



JNCC Report 760

**25 Year Environment Plan Outcome Indicator K4:
2023 update on the extent of Protected Areas in the UK Overseas Territories**

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JNCC EQA statement:

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Executive Summary

At a glance – indicator K4 on the extent of protected areas in the UK Overseas Territories

The 25 Year Environment Plan (Defra 2018) and its 2023 update, the Environmental Improvement Plan (Defra 2023), outline the UK Government's aspirations to help our environment "regain and retain good health". Accompanying the plan is a comprehensive set of 66 indicators – the Outcome Indicator Framework – which show how the environment is changing and whether our interventions are effective (Defra 2019).

The UK Overseas Territories (UKOTs) support a highly diverse range of terrestrial and marine species, habitats, and ecosystems. Protected areas and other effective area-based conservation measures (OECMs) are key tools for conserving this biodiversity, much of which is endemic and globally threatened. 25 Year Environment Plan Outcome Indicator K4 measures the extent and condition of terrestrial and marine protected areas in the UKOTs.

Indicator K4 is currently under development. While work to create the protected area condition aspect of this indicator is ongoing, Defra commissioned JNCC to deliver an interim K4 indicator presenting UKOT protected area extent statistics. K4 focuses on spatially defined, formally enacted measures for biodiversity conservation. Decisions on which sites and measures to report are made by the UKOT Governments alone, in line with their responsibilities for the environment. In addition to protected areas, indicator K4 statistics also include OECMs, where the UKOTs consider these to be delivering biodiversity conservation outcomes by virtue of a long-term management regime. JNCC collates statistics from UKOT Governments to produce the indicator results, only undertaking area calculations on their behalf when requested to do so and using UKOT Governments' official sources of protected area data.

The first iteration of indicator K4 PA extent statistics (Defra 2021; Wright & Woods 2021) established a 2020 baseline for measuring progress in terrestrial and marine protection up to 2043. This report presents a third update, including protected areas and OECMs established to the end of 2023, and provides technical information to accompany interim indicator K4 on the [Outcome Indicator Framework dashboard](#) (Defra, in prep.). The Cayman Islands Government provided updated statistics following two protected area extensions in 2023, creating a very minor increase in terrestrial protection. Maritime limit data were updated for six UKOTs, resulting in a more accurate measure of the UKOTs' combined sea area and an 85 km² increase in marine protection for the UKOTs combined (a consequence of updated boundary data for the Pitcairn Islands Exclusive Economic Zone and Marine Reserve). This report presents protected area extent statistics for each UKOT individually, in addition to aggregated statistics for all UKOTs combined and by broad geographic region.

As of the end of 2023, protected areas and OECMs covered 75% of the UKOTs' marine environment (remaining level since 2021) and more than a quarter (26.1%) of the terrestrial environment (remaining level since 2022). Marine protected areas covered a total of 4,308,679 km² compared to 4,628 km² in terrestrial protected areas (noting that UKOTs' waters are over 300 times larger than the UKOTs' combined land area). There are marked differences in protected area coverage between regions. The greatest extent of protection to the marine environment remains in the Indian and Pacific Ocean UKOTs (nearly 100%) and South Atlantic UKOTs (84.4%), compared to 22.7% and 0.1% for the Mediterranean and wider Caribbean UKOTs, respectively. Terrestrial protected area coverage is also greatest in the Indian and Pacific Ocean UKOTs (60.6%), compared to the Mediterranean (38.1%), South Atlantic (26.5%) and wider Caribbean (15.1%) UKOTs.

JNCC aims to develop and improve the K4 protected area statistics to better support and inform the work of UKOT Governments, non-governmental stakeholders and the wider public. JNCC and Defra welcome feedback and suggestions on any aspect of the interim indicator K4 via 25YEPindicators@defra.gov.uk.

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1 Introduction to 25 Year Environment Plan Outcome Indicator K4

1.1 The 25 Year Environment Plan Outcome Indicator Framework

The 25 Year Environment Plan (Defra 2018) and its update, the Environmental Improvement Plan (Defra 2023), are UK governmental action plans aspiring to help our environment “regain and retain good health”. Safeguarding biodiversity is one of 10 goals in the plans that address a broad array of environmental threats and management issues. The 25 Year Environment Plan and the Environmental Improvement Plan also set out the UK Government’s international ambitions, such as leaving a lighter footprint on the global environment, showing international leadership on issues such as climate change, and supporting overseas countries to protect and improve the environment.

Accompanying the 25 Year Environment Plan is a comprehensive set of 66 environmental indicators, known as the Outcome Indicator Framework, which are designed and being built to show how the environment is changing over time (Defra 2019). This framework is helping Government, stakeholders and the wider public to assess the effectiveness of interventions and track progress towards improving the environment over the 25-year lifespan of the plan. Although the 25 Year Environment Plan does not set specific goals for the UK Government’s international ambitions, the Outcome Indicator Framework includes four international indicators to demonstrate the scale of the UK’s impact on the environment, the status of biodiversity and the progress of conservation efforts overseas.

1.2 Indicator K4 – protected areas in the UK Overseas Territories

The 25 Year Environment Plan recognises the global significance of biodiversity in the UK Overseas Territories (UKOTs) and the reliance of UKOT communities on the natural environment. The UK Government is committed to supporting the UKOTs in protecting their environmental assets, including biodiversity, and protected areas (PAs) are a key measure for restoring and conserving vulnerable ecosystems, habitats, and species (of which many are endemic to the UKOTs).

25 Year Environment Plan Outcome Indicator K4 will measure the extent and condition of terrestrial and marine protected areas in the UK Overseas Territories.

Evaluating the condition of habitats and species in PAs will provide evidence on the state of protected features, impacts from pressures and the ecological functions of PAs. However, building this component of the indicator in the context of the UKOTs’ diverse environments, differing environmental policies and varying data availability will be challenging and take several years. While work on the condition component of K4 was just beginning, Defra commissioned JNCC to deliver an interim K4 indicator from 2020 onwards, presenting PA extent statistics as a simple and accessible metric for assessing the UKOTs’ progress in establishing PA networks for biodiversity conservation.

1.3 Assessing protected area extent

Working closely with, and using data from, the UKOT Governments, JNCC developed statistics that quantify the UKOTs’ collective progress in implementing PAs and other effective area-based conservation measures (OECMs). The first iteration of the interim indicator (Defra 2021; Wright & Woods 2021) presented the total area and percent coverage of PAs and OECMs across the UKOTs combined, establishing a 2020 baseline for

measuring progress in terrestrial and marine protection up to 2043. The interim indicator has been updated annually since 2021 (Wright 2022, Wright 2023).

As well as assessing progress in the context of 25 Year Environment Plan aspirations, these statistics inform a number of UK Government international policy areas including: the Convention on Biological Diversity's (CBD) [Kunming-Montreal Global Biodiversity Framework](#) (GBF); the 2030 UN [Sustainable Development Goals](#) and the Blue Belt Programme. Integrating the indicator across multiple policy areas has improved consistency in the use of PA statistics, such as for international reporting of UKOT PAs.

The PA extent statistics also help to inform UKOT Governments' work at national and regional levels, supporting them in prioritising where further development of PA networks would be beneficial for biodiversity conservation. JNCC also hope that indicator K4 will be valuable to civil society stakeholders and the wider public, in communicating progress in the conservation of UKOT biodiversity and to attract and direct interested parties with potential offers of support and assistance to the UKOTs.

1.4 Update to interim indicator K4

This report presents an update to interim indicator K4 – including PAs and OECMs established up to the end of 2023 – and provides technical information to accompany the published indicator on the [Outcome Indicator Framework dashboard](#) (Defra in prep.). The Cayman Islands Government provided updated statistics following two terrestrial PA extensions in 2023, and maritime limit data were updated for six UKOTs, resulting in a more accurate measure of the UKOTs' combined sea area.

For the first time, this report presents a breakdown of PA extent statistics for each UKOT, in addition to the aggregated statistics for all UKOTs combined and by region. JNCC hope that this extra level of detail at a finer spatial scale will make the indicator more useful to the UKOT Governments and other stakeholders, while also improving the transparency of the interim indicator. The Territory-level statistics are also published on a dedicated [JNCC webpage](#) and available to download (in an Excel spreadsheet) from JNCC's [Resource Hub](#).

