Common Tern *Sterna hirundo*

Summary

Common Tern is projected to increase in population size in the INTERREG VA area from 1998-2002 to 2050 under climate change. Overall, Common Tern is projected (with poor confidence) to have high opportunity under climate change in the INTERREG VA area.

Table 1. Current (observed) and future (projected) Common Tern population size (breeding pairs) in GB & Ireland, INTERREG VA area and MarPAMM management areas.

Area	1998-2002	Projection for 2050	
GB & Ireland	13859	14404	↑4%
INTERREG VA area	3911	4629	↑+18%
Argyll	1313	2034	↑+55%
Co. Down – Co. Louth	1078	856	↓-21%
N Coast Ireland – N Channel	658	478	↓-27%
Outer Hebrides	492	595	↑+21%

Under climate change, Common Tern **population size** is projected to **increase** in the INTERREG VA area between 1998-2002 and 2050, at a higher rate than across Britain and Ireland as a whole (Table 1, Fig. 2a).

Abundance trend for Common Tern is expected to vary considerably across the INTERREG VA area, with no clear spatial pattern (Fig. 2a). Some new sites may become more suitable for Common Tern under climate change (Fig. 2b), again with no clear spatial pattern.

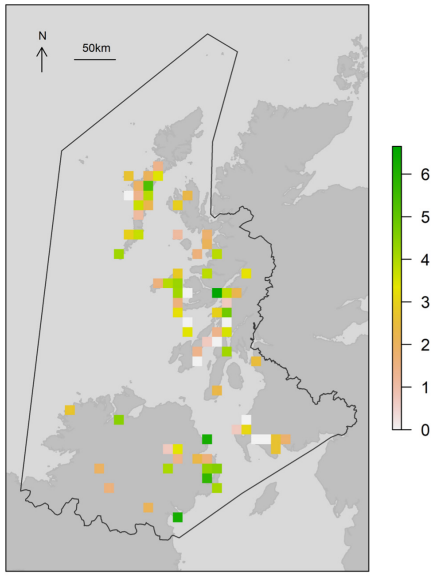

Figure 1. Observed Common Tern abundance (log breeding pairs), 1998-2002. Black polygon = INTERREG VA area.

This work was produced as part of the Marine Protected Area Management and Monitoring (MarPAMM) project. MarPAMM has been supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body.

