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Agenda Item 5.1: **Pollution, noise pollution, disturbance**

Report on Information on Seismic Survey Activities by the United Kingdom 2004-2005

Submitted by: **United Kingdom**

NOTE:
IN THE INTERESTS OF ECONOMY, DELEGATES ARE KINDLY REMINDED TO BRING THEIR OWN COPIES OF THESE DOCUMENTS TO THE MEETING

Department of Trade and Industry

Report

on

Information on Seismic Survey Activities by the United Kingdom 2004-2005

Working paper

March 2006

Department of Trade and Industry
Licensing and Consents Unit
Offshore Environment and Decommissioning

CONTENTS

1 INTRODUCTION

The United Kingdom is a Party to The Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS).

ASCOBANS has *inter alia* been developing its approach to the conservation of small cetaceans with respect to seismic surveys. This includes requesting Parties to introduce mitigation measures, such as those used in the UK and commended by ASCOBANS, and to introduce monitoring systems and also inviting Parties to report on high energy seismic surveys. Currently, the UK reports all seismic surveys via the UKDEAL portal (www.ukdeal.co.uk).

At the 12th meeting of the Advisory Committee to ASCOBANS (March 2005), the UK presented data on 2D and 3D seismic survey activity in the UK maritime area for 1997-2003. This was in accordance with agreements reached at the 7th meeting of the Advisory Committee to ASCOBANS (March 2000) and at the 4th Meeting of the Parties in the Report of Working Group II (August 2003).

The following agreed information is collected and reported:

- Shot point density information per 1º by 1º rectangle
- Data resolved for each month
- Size/power of survey gun (if easily obtainable)
- Use of marine mammal observers (if easily obtainable)

This report continues the reporting of 2D and 3D seismic survey activity for 2004 and 2005. For previous years (1997-2003) reference should be made to the earlier UK submission.

2 BASIS OF CALCULATION

Shot point density is obtained by dividing the number of seismic shot points per quadrant by the offshore sea area within each quadrant up to the median line (land, islands and coastal waters are subtracted). Given this, and the curvature of lines of longitude, quadrants are all of varying sizes.

The following methodology is used to calculate shot point density.

- For 2D seismic surveys the average shot point interval is assumed to be 25 metres. This results in a shot point count of 40 SP/km.
- For 3D seismic surveys the average shot point interval is assumed to be 25 metres, with an average line spacing of 50 metres. This results in a shot point count of 800 SP/km^2. It is assumed that shot point density is uniform within the outline polygon of the survey area.

The 2D and 3D values were then added together for each quadrant and the shot point density calculated by dividing the number of shots per quadrant per year by the offshore area of each quadrant.

In addition to exploration surveys, 'site surveys' using airguns of less than 200 cubic inches are undertaken for purposes such as detecting shallow gas prior to siting a jackup rig. These surveys are not included in the reported figures as the airguns are small and the survey is of very short duration. They therefore do not qualify as 'high energy seismic surveys' under the ASCOBANS request.

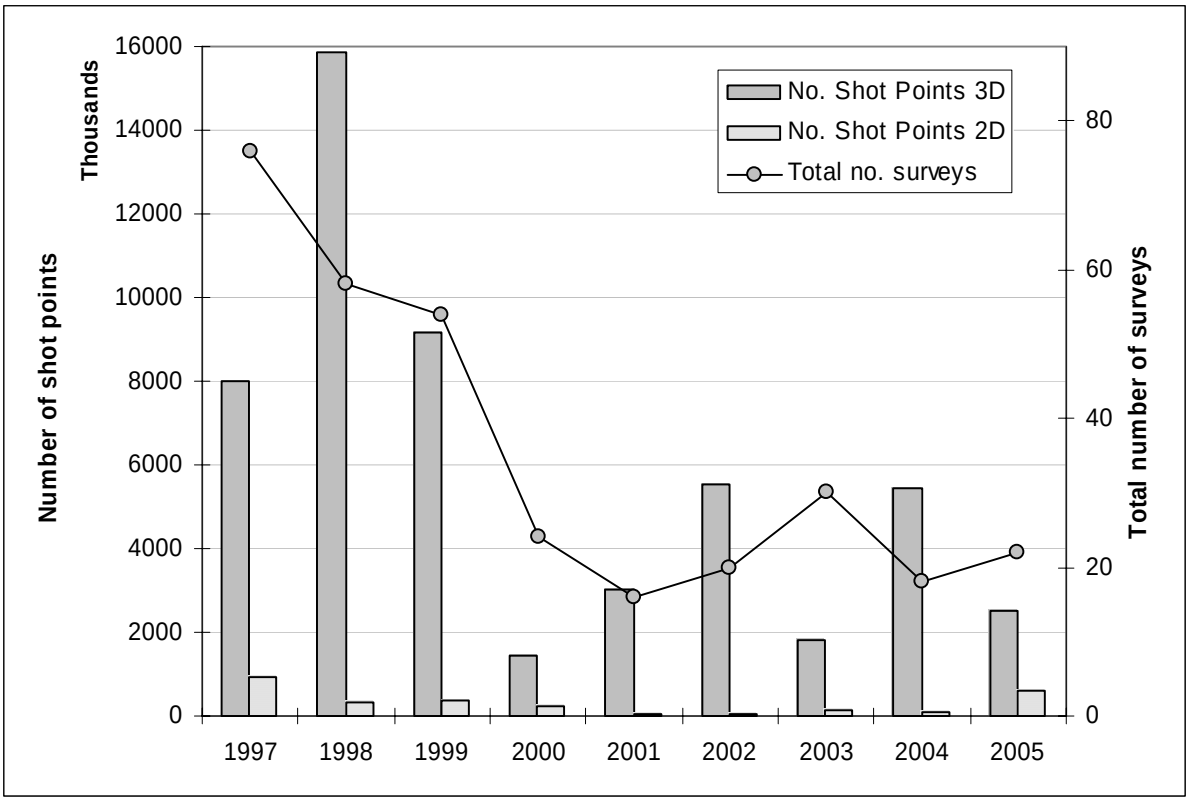
4D surveys are not captured in this report. In 2004/2005 there were eight 4D Seismic Surveys carried out in UK waters. 4D surveys are undertaken to monitor changes over time in oil and gas producing fields by looking at movement of oil and gas in the reservoir. The UK propose that for future reports, 4D seismic surveys should be reported using the same shot point density calculation as 3D seismic surveys resulting in a shot point count of 800 SP/km2.

3 RESULTS

3.1 Overall

A summary of 2D and 3D seismic survey activity is shown in **Figure 3-1**. The great majority of survey activity (measured by shot points) is 3D. Activity has fallen overall over this 9-year period but it is clearly very variable year-on-year. There is no obvious correlation between the number of surveys and the number of shot points, indicating that survey size is also very variable.

Figure 3-1 Overview of survey activity 1997-2005



The maximum shot point density over a quadrant over an entire year was 269 SP/km^2 in 2004 and 155 SP/km^2 in 2005.

3.2 Monthly analysis

Monthly plots of shot point density by quadrant have been constructed from the post-survey reports submitted to the DTI and JNCC. These are shown in **Appendix A**.

The maximum shot point density over a quadrant over a month was 97 SP/km^2 in 2004 and 93 SP/km^2 in 2005.

3.3 Data Gaps

Post-survey reports were not received for four consented surveys in 2004. These were 2D surveys and amounted to no more than 6% of the total of shot points for 2004.

Additionally, a further four surveys did not have complete reporting and have been included by estimating the SPs from the length of survey lines reported using the agreed assumptions of 2D - 40 SP/km, 3D - 800 SP/km^2 and also a density of 3 km/km^2 for 3D survey lines. The potential inaccuracy over the year's results is believed to be very small.

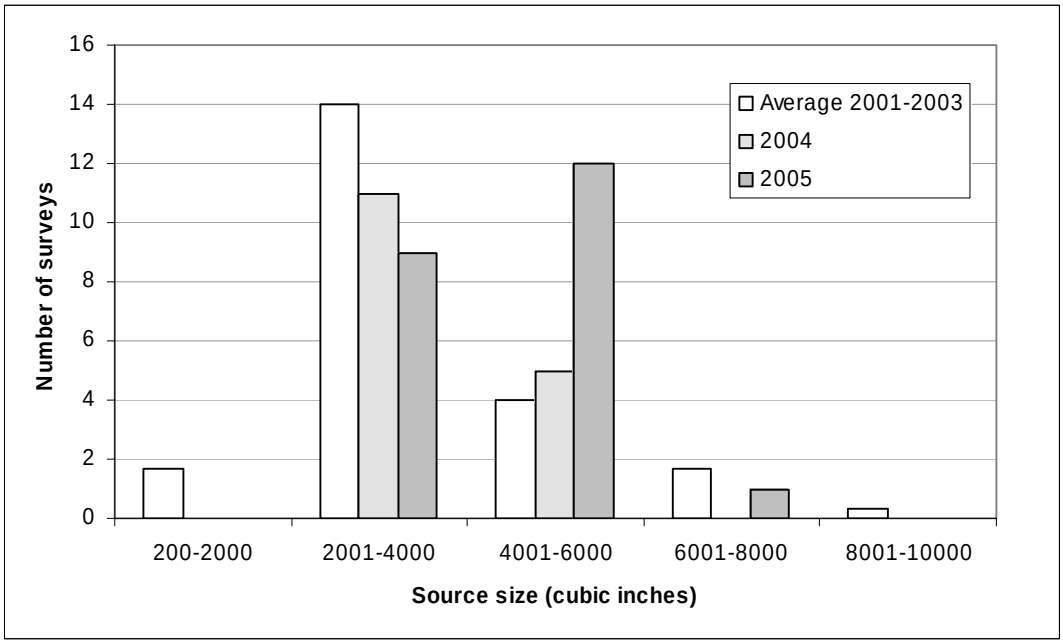
In 2005, all surveys are included with the exception of one survey that is still ongoing. Three surveys were conducted without consent and have been included by estimating the SPs using the same method as above, the potential inaccuracy of which is again believed to be very small.

3.4 Airgun power

Details of airgun power (measured by cubic inches) were taken from database of PON14 records (the form used to apply for permission to conduct a seismic survey) submitted to the DTI. Airgun sizes could not be ascertained for two of the surveys.

A histogram of the airgun sizes for 2004 and 2005 is shown in **Figure 3-2** alongside the average figures for 2001-2003 reported in the previous report. The most common size range has moved progressively from 2000-4000 up to 4000-6000 cubic inches. It is not known why this should be the case or whether the trend for larger airguns will continue.

Figure 3-2 Distribution of airgun sizes 2004-2005



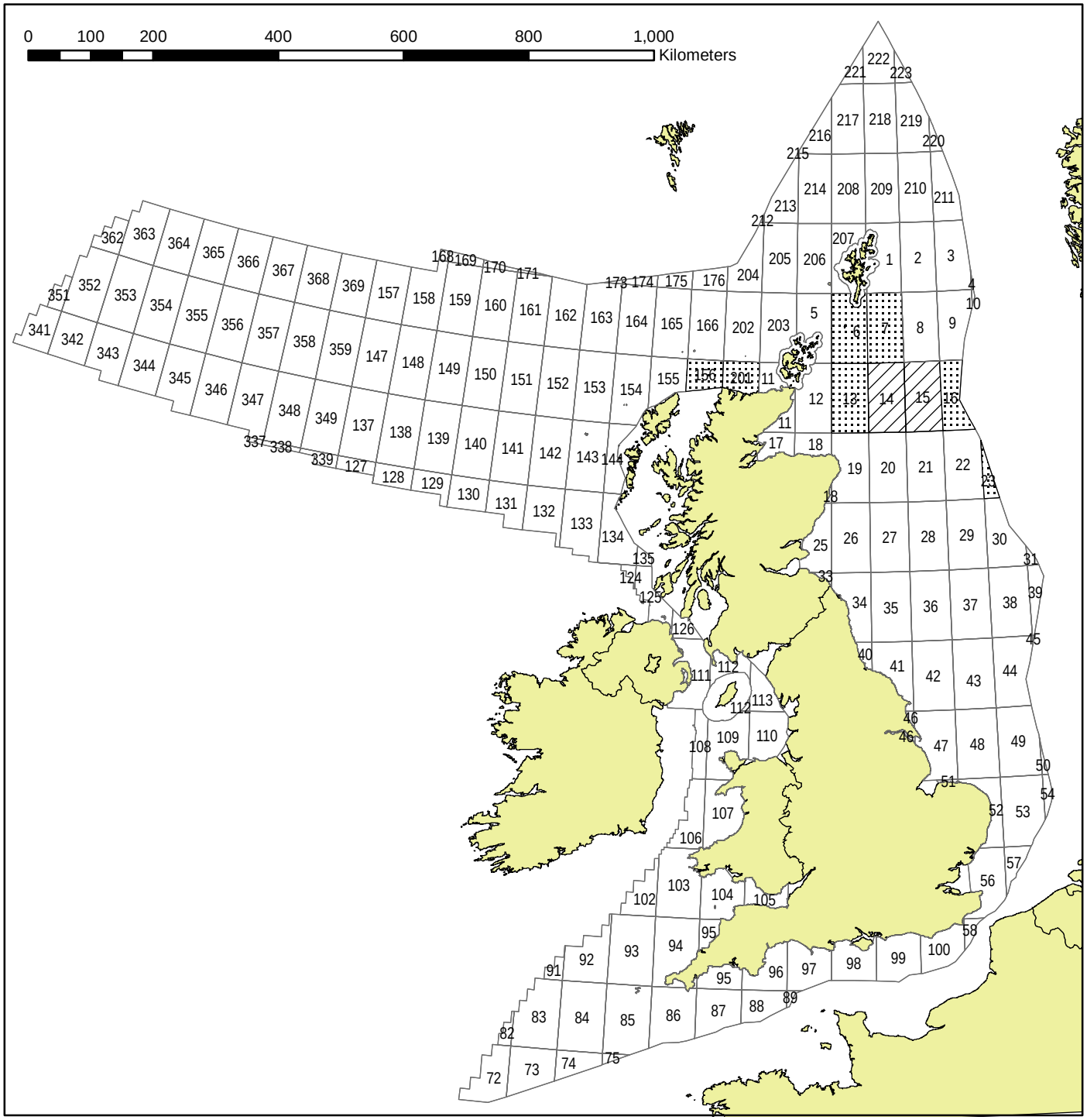
3.5 Use of Marine Mammal Observers

Recommendations for Marine Mammal Observers (MMOs) are generally based on the size of the airguns being used (MMOs are seldom recommended for surveys <500 ci) and on the sensitivity of the location.

