Range extension of Great Grey Owl in Europe

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Great Grey Owl *Strix nebulosa* is a boreal species, occurring in vast areas of the taiga of Eurasia (*S n lapponica*) and North America (*S n nebulosa*). Its main range in the Western Palearctic includes Fennoscandia and northern Russia (König et al 2008, Mebs & Scherzinger 2008, Mikkola 2012; figure 1). The poorly known population in European Russia (west of the Ural mountains) is estimated at 1500-4500 pairs (BirdLife International 2004). In Fennoscandia, the species is relatively abundant in Finland, with slightly smaller populations in Sweden and Norway, where in recent years its range has expanded far to the south (Solheim 2009, Berg et al 2011, Valkama et al 2011; see below). Around 1900, it was known to breed in Fennoscandia's northernmost forests only, mainly in northern Finland and Sweden and in north-eastern Norway but, probably in the mid-1960s, the area expanded southward (Sulkava & Huhtala 1997). In addition to its extensive range in the north there is also an isolated population in northern Ukraine and adjacent Belarus, c 400-500 km from the southern boundary of its main range (Snow & Perrins 1998; see below).

In this paper, we discuss the southward and westward spread of the Great Grey Owl population in Europe, which in recent years has proceeded very rapidly.

Distribution and southward range extension in Fennoscandia

In Fennoscandia, Great Grey Owl expanded its distribution southward between the mid-1960s and early 1990s (Stefansson 1997, 2009, Sulkava & Huhtala 1997, Solheim 2009, Valkama et al 2011, Ottosson et al 2012). In Sweden, there was a marked increase in population size from 1960 to the late 1980s (Stefansson 1997), with 1987 be-

175 Great Grey Owls / Laplanduilen *Strix nebulosa*, female with grown nestlings on artificial breeding platform, Aasnes, Hedmark, Norway, 3 June 2011 *(Roar Solheim)*. This female was ringed as nestling 120 km to the east in central Sweden on similar breeding platform in 2010.

176 Great Grey Owl / Laplanduil *Strix nebulosa*, female incubating eggs on top of Ural Owl *S uralensis* nest box, Elverum, Hedmark, Norway, 2 June 2011 *(Roar Solheim)*

ing a very good breeding year. According to Stefansson (1997), the autumn population in Sweden that year must have been at least 3000 individuals. However, the total population in Sweden is considered to have declined slightly during the last 30 years to 400 pairs (from an estimated 500 pairs; Ottosson et al 2012, cf Hipkiss et al 2008), while it is considered stable in Finland (estimated population size fluctuating between 300 and 1500 breeding pairs; Valkama et al 2011). In Norway, Great Grey Owls have been regularly sighted in south-eastern districts ever since the first breeding pair was found there in 1989 (Solheim 2009; figure 1). The winters of 2009/10 and 2010/11 in Norway were cold with dry and loose snow, which seemed to trigger the biggest vole year in decades. The species bred in the south-east of the country in unprecedented numbers, with three pairs in 2010 (Berg 2010) and at least 22 pairs in 2011 (Berg et al 2011; figure 1; plate 175-176). Based on wing moult patterns (cf Solheim 2011), the majority of them were aged as first-year birds (Solheim et al in prep). Two breeding females had been ringed as juveniles in mid-central Sweden one and 11 years earlier (Berg et al 2011). During the winter of 2011/12, at least 12 individuals (adult and juvenile birds) were reported along the coast of south-eastern Norway (figure 1). In autumn 2012, birds were reported from six localities in the same area. In central and southern Sweden, birds turned up in considerable numbers after April 2012, although only two nesting pairs were found that year, one as far south as Kalmar at c 58˚N (Anders Wirdheim pers comm; figure 1).

Surveys of ringed Great Grey Owls show that adults and juveniles may choose different dispersal strategies. Most adults seem to remain within the same area where they have bred once (Stefansson 2009). Juveniles have been found breeding up to 650 km from their natal area, while adults ringed as breeding birds have later been found breeding up to 450 km away (Stefansson 1997, 2009). Individuals ringed in northern Sweden have been recovered both to the east in Finland and Russia, and to the south-south-west in central Sweden (Fransson et al 2008).

