BARROW'S GOLDENEYE
Bucephala islandica

Subspecies:

Monotypic. Females in western North America have yellow bills, and this has prompted suggestions of racial separation (Madge & Burn, 1988).

Distribution:

Primarily Nearctic, with a highly fragmented distribution, occurring in northwestern North America from southern Alaska to northern California and Wyoming, in northeastern North America from Labrador to Maine, in Greenland and in Iceland. In Iceland, the breeding range is centred on Lake Myvatn and the upper Laxa River which together account for at least 95% of the population (Gardarsson, 1978). The status of *B. islandica* in northeastern North America and Greenland is uncertain. Most authors state that the species breeds in Labrador and southwestern Greenland, and assume that the birds wintering in northeastern North America (from the upper St Lawrence drainage, Gulf of St Lawrence and Nova Scotia south to New York) originate from these breeding areas.

Movements:

Partially migratory, with some populations being mostly sedentary. Populations in northwestern North America are partly migratory, with birds from inland breeding areas moving to the Pacific coast for the winter. Most of the Icelandic breeding birds are sedentary. However, in some years, counts in mid-winter are lower than counts in the following spring. This is particularly the case with first-year birds, and it has been suggested that some emigration takes place, possibly to Greenland or even Labrador (A. Gardarsson, *in litt.*). Recent evidence confirms that there is a breeding population of *B. islandica* in Canada on the north bank of the St Lawrence seaway about 300 km east of Quebec. The number of breeding pairs is also thought to be large enough to account for the 2,000–3,000 wintering birds in the northwestern Atlantic (M. Guillemette, *in litt.*). This gives support to the traditional theory that there are two sedentary populations of *B. islandica* in the North Atlantic. The small number of birds in southwestern Greenland could be vagrants from either population. In light of the proof of breeding in Canada it seems most likely that the Icelandic population is sedentary and rarely if ever do individulas from Iceland reach the coast of Canada.

Population limits:

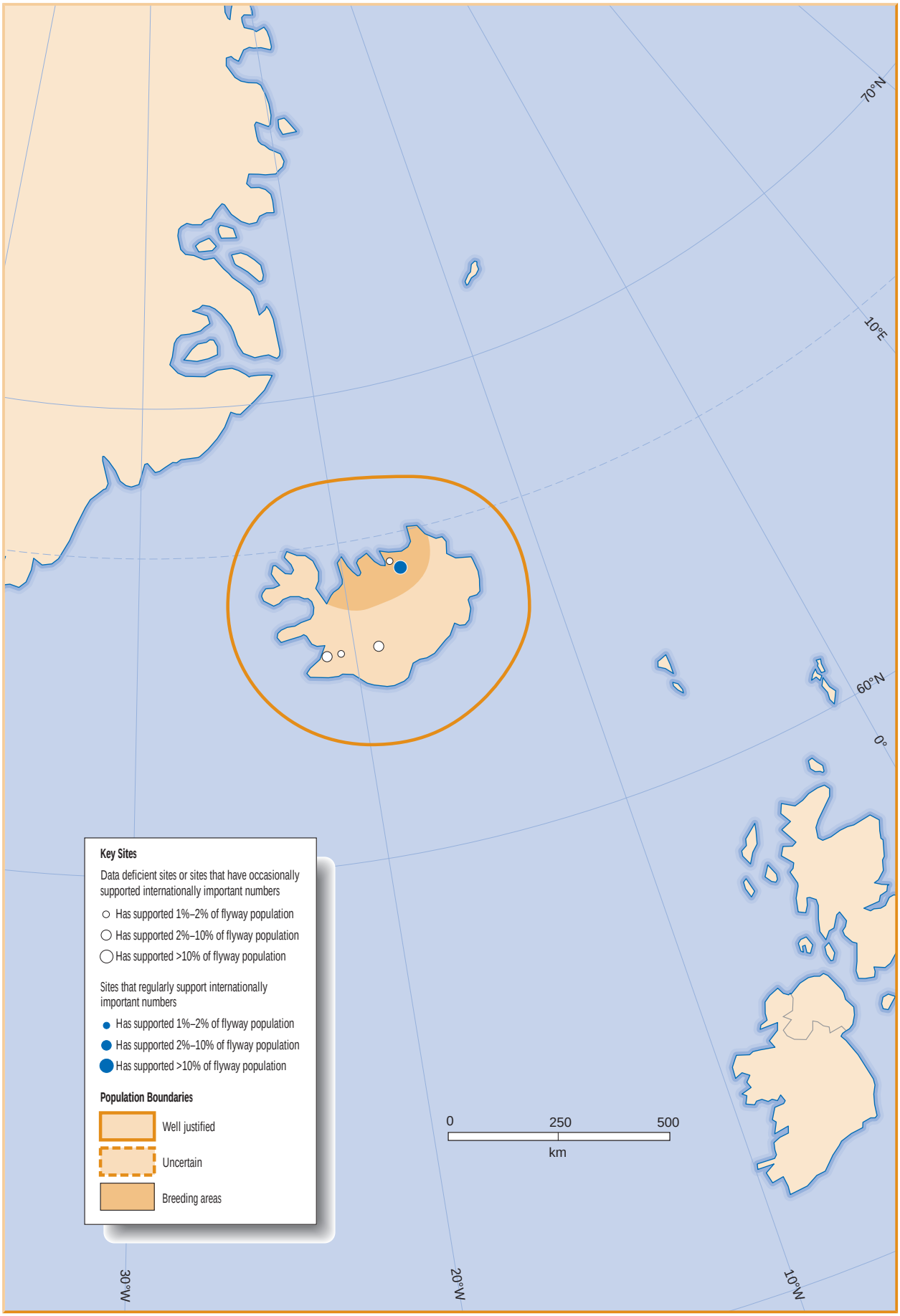
Only one population is recognized: the Icelandic breeding population. This population may account for most if not all of the birds occurring in southwestern Greenland, and possibly also some of the birds which moult in Labrador and winter along the Atlantic seaboard of northeastern North America.

