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Status of the Glossy ibis *Plegadis falcinellus* Breeding and Wintering in Portugal

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ABSTRACT

This work intends to present the current status the Glossy Ibis *Plegadis falcinellus* in Portugal, resulting from surveying and monitoring efforts during both breeding and wintering seasons over the last 10 years. The wintering population of Glossy Ibis has increased considerably since the end of the 20th century in Portugal. The number of birds in winter has increased at a very rapid with only 1-7 individuals being recorded in 2005 and 8,320 birds recorded wintering in Portugal in 2015. The first recorded nesting occurred in 2005 in Paul do Boquilobo Natural Reserve. Currently, the breeding population is estimated between 600 and 700 breeding pairs. The breeding colonies are so far established in the vicinity of or within rice fields. This fact limits the species' potential expansion and settlement. Half of the nesting population is found in the colonies located in the Tagus river basin. Controls and recoveries of ringed birds show that the wintering population is mostly composed of individuals from Spain and France, which potentially indicates the continuation of the European population expansion. The continued increase could potentially result in conflicts with rice cultivation.

Introduction

The present work intends to present the current status the Glossy Ibis *Plegadis falcinelus* in Portugal, resulting from surveying and monitoring efforts during both the breeding and wintering season over the last 10 years.

During the twentieth century the species was extinct as breeders in diverse places in Europe, mainly due to the destruction and degradation of habitat and hunting pressure (Tucker and Heath 1994).

Until the recent past, a large number of individuals of the species was known to have wintered in the countries of North Africa, and Moreau (1972) estimates that a majority belongs to the Palearctic population. On the other hand, Bernis (1969) is of the opinion that most of the individuals observed in the Iberian Peninsula must come from the colonies of the Danube River in central Europe and Italy.

Historically, the species is referred to as common in the Alentejo region by Felix Capelo, in "*Aves de Portugal*" (1932), but after that, until the 1990s it was a rare species to observe in Portugal. However, since 1994, there has been a substantial increase in records of individuals, initially mostly in the Algarve. In the last decade it has been observed more frequently throughout Portugal, mainly in the estuaries of the Tejo and Sado rivers, but in also in almost all coastal wetlands and even inland, on the center and south

regions of the country and in very significant numbers.

This increase in observations is a consequence of both, the increase in the number of observers and the recent increase in the populations of the species in Europe (Costa 1993). The Santo André Lagoon is one of the places besides the great estuaries, where the species was observed at the beginning of its expansion, throughout the national territory, mainly during the period of migratory passage (Costa 1993), but also during the winter.

Its presence and population evolution in Portugal cannot be separated from its distribution in Spain, given its proximity, either by the existence of some colonies in some places of southwest Spain or in northwest Africa, along the Mediterranean basin, especially in the marshes of the Guadalquivir (Bernis 1969). This situation is reinforced by the fact that there are no records of nesting in the last century in Portugal.

The Glossy Ibis is a recent breeding species in Portugal, following a very significant increase in the wintering population during the last decade, having settled as breeders only six years ago. The first breeding records were in colonies on wetlands in the center of the country, at the Mondego, Tejo and Sado basins and also at Alentejo rivers, with the largest breeding colonies being currently located in the Tagus and Sado basins. The Glossy ibis breeds in mixed colonies where other Ardeidae are also present and does not yet present relevant numbers when compared to those species.

Methods

Study Area

The study area covers the entire continental territory of Portugal, although the known occurrence areas of the species, are particularly relevant in the southern half of the country, where its presence as wintering and/or nesting is more significant.

The field surveys and subsequent presentation of the results are organized in accordance to Portuguese river basins, considering the distribution of the species and the location of the respective breeding colonies and refuges.

Winter season

Winter counts are carried out under the National Program for the Monitoring of Winter Waterfowl (PNMAAI) in January, coordinated by the ICNF/CEMPA and take place every year in the most important wetlands for these species, in particular estuaries, dams, and reservoirs.

Counts are usually performed by a set of volunteer-professional staff (ICNF), mostly from points located at the edge of wetlands. In large estuarine wetlands, counts are also made from a boat and along a pre-defined transect during high tide. In winter, each wetland area is visited in January, preferably in a period of seven days selected in order to promote simultaneous surveys between the various wetlands, while avoiding hunting days. In the case of estuarine areas, counts are carried out during the highest tides of the month and during the high tide period.

Whenever possible the quantification of the number of birds is performed by direct counting. In the case of large flocks or when in flight, the numbers are an estimation of groups with n birds (Bibbly *et al.* 1992).

Breeding season

The method used to inventory the breeding population was the nest count method (Franzeb 1977).

For the identification of the location of the colonies, where the species nests together with ardeids, known colonies were visited and others where their presence and possible nesting were known.