Projected change in breeding pairs

Projected change in presence probability

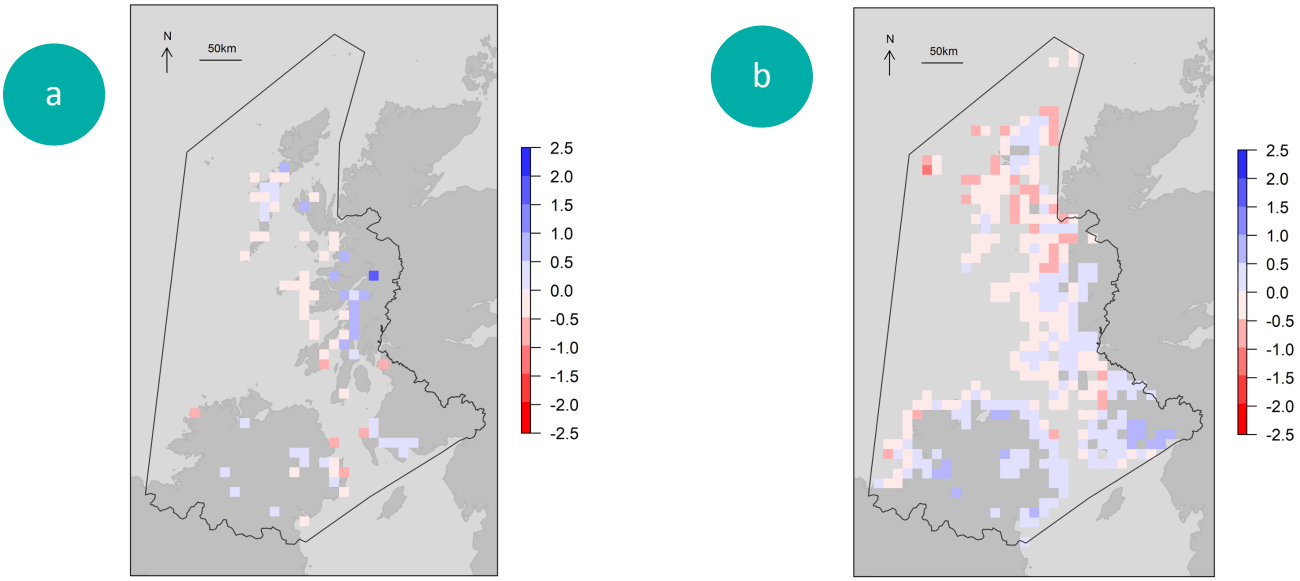

Figure 2. Projected change (1998-2002 to 2050; log proportional change) in: a) Common Tern breeding pairs, for all cells where Common Tern was present in 1998-2002; (b) Common Tern presence probability for all squares where any seabird was censused in 1985-1988 or 1998-2002. White/blue = increase, red = decrease. Black polygon = INTERREG VA area.

Model predictive power was good for the presence/absence component of the model, but poor for the abundance component*. Common Tern presence/absence and abundance had significant relationships with terrestrial climate, oceanographic and nuisance variables (Table 2).

Table 2. Effect on presence and abundance for significant variables in model*. Variables included in table if significant in at least one model component; field left blank if variable not significant in that model component. Variables shown in parentheses represent quadratic terms. Projections made using full model (i.e. not just significant variables).

Variable	Presence	Abundance
Breeding season precipitation	-	
(Breeding season precipitation)^2	+	
Winter precipitation		-
(Breeding season potential energy anomaly)^2		-
Bathymetry	-	-
(Bathymetry)^2		+
Coast length	+	+
Distance inside coast		-
Small islands area	+	-

Table 3. Projected change for Common Tern at the ten sites with the most breeding pairs in 1998-2002. Sites are as defined in Seabird 2000 census. Superscript denotes MarPAMM management region, where applicable: [A], Argyll; [B], Co. Down - Co. Louth; [C], North Coast Ireland - North Channel; [D], Outer Hebrides.

Site	Breeding pairs, 1998-2002 (count)	Projected breeding pairs, 2050 (median & 95% CI*)	Projected % change in breeding pairs (median & 95% CI*)
North Mull[A]	772	1405 (490, 3933)	+82 (-36.5, +409.5)
Strangford Lough[B]	559	523 (127, 2299)	-6.4 (-77.3, +311.2)
Larne Lough[C]	521	305 (20, 2235)	-41.4 (-96.2, +328.9)
Carlingford Lough[B]	509	322 (22, 2424)	-36.7 (-95.7, +376.3)
North Uist[D]	211	311 (85, 1140)	+47.6 (-59.7, +440.3)
Craobh Haven to Craignish & Selected Offshore Islands[A]	119	228 (47, 1008)	+91.9 (-60.3, +746.9)
Coll[A]	100	73 (6, 522)	-26.7 (-94.4, +422.2)
Inch Island[C]	89	114 (23, 534)	+28.3 (-74.5, +500)
Benbecula[D]	71	99 (29, 372)	+39 (-59.6, +423.5)
Mingulay[D]	66	47 (4, 298)	-29.1 (-94.5, +351.4)

* See main report for details of modelling, variables, categories of model predictive power and derivation of confidence intervals for projections.

Climate Change Mechanisms

The review of climate change mechanisms affecting seabirds (Johnston et al. 2021) identified largely indirect effects of climate on the demographic parameters of terns as a group. Common Tern clutch size and nest success can be negatively related to rainfall at some colonies, with both likely to be mediated by provisioning rate or food supply. Foraging success in Common Tern is particularly sensitive to wind speed and sea choppiness.

Overall, climate change is projected (with **poor confidence**) to present Common Tern with **low risk** and **very high opportunity** in the INTERREG VA area.

Citation: Common Tern species factsheet. From Davies, J.G., Humphreys, E.M. & Pearce-Higgins, J.W. 2021. Projected future vulnerability of seabirds within the INTERREG VA area to climate change. Report to Agri-Food and Biosciences Institute and Marine Scotland Science as part of the MarPAMM Project. BTO, Thetford

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www.mpa-management.eu