

E40 waterway: impacts on protected areas in Poland, Belarus and Ukraine



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Scientific report by Save Polesia

Frankfurt, September 2022

Save Polesia is now an international partnership of four civil society organisations. We strive to protect Polesia for the citizens of Belarus, Poland, Ukraine and wider Europe – now and in the future. We stand against the construction of the E40 waterway and for the development of nature-based tourism in Polesia. While working on this analysis the coalition also included APB-Birdlife Belarus, which was operating until mid-March 2022.

Editor

for the ‚Save Polesia‘ coalition
Frankfurt Zoological Society
Bernhard-Grzimek-Allee 1 | 60316 Frankfurt | Germany
Tel. +49 (0)69 - 94 34 46 0
info@savepolesia.org
www.savepolesia.org

Lead authors

Helen Byron & Wouter Langhout, Frankfurt Zoological Society

Editorial staff

Heorhiy Veremiychyk, NECU
Kirstin Ulrichs, Frankfurt Zoological Society
Małgorzata Górska, Justyna Choroś, Jarosław Krogulec
& Marek Elas, OTOP
Oleg Lystopad, Ukrainian environmental journalist & writer
Volha Kaskevich, Bahna

Design of the maps

Pitt Gropengiesser, pg-webstudio
Iurii Strus, Frankfurt Zoological Society

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Further information

Helen Byron, Save Polesia Campaign Coordinator,
Frankfurt Zoological Society
info@savepolesia
www.savepolesia.org

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1. Executive Summary

- In 2013 Governments of Belarus, Poland, and Ukraine began to develop the idea of one of Europe's longest inland waterways – the so-called E40 waterway. The 2,000 km-long navigable shipping channel would connect the Black Sea and the Baltic, stretching from Gdańsk in Poland to Kherson in Ukraine. It would cut through the heart of Polesia, the largest wetland wilderness of the European continent. Constructing this massive infrastructure project would require dredging, damming, straightening, and deepening of natural rivers including the Pripyat and the Vistula.
- The E40 waterway would have a range of impacts on people and the environment, including on protected areas (PAs) of international importance. The extent of the threat has led to experts recognising the E40 waterway as one of the top emerging issues of concern for global biodiversity conservation.
- This report reveals the protected areas which are likely to be impacted by the proposed E40 waterway. The analysis looks at both, protected areas directly on the E40 waterway route (including those which would be bisected by the E40) as well as those likely to be subject to indirect impacts especially from changes in hydrology.
- Moreover, the analysis considers potential impacts on internationally protected areas (Natura 2000, Emerald, Ramsar, IBAs, UNESCO-MAB and HELCOM) and nationally protected areas and identifies key biodiversity hotspots which would be impacted.
- The analysis was carried out in two phases: phase one involved the analysis of publicly available GIS data for protected areas; phase two included the verification of the GIS outputs by Save Polesia partners based on local information and expert knowledge.
- The overall aim of the analysis is to highlight the high number of protected biodiversity areas likely to be impacted by the planned E40 waterway and hence the urgent need for further assessment of this issue before implementation of the project can be considered.

Key findings:

Impacts on international PAs protected by designations under international policy and legislation:

- 73 international PAs with a total area of 20,058 km² (larger than the size of Slovakia) would be impacted directly by E40 waterway: 24 sites in Poland (total area 2,065 km²), 18 in Belarus (total area 5,071 km²) and 31 in Ukraine (total area 12,922 km²); 25 of the 73 sites (a total area of 9,432 km²) are in Polesia.
- 120 international PAs, with a total area of 13,270 km² are very likely to be impacted indirectly by E40 waterway: 62 sites in Poland, 46 in Belarus, ten in Ukraine plus two transboundary sites (one between Poland, Belarus and Ukraine, the other between Poland and Ukraine). The total areas of sites impacted in each country (including the national components of the transboundary sites) are: Poland 4,972 km²; Belarus 5,544 km²; and Ukraine 2,754 km². 59 of the 120 sites (a total area 7,255 km²) are in Polesia.
- In total **193 international PAs would be impacted** (directly and indirectly) by E40 waterway (84 of these are in Polesia); 86 sites in Poland (10 in Polesia), 64 in Belarus (all in Polesia) and 41 in Ukraine (nine in Polesia), plus the two transboundary sites (one between Poland, Belarus and Ukraine, the other between Poland and Ukraine). A total

area of 33,328 km² (larger than the size of Austria) of which 16,687 km² is in Polesia (9 percent of the total area of Polesia)

Types of international PAs impacted:

- 66 **Natura 2000 sites** would be impacted in Poland – a total area of 5,182 km², almost 8.5 percent of the Polish Natura 2000 network area; 14 of these sites (one of which is in Polish Polesia) would be impacted directly (nine with serious impacts as they are river valley sites that would be bisected). The other 52 sites (five in Polish Polesia) would have indirect impacts.
- 52 **Emerald sites** would be impacted (39 in Polesia), a total of 24,098 km², an area almost the size of North Macedonia and 3.5 percent of the total area of Emerald sites in Belarus and Ukraine. 26 of these sites would be impacted directly, (13 of these sites are in Polesia of which nine sites in Belarus would have serious impacts). 26 sites (all in Polesia) would have indirect impacts (six of these sites would have serious impacts).
- 16 **Ramsar sites** would be impacted a total area of 4,570 km², more than 26 percent of the total area of Ramsar sites in Poland, Belarus and Ukraine. Eleven of these sites, 4,194 km² are in Polesia. Seven sites would have direct impacts (three of these in Belarusian Polesia would have serious impacts). A further nine sites (all in Polesia) would have indirect impacts (two of the sites in Belarus would have serious impacts).
- 55 **IBAs** would be impacted, a total of 16,858 km², an area larger than Montenegro and 16 percent of the total area of IBAs in Poland, Belarus and Ukraine. 26 of these sites, 10,845 km² are in Polesia. 24 sites would have direct impacts (eight of these are in Polesia and nine (three in Poland and six in Belarusian Polesia) would have serious impacts. A further 31 sites (18 in Polesia) would have indirect impacts (four of the sites in Belarus would have serious impacts).
- Two **transboundary UNESCO-MAB sites** (one in Polesia – West Polesia Biosphere Reserve, a transboundary site between Belarus, Poland and Ukraine) would have indirect impacts, a total area of 6,670 km².
- Two **Baltic Sea (HELCOM) sites** in Poland would be directly impacted, a total area of 641 km².
- At least 43 international PAs would have serious impacts, a total area of 17,064 km². 31 sites in Belarus (15 Emerald sites, five Ramsar sites, ten IBAs and the Belarus section of the West Polesia Biosphere Reserve) and 13 in Poland (two SPAs, seven SACs, one Ramsar site and three IBAs).

Table ES 1: Overview of the number and size of international protected areas impacted directly and indirectly if the E40 waterway is built.

	Number and size of international PAs impacted	
	along the whole E40 route	in Polesia
Direct impacts	73 sites 20,058 km ²	25 sites 9,432 km ² (\pm 5.1 % of the total area of Polesia)
Indirect impacts*	120 sites 13,270 km ²	59 sites 7,255 km ² (\pm 3.9 % of the total area of Polesia)
Total impacts	193 sites 33,328 km²	84 sites 16,687 km² (\pm 9 % of the total area of Polesia)

* including hydrology impacts

Impacts on national PAs:

- 54 national PAs (sites protected by designations under national policy and legislation) **impacted directly** by E40 waterway (nine of these are in Polesia); 30 sites in Poland, eight in Belarus and 16 in Ukraine, a total area of 14,130 km²
- 85 national PAs are very likely to have **indirect impacts**, an area of 8,120 km²: 38 of these sites are in Polesia (5,892 km²); 52 are in Poland (six in Polesia), 31 in Belarus (30 in Polesia and six of which would have serious impacts) & two in Ukraine (both in Polesia).
- In total **139 national PAs would be impacted** (directly and indirectly) by E40 waterway (47 of these are in Polesia); 82 sites in Poland (six in Polesia), 39 in Belarus (38 in Polesia) and 18 in Ukraine (three in Polesia). A total area of 22,250 km² of which 12,423 km² is in Polesia (almost 7 percent of the total area of Polesia).

Table ES 2: Overview of the number and size of national protected areas impacted directly and indirectly if the E40 waterway is built.

	Number and size of national PAs impacted	
	along the whole E40 route	in Polesia
Direct impacts	54 sites 14,130 km ²	9 sites 6,531 km ² (\pm 3.5 % of the total area of Polesia)
Indirect impacts*	85 sites 8,120 km ²	38 sites 5,892 km ² (\pm 3.2 % of the total area of Polesia)
Total impacts	139 sites 22,250 km²	45 sites 12,423 km² (\pm 6.7 % of the total area of Polesia)

* including hydrology impacts

Biodiversity and habitats:

- **Key biodiversity hotspots** impacted include
 - Prip'yatsky National Park and Almany Mire in Belarus,
 - Ten Natura 2000 sites (SACs and SPAs) in Lower and Middle Vistula Valley, Dolny Wieprz Natura 2000 (SAC, IBA and candidate SPA) and peatland in the Tyśmienica, Bystrzyca, and Wieprz River catchments in Poland,
 - and National Nature Park Prip'yat-Stokhid and Chornobyl Radiation and Ecological Biosphere Reserve in Ukraine.
- **Species** that would be impacted in Polesia include the threatened Aquatic Warbler, Greater Spotted Eagle, Giant Noctule Bat and the carnivorous Waterwheel Plant. In the Vistula Valley many bird and aquatic species would be impacted including Sandwich Tern, Little Tern, Common Ringed Plover, Oystercatcher, Common Shelduck, Atlantic Salmon and European Eel.
- Iconic mammals like Brown Bear, Grey Wolf, Elk and Eurasian Lynx may have their habitats and migration pathways affected. And birds migrating through the Prip'yat floodplain (more than 1.5 million birds annually) may have their habitats and thus migration affected.
- **Key habitats** that would be impacted in Polesia are open water, grassland, forest and mire habitats. In particular floodplain hardwood or alluvial forests and transition mires and quaking bogs. All habitats that are highly threatened in Europe.

Hydrology:

- Our scoping exercise identified 407 internationally protected areas (Natura 2000, Emerald, Ramsar, UNESCO and Baltic Sea sites) in river basins through which the E40 waterway would pass which may have hydrological impacts. 118 of which are in Polesia) i.e. an additional 214 sites (35 in Polesia) on top of those we identified as very likely to have direct or indirect impacts which would need investigating further. These impacts could be more serious in light of climate change, and this will be an underestimate as the present scoping analysis did not look at IBAs due to limited capacity.

Overall conclusion:

- The implementation of the E40 waterway would lead to huge and unacceptable impacts on protected areas, habitats and species. Impacts that will be significant at European level and which will be completely at odds with the international and European biodiversity commitments that the three countries have entered into, including commitments under the Convention on Biological Diversity and Ramsar and Bern Conventions. In Poland, the E40 project is at odds with commitments under the EU Biodiversity Strategy.
- These biodiversity impacts are not acceptable. Our analysis makes it clear the E40 inland waterway project should be abandoned on biodiversity grounds alone.
- Until this happens it is not surprising that experts recognise E40 waterway as one of the top emerging issues of concern for global biodiversity conservation.

2. Background

2.1 E40 waterway project

In 2013 Governments of Belarus, Poland, and Ukraine began to develop the idea of one of Europe's longest inland waterways. Known as the E40, the 2,000km-long navigable waterway would stretch from Gdańsk in Poland to Kherson in Ukraine. Constructing E40 waterway would require dredging, damming, straightening, and deepening of pristine rivers. It would cut through the heart of Polesia, Europe's largest wetland wilderness. This massive infrastructure project would have a range of impacts on people and the environment, including on protected areasⁱ. The extent of the threat has led to experts recognising E40 waterway as one of the top 15 emerging issues of concern for global biodiversity conservation in 2021ⁱⁱ.

A consortium led by the Maritime Institute of Gdańsk – an organisation overseen by the Polish government – published a feasibility study for the construction of the E40 waterway in 2015ⁱⁱⁱ. Proposals comprise the rivers Vistula, Bug, Mukhavets, Pina, Pripyat, and Dnieper, as well as the Dnieper-Bug channel. The study considers three possible options for the route of the E40 waterway in eastern Poland, which differ in how the Vistula river is linked to Terespol (on the Bug and Mukhavets rivers). One variant (V1) proposes a new channel running to the south of the river Bug; a second (V2) is based on the river Vistula and the river Wilga plus a planned new channel; and the third (V3) is based on the river Vistula, the river Wieprz and the planned new channel. The options vary in length.



Figure 1: Location of E40 Inland Waterway, including the three route variants in Poland.^{iv}

A second, more detailed feasibility study was undertaken on the E40 waterway route in Poland. While the final version is still not publicly available, interim information from this Polish feasibility study published in March 2020 is recommending a route based on variant 3, with three differing options of this variant currently being investigated further^v. All three of these options would be extremely damaging to nature^{vi}.

While the E40 waterway might appear a complete route on the map, some of its sections are either completely unsuitable for shipping or have low shipping classes (I-III), meaning they are not suitable for freight transport. For example, in Poland only 66.5 km of the Lower Vistula (55 km of Włocławek reservoir and 11,5 km of “Dead Vistula”) is currently at the required international technical standards for freight transport^{vii}. Hence, to make E40 waterway fully navigable to shipping class IV (the requirement for an international waterway^{viii}) extensive infrastructure works would be needed, including 12-15 dams on the Vistula in Poland, the roughly 160 km new channel with seven locks in Poland, five-six dams in Belarus and extensive dredging and channel straightening, including in the Chornobyl Exclusion Zone. Works of this extent would make this one of the most complicated and expensive construction projects in the world.

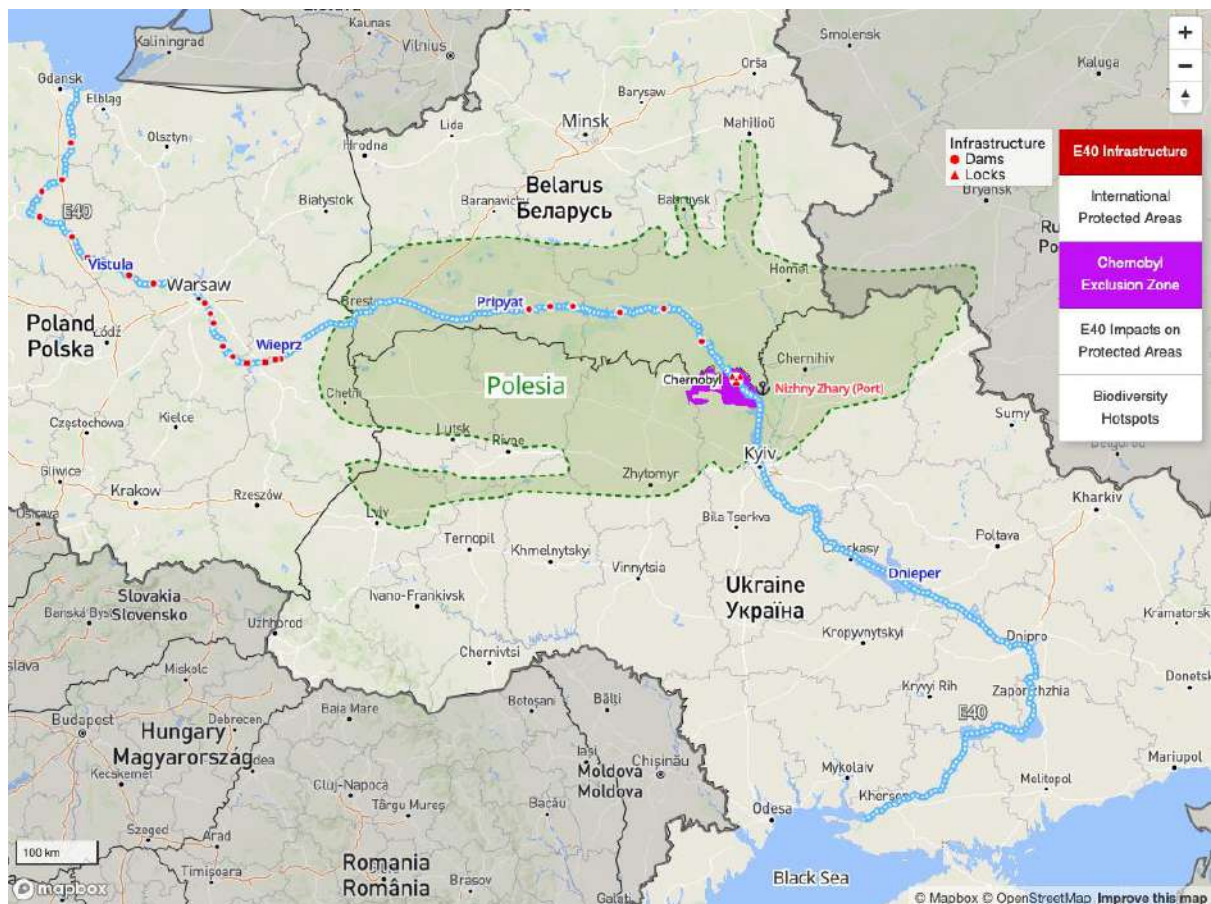


Figure 2: Map of planned E40 Inland Waterway including key infrastructure elements and the rough borders of Polesia, Europe’s largest wetland wilderness.^{ix}

In late July 2022, in light of current circumstances, the Government of Ukraine denounced its Agreement with Belarus on inland waterway navigation^x. As a result, Ukraine will no longer cooperate with Belarus on E40 waterway. However, both Ukraine and Poland are

continuing plans for their national sections of E40 waterway. For example, the majority of the Ukrainian section has been included in the revised maps for the Trans-European Transport Network (TEN-T) for Ukraine^{xi}. Hence there is still a real risk that E40 waterway will be constructed in a piece-meal ‘salami-slice’ fashion.

2.2 Polesia

Polesia¹ is Europe’s Amazon. This stunning region, which straddles the borders of Poland, Belarus, Ukraine, and Russia, is the continent’s greatest intact floodplain region. Despite ongoing threats from climate change, hunting, logging, and mining, huge areas of Polesia remain pristine.

Natural and wild rivers lie at Polesia’s heart – the Bug in Poland, Dnieper in Ukraine, and the 750 km-long Pripyat, one of Europe’s most pristine rivers. The altitude across the remarkable 186,000 km² region never varies by more than 150 meters. Meandering rivers, tributaries, and oxbows shape a labyrinth of wetlands, peatlands, forests, islands, swamps, bogs, marshes, and lakes that are home to some of the most biodiverse and culturally rich parts of Europe. The floodplains also mitigate floods, clean air, and are a major carbon store. Polesia is home to local communities, whose culture and lifestyle is adapted to the extraordinary environment^{xii}.

¹ Note: The three different countries have different spellings for ‘Polesia’ – in Belarus Palessie, in Poland Polesie, in Ukraine Polissya. In this report we use the English international spelling Polesia for consistency.

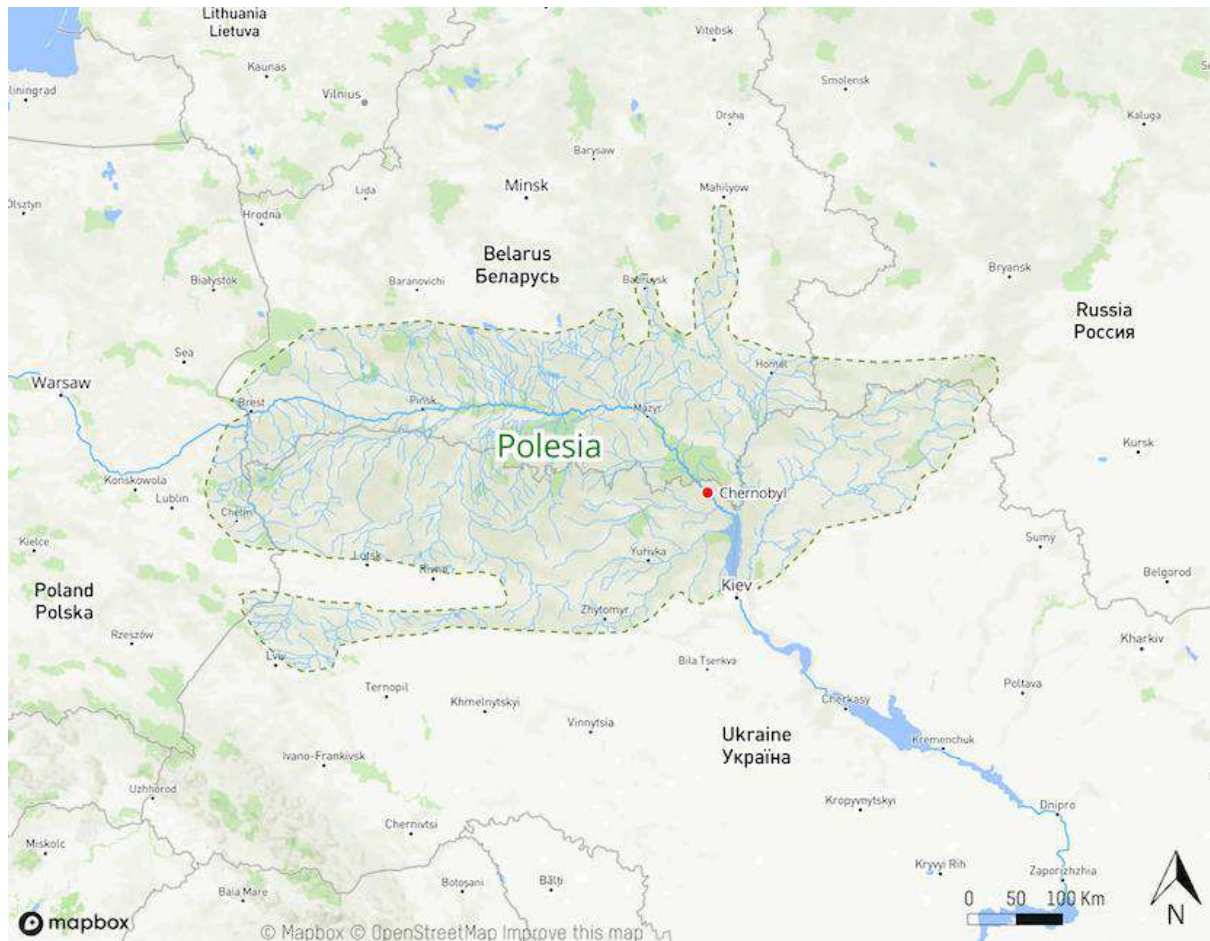


Figure 3: Key river network and waterbodies of the European wetland wilderness Polesia (dashed line).

Polesia hosts a massive diversity of insects, amphibians, fish, birds, mammals, and plants, many globally endangered. The survival of many depends on this pristine landscape. It is one of Europe’s most important sites for migratory birds. In spring, millions of birds descend on Polesia to rest and refuel. Spring numbers of at least 150,000-200,000 Eurasian Widgeon, 200,000-400,000 Ruff and 20,000-25,000 Black-tailed Godwit have been recorded in the Pripjat floodplains alone – to mention just a few stunning statistics. Polesia is particularly important for the globally threatened Aquatic Warbler. The area is also home to large mammals such as European Bison, Brown Bear, Grey Wolf, and Eurasian Lynx.

Polesia’s spectacular biodiversity is recognized internationally and many sites have been designated as areas of international importance for nature conservation: 153 have been recognised as Emerald Network or Natura 2000 sites, but there are also UNESCO Biosphere Reserves, Ramsar sites and Important Bird Areas. These sites include the transboundary Biosphere Reserve West Polesie, made up of three national parks – Pribuzhskoe Polesie (Belarus), Shatsky (Ukraine) and Polesie (Poland). Also, two transboundary Ramsar sites – Almany – Perebrody Mires Transboundary Ramsar Site, made up of the Almany Mires (Belarus) and the Perebrody Peatlands (Ukraine) and Pripjat-Stokhid-Prostyr transboundary Ramsar site, made up of the Pripjat River Floodplains and Stokhid River Floodplains sites (Ukraine) and Prostyr (Belarus).

Moreover, Polesia has significant potential for gaining UNESCO World Heritage Status. It was recently awarded a prestigious Endangered Landscapes Programme grant to restore wetlands, improve connectivity of the habitats of large mammals, and secure further protection. This also envisaged an application for Polesia to be designated a World Heritage Site with the aim of creating one of Europe's largest protected natural wilderness areas^{xiii}. The invasion of Ukraine by Russia in February 2022 found Polesia in the heart of military activities as troops crossed from the north aiming for Kyiv. While the wetlands in Polesia acted as a form of natural defence for Kyiv^{xiv}, key nature sites have been damaged. In this time of war on-the-ground conservation work is difficult, but FZS remain strongly committed to Polesia and are currently assessing what conservation work remains possible.

2.3 Protected Areas – types

A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values^{xv}. Sites can be protected at national and/or international levels.

Effectively managed systems of protected areas have been recognized as critical instruments in achieving the objectives of the Convention on Biological Diversity (CBD)^{xvi} and the Sustainable Development Goals^{xvii} (CBD: no date; United Nations: no date). Around 16.6 percent of the land and 7.6 percent of the ocean globally is currently in areas designated or proposed for protection^{xviii}. But this is widely acknowledged as inadequate and the CBD propose that the area protected increases to 30 percent^{xix}. The EU Biodiversity Strategy adopted in 2020 supports protection of at least 30 percent of the land and 30 percent of the sea areas by 2030. It also stresses the need for greater efforts to restore degraded ecosystems including freshwater ecosystems and the natural functions of rivers, committing that at least 25,000 km of rivers will be restored into free-flowing rivers by 2030^{xx}.

Natura 2000 sites

Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 27 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the [Birds Directive](#) and the [Habitats Directive](#)^{xxi}.

Natura 2000 sites are designated specifically to protect core areas for a sub-set of species or habitat types listed in the Habitats and Birds Directives. They are deemed to be of European importance because they are endangered, vulnerable, rare, endemic or present outstanding examples of typical characteristics of one or more of Europe's nine biogeographical regions. In total, there are around 2,000 species and 230 habitat types for which core sites need to be designated as Natura 2000 sites. Sites designated under the Birds Directive are Special Protection Areas (SPAs). Sites designated under the Habitats Directive are called Sites of Community Importance (SCIs) or Special Areas of Conservation (SACs), depending on the level

of protection. SCIs are sites that have been officially adopted by the European Commission and which have some protection under the Habitats Directive. SACs are SCIs that have been designated by Member States and which have fuller protection^{xxii}.

Poland as an EU Member State fully adopted the two Nature Directives and hence established a Natura 2000 network.

Table 1: Overview of the total number and area of Natura 2000 sites, Sites of Community Importance (SCI) and Special Protection Areas (SPA) in Poland and all EU Member states.

	Natura 2000 network (terrestrial and marine)		Terrestrial			
			SCI/SAC	SPA	Natura 2000 network	
	Total No Natura 2000 sites	Total area Natura 2000 km²	SCI/SAC area (km²)	SPA area (km²)	Natura area (km²)	% land area covered
Poland	999	68457	34266	48428	61220	20%
EU-27	26935	1214974	587172	527472	764222	17.46%

Table 2: Overview of the total number and area of Special Areas of Conservation (SAC) and Special Protection Areas (SPA) within Natura 2000 sites in Polesia.

