

# Goodbye “Slender-billed”: the extinction of *Numenius tenuirostris* and the sample from the Antinori Collection in Perugia

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## ABSTRACT

On November 18th, 2024, the Slender-billed Curlew *Numenius tenuirostris* was declared globally extinct with a probability of 96,0%\*. In presenting the specimen that belonged to the “Orazio & Raffaele Antinori” Collection of Perugia (Umbria, central Italy), still unknown to the scientific community, the contribution also introduces a brief focus on the dynamics of the species in Italy since the early 1960s.

Key words:

Slender-billed Curlew, Scolopacidae, Antinori Collection Perugia.

## RIASSUNTO

Addio “Beccosottile”: l'estinzione del *Numenius tenuirostris* e l'esemplare della Collezione Antinori a Perugia

In data 18 novembre 2024, il Chiurlottello *Numenius tenuirostris* è stato dichiarato estinto a livello globale con probabilità del 96,0%\*. Nel presentare l'esemplare appartenuto alla Collezione “Orazio e Raffaele Antinori” di Perugia (Umbria, Italia centrale), ancora sconosciuto alla comunità scientifica, il contributo introduce anche un sintetico focus sulle dinamiche della specie in Italia dall'inizio degli anni Sessanta del Novecento.

Parole chiave:

Chiurlottello, Scolopacidae, Collezione Antinori Perugia.

## INTRODUCTION

“Extinction is... forever! Biodiversity in danger at the dawn of the new millennium” was the title of an engaging and successful exhibition held in Perugia (Umbria, central Italy) in December 2000 (Barili et

al., 2008a) by the University Centre for Scientific Museums (CAMS). It was chosen, not by chance, as a warning to alert public opinion to the environmental problems and catastrophes that it might face in the new century. This warning is unfortunately

becoming a reality after a few years: *Capra p. pyrenaica* († 2000), *Incilius periglenes* († 2004), *Lipotes vexillifer* († 2006), *Diceros bicornis longipes* († 2011), *Chelonoidis abingdonii* († 2012), *Pipistrellus murrayi* († 2017), and *Ceratotherium simum cottoni* († 2018) are only a few instances of taxa declared extinct from the beginning of the third millennium. Recently, in November 18, 2024, the global extinction (with a probability of 96.0%\*) of the Slender-billed Curlew *Numenius tenuirostris* Vieillot, 1817, a scolopacid considered for decades the rarest species of European avifauna (Gretton, 1995) and one of those in the world with a critical survival expectancy, was decreed (Buchanan et al., 2025). Its extinction, unless there are confirmations in the future\*, represents the first of the class Aves that has affected three continents and the third recorded in the Western Palearctic since 1500 (Buchanan et al., 2025), after those of the Great Auk *Pinguinus impennis* in 1844 (Fuller, 2003) and the Canary Islands Oystercatcher *Haematopus meadewaldoi* by 1940 (Valledor de Lozoya, 2013; Ens & Underhill, 2014; Collar et al., 2021; see website 1). Also belonging to the order Charadriiformes, *Pinguinus impennis* was flightless and lived in huge colonies distributed on the coasts of the North Atlantic (from Labrador to Scotland), while *Haematopus meadewaldoi* was endemic to the Canary Archipelago and was confined to its eastern sector, specifically in Fuerteventura, Lanzarote, Lobos, La Graciosa, Roque del Oeste, Alegranza and probably Roque del Este (Senfeld et al., 2019; Barone, 2021; Collar et al., 2021). *Numenius tenuirostris* (hereinafter SbC) was instead a long-range migrant with a vast range, which touched central-northern Asia (where it nested), southern Europe (where it was regularly observed during the two migrations) and the Mediterranean Basin (where it wintered in consistent numbers also). Similar in structure to a small Eurasian Curlew *Numenius arquata* with a slender bill, in adults the flanks, lower chest and ventral parts were white, with black heart-shaped feather tips giving it a decidedly different mottled appearance from the typical streaked-speckled of the other *Numenius*; the sexes were similar, but females had slightly larger measurements. Despite the decline of its contingents, noticed since the end of the 19th century (Gretton, 1995), in Italy still in the immediate post-war period SbC "[...] is rare in the north, less rare in the central part, and quite frequent in Sicily as a bird of passage and wintering [...]" (Scortecci, 1953). To realize the progressive and very rapid rarefaction at the national level, it is sufficient to summarize the dynamics of its status through some salient stages extrapolated from the following 5 decades.