Range extension and increase in numbers in eastern Europe

Belarus

Breeding in north-eastern Belarus in the early 19th century was first reported by Tyzenhauz (1843). The second published record was by Shnitnikov (1913), who described two cases of breeding in 1902-03 in the Yaselda river valley north of Pinsk. No records were reported by German ornithologists working in Belarus during World War I. Two nests were found in the Białowieża primeval forest in 1929-30, near the present-day Polish-Belarusian border. The species was considered extremely rare in Belarus after World War II (Fedyushin & Dolbik 1967, Dolbik & Dorofeev 1978, Nikiforov et al 1984). However, numerous subsequent discoveries of the species in the Belarusian part of Białowieża forest suggested the possibility of its nesting there between the 1950s and 1990s (Tishechkin et al 1997, Tomiałojć & Stawarczyk 2003). In the 1990s, a number of new breeding sites were found: six territories along the Shchara river floodplain, Lyakhavichy district, in 1992 and 1995-96; five territories at Svyatitsa, Lyakhavichy district, in 1994-96; one or two territories along the Neman river floodplain, Navahrudak district, in 1993-95; four nests at Olmany, Stolin district, in 1995-96; and four-five territories in Białowieża forest in 1999. In the mid-1990s, there were a number of breeding records from south-west and south-central Belarus, on the Black Sea-Baltic watershed in the upper Pripyat river basins and tributaries, the river Narew, the upper Neman and the Białowieża

FIGURE 1 Current distribution of Great Grey Owl *Strix nebulosa* in Fennoscandia and western Russia (based on Solheim 2009, Berg et al 2011, Valkama et al 2011, Ottosson et al 2012; this paper).

forest. At that time, the population in Belarus was estimated at 50-100 pairs (Tishechkin et al 1997).

The current distribution area in southern Belarus extends from the western border of Belarus (Białowieża forest; plate 177-180) through the southern part of the Rozanska forest (Buslowka reserve), Important Bird Area (IBA) Chavanscyna, the Wygonowskie swamps, the Podwielikij Moch reserve, IBA Vieluta, the swamps around Lake Kniaz, the Pripyat National Park and the Olmanskie swamps to the border with Ukraine. The total number in Belarus is currently estimated at 100-250 pairs. In recent years, however, there has been a tendency for this species to expand south-westward. In 2007-09, the species was found near the Polish border in the Brest and Maloritsky districts, in the vicinity of the villages of Rogozno and Czarne, respectively (Abramčuk 2010; Andrej Abramčuk pers obs; figure 2).

Ukraine

The first Great Grey Owl in the forest zone of Ukraine was recorded in 1912 in the Zhytomyr district (Burchak-Abramovich 1928). A breeding

177-179 Great Grey Owl / Laplanduil *Strix nebulosa*, Białowieża forest, Bobrovichy area, Belarus, 31 May 2010 *(Ronald Messemaker)* **180** Great Grey Owl / Laplanduil *Strix nebulosa*, nestling, Białowieża forest, Bobrovichy area, Belarus, 31 May 2010 *(Ronald Messemaker)*

