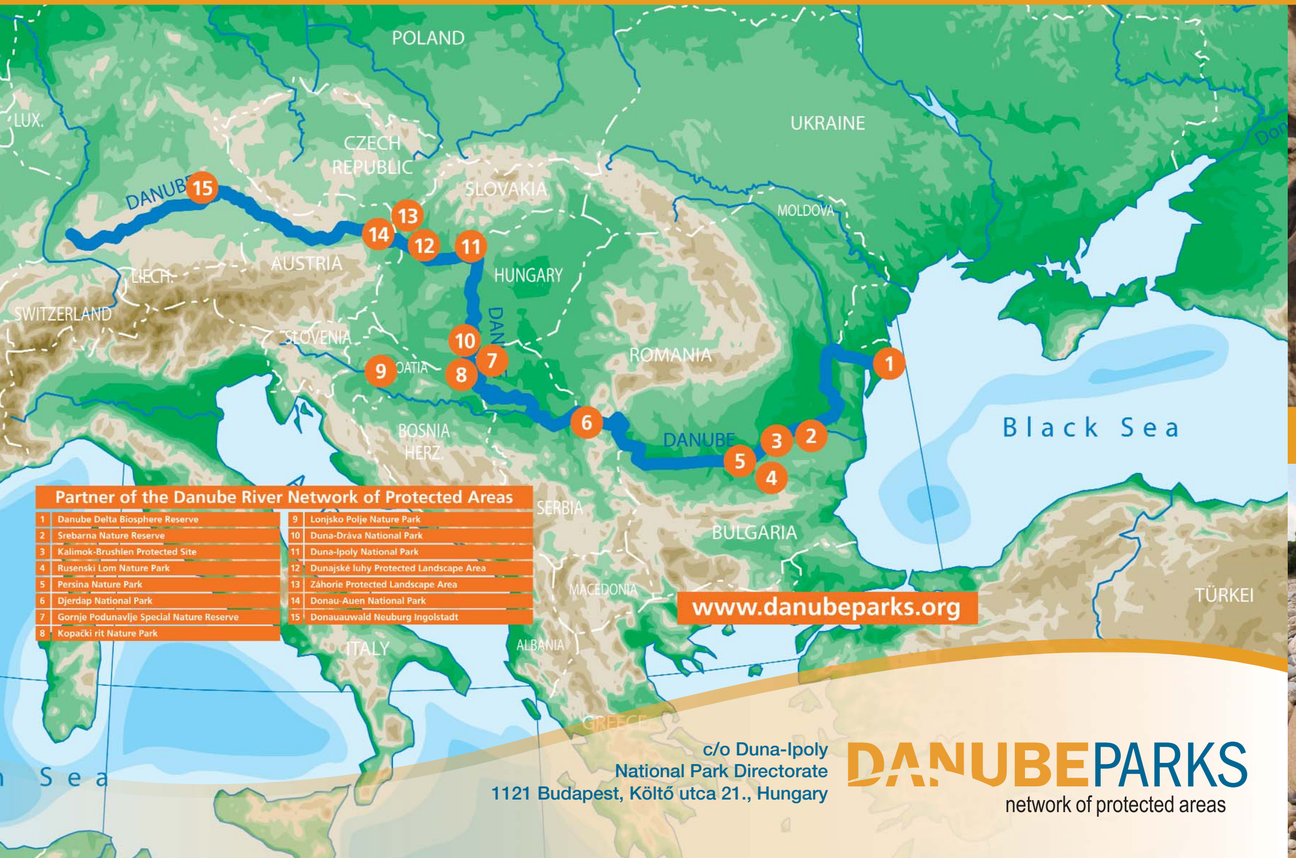


Partner of the Danube River Network of Protected Areas

1 Danube Delta Biosphere Reserve	9 Lonjsko Polje Nature Park
2 Srebarna Nature Reserve	10 Duna-Dráva National Park
3 Kalimok-Brushlen Protected Site	11 Duna-Ipoly National Park
4 Rusenski Lom Nature Park	12 Dunajské luhy Protected Landscape Area
5 Persina Nature Park	13 Záhorie Protected Landscape Area
6 Djerdap National Park	14 Donau-Auen National Park
7 Gornje Podunavlje Special Nature Reserve	15 Donauauwald Neuburg Ingolstadt
8 Kopacki rit Nature Park	

