frontiers

Supplementary Material

1. Supplementary Methods

1.1. Vertebrate community definition

We defined the vertebrate community at the species level with both standardized and non-standardized observations. We used annual records of vertebrates by field observations during the bird incubation period from late June to mid-July from 2010 to 2019. The observations were made from 500m linear transects (n= 145 to 295 per year), where all vertebrates were recorded within 150m of each side (Lamarre et al., 2017; Duchesne et al., 2021). We also used non-standardized daily incidental observations of vertebrates made by a single or a group of researchers from late May to late August each year from 2007 to 2019. Each species observed incidentally during field days was recorded. We apply the following criteria to each data set to exclude occasional visitors: i) species without confirmed breeding cases on the study site, ii) species observed only in a single year, and iii) species typically breeding and foraging in nearby marine or coastal habitats. After applying those criteria, we obtained 32 species with the standardized data and 35 with the daily incidental observations. We retained the largest number of species from these two lists **(Table S1)**.

1.2. Non-breeding range delimitation

1.2.1. Range maps

The non-breeding range of most migratory species (22 of 28) was derived from species range maps defined by either a collection of diverse data sources, models of species occurrence based on amateur bird watching observations, or a combination of both.

Birdlife range maps (Migratory species)

We used the non-breeding range maps defined by BirdLife International and Handbook of the Birds of the World (2019) **(hereafter Birdlife)**. The Birdlife range maps are based on a combination of individual localizations from scientific collections, field observations, published and unpublished literature, range maps and expert knowledge. All maps were reviewed between 2014 to 2017. Birdlife range maps include the intercontinental distribution of species in terrestrial, coastal and marine habitats. However, the precision and accuracy seem to vary between species, probably depending on the quality of the available data.

eBird range maps (Migratory species)

We used range maps defined by Fink et al. (2020a; **hereafter eBird**) based on models of species occurrence built with amateur birdwatching observations and 79 environmental predictors, where 76 were derived from 19 land cover variables (Fink et al., 2020b). Species range maps defined by eBird

have a high resolution (2.8 × 2.8 km) and are defined based on recent observations but are, for the moment, restricted to the Americas only. The eBird ranges do not extend to marine habitats since most observations are on land.

1.2.2. Tracking devices

Snowy owls

Snowy owls were captured at the study site and tracked for up to three consecutive years with ARGOS satellite transmitters in 2007 (n=9) and 2014 (n=3) (Therrien et al., 2012; Robillard et al., 2018). The non-breeding period was defined for each individual and year based on the daily distance traveled (Robillard et al., 2018). The non-breeding range of snowy owls was defined with a 95 % kernel density function of pooled non-breeding locations using the R package *adehabitatHR* (Calenge, 2006). The kernel was based on a bivariate normal kernel distribution with a fixed smoothing term, an automatic bandwidth selection with the ad hoc method, and the default software grid resolution.

Common-ringed plovers

Common-ringed plovers were captured at the study site and tracked from 2014 to 2016 (n= 14) with geolocators (Léandri-Breton et al., 2019). The non-breeding period was defined for each individual by considering the period where no apparent migration movement was observed for more than sixty days. The non-breeding range was defined with a 95 % kernel density function of pooled non-breeding locations using the R package *adehabitatHR* (Calenge, 2006). The kernel was based on a bivariate normal kernel distribution with a fixed smoothing term, bandwidth selection was done with a least-square cross-validation method (LSCV) because we did not observe convergence with the ad hoc method, and we used the default software grid resolution. We removed the marine part of the defined non-breeding range polygon since common-ringed plovers are associated to terrestrial and coastal habitats during the non-breeding period based on Billerman et al. (2021). The presence of a marine portion in the raw non-breeding range defined with geolocators could be explained by the uncertainty of the tracking devices, which located coastal individuals in the nearby marine environment.

Snow Geese

Snow geese were captured during migration at a staging site at Île-aux-Oies (St-Lawrence River, Québec, Canada) and equipped with GPS-GSM collars from 2019 to 2021 (Legagneux et al., unpublished data; Létourneux et al., 2021). We selected only locations from geese that have bred on Bylot (n= 12) and filtered to keep only locations during January and February to represent the non-breeding range. We defined the non-breeding period for snow geese as January and February, based on a visual inspection of the individual movement to identify the longest period where individuals are relatively stationary. The non-breeding range of snow goose was also defined with a 95 % kernel density function of pooled non-breeding locations using the R package *adehabitatHR* (Calenge, 2006). The kernel was based on a bivariate normal kernel distribution with a fixed smoothing term, an automatic bandwidth selection with the ad hoc method, and the default software grid resolution.

We removed the marine part of the defined non-breeding range polygon since snow geese are associated to terrestrial and coastal habitats during the non-breeding period based on Billerman et al. (2021). The presence of a marine portion in the raw non-breeding range defined with GPS could be explained by the uncertainty of the tracking devices, which located coastal individuals in the nearby marine environment. We compared the non-breeding range of snow geese defined with tracking devices to the non-breeding range defined with winter band recovery from individuals banded from Bylot Island (n= 7 156) and observed a highly similar range. The non-breeding of snow goose encompassed the boundaries of six ecoregions when defined with tracking devices and seven ecoregions when defined with banding data. The further analyses were performed with the tracking data.

Long-tailed jaegers

Long-tailed jaegers were captured in 2008 and from 2014 to 2019, equipped with geolocators or satellite transmitter devices, and tracked year-round (Seyer et al., 2021). Most individuals were tracked from Bylot Island (n= 50); however, two individuals were tracked from a site located around 400 km south of the study site (Seyer et al., 2021). The non-breeding range of long-tailed jaegers was also defined with a 95 % kernel density function of pooled non-breeding locations using the R package *adeadehabitatHR* (Calenge, 2006). The kernel was based on a bivariate normal kernel distribution and the least-square cross-validation method (LSCV) to select the smoothing parameters (Seyer et al., 2021).

American golden-plovers

American golden-plovers were captured at the study site from 2009 to 2015 and equipped with geolocators (Lamarre et al., 2021). Individuals were recaptured on Bylot 1 to 4 years after the first capture; we used the tracks of 19 individuals. The non-breeding locations were defined as the southernmost cluster of locations. The non-breeding range was defined with a 95 % kernel density estimation of pooled non-breeding locations using the *kde* function in the R package *ks* (Duong et al., 2007). We removed the marine part of the defined non-breeding range polygon since American golden-plovers are associated to terrestrial and coastal habitats during the non-breeding period based on Billerman et al. (2021). The presence of a marine portion in the raw non-breeding range defined with geolocators could be explained by the uncertainty of the tracking devices, which located coastal individuals in the nearby marine environment.

King eiders

King eiders were captured at East Bay in the Eastern Canadian subarctic around 1 000 km south of the study site (n= 6; Gilchrist et al., 2004). Subarctic and High-Arctic king eiders from the Canadian Eastern Arctic mixed on the same non-breeding grounds on the West coast of Greenland (Salomonsen, 1968). We defined the stationary non-breeding period for king eiders from November to March, based on a visual inspection of the individual movement to identify the longest period where individuals are relatively stationary. We filtered to keep only stationary non-breeding locations. The non-breeding range of king eiders was defined with a 95 % kernel density function of pooled non-breeding locations using the R package *adehabitatHR* (Calenge, 2006). The kernel was based on a bivariate normal kernel distribution with a fixed smoothing term, an automatic bandwidth selection with the ad hoc method, and the default software grid resolution. We removed the terrestrial

portion of the defined non-breeding range polygon since king eiders are associated to coastal and marine habitats during the non-breeding period based on Billerman et al. (2021). The presence of a terrestrial portion in the raw non-breeding range could be explained by the uncertainty of the tracking devices, which located coastal individuals in the nearby terrestrial environment.

1.2.3. Buffer zones (Partially migratory species)

The non-breeding range of the partially migratory arctic fox was delimited with a 500 km buffer around the study site based on the extent of the foraging trips documented by Lai et al. (2016). The non-breeding range of the partially migratory common raven was delimited with a 100 km buffer centered on the study site. We selected a 100 km radius around the study site which allow to encompass the nearest town and the nearby marine environment where ravens could scavenge on seals; based on winter foraging behavior documented by Temple (1974).

1.2.4. Selecting range data for each migratory species

We used the non-breeding ranges defined with tracking devices in priority if available. Otherwise, Birdlife range maps, eBird range maps, or the overlap between eBird and Birdlife range maps were used **(Table S1)**. Birdlife range maps were selected over eBird range maps for species associated with marine habitats during the non-breeding season (6 species). Birdlife range maps were also prioritized for migratory species associated with the East Atlantic Flyway connecting the Canadian Arctic with European and African regions since eBird range maps are restricted to the Americas. Ebird range maps were chosen over Birdlife when the eBird range boundaries of a species fell inside the Birdlife range because the resolution of eBird was higher (2.8 km × 2.8 km; 3 species). In other cases, a visual inspection of the correspondence between the Birdlife, eBird and the overlap between Birdlife and eBird non-breeding range maps with the non-breeding density defined by Fink et al., (2020b) was realized to select the most representative range data (11 species; **Figure S1.A**).

