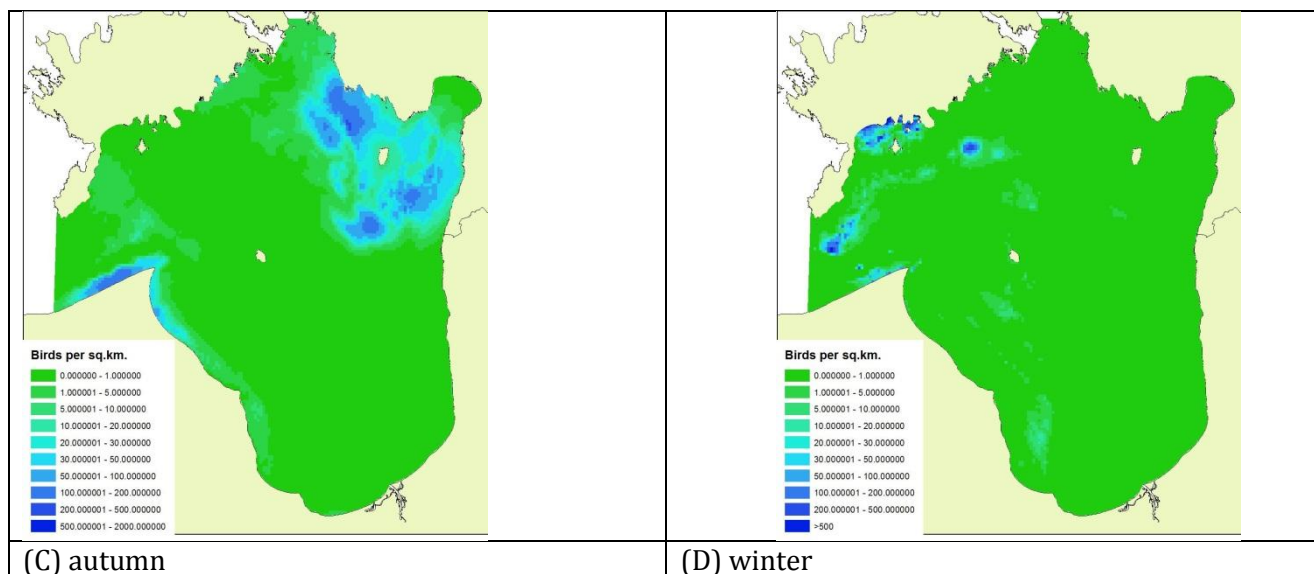


Figure 6. Distribution of Scoters *Melanitta sp.* in spring (A), summer (B), autumn (C) and winter (D).