25 Year Environment Plan Outcome Indicators are voluntarily compliant with the UK's [Code of Practice for Statistics](#), which advocates that users' interests should be at the core of indicator development. JNCC and Defra therefore welcome feedback (via 25YEPindicators@defra.gov.uk) on the suitability, quality, usefulness, or any aspect of the indicator K4 PA extent statistics, from users across the UKOTs and metropolitan UK.

2 Extent of protected areas in the UK Overseas Territories: results

Indicator K4 statistics on the extent and percent coverage of PAs and OECMs in the UKOTs are presented in Section 2.1. These results mirror the aggregated statistics presented on the 25 Year Environment Plan [Outcome Indicator Framework dashboard](#) (Defra 2023). More detailed statistics showing the extent and percent coverage of PAs and OECMs for each individual UKOT are presented in Section 2.3. Results for the terrestrial and marine environments are presented separately throughout – in this context “terrestrial” refers to both land and inland water environments. The British Antarctic Territory is excluded from all statistics since Antarctic terrestrial and marine protection is delivered through the Antarctic Treaty System.

Sections 2.1 and 2.2 refer to GBF Target 3 to consider the statistics in a global conservation context. Target 3 aims for at least 30% of terrestrial and inland water areas, and at least 30% of coastal and marine areas (globally), to be effectively conserved and managed through systems of PAs and OECMs by 2030 (CBD 2022). However, it must be noted that the CBD has only been extended to a subset of the UKOTs (British Virgin Islands; Cayman Islands; Falkland Islands; Gibraltar; St Helena, Ascension, and Tristan da Cunha; and South Georgia and the South Sandwich Islands) and the 25 Year Environment Plan does not set any targets for PA coverage; environmental management, designation of PAs and target setting is the responsibility of the UKOT Governments. Furthermore, extent statistics do not demonstrate the effectiveness of PAs and OECMs, which is another key component of GBF Target 3 (see also Section 3.10).

2.1 Extent of protected areas in the UKOTs combined

PAs and OECMs covered three-quarters of the UKOTs’ marine environment at the end of 2023 (Figure 1, Table 1), remaining level with the coverage at the end of 2021. This far exceeds Target 3 of the GBF, which aims for at least 30% protection of coastal and marine areas (globally) by 2030. Terrestrial PAs covered more than a quarter of the combined UKOT land area (26.1%), remaining level since 2022 (Wright 2023) and still approaching the at least 30% GBF protection target for terrestrial and inland water environments. Despite the status quo in 2023, PA and OECM coverage has grown considerably over the last three years, with a 21.4% increase in terrestrial protection and a 12.0% increase in marine protection since the end of 2020 (the first year in the time series).

Changes to UKOT PAs were minimal in 2023 (Appendix 1 lists the updates since 2022), with no impact on percent coverages at the aggregated level for all UKOTs combined (to one decimal place). Updates to the areas of six UKOTs’ seas (see Appendix 1) resulted in a minor (37 km²) net increase in the combined extent of UKOTs’ waters in 2023. The total extent of marine PAs and OECMs across the UKOTs combined increased by 85 km² in 2023 as a consequence of updated boundary data for the Pitcairn Islands Exclusive Economic Zone and equivalent Pitcairn Islands Marine Reserve. This resulted in no change to the aggregated marine PA percent coverage (to one decimal place).

Only five OECMs have been reported by UKOT Governments to date, with PAs representing all of the terrestrial coverages and the vast majority of the marine coverages presented in Figure 1 and Table 1 below. The OECMs reported include a no-boating zone in Bermuda (with a marine area of 0.4 km²) and a dolphin protection zone and three no-anchoring zones in Gibraltar (with a combined area of 37 km²). Together these contribute a tiny proportion (less than 0.001%) of overall marine protection across the UKOTs. Limitations relating to the reporting of OECMs are outlined in Section 3.9.

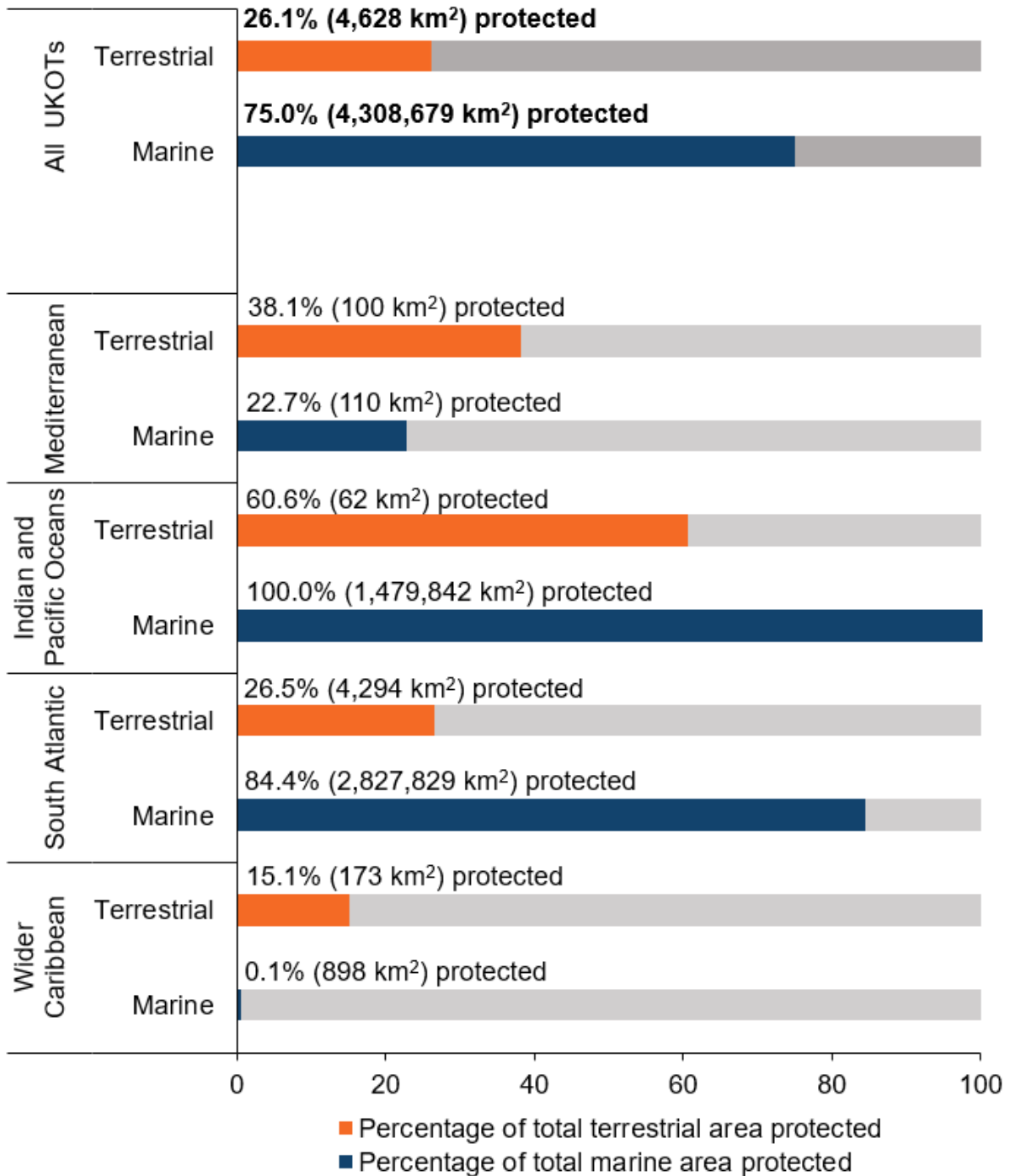


Figure 1. Percent coverage of terrestrial and marine protected areas and other effective area-based conservation measures, in total (across thirteen UK Overseas Territories) and by region, by end of December 2023.

