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## HAMBURG

### INTRODUCTION

This contribution is about the bird-life of the territory of the “Freie und Hansestadt Hamburg,” (excluding the isles in the North Sea Neuwerk, Scharhörn and Nigehörn), which occupies an area of 747 km<sup>2</sup>.

The position of Hamburg between the North and Baltic Sea, the sea and the hinterland and at the river Elbe (the largest river of northern Germany) has a great influence on its birdlife. The region is relatively rich in species because of the juxtaposition of three extensive landscapes: old and young moraines and marsh. As a result of these features Hamburg supports approximately 160 breeding bird species and about 80 species that visit the city for resting or wintering.

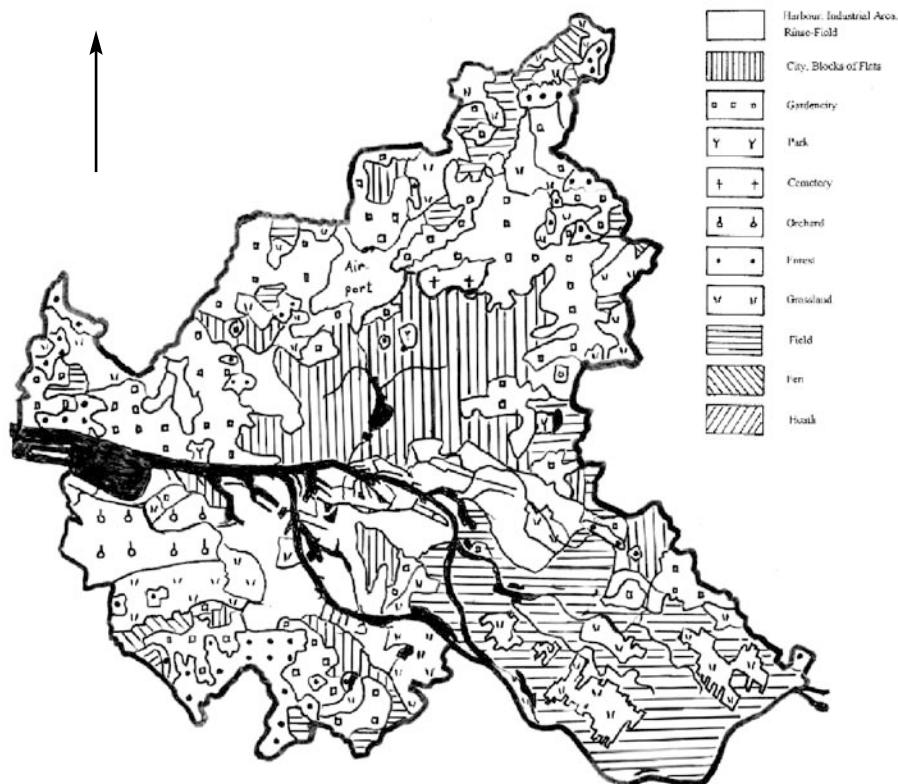


Figure 1: Map of Hamburg and some habitats

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*Figure 2: Hamburg Harbour – Common Gull colony  
Photo: G. Helm*

The marine influence on the birdlife is quite obvious, species such as terns, gulls, waders and waterfowl settle on the shores and islands of the river Elbe up to Hamburg whilst heavy storms in autumn and winter often sweep sea birds into the area. Only a few continental species such as Red-breasted Flycatcher and Thrush Nightingale reach the eastern boundary of Hamburg and some southern species such as Stonechat and Little Crake reach their northern limit here.

In addition to the climate, soil and vegetation the topography is an important feature. Typical of Hamburg is the complex juxtaposition of water and land, especially within the glacial valley of the river Elbe. At least, as important as the geographical features is the human impact. With 1.7 million people, Hamburg is the second biggest city of Germany after Berlin. The city is surrounded by several densely populated suburbs. It is not only the centre of important traffic and trade routes, it also lies on the flyways of many birds migrating from northern and eastern Europe.

Following the creation of large and densely populated urban conurbations they were colonised by birds, especially waterfowl and forest species, which have adapted to the urban environment. So, the history of the bird-life of Hamburg is tightly interwoven with the history of the city.

## HAMBURG IN FORMER TIMES

### *Historical development*

The “Hammaburg“ is first mentioned in 834 AD, when Ludwig, son of Charlemagne, built a town as a symbol of Christianity and to protect Franconia. The city, which was built on the spit of land between the rivers Elbe, Alster and Bille, provided shelter and protection for the Saxons against the attacks of the Wenden.

The first harbour had been constructed by the 13<sup>th</sup> century. Hamburg, as a member of the Hanseatic League, developed into a town for free tradesmen and merchants. It first became important as a centre of trade between the Elbe and the North and Baltic Sea. After the discovery of America (1492 AD), Hamburg expanded into a major overseas port surpassing Lübeck, which had been a much more important town up to that time. Although the number of citizens increased steadily the expansion of the town was constrained by its walls, which had been built in 1625 AD during the wars of the reformation to protect the inhabitants against the occupation of the city, rape and pilage. The presence of the walls resulted in cramped buildings and narrow streets. Only after 1860, when the locking of the wall gates in the evening was abolished, the surrounding land was developed linking the city to the suburbs. After a major fire in 1842 and even more so after the vast destructions by air attacks in 1943 there were more spaces and opportunities for buildings. Subsequent development spread into the natural landscape, which has been destroyed by new buildings. As a consequence bird species of these habitats decreased dramatically. On the other hand continuous urbanisation has brought other species nearer to the city – some colonised the centre very early, others arrived more recently.

Hamburg attained its present size by the “Groß-Hamburg-Gesetz” (1937); some competitive towns of the neighbourhood were linked to Hamburg by this law. The map (fig. 1) shows the territory of Hamburg and some of the more important habitats.

## TURNOVER OF BIRDLIFE UP TO 1940

### *Extinct species*

There was a marked change (mainly negative) in the bird-life of Hamburg during the 19<sup>th</sup> century; first, mainly by human persecution (trapping, shooting, collecting eggs) and second, by increasing habitat destruction caused by the building of houses, roads and factories. The changes in the avifauna were incompletely documented, however, it is known that prior to 1900 the following species became extinct: Black Stork, Short-toed Eagle, Great Bustard, Hoopoe, Roller and eventually Golden Plover. Later on the Black Kite also became extinct. In general, they were all large, remarkable species; no songbirds were recorded as becoming extinct during this period but perhaps nobody took a note of them.

*Decreasing species*

After 1900 the populations of many species, especially those of wetlands, declined as a result of habitat loss: White Stork, Snipe, Black Grouse, Little Owl and Sedge Warbler. The last one was reported (Gaedechens 1938) to be the most frequent species of its genus but today it is very difficult to find. As a result of increasing agricultural production there has been a continual loss of nutrient-poor habitats with very dry or very wet soils. This trend has continued up today, as a consequence the populations of species such as Corn Bunting, Whinchat, Wryneck and Nightjar have decreased. The colonies of noisy Rooks in the city were often destroyed (by people) and after the big fire of 1842, Jackdaws, which in earlier times bred in church steeples, disappeared from the city centre.

*New species*

By the 19<sup>th</sup> century the Corn Bunting had colonised the city from the east whilst Crested Lark and Black Redstart colonised from the south via the trafficways. By 1939 several other species had arrived, such as Grey Wagtail, Serin, Black Woodpecker, Shelduck and Tufted Duck.

*More frequent species*

As a result of the introduction of bird protection measures the population of species such as Tits, Flycatchers, and Redstarts increased. The Swift and House Sparrow populations grew with the city. Some of the wetland and forest species stayed in the city during the wintertime, showing increasing adaptation to the urban habitat. By the 19<sup>th</sup> century the 'Wood Blackbird' became the 'Garden Blackbird', since then its density has increased by 20 times (Luniak & Mulsow 1986). From 1910 onwards the Song Thrush followed this trend. The Woodpigeon, Magpie, Hawfinch, Coot and Moorhen were also found more frequently in towns.