1.2.5. Refining non-breeding range with species flyways

The non-breeding ranges of species were refined with the specific flyways used by the population or subspecies at the study site. The subspecies of polytypic migratory species were identified using the subspecies breeding range (Billerman et al., 2021). Populations of monotypic species with distinct geographic populations were identified with the literature available: research articles, unpublished tracking programs and animal movement database (Wikelski et al., 2021; Seaturtle, 2021). It allowed us to identify a single or multiple flyways encompassing the entire non-breeding range of each subspecies or population present at the study site **(Table S2)**. We used the spatial extent of the major flyways of the world obtained from Wetlands International (2022). For each species, the area of the non-breeding range falling outside the boundaries of the identified flyway(s) was removed (**Figure S1.B**). It allowed us to retain only areas of the non-breeding range where individuals from the study site have a higher occurrence probability.

1.3. Association between species non-breeding range and biogeographic ecoregions

Biogeographic ecoregions of the world

We used worldwide classifications of terrestrial, marine and coastal ecoregions to determine the ecoregions where each migratory species is found during the non-breeding period. We used the well-known classifications of terrestrial ecoregions made by Olson et al. (2001) and marine ecoregions made by Spalding et al. (2007). An ecoregion represents a relatively homogeneous species assemblage at the regional scale (e.g., Bylot Island is located in the "High Arctic Tundra Ecoregion" and New York is located in the "Northeastern Coastal Forests Ecoregion"). The ecological relevance of terrestrial ecoregion boundaries has been shown for vertebrate and plant species assemblages (Smith et al., 2018). Ecoregion boundaries are caused by environmental conditions, topography and biogeographic history (Olson et al., 2001; Spalding et al., 2007). The absence of a worldwide classification of coastal ecoregions leads us to implement a classification consisting of narrow biogeographic regions along the coastline of the world. We refer to coastal regions as a region under the influence of the tide, so we defined a buffer of less than three km width on both sides of the coastline of the world. We delineated and named coastal ecoregions based on the adjacent marine ecoregions (Spalding et al., 2007). We removed the continental and coastal portions of the marine ecoregions since we defined a unique classification for coastal ecoregions. We decided to change the classification of mangroves from terrestrial to coastal ecoregion since tides influence them. Finally, large bodies of water were not assigned to specific ecoregions in the classification of terrestrial ecoregions (Olson et al., 2001), thus we assigned freshwater ecoregions to large inland bodies of water from the classification of freshwater ecoregions of the world (Abell et al., 2008).

1.4. Filtering selected ecoregions based on species' non-breeding habitats

We filtered the ecoregions associated with each species during the non-breeding period based on the main type(s) of non-breeding habitat (terrestrial, marine or coastal). It allowed us to avoid the inclusion of edges that would represent weak ecological interaction between a species and an ecoregion. Single or multiple habitat types (terrestrial, marine and coastal) were assigned to each species based on the typical non-breeding habitat described in Billerman et al. (2021; **Table S3**). Terrestrial habitats were defined as continental, including freshwater, but excluding coastal environments. Coastal habitats were defined as 3 km from both sides of the coastline to represent tidal environment and marine habitats were defined as the oceanic area located more than 3km from the coastline. We removed the ecoregions associated with unassigned habitat types for each species. Using habitat type(s) as an ecological filter prevents the consideration of ecologically irrelevant associations between species and ecoregions during the geoprocessing based on a minor spatial overlap.

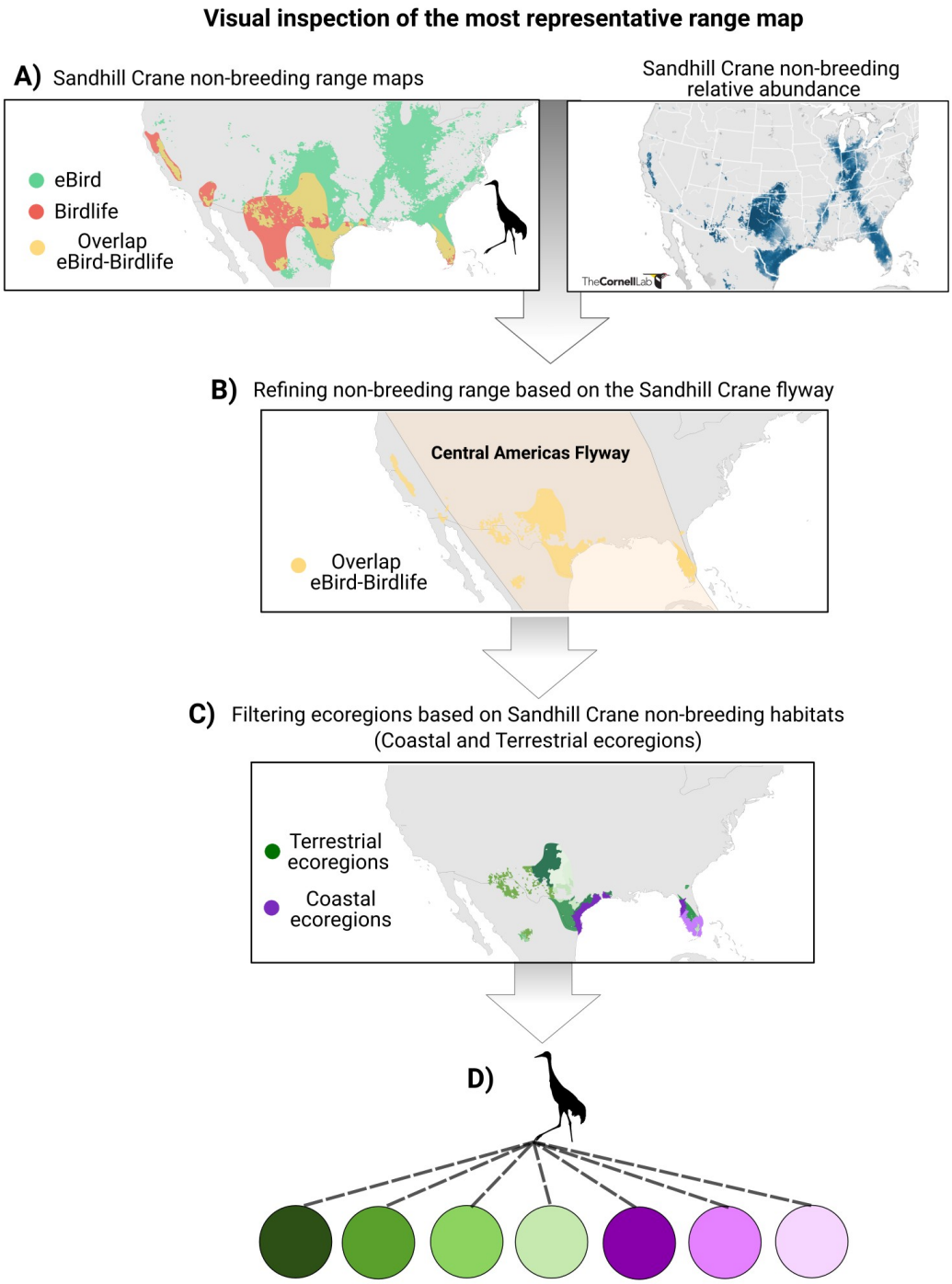

Figure S1. **(A)** Example of the visual inspection criteria to select the most representative non-breeding range data for sandhill crane. **(B)** Refinement of the selected non-breeding range map with the flyway used by sandhill crane from the study site population (i.e., Central Americas Flyway). **(C)** Refinement of the list of ecoregions associated with sandhill crane based on the non-breeding habitat type (i.e., terrestrial and coastal habitats).

1.5. Validation of the non-breeding range refinement with the flyways(s) and the non-breeding habitat type(s)

To validate our non-breeding ranges refinement and filtering methods, we performed a preliminary validation analysis based on the highly specific tracking programs available as reference (n=6). We compared the proportion of ecoregions filtered from general range maps using the non-breeding range defined with tracking data **(Figure S2)**.