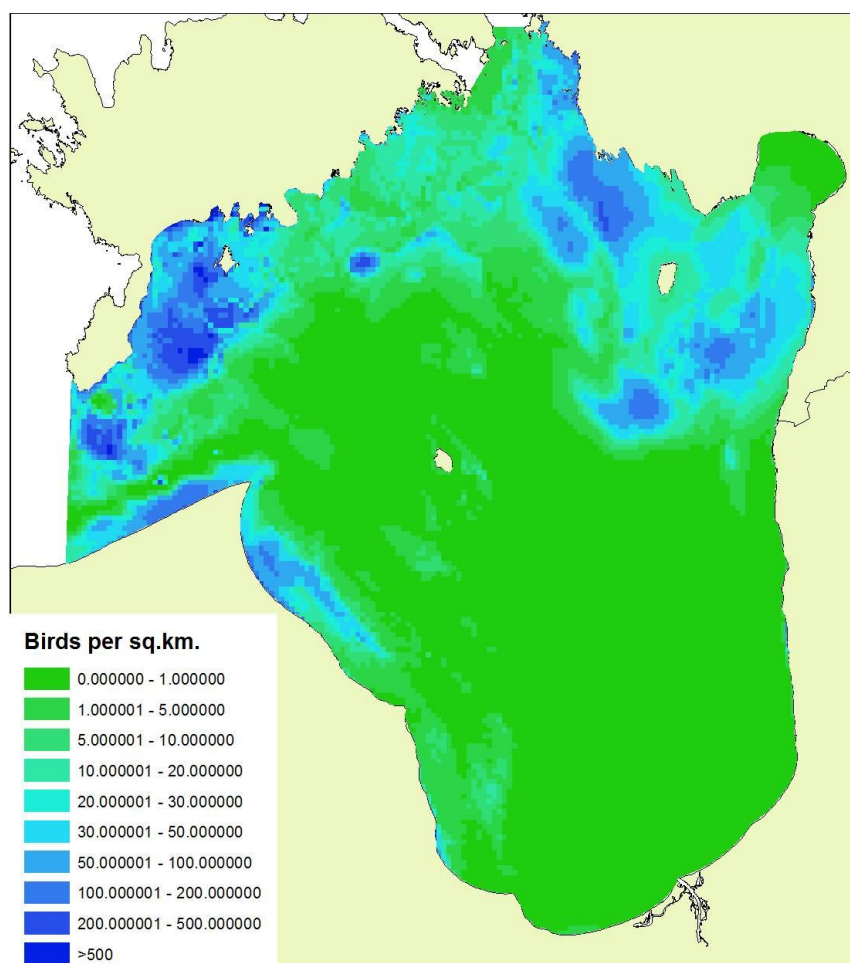


Figure 7. Maximum densities of Scoters *Melanitta sp.* in the Gulf of Riga

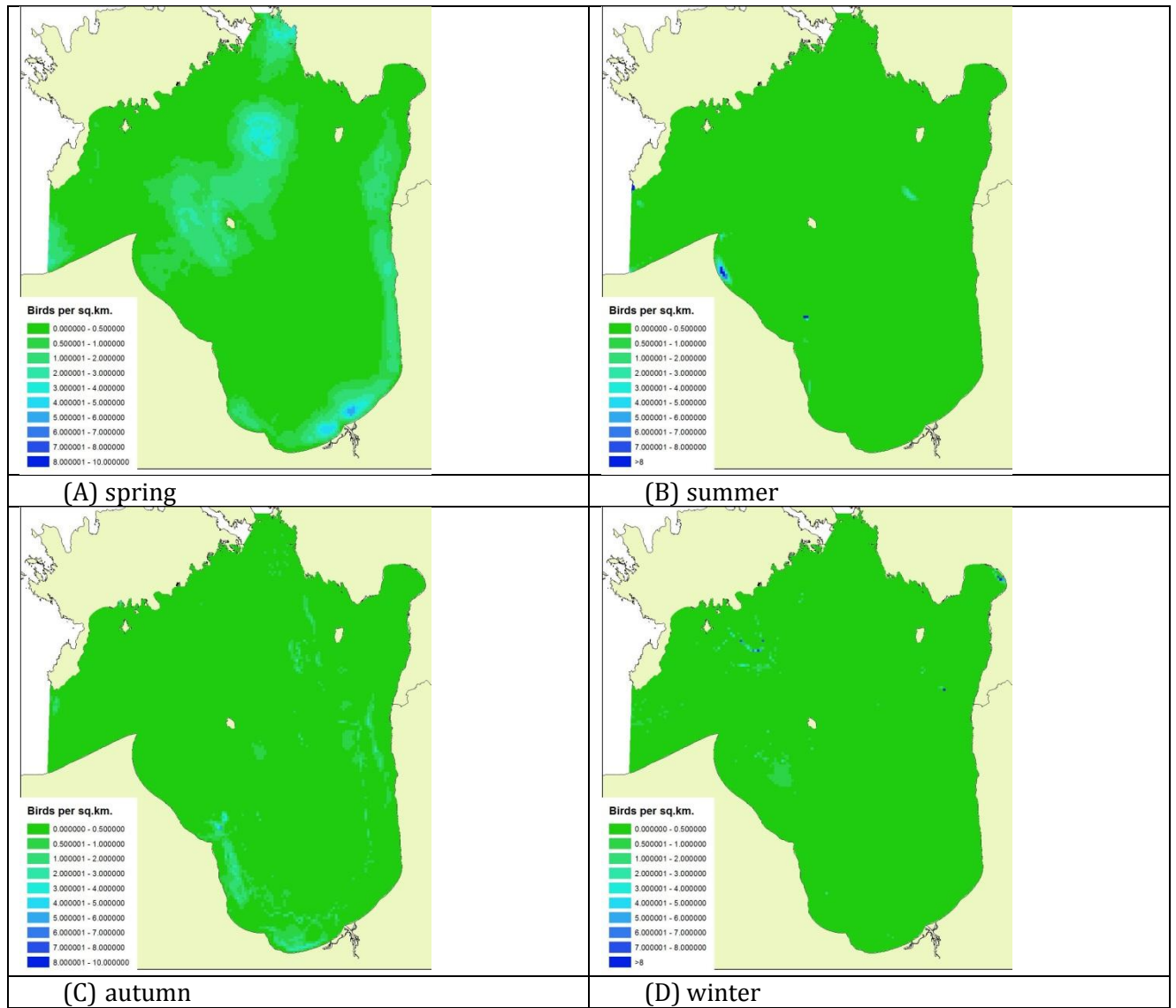


Figure 8. Distribution of Divers *Gavia sp.* in spring (A), summer (B), autumn (C) and winter (D).