Population size:

• Iceland: 2,000 (A. Einarsson in Tucker & Heath, 1994; A. Gardarsson, *in litt.*). 1% level 20. Detailed censuses during the period 1975–78 suggested a total spring population of 1,800–2,100 birds (Gardarsson, 1978). Annual counts in the Myvatn-upper Laxa system since 1975 have indicated a rather stable population of about 2,000 full-grown birds in spring (including 500–900 adult males and 300–600 adult females), 200–400 territorial (presumably breeding) pairs and 700–1,400 moulting males in summer, and 200–900 fledged young in autumn (A. Gardarsson, *in litt.*). (The estimate of 600–1,200 individuals given by Rose & Scott, 1994, is based on a breeding population of 200–400 pairs, and does not adequately take into account the large number of non-breeding birds in the population).

Habitat/ecology:

Bucephala islandica is a hole-nesting, highly territorial duck, breeding around freshwater lakes, pools and rivers in open or wooded country, and wintering on larger, unfrozen lakes, on brackish coastal lagoons and along sea coasts. In Iceland, *B. islandica* winters mainly on spring-fed fresh waters (lakes and rivers), mostly in the Myvatn-Laxa system, but also in a few other localities in the volcanic zone (A. Gardarsson, *in litt.*). In North America, the species also winters in estuaries,


70°N
10°E
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20°W
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Key Sites
Data deficient sites or sites that have occasionally supported internationally important numbers
Has supported 1%–2% of flyway population
Has supported 2%–10% of flyway population
Has supported >10% of flyway population
Sites that regularly support internationally important numbers
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Has supported 2%–10% of flyway population
Has supported >10% of flyway population
Population Boundaries
Well justified
Uncertain
Breeding areas
0
250
500
km

including the St Lawrence River, and in fiords in British Columbia. The species is mainly gregarious outside the breeding season. Those birds that leave the Myvatn-Laxa system do so mainly in late October and November; the return movement occurs in late March and throughout April (Gardarsson, 1978). Concentrations of moulting birds have been observed on the Labrador coast, but these are mostly from the St Lawrence breeding colony.

Conservation status:

Numbers in Iceland are relatively stable, although a crash occurred in 1989, temporarily reducing the adult population to about 1,000 birds following a marked reduction in food supply (Tucker & Heath, 1994; A. Gardarsson, *in litt.*). The birds are dependent for food on aquatic insects, and are consequently threatened by planned introductions of Atlantic salmon into the River Laxa and by sediment dredging which is now in progress at Lake Myvatn (Tucker & Heath, 1994). Hydro-electric schemes also pose a potential threat.

Network of key sites:

This population is virtually endemic to the Myvatn-Laxa lake complex on Iceland so this site plus the four other minor wintering sites listed must be one of the most complete key sites networks for any European Anatidae population.

Protection status of key sites:

The Myvatn-Laxa system is protected by law, and was designated as a Ramsar Site in 1977. This is the main breeding and wintering area for the species in Iceland, supporting 65%–75% of the population.

SMEW
Mergellus albellus

Subspecies:

Monotypic.

Distribution:

Palearctic, with a wide breeding distribution across northern Eurasia from Norway to Kamchatka. The breeding range in Western Eurasia extends eastwards from Norway and northern Sweden through the taiga and forest-tundra zones between 55°N and the Arctic Circle. The wintering range normally extends south to the North Sea, the Black and Caspian Seas, central China and Japan, although in hard winters, large numbers of birds may extend much further south, e.g. to North Africa (Algeria, Tunisia and Egypt) and central Iraq. In Western Eurasia, the main wintering areas are in the southern Baltic Sea and the Netherlands, the Black Sea and the Caspian Sea, although a small number of birds reach eastern Britain and the lakes and rivers of central Europe.

Movements:

Highly migratory, moving south to temperate latitudes for the winter; occasionally further south, especially during severe winters. Very few *M. albellus* have been ringed, and little is known about the origins of the main wintering groups or their degree of isolation. However, Svazas *et al.* (1994) suggest that most *M. albellus* wintering in northwest Europe are from breeding areas in northern Russia east to the Pechora, with birds breeding further east wintering in the Black Sea, Sea of Azov and Caspian Sea. In hard winters, many of the birds which normally winter in the southern Baltic move to the western Baltic, especially Danish waters (Durinck *et al.*, 1994). *M. albellus* is also subject to hard weather movements in the Caspian region, with large numbers of birds reaching the south Caspian in Iran during particularly severe winters (Perennou *et al.*, 1994).

Population limits:

No discrete populations are identifiable. Three main wintering groups are recognized: a group wintering in northwest and central Europe, concentrated in the southern Baltic and the Netherlands, a group wintering in the Black Sea/east Mediterranean region, concentrated in the Sea of Azov, and a group wintering in Southwest Asia, concentrated in the north Caspian and Uzbekistan (Atkinson-Willes, 1976; Monval & Pirot, 1989; Perennou *et al.*, 1994). The relatively small number of birds wintering in Hungary and the middle Danube are included in the northwest and central European group.

Population size:

- Northwest and central Europe: 25,000–30,000 (see Annex 1 and Pihl & Laursen, in press). 1% level 250.