c/o Duna-Ipoly
National Park Directorate
1121 Budapest, Költő utca 21., Hungary

DANUBEPARKS
network of protected areas

Dynamic Danube Natural Values

Funded by the European Union
SOUTH EAST EUROPE
Transnational Cooperation Programme

DANUBEPARKS
network of protected areas

DANUBEPARKS – Danube River Network of Protected Areas

Based on existing co-operation, DANUBEPARKS – The Danube River Network of Protected Areas – was established as a platform for continuous transnational co-operation of numerous Protected Area administrations from almost all of the Danube countries. Between 2009 and 2012, Danube-wide monitoring in the fields of habitat management, river restoration, conservation of Danube flagship species and Danube nature tourism were carried out; joint Danube-wide conservation concepts were also developed and strategic pilot actions implemented. DANUBEPARKS is funded within the framework of the EU funding programme ETC - South East Europe (SEE) and is a "flagship project" in the EU Strategy for the Danube region.

www.danubeparks.org

www.southeast-europe.net

www.danube-region.eu

IMPRINT

DANUBEPARKS
network of protected areas

c/o Duna-Ipoly National Park Directorate
1121 Budapest, Költő utca 21., Hungary

Scientific Coordination of Monitoring: Matthias Schmidt, BirdLife Austria
Coordination of Monitoring: Gyula Kiss, kiss.gyula@dinpig.hu

Maps created with Natural Earth,
created by Matthias Schmidt, BirdLife Austria

Monitoring Observers:
Germany: A. Schuhbauer; Austria: M. Schmidt, H. Frötscher, M. Schindler; Slovakia: D. Krivošik, D. Turčani, S. Keresztesová, A. Kürthy; Hungary: Á. Selmeczi Kovács, A. Füri, K. Sipos, P. Csonka, Z. Hegyi, A. Nagy, B. Tóth, Gy. Kiss, I. Staudinger, T. Bíró, Z. Kovács, A. Mórocz, T. Gruber; Serbia: B. Grubač, S. Barbulović, V. Jovanović, Z Milovanović, D. Jankulović, M. Tucakov, Jankovic, Stojnic, Ham; Bulgaria: V. Koev, P. Shurolinkov, G. Daskalova; Romania: I. Cobzaru, F. Bodescu, D. Damuc

www.danubeparks.org

Photos: D. Grlica, G. Frank, H. Frötscher, F. Kern, C. Manzano, O. Roland, M. Schmidt, BROZ, B. Tóth, M. Tucakov, Z. Milovanovic, I. Cobzaru, Á. Selmeczi Kovács

Layout: Michael Kalb - www.michaelkalb.at, Kiss Maja
Printing: Szó-Kép Nyomdaipari Kft., www.szo-kep.hu

Printed in 2000 copies. February 2012.
Produced by environmentally friendly technologies and materials.

Introduction

The natural sections of the Danube River and its large wetlands are part of our common **European natural heritage**. Numerous protected areas and NATURA 2000 sites along the course of the Danube reflect the high value of this transnational ecosystem and represent unique natural areas.

River dynamics and **natural morphological processes** are the key for the long-term preservation of the Danube River ecosystem. Intact water and sediment regimes, river dynamics and adequate space for the river determine the great **habitat variety and species richness** – qualities which are still characteristic for parts of the Danube floodplains.

Human activities (e.g. agriculture, forestry) usually require stable hydro-morphological circumstances rather than dynamic, natural conditions. Regulation of meanders, cutting-off of side arms, embankments, dykes and other man-made **hydro-morphological alterations** have changed the abiotic parameters and, ultimately, the healthy status of the habitats. Dams have dramatically impacted longitudinal continuity and sediment transportation, resulting in, for example, riverbed erosion on most Danube sections. Waterway transport projects which are intended to improve conditions for navigation routes can also be seen as a risk.

