



**Indicator fact sheet**

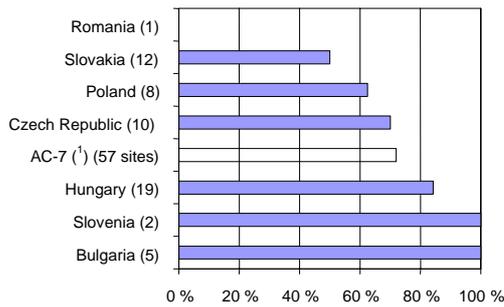
**TERM 2002 07 EU+AC — Proximity of transport infrastructure to designated areas**

The data in this fact sheet have not been updated since TERM 2001. Statistics on Ramsar areas date back to March 2001, on transport infrastructure to 1998.

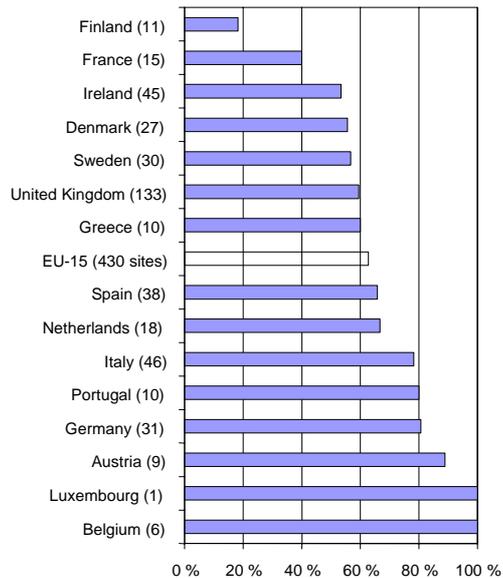
⊗ **Expanding transport infrastructure networks poses a serious threat to designated nature areas. As regards wetlands, 72 % of those of the ACs and 63 % of those of the EU have at least one type of infrastructure within 5 km from their centres. The same applies to 66 % of EU areas designated under the EU birds directive. Further expansion of the transport infrastructure and intensification of its use could jeopardise the future of many important designated nature areas. It is also increasingly difficult to designate new areas for protection that are not affected by infrastructure networks.**

**Figure 1: Percentage of designated Ramsar sites with transport infrastructure closer than 5 km to their centres**

**Accession countries**



**Member States**

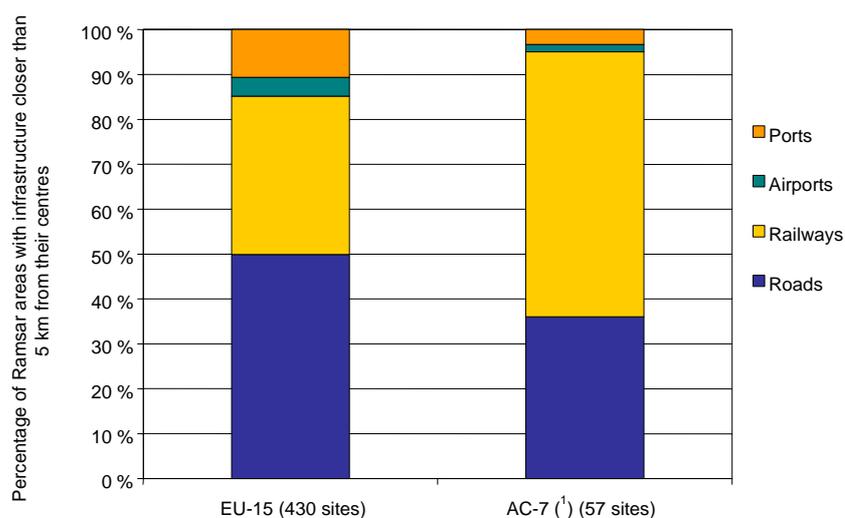


NB: Statistics on Ramsar areas date back to March 2001; statistics on transport infrastructure date back to 1998.

<sup>(1)</sup> AC-7 refers to the ACs shown in the graph.

Source: EEA-ETC/TE, 2002; EEA-ETC/NPB, 2002.

**Figure 2: Proximity of transportation infrastructure to wetlands (Ramsar sites)**



NB: Statistics on Ramsar areas date back to March 2001; statistics on transport infrastructure date back to 1998.

(1) AC-7 refers to the ACs shown in Figure 1.

Source: EEA-ETC/TE, 2002; EEA-ETC/NPB, 2002.

## Results and assessment

### Policy relevance

Preserve biodiversity and protect designated nature areas.

### Policy context

The UN Convention on Biological Diversity sets a general framework for the conservation of habitats and species. However, lack of integration of biodiversity concerns into other policy areas is currently one of the greatest obstacles to securing conservation goals. Integration is therefore a key element of the sixth EAP, the sustainable development strategy (European Commission, 2001b), the Community biodiversity strategy (European Commission, 1998) and the Community biodiversity action plans (European Commission, 2001a).

