

This document was compiled by the Regional Assessment of Offshore Wind Development Secretariat. It includes an excerpt from the submission:

Offshore Wind Regional Assessment Requests for Advice: Product Descriptions and Context for Interpretation

Provided by Environment and Climate Change Canada – Canadian Wildlife Service to the Committees for the Regional Assessment of Offshore Wind Development in Nova Scotia and Regional Assessment of Offshore Wind Development in Newfoundland and Labrador

November 30, 2023

The full submission was provided to the Committee in confidence, as per the Committee's [Confidentiality Procedures](#).

2.2.5 Shorebird Coastal Density and Temporal Trends

Product Objective

Although not explicitly requested by the Committee, this series of maps will show species-specific relative densities and temporal trends of shorebirds in Atlantic Canada during all seasons. Shorebird Coastal Density and Temporal Trends.

The following data sources were used to produce the maps:

- CWS. 2012. Atlantic Canada Shorebird Surveys (ACSS) data, 1971-present. Internal database.
- CWS. 2023b. Purple Sandpiper Surveys. 1971-2023. Internal database.
- CWS. 2014. Semipalmated Sandpiper aerial survey data from Bay of Fundy 1976 – 2014. Internal database.
- CWS. 2015. Phalarope Aerial Surveys in the Bay of Fundy 2009, 2010 and 2015. Internal database.
- eBird. 2023. Status and Trends Data - Observations for timing of occurrence.

Migratory shorebirds could interact with offshore wind energy developments during migratory flights or when transiting between habitats used for foraging, resting, and breeding. Therefore, these species should be considered for the RA.

Methodology

Distribution and density mapping are based on data obtained from the Atlantic Canada Shorebird Surveys (ACSS) data and eBird for 28 species. Additional records were obtained for the Purple Sandpiper (PUSA) from the ECCC-CWS-ATL dataset, for the Semipalmated Sandpiper (SESA) from SESA aerial surveys (1976 – 2014), and for Phalaropes from aerial surveys done in 2009, 2010, and 2015. ACSS data contains records from 1971-2023, while the ECCC-CWS-ATL PUSA data contains records from 1971-2023. Site maxima records (i.e., the record with the highest count for each area, using the standardized area name column) were calculated for each season of interest. Seasons include fall (July 1 to December 31), winter (January 1 to March 14), spring (March 15 to May 31), and all seasons combined (January 1 to December 31). Point data layers using the complete datasets were created for each species and site maxima point data layers were also created for each season/species. A density analysis was conducted for each species and season of interest to map their density/distribution in Atlantic Canada. Point data density rasters were then created for each species. Analysis was done using the density function of the spatstat package of the R programming language. Density estimates were calculated using a cell size of 500 m and a sigma of 5,000 m. Density values were rescaled between 0 and 1 and very low values ($< 10e-4$) set to 0 to remove modelling artifacts. Data values of "0" were excluded from the classification and a colour ramp of blue to yellow was used. Seasonal occurrence of shorebirds in the study area was compiled using the "ebirdst" R package (<https://ebird.github.io/ebirdst/>). This package retrieves Status and Trends Data

Products compiled by Cornell University based on the eBird dataset. Weekly median abundance rasters were downloaded for each species, cropped to the study area, and normalized across the year. Timing data presented represent values for the year 2022.

Shorebird coastal density and temporal trend maps are provided for the following species:

- American Golden Plover
- American Oystercatcher
- Black-bellied Plover
- Buff-breasted Sandpiper
- Dunlin
- Greater Yellowlegs
- Hudsonian Godwit
- Killdeer
- Least Sandpiper
- Lesser Yellowlegs
- Pectoral Sandpiper
- Piping Plover
- Purple Sandpiper
- Red Knot
- Red Phalarope
- Red-necked Phalarope
- Ruddy Turnstone
- Sanderling
- Semipalmated Plover
- Semipalmated Sandpiper
- Solitary Sandpiper
- Spotted Sandpiper
- Whimbrel
- Willet
- Wilson's Phalarope
- Wilson's Snipe
- White-rumped Sandpiper

Context and Interpretation

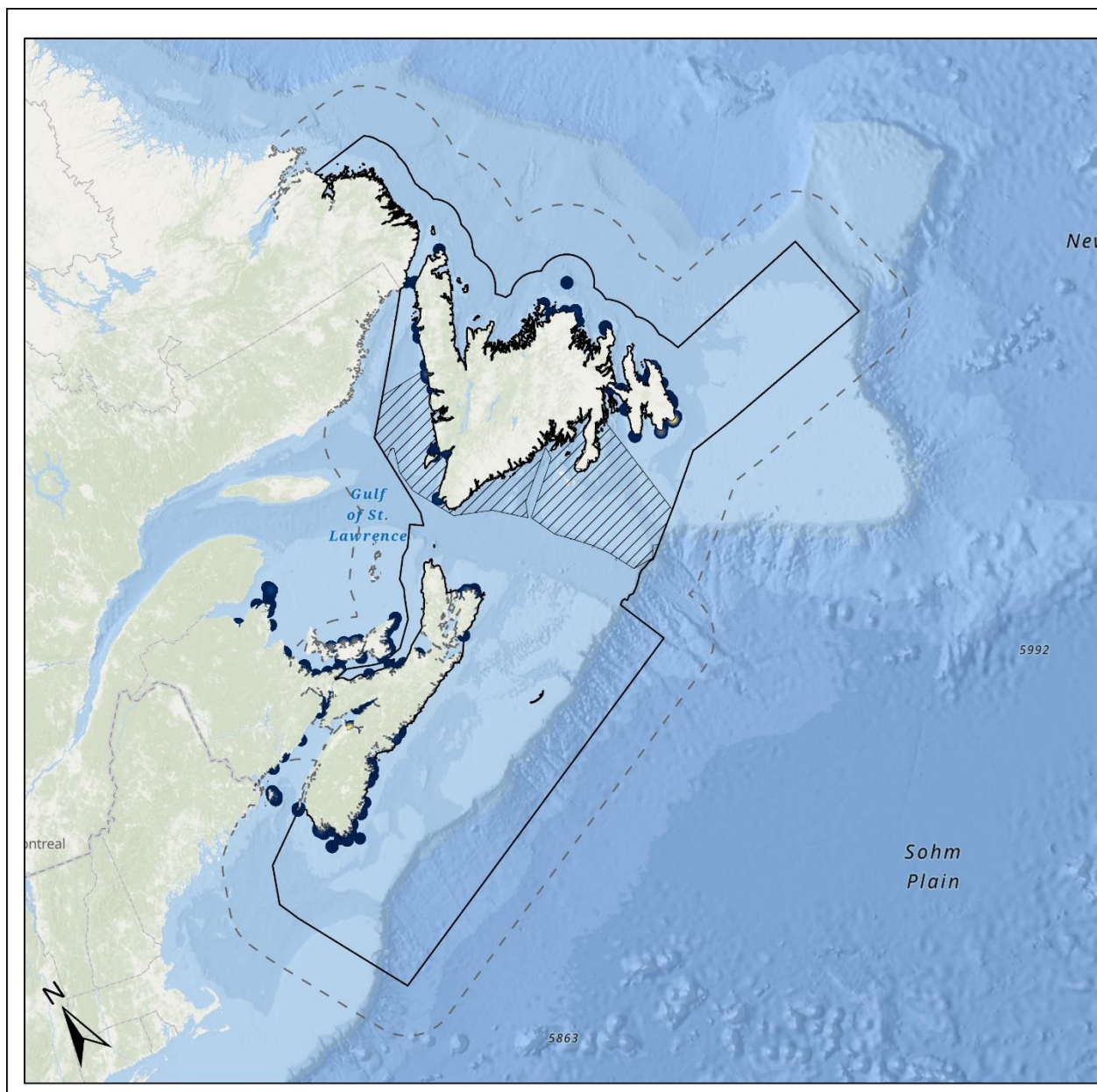
Spatial Distribution: Includes shorebird densities and temporal trends in Atlantic Canada (Nova Scotia, Newfoundland and Labrador, New Brunswick, and Prince Edward Island). The spatial distribution of shorebirds within the study area is unknown, as these datasets are terrestrial. However, these maps indicate coastal hotspots (e.g., southeastern Nova Scotia, Bay of Fundy) that could be areas of higher risk for offshore wind energy development, as birds may interact


with nearshore turbines while travelling between roosting locations during stopover or while initiating migratory transoceanic flights.

Temporal Distribution: Most species showed one or more pronounced peaks in abundance and most peaks occurred somewhere between summer and early fall (July-October), indicating these periods would be the riskiest for migrating shorebirds with respect to offshore wind energy development. Most species have low abundance or are absent in the winter months, except Purple Sandpiper which shows moderate relative abundance over winter with peak abundance in April.

Assumptions, Caveats, and Product Updates

- Update: Data was updated with most current records and additional data.