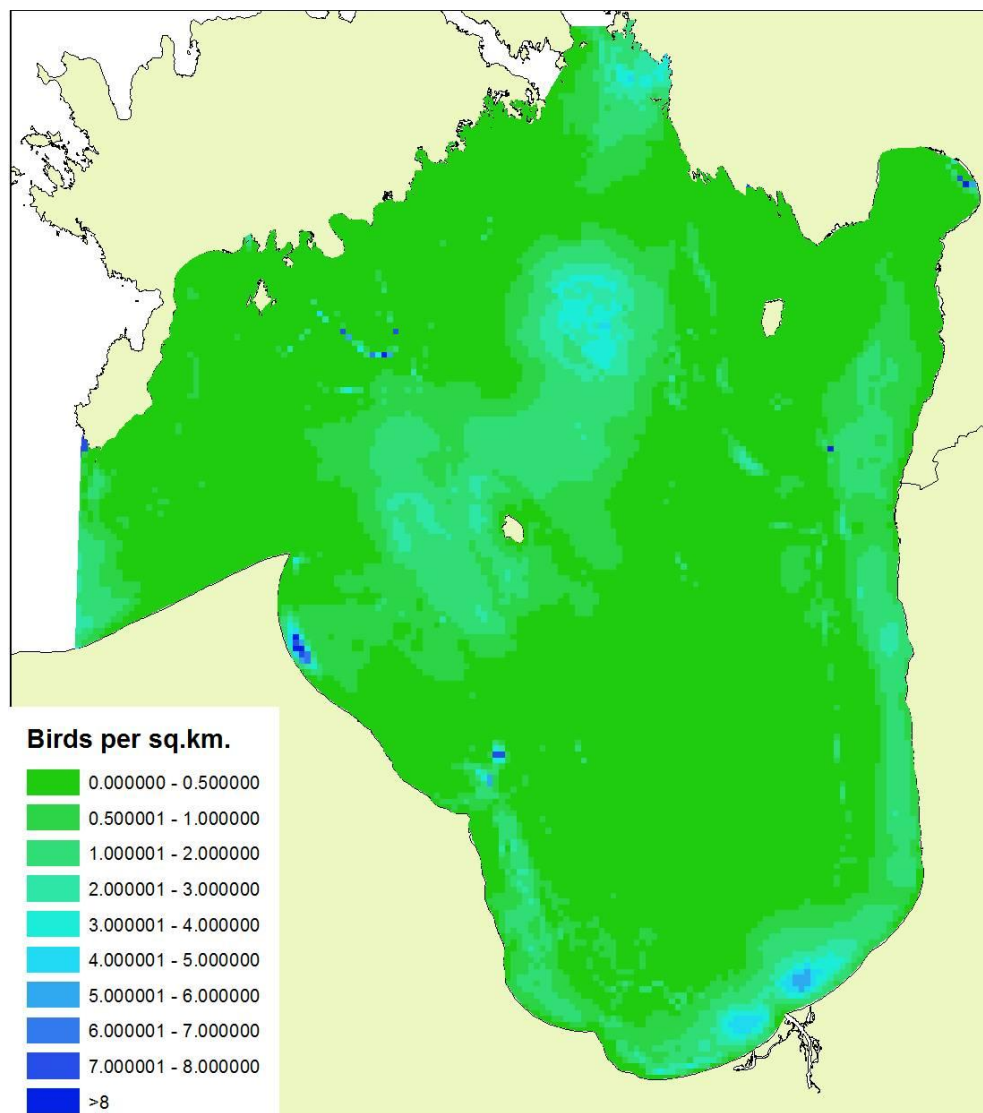
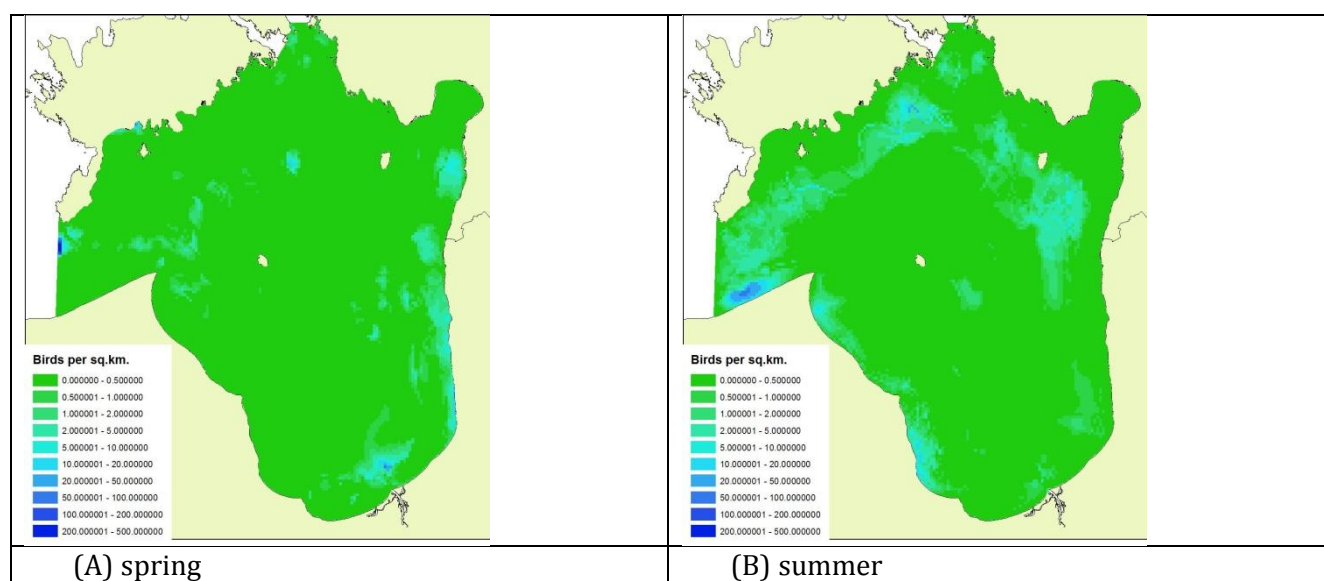


Figure 9. Maximum densities of Divers *Gavia species* in the Gulf of Riga



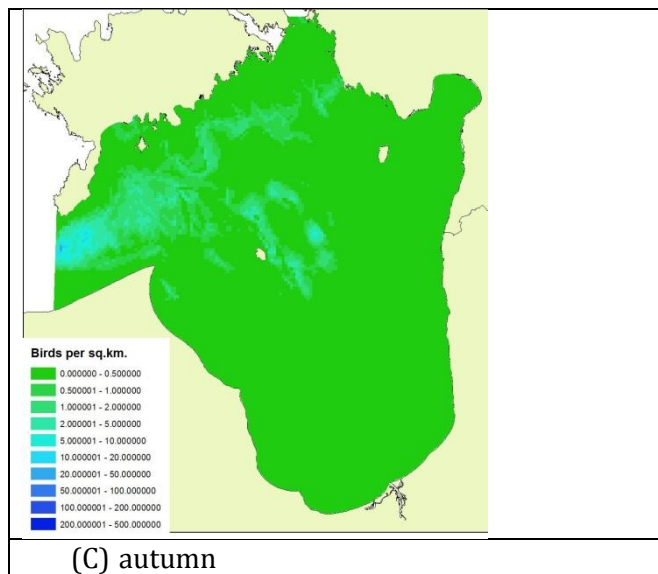


Figure 10. Distribution of Little Gull *Larus minutus* in spring (A), summer (B) and autumn (C). Species normally does not occur in the Gulf of Riga in winter.