The designation of areas for nature protection is one of the longest established and most common measures for the protection of biodiversity. The designation of areas for nature protection is one of the longest established and most common measures for the protection of biodiversity. Various international and national regulations have been established to this end, such as the EU birds directive (1) and habitats directive (European Commission, 1992). These two directives aim at protecting more than 10 % of the territory of the EU through designation of sites for nature protection during the first decade of the 21st century. However, infringements of existing nature conservation regulations as a result of transport infrastructure projects are still regularly reported. Even though environmental impact assessments (EIAs) are now customarily carried out for large transport infrastructure projects (in accordance with national legislation and the EU directive on environmental impact assessment), these often fail to consider alternative routes to avoid pressures on nature.

EU COST Action 341, initiated in 2000 and lasting 4.5 years, studies problems connected with infrastructure use and fragmentation of habitats (COST Action 341, 2000). It will produce a 'European handbook on habitat fragmentation due to linear transportation infrastructure' and an online database including experts and literature. It is based on national collaboration. A preliminary report for 2000 begins to outline the scale of impact of infrastructures on animals and habitats, but does not yet contain much data. Several national reports with data can be found via the IENE network.

(1) OJ L 103, 25.4.1979, pp. 1-18.

Behind the work lie long-standing concerns by national road and rail authorities about accidents caused by collisions with animals. During the last 10 to 20 years, however, interest has been extended to meet the concerns of nature conservation authorities for the affected animal species and populations

### **Environmental context**

The impact of infrastructure on biodiversity depends on the type, intensity, location and form of the infrastructure elements. However, there are large similarities for road and rail infrastructure (large areas taken or influenced, sealing of surfaces), while other types of infrastructure such as waterways, shipping routes and airports pose other problems. This indicator deals mainly with road and rail infrastructures, as these types of infrastructure pose the most significant problems related to the proximity of transport infrastructure to natural areas. Road and railway infrastructures and their accompanying constructions including fences have important fragmenting effects (see indicator on fragmentation). As a consequence, habitats are becoming smaller and species populations are becoming more dispersed. By acting as barriers to movement and interchange between populations, especially for vertebrates, infrastructures can lead to inbreeding and genetic erosion until the population can no longer survive.

Expansion of transport infrastructure networks and continuous growth of traffic in the ACs pose an important threat to biodiversity. This makes the survival of some species uncertain and diminishes the value of many natural and semi-natural habitats. Habitats and species are affected directly by land take for infrastructure and indirectly by vehicle emissions, run-off substances from road surfaces and runways (to which salt and other de-icing chemicals have been applied) and oil discharges, particularly into rivers and seas. In addition, some groups of animals are highly susceptible to accidents caused by vehicles (small and large mammals, amphibians, raptors which feed from small mammals concentrated on road verges) and by traffic noise and light.

Proximity to major traffic infrastructure and growth in traffic using such infrastructure can therefore clearly affect habitats and species. Many animals are even more susceptible to disturbance from people who gain access by new roads to areas formerly less accessible.

In addition to fragmentation, infrastructures create pathways for new species (for example open-land species into forest areas), which may become invasive. On the other hand, recent techniques and management plans have created new habitat types (road and rail verges and plantings), which sometimes become more favourable to biodiversity than the surrounding environment.

### **Assessment**

The expansion of transport infrastructure networks and the continuous growth in traffic in the ACs as well as the EU pose an important threat to biodiversity. Transport systems conflict more and more with nature conservation policies in a number of ways, making the survival of some species uncertain and diminishing the value of many natural and semi-natural habitats.

Proximity analysis of transport infrastructure to designated nature areas shows that most designated areas are near major infrastructure elements — they have a major infrastructure (motorway, national or principal road, railway, airport or maritime port) within 5 km of their centre.

Designated areas evaluated consist of wetland areas (Ramsar sites designated in the global Ramsar Convention on Wetlands) and special bird areas (SPAs designated under the EU birds directive). As concerns wetland areas, 63 % of those in EU Member States and 72 % of those in the ACs have at least one type of transport infrastructure within 5 km from their centres. Similarly, the same situation applies for 66 % of EU areas designated under the birds directive. The proximity problem is very high for roads and railways, high for maritime ports in nearly all cases and less important for airports.

Disturbance of biodiversity by transport is higher in Member States with dense infrastructures (such as Belgium, Denmark, Germany, Luxembourg, Austria and the Netherlands). However, the problem seems to be general and not dependent on the number of designated sites in the Member State. Few nature protection areas are far from a major transport infrastructure.

In the ACs, railways are currently the most frequent type of transportation infrastructure affecting designated areas, but this situation is likely to be changed in near future due to new roads construction. For example, the percentage of wetlands in ACs affected by roads will increase from 39 % to 63 % until 2010, when planned roads are completed (EEA-PTL/LC, 2000).