## DEVELOPMENT OF THE AVIFAUNA UP TO NOW

In 1928 Hamburg was praised for the species-richness of its bird-life, which in addition to its geographical position and the diversity of its landscape could be related to the presence of undeveloped green areas, avenues and streams, which allowed birds to colonise the city (Dietrich 1928). An axis-model for the development of the city was proposed, which reduced the extent of industrial and business centres and residential areas along some main radial routes and defined the area in between as reserves for nature protection, recreation and to provide a healthy environment for people. However, after 1945 people wanted more economic growth and to make money rather than to care for nature. Today the last green belt left is the river Alster, which has been partly canalised and the water is polluted by the discharge of sewage. Drainage, the application of fertilisers (especially for agriculture) and the use of land

for buildings, which started about the same time and has continued, resulted in a long list of endangered bird species. In addition, other dangers for birds such as the intensification of agriculture and the application of DDT, with its well-known effects for raptors, also were observed in Hamburg.

Quantitative studies of the avifauna (including territory mapping, especially of the inner city) and the counting of migrating and wintering birds were undertaken in Hamburg earlier than in most other European cities.

The number of long-distance migrant species has decreased since 1960, especially so in habitats influenced by man. Some species such as Nightingale and Marsh Warbler stabilised later on but at a lower level. Resident species and short-distance migrants have benefited from human activities, fewer predators, the more mild winter climate and an abundance of food during the winter which has reduced the rate of winter mortality. As a result there have been remarkable increases in the populations of such species as Wren (see fig. 3), Robin, Chiffchaff and Blackcap (Mitschke et al. 2000).

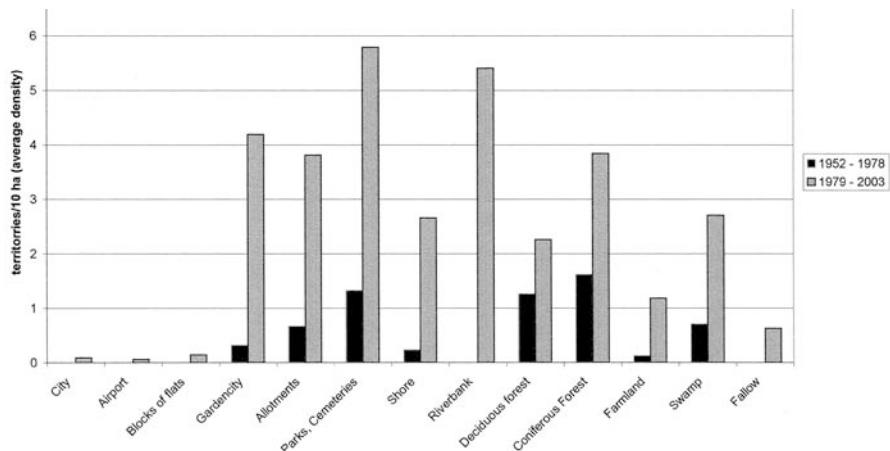


Figure 3. Wren; densities in different habitats and periods.

Since 1970 and after the ban of DDT and hunting, the populations of most of the predators recovered, the Goshawk has even colonised the urban parks. The Grey Heron population has also recovered.

From 1970 losses were reported of some of the earlier colonisers, for example Crested Lark and some more recent colonisers, for example the Collared Dove. In 1975, the Collared Dove held 21 territories on a plot in the garden-city but only one in 1999. In addition, dramatic losses have been observed in the populations of some

of the older inhabitants of the city such as the House Sparrow, the numbers of which have declined by at least 50 %. Nowadays it is no longer ranked at the top of the dominance list but at rank four after the Blackbird, Great Tit and Blue Tit. Both the House Sparrow and the Tree Sparrow have more or less disappeared from all the urban parks and cemeteries. Other major losses have been recorded for the Song Thrush (50 %), Partridge and Redstart (80 %, see fig. 4).

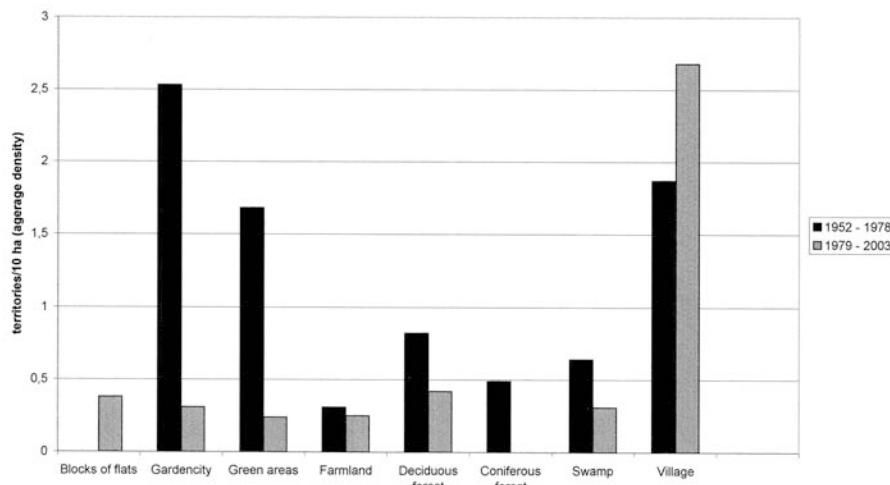


Figure 4. Redstart; density in different habitats and periods.

Other species that have declined include: Tree Pipit, Whitethroat, Lesser Whitethroat, Willow, Wood and Icterine Warbler, Spotted and Pied Flycatcher, Starling, Greenfinch and Linnet. On the other hand, some forest species have colonised the centre of the city; they include Blackbird, Woodpigeon, Jay and the Magpie; some have started to breed on buildings. Species of open landscapes, wet and dry pastures and marshes have also declined, especially the insectivores and long-distance migrants. A survey of the more serious changes on the species level is given as follows:

*Extinct:* Tawny Pipit (1963), Wood Sandpiper (1966), Great Grey Shrike (1967), Ortolan Bunting (1970), Corn Bunting (1973).

*Nearly extinct:* There are only a few territories of Partridge, Curlew, Little Owl and probably Wryneck.

*Decreased:* Bittern, Water Rail, Snipe, Barn Owl, Redshank, Black-tailed Godwit, Woodcock, Skylark.

*Recently recovered:* Cormorant, Grey Heron, Crane, Red Kite, Raven, Eagle Owl.

*Increased:* Mallard, Gadwall, Coot, Common Gull, Nuthatch, Coal Tit, Black Redstart, Redpoll, Stonechat.

*Newcomers:* Oystercatcher (1949), Collared Dove (1953), Pochard (1961), Penduline Tit (1962), Fieldfare (1968), Mediterranean Gull (1969), Herring Gull (1970), Canada Goose (1975), Greylag Goose (1977), Avocet (1985), Redpoll (1991), Scarlet Grosbeak (1999), Goldeneye (1999), Lesser Black-backed Gull (2000), Great Black-backed Gull (2003), Peregrine – and in the neighbourhood: White-tailed Eagle.

*Irregular breeders:* Bearded Tit, Thrush Nightingale, River Warbler.

*Alien Species:* Whooper Swan, Mandarin Duck, Egyptian Goose, Ring-necked Parakeet; near Hamburg: Ruddy Shelduck.

## HAMBURG TODAY – HABITATS AND THEIR BIRD COMMUNITIES

### *General*

The area and proportion of the different habitats taken from a habitat map prepared by the Ministry of the Environment are listed in Table 1, for a more detailed description of these habitats and their bird-life see Mulsow (in Holzapfel et al. 1984).

*Table 1. The area and proportion of the different habitats found in Hamburg*

habitat	(km <sup>2</sup> )	% of total
Gardencity	141,2	19 %
Grassland	101,0	14 %
Blocks of flats	86,8	12 %
Industrial areas	61,5	8 %
Fields	56,0	8 %
Parks	30,0	4 %
Deciduous Wood	28,7	4 %
Horticultural fields	24,5	3 %
Allotment Gardens	22,2	3 %
Others	195,1	26 %
<b>total</b>	<b>747,0</b>	<b>101%</b>

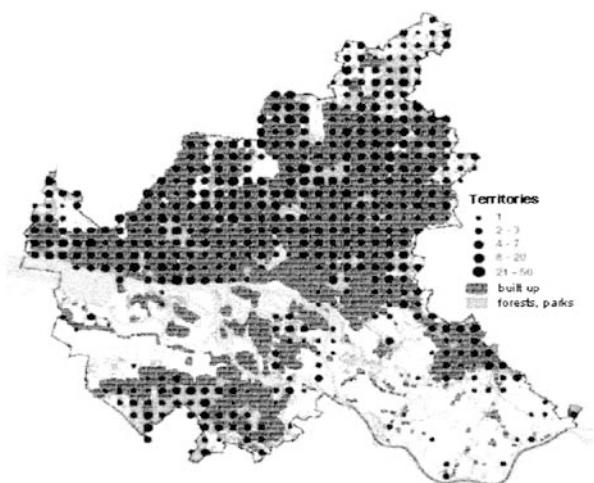
Between 1997 and 2002, about 90 ornithologists mapped the presence of breeding birds in an area of 768 km<sup>2</sup> (including some km<sup>2</sup> along the city's border), 160 species were found. The most abundant species within the 768 km<sup>2</sup> are listed in Table 2 (details of the study are given in Mitschke & Baumung 2001).

