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SPECIAL ISSUE: GLOSSY IBIS ECOLOGY & CONSERVATION

The Current Status of the Glossy Ibis in Italy with an Update on Distribution and Population Trend

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ABSTRACT

This paper reviews the status of the Glossy Ibis *Plegadis falcinellus* in Italy reporting updated information on the distribution and numbers of the breeding and wintering population. In Italy, until the last five-ten years, this ibis species was considered a regular migrant, an irregular and localized breeder, and a rare and uncommon wintering species. Breeding was historically known in some heronries located in northern Italy and a few other sites irregularly occupied in Apulia and Sardinia. During migrations, single individuals and small flocks were more frequent and regular in April and September. These data contrast with the information from the 19th and early 20th centuries when the Glossy Ibis were observed throughout entire Italian peninsula and up to thousands of individuals were recorded in Sicily in the spring and several hundreds of breeding pairs were recorded in Piedmont. A slow but significant change in the distribution and number of Glossy Ibises has been recorded from about the year 2010 when Glossy Ibises have been seen during the whole year and across the whole country, a larger number of wintering birds have been reported, and the breeding population has increased in number, spreading into new areas. From recoveries of colour-ringed ibises, changes in population size and distribution observed in Italy could be linked to the expansion of the new increasing population in Western Europe. Because of its pivotal position at the centre of the Mediterranean basin, Italy can play a significant role as a bridge between western and eastern populations, contributing to the conservation of the Glossy Ibis along the African-Eurasian Waterbird Agreement (AEWA) flyway.

Introduction

In Italy, for a long time, the Glossy Ibis *Plegadis falcinellus* has been considered a regular migrant, an irregular and localised breeder, and a rare and uncommon wintering species (Brichetti 1983; 1992). Breeding was historically known in some heronries located in northern Italy (Piedmont and Emilia-Romagna) and a few other sites irregularly occupied by a few pairs in Apulia and Sardinia. During migrations, single individuals and small flocks were more frequent and regular in April and September, with higher numbers recorded in southeastern Italy and Sicily in spring and in the Po Plain and along the Tyrrhenian coast in autumn. Far in the past, up to thousands of individuals were recorded in Sicily in April (Doderlein 1869) but, although with lower numbers, the entire Italian peninsula saw movements of Glossy Ibises, probably because of its central geographical position in the Mediterranean, between

the past stronghold of the species in eastern Europe and the former USSR and the winter quarters located in Africa (Cramp and Simmons 1977). As reported in other European countries (Bauer and Glutz von Blotzheim 1966; Matvejev and Vasic 1973), winter records have been sporadic and very rare until recently, with only seven reports between 1871-1977 (Brichetti 1983). Since the 1980s, and especially in the last five-ten years, several changes in phenology, distribution and size of the breeding and the wintering population have been recorded. New breeding sites have been occupied and observations of single individuals or flocks up to 50 birds have become increasingly common both outside the historic distribution range and in winter. In Italy no monitoring program has ever been devoted to the Glossy Ibis and this has led to a lack of continuous data available on this species. Furtermore, information is often scattered among different sources, making retrieval difficult. In this paper, the status of the Glossy Ibis in Italy is updated, describing the recent changes in phenology, distribution and population trend. Recoveries of Glossy Ibises ringed in Italy and abroad are also analysed, linking the observed population changes to the movements and the immigrations of Glossy Ibises born in the rapidly growing colonies established in southern Spain and Camargue (France) (Ramo *et al.* 2013; Thibault *et al.* 2014).

Methods

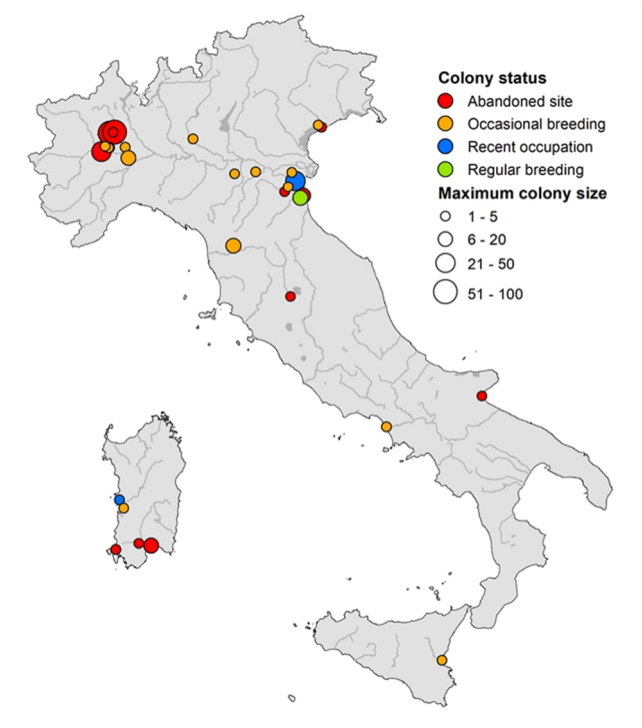
The national and local ornithological literature was reviewed and reports, ornithological blogs and websites, birdwatcher's e-lists and forums were accessed looking for historical (from the early 1900s onwards) and new data on the distribution and numbers of breeding and wintering Glossy Ibises. All information was checked, with old data revised and new data collected from different sources ammended to delete double observations, or data that could refer to the same birds if reported in the same localities, nearby areas or within the same period of time. All verified data was entered into a geo-database for analysis. Information on Glossy Ibises breeding in the Po Delta and most data on ringed birds come from the field work carried out by the Author's team since the early 1990s on colonial waterbird ecology (Costa *et al.* 2009; Passarella and Volponi 2009). Other data on Glossy Ibises ringed and recovered in the period from 1925 to 2017 have been provided by the Italian ringing scheme based at the ISPRA in Ozzano Emilia (Bologna).