Incidence of MMOs taken from the database of PON14 forms submitted to the DTI for 2004-2005 showed that MMOs were recommended for all surveys except one in 2004 and all surveys except one in 2005.

However, this data is from the application forms rather than the post-survey reports, and more accurate data on MMO incidence can be found in the periodic JNCC reviews of seismic activity, the last being Stone, C J (2003) (The effects of seismic activity on marine mammals in UK waters, 1998-2000, JNCC Report No. 323) covering 1998-2000.

APPENDIX A – MONTHLY SHOT POINT PLOTS

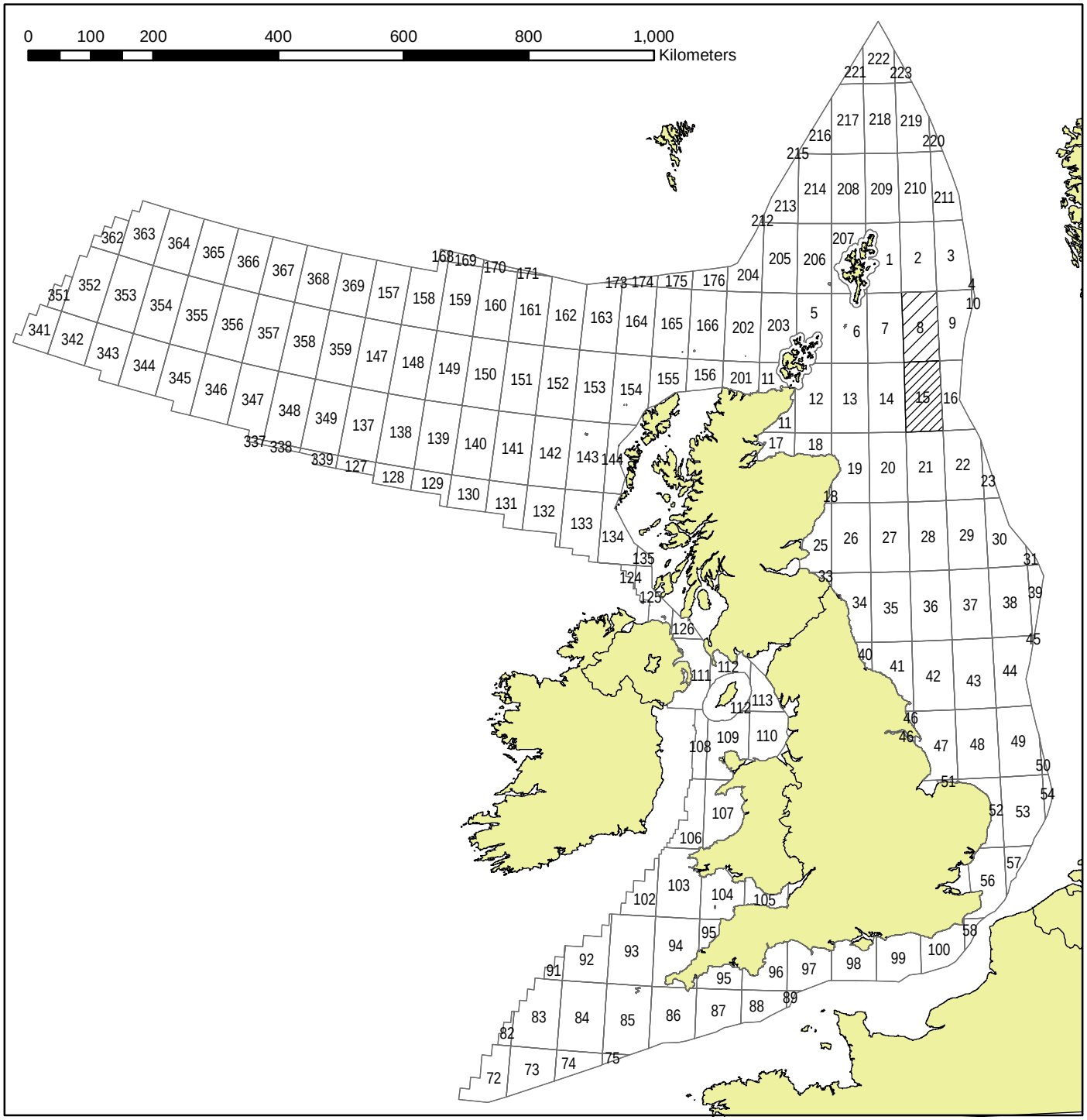


Legend

Shot Point Density SP/sq.km

- 0
- 0-2
- 2-10
- 10-50
- 50-100
- 100-200
- >200

United Kingdom
2D and 3D Seismic Survey Activity
January 2004



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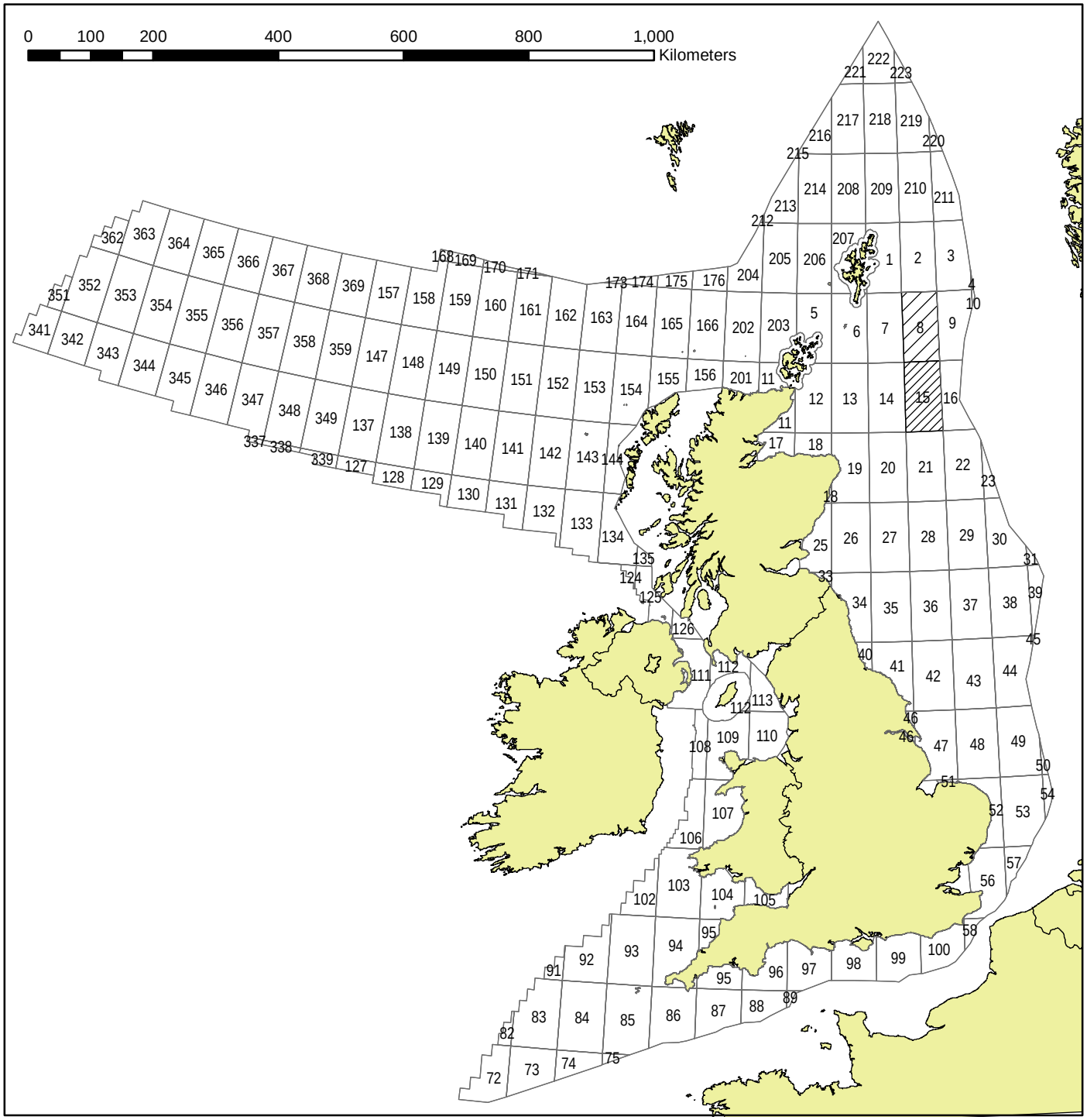

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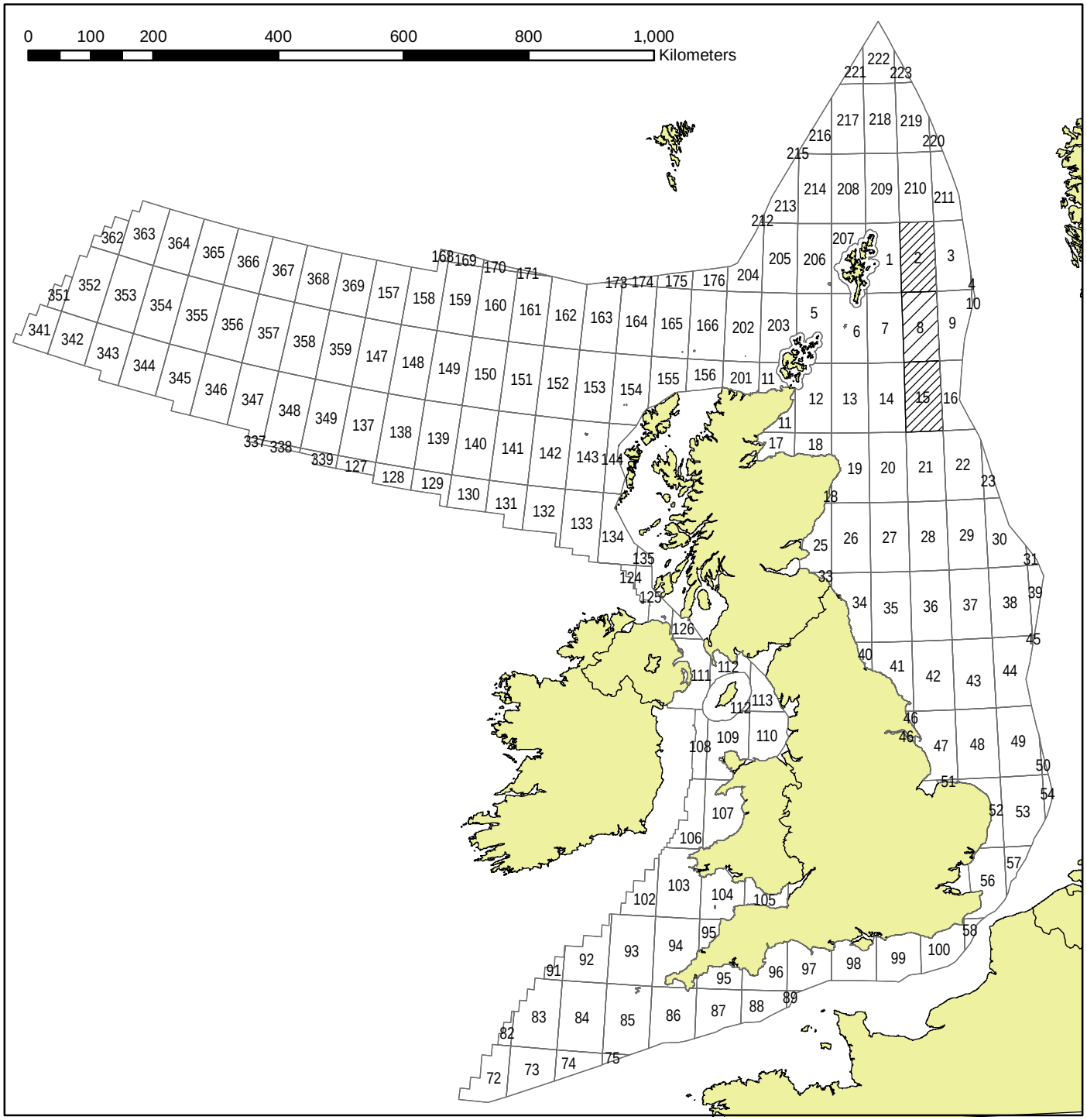