*Table 2. Breeding birds of Hamburg in 1997-2000 ranked by the number of pairs.*  
*Distribution Index (DI) = the number of squares occupied by the species expressed as percentage of the total number of squares (768)*

species	pairs	DI	13. Blackcap	11.500	96,2
1. Blackbird	70.000	99,5	14. Feral Pigeon	10.600	41,4
2. Great Tit	36.000	98,8	15. Magpie	7.500	86,6
3. Blue Tit	10.600	97,8	16. Tree Sparrow	5.500	70,2
4. House Sparrow	29.000	85,3	17. Swift	5.400	45,2
5. Wren	18.000	94,1	18. Song Thrush	5.000	82,7
6. Greenfinch	17.700	94,9	19. Willow Warbler	4.600	76,3
7. Woodpigeon	17.300	97,5	20. Carrion Crow	4.400	91,5
8. Chiffchaff	16.400	98,4	21. Bullfinch	4.100	62,8
9. Chaffinch	14.500	95,3	22. Jay	3.200	75,2
10. Dunnock	13.500	95,5	23. Wagtail	3.000	75,5
11. Starling	13.000	91,2	24. Mallard	2.800	68,8
12. Robin	12.000	85,3	25. Gr. sp. Woodpecker	2.700	69,5

The top ranking species have changed over the years. For example 30 years ago the House Sparrow, Blackbird and Greenfinch occupied the first three places. In 1967 within an area comprising 75 km<sup>2</sup> of the garden-city and blocks of flats, the top 10 species were: House Sparrow > Blackbird > Greenfinch > Starling > Great Tit > Woodpigeon > Song Thrush > Chaffinch > Blue Tit > Dunnock (Mulsow 1968).

Since 1967 Great Tit and Blue Tit have increased remarkably while losses of the House Sparrow have continued. The most species-rich area is the agricultural land within the surroundings of the city. In summer there may be 60-80 breeding species. Those habitats that support the lowest number of species are the city, harbour, indus-



*Figure 5. Distribution of the Bullfinch.*

trial areas and blocks of flats, where there are only between none and 20 breeding species per km<sup>2</sup>.

The largest number of endangered bird species in Hamburg live in the Elbe marshes, which contain extensive orchards and grasslands of great ecological value. The highest densities of territories are found in the garden-city and parks (Mulssow 1980). One of the surprising results of the last (1997-2000) mapping exercise is the fact that the Bullfinch avoids the marshes of the river Elbe (see fig. 5).

### *City*

#### *Birdlife in summer*

After 1945 only a few old buildings remained in the historical centre, which is now characterised by new buildings constructed of glass and concrete. There is an extreme poverty of species in this area because of the small amount of vegetation cover (only individual, planted trees) and the lack of nesting sites. The watercourses have been canalised and the water is polluted. Large areas are covered with paving, roads and other hard surfaces and much of the soil is compacted.

Nevertheless, on a plot of 22 ha the number of species increased by five new species over 30 years; from 7 in 1966 to 12 in 1996. The number of territories of Blackbird increased while the House Sparrow suffered a serious decrease. These changes probably occurred for two reasons, first, the planted trees matured and second, the continual adaptation of the species to the urban habitat. The typical features of this area are the dominance of the Feral Pigeon and the presence of summer visitors that breed in the area but use other areas for foraging, for example the Swift, Kestrel, House Martin (which builds its nest from mud obtained from the canals at low-tide) and Woodpigeon, which may fly rather far from its nesting place for foraging. Some general features of adaptation to increasing urbanisation are shown by other species, especially for Magpie and Carrion Crow, which have colonised the central area and the Jay, which occurs on the blocks of flats.

#### *Birdlife in winter*

Gulls and many waterfowl rest on the Alsterlake and on the canals: Black-headed Gull, Mallard, Coot, Goosander. Since 1960 some winter roosts of Starling and Twite have been reported. These roosts are occupied from November to March, when the total number of Twites actually roosting on the north side of the Town Hall is nearly 200. Up to 1970 the Peregrine could be seen resting on the church towers and during recent years it is sometimes watched in the harbour area.

### *Harbour and Industrial Areas*

#### *Birdlife in summer*

The harbour and the industrial areas of the city, which cover a total of 77 km<sup>2</sup>, have a high level of human activity including a lot of traffic movements and loud noise,

consequently the number of species and their densities are low. However, if the neglected/disused areas are allowed to lie fallow, they attract rare and endangered species, such as Tawny Pipit, Stonechat, Penduline Tit, Partridge, Little Tern and Avocet.

The characteristic breeding species of this habitat are Feral Pigeon, Black Redstart, House Sparrow, Kestrel. Two fallow areas have recently been colonised by and support colonies of gulls; the species present and the number of pairs found during the 2003 breeding census are as follows: Common Gull 2,808 (fig. 2), Herring Gull 200, Lesser Black-backed Gull 10, Mediterranean Gull 12, Great Black-backed Gull 1.

#### *Birdlife in winter*

The dominant species include the House Sparrow and Feral Pigeon together with such species as the Black-headed Gull and Mallard. Those harbour basins that receive warm water discharges from power stations are used by Cormorants, Shelducks, Goosanders, Smews, Great Crested Grebes, Little Grebes, Pochards and Tufted Ducks to rest.

#### *Blocks of Flats*

##### *Birdlife in summer*

This zone, which is contiguous with the city centre, is characterised by older blocks of 3-6 storey flats that are very close to each other. The new flats that have been built in this area are more widely spaced. Vegetation covers a larger area than it does in the city, but this is often merely lawns and a lonely tree. Between 1966 and 1976 25 breeding species were found on seven plots covering a total of 265.5 ha (Mulsow 1980). Cave nesting and grain feeding species were dominant in this community together with strongly urbanised and mainly resident species. The typical species

*Table 3. Changes in the densities of the most important breeding species of the blocks of flats between 1960/70 and the 1990's.*

	<b>Territories/10 ha</b>			
	<b>1960/70*</b>	<b>1990's**</b>		
House Sparrow	36,8	<u>10,8</u>	Great Tit	1,4 <u>6,3</u>
Feral Pigeon	15,3	18,5	Woodpigeon	0,7 <u>4,7</u>
Blackbird	11,8	13,6	Crested Lark	0,7 <u>0,0</u>
Greenfinch	3,4	2,2	Collared Dove	0,7 <u>0,1</u>
Swift	3,2	<u>1,7</u>	Blue Tit	0,3 <u>4,5</u>
Starling	2,6	1,5	Chaffinch	0,2      1,7
			Dunnock	0,1      2,4
			Carrión Crow	0,04     1,1
			Magpie	0,0 <u>2,7</u>

\* seven plots = 265.5 ha

\*\* two plots = 59,2 ha

Note: underlining indicates a clear decline or increase

were: House Sparrow and Swift (with their highest densities in this area), Black Redstart and Feral Pigeon. As long as there were areas being developed, the Crested Lark was rather abundant but today it is nearly extinct. The mean densities of the most important species and their gains and losses during the last decades are given in Table 3. The Collared Dove and the House Sparrow have suffered strong decline since 1980; the former species has shown a similar trend in Berlin.

#### *Birdlife in winter*

In areas where there is open water the number of species may be higher in winter than in the summer (about 40 species versus about 30 species). The dominant birds (from 1974-76 census) were: House Sparrow, Feral Pigeon, Blackbird and Black-headed Gull. Winter visitors sometimes occur in this area, especially looking for berry-fruited trees that occur between the blocks of flats, the species include Redwing, Fieldfare, Redpoll, Siskin and Waxwing.

