Table S1. 'ProbGLS' model input parameters for estimating locations using geolocator data from Atlantic puffins (ATPU), razorbills (RAZO), and common murres (COMU).

	ATPU	RAZO	COMU
wetdry.resolution (s)	30	30	3
max.sst.diff (°)[a]	2	2	3
speed.dry (mps)[b]	17.6/ 0.2/18.6	16.0/0.2/17.0	19.1/ 0.2/20.1
speed.wet (mps)[b]	1/1.3/ 5		
loess.quartile	k = 3		
particle.number	2000		
iteration.number	100		
sunrise.sd[c]	2.49/0.94/0		
sunset.sd[c]	2.49/0.94/0		
range.solar (°)	-6 to -3		
sst.sd (°)	calculated for each individual		
boundary.box (°)	-85 to -1 longitude, 25 to 70 latitude		
days.around.spring.equinox[d]	21 before, 14 after		
days.around.fall.equinox[d]	14 before, 21 after		
ice.conc.cutoff	1		
land.mask	T		

[a]Maximum tolerance in sea surface temperature (SST) variation
[b]Maximum expected speed/speed standard deviation (SD)/maximum speed allowed
[c]Shape/scale/delay values defining uncertainty for each twilight event, following a log normal distribution
[d]Number of days surrounding equinox for which a random latitude will be assigned

Table S2. Utilization distribution overlap index (UDOI) values of pairwise 50% kernel density distribution overlap between Atlantic puffins (ATPU), razorbills (RAZO), and common murres (COMU) during successive 2-month periods in the non-breeding season, calculated with two different underlying grid sizes (25 km and 150 km). The degree of green shading ranges from the smallest value (white) to the largest in each column (darkest green).

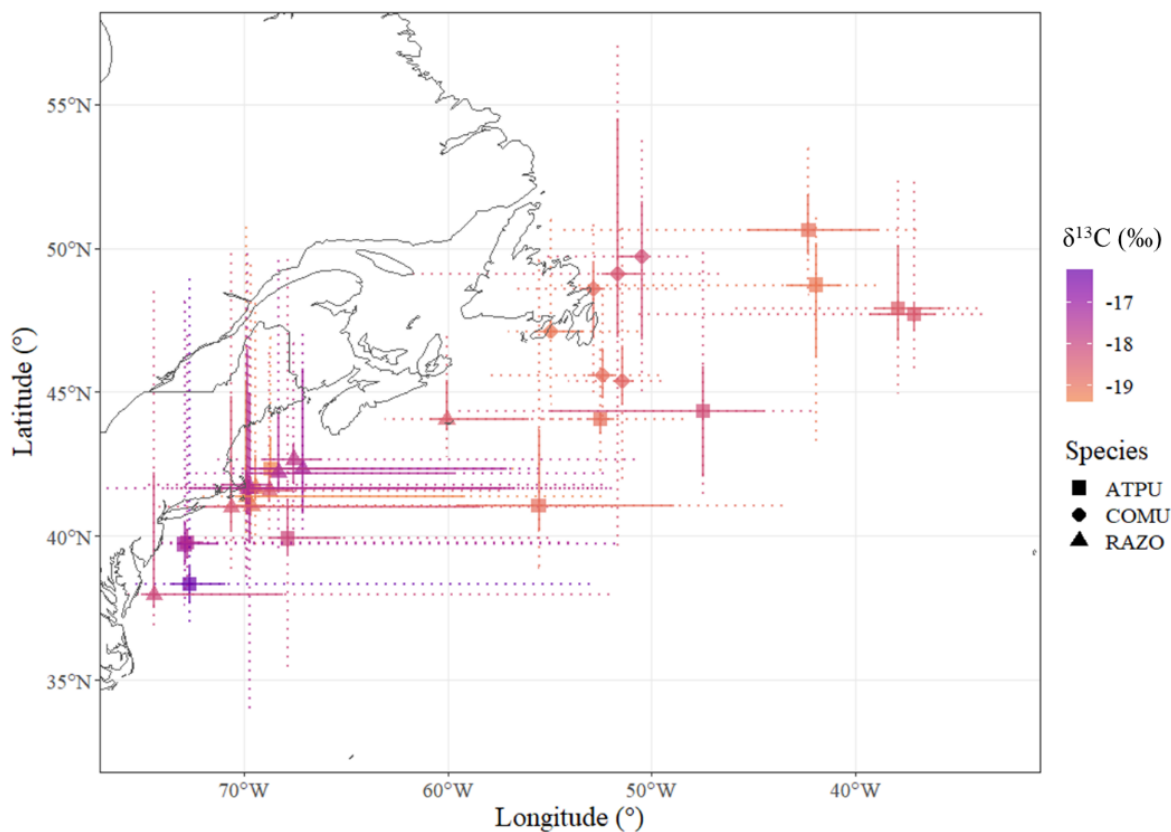| Months	Overlapping species	25 km grid UDOI	150 km grid UDOI
Aug–Sep	ATPU-COMU	0.16	0.12
	ATPU-RAZO	0.19	0.18
	COMU-RAZO	0.12	0.09
Oct–Nov	ATPU-COMU	0.08	0.08
	ATPU-RAZO	0.10	0.11
	COMU-RAZO	0.00	0.00
Dec–Jan	ATPU-COMU	0.10	0.04
	ATPU-RAZO	0.07	0.07
	COMU-RAZO	0.00	0.00
Feb–Mar	ATPU-COMU	0.02	0.02
	ATPU-RAZO	0.07	0.08
	COMU-RAZO	0.00	0.00
Apr–May	ATPU-COMU	0.01	0.01
	ATPU-RAZO	0.06	0.06
	COMU-RAZO	0.01	0.01

Fig. S1. Head feather δ^{13}C of individual geolocator-tagged Atlantic puffins (ATPU), razorbills (RAZO), and common murres (COMU) at their estimated geographic median locations during March – May, the time of year when head feathers are molted. Solid error bars represent the 25th-75th quantiles of latitude and longitude estimates, and dotted lines indicate the entire range of latitude and longitude estimates during this period.