Polesia^{xxiii}	No of Natura 2000 sites	Total area Natura 2000 (km²)^{xxiv}
SPAs	13	2812.87
SAC	29	869.70
Total	42	3,682.57

Emerald Network sites

‘The Emerald Network is an ecological network made up of Areas of Special Conservation Interest. Its implementation was launched by the Council of Europe as part of its work under the Bern Convention, with the adoption of [Recommendation No. 16 \(1989\)](#) of the Standing Committee to the Bern Convention. Setting-up the Emerald Network at national level is considered as one of the main tools for the Contracting Parties to comply with their obligations under the Bern Convention.

Before being officially adopted as Emerald sites, all sites proposed to join the Network are thoroughly assessed at biogeographical level for their sufficiency to achieve the ultimate objective of the Network. This objective is the long-term survival of the species and habitats of the Bern Convention requiring specific protection measures. These habitats and species are listed respectively in Resolution No. 4 (1996) and Resolution No. 6 (1998) of the Standing Committee to the Bern Convention. Once the areas proposed are officially adopted as Emerald Network sites, they have to be designated and managed at national level^{xxv}.

Both Ukraine and Belarus – although not a contracted party – adopted their Emerald Network sites. Ukraine has 377 officially adopted Emerald sites covering an area of 668,823 km² and Belarus has 155 officially adopted Emerald sites^{xxvi} covering an area of 23,065 km² (11 percent of the country’s area^{xxvii}) plus 7 officially nominated candidate sites^{xxviii} with a total area of 974 km²^{xxix}. Preliminary estimates are that once completed the Emerald network will cover 13-15 percent of the area of Belarus.

However, adoption of the sites does not automatically ensure protection of the sites, as these depend on the national legislative frameworks. For example, over 30 percent of Emerald sites in Ukraine are not currently underpinned by national designations^{xxx}; although a draft law on the establishment, management and protection of the Ukrainian Emerald network is currently under development^{xxxii}.

Table 3: Overview of the total number and area of Emerald sites in Belarusian and Ukrainian Polesia.

Polesia^{xxxii}	No of Emerald sites	Total area Emerald sites (km²)
Belarus	52	12641.14
Ukraine	59	19692.21
Total	111	32333.35

Ramsar sites

Ramsar sites are wetland sites designated for their international importance under the Ramsar Convention^{xxxiii}. The Convention on Wetlands, known as the Ramsar Convention, is an intergovernmental environmental treaty established in 1971 by UNESCO, and coming into force in 1975.

Table 4: Overview of the total number and area of Ramsar sites in Belarus, Poland and Ukraine.

Country	No of Ramsar sites	Total area Ramsar sites (km²)
Belarus ^{xxxiv}	26	7813.55
Poland ^{xxxv}	19	1529.64
Ukraine ^{xxxvi}	50	8026.04

Table 5: Overview of the total number and area of Ramsar sites in Belarusian, Polish and Ukrainian Polesia.

Polesia^{xxxvii}	No of Ramsar sites	Total area Ramsar sites (km²)
Belarus	13	4324.35
Poland	1	97.62
Ukraine	6	773.58
Total	20	5,195.55

Important Bird and Biodiversity Areas (IBAs)

BirdLife's Important Bird and Biodiversity Area concept has been developed and applied for over 30 years. Considerable effort has been devoted to refining and agreeing a set of simple but robust criteria that can be applied worldwide. Important Bird and Biodiversity Areas (IBAs) are:

- Places of international significance for the conservation of birds and other biodiversity
- Recognized world-wide as practical tools for conservation
- Distinct areas amenable to practical conservation action
- Identified using robust, standardised criteria
- Sites that together form part of a wider integrated approach to the conservation and sustainable use of the natural environment^{xxxviii}.

As with Emerald sites protection of IBAs depends on underpinning by national designations. In the EU, the selection criteria for IBAs were deliberately aligned with SPA selection criteria and BirdLife’s IBA inventory has been repeatedly recognised as a ‘shadow list’ of SPAs against which to judge the sufficiency of a Member States SPA network by the European Court of Justice and the European Commission^{xxxix}. In Poland, the Government initially designated 72 SPAs, which is only half the IBAs. Following a legal infringement based on the 2004 IBA inventory^{xl}, in 2008 all IBAs were designated. An 2010 update of the IBA inventory^{xli} identified 30 more IBAs, but to date these have not been included in the Natura 2000 network, with both the EU and Poland considering that Poland’s Natura 2000 network is now complete.

In Belarus IBAs do not have currently official protection status. However, most IBAs overlap wholly or in part with other protected nature areas. Close attention from environmental NGOs, scientists and IBA caretakers ensures threats and legal breaches are quickly identified and addressed.

Table 6: Overview of the total number and area of Important Bird and Biodiversity Areas (IBAs) in Poland, Belarus and Ukraine.

Country	No of IBAs	Total area IBAs (km ²)
Poland ^{xlii}	175	64079.75
Belarus ^{xliii}	53	16,163.10
Ukraine ^{xliv}	141	24868.64

Table 7: Overview of the total number and area of Important Bird and Biodiversity Areas (IBAs) in Belarusian, Polish and Ukrainian Polesia.

Polesia ^{xlv}	No of IBAs	Total area IBAs (km ²)
Poland	15	3836.49
Belarus	33	10736.20
Ukraine	23	11773.30
Russia	2	2702.19
Total	73	29,048.18

UNESCO Man & Biosphere Reserves

Biosphere reserves are ‘learning places for sustainable development’. They are sites for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity. They are places that provide local solutions to global challenges. Each site promotes solutions reconciling the conservation of biodiversity with its sustainable use.

Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Biosphere Reserves are designated under the intergovernmental MAB Programme by the Director-General of UNESCO following the

decisions of the MAB International Coordinating Council (MAB ICC). Their status is internationally recognized^{xlvi}.

There are currently 714 biosphere reserves in 129 countries, including 21 transboundary sites, that belong to the World Network of Biosphere Reserves^{xlvii}. The network has an area of over of 6,812,000 km² and is home to about 257 million people.

Biosphere Reserves involve local communities and all interested stakeholders in planning and management. They integrate three main “functions”:

- Conservation of biodiversity and cultural diversity
- Economic development that is socio-culturally and environmentally sustainable
- Logistic support, underpinning development through research, monitoring, education and training

These three functions are pursued through the Biosphere Reserves’ three main zones.



Figure 4: Biosphere Reserve Zones.^{xlviii}

Core Area

A strictly protected zone that contributes to the conservation of landscapes, ecosystems, species and genetic variation.

Buffer Zones

This surrounds or adjoins the core area(s), and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.

Transition Area

The transition area is where communities foster socio-culturally and ecologically sustainable economic and human activities^{xlix}.

Table 8: Number of Biosphere Reserves in Poland, Belarus and Ukraine and names of sites located in Polesia.

Country ⁱ	No of Biosphere Reserves	Biosphere Reserves in Polesia
Poland	11	West Polesie Transboundary Biosphere Reserve
Belarus	3	West Polesie Transboundary Biosphere Reserve Belovezhskaya Pushcha
Ukraine	8 ²	West Polesie Transboundary Biosphere Reserve Desnianskyi Biosphere Reserve

The total area of the MAB-Biosphere sites in Polesia is 6,410 km².

One of the goals of the Endangered Landscape Project (ELP) funded project Polesia – Wilderness Without Borders (‘Wild Polesia’) is to support a new transboundary Biosphere Reserve nomination for Polesia (Belarus/Ukraine), expected to be around 1 million ha in sizeⁱⁱ.

UNESCO World Heritage Sites

World Heritage Sites are identified under the 1972 Convention concerning the Protection of the World Cultural and Natural Heritage. There are currently 1121 sites of which 39 are transboundary. Sites can be cultural, natural or mixed and to be included on the World Heritage List must be of outstanding universal valueⁱⁱⁱ.

Table 9: Number of World Heritage Sites in Poland, Belarus and Ukraine and names of sites located in Polesia.

Country ⁱⁱⁱ	Total number of World Heritage Sites	Natural heritage sites in Polesia
Poland	16	-
Belarus	4	Białowieża Forest (Belarus/Poland)
Ukraine	7	-

Currently the only World Heritage Site within Polesia is a small area of the Belarusian Białowieża Forest (Belarus/Poland) site.

One of the goals of the Wild Polesia project is to support a transboundary WHS nomination for Central Polesia (Belarus/Ukraine), expected to be around 290,000 ha in size^{iv}.

HELCOM (Baltic Sea Protected Areas)

The aim of the coastal and marine Baltic Sea protected areas (HELCOM MPAs) is to protect valuable marine and coastal habitats in the Baltic Sea. This is done by designating sites with particular nature values as protected areas, and by managing human activities within those areas. Each site has its unique management plan.^{iv} There are 176 HELCOM MPAs in the Baltic Sea. Poland has nine HELCOM MPAs covering a total of 7,531.33 km².

² In addition, there is the ‘Chornobyl Radiation and Ecological Biosphere Reserve’, though this has only national status: <http://chornobyl-gef.com/en/tasks-of-the-reserve.html#more-280>

Protected areas – overlaps

Areas of high biodiversity value may be covered by a number of designations, for example Ramsar and Emerald or Natura 2000 designations in addition to national designations. Given Polesia's very high nature value many of the designations do overlap, e.g. Pripyatskiy in Belarus is designated as a national park, Ramsar site, IBA and Emerald site. However, even after discounting overlaps between different designations a staggering 51,700 km² of Polesia, which accounts for 28 percent of its area, is protected under international nature designations^{lvi}.

National Protected Areas

Different countries have different protected area systems. This section provides a brief summary of the situation in Belarus, Poland and Ukraine^{lvii}. As discussed above, as the international designations are underpinned by national designations there is overlap between different designations.

Belarus

The Belarusian Law on Protected Nature Areas^{lviii} establishes the following categories of protected areas:

- Strict nature reserves (zapovednik)
- National parks
- Nature reserves (zakaznik) – of national and local importance
- Nature monuments – of national and local importance

Strict nature reserves and national parks are protected areas of national importance, while nature reserves and nature monuments can be protected areas of local or national importance.

There are three categories of protected areas within the Belarusian Polesia: national park, nature reserves of national and local importance, and nature monuments. In addition, there is another form of environmental protection that is not mentioned in the legislation, the Polesie State Radioecological Reserve (PSRR), subordinate to the Ministry of Emergency Situations of the Republic of Belarus. This protected area has the status of an environmental institution. The numbers of sites in these categories are given below. Further details are given in Appendix 1.

Table 10: Number of national protected areas in Belarusian Polesia.

Type of site	National parks	Nature reserves (zakaznik) of national importance	Nature reserves (zakaznik) of regional importance	Radioecological Reserve
No. of sites	2	16	16	1

Poland

The Polish Nature Conservation Law^{lix} establishes the following categories of protected areas:

- National parks (parki narodowe);
- Nature reserves (rezerваты przyrody);
- Landscape parks (parki krajobrazowe);
- Nature parks (obszary chronionego krajobrazu);
- Natura 2000 areas (obszary Natura 2000): Special Protection Areas and Special Areas of Conservation;
- Nature monuments (pomniki przyrody);
- Documented sites (stanowiska dokumentacyjne);
- Ecological sites (użytki ekologiczne);
- Nature and landscape protected areas (zespoły przyrodniczo-krajobrazowe);

All of these categories of protected areas are present in the Polish Polesia. Large-scale forms of environmental protection include five out of nine categories: national parks, nature reserves, landscape parks, nature parks, Natura 2000 sites. The numbers of sites in the first four of these categories are given below. Further details are given in Appendix 1.

Table 11: Number of national protected areas in Polish Polesia.

Type of site	National Parks	Landscape parks (parki krajobrazowe)	Protected Landscape Areas (obszary chronionego krajobrazu)	Nature Reserves (rezerваты przyrody)
No. of sites	1	5	4	17

Ukraine

The Law on the Nature Reserve Fund of Ukraine^{lx} establishes the following categories of protected natural areas and objects:

- Strict nature reserves (zapovidnyk);
- Biosphere reserves;
- National nature parks;
- Regional landscape parks;
- Nature reserves (zakaznyk) – of national and local importance;
- Natural monuments – of national and local importance;
- Protected tracts.

All these categories of protected areas exist in Ukrainian Polesia. The numbers of sites in key categories are given below. Further details are given in Appendix 1.

In addition, there is another form of environmental protection Chornobyl Exclusion Zone (CEZ) an environmental recovery area managed by the State Agency of Ukraine on the

Exclusion Zone Management (SAUEZM). In 2016, the Chernobyl Radiation and Ecological Biosphere Reserve was established in the CEZ covering almost 227 thousand hectares, two-thirds of the CEZ.

Table 12: Number of national protected areas in Ukrainian Polesia.^{lxi}

Type of site	National Nature Parks	Strict Nature Reserves (zapovidnyk)	Regional Landscape Parks	Biosphere (Radio-ecological) Reserve	Wildlife Sanctuary (zakaznyk) of national importance	Wildlife Sanctuary (zakaznyk) of local importance
No. of sites	11	4	5	1	260*	*116

* Estimates based on FZS analysis

Russia’s invasion of Ukraine is having a serious impact on Ukraine’s protected areas, including in Polesia. In total it is thought that 900 protected areas with an area of 12,000 km² have been impacted. This is about a third of all Ukraine’s protected areas^{lxii}.

2.4 Protected Areas – benefits

Our economies, livelihoods and well-being all depend on biodiversity. Protected areas – national parks, wilderness areas, community conserved areas, nature reserves and so on – are a mainstay of biodiversity conservation, while also contributing to people’s livelihoods, particularly at the local level. Protected areas are at the core of efforts towards conserving nature and the services it provides us – food, clean water supply, medicines and protection from the impacts of natural disasters. Their role in helping mitigate and adapt to climate change is also increasingly recognized; it has been estimated that the global network of protected areas stores at least 15 percent of terrestrial carbon^{lxiii}.

Table 13: Values of protected areas.

Socio-economic values	Social values	Environmental values
Jobs	Heritage value	Services provided by ecosystems
Production	Recreational use	Protection against natural hazards
Capacity building	Scientific and educational use	Services provided by the species
Governance	Health and quality of life	Biodiversity and genetic heritage

Exposure to nature is known to improve mental health and wellbeing. As poor psychological health has an economic cost and positive mental health contributes to a stronger economy, protected areas, therefore, have additional economic value — alongside the value arising from ecosystem services and tourism — through their beneficial impact on visitors’ wellbeing. For example, a recent study estimated that protected areas provide mental health benefits worth €5.55 trillion globally^{lxiv}.

More than half of global GDP – some €40 trillion – depends on nature hence the business case for investing in biodiversity is compelling and the EU sees investing in nature as a key part of its Green Deal^{lxv lxvi}. Recent economic analysis calculates that the benefits of protecting 30 percent of the planet’s land and oceans would be at least five times bigger than the costs^{lxvii}. But that our current engagement with nature is unsustainable and that transformational change is needed to our institutions and decision-making systems if nature, the basis of our own life, is to be sustained for future generations^{lxviii}.

3. Data and Methodology

3.1 Data

Background/context data was available from three studies commissioned by FZS.

- A review of protected areas in Polesia^{lxix}
- An analysis of potential impacts of proposed E40 waterway on hydrology, and river and water ecology in Poland^{lxx}
- Analysis of possible impacts of proposed E40 waterway development in Belarus and Ukraine on hydrological and environmental conditions of neighbouring rivers and wetlands^{lxxi}.

Table 14: Sources of spatial data used for the protected area analysis.

E40 waterway (variant 3)	Zhang Y and Carver S (2019) <i>E40 Mapping Report</i> for Frankfurt Zoological Society. Wildland Research Institute, University of Leeds ^{lxxii} .
<i>International Sites</i>	
Natura 2000	European Environment Agency (2020) Natura 2000 End of 2018. https://www.eea.europa.eu/data-and-maps/data/natura-11 (accessed on 1 April 2020)
Emerald	EIONET Central Data Repository (2019) Emerald Sites in Belarus 2016 and Emerald Sites in Ukraine 2015 (accessed on 31 December 2019)
Ramsar	World Database on Protected Areas (accessed on 1 April 2020)
UNESCO Biosphere Reserves	Kampinos Biosphere Reserve https://www.kampinoski-pn.gov.pl/informacje-ogolne/rezerwat-biosfery Roztocze Transboundary Biosphere Reserve https://roztoczanski-pn.pl/pl/trb-roztocze ³ Poleski Transboundary Biosphere Reserve http://www2.poleski-pn.pl/index.php/o-nas ⁴ Tuchola Forest Biosphere Reserve https://en.unesco.org/biosphere/eu-na/tuchola-forest ⁵
HELCOM	World Database on Protected Areas (accessed on 1 April 2020)
IBAs	BirdLife Data Zone (accessed on 11 January 2021) ^{lxxiii}
<i>National sites</i>	World Database on Protected Areas (accessed on 1 April 2020)

³ Area only, no polygon available.

⁴ Polygon area differs from official site size listed on UNESCO website (2951 km² compared to 2630 km²)

⁵ Area only, no polygon available.

River basins	WISE Europe (2012) European catchments and Rivers network system ECRINS. European Environment Agency (accessed on 1 April 2020).
Rivers	WISE Europe (2012) European catchments and Rivers network system ECRINS. European Environment Agency (accessed on 1 April 2020).
Polesia borders	Kubijovyč V., Stebelsky I., Sydoruk-Pauls I., (1993) Polisia. In: Internet Encyclopedia of Ukraine (accessed on 1 April 2020)

This report is based on the official areas and boundaries for all sites from the sources indicated above. However, it should be noted that there are sometimes discrepancies between this data and the data available at national level.

The borders of Polesia are not sharply defined. There are several definitions of Polesia, and there is no universally agreed set of borders. For our work we use the broad borders of the Internet Encyclopaedia of Ukraine. This includes the Dnieper lowland, Volynian (or little) Polesia and Polish Polesia (Polesie Podlaskie and Polesie Lubelskie). Hence our report focuses on protected areas of Poland, Belarus and Ukraine. The borders were digitized from the map ‘Polisia’^{lxxiv} and are shown on the maps in this report by a dotted green line.

3.2 Methodology

The analysis was carried out in two phases: phase one involved the analysis of publicly available GIS data for protected areas; phase two included the verification of the GIS outputs by Save Polesia Partners based on local information and expert knowledge.

We have looked at two kinds of impacts

- (1) protected areas directly on the E40 waterway route
- (2) protected areas not on the E40 waterway route, but very likely to have indirect impacts e.g. the areas at risk from hydrological impacts as identified by studies conducted for Poland, Belarus and Ukraine.

Sites directly on the E40 waterway route may have very likely a range of impacts including direct habitat loss, changes to habitat quality and species (e.g. due to changes in hydrology, morphology, pollution, introduction of invasive alien species).

Some sites may also have indirect impacts. Those will not suffer direct habitat or species loss, but may be subject to changes in habitat quality and species due to changes in hydrology or other natural processes (e.g. changes in groundwater or surface water flows, flooding regimes, soil erosion), the effects of pollution (water, soil or air), disturbance, introduction of exotic species, etc. Changes in hydrology may impact a much wider area than that of the site directly dissected and affected by the E40 waterway route. For sites with indirect impacts, we adopted a cautious approach including only sites that, based on hydrological studies or on ground expert knowledge, we felt confident are very likely to have impacts.

We have not attempted to classify the levels of impacts on particular sites (e.g. into high, moderate or low) as this would require further detailed study. However, we have

highlighted sites where it is already evident (from the nature of protected area and the E40 waterway project) that impacts are likely to be very serious.

Our overall aim is to highlight the number of protected areas likely to be impacted by E40 waterway and hence the urgent need for further assessment of this issue.

The analysis for Poland was verified by the Polish Society for the Protection of Birds (OTOP) – BirdLife Poland, for Belarus by APB-Birdlife Belarus and Bahna, and for Ukraine by the National Ecological Centre Ukraine (NECU) and the Ukrainian Society for the Protection of Birds (USPB). All Partners have excellent nature conservation expertise and strong knowledge of the sites.

Notes: some of the sites overlap i.e. the same area can have a number of different designations and some sites have both direct and indirect impacts. However, to avoid double-counting in the total numbers of sites impacted (direct and indirect impacts), while we indicate in the text that a site with direct impacts may also have indirect impacts, we have not included the site separately in the lists of sites with indirect impacts. For both types of impacts, we considered both the sites within Polesia and the sites on the entire E40 waterway route. Information on site areas is rounded to the nearest km².

Due to our cautious approach to identifying sites likely to have indirect impacts, our analysis will inevitably be an underestimate of the actual number of sites that would have indirect impacts. Hence, in addition we also considered protected areas in river basins through which the E40 waterway route would pass i.e. sites which may have hydrological impacts and which will need to be investigated further in any detailed environmental assessment of E40 waterway. This analysis is included in Appendix 4 and provides a ‘scoping’ list of sites needing further assessment.

4. International sites impacted

4.1 Overview of impacted sites

Table 15: Overview of the number and size of international protected areas impacted directly and indirectly if the E40 waterway is built.

	Number and size of international PAs impacted	
	along the whole E40 route	in Polesia
Direct impacts	73 sites 20,058 km ²	25 sites 9,432 km ² <i>(\cong 5.1 % of the total area of Polesia)</i>
Indirect impacts*	120 sites 13,270 km ²	59 sites 7,255 km ² <i>(\cong 3.9 % of the total area of Polesia)</i>
Total impacts	193 sites 33,328 km²	84 sites 16,687 km² <i>(\cong 9 % of the total area of Polesia)</i>

* including hydrology impacts

Note: The area figures are after removal of overlaps between different international designations^{lxv}.



Figure 5: International protected areas directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Direct impacts

Table 16: Number and total area of sites with direct impacts – along the whole E40 waterway and in Polesia.

	Along the whole E40 waterway				In Polesia			
	Poland	Belarus	Ukraine	Total	Poland	Belarus	Ukraine	Total
SPA	6			6	1			1
SAC	8			8				
<i>Emerald</i>		9*	17	26		9	4	13
<i>Ramsar</i>	1	3	3	7		3		3
IBA	7	6	11	24	1	6	1	8
UNESCO-MAB								
HELCOM (Baltic Sea PA)	2			2				
Total no. of sites	24	18	31	73	2	18	5	25
Total area of sites (after removing overlaps)^{lxvii}	2,065 km²	5,071 km²	12,922 km²	20,058 km²	261 km²	5,071 km²	4,100 km²	9,432 km²

* 8 officially adopted sites plus one candidate site (Lower Pripyat Valley)

Indirect impacts including hydrological impacts

Table 17: Number and total area of sites with indirect impacts – along the whole E40 waterway and in Polesia.

	Along the whole E40 waterway				In Polesia			
	Poland	Belarus	Ukraine	Total	Poland	Belarus	Ukraine	Total
SPA	8			8	1			1
SAC	44			44	4			4
<i>Emerald</i>		24	2	26		24	2	26
<i>Ramsar</i>	1	7	1	9	1	7	1	9
IBA	9	15	7	31	2	15	1	18
UNESCO-MAB (Transboundary)	2 (part)	1 (part)	2 (part)	2	1 (part)	1 (part)	1 (part)	1
Total no. of sites	62	46	10	120	8	46	4	59
Total area of sites (after removing overlap)^{lxviii}	4,972 km²	5,544 km²	2,754 km²	13,270 km²	1,282 km²	4,195 km²	1,778 km²	7,255 km²

Total impacts

Table 18: Total number and area of sites with impacts – along the whole E40 waterway and in Polesia.

	Along the whole E40 waterway				In Polesia			
	Poland	Belarus	Ukraine	Total	Poland	Belarus	Ukraine	Total
SPA	14			14	2			2
SAC	52			52	4			4
<i>Emerald</i>		33*	19	52		33	6	39
<i>Ramsar</i>	2	10	4	16	1	10	1	12
<i>IBA</i>	16	21	18	55	3	21	2	26
<i>UNESCO-MAB (Transboundary)</i>	2 (part)	1 (part)	2 (part)	2	1 (part)	1 (part)	1 (part)	1
<i>HELCOM (Baltic Sea PA)</i>	2			2				
Total no. of sites	86	64	41	193	10	64	9	84
Total area of sites (after removing overlap)^(xxviii)	7,037 km²	10,615 km²	15,676 km²	33,328 km²	1,543 km²	9,266 km²	5,878 km²	16,687 km²

*includes officially adopted sites plus one candidate site (Lower Pripyat Valley)

4.2 Types of protected areas impacted

4.2.1 Natura 2000

- 14 sites with direct impacts (one in Polesia); total area 2,213 km² of which 281 km² is in Polesia
- 52 sites with indirect impacts (five in Polesia); total area 2,969 km² of which 218 km² is in Polesia
- In total 5,182 km² Almost 8.5 percent of the area of Polish Natura 2000 network would be impacted

Table 19: Overview of Natura 2000 sites with impacts.

	Number of Natura 2000 sites	Total area [km ²]
Direct impacts	14	2,213
	1 in Polesia	281
	9 with serious impacts*	1208
Indirect impacts	52	2,969
	5 of them in Polesia	218
Total	66	5,182
	6 of them in Polesia	499

*None in Polesia.

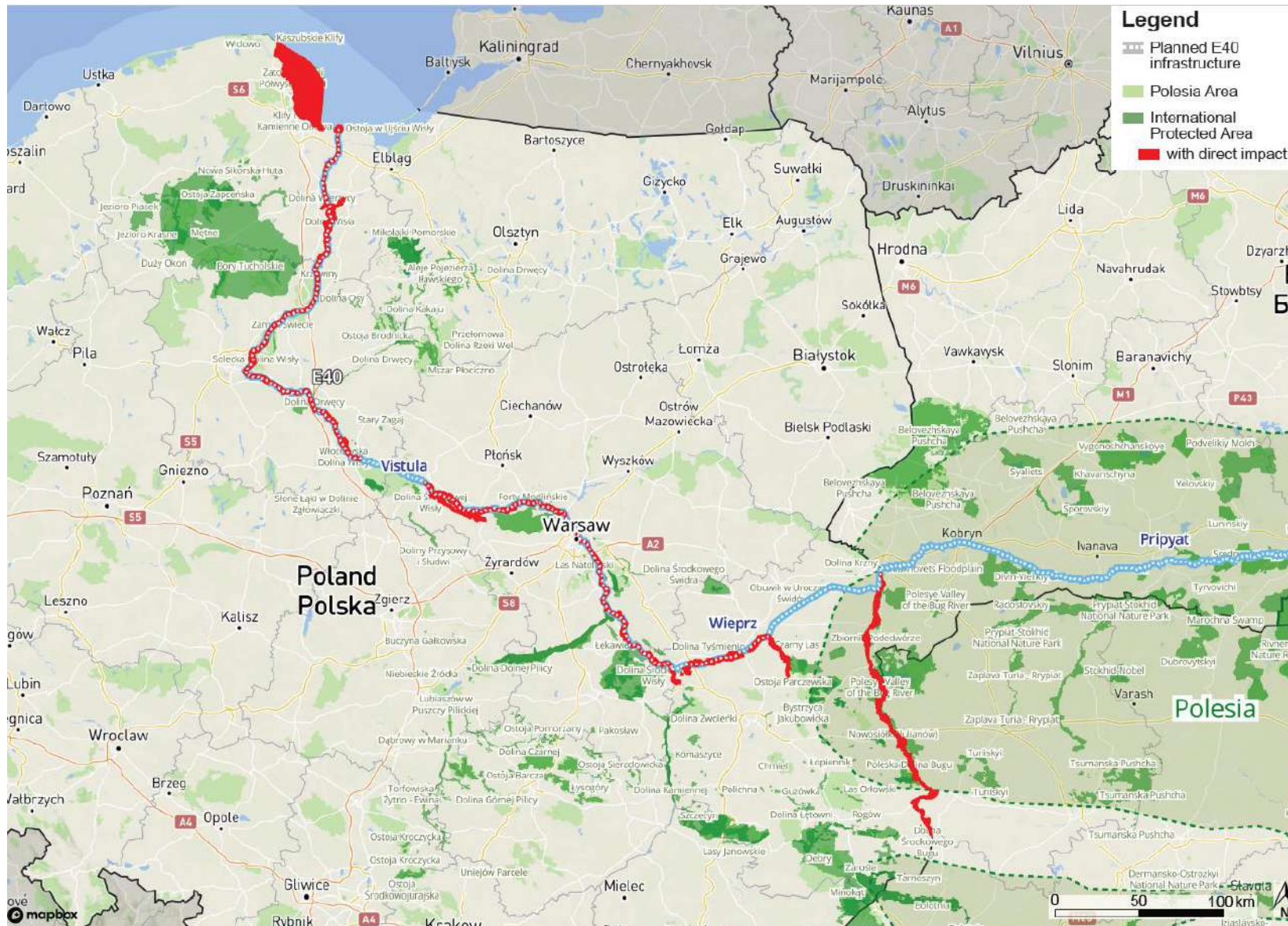


Figure 6: Natura 2000 sites directly (red) impacted if the E40 waterway is built. Along the E40 route, these internationally protected sites exist in Poland only.