The formation of "new" habitats in the early stages of succession, such as steep loam walls, gravel islands or large scale sand banks could be done only through permanent relocation of sediments, by erosion and accumulation. Blocking river dynamics stops these initiating processes; due to ongoing succession, these characteristic habitats of natural rivers have become extremely rare. Consequently, the conenose related to these dynamic habitats is highly threatened on a European scale, stressed also by the highest rate of extinct species of all habitat types along the Danube.

Accordingly, both the **conservation** as well as the **restoration** of river dynamic processes and habitats is a priority for nature conservation on the Danube River. Protected areas have an outstanding role, conserving valuable sites and being a key driver for the revitalization of side arms, restoration of river banks and supporting concepts for ecological river management.

The Danube River is one **interrelated ecosystem**. Hydro-morphology, river dynamics and sediment balance can be tackled only by a Danube-wide approach. Hence, DANUBEPARKS initiated a **transnational study** to describe the situation on a Danube-wide scale using two **indicator species: the Little Ringed Plover and the Sand Martin**. The aim of the study is to identify hot spots of these species as priority areas for conservation of dynamic habitats, as well as gaps in their distribution to highlight their needs and the potential for river restoration.

Both species are closely linked with and adapted to these river dynamic habitats. The Little Ringed Plover needs bare or sparsely vegetated gravel or sand banks, laying its brilliantly disguised eggs on blank sediments. However, natural river sections without "strong" regulation and inducing such extensive gravel and sand banks have shrunk significantly over the last two centuries, especially on the Upper Danube. Once abundant along the Danube, the Little Ringed Plover has been displaced from its natural environment by human impact.

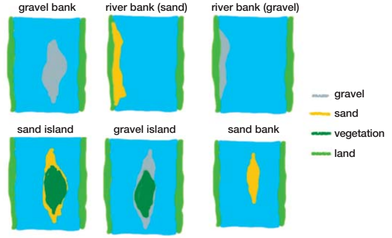
The Sand Martin needs steep natural river banks to burrow its nests. Breeding colonies indicate sites where natural lateral erosion is still active. Due to the high number of characteristic insects, different threatened bird species and other organisms dependent on this habitat type; these sites are also of high conservation concern.

Both species were originally widespread along the Danube and are still relatively common in the Danube countries thanks to their adaptation to artificial secondary habitats. Being adapted to dynamic habitats, Little Ringed Plover and Sand Martin react quickly to structural changes and provide good and quick indication of impacts on their habitats, whether positive (e.g. restoration actions) or negative (e.g. river regulation). Finally, the birds are easy to recognize, to identify and to monitor. As they are attractive species, monitoring could be shared with interested public, press and stakeholders. All this qualifies the Little Ringed Plover and the Sand Martin as perfect indicator species and as drivers for river dynamic processes.

Monitoring 2011

During the 2011 breeding season the whole Danube from the Black Forest to the Black Sea was surveyed for breeding pairs of Little Ringed Plover and Sand Martin. Nine Protected Area administrations from seven Danube countries took part in the monitoring and covered more than 3,100 kilometres, including the branches of the islands of Baltalaomiței and Great Brăila Island. Two surveys of the study area (each one in May and June) were completed; in the upper-most part of Germany and in a section in Serbia only one survey took place. The monitoring was mainly done by small boats and the survey was limited to the main stream of the Danube. All suitable habitats for both species were investigated; artificial areas like sand quarries were not considered in the analysis. For each site the number of birds and breeding pairs were counted or estimated by the observers. Details of the habitat were noted. For the Little Ringed Plover, habitat was classified according to one of six possible types (see graph).