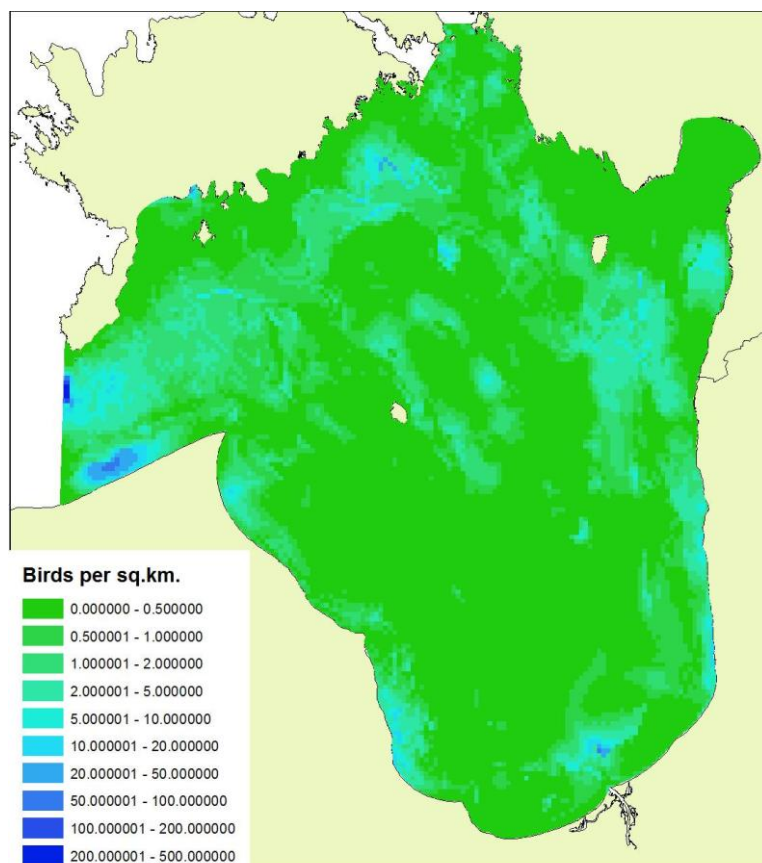


Figure 11. Maximum densities of Little Gull *Larus minutus* in the Gulf of Riga

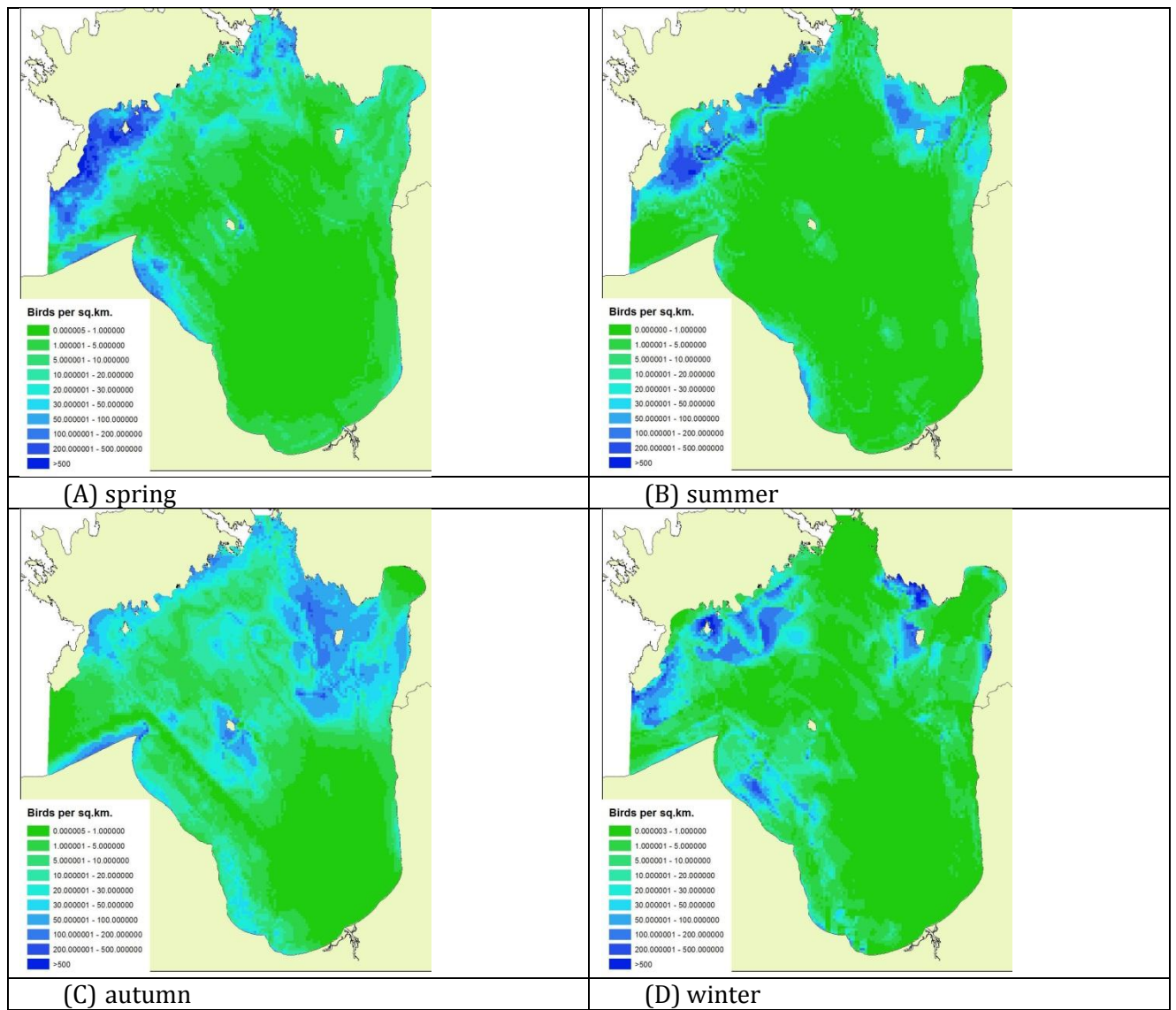


Figure 12. Distribution of all waterbirds (except gulls and terns) in spring (A), summer (B), autumn (C) and winter (D).