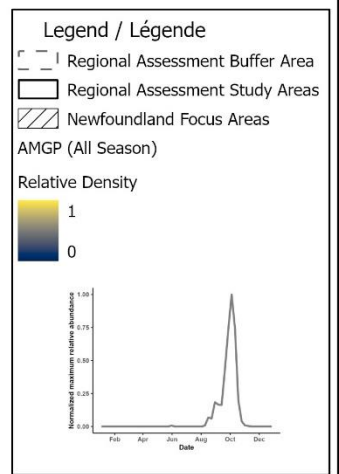

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CWS Atlantic

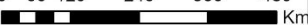
Relative Shorebird
Coastal Density

American Golden-Plover

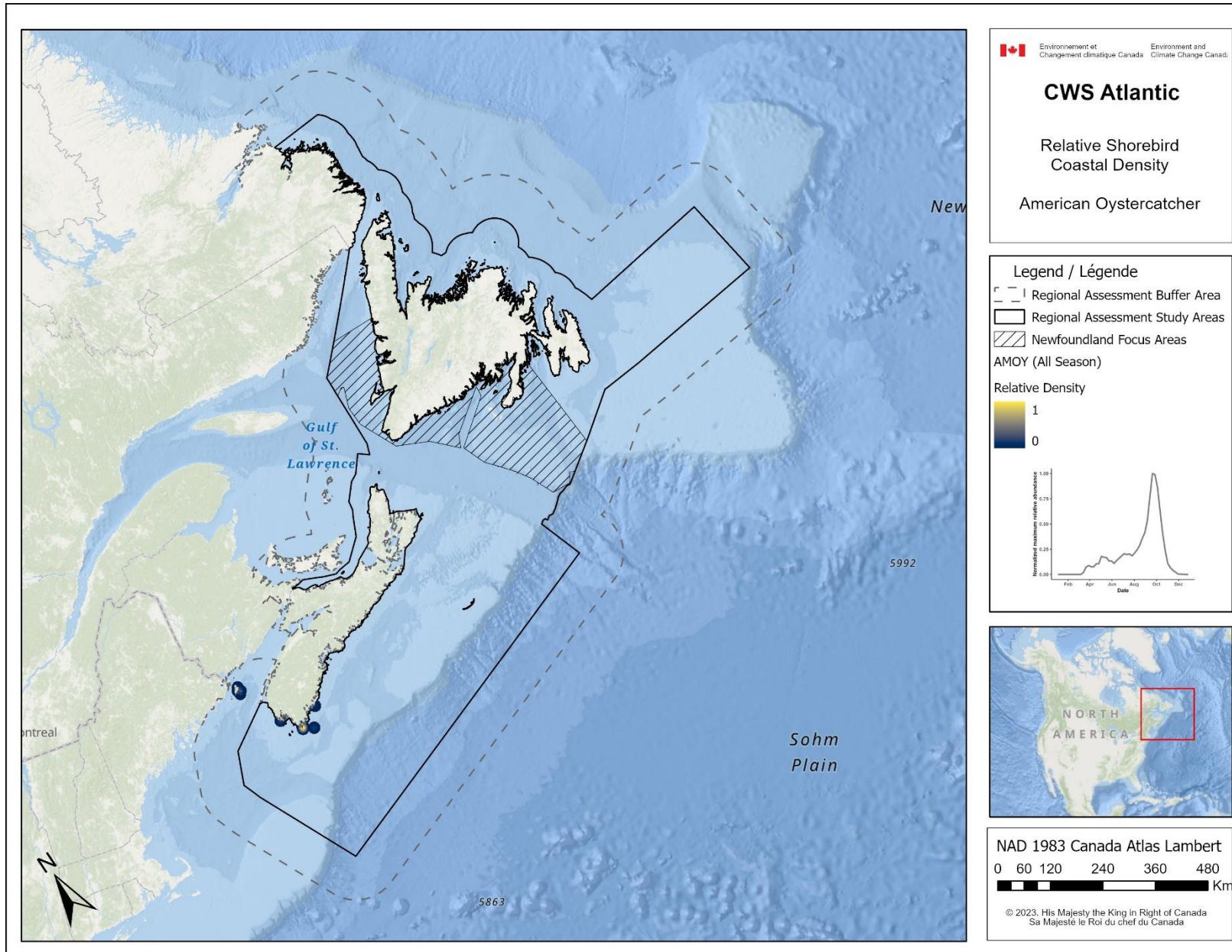


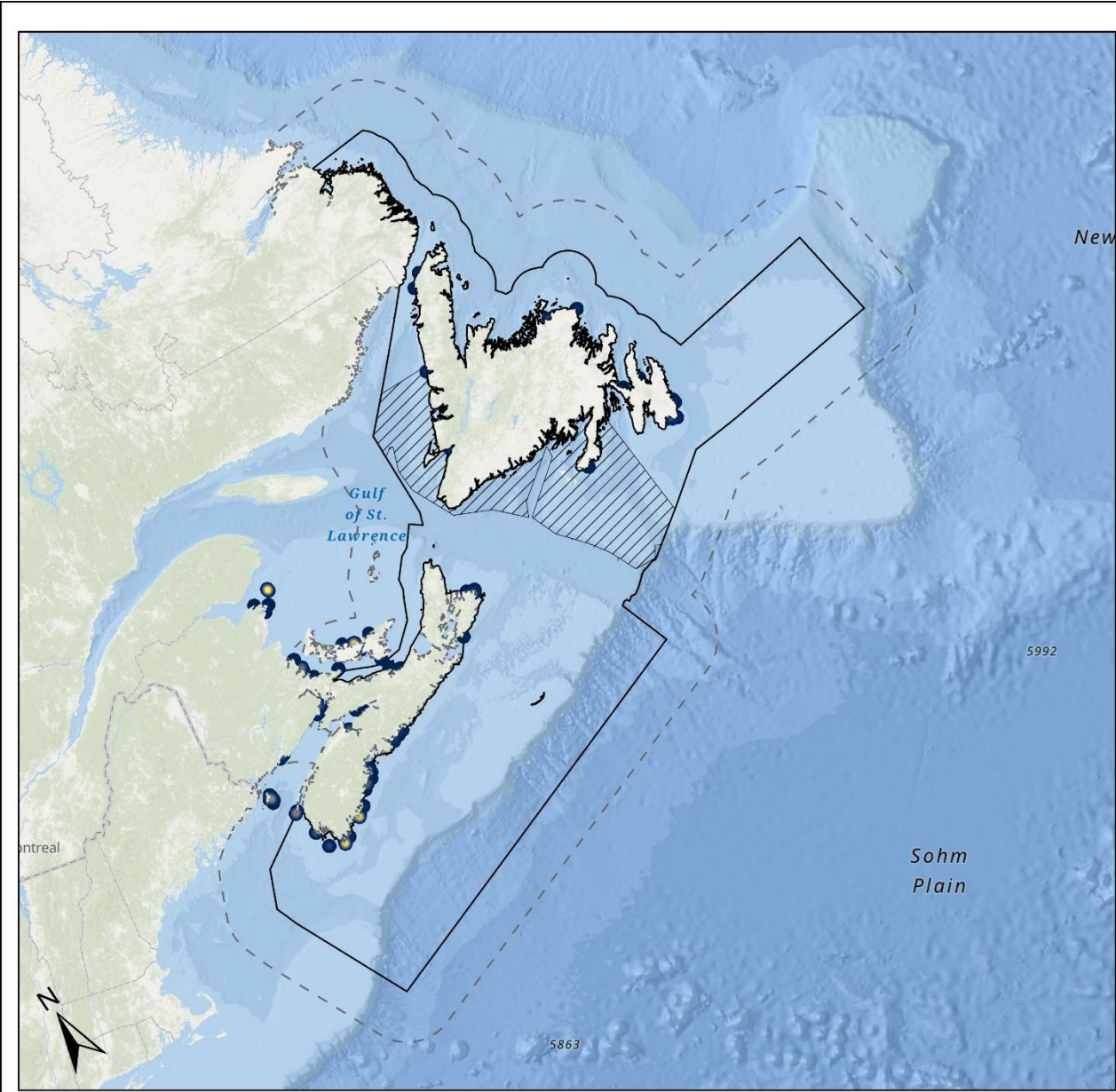
NAD 1983 Canada Atlas Lambert

0 60 120 240 360 480 Km



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CWS Atlantic

Relative Shorebird
Coastal Density

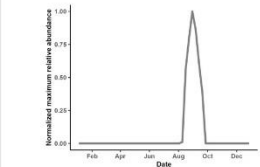
Baird's Sandpiper

Legend / Légende

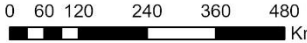
- Regional Assessment Buffer Area
- Regional Assessment Study Areas
- Newfoundland Focus Areas

BASA (All Season)

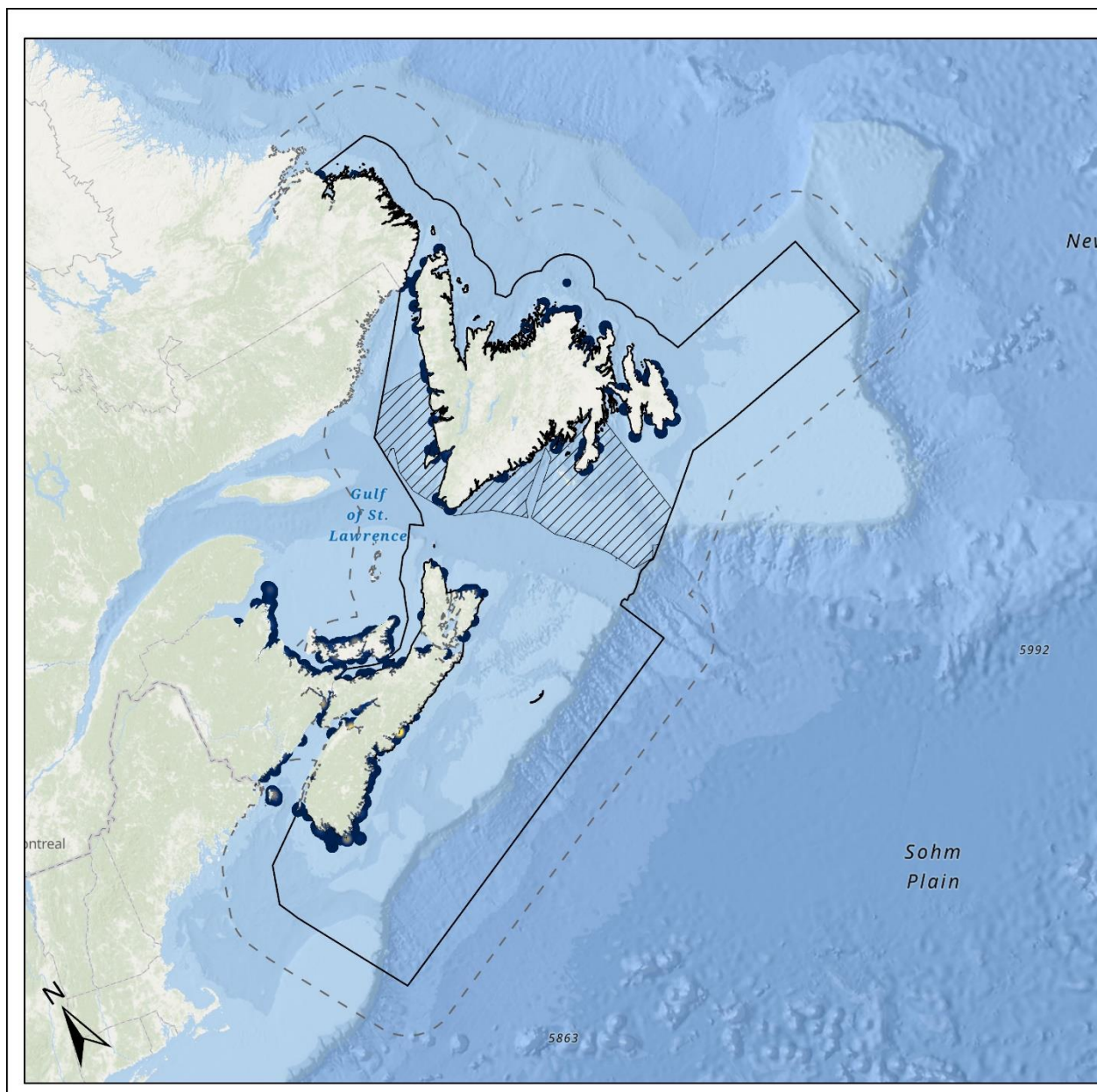
Relative Density



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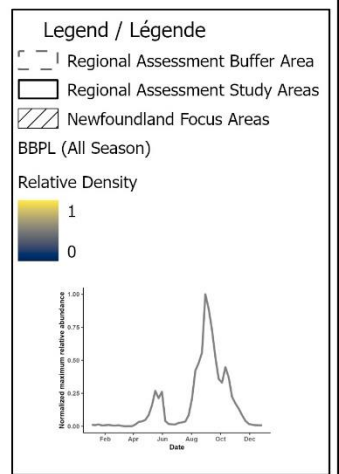

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Relative Shorebird
Coastal Density

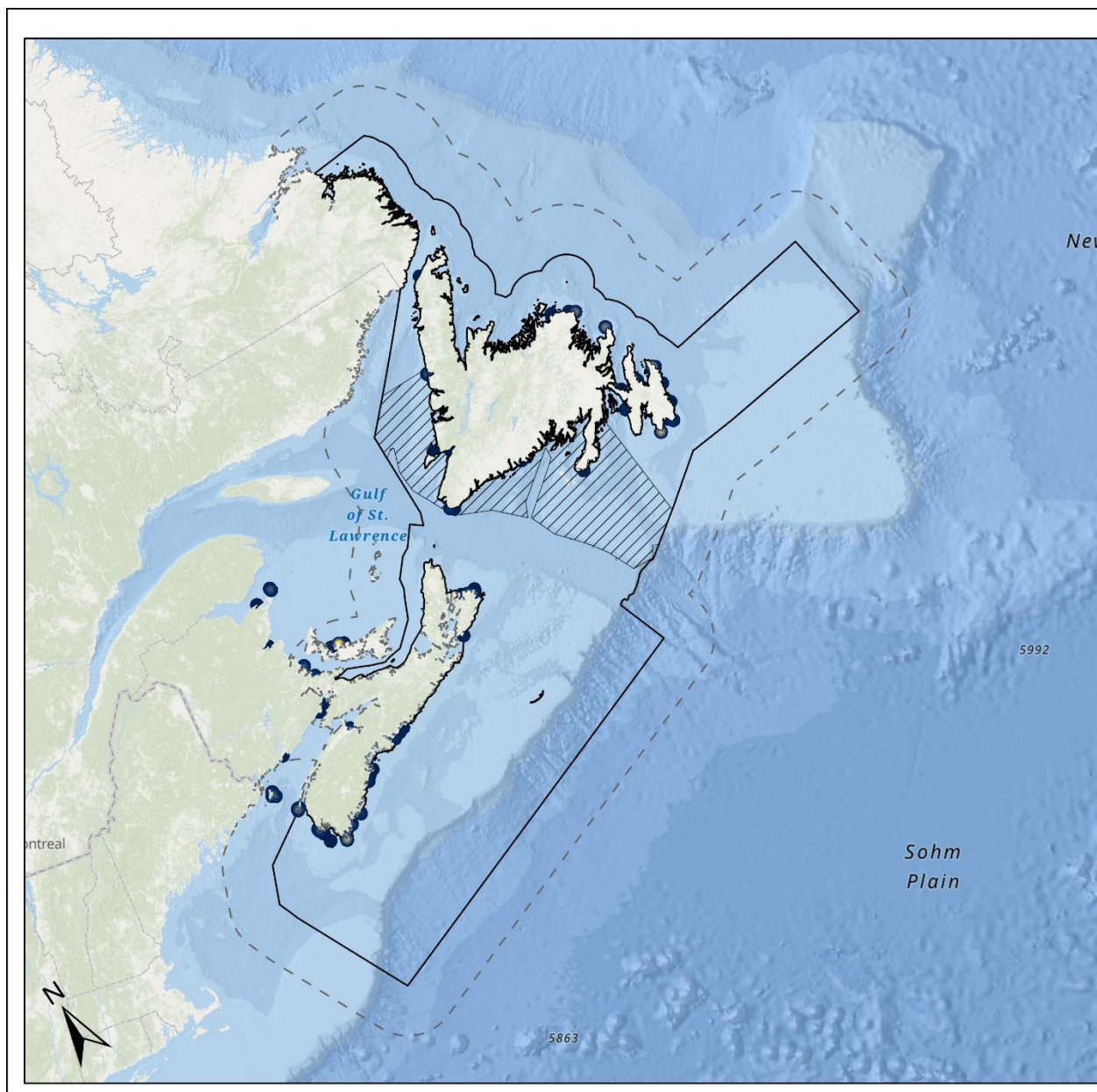
Black-bellied Plover



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0 60 120 240 360 480
Km

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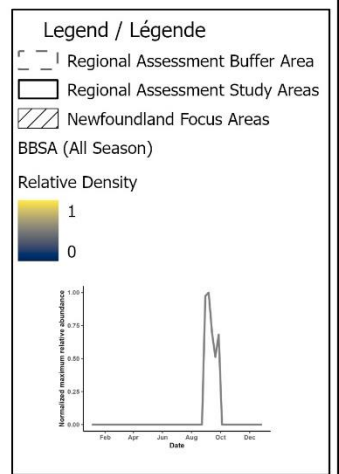

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CWS Atlantic

Relative Shorebird
 Coastal Density

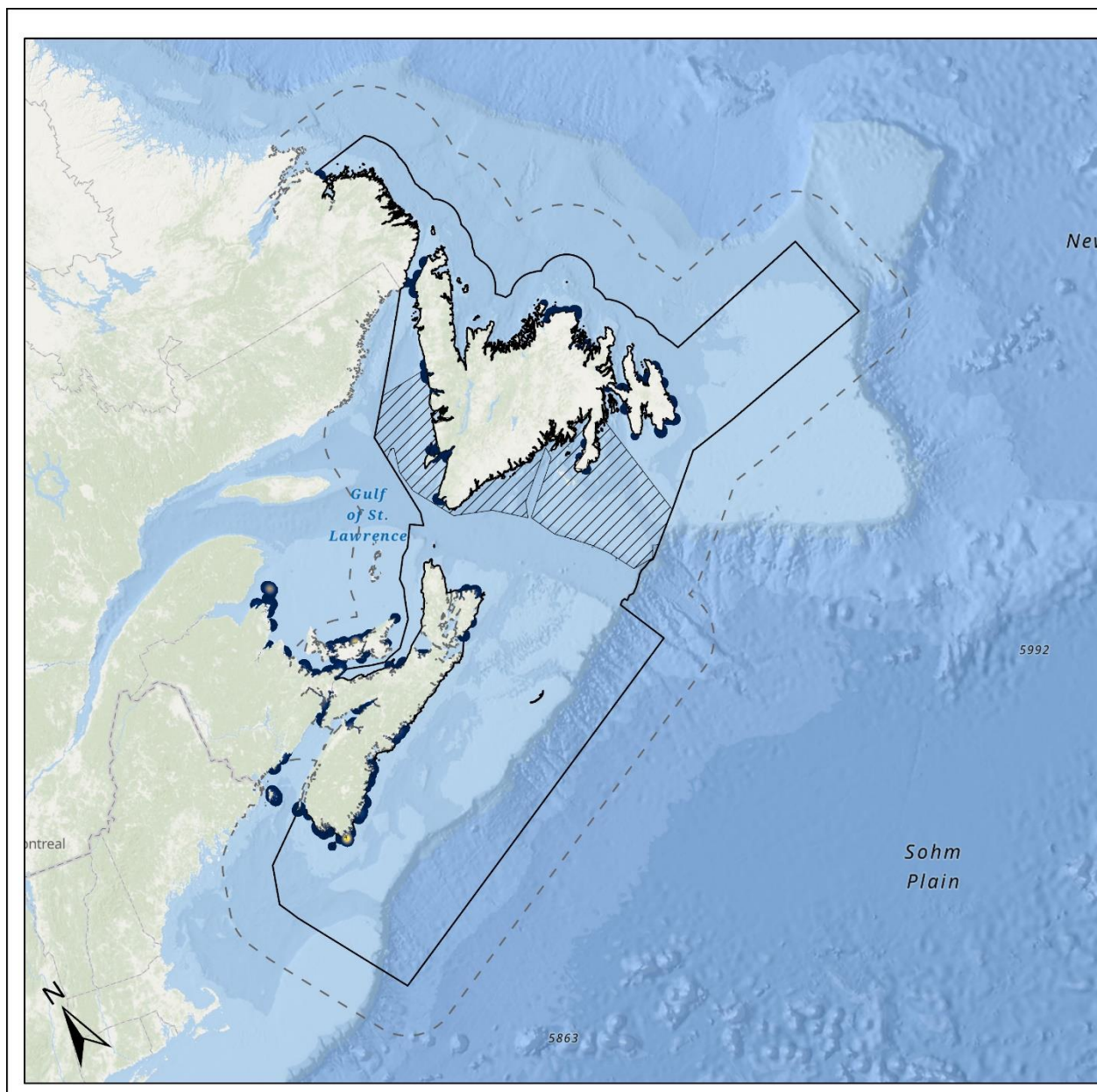
Buff-breasted Sandpiper




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
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Climate Change Canada