#### *Garden-City*

##### *Birdlife in summer*

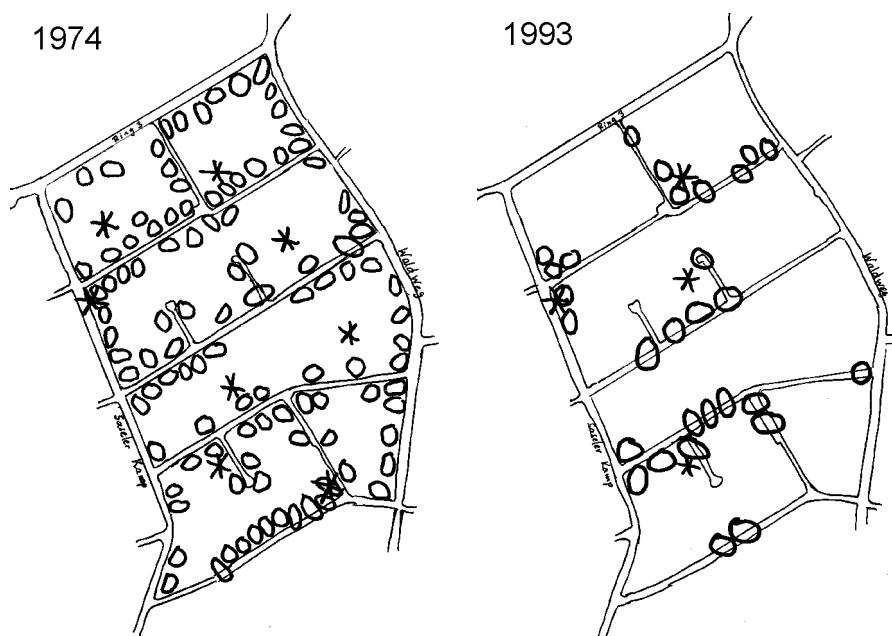
This green belt, which occupies the largest area of the city, is the most important urban zone for many birds. The habitat becomes continuously larger from inner parts of the city to the outskirts (see fig 1). During the last 20 years the Coal Tit and Crested Tit have colonised those areas where there were many coniferous trees in the gardens. In some areas where there are old trees Goldcrest, Nuthatch and Great Spotted Woodpecker have become established. Table 4 shows 'winners and losers' of the last 30 years on a 30 ha plot, which has been surveyed several times since 1974. This long-term study plot is generally typical of the garden-city habitat as a whole.

*Table 4. Changes in the abundance of breeding birds of the garden-city: Territories on a 30 ha long-term study plot since 1974 (for details see Mulsow 1980).*

	<b>Territories</b>				
	<b>1974-76</b>	<b>1999</b>			
House Sparrow	96,6	44	Collared Dove	17,6	1
Blackbird	63,6	85	Song Thrush	10,3	2
Great Tit	20,0	41	Serin	7,3	0
Blue Tit	9,0	25	Redstart	3,6	0
Robin	0,3	16	Chiffchaff	0,6	7
			Wren	2,3	21

In general, rare species and mainly long-distance migrants such as the Swallow, Spotted Flycatcher, Pied Flycatcher, Icterine Warbler, Serin and Redstart disappeared completely. House Sparrow (see fig. 6), Collared Dove and Song Thrush suffered heavy losses. Finally there were only a few colonies of House Sparrows left near the

last of the livestock holdings. The 'winners' have exploited the opportunities provided or by the many mild winters and food provided by people during the winter months. The numbers of some species, especially residents and short-distance migrants, increased 10 times and more, for example, Chiffchaff, Robin and Wren. Blackbirds reach their highest densities in this habitat (sometimes > 40 territories/10 ha).



*Figure 6. Territories of the House Sparrow in the gardencity of Hamburg-Sasel (30 ha-plot; Mulsow in Mitschke et al. 2000).*

✖ = life stock holding

#### *Birdlife in winter*

While there is a stable ranking of the density of resident species, the rank order can be distorted in different ways from winter to winter by invasions of vagrants. The most abundant winter visitors in Hamburg are Black-headed Gulls, Rooks, Fieldfares and Siskins.

The first seven in the current ranking are: Greenfinch, Blackbird, Great Tit, Blue Tit, House Sparrow, Magpie and Woodpigeon. The question remains, whether birds will come into the city during cold winters and if so, how many of them?

#### *Green Areas*

##### *Birdlife in summer*

The parks and cemeteries contain a high diversity of vegetation and birds, especially woodland species. However, these areas are subject to a lot of disturbance by peo-

ple visiting them. The more rare species have found their niche in the very large parks and similar areas, for example the forest-like parts of the Ohlsdorf cemetery (410 ha), the Stadtpark (180 ha) and the Volkspark (160 ha) where even some raptors such as Sparrowhawk, Goshawk, Hobby and Eagle Owl breed.

The bird community is similar to that of the garden-city but since 1980 both Tree and House Sparrows have experienced strong declines. Today it is very difficult to find any sparrows in this habitat. The bird with the highest densities is the Dunnock, which benefits from dense shrubs and well trimmed hedges, especially in those cemeteries with a lot of coniferous trees.

The old Botanical Garden (8 ha), which forms part of the former city wall area and is situated very closely to the centre of the city has lost eight species since 1955 – mainly insectivores and migrants.

#### *Birdlife in winter*

The number of species that occur in this habitat reaches its peak in summer and decreases remarkably in the winter, nevertheless the species-richness during the winter is the highest of all the habitats in the city (Mulsow 1980). The number of winter visitors depends on just how severe the winter is. Table 5 shows the most abundant of the winter species in three types of the green areas. The counts were made along line transects but used different methods.

*Table 5. The most abundant species in different types of green areas in winter.*

parks with waters (1964-67; app.15 km)	%	cemetries (1975-77; 24 km)	%	cityparks (1992-2002; 380 km)	%
Black-headed Gull	35,7	Woodpigeon	21,9	Mallard	13,5
Mallard	28,4	Black-headed Gull	16,8	Coot	9,2
Coot	6,6	Rook	8,3	Black-headed Gull	7,9
House Sparrow	5,7	Redpoll	8,3	Blackbird	5,0
Siskin	2,6	Blackbird	6,2	Woodpigeon	4,8
Blackbird	2,3	Mallard	4,9	Great Tit	4,8
Common Gull	1,7	Brambling	4,2	Siskin	4,6

#### *Agricultural Areas*

##### *Birdlife in summer*

Outside of the Elbe valley the farmland on the moraines normally forms a mosaic of fields and pastures separated by “Knicks” (long hedges or rows of trees on a small wall). Some of the grassland areas within the marshes of the river Elbe are also bordered by trees or shrubs. There are also large horticultural fields that are extremely poor in birds. Most of the species breed in the hedgerows; the few species that breed

in the fields include Lapwing, Partridge and Skylark; most of the species breed in the hedgerows. In 1902, Whitethroat and Yellowhammer were the most abundant breeding species (Dietrich 1903) in the "Knicks". Today the four most abundant species are Blackbird, Great Tit, Dunnock and Woodpigeon. In the course of the land consolidation and later on the intensification of agricultural production using fertilisers and herbicides, the populations of several species suffered major decreases, for example the Skylark, Yellowhammer and Tree Pipit have lost 40-80 % of their populations and Partridge and Corn Bunting have nearly disappeared.

As a result of intensive agricultural production many of all the small habitats such as fallows, ditches, ponds, wetland and small forests have disappeared. The application of ecologically based land management has only gained importance during recent years. This has been beneficial for bird-life because nowadays the requirements of nature conservation are taken into account much more, especially in the use of low-impact engineering works to watercourses, track and road construction. As a consequence of several large flood disasters even restoration of river floodplains may get its chance. It is hoped that land consolidation in future will benefit both farming and nature. Hence, long-suffering species such as the Red-backed Shrike, Golden Oriole and Linnet may recover.

#### *Birdlife in winter*

Whilst a relatively large plot (100 ha and more) with many different small-scale habitats may support more than 70 species in the breeding season, in winter there is a substantial decline to 20-30 species. The dominant winter birds on the fields are the "flocking birds" such as Woodpigeon, Fieldfare, Rook, Siskin and residents such as thrush and tit species. There is a wide variation from winter to winter.

#### *Forests*

##### *Birdlife in summer*

Hamburg is the federal state of Germany with the smallest area of forest – 5 %. Fortunately there are only a few private forests therefore most of the forest areas are in the responsibility of the forest authority, which in recent years has introduced a more sympathetic nature conservation and ecological management strategy into the public forests.

The old deciduous forests that comprise a wide variety of tree species support 60 breeding bird species with up to 80 breeding species being found in the wet bog forest. The characteristic species include Chaffinch, Robin, Wren and Pied Flycatcher. The coniferous forests are remarkably poorer in birds; typical species are Coal Tit and Goldcrest. The endangered Woodcock has found its niche only in the wet forests in the east and north of the city.