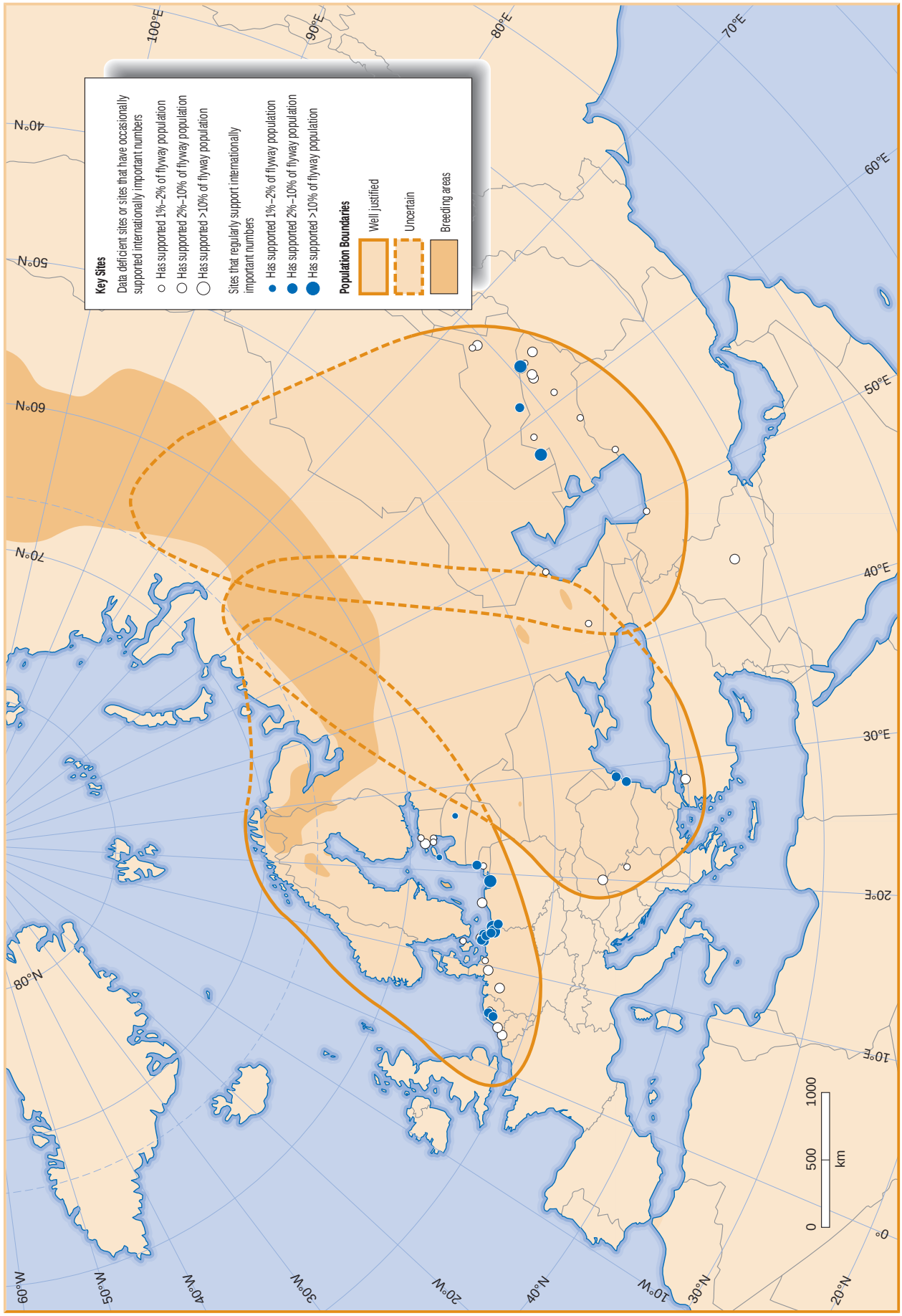
The former estimate of 15,000 for the northwest European population is clearly too low; 23,900 were counted in northwest and central Europe in January 1987 and 24,962 in January 1992. Pihl *et al.* (1995) estimated that there were 20,000 in the Baltic area alone in January 1993. Durinck *et al.* (1994) suggested that the population estimate be raised to 25,000, while Svazas *et al.* (1994) reported a huge flock of about 30,000 *M. albellus* at Szecin Lagoon in Poland in December 1991, and suggested that the northwest European population was likely to be in the range 35,000–40,000.

- Black Sea/east Mediterranean: 65,000 (Atkinson-Willes, 1976). 1% level 650.

Isakov (1970b) reported up to 57,000 birds wintering in the Black Sea, while Atkinson-Willes (1976) gave an estimate of 65,000 for the whole Black Sea-Mediterranean region. This estimate was followed by Monval & Pirot (1989) and Rose & Scott (1994), and in the absence of any better information is retained here.

- Southwest Asia: 30,000 (Perennou *et al.*, 1994). 1% level 300.

Krivonosov (1970) estimated that 6,000–20,000 wintered in the north Caspian, while 26,300 were counted in Uzbekistan alone in 1986. Krivenko (1993) estimates the post-breeding population in western


Key Sites
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Has supported 2%–10% of flyway population
Has supported >10% of flyway population
Sites that regularly support internationally important numbers
Has supported 1%–2% of flyway population
Has supported 2%–10% of flyway population
Has supported >10% of flyway population
Population Boundaries
Well justified
Uncertain
Breeding areas
0
500
1000
km

and central Siberia at 72,500 birds, which could account for most if not all of the birds wintering in Southwest Asia and a large proportion of those wintering in the Black Sea region.

Habitat/ecology:

Mergellus albellus breeds around freshwater lakes, pools, rivers and muskegs in the taiga zone, and winters mainly on larger lakes, ice-free rivers, coastal brackish lagoons and estuaries. In the Baltic Sea, *M. albellus* usually occurs in shallow waters close to the coast. The species is highly gregarious in winter, sometimes forming flocks of over 10,000 birds. Groups of moulting males are known from Siberia, but have not been reported in Europe. The birds begin to leave their breeding grounds in early September, and these areas are deserted in October. *M. albellus* begin to arrive in the Baltic Sea in mid-October, but the main arrival in the Baltic and North Sea is usually not until December or even January, when cold weather further east forces birds to move west. Spring migration begins in March, with birds arriving on the breeding grounds between early May and early June.