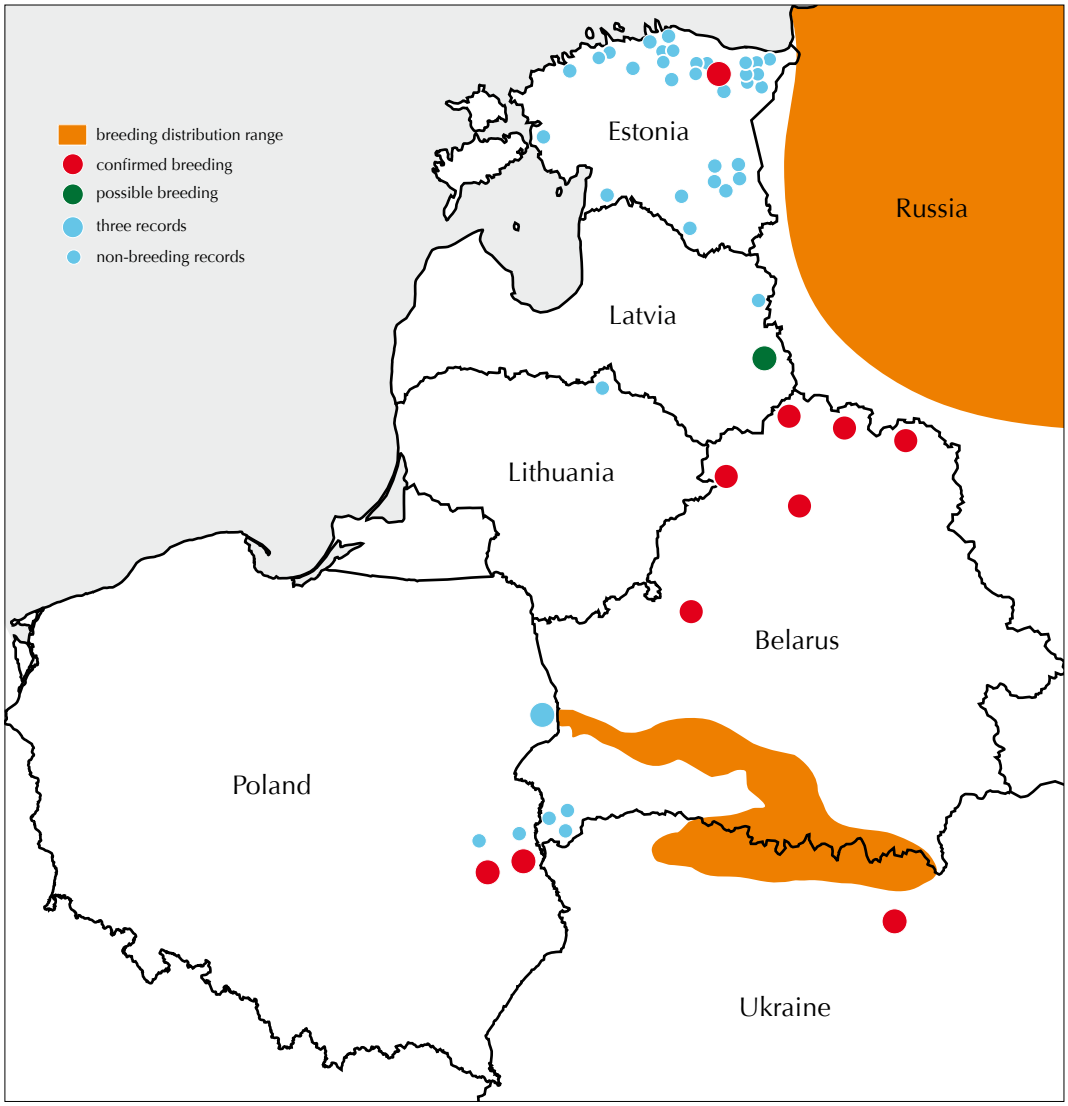

FIGURE 2 Distribution of Great Grey Owl *Strix nebulosa* in eastern Europe in 2000-12 (based on data cited in this paper).

bird was noted for the first time in 1985, in the Ovruch, Zhytomyr district in the Polesie reserve on the border with Belarus (Yaremchenko & Sheygas 1991). Until 1997, there were regular reports of the species nesting in the reserve; in some years, 15 territories were reported (Wyre 1997). In the same administrative district in 1992, a new site with breeding Great Grey Owls was found, c 60 km east of the main distribution range (Tsitsyura et al 1993). In 1997, a single bird appeared in a park on the outskirts of Kiev – the first record in this part of Ukraine (Topishko & Matus 1998). In 2002-03, the first successful breeding in the Kiev region was reported (Mishchenko 2004). Following this discovery, a female with fresh belly feathers (regrown on the incubation patch) was caught by hunters in the 30 km Chernobyl exclusion zone in the Kiev district in May 2003. These new localities lie 120-150 km to the east of the core breeding population in Ukraine (Domashevsky 2004; figure 2). During the period of increase and dispersal of birds in the neighbouring

181 Great Grey Owl / Laplanduil *Strix nebulosa*, adult, Sobibor forest, Lublin province, Poland, 15 July 2012 *(Maciej Kowalski)*