CWS Atlantic

Relative Shorebird
Coastal Density


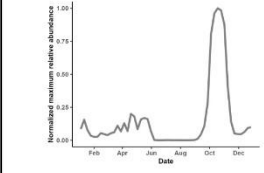
Dunlin

Legend / Légende

-  Regional Assessment Buffer Area
-  Regional Assessment Study Areas
-  Newfoundland Focus Areas

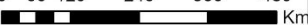
DUNL (All Season)

Value

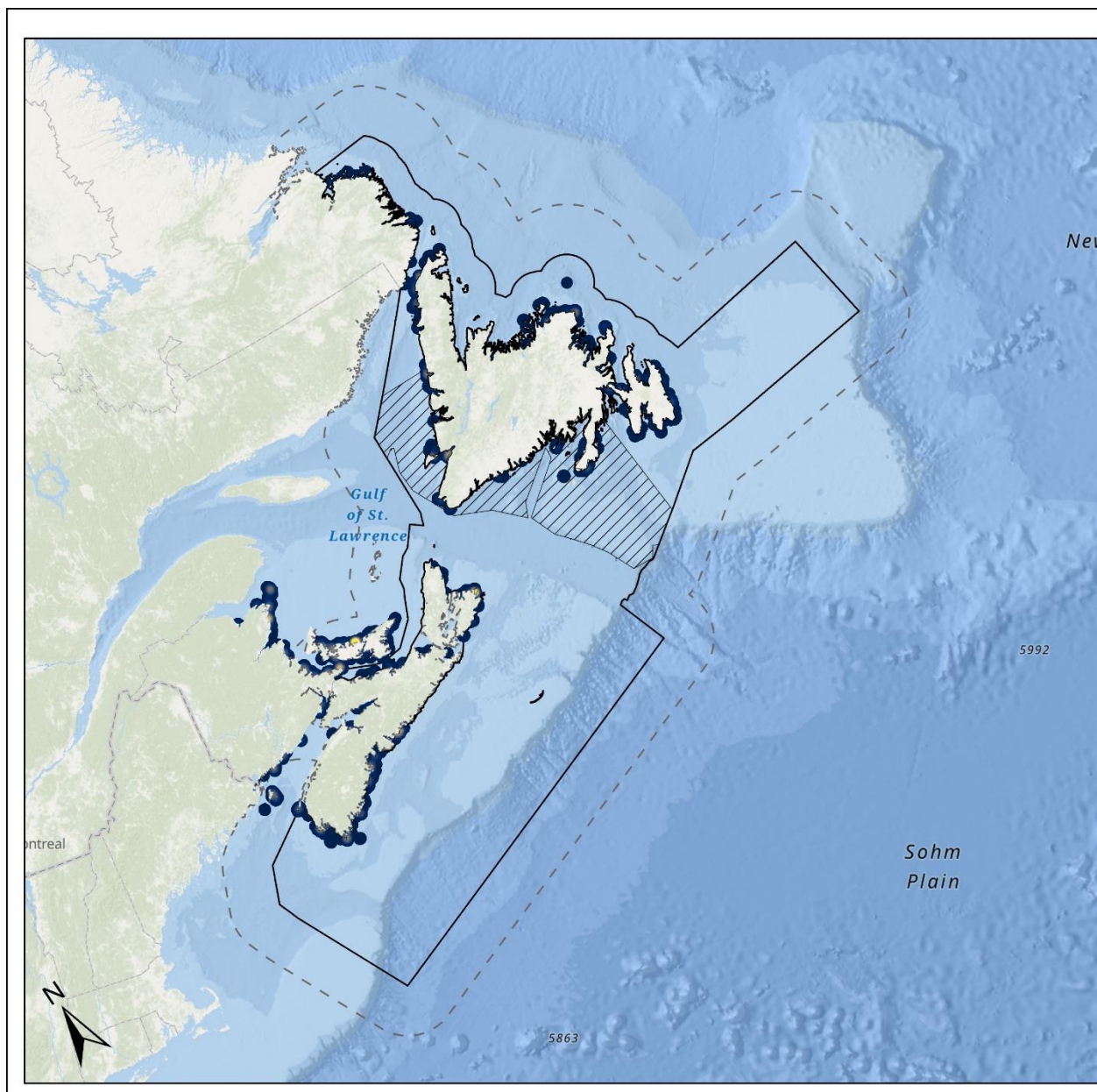




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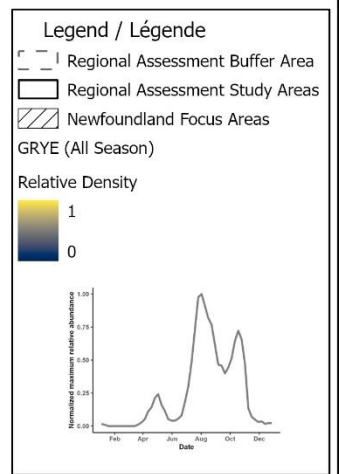

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Relative Shorebird
Coastal Density

Greater Yellowlegs

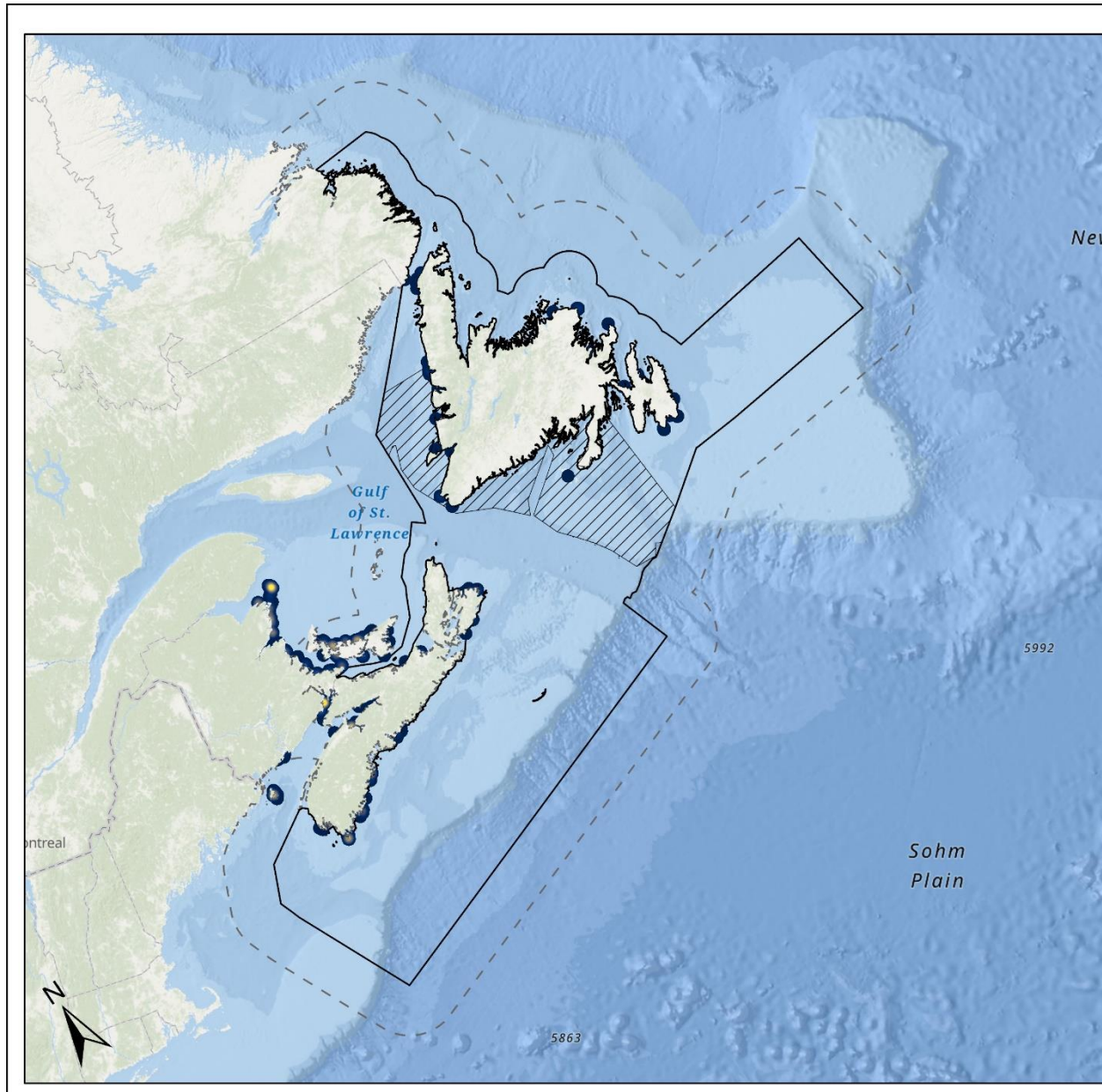



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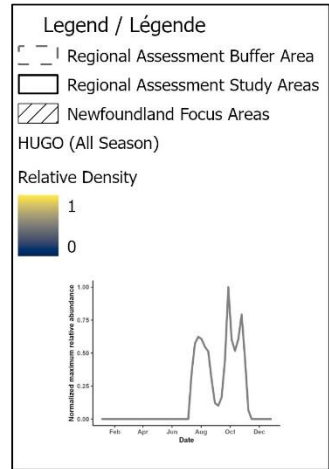

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Relative Shorebird
Coastal Density

Hudsonian Godwit

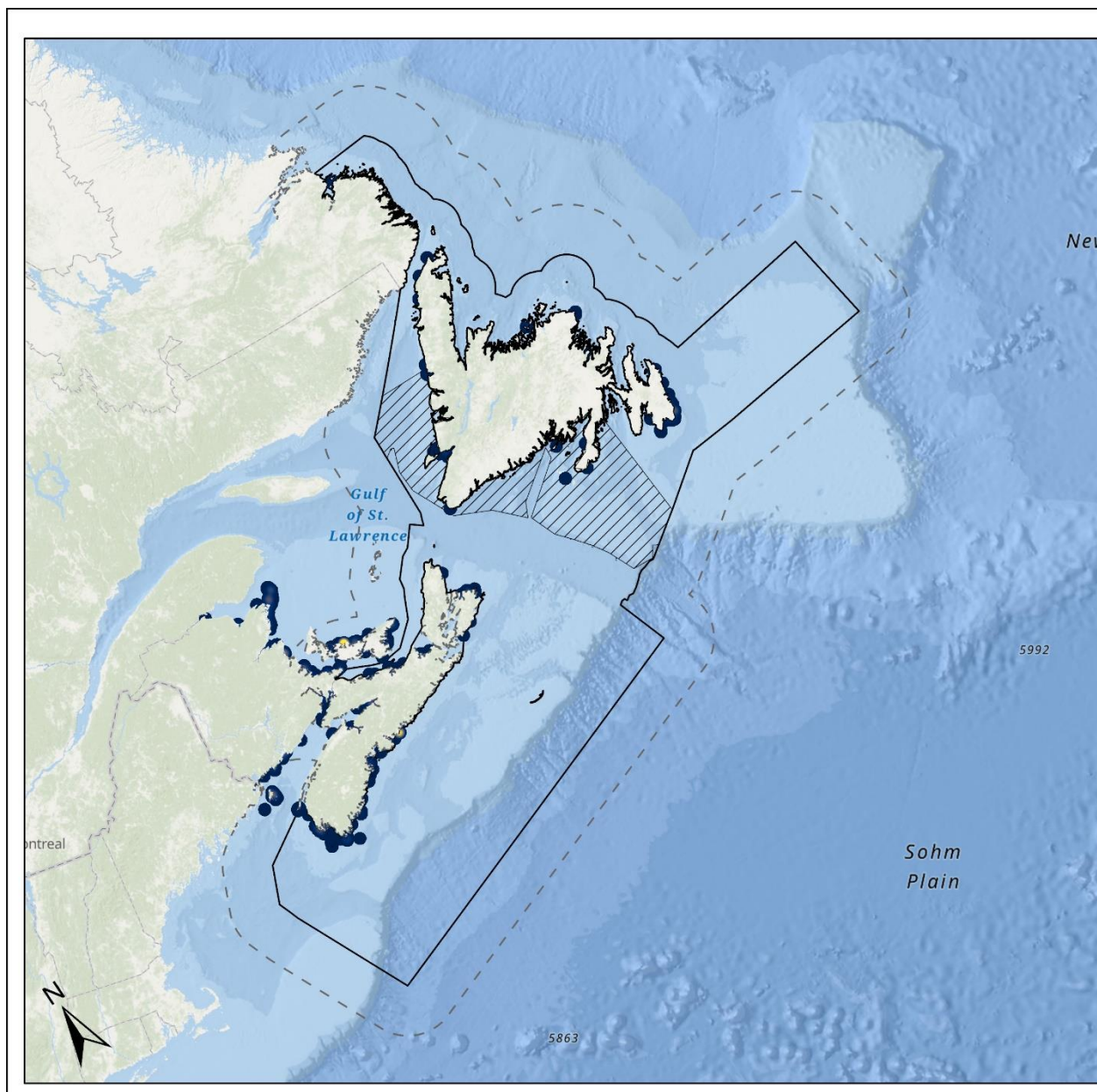



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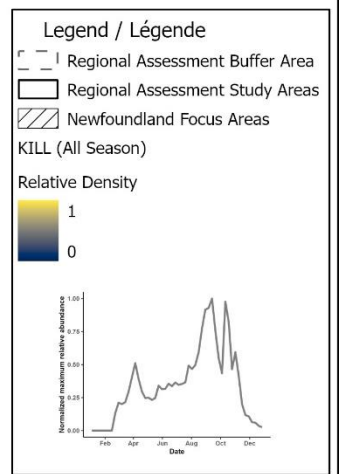