- **1960s decade.** Hunting activity in Italy is regulated by the Royal Decree (R.D.) of 1939 which lists SbC among the species subject to hunting. In 1961 Dr. Alfredo Brandolini, presenting the three SbCs preserved in his ornithological collection creat-

ed in the province of Ravenna (Emilia Romagna, northern Italy), states that "About forty years ago (therefore in the 1920s, ed.) it was quite common, but then it became scarcer and now it can be said to be rare" (Brandolini, 1961; Ortali, 1974). At the end of the decade, the ornithologist Carlo Cova, in a decidedly more objective way, concludes: "[...] The Slender-billed Curlew can be considered a species of more or less imminent extinction. [...] In Italy it is formally extinct as a bird of passage; in the recent past it was present every year" (Cova, 1969).

- **1970s decade.** SbC appears in the new and important encyclopedia on European avifauna by Frugis (1971) simply as "[...] in transit in southeastern Europe and wintering in the Mediterranean area", also including Italy among the nations where the species has been ascertained without however making any mention of threats of extinction: the only threats, introducing the Scolopacidae family, are those referring to the Eskimo Curlew *Numenius borealis* "[...]" and the perhaps extinct Eskimo Curlew "[...]". In the same period, a well-known Italian taxidermy manual continues to consider SbC in a "[...] list of birds present or capturable more or less frequently in our country", indicating the materials suitable for its preparation and the degree of edibility, listed as "good" (Marchetti, 1975). The reality possibilities of "collecting" SbC in Italy are now very limited: the last officially preserved specimen was collected in Iesolo (Venice) on March 23, 1974 (Baccetti, 1995). In January 1978, the national framework law on hunting no. 968/77 came into force to replace the old R.D. 39, Whrimbel *Numenius phaeopus* and SbC are finally included in the list of protected species while Eurasian Curlew remains huntable (fig. 1); among other novelties, bird trapping with any type of net is suppressed and shortly after the hunting period is restricted from the third to the first decade of March. These prohibitions, although late and certainly not aimed at the direct protection of the species, contributed to protecting it in a better way considering that the hunting of waders with nets (e.g. "paretaio", "larga", "prodina"; cf. Pieroni, 1967b) was still practiced and that the peak of contacts with SbC was recorded in Italy in late March (Baccetti, 1995).

- **1980s decade.** Like twenty years before, the criticality of the situation returns to focus and SbC is for Italy an occasional, very rare species, in continuous decline (Incerpi et al., 1980); after a few years, as an occasional/accidental species in Italy its name does not appear in the work of Bricchetti et al. (1986). Although it now enjoys full protection from Italian legislation, it cannot be excluded that illegal killings may have continued especially due to confusion with the Eurasian Curlew: the last capture of SbC in the national territory, nev-



Fig. 1. "Vintage" hunting decoy (around 1960s)

of Eurasian Curlew, once used both in coastal hides (sea hunts) and in inland wet meadows (meadow hunts) (Pieroni, 1967a), both stopover areas also frequented by Slender-billed Curlew during the two migrations through Italy (Zenatello & Baccetti, 2001) (photo courtesy D. Lombardi).

er ascertained, would have taken place in March 1981 in Umbria (central Italy) in a hunting pond near San Giustino (Perugia), reported by Paci (1992a, 1992b) and Laurenti et al. (1995) based on oral information provided by the taxidermist who had prepared the specimen. This record was subsequently discarded (Baccetti, 1995; Zenatello & Baccetti, 2001; Laurenti & Paci, 2006), as it was supported by too weak references given the importance of the event it dealt with and the concrete possibility of error with small males of Eurasian Curlew with characters overlapping those of large females of SbC (Van Duivendijk, 2010; Collinson et al., 2014; Corso et al., 2014).