182 Great Grey Owl / Laplanduil *Strix nebulosa*, juvenile, Sobibor forest, Lublin province, Poland, 15 July 2012 *(Maciej Kowalski)*

Zhytomyr district in the Polesie reserve in 2002, a total of 26 occupied nests were reported. Overall, the number is estimated at 30-33 pairs (Gorban & Bumar 2003). During this period, the species began to show up in areas south of the reserve. Later, it was found nesting west of the Polesie reserve in the Rivne and Volyn districts. A nest was found in the Rivne reserve in May 2005 (Hymyn 2005a), while previously at least 10 breeding pairs had been found in the reserve (Gorban & Bumar 2003). Thereafter, a nest was found in Cheremskom reserve in the western Volyn region in late May 2005 (Hymyn 2005b); this is the most westerly nest found in Ukraine. The distance from the Polesie reserve is c 290 km west-south-west. Only one sighting was reported in the Chernihiv region of left-bank Polesie in September 1984 (Marisova et al 1991). However, these data are not confirmed. There are no other reports from left-bank Polesie.

In recent decades, Great Grey Owl has spread over northern Ukrainian Polesie, with some new locations of the right bank of the Kiev district, as well as in the Zhytomyr, Rivne and Volyn districts. New nests should be expected in the northern part of right-bank Polesie (Domashevsky 2009). As we assumed earlier, at this pace of settlement, in the near future we may see the species in left-bank Polesie (Domashevsky 2004). The current number of Great Grey Owls in Ukraine can be estimated at 60-110 pairs, concentrated in the right-bank region (Sergey Domashevsky pers obs).

Poland

Up to 2010, there were 17 records in Poland: in the mid-1860s, 1872, 1953, 1985, 1987, 1991, 1993, 1996, 1997, 2003, 2004, 2006 and 2007 (Tomiałojć & Stawarczyk 2003, Keller et al 2011). Most observations were from the Białowieża forest, where the species nests on the Belarusian side. In the spring of 2010, unexpectedly, two nests with young were found in the Sobibor forest, Lublin district, in south-eastern Poland. These were the first breeding records for Poland (Keller et al 2011). In 2011, there was a lack of food (as it was a poor rodent year) and no breeding. In 2012, however, seven pairs were found in Sobibor forest (plate 181-183) and another pair in Wlodawa forest, Polesie Lubelskie – making it a total of eight pairs in 2012 for south-eastern Poland (Tomasz Chodkiewicz, Bartłomiej Woźniak and Sylwester Aftyka pers obs; figure 2).

Estonia

In the first half of the 19th century, Great Grey Owl was considered to be a regular breeder in Estonia (Kumari 1958) but no exact numbers are

available. During the 19th century, there were five observations (all involving birds shot), including three breeding records: in 1859, between 1862 and 1874, and in 1893 (Leibak et al 1994). There were 41 records from 1904-98, all except one of the 15 before 1958 relating to birds shot. Most of these records were from winter, and the owls were presumably from distant populations. At least six records were from the summer period but no breeding was confirmed during the 20th century. The number of records has risen rapidly since the turn of the century, with 25 records in 2001-11 (data from the Estonian Rarities Committee; figure 2). After a 116-year interval, breeding was confirmed in 2009 in the north-eastern part of the country in Iisaku in the province of Ida-Virumaa; three territorial pairs were found, including one pair with three nestlings (Ots & Paal 2010; plate 184). The best year was 2011 with seven records, illustrating that the species is becoming more common in Estonia (for details of all records, see www.eoy.ee/en/rc).

Latvia

There are only three confirmed and properly documented historical records for Latvia. One bird was shot near Lielvarde on 24 February 1873 and another near Valmiera in August 1903. A third bird was shot (at a possible nesting site) near Lubana on 20 April 1910. The latter was published as a nesting record (see, eg, Krüdener 1910, Perrins 1998) but neither the nest nor the second bird of the presumed nesting pair were found (Strazds et al 2006). Then, after a long absence, in spring 2006, the species was again recorded east of Ludza near the border with Russia: one singing male was discovered on 27 April and a pair was observed in the same place on 11 May. However, no nest was found, and the birds' behaviour did not reveal any signs of nesting (Strazds et al 2006). On 11 May 2007, again in Ludza, a pair (heard only) was confirmed, and on 17 April 2009 several song series were heard and one bird was seen. In addition, around 20 November 2006, a second-year female was found dead in the town of Vilaka (Agris Celmins in litt).