Results

Breeding distribution and trend

Earliest data on Glossy Ibis colonies date back to the 15th and 19th centuries, when breeding was reported in mixed heronries located in the municipalities of Malalbergo (Bologna) and Argenta (Ferrara) (Brichetti 1983; 1992). In mid 1916-17, several hundreds of breeding pairs were recorded in Piedmont but, due to persecution, colonies disappeared by 1927 (Brichetti 1992). Later on, breeding was reported only at Verrua Savoia (Torino) in 1959-1964 and, from 1970 at Daunia Risi (Foggia) and Punte Alberete (Ravenna). The latter colony, located in the southern Po Delta, is the only breeding site regularly occupied almost every season for almost 50 years (Brichetti and Fracasso 2003; Costa *et al.* 2009, Volponi and Emiliani unpubl. data). From 1980 to 2009 occasional breeding was also reported for southern Sardinia, Sicily, Tuscany, the Lagoon of Venice and a few localities in the eastern Po Plain (Figure 1).

Figure 1. Map of breeding sites reported since early 1900s to now. The actual status and the maximum number of nests recorded at each site are also reported. In abandoned sites breeding has never been reported in the last twenty years or more up to now, or the habitat changed becoming unsuitable for the reproduction of Glossy Ibises. In occasional breeding sites, Glossy Ibises have bred in one or more seasons, even non-consecutive, since the year 2000 onwards. Regularly breeding refers to the colony of Punte Alberete, while in recent occupied sites Glossy Ibis are known to breed only since 2015

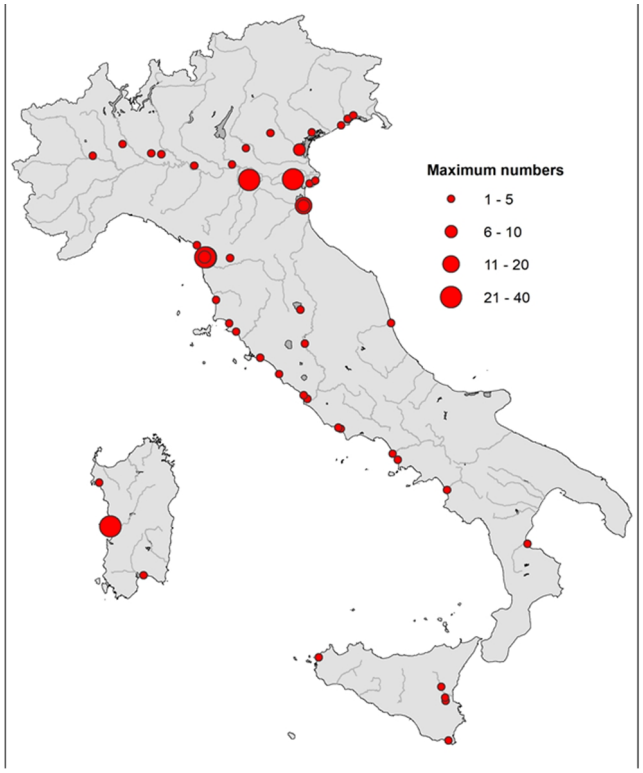


In these three decades, Glossy Ibises were known to breed in about 15 sites, most of them irregularly occupied by single pairs or small groups of birds (1-12 nests), which bred for just one or a few consecutive seasons. From 2010 onwards, things started to change. Breeding was reported from 17 mixed heronries, mostly located in the Po Plain (plus two in Tuscan inland, coastal Campania and western Sardinia) with colony sizes ranging from 1 to 30-40 nests. Nowadays, the overall population is growing, but it is still small compared to the rapidly expanding populations in Portugal, Spain, France and Algeria. Lack of a coordinated and exhaustive census does not facilitate the drawing of a complete trend line, but available data allows for an estimate of the Italian population in 0-24 breeding pairs (bp) in the 1960s, 0-18 bp in the 1970-2000s and 10-50 bp in the years from 2010 to 2016 (Brichetti and Fracasso 2003; Grussu 2019; Volponi this paper).