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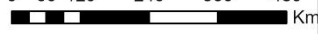
Relative Shorebird
Coastal Density

Killdeer

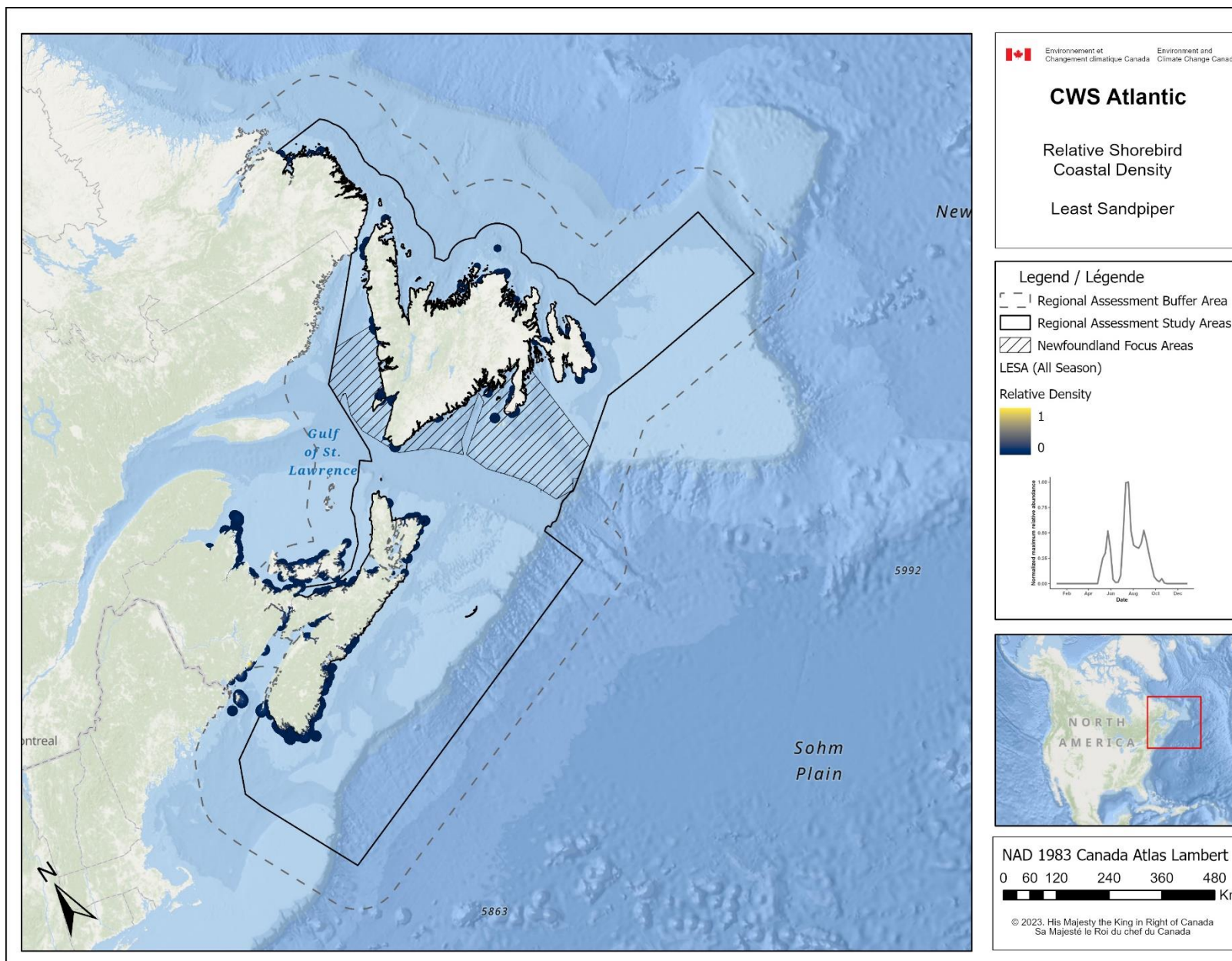


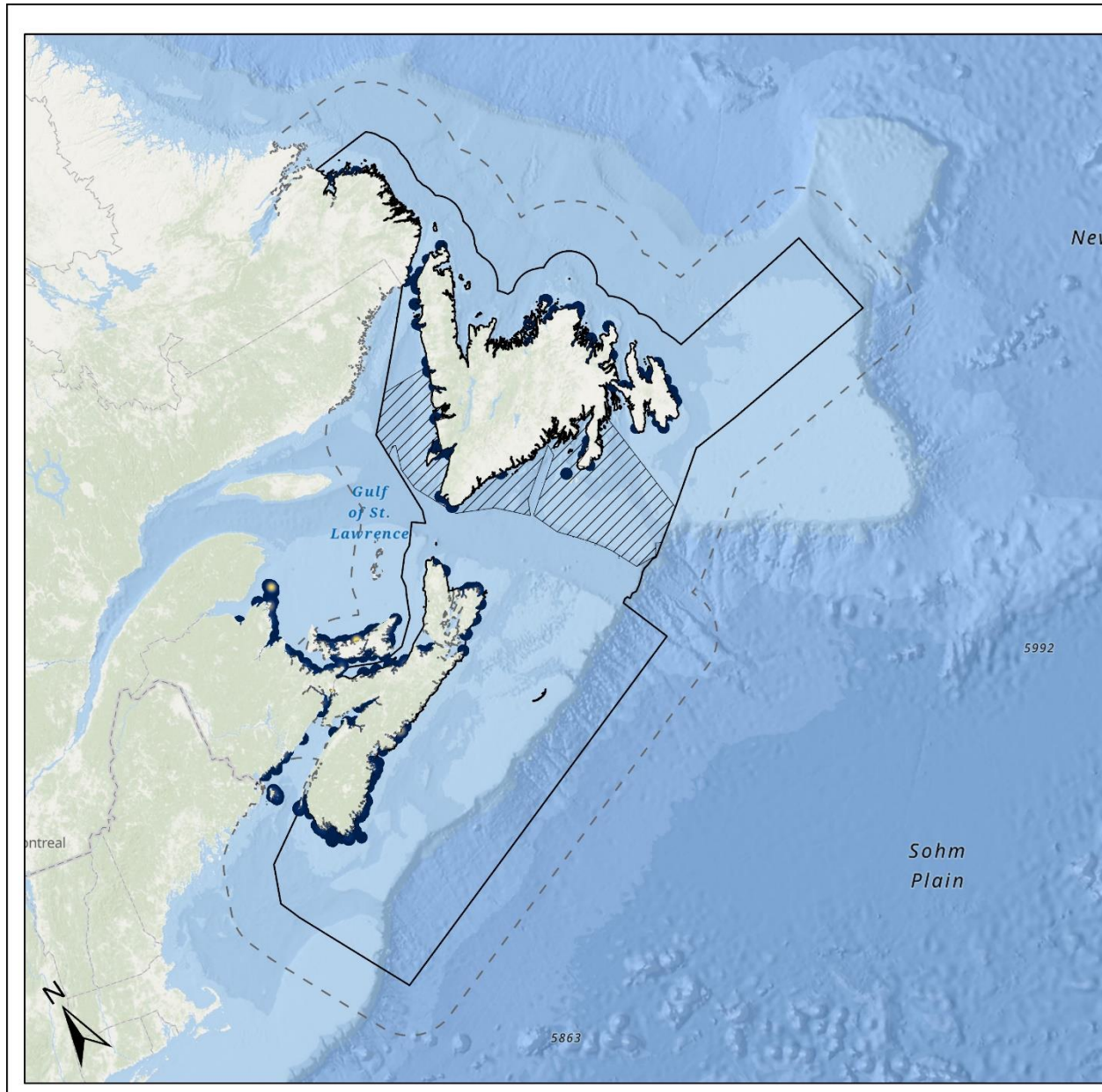
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

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CWS Atlantic

Relative Shorebird
Coastal Density

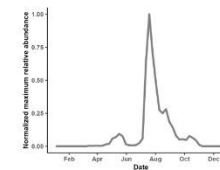
Lesser Yellowlegs

Legend / Légende

-  Regional Assessment Buffer Area
-  Regional Assessment Study Areas
-  Newfoundland Focus Areas

LEYE (All Season)

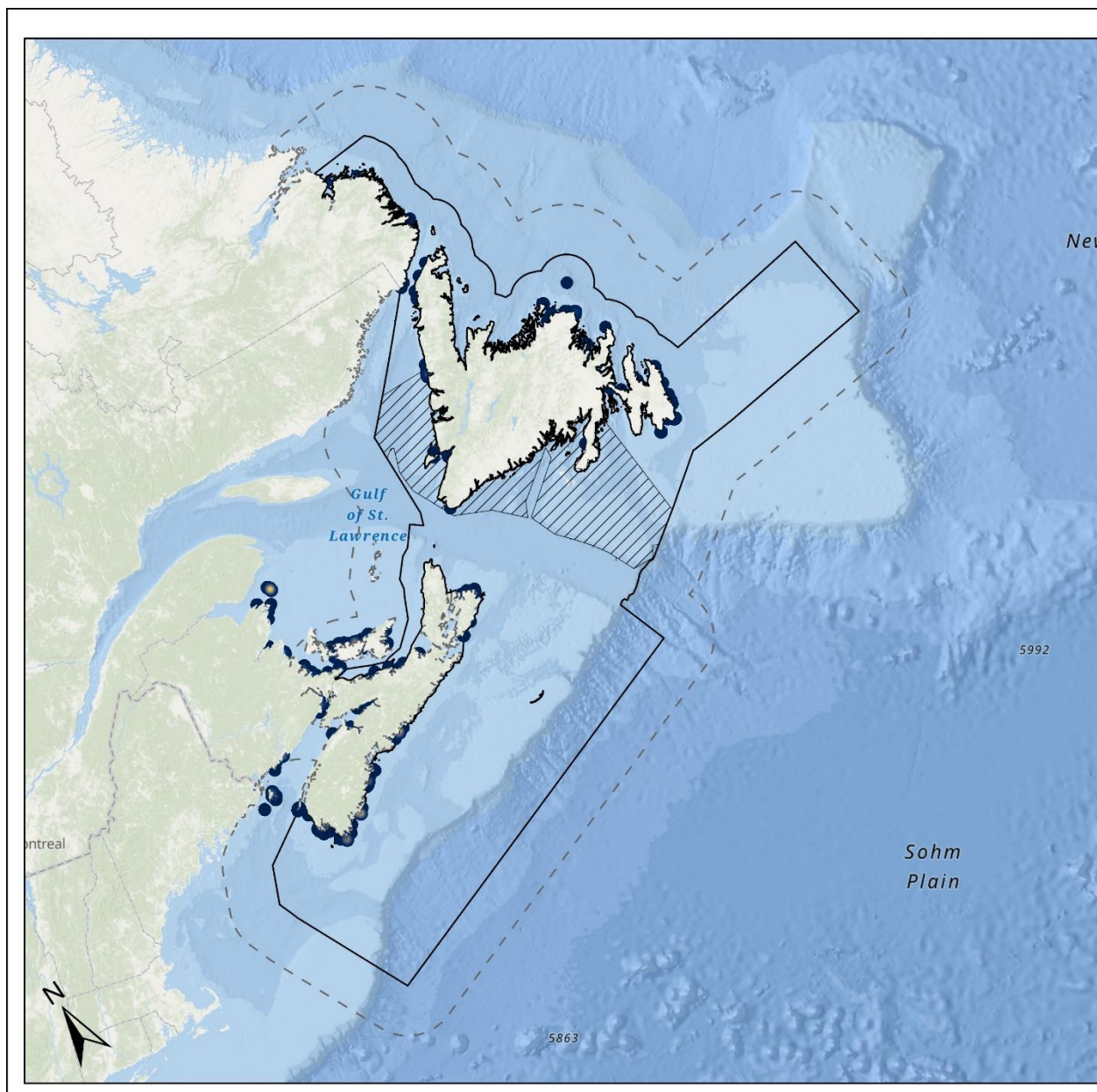
Relative Density



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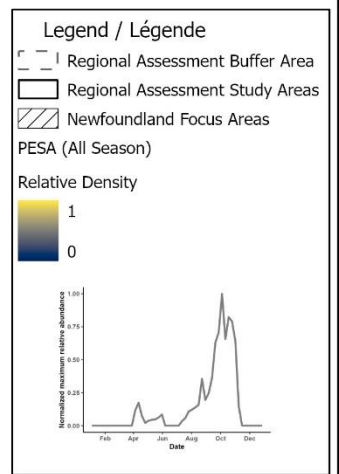

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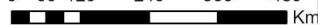
Relative Shorebird
Coastal Density