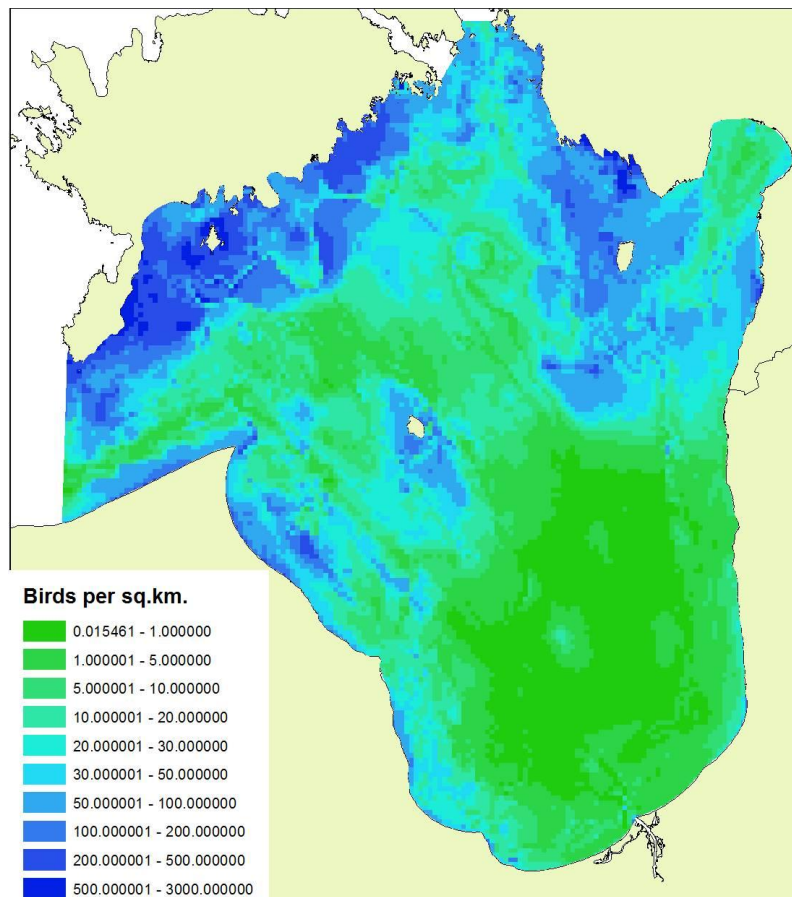
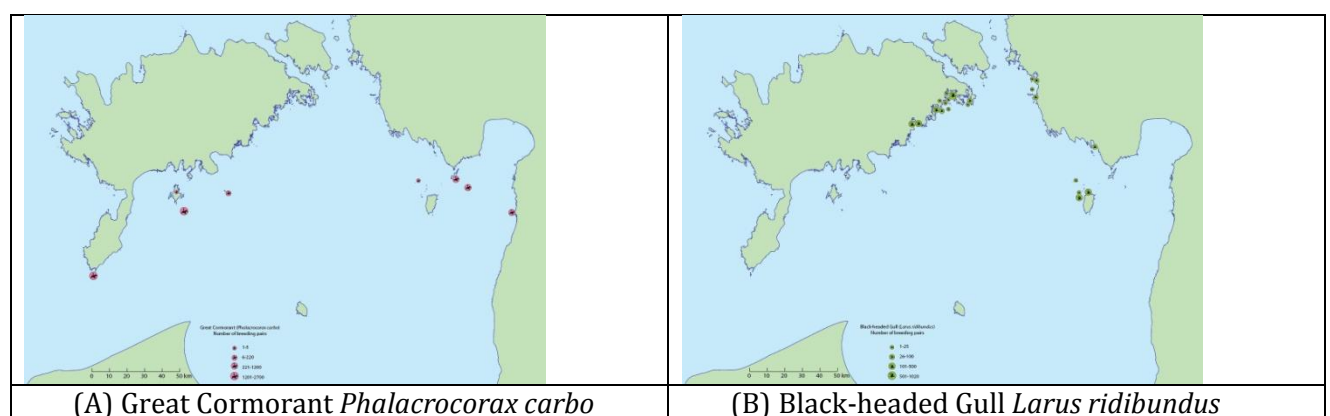


Figure 13. Maximum densities of all waterbirds (except gulls and terns) in the Gulf of Riga

Figure 14. Proportion (%) of different taxonomic groups (no of species in parenthesis) from all breeding pairs (Non-passerines).