During the last ten years two small owls have colonised the coniferous (fir) forests to the south and east of the city, namely the Tengmalm's Owl and the Pygmy Owl. The reason for this may be the general expansion of the range of both species.

*Birdlife in winter*

During the winter the density of species and individuals is also higher in the old forests (30-40 species) than in young ones. The most abundant winter birds are Siskin, Great Tit, Blue Tit, Goldcrest, Chaffinch and Blackbird.

*Grassland*

*Birdlife in summer*

Natural grassland is extremely rare in Hamburg, however some wet remnants of fens and dry, low-productivity grassland can be included in this category. Most of the grassland comprises the pastures in the Elbe valley. It is an artificially established and maintained habitat that can only be preserved by mowing or cattle grazing. There are still some valuable wet grasslands in the Elbe marshes southwest of the city, where Corncrakes live. Several years ago they emerged like movie-stars because their presence prevented the construction of blocks of flats.

The marshes – reeds and waters included – belong to the most valuable landscapes for nature because they are home for many rare and endangered birds. During the last 20 years many of the “pasture birds” have decreased dramatically as the result of intensive management such as heavy grazing, frequent mowing, manuring, rolling and drainage improvements (including dam constructions) that lowered the water-table. As a result of these ‘improvements’ the following species have lost up to 80 % of their population: Black-tailed Godwit, Redshank, Snipe, Lapwing, Skylark, Yellow Wagtail etc.

The number of territories present on a plot of 102 ha in Hamburg-Finkenwerder has been studied several times, the results are given in Table 6.

*Table 6. Loss of territories between 1979 and 2001.  
(See Holzapfel 1981 for further information and Rahr [unpubl.])*

	1979	1994	1997	2001
Lapwing	36	22	5	2
Black-tailed Godwit	17	4	1	0
Redshank	11	5	2	0
Snipe	3	0	0	0
Partridge	3	0	0	0
Blue-headed Wagtail	8	1	1	1
Whinchat	3	0	0	0

*Birdlife in winter*

As in the farmland habitats vagrants and “flocking species” constitute the dominant species, for example, Woodpigeon, Rook, Fieldfare and in some years, Siskin. Large flocks of swans, geese and ducks often rest in the Elbe marshes, where hundreds or

even thousands of the White-fronted Goose, Brent Goose, Greylag Goose and sometimes Bean Goose can be seen.

#### *Other habitats*

As a percentage of the total surface area of the city the ‘other habitats’ are negligible, however they are important for some bird species. Once there had been a lot of swamps in Northern Germany, but most of the peat bogs have been destroyed by the extraction of the peat. Fens have been cultivated or they disappeared under road and other constructions. As a consequence of these activities the breeding habitats of Golden Plover, Wood Sandpiper or Black Grouse were lost. The number of other breeding birds including Bittern, Rails and Black Tern decreased. The typical species of these areas are now Tree Pipit, Reed Bunting, Whinchat and Willow Warbler. Since 1980 the Crane has returned and during the last few years the Stonechat has also recovered.

Southwest of the city, within the marshes, the “Altes Land” is the largest continuous area of orchards in Europe. Nowadays the fruit-farming has been intensified as well; hence farmers apply more fertilisers and pesticides and replace the old fruit trees with low-growing varieties. Nevertheless this area is still the stronghold for several grain-eating species such as Serin, Linnet and Goldfinch – all three prefer the marshes. The ‘Altes Land’ was the first area of Hamburg to be colonised by the Redpoll, whose populations are more associated with the villages. The presence of the species was first detected in the area as a result of the atlas mapping exercise of 1997-2002 (more details are contained in Mitschke & Baumung 2001). The Redpoll is one of the few species that has colonised the city from the western Elbe region.

As a consequence of the frequent deepening of the Elbe river because of the ever growing size of merchant ships it is necessary to provide ‘silt lagoons’ to dispose of the dredgings, which comprise water-logged sand and mud. The lagoons and rinse fields, which are mainly situated in the harbour area and on islands in the Elbe, provide resting and breeding habitats for several water birds, waders, terns and gulls, for example Shelduck, Oystercatcher, Avocet, Ringed Plover, Little Tern and Common Gull. After several years the lagoons are usually colonised by vegetation and as a result they become unsuitable for wildfowl and waders, which have to find new breeding sites.

On the western border of the city, just before the river narrows, there are the last large areas of freshwater mudflats in Hamburg – the Mühlenberger Loch. This area is of international importance because of the high populations of resting water birds it supports. Unfortunately this habitat was partly destroyed and is highly endangered by an aircraft factory. Very important for the birdlife are the many still and moving water habitats in the Hamburg area. Still waters, such as lakes and ponds (most of which are shallow and contain nutrient-rich water), provide breeding habitats for waterfowl and reed-living passersines like Reed Warbler, Bluethroat and Savi’s Warbler. The most important moving water habitats are the Alster and Bille creeks, both are small tributaries of the Elbe. The water in the upper regions of these creeks is very clear and supports Kingfishers and Grey Wagtails. These tributaries also provide the winter habitat for Dippers from Scandinavia.

### A COMPARISON OF THE BIRD-LIFE IN THREE GERMAN CITIES

Situated right in the heart of Europe, Berlin is the biggest city of Germany; it is about 250 km ESE of Hamburg. Bonn, the capital of the former West Germany is located about 360 km SW of Hamburg and about the same distance WSW of Berlin.

The climate of the three cities is different; Berlin has a distinctly continental climate whereas that of Hamburg is oceanic. The climate of Bonn is influenced by its more southerly position.

A comparison of the arrival dates of long-distance migrants such as Swift and Nightingale shows that they reach their breeding grounds in the order Berlin, Bonn, Hamburg. On the other hand Dunnock and Black Redstart, which partly overwinter in Hamburg start to establish territories in Hamburg earlier than they do in Berlin or Bonn.

The zoogeographic difference is also reflected by the density and/or the size of the population of some species (for example see Dunnock and Song Thrush in Table 7). These data, from recent studies by ornithologists in Berlin (Witt et al. 2003), support this hypothesis. The studies showed that the Atlantic climate encourages some forest species to colonise the urban areas of Hamburg to a greater extent than they do in cities with a continental climate. On the other hand the cave-nesting species that use buildings have a greater advantage in cities with more continental climate. Table 7 shows a selection of data for some breeding birds of the three cities.

*Table 7. Comparison of physical and climatic differences and aspects  
of the birdlife of three German cities*

Sources: Otto & Witt 2002; Mulsow original, Rheinwald in litt.

	Berlin	Hamburg	Bonn
Area	900 km <sup>2</sup>	747 km <sup>2</sup>	141 km <sup>2</sup>
Inhabitants	3,400,000	1,700,000	250,000
Geographic Position	13°24' E / 52°31' N	10° E / 53°33' N	7° E / 50°40' N
Temperature-average			
January	0.4 °C	-0.3 °C	1.3 °C
July	17.9 °C	17.1 °C	18.2 °C
Annual	8.9 °C	8.5 °C	10.7 °C
Mean annual precipitation	596 mm	729 mm	< 900 mm
No. breeding bird species	139	159	152
<b>Swift</b>			
Median first arrival	22.4. (1965-99) up to 1982:7x earlier after 1982:11x earlier	27.4. (1948-58) 26.4. (1959-79) 26.4. (1979-99)	24.4. (1930-85)
Average density	17 pairs/km <sup>2</sup> (on 680 km <sup>2</sup> )	7.1 pairs/km <sup>2</sup> (on 345 km <sup>2</sup> )	4.3 pairs/km <sup>2</sup>
Size of population	13,000 pairs	5,400 pairs	3,000

Table 7 (continued)