Sites with direct impacts are listed below. The sites riverine shown in bold would be impacted along their whole length and have serious impacts. A full list of sites impacted is in Appendix 2.

Table 20: Natura 2000 sites with direct impacts.

Site number	Name	Designation	Direct impact	Polesia
PLB040003	Lower Vistula Valley (Dolina Dolnej Wisły)	SPA	x	
PLB140004	Middle Vistula Valley (Dolina Środkowej Wisły)	SPA	x	
PLB060004	Tysmienica Valley (Dolina Tyśmienicy)	SPA	x	
PLB220004	Vistula River Mouth (Ujście Wisły)	SPA	x	
PLB220005	Puck Bay (Zatoka Pucka)	SPA	x	
PLB060003	Middle Bug Valley (Dolina Środkowego Bugu)	SPA	x	X
PLH220033	Lower Vistula (Dolna Wisła)	SAC	x	
PLH060051	Lower Wieprz (Dolny Wieprz)	SAC	x	
PLH040011	Dybowska Valley of the River Vistula (Dybowska Dolina Wisły)	SAC	x	
PLH140029	Kampinowska Valley of the River Vistula (Kampinowska Dolina Wisły)	SAC	x	
PLH040012	Nieszawska Valley of the River Vistula (Nieszawska Dolina Wisły)	SAC	x	
PLH220044	Vistula River Mouth (Ostoja w Ujściu Wisły)	SAC	x	
PLH040003	Solecka Valley of the River Vistula (Solecka Dolina Wisły)	SAC	x	
PLH040039	Włocławska Valley of the River Vistula (Włocławska Dolina Wisły)	SAC	x	

Information about the impacted sites is available through the Natura 2000 viewer^{lxxxix}.

Ukraine – although not an EU member state – agreed to adopt the two Nature Directives in its legislation within the framework of its association agreement^{lxxx} with the European Union. Part of the agreement is the preparation of inventory of sites, designation of these sites and establishing priorities for their management including the establishment of measures required for the conservation of such sites.

4.2.2 Emerald

- In total 52 Emerald sites (includes one officially nominated candidate site) would be impacted (39 in Polesia), a total of 24,098 km², an area almost the size of North Macedonia and 3.5 percent of the total area of Emerald sites in Belarus and Ukraine.
- 26 of these sites (total area 17,224 km²) would be impacted directly. 13 of these sites (6,875 km²) are in Polesia and nine of these sites in Belarus would have serious impacts.

- 26 sites, all in Polesia, (total area 6,875 km²) would have indirect impacts. Six of these sites would have serious impacts.
- 46 percent (10,622 km²) of the area of the Belarus Emerald network (adopted sites) would be impacted, plus 44 percent (431 km²) of the nominated sites
2 percent (13,045 km²) of the area of the Ukrainian Emerald network would be impacted

Table 21: Overview of Emerald sites with impacts.

	Number of Emerald sites	Total area [km ²]
Direct impacts	26	17,224
	13 of them in Polesia*	9,056
	9 with serious impacts**	4,997
Indirect impacts	26	6,875
	26 of them in Polesia***	6,875
	6 of them with serious impacts****	2,362
Total	52	24,098
	39 of them in Polesia	15,920

*9 in Belarus and 4 in Ukraine; ** All in Belarus; *** 24 in Belarus and 2 in Ukraine; **** All in Belarus

Sites with impacts are listed below. Sites shown in bold are those that would be seriously impacted i.e. on the river channel or impacted by the construction of the Vistula-Bug Canal in Poland or construction of a river port in the Belarusian village of Nizhny Zhary.

Table 22: Emerald sites with impacts.

Site number	Name	Country	Direct impact	Indirect impacts	Polesia
BY0000060	Lower Prypiats	BY	x		X
BY0000007	Pripyatskiy	BY	x		X
BY0000005	Srednyaya Pripyat	BY	x		X
BY0000056	Turovskiy Lug	BY	x		X
BY0000004	Zvanets	BY	x		X
BY0000082	Strelskiy	BY	x		X
BY0000026	Mozyrskiy ovragi	BY	x		X
BY0000040	Divin-Vielikiy Lies	BY	x		X
BY0000162	Lower Pripyat Valley*	BY	x		X
UA0000046	Chornobylskiy Biosphere Reserve	UA	x		X
UA0000135	Dniprodzerzhynske Reservoir	UA	x		
UA0000093	Dniprovskoe Reservoir	UA	x		
UA0000109	Dniprovsko-Buzkyi Lyman	UA	x		
UA0000004	Dniprovsko-Orilskiy Nature Reserve	UA	x		
UA0000106	Kakhovske Reservoir	UA	x		
UA0000111	Kanivske Reservoir	UA	x		
UA0000110	Kremenchutske Reservoir	UA	x		

UA0000087	Kremenchutski Plavni Regional Landscape Park	UA	x		
UA0000233	Kyivske Podesennia	UA	x		X
UA0000094	Kyivske Reservoir	UA	x		X
UA0000192	Lower Dnipro	UA	x		
UA0000047	Mizhrichynskiy Regional Landscape Park	UA	x		X
UA0000072	Nyzhnovorskiy Regional Landscape Park	UA	x		
UA0000037	Velyki Luh National Nature Park	UA	x		
UA0000097	Biloberezhzhia Sviatoslava National Nature Park	UA	x		
UA0000012	Kanivskiy Nature Reserve	UA	x		
BY0000002 a	Belovezhskaya Pushcha**	BY		x	X
BY0000045 a	Lesnaya River**	BY		x	X
BY0000035 a	Polesye Valley of the Bug River**	BY		x	X
BY0000068 a	Mukhovets Floodplain**	BY		x	X
BY0000152 a	Dnepr Floodplain***	BY		x	X
BY0000021 a	Dnepro-Sozhskiy***	BY		x	X
BY0000069 a	Radostovskiy	BY		x	X
BY0000003 a	Sporovski	BY		x	X
BY0000073 a	Izin	BY		x	X
BY0000050 a	Prostyr	BY		x	X
BY0000061 a	Marochna Swamp	BY		x	X
BY0000116 a	Tyrvovichi	BY		x	X
BY0000080 a	Luninskiy	BY		x	X
BY0000055 a	Vieluta	BY		x	X
BY0000039 a	Volkhva	BY		x	X
BY0000064 a	Chyrvonaye	BY		x	X
BY0000049 a	Lva Floodplain	BY		x	X
BY0000012 a	Olmanskiye bolota	BY		x	X
BY0000051 a	Stary Zhadzien	BY		x	X
BY0000083 a	Topila Bog	BY		x	X
BY0000144 a	Ubort River Valley	BY		x	X
BY0000145a	Lelchitskaya Ubort	BY		x	X
BY0000147a	Manchitsy	BY		x	X
BY0000052 a	Staraya Vits	BY		x	X
UA0000023	Rivnenskiy Nature Reserve	UA		x	X
UA0000044	Prypiat-Stokhid National Nature Park	UA		x	X

*Officially nominated candidate site

**These four sites would be affected by the construction of the Vistula-Bug Canal in Poland

***These two sites would be affected by the construction of a river port in the Belarusian village of Nizhny Zhary

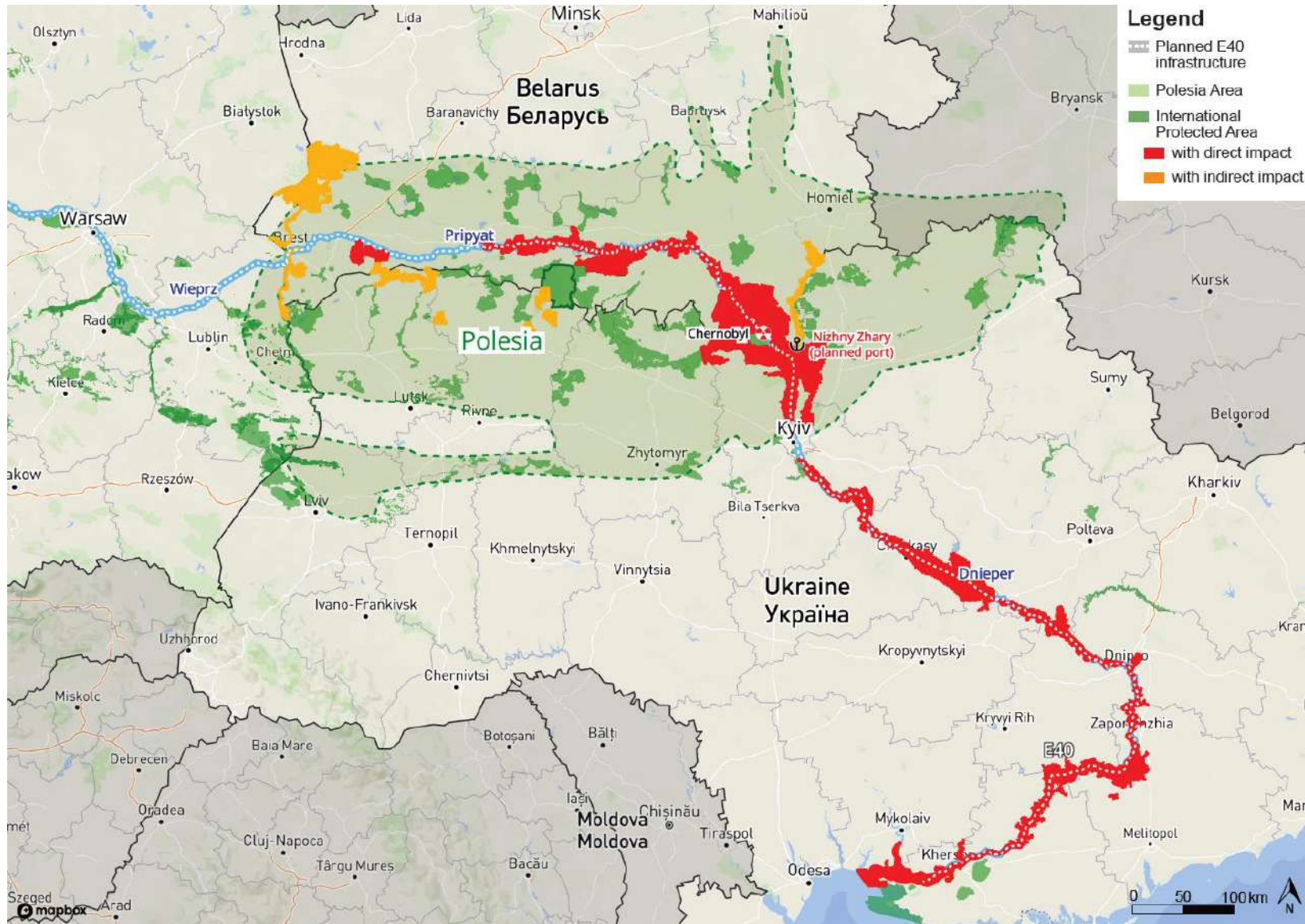


Figure 7: Emerald sites directly (red) and indirectly (orange) impacted if the E40 waterway is built. Along the E40 route, these internationally protected sites exist in Belarus and Ukraine only.

4.2.3 Ramsar

- 16 Ramsar sites would be impacted with a total area of 4,570 km², which is more than 26 percent of the total area of Ramsar sites in Poland, Belarus and Ukraine. Eleven of these sites, 4,194 km² are in Polesia.
- Seven sites (2355 km²) would have direct impacts, three of these in Belarusian Polesia (1978 km²) would have serious impacts.
- A further nine sites (all in Polesia, total area 2216 km²) would have indirect impacts (two of the sites in Belarus would have serious impacts).
- 51 percent of the area of Belarus' Ramsar sites would be impacted
- Over 7.5 percent of the area of Poland's Ramsar sites would be impacted
- Over 6 percent of the area of Ukraine's Ramsar sites would be impacted
- The size of the impacted sites in Belarus is 3,970 km², in Poland 115 km² and in Ukraine 486 km².

Table 23: Overview of Ramsar sites with impacts.

	Number of Ramsar sites	Total area [km ²]
Direct impacts	7	2,355
	3 of them in Polesia*	1,978
	4 with serious impacts**	1,995
Indirect impacts	9	2,216
	9 of them in Polesia***	2,216
	2 of them with serious impacts****	525
Total	16	4,570
	11 of them in Polesia	4,194

*All in Belarus

** 1 in Poland and the 3 sites in Belarusian Polesia

*** 1 in Poland, 7 in Belarus and 1 in Ukraine

**** Both in Belarus



Figure 8: Ramsar sites directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Ramsar sites with impacts are listed below. Sites shown in bold are those that would be seriously impacted i.e. on the river channel or impacted by the construction of the Vistula-Bug Canal in Poland or construction of a river port in the Belarusian village of Nizhny Zhary.

Table 24: Ramsar sites with impacts.

Site number	Name	Country	Direct impact	Indirect impacts	Polesia
2321	Vistula River Mouth	POL	x		
1090	Mid-Pripyat State Landscape Zakaznik	BY	x		X
2197	Pripyatsky National Park	BY	x*		X
1219	Zvanets	BY	x		X
2282	Archipelago Velyki and Mali Kuchugury	UA	x		
767	Dnipro River Delta	UA	x		
2273	Sim Maiakiv Floodplain	UA	x		
900564	Olmany Mires Zakaznik****	BY		x	X
555558384	Stary Zhaden	BY		x	X
2139	Morochno	BY		x	X
1611	Prostyr	BY		x	X
2252	Polesye Valley of River Bug**	BY		x	X
2244	Dnieper River Floodplain***	BY		x	X
1007	Sporovsky Biological Reserve	BY		x	X
1402	Perebrody Peatlands****	UA		x	X
1565	Poleski National Park	POL		x	X

*Indicates that the site would also have significant hydrology impacts

**This site would be affected by the construction of the Vistula-Bug Canal in Poland

***This site would be affected by the construction of a river port in the Belarusian village of Nizhny Zhary

****Part of the Almany – Perebrody Mires Transboundary Ramsar Site established in 2015

4.2.4 IBA

- 55 IBAs would be impacted, a total of 16,548 km², an area larger than Montenegro and 16 percent of the total area of IBAs in Poland, Belarus and Ukraine. 26 of these sites with a total size of 10,845 km² are in Polesia.
- 24 sites (8,779 km²) would have direct impacts (eight of these are in Polesia (5,763 km²) and nine of these (three in Poland and six in Belarusian Polesia) would have serious impacts.
- A further 31 sites (8,080 km²), 18 in Polesia (5,082 km²) would have indirect impacts. Four of the sites in Belarus would have serious impacts.
- In summary, >56 percent of the area of Belarus' IBAs (= 9,084km²), ~ 6.5 percent of the area of Poland's IBAs (= 4,159km²) and >13 percent of the area of Ukraine's IBAs (3,304km²) would be impacted.

Table 25: Overview of IBAs with impacts.

	Number of IBAs	Total area [km ²]
Direct impacts	24	8,779
	8 of them in Polesia*	5,763
	9 with serious impacts**	5,127
Indirect impacts	31	7,769
	18 of them in Polesia***	5,082
	4 of them with serious impacts****	1,553
Total	55	16,548
	26 of them in Polesia	10,845

*1 in Poland, 1 in Ukraine and 6 in Belarus

**3 in Poland on the Vistula (outside Polesia) and 6 in Belarussian Polesia.

*** 2 in Poland, 15 in Belarus and 1 in Ukraine

**** All in Belarus

IBA sites with impacts are listed below. Sites shown in bold are those that would be seriously impacted i.e. on the river channel or impacted by the construction of the Vistula-Bug Canal in Poland or construction of a river port in the Belarussian village of Nizhny Zhary.

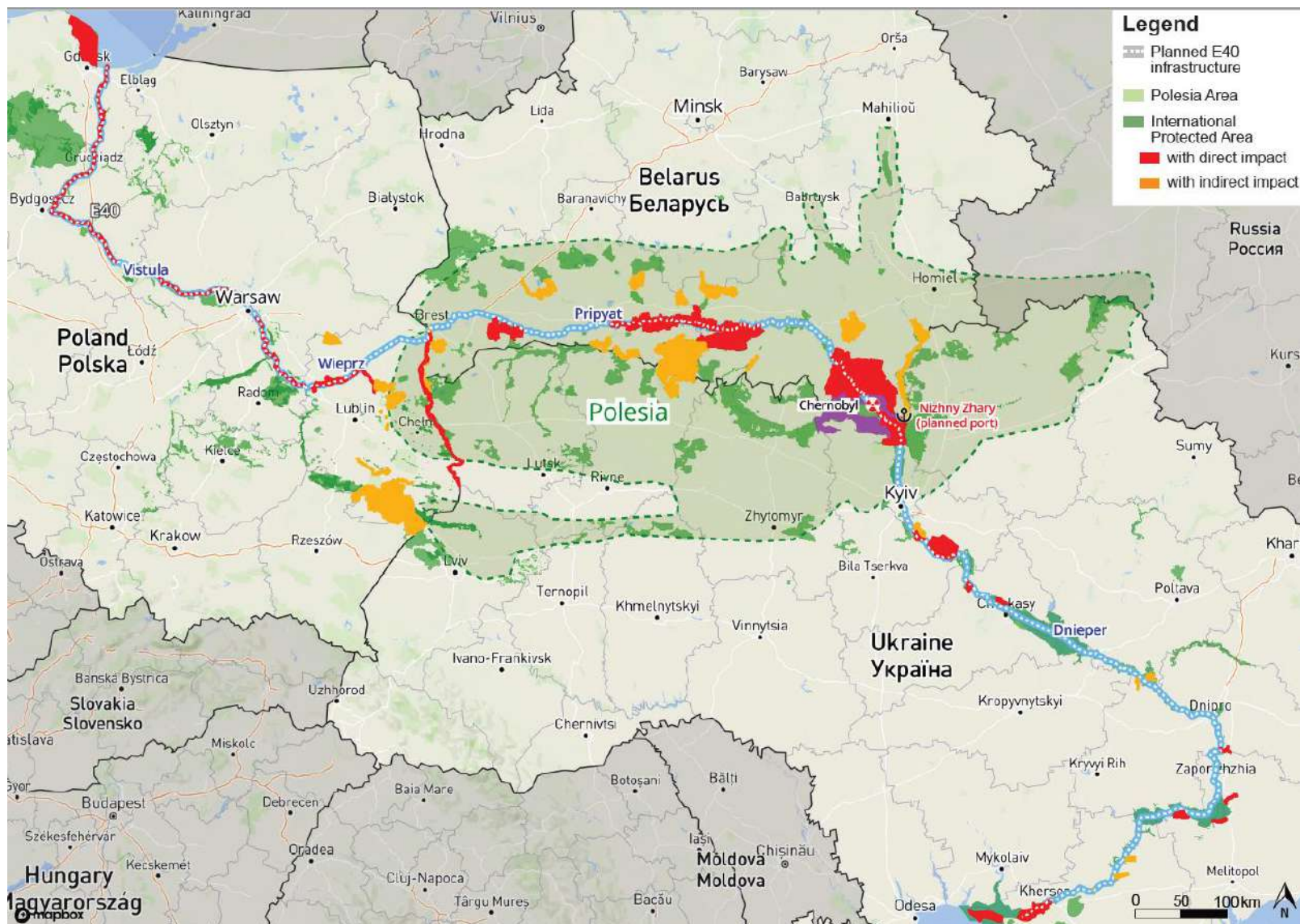
Table 26: IBAs with impacts.

Site number	Name	Country	Direct impact	Indirect impact	Polesia
PL028	Lower Vistula River Valley	POL	x		
PL144	Lower Wieprz River Valley	POL	x		
PL083	Middle Vistula River Valley	POL	x		
PL024	Puck Bay	POL	x		
PL098	Tysmienica River Valley	POL	x		
PL027	Vistula River Mouth	POL	x		
PL104	Middle Bug river valley	POL	x		x
BY050	Dzivin – Vialiki lies	BY	x		x
BY016	Balota Zvaniec	BY	x		x
BY017	Mid Prypiac’	BY	x		x
BY046	Turaŭskaje balonnie	BY	x		x
BY036	Prypiackiya baloty	BY	x		x
BY035	Lower Prypiac	BY	x		x
UA064	Dnipro delta	UA	x		
UA115	Kakhovs’ke reservoir (Enerгодар)	UA	x		
UA114	Kakhovs’ke reservoir (Vasylivka village)	UA	x		
UA018	Kanivs’ke reservoir	UA	x		
UA028	Kanivs’kyi Nature Reserve	UA	x		
UA116	Konka River Mouth	UA	x		
UA015	Kyivs’ke reservoir	UA	x		x
UA132	Lypivs’kyj protected locality	UA	x		

UA017	Rzhyschivs'ke Game Reserve	UA	x		
UA106	Velyka Osokorovka	UA	x		
UA063	Kinburns'kyj peninsula	UA	x		
PL061	Łuków Forests	POL		x	
PL108	Nielisz Site	POL		x	
PL099	Parczew forests	POL		x	x
PL161	Peatbogs at Wieprz River	POL		x	
PL102	Polesie	POL		x	x
PL107	Por River Valley	POL		x	
PL111	Roztocze	POL		x	
PL110	Solska Forest	POL		x	
PL112	Upper Labunka River Valley	POL		x	
BY009	Bielaviežškaja pušča*	BY		x	x
BY049	Liasnaja river*	BY		x	x
	Palieskaja dalina raki Buh [Polesia Valley of the River Bug]*	BY		x	x
BY053	Dniepr floodplain Lojeŭ Źary**	BY		x	x
BY022	Sporaŭskaje balota	BY		x	x
BY037	Prostyr	BY		x	x
BY034	Balota Maročna	BY		x	x
BY030	L'va floodplain	BY		x	x
BY018	Al'manskija baloty	BY		x	x
BY038	Stary Źadzien	BY		x	x
BY043	Vieluta	BY		x	x
BY052	Volchva	BY		x	x
BY028	Cyrvonaye	BY		x	x
BY033	Leichitsy-Ubort	BY		x	x
BY042	Staraya Vic'	BY		x	x
UA008	Syra Pogonya mire	UA		x	x
UA016	Meadows near Procriv village	UA		x	
UA123	Dniprodzerzhyns'ke reservoir	UA		x	
UA110	Mishurn Rig	UA		x	
UA130	Kakhovs'ke reservoir (Knyazhe-Grigorivka village)	UA		x	
UA129	Kakhovs'ke reservoir (Kajiry village)	UA		x	
UA066	Kakhovs'ke reservoir (Kozats'ki islands)	UA		x	

*These three sites would be affected by the construction of the Vistula-Bug Canal in Poland

**This site would be affected by the construction of a river port in the village of Nizhny Zhary



4.2.5 UNESCO-MAB

Two transboundary UNESCO-MAB sites (one in Polesia) would have indirect impacts, a total area of 6,681 km² of which 2,962 km² is in Polesia.

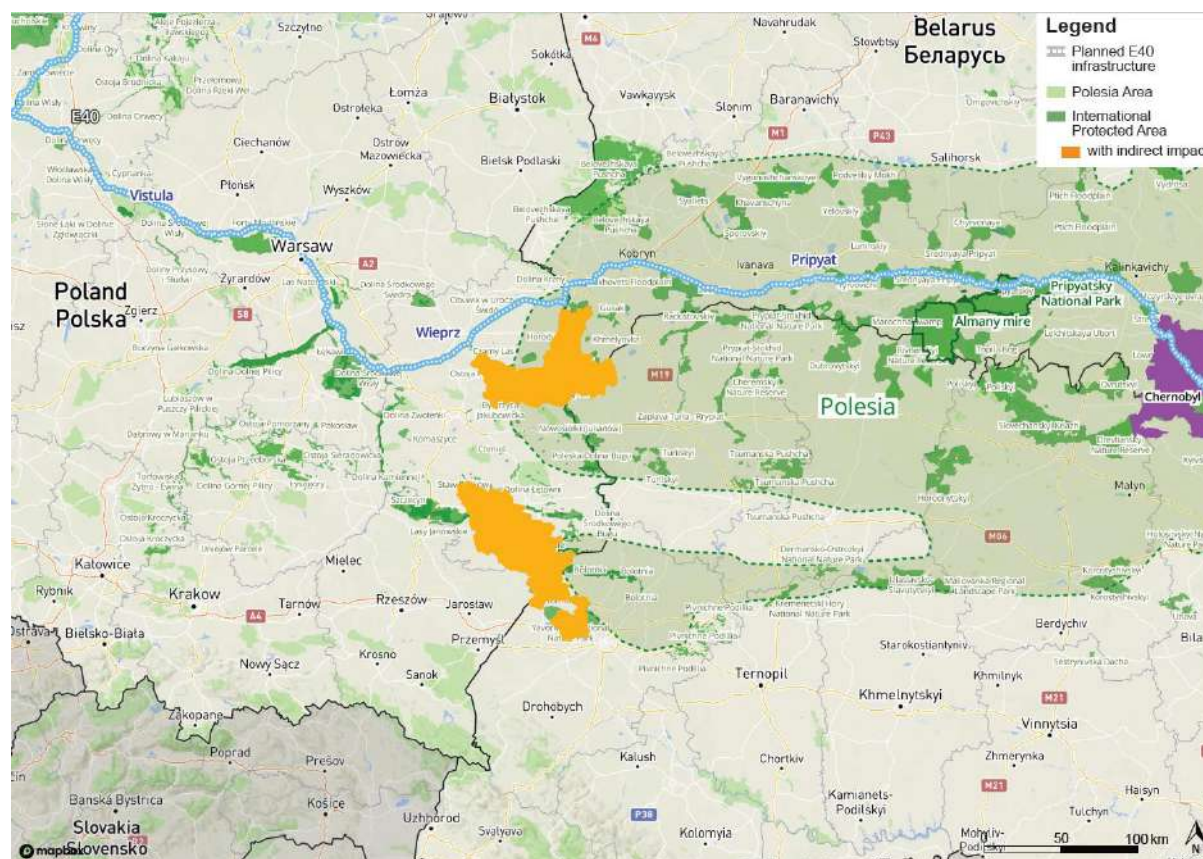


Figure 10: UNESCO-MAB sites indirectly (orange) impacted if the E40 waterway is built.