Conservation status:

The reliance of *Mergellus albellus* on a few very important wintering sites and the frequent movement of birds between these sites make the calculation of trends very difficult. Thus, no conclusions can be drawn concerning the trends in the population of this species on the basis of winter counts (Rose, 1995). A marked fall in breeding numbers undoubtedly occurred in Europe during the second half of the 19th century and first two-thirds of the 20th century, and this has been attributed to habitat loss or degradation, notably deforestation of river valleys through logging, conversion to agriculture and destruction due to river canalization (Tucker & Heath, 1994). Range contractions are believed to have continued in southern European Russia, but local increases have been reported in Finland and Belarus (Tucker & Heath, 1994). Further east, Krivenko (1993) has reported a slight decline in post-breeding numbers in western and central Siberia between 1972 and 1989, and Patrikeev (in prep.) has reported a marked decline in the numbers wintering in Azerbaijan during the 20th century.

Network of key sites:

Key sites in the Baltic are described by Svazas *et al.* (1994) and 35 are listed in Annex 2. It seems likely that additional important sites are present in the Gulf of Finland and in Russia, perhaps in the White Sea, and also between the breeding grounds in northern Russia and the wintering areas in the Black Sea and Caspian Sea. *M. albellus* is very concentrated on a few sites in winter so when a new wintering locality is identified, such as Szecin Lagoon in Poland, this has significant implications to the status of the population. Only three sites in Southwest Asia have held over 300 *M. albellus* in recent years: Tyuyamuyun Reservoir (average 400) and Lake Sarakamysh (average 380) in Turkmenistan, and Lake Dengizkul (average 320) in Uzbekistan. The latter held a concentration of 26,000 *M. albellus* in January 1986, many times higher than the total counted in the region in any other year (Perennou *et al.*, 1994). Haur Abu Dibis (Lake Razazah) in Iraq held 1,000 males in January 1979. Only six relatively minor key sites can be identified for the Black Sea wintering population. For all four populations only two key sites are selected on the basis of non-winter concentrations of *M. albellus*, and these are both relatively minor and not well substantiated.

Protection status of key sites:

Some of the breeding areas in Sweden and Finland are protected, but the main breeding areas further to the east are largely unprotected. Several of the most important staging and wintering areas in the Baltic are protected including Matsalu Bay (a Ramsar Site) in Estonia, the northern part of Kursiu Lagoon in Lithuania and the southern part of Vistula Lagoon (Elblag Bay) in Poland. Szecin Lagoon, on the Polish/German border, has been proposed as a transboundary Biosphere Reserve (Svazas *et al.*, 1994). Very few of the wintering areas in the Black Sea and Caspian regions are protected.

RED-BREASTED MERGANSER
Mergus serrator

Subspecies:

Polytypic. Two subspecies have been described: the nominate form is circumpolar except for west Greenland, where the form *M. s. schioleri* occurs (the validity of this form has been questioned). Birds breeding in east Greenland closely resemble the nominate form.

Distribution:

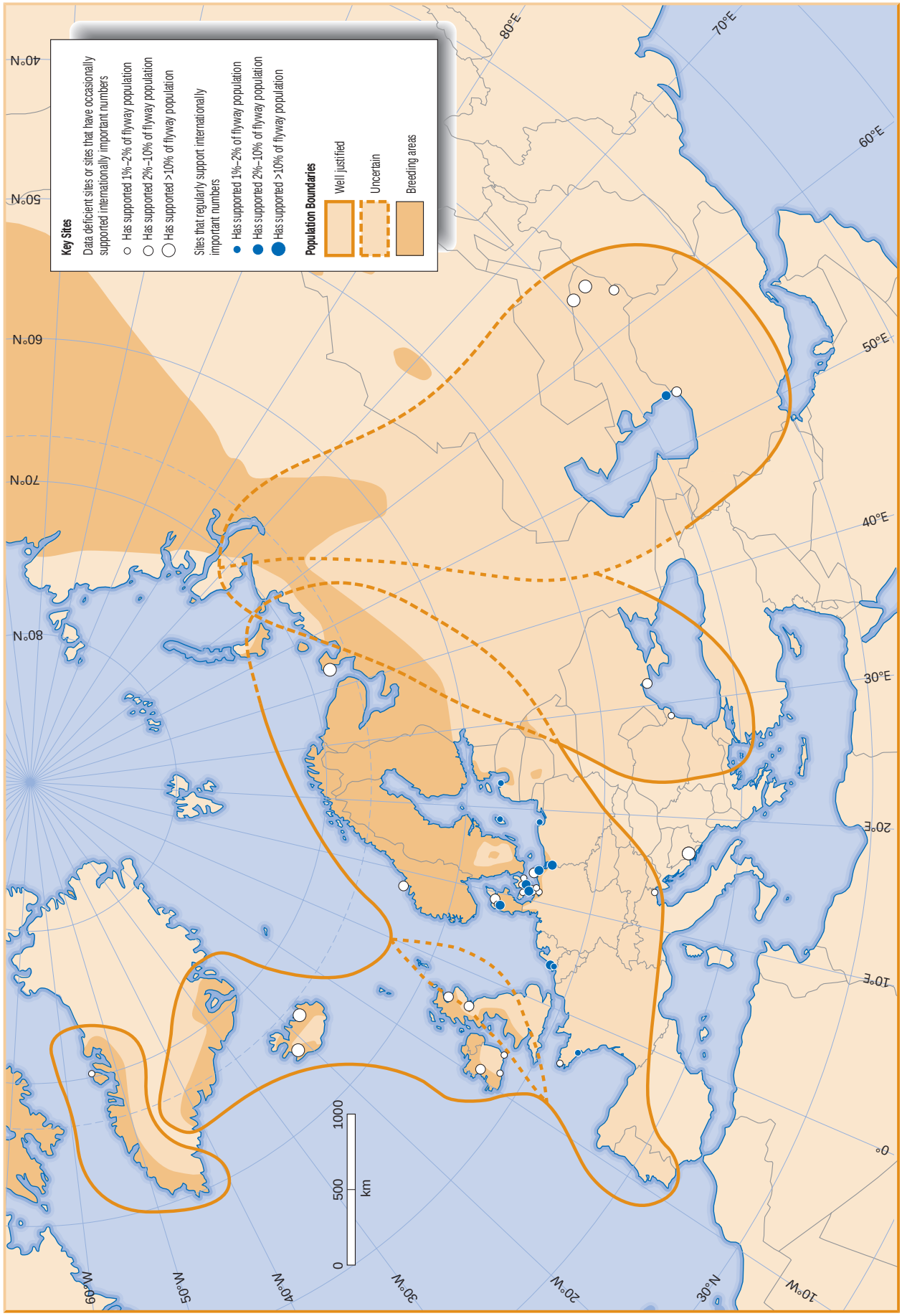
Holarctic, with a wide breeding range across northern Eurasia and North America. The wintering range extends south to the Mediterranean, Black and Caspian Seas, China, Japan and Mexico. Both subspecies occur in Western Eurasia. The nominate form breeds in east Greenland, Iceland, the Faroes, Britain and Ireland, and from Denmark and northern Germany eastwards, mainly in the forested tundra zone, but in the southern parts of it range in western Europe, also in the temperate forest zone. It winters south to Portugal, North Africa (mainly Algeria and Tunisia, rarely to Egypt), the south Caspian and occasionally the Gulf. The breeding range seems to be expanding slowly in western Europe. *M. s. schioleri* breeds on the west coast of Greenland, and apparently winters mainly along the southwest coast.

