

# Little Tern *Sternula albifrons*

## Summary

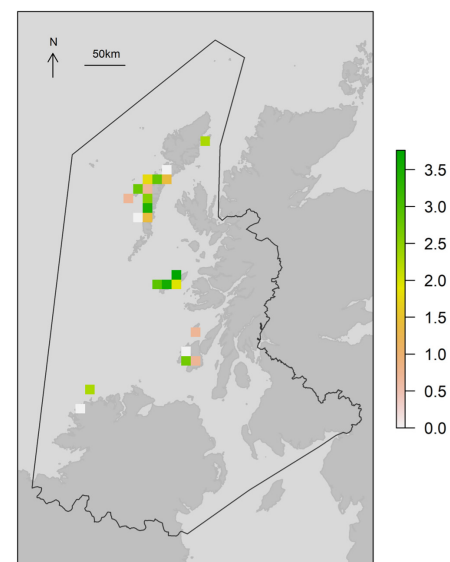
Little Tern is projected to decline considerably in population size in the INTERREG VA area from 1998-2002 to 2050 under climate change. Due to a paucity of data, model behaviour was unusual for this species, and therefore projections may be less reliable than for other species. Overall, Little Tern is projected (with moderate confidence) to have high vulnerability under climate change in the INTERREG VA area.

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

Area	1998-2002	Projection for 2050
GB & Ireland	2093	995 ↓-53%
INTERREG VA area	242	65 ↓-73%
Argyll	123	14 ↓-89%
Co. Down – Co. Louth	0	0
N Coast Ireland – N Channel	11	0 ↓-100%
Outer Hebrides	108	51 ↓-53%

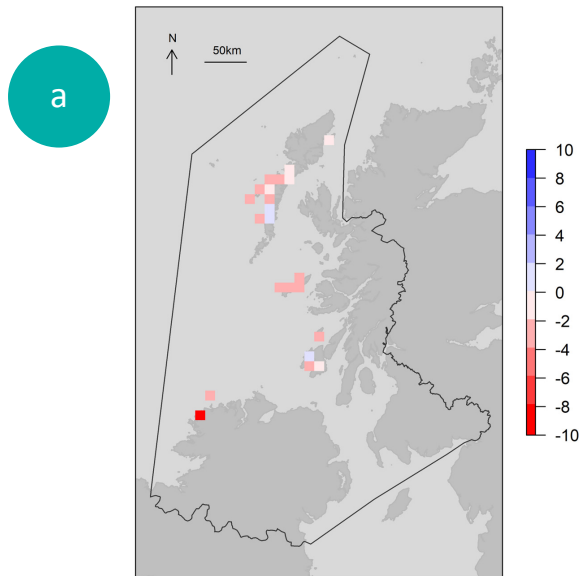
Under climate change, Little Tern **population size** is projected to **decline** considerably in the INTERREG VA area between 1998-2002 and 2050, at a higher rate than across Britain and Ireland as a whole (Table 1, Fig. 2a).

Little Tern is projected to **decline** in **abundance** almost everywhere across the INTERREG VA area, with no clear spatial pattern (Fig. 2a). Some new sites may become more suitable for Little Tern under climate change (Fig. 2b); therefore this projected decline in abundance may be partially compensated for by colonisation.

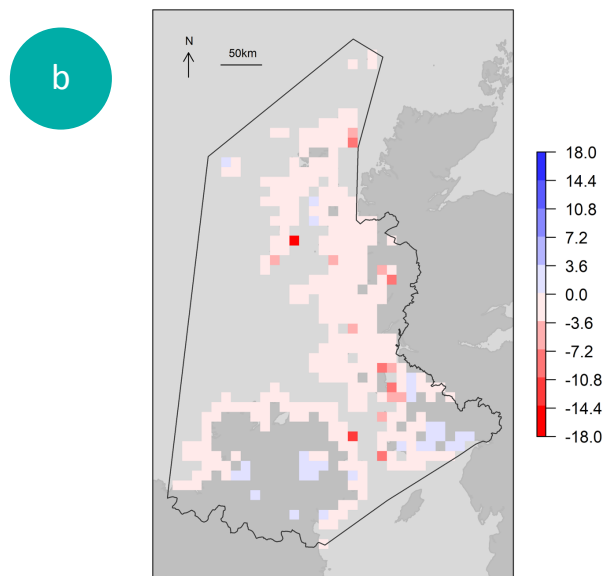


**Figure 1.** Observed Little Tern abundance (log breeding pairs), 1998-2002. Black polygon = INTERREG VA area.

## Projected change in breeding pairs



## Projected change in presence probability



**Figure 2.** Projected change (1998-2002 to 2050; log proportional change) in: a) Little Tern breeding pairs, for all cells where Little Tern was present in 1998-2002; (b) Little 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.

Due to a paucity of data, model behaviour was unusual for this species, and therefore projections may be less reliable than for other species\*. Model predictive power was excellent for the presence/absence component of the model, but poor for the abundance component. Little Tern presence/absence 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 potential energy anomaly	+	
Winter potential energy anomaly	-	
Winter sea surface temperature	-	
Bathymetry	-	
Distance inside coast	-	

**Table 3.** Projected change for Little 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: <sup>A</sup>, Argyll; <sup>B</sup>, Co. Down - Co. Louth; <sup>C</sup>, North Coast Ireland - North Channel; <sup>D</sup>, Outer Hebrides.

Site	Breeding pairs, 1998-2002 (count)	Projected breeding pairs, 2050 (median & 95% CI*)	Projected % change in breeding pairs (median & 95% CI*)
Tiree <sup>A</sup>	56	5 (0, 1140)	-90.3 (-100, +1935.8)
Coll <sup>A</sup>	47	5 (0, 560)	-89.4 (-100, +1092.1)
North Uist <sup>D</sup>	37	6 (0, 380)	-85 (-98.7, +926.8)
South Uist <sup>D</sup>	37	38 (8, 155)	+1.6 (-77.9, +317.7)
Islay – East (Port Askaig to Bowmore) <sup>A</sup>	18	3 (0, 238)	-81.6 (-97.6, +1220.5)
Berneray, Sound of Harris <sup>D</sup>	15	2 (0, 152)	-87.7 (-99.9, +914.1)
Melbost - Lewis <sup>D</sup>	10	4 (0, 132)	-59.4 (-99.6, +1216.5)
Tory Island and Bloody Foreland <sup>C</sup>	10	0 (0, 226)	-96.8 (-100, +2158.4)
Ensay - Harris <sup>D</sup>	4	1 (0, 53)	-82.1 (-99.9, +1233.7)
Isle of Colonsay <sup>A</sup>	2	0 (0, 43)	-91.7 (-100, +2066.8)

\* 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. For Little Tern in particular, arrival and breeding phenology are related to winter or spring NAO. Little Tern clutch size and egg volume are negatively related to late winter/spring SST and spring NAO, probably through food availability.

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

**Citation:** Little 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



For more information on the MarPAMM project please visit the project website:

[www.mpa-management.eu](http://www.mpa-management.eu)