Considering the compacted methodology with only two surveys, the maximum numbers of territories per location were used for the analyses. For visualization, the results were summed up for twenty-kilometre sections. The first survey in May was distinguished by a very low water level on the whole Danube, which results in very good breeding conditions especially for Little Ringed Plover. On the second run the water level was more heterogeneous and so there were various conditions in the different sections. Due to the direct influence of the water level on the population size of Little Ringed Plover, follow-up surveys are planned for the evaluation of the results, although first local verification of the data fits in well with the results of local monitoring programmes.

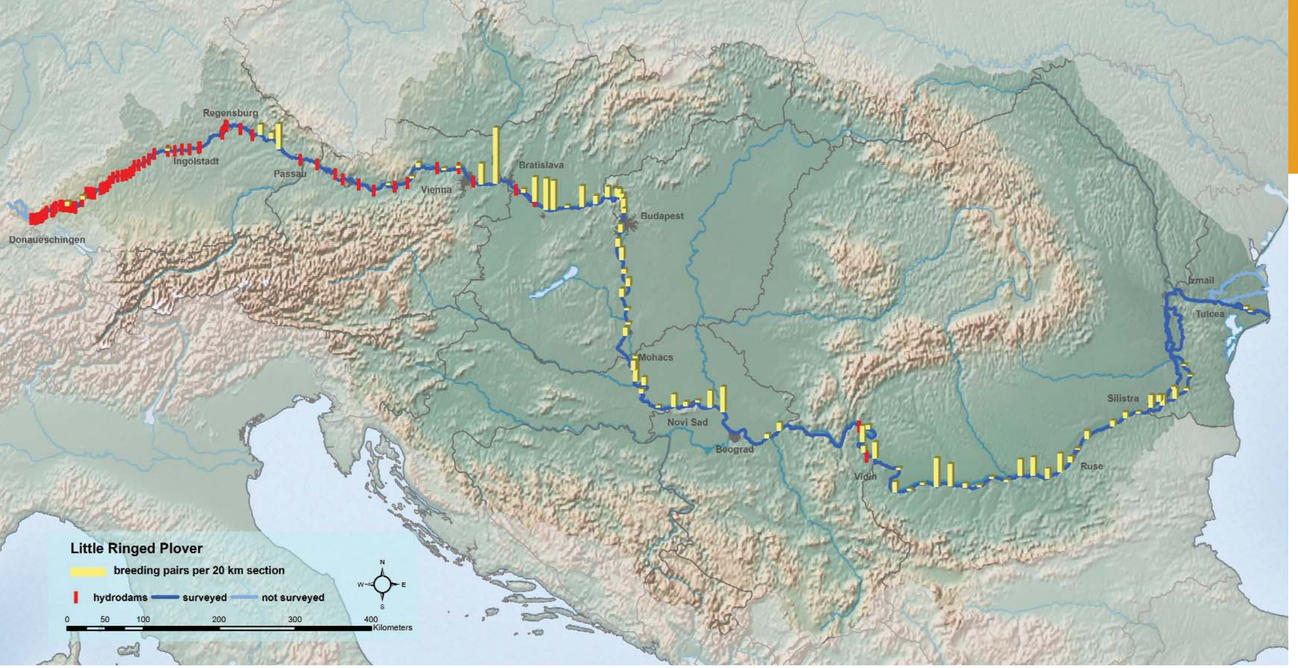


LITTLE RINGED PLOVER *(CHARADRIUS DUBIUS)*

The Little Ringed Plover is a widespread, long distance migratory bird of the wader group. It breeds in Europe from the end of March to the end of July. Primary breeding habitats are bare or sparsely vegetated sand or gravel structures of freshwater areas. Due to river regulation and damming (in particular for hydro power), this habitat type and its characteristic conenose is one of the most threatened in Europe. Although the Little Ringed Plover was faced with a decline in central Europe, the species managed to use artificial nesting sites such as quarries or fishponds. Today, more than 90% of its European population breeds in secondary habitats.