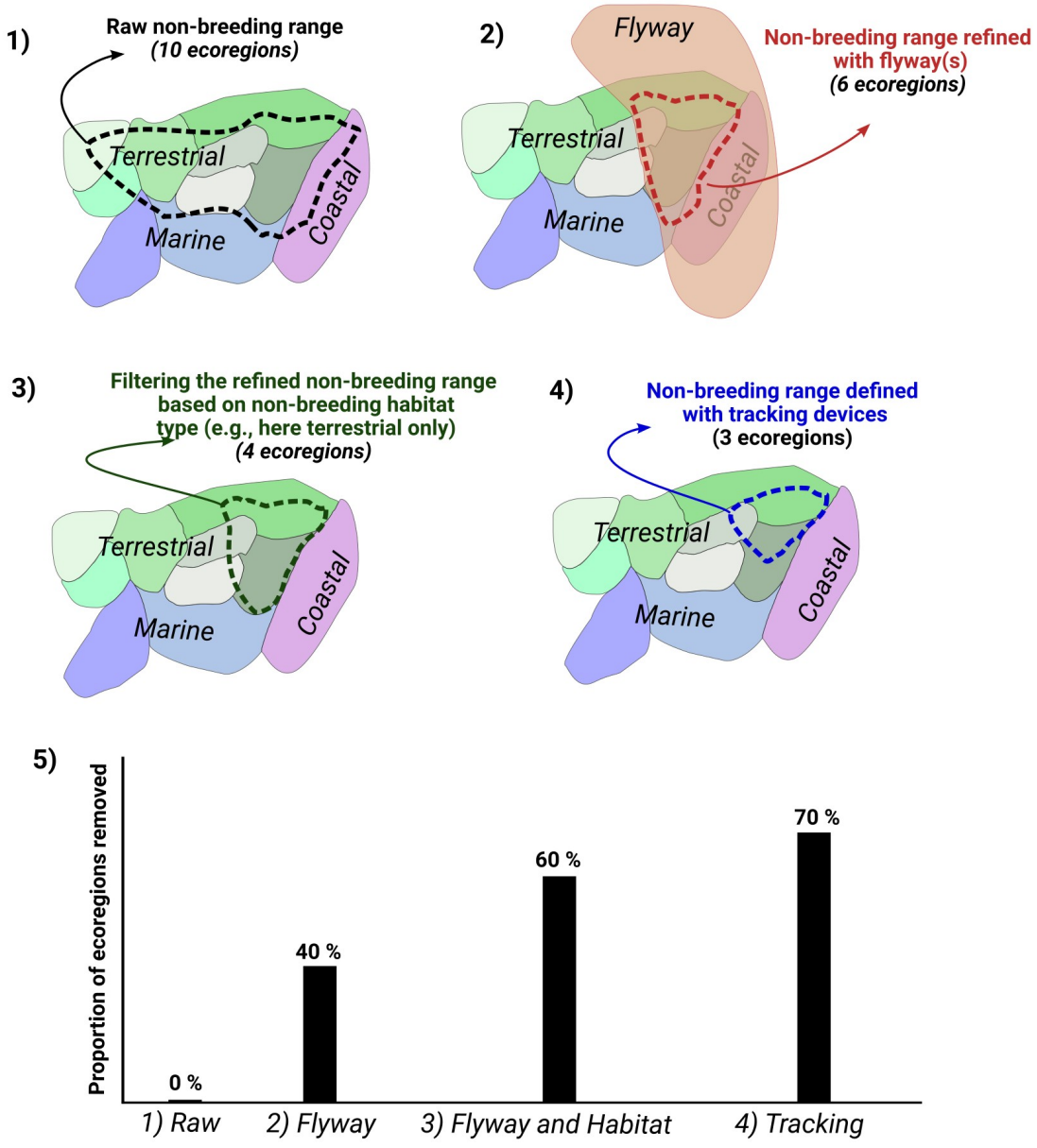

Figure S2. Fictive example of the refinement of a non-breeding range with flyway(s) and filtering with habitat type(s) to illustrate the method employed to calculate the proportion of ecoregions removed. **(1)** Number of ecoregions overlapping with the raw species non-breeding range maps. **(2)** Number of ecoregions associated with the non-breeding range map refined with the flyway(s) used

by the individuals from the study site. **(3)** Number of ecoregions associated with the non-breeding range map refined with the flyway(s) used by the individuals from the study site and their habitat type(s). **(4)** Number of ecoregions associated with the non-breeding range map defined with accurate and specific tracking data. **(5)** Comparison of the efficiency of each type of filter (Flyway(s), Habitat and Flyway(s) and Tracking data) measured by the proportion of removed ecoregions.

Despite the relatively low sample size of our reference data set (n=6), the validation analysis suggests that the use of flyway(s) and non-breeding habitat type(s) allow the removal of a considerable number of ecoregions **(Figure S3)**. The use of flyway(s) was more effective in refining Birdlife range maps than eBird range maps because it allows the removal of areas in the Old World which are not included in eBird range maps. The high proportion of ecoregions removed by using specific data (tracking) highlights the need to consider ecological filters to refine non-breeding ranges when focusing on a local or regional community. Note that the higher sample size with Birdlife range maps is explained by the presence of some species only outside of the Americas, thus for which eBird data are not available yet.

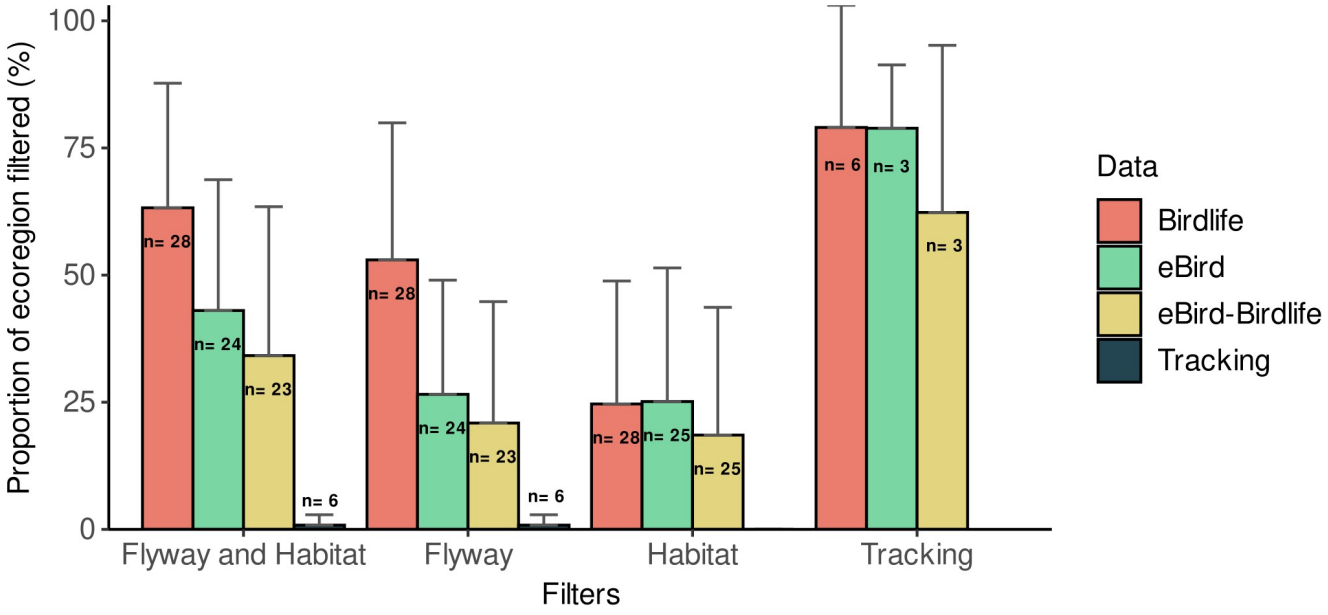

Figure S3. Mean proportion of ecoregion removed from the raw non-breeding range maps by the refinement with flyway(s) and the filtering with habitat type(s), the refinement with the flyway(s) only, the filtering with habitat type(s) only and the filtering with non-breeding ranges defined with tracking data. Error bars represent standard deviation.

Table S1. Species of Bylot Island tundra food web and the non-breeding range map selected for migratory and partially migratory species based on the selection criteria used to retain the most representative non-breeding range data available.

Functional group	Species	Non-breeding strategy	Range selected	Selection criteria
lemmings	collared lemming (*Dicrostonyx groenlandicus*)	Resident	-	-
lemmings	brown lemming (*Lemmus trimucronatus*)	Resident	-	-
hares	arctic hare (*Lepus arcticus*)	Resident	-	-
ptarmigans	rock ptarmigan (*Lagopus muta*)	Resident	-	-
geese and swans	snow goose (*Anser caerulescens*)	Migrant	Tracking	Legagneux et al., unpublished data
geese and swans	cackling goose (*Branta hutchinsii*)	Migrant	eBird-Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
geese and swans	tundra swan (*Cygnus columbianus*)	Migrant	Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
passerines	lapland longspur (*Calcarius lapponicus*)	Migrant	eBird-Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
passerines	horned lark (*Eremophila alpestris*)	Migrant	eBird	Visual inspection of the overlap with the Ebird relative abundance map
passerines	snow bunting (*Plectrophenax nivalis*)	Migrant	eBird-Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
passerines	American pipit (*Anthus rubescens*)	Migrant	eBird-Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
shorebirds	American golden-plover (*Pluvialis*	Migrant	Tracking	Lamarre, J. F., Gauthier, G., Lanctot, R. B., Saalfeld, S. T., Love, O. P., Reed, E., et al., (2021). Timing of

	dominica)			Breeding Site Availability Across the North American Arctic Partly Determines Spring Migration Schedule in a Long-Distance Neotropical Migrant. Front. Ecol. Evol. 9, 710007. https://doi.org/10.3389/fevo.2021.710007
shorebirds	black-bellied plover (*Pluvialis squatarola*)	Migrant	eBird	Ebird range falls inside the boundary of the Birdlife range
shorebirds	common-ringed plover (*Charadrius hiaticula*)	Migrant	Tracking	Léandri-Breton, D.-J., Lamarre, J.-F., and Bêty, J. (2019). Seasonal variation in migration strategies used to cross ecological barriers in a nearctic migrant wintering in Africa. J. Avian Biol. 50, e02101. https://doi.org/10.1111/jav.02101
shorebirds	ruddy turnstone (*Arenaria interpres*)	Migrant	Birdlife	Birdlife range encompass palearctic distribution
shorebirds	red phalarope (*Phalaropus fulicarius*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
shorebirds	red knot (*Calidris canutus*)	Migrant	Birdlife	Birdlife range encompass palearctic distribution
shorebirds	white-rumped sandpiper (*Calidris fuscicollis*)	Migrant	eBird	Visual inspection of the overlap with the Ebird relative abundance map
shorebirds	buff-breasted sandpiper (*Calidris subruficollis*)	Migrant	eBird	Visual inspection of the overlap with the Ebird relative abundance map
shorebirds	Baird's sandpiper (*Calidris bairdii*)	Migrant	eBird	Ebird range falls inside the boundary of the Birdlife range
shorebirds	pectoral sandpiper (*Calidris melanotos*)	Migrant	eBird	Ebird range falls inside the boundary of the Birdlife range
ducks and loons	king eider (*Somateria spectabilis*)	Migrant	Tracking	Gilchrist, G., Mosbech, A., and Sonne, C. (2004). Data available on movebank.org, study name "Common/King Eiders; East Bay