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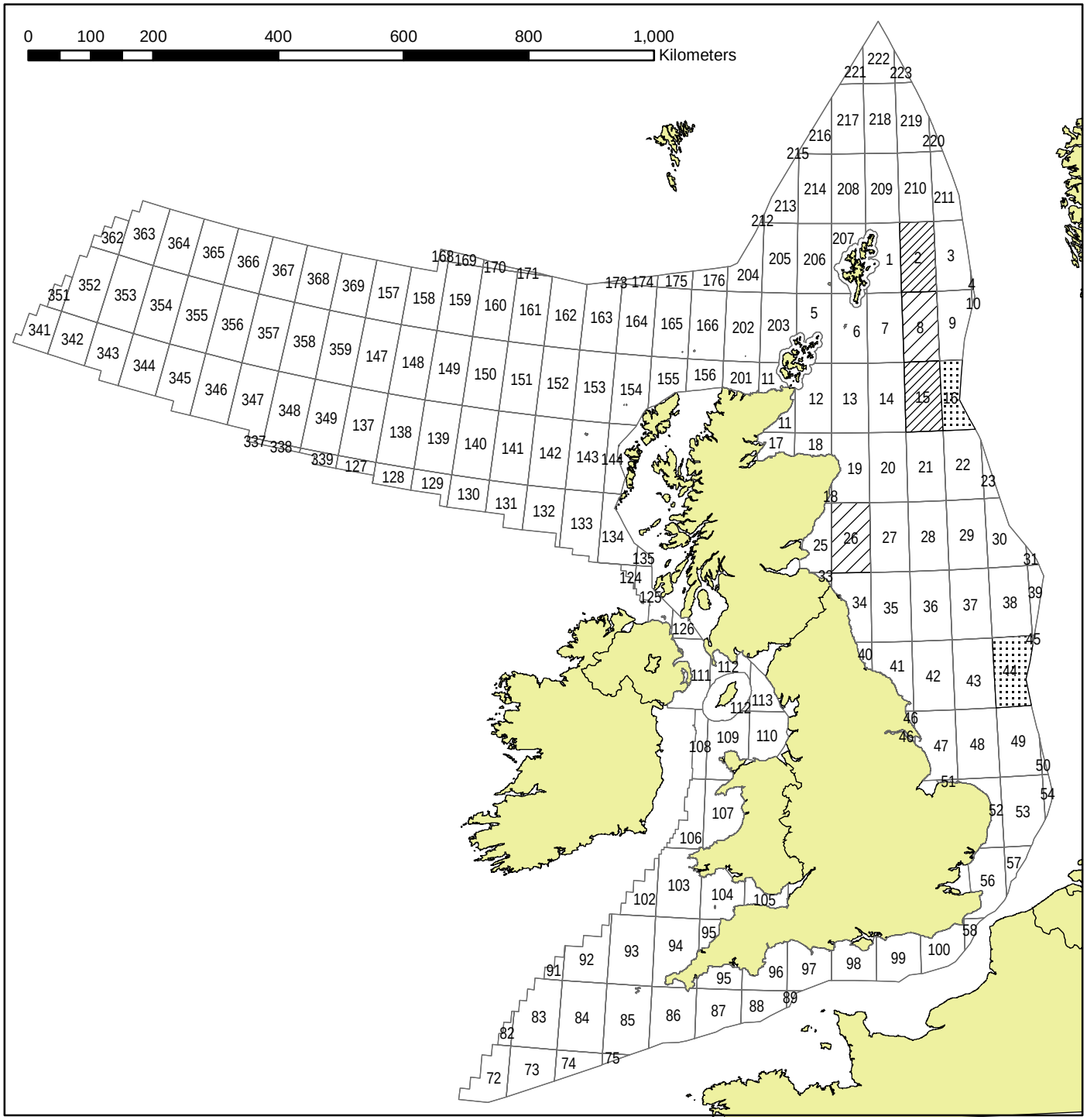

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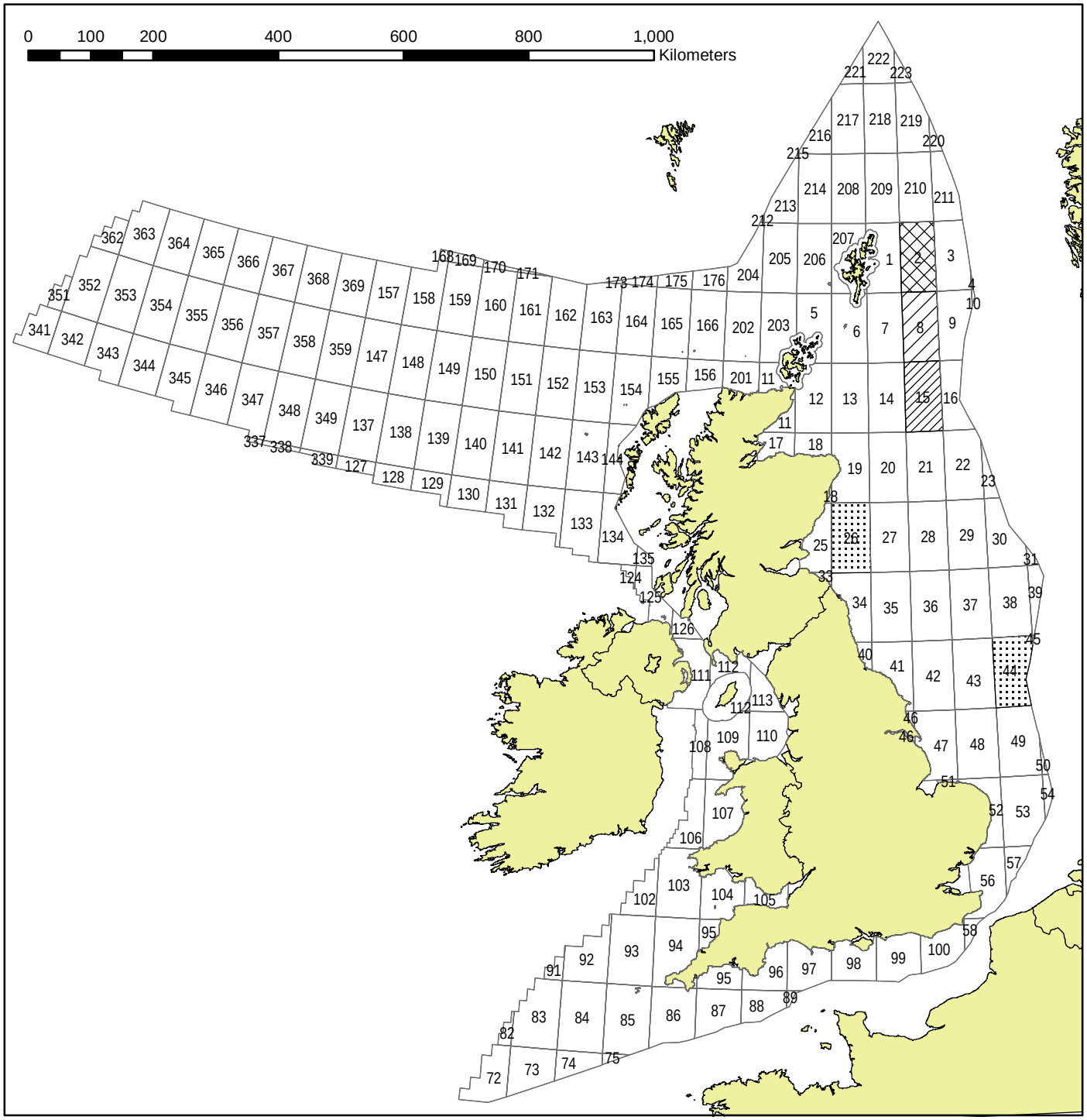

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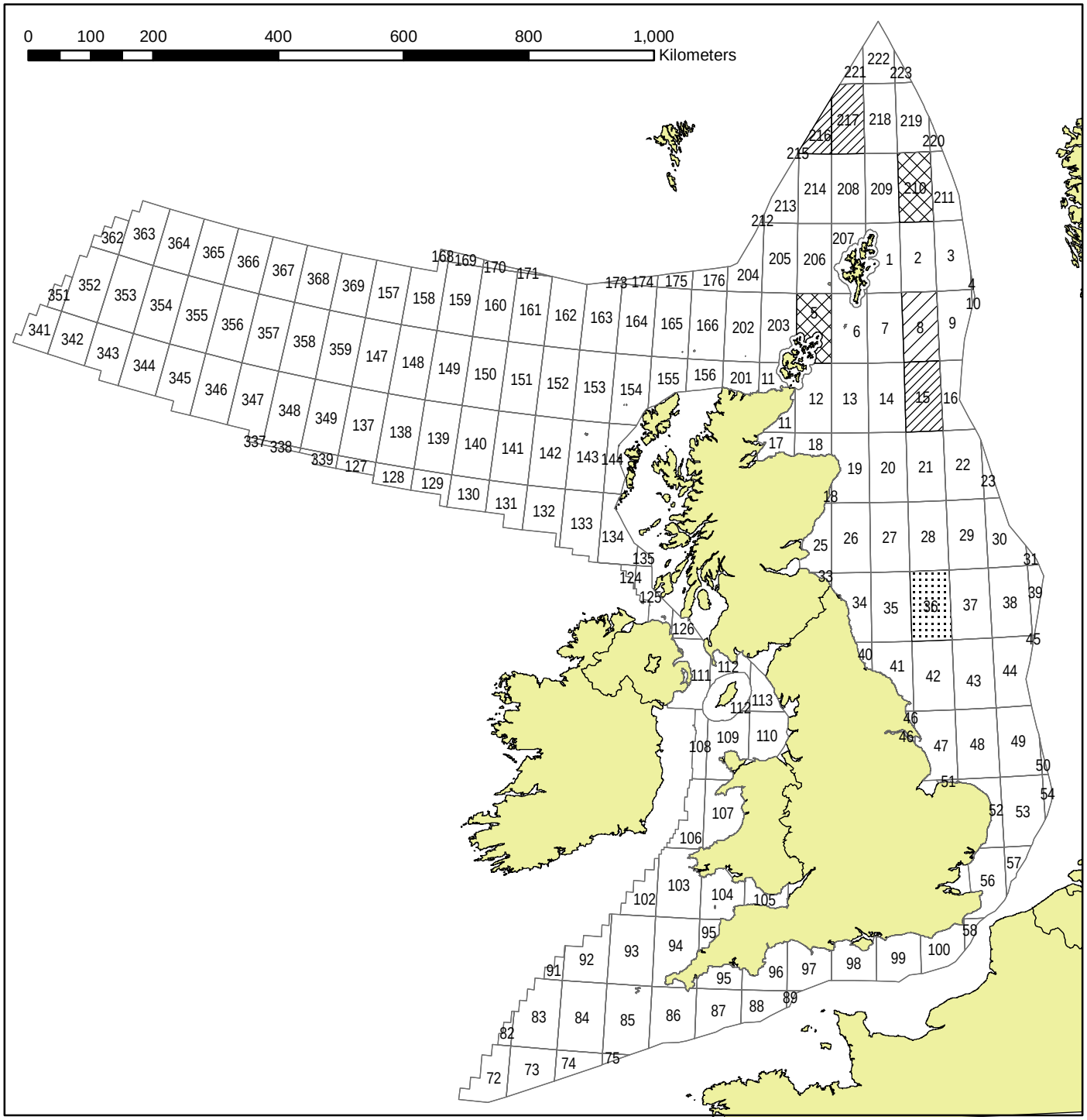