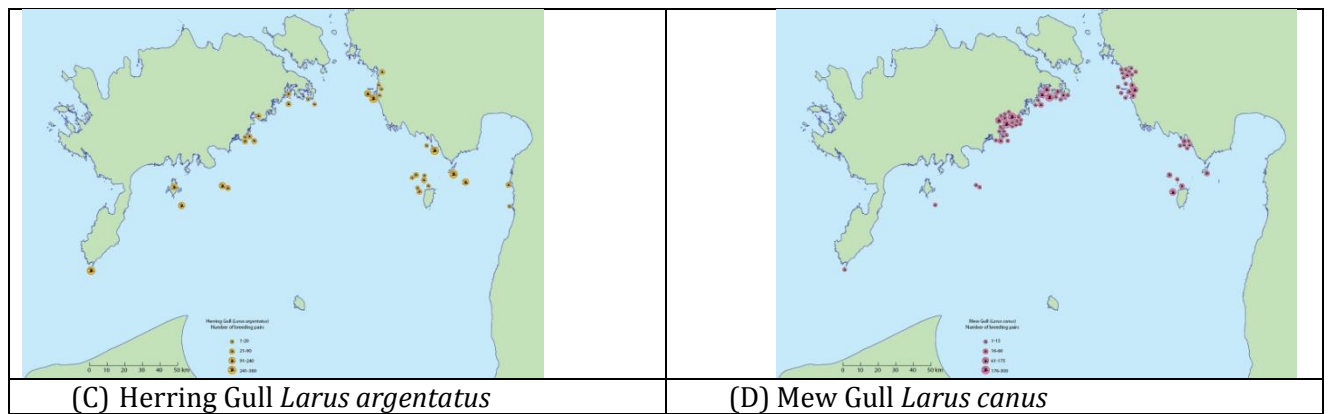


Figure 15. Distribution and numbers of breeding cormorant and gulls in the Gulf of Riga in 2011: Great Cormorant *Phalacrocorax carbo* (A), Black-headed Gull *Larus ridibundus* (B), Herring Gull *Larus argentatus* (C), Mew Gull *Larus canus* (D).

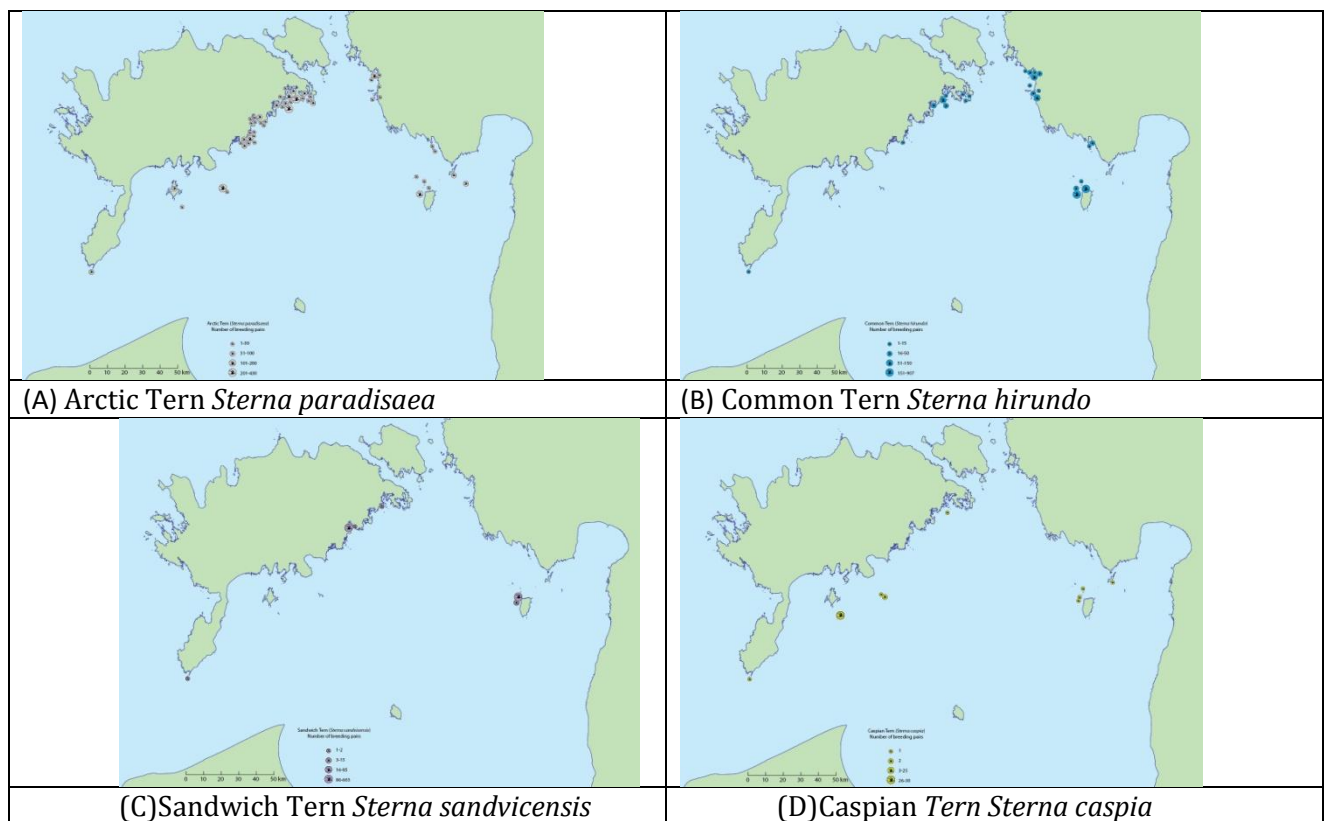


Figure 16. Distribution and numbers of breeding terns in the Gulf of Riga in 2011: Arctic Tern *Sterna paradisaea* (A), Common Tern *Sterna hirundo* (B), Sandwich Tern *Sterna sandvicensis* (C), Caspian Tern *Sterna caspia* (D).