				Island, Nunavut; Gilchrist/Mosbech/Sonne 2001 and 2003", study ID 43747715).
ducks and loons	long-tailed duck (*Clangula hyemalis*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
ducks and loons	pacific loon (*Gavia pacifica*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
ducks and loons	red-throated loon (*Gavia stellata*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
ermines	ermine (*Mustela erminea*)	Resident	-	-
cranes	sandhill crane (*Antigone canadensis*)	Migrant	eBird-Birdlife	Visual inspection of the overlap with the Ebird relative abundance map
jaegers	long-tailed jaeger (*Stercorarius longicaudus*)	Migrant	Tracking	Seyer, Y., Gauthier, G., Bêty, J., Therrien, J.-F., and Lecomte, N. (2021). Seasonal variations in migration strategy of a long-distance Arctic-breeding seabird. Mar. Ecol. Prog. Ser. 677, 1-16. https://doi.org/10.3354/meps13905
jaegers	parasitic jaeger (*Stercorarius parasiticus*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
gulls	glaucous gull (*Larus hyperboreus*)	Migrant	Birdlife	Species found mostly in marine habitats during non-breeding
ravens	common raven (*Corvus corax*)	Partial migrant	100 km buffer	Approximate distance from the nearest landfill: Temple, S. A. (1974). Winter food habits of ravens on the Arctic Slope of Alaska. Arctic 27 41-46. https://doi.org/10.14430/arctic2851
raptors	peregrine falcon (*Falco peregrinus*)	Migrant	eBird	Visual inspection of the overlap with the Ebird relative abundance map
raptors	rough-legged hawk (*Buteo lagopus*)	Migrant	eBird	Visual inspection of the overlap with the Ebird relative abundance map
raptors	snowy owl (*Bubo scandiacus*)	Migrant	Tracking and eBird	Robillard, A., Gauthier, G., Therrien, J.-F., and Bêty, J. (2018). Wintering space use and site fidelity in a nomadic species, the snowy owl. J. Avian Biol. 49, jav–01707.

				https://doi.org/10.1111/jav.01707
foxes	arctic fox (*Vulpes lagopus*)	Partial migrant	500 km buffer	Lai, S., Bêty, J., and Berteaux, D. (2017). Movement tactics of a mobile predator in a meta-ecosystem with fluctuating resources: the arctic fox in the High Arctic. Oikos 126, 937-947. https://doi.org/10.1111/oik.03948

Table S2. Seasonal migratory species of Bylot Island with their assigned global avian flyway(s) (geographical grouping of annual ranges of avian migratory species). The assignment of flyway(s) was based on the available literature.

Species	Subspecies	Flyway	Justification	Reference
American golden-plover	NA	Central Americas Atlantic Americas	Individuals tracked from study site (n=19)	Lamarre, J. F., Gauthier, G., Lanctot, R. B., Saalfeld, S. T., Love, O. P., Reed, E., et al., (2021). Timing of Breeding Site Availability Across the North American Arctic Partly Determines Spring Migration Schedule in a Long-Distance Neotropical Migrant. Front. Ecol. Evol. 9, 710007. https://doi.org/10.3389/fevo.2021.710007
American pipit	*A. r. rubescens*	Central Americas Atlantic Americas	Subspecies non-breeding range: "se. United States and ne. Mexico, with records south to Guatemala"	Hendricks, P., and Verbeek, N. A. (2020). "American Pipit (Anthus rubescens), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.amepip.01 [Accessed July 2020]
Baird's sandpiper	NA	Central Americas Pacific Americas	Annual range map	BirdLife International (2020). "Species factsheet: Calidris bairdii", in BirdLife Data Zone. http://datazone.birdlife.org [Accessed July 2020]
black-bellied plover	NA	Atlantic Americas	Indivuals tracked from the Eastern Arctic	Canadian Wildlife Service (2020). "Black-bellied Plover Tracking (Canada)", in Seaturtle.org Satellite Tracking Data Repository. http://www.seaturtle.org/tracking/?project_id=1020 [Accessed July 2020]
buff-breasted sandpiper	NA	Central Americas	Annual range map	Lanctot, R. B., Aldabe, J., Almeida, J. B., Blanco, D., Jorgensen, J., Rocca, P., et al. (2010). Conservation plan for the Buff-breasted Sandpiper (Tryngites subruficollis) Version 1.1. Manomet Center for

				Conservation Science, Manomet, Massachusetts, and U.S. Fish & Wildlife Service, Anchorage, Alaska.
cackling goose	*B. h. hutchinsii*	Central Americas	Subspecies non-breeding range: "south-central United States (chiefly Oklahoma and Texas) and south and northeastern Mexico (chiefly Tamaulipas)"	Mowbray, T. B., Ely, C. R., Sedinger J. S., and Trost, R. E. (2020). "Cackling Goose (Branta hutchinsii), version 1.0", in Birds of the World, ed. Rodewald, P. G., and Keeney, B. G. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.cacgoo1.01 [Accessed July 2020]
common-ringed plover	NA	East Atlantic	Individuals tracked from study site (n=14)	Léandri-Breton, D.-J., Lamarre, J.-F., and Bêty, J. (2019). Seasonal variation in migration strategies used to cross ecological barriers in a nearctic migrant wintering in Africa. J. Avian Biol. 50, e02101. https://doi.org/10.1111/jav.02101
glaucous gull	*L. h. leuceretes*	Atlantic Americas	"winters south to the ne. United States, with some reaching south to Florida, east to Bermuda, and west to the Great Plains, e. New Mexico, and s. Texas"	Weiser, E. and Gilchrist, H. G. (2020). "Glaucous Gull (Larus hyperboreus), version 1.0" in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.glagul.01 [Accessed July 2020]
horned lark	*E. a. hoyti*	Central Americas Atlantic Americas	"Subspecies non-breeding range: "Nevada to Michigan"	Beason, R. C. (2020). "Horned Lark (Eremophila alpestris), version 1.0" in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.horlar.01 [Accessed July 2020]
king eider	NA	East Atlantic	Individuals tracked from a subarctic Eastern Canadian arctic breeding site (n=6)	Gilchrist, G., Mosbech, A., and Sonne, C. (2004). Data available on movebank.org, study name “Common/King Eiders; East Bay Island, Nunavut; Gilchrist/Mosbech/Sonne 2001 and 2003”, study ID 43747715). Mosbech, A., and Boertmann, D.

				(1999). Distribution, relative abundance and reaction to aerial surveys of post-breeding king eiders (Somateria spectabilis) in western Greenland. Arctic 52, 188-203. https://doi.org/10.14430/arctic922
lapland longspur	*C. l. subcalcaratus*	Central Americas Atlantic Americas	Subspecies non-breeding range: "e. North America west to Nebraska, Colorado, Oklahoma, and Texas"	Hussell, D. J. T., and Montgomerie, R. (2020). "Lapland Longspur (Calcarius lapponicus), version 1.0", in Birds of the World, ed. Billerman S. M., Keeney, B. K., Rodewald, P. G., and Schulenberg, T. S. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.laplon.01 [Accessed July 2020]
long-tailed duck	NA	Atlantic Americas	Tracks of individuals from non-breeding sites	Sea Duck Joint Venture (2015). Atlantic and Great Lakes sea duck migration study: progress report June 2015.
long-tailed jaeger	*S. l. pallescens*	Atlantic Americas East Atlantic	Individuals tracked from study site (n=50)	Seyer, Y., Gauthier, G., Bêty, J., Therrien, J.-F., and Lecomte, N. (2021). Seasonal variations in migration strategy of a long-distance Arctic-breeding seabird. Mar. Ecol. Prog. Ser. 677, 1-16. https://doi.org/10.3354/meps13905
pacific loon	NA	Pacific Americas	Species non-breeding range	Russell, R. W. (2020). "Pacific Loon (Gavia pacifica), version 1.0" in Birds of the World, ed. Rodewald, P. G. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.pacloo.01 [Accessed July 2020]
parasitic jaeger	NA	Atlantic Americas East Atlantic	"Widely distributed off both coasts of South America...Common near coasts of s. Africa from late Oct to early May, especially around the Benguela Current"	McCarty, J. P., L. L. Wolfenbarger, C. D. Laredo, P. Pyle, and R. B. Lanctot (2020). Buff-breasted Sandpiper (Calidris subruficollis), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.bubs