Pectoral Sandpiper

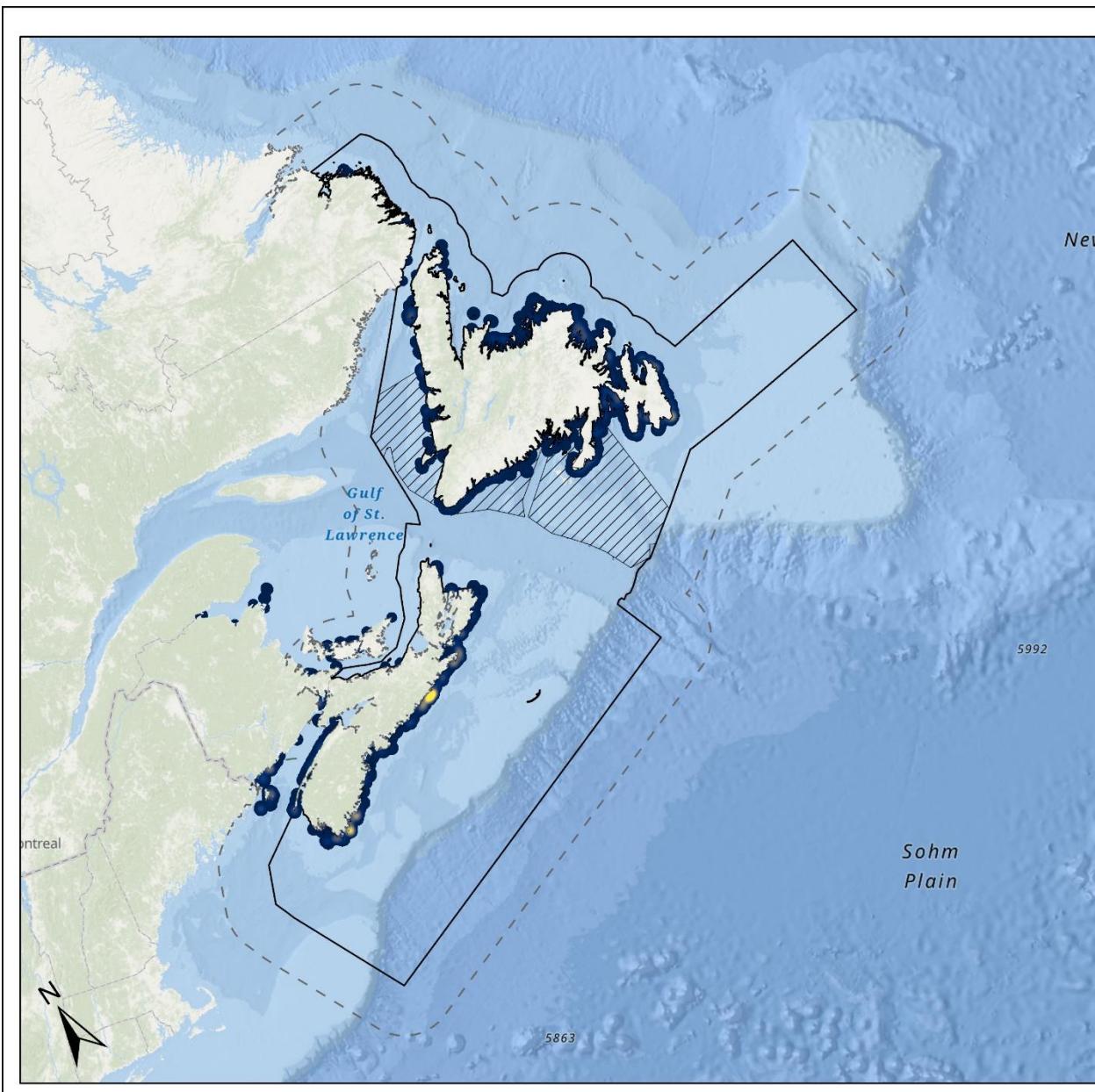


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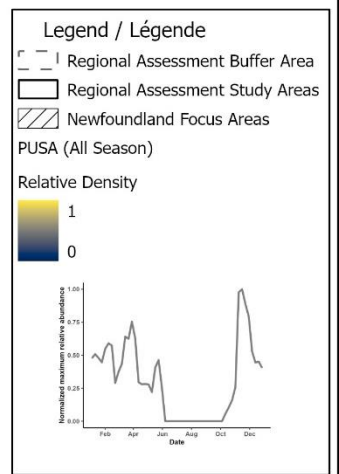

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Relative Shorebird
Coastal Density

Purple Sandpiper

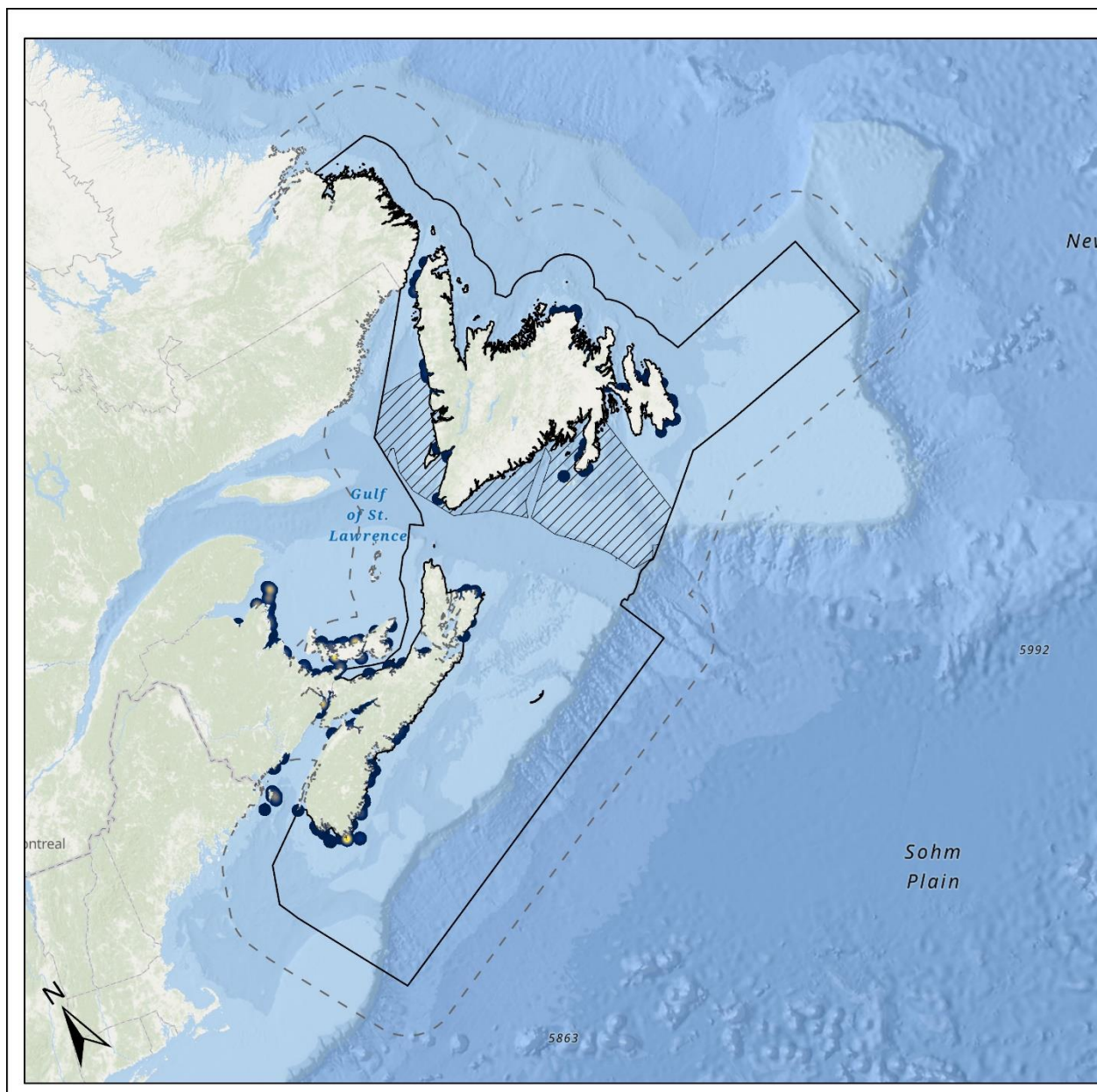



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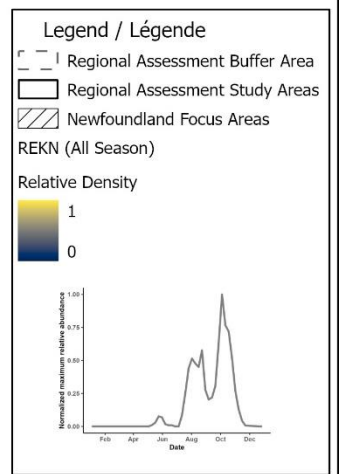

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CWS Atlantic

Relative Shorebird
Coastal Density

Red Knot

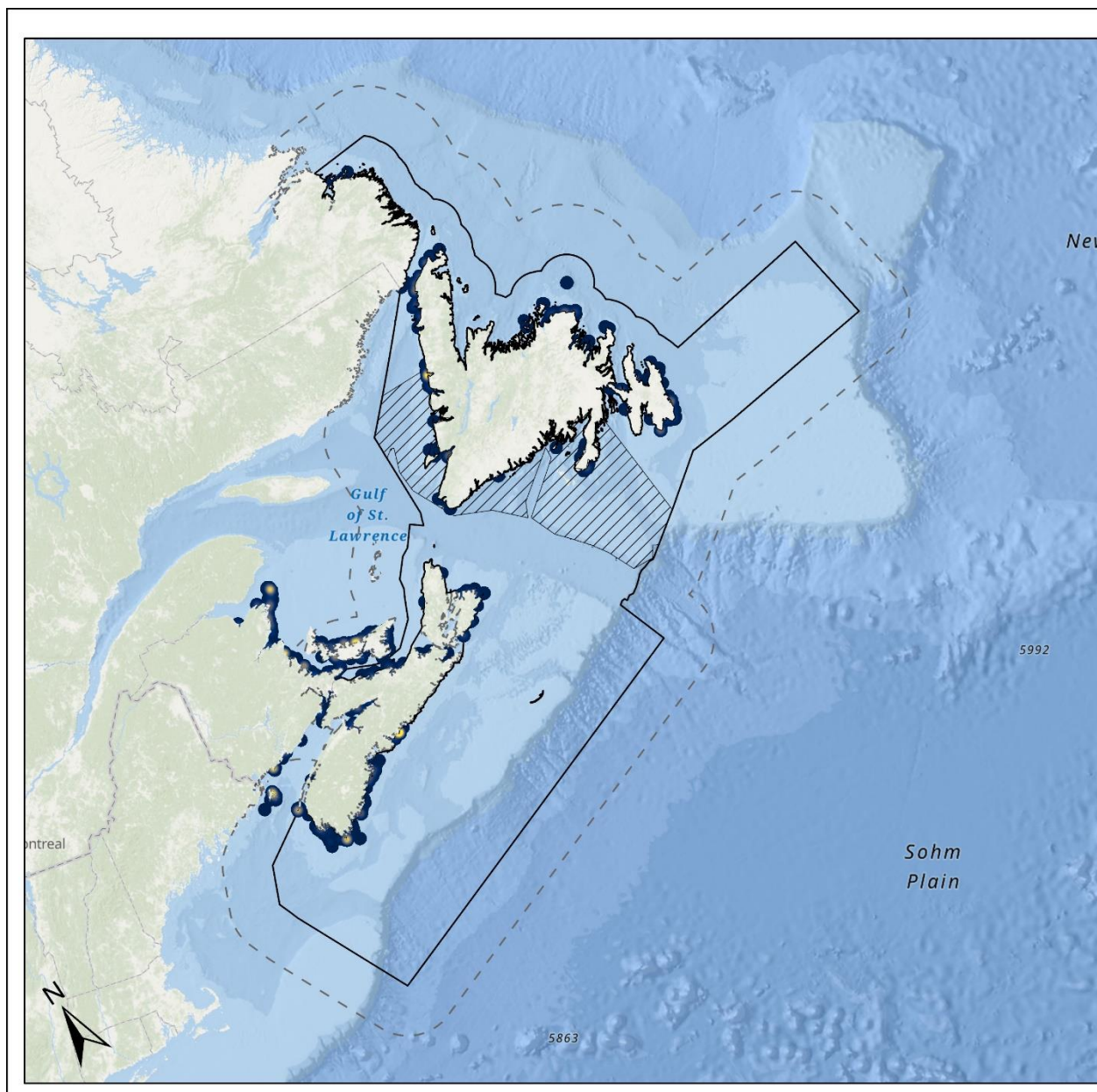



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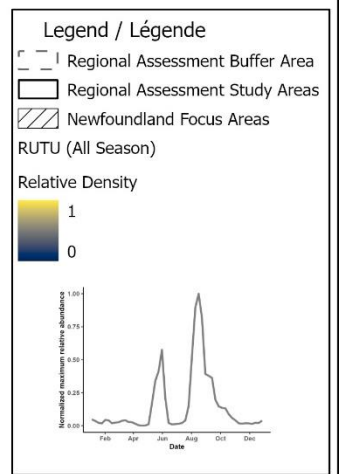

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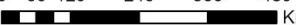
Relative Shorebird
Coastal Density