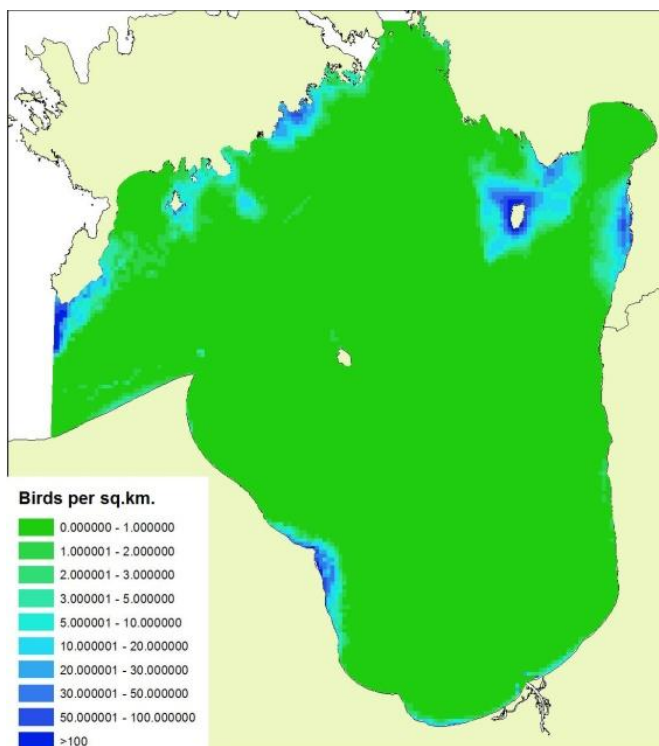
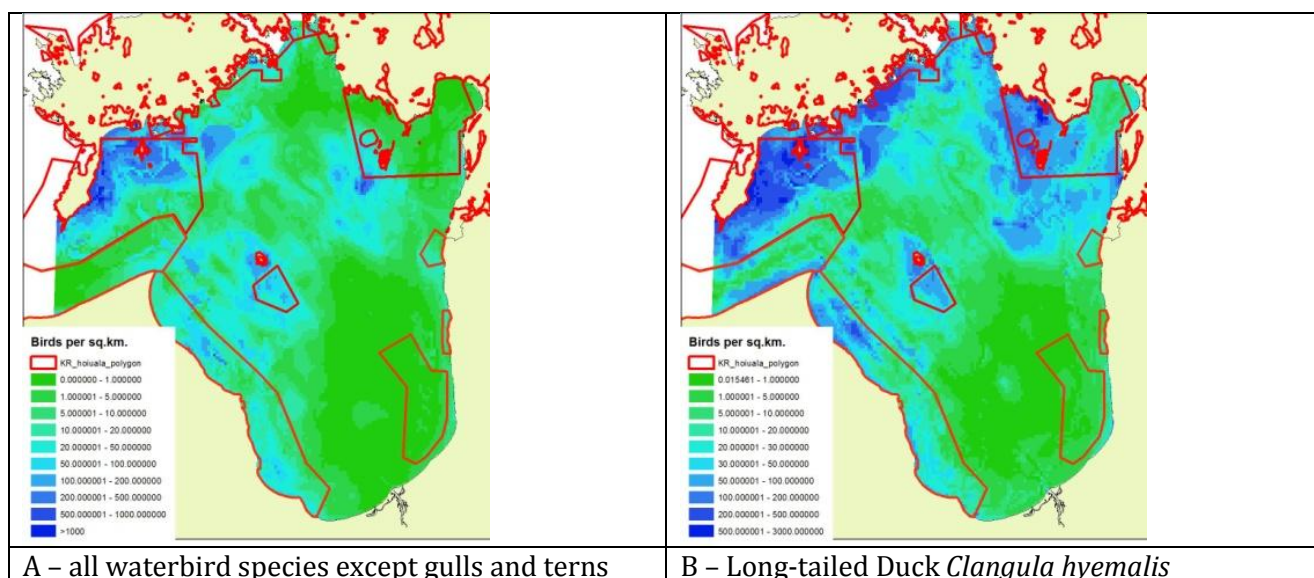


Figure 17. Foraging areas of Cormorant *Phalacrocorax carbo* extend 4-7 km from breeding colonies according to the distribution model derived from aerial surveys in summer 2011 (late July-early August). See also figure 15(A) for location of breeding colonies in Estonian islands (foraging area in SW part of the Riga Bay around Cape Ragaciems is used by cormorants breeding in Lake Kanieris).