Table 1. Extent and percent coverage of: (a) terrestrial, and (b) marine, protected areas, and other effective area-based conservation measures in the UK Overseas Territories, in total and by region. Change in PA extent and coverage is the net difference between the end of 2020 (the base year) and the end of 2023. “+” indicates a positive direction of change; changes of less than 0.1 km² or 0.01% are reported as “no change”. Percent coverages were calculated relative to the Territories’ combined land and approximate sea areas.

(a) Terrestrial protection		End of 2023		2020–2023	
Region	Area of land (km²)	Area of PAs (km²)	% coverage of PAs	Change in PA extent (km²)	Change in % coverage
All UKOTs	17,738	4,628	26.1	+3,797	+21.4
Mediterranean	261	100	38.1	No change	No change
Indian and Pacific Oceans	102	62	60.6	No change	No change
South Atlantic	16,225	4,294	26.5	+3,794	+23.4
Wider Caribbean	1,149	173	15.1	+3	+0.3

(b) Marine protection		End of 2023		2020–2023	
Region	Area of sea (km²)	Area of PAs (km²)	% coverage of PAs	Change in PA extent (km²)	Change in % coverage
All UKOTs	5,748,660	4,308,679	75.0	+687,352	+12.0
Mediterranean	484	110	22.7	No change	No change
Indian and Pacific Oceans	1,480,105	1,479,842	100.0	+85 [note 1]	No change
South Atlantic	3,349,988	2,827,829	84.4	+687,241	+20.5
Wider Caribbean	918,083	898	0.1	+27	No change

Note 1: The increase in marine PA extent for the Indian and Pacific Oceans is a result of remeasuring the area of the Pitcairn Islands Exclusive Economic Zone in 2023 and its parallel impact on the Pitcairn Islands Marine Reserve (not due to further designation or deliberate expansion of protected areas).

2.2 Extent of UKOT protected areas by region

UKOTs were grouped into four broad regions to demonstrate differences in PA and OECM extent across contrasting environmental, socio-economic, and geographic contexts. The characteristics of these four regions are briefly outlined in Box 1. Extensions to two PAs in the Cayman Islands, plus remapping of one other site boundary, resulted in a very minor (0.4 km²) increase in the area of terrestrial PAs in the Wider Caribbean in 2023, detectable as a 0.1% difference in percent coverage (Table 1a) compared to the end of 2022.

Variation in PA and OECM coverage remained noticeable across the four regions in 2023. The Indian and Pacific Ocean UKOTs (British Indian Ocean Territory and Pitcairn Islands group, collectively) continued to have the greatest percent coverage of PAs in the terrestrial

environment compared to other regions (Figure 1, Table 1a). In this and the Mediterranean region, the UKOTs together exceed the global GBF target of 30% terrestrial protection by 2030. Nevertheless, the extent of terrestrial protection has remained stable in these two regions since the end of 2020 but has increased across the South Atlantic and Wider Caribbean UKOTs (by 23.4% and 0.3%, respectively) over this time span.

Box 1. Socio-economic and geographic characteristics of the UKOTs by region

The Mediterranean region comprises two UKOTs: Sovereign Base Areas of Akrotiri and Dhekelia (SBAs) and Gibraltar. These UKOTs have contrasting human population densities, with approximately 40 people/km² in the SBAs (SBA Administration 2019) compared to 5,152 people/km² in Gibraltar's very small land area (Government of Gibraltar 2016). The SBA economy is centred on military activity while Gibraltar has strong service and tourism sectors. These are the only UKOTs with international land borders and so they have immediate proximity to other nations.

The Indian and Pacific Oceans region comprises two UKOTs: British Indian Ocean Territory (BIOT) and the Pitcairn Islands group, in the tropics and sub-tropics, respectively. These UKOTs are very remote, found between 380 km and 520 km from the nearest neighbouring island nation and between 1,700 km and 5,000 km from the nearest major landmass. BIOT has no permanent inhabitants (BIOT Administration 2021); the main island hosts a joint UK-US defence facility supported by military personnel and civilian contractors while all other islands are uninhabited (Nicolas *et al.* 2017). Only one island in the Pitcairn Islands group is inhabited, resulting in an overall population density of just 0.9 people/km² (Government of the Pitcairn Islands 2023). The Pitcairn Islands' micro-economy comprises a mix of public sector services and micro-enterprises, including a small (but economically significant) level of tourism (Avagliano *et al.* 2016).

The South Atlantic region comprises three UKOTs: Falkland Islands; St Helena, Ascension and Tristan da Cunha; and South Georgia and the South Sandwich Islands. Resident population densities are very low, ranging from zero permanent residents to 37 people/km² (Government of SGSSI 2022, St Helena Government 2024), and economies feature a mix of sectors, including fisheries, military activity, tourism, agriculture and oil and gas exploration (Taylor *et al.* 2016). While the Falkland Islands are approximately only 350 km from their nearest neighbouring nations, the other islands are all in excess of 1,000 km from their nearest neighbours (2,600 km in the case of Tristan da Cunha). These UKOTs also span a very broad range of ecoregions and climates, from subtropical Ascension to sub-polar South Georgia and the South Sandwich Islands.

The wider Caribbean region comprises six UKOTs: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, and Turks and Caicos Islands. With the exception of Gibraltar, these are the most densely populated UKOTs with 42 to 1,186 people/km² (Government of Bermuda 2023, Montserrat Statistics Department 2023). Tourism is significant in most of these UKOTs' economies, with fisheries or financial services also important in some Caribbean Territories (Vaslet & Renoux 2016). With the exception of Bermuda (over 1,000 km from its nearest neighbour), these UKOTs are close to neighbouring nations, with distances ranging from 1 km to 210 km only. Four of these UKOTs do not have fully delimited maritime boundaries with neighbouring countries.

The Indian and Pacific Ocean UKOTs also maintained the greatest percent coverage of marine PAs, collectively protecting almost 100% of their waters (Table 1b). However, in area terms the South Atlantic UKOTs have protected the largest expanse of ocean at more than 2.8 million km² collectively (more than four-fifths of their waters). At the regional level, the

Indian and Pacific Ocean and South Atlantic UKOTs already collectively exceed the GBF target for at least 30% protection of coastal and marine areas by 2030.

The coverage of marine PAs expanded in three regions from 2020 to 2023, although the increase for the Indian and Pacific Ocean UKOTs was very small in percentage terms and the result of an improved delimitation of Pitcairn Islands' waters, not a direct or formal change to the marine PA itself (an 85 km² increase to the Exclusive Economic Zone (EEZ) was mirrored in Pitcairn Islands Marine Reserve, which follows the EEZ as its boundary). The South Atlantic UKOTs have delivered by far the biggest increase in marine protection since the end of 2020 (20.5%), mostly attributable to the designation of the Tristan da Cunha Marine Protection Zone in 2021. The extent of marine PAs has also increased in the Wider Caribbean region, but this growth appears very small (0.003%) when calculated relative to the full extent of these UKOTs' waters.

2.3 Extent of protected areas by UKOT

Disaggregated statistics for the extent and percent coverage of PAs and OECMs in each UKOT are presented in Table 2. The size of UKOTs' land and sea areas differ by up to four orders of magnitude and, correspondingly, the PA extent statistics also vary significantly (by up to seven orders of magnitude for marine protection). Percent coverages account for underlying size differences by presenting the proportion of UKOTs' terrestrial and marine environments in PAs, allowing for more meaningful comparisons between Territories.

By the end of December 2023, all UKOTs had established at least one terrestrial PA, with coverage ranging from 0.5% (Anguilla) to 100% (South Georgia and the South Sandwich Islands, SGSSI) averaging 30.4% (SD = 29.2%) of the terrestrial environment. Nine of the thirteen Territories have protected more than 10% of their terrestrial environment and six have protected more than 30% (treating Saint Helena, Ascension Island and Tristan da Cunha as a single territory).