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pectoral sandpiper	NA	Central Americas Atlantic Americas Pacific Americas	Annual range map	BirdLife International (2020). "Species factsheet: Calidris melanotos", in BirdLife Data Zone. http://www.birdlife.org [Accessed July 2020]
peregrine falcon	*F. p. tundrius*	Central Americas Atlantic Americas Pacific Americas	Individuals tracked from western Greenland	Burnham, K. K., Burnham, W.A., Newton, I., Johnson, J. A., and Gosler, A.G. (2012). The history and range expansion of peregrine falcons in the Thule Area, Northwest Greenland. Monographs on Greenland Bioscience. Museum Tusculanum Press
red knot	*C. c. islandica* *C. c. rufa*	Atlantic Americas East Atlantic	Study site is located in an overlap zone between the Atlantic Americas population and the East Atlantic population	Environment and Climate Change Canada (2017). Recovery Strategy and Management Plan for the Red Knot (Calidris canutus) in Canada. Ottawa.
red phalarope	NA	East Atlantic	"Most birds nesting in e. Canadian Arctic thought to winter off w. and sw. Africa (Brown 1986)"	Tracy, D. M., Schamel, D., and Dale, J. (2020). "Red Phalarope (Phalaropus fulicarius), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.redpha1.01 [Accessed July 2020]
red-throated loon	NA	Atlantic Americas	Individuals tracked from non-breeding sites (n=31)	Spiegel, C.S., Berlin, A. M., Gilbert, A. T., Gray, C. O., Montevecchi, W.A., Stenhouse, I. J., et al. (2017). Determining Fine- scale Use and Movement Patterns of Diving Bird Species in Federal Waters of the Mid-Atlantic United States Using Satellite Telemetry. U.S. Department of the Interior, Bureau of Ocean Energy Management . OCS Study BOEM 2017-069.
rough-legged hawk	*B. l. sanctijohannis*	Central Americas Atlantic Americas	Individuals tracked from study site (n=2) and other arctic breeding sites	Paprocki, N. (n.d.). Year-round GPS movements of 77 Rough-legged Hawks .Idaho Cooperative Fish and Wildlife

				Research Unit. https://www.usgs.gov/media/images/year-round-gps-movements-77-rough-legged-hawks [Accessed July 2020]
ruddy turnstone	*A. i. morinella* *A. i. interpres*	Atlantic Americas East Atlantic	*A. i. morinella:* "Canadian arctic populations mainly migrate to and winter in Old World" *A. i. interpres:* "Winters mainly from s. U.S. along Atlantic and Gulf coasts south around Caribbean Sea, West Indies, and along both coasts of South America"	Nettleship, D. N. (2020). "Ruddy Turnstone (Arenaria interpres), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.rudtur.01 [Accessed July 2020]
sandhill crane	*A. c. canadensis*	Central Americas	Individuals tracked from non-breeding sites	Krapu, G. L., Brandt, D. A., Jones, K. L., and Johnson, D. H. (2011). Geographic distribution of the mid-continent population of sandhill cranes and related management applications. Wildl. Monogr. 175, 1-38. https://doi.org/10.1002/wmon.1
snow bunting	*P. n. nivalis*	Central Americas Atlantic Americas	Low Canadian Arctic populations are associated to the Central Americas Flyway and the populations from western Greenland are associated to the Altantic Americas Flyway	Macdonald, C. A., Fraser, K. C., Gilchrist, H. G., Kyser, T. K., Fox, J. W., and Love, O. P. (2012). Strong migratory connectivity in a declining Arctic passerine. Anim. Migr. 1, 23-30. https://doi.org/10.2478/ami-2012-0003
snow goose	*A. c. atlanticus*	Atlantic Americas	Individuals tracked from study site (n=12)	Legagneux et al., unpublished data
snowy owl	NA	Central Americas Atlantic Americas	Individuals tracked from study site (n=12)	Robillard, A., Gauthier, G., Therrien, J.-F., and Bêty, J. (2018). Wintering space use and site fidelity in a nomadic species, the snowy owl. J. Avian Biol. 49, jav–01707.

				https://doi.org/10.1111/jav.01707
tundra swan	*C. c. columbianus*	Atlantic Americas	Individuals banded and encountered across North America	Ely, C. R., Sladen, W. J., Wilson, H. M., Savage, S. E., Sowl, K. M., Henry, B., et al. (2014). Delineation of Tundra Swan Cygnus c. columbianus populations in North America: geographic boundaries and interchange. Wildfowl 64, 132-147.
white-rumped sandpiper	NA	Central Americas Atlantic Americas	Annual range map	BirdLife International (2020). "Species factsheet: Calidris fuscicollis", in BirdLife Data Zone. http://www.birdlife.org [Accessed July 2020]

Table S3. Seasonal and partially migratory species of Bylot Island with their assigned primary non-breeding habitat type(s). The assignment of the non-breeding habitat type(s) was based on the available literature.

Species	Habitat type	Justification	Reference
arctic fox	Terrestrial Marine Coastal	Loop migration of several hundreads of kilometres in adjacent habitats	Lai, S., Bêty, J., and Berteaux, D. (2017). Movement tactics of a mobile predator in a meta-ecosystem with fluctuating resources: the arctic fox in the High Arctic. Oikos 126, 937-947. https://doi.org/10.1111/oik.03948
rock ptarmigan	Terrestrial	"Shrubby areas and margins of lakes and rivers"	Montgomerie, R., and Holder, K. (2020). "Rock Ptarmigan (Lagopus muta), version 1.0", in Birds of the World, ed. Billerman, S. M., Keeney, B. K., Rodewald, P. G., and Schulenberg, T. S. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.rocpta1.01
cackling goose	Terrestrial Coastal	"Coastal areas, mudflats, shallow tidal waters, salt-water marshes, wet grasslands, freshwater marshes, lakes, reservoirs, rivers and agricultural fields"	Mowbray, T. B., Ely, C. R., Sedinger, J. S., and Trost, R. E. (2020). "Cackling Goose (Branta hutchinsii), version 1.0", in Birds of the World, ed. Rodewald, P G., and Keeney, B. K. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.cacgoo1.01
snow goose	Terrestrial Coastal	"Coastal areas, estuarine marshes, inlets, bays, shallow tidal waters, coastal freshwater, brackish marshes, wet grasslands, freshwater marshes, coastal prairies and cultivated fields"	Mowbray, T. B., Cooke, F., and Ganter, B. (2020). "Snow Goose (Anser caerulescens), version 1.0", in Birds of the World, ed. Rodewald, P. G. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.snogoo.01
tundra swan	Terrestrial Coastal	"Shallow estuarine tidal areas, freshwater lakes, ponds, rivers, agricultural fields and flooded pastures"	Limpert, R. J., Earnst, S. L., Carboneras, C., and Kirwan, G. M. (2020). "Tundra Swan (Cygnus columbianus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.tunswa.01
king eider	Marine Coastal	"Southern edge of sea ice, polynyas in sea ice, coastal areas, shallow open waters, offshore waters"	Gerber, B. D., Dwyer, J. F., Nesbitt, S. A., Drewien, R. C., Littlefield, R. C., Tacha, T. C., and Vohs, P. A. (2020). "Sandhill Crane (Antigone canadensis), version 1.0", in Birds of the World, ed. Poole, A. F. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.sancra.01

long-tailed duck	Terrestrial Marine Coastal	"Coastal marine waters, large freshwater lakes, with extensive sea ice, will use recurring polynyas and floe edges"	Robertson, G. J., and Savard, J.-P. L. (2020). "Long-tailed Duck (Clangula hyemalis), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.lotduc.01
pacific loon	Marine	"Coastal water; nearshore open ocean, bays and estuaries"	Russell, R. W. (2020). "Pacific Loon (Gavia pacifica), version 1.0", in Birds of the World, ed. Rodewald, P G. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.pacloo.01
red-throated loon	Terrestrial Marine Coastal	"Coastal upwellig, coastal estuaries, occasionally on large freshwater lakes and slow-moving rivers"	Rizzolo, D. J., Gray, C. E., Schmutz, J. A., Barr, J. F., Eberl, C., and McIntyre, J. W. (2020). "Red-throated Loon (Gavia stellata), version 2.0", in Birds of the World, ed. Rodewald, P. G., and Keeney, B. K. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.retloo.02
snowy owl	Terrestrial Marine Coastal	"Snow-covered tundra, open water within the ice pack, rangelands, farmlands, coast lines, marshes, large forest clearings and cities and towns"	Holt, D. W., Larson, M. D., Smith, N., Evans, D. L., and Parmelee, D. F. (2020). "Snowy Owl (Bubo scandiacus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.snoowl1.01
rough-legged hawk	Terrestrial Coastal	"Prairies, shrub-steppes, semideserts, open fields, marshlands, bogs, dunes and coastal areas"	Bechard, M. J., Swem, T. R., Orta, J., Boesman, P. F. D., Garcia, E. F. J., and Marks, J. S. (2020). "Rough-legged Hawk (Buteo lagopus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.rolhaw.01
peregrine falcon	Terrestrial Coastal	"Extreme habitat variability: Open-relief, mangrove, coastal or wetland areas, major river valleys, lake shores, pasture lands and urban areas"	White, C. M., Clum, N. J., Cade, T. J., and Hunt, W. G. (2020). "Peregrine Falcon (Falco peregrinus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.perfal.01
parasitic jaeger	Marine Coastal	"Near shore to beyond the edge of the continental shelf and in estuaries"	Wiley, R. H., and Lee, D. S. (2020). "Parasitic Jaeger (Stercorarius parasiticus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.parjae.01
long-tailed jaeger	Marine	"Pelagic"	Wiley, R. H., and Lee, D. S. (2020). "Long-tailed Jaeger (Stercorarius longicaudus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.lotjae.01