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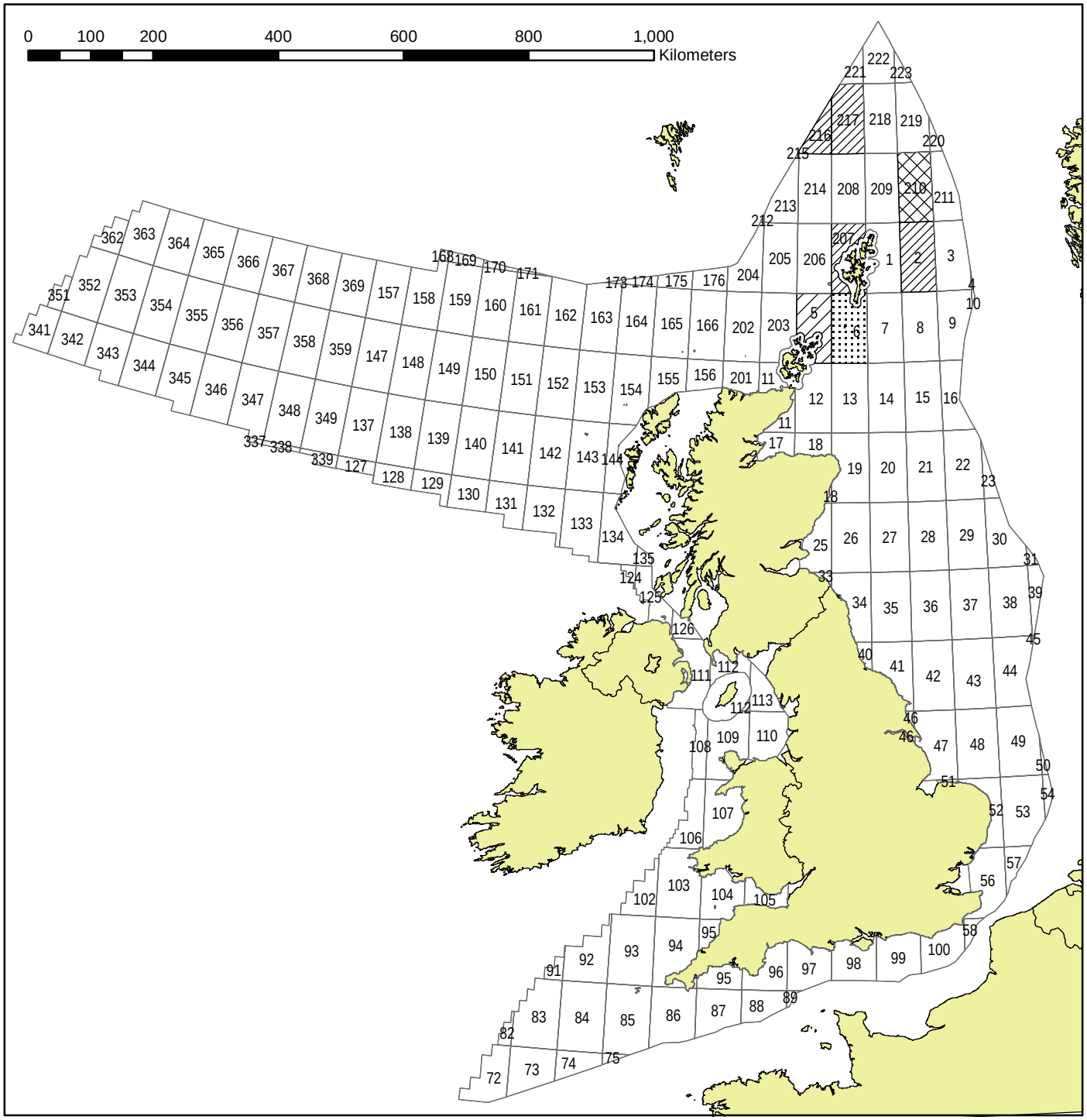

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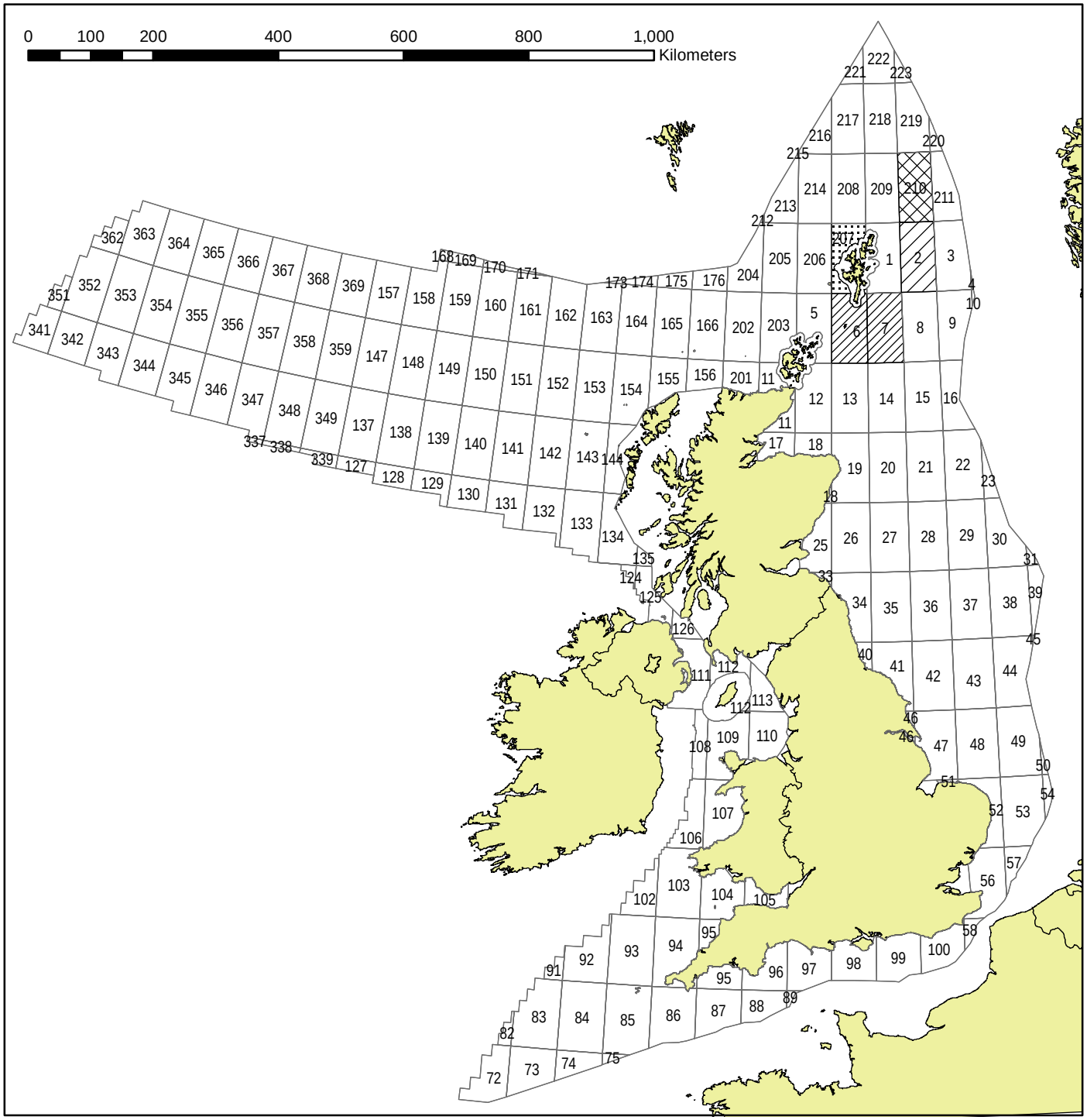

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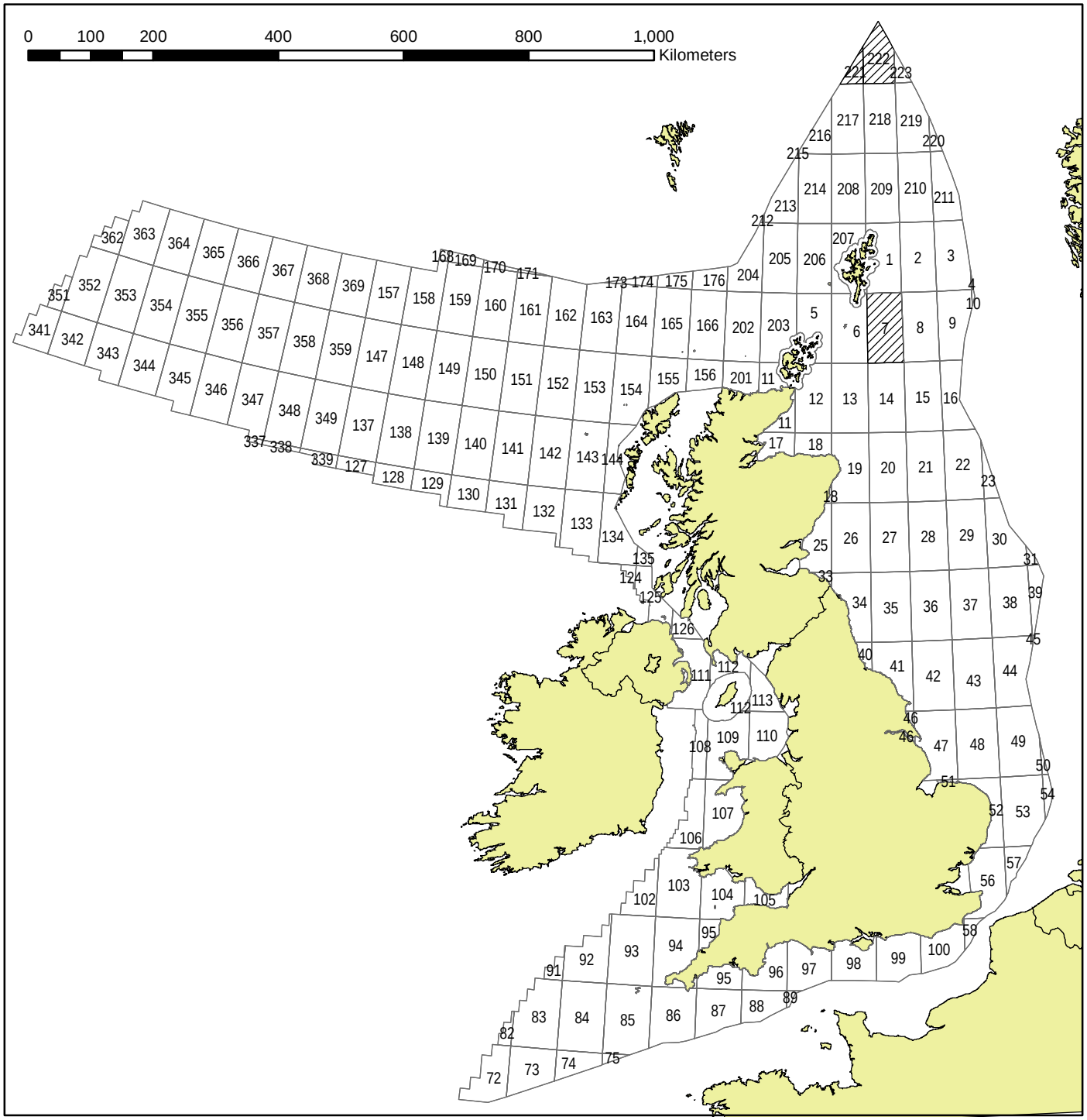