Each breeding colony was visited two times during the breeding season while trying to maximize the level nesting evidence. The abundance quantification method was carried out in the form of direct censuses according to the characteristics of the species, by quantifying the number of breeding pairs. Most cases are in the smaller colonies.

When this method was not possible to employ, in the large colonies, censuses were made by estimations based on sampling and extrapolation.

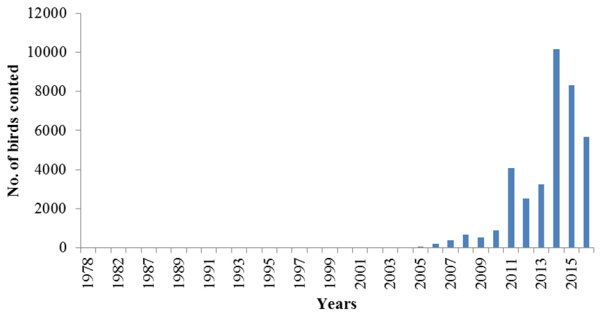
For ease of presentation, the smaller river basins were encompassed with those adjacent to them, or with larger basins, forming larger sets which are named

according to the Portuguese Environment Agency (APA 2017).

Results

The wintering population of Glossy Ibis in Portugal has increased considerably since the end of the 20th century. The number of birds in winter has increased at a very rapid rate since 2005, when only 1-7 birds had been recorded, whilst 43 were recorded in that year (Figure 1).

Figure 1. Variation on wintering population of Glossy ibis in mainland of Portugal



In 2006 a new record count of 191 was attained and only nine years later (2015) 8,320 birds were wintering in Portugal. In 2016, the winter numbers decrease substantially, likely due to the severe drought that began the previous year. During winter the species is present in 21 of the 80 wetlands covered by the winter surveys, occupying mainly coastal areas and rice fields.

The first recorded nesting occurred in 2005 in Paul do Boquilobo Natural Reserve, followed by another record, in 2006 in a small island on the Tagus basin. Since 2012 breeding has been recorded each year. The breeding population was estimated in 2016 at between 600 and 700 breeding pairs, (Table 1) following a trend of growth, and has grown rapidly since the last census (Encarnação 2014).

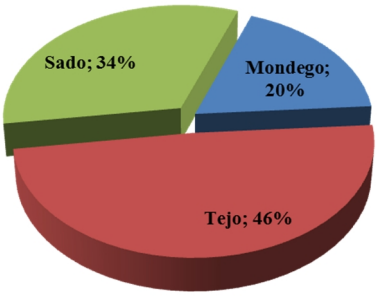
Table 1. Distribution of breeding pairs by colonies

River basins/colonies	No. Pairs 2014	No. Pairs 2016
Mondego river		
Paul do Taipal	85 - 90	120 - 150
Tejo river		
Paul do Boquilobo	200 - 210	150 - 200
Escaropim	40 - 44	125 - 150
Póvoa	0	45 - 50
Sado river		
Sacholinha	120 - 150	150 - 190
Murta	0	12 - 14
Santo André - Covinha	2	50 - 60
Pizão	0	2 - 3

The species is currently breeding at 8 different sites, mainly in the river basins of Mondego, Tejo and Sado, as well as in one coastal lagoon of Alentejo and in a small dam near of Beja (Figure 2). Half of the nesting population is found in the colonies located in the Tagus river basin (Figure 3). In all cases breeding is mixed with herons and spoonbills.

Figure 2. Map of Portugal, its main hydrographic basins and geographical location of Glossy Ibis breeding colonies (red spots)

Figure 3. Distribution of breeding pairs by river basin



Discussion

During the winter, the Glossy Ibis is observed in several wetland areas, all of which encompass rice fields thus suggesting its dependent on this habitat, where they may find abundant food mainly consisting of Red Swamp Crayfish *Procambarus clarkii* from Louisiana. Likewise, the breeding colonies are so far established in the vicinity or within areas of rice fields. This fact, limits the species' potential expansion and settlement as a breeding bird to very specific regions.

On the other hand, controls and recoveries of ringed birds show that the wintering population is mostly composed of individuals originating from Spain and France, which potentially indicates the continuation of the European population expansion (CEMPA, not published data). Many of the wintering birds may become established as breeders, if they find food availability and favourable habitat.

The continued increase in population could potentially result in conflicts with rice cultivation. Although the largest numbers occur during the winter, when there should be no conflict as rice-paddies have no agricultural activity at that time, this is no longer the case during spring and summer. Given its current association with rice fields the continued growth of the breeding population might potentially be regulated by agricultural practices limiting the species access to rice-fields.

Finally, given the rapid population growth during both, winter and breeding seasons, it will be vital to continue monitoring the species numbers and its movements. Therefore, marking individuals born in the Portuguese colonies is a priority, which together with the observations of individuals marked in other countries will allow a better understanding of population dynamics.

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