glaucous gull	Terrestrial Marine Coastal	"Maritime coasts, freshwater lakes, agricultural fields, urban areas, garbage dumps, polynyas and open water"	Weiser, E., and Gilchrist, H. G. (2020). "Glaucous Gull (Larus hyperboreus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.glagul.01
common raven	Terrestrial Marine Coastal	"Extreme habitat generalist: forested and open coastal, steppe, mountain, desert, tundra, Arctic ice floes, mountains and cliff"	Boarman, W. I., and Heinrich, B. (2020). "Common Raven (Corvus corax), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.comrav.01
sandhill crane	Terrestrial Coastal	"Shallow open water marshes, estuarine intertidal areas, wetland areas, croplands and pastures"	Gerber, B. D., Dwyer, J. F., Nesbitt, S. A., Drewien, R. C., Littlefield, C. D., Tacha, T. C., and Vohs, P. A. (2020). "Sandhill Crane (Antigone canadensis), version 1.0", in Birds of the World, ed. Poole, A. F. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.sancra.01
American pipit	Terrestrial Coastal	"Coastal beaches and marshes, stubble fields, recently-plowed fields, mud flats and river courses"	Hendricks, P., and Verbeek, N. A. (2020). "American Pipit (Anthus rubescens), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.amepip.01
horned lark	Terrestrial Coastal	"Open barren country, shortgrass prairies, deserts, brushy flats, alpine habitats, shrubsteppes, sandy beaches, sand dunes, steppes, agricultural areas, areas grazed by livestock"	Beason, R. C. (2020). "Horned Lark (Eremophila alpestris), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.horlar.01
lapland longspur	Terrestrial	"Prairies, open weedy and grassy fields, grain stubbles, shores"	Hussell, D. J. T., and Montgomerie, R. (2020). "Lapland Longspur (Calcarius lapponicus), version 1.0", in Birds of the World, ed. Billerman, S. M., Keeney, B. K., Rodewald, P. G., and Schulenberg, T. S. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.laplon.01
snow bunting	Terrestrial Coastal	"Open weedy and grassy fields, grain stubbles, shores of lakes and rivers, farmyards, shingle beaches, salt marshes, sand dunes, tidelines, coastal lowlands"	Montgomerie, R., and Lyon, B. (2020). "Snow Bunting (Plectrophenax nivalis), version 1.0", in Birds of the World, ed. Billerman, S. M., Keeney, B. K., Rodewald, P. G., and Schulenberg, T. S. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.snobun.01
American golden-	Terrestrial Coastal	"Grasslands, coastal wetlands and tidal areas"	Johnson, O. W., Connors, P. G., and Pyle, P. (2021). "American Golden-Plover (Pluvialis

plover			dominica), version 1.1", in Birds of the World, ed. Rodewald, P. G., Keeney, B. K., and Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.amgplo.01.1
black-bellied plover	Coastal	"Coastal beaches and estuaries, flooded pastures and agricultural land near sea and bays, salt marshes, mangrove"	Poole, A. F., Pyle, P., Patten, M. A., and Paulson, D. R. (2020). "Black-bellied Plover (Pluvialis squatarola), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.bkbplo.01
common-ringed plover	Coastal Terrestrial	"Beaches, sandbanks, mudflats, estuaries, rivers, lakes, lagoons, saltmarshes, grassland, flooded fields and artificial habitats (gravel pits, reservoirs, farmland and playing fields)"	Wiersma, P., Kirwan, G. M., and Boesman, P. F. D. (2020). "Common Ringed Plover (Charadrius hiaticula), version 1.0", in Birds of the World, ed. del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A., and de Juana, E. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.corplo.01
ruddy turnstone	Coastal	"Almost exclusively coastal, shorelines, mudflats, sandflats and delta"	Nettleship, D. N. (2020). "Ruddy Turnstone (Arenaria interpres), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.rudtur.01
red phalarope	Marine	"Pelagic"	Tracy, D. M., Schamel, D., and Dale, J. (2020). "Red Phalarope (Phalaropus fulicarius), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.redpha1.01
red knot	Coastal	"Sandy beaches, peat banks, salt marshes, brackish lagoons, tidal mudflats, mangroves, sandflats"	Baker, A., Gonzalez, P., Morrison, R. I. G., and Harrington, B. A. (2020). "Red Knot (Calidris canutus), version 1.0", in Birds of the World, ed. Billerman, S. M. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.redkno.01
white-rumped sandpiper	Terrestrial Coastal	"Beaches, river banks, open fields, marshes, intertidal areas, saltmarsh/slough, stream and canal, pond/lagoon edge, flooded field"	Parmelee, D. F. (2020). "White-rumped Sandpiper (Calidris fuscicollis), version 1.0", in Birds of the World, Poole, A. F., Stettenheim, P. R., and Gill, F. B. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whrsan.01
buff-breasted sandpiper	Terrestrial Coastal	"Grasslands in the coastal portions of the Río de La Plata Grasslands, the eastern portion of the Flooding Pampa of Argentina, and	McCarty, J. P., Wolfenbarger, L. L., Laredo, C. D., Pyle, P., and Lanctot, R. B. (2020). "Buff-breasted Sandpiper (Calidris subruficollis), version 1.0", in Birds of the World, ed. Rodewald, P. G. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.bubsan.01

		areas adjacent to lagoon complexes"	
Baird's sandpiper	Terrestrial	"Habitats about 2,550-4,500 m elevation, dry areas with short vegetation, strongly grazed shore meadows with muddy, partly dry ponds, short-grass plains and slopes"	Moskoff, W., and Montgomerie, R. (2020). "Baird's Sandpiper (Calidris bairdii), version 1.0", in Birds of the World, ed. Poole, A. F., and Gill, F. B. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.baisan.01
pectoral sandpiper	Terrestrial	"Grasslands, marshy areas and wetlands, rarely tidal"	Farmer, A., Holmes, R. T., and Pitelka, F. A. (2020). "Pectoral Sandpiper (Calidris melanotos), version 1.0", in Birds of the World, ed. Billerman, S. Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.pecsan.012.

2. Network analysis

2.1. Modularity analysis

The modularity analysis was performed with the package *infomapecology* based on network flow (Farage et al., 2021), representing the flow of migratory individuals between the focal community and non-breeding regions. The *infomap* algorithm is based on an iterative process of random walks (paths from node to node) to optimize the partition of nodes into groups (modules) with the minimum amount of information possible (Farage et al., 2021). A partition represents a specific organization of nodes into sub-groups (modules). At each iteration, the nodes are partitioned into modules, then the algorithm goes from node to node and applies an information cost and an additional cost for changing modules. Afterward, it calculates an index of the quality of the partition based on an objective function. In the next iteration, the algorithm proposes a slightly different partition and repeats the same walk, and so on, until reaching the optimal partition (i.e., the minimum index value).

Supplementary Results

Figure S4. Degree distributions (i.e., number of links) of the nodes representing species in the Bylot Island community **(A)** and the nodes representing ecoregions used as non-breeding grounds by the migratory and partially migratory species from Bylot Island **(B)**.

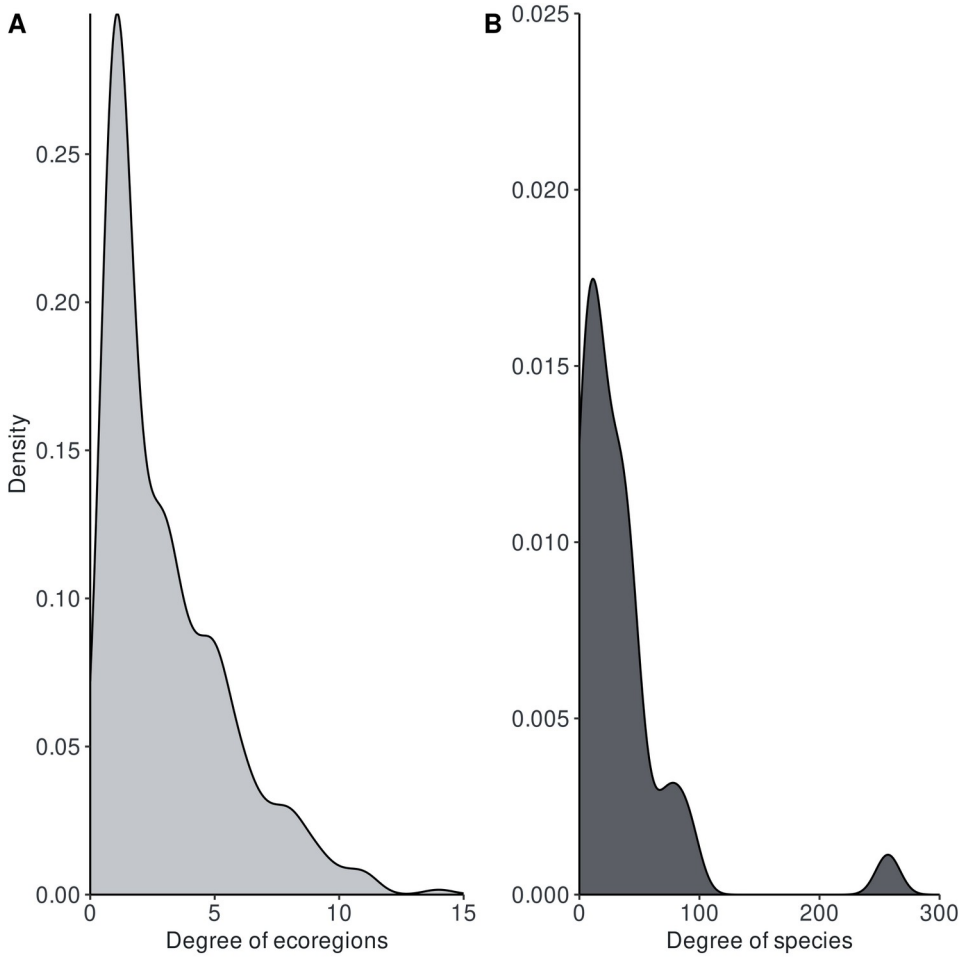

Table S4. List of the 393 ecoregions used as non-breeding grounds by the migratory and partially migratory species from Bylot Island and their assigned module in the community migration network determined by the *infomap* algorithm.

