

A SPATIAL ANALYSIS OF SCOTLAND'S PROTECTED AREAS AND PRIORITY PEATLANDS

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Introduction

Scotland's system of protected areas has evolved into a multiscale matrix of public and private spaces with varying degrees of protection. Approximately 23% of the country's 8-million-hectare terrestrial area has some level of protection in 2024. Included in some of these protected areas are valuable peatlands; however, there is a spatial mismatch in some regions. This project maps and analyzes the spatial relationships between priority peatlands and protected areas across Scotland.

Methodology

Table 1. Data Sources

Data	Source	Pre-processing
United Kingdom Country Boundaries	Office for National Statistics (ONS_Geography Data, 2023)	Scotland Boundary Clipped
Priority Peatlands	Carbon and Peatland 2016 v2, NatureScot	Class 1 and Class 2 Peatlands extracted
World Database on Protected Areas (WDPA)	UNEP-WCMC and IUCN (2024)	Marine Protected Areas removed
Country Parks	NatureScot Maps, 2004-2020	
Geological Conservation Review Sites (GCR)	NatureScot Maps, 2005-2020	Merged with WDPA Dataset
Other Local Protected Areas of Scotland	Spatial Hub Scotland, 2021	

Workflow

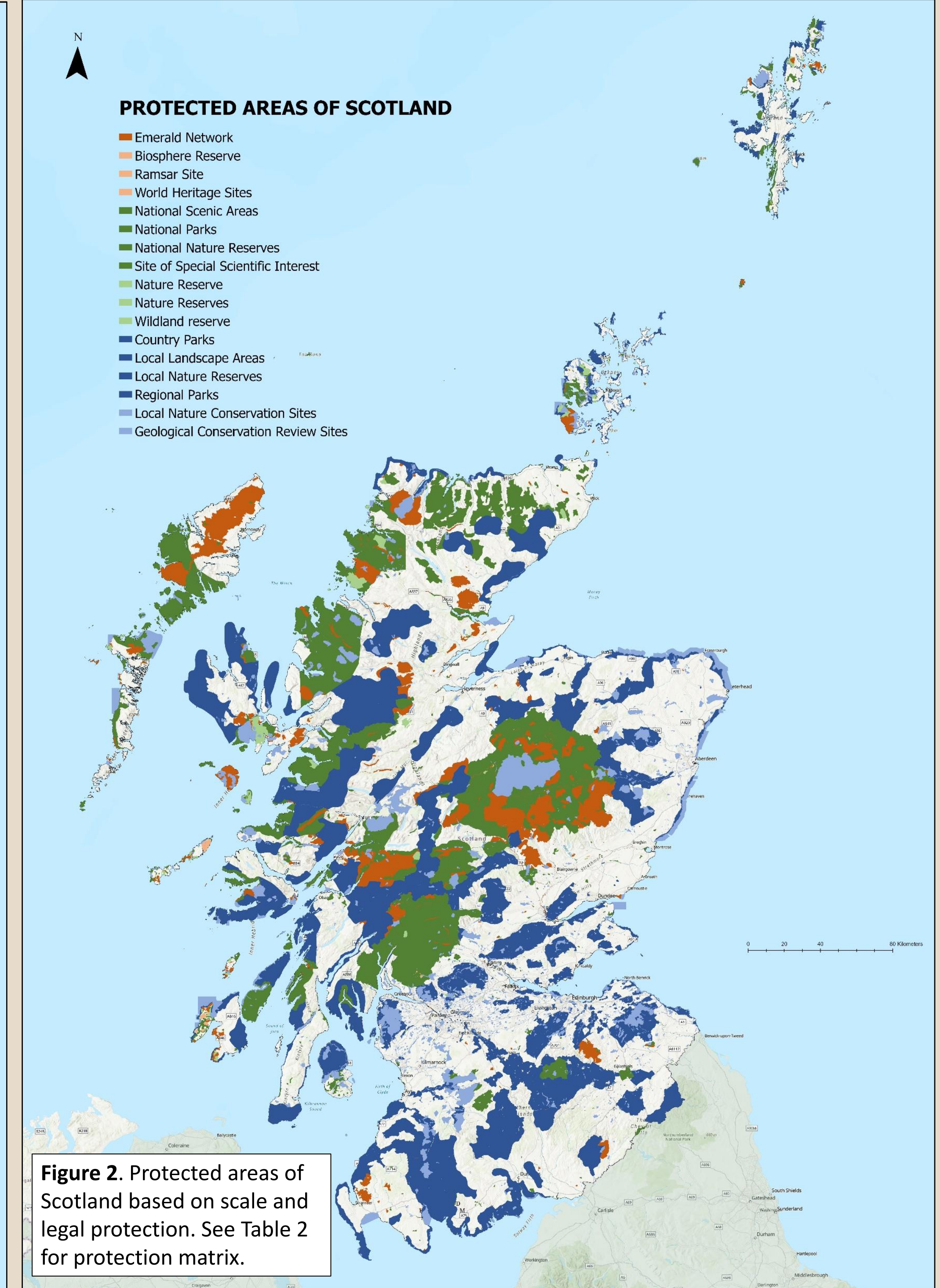
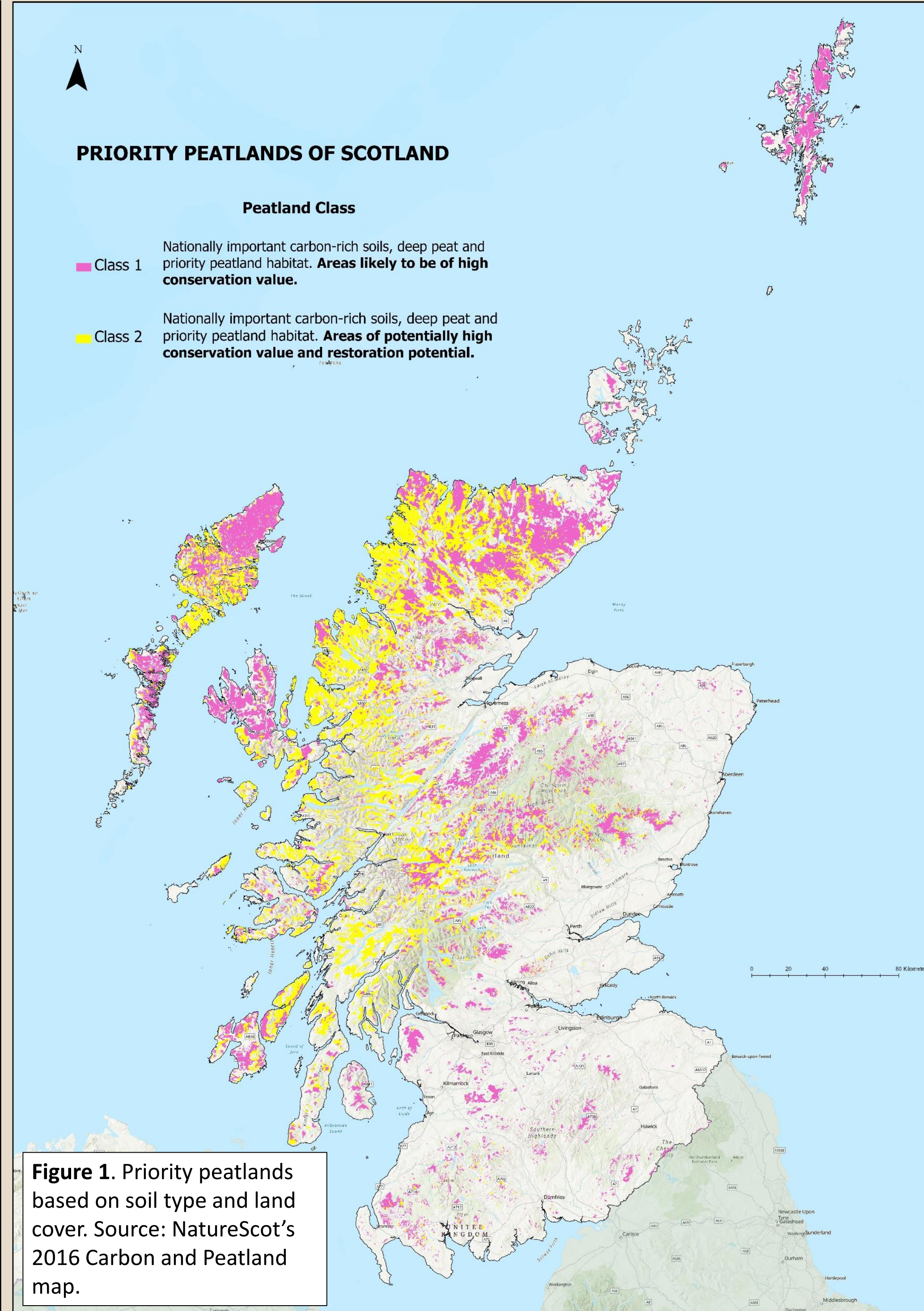
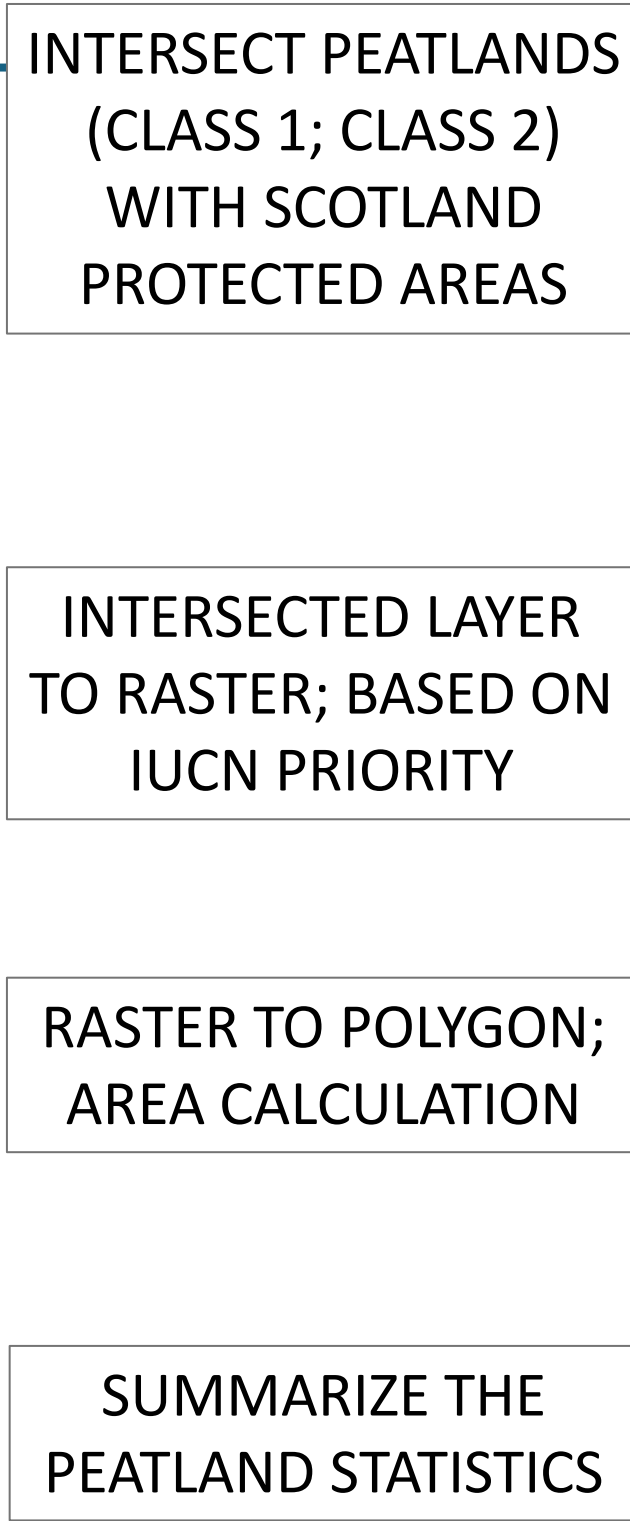