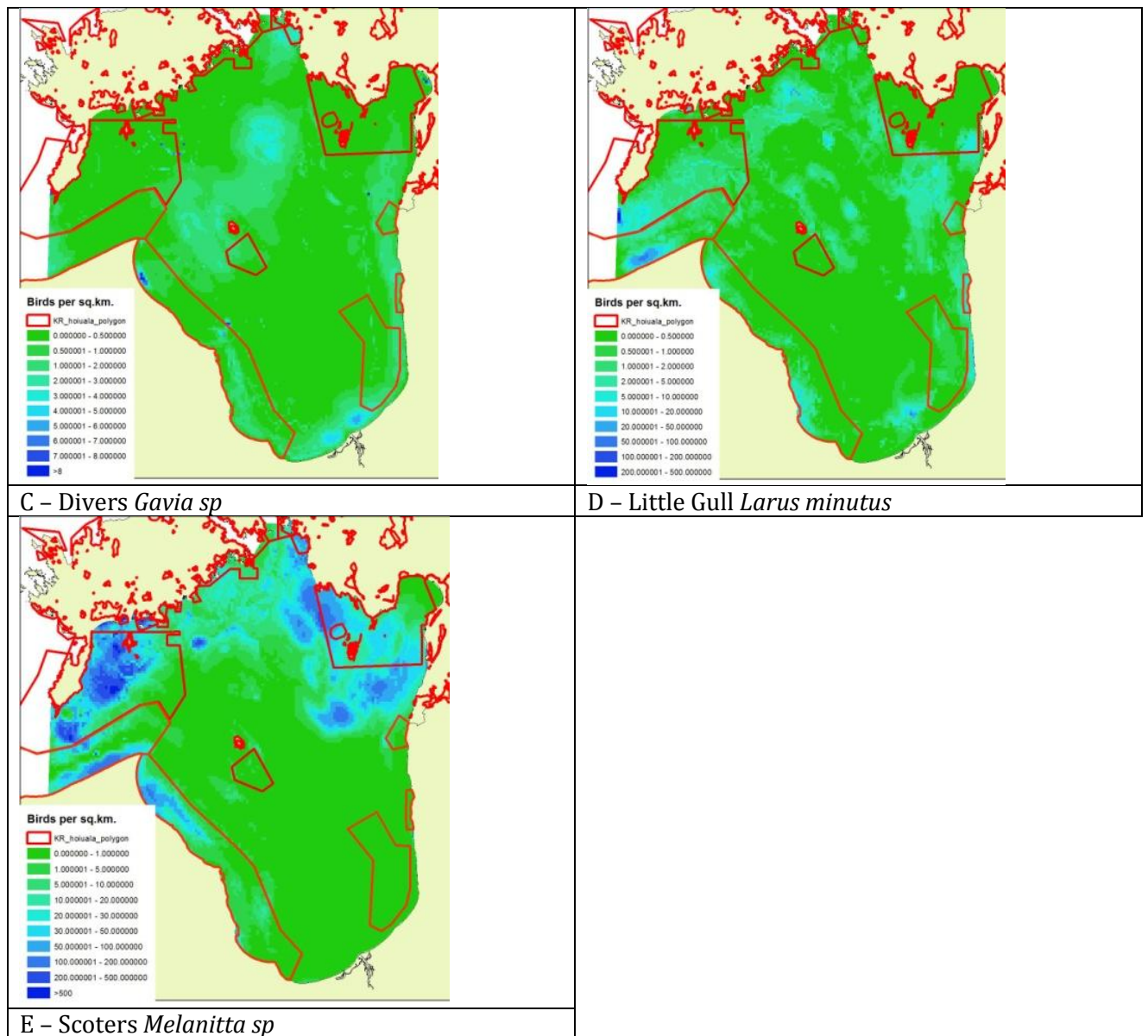


Figure18. Marine protected areas and distribution of marine birds (A – all waterbird species except gulls and terns, B – Long-tailed Duck *Clangula hyemalis*, C – Divers *Gavia sp.*, D – Little Gull *Larus minutus*, E – Scoters *Melanitta sp.*)

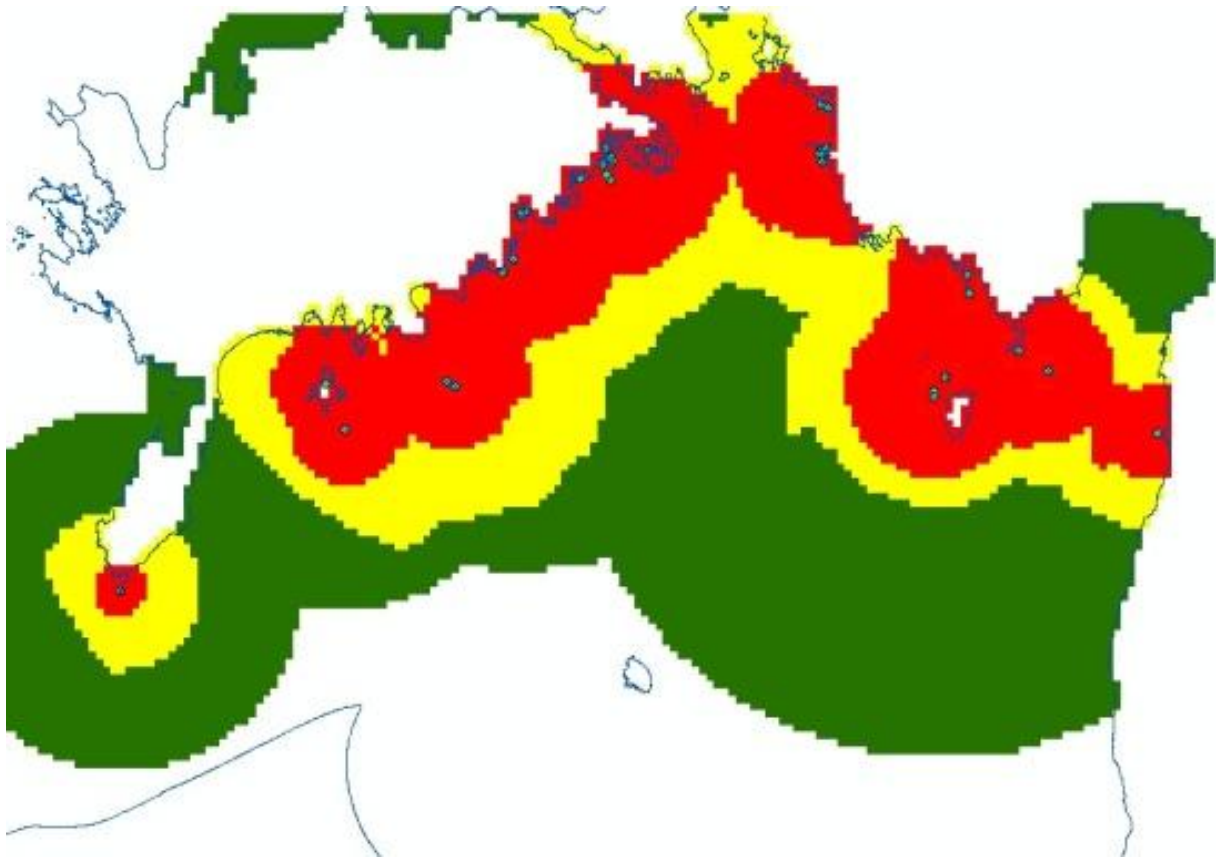


Figure 19. Modelled combined density distribution of foraging terns *Sterna paradiseae*, *S. hirundo*, *S. sandvicensis* and *S. caspia* in the Gulf of Riga (densities 0-10 ind/km² 11-100 ind/km² 100 ind/km²) during breeding period according count data in 2011.