Movements:

Migratory and partially migratory, northern populations migrating south to winter at temperate latitudes, but present year-round on or near the breeding areas over much of northwest Europe, with many birds undertaking only short-distance movements to nearby coasts. Birds breeding in Finland and northwest Russia are highly migratory, wintering mainly in northwest Europe, especially the Baltic Sea, but also in small numbers along the north coast of the Mediterranean (Monval & Pirot, 1989). In mild winters, about 44% of the northwest European population winters in the western part of the Baltic Sea (Pihl *et al.*, 1995). Other birds leave the Baltic in autumn to winter along the Atlantic coast from the Netherlands to Portugal. Lack (1986) has suggested that most of the birds wintering on the east and south coasts of England, from the Wash southwards, are of continental origin, as are those occurring inland in Britain during severe winters. Laursen *et al.* (in prep.) have suggested that many of the birds staging in southeast Denmark in autumn winter in the Netherlands, while birds staging at Limfjorden in northwest Denmark cross the North Sea to winter in Britain. British and Irish breeding birds are apparently dispersive within Britain and Ireland. The breeding population in Iceland is partially migratory; some birds are resident, while others migrate to Britain (mainly Scotland) and Ireland, although there are also single recoveries from the Netherlands and east Greenland (Cramp & Simmons, 1977). Greenland breeding birds are partially migratory within Greenland, with western breeding birds (*schioleri*) wintering along the southwest coast. Birds from east Greenland probably winter mainly in Iceland (where there has been one recovery), but may also reach Britain and Ireland. Birds wintering in the Black Sea region south to Romania, Greece and Turkey may originate from northeast European Russia and western Siberia, although there are no ringing recoveries to confirm this (Monval & Pirot, 1989). Birds wintering in the Caspian region south to the Gulf are presumably from breeding areas further east in western and central Siberia.

Population limits:

Four main groups are recognized: a discrete population of the subspecies *schioleri* in west Greenland, and three main wintering groups of the nominate form in Western Eurasia, a group in northwest and central Europe (including east Greenland and Icelandic birds), a group in the Black Sea/ Mediterranean region, and a group in the Caspian region. The relatively small Icelandic breeding population, estimated at 2,000–4,000 pairs (Koskimies, 1993) winters mainly in Britain and Ireland, along with the birds breeding in Britain and Ireland (2,850 pairs; S. Carter *in* Gibbons *et al.*, 1993). These birds (and the birds from east Greenland) have traditionally been included within the northwest European population, and this treatment is retained here. However, there would appear to be some justification, at least on conservation grounds, for considering the birds breeding in east Greenland, Iceland, Ireland and Britain as a separate population.


Key Sites
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Has supported >10% of flyway population
Sites that regularly support internationally important numbers
Has supported 1%–2% of flyway population
Has supported 2%–10% of flyway population
Has supported >10% of flyway population
Population Boundaries
Well justified
Uncertain
Breeding areas
80°E
70°E
60°E
50°E
40°E
30°E
20°E
10°E
0°
40°N
50°N
60°N
70°N
80°N
60°W
50°W
40°W
30°W
20°W
10°W
30°N
0
500
1000
km

Population size:

- West Greenland (*schioleri*): Unknown.

No information is available on population size. The total breeding population of *M. serrator* in Greenland (including nominate *serrator* in east Greenland) has been given as 1,000–50,000 pairs (European Bird Database, 1994). It is recommended that a provisional numerical criterion of 100 be used in the identification of key sites.

- Northwest and central Europe: 125,000 (Pihl & Laursen, in press). 1% level 1,250.
- East Greenland/Iceland/Britain and Ireland: 15,000–25,000. 1% level 200.

Rose & Scott (1994), following Monval & Pirot (1989), gave a figure of 100,000 for the northwest European wintering population, but this included only an estimated 20,000–30,000 birds in the Baltic. Recent surveys have indicated that at least 50,000 and possibly as many as 90,000 birds winter in the Baltic (Pihl *et al.*, 1995). Pihl & Laursen (in press) have therefore recommended that the total population estimate be raised to 125,000, and this figure is adopted here. The total wintering population in Britain and Ireland was estimated at 11,000 birds in the early 1980s (Lack, 1986), and 12,000–13,000 in recent years (Kirby *et al.*, 1993).

- Northeast Europe/Black Sea/Mediterranean: 50,000 (Monval & Pirot, 1989). 1% level 500.