Table 2. Distribution of protected priority peatlands by class (Figure 1) and organized by the NatureScot protected areas framework (Figure 2). In the case of multiple designations (see Figure 3), the designation with the highest level of protection (or IUCN priority) was used.

SCALE / LEGAL PROTECTION	LOCAL	Priority Peatlands				NATIONAL	Priority Peatlands				INTERNATIONAL	Priority Peatlands			
		Class 1	Class 2	Class 1	Class 2		Class 1	Class 2	Class 1	Class 2					
		Area (ha)	%	Area (ha)	%		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	
STATUTORY	Country Parks	45.6	<0.1	0	0	National Scenic Areas	70,948.0	12.4	198,240.2	38.4	Emerald Network	307,661.3	53.8	165,860.3	32.1
	Local Landscape Areas	127,694.8	22.3	112,351.9	21.8	National Parks	36,332.9	6.4	24,135.5	4.7					
	Local Nature Reserves	147.1	<0.1	0	0	National Nature Reserves	848.8	0.2	30.8	<0.1					
	Regional Parks	2,771.3	0.5	4.7	<0.1	Sites of Special Scientific Interest	7,376.6	1.3	3,382.3	0.7					
NON-STATUTORY	Local Nature Conservation Sites	10,745.7	1.9	499.6	0.10	Wildland Reserve	667.7	0.1	179.1	<0.1	Biosphere Reserve	837.2	0.2	1,901.7	0.4
	Geological Conservation Review Sites (GCR)	3,231.4	0.6	7,310.9	1.4	Nature Reserve	2,476.2	0.4	1,932.3	0.4	Ramsar Sites	0	0	0	0
						Nature Reserves	80.0	<0.1	0.1	<0.1	World Heritage Sites (natural or mixed)	0	0	0	0

Notes: The World Database on Protected Areas (WDPA) categories were added to the NatureScot Protected Areas Matrix. Marine Protection Areas were not used in our analysis. All Ramsar Sites are part of the Emerald Network, and thus included in the higher protection category. Forest Parks and Reserves (Woodland, Forest Park, Forest Nature Reserve, Caledonian Forest Reserve) are managed by FCS (Forestry Commission Scotland), and these designations may overlap with, and gain statutory protection from, a Site of Special Scientific Interest and/or Emerald Network. GeoParks and Biogenetic Reserves overlap with other protected areas like World Heritage Sites and National Nature Reserve.