Ecoregions	Type	Module
Coastal Baffin Bay - Davis Strait	coastal	1
Coastal High Arctic Archipelago	coastal	1
Coastal Lancaster Sound	coastal	1
Baffin Bay - Davis Strait	marine	1
High Arctic Archipelago	marine	1
Lancaster Sound	marine	1
Baffin coastal tundra	terrestrial	1
Davis Highlands tundra	terrestrial	1
High Arctic tundra	terrestrial	1
Rock and Ice	terrestrial	1
Coastal Carolinian	coastal	2
Coastal Gulf of Alaska	coastal	2
Coastal Gulf of Maine/Bay of Fundy	coastal	2
Coastal Gulf of St. Lawrence - Eastern Scotian Shelf	coastal	2
Coastal Hudson Complex	coastal	2
Coastal Northern Grand Banks - Southern Labrador	coastal	2
Coastal Oregon, Washington, Vancouver Coast and Shelf	coastal	2
Coastal Puget Trough/Georgia Basin	coastal	2
Coastal Scotian Shelf	coastal	2
Coastal Southern Grand Banks - South Newfoundland	coastal	2
Coastal Southern Gulf of Mexico	coastal	2
Coastal Virginian	coastal	2
Mesoamerican Gulf-Caribbean mangroves	coastal	2
Bahamian	marine	2
Carolinian	marine	2
Floridian	marine	2
Gulf of Maine/Bay of Fundy	marine	2
Gulf of St. Lawrence - Eastern Scotian Shelf	marine	2
Hudson Complex	marine	2
North Greenland	marine	2
Northern Grand Banks - Southern Labrador	marine	2
Scotian Shelf	marine	2
Southern Grand Banks - South Newfoundland	marine	2
Virginian	marine	2
Alaska-St. Elias Range tundra	terrestrial	2
Alberta Mountain forests	terrestrial	2

Alberta-British Columbia foothills forests	terrestrial	2
Allegheny Highlands forests	terrestrial	2
Appalachian mixed mesophytic forests	terrestrial	2
Appalachian-Blue Ridge forests	terrestrial	2
Arizona Mountains forests	terrestrial	2
Atlantic coastal pine barrens	terrestrial	2
Bajío dry forests	terrestrial	2
Balsas dry forests	terrestrial	2
Blue Mountains forests	terrestrial	2
British Columbia mainland coastal forests	terrestrial	2
Canadian Aspen forests and parklands	terrestrial	2
Cascade Mountains leeward forests	terrestrial	2
Central and Southern Cascades forests	terrestrial	2
Central and Southern mixed grasslands	terrestrial	2
Central British Columbia Mountain forests	terrestrial	2
Central Canadian Shield forests	terrestrial	2
Central forest-grasslands transition	terrestrial	2
Central Mexican matorral	terrestrial	2
Central Pacific coastal forests	terrestrial	2
Central tall grasslands	terrestrial	2
Central U.S. hardwood forests	terrestrial	2
Chihuahuan desert	terrestrial	2
Colorado Plateau shrublands	terrestrial	2
Colorado Rockies forests	terrestrial	2
East Central Texas forests	terrestrial	2
Eastern Canadian forests	terrestrial	2
Eastern Canadian Shield taiga	terrestrial	2
Eastern Cascades forests	terrestrial	2
Eastern forest-boreal transition	terrestrial	2
Eastern Great Lakes lowland forests	terrestrial	2
Edwards Plateau savanna	terrestrial	2
English - Winnipeg Lakes	terrestrial	2
Everglades	terrestrial	2
Flint Hills tall grasslands	terrestrial	2
Florida sand pine scrub	terrestrial	2
Fraser Plateau and Basin complex	terrestrial	2
Great Basin montane forests	terrestrial	2
Great Basin shrub steppe	terrestrial	2
Gulf of St. Lawrence lowland forests	terrestrial	2
Lake	terrestrial	2
Laurentian Great Lakes	terrestrial	2
Low Arctic tundra	terrestrial	2
Meseta Central matorral	terrestrial	2

Mid-Continental Canadian forests	terrestrial	2
Middle Arctic tundra	terrestrial	2
Middle Atlantic coastal forests	terrestrial	2
Midwestern Canadian Shield forests	terrestrial	2
Mississippi lowland forests	terrestrial	2
Mojave desert	terrestrial	2
Montana Valley and Foothill grasslands	terrestrial	2
Muskwa-Slave Lake forests	terrestrial	2
Nebraska Sand Hills mixed grasslands	terrestrial	2
New England-Acadian forests	terrestrial	2
Newfoundland Highland forests	terrestrial	2
North Central Rockies forests	terrestrial	2
Northeastern coastal forests	terrestrial	2
Northern Canadian Shield taiga	terrestrial	2
Northern Cordillera forests	terrestrial	2
Northern mixed grasslands	terrestrial	2
Northern Pacific coastal forests	terrestrial	2
Northern short grasslands	terrestrial	2
Northern tall grasslands	terrestrial	2
Northern transitional alpine forests	terrestrial	2
Okanagan dry forests	terrestrial	2
Ozark Mountain forests	terrestrial	2
Pacific Coastal Mountain icefields and tundra	terrestrial	2
Palouse grasslands	terrestrial	2
Piney Woods forests	terrestrial	2
Puget lowland forests	terrestrial	2
Sierra Madre de Oaxaca pine-oak forests	terrestrial	2
Sierra Madre del Sur pine-oak forests	terrestrial	2
Sierra Madre Occidental pine-oak forests	terrestrial	2
Sierra Madre Oriental pine-oak forests	terrestrial	2
Snake-Columbia shrub steppe	terrestrial	2
Sonoran desert	terrestrial	2
Sonoran-Sinaloan transition subtropical dry forest	terrestrial	2
South Avalon-Burin oceanic barrens	terrestrial	2
South Central Rockies forests	terrestrial	2
South Florida rocklands	terrestrial	2
Southeastern conifer forests	terrestrial	2
Southeastern mixed forests	terrestrial	2
Southern Great Lakes forests	terrestrial	2
Southern Hudson Bay	terrestrial	2
Southern Hudson Bay taiga	terrestrial	2
St.Lawrence	terrestrial	2
Tamaulipan matorral	terrestrial	2

Tamaulipan mezquital	terrestrial	2
Tehuacán Valley matorral	terrestrial	2
Texas blackland prairies	terrestrial	2
Torngat Mountain tundra	terrestrial	2
Trans-Mexican Volcanic Belt pine-oak forests	terrestrial	2
Upper Midwest forest-savanna transition	terrestrial	2
Veracruz moist forests	terrestrial	2
Wasatch and Uinta montane forests	terrestrial	2
Western Great Lakes forests	terrestrial	2
Western Gulf coastal grasslands	terrestrial	2
Western short grasslands	terrestrial	2
Willamette Valley forests	terrestrial	2
Wyoming Basin shrub steppe	terrestrial	2
Yukon Interior dry forests	terrestrial	2
Coastal Araucanian	coastal	3
Coastal Central Chile	coastal	3
Coastal Central Peru	coastal	3
Coastal Chiapas-Nicaragua	coastal	3
Coastal Chiloense	coastal	3
Coastal Cortezian	coastal	3
Coastal Guayaquil	coastal	3
Coastal Humboldtian	coastal	3
Coastal Magdalena Transition	coastal	3
Coastal Mexican Tropical Pacific	coastal	3
Coastal Nicoya	coastal	3
Coastal North American Pacific Fijordland	coastal	3
Coastal Northern California	coastal	3
Coastal Panama Bight	coastal	3
Coastal Southern California Bight	coastal	3
Coastal Southwestern Caribbean	coastal	3
Coastal Western Caribbean	coastal	3
Northern Mesoamerican Pacific mangroves	coastal	3
South American Pacific mangroves	coastal	3
Southern Mesoamerican Pacific mangroves	coastal	3
Apure-Villavicencio dry forests	terrestrial	3
Araya and Paria xeric scrub	terrestrial	3
Atlantic dry forests	terrestrial	3
Bahamian pine mosaic	terrestrial	3
Bahia interior forests	terrestrial	3
Baja California desert	terrestrial	3
Belizian pine forests	terrestrial	3
California Central Valley grasslands	terrestrial	3
California coastal sage and chaparral	terrestrial	3

California interior chaparral and woodlands	terrestrial	3
California montane chaparral and woodlands	terrestrial	3
Campos Rupestres montane savanna	terrestrial	3
Catatumbo moist forests	terrestrial	3
Cauca Valley dry forests	terrestrial	3
Cauca Valley montane forests	terrestrial	3
Central American Atlantic moist forests	terrestrial	3
Central American dry forests	terrestrial	3
Central American montane forests	terrestrial	3
Central American pine-oak forests	terrestrial	3
Chiapas Depression dry forests	terrestrial	3
Chiapas montane forests	terrestrial	3
Chimalapas montane forests	terrestrial	3
Chocó-Darién moist forests	terrestrial	3
Cordillera La Costa montane forests	terrestrial	3
Cordillera Oriental montane forests	terrestrial	3
Costa Rican seasonal moist forests	terrestrial	3
Cuban cactus scrub	terrestrial	3
Cuban dry forests	terrestrial	3
Cuban moist forests	terrestrial	3
Cuban pine forests	terrestrial	3
Cuban wetlands	terrestrial	3
Eastern Panamanian montane forests	terrestrial	3
Enriquillo wetlands	terrestrial	3
Guajira-Barranquilla xeric scrub	terrestrial	3
Guayaquil flooded grasslands	terrestrial	3
Guianan freshwater swamp forests	terrestrial	3
Guianan Highlands moist forests	terrestrial	3
Guianan moist forests	terrestrial	3
Guianan piedmont and lowland moist forests	terrestrial	3
Guianan savanna	terrestrial	3
Gulf of California xeric scrub	terrestrial	3
Gurupa varzeá	terrestrial	3
Hispaniolan dry forests	terrestrial	3
Hispaniolan moist forests	terrestrial	3
Hispaniolan pine forests	terrestrial	3
Iquitos varzeá	terrestrial	3
Isthmian-Atlantic moist forests	terrestrial	3
Isthmian-Pacific moist forests	terrestrial	3
Jalisco dry forests	terrestrial	3
Jamaican dry forests	terrestrial	3
Jamaican moist forests	terrestrial	3
Klamath-Siskiyou forests	terrestrial	3