Lithuania

Only five records are known. On 5 February 1933, one bird was found dead in the Siauliai region; in 1963, a nest with young was found in Panevezys district; in 1982, a female was shot in Panevezys

183 Great Grey Owls / Laplanduilen *Strix nebulosa*, female with five nestlings on old nest of Common Buzzard *Buteo buteo*, Sobibor forest, Lublin province, Poland, 29 April 2012 *(Tomasz Chodkiewicz)*. Photograph taken by digital trail camera.

184 Great Grey Owls / Laplanduilen *Strix nebulosa*, nestlings, Iisaku, Ida-Virumaa, Estonia, 12 June 2009 *(Riho Männik)*. First breeding record in Estonia for 116 years.

district; on 3 March 1983, a female was killed by a car in the Alytus district; and the latest record was on 16 February 2011 when one bird was sighted in Birzai in the northern part of the country (Žalakevičius 1995; Vytautas Jusys in litt). The information given by Perrins (1998; 'bred in 1825 in Lithuania') refers to the present-day territory of Belarus, near the village of Postav (cf Ivanauskas 1959; Vytautas Jusys in litt).

European Russia

In European Russia, Great Grey Owl regularly nests in the Tver, Moscow, Vladimir, Ivanovo and Nizhny Novgorod regions. The most southern locality is in the Ryazan region. The species may also breed in the Yaroslavl and Smolensk regions (Kontorshikov et al 2008, Levashkin et al 2011; Alexander Sharikov in litt). Information from European Russia is sparse and the population figures (1500-4500 pairs; BirdLife International 2004) are only a very rough estimate. So far, there appears to be little evidence of a southward expansion (Alexander Sharikov in litt).

Discussion

The numbers and distribution of Great Grey Owls in Europe (especially in the eastern part) are still poorly known. On the basis of published data, it can be assumed that both the numbers and distribution have varied considerably in the past 120 years. In the Finnish population, for example, there has been a clear southward shift in range – from Lapland towards the central and eastern regions (Sulkava & Kuhtala 1997). In 2010-12, the species was found nesting in unprecedented numbers in south-eastern Norway. In 2007-09, the species was found in Belarus near the Polish border, south-west of its regular breeding grounds. After a 116-year gap, breeding was again confirmed in Estonia in 2009, and there were seven further records in 2011. In Latvia, a stationary pair was recorded in 2006-07 and a territorial male in 2009 but nesting has yet to be confirmed. Finally, Great Grey Owls nested for the first time in Poland in 2010, and in 2012 eight pairs were found. This overview provides evidence that new areas have been colonized and that, since 2007, this occurred with an unprecedented speed when comparing it with published data from previous decades.

The increase in the number and distribution in south-eastern Norway and probably also in Estonia may be due to an influx of birds from northern Europe, while in other countries it may reflect dispersal from the population in eastern Europe. The influx from the north may be the result of harsh weather and lack of food, ie, small mammals like rodents and shrews. Limited access to food during winters with thick snow cover may impair the hunt for small mammals (Mikkola 1981, 1983, Hipkiss et al 2008; cf Lehikoinen et al 2011). These conditions occurred during the extremely harsh and snowy winter of 2009-10 (http://en.wikipedia.org/wiki/Winter_of_2009), and some birds that move long distances in search of food do not return to their former breeding grounds (Mikkola 1981, 1983, Mebs & Scherzinger 2008). The intensity of the influx may be related to the considerable abundance and productivity of owls in northern Europe, as observed in Finland in 2009 (Honkala et al 2009). The species' successful breeding attempts in new areas greatly increase its chances of permanently colonizing them. This may have occurred in Poland, where the rearing of young by two pairs in 2010 may have contributed to the population increase two years later.