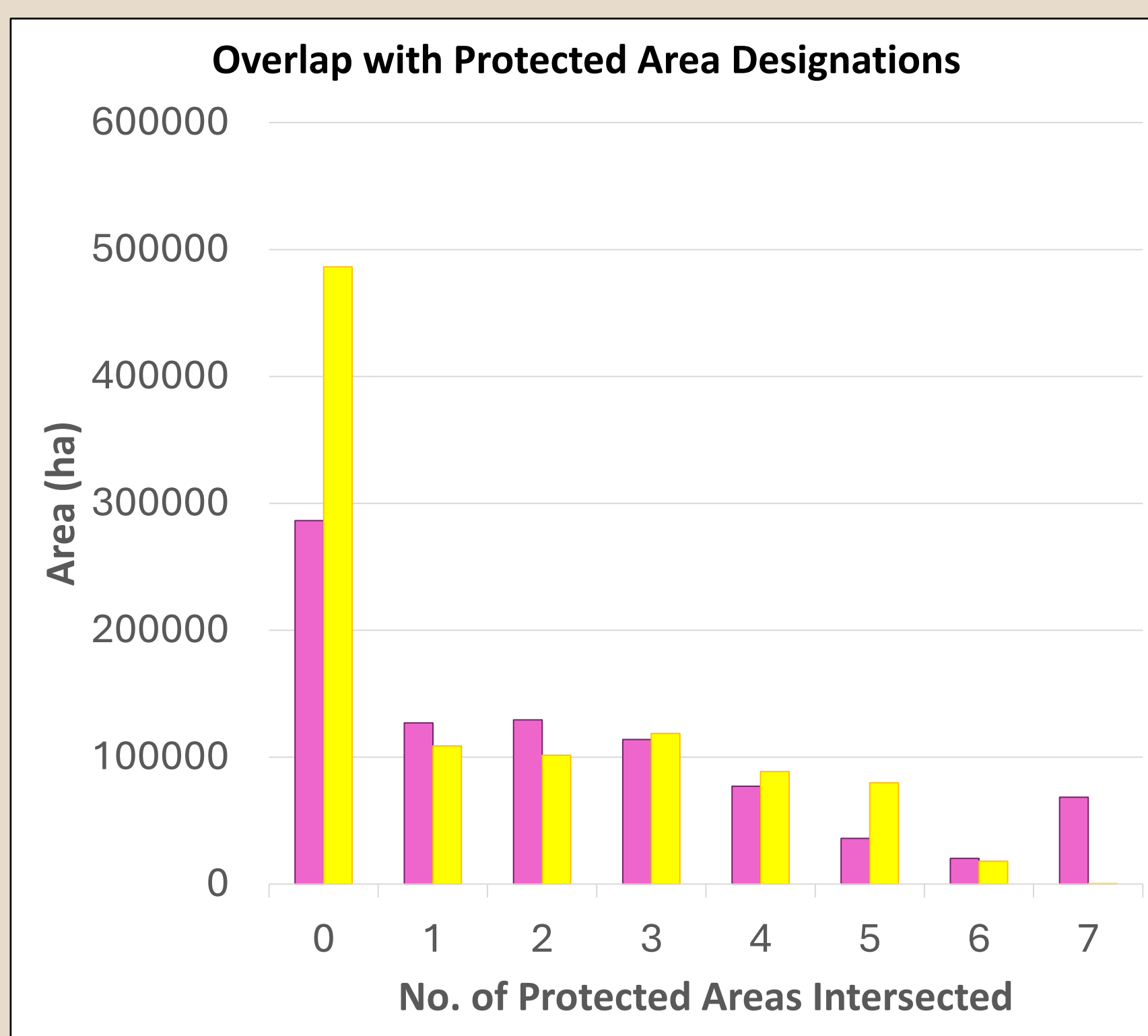


Figure 3. Priority peatlands (by Class) overlap with multiple protected area designations.