Table 27: UNESCO-MAB sites with impacts.

Name	Country	Direct impact	Indirect impact	Polesia
Roztocze Transboundary Biosphere Reserve	POL & UA		X	
West Polesie Transboundary Biosphere Reserve	BY, POL & UA		X	X

Roztocze Transboundary Biosphere Reserve^{lxxxix} is located in the Roztocze region in Poland and Ukraine which is a natural and cultural borderland located near the European Union border. Outside of our Polesia boundary it is also located in the immediate vicinity of Lviv (Ukraine) and Zamość (Poland), cities that are inscribed on the UNESCO World Heritage List. Roztocze is a region with potential for dynamic development because of its scenic location and great natural and cultural heritage. The Ukrainian part, called Roztochya, was designated a biosphere reserve in 2011.

Table 28: Roztocze Transboundary Biosphere Reserve UNESCO-MAB sites.

	Total area (km²)	Poland (km²)	Ukraine (km²)
Whole site	3719.02	2970.15	748.87
Core area(s):	124.74	91.49	33.25
Buffer zone(s)	921.92	803.92	118.00
Transition zone(s):	2672.35	2074.73	597.62

West Polesie Transboundary Biosphere Reserve ^{lxxxii}, a unique natural area, is located at the junction of Polesia of Belarus, Poland and Ukraine. Recognised in 2019 it is one of the four Trilateral International Transboundary Biosphere Reserves in the world and is entirely within our Polesia boundary.

Table 29: West Polesie Transboundary Biosphere Reserve.

	Total area (km²)	Belarus (km²)	Poland (km²)	Ukraine (km²)
Whole site	2630.16	480.24	1399.17	750.75
Core area(s):	153.23	43.67	52.24	57.32
Buffer zone(s)	808.77	253.37	432.15	123.25
Transition zone(s):	1668.16	183.20	914.78	570.18

As noted above, one of the long-term goals of the Wild Polesia project is to support a new transboundary Biosphere Reserve nomination for Polesia (Belarus/Ukraine), expected to be around one million ha in size. This could also be impacted by E40 waterway.

4.2.6 Baltic Sea

Two Baltic Sea (HELCOM) sites in Poland would be directly impacted, a total area of 641 km²

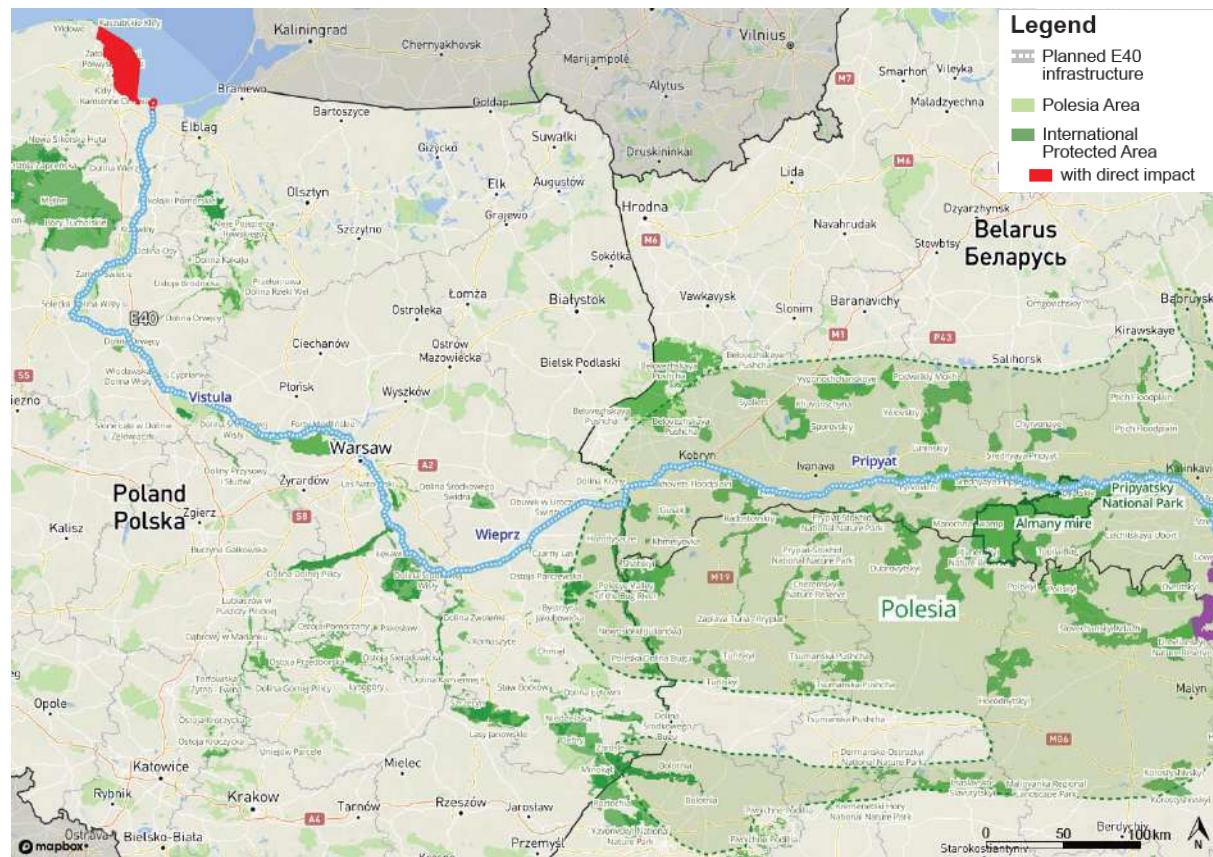


Figure 11: One Baltic Sea (HELCOM) site directly (red) impacted if the E40 waterway is built.

Table 30: Baltic Sea (HELCOM) sites with impacts.

Site number	Name	Country	Direct impact
MPA 302	Ujście Wisły	POL	x
MPA84	Zatoka Pucka	POL	x

4.2.7 UNESCO World Heritage Status

Currently the only World Heritage Site (WHS) within Polesia is a small area of the Belarusian Białowieża Forest (Belarus/Poland) site and this is unlikely to be impacted by E40 waterway.

However, as mentioned above, one of the goals of the Wild Polesia project is to support a transboundary WHS nomination for Central Polesia (Belarus/Ukraine), expected to be around 2,900 km² in size^{lxxxiii}. This could also be impacted by E40 waterway.

4.2.8 Summary of international sites likely to have serious impacts

Our initial analysis indicates that at least 43 international PAs would have serious impacts, a total area of 17,064 km². 31 sites in Belarus (15 Emerald sites, five Ramsar sites, ten IBAs and the Belarus section of the West Polesie Biosphere Reserve) and 13 in Poland (two SPAs, seven SACs, one Ramsar site and three IBAs).

Table 31: International sites with serious impacts.

International site type	Country	Number of sites likely to have serious impacts	No. of these sites in Polesia
SPA	Poland	2	0
SAC	Poland	7	0
Emerald	Belarus	15	15
Ramsar	Belarus	5	5
	Poland	1	0
IBA	Belarus	10	10
	Poland	3	0
UNESCO-MAB	Belarus	1	1

More detailed information about these sites is given in the country summaries (section 7 below).

4.3 Key biodiversity hotspots

Our analysis identifies a number of key biodiversity hotspots – areas strongly protected by different international designations – which would be impacted if the E40 waterway is built. These are summarised and their locations shown below. More detail about each is included in the country sections.

Table 32: Key biodiversity hotspots with impacts if E40 waterway is built.

Hotspot	International designations	National designations	Country	Direct impact	Indirect impacts	Polesia
Pripyatsky National Park	IBA Ramsar site	National Park	Belarus	x		x
Almany Mire	Ramsar site Emerald site IBA	Nature reserve (zakaznik) of national importance	Belarus		X	x
Lower Vistula Valley	Seven Natura 2000 sites (1 SPA and 6 SACs)	Five Nature Reserves and three Landscape Parks	Poland	x		

Middle Vistula Valley	Natura 2000 site (SPA)	Thirteen Nature Reserves	Poland	x		
Dolny Wieprz	Natura 2000 (SAC)	Nature Reserve	Poland	x		
Peatland in the Tyśmienica, Bystrzyca, and Wieprz River catchments	Tyśmienica Valley – Natura 2000 site (SPA)		Poland	x		
National Nature Park Pripjat-Stokhid	Ramsar sites “Pripjat River Floodplains” and “Stokhid River Floodplains” include part of the part of site	National Park	Ukraine		x	x
Chornobyl Radiation and Ecological Biosphere Reserve	Emerald site	Biosphere Reserve	Ukraine	x		x

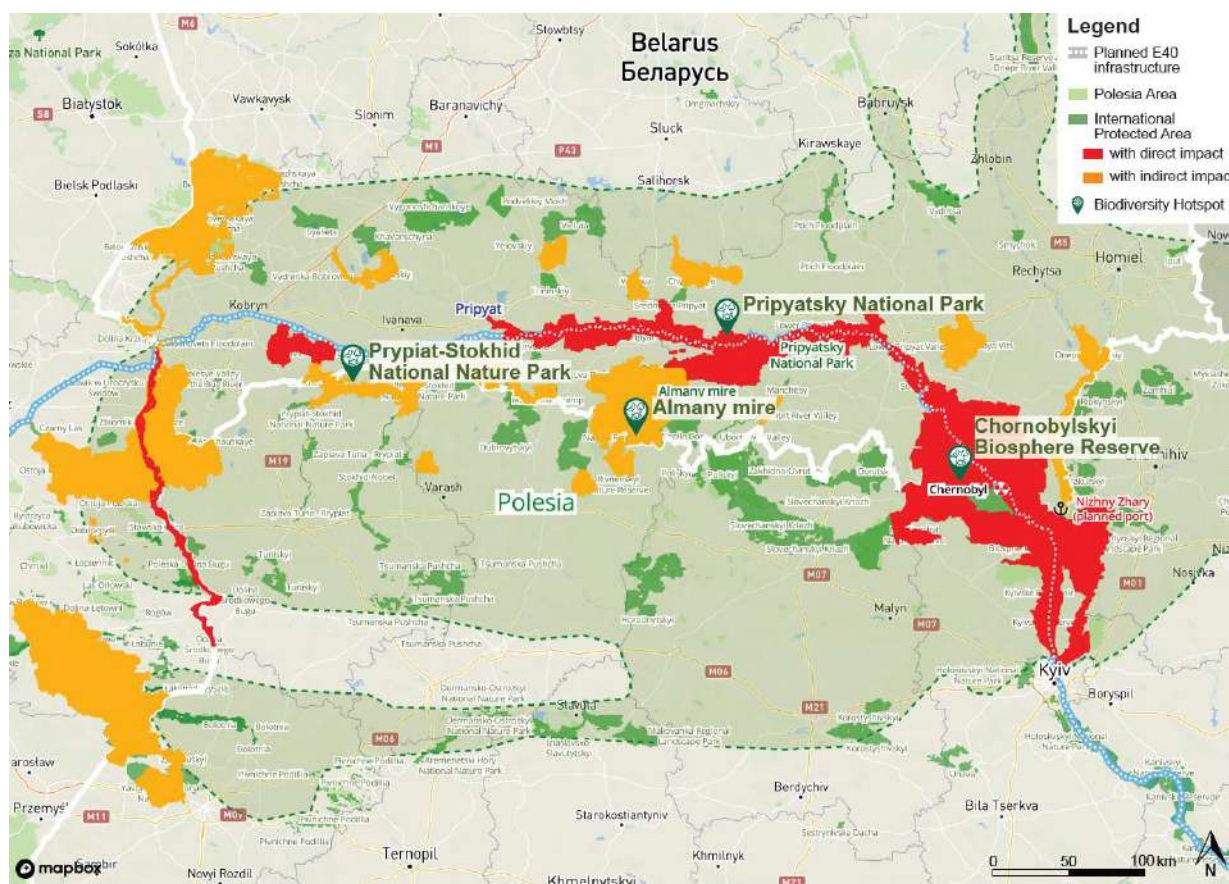


Figure 12: Key biodiversity hotspots along the E40 route in Polesia.



Figure 13: Key biodiversity hotspots along the E40 route in Poland.

5. National protected areas impacted

- In total 139 national protected areas would be impacted, a total of 22,250 km². 47 of these sites (=12,423 km²) are in Polesia.
- 54 national PAs impacted directly by E40 waterway (30 sites in Poland, eight in Belarus and 16 in Ukraine, a total area of 14,130 km²). Nine of the 54 sites, eight in Belarus and one in Ukraine, are in Polesia (=6,531 km²);
- In addition, in Poland there are a further six planned nature reserves in the Middle Vistula Valley with a total area of 77 km², all of which would be directly impacted by E40 waterway.
- 85 national PAs are very likely to have indirect impacts, an area of 8,120 km², 38 of these sites are in Polesia (5,892 km²). 52 sites are in Poland (six in Polesia), 31 in Belarus (30 in Polesia and six of which would have serious impacts) and two in Ukraine (both in Polesia).

5.1 Overview of impacted national sites

Table 33: Overview of the number and size of national protected areas impacted directly and indirectly if the E40 waterway is built.

	Number and size of national PAs impacted	
	along the whole E40 route	in Polesia
Direct impacts	54 sites 14,130 km ²	9 sites 6,531 km ² <i>(\cong 3.5 % of the total area of Polesia)</i>
Indirect impacts*	85 sites 8,120 km ²	38 sites 5,892 km ² <i>(\cong 3.2 % of the total area of Polesia)</i>
Total impacts	139 sites 22,250 km²	45 sites 12,423 km² <i>(\cong 6.7 % of the total area of Polesia)</i>

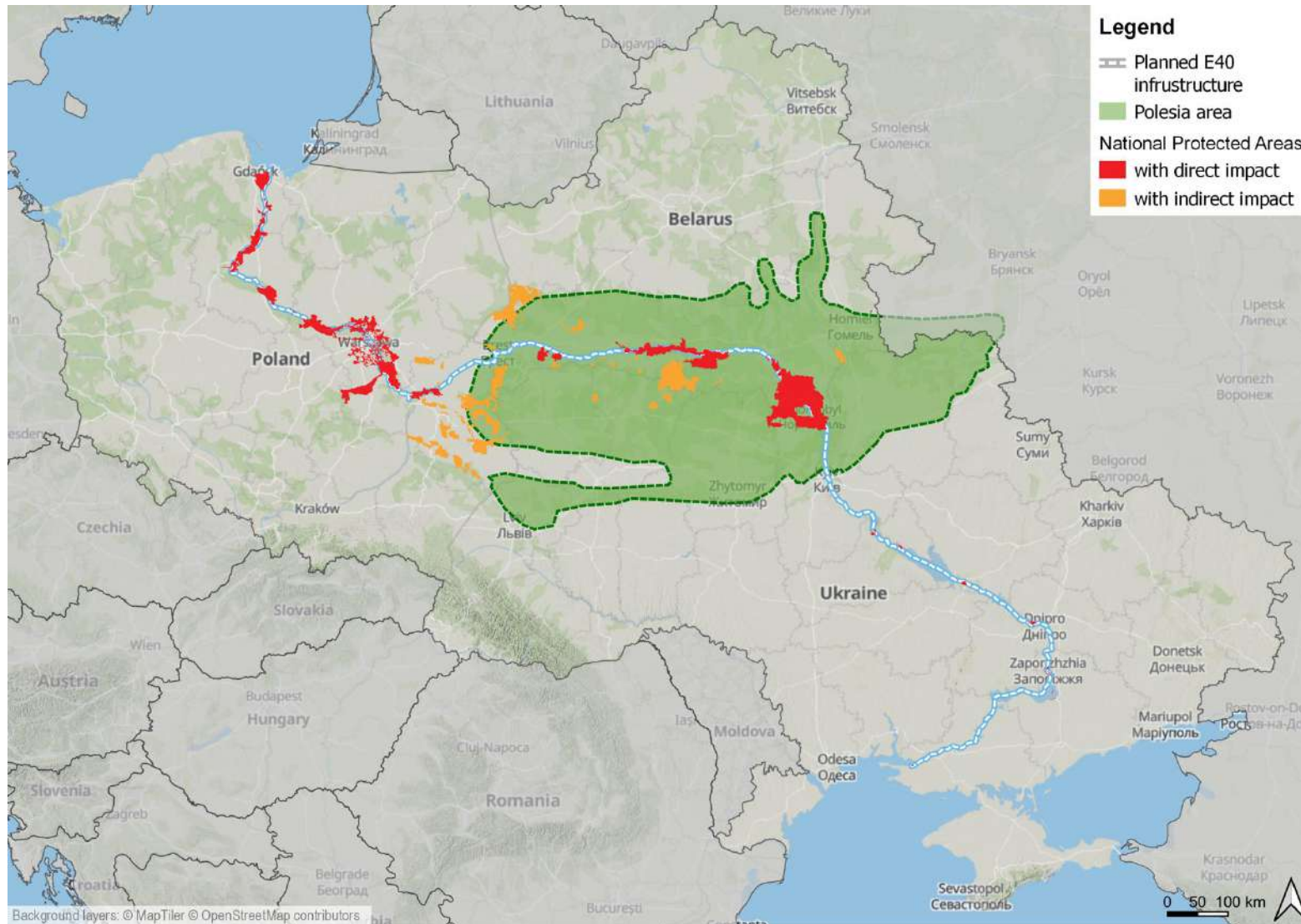


Figure 14: National protected areas directly (red) and indirectly (orange) impacted if the E40 waterway is built.

6. Country summaries

6.1 Belarus

Overview of international sites

Table 34: Overview of international sites in Belarus with impacts if the E40 waterway is built..

	Direct impacts				Indirect impacts				Total impacts			
	Whole E40 waterway		Polesia		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
<i>Emerald</i>	9*	4997	9	4997	24	6056	24	6056	33	11,053	33	11,053
<i>Ramsar</i>	3	1978	3	1978	7	1991	7	1991	10	3,970	10	3,970
<i>IBA</i>	6	4441	6	4441	15	4644	15	4644	21	9084	21	9084
<i>UNESCO-MAB (Transboundary)</i>					1***	480**	1	480**	1	480	1	480
Total (after removal of overlaps)	18	5,071 km²	18	5,071 km² ****	47	5,544 km²	47	4,195 km² ****	65	10,615 km²	65	9,266 km² ****

*one of these sites (Lower Pripyat Valley) is currently a candidate site

** area of site in Belarus

***The part of West Polesie Transboundary Biosphere Reserve in Belarus

****after removal of overlaps between different international designations and including only the area of individual sites within Polesia – some sites straggle the boundaries

All of the international sites with direct impacts are likely to have serious impacts. 13 of the sites with indirect impacts are also likely to have serious impacts. Hence in total 31 international sites in Belarus would have serious impacts (15 Emerald sites, five Ramsar sites, ten IBAs and the Belarus section of the West Polesie Biosphere Reserve). Information about these sites is summarized below.

Table 35: Details of international sites in Belarus with impacts if the E40 waterway is built.

International site type	Name	Direct impact	Indirect impacts	Polesia
Emerald	Lower Prypiats	X		X
	Pripyatskiy	X		X
	Srednyaya Pripyat	X		X
	Turovskiy Lug	X		X
	Zvanets	X		X
	Strelskiy	X		X
	Mozyrskiye ovragi	X		X
	Divin-Vielikiy Lies	X		X
	Lower Pripyat Valley*	X		X
	Belovezhskaya Pushcha**		X	X
	Lesnaya River**		X	X
	Polesye Valley of the Bug River**		X	X
	Mukhovets Floodplain**		X	X
	Dnepr Floodplain***		X	X
Dnepro-Sozhskiy***		X	X	
Ramsar	Mid-Pripyat State Landscape Zakaznik	X		X
	Pripyatsky National Park	X*		X
	Zvanets	X		X
	Polesye Valley of River Bug**		X	X
	Dnieper River Floodplain***		X	X
IBA	Dzivin – Vialiki lies	X		X
	Balota Zvaniec	X		X
	Mid Prypiac'	X		X
	Turaŭskaje balonnie	X		X
	Prypiackiya baloty	X		X
	Lower Prypiac	X		X
	Bielaviežškaja pušča**		X	X
	Liasnaja river**		X	X
	Palieskaja dalina raki Buh [Polesia Valley of the River Bug]**		X	X
	Dniepr floodplain Lojeŭ Žary***		X	X
UNESCO-MAB (Transboundary)	Western-Polesie Transboundary Biosphere Reserve		X	X

* Indicates that the site would also have significant hydrology impacts

**This site would be affected by the construction of the Vistula-Bug Canal in Poland

***This site would be affected by the construction of a river port in the village of Nizhny Zhary

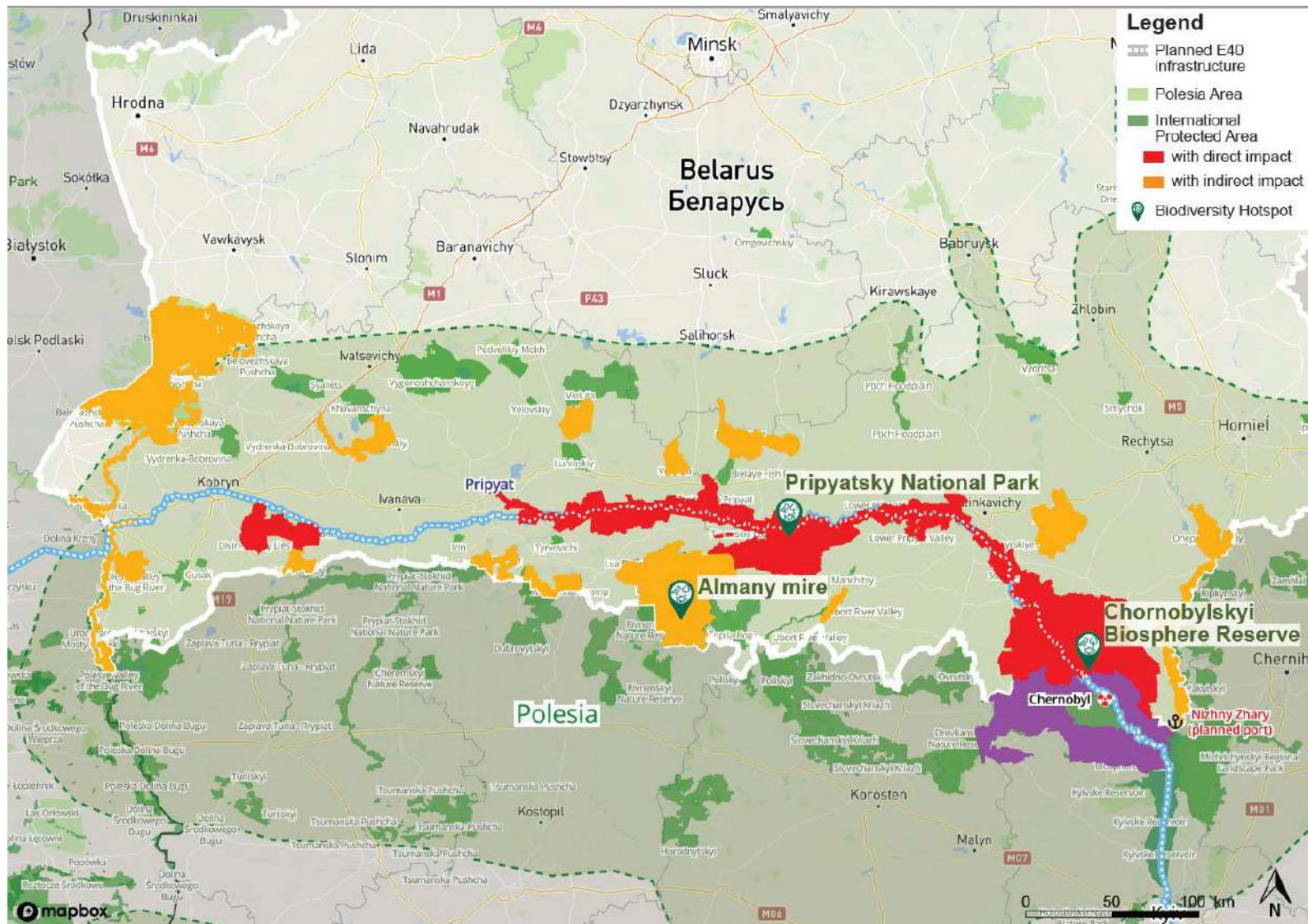


Figure 15: Internationally protected sites in Belarus directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Overview of national sites

Table 36: Overview of national sites in Belarus with impacts if the E40 waterway is built.

	Direct impacts				Hydrology impacts				Direct & hydrology impacts			
	Whole E40 waterway		Polesia		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
National Park	1	812	1	812	1	1530	1	1530	2	2,342	2	2,342
Radiological Reserve	1	2,183	1	2,183					1	2,183	1	2,183
Nature reserve (zakaznik) of national importance	4	1226	4	1226	6	1413	6	1413	10	2,639	10	2,639
Nature reserve (zakaznik) of regional importance	2	40	2	40	24	883	23	882	26	923	25	922
Total	8	4,261	8	4,261	31	3826	30	3825	39	8,087	38	8,086

Note: Due to the timing of our analysis the area of the recent expansion to the Almany Mires Nature Reserve is not included^{lxxxiv}.