Ruddy Turnstone

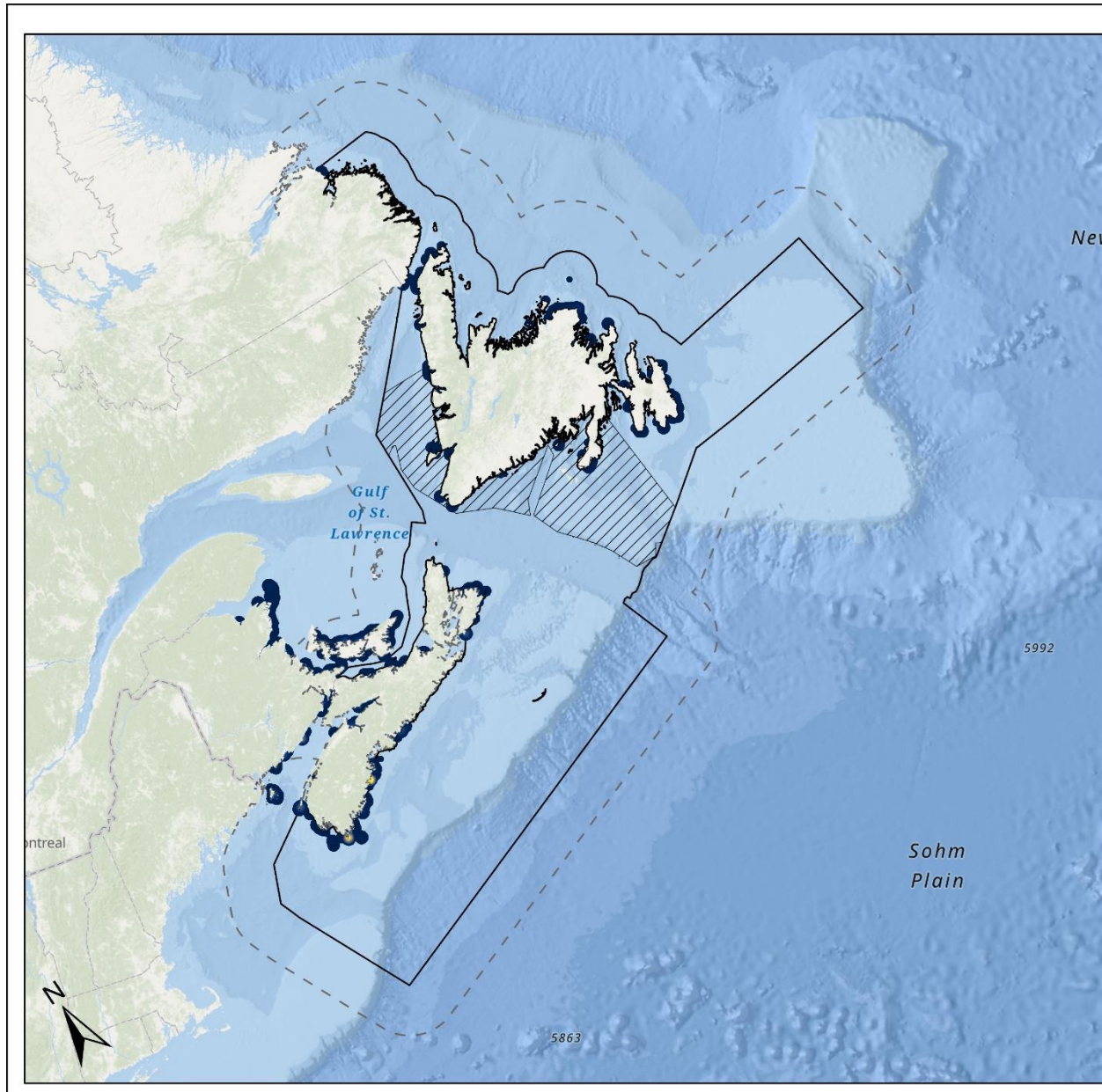



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Relative Shorebird
 Coastal Density

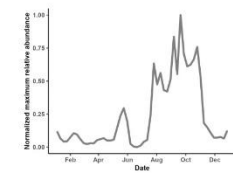
Sanderling

Legend / Légende

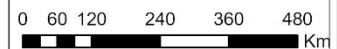
-  Regional Assessment Buffer Area
-  Regional Assessment Study Areas
-  Newfoundland Focus Areas

SAND (All Season)

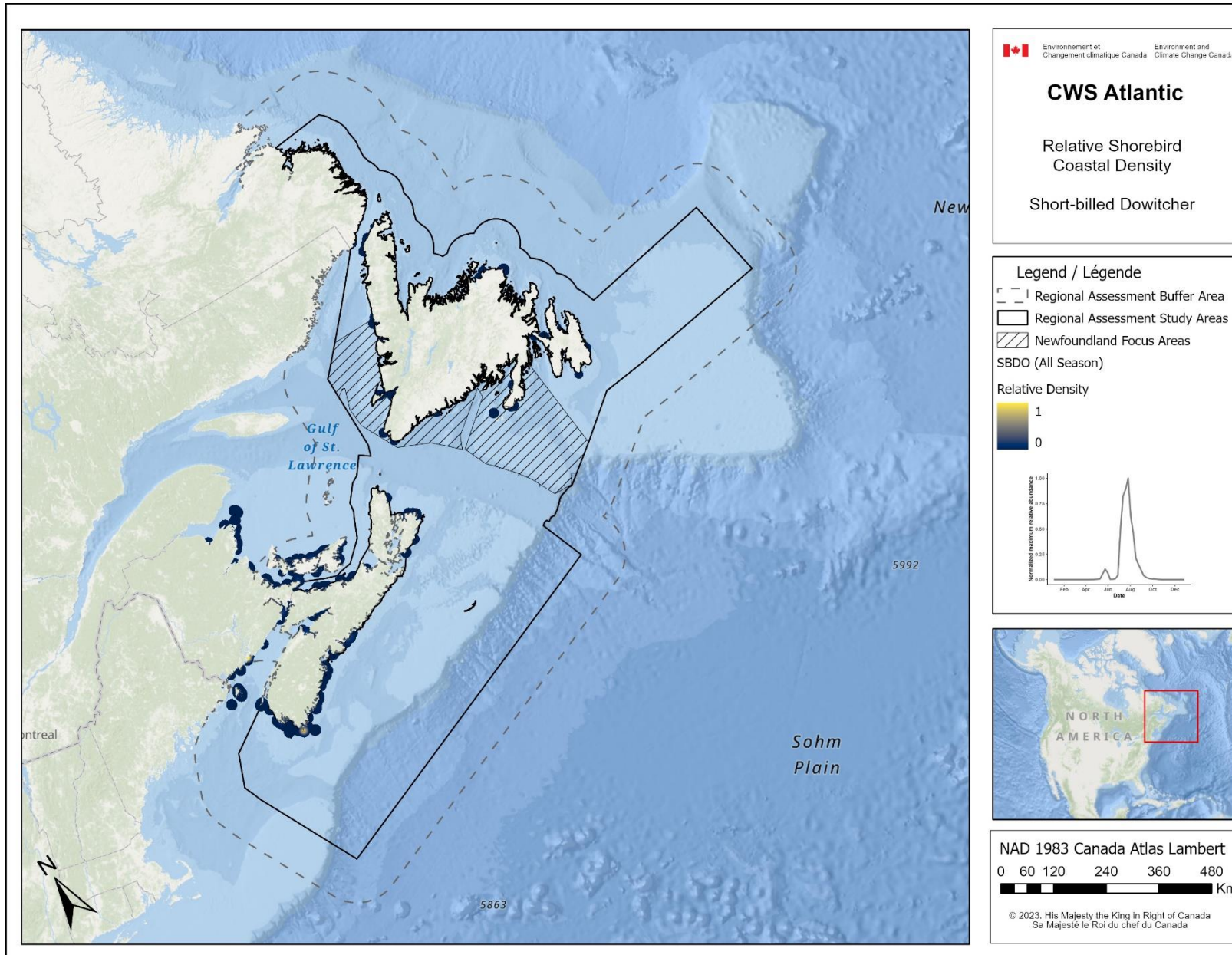
Relative Density

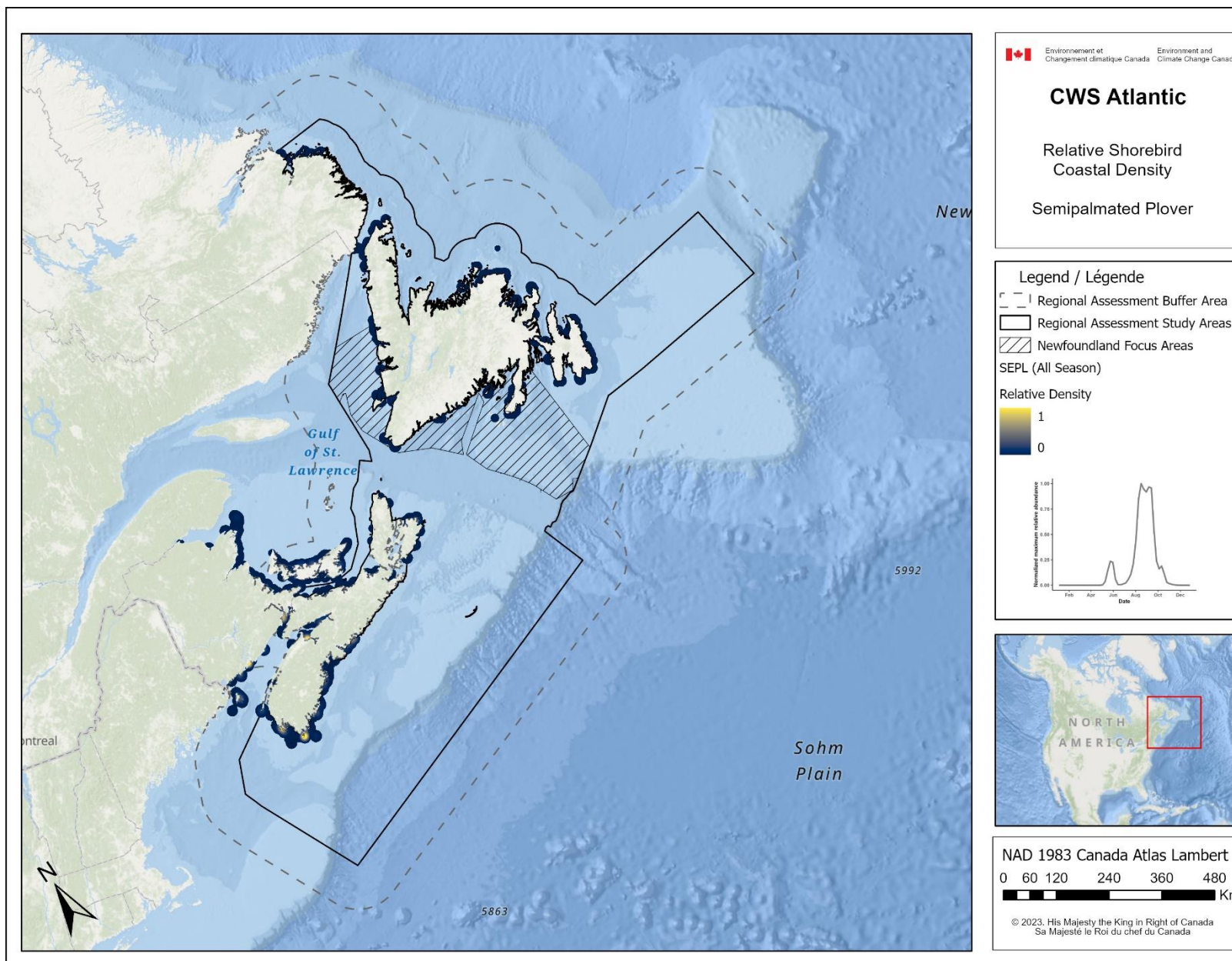


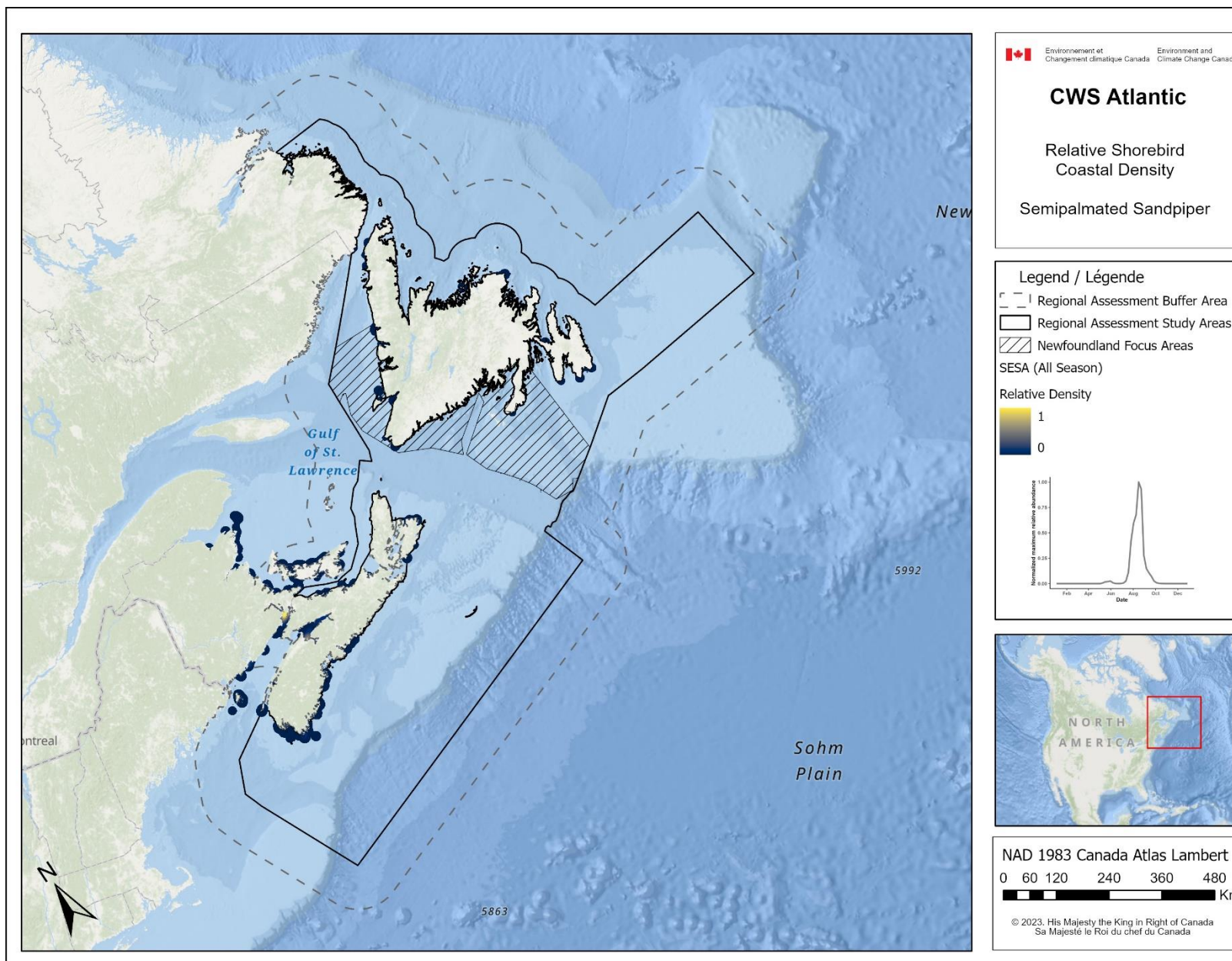
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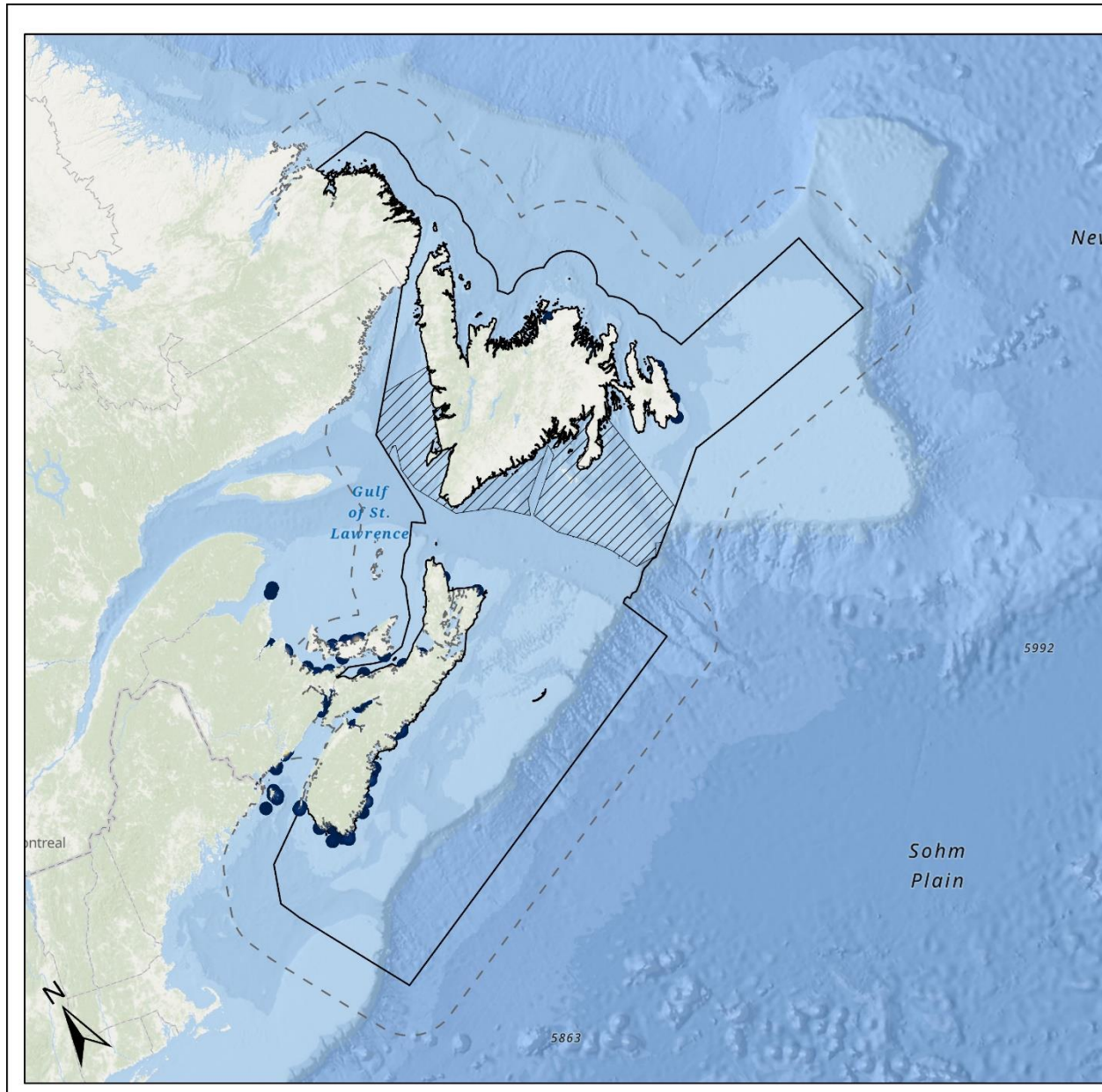