Eleven UKOTs had designated marine PAs by the end of 2023. Coverage of the marine environment ranged from less than 1% in four Caribbean UKOTs (calculated to their outermost maritime limits), to complete coverage in four Atlantic and Pacific Ocean UKOTs. Marine protection averaged 45.9% (SD = 49.8%) across all Territories – considerably lower than the aggregated statistic of 75.0% for all UKOTs combined (Figure 1, Table 1a). This further demonstrates the strong differences among UKOTs, with six Territories with vast maritime zones protecting major areas of ocean in large-scale MPAs (driving the all-UKOT statistic higher), while other Territories have lower coverage of marine PAs combined with smaller areas of jurisdiction. Two UKOTs, the Falkland Islands and Montserrat, have not yet designated marine PAs.

UKOT Protected Area policy is implemented at a range of spatial scales and involves a variety of management regimes, which can differ markedly between Territories. The marine coverage statistics presented in Table 2 are calculated based on the full extent of UKOTs' waters to provide a reasonably consistent scale of analysis across all Territories. This broad resolution is particularly relevant to Territories with large-scale marine PAs covering most or all of their waters. However, other UKOTs have focused their conservation efforts at finer geographic scales, including coastal and inshore zones in particular. In 2023, two UKOT Governments expressed an interest in publishing additional, higher-granularity marine protection statistics to accompany indicator K4. These are presented in Appendix 2.

Table 2. Extent and percent coverage of terrestrial and marine protected areas and other effective area-based conservation measures in each UK Overseas Territory by end of December 2023. Percent coverages were calculated relative to total land and sea areas (sea areas defined by the outermost boundaries of each UKOT's waters). The four UKOTs marked with '*' lack formal international maritime boundaries for parts of their waters, therefore sea area calculations used median lines as proxies for boundary positions – these do not represent formal, agreed delimitations and could be subject to change.

UK Overseas Territory	Terrestrial protection			Marine protection		
	Area of land (km ²)	Area of PAs (km ²)	% coverage of PAs	Area of sea (km ²)	Area of PAs (km ²)	% coverage of PAs
Anguilla *	78.8	0.4	0.5	83,756	71	0.1
Bermuda	53.6	2.4	4.4	464,826	< 1	< 0.01
British Indian Ocean Territory	50.2	19.1	37.9	638,110	637,847	99.96
British Virgin Islands	153.2	4.1	2.7	87,899	52	0.1
Cayman Islands *	264.0	30.3	11.5	120,921	123	0.1
Falkland Islands	12,030.6	353.0	2.9	455,521	0	0.0
Gibraltar	6.6	2.4	36.4	87	77	89.1
Montserrat *	102.8	11.2	10.9	6,771	0	0.0
Pitcairn Islands group	51.8	42.7	82.5	841,995	841,995	100.0
Saint Helena, Ascension, and Tristan da Cunha	123.0	46.8	38.0	448,411	448,411	100.0
Tristan da Cunha	96.9	18.9	19.5	445,489	445,489	100.0
Tristan da Cunha	181.1	81.4	45.0	757,646	691,009	91.2
South Georgia and the South Sandwich Islands	3,793.9	3,793.9	100.0	1,242,921	1,242,921	100.0
Sovereign Base Areas of Akrotiri and Dhekelia	254.7	97.1	38.1	397	32	8.2
Turks and Caicos Islands *	497.2	124.7	25.1	153,911	651	0.4

2.4 Confidence in the protected area extent statistics

JNCC has high confidence in the indicator K4 UKOT PA extent statistics because of the predominance of official data – information gathered from government sources – used in the UKOTs' and JNCC's area calculations. In the absence of quantitative confidence intervals, JNCC qualitatively assessed the impact of data uncertainty on the aggregated PA extent statistics (Section 3.9). Although some uncertainties in the underlying data persist (e.g. for a small number of possible PAs and OECMs, and for international maritime boundaries in particular), JNCC concluded that these sources of uncertainty did not significantly impact the aggregated 2023 results presented in Table 1.

PA data issues (such as the uncertain protection of some offshore islands and unconfirmed OECM status of some management measures) affected a small number of sites only. Although these could make important contributions to terrestrial and marine protection at the individual UKOT level (if reported in future updates), these are unlikely to have a significant impact on the aggregated PA coverage statistics. The use of median lines as proxies for international maritime boundaries creates uncertainty in total sea areas and marine PA coverage statistics for five UKOTs. However, once the extent of UKOTs' waters is combined at the all-UKOT level, these potential maritime boundary changes will be small relative to the huge collective area of UKOT waters that is already formally delimited.

Comparing the indicator K4 PA extent statistics with other published figures provided further validation for the coverage of marine protection in the UKOTs. UNEP-WCMC (2024) country-specific statistics (accessed at ProtectedPlanet.net in March 2024) suggested that PAs cover 71.5% of the marine environment across all UKOTs – comparable to the 75.0% presented in Table 1, given some differences in underlying PA data and calculation methods. Marine statistics also compare favourably at the Territory level, with 10 UKOTs having similar marine PA percent coverages (less than a 1% difference) in Table 2 compared to UNEP-WCMC's statistics. Terrestrial PA extent was not comparable for the UKOTs combined, as ProtectedPlanet statistics did not include the large SGSSI terrestrial PAs at the time of publication (May 2024).

At the individual Territory level, PA extent statistics for some UKOTs (Table 2) involve much smaller PA, land and sea areas than the aggregated statistics, making them more sensitive to fine scale errors and issues of data quality or uncertainty. All the issues considered in the uncertainty assessment have a potentially higher impact on Territory-level statistics than the aggregated statistics (Table 4), however their level of impact varies. For example, the impact of poor quality or low-resolution PA boundaries (spatial data) is small in comparison to the potential error associated with using approximate median lines to measure the size of some UKOTs' waters. Data uncertainty also varies considerably by Territory; more widely applicable issues (such projection choice) typically have a lower impact, whereas issues with the biggest potential impact (e.g. use of median lines) only affect a subset of UKOTs.

3 Technical background

This section provides methodological and evidence quality information to accompany the aggregated indicator K4 PA extent statistics published on the 25 Year Environment Plan [Outcome Indicator Framework dashboard](#) (Defra in prep.), and Territory-level statistics published on the [JNCC website](#).

3.1 Geographic scope

Indicator K4 includes 13 of the 14 UKOTs (Figure 2); the British Antarctic Territory is excluded (as explained in Section 2). JNCC worked with the Governments and Administrations of all 13 Territories to produce the indicator.