SAND MARTIN *(RIPARIA RIPARIA)*

The Sand Martin is a common species in Europe and occurs in most European countries as a breeding bird. The European population winters in tropical Africa and the first birds return to Europe in March, breeding from May to July in colonies of only a few up to several thousand pairs. Colony sites are mostly located near river or other freshwater sites and nests are bored into vertical sand or loam walls, basically resulting from lateral erosion of dynamic rivers. This habitat structure is shared by Sand Martin with a wide range of rare species; its loss due to river regulation was compensated by occupying artificial breeding habitats such as sand quarries.



TYPICAL LITTLE RINGED PLOVER HABITATS

at upper Danube

at middle Danube

at lower Danube

Population, distribution and habitat of Little Ringed Plover

During the breeding season, the Little Ringed Plover can be found along the whole Danube. In total, 369 territories of Little Ringed Plover on 218 nesting sites were recorded during this monitoring. The highest densities were detected between Vienna and Bratislava, up to 27 territories/20 km (river-km 1,900 to river-km 1,880) in the free flowing section in the Donau-Auen National Park. The border section between Romania and Bulgaria provides good breeding conditions over a long distance and, therefore, is of highest importance in terms of number of territories.

Upstream of Vienna this species breeds only in low densities due to the high degree of regulation and embankment. The good size of the breeding population along the free flowing section between Straubing and Vilshofen (river-km 2,320 to river-km 2,250), and the fact that small revitalized areas were also colonized, underline the high potential of the gravel-dominated Upper Danube for this species – before hydro-morphological alterations most probably the optimum habitat along the Danube.

The high density along the "old" original Danube arm (up to 14 breeding pairs/20 km) parallel to the "hydropower channel" of Gabčikovo hydropower plant – where the Little-ringed Plover is totally missing – stresses the fundamental negative impact of dams on this species. Also noticeable is also the gap in the distribution found in the back water of the Djerdap hydro dam, upstream of the Iron Gate.

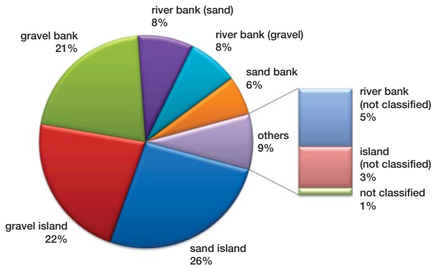
The Little ringed Plover shows a clear preference for island structures; more than three-quarter of the territories were found on these structures (see graph). In particular, sand islands in the Lower Danube are of high importance for this species, as are gravel islands and banks. Consequently, the highest densities along the Lower Danube were found in the section between Nikopol and Ruse (river-km 500 to river-km 600), which offers huge complexes of sand islands and banks, providing habitat for 34 breeding pairs on 20 sites.

For natural, river morphological reasons, the Little Ringed Plover seems to be rare in the area of the Great Brăila Island and the Danube Delta is lacking in suitable habitats for this species.