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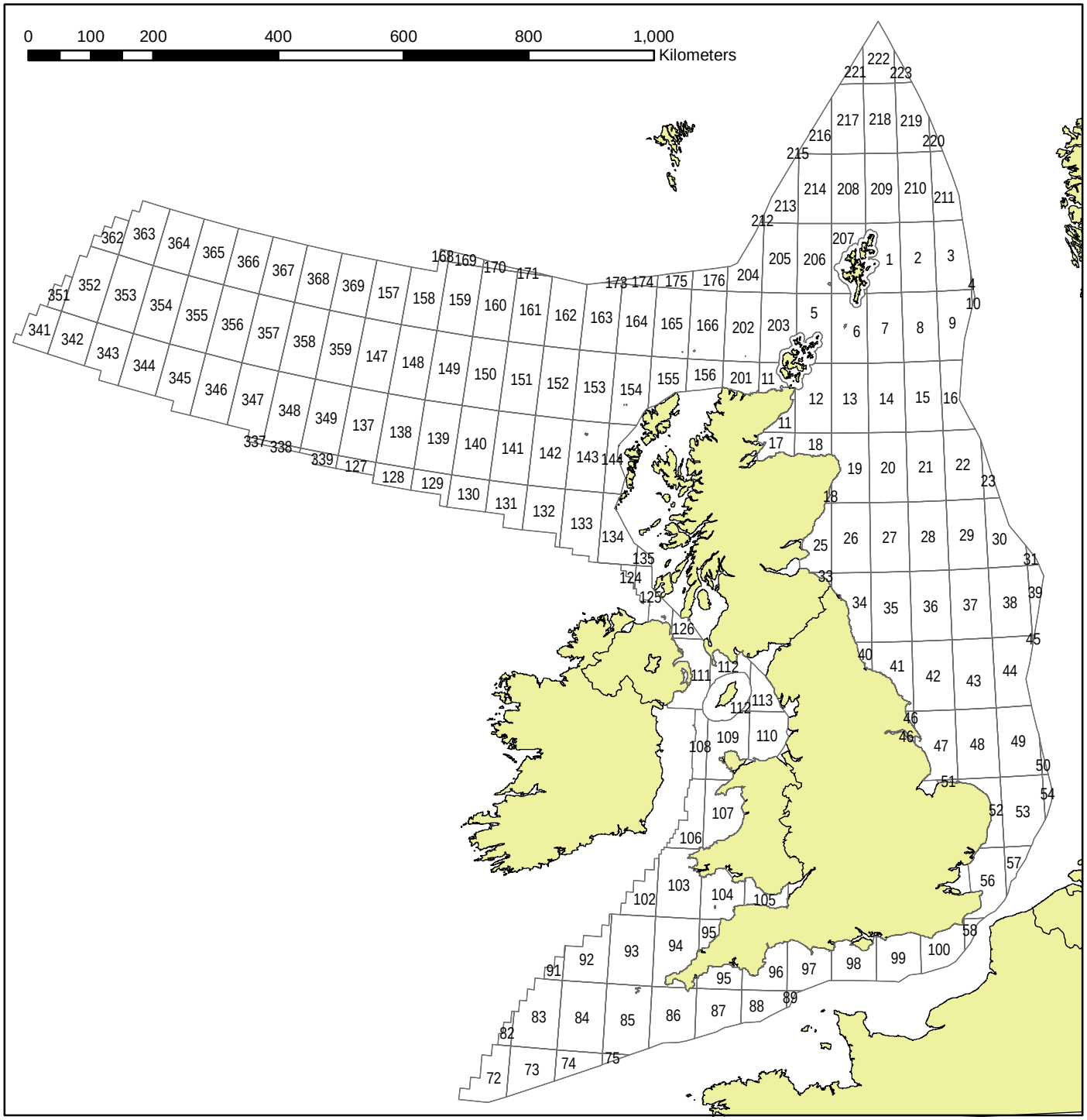

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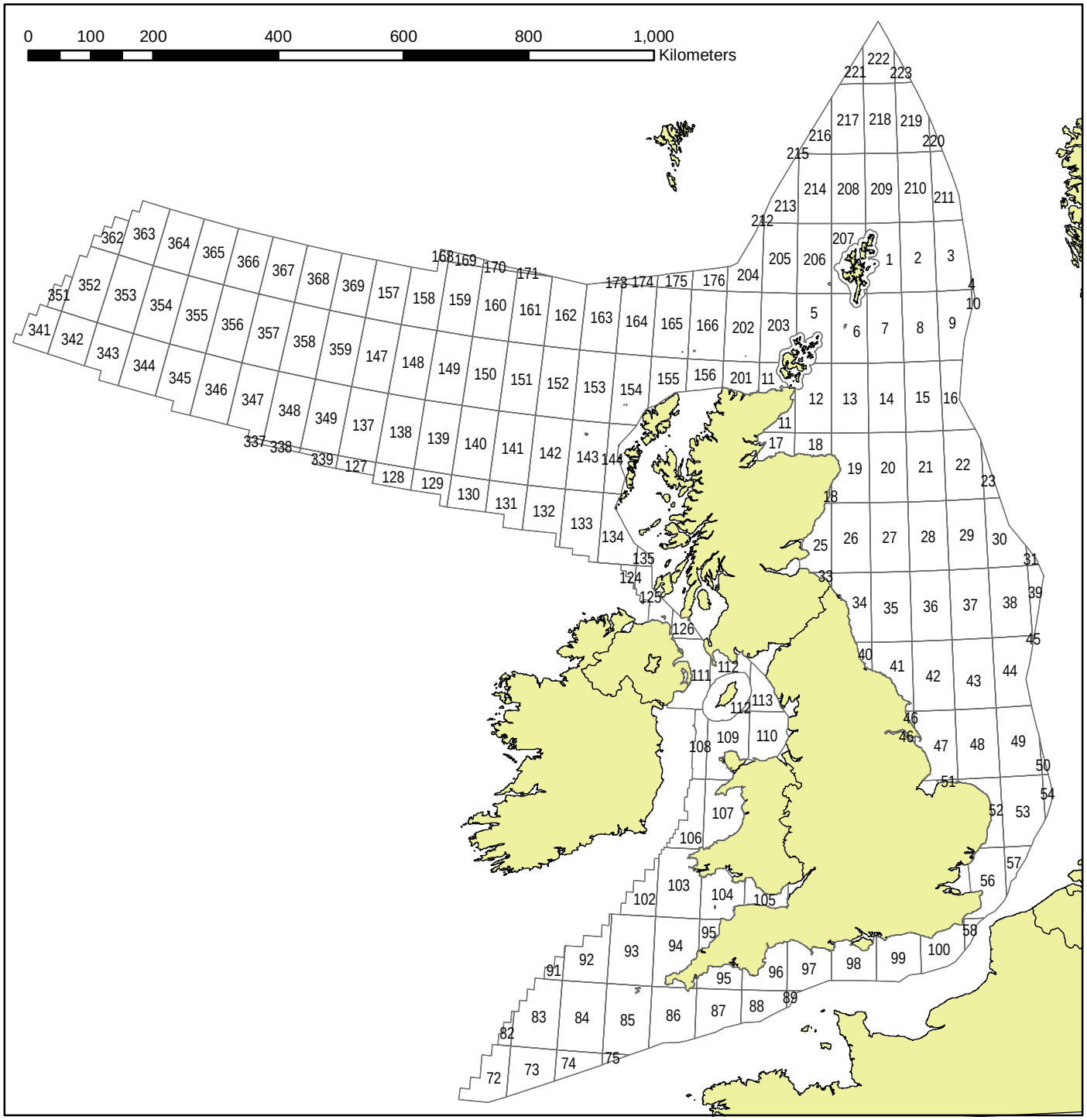

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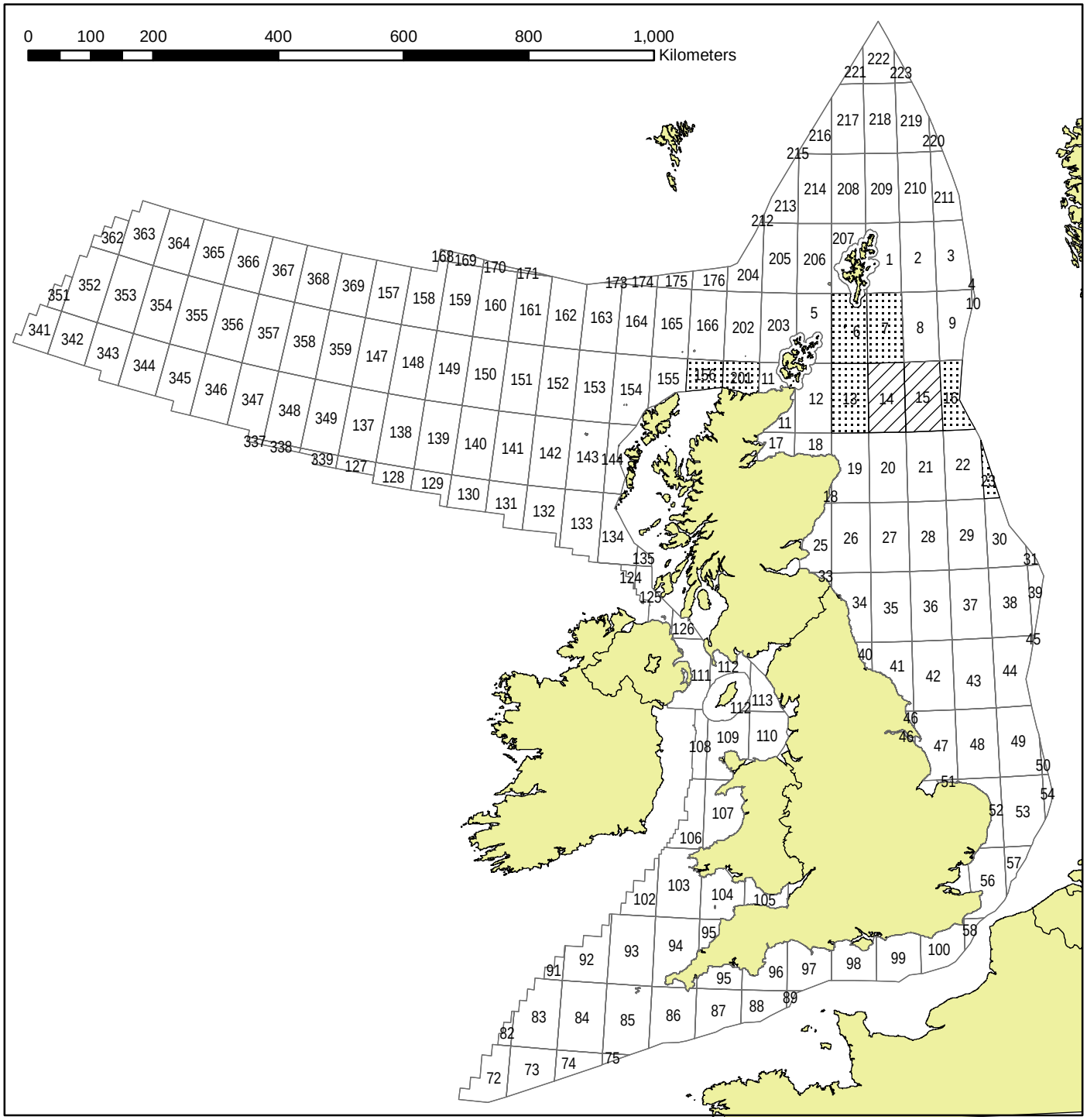

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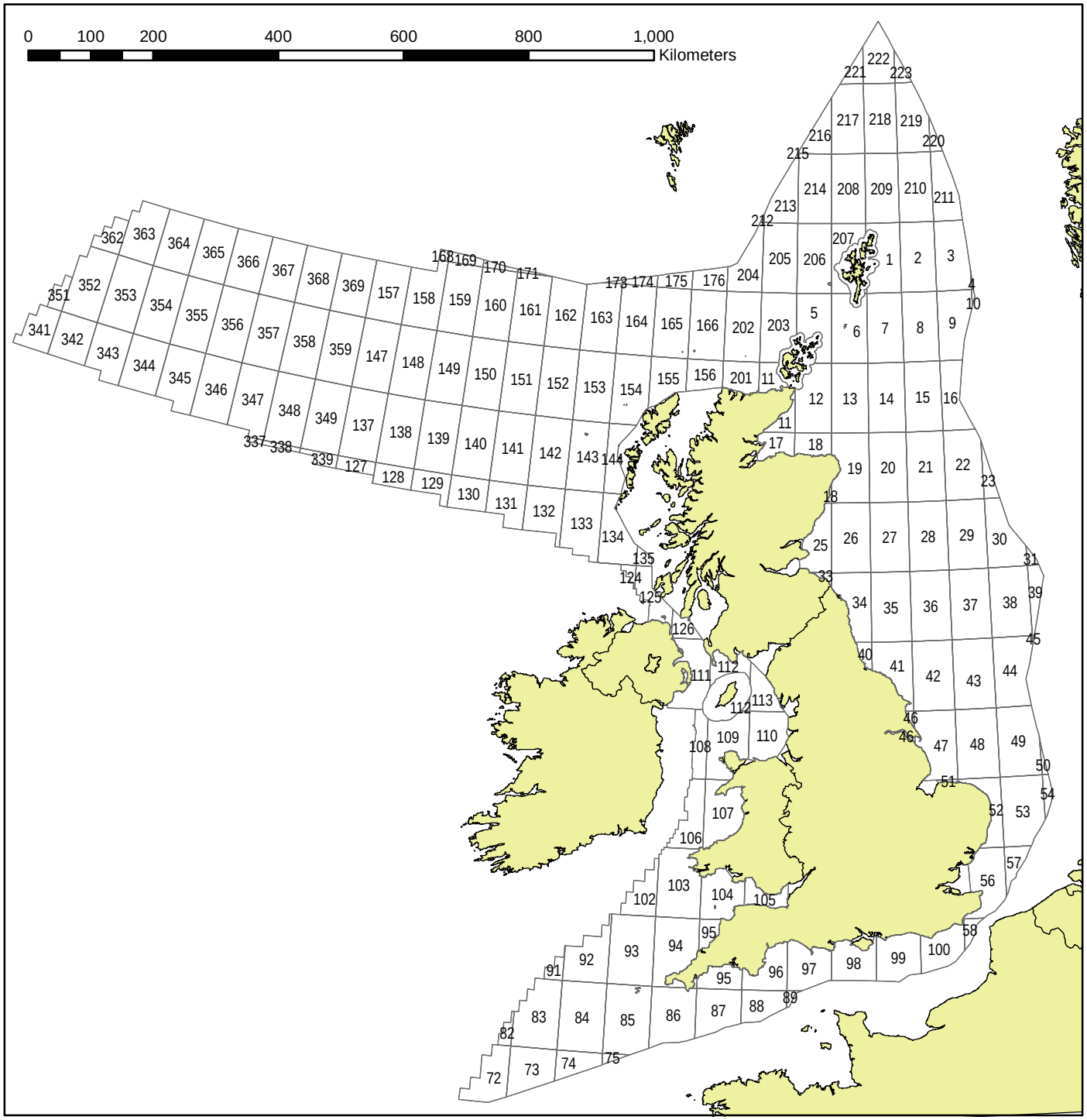