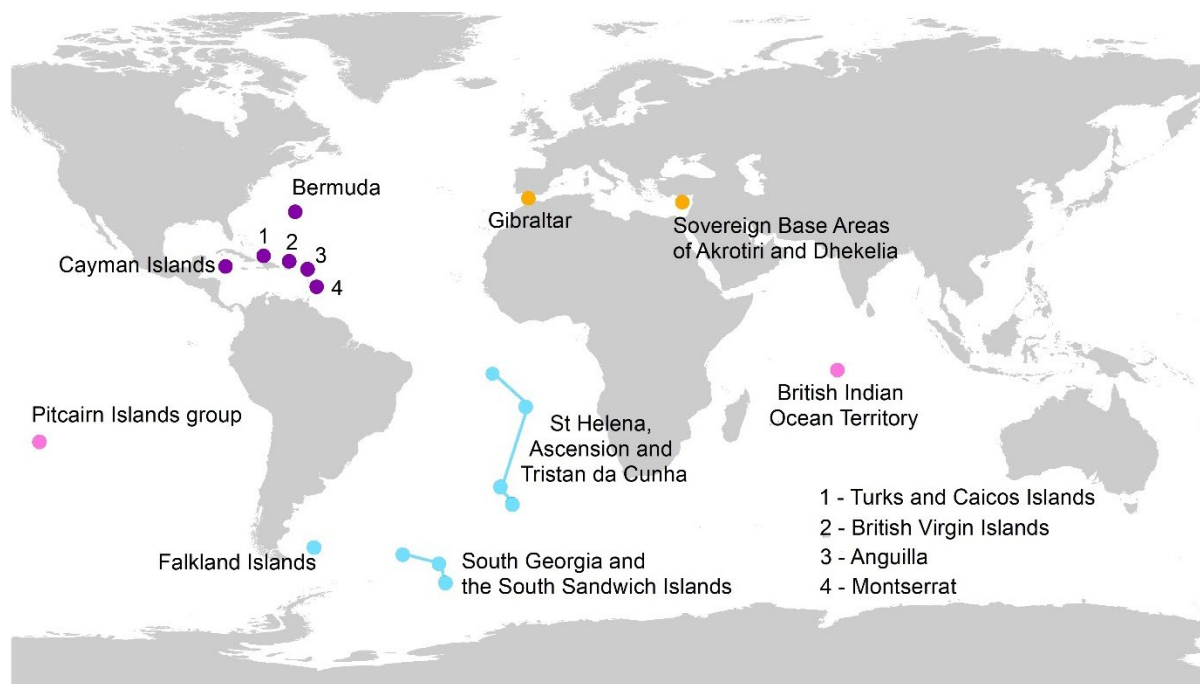


Figure 2. UK Overseas Territories (UKOTs) included in 25 Year Environment Plan Outcome Indicator K4. Regional groupings adopted for indicator K4 purposes are: Mediterranean UKOTs – Gibraltar, Sovereign Base Areas of Akrotiri and Dhekelia; Indian and Pacific Ocean UKOTs – British Indian Ocean Territory, Pitcairn Islands group; South Atlantic UKOTs – Falkland Islands, St Helena, Ascension and Tristan da Cunha, South Georgia and the South Sandwich Islands; wider Caribbean UKOTs – Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos Islands (see also Box 1).

In addition to producing statistics for all UKOTs combined, UKOTs are grouped into four broad regions (based on geographic similarities) to present PA extent statistics at a slightly finer spatial resolution. Grouping the UKOTs into Mediterranean, Indian and Pacific Oceans, South Atlantic and wider Caribbean regions (Figure 2) is useful for showing the different spatial scale of PA networks established, and the different contexts in which PA designation takes place, across the UKOTs. It also increases the sensitivity of the indicator, detecting change in the extent of small- as well as large-scale PAs, thereby enabling the indicator to demonstrate progress made by all UKOTs.

3.2 Data collation

PA extent figures are collated via two routes (Figure 3) and then aggregated across the UKOTs to produce indicator K4 statistics. Both routes use UKOT Governments' PA data.

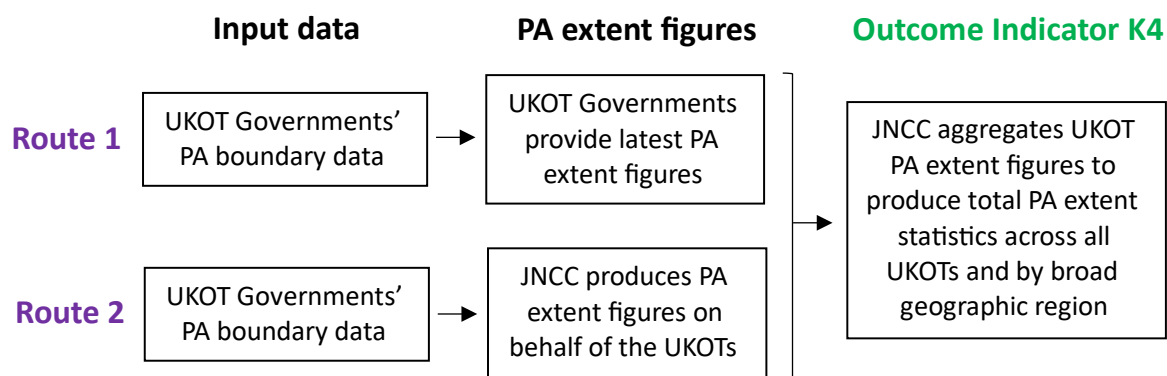


Figure 3. Process for collating or deriving UK Overseas Territory protected area (PA) extent figures from government sources and their aggregation into indicator K4 statistics.

UKOT Governments recommended in early discussions that JNCC should use data from government sources in preference to using statistics calculated by third-parties or data from secondary sources. JNCC therefore invites all UKOT Governments and Administrations to provide their own PA extent, land and sea area figures to inform the indicator (route 1, Figure 3). JNCC also encourages this option to ensure indicator K4 is consistent with the policy interpretations and statistics applied within individual UKOTs, thereby improving the value and applicability of indicator K4 for UKOTs' own purposes.

If UKOT Governments decide that route 1 is not possible or desirable, JNCC offers to undertake PA extent calculations on their behalf (route 2, Figure 3). JNCC's calculations are informed by the UKOT Governments' own official PA boundary data and the PA extent figures are confirmed by the Governments before being aggregated with figures from route 1 to produce the indicator. In 2020-2023, seven UKOTs opted to supply their own PA extent figures (route 1), five asked JNCC to calculate PA extent figures on their behalf (route 2), and St Helena, Ascension and Tristan da Cunha took a mixed approach (Table 3).

Table 3. UK Overseas Territory (UKOT) adoption of two methods for supplying indicator K4 PA extent figures: UKOT Governments' providing their own figures (route 1 in Figure 3), or JNCC-led calculations with subsequent confirmation by UKOT Governments (route 2 in Figure 3).

UKOTs in route 1 – providing their own PA extent figures	UKOTs in route 2 – JNCC calculating PA extent on a UKOT's behalf
Bermuda	Anguilla
British Virgin Islands	British Indian Ocean Territory
Cayman Islands	Pitcairn Islands group
Falkland Islands	St Helena, Ascension, and Tristan da Cunha: Ascension Island; Tristan da Cunha
Gibraltar	Sovereign Base Areas of Akrotiri and Dhekelia
Montserrat	Turks and Caicos Islands
St Helena, Ascension, and Tristan da Cunha: St Helena	
South Georgia and the South Sandwich Islands	

Digital boundary data were lacking for five marine and eight terrestrial PAs in 2020 to 2021. JNCC digitally delineated the marine sites using descriptions of the site boundaries and printed maps or charts from the time of designation. The boundaries were aligned with the latest UK Hydrographic Office (UKHO) maritime boundary data (where applicable) and confirmed with UKOT Governments before use in PA extent calculations. JNCC digitally delineated the eight terrestrial sites (all penguin colonies on Tristan da Cunha) using GPS data provided by the RSPB, combined with Maxar Vivid satellite imagery from 2021 to 2022.

3.3 Identifying protected areas and other effective area-based conservation measures

Managing the environment is a devolved responsibility and UKOT Governments have adopted a variety of legislative and policy mechanisms to deliver biodiversity conservation. Establishing, recognising and reporting on area-based conservation measures is the responsibility of the individual UKOT Governments. JNCC therefore adopts the UKOT Governments' interpretations of what constitutes a PA and OECM, to ensure that indicator K4 aligns with UKOTs' domestic policy views.

A wide variety of area-based measures have been established for biodiversity conservation across the UKOTs, ranging from no-take zones where all extractive activities are prohibited, through to sustainable use areas where natural resource use is managed hand in hand with biodiversity conservation. A few UKOTs have established area-based measures to address multiple, co-occurring management issues, with biodiversity conservation just one of several purposes for designation.

Indicator K4 includes PAs with a primary biodiversity conservation goal and OECMs, in which nature conservation may be one of several objectives, or not explicitly identified as an objective but delivered incidentally as a by-product of a long-term management regime. By encompassing both PA and OECM concepts, indicator K4 aligns with the scope of Target 3 of the GBF (CBD 2022).

Although indicator K4 is designed to capture the variety of PAs and OECMs in the UKOTs, some parameters for identifying PAs and OECMs need to be consistent to ensure that the indicator remains focussed on biodiversity conservation, temporally defined, and comparable with other related PA indicators and targets. JNCC therefore asks the UKOT Governments to apply three key criteria when identifying and reporting spatial measures for indicator K4:

- 1) PAs and OECMs must be designated for an in-situ biodiversity conservation purpose and/or be delivering an in-situ biodiversity conservation outcome;
- 2) PAs and OECMs must be spatially defined; *and*
- 3) PAs and OECMs must be formally implemented (through legal or other effective means) at the time of reporting.