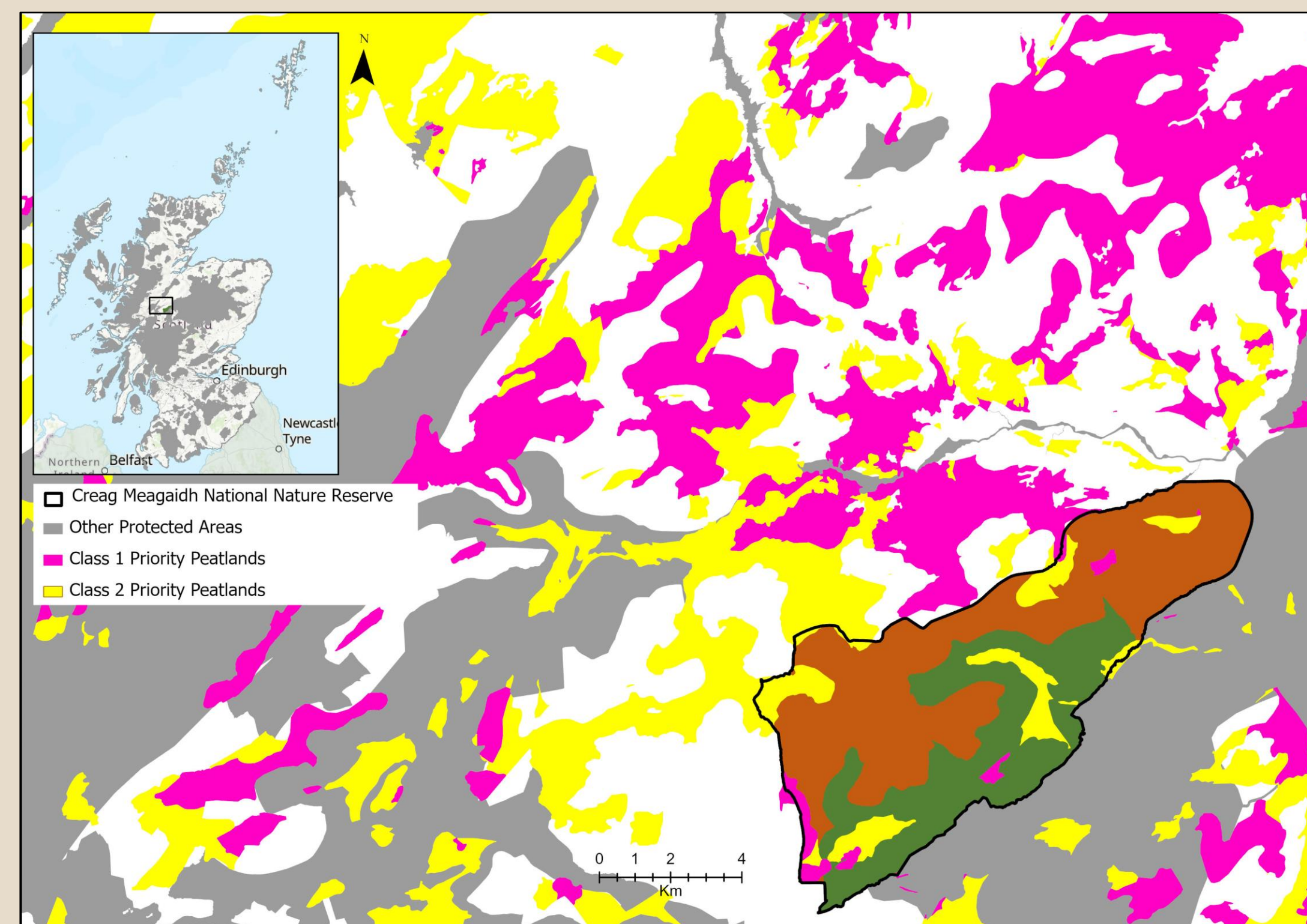
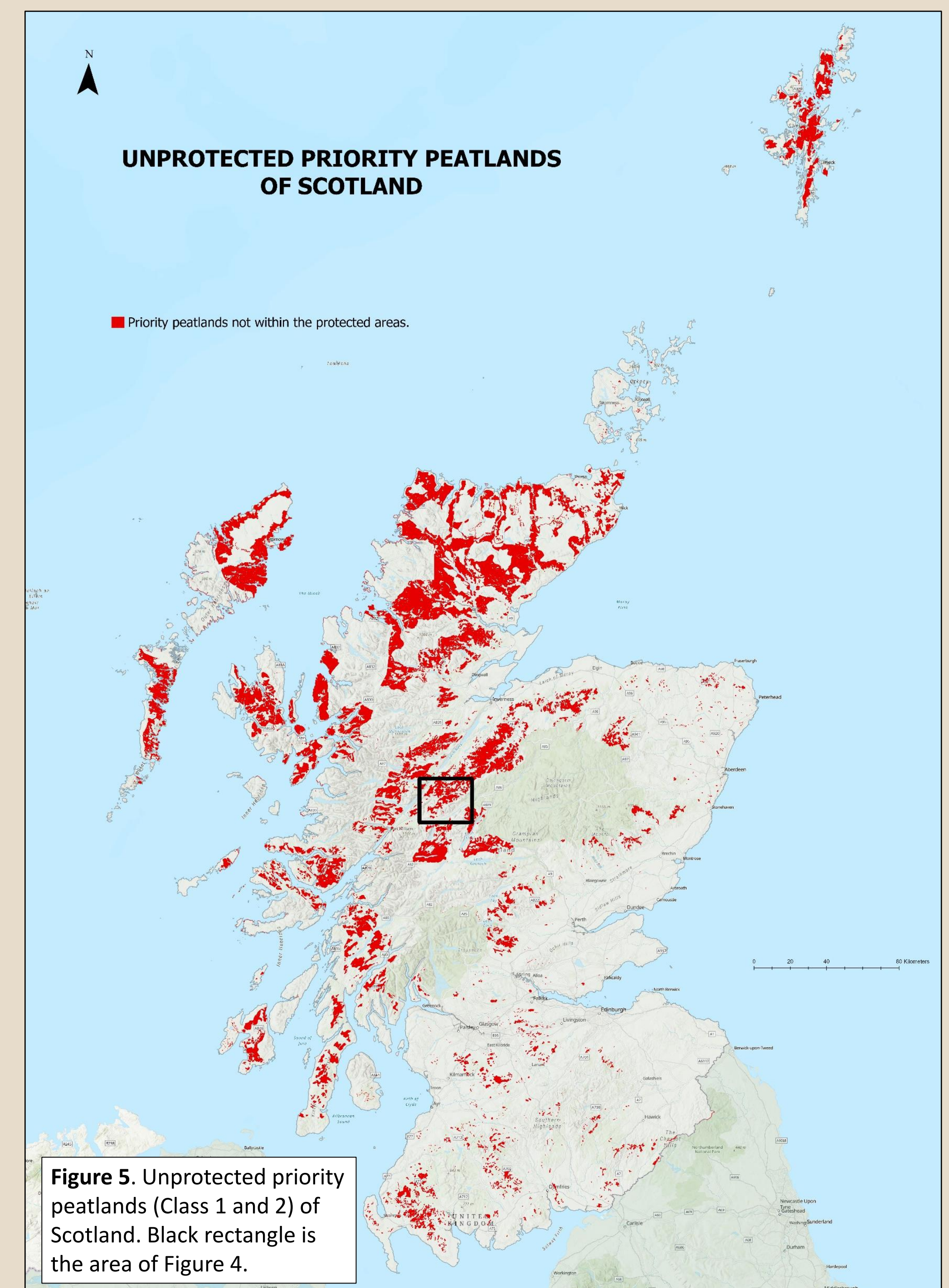