	<b>Berlin</b>	<b>Hamburg</b>	<b>Bonn</b>
<b>Nightingale</b>			
Median first arrival	19.4. (1965-99) up to 1982: 5x earlier after 1982: 12x earlier	27.4. (1948-58) 27.4. (1959-79) 22.4. (1979-99)	20.4. (1950-85)
Average density	12 pairs/km <sup>2</sup> (on 680 km <sup>2</sup> )	0.5 pairs/km <sup>2</sup> (on 162 from 768 km <sup>2</sup> )	0.1 pairs/km <sup>2</sup>
Size of population	1,500 pairs	350 pairs	20 pairs
<b>Black Redstart</b>			
Median first arrival	22.3. (1965-99) up to 1982: 6x earlier after 1982: 12x earlier	20.3. (1948-58) 22.3. (1959-77) 19.3. (1979-99)	24.3. (1957-80)
Average density	10 pairs/km <sup>2</sup> (on 680 km <sup>2</sup> )	3.1 pairs/km <sup>2</sup> (on 534 from 768 km <sup>2</sup> )	?
Size of population	5,000 pairs	2,350 pairs	ca 1,500 pairs
<b>Song Thrush</b>			
Date of first song	28.2. (1965-99) up to 1982: 8x earlier after 1982: 9x earlier	28.3. (1949-59) 26.2. (1959-79) 24.2. (1979-99)	9.3. (1957-80)
Average density	11 pairs/km <sup>2</sup> (on 156 km <sup>2</sup> )	6.6 pairs/km <sup>2</sup> (on 631 from 768 km <sup>2</sup> )	8.0 pairs/km <sup>2</sup>
Size of population	1,700 pairs	5,000 pairs	< 1,000 pairs
<b>Dunnock</b>			
Date of first song	28.2. (1987-99) 28.1. (1959-79) 27.1. (1979-99)	18.2. (1949-59)	app. 15.2.
Average density	0.3 pairs/km <sup>2</sup> (on 900 km <sup>2</sup> )	17.7 pairs/km <sup>2</sup> (on 729 from 768 km <sup>2</sup> )	10.3 pairs/km <sup>2</sup>
Size of population	app. 250 pairs	13,500 pairs	1,500 pairs

Species that breed in Berlin and not at all or irregularly in Bonn and Hamburg are Tawny Pipit, Redwing, Barred Warbler and Hooded Crow, whilst the "Hamburgers" are: Shelduck, Eagle Owl (which breeds irregularly in Bonn), Black-tailed Godwit, Redshank, Curlew, Common Sandpiper, Ringed Plover, Avocet, Oystercatcher, Herring Gull, Lesser Black-backed Gull, Great Black-backed Gull, Mediterranean Gull, Little Tern. Bonn comes up with: Black Stork, Grey-headed Woodpecker, Dipper, Yellow-legged Gull, Little Owl (nearly extinct in Hamburg); in the surroundings: Nutcracker, Melodious Warbler and Rock Bunting.

## BIRDS AS VISITORS IN HAMBURG

### *Summer*

The summer birdlife of Hamburg contains a proportion of non-breeding individuals, most of which do not occupy fixed territories, but stroll along searching for food. If they are of a resident breeding species these individuals are rarely noted, however, if the species have a breeding range that is further to the east or south, the birds are recorded as summer visitors. Some species occur in the area as a consequence of special weather conditions, for example Great White Egret, Purple Heron, Pratincole, Black-winged Stilt, Caspian Tern and Woodchat Shrike. The Red-footed Falcon, Redpoll, Two-barred Crossbill, Crossbill, Parrot Crossbill invade the area irregularly, usually in July and August. Especially in weather conditions with persistent strong winds, resulting from high pressure areas in Russian and Azores (causing a strong east to west-'wind'), rare species of continental origin may occur such as Short-toed Eagle, Lesser Spotted Eagle, Spotted Eagle, Whiskered Tern and White-winged Black Tern, Hoopoe or Greenish Warbler.

### *On Migration*

More than 100 bird species visit Hamburg on migration between their winter quarters and their breeding grounds. They may rest in their preferred habitats for a few days or weeks or even for several months. Some of these visitors occur on migration only, such as Osprey, Greenshank, Little Gull and Ring Ouzel. Other visitors, which may rest during winter time, reach peak numbers at certain times when some individuals migrate further to some distant winter quarter while some other individuals may stay, for example Rough-legged Buzzard, Bewick's Swan, White-fronted Goose, Wigeon, Redwing, Siskin.

Another group comprises breeding species that appear in larger numbers during the migration periods when individuals from other breeding grounds fly over the city, included in this category are: Honey Buzzard, Lapwing, Swift, Larks and Warblers. Some so-called resident species sometimes cause surprise by occurring in large numbers during migration periods: Greylag Goose, Goldeneye, Buzzards, Fieldfare, several tit species and Chaffinch.

Information about the presence of a rare visitor is passed quickly from one ornithologist to another, as a consequence many observers gather to see species such as Great Northern Diver, Dotterel, Temminck's Stint and Red-necked Phalarope.

### *Accidentals*

We know that birds have genetically encoded means of determining compass orientations in order to find the right route from their breeding grounds to their winter quarters and back. However, in some cases they may have bad luck and encounter weather conditions that cause them to become disorientated. For example prolonged air movements in a different direction, severe storms, fog and dense snowfall, which may turn them off the correct route. High sea species are a special group, which reach

Hamburg in quite large numbers if storms from the northwest blow into the mouth of the river Elbe from where they find shelter and rest on the upstream section of river Elbe, on the Alster and on other quiet waters. Among these species are: Arctic Skua, Fulmar, Manx Shearwater – which has been found worn-out on two occasions –, Storm Petrel, Gannet, Kittiwake and Guillemot.

Species of Mediterranean or Oriental origin also appear in Hamburg, for example the Cream-coloured Cursor (which was seen on 9 September 1961 among Lapwings), Pratincole and on one occasion the Blue-cheeked Bee-eater.

It is presumed that the Wallcreeper, which was seen at the Planetarium from 4<sup>th</sup> of February to 6<sup>th</sup> of April 1950, came from the Alps and that Alpine Swifts, which have been seen on two occasions originated from the same area. Rare visitors from eastern Europe include: Spotted Eagle, Great Snipe, White's Thrush, Blyth's Reed Warbler, Greenish Warbler, Yellow-browed Warbler and Dusky Warbler. Rare visitors from the northern Tundra are sometimes seen in the wide treeless marshes of the Elbe valley: Iceland Gull, Glaucous Gull, Snowy Owl, Hawk Owl, Lapland Bunting and Little Bunting.

#### *Invasion species*

There are several common migrant species that appear in extraordinarily high numbers in some years, included in this group are Blue Tit, Jay, Brambling, Siskin, Redpoll and Crossbill. The ‘true invaders’ are species that do not breed in Hamburg, they generally appear irregularly with the ‘invasions’ being several years apart, for example the Waxwing which had large invasions within a rhythm of about 10 years – 1903/04, 1913/14, 1923/24, 1931/32, 1941/42, 1953/54, 1964/65 and 1988, with smaller invasions between. Large invasions of Nutcracker happened in the years 1955, 1968 and 1977. A notable event in the second half of the 19<sup>th</sup> century were the great influxes of Pallas’s Sandgrouse, which were also recorded in Hamburg in 1863 and 1888.

#### *Aliens*

Aliens are species that have been brought to Hamburg with human help. Some of these species have ‘naturalised’ and now breed in the wild. The population of the north American Canada Goose can be traced back to continuous releases from the early 1950’s onwards. From Africa came the Egyptian Goose which, after having colonised the Netherlands and the northwest parts of Germany, arrived in Hamburg and its surroundings, where in 2000 2-3 pairs bred (exclusively) in the Elbe valley. From Africa and Asia came a parrot, the Ring-necked Parakeet, which was released in Hamburg. Since 1980 it has been an irregular breeding species with a few pairs occurring in the Alster valley, where they used the holes of Woodpeckers. Large colonies of this species occur in other German cities such as Wiesbaden, Cologne and Bonn. Several pairs of the Mandarin Duck, which originates from east Asia and are likely to have escaped from captivity, have bred in Hamburg for about 10 years. Interestingly the several individuals of the North American Wood Duck (a close relative of the Mandarin Duck) that live free in Hamburg, are not known to have bred so far.

**"KNIGHT OF THE NIGHT" IN HAMBURG**

As a result of persecution and presumed habitat loss the Eagle Owl had disappeared from Hamburg by 1900. From about 1980 onwards records of the presence of this species around the city became more numerous, probably as a result of its re-introductions in Schleswig-Holstein by hunters. Several pairs were seen in forests near the northern and western borders of the city. At the same time it became a winter visitor in the central parts of the city, for example it was seen in Wilhelmsburg (harbour area), where it occupied a bunker and preyed on Feral Pigeons and effectively reduced the population.