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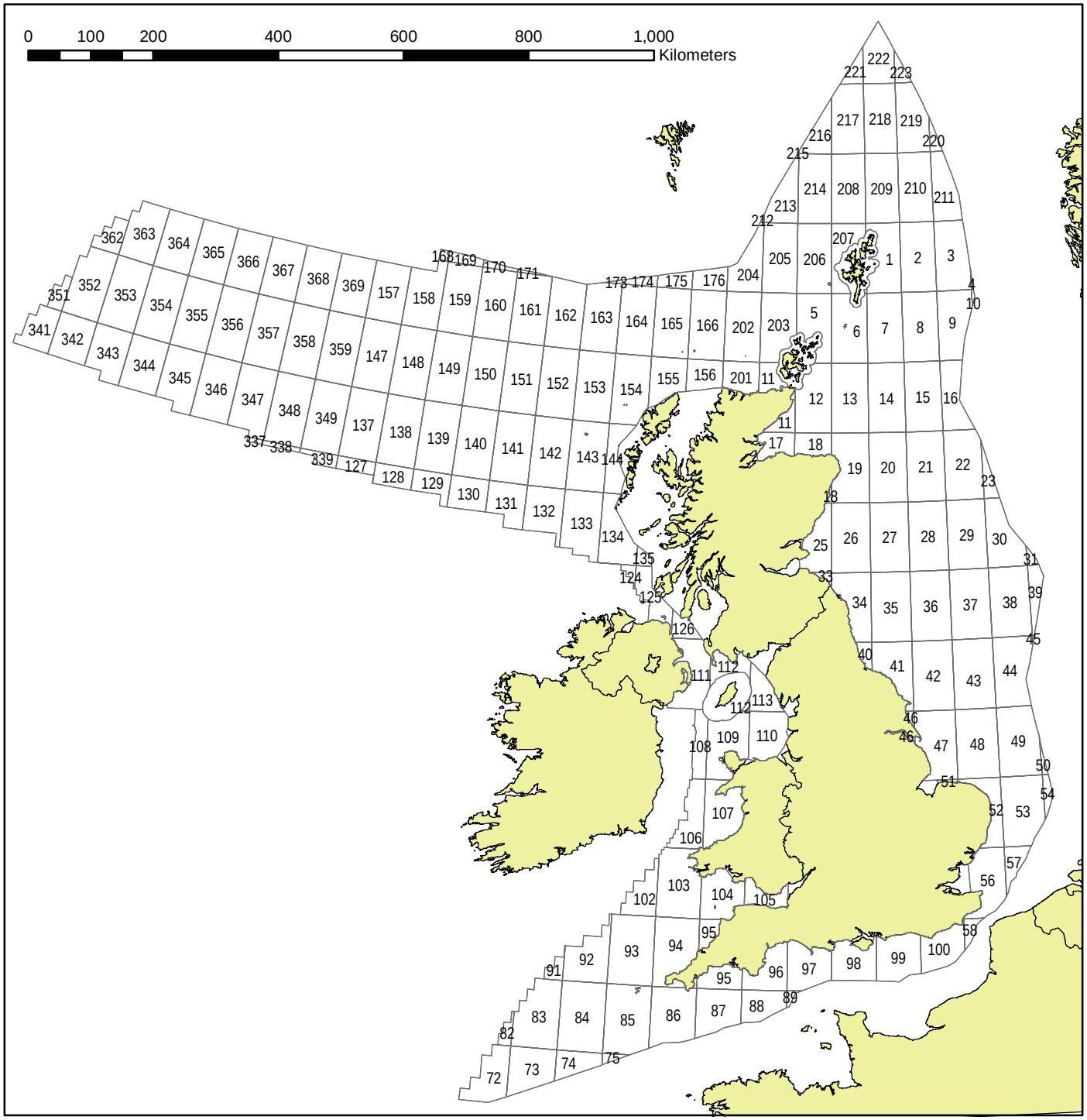

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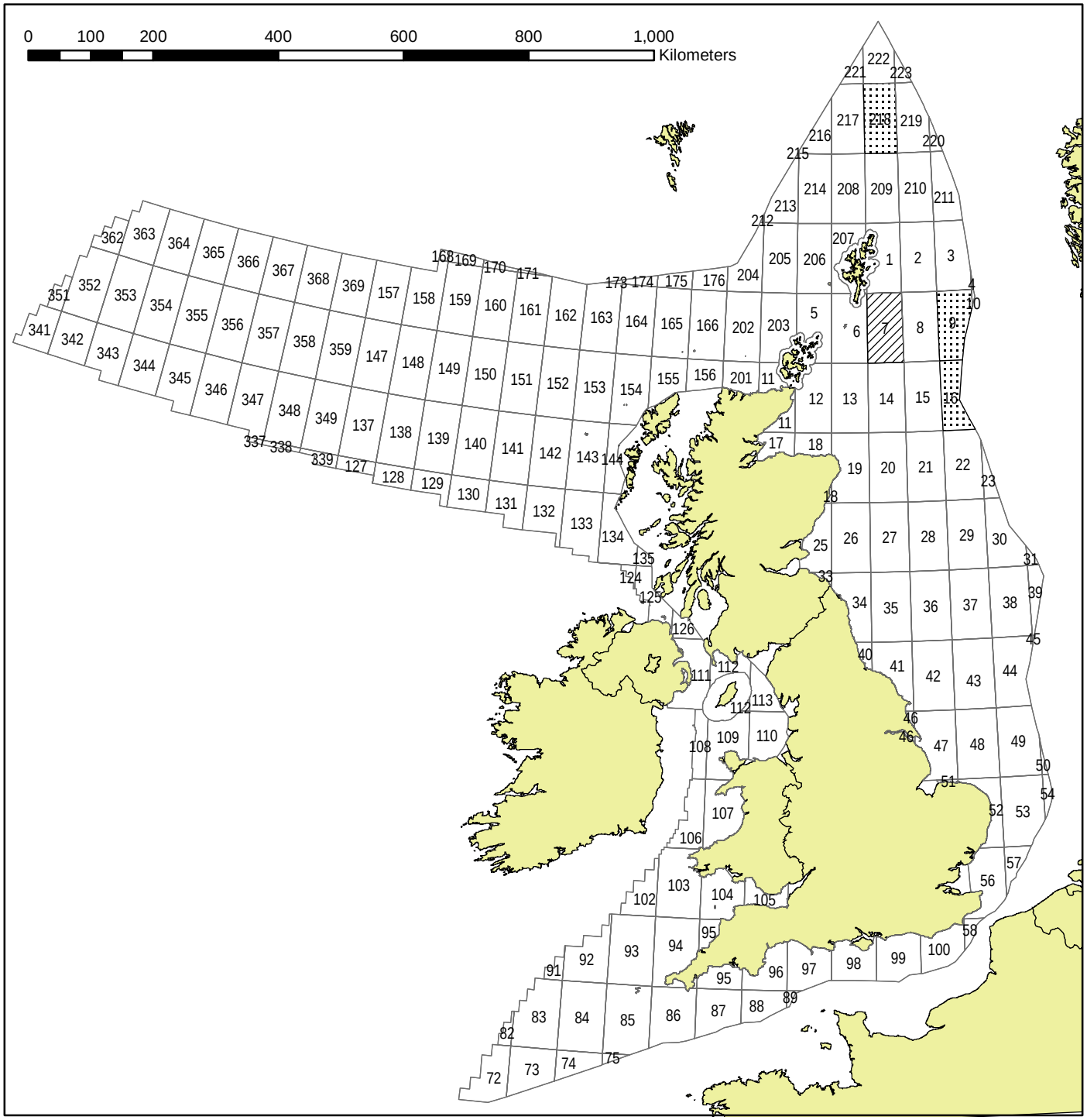

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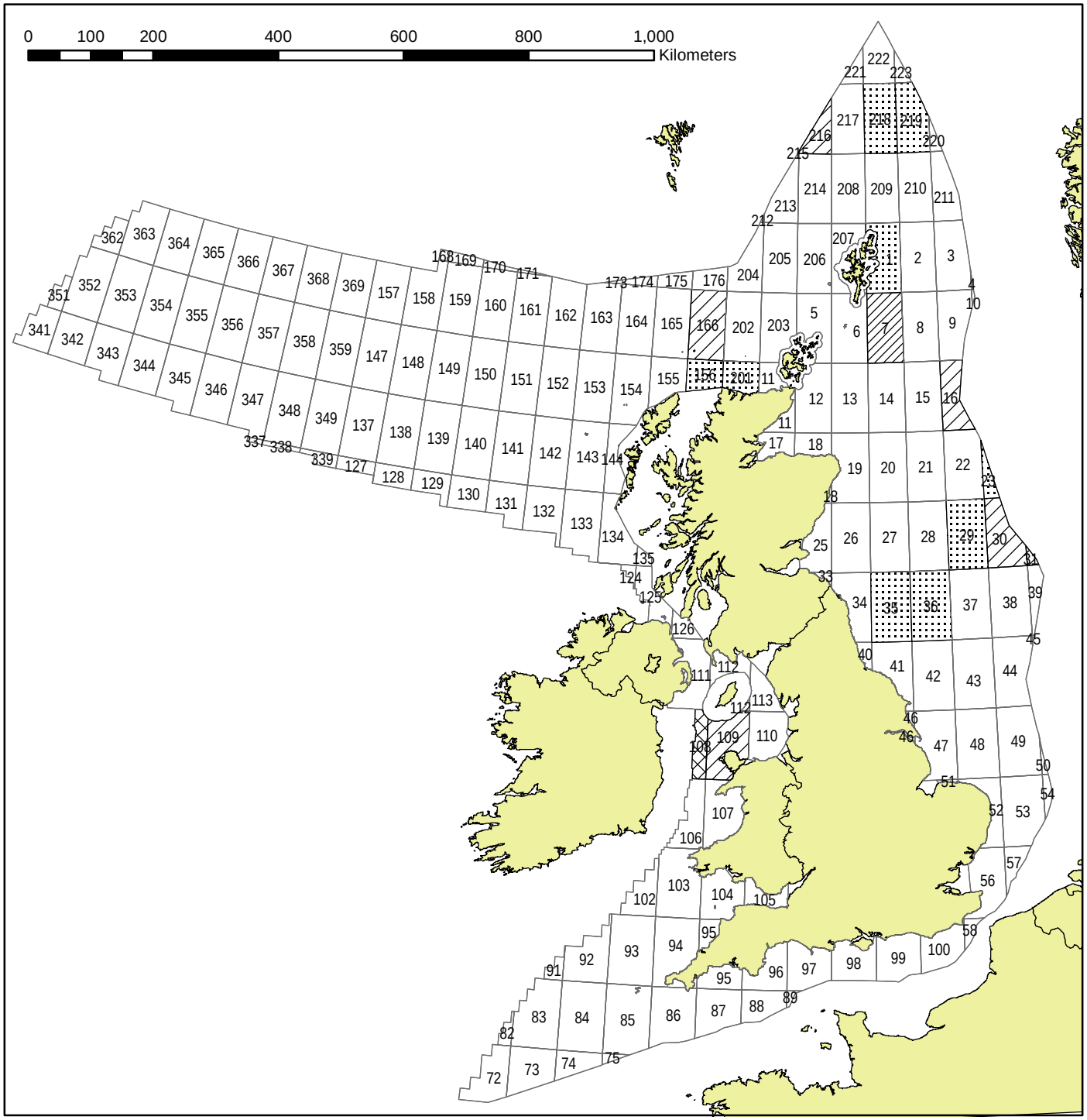