We cannot rule out the possibility that the increase in numbers in eastern Europe (especially in Belarus and Ukraine) is simply due to the increased activity of birdwatchers and the use of appropriate methods for their detection. In Estonia, the species was probably also overlooked. During the last two decades, the species has attracted much attention from local birders and nature photographers here, and more time is being spent looking for it in poorly visited areas. Most of the records come from the north-eastern parts of Estonia, which has excellent breeding habitat but very poor observer coverage. Some of the vast old-growth forest areas in north-eastern, eastern and central Estonia are hard to access and need extra effort to be surveyed properly, especially when dealing with a fairly elusive species such as Great Grey Owl. The increase in the number of nests found in northern Europe in 1960-94 was partially due to the increase in nest searching efforts for all owls for ringing and monitoring, and in the building of artificial nests (Sulkava & Kuhtala 1997).

The other three owl species that are basically restricted to the boreal zone (Eurasian Pygmy Owl *Glaucidium passerinum*, Ural Owl *Strix uralensis* and Boreal Owl *Aegolius funereus*) have also increased their numbers in many regions in east-central Europe during 1990-2007 (Kopij 2011). According to this author, these changes can be explained by the possible decline of their potential competitors and/or as a consequence of the population expansion of these owl species from their Fennoscandian and Russian strongholds.

Acknowledgements
We wish to express our gratitude to the following persons who helped in various ways: Victor Belik, Agris Celmins, Gennady Grishanov, Vitaly Grishchenko, Magnus Hellström, Vladimir Ivanovski, Vytautas Jusys, Maciej Kowalski, Aleksi Lehikoinen, Riho Männik, Ronald Messemaker, Tor A Olsen, Peter Senn, Alexander Sharikov and Anders Wirdheim. Special thanks go to Przemek Wylegała for his help in preparing the maps.

Samenvatting
Uitbreiding van Laplanduil in Europa Dit artikel beschrijft de recente sterke uitbreiding van Laplanduil *Strix nebulosa* in Europa. Binnen de West-Palearctische regio komt de soort vooral voor in Fenno-Scandinavië en het noorden van Rusland maar er bevindt zich ook een geïsoleerde populatie in Oost-Europa, c 400-500 km ten zuiden van het aaneengesloten boreale verspreidingsgebied.

In Fenno-Scandinavië breidde Laplanduil zich zuidwaarts uit aan het eind van de jaren 1960 tot het begin van de jaren 1990. In Zweden nam de populatie opvallend toe van 1960 tot ver in de jaren 1980 maar de laatste 30 jaar lijkt zich weer een afname voor te doen. In Finland is het verspreidingsgebied duidelijk naar het zuiden opgeschoven, van Lapland naar het midden en het oosten van het land. In Noorwegen wordt de soort regelmatig waargenomen in het zuidoosten sinds daar een broedpaar werd gevonden in 1989. Ongekend hoge aantallen Laplanduilen broedden in het zuidoosten van Noorwegen in 2010 (drie paren) en 2011 (22 paren).

In Oost-Europa bevindt zich een geïsoleerde populatie, die vroeger beperkt was tot het centrale en zuidelijke deel van Wit-Rusland. De soort koloniseerde het noorden van Oekraïne in de loop van de jaren 1990, met nieuwe vestigingen op c 120-150 km buiten het normale verspreidingsgebied in het oosten van het land. Deze zeer snelle uitbreiding vond plaats tijdens de laatste vijf jaar. In 2007-09 dook de soort op in Wit-Rusland dicht bij de Poolse grens, ten zuidwesten van het normale broedgebied. In Estland werd een broedgeval vastgesteld in 2009 na een afwezigheid van 116 jaar; in 2011 waren er al zeven broedgevallen. In Letland werd een plaatstrouw paar waargenomen in 2006-07 en was er een roepend mannetje in 2009 maar het is niet zeker of het tot een broedgeval kwam. In Polen hebben Laplanduilen zich voor het eerst gevestigd in 2010 en waren er acht broedparen in 2012. De toename in aantal en verspreiding van Laplanduil in deze landen is mogelijk het gevolg van een invasie vanuit Noord-Europa of van dispersie uit Oost-Europa. De toename in Oost-Europa (Wit-Rusland en Oekraïne) en Estland kan echter ook verklaard worden door een toegenomen intensiteit van zoekacties, met betere methoden.

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