- Western Siberia/Southwest Asia: probably under 10,000. Provisional numerical criterion 100.

Poorly known; Perennou *et al.* (1994) thought that the total population of *M. serrator* wintering in the central Asian republics and Caspian region did not exceed 10,000 individuals.

Habitat/ecology:

Over much of its range, *Mergus serrator* breeds on rather deep lakes and small rivers, often, but not necessarily, in wooded country, although in some areas, especially the Baltic, it breeds mainly along the coast and on small offshore islands. It winters almost exclusively in brackish or saline waters, preferring shallow, protected coasts, estuaries, bays and brackish lagoons, but also occurring offshore in shallow waters. The species is gregarious outside the breeding season, wintering in small flocks of up to a few hundred birds. Males leave the breeding grounds in June, and moult with immatures in small groups along the coast. The largest known moulting area in Europe is in Denmark, where peak numbers of moulting birds occur in mid-July. The autumn migration begins in September, and most birds have left their breeding areas by mid- or late October. In the Baltic, the peak of the autumn migration occurs in November. Females and juveniles migrate further south than males. The spring migration starts in late February. Birds arrive on their breeding grounds in the Baltic in April, and somewhat later on breeding grounds further north and east.

Conservation status:

Trends in the population of *schioleri* in west Greenland are unknown. The population wintering in northwest Europe is believed to be relatively stable. The large breeding populations in Norway, Sweden and Finland are thought to be stable, and an increase has been reported in the breeding population in Denmark, while decreases have been reported only in some of the smaller marginal breeding populations (European Bird Database, 1994). The Icelandic breeding population is thought to be stable (Koskimies, 1993). There was a marked increase in the British breeding population until about 1980, associated with an expansion in the breeding range, but there appears to have been little change since then (Kirby *et al.*, 1993).

No information is available on trends in the populations wintering in the Black Sea/Mediterranean region and Southwest Asia. However, a slight decline was reported in post-breeding numbers in western and central Siberia between 1972 and 1989 (Krivenko, 1993). These birds, estimated to number 57,500 (Krivenko, 1993), could account for most if not all of the Caspian birds and a large proportion of those wintering in the Black Sea and east Mediterranean.

Network of key sites:

M. serrator is widely dispersed in small flocks during most seasons, perhaps with the exception of moult and passage. It also occurs in deep (>6 m) offshore waters throughout northern Europe and winters right up to the edge of the Arctic ice, and in ice free polynias, even in areas of permanent winter night. Obviously key wintering sites are very difficult to find and most birds will always be wintering away

from the 23 relatively minor key sites listed in Annex 2. Many more than the 12 key moulting and passage sites listed must exist although there is no evidence to suggest that there will be any enormous concentrations at these times. The Black Sea and Caspian wintering populations of *M. serrator* must be amongst the least known Anatidae populations in Europe so it is not surprising that only three and five key sites respectively are listed in Annex 2.

Protection status of key sites:

Most of the important breeding areas are unprotected. Most of the main wintering areas in the west Baltic are protected, but further southwest, most sites are unprotected, including the very important sites in the Netherlands. Most important sites in the Black Sea and Caspian regions are unprotected.

GOOSANDER
Mergus merganser

Subspecies:

Polytypic. Three subspecies are recognized: the nominate form in northern Eurasia east to Kamchatka; *M. m. orientalis* in central Asia from northeast Afghanistan through Tibet and the Himalayas to western China; and *M. m. americanus* in North America. The form *comatus*, listed by some authors for central Asia, is now considered to be synonymous with *orientalis*.

Distribution:

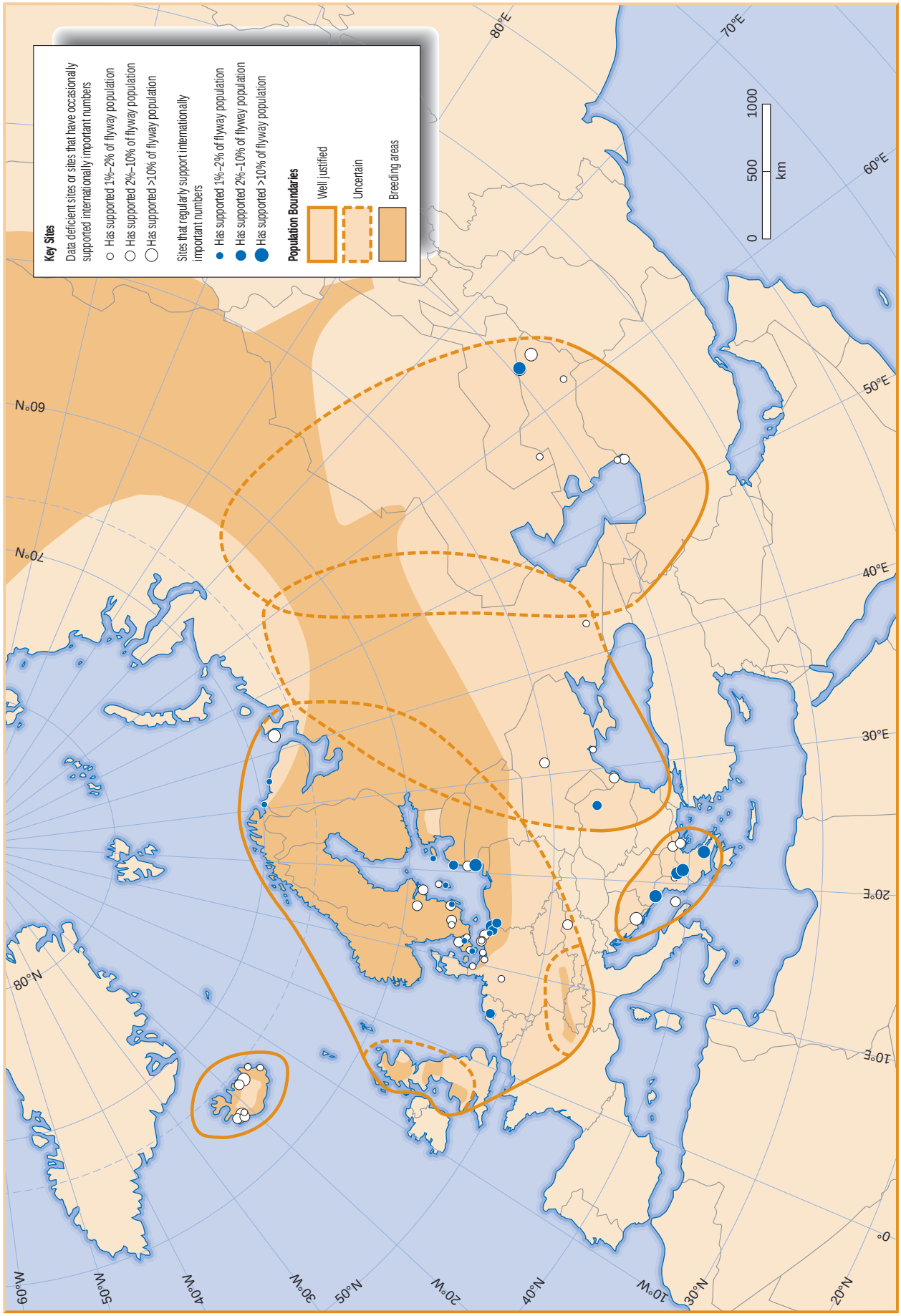
Holarctic, with a wide breeding range across Eurasia and North America in forested tundra between 50°N and the Arctic Circle. The wintering range extends south to southern Europe, the Middle East, northern India, China, Japan and the southern USA. Only the nominate form occurs in Western Eurasia, breeding in Iceland and from Britain, Norway, Denmark and central Europe eastwards, and wintering south to western France, the Adriatic, Turkey and the south Caspian region. There is a small, isolated breeding population in the southern Balkans (Albania, the former Yugoslav Republic of Macedonia and Greece). The species has occurred as a rare winter visitor to North Africa (Morocco to Egypt).