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CWS Atlantic

Relative Shorebird
Coastal Density

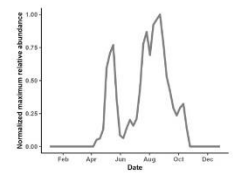
Solitary Sandpiper

Legend / Légende

-  Regional Assessment Buffer Area
-  Regional Assessment Study Areas
-  Newfoundland Focus Areas

SOSA (All Season)

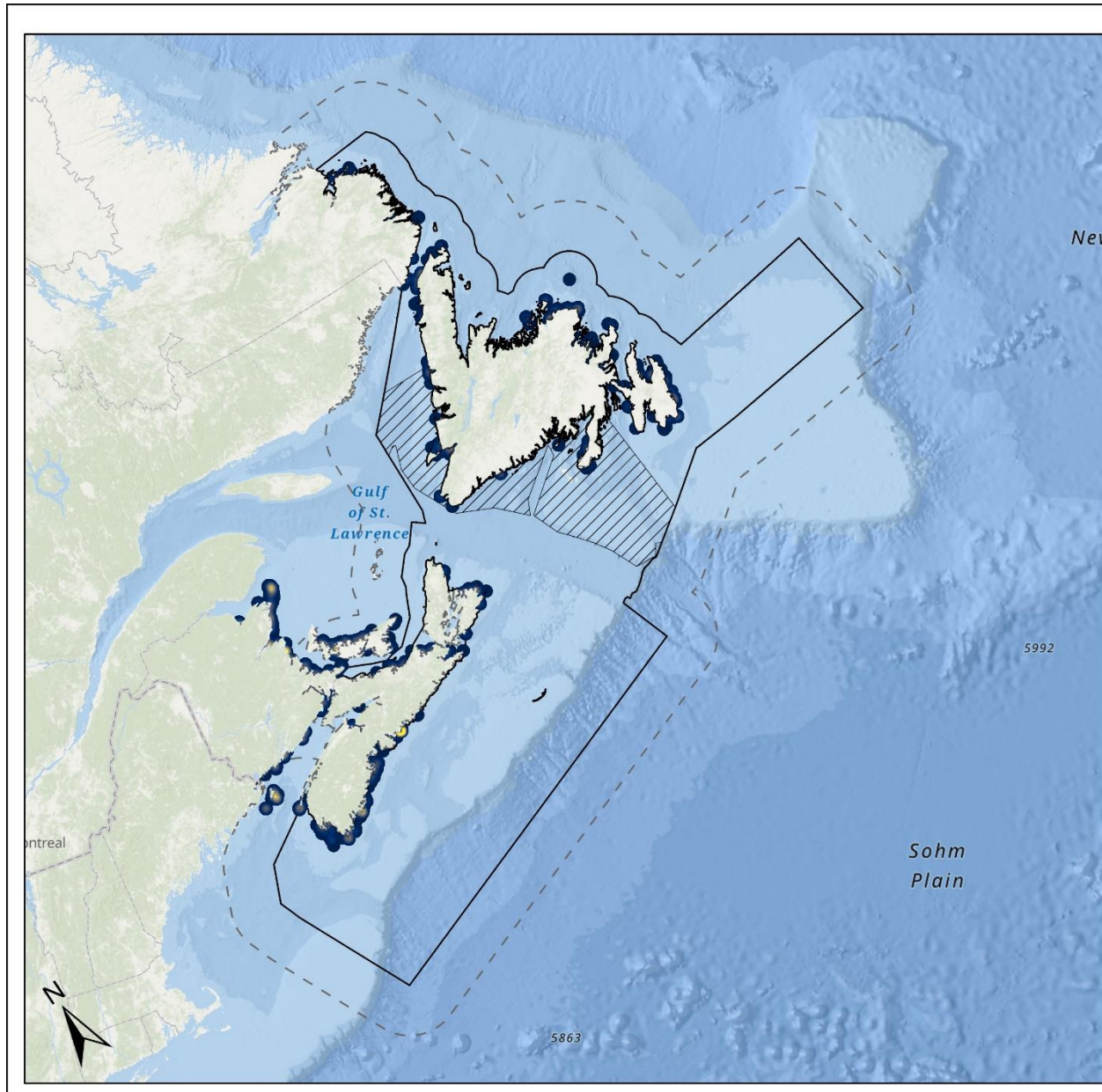
Relative Density




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CWS Atlantic

Relative Shorebird
Coastal Density

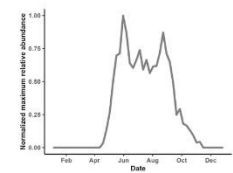
Spotted Sandpiper

Legend / Légende

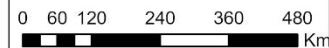
-  Regional Assessment Buffer Area
-  Regional Assessment Study Areas
-  Newfoundland Focus Areas

SPSA (All Season)

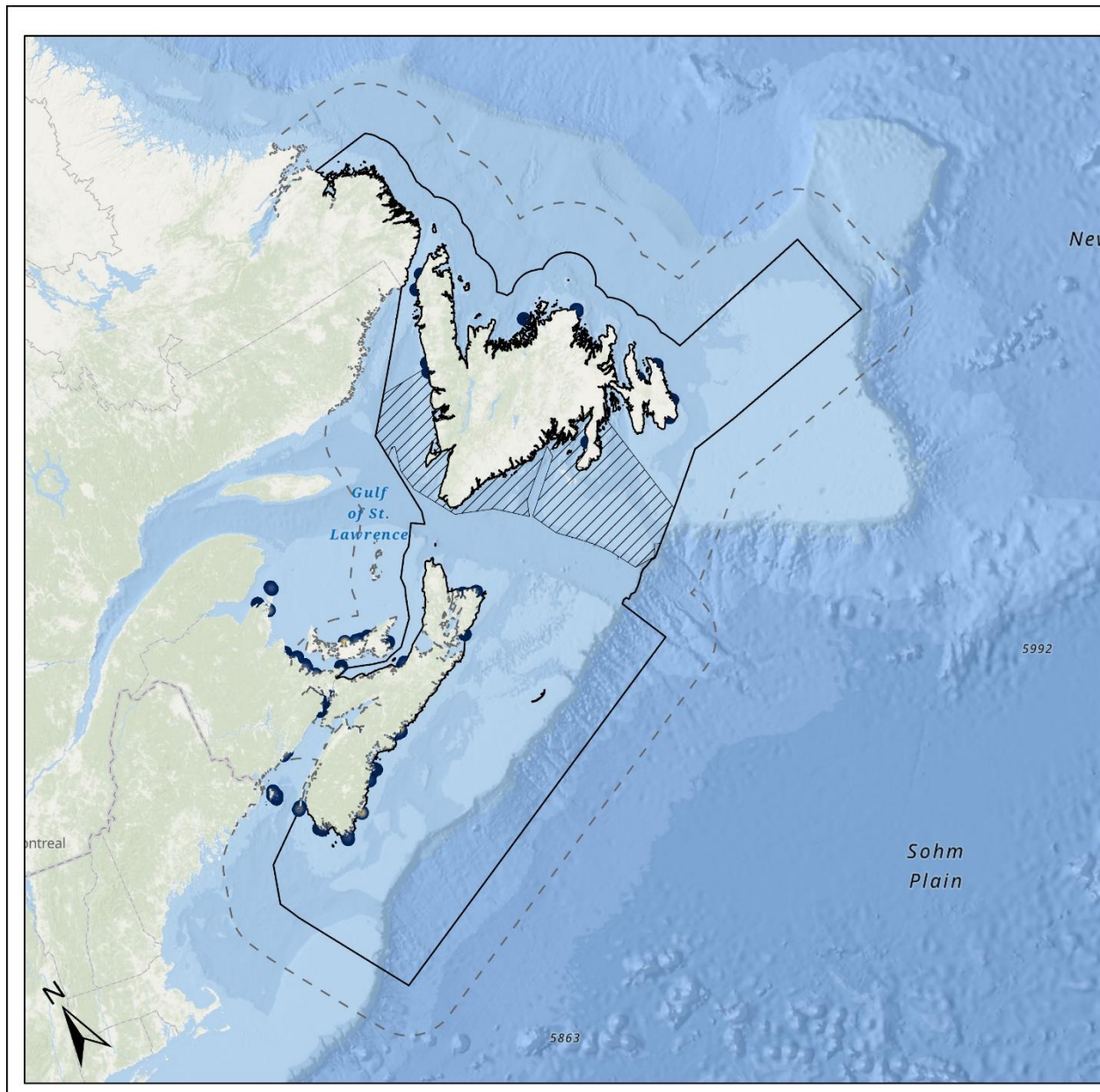
Relative Density




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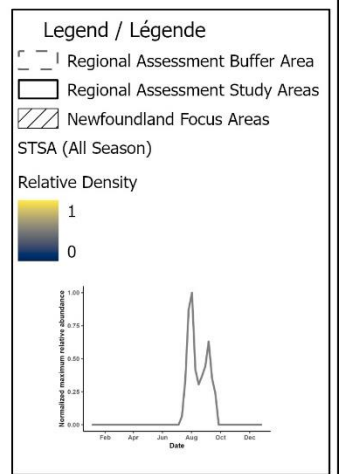