UKOT Governments have accepted and applied these criteria for indicator K4 purposes, ensuring that sites with no relevance to biodiversity conservation (e.g. those established purely for heritage/historic reasons), wider measures lacking a specific geographically defined area, and sites proposed or announced but not formally designated, are excluded. The criteria also ensure consistency with the foci of international obligations (e.g. GBF and UN Sustainable Development Goal targets) and a broad level of comparability with associated PA and OECM guidelines (e.g. Dudley 2008; Day *et al.* 2019).

International PA designations, such as Ramsar Sites and UNESCO World Heritage Sites (where selected against natural criteria) are included in the indicator where UKOT Governments formally recognise these as part of their PA networks. PAs owned and/or

managed by private or non-governmental organisations are also included where formally recognised by UKOT Governments and established through legal or other effective means.

The indicator includes large-scale marine PAs supported through the Blue Belt Programme in five of the UKOTs. These sites protect very substantial areas in the Indian, Pacific and South Atlantic Oceans, but they form only a subset of the marine PAs and OECMs implemented across the UKOTs as a whole (all of which are included in indicator K4).

3.4 Terrestrial and marine protected area categorisation

PAs and OECMs are categorised into sites protecting the terrestrial environment, the marine environment, or both, using information on their location, designation type and objectives. UKOTs are asked to confirm what category applies to sites that straddle the coastline. Where available, mean high water (MHW) limits are used as the dividing line between terrestrial and marine environments, otherwise best available (highest resolution and/or the most recent) coastline data are used. The Cayman Islands Government opted to use the vegetated shoreline (beneath MHW) to align with the local legal definition of the coastline.

In some instances, sites formally affording protection to the terrestrial *or* marine environment (but not both) can have boundaries that inadvertently extend above or below the coastline (often because they were drawn using low-resolution or misaligned coastline layers at the time of designation). To avoid exaggerating the breadth and extent of protection, these small, unprotected parts of coastline-straddling sites are excluded from extent calculations.

3.5 Calculating protected area extent

PA extent is calculated as the sum (in square kilometres) of all areas occurring within PAs and OECMs in the terrestrial and marine environments. Overlaps between site boundaries (e.g. where multiple designation types co-occur) are frequent and have to be discounted to prevent overestimating total PA extent. UKOT Governments and JNCC use a geographic information system (GIS) to dissolve boundaries into a layer of non-overlapping polygons, or subtract overlaps to calculate unique extents per PA, before calculating total PA extent. PA boundaries straddling the coastline are split using a MHW limit (or best available coastline) to produce separate area figures for the terrestrial and marine environments.

JNCC has developed an automated script to calculate PA extent for the UKOTs that opt not to produce and provide their own figures. The script joins a PA boundary layer with a list of PAs to select boundary polygons for calculation; the list contains only those sites that meet the criteria described in Section 3.3 and indicates their terrestrial and/or marine status. Boundaries are dissolved to remove overlaps and intersected with MHW (or best available coastline) data to split sites into their terrestrial and marine sections. The area of terrestrial and marine PAs is then summed, excluding any terrestrial or marine sections of sites if they are not the formal target of protection (see Section 3.4). The [script](#) is run for each UKOT, using R version 3.6.1 and the rgeos (0.5-3), rgdal (v1.5-12), raster (3.3-7) packages.

3.6 Land and sea extent

Calculating PA percent coverage requires basemaps of UKOT coastlines, maritime boundaries and international land borders from which land and sea areas can be calculated. Several UKOTs (listed under route 1, Table 3) provided ready-calculated land and sea areas. For the remaining UKOTs (route 2, Table 3), JNCC calculated their land and sea areas on their behalf.

UKOT Government coastline (described in Section 3.4) and land-border data are used to calculate land areas; these data sources are typically higher resolution than open-source global datasets of country boundaries. Some UKOT landmasses have only been mapped using satellite images (of variable quality) and/or without a constant tidal state, therefore coastline data are likely to continue improving. Coastline datasets are periodically upgraded in indicator K4 calculations to increase the accuracy and precision of land and sea area figures, but these updates are unlikely to change aggregated PA percent coverage figures.

UKOTs' waters are defined by their outermost maritime boundaries for indicator K4 purposes, with the exception of the Sovereign Base Areas of Akrotiri and Dhekelia (where the current 3 NM limit is used) and the Falkland Islands (where the Inner and Outer Conservation Zones are used). The extent of UKOTs' waters are calculated using publicly available maritime boundaries produced by the UKHO, with the exception of the Falkland Islands where Fisheries Department data are used. Five UKOTs do not have agreed international maritime boundaries with neighbouring states, therefore UKHO-calculated median lines provide an interim boundary for the purpose of calculating the approximate total extent of UKOT waters. These median lines do not represent agreed delimitations and could be subject to change if formal international maritime boundaries are negotiated in future.

Maritime boundary data were obtained via UKHO's [Marine Data Portal](#) in October 2023 and compared with earlier versions (from 2020-2022 calculations) to check for noteworthy changes to the extents of UKOT waters. Sea areas were recalculated for six UKOTs in this 2023 update (listed in Appendix 1).

3.7 Projected coordinate systems

PA extent, land area and sea area figures provided by UKOT Governments are calculated using a variety of native coordinate reference systems suitable for projecting areas (without distortion) at an individual UKOT-scale. JNCC calculations are undertaken using a Lambert Azimuthal Equal-Area (LAEA) projected coordinate system (and WGS 1984 datum) with latitudes of origin and central meridians customised to the mid-point of each UKOT's waters. Nine different projected coordinate systems (PCS) were used in calculations for the 2023 update (listed in Appendix 3); a customised LAEA PCS was used for six UKOTs.

JNCC tested the impact of projection choice on indicator K4 statistics by comparing the 2023 PA extent statistics (Table 1) with a set of dummy results based on the LAEA PCS only. Area calculations for seven UKOTs were replicated, using customised LAEA projections in place of the UKOTs' native PCS. Once PA extent results had been aggregated for all UKOTs combined, this found less than 0.005% difference in the percent coverage of terrestrial and marine PAs compared to the statistics in Table 1.

3.8 Aggregating extent figures

JNCC aggregates PA extent, land areas and sea areas across the UKOTs to produce combined extent statistics for all UKOTs and for four geographic regions (Figure 1, Table 1). PA percent coverages are calculated from the aggregated PA extent and land/sea area figures and these are presented graphically (for the UKOTs combined and per region) in indicator K4, on the 25 Year Environment Plan [Outcome Indicator Framework dashboard](#). JNCC also maintains time series datasets of aggregated (all-UKOT) and Territory-level PA extent results, with each calendar year representing a single data point in the series.

3.9 Confidence, uncertainty, and variability

JNCC's [Evidence Quality Assurance Policy](#) defines high confidence as “high agreement between evidence and plenty of good to high quality relevant evidence available”. JNCC is confident that the 2023 indicator K4 statistics accurately represent the current extent of PAs in the UKOTs, as the PA data were obtained from official sources or (for a small number of sites) confirmed by UKOT Governments following digital delineation by JNCC. Statistics from another source ([ProtectedPlanet.net](#)) are also comparable to the indicator K4 results for PA coverage of the marine environment (see Section 2.4).

3.9.1 Sources of uncertainty

To evaluate indicator confidence in more depth, JNCC qualitatively assessed six sources of uncertainty (Table 4) for sets of statistics at two spatial scales: aggregated statistics for all UKOTs combined and statistics for each individual UKOT (Territory-level). In summary, these areas of uncertainty range from having a small to no potential effect on the 2023 aggregated PA coverage statistics. However, the impact of data uncertainty on Territory-level statistics is likely to be greater, where smaller PA, land, or sea areas may make the results more sensitive to changes in interpretation, improvements to data quality and/or error correction.

The latest indicator K4 statistics include all sites and measures that UKOT Governments formally recognised as PAs or OECMs at the end of 2023. However, uncertainty remains around the formal protected status of a few locations (e.g. uninhabited offshore islands in one UKOT) and the OECM status of certain fisheries management measures. Although very low in number, the size of these potential PAs and OECMs could vary from very small offshore islets to potentially larger expanses of ocean. Until the status of these sites and measures is confirmed by the relevant UKOTs, there will remain a degree of uncertainty in the statistics. This could impact the PA extent and coverage results at the Territory-level, but the effect on the aggregated PA coverage statistics is likely to be small.