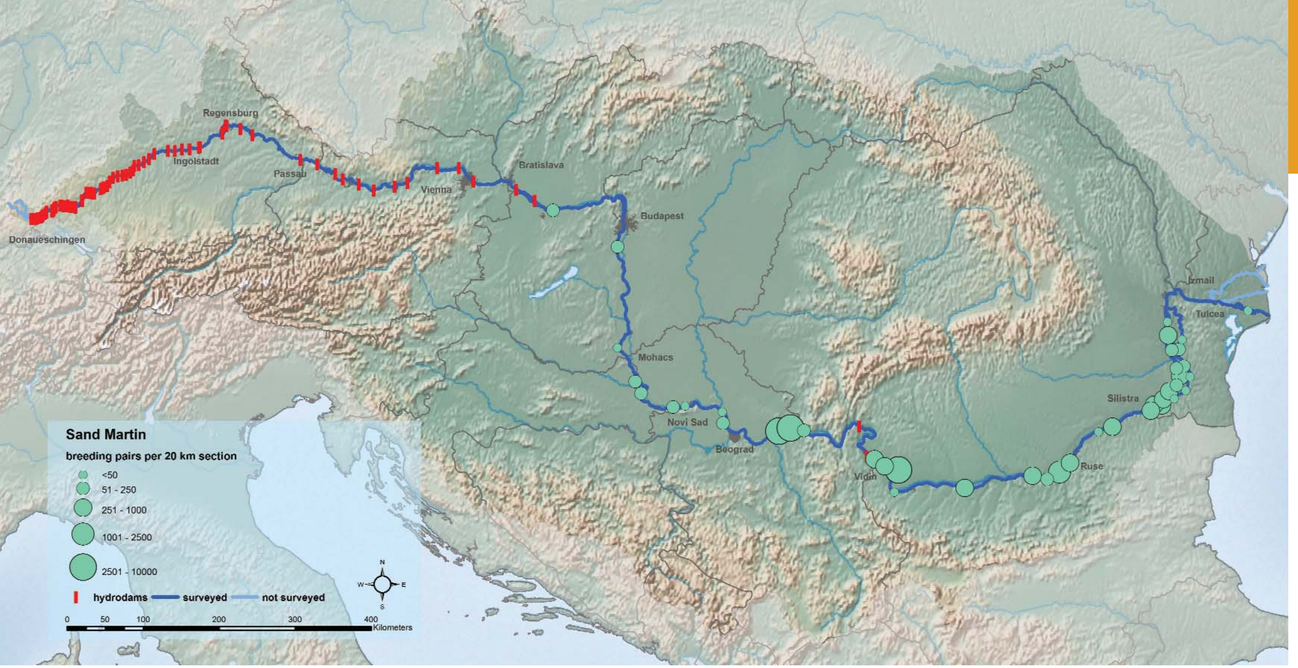
Counrty / Section		Breeding sites (n)	(n)	Territories (%)	per/km	Mean territories per site (n)
Germany	(658 km)	22	25	6.8	0.04	1.14
Germany-Austria	(29 km)	0	0	0.0	0.00	
Austria	(321 km)	24	45	12.2	0.14	1.88
Austria-Slovakia	(8 km)	0	0	0.0	0.00	
Slovakia	(22 km)	0	0	0.0	0.00	
Slovakia-Hungary	(142 km)	37	62	16.8	0.44	1.68
Hungary	(275 km)	36	48	13.0	0.17	1.33
Serbia-Croatia	(138 km)	10	26	7.0	0.19	2.60
Serbia	(220 km)	15	33	8.9	0.15	2.20
Serbia-Romania	(230 km)	5	17	4.6	0.09	3.40
Bulgaria-Romania	(471 km)	54	88	23.8	0.19	1.63
Romania	(ca. 600 km)*	15	25	6.8	0.04	1.67
Total	**> 3100 km**	**218**	**369**	**100**	0.12	**1.69**

*including Island Balta Ialomiței, Great Brăila Island and Stânca Greierghe Island

Types of breeding habitat of Little Ringed Plover



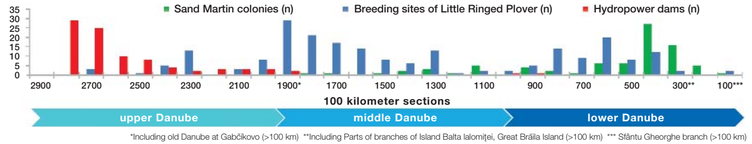
Breeding of Sand Martin along the Danube



TYPICAL SAND MARTIN HABITATS

at middle Danube

at lower Danube



*Including old Danube at Gabčíkovo (>100 km) **Including Parts of branches of Island Balta Ialomiței, Great Brăila Island (>100 km) *** Stântu Gheorghe branch (>100 km)

The monitoring showed 22,817 breeding pairs at 82 different colonies along the whole Danube. Most colonies were found in the border section of Bulgaria and Romania (between river-km 845 and 374) as well as in the region of the Island of Baltalalomiței (river-km 370 to river-km 250), which again highlights the high value of these areas. When higher plateau banks are sloped deeply by the Danube, the resulting huge natural river banks can offer perfect breeding sites; but smaller natural steep river banks at various places are also occupied by Sand Martin.