Movements:

Migratory and partially migratory; the northernmost breeding birds migrate south to winter at temperate latitudes, but southern breeding birds are mainly sedentary, moving only short distances to suitable wintering habitat, usually at lower elevations. The small breeding population of about 300 pairs in Iceland is resident within Iceland, wintering mainly near the coast. British breeding birds are also almost entirely resident but males do move to Norway to moult before returning to the UK (Little & Furness, 1985). Otherwise British birds move only short distances (usually less than 150 km) from breeding waters to lakes and sheltered estuaries. Birds breeding in Scandinavia and northwest Russia east to the Pechora Delta winter mainly in the Baltic Sea and countries bordering the North Sea, but also in smaller numbers on rivers and lakes in central Europe and rarely in the west Mediterranean. There is also some evidence to suggest that males from these breeding areas fly to northern river mouths in Russia and Norway to moult. Ringing recoveries suggest that many of the birds wintering in southern England are from the continent, with recoveries from Sweden, Finland, northwest Russia, the Netherlands and Germany (Lack, 1986). In mild winters, about 59% of the northwest European population winter in the Baltic Sea, with Szecin Bay being much the most important site (peak of 30,750 in January 1993). In hard winters, birds in the Baltic move southwest, and numbers in Danish waters increase (Durinck *et al.*, 1994). Little is known about the much smaller populations wintering in the northern Black Sea and Caspian Sea, but it is assumed that these breed further to the east in Russia (Monval & Pirot, 1989).

Population limits:

Previous authors have recognized two main wintering groups in Europe: a large west European group including the resident Icelandic population, the rather sedentary British population and central European breeding birds, as well as the very small number of birds reaching the west Mediterranean; and a much smaller Black Sea/east Mediterranean group including the isolated breeding population in the Balkans (Atkinson-Willes, 1976; Ruger *et al.*, 1986; Monval & Pirot, 1989). Perennou *et al.* (1994) recognized a third wintering group in Southwest Asia, concentrated in the north Caspian and central Asian republics. There is no evidence of movement between the resident Icelandic population and other European breeding birds, and this population should obviously be given separate treatment. Similarly, the tiny breeding population in the southern Balkans now appears to be completely isolated from other populations and also merits separate treatment. There is some justification for treating the British breeding population (5,000–8,000 birds) and central European breeding population (about 3,000 birds) as separate populations. However, as some birds from northern Europe are known to reach Britain and central Europe during severe winters, some mixing of birds is likely to occur, and for the time being at least, the British and central European breeding birds are retained within the main northwest European population. Thus five populations are recognized: two small resident populations, in Iceland and in the Balkans, and three main wintering groups, in northwest and central Europe, in the Black Sea region and in Southwest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Has supported >10% of flyway population
Population Boundaries
Well justified
Uncertain
Breeding areas
0
500
1000
km

Asia. The extent to which these three wintering groups are separated on their breeding grounds is, however, unknown, although it seems likely from breeding estimates that most if not all of the birds wintering in northwest and central Europe originate from breeding grounds in Europe, while most of the birds wintering in the Black and Caspian Seas probably originate from breeding areas in western Siberia.

Population size:

- Iceland: 900. 1% level 9.

The breeding population in Iceland has been estimated at 300 pairs (Koskimies, 1993), or 100–300 pairs (European Bird Database, 1994).

- Northwest and central Europe: 200,000 (see Annex 1). 1% level 2,000.
  UK (breeding): 5,000–8,000.
  Central Europe (breeding): 3,000.

The total wintering population in Britain in the early 1980s was estimated at between 5,000 and 8,000 birds (Lack, 1986); more recently the British population has been estimated at 2,700 pairs (Carter, 1995) which might be expected to give a winter population of about 8,100 birds. The central European breeding population has been estimated at about 840–1,180 pairs or 3,000 birds (640–780 pairs in Austria, Switzerland and France, and an estimated 200–400 pairs in Germany).