Wintering

Winter observations of Glossy Ibises had always been very rare until the early 1980s, when small groups of 9-25 birds had been observed in the lagoons near Cagliari (southern Sardinia) (Grussu 1987; Brichetti 1992). During the 1990s and the 2000s small groups of wintering birds have been regularly reported in Sardinia, Sicily, and in a few other sites in continental Italy (Serra *et al.* 1997; Baccetti *et al.* 2002). In January 1992-1995, 13-28 Glossy Ibises were counted in 1-5 localities. Numbers remained low in the following fifteen winters (3-20 Glossy Ibises reported 2-4 localities) with the exception of two peaks recorded in January 2005 and 2006. In midwinter 2006-2010, more than 90% of the average numbers of Glossy Ibises have been seen in only four localities (one located in north continental Italy). On average, in 2001-2010, 20-50 Glossy Ibises per winter have been reported during the mid-January International Waterbird Counts (IWC), with a maximum of 62 Glossy Ibises recorded in five sites in January 2005 (Zenatello *et al.* 2014). Overall, Glossy Ibises were more regular and numerous in Sardinia, Sicily and central-southern Italy, where, however, no site has been constantly and continuously used for more than a few consecutive winters. Less than 20 Glossy Ibises have been recorded in the winters of 2008-2013, but since then the trend has continued to be positive and in January 2016 and 2017 about 90 birds have been counted in a dozen of sites. In recent years, Glossy Ibises have been regularly observed in the wetlands of Sardinia, Sicily, Tyrrhenian Sea coast, Po Plain, the coastal lagoons of the northern Adriatic Sea and some large wetlands in central Italy (Figure 2).

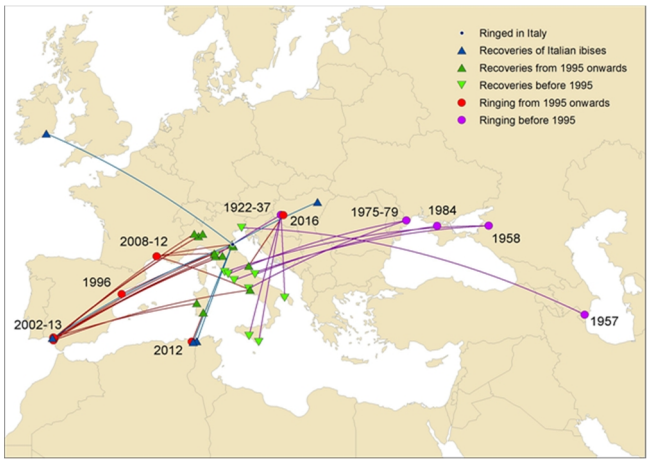
Figure 2. Map of Glossy Ibis observations reported in winters 2010-2017. Only data recorded in the period of November-February are shown. Duplicate data and observations that could refer to the same individual or flock have not been considered here. In winter, distribution of Glossy Ibises is clearly associated with wetland availability. Glossy Ibises are more common in freshwater wetlands along the river Po and its tributaries in the Po Plain as well as in coastal lagoons of the northern Adriatic Sea and Sardinia. They also occur at river mouths along the Tyrrhenian coast and in few inland freshwater wetlands of central Italy



Origin and movement

Recoveries of marked Glossy Ibises were very rare until 2005, when the first observation of a colour-ringed bird was recorded. From 1925 to 1984, only ten Glossy Ibises ringed at the nest in colonies located in the Kis-Balaton (Hungary), the Dniestr Delta (Ukraine), the mouth of the River Beisug (Russia), the Gulf of Perekop (Krimea) and the Kura Delta (Azerbaijan) were reported to the Italian Ringing Centre. All these Glossy Ibises had been shot along the Italian coasts during spring or autumn migrations (Brichetti 1983; Spina and Volponi 2009). No marked ibis was then reported until late December 1996, when a bird born in the Ebro Delta (Spain) was seen in the southern Po Delta. From 2005 to March 2017 twelve Glossy Ibises wearing colour rings have been spotted. Except one born in the Kis-Balaton, all of them have been ringed in the new colonies established in the Coto Doñana, the Ebro Delta, the Camargue and Dakhla (northern Algeria) (Figure 3).

