Common Guillemot *Uria aalge*

Summary

Common Guillemot is projected to decline considerably in population size in the INTERREG VA area from 1998-2002 to 2050 under climate change, particularly in the south. Overall, Common Guillemot is projected (with poor confidence) to have moderate vulnerability under climate change in the INTERREG VA area.

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

Area	1998-2002	Projection for 2050
GB & Ireland	1559484	784397 ↓ -50%
INTERREG VA area	298349	151772 ↓ -49%
Argyll	39407	17623 ↓ -55%
Co. Down – Co. Louth	0	0
N Coast Ireland – N Channel	106215	49896 ↓ -53%
Outer Hebrides	120594	68475 ↓ -43%

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

Common Guillemot is projected to **decline** in **abundance** everywhere across the INTERREG VA area, and at a slightly higher rate in the south (Fig. 2a). It is unlikely that new sites will become more suitable for Common Guillemot under climate change (Fig. 2b); therefore this projected decline in abundance is unlikely to be compensated for by colonisation.

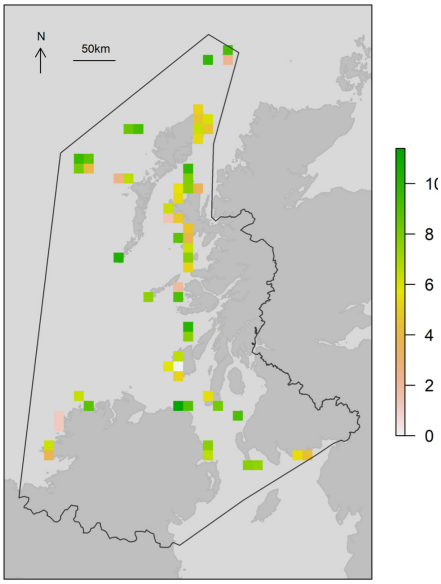

Figure 1. Observed Common Guillemot abundance (log breeding pairs), 1998-2002. Black polygon = INTERREG VA area.

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

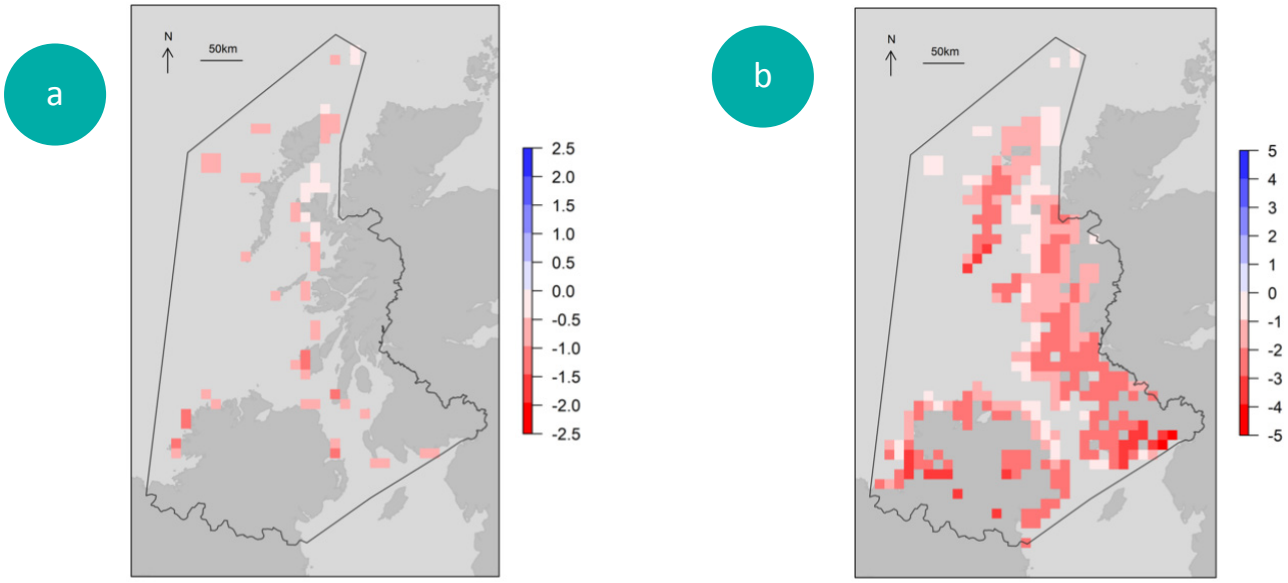

Figure 2. Projected change (1998-2002 to 2050; log proportional change) in: a) Common guillemot breeding pairs, for all cells where Common Guillemot was present in 1998-2002; (b) Common Guillemot presence probability for all squares where any seabird was censused in 1985-1988 or 1998-2002. White/blue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

Model predictive power was good for the presence/absence component of the model, and moderate for the abundance component*. Common Guillemot 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 maximum temperature	-	-
(Winter potential energy anomaly)^2	-	
Bathymetry	+	
Coast length	+	+
Distance inside coast	-	

Table 3. Projected change for Common Guillemot 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*)
Rathlin Island (whole coastline and stacks)[C]	95117	45343 (5567, 271683)	-52.3 (-94.1, +185.6)
Isle of Colonsay[A]	26429	11529 (810, 86899)	-56.4 (-96.9, +228.8)
Sula Sgeir Island[D]	20877	12517 (812, 137708)	-40 (-96.1, +559.6)
Berneray[D]	19083	10697 (798, 75237)	-43.9 (-95.8, +294.3)
Shiant Islands[D]	16456	10352 (1513, 46125)	-37.1 (-90.8, +180.3)
Flannan Isles[D]	14638	8038 (393, 109382)	-45.1 (-97.3, +647.2)
Mingulay[D]	13387	7504 (560, 52780)	-43.9 (-95.8, +294.3)
Hirta, St Kilda[D]	10903	5576 (292, 50100)	-48.9 (-97.3, +359.5)
North Rona[D]	10497	6440 (418, 71926)	-38.7 (-96, +585.2)
Treshnish Isles[A]	9585	4637 (256, 43155)	-51.6 (-97.3, +350.2)

* 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 that Common Guillemot breeding success generally has low sensitivity to prey-mediated climatic effects, because the species can forage at a range of depths. However, adverse weather can more directly impact Common Guillemots' ability to forage prey. Common Guillemot breeding phenology is related to the NAO, potentially through food supple. The effect of climatic variation on Common Guillemot survival is highly variable between studies.

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

Citation: Common Guillemot 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