In or about December 2000 some joggers saw two Eagle Owls displaying in the Ohlsdorfer cemetery (at 400 ha it is the largest park cemetery of the world). Their presence in the cemetery was later confirmed by ornithologists. Daytime roosts and pellets were found, which contained mainly skins of hedgehogs (*Erinaceus europaeus*). In 2001 the first attempt at breeding occurred; a pair occupied the old nest of a Goshawk which had built a new nest only 50 m away. Observers feared for the success of the Goshawk brood, however, three young fledged, whereas the Eagle Owls left their nest by June without any success. In 2002 the Eagle Owls took over the previous year's Goshawk nest because the old nest, which they had used in 2001, had been blown down during a heavy storm. Eggs were laid and three fledglings were raised successfully but not without a drama. At the beginning of June, the male Eagle Owl became ill and died. The ornithologists guarding the nest laid out chicken's legs, freshly killed mice, and one day old chickens, which were immediately "understood" by the female to be a new resource of prey and which she fed to her nestlings. However, the most dangerous time came when they had left the nest. Still flightless and sitting on the ground for three weeks they were vulnerable to been taken by Martens (*Marten* species), Foxes (*Vulpes vulpes*) and visitors of the cemetery. By good luck the nestlings survived all these dangers, enjoyed the chicken's legs and made their first attempts at flight during the night along a paved road of the cemetery. One night one of the ornithologist guards left a big plastic bag containing chicken's legs at the edge of the forest because he had forgotten something. When he came back, the complete bag had vanished, obviously because the female had taken it and the whole of its contents.

In 2003 the female Eagle Owl had found and paired with a new male. They occupied the same nest as in the previous year and during May two nestlings were raised. One of the nestlings fell out of the nest, which had become a little "worn". It was returned with the help of a rotary ladder. Another story – one day a gardener heard human cries for help coming from some bushes, he hurried to the place and saw an Eagle Owl just trying to leave the ground with a Dachshund in its talons. He ran towards it making such loud cries that the Eagle Owl became startled and dropped its prey. The dog returned to its owner only a little hurt. What is so special about this story is that dogs are not allowed in the cemetery!

**WATCHING BIRDS IN HAMBURG – WHEN AND WHERE ?***Different sites are of ornithological interest at different times of the year*

In January and February – in general the coldest months of the year – waterfowl concentrate at the last of the open (unfrozen) waters. Tufted Duck, Scaup, Goldeneye, Mergansers and Divers can be well observed at river Elbe and Alster. At the fast-flowing creeks such as the Bille and the tributaries of the upper Alster the rare Dipper may be seen. Nordic visitors such as Snow Bunting, Shore Lark and Rough-legged Buzzard are mostly seen at the marshes near Wedel, just outside the western boundary of Hamburg. January and February are the best times to see Long-eared Owl, Rook and Jackdaw at their day or night roosts in different cemeteries (for example Ohlsdorf, Öjendorf and Bergedorf) and in several parks and thickets within the city and near its border.

During March and April, together with the flowering Willows (*Salix*) and early blossoms, insect life starts, the winter says good-bye and homeward migration of nearly all migrants happens. This migration can be well studied in the marshes of river Elbe and from treeless elevations especially during the early morning. Peak numbers of migrating Brambling, Robin and Redwing can be seen during this period as well as resting flocks of Waxwing, Ducks, Geese, Swans and Crane. It is also during this time that the first insect feeders such as Chiffchaff and White Wagtail return from their winter quarters and resident species such as Crows, Owls and Tits have already started their first brood.

May/June is the best season for breeding birds. In parks, especially when they are close to water edges, the highest number of songbirds can be heard. However, the valley of river Elbe is also very attractive as in addition to breeding birds late migrants may occur in quite large numbers as they make their way north, for example waders, Black Tern or even Honey Buzzard.

In the middle of summer (July/August) on the wet meadows and marshes of the Elbe valley in the southern part of the city, Quail and Corncrake may be calling and on the dry heathland (such as Fischbeker Heide) the Nightjar may be heard ‘churring’ and the Woodlark singing. On the river banks the first migrating waders are starting to leave. Over the river Elbe terns and high in the sky, sometimes just over the centre of the city, flocks of Honey Buzzards can be seen.

September and October is the best period to see the autumn migration. Ospreys may be seen catching prey on the larger lakes. During October the first flocks of Geese and Thrushes arrive.

In November the numbers of Woodcock and Bewick’s Swan reach their peak as does the number of Waxwings – in those years when there is an invasion. Autumn migrants are caught and ringed at the “Reit”-station, a ringing and research station in the marshes on the southeast side of the city. There are reed-beds around small ponds, so mostly wetland birds are caught, however, sometimes rare migrants as Wryneck, Bluethroat and Aquatic Warbler as well.

The “Mecca” for ornithologists from Hamburg are the marshes near Wedel. It is also an attractive area during December, when large numbers of the White-fronted Goose,

Bean Goose and Barnacle Goose rest on these extensive marshes. With good luck a Peregrine may be seen hunting. Except for the ponds and lakes even the very city of Hamburg is attractive. The Twite can be seen at its night roost on the Town Hall – the only place in Germany and probably Europe, where this species uses a building for its night roost. Christmas shopping trips should be arranged so that the Town Hall can be visited at dusk, however in March the number peaks at app. 200 individuals.

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#### REFERENCES

- Dietrich, F. (1903). 2. Bericht des Ornithologischen Vereins zu Hamburg für die Jahre 1902/03.  
Dietrich, F. (1928). Hamburgs Vogelwelt. – Hamburg.  
Gaedeckens, E. (1938): Die Vogelwelt im Westen Hamburgs. – Hammerich und Lesser, Hamburg, 119 p.  
Holzapfel, C. (1981). Brutbestand gefährdeter Vogelarten im Bereich der alten Süderelbe im Jahre 1979. – Hamburger Avifaun. Beitr.18, 87-104.  
Holzapfel, C., Hüppop, O. & Mulsow, R. (1984). Die Vogelwelt von Hamburg und Umgebung. Band 1. – Wachholz-Verlag, Neumünster.  
Luniak, M. & Mulsow, R. (1986). Ecological Parameters in Urbanization of the European Blackbird. –Acta XIX. Congressus Internationalis Ornithologici II, 1787-1793.  
Mitschke, A. & Baumung, S. (2001). Brutvogel-Atlas Hamburg. – Hamburger avifauna. Beitr. 31, 1-344.  
Mitschke, A., Garthe, S. & Mulsow, R. (2000): Langfristige Bestandstrends von häufigen Brutvögeln in Hamburg. – Vogelwelt 121, 155-164.  
Mulsow, R. (1968): Untersuchungen zur Siedlungsdichte der Hamburger Vogelwelt. – Abh. Verh. Naturwiss. Ver Hamburg N.F. 12, 123-188.  
Mulsow, R. (1980): Untersuchungen zur Rolle der Vögel als Bioindikatoren am Beispiel ausgewählter Vogelgemeinschaften im Raum Hamburg. – Hamburger Avifauna. Beitr. 17, 1-270.  
Otto, W. & Witt, K. (2002). Verbreitung und Bestand Berliner Brutvögel. Berl. ornithol. Ber. 12, Sonderheft.  
Witt, K., Mitschke, A. & Luniak, M. (2003). Evidence of biogeographic effects in urban birds of Hamburg, Berlin and Warsaw. – Vogelwarte 42, 4<sup>th</sup> Conference of the European Ornithologists' Union ; Symposium Abstracts, 13-14.