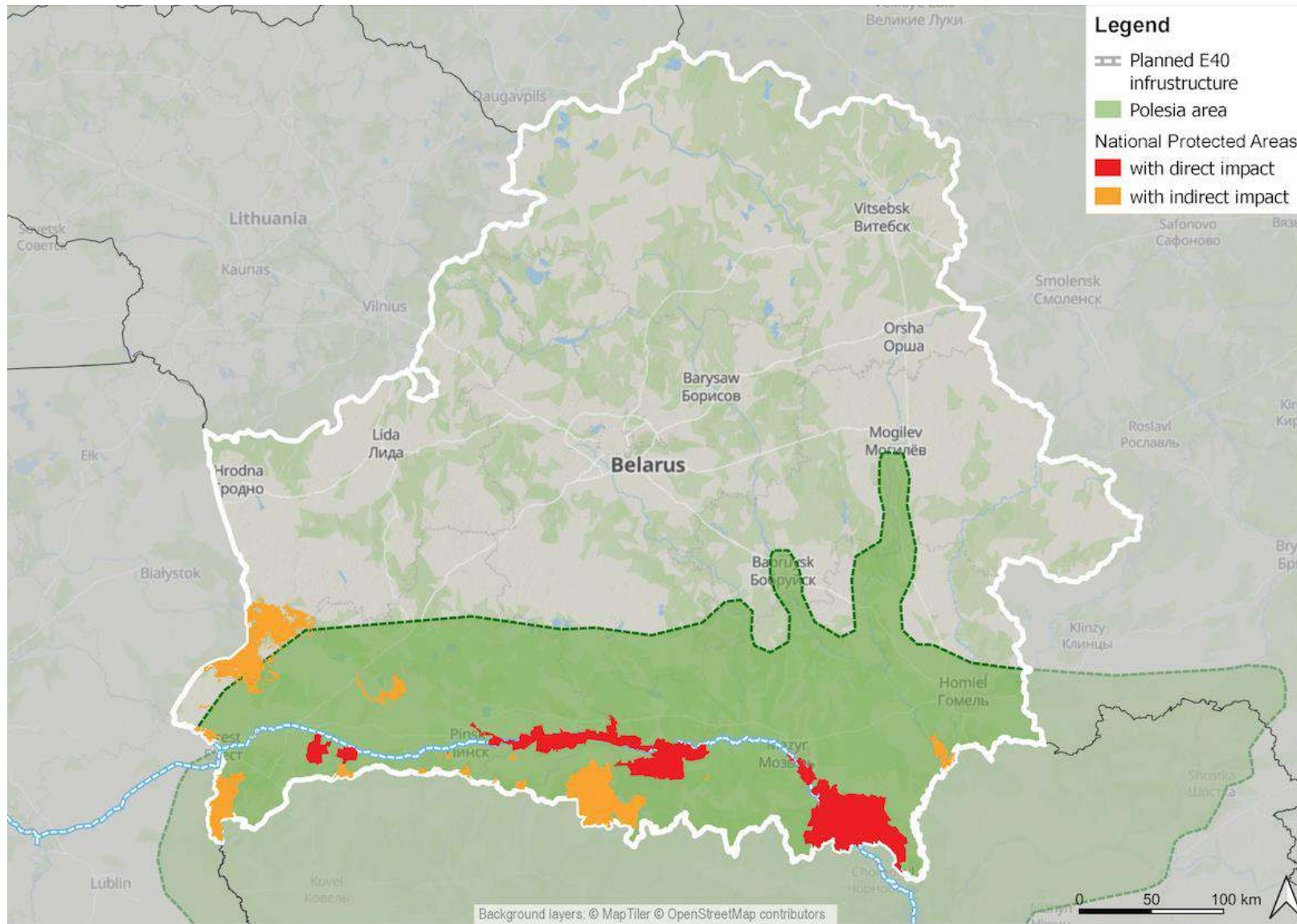


Figure 16: National protected areas in Belarus directly (red) and indirectly (orange) impacted if the E40 waterway is built.

All of the national sites in Belarus with direct impacts are likely to have serious impacts. Six of the sites with indirect impacts are also likely to have serious impacts. Hence in total 13 national sites in Belarus would have serious impacts (two National Parks, five Nature Reserves of National importance and six Nature Reserves of Regional Importance). Information about these sites is summarized below. Information about all national sites likely to be impacted is included in Appendix 3.

Table 37: Details of national sites in Belarus likely to have serious impacts.

National site type	Name	Direct impact	Indirect impacts	Polesia
National Park	Pripyatsky*	x		x
	Belovezhskaya Pushcha**		x	x
Radiological Reserve	Polissky State Radioecological Reserve	x		x
Nature reserve (zakaznik) of national importance	Zvanets	x		x
	Mid-Pripyat	x		x
	Mozyr Ravines	x		x
	Strelsky	x		x
	Dnepr-Sozhsky***		x	x
Nature reserve (zakaznik) of regional importance	Divin Velikiy Les	x		x
	Turau Meadows	x		x
	Bugsky**		x	x
	Nepakoichitsy**		x	x
	Brestsky**		x	x
	Pribuzskoye Polesie **		x	x

*Indicates that the site would also have significant hydrology impacts

**This site would be affected by the construction of the Vistula-Bug Canal in Poland

***This site would be affected by the construction of a river port in the village of Nizhny Zhary

Key biodiversity hotspots

Pripyatsky National Park – direct and indirect hydrology impacts

Pripyatsky National Park protects the middle stretch of the river Pripyat. In spring, as snow melts, vast wetlands form and this area is more like a large lake than a river. Its landscape is a huge labyrinth of diverse habitats – waters, islands, swamps, wetlands, and floodplain forests. It is one of the most pristine areas of Belarus and a key site for migratory birds.

Beside the protection as a National Park it is also an Important Bird Area and Ramsar Site and one component forms part of the national Biosphere Reserve Pripyatskoye Polesie (together with Almany Mires Reserve and Stary Zhaden reserve) – see Map 17. However, our analysis reveals that Pripyatsky National park would be subject to both direct and hydrology impacts.

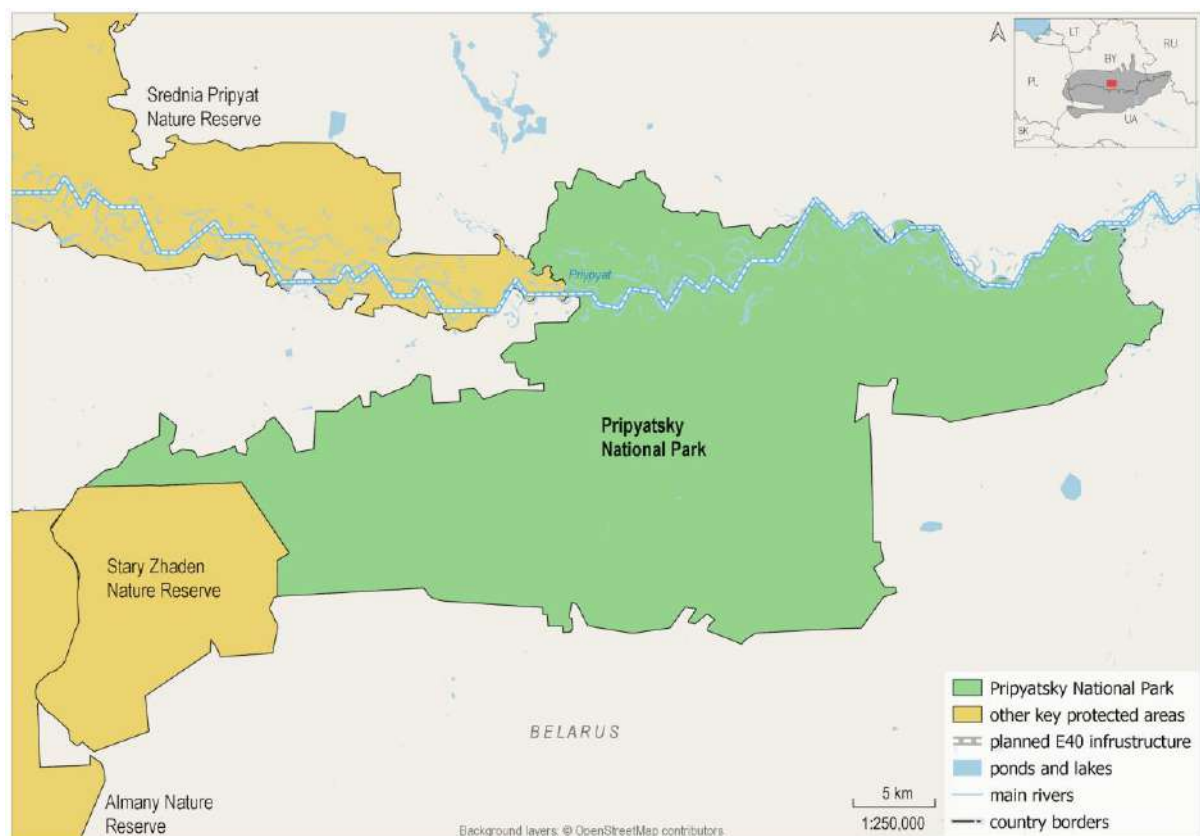


Figure 17: Pripyatsky National Park boundaries.^{lxxxv}

The Pripyatsky National Park is one of the least disturbed areas of Belarusian Polesia and can be regarded as the reference of its natural ecosystems^{lxxxvi}, ^{lxxxvii}. The site harbours numerous nationally-rare species of flora and fauna which are important for the conservation of biological diversity within the continental biogeographic region.

Most of the surface of the site is afforested; open ecosystems occupy less than 15 percent of its area. The structure is dominated by pine forests, with a mixture of oaks, birch and alder. Oak floodplain forests are among the most threatened in Europe and have lost most

of their original distribution due to habitat conversion and degradation (conversion to pastures and agricultural land, river regulation and drainage, etc.). These forests play an important part in the protection of biodiversity (e.g. for dead-wood specialists) and ecosystem services (flood control and regulation).

The high diversity of habitats means there is a high diversity of species in a limited area:

- About 1073 species of vascular plants – over ¾ of the total species in Belarusian Polesia.
- 362 species of vertebrates (95 percent of the fauna of the Belarusian Polesia).
- 2057 species of macroinvertebrates, including 1768 species of insects.
- 76 species of vertebrates and 43 invertebrate species are included in the Red Data Book of Belarus.
- A high diversity of birds. A 2011 survey found 173 species of birds nesting in the area, including globally threatened Greater Spotted Eagle (*Aquila clanga*) (six pairs), Snipe (*Gallinago media*) (> 20 pairs), Pintail (*Anas acuta*), Bittern (*Botaurus stellaris*), Black Stork (*Ciconia nigra*), Black Kite (*Milvus milvus*), White-tailed Eagle (*Haliaeetus albicilla*), Short-toed Snake Eagle (*Circaetus gallicus*), Crane (*Grus grus*), Golden Plover (*Pluvialis apricaria*), Curlew (*Numenius arquata*), Little Tern (*Sterna albifrons*), and White-backed Woodpecker (*Dendrocopos leucotos*). The Pripyat is also extremely important as a migration site for birds.

In addition, the floodplain plays an important role in flood regulation, water supply and the maintenance of water quality and groundwater recharge. The peatland areas also store and sequester vast amounts of carbon, thus contributing to global climate regulation. Peatlands are the most carbon-dense terrestrial ecosystems. Although they cover less than three percent of the global land surface, the carbon stored in them exceeds carbon stored in all other vegetation combined, including forests^{lxxxviii}. Maintaining them is essential to help tackle the climate crisis.



Figure 18: Aerial photo of the river Pripyat and its floodplain meadows, wetlands and oxbow lakes in Belarusian Polesia © Daniel Rosengren / FZS.

Almany Mires Nature Reserve – indirect hydrology impacts

Covering 100,000 hectares, Almany is the largest transition mire in Europe. The main part of the mire complex is located in Belarus. The mire is protected as a Nature reserve (zakaznik) of national importance⁶, IBA, Ramsar Site and Emerald site – see Map 13. The site stores a huge amount of carbon and provides a home to Belarus’ largest population of the globally endangered Greater Spotted Eagle (*Aquila clanga*).

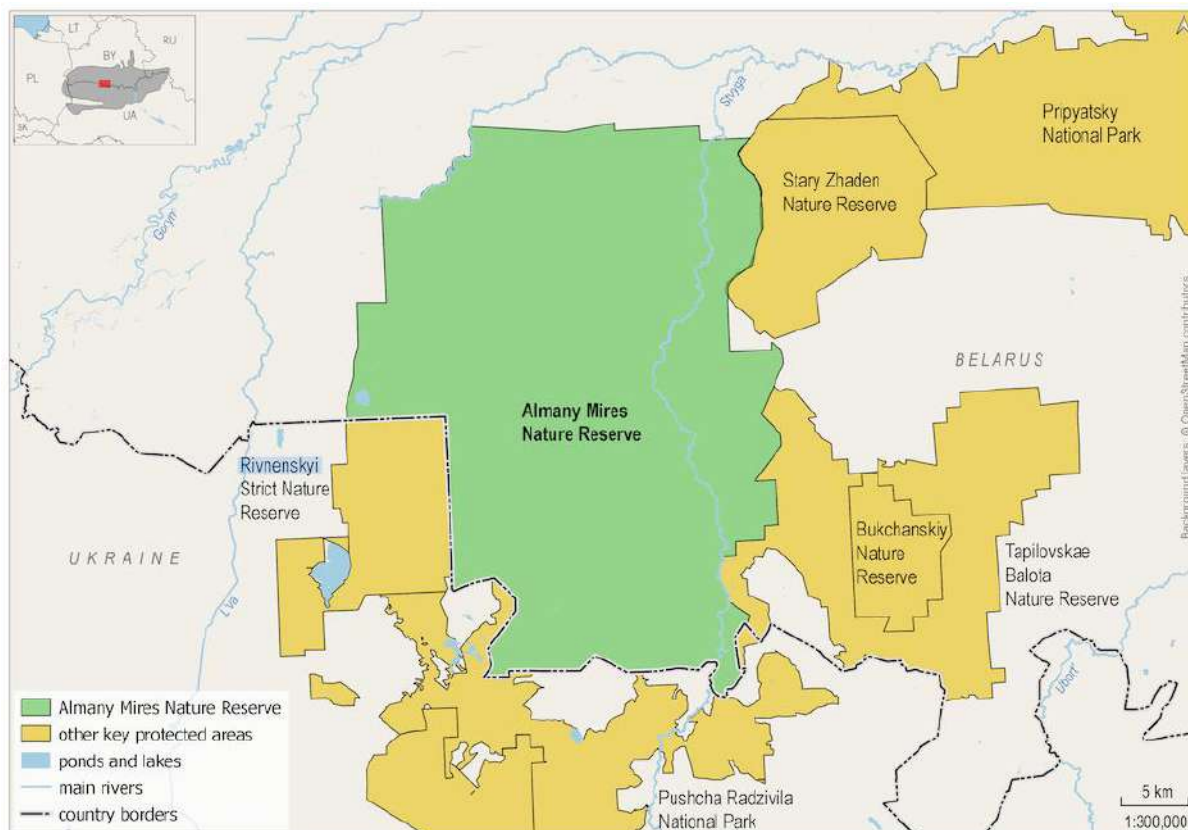


Figure 19: Almany Mires Nature Reserve boundaries.^{lxxxix}

Natural or little transformed areas (including forest) occupy 90 percent of the national protected area. 50 percent are open mires (with large areas of pine and birch bog woodlands), 40 percent are mainly transition mires, 5 percent comprise rivers and reservoirs and another 5 percent other land. Key is to preserve mire ecosystems – both open (active raised bogs, transition mires and quaking bogs) and forested (bog woodlands). Active raised bogs (Natura 2000 code: 7110) occupy over 2,000 ha within the Belarusian part of the Almany Mire complex. Transition mires and quaking bogs (code 7140) occupy over 37,000 ha. Bog woodlands (code 91D0) occupy over 13,000 ha^{xc}.

⁶ Almany Mires Nature Reserve was expanded by 10,000 ha in 2021.



Figure 20: Aerial photo of the Almany Mire in Belarusian Polesia © Viktor Fenchuk

The site hosts a wide variety of bird species, including over 20 nationally protected species and over 40 internationally protected species. Many of them are wetland-related species, including Europe's largest population of Greater Spotted Eagle (*Aquila clanga*) (18-20 pairs); the largest populations in Belarus of Short-toed Eagle (*Circaetus gallicus*) (10-30 pairs), Crane (*Grus grus*) (100-200 pairs), Greenshank (*Tringa nebularia*) (50-70 pairs) and Aquatic Warbler (*Acrocephalus paludicola*) (50-100 pairs)^{xci}.

6.2 Poland

Overview of international sites

Table 38: Overview of international sites in Poland with impacts if the E40 waterway is built.

	Direct impacts				Indirect impacts				Total impacts			
	Whole E40 waterway		Polesia		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
SPA	6	1641	1	281	8	2238	1	102	14	3879	2	383
SAC	8	572			44	731	4	117	52	1303	4	117
<i>Emerald</i>												
Ramsar	1	17			1	98	1	98	2	115	1	98
IBA	7	1791	1	298	9	2369	2	312	16	4159	3	610
UNESCO-MAB (Transboundary)					2	4369 [^]	1	1399 ^{**}	2	4369 [^]	1	1399 [^]
HELCOM	2	641							2	641		
Total (after removal of overlaps)	24	2,065 km²	2	261 km²*	64	4,972 km²	9	1,282 km²*	86	7,037 km²	11	1,543 km²*

* after removal of overlaps between different international designations and including only the area of individual sites within our Polesia – some sites straggle the boundaries.

**area of site in Poland.

Some of the international sites are likely to have serious impacts. Particularly the riverine sites which would have direct impacts along their whole length. Initial analysis indicates that at least 13 international sites in Poland would have serious impacts (two SPAs, seven SACs, one Ramsar site and three IBAs). Information about these sites is summarized below.



Figure 21: Internationally protected sites in Poland directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Table 39: Details of international sites in Poland with serious impacts.

International site type	Name	Direct impact	Indirect impacts	Polesia
SPA	Lower Vistula Valley (Dolina Dolnej Wisły)	x		
	Middle Vistula Valley (Dolina Środkowej Wisły)	x		
SAC	Lower Vistula (Dolna Wisła)	x		
	Lower Wieprz (Dolny Wieprz)	x		
	Dybowska Valley of the River Vistula (Dybowska Dolina Wisły)	x		
	Kampinowska Valley of the River Vistula (Kampinowska Dolina Wisły)	x		
	Nieszawska Valley of the River Vistula (Nieszawska Dolina Wisły)	x		
	Solecka Valley of the River Vistula (Solecka Dolina Wisły)	x		
	Włocławska Valley of the River Vistula (Włocławska Dolina Wisły)	x		
Ramsar	Vistula River Mouth	x		
IBA	Lower Vistula River Valley	x		
	Middle Vistula River Valley	x		
	Vistula River Mouth	x		

Overview of national sites

Table 40: Overview of national sites in Poland with impacts.

	Direct impacts		Indirect impacts				Total impacts			
	Whole E40 waterway		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
Landscape Park	3	682	8	1061	2	173	11	1743	2	173
National Park			2	182	1	97	2	182	1	97
Nature Reserve	13*	54	30	20	0		43	74		
Protected Landscape Area	14	4,679	12	2,348	3	1,114	26	7,028	3	1,114
Total	30	5,415	52	3,611	6	1,384	82	9,027	6	1,384

*In addition, there are a further six planned nature reserves in the Middle Vistula Valley with a total area of 77 km². All of these would be directly impacted by E40 waterway.

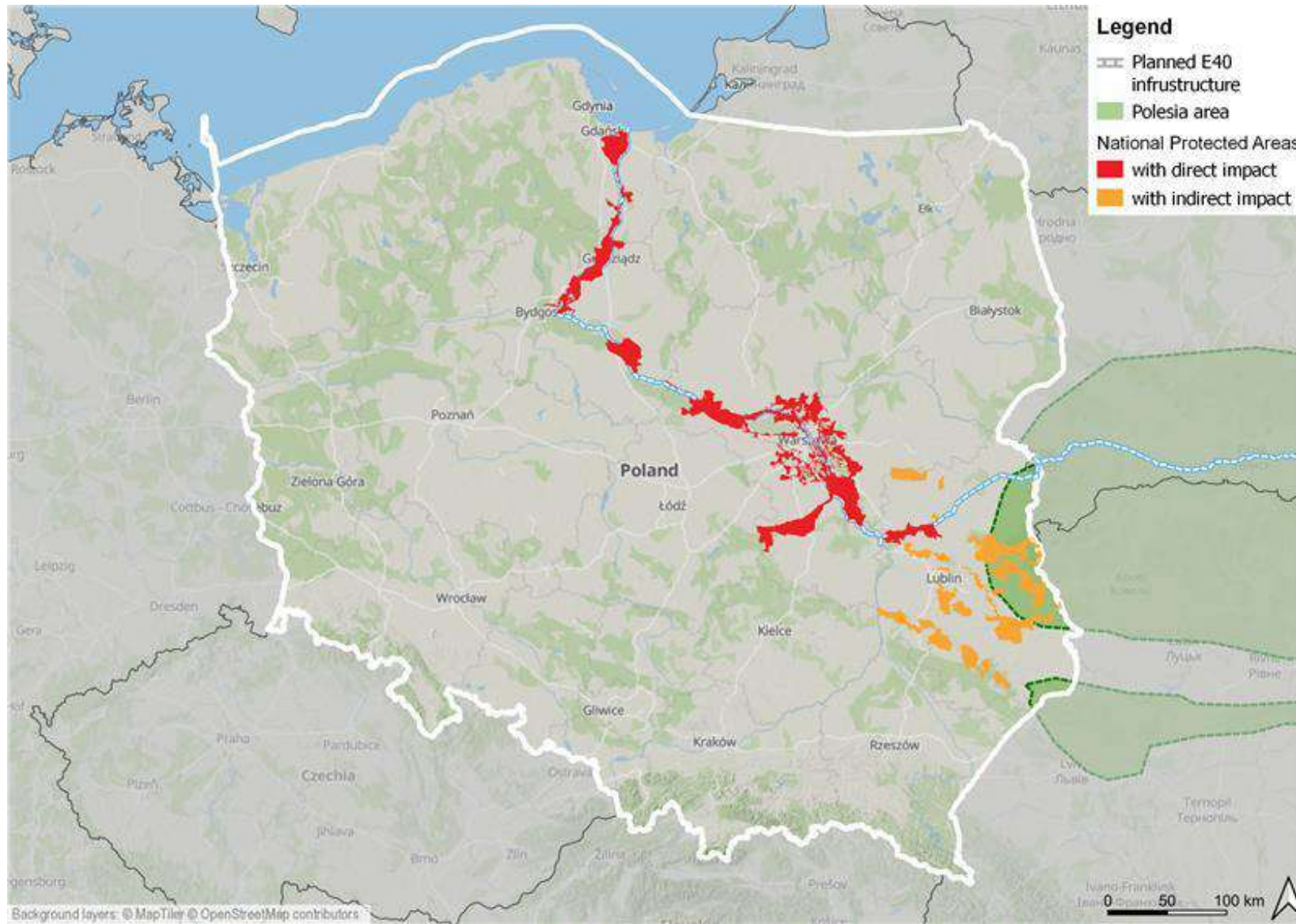


Figure 22: National protected areas in Poland directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Sites with direct impacts are listed below. None of these are in Polesia. A full list of sites is in Appendix 3.

Table 41: Details of national sites in Poland with direct impacts.

National site type	Name	Direct impact
Landscape Park	Chełmiński Park Krajobrazowy	X
	Góry Łosiowe	X
	Nadwiślański Park Krajobrazowy	X
Nature Reserve	Kępa Antonińska	X
	Kępa Bazarowa	X
	Kępa Wykowska	X
	Kępy Kazuńskie	X
	Łachy Brzeskie	X
	Ławice Kiełpińskie	X
	Ławice Troszyńskie	X
	Wikliny Wiślane	X
	Wyspy Biało-brzeskie	X
	Wyspy Świdzkie	X
	Wyspy Zakrzewskie	X
	Wyspy Zawadowskie	X
	Zakole Zakroczymskie	X
Protected Landscape Area	Białej Góry	X
	Dolina Rzeki Pilicy i Drzewiczki	X
	Doliny Kwidzyńskiej	X
	Gniewski	X
	Gostynińsko-Gąbiński	X
	Nadwiślański (Powiat Garwoliński, Miński i Otwocki)	X*
	Nadwiślański (Powiat Płoński, Płocki i Sochaczewski)	X
	Nadwiślański (Powiat Sochaczewski)	X
	Nadwiślański (Woj. Pomorskie)	X
	Niziny Ciechocińskiej	X
	Obszar Chronionego Krajobrazu Pradolina Wieprza	X*
	Środkowożuławski	X
	Warszawski	X
Żuław Gdańskich	X	

* Indicates that the site would also have significant hydrology impacts.

In addition, there are the further six planned nature reserves (Kępy Śladowskie, Wyspy Smoszewskie, Kępa Czerska, Ławice Podgórzyckie, Wyspy Kobylnickie, Dunajek) in the Middle Vistula Valley mentioned above.

Key biodiversity hotspots

In Poland, the planned E40 waterway would not just cross protected Natura 2000 sites, but go along whole sites. **Nine sites** would be affected along their **whole length**:

- Lower Vistula Valley SPA (Dolina Dolnej Wisły)
- Lower Vistula SAC (Dolna Wisła)
- Solecka Valley of the River Vistula SAC (Solecka Dolina Wisły)
- Dybowska Valley of the River Vistula SAC (Dybowska Dolina Wisły)
- Nieszawska Valley of the River Vistula SAC (Nieszawska Dolina Wisły)
- Włocławska Valley of the River Vistula SAC (Włocławska Dolina Wisły)
- Kampinoska Valley of the River Vistula SAC (Kampinoska Dolina Wisły)
- Middle Vistula Valley SPA (Dolina Środkowej Wisły)
- Lower Wieprz SAC (Dolny Wieprz)

In addition, the E40 waterway route crosses/goes along an important section of the Tyśmienica Valley SPA (Dolina Tyśmienicy). 13 state Nature Reserves with a total area of 54 km² (plus 77 km² of planned nature reserves) would also be directly damaged. Below we provide more information about some of these key biodiversity sites.

Middle Vistula Valley SPA (Dolina Środkowej Wisły) was established along a 260 km long section of the Vistula river between Puławy (near to the place where the E40 waterway would leave the Vistula and turns East towards Polesia) and Płock (where the Vistula's natural features were changed into a water reservoir by Włocławek dam).

The Vistula river is in some sections within the site retaining the character of a natural braided river with numerous branches and oxbow lakes, between which there are sandbanks, shoals and islands covered with willow and poplar bushes. The banks of the river with the floodplain terrace have wet meadows and pastures with ponds and intensively exploited willow thickets. In some places, relict habitats of riverside alluvial forests have been preserved. Seasonal fluctuations in the water level affect the formation of the landscape with high dynamics of changes, which determines the great natural values of the Middle Vistula Valley. This area is a very important refuge for wetland birds, providing breeding sites for 40-50 species of birds. It is the most important breeding ground of the Mew Gull (*Larus canus*), Little Tern (*Sternula albifrons*) and Common Ringed Plover (*Charadrius hiaticula*) in Poland, one of the most important for Common Tern (*Sterna hirundo*) and a nesting place for many rare bird species such as the Eurasian Oystercatcher (*Haematopus ostralegus*) and the Common Shelduck (*Tadorna tadorna*). The area is of great importance as a migratory corridor of birds – Mallard (*Anas platyrhynchos*), Gray Heron (*Ardea cinerea*) and Black Stork (*Ciconia nigra*), as well as a wintering site for Goldeneye (*Bucephala clangula*), Goosander (*Mergus merganser*) and Smew (*Mergus albellus*). The Management Plan for the site identified straightening of the riverbed and changing the river course as key threats to some of the site's conservation objectives.



Figure 23: Natural river bed of the Middle Vistula 30 kilometres upstream of Warsaw © Marek Elas / OTOP.

Lower Vistula Valley SPA (Dolina Dolnej Wisły) covers the river and floodplains over a distance of over 250 km downstream from Włocławek to Gdańsk. In this fragment, the Vistula, despite its transformations, retains the natural character and dynamics of a freely flowing river. There are vast areas of wet meadows in some places between the flood embankments. Lower Vistula Valley SPA is used by birds as a breeding site, an important place of rest on migration (including groups of waders of 25,000 individuals) and a wintering area (for *Anseriformes* and White-tailed Eagle (*Haliaeetus albicilla*) among others). This is mainly due to the variety of habitats occurring here; the most valuable of which are sandy islands and shoals in the river bed. They are characterized by high dynamics, and their occurrence and variability are influenced by both natural factors (fluctuations in water level, accumulation and erosion activity of the river) and anthropogenic factors (river regulation, in particular the activity of the Włocławek barrage). The Lower Vistula Valley is one of the most important national breeding sites for the Little Tern (*Sternula albifrons*) and Common Tern (*Sterna hirund*). The Little Ringed Plover (*Charadrius dubius*) and Common Ringed Plover (*Charadrius hiaticula*) nest on sandy islands and river banks.