- Black Sea: 10,000 (Monval & Pirot, 1989). 1% level 100.

The size of the Black Sea wintering population is very poorly known. Scott (1980) suggested a figure of 10,000, and this was retained by Monval & Pirot (1989). Up to 19,000 *Mergus* spp. were recorded in the Soviet Black Sea in the 1980s (Monval & Pirot, 1989), and an average of 3,500 *M. merganser* were reported during the autumn migration in the Sea of Azov between 1971 and 1975 (Krivenko, 1981). However, in recent years, the maximum count has been only 1,000 (1992).

- Balkans: 50–100. 1% level 1.

The breeding population in the Balkans is thought to number only 11–32 pairs (European Bird Database, 1994).

- Southwest Asia: 20,000. 1% level 200.

Perennou *et al.* (1994) thought that this population numbered less than 10,000 birds, but counts of 15,000 and 13,700 were obtained in the north Caspian in 1967 and 1968, respectively (Isakov, 1970b), and according to Krivonosov (1970), the Volga Delta alone holds between 5,000 and 15,000 birds in winter. An average of 20,000 was reported during the autumn migration in the north Caspian between 1971 and 1975 (Krivenko, 1981). As there has been no evidence of any major decline in this population, a figure of 20,000 would seem to be more appropriate. Krivenko (1993) gives an estimate of 36,000 for the post-breeding population of *M. merganser* in western and central Siberia, which could account for most if not all of the birds wintering in the Caspian and Black Sea regions.

Habitat/ecology:

Mergus merganser breeds on freshwater lakes, pools and the upper reaches of rivers, generally in the vicinity of trees; it winters on large unfrozen lakes and brackish lagoons, less commonly on estuaries and rarely along sea coasts. In hard winters, many birds move to estuaries, coastal lagoons and sheltered sea coasts in areas with a water depth of less than 10 m (Durinck *et al.*, 1994). The species usually occurs in relatively small flocks, although it occasionally forms flocks of several thousand birds in winter. Large numbers of birds moult at the mouths of major rivers in northern Norway (Tana) and northern Russia (Frantzen, *in litt.*). Mass departure from northern breeding areas does not occur until the first frosts. Major movements occur in Russia and the Baltic in October and early November. Birds begin to arrive in countries bordering the North Sea in late October and early November, and reach a peak in December. In the Black Sea region, numbers increase from mid-October to mid-December. The return migration in spring begins very early; except in hard winters, many *M. merganser* leave Danish waters in late January, while in other parts of the Baltic, most movements take place in March (Durinck *et al.*, 1994). Most wintering areas are deserted by mid-April. Birds breeding in Britain and Switzerland return to their breeding areas in March; those breeding in northern Fennoscandia and Russia return in late April or May.

Conservation status:

The isolated Icelandic breeding population has been reported as probably decreasing (Koskimies, 1993) or stable (European Bird Database, 1994). The northwest European population is apparently stable or increasing slightly. There have been some recent increases in the numbers of birds wintering in Sweden, Lithuania, Poland and Germany, but the numbers wintering in the Netherlands have shown a marked decline in recent years (Svazas *et al.*, 1994). A recent trend analysis based on mid-winter counts suggests long-term stability in northwest Europe, but this analysis excludes a large number of birds wintering in the Baltic (Rose, 1995). Breeding populations in Norway and Sweden are thought to be stable, while the large breeding population in Finland is thought to be increasing (European Bird Database, 1994). In Britain, there has been a major southward expansion in breeding range in recent decades, with the population increasing from 1,000–2,000 pairs in 1968–72 to 2,700 pairs in 1988–91 (S. Carter *in* Gibbons *et al.*, 1993). However, decreases have been reported in the relatively small breeding populations in Germany and the Baltic States (European Bird Database, 1994). An analysis of mid-winter counts in central Europe shows no significant trends over the last 20 years (Rose, 1995). However, the breeding population appears to be increasing, with increases reported in Switzerland, Austria and France (European Bird Database, 1994). Overall trends in the small Balkans population are unknown, although the population of 5–10 pairs is said to be stable (European Bird Database, 1994). Trends in the populations wintering in the Black Sea region and Southwest Asia are also unknown. However, Krivenko (1993) reports a sharp decline in numbers in western and central Siberia between 1972 and 1989.

Network of key sites:

Only seven key sites can be identified in Southwest Asia and even fewer are known in the Black Sea (5). Major wintering concentrations have been recorded along the edge of the ice in the north Caspian, but these are poorly documented. In northwest Europe key sites for *M. merganser* are only well known in winter when the majority of the population is usually congregated on a few coastal lagoonal sites (Szecin lagoon in Poland up to 33,000 and Kursiu Lagoon in Lithuania 25,000 in 1994) which together with 28 smaller sites make a fairly complete key wintering sites network. Only 5 key sites are known for other times of year but some sites in Sweden and the Kanin peninsula seem to be important to *M. merganser* on passage. With the lack of information to the contrary, it is assumed that the Balkan population of approximately 30 pairs is dispersive and that it is not joined in winter by migratory birds from further north. If this is true the cluster of 10 key sites in this region must be a very complete key sites network. Up to 94 *M. merganser*, thought to be the entire population, has been counted at Kastoria in Greece. The resident Icelandic population is known to occur in internationally important concentrations at eight sites of which the Myvatn Laxa complex and the Sog River are very important at most times of year.

Protection status of key sites:

Most of the important wintering sites in Denmark, the northern part of Kursiu Lagoon in Lithuania and several important sites in Poland, including part of the Gulf of Gdansk (Puck Bay), are protected, but most of the other main wintering areas in northwest Europe are unprotected. Szecin Lagoon, on the Polish/German border, has been proposed as a transboundary Biosphere Reserve (Svazas *et al.*, 1994). Most of the important sites in the Black Sea and Caspian regions are likely to be unprotected, but the situation is poorly known.