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CWS Atlantic

Relative Shorebird
Coastal Density

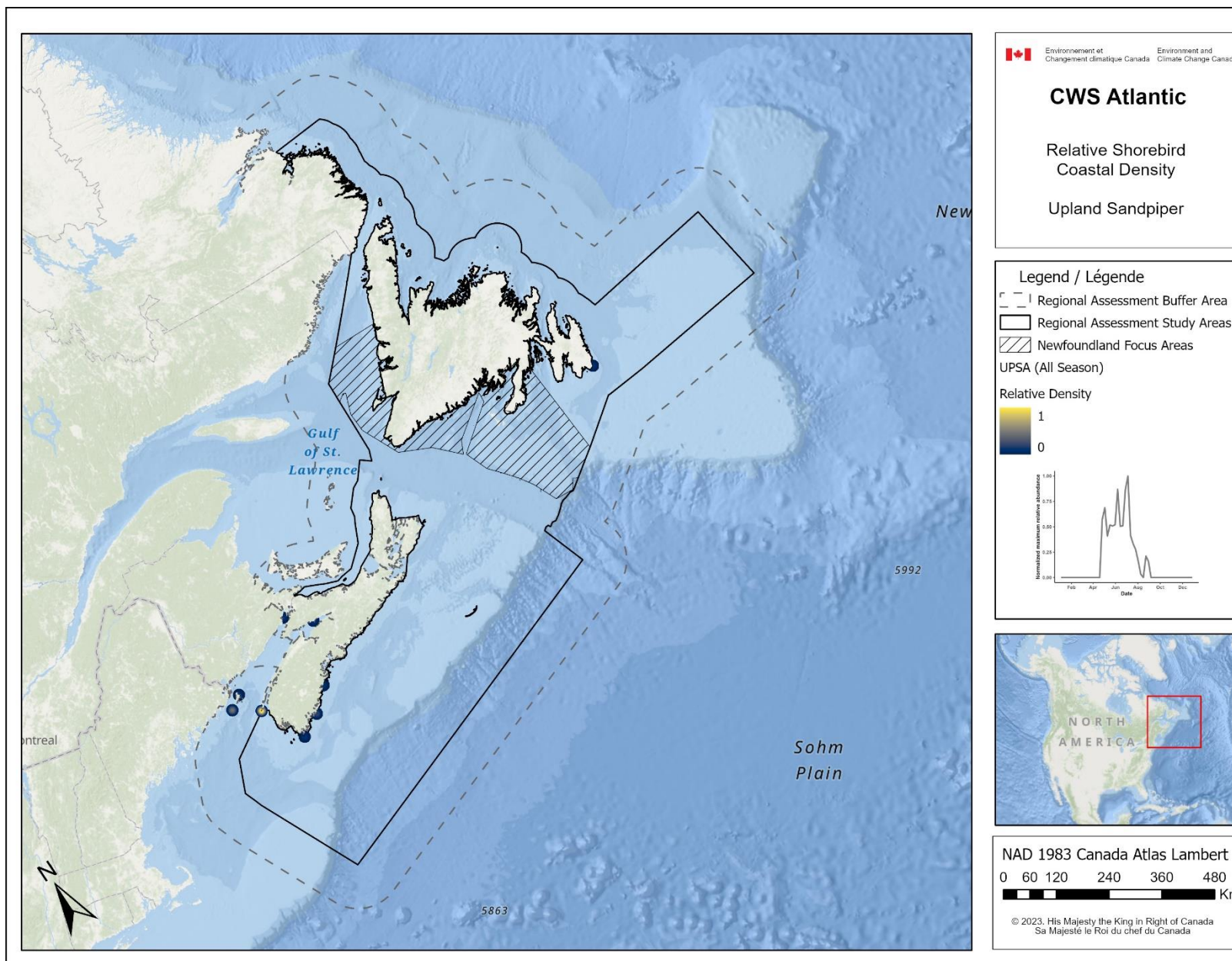
Stilt Sandpiper

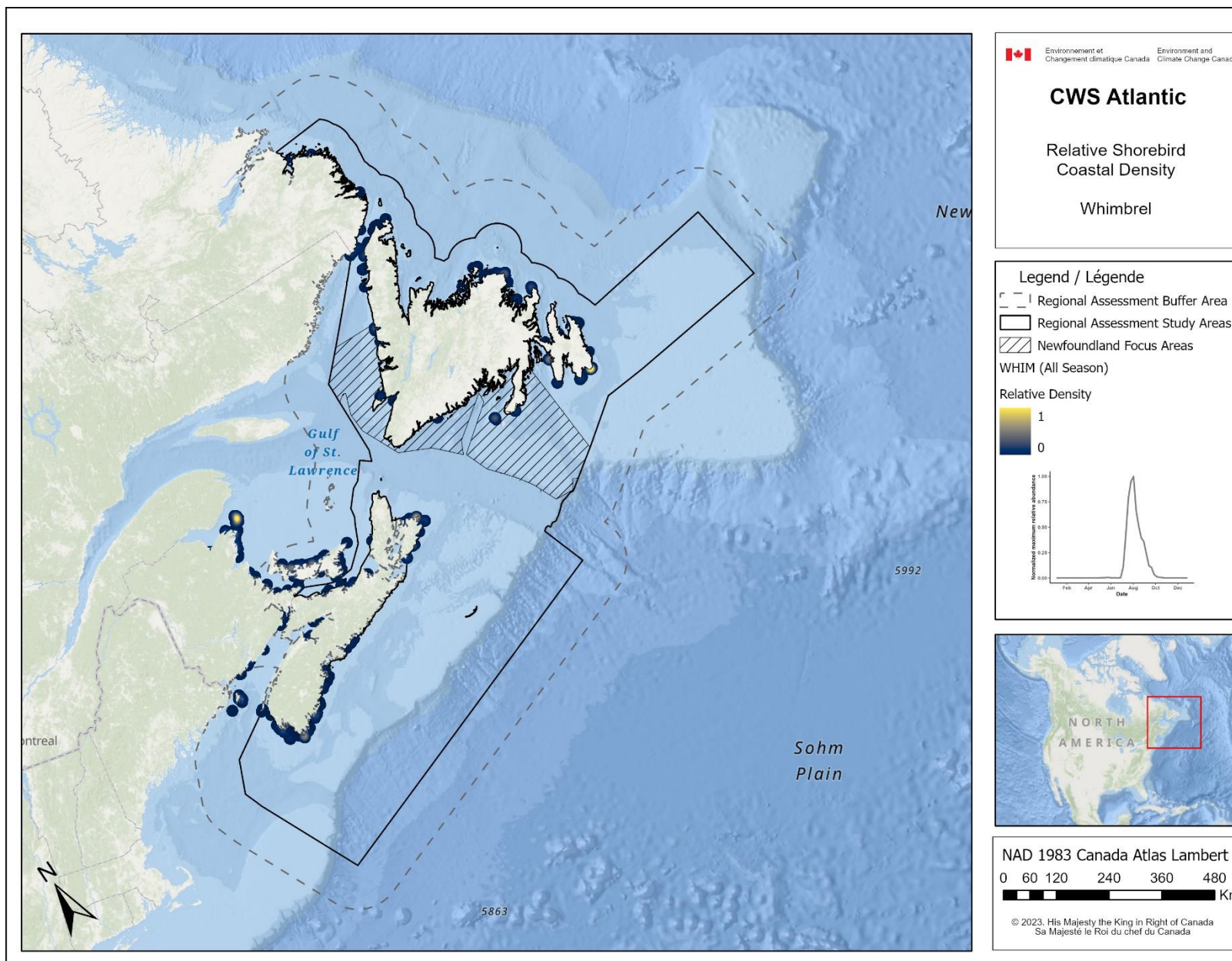


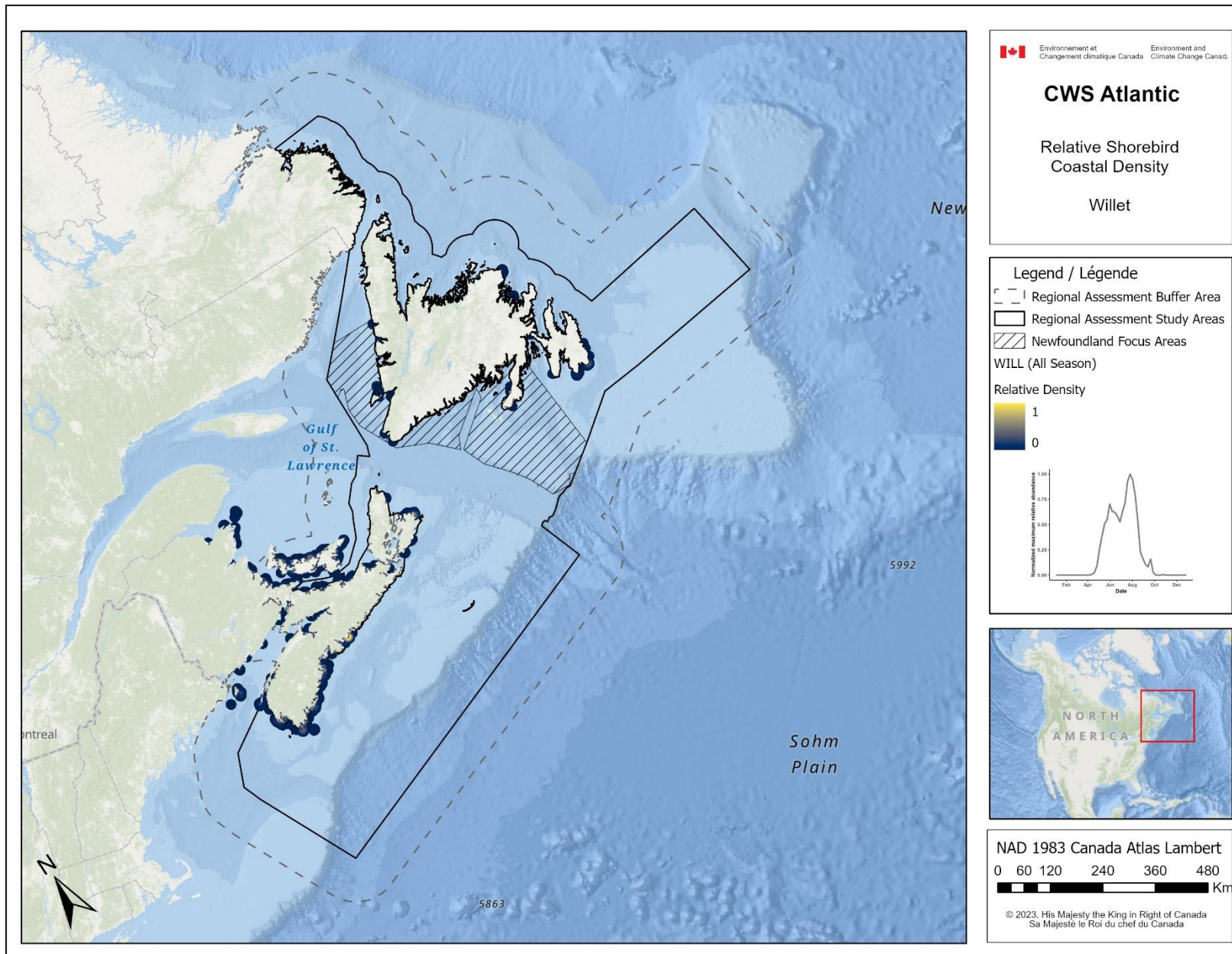
NAD 1983 Canada Atlas Lambert

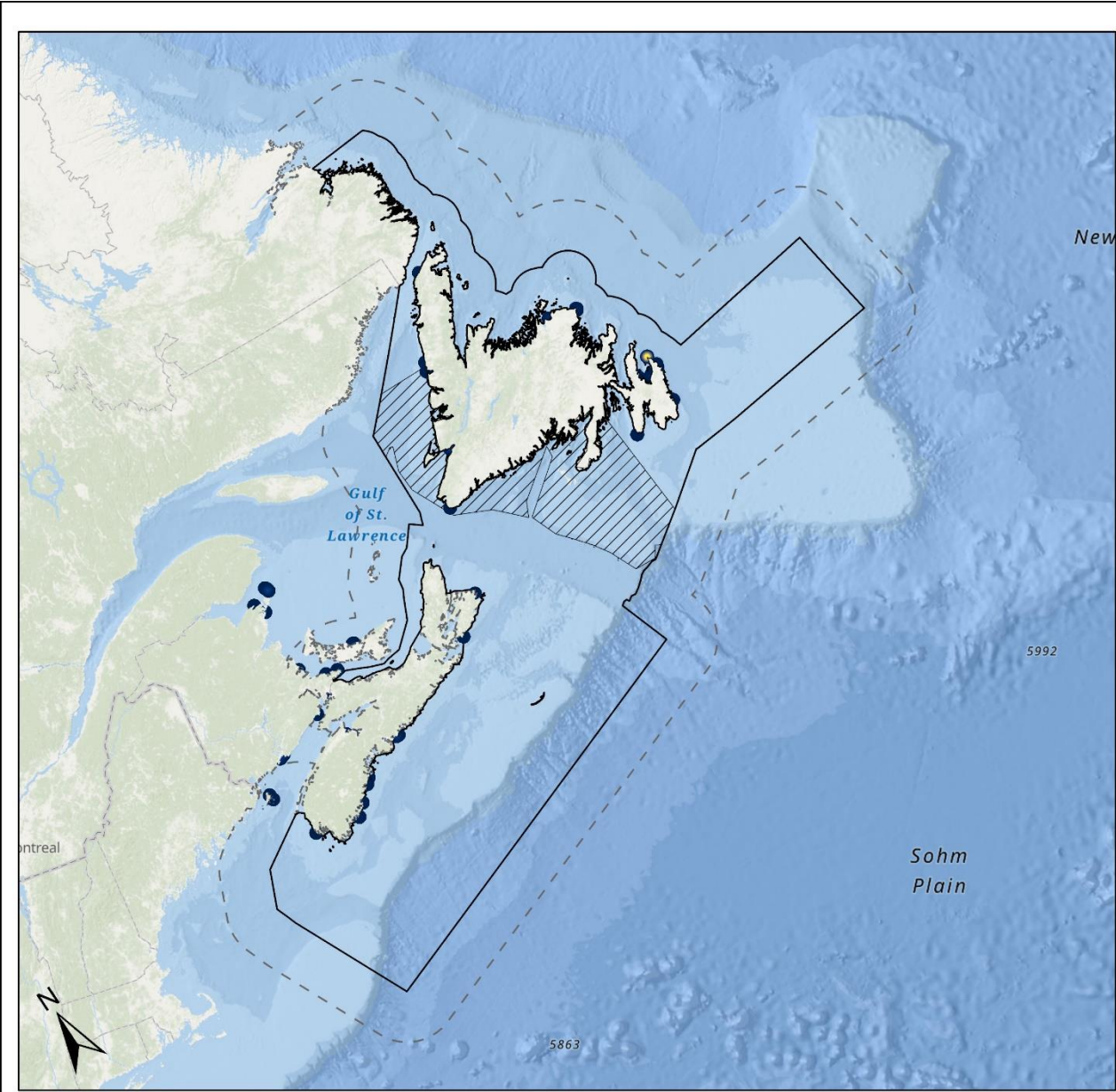
0 60 120 240 360 480 Km

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CWS Atlantic

Relative Shorebird
Coastal Density

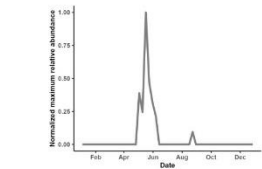
Wilson's Phalarope

Legend / Légende

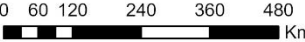
- Regional Assessment Buffer Area
- Regional Assessment Study Areas
- Newfoundland Focus Areas

WIPH (All Season)

Relative Density



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