The absence of formal maritime boundaries leads to uncertainty in the size of five UKOTs' waters. Measuring sea areas using approximate median lines (explained in Section 3.6) enables PA coverages to be calculated, but as these are only approximate boundaries, they introduce a degree of uncertainty to the statistics. Progress with formal maritime boundary delimitation has the potential to significantly change these sea area estimates. The impact on the total sea area and marine PA coverage across *all* UKOTs will be minor, as boundary changes in the affected UKOTs (if they occur) will be small relative to the huge scale of UKOTs' combined waters, the majority of which is already formally delimited. However, new formal boundaries will likely create moderate or even large changes to sea area and marine PA percent coverage statistics at the Territory-level.

Coastline data vary in quality across the UKOTs, with low spatial resolution and/or inconsistent tidal state affecting some of the datasets informing land area calculations in the indicator. This margin of error will only be detectable at a very fine scale, so will have negligible impact on the aggregated marine protection statistics and (at most) a small impact on the terrestrial protection statistics. However, the impact may be more pronounced in Territory-level statistics, especially in UKOTs with a small landmass and/or where terrestrial PAs adjoin or straddle the coastline and have a small overall extent.

Table 4. Current sources of data uncertainty and a qualitative assessment of their potential impact on the 2023 indicator K4 PA extent statistics. The table presents likely impacts on: (a) aggregated statistics (all UKOTs combined); and (b) statistics at the individual UKOT level.

Current source of uncertainty	Relevance to indicator K4	(a) Aggregated statistics				(b) Territory-level statistics			
		Impact on PA extent	Impact on land area	Impact on sea area	Impact on PA % coverage	Impact on PA extent	Impact on land area	Impact on sea area	Impact on PA % coverage
Status of some unreported areas as PAs (e.g. uninhabited islands) and unreported measures as OECCMs (e.g. fisheries management areas)	Relevant to a small number of UKOTs. Could impact the inclusion of a very small number of PAs/OECCMs in K4 (but these could be of small to large).	Small (marine) to moderate (terrestrial)	n/a	n/a	Small (terrestrial and marine)	Moderate to large (terrestrial and marine)	n/a	n/a	Moderate to large (terrestrial and marine)
Incomplete or uncertain info on PA/OECCM objectives and protected features	Relevant to a small number of UKOTs. Could impact terrestrial versus. marine status of sites that straddle the coast.	Very small (terrestrial and marine)	n/a	n/a	Close to no effect (at 1 decimal place)	Small (terrestrial and marine)	n/a	n/a	Very small (marine) to small (terrestrial)
Quality of PA/OECCM boundary data	PA/OECCM boundaries may be mapped to old or low-resolution land parcel and/or coastline data	Very small (terrestrial and marine)	n/a	n/a	Close to no effect (at 1 decimal place)	Small (terrestrial and marine)	n/a	n/a	Very small (terrestrial and marine)

Current source of uncertainty	Relevance to indicator K4	(a) Aggregated statistics				(b) Territory-level statistics			
		Impact on PA extent	Impact on land area	Impact on sea area	Impact on PA % coverage	Impact on PA extent	Impact on land area	Impact on sea area	Impact on PA % coverage
Quality of coastline data	Coastline data vary in quality and age. Data of low-resolution and/or inconsistent tidal state occur for multiple UKOTs.	Very small (marine) to small (terrestrial)	Small	Very small	Close to no effect (marine) to small (terrestrial)	Small (marine) to moderate (terrestrial)	Small to moderate	Very small	Small (marine) to moderate (terrestrial)
Approximate international maritime boundaries (where not formally delimited)	Formal maritime boundaries lacking or only partially agreed for five UKOTs; median lines used to approximate the boundaries instead	Very small (marine). No effect for terrestrial.	n/a	Small	Small (marine). No effect for terrestrial.	Small (marine). No effect for terrestrial.	n/a	Moderate to very large	Moderate to large (marine only). No effect for terrestrial.
Choice and variety of projected coordinate systems (PCS) used in area calculations	Choice of PCS creates minor variation in area results (see Section 3.7). Using a mixture of PCS across the UKOTs creates a minor inconsistency within aggregated results.	Very small (terrestrial) and marine)	Very small	Very small	Very small (terrestrial and marine)	Very small (terrestrial and marine)	Very small	Small	Very small (terrestrial and marine)

3.9.2 Variability in indicator trends

As indicator K4 tracks the UKOTs' progress in PA and OECM designation going forward, temporal trends in PA and OECM extent will be subject to a degree of statistical noise. The areas of uncertainty identified in Table 4 are likely to create variability in K4 PA extent trends, as underpinning datasets improve, UKOT Governments' interpretations of PA and OECM networks evolve, and political developments change how the UKOTs are mapped (e.g. through the formal delimitation of maritime boundaries).

Some variation will be fine scale (such as improvements to the mapping of PA boundaries and coastlines) and will only be apparent in Territory-level PA extent statistics, if at all. Nevertheless, some sources of variation will have an observable impact on PA extent trends (at individual territory and/or all-UKOT levels) which will require documenting in the indicator so that true growth or decline in PA or OECM extent can be discerned from these other sources of change.

The largest potential drivers of variability will likely be the formal delimitation of UKOTs' waters (discussed in Section 3.9.1) and changes to the sites and measures already reported to indicator K4, as Governments review or re-interpret their PA and OECMs networks in light of new policies, commitments or targets (such as GBF Target 3). In the longer term, adjustments to the configuration of PA networks as conservation policy attempts to keep up with climate change-driven shifts in environmental conditions and habitat and species distributions may also cause significant variation in PA extent trends.

Indicator K4 statistics include OECMs where the UKOTs already recognise and report these measures (Section 2.1), and the reporting criteria (outlined in Section 3.3) are intentionally broad to ensure that K4 captures the breadth of spatial measures delivering biodiversity conservation in UKOTs, regardless of current PA versus OECM status. Given the infancy of the OECM concept, the overall extent of OECMs (and their contribution relative to PAs) is likely to change if or when they are more widely assimilated into UKOT PA policy. Future trends in the extent of terrestrial and marine protection may therefore reflect the outcome of reviews and re-interpretations of existing sites and measures, as well as the changes driven by the actual expansion of site boundaries and/or designation of new PAs and OECMs.

3.10 Constraints

The indicator K4 PA extent statistics are a measure of the total size of PAs only, using the formal, outer boundaries of the sites. The PA extent statistics therefore do not indicate:

- whether management measures are implemented within PAs;
- the type of management occurring (or intended), nor a judgement as to the overall level of protection afforded to biodiversity;
- the spatial and temporal extent of managed zones/areas within PAs;
- the effectiveness of the management measures in place; *or*
- the condition of the protected species, habitats, or ecosystems within the PAs.

In the longer term, indicator K4 also aims to assess the condition of PAs in the UKOTs to provide a more holistic assessment of the contribution of PAs to biodiversity conservation. This requires a method of synthesising UKOT-specific condition metrics to assess, and be sensitive to, the overall status of ecological elements protected across the UKOTs. This is a much more challenging subject to measure given the substantial variation in environments, ecology, PA types and purposes, and environmental policies found throughout the UKOTs, compounded by a paucity of data for many PAs. Developing an approach to track PA

condition will therefore take time and require close collaboration with the UKOTs, but, if feasible, will enhance the ecological meaningfulness of indicator K4 and improve understanding around the effectiveness of the UKOTs' conversation interventions.

3.11 Quality control and quality assurance

PA extent figures provided by the UKOT Governments undergo quality control by JNCC to check that area calculations are scientifically sound. These checks identify technical issues (such as the need to discount overlaps between PAs) which are addressed by the UKOTs before area figures contribute to K4. Where JNCC calculates PA extent on a UKOT's behalf, JNCC replicates area calculations in a GIS (ArcGIS v10.1) to corroborate the figures produced using the automated script. JNCC does not attempt to verify the sites that UKOTs report in the indicator, as formally identifying and reporting PAs is a policy decision for the UKOT Governments alone. However, correspondence with UKOT Governments in 2020-2023 indicated that they had applied the three inclusion criteria outlined in Section 3.3.