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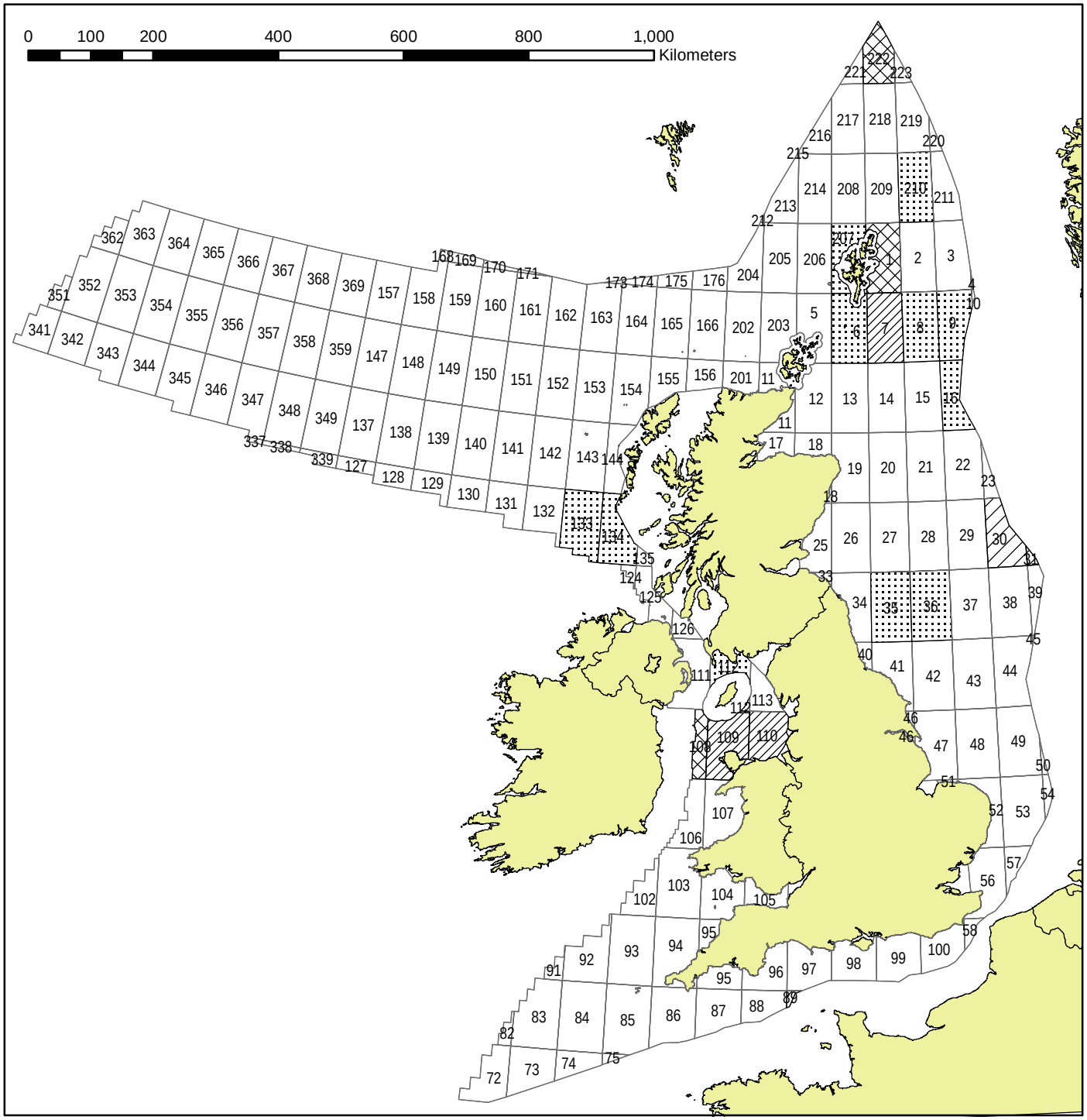

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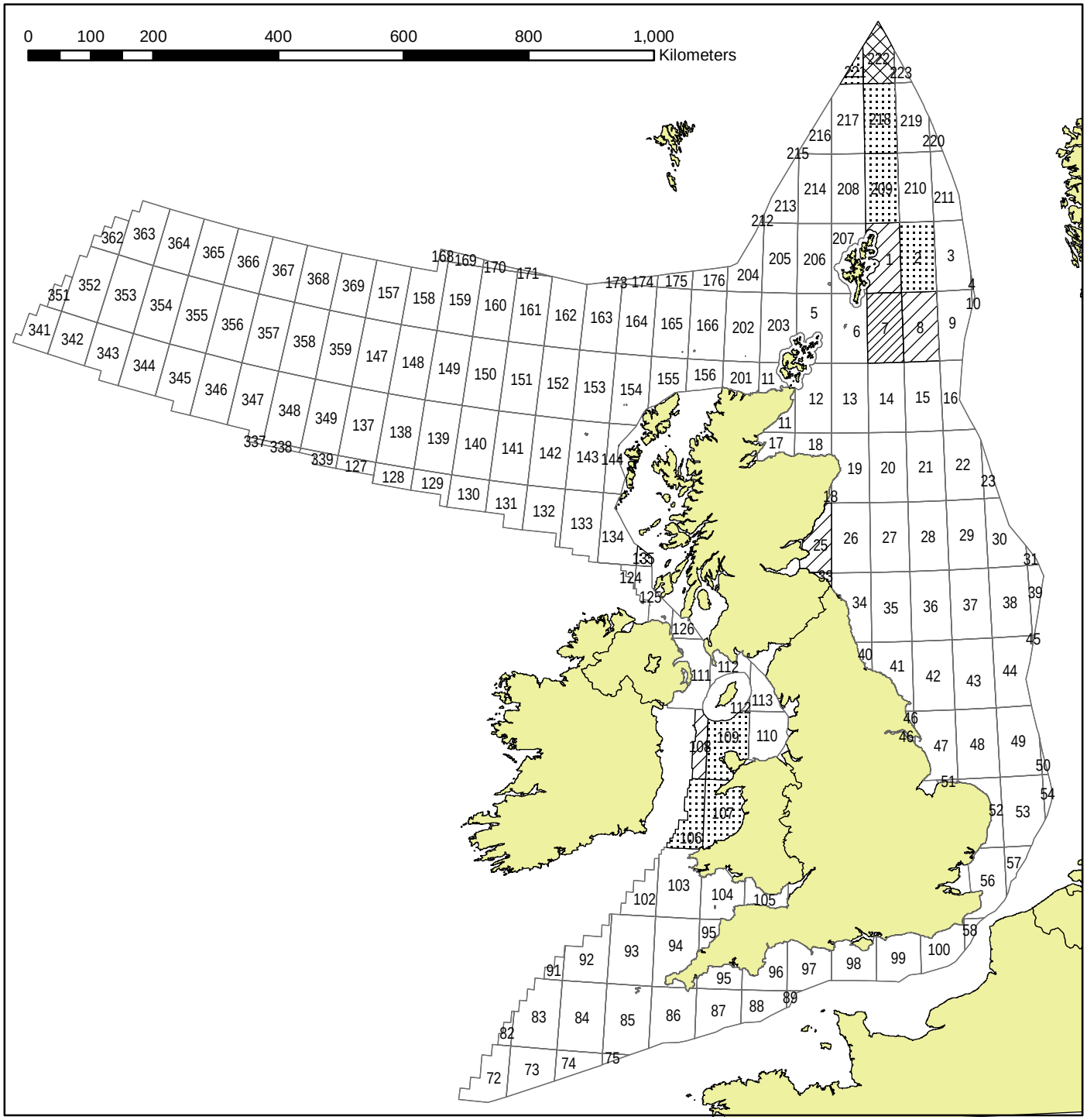

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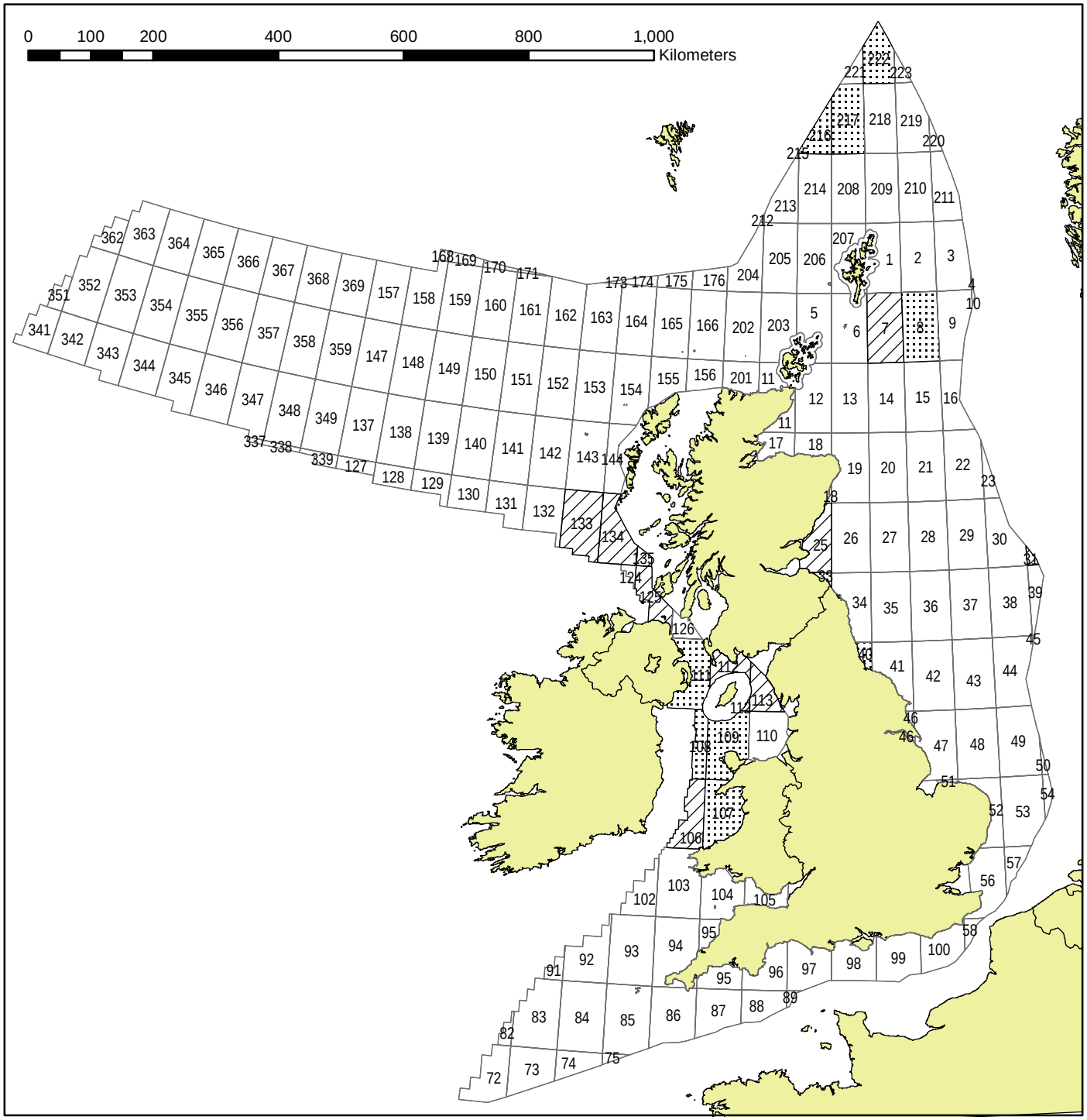

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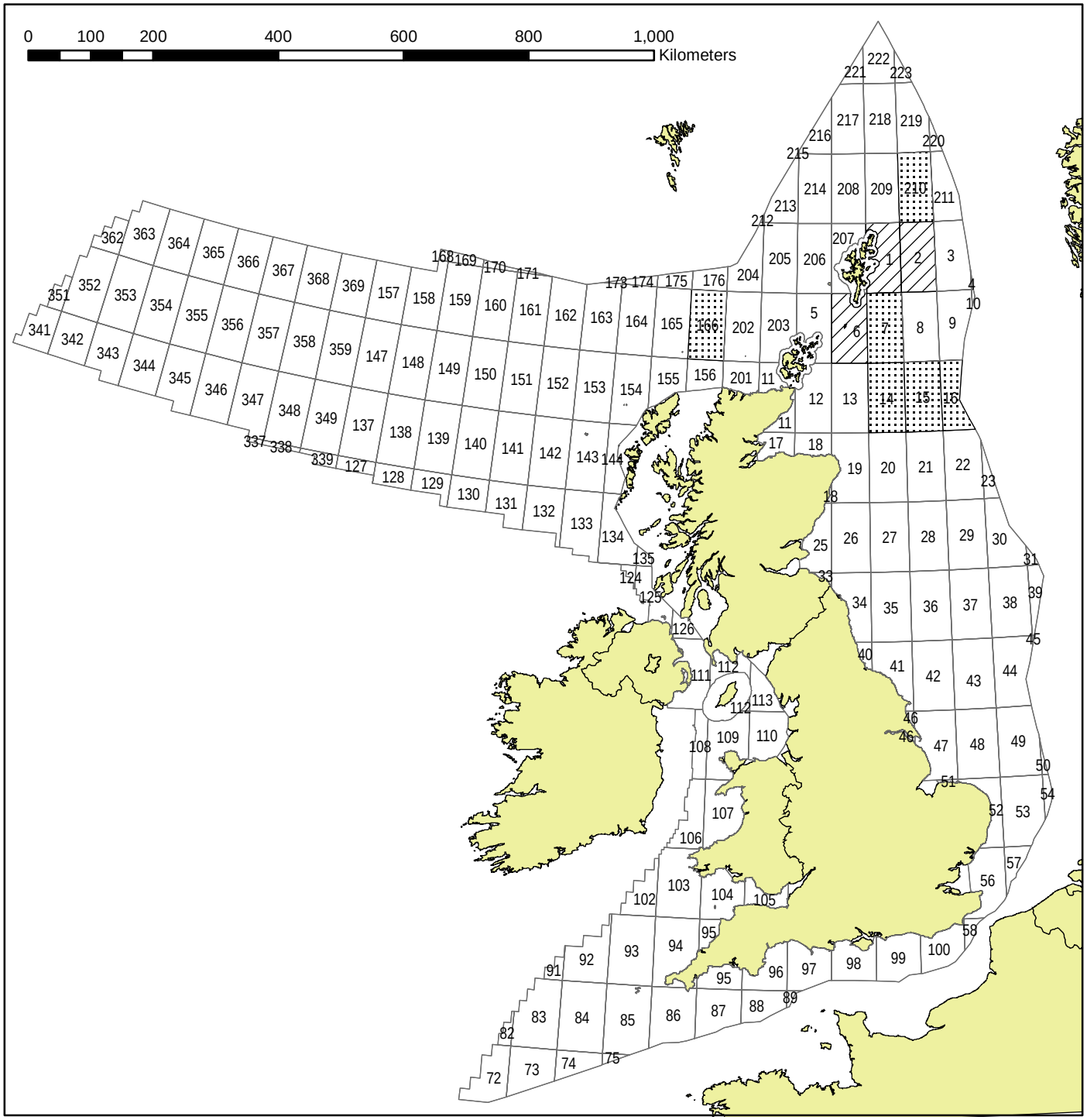