- **1990s decade.** The new (and current) Italian hunting law no. 157/92 also excludes Eurasian Curlew from huntable species and then, with D.P.C.M. of March 21, 1997 (art. 2), also prohibits Black-tailed Godwit *Limosa limosa* considering that SbC could associate with both in resting and feeding areas. In the meantime, SbC is included among the five globally threatened species of Italian avifauna (Lambertini, 1995; see also Baccetti, 1995).
- **2000s decade.** On April 18, 2000, Italy signed the Memorandum of Understanding (MoU, produced in 1994 by the Convention on Migratory Species of Wild Animals) regarding the serious risk of extinction of the SbC and a year later the national guidelines aimed at its knowledge, recovery and conservation are published (Zenatello & Baccetti, 2001); on 4 December 2008 RSPB, Birdlife International and other partners launched a campaign to search for the last SbCs, on the occasion of the IX Convention on Migratory Species (CMS

COP9) held in Rome; on 30 November 2009, the European Directive 2009/147/EC on the conservation of wild birds was adopted and in Annex I, which provided for special measures to ensure the protection of the habitat of threatened species in their respective distribution areas, SbC was also included.

At a global level, already in 1988 *Numenius tenuirostris* was in fact considered by the IUCN a threatened species and since 1994 critically endangered (Buchanan et al., 2025); the following year, on February 23, 1995, the last contact with the species relating to the now sadly famous isolated individual photographed in the historic wintering site of Merja Zerga (Morocco) will be documented (see also Collinson et al., 2014). In our country during the 20th century there were about 75 records of ascertained SbC, of which only about fifteen after 1970 (Gretton, 1995); the remaining records include 141 capture reports from 1828 to 1974 with approximately one hundred specimens preserved in various museums and private collections (Baccetti, 1995).

The aim of this contribution is to outline the profile of the sole Slender-billed Curlew specimen known from Umbria (fig. 2), preserved to this day thanks to museum curation for at least 150 years. Of uncertain Italian origin and still unknown to the scientific community, except for a recent brief mention in Laurenti & Paci (2017: 26), it originates from the former Antinori Brothers Collection of Perugia, now curated by CAMS (Barili et al., 2008b; Galassi, 2019; Cecchetti, 2023).

## MATERIALS AND METHODS

The specimen belonged to the historical collection established by the Perugian Marquises Orazio and Raffaele Antinori, initiated at least in 1828 (based on the first specimen known to exist), donated to the then Libera Università di Perugia in 1885 (n. 621 of museum inventory) and preserved now in the Gallery of Natural History (GSN) of the University of Perugia (Cecchetti, 2023). It belongs to a rich collection of 800 specimen from various zoogeographic regions such as Western Palearctic, Neotropical, Oriental and Australian, collected directly by the Antinori brothers or donated by illustrious naturalists of the time (Barili & Gentili, 2017). The specimen, subjected to a complete restoration in 2014, present itself as a well-prepared and very well-preserved taxidermy mount, lacking a label, mounted on a square, turned, light grey base (fig. 2); fragmentary information regarding its provenance was derived from the zoology museum inventory of the University, 1928 update (figs. 3, 4). Figure 5 reports information and measurements of the specimen of this study, extrapolated by Zenatello & Serra (2002), Brichetti & Fracasso (2004), Van Duivendijk (2010), Corso et al. (2014).



Fig. 2. Slender-billed Curlew *Numenius tenuirostris* from "O. & R. Antinori" Collection in Perugia.



Fig. 3. Frontispiece of the inventory of the ornithological collection of the Libera Università di Perugia.