The work on indicator K4 (published here and on the Outcome Indicator Framework dashboard) is compliant with JNCC's [Evidence Quality Assurance Policy](#). JNCC's risk assessment recognises that indicator K4 figures could have a moderate or even major impact if used to inform UKOT policy decisions on PA designation. Accordingly, the outputs of this work are quality assured by senior JNCC colleagues and Defra's 25 Year Environment Plan Outcome Indicators team. UKOT biodiversity, international marine and conservation policy leads from Defra and FCDO also contribute to review and sign-off.

JNCC is pursuing voluntary application of the [Code of Practice for Statistics](#) in the production of indicator K4. A statement of compliance is currently under development and will be published in a future iteration of this report.

3.12 Update frequency and revisions

UKOT PA extent statistics for indicator K4 will be updated on an annual basis. Significant errors affecting key results may be corrected within-year, with Defra issuing a correction notification online via the 25 Year Environment Plan [Outcome Indicator Framework dashboard](#). Statistical errors in PA extent and/or coverage results will be corrected retrospectively in the time series dataset (see Appendix 1 for details); this includes instances where reporting of PAs/OECMs is delayed by one or more years after being formally established, requiring their extent to be backdated to their year of actual designation. Updates to land and sea areas (e.g. following the release of improved coastline or maritime limit data) will be incorporated periodically but will not be applied retrospectively to the time series (unless older figures incorrectly represent the data available at the time).

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Appendix 1: Inventory of updates to K4 protected area extent statistics

This Appendix contains a list of data updates to indicator K4 since the first publication of the UK Overseas Territory protected area (PA) extent statistics in 2020.

2021 update

- Cayman Islands: addition of new marine PAs and replacement of existing PAs following their re-designation and expansion in March 2021.
- Tristan da Cunha: addition of a new Marine Protection Zone formally enacted in August 2021; update to five other PAs following work to digitise and improve the accuracy of their boundaries; update to Exclusive Economic Zone boundary.

2022 update

- Ascension Island: boundary change to the terrestrial part of one Nature Reserve.
- British Virgin Islands: removal of PAs erroneously included in 2020 and 2021 (sites proposed but not yet formally gazetted). Extent of terrestrial PAs reduced by 0.6 km² and extent of marine PAs reduced by 84 km², including formally implemented sites only. Corrections applied to 2020 and 2021 PA extent statistics in the time series. Area of sea updated using UKHO maritime boundary data.
- Cayman Islands: addition of three new PAs (two terrestrial, one marine and terrestrial) designated in 2022 and two PA extensions (one terrestrial, one marine and terrestrial).
- Gibraltar: correction to include four OECMs in the marine environment (one dolphin protection zone and three no-anchoring zones), applied to 2020 and 2021 statistics in the time series.
- South Georgia and the South Sandwich Islands (SGSSI): addition of two terrestrial PAs covering 100% of the SGSSI landmass, designated in July 2022.
- Tristan da Cunha: addition of eight terrestrial nature reserves protecting northern rockhopper penguin colonies (boundaries drawn digitally by JNCC), filling a data gap. Corrections applied to 2020 and 2021 statistics in the time series.

2023 update

- Anguilla: area of sea updated using UKHO maritime boundary data (obtained October 2023), resulting in a very minor change to percent coverage of marine protection.
- Bermuda: recalculation of terrestrial and marine PA extents using improved PA boundary data, resulting in minimal change to statistics but higher accuracy. Corrections applied to 2020-2022 PA extent statistics in the time series. Area of sea updated using UKHO maritime boundary data (obtained October 2023).
- Cayman Islands: extension to two terrestrial PAs and recalculation of the extent of one further terrestrial PA (using improved boundary data), resulting in a minor (0.4 km²) increase in the area of terrestrial protection. Area of sea updated using UKHO maritime boundary data (obtained October 2023), resulting in a very minor change to percent coverage of marine protection.
- Falkland Islands: area of sea updated using UKHO maritime boundary data (obtained October 2023).

- Pitcairn Islands group: area of sea and area of Pitcairn Islands Marine Reserve updated using UKHO maritime boundary data (obtained October 2023), resulting in a small (85 km²) increase in marine PA extent.
- Turks and Caicos Islands: area of sea updated using UKHO maritime boundary data (obtained October 2023), resulting in a very minor change to percent coverage of marine protection.

Appendix 2: Supplementary marine protection statistics

Table 5. Supplementary statistics on the extent and coverage of marine PAs and OECMs for geographic scales, management types or other breakdown relevant to individual Territories. These results were volunteered for publication by the respective UKOT Governments and relate to finer scales, or more granular breakdowns, than the statistics presented in Table 2 (for all PAs and OECMs across the whole of each UKOTs' waters). Statistics are accurate as at the end of 2023.

UK Overseas Territory	Geographic breakdown of UKOT's waters	Area of waters (km ²)	Type of PA/OECM or management	Area of marine PAs and OECMs (km ²)	% coverage of PAs and OECMs
British Virgin Islands	Territorial Sea	5,394	All types	52	1.0
Cayman Islands	Coastal shelf (150 ft [45.7 m] depth contour)	214	All types	117	54.8
	Coastal shelf (150 ft [45.7 m] depth contour)	214	No Take Zones	97	45.3

Appendix 3: Projected coordinate systems used in indicator K4 area calculations

Table 6. Projected coordinates systems used in indicator K4 area calculations. For calculations using Lambert Azimuthal Equal-Area (LAEA), latitudes of origin and central meridians were customised to the mid-point of each UKOT's waters (units in decimal degrees). Two UKOTs chose a different PCS for sea area calculations, given the large spatial scale of their waters (compared to the smaller spatial scale of their landmass and PAs).

UK Overseas Territory	Projected coordinate system for PA extent and land area calculations	Projected coordinate system for sea area calculations
Anguilla	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -62.481158, latitude of origin 19.946334	As for PA extent and land area
Bermuda	Bermuda National Grid 2000 (EPSG:3770)	As for PA extent and land area
British Indian Ocean Territory	WGS 1984 Lambert Azimuthal Equal-Area, central meridian 71.949438, latitude of origin -6.583298	As for PA extent and land area
British Virgin Islands	North American Datum 1983 UTM Zone 20 North (EPSG:26920)	As for PA extent and land area
Cayman Islands	North American Datum 1927 UTM Zone 17 North with customised local 'CaymanLIS' grid	WGS 1984 UTM Zone 17 North (EPSG:32617)
Falkland Islands	WGS 1984 UTM Zone 21 South (EPSG:32721)	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -60.0, latitude of origin -57.0
Gibraltar	European Terrestrial Reference System 1989 UTM Zone 30 North (EPSG:25830)	As for PA extent and land area
Montserrat	Montserrat 1958 British West Indies Grid (EPSG:2004)	As for PA extent and land area

UK Overseas Territory	Projected coordinate system for PA extent and land area calculations	Projected coordinate system for sea area calculations
Pitcairn Islands group	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -127.423504, latitude of origin -24.60071	As for PA extent and land area
Saint Helena, Ascension, and Tristan da Cunha	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -5.708613, latitude of origin -15.972834	As for PA extent and land area
Ascension Island	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -14.363839, latitude of origin -7.947698	As for PA extent and land area
Tristan da Cunha	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -11.211127, latitude of origin -38.7616	As for PA extent and land area
South Georgia and the South Sandwich Islands	WGS 1984 Albers Equal-Area Conic, central meridian -34.0, latitude of origin -57.0, standard parallels of -54.0 and -60.0	As for PA extent and land area
Sovereign Base Areas of Akrotiri and Dhekelia	WGS 1984 Lambert Azimuthal Equal-Area, central meridian 33.277474, latitude of origin 34.750774	As for PA extent and land area
Turks and Caicos Islands	WGS 1984 Lambert Azimuthal Equal-Area, central meridian -70.304467, latitude of origin 22.578752	As for PA extent and land area