The plans for dam construction in the site and construction of further dam reservoirs along the river up to the estuary (known as “Lower Vistula Cascade”) were identified as a threat to conservation objectives of the site.

The Special Areas of Conservation Lower Vistula (Dolna Wisła), Solecka Valley of the River Vistula (Solecka Dolina Wisły), Dybowska Valley of the River Vistula (Dybowska Dolina

Wisły), Nieszawska Valley of the River Vistula (Nieszawska Dolina Wisły), Włocławska Valley of the River Vistula (Włocławska Dolina Wisły), Kampinoska Valley of the River Vistula (Kampinoska Dolina Wisły) are an important ecological corridor for Atlantic Salmon (*Salmo salar*) and River Lamprey (*Lampetra fluviatilis*). They are significant areas of occurrence of populations of breeding species of ichthyofauna listed in Annex II of the Habitats Directive: Asp (*Aspius aspius*), European bitterling (*Rhodeus sericeus amarus*), Spine Loach (*Cobitis taenia*) and Weatherfish (*Misgurnus fossilis*).



Figure 24: Drone photo of the Vistula river in Poland © Tomasz Pezold

Włocławska Valley of Vistula River SAC (Włocławska Dolina Wisły) was identified of special importance for Spine Loach and European Bitterling conservation in the whole Vistula catchment. Construction of the dam and water reservoir would damage their habitats directly. It would also significantly impact the population of migratory fish species, such as Atlantic Salmon (*Salmo salar*), River Lamprey (*Lampetra fluviatilis*), Sea Trout (*Salmo trutta morpha trutta*), European Eel (*Anguilla anguilla*), Vimba Bream (*Vimba vimba*) and rheophilic species (species that live in fast flowing water) such as European Brook Lamprey (*Lampetra planeri*) and Barbel (*Barbus*). The project decreases also chances of Baltic Sturgeon (*Acipenser sturio*) restitution.

If one of the next dams of Lower Vistula Cascade (Siarzewo) was constructed, it would also significantly impact Natura 2000 sites on Vistula tributaries in the upper catchment: Raba, Dunajec and San rivers, including SACs: Wisłok Valley and Tributaries (Dolina Wisłoka z Dopywami), Middle Wisłok and Tributaries (Wisłok Środkowy z Dopywami), Upper San Catchment (Dorzecze Górnego Sanu), Lower San Valley (Dolina Dolnego Sanu) and San River (Rzeka San).

Impacts on bird species in the SPAs and IBA along planned route of E40 waterway in

Poland:

Predicted decrease^{xcii} in the population size of birds of conservation interest in Natura 2000 Special Protection Areas (Ujście Wisły, Dolina Dolnej Wisły, Dolina Środkowej Wisły, Dolina Tyśmienicy) and IBA (Dolina Dolnego Wieprza) located along the route of the planned E40 waterway is:

- Sandwich Tern (*Thalasseus sandvicensis*) – 50-100 percent
- Little Tern (*Sternula albifrons*) – more than 50 percent
- Eurasian Oystercatcher (*Haematopus ostralegus*) – app. 50 percent
- Common Ringed Plover (*Charadrius hiaticula*) – app. 50 percent
- Mew Gull (*Larus canus*) – up to 50 percent
- Common Tern (*Sterna hirundo*) – up to 40 percent
- Caspian Gull (*Larus cachinnans*) – app. 20 percent
- Common Sandpiper (*Actitis hypoleucos*) – up to 20 percent
- Common Shelduck (*Tadorna tadorna*) – 15-25 percent
- Black-headed Gull (*Chroicocephalus ridibundus*) – up to 10 percent
- Goosander (*Mergus merganser*) – up to 10 percent
- Mediterranean Gull (*Larus melanocephalus*) – up to 10 percent

Thus, damming the Vistula river and constructing the E40 waterway may result in the collapse or even extinction of key Polish populations of terns, gulls and other waders.

Lower Wieprz SAC (Dolny Wieprz)

The most severe biodiversity impacts and losses are expected in Dolny Wieprz SAC as construction of the Polish variant 3 of the E40 waterway (as currently being investigated) would go along the whole Wieprz valley, destroying it totally. The Wieprz riverbed has a natural, strongly meandering nature. The river is accompanied by numerous oxbow lakes and extensively used wet meadows.

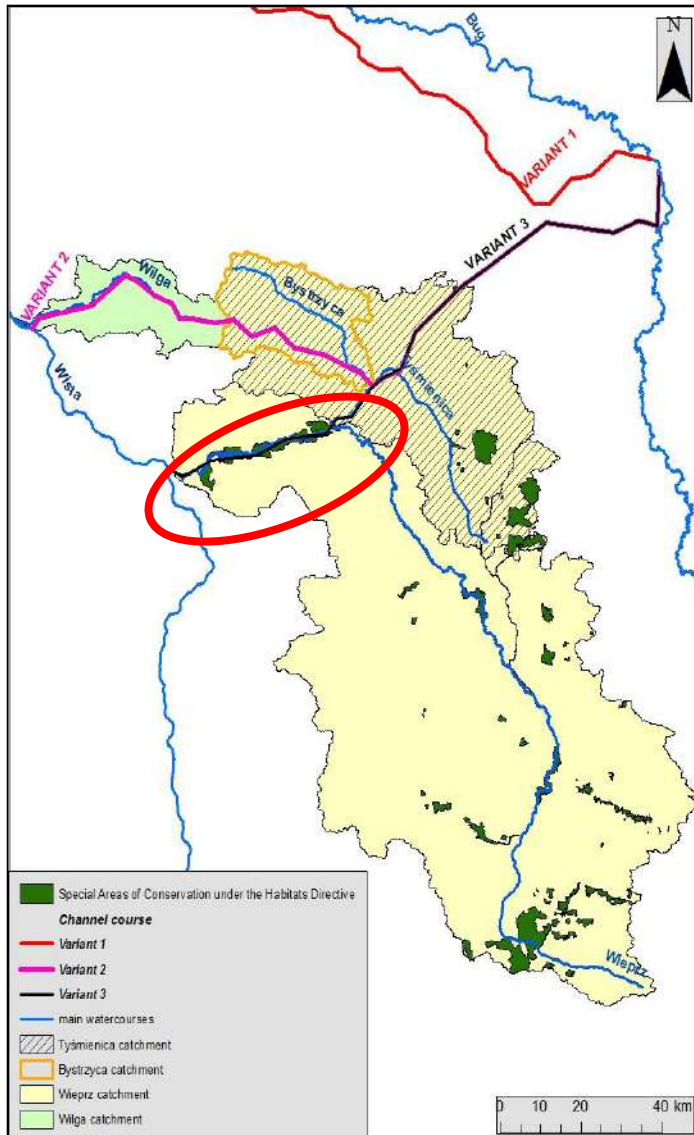


Figure 25: Special Areas of Conservation under the Habitats Directive in the catchments of Tysmienica, Bystrzyca, Wieprz and Wilga. Lower Wieprz SAC (Dolny Wieprz) encircled with a red ellipse^{xciii}.

Lower Wieprz SAC was established to protect the following natural habitats:

- Natural eutrophic lakes with Magnopotamion or Hydrocharition (3150)
- Rivers with muddy banks with *Chenopodium rubri* p.p. and *Bidention* p.p. (3270)
- Xeric sand calcareous grasslands (6120)
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)
- Lowland hay meadows (6510)
- Alkaline fens (7230)
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0)
- and species such as: Asp, Fire-bellied Toad, Otter and Weatherfish^{xciv}.

The site was also designated as IBA (PL144) for the protection of migratory birds, Greater White-fronted Goose (*Anser albifrons*), Corncrake (*Crex crex*), Black-tailed Godwit (*Limosa limosa*), Black Tern (*Chlidonias niger*) and Syrian Woodpecker (*Dendrocopos syriacus*). It is also in the process of SPA designation^{xcv}.



Figure 26: The meandering Wieprz river in Poland © Damian Pankowicz.

Peatlands in the Tyśmienica, Bystrzyca, Wieprz and Wilga River catchments

If the water for filling the proposed canal on the Wieprz river was taken from the Tyśmienica, Bystrzyca or Wieprz rivers, as is envisaged for variant 3, severe water deficits would occur in these rivers. This could result in lowering the groundwater level in their whole catchments. Variant 2 would also take water from the Wilga river. In both cases, a negative impact on all water-dependent species and habitats in the catchments of these rivers cannot be excluded^{xvii}.

There is over **62 500 ha of peatlands** in the catchments of these rivers (Map 15). A decrease of groundwater level may result in destruction of peatlands that are still well-preserved and contribute to the progressive degradation of peatlands already drained. This could lead to further negative effects such as the release of carbon, turning a carbon sink into a carbon sources.

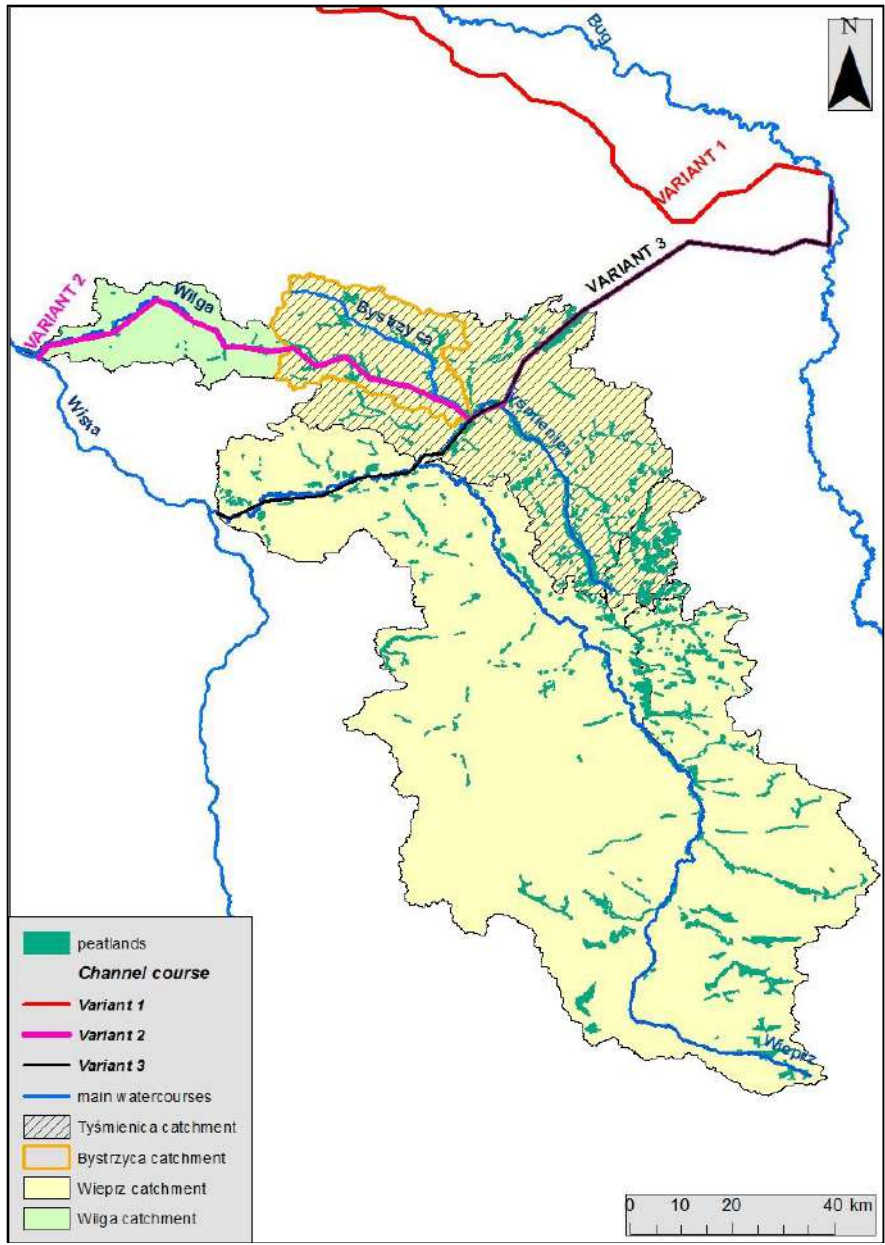


Figure 27: Peatlands in the catchments of Tysmienica, Bystrzyca, Wieprz and Wilga.^{xcvii}

6.3 Ukraine

Overview of international sites

Table 42: Overview of international sites in Ukraine with impacts.

	Direct impacts				Indirect impacts				Total impacts			
	Whole E40 waterway		Polesia		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
<i>Emerald</i>	17	12227	4	4049	2	819	2	819	19	13046	6	4868
<i>Ramsar</i>	3	359			1	127	1	127	4	486	1	127
<i>IBA</i>	11	2547	1	1024	7	757	1	127	18	3304	2	1151
<i>UNESCO-MAB (Transboundary)</i>					2	1450	1	751**	2	1450	1	751
Total (after removal of overlaps)	31	12,922 km²	5	4,100 km² *	12	2,754 km²	5	1,778 km² *	43	15,676 km²	10	5,878 km² *

* after removal of overlaps between different international designations and including only the area of individual sites within our Polesia – some sites straggle the boundaries.

** area of site in Ukraine.

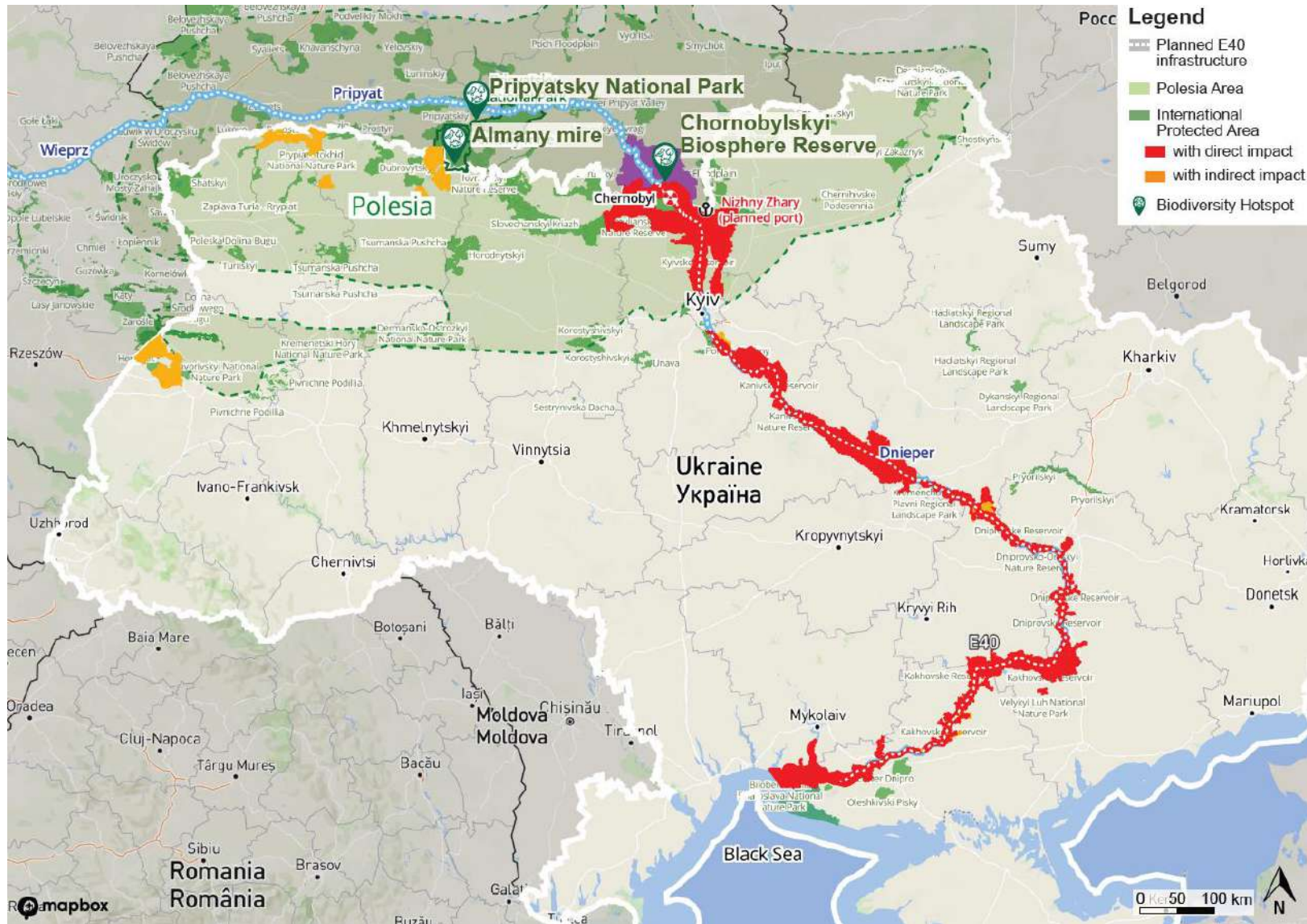


Figure 28: Internationally protected sites in Ukraine directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Table 43: Details of international sites in Ukraine with impacts.

International site type	Name	Direct impact	Indirect impacts	Polesia
Emerald*	Chornobylskiy Biosphere Reserve	x		x
	Dniprodzerzhynske Reservoir	x		
	Dniprovske Reservoir	x		
	Dniprovske-Buzkyi Lyman	x		
	Dniprovske-Orilskiy Nature Reserve	x		
	Kakhovske Reservoir	x		
	Kanivske Reservoir	x		
	Kremenchutske Reservoir	x		
	Kremenchutski Plavni Regional Landscape Park	x		
	Kyivske Podesennia	x		x
	Kyivske Reservoir	x		x
	Lower Dnipro	x		
	Mizhrichynskiy Regional Landscape Park	x		x
	Nyzhnovorsklianskyi Regional Landscape Park	x		
	Velykyi Luh National Nature Park	x		
	Biloberezhzhia Sviatoslava National Nature Park	x		
	Kanivskiy Nature Reserve	x		
	Rivnenskyi Nature Reserve		x	x
Prypiat-Stokhid National Nature Park		x	x	
Ramsar	Archipelago Velyki and Mali Kuchugury	x		
	Dnipro River Delta	x		
	Sim Maiakiv Floodplain	x		
	Perebrody Peatlands**		x	x
IBA	Dnipro delta	x		
	Kakhovs'ke reservoir (Energodar)	x		
	Kakhovs'ke reservoir (Vasylivka village)	x		
	Kanivs'ke reservoir	x		
	Kanivs'kyi Nature Reserve	x		
	Konka River Mouth	x		
	Kyivs'ke reservoir	x		x
	Lypivs'kyj protected locality	x		
	Rzhyschivs'ke Game Reserve	x		
	Velyka Osokorovka	x		
	Kinburns'kyj peninsula	x		
	Syra Pogonya mire		x	x
	Meadows near Prodiv village		x	
	Dniprodzerzhyns'ke reservoir		x	
	Mishuryn Rig		x	
Kakhovs'ke reservoir (Knyazhe-Grigorivka village)		x		

	Kakhovs'ke reservoir (Kajiry village)		x	
	Kakhovs'ke reservoir (Kozats'ki islands)		x	
UNESCO-MAB	Roztocze Transboundary Biosphere Reserve		x	
	Western-Polesie		x	x

*Additional potential Emerald sites have been proposed in Ukraine – see - <https://emerald.eea.europa.eu/#>. Although further analysis is needed, it seems that at least two of these could be impacted by the planned E40 inland waterway.

**Part of the Almany – Perebrody Mires Transboundary Ramsar Site established in 2015.

Overview of national sites

Table 44: Overview of national sites in Ukraine with impacts.

	Direct impacts				Indirect impacts				Total impacts			
	Whole E40 waterway		Polesia		Whole E40 waterway		Polesia		Whole E40 waterway		Polesia	
	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)	No of sites	Area (km ²)
Strict Nature Reserves (Zapovidnyk)	2	66	0		1	518	1	518	3	584	1	518
Biosphere (Radioecological) Reserve	1	2,270	1	2,270					1	2,270	1	2,270
Nature reserve (Zakaznyk) of national importance	7	107	0		1	165	1	165	8	272	1	165
Nature reserve (Zakaznyk) of local importance	5	11	0						5	11		
Nature Monument of national importance	1	0.21	0						1	0.21		
Total	16	4,454	1	2,270	2	683	2	683	18	3,137	3	2,953

Information about national sites with serious impacts is given below. Information about all sites likely to be impacted is included in Appendix 3.

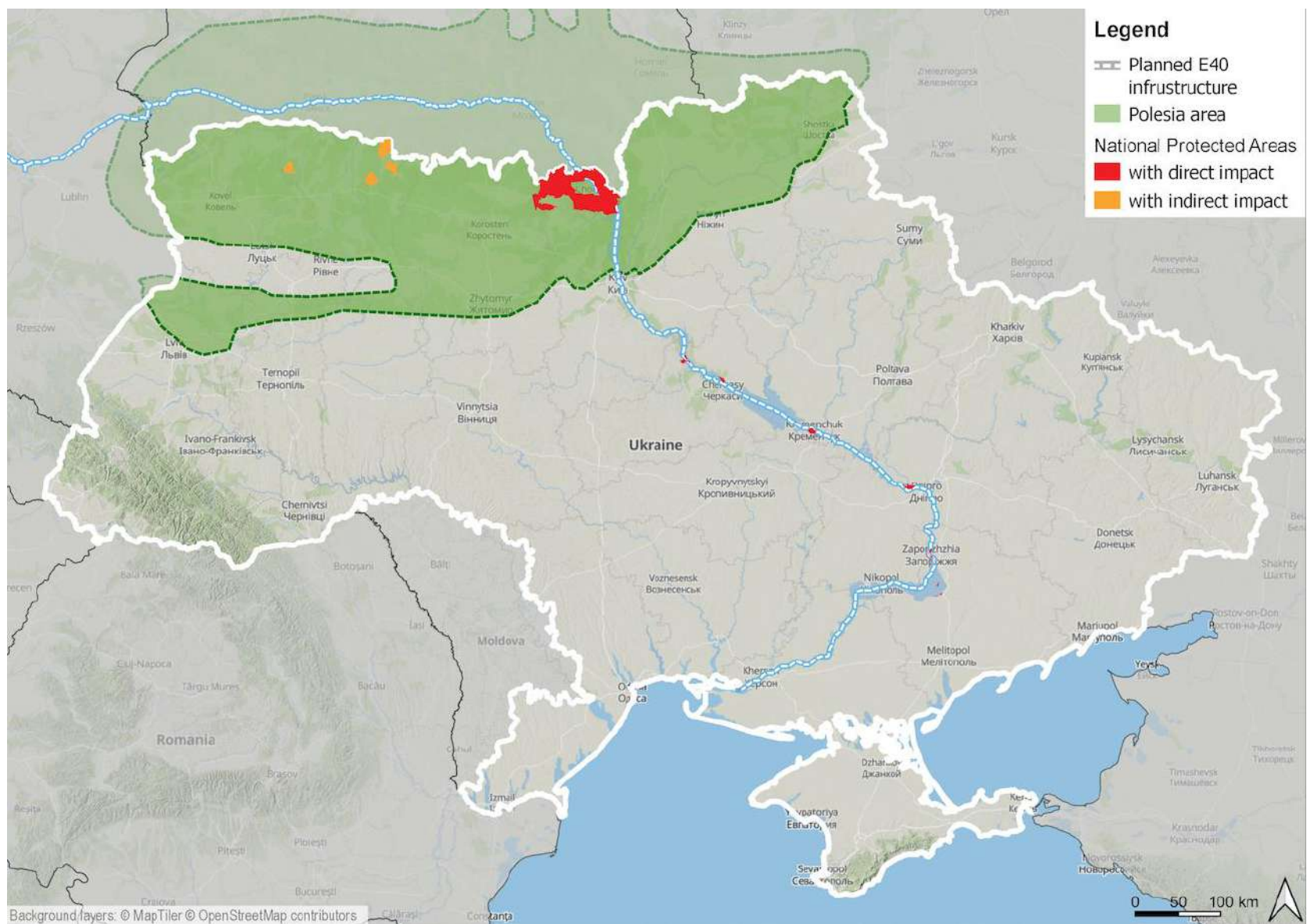


Figure 29: National protected areas in Ukraine directly (red) and indirectly (orange) impacted if the E40 waterway is built.

Information about these sites is summarized below.

Table 45: Details of national sites in Ukraine likely to have serious impacts.

National site type	Name	Direct impact	Indirect impacts	Polesia
Strict Nature Reserve (Nature Zapovednyk)	Dneprovsko-Orel'skiy	x		
	Kanevskiy	x		
Biosphere (Radiological) Reserve	Chornobyl Radiation and Ecological Biosphere Reserve	x		x
Nature reserve (Zakaznyk) of national importance	Tarasiv obriy	x		
	Velika Zapadnya	x		
	Veliki ta Mali Kuchuguri	x		
	Perebrodivs'kiy		x	x
Nature reserve (Zakaznyk) of local importance	Kam'yans'kiy lisoviy masiv	x		
	Lisoviy masiv	x		
	Lisoviy masiv vzdovzh livogo berega richki Dnipro	x		
	Ostriv Tavolzhnanin	x		
	Zaplava r. Bazavluk	x		
Nature Monument of national importance	Balka Rossokovata	x		

National Nature Park Pripjat-Stokhid – indirect hydrology impacts

Pripjat-Stokhid park is Polesia's largest protected area. It is one of the most unique natural complexes in Europe and a wetland of international importance, providing a home to a myriad of species. It is located in the valleys of the rivers Pripjat and Stokhid which have numerous tributaries and islands. In the west the park begins from the confluence of Turia river to the Pripjat and stretches along the riverbed and floodplain to the eastern borderline of Volyn region with Rivne region and Belarus. In the far east, the park includes the tributary of Pripjat Stokhid river. There are two large lakes: Bile and Lyubyazh (at the confluence of Korostyanka river with the Pripjat).



Figure 30: National Nature Park Pripjat-Stokhid boundaries.

The main part of the park is a complex of Pripjat Valley that consists of swampy floodplains, lakes, marshes, small grasslands. Marshes occupy 43 percent of the park, and including about 60 percent shrubs that grow mainly in the marshes. About 35 percent of the area is covered by forests/woodlands. The rivers occupy a relatively small area (over 5 percent), but they are a major component the entire complex of the park’s ecosystems. Other water bodies, including the lakes also cover more than five percent of the park.



Figure 31: Aerial photo of the river Pripjat in the Pripjat-Stokhid National Nature Park in Ukrainian Polesia © Daniel Rosengren / FZS.

The park has rich vegetation. There are 39 rare plant species (two of them are on the European Red List and four on Annex 1 of the Bern Convention). A diverse range of forest, grassland, pasture, marsh, and wetland provides habitat for a great variety of species. This includes 17 species listed on the IUCN Red List, 13 species on the European Red List, 181 species on Annex 2 of the Bern Convention and 139 Bonn Convention species.