La Costa xeric shrublands	terrestrial	3
Lara-Falcón dry forests	terrestrial	3
Leeward Islands moist forests	terrestrial	3
Lesser Antillean dry forests	terrestrial	3
Llanos	terrestrial	3
Magdalena Valley dry forests	terrestrial	3
Magdalena Valley montane forests	terrestrial	3
Magdalena-Urabá moist forests	terrestrial	3
Maracaibo dry forests	terrestrial	3
Marajó varzeá	terrestrial	3
Maranhão Babaçu forests	terrestrial	3
Miskito pine forests	terrestrial	3
Motagua Valley thornscrub	terrestrial	3
Napo moist forests	terrestrial	3
Northeastern Brazil restingas	terrestrial	3
Northern California coastal forests	terrestrial	3
Oaxacan montane forests	terrestrial	3
Orinoco Delta swamp forests	terrestrial	3
Orinoco wetlands	terrestrial	3
Panamanian dry forests	terrestrial	3
Pantanos de Centla	terrestrial	3
Paraguana xeric scrub	terrestrial	3
Petén-Veracruz moist forests	terrestrial	3
Puerto Rican dry forests	terrestrial	3
Puerto Rican moist forests	terrestrial	3
Purus varzeá	terrestrial	3
Rio Negro campinarana	terrestrial	3
San Lucan xeric scrub	terrestrial	3
Santa Marta montane forests	terrestrial	3
Sierra de la Laguna dry forests	terrestrial	3
Sierra de la Laguna pine-oak forests	terrestrial	3
Sierra de los Tuxtlas	terrestrial	3
Sierra Madre de Chiapas moist forests	terrestrial	3
Sierra Nevada forests	terrestrial	3
Sinaloan dry forests	terrestrial	3
Sinú Valley dry forests	terrestrial	3
Solimões-Japurá moist forests	terrestrial	3
Southern Pacific dry forests	terrestrial	3
Talamancan montane forests	terrestrial	3
Tapajós-Xingu moist forests	terrestrial	3
Tocantins/Pindare moist forests	terrestrial	3
Trinidad and Tobago moist forests	terrestrial	3
Tumbes-Piura dry forests	terrestrial	3

Uatuma-Trombetas moist forests	terrestrial	3
Veracruz dry forests	terrestrial	3
Veracruz montane forests	terrestrial	3
Xingu-Tocantins-Araguaia moist forests	terrestrial	3
Yucatán dry forests	terrestrial	3
Yucatán moist forests	terrestrial	3
Amazon-Orinoco-Southern Caribbean mangroves	coastal	4
Bahamian-Antillean mangroves	coastal	4
Central African mangroves	coastal	4
Coastal Agulhas Bank	coastal	4
Coastal Alboran Sea	coastal	4
Coastal Amazonia	coastal	4
Coastal Angolan	coastal	4
Coastal Azores Canaries Madeira	coastal	4
Coastal Bahamian	coastal	4
Coastal Cape Verde	coastal	4
Coastal Celtic Seas	coastal	4
Coastal Channels and Fjords of Southern Chile	coastal	4
Coastal Eastern Brazil	coastal	4
Coastal Eastern Caribbean	coastal	4
Coastal Faroe Plateau	coastal	4
Coastal Floridian	coastal	4
Coastal Greater Antilles	coastal	4
Coastal Guianan	coastal	4
Coastal Gulf of Guinea Central	coastal	4
Coastal Gulf of Guinea Islands	coastal	4
Coastal Gulf of Guinea South	coastal	4
Coastal Gulf of Guinea Upwelling	coastal	4
Coastal Gulf of Guinea West	coastal	4
Coastal Namaqua	coastal	4
Coastal Namib	coastal	4
Coastal North and East Iceland	coastal	4
Coastal North Patagonian Gulfs	coastal	4
Coastal North Sea	coastal	4
Coastal Northeastern Brazil	coastal	4
Coastal Northern Gulf of Mexico	coastal	4
Coastal Patagonian Shelf	coastal	4
Coastal Rio de la Plata	coastal	4
Coastal Saharan Upwelling	coastal	4
Coastal Sahelian Upwelling	coastal	4
Coastal South and West Iceland	coastal	4
Coastal South European Atlantic Shelf	coastal	4
Coastal Southeastern Brazil	coastal	4

Coastal Southern Caribbean	coastal	4
Coastal Southern Norway	coastal	4
Coastal Uruguay-Buenos Aires Shelf	coastal	4
Guinean mangroves	coastal	4
Southern Atlantic mangroves	coastal	4
Channels and Fjords of Southern Chile	marine	4
Malvinas/Falklands	marine	4
North Patagonian Gulfs	marine	4
Northeastern Brazil	marine	4
Patagonian Shelf	marine	4
Rio de la Plata	marine	4
Southern Caribbean	marine	4
Coastal Malvinas/Falklands	coastal	5
Coastal Rio Grande	coastal	5
Alto Paraná Atlantic forests	terrestrial	5
Araucaria moist forests	terrestrial	5
Atacama desert	terrestrial	5
Atlantic Coast restingas	terrestrial	5
Beni savanna	terrestrial	5
Bolivian montane dry forests	terrestrial	5
Bolivian Yungas	terrestrial	5
Caribbean shrublands	terrestrial	5
Central Andean dry puna	terrestrial	5
Central Andean puna	terrestrial	5
Central Andean wet puna	terrestrial	5
Cerrado	terrestrial	5
Chilean matorral	terrestrial	5
Chiquitano dry forests	terrestrial	5
Dry Chaco	terrestrial	5
Eastern Cordillera real montane forests	terrestrial	5
Ecuadorian dry forests	terrestrial	5
Espinal	terrestrial	5
High Monte	terrestrial	5
Humid Chaco	terrestrial	5
Humid Pampas	terrestrial	5
Low Monte	terrestrial	5
Madeira-Tapajós moist forests	terrestrial	5
Magellanic subpolar forests	terrestrial	5
Northern Andean páramo	terrestrial	5
Northwestern Andean montane forests	terrestrial	5
Pantanal	terrestrial	5
Paraná flooded savanna	terrestrial	5
Patagonian steppe	terrestrial	5

Peruvian Yungas	terrestrial	5
Sechura desert	terrestrial	5
Serra do Mar coastal forests	terrestrial	5
Southern Andean steppe	terrestrial	5
Southern Andean Yungas	terrestrial	5
Southern Cone Mesopotamian savanna	terrestrial	5
Southwest Amazon moist forests	terrestrial	5
Titicaca	terrestrial	5
Uruguayan savanna	terrestrial	5
Valdivian temperate forests	terrestrial	5
Western Ecuador moist forests	terrestrial	5
Agulhas Bank	marine	6
Amazonia	marine	6
Angolan	marine	6
Azores Canaries Madeira	marine	6
Cape Verde	marine	6
Guianan	marine	6
Gulf of Guinea Central	marine	6
Gulf of Guinea Islands	marine	6
Gulf of Guinea South	marine	6
Gulf of Guinea Upwelling	marine	6
Gulf of Guinea West	marine	6
Namaqua	marine	6
Namib	marine	6
Natal	marine	6
Rio Grande	marine	6
Saharan Upwelling	marine	6
Sahelian Upwelling	marine	6
Sao Pedro and Sao Paulo Islands	marine	6
Southeastern Brazil	marine	6
Uruguay-Buenos Aires Shelf	marine	6
Atlantic coastal desert	terrestrial	7
Guinean forest-savanna mosaic	terrestrial	7
Mediterranean acacia-argania dry woodlands and succulent thickets	terrestrial	7
Mediterranean conifer and mixed forests	terrestrial	7
Mediterranean dry woodlands and steppe	terrestrial	7
Mediterranean High Atlas juniper steppe	terrestrial	7
Mediterranean woodlands and forests	terrestrial	7
North Saharan steppe and woodlands	terrestrial	7
Saharan halophytics	terrestrial	7
Sahelian Acacia savanna	terrestrial	7
West Sudanian savanna	terrestrial	7
Coastal East Greenland Shelf	coastal	8

Coastal Northern Labrador	coastal	8
Coastal West Greenland Shelf	coastal	8
East Greenland Shelf	marine	8
Northern Labrador	marine	8
West Greenland Shelf	marine	8
Cortezian	marine	9
Gulf of Alaska	marine	9
Magdalena Transition	marine	9
North American Pacific Fijordland	marine	9
Northern California	marine	9
Oregon, Washington, Vancouver Coast and Shelf	marine	9
Puget Trough/Georgia Basin	marine	9
Southern California Bight	marine	9

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