The largest colonies of Sand Martin were recorded in Serbia, with impressive colony sizes of more than 8,000 breeding pairs in two neighbouring colonies in the "Deliblato sands" Special Nature Reserve. Therefore, this section hosts by far the highest number of breeding pairs per river-km Danube-wide.

The total lack of this species along the Upper Danube is striking; there is no possibility for breeding directly on the main stream of the Danube because dynamic lateral erosion – the basic process initiating steep banks as suitable habitats – has ceased due to damming. Even in the last remaining free-flowing section of the Upper Danube, the river is more or less totally embanked and doesn't offer potential breeding sites.

Despite there being more potential habitats between Budapest and Belgrade, only very few colonies were recorded along the Danube in this section as well. Numerous colonies in artificial habitats in the hinterland were not counted in this monitoring.

Very similar to the distribution of the Little Ringed Plover, only few suitable breeding habitats are offered for this species by the Danube Delta with its huge reed areas and the Great Brăila Island with the banks mostly covered by woods.

Counrty / Section		Colonies (n)	(n)	Breeding pairs (%)	per/km	Mean pairs per colonies (n)
Germany	(658 km)	0	0	0.0	0.0	0
Germany-Austria	(29 km)	0	0	0.0	0.0	0
Austria	(321 km)	0	0	0.0	0.0	0
Austria-Slovakia	(8 km)	0	0	0.0	0.0	0
Slovakia	(22 km)	0	0	0.0	0.0	0
Slovakia-Hungary	(142 km)	1	60	0.3	0.4	60
Hungary	(275 km)	2	66	0.3	0.2	33
Serbia-Croatia	(138 km)	2	350	1.5	2.5	175
Serbia	(220 km)	6	8466	37.1	38.5	1411
Serbia-Romania	(230 km)	4	1330	5.8	5.8	333
Bulgaria-Romania	(471 km)	18	7321	32.1	15.5	407
Romania	(ca. 600 km)*	49	5224	22.9	8.7	107
Total	**> 3100 km**	**82**	**22 817**	**100**	**7.4**	**360.7**

*including Island Balta Ialomiței, Great Brăila island and Stântu Gheorghe branch

Conservation of indicator species and their habitats




This monitoring was conducted to learn more from the distribution pattern of the indicator species about the Danube-wide status of dynamic river habitats, which are threatened on a Europe-wide scale. Consequently, the presence and absence of these indicator species illustrates the status of these habitats, stressing the need for conservation or restoration. Apart from lower densities of Little Ringed Plover and Sand Martin in specific Danube sections for natural reasons (e.g. in gorges, on the Delta), human made hydro-morphological alterations such as dams, embankments or channelling of the river are generally identified as the main factors impacting the distribution of these species. Conversely, important breeding sites demonstrate valuable river sections in terms of dynamic river habitats. As a result of this monitoring, the Danube Protected Areas have formulated the following demands for the long-term conservation of Little Ringed Plover and Sand Martin, representative of habitats and hydro-morphological processes:

1. River dynamics and active morphological processes are vital for the Danube River ecosystem. Consequently, the construction of new dams and hydropower plants along the Danube is not compatible with the preservation of river dynamic habitats and their characteristic coenoses!

2. Permanent relocation of river sediments, arising from river dynamics combined with intact sediment balances, is needed to initiate the highly valuable habitats in young stages of succession. Development and implementation of (hydro-morphological) concepts are needed to ensure and restore the longitudinal continuity of sediment transportation along the Danube and its tributaries, and to assure the balance in material load per section as well as to restore consequent lateral mobilization of sediments.

3. Breeding sites of Sand Martin are priority subjects of protection! River regulation and embanking needs to be avoided at breeding colonies*, and the inclusion of the sites in Danube Protected Areas has to be intensified to ensure long-term conservation, in particular at the hotspots in the Lower Danube.