The park is located on the flyway and is a place of seasonal migration of birds (120 000-150 000 birds). During migrations thousands of migratory waterbirds (ducks, waders, rails, terns) are observed as well as forest species (mostly passerines). In addition, the protected area is the only nesting place of the Azure Tit (*Parus cyanus*) in Ukraine. The largest population in Ukraine of globally threatened species Aquatic Warbler (*Acrocephalus paludicola*) (2100-2800 singing males) is found in sedge marshes of the park. Other rare species include nesting Black Stork (*Ciconia nigra*), Crane (*Grus grus*), Lesser Spotted Eagle (*Aquila pomarina*), Curlew (*Numenius arquata*), Snipe (*Gallinago media*), Corncrake (*Crex crex*), Hazel Grouse (*Tetrastes bonasia*), Capercaillie (*Tetrao urogallus*), Eagle Owl (*Bubo bubo*), Green Woodpecker (*Picus viridis*), Stock Dove (*Columba oenas*) and Roller (*Coracias garrulous*).

Among the rare mammals are Grey Wolf (*Canis lupus*), Weasel (*Mustela erminea*), Otter (*Lutra lutra*), Eurasian Lynx (*Lynx lynx*), European polecat (*Mustela putorius*). One bat species is listed in the European Bat Agreement.

As well as protection as a National Nature Park (total size of 39 315.5 ha) parts of the area are included in the Ramsar sites "Pripjat River Floodplains"^{xcviii} and "Stokhid River Floodplains"^{xcix}. Together with Prostyr Ramsar site in Belarus these sites constitute one of

the largest complexes of floodplain meadows and mires in Europe – the transboundary Ramsar site “Pripyat-Stokhid-Prostyr”.

The Wild Polesia project was in the process of supporting the development of a Management Plan for the Pripyat-Stokhid National Nature Park and the potential expansion of the site when Russia invaded. As noted above, the Wild Polesia project is currently being reviewed to determine which activities are possible in the current context.

The park is already suffering water quantity and quality impacts from regulation of its rivers and reduced water volumes from water abstraction including for the needs of the existing Dnieper-Bug shipping canal. Flow in rivers is reduced, aquatic vegetation in rivers and creeks is overgrown leading to a loss of biodiversity. This is a transboundary problem due to the location of the park.

According to the 2015 Feasibility Study of the E40 waterway, construction will require significant engineering work. In Belarus, this will include straightening strongly meandering sections of the Pripyat River extensive dredging and construction of 5-6 dams. These works will also affect protected areas on the adjacent Ukrainian side. Water abstraction from the Pripyat will be needed to fill the deeper channel and enable navigability for larger vessels. The impacts this could have on the Pripyat-Stokhid Park and wider Ukrainian Polesia are extremely concerning, especially in the context of existing water pressures and droughts in Ukraine.

In a recent interview Vitaliy Veremchuk^c, head of the kayak-canoe club “Crazy oars” in Lyubeshiv district, Volyn expressed the concerns of local communities. Explaining that in low-water years they have already seen that in the National Park Pripyat-Stokhid there is not enough water in the rivers and lakes due to water abstraction from the Vyzhiv water intake to feed the Dnieper-Bug canal. When abstraction levels were high the drastic consequences were clearly visible: the Pripyat river disappeared from Nevir village. The low water levels damaged not only the natural ecosystems and dependent wildlife, but also fisheries and tourism with kayaks scraping the bottom and recovery was slow.



Figure 32: Kayakers on the river Pripyat in Belarusian Polesia © Daniel Rosengren / FZS.

Tourism is now developing and in a few years Pripyat-Stokhid National Park could be a real Mecca for kayakers and for people wanting to learn about wildlife and swim in the clear waters of Pripyat and Stokhid. But this could be jeopardized by E40 waterway. People are extremely worried about the impacts the additional water abstraction needed for E40 waterway will cause and believe this needs to be studied in great detail.

These concerns about the hydrological impacts of E40 waterway are shared by experts, including Eugene Yakovlev Leading hydrologist, author and Chief Researcher of the Department of Natural Resources of the Institute of Telecommunications and Global Information Space of the National Academy of Science of Ukraine who believes “Polesia will simply dry up due to the reduction of accumulation and retention of groundwater and, accordingly, will not be able to feed the tops of rivers, including the tributary of the Dnieper from which half of Ukraine drinks water.”^{ci}

Chornobyl Radiation and Ecological Biosphere Reserve – direct impacts

Chornobyl Biosphere Reserve is located in the Dnieper river basin and includes a large part of the exclusion zone created after the Chornobyl accident. Almost half of the area (45 percent) is covered by forests, with pine and secondary birch forests dominating. Hornbeam-oak and ash-hornbeam-oak forests with middle-aged (60-80 years) and mature forests (100-110 years) occur in old-lake depressions of the Korogodsky landscape, where they cover five-six percent of the area. There are many grasslands including neglected fields, wet grasslands and water-logged meadows in the floodplains. There are various different marshes and grass and grass-moss heathlands on the sand dunes of upland terraces of the rivers Pripyat and Uzh. Juniper heathlands occur on the lower slopes as well as terraces of coniferous forests.

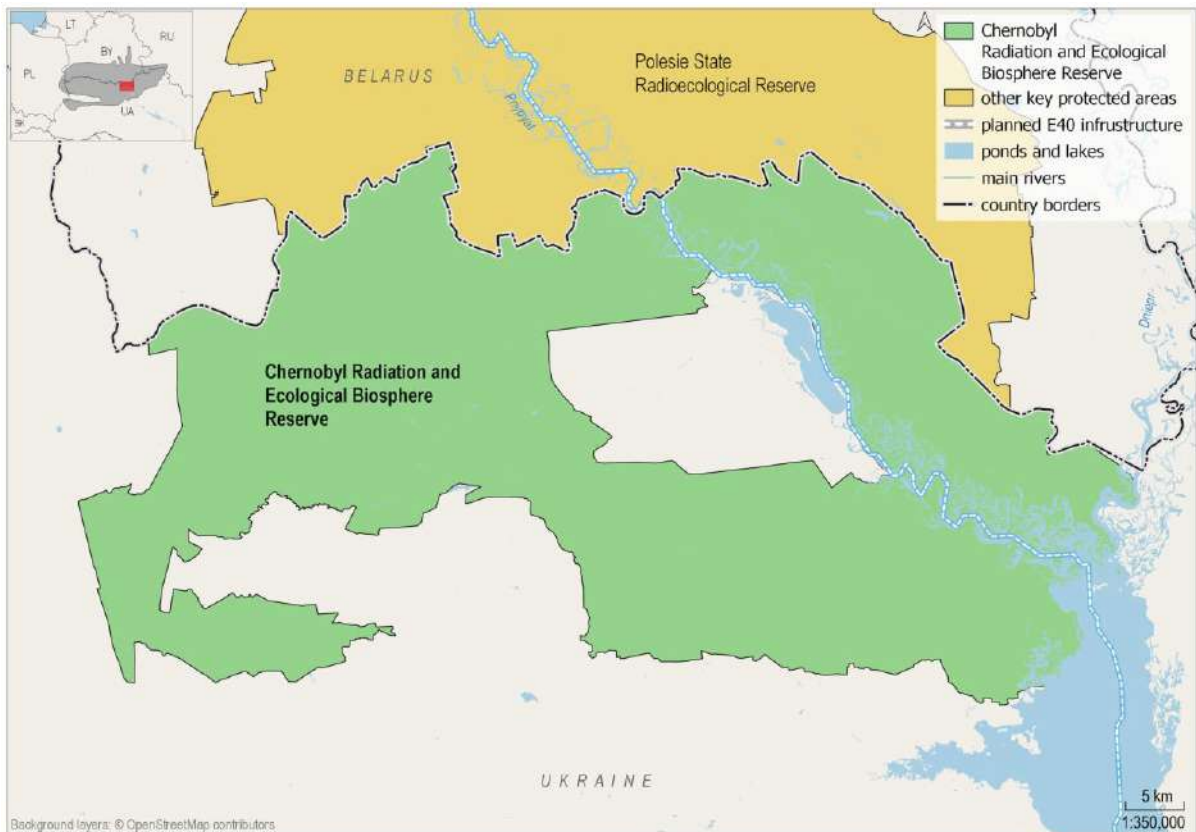


Figure 33: Chernobyl Radiation and Ecological Biosphere Reserve boundaries.

The reserve has very rich diversity, including 19 different habitat types. Over 1,200 species of vascular plants have been identified and described. At least four species of mosses, four species of higher fungi, and about 20 species of vascular plants found here are listed in the Red Data Book of Ukraine. Wildlife has not been well studied in recent years, but current data suggest there are about 394 vertebrate species, including 62 species of fish, eleven of amphibians, seven of reptiles, 245 of birds (200 nesting, 60 wintering) and 69 of mammals.

Ungulates (Red deer (*Cervus elaphus*), Roe deer (*Capreolus capreolus*), Elk (*Alces alces*), Wild boar (*Sus scrofa*)) and predators are numerous. A very rich group of birds is represented by wetland, forest, and farmland species. The area is not only nesting and roosting ground, but also stop-over for migrating species as the Dnipro flyway crosses the area.

There are many rare species including:

- Mammals: Eurasian Lynx (*Lynx lynx*), Otter (*Lutra lutra*), Weasel (*Mustela erminea*), Badger (*Meles meles*), Grey Wolf (*Canis lupus*), Brown Bear (*Ursus arctos*);
- Birds: Black stork (*Ciconia nigra*), Crane (*Grus grus*), White-tailed Eagle (*Haliaeetus albicilla*), Lesser Spotted Eagle (*Aquila pomarina*), Black Grouse (*Lyrurus tetrix*), Hazel Grouse (*Tetrastes bonasia*), Green Woodpecker (*Picus viridis*), Stock Dove (*Columba oenas*), Roller (*Coracias garrulous*).

The area was originally heavily modified by human activity. But now in most parts of the Chernobyl Exclusion Zone (CEZ) the limited management and almost complete absence of people is helping rich nature systems to recover.

Some of the main drainage canals (especially on the left bank of Pripjat river) are maintained in working condition. The level of groundwater in the central sites of the CEZ is regulated and large flood protection dams were constructed along the main river channel after the accident to prevent water contamination. In recent years decommissioning of the artificial cooling pond (drainage to the natural level) has been underway. There have been a number of large fires in forest areas and fire-prevention measures are taken. Visits to the area are restricted.

According to the 2015 information^{cii} extensive dredging of the Pripjat will be needed to reach the required depths for vessels including in the CEZ. Moreover, a dam is proposed within the CEZ just upstream of Pripjat city. Given the radiation contamination in the CEZ there are understandably serious concerns about the potential impacts of E40 waterway, including from local experts such as Sergei Kireev, Director General of SSE “Ecocenter”. At a meeting in March 2021 he highlighted that the floodplain of the Pripjat river is one of the most polluted areas and that today, the leaching of radioactive elements from the river floodplain is only prevented due to water protection complexes created shortly after the Chornobyl accident. He raised concerns that no information about how construction of E40 waterway may affect the existing water protection structures has been provided, which justifies and even enhances public concerns^{ciii}.

Despite these concerns worryingly initial dredging took place in the CEZ in 2020 without prior environmental assessment^{civ}. Recently the Ukrainian cabinet amended the official list of navigable waterways to include future E40 waterway on the Ukrainian Pripjat, including in the CEZ^{cv}.

The inclusion of the Pripjat River part near its estuary to this list has led to a revision of the zoning plan of the Chornobyl Biosphere Radiation and Ecological Reserve and the removal of this part of Pripjat River from the list of areas with high conservation status. According to the developed new zoning, the riverbed of the Pripjat in the southern part of the Reserve will belong to the zone of anthropogenic landscapes, and its channel in the northern part – to the buffer zone^{cvi}.

7. Key habitats and species

Habitats

The rivers impacted by the planned E40 waterway route form various freshwater habitat types along their banks and beyond. Freshwater habitats of Polesia include open water, grassland, forest and mire habitats.



Figure 34: The meandering Pripjat river of Polesia provides a diverse range of habitats © Viktor Malyschchyt's.

More than a third of the world's wetlands have been lost since the 1970s, at a faster rate than for any other major ecosystem^{cvi}. And according to the European Red List of Habitats^{cvi}, 46 percent of freshwater habitats are threatened. This is an alarming number, but the situation of habitats like the mires and bogs which are present along the Pripjat river (and its tributaries) is even more shocking: 85 percent of them are threatened in Europe.

Hardwood floodplain forests are high biodiversity riparian forests located typically in the middle course of larger rivers. Most of these forests disappeared in Europe or were turned into plantations. Forests which still exist along the planned E40 inland waterway, are not only important from a biodiversity perspective, but they also serve as an important function of flood control. A naturally vegetated floodplain reduces the force, height and volume of floodwaters by allowing them to spread out horizontally, causing relatively reduced damage across the floodplain^{cix}.

Transition mires and quaking bogs, like the Almany transition mire in Belarus, present a large and diverse range of plant communities. Mires and bogs are important because of their unique biodiversity and the various regulatory services they provide. One of the most

critical services is linked to the mitigation of climate change. Mires act as sinks of atmospheric carbon dioxide and peatlands constitute large reservoirs of carbon and nitrogen. Drained peatlands emit carbon dioxide. Because of their extent and the large volumes of carbon stored in their peat, mires and peatlands play a major role in the global carbon balance. Peatlands cover only 3 percent of the earth's land, but store more carbon than the global forest biomass. The past drainage of peatlands is responsible for 5 percent of the global CO₂ emissions^{cx}. Thus, protecting such sites of Polesia and along the planned E40 waterway route is key.

Covering 1000 km², the Almany Mire in Belarus is the largest transition mire in Europe. The planned E40 inland waterway endangers not only the mire's carbon stock, but also its Greater Spotted Eagle (*Clanga clanga*) population (IUCN Red List category: endangered for Europe, and vulnerable globally)^{cxii}, which is extremely sensitive to human disturbance. Belarus is one of the few countries where this globally vulnerable species can still be found and the country's largest population (18-20 pairs) is found right here.

Species richness

Wetlands cover just 7 percent of the planet but are home to 40% of the world's biodiversity^{cxii}. As a large wetland, Polesia hosts a massive diversity of insects, amphibians, fish, birds, mammals, and plants, many rare and/or threatened. The riverine habitats harbour iconic mammals like Eurasian Lynx (*Lynx lynx*), European Bison (*Bison bonasus*), Brown Bear (*Ursus arctos*), Grey Wolf (*Canis lupus*) and birds such as waders.



Figure 35: Polesia hosts more than 60 percent of the world's population of the Aquatic Warbler, Europe's rarest migratory songbird © Daniel Rosengren / FZS.

Polesia is particularly important for Aquatic Warbler (*Acrocephalus paludicola*), Europe's rarest migratory songbird. Aquatic Warbler is globally threatened and their population is

decreasing. Once common in fen mires and wet meadows throughout Europe, the Aquatic Warbler has disappeared from most of its former range. Today, its global population is confined to breeding sites in only five countries. Polesia is one of the key areas crucial for its survival. It hosts more than 60 percent of the world’s population of Aquatic Warblers and is an essential breeding ground for the species. In winter months, Aquatic Warblers migrate to their winter home in West Africa.

Greater Spotted Eagle (*Aquila pomarina*) is vulnerable to extinction, primarily due to habitat degradation and loss. Polesia is a key breeding ground for the majestic birds. Every year, 80-90 percent of the Belarusian population (120-150 pairs) breed here. In winter, Greater Spotted Eagles fly south to countries such as Greece, Turkey, Egypt, South Sudan and Ethiopia.

Polesia’s flood meadows are of global significance for bird species. The Pripyat floodplain alone is a key destination for more than 1.5 million migratory birds annually. Here, the birds nest, rest, and gather strength on their long journeys. Spring numbers of at least 150,000-200,000 Eurasian Wigeon (*Mareca penelope*), 200,000-400,000 Ruff (*Calidris pugnax*) and 20,000-25,000 Black-tailed Godwit (*Limosa limosa*) have been recorded in the Pripyat floodplains. Collectively, they form the largest gathering in Central and Eastern Europe. Hence, as well as impacting habitat available for the birds, E40 waterway would negatively affect their migration.

The Giant Noctule Bat (*Nyctalus lasiopterus*), Europe’s largest bat, with a wingspan of up to 46 cm is vulnerable to extinction. Despite there being no sightings in Belarus for more than 80 years, in 2016 scientists were stunned to rediscover the presence of Giant Noctule Bats in a remote part of Belarusian Polesia. Undisturbed natural forests are essential to their survival and their presence in Polesia is an indicator of how important the region’s wild landscapes are to wildlife.

The Waterwheel Plant (*Aldrovanda vesiculosa*) is carnivorous. It grows snapping traps underwater to hunt small insects, fish and tadpoles. Around two thirds of all Waterwheel Plants can be found in the exclusion zone surrounding the Chernobyl nuclear accident site. The populations of this endangered plant have been decimated globally by habitat loss.

Table 46: Key IUCN Global Red List species found in Polesia.

Red List category	Species
Endangered	Waterwheel Plant (<i>Aldrovanda vesiculosa</i>) ^{cxiii}
	Polish Scurvy-Grass <i>Cochlearia polonica</i> ^{cxiv}
	<i>Physcomitrium arenicola</i> (a moss) ^{cxv}
Vulnerable	Aquatic Warbler (<i>Acrocephalus paludicola</i>) ^{cxvi}
	Greater Spotted Eagle (<i>Aquila pomarina</i>) ^{cxvii}
	Giant Noctule (<i>Nyctalus lasiopterus</i>) ^{cxviii}
	Sterlet (<i>Acipenser ruthenus</i>) ^{cxix}
Near threatened	European Pond Turtle (<i>Emys Orbicularis</i>) ^{cxx}

Wild Polesia project

To enhance knowledge of the habitats and species of Polesia, the Wild Polesia project has been collecting new data on rare and threatened habitats and species – mainly on birds, bats and insects. It is also monitoring species like Elk (*Cervus canadensis*), Grey Wolf (*Canis lupus*), and Eurasian Lynx (*Lynx lynx*) that migrate through the vast lands of Polesia.

8. Biodiversity policy context

Belarus, Poland and Ukraine have all entered into the Convention on Biological Diversity (CBD), Ramsar and Bern Conventions. In addition, Poland has legal obligations under the EU Birds and Habitats Directives (the EU Nature Directives) and is also committed to the EU Biodiversity Strategy.

Protected areas are recognized as a key delivery mechanism for these conventions. All three countries are parties of the CBD and therefore made concrete commitment to conserve biological diversity and contribute to the targets for protected areas. Aichi Target 11, which aims at protecting 17 percent of the terrestrial area globally, requires the areas to be effectively managed for biodiversity. This target may be increased to 30 percent.

The Bern Convention requires the conservation of biodiversity features in the Emerald sites, including through addressing activities adjacent to the sites. The Bern Convention has a system of case files, through which the Standing Committee can address specific breaches of the Convention. Similarly, the Ramsar Convention maintains the Montreux Record to highlight Ramsar sites of which the ecological character is degraded.

The EU Nature Directives are legally binding for Poland and the other EU Member States. These laws prohibit the implementation of plans and projects which are negatively affecting Natura 2000 sites for which satisfactory alternatives exist. The European Commission can open infringement procedures against EU Member States that allow plans and projects that contravene the EU Nature Directives or that fail to act to protect the sites. The Court of Justice of the EU can order EU Member States to halt such plans and projects and to remedy their negative effects. Ultimately, if EU Member States fail to act, the Court of Justice can impose large financial penalties.

Only 40 percent of Europe's surface waters (rivers, lakes and transitional and coastal waters) are in good ecological status or potential^{cxxi}. The EU Biodiversity Strategy for 2030 calls for greater efforts to restore freshwater ecosystems and the natural functioning of rivers including restoration of at least 25,000 km of free-flowing rivers by 2030. The European Commission plans technical guidance and support for rivers taking a wide range of issues into account including hydropower generation, flood management, water supply, agriculture and navigability.

In addition, a key element of the Biodiversity Strategy is a proposal for legally binding EU nature restoration targets. Currently under discussion, the main objective of the initiative is to restore degraded ecosystems, in particular those with the most potential to:

- capture and store carbon
- prevent and reduce the impact of natural disasters
- deliver further benefits, such as soil health and pollination
- improve knowledge and monitoring of ecosystems and their services^{cxxii}.

More broadly – in response to the threats from climate change and environmental degradation – the European Green Deal aims to transform the EU into a modern, resource-efficient and competitive economy. Nature-based solutions^{cxxiii}, such as large-scale river and floodplain restoration investments should play a key role providing an economic boost to the restoration sector and local socioeconomic activities such as tourism and recreation. At the same time, improving water regulation, flood protection, nursery habitats for fish, and the removal of nutrient pollution^{cxxiv}.

The recent IPCC report^{cxxv} emphasises the interdependence of climate, ecosystems and biodiversity, and human societies. Key headlines are that human-induced climate change, has caused widespread adverse impacts and related losses and damages to nature and people. A high proportion of species is vulnerable to climate change. Current unsustainable development patterns are increasing exposure of ecosystems and people to climate hazards. Safeguarding biodiversity and ecosystems is fundamental to climate resilient development. Recent analyses suggest that maintaining the resilience of biodiversity and ecosystem services at a global scale depends on effective and equitable conservation of approximately 30% to 50% of Earth's land, freshwater and ocean areas, including currently near-natural ecosystems.

Plans for the E40 inland waterway are in direct conflict with the aspirations of these international instruments. The biodiversity impacts of E40 waterway are not acceptable, and our analysis makes it clear the E40 inland waterway project should be abandoned on biodiversity grounds alone.

9. Conclusions

- In 2013 Governments of Belarus, Poland, and Ukraine began to develop the idea of one of Europe's longest inland waterways – the so-called E40 waterway. The 2,000 km-long navigable shipping channel would connect the Black Sea and the Baltic, stretching from Gdańsk in Poland to Kherson in Ukraine. It would cut through the heart of Polesia, the largest wetland wilderness of the European continent. Constructing this massive infrastructure project would require dredging, damming, straightening, and deepening of natural rivers including the Pripyat and the Vistula.
- The E40 waterway would have a range of impacts on people and the environment, including on protected areas (PAs) of international importance. The extent of the threat has led to experts recognising the E40 waterway as one of the top emerging issues of concern for global biodiversity conservation.
- This report reveals the protected areas which are likely to be impacted by the proposed E40 waterway. The analysis looks at both, protected areas directly on the E40 waterway route (including those which would be bisected by the E40) as well as those likely to be subject to indirect impacts especially from changes in hydrology.
- Moreover, the analysis considers potential impacts on internationally protected areas (Natura 2000, Emerald, Ramsar, IBAs, UNESCO-MAB and HELCOM) and nationally protected areas and identifies key biodiversity hotspots which would be impacted.
- The analysis was carried out in two phases: phase one involved the analysis of publicly available GIS data for protected areas; phase two included the verification of the GIS outputs by Save Polesia partners based on local information and expert knowledge.
- The overall aim of the analysis is to highlight the high number of protected biodiversity areas likely to be impacted by the planned E40 waterway and hence the urgent need for further assessment of this issue before implementation of the project can be considered.

Key findings:

Impacts on international PAs protected by designations under international policy and legislation:

- 73 international PAs with a total area of 20,058 km² (larger than the size of Slovakia) would be impacted directly by E40 waterway: 24 sites in Poland (total area 2,065 km²), 18 in Belarus (total area 5,071 km²) and 31 in Ukraine (total area 12,922 km²); 25 of the 73 sites (a total area of 9,432 km²) are in Polesia.
- 120 international PAs, with a total area of 13,270 km² are very likely to be impacted indirectly by E40 waterway: 62 sites in Poland, 46 in Belarus, ten in Ukraine plus two transboundary sites (one between Poland, Belarus and Ukraine, the other between Poland and Ukraine). The total areas of sites impacted in each country (including the national components of the transboundary sites) are: Poland 4,972 km²; Belarus 5,544 km²; and Ukraine 2,754 km². 59 of the 120 sites (a total area 7,255 km²) are in Polesia.
- In total **193 international PAs would be impacted** (directly and indirectly) by E40 waterway (84 of these are in Polesia); 86 sites in Poland (10 in Polesia), 64 in Belarus (all in Polesia) and 41 in Ukraine (nine in Polesia), plus the two transboundary sites (one between Poland, Belarus and Ukraine, the other between Poland and Ukraine). A total

area of 33,328 km² (larger than the size of Austria) of which 16,687 km² is in Polesia (9 percent of the total area of Polesia)

Types of international PAs impacted:

- 66 **Natura 2000 sites** would be impacted in Poland – a total area of 5,182 km², almost 8.5 percent of the Polish Natura 2000 network area; 14 of these sites (one of which is in Polish Polesia) would be impacted directly (nine with serious impacts as they are river valley sites that would be bisected). The other 52 sites (five in Polish Polesia) would have indirect impacts.
- 52 **Emerald sites** would be impacted (39 in Polesia), a total of 24,098 km², an area almost the size of North Macedonia and 3.5 percent of the total area of Emerald sites in Belarus and Ukraine. 26 of these sites would be impacted directly, (13 of these sites are in Polesia of which nine sites in Belarus would have serious impacts). 26 sites (all in Polesia) would have indirect impacts (six of these sites would have serious impacts).
- 16 **Ramsar sites** would be impacted a total area of 4,570 km², more than 26 percent of the total area of Ramsar sites in Poland, Belarus and Ukraine. Eleven of these sites, 4,194 km² are in Polesia. Seven sites would have direct impacts (three of these in Belarusian Polesia would have serious impacts). A further nine sites (all in Polesia) would have indirect impacts (two of the sites in Belarus would have serious impacts).
- 55 **IBAs** would be impacted, a total of 16,858 km², an area larger than Montenegro and 16 percent of the total area of IBAs in Poland, Belarus and Ukraine. 26 of these sites, 10,845 km² are in Polesia. 24 sites would have direct impacts (eight of these are in Polesia and nine (three in Poland and six in Belarusian Polesia) would have serious impacts. A further 31 sites (18 in Polesia) would have indirect impacts (four of the sites in Belarus would have serious impacts).
- Two **transboundary UNESCO-MAB sites** (one in Polesia – West Polesia Biosphere Reserve, a transboundary site between Belarus, Poland and Ukraine) would have indirect impacts, a total area of 6,670 km².
- Two **Baltic Sea (HELCOM) sites** in Poland would be directly impacted, a total area of 641 km².
- At least 43 international PAs would have serious impacts, a total area of 17,064 km². 31 sites in Belarus (15 Emerald sites, five Ramsar sites, ten IBAs and the Belarus section of the West Polesia Biosphere Reserve) and 13 in Poland (two SPAs, seven SACs, one Ramsar site and three IBAs).

Impacts on national PAs:

- 54 national PAs (sites protected by designations under national policy and legislation) **impacted directly** by E40 waterway (nine of these are in Polesia); 30 sites in Poland, eight in Belarus and 16 in Ukraine, a total area of 14,130 km²
- 85 national PAs are very likely to have **indirect impacts**, an area of 8,120 km²: 38 of these sites are in Polesia (5,892 km²); 52 are in Poland (six in Polesia), 31 in Belarus (30 in Polesia and six of which would have serious impacts) & two in Ukraine (both in Polesia).
- In total **139 national PAs would be impacted** (directly and indirectly) by E40 waterway (47 of these are in Polesia); 82 sites in Poland (six in Polesia), 39 in Belarus (38 in Polesia) and 18 in Ukraine (three in Polesia). A total area of 22,250 km² of which 12,423 km² is in Polesia (almost 7 percent of the total area of Polesia).