Figure 3. Recoveries of Glossy Ibises ringed in Italy and recorded abroad, and vice versa, reported from 1924 to March 2017. For the 26 Glossy Ibises ringed outside Italy, the ringing year or interval of years are shown close to each ringing locality. From 1982 to 2017, 97 Glossy Ibises were ringed in Italy, and six of them were observed 36 times abroad. For each bird, however, only the first recovery is shown here



Recoveries of five nestlings ringed in Italy in 2008-2011 show a similar pattern of movements across southern Spain, eastern Europe and North Africa, while an observation carried out in Ireland in December 2016 confirms the nomadic behaviour of some individuals as already reported by Cramp and Simmons (1977) and more recently by Mañez *et al.* (2019).

Discussion

From historical and recent data the core breeding area of the Italian Glossy Ibises extends over the river Po plain, from the main rice fields area of Piedmont and Lombardy to the semi-natural freshwater wetlands in the Po Delta and the lagoon of Venice. Single pairs or small groups established in Sardinia, Sicily and southern continental Italy, bred only for one or few

seasons, which is typical of birds nesting at the border of their main breeding range and for this species known to shift nesting sites quickly (Hancock *et al.* 1992). In Italy Glossy Ibises have always bred in mixed heronries, mostly with herons (*Ardea cinerea, Ardeola ralloides, Nyctycorax nyctycorax*) and egrets (*Ardea alba, Ardea ibis, Egretta garzetta*), but also with Eurasian spoonbills *Platalea leucorodia* and cormorants (*Phalacorcorax carbo, Microcarbo pygmeus*). Finding the few and well-hidden nests of the Glossy Ibis in mixed colonies has always proved difficult and it is possible that some breeding events have not been reported, also considering the irregular breeding and low number of pairs involved in most of the nesting attempts. Thus, both colony distribution and population size may have been, to some extent, under-estimated. However, the Italian population has always been very small and only over the last three to five years has shown a slight positive trend. A similar positive trend has affected distribution and number of Glossy Ibises seen during the whole year. Nowadays, the observations of Glossy Ibises in winter, during post-breeding dispersal and migrations are becoming more frequent than ever in the last century, especially in the eastern Po Plain and along the Tyrrhenian and the northern Adriatic coasts. Regular wintering occurs now in north-eastern Italy, in wetlands along the Tyrrhenian coast, in Sicily and Sardinia, while in the Po Delta the Glossy ibis is becoming a resident bird.

In the past, factors limiting the breeding population were wetland transformation, direct persecution and killing of adults and nestlings for consumption (Moltoni 1936). Although protected since 1977, the illegal killing of Glossy Ibises and other waterbirds still occurs in some breeding areas and in hot spots used in autumn and winter (e.g. Campania, Puglia, Po Delta). Illegal shooting may have been one of the causes of the low number of ibises wintering in Italy until a few years ago, considering that most of their wintering sites coincide with the areas with the highest waterfowl hunting pressure. Habitat degradation (e.g. salinization of the water table in coastal freshwater wetlands), loss of foraging areas and prey (e.g. water pollution, transition from wet to dry rice cultivation, introduction of alien species) can limit population growth and the expansion of the Glossy Ibis range in Italy. On the contrary, positive factors are the overabundant general availability of the Red swamp crawfish (*Procambarus clarkii*), the increased winter survival due to milder winters and the recruitment from rapidly expanding colonies in Spain, Camargue and northern Algeria. In some areas (e.g. northwestern Po Plain and the Po Delta), Glossy Ibises and African Sacred Ibises *Threskiornis aethiopicus* breed, roost and forage in close association, but, at least for now, there are no elements suggesting any negative impact of the larger exotic species on the autochthonous ibis.

In the last century and until today, recruitment from Glossy Ibises born in Italy was low and likely not sufficient to support a viable population without a constant immigration of new breeders. Recoveries of ringed birds show that Glossy Ibises historically observed in Italy were linked to populations distributed from Hungary to the Black Sea and the Caspian Sea. During the 20th century and even today, these eastern populations have remained stable or have declined (Cramp and Simmons 1977), so the flux of potential immigrants was not enough to promote the growth of the Italian population. Therefore, the recent increase of Glossy Ibis numbers observed throughout the year in Italy could be the consequence of the dramatic population growth occurring in the colonies of southwestern Europe (Santoro *et al.* 2010; Kaiser *et al.* 2014). Italy lies at the centre of the Mediterranean Sea, where Glossy Ibises from Spain and Camargue can meet and mix with individuals flying from the Balkans, the Black Sea and the Caspian Sea towards the wintering quarters located in North and sub-Saharan Africa. Italy can thus play a significant role as a bridge between western and eastern populations, contributing to the conservation of the Glossy Ibis along the African-Eurasian Waterbird Agreement (AEWA) flyway.

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