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## APPENDIX

*List of breeding bird species of Hamburg (1970-2000)*

Avocet - <i>Recurvirostra avosetta</i>	Goshawk - <i>Accipiter gentilis</i>
Barn Owl - <i>Tyto alba</i>	Grasshopper Warbler - <i>Locustella naevia</i>
Barn Swallow - <i>Hirundo rustica</i>	Great Grey Shrike - <i>Lanius excubitor</i>
Bearded Tit - <i>Panurus biarmicus</i>	Great Reed Warbler - <i>Acrocephalus arundinaceus</i>
Bittern - <i>Botaurus stellaris</i>	Great Spotted Woodpecker - <i>Dendrocopos major</i>
Black-headed Gull - <i>Larus ridibundus</i>	Great Tit - <i>Parus major</i>
Black Redstart - <i>Phoenicurus ochruros</i>	Great-crested Grebe - <i>Podiceps cristatus</i>
Black Tern - <i>Chlidonias niger</i>	Green Woodpecker - <i>Picus viridis</i>
Black Woodpecker - <i>Dryoscopus martius</i>	Greenfinch - <i>Carduelis chloris</i>
Blackbird - <i>Turdus merula</i>	Grey Wagtail - <i>Motacilla cinerea</i>
Blackcap - <i>Sylvia atricapilla</i>	Greylag Goose - <i>Anser anser</i>
Black-tailed Godwit - <i>Limosa limosa</i>	Hawfinch - <i>Coccothraustes coccothraustes</i>
Blue Tit - <i>Parus caeruleus</i>	Heron - <i>Ardea cinerea</i>
Bluethroat - <i>Luscinia svecica</i>	Herring Gull - <i>Larus argentatus</i>
Bullfinch - <i>Pyrrhula pyrrhula</i>	Hobby - <i>Falco subbuteo</i>
Buzzard - <i>Buteo buteo</i>	Honey Buzzard - <i>Pernis apivorus</i>
Canada Goose - <i>Branta canadensis</i>	House Martin - <i>Delichon urbica</i>
Carrion Crow - <i>Corvus corone</i>	House Sparrow - <i>Passer domesticus</i>
Chaffinch - <i>Fringilla coelebs</i>	Icterine Warbler - <i>Hippolais icterina</i>
Chiffchaff - <i>Phylloscopus collybita</i>	Jackdaw - <i>Corvus monedula</i>
Coal Tit - <i>Parus ater</i>	Jay - <i>Garrulus glandarius</i>
Collared Dove - <i>Streptopelia decaocto</i>	Kestrel - <i>Falco tinnunculus</i>
Common Gull - <i>Larus canus</i>	Kingfisher - <i>Alcedo atthis</i>
Common Sandpiper - <i>Actitis hypoleucos</i>	Lapwing - <i>Vanellus vanellus</i>
Common Tern - <i>Sterna hirundo</i>	Lesser Black-backed Gull - <i>Larus fuscus</i>
Coot - <i>Fulica atra</i>	Lesser Spotted Woodpecker - <i>Dendrocopos minor</i>
Cormorant - <i>Phalacrocorax carbo</i>	Lesser Whitethroat - <i>Sylvia curruca</i>
Corn Bunting - <i>Emberiza calandra</i>	Linnet - <i>Carduelis cannabina</i>
Corncrake - <i>Crex crex</i>	Little Crake - <i>Porzana parva</i>
Crane - <i>Grus grus</i>	Little Grebe - <i>Podiceps ruficollis</i>
Crested Lark - <i>Galerida cristata</i>	Little Owl - <i>Athene noctua</i>
Crested Tit - <i>Parus cristatus</i>	Little Ringed Plover - <i>Charadrius dubius</i>
Crossbill - <i>Loxia curvirostra</i>	Little Tern - <i>Sterna albifrons</i>
Cuckoo - <i>Cuculus canorus</i>	Long-eared Owl - <i>Asio otus</i>
Curlew - <i>Numenius arquata</i>	Long-tailed Tit - <i>Aegithalos caudatus</i>
Dunnock - <i>Prunella modularis</i>	Magpie - <i>Pica pica</i>
Eagle Owl - <i>Bubo bubo</i>	Mallard - <i>Anas platyrhynchos</i>
Egyptian Goose - <i>Alopochen aegyptiacus</i>	Mandarin - <i>Aix galericulata</i>
Feral Pigeon - <i>Columba livia f. domestica</i>	Marsh Harrier - <i>Circus aeruginosus</i>
Fieldfare - <i>Turdus pilaris</i>	Marsh Tit - <i>Parus palustris</i>
Firecrest - <i>Regulus ignicapillus</i>	Marsh Warbler - <i>Acrocephalus palustris</i>
Gadwall - <i>Anas strepera</i>	Meadow Pipit - <i>Anthus pratensis</i>
Garden Warbler - <i>Sylvia borin</i>	Mediterranean Gull - <i>Larus melanocephala</i>
Garganey - <i>Anas querquedula</i>	Middle Spotted Woodpecker - <i>Dendroc. medius</i>
Goldcrest - <i>Regulus regulus</i>	Mistle Thrush - <i>Turdus viscivorus</i>
Golden Oriole - <i>Oriolus oriolus</i>	Moorhen - <i>Gallinula chloropus</i>
Goldeneye - <i>Bucephala clangula</i>	Mute Swan - <i>Cygnus olor</i>
Goldfinch - <i>Carduelis carduelis</i>	Nightingale - <i>Luscinia megarhynchos</i>

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Nightjar - <i>Caprimulgus europaeus</i>	Snipe - <i>Gallinago gallinago</i>
Nuthatch - <i>Sitta europaea</i>	Song Thrush - <i>Turdus philomelos</i>
Ortolan Bunting - <i>Emberiza hortulana</i>	Sparrowhawk - <i>Accipiter nisus</i>
Oystercatcher - <i>Haematopus ostralegus</i>	Spotted Crake - <i>Porzana porzana</i>
Partridge - <i>Perdix perdix</i>	Spotted Flycatcher - <i>Muscicapa striata</i>
Penduline Tit - <i>Remiz pendulinus</i>	Starling - <i>Sturnus vulgaris</i>
Pheasant - <i>Phasianus colchicus</i>	Stock Dove - <i>Columba oenas</i>
Pied Flycatcher - <i>Ficedula hypoleuca</i>	Stonechat - <i>Saxicola torquata</i>
Pochard - <i>Aythya ferina</i>	Swift - <i>Apus apus</i>
Quail - <i>Coturnix coturnix</i>	Tawny Owl - <i>Strix aluco</i>
Raven - <i>Corvus corax</i>	Teal - <i>Anas crecca</i>
Red-backed Shrike - <i>Lanius collurio</i>	Thrush Nightingale - <i>Luscinia luscinia</i>
Red-breasted Flycatcher - <i>Ficedula parva</i>	Treecreeper - <i>Certhia familiaris</i>
Red-necked Grebe - <i>Podiceps grisegena</i>	Tree Pipit - <i>Anthus trivialis</i>
Redpoll - <i>Carduelis flammea</i>	Tree Sparrow - <i>Passer montanus</i>
Redshank - <i>Tringa totanus</i>	Tufted Duck - <i>Aythya fuligula</i>
Red Kite - <i>Milvus milvus</i>	Turtle Dove - <i>Streptopelia turtur</i>
Redstart - <i>Phoenicurus phoenicurus</i>	Water Rail - <i>Rallus aquaticus</i>
Reed Bunting - <i>Emberiza schoeniclus</i>	Wheatear - <i>Oenanthe oenanthe</i>
Reed Warbler - <i>Acrocephalus scirpaceus</i>	Whinchat - <i>Saxicola rubetra</i>
Ringed Plover - <i>Charadrius hiaticula</i>	White Stork - <i>Ciconia ciconia</i>
Ring-necked Parakeet - <i>Psittacula krameri</i>	White-tailed Eagle - <i>Haliaeetus albicilla</i>
River Warbler - <i>Locustella fluviatilis</i>	Whitethroat - <i>Sylvia communis</i>
Robin - <i>Erythacus rubecula</i>	White Wagtail - <i>Motacilla alba</i>
Rook - <i>Corvus frugileus</i>	Whooper Swan - <i>Cygnus cygnus</i>
Ruff - <i>Philomachus pugnax</i>	Willow Tit - <i>Parus montanus</i>
Sand Martin - <i>Riparia riparia</i>	Willow Warbler - <i>Phylloscopus trochilus</i>
Savi's Warbler - <i>Locustella luscinoides</i>	Wood Lark - <i>Lullula arborea</i>
Scarlet Grosbeak - <i>Carpodacus erythrinus</i>	Wood Sandpiper - <i>Tringa glareola</i>
Sedge Warbler - <i>Acrocephalus schoenobaenus</i>	Wood Warbler - <i>Phylloscopus sibilatrix</i>
Serin - <i>Serinus serinus</i>	Woodcock - <i>Scolopax rusticola</i>
Shelduck - <i>Tadorna tadorna</i>	Woodpigeon - <i>Columba palumbus</i>
Short-eared Owl - <i>Asio flammeus</i>	Wren - <i>Troglodytes troglodytes</i>
Short-toed Treecreeper - <i>Certhia brachydactyla</i>	Wryneck - <i>Jynx torquilla</i>
Shoveler - <i>Anas clypeata</i>	Yellowhammer - <i>Emberiza citrinella</i>
Siskin - <i>Carduelis spinus</i>	Yellow Wagtail - <i>Motacilla flava</i>
Skylark - <i>Alauda arvensis</i>	

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