In an analysis of more than 3 000 important bird areas (IBAs) in Europe, which are priority areas for conservation identified by BirdLife International in 2000, infrastructure itself was considered a highly important threat to 22 % of the areas. Disturbance to birds, mostly from people accessing the areas, were counted as threats to 29 % of the areas (BirdLife International, 2000).

Continuous expansion of major infrastructure networks is likely to further impact existing designated areas in all countries. Furthermore, it will be increasingly difficult to designate new areas that will be sufficiently distant from infrastructure elements.

## Data

**Table 1: Proximity of transportation infrastructure to wetlands (Ramsar sites)**

	Total number of sites	Number of affected sites (%)	Type of infrastructure affecting site (and percentage of total sites)			
			Road	Rail	Airport	Port
Belgium	6	6 (100 %)	5 (83 %)	4 (67 %)	0 (0 %)	2 (33 %)
Denmark	27	15 (56 %)	10 (37 %)	5 (19 %)	0 (0 %)	4 (15 %)
Germany	31	25 (81 %)	21 (68 %)	19 (61 %)	2 (6 %)	3 (10 %)
Greece	10	6 (60 %)	5 (50 %)	2 (20 %)	2 (20 %)	1 (10 %)
Spain	38	25 (66 %)	23 (61 %)	12 (32 %)	0 (0 %)	5 (13 %)
France	15	6 (40 %)	6 (40 %)	3 (20 %)	1 (7 %)	1 (7 %)
Ireland	45	24 (53 %)	18 (40 %)	15 (33 %)	1 (2 %)	5 (11 %)
Italy	46	36 (78 %)	35 (76 %)	22 (48 %)	2 (4 %)	2 (4 %)
Luxembourg	1	1 (100 %)	1 (100 %)	1 (100 %)	0 (0 %)	0 (0 %)
Netherlands	18	12 (67 %)	12 (67 %)	5 (28 %)	0 (0 %)	2 (11 %)
Austria	9	8 (89 %)	8 (89 %)	6 (67 %)	1 (11 %)	0 (0 %)
Portugal	10	8 (80 %)	6 (60 %)	6 (60 %)	0 (0 %)	2 (20 %)
Finland	11	2 (18 %)	2 (18 %)	1 (9 %)	1 (9 %)	1 (9 %)
Sweden	30	17 (57 %)	13 (43 %)	7 (23 %)	1 (3 %)	4 (13 %)
United Kingdom	133	79 (59 %)	61 (46 %)	52 (39 %)	8 (6 %)	16 (12 %)
Bulgaria	5	5 (100 %)	5 (100 %)	1 (20 %)	0 (0 %)	1 (20 %)
Czech Republic	10	7 (70 %)	3 (30 %)	7 (70 %)	0 (0 %)	0 (0 %)
Hungary	19	16 (84 %)	7 (37 %)	16 (84 %)	0 (0 %)	0 (0 %)
Poland	8	5 (63 %)	0 (0 %)	5 (63 %)	0 (0 %)	0 (0 %)
Romania	1	0 (0 %)	0 (0 %)	0 (0 %)	0 (0 %)	0 (0 %)
Slovakia	12	6 (50 %)	5 (42 %)	6 (50 %)	0 (0 %)	0 (0 %)
Slovenia	2	2 (100 %)	2 (100 %)	1 (50 %)	1 (50 %)	1 (50 %)
<b>EU-15</b>	<b>430</b>	<b>270 (63 %)</b>	<b>226 (53 %)</b>	<b>160 (37 %)</b>	<b>19 (4 %)</b>	<b>48 (11 %)</b>
<b>AC-7 <sup>(1)</sup></b>	<b>57</b>	<b>41 (72 %)</b>	<b>22 (39 %)</b>	<b>36 (63 %)</b>	<b>1 (2 %)</b>	<b>2 (4 %)</b>

NB: Statistics on Ramsar areas date back to March 2001; statistics on transport infrastructure date back to 1998.

<sup>(1)</sup> AC-7 refers to the ACs shown in the table.

Source: EEA-ETC/TE, 2002; EEA-ETC/NPB, 2002.

File: Spreadsheet file containing graph and data: TERM 2002 07 EU+AC — Proximity to designated areas.xls

## References

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IENE network (Infra Eco Network Europe), <http://www.iene.org>

Ramsar database, [http://www.wetlands.org/RDB/ramsar\\_sites\\_dir.html](http://www.wetlands.org/RDB/ramsar_sites_dir.html)

## Metadata

### Technical information

1. Data source:

Ramsar data: The Ramsar data consist of information compiled from the Ramsar database by the European Topic Centre on Nature Protection and Biodiversity (EEA–ETC/NPB), March 2001 update.