*As most colonies are located at erosion sites of plateaus, conflicts with flood prevention are not expected.

4. Gravel and sand islands are key habitats in the Danube ecosystem! These sites must not be negatively impacted by further river regulation and should consequently be included in Danube Protected Areas. Their hydro-morphological initiating and obtaining processes Danube-wide, as well as on a local scale, have to be preserved; investigations should be done for creation of additional sites.
In particular in the Middle and Lower Danube, building up a network of protected islands is seen as a relevant contribution.

5. In the Middle Danube, as well as existing colonies, potential nesting sites of Sand Martin (all steep natural river banks) are also to be strongly taken into consideration for conservation; embanking is to be avoided.
Despite numerous Sand Martin colonies in the hinterland, the number of breeding sites on the Danube between Budapest and Belgrade is relatively low and should be positively developed. (Potential) Sand Martin breeding sites indicate the capacity for natural positive recovery in this section.

6. The high restoration potential along the last remaining free-flowing sections of the Upper Danube needs to be used to restore dynamic river habitats!
The highest abundance of Little Ringed Plover in some "gravel sections" underlines the potential capacity for this species and its characteristic habitat structures in the Upper Danube, additionally highlighted by the positive impact of restoration projects. Removal of embankments is expected to create potential breeding slopes for Sand Martin.

7. In Danube sections altered by dams and hydropower plants, the (limited) restoration capacity should be used by specific revitalization actions.
Small breeding "populations" of Little Ringed Plovers in these sections show the potential for revitalization in particular at the beginning of backwaters.

8. The consequent implementation of NATURA 2000 and the Water Framework Directive, taking stronger river dynamics and morphological process into consideration, is to be used as a tool for the long-term conservation of these species, habitats and initiating processes.
The consequent implementation of these demands is a long-term investment in the future. In the short term, both species react very quickly to changes in their habitats. Successful examples of river restorations have a positive influence not only on Little Ringed Plover and Sand Martin – transparent representatives for the endangered coenosis of these valuable habitats – but on many other plant and animal species and, ultimately, on humans by providing habitats also suitable for recreation. Finally, conservation and restoration actions for the habitats of Little Ringed Plover and Sand Martin on a Danube-wide scale often contribute to ecological flood prevention by giving more space to the river. Long-term and integrative preservation of the ecological value of the Danube has to consider intact river morphology as a basic process of the river ecosystem.

Some of the most significant threats for the habitats of Little Ringed Plover and Sand Martin: riprap embankments, gravel excavation, hydropower dams, inland waterway traffic and human disturbance.





INVOLVEMENT OF THE PUBLIC

DANUBEPARKS intends to bring more attention to river morphological processes as a key for nature conservation along the Danube. The adaptation of Little Ringed Plover and Sand Martin to their habitats makes river dynamics visible and appreciable. Special excursions in Protected Areas, school events on Danube Day, an online video game on the DANUBEPARKS website, press events and video clips produced for the EU Strategy for the Danube Region have accompanied the monitoring. The great interest and positive feedback of stakeholders and the public qualifies the Little Ringed Plover and the Sand Martin as drivers for more river dynamics along the Danube.

Partner of the Danube River Network of Protected Areas

1 Danube Delta Biosphere Reserve	9 Lonjsko Polje Nature Park
2 Srebarna Nature Reserve	10 Duna-Dráva National Park
3 Kalimok-Brushlen Protected Site	11 Duna-Ipoly National Park
4 Rusenski Lom Nature Park	12 Dunajské luhy Protected Landscape Area
5 Persina Nature Park	13 Záhorie Protected Landscape Area
6 Djerdap National Park	14 Donau-Auen National Park
7 Gornje Podunavlje Special Nature Reserve	15 Donauauwald Neuburg Ingolstadt
8 Kopacki rit Nature Park	

c/o Duna-Ipoly
National Park Directorate
1121 Budapest, Költő utca 21., Hungary

DANUBEPARKS
network of protected areas