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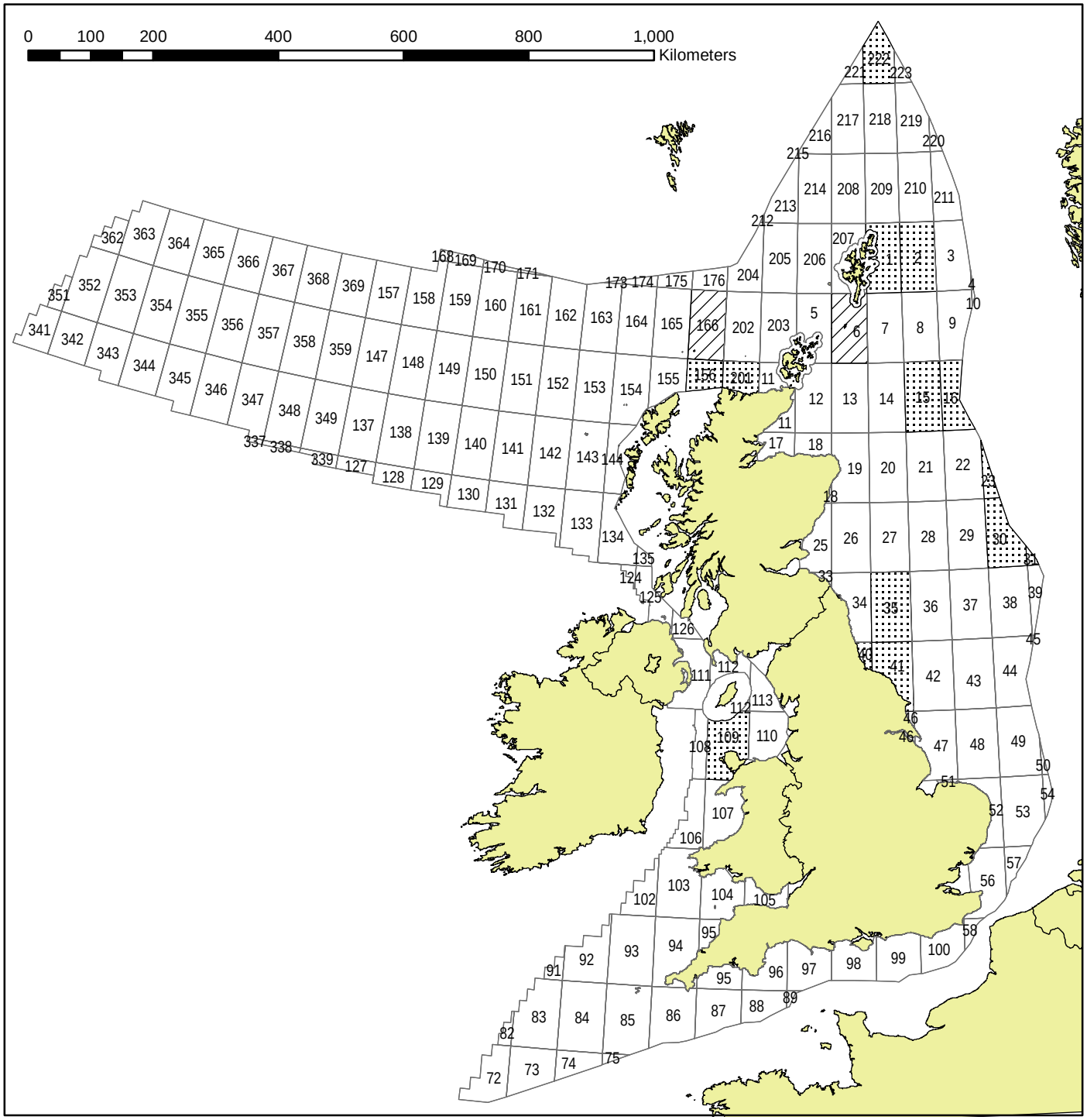

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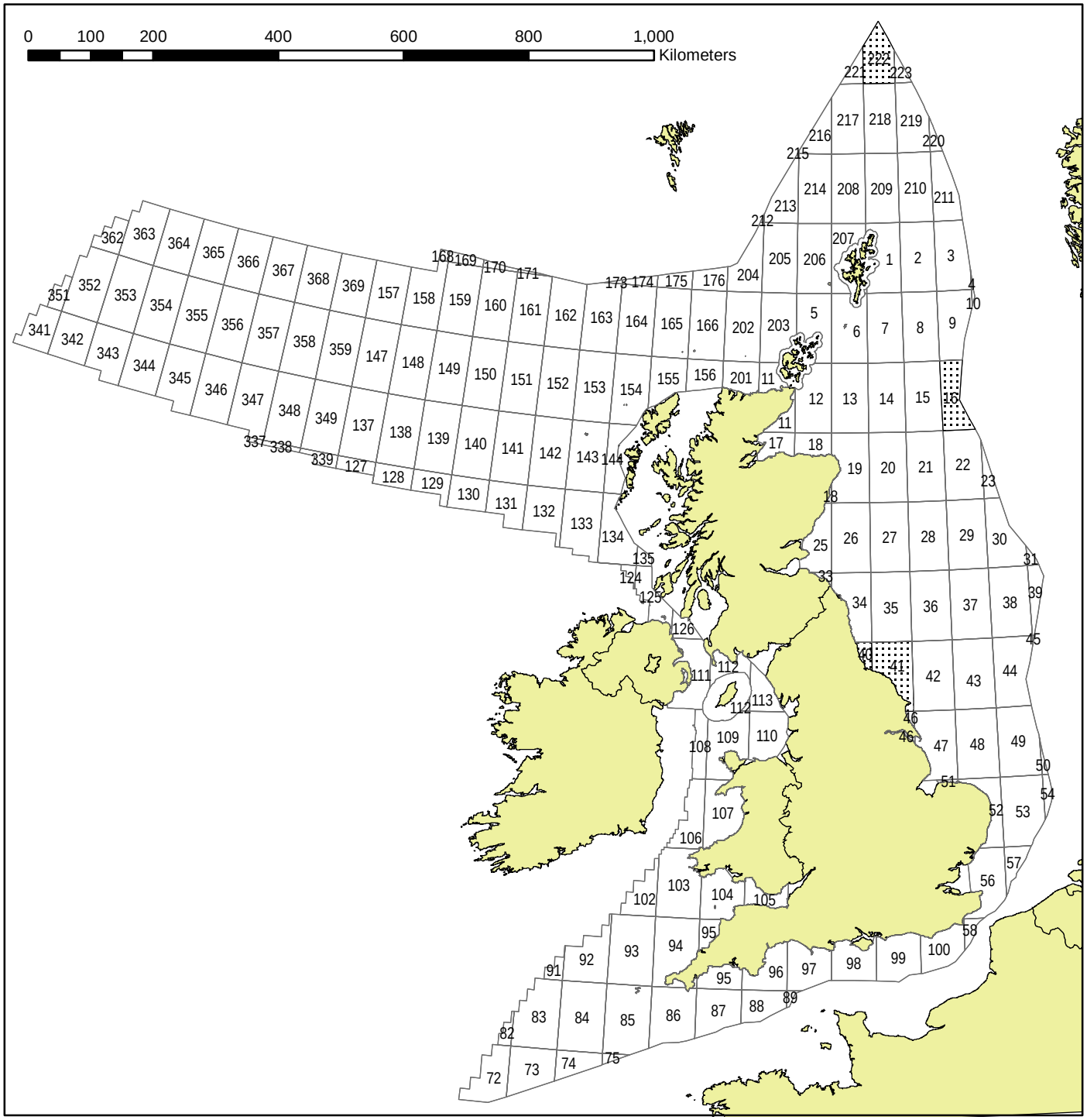

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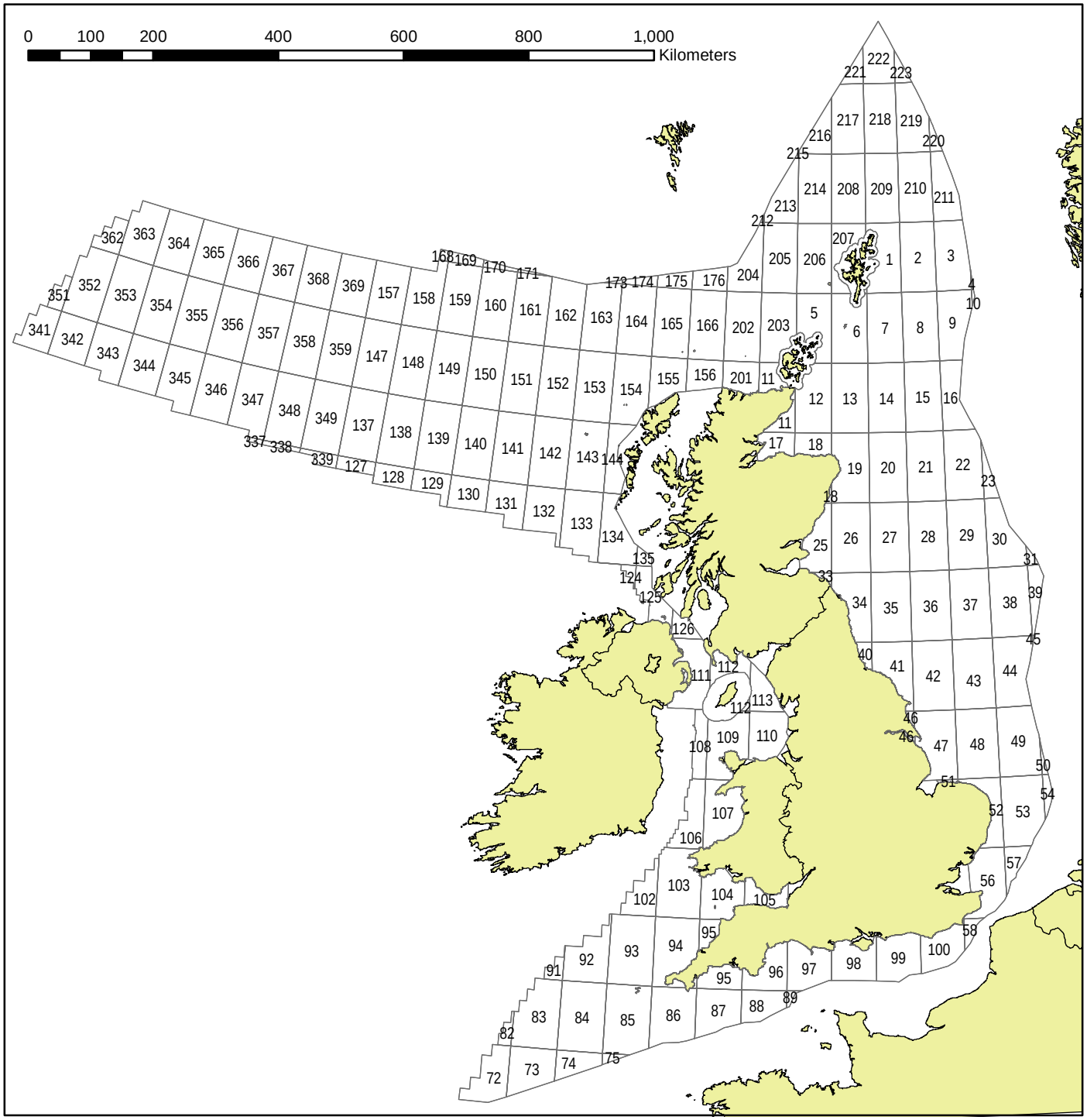

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