Figure 4. Creag Meagaidh National Nature Reserve (also a Site of Special Scientific Interest, and part of the Emerald Network) and surrounding areas of unprotected priority peatlands.



Key Findings

Peatland areas of high conservation value (Class 1) cover 1,002,231.9 ha (13%) of Scotland. Peatland areas of potentially high conservation value and restoration potential (Class 2) cover 858,237.5 ha (11%) of Scotland. Together, these two classes of priority peatlands cover almost a quarter of Scotland's total land area (Figure 1). When placed in the spatial context of protected areas (Figure 2), 1,057,832.1 ha (56%) of priority peatlands are legally protected, while another 29,861.9 ha (2%) have non-statutory protections. The statutes protecting Class 1 peatlands are mostly international designations via the Emerald Network (Table 2). The most protections for Class 2 peatlands are through National Scenic Areas (Table 2). Local Landscape Areas legally protect about 22% of Class 1 and Class 2 peatlands. Most of the protected priority peatlands have multiple designations, some as many as seven (Figure 3). The Creag Meagaidh National Nature Reserve, for example, is also a Site of Special Scientific Interest and part of the Emerald Network (Figure 4). The area around Creag Meagaidh NNR is also a good example of how most connected priority peatlands are not protected (Figure 4). In all, 1,860,469.5 ha of Scotland's priority peatlands (42%) have no level of protection (Figure 5). Large areas of unprotected priority peatlands include the Shetland Islands, Uist Islands, Isle of Skye, Northwest Highlands, and Monadhliath Mountains, which includes the lands northwest of Creag Meagaidh NNR (Figure 4).