Biodiversity and habitats:

- **Key biodiversity hotspots** impacted include
 - Prip'yatsky National Park and Almany Mire in Belarus,
 - Ten Natura 2000 sites (SACs and SPAs) in Lower and Middle Vistula Valley, Dolny Wieprz Natura 2000 (SAC, IBA and candidate SPA) and peatland in the Tyśmienica, Bystrzyca, and Wieprz River catchments in Poland,
 - and National Nature Park Prip'yat-Stokhid and Chornobyl Radiation and Ecological Biosphere Reserve in Ukraine.
- **Species** that would be impacted in Polesia include the threatened Aquatic Warbler, Greater Spotted Eagle, Giant Noctule Bat and the carnivorous Waterwheel Plant. In the Vistula Valley many bird and aquatic species would be impacted including Sandwich Tern, Little Tern, Common Ringed Plover, Oystercatcher, Common Shelduck, Atlantic Salmon and European Eel.
- Iconic mammals like Brown Bear, Grey Wolf, Elk and Eurasian Lynx may have their habitats and migration pathways affected. And birds migrating through the Prip'yat floodplain (more than 1.5 million birds annually) may have their habitats and thus migration affected.
- **Key habitats** that would be impacted in Polesia are open water, grassland, forest and mire habitats. In particular floodplain hardwood or alluvial forests and transition mires and quaking bogs. All habitats that are highly threatened in Europe.

Hydrology:

- Our scoping exercise identified 407 internationally protected areas (Natura 2000, Emerald, Ramsar, UNESCO and Baltic Sea sites) in river basins through which the E40 waterway would pass which may have hydrological impacts. 118 of which are in Polesia) i.e. an additional 214 sites (35 in Polesia) on top of those we identified as very likely to have direct or indirect impacts which would need investigating further. These impacts could be more serious in light of climate change, and this will be an underestimate as the present scoping analysis did not look at IBAs due to limited capacity.

Overall conclusion:

- The implementation of the E40 waterway would lead to huge and unacceptable impacts on protected areas, habitats and species. Impacts that will be significant at European level and which will be completely at odds with the international and European biodiversity commitments that the three countries have entered into, including commitments under the Convention on Biological Diversity and Ramsar and Bern Conventions. In Poland, the E40 project is at odds with commitments under the EU Biodiversity Strategy.
- These biodiversity impacts are not acceptable. Our analysis makes it clear the E40 inland waterway project should be abandoned on biodiversity grounds alone.
- Until this happens it is not surprising that experts recognise E40 waterway as one of the top emerging issues of concern for global biodiversity conservation.

10. Glossary

2015 Feasibility Study	The Feasibility Study for the construction of the E40 waterway undertaken by a consortium led by the Maritime Institute of Gdańsk and published in 2015.
Bern Convention	The Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats (1979) - https://www.coe.int/en/web/bern-convention
BirdLife International	BirdLife International is a global partnership of environmental NGOs, national conservation organisations, all of whom share a common vision – to mobilise lasting, sustainable protection for the world's birds, their habitats, and global biodiversity in general - https://www.birdlife.org/
Birds Directive	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds - https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm
Bug River	The Bug or Western Bug is a major river (774 km long) that flows through Belarus , Poland , and Ukraine . A tributary of the Narew , the Bug forms part of the Belarus–Poland border and part of the Poland–Ukraine border . https://en.wikipedia.org/wiki/Bug_(river)#/media/File:Vistula_river_map.png
CBD	The Convention on Biological Diversity signed by 150 government leaders at the 1992 Rio Earth Summit - https://www.cbd.int/convention/
Dnieper River	The Dnieper or Dnipro is only of Europe's major rivers (2201 km long) arising in Russia and flowing through Belarus and Ukraine to the Black Sea - https://kids.britannica.com/students/assembly/view/143496
E40 waterway	The 2,000km-long navigable waterway would connect the Black Sea and the Baltic, stretching from Gdańsk in Poland to Kherson in Ukraine.
EU Biodiversity Strategy	The EU's biodiversity strategy for 2030 - a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems - https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en
FZS	Frankfurt Zoological Society is an international conservation organization founded in 1858 with headquarters in Frankfurt am Main, Germany. FZS conserves wildlife and ecosystems focusing on protected areas and outstanding wild places. - https://fzs.org/en/
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora - https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
HELCOM (Baltic Sea Protected Areas)	Coastal and marine Baltic Sea protected areas (HELCOM MPAs) protect valuable marine and coastal habitats in the Baltic Sea. There are currently 176 HELCOM MPAs each with a unique

	management plan - https://helcom.fi/action-areas/marine-protected-areas/
IBA	An Important Bird and Biodiversity Area is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations. IBA was developed and sites are identified by BirdLife International. There are over 13,000 IBAs worldwide - https://www.birdlife.org/projects/ibas-mapping-most-important-places/
International Sites	Protected Areas of international value identified and protected under international legislation including the Bern and Ramsar Conventions and the EU Nature Directives
Key Biodiversity hotspots	Key areas with high biodiversity (internationally protected sites) which would be impacted
National Sites	Protected Areas of national value identified and protected under national legislation
Natura 2000	The network of sites of European Importance designated under the Birds and Habitats Directives, which aims to ensure the long-term survival of Europe's most valuable and threatened species and habitats
Polesia	The vast landscape (186,000 km ²) rich with natural and cultural heritage straddling the borders of Poland, Belarus, Ukraine, and Russia. Known as Europe's Amazon it is the continent's greatest intact floodplain region with natural and wild rivers at its heart the Pripyat, one of Europe's most pristine rivers - https://savepolesia.org/polesia/
Pripyat River	The Pripyat or Prypiać is an Eastern European river (761 km long). It flows east through Ukraine, Belarus and Ukraine again draining into the Dnieper - https://upload.wikimedia.org/wikipedia/commons/7/77/Bo-map.png
Protected Areas	A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. Sites can be protected at national and/or international levels - https://www.iucn.org/theme/protected-areas/about
Ramsar Convention	The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat is an international treaty for the conservation and sustainable use of wetlands. It is named after the city of Ramsar in Iran, where the convention was signed in 1971 - https://www.ramsar.org/
Save Polesia Partnership	The international partnership of civil society organizations striving to protect Polesia - https://savepolesia.org/about-us/
Save Polesia	Partnership project which aims to raise awareness of the value of Polesia, protect it from damage by construction of E40 waterway and promote its sustainable development - https://savepolesia.org/
Sites with direct impacts	Sites directly on the E40 waterway route which are likely to a range of impacts including direct habitat or species loss, changes

	to habitat quality and species (e.g. due to changes in hydrology, morphology, pollution, introduction of invasive alien species).
Sites with indirect impacts	Sites not directly on the E40 waterway route, which would not suffer direct habitat or species loss, but may be subject to changes in habitat quality and species due to changes in hydrology or other natural processes, the effects of pollution, disturbance, introduction of exotic species, etc.
Sites with serious impacts	Sites where it is already evident (from the nature of protected area and the E40 waterway project) that impacts are likely to be very serious.
TEN-T	The Trans-European Transport Network (TEN-T) is the European Union's policy to develop a Europe-wide network of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railway terminals supported by innovation, new technologies and digital solutions - https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en . The current TEN-T Regulation dates from 2013. A revision is currently under discussion due to be adopted in 2023 - https://transport.ec.europa.eu/news/efficient-and-green-mobility-2021-12-14_en and https://transport.ec.europa.eu/news/commission-amends-ten-t-proposal-reflect-impacts-infrastructure-russias-war-aggression-against-2022-07-27_en
UNESCO-MAB Biosphere Reserves	The United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere (MAB) programme aims to establish a scientific basis for enhancing the relationship between people and their environments. The MAB programme includes the world network of Biosphere Reserves – currently 727 sites in 131 countries - https://en.unesco.org/biosphere/wnbr
UNESCO-World Heritage Sites	Sites of cultural and natural heritage around the world considered to be of outstanding value to humanity, identified, protected and preserved under the Convention concerning the Protection of the World Cultural and Natural Heritage , adopted by UNESCO in 1972 - https://whc.unesco.org/en/list/
Vistula River	The <i>Vistula</i> is the longest <i>river</i> in Poland (1,047 km long). It rises in the south of Poland and flows through Poland's largest cities including Warsaw and empties into Vistula Lagoon/the Baltic Sea at Gdansk Bay - https://en.wikipedia.org/wiki/Vistula#/media/File:Vistula_river_map.png
Wild Polesia	The partnership project of conservation organizations working to protect the unique natural landscape of Polesia - https://wildpolesia.org/

11. Appendices

Appendix 1 – Overview of national protected areas in Polesia

Table A1.1: Poland - National sites in Polesia

Type of site	National Parks	Landscape parks (parki krajobrazowe)	Protected Landscape Areas (obszar chronionego krajobrazu)	Nature Reserves (rezerваты przyrody)
Names of sites	Poleski Park Narodowy	Chełmski Park Krajobrazowy	Chełmski Obszar Chronionego Krajobrazu	Bagno Serebryskie
		Sobiborski Park Krajobrazowy	Poleski Obszar Chronionego Krajobrazu	Bachus Serniawy
		Poleski Park Krajobrazowy	Nadbużański Obszar Chronionego Krajobrazu	Brudzieniec
		Strzelecki Park Krajobrazowy	Grabowiecko-Strzelecki Obszar Chronionego Krajobrazu	Jezioro Orchowe
		Park Krajobrazowy Pojezierze Łęczyńskie		Jezioro Świerszczów
				Brzeźno
				Liski I
				Magazyn
				Małoziemce
				Podlaski Przełom Bugu
				Roskosz
				Siedliszcze
				Trzy Jeziora
				Wolwinów
			Żmudź	
			Żółwiowe Błota	
No. of sites	1	5	4	17

Table A1.2: Belarus - National sites in Polesia

Type of site	National Parks	Radiological Reserve	Nature Reserve (zakaznik) of National Importance	Nature Reserve (zakaznik) of Regional Importance
Names of sites	Belovezhskaya Pushcha National Park	Poleskiy Radioecological Reserve	Babinets	Borskiy
	Pripyatsky National Park		Buda-Koshelevskiy	Bukchanskiy
			Vygonoshchanskoe	Buslovka
			Vydritsa	Yelovskiy
			Dniepro-Sozhskiy	Kaskad Ozer
			Zvanets	Lukovo
			Luninskiy	Morochno
			Mazyrskija jary	Obidovichi
			Almany Mires	Oktiabrskiy
			Pribuzhskoe Polesie	Podvelikiy Moh
			Prostyr'	River Sozh Valley
			Ruzhanskaya Pushcha	Radostovskiy
			Smychok	Staritsa, Bykhovskoy
			Sporovskiy	Strel'skiy
		Srednia Pripiat'	Tyrvovichi	
		Sary Zhaden	Chyrkovichskiy	
No. of sites	2	1	16	16

Table A1.3: Ukraine - National sites in Polesia

Type of site	National Nature Parks	Strict Nature Reserves (zapovidnyk)	Regional Landscape Parks	Biosphere (Radiological) Reserve	Nature Reserve (zakaznyk) of National importance	Nature Sanctuary (zakaznyk) of Local Importance
Names of sites	Pripiat-Stohid National Nature Park	Poliskiy Nature Reserve	Mizhrichynskiy Regional landscape park	Chornobyl Radiation and Ecological Biosphere Reserve		
	Nobelskiy National Nature Park	Cheremskiy Nature Reserve	Pecherskiy Regional landscape park			
	Poyaskivskiy National Nature Park	Drevlyanskiy Nature Reserve	Nadsluchanskiy Regional landscape park			

	Shatskyi National Nature Park	Rivnenskyi Nature Reserve	Dniprovski Ostrovy Regional landscape park			
	Holosiivskyi National Nature Park		Seimskyi Regional landscape park			
	Mezynskyi National Nature Park					
	Desniansko-Starogutskyi National Nature Park					
	Zalissia National Nature Park					
	Golosiivskyi National Nature Park					
	Kremenetski Gory National Nature Park					
	Dermansko-Ostrozkyi National Nature Park					
	Male Polissia National Park					
	Tsumanska Pushcha National Park					
No. of sites	13	4	5	1	260*	116*

* Estimates based on FZS analysis

Appendix 2 – International sites impacted if the E40 waterway is built

Table A2.1: Natura 2000 sites impacted if the E40 waterway is built. Names in bold indicate that the site would have serious impacts.

Site number	Name	Designation	Direct impact	Indirect impact	Polesia
PLB040003	Dolina Dolnej Wisły (Lower Vistula Valley)	SPA	x		
PLB140004	Dolina Środkowej Wisły (Middle Vistula Valley)	SPA	x	x	
PLB060004	Dolina Tyśmienicy (Tyśmienica Valley)	SPA	x	x	
PLB220004	Ujście Wisły (Vistula River Mouth)	SPA	x		
PLB220005	Zatoka Pucka (Puck Bay)	SPA	x		
PLB060003	Dolina Środkowego Bugu (Middle Bug Valley)	SPA	x		x
PLH220033	Dolna Wisła (Lower Vistula)	SAC	x		
PLH060051	Dolny Wieprz (Lower Wieprz)	SAC	x	x	
PLH040011	Dybowska Dolina Wisły (Dybowska Valley of the River Vistula)	SAC	x		
PLH140029	Kampinowska Dolina Wisły (Kampinowska Valley of the River Vistula)	SAC	x		
PLH040012	Nieszawska Dolina Wisły (Nieszawska Valley of the River Vistula)	SAC	x		
PLH220044	Ostoja w Ujściu Wisły	SAC	x		
PLH040003	Solecka Dolina Wisły (Solecka Valley of the River Vistula)	SAC	x		
PLH040039	Włocławska Dolina Wisły (Włocławska Valley of the River Vistula)	SAC	x		
PLB060013	Dolina Górnej Łabuńki (Upper Labunka Valley)	SPA		x	
PLB060006	Lasy Parczewskie (Parczewskie Forests)	SPA		x	
PLB060020	Ostoja Nieliska	SPA		x	
PLB060019	Polesie	SPA		x	x
PLB060008	Puszcza Solska (Solska Primeval Forest)	SPA		x	
PLB060012	Roztocze	SPA		x	
PLB060016	Staw Boćków (Boćków pond)	SPA		x	
PLB060010	Lasy Łukowskie (Łukowskie Forests)	SPA		x	
PLH060085	Bródek	SAC		x	

PLH060076	Brzeziczno	SAC		x	
PLH060096	Bystrzyca Jakubowicka	SAC		x	
PLH060001	Chmiel	SAC		x	
PLH060002	Czarny Las	SAC		x	
PLH060003	Debry	SAC		x	
PLH060033	Dobromyśl	SAC		x	x
PLH060040	Dolina Łętowni	SAC		x	
PLH060005	Dolina Środkowego Wieprza (Middle Wieprz Valley)	SAC		x	
PLH060058	Dolina Wolicy (Wolica Valley)	SAC		x	
PLH060087	Doliny Łabuńki i Topornicy (Łabuńka and Topornica valleys)	SAC		x	
PLH060059	Drewniki	SAC		x	
PLH060006	Gliniska	SAC		x	
PLH060071	Guzówka	SAC		x	
PLH060101	Horodysko	SAC		x	x
PLH060008	Hubale	SAC		x	
PLH060030	Izbicki Przełom Wieprza (Izbica Wieprz River Gorge)	SAC		x	
PLH060095	Jelino	SAC		x	
PLH060009	Jeziora Uściwierskie (Uściwierskie Lakes)	SAC		x	
PLH060010	Kąty	SAC		x	
PLH060091	Kornelówka	SAC		x	
PLH060080	Łabunie	SAC		x	
PLH060061	Las Orłowski	SAC		x	
PLH060081	Łopiennik	SAC		x	
PLH060105	Maśluchy	SAC		x	
PLH060044	Niedzieliska	SAC		x	
PLH060092	Niedzieliski Las	SAC		x	
PLH060064	Nowosiółki (Julianów)	SAC		x	
PLH060106	Obuwik w Uroczysku Świdów	SAC		x	
PLH060012	Olszanka	SAC		x	
PLH060107	Ostoja Parczewska	SAC		x	
PLH060013	Ostoja Poleska	SAC		x	x
PLH060065	Pawłów	SAC		x	x
PLH060062	Rogów	SAC		x	
PLH060017	Roztocze Środkowe	SAC		x	
PLH060090	Siennica Różana	SAC		x	
PLH060021	Świdnik	SAC		x	
PLH060022	Święty Roch	SAC		x	
PLH060094	Uroczyska Lasów Adamowskich	SAC		x	
PLH060034	Uroczyska Puszczy Solskiej	SAC		x	

PLH060026	Wodny Dół	SAC		x	
PLH060098	Wrzosowisko w Orzechowie	SAC		x	
PLH060027	Wygon Grabowiecki	SAC		x	
PLH060028	Zarośle	SAC		x	

Information about the impacted sites is available through the Natura 2000 viewer^{cxvii}.

Appendix 3 – National sites impacted if the E40 waterway is built

Table A3.1: Belarus national sites impacted if the E40 waterway is built. Names in bold indicate that the site would have serious impacts.

National site type	Name	Direct impact	Indirect impacts	Polesia
National Park	Pripyatsky	X	X	X
	Belovezhskaya Pushcha*		X	X
Radiological Reserve	Polissky State Radioecological Reserve	X		X
Nature reserve (zakaznik) of national importance	Zvanets	X		X
	Mid-Pripyat	X		X
	Mazyrskija jary	X		X
	Strelsky	X		X
	Dnepr-Sozhsky**		X	X
	Radostovsky		X	X
	Sporausky		X	X
	Prostyr		X	X
	Tyrvovichy		X	X
	Almany Mires		X	X
Nature reserve (zakaznik) of regional importance	Divin Velikiy Les	X		X
	Turau meadow	X		X
	Bugsky*		X	X
	Nepakoichitsy*		X	X
	Brestsky*		X	X
	Dolbnevo		X	X
	Vorokhovo		X	X
	Trostsyanitsa		X	X
	Zavishje		X	X
	Konchitsy		X	X
	Izin		X	X
	Stupskoje		X	X
	Marochna		X	X
	Jermaki		X	X
	Nevitsa		X	X
	Bukchansky		X	X
	Tapilauskae		X	X
	Zasadishche		X	X
	Rechitsa		X	X
	Zaruchevje urochishche		X	X
	Lugovoe		X	X
	Lahnitskaje		X	X
Lelchitskaje-Svidavets		X	X	
Manchitsy		X	X	
Beryn urochishche		X	X	
Biosphere Reserve	Pribuzhskae Palesse		X	X

*This site would be affected by the construction of the Vistula-Bug Canal in Poland

**This site would be affected by the construction of a river port in the village of Nizhny Zhary

Table A3.2: Poland national sites impacted if the E40 waterway is built. Names in bold indicate that the site would have serious impacts.

Site number	Name	Designation	Direct impact	Indirect impact	Polesia
555562926	Chełmiński Park Krajobrazowy	Landscape Park	x		
555638767	Góry Łosiowe	Landscape Park	x		
555562925	Nadwiślański Park Krajobrazowy	Landscape Park	x		
177414	Kępa Antonińska	Nature Reserve	x		
115938	Kępa Bazarowa	Nature Reserve	x		
177416	Kępa Wykowska	Nature Reserve	x		
177417	Kępy Kazuńskie	Nature Reserve	x		
177446	Łąchy Brzeskie	Nature Reserve	x		
177447	Ławice Kiełpińskie	Nature Reserve	x		
177448	Ławice Troszyńskie	Nature Reserve	x		
177622	Wikliny Wiślane	Nature Reserve	x		
177636	Wyspy Białobrzeskcie	Nature Reserve	x		
177637	Wyspy Świderskie	Nature Reserve	x		
177638	Wyspy Zakrzewskie	Nature Reserve	x		
177639	Wyspy Zawadowskie	Nature Reserve	x		
11380	Zakole Zakroczymskie	Nature Reserve	x		
115201	Białej Góry	Protected Landscape Area	x		
31660	Dolina Rzeki Pilicy i Drzewiczki	Protected Landscape Area	x		
115203	Doliny Kwidzyńskiej	Protected Landscape Area	x		
177750	Gniewski	Protected Landscape Area	x		
555562822	Gostynińsko-Gąbiński	Protected Landscape Area	x		
177680	Nadwiślański (Powiat Garwoliński, Miński i Otwocki)	Protected Landscape Area	x*		
555562800	Nadwiślański (Powiat Płoński, Płocki i Sochaczewski)	Protected Landscape Area	x		
177681	Nadwiślański (Powiat Sochaczewski)	Protected Landscape Area	x		
177679	Nadwiślański (Woj. Pomorskie)	Protected Landscape Area	x		
31695	Niziny Ciechocińskiej	Protected Landscape Area	x		
115125	Obszar Chronionego Krajobrazu Pradolina Wieprza	Protected Landscape Area	x*		
115200	Środkowożuławski	Protected Landscape Area	x		
177742	Warszawski	Protected Landscape Area	x		

177763	Żuław Gdańskich	Protected Landscape Area	x		
62881	Kozłowiecki	Landscape Park		x	
62882	Krasnobrodzki	Landscape Park		x	
62883	Krzczonowski	Landscape Park		x	
62886	Nadwieprzański	Landscape Park		x	
62887	Pojezierze Łęczyńskie	Landscape Park		x	x
11639	Poleski	Landscape Park		x	x
148565	Skierbieszowski	Landscape Park		x	
62895	Szczepreszyński	Landscape Park		x	
11147	Poleski Park Narodowy	National Park		x	x
856	Roztoczański Park Narodowy	National Park		x	
115252	Broczówka	Nature Reserve		x	
115289	Chmiel	Nature Reserve		x	
115323	Czapliniec Koło Gołębia	Nature Reserve		x	
115322	Czapliniec W Uroczysku Feliksówka	Nature Reserve		x	
115334	Czarny Las	Nature Reserve		x	
177321	Debry	Nature Reserve		x	
177349	Głęboka Dolina	Nature Reserve		x	
115555	Gliniska	Nature Reserve		x	
115729	Hubale	Nature Reserve		x	
11371	Jezioro Brzeziczno	Nature Reserve		x	
11374	Jezioro Obradowskie	Nature Reserve		x	
115957	Kozie Góry	Nature Reserve		x	
116018	Królowa Droga	Nature Reserve		x	
177430	Księżostany	Nature Reserve		x	
116163	Łabunie	Nature Reserve		x	
177440	Las Królewski	Nature Reserve		x	
116068	Lasy Parczewskie	Nature Reserve		x	
122884	Olszanka	Nature Reserve		x	
122891	Omelno	Nature Reserve		x	
177519	Piskory	Nature Reserve		x	
124048	Podzamcze	Nature Reserve		x	
124094	Rogów	Nature Reserve		x	
124119	Skrzypny Ostrów	Nature Reserve		x	
145185	Stasin	Nature Reserve		x	
145215	Święty Roch	Nature Reserve		x	
11372	Torfowisko przy Jeziorze Czarnym	Nature Reserve		x	
145284	Wieprzec	Nature Reserve		x	
145291	Wierzchowiska	Nature Reserve		x	
177628	Wodny Dół	Nature Reserve		x	

177632	Wygon Grabowiecki	Nature Reserve		x	
31605	Chełmski	Protected Landscape Area		x	x
115122	Czerniejowski	Protected Landscape Area		x	
555562795	Grabowiecko-Strzelecki	Protected Landscape Area		x	x
115119	Kraśnicki	Protected Landscape Area		x	
177675	Łukowski	Protected Landscape Area		x	
115127	Annówka	Protected Landscape Area		x	
115123	Dolina Ciemięgi	Protected Landscape Area		x	
115124	Kozi Bór	Protected Landscape Area		x	
31607	Pawłowski	Protected Landscape Area		x	
31608	Poleski	Protected Landscape Area		x	x
31668	Radzyński	Protected Landscape Area		x	
115139	Roztoczański	Protected Landscape Area		x	

* Indicates that the site would also have significant hydrology impacts.

Table A3.3: Ukraine national sites impacted if the E40 waterway is built

National site type	Name	Direct impact	Indirect impacts	Polesia
Strict Nature Reserve (Nature Zapovednyk)	Dneprovs'ko-Orel'skiy	X		
	Kanevskiy	X		
	Rivnens'kiy		x	x
Biosphere (Radiological) Reserve	Chornobyl Radiation and Ecological Biosphere Reserve	X		x
Nature reserve (Zakaznyk) of national importance	Bakays'kiy	X		
	Bilets'kivs'ki plavni	X		
	Dniprov's'ki porogi	X		
	Lipivs'kiy	X		
	Tarasiv obriy	X		
	Velika Zapadnya	X		
	Veliki ta Mali Kuchuguri	X		
	Perebrodivs'kiy		x	x
Nature reserve (Zakaznyk) of local importance	Kam'yans'kiy lisoviy masiv	X		
	Lisoviy masiv	X		
	Lisoviy masiv vzdovzh livogo berega richki Dnipro	X		
	Ostriv Tavolzhaniin	X		
	Zaplava r. Bazavluk	X		
Nature Monument of national importance	Balka Rossokovata	X		

Note: Name in bold indicates the site would have serious impacts

Appendix 4 – Scoping of protected areas in relevant river basins

In addition, we also considered protected areas in river basins through which the E40 waterway route would pass i.e. sites which may have hydrological impacts and which will need to be investigated further in any detailed environmental assessment of E40 waterway. This analysis provides a ‘scoping’ list of sites needing further assessment. Such assessment should be part of a detailed environmental assessment on E40 which will need to be undertaken by the three countries prior to an informed strategic decision on E40 waterway.

Methodology

River basins were selected from the ECRINS dataset on the basis of their overlap with the E40 waterway variant III, with a margin of 1 kilometer. The river basins contained small errors in their polygons with areas overlapping within the same polygon. The nodes causing these errors were removed manually after visual inspection, minimizing deviation. River basins for rivers that did not directly drain into the main watercourses of the E40 waterway, mainly basins draining in the Baltic Sea and in the Vistula lagoon near Elbląg in Poland and in the Black Sea on the Crimean Peninsula in Ukraine were excluded.

The resulting set of river basins was overlapped with the protected areas. Areas with more than 50 percent of their area in the river basins were retained.

Results

Table A4.1: Overview of international sites in river basins that may have hydrology impacts – whole E40

	Poland	Belarus	Ukraine	Transboundary	Total
SPA	37				37
SAC	249				249
Emerald		41	48		89
Ramsar	3	11	11		25
IBA	?	?	?		?
UNESCO-MAB	2		1	2	5
Baltic Sea (HELCOM)	2				2
Total	293	52	59		407

Table A4.2: Overview of international sites in river basins that may have hydrology impacts – Polesia

	Poland	Belarus	Ukraine	Transboundary	Total
SPA	11				11
SAC	25				25
Emerald		39	25		64
Ramsar	1	9	7		17
IBA	?	?	?		
UNESCO-MAB				1	1
Baltic Sea (HELCOM)					
Total	37	48	32		118

Deducting the sites already identified as very likely to have direct or indirect impacts (193 sites on the whole E40 waterway, 83 in Polesia (details in section 4) this is an additional 214 sites (35 in Polesia) which will need investigating further for potential indirect impacts.

These figures will be an underestimate as this scoping analysis did not look at IBAs (as this would have required significantly more work, due to the large number of sites involved).

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