Infrastructure data: Eurostat GISCO reference database: infrastructure data including trans-European networks (TENS) planned until 2010, June 1998 update.

2. Description of data:

Ramsar data: The Ramsar data consist of information on Ramsar areas compiled from the Ramsar database by the European Topic Centre on Nature Protection and Biodiversity (EEA–ETC/NPB), March 2001 update.

Infrastructure data: The CISCO infrastructure data set contains major roads down to dual carriageways, including roads foreseen until 2010. However, the available data set is incomplete for ACs: no road data for Estonia, Latvia, Lithuania, Malta and Cyprus; no data on foreseen roads for Bulgaria; incomplete data for Turkey. Irregular updates and amendments.

Files: TERM 2002 07 EU+AC — Proximity.xls

3. Geographical coverage: EU-15 + AC-7

4. Temporal coverage: Reference time 1998 — the GISCO infrastructure data set is a compilation of various data sources referring to July 1998 update.

5. Methodology and frequency of data collection: The GISCO database is a compilation of various data sources and it is updated irregularly. The Ramsar database is a compilation of various data sources and it is updated irregularly.

6. Methodology of data manipulation: For each Ramsar site the number of hits on GISCO infrastructure features (lines, points) within 5 km of the site centre was calculated — using a GIS proximity function.

#### Quality information

7. Strength and weakness (at data level): The analysis is simple and fast and indicative of existence of potential pressures in the vicinity of important nature conservation sites.

The GISCO infrastructure data set contains major roads down to dual carriageways, including roads foreseen until 2010. However, the available data set is incomplete for ACs: no roads data for Estonia, Latvia, Lithuania, Malta and Cyprus; no data on foreseen roads for Bulgaria; incomplete data for Turkey. Irregular updates and amendments.

No data layer with boundaries of the designated sites is used. For the analysis of proximity, a circle with a size proportional to the area of the site around its centre point location was used instead of the exact boundaries. The data set does not allow more detailed analysis of pressure from smaller roads. The traffic load is not included.

The Ramsar site data only include the centre points to localise the site. An approximation of the geographical area is based on a circle buffer calculated from the centre point. Digitised boundaries for all sites will increase the usefulness of the data considerably.

8. Reliability, accuracy, robustness, uncertainty (at data level):

The GISCO infrastructure data set is a compilation of various data sources:

roads (version 2) — based on IRPUD database, Institut für Raumplanung, Universität Dortmund; this data set was originally digitised using various basic maps (1:200 000–1:800 000 scale) during 1991–97; linear objects, accuracy 1:1 000 000 equivalent;

railways (version 3) — based on IRPUD database, Institut für Raumplanung, Universität Dortmund; this data set was originally digitised using various basic maps (1:200 000–1:1 000 000 scale) during 1991–97; linear objects, accuracy 1:1 000 000 equivalent, resolution 500 m;

ports (version 1) — based on Lloyd's Maritime Information Services Ltd, 'Ports dictionary' (07/1992), further improved by data from Eurostat and the UN (UN/Locode list, 02/1994); point objects, accuracy 1 minute, corresponding ground resolution c. 1 200 m;

airports (version 1) — based on Digital chart of the world, ESRI 1993, further improved by data from DGVII, UN (UN/Locode list 02/1994), ICAO (ICAO-CODE list, 72nd ed., 09/1993), Reed Travel Group (IATA-CODE list 06/1995) and DMA (ONC maps 1:1 000 000, GNC maps 1:5 000 000); point objects, accuracy 1 minute, corresponding ground resolution c. 1 200 m;

Ramsar data (update 2001) — compiled from the Ramsar database by the European Topic Centre on Nature Protection and Biodiversity (EEA-TC/NPB), March 2001 update, point objects; no further information available.

9. Overall scoring (give 1 to 3 points: 1 = no major problems, 3 = major reservations): 2  
Relevancy: 2 (Designating a new nature site that is close to infrastructure will score 'bad' according to the applied methodology.)  
Accuracy: 3 (No contour data available for designated sites; old transport infrastructure data.)  
Comparability over time: 3 (No time series available.)  
Comparability over space: 1

#### Further work required

The proximity of transport infrastructure to a nature conservation area is closely linked to the potential risk of disturbance of that area. Data improvements that would enhance the value of this indicator include:

- digitisation of information on the boundaries and areas of designated nature areas;

- inclusion of other types of designated area (such as those under the habitats directive);
- updated information on designated areas (including information on species and habitat distribution) and on land cover;
- testing of the indicator using distances of disturbance other than 5 m.

This indicator will be improved in close coordination with various other initiatives at the international and Member State levels. At the European level, EEA, Eurostat and OECD are jointly developing indicators for environmental reporting. Under the Convention on Biological Diversity, biological indicators related to proximity problems are also being considered.