## RESULTS

From the parameters in figures 4, 5, 6, 7, 8 it is evident, with regards to the specimen, what is reported in the following points:

1. it is a female, by wing measurements exceeding the maximum limits of 270 mm and 274 mm reported for this sex by Brichetti & Fracasso (2004) and Corso et al. (2014), respectively; the tarsus also exceeds the maximum limit of 69 mm, reaching the minimum limit for male Eurasian Curlew of the subspecies *arquata* (Corso et al., 2014);
2. it is a sub-adult in its first summer (2CY), by numerous black spots on the lower parts of the adult plumage still combined with the presence of juvenile primary remiges 5-7 (fig. 6) and tertiary remiges (fig. 7), as well as old wing coverts contrasting sharply with the fresh molted mantle and scapular feathers (fig. 8) (Zenatello & Serra, 2002; Van Duivendijk, 2010; Corso et al., 2014);
3. it is of European origin;
4. it was collected within a very broad temporal window, spanning almost the entire 19th century;
5. it was acquired for a price of 15 lire (fig. 4) corresponding, approximately, to 76,00 euros today (see website 2).

621	1		<i>Numenius tenuirostris</i>	"	Coll. Antinori	15
622	1		<i>Numenius arquata</i>	"	"	15
623	1		<i>Numenius phaeopus</i>	"	"	45
624	1		<i>Numenius phaeopus</i> ♀	"	"	45
625	1		<i>Vanellus cafer</i> ♂	Valparaiso	Coll. Antinori	30
626	1		<i>Hypoplesterus spinicollis</i> ♂	Alfa menoa	Coll. Antinori	30
627	1		<i>Hypoplesterus spinicollis</i> ♂	Alfa menoa	Coll. Antinori	30
628	1	<i>Vanellus cristatus</i> Meyer		Alfa menoa	Coll. Antinori	15

Fig. 4. Detail of the inventory, with the extremes of *Numenius tenuirostris* underlined.

Museum	CAMS-UNIPG
Catalog	Mus. Zool. Libera Università di Perugia
Catalog code	621
Collection	formerly "Orazio & Raffaele Antinori" Collection
Species	<i>Numenius tenuirostris</i>
Location of collection	Europe
Date of collection	Spring, post 1827- ante 1885
Sex	♀
Age	Immature in early summer (2CY)
*Left Wing (wing slightly damaged)	mm 275,0
*Bill height	mm 10,7
*Bill width	mm 88,1
*Bill length to plumage	mm 90,1
Nalospa	mm 76,3
Head + Bill	mm 132,4
*Left Tarsus	mm 71,0
Foot	mm 51,5
Notes	Purchased by the Libera Università di Perugia for lire 15

Fig. 5. Specimen sheet: the asterisked measurements are those considered for sex determination, comparable with the values reported in the literature.



Fig. 6. Abraded white margins on primary remiges 5, 6, 7 of juvenile type (Zenatello & Serra, 2002).



Fig. 7. Juvenile tertiary remiges very abraded with a species-typical pattern of rectrices and supracaudals (Corso et al., 2014).



Fig. 8. Sharp contrast between unmolted wing coverts and fresh mantle and scapular feathers (Van Duivendijk, 2010; Corso et al., 2014).

## DISCUSSION

Based on the limited available evidence, it is hypothesized that the individual of *Numenius tenuirostris* from the "O. & R. Antinori" Collection is a sub-adult female collected in Europe during spring migration, at a time when populations were relatively abundant and far from their impending fate: "In all parts of Italy SbC is encountered, but while in the northern parts it is rather rare and only passing through, in the central and southern parts it is common and spends the winter there. [...] During the winter it is common in the Romano and in Sardinia; in Sicily [...] it is the most common species in that season. In the Romano [...] it is rather common in the low meadows along the Tiber [...]" (Salvadori, 1872); "On the banks of the Ofanto river in the marshy lands of the salt pans, slender-billed curlews arrive in large packs in August. They are hunted very actively, which lasts beyond the first half of September" (de Romita, 1900). However, already in the first decades of the XX<sup>o</sup> century its status in Italy was beginning to be given particular attention by the ornithological world: "[...] this curlew is very rare among us [Italy, ed.] [...] with the exception of a few central and southern provinces [...] In various years and on various markets I was unable to procure more than five specimens [...] my observations were made for about twenty years in Tuscany, and then in other central parts, such as the Campagna Romana, the Maremma, and Sardinia, and SbC I never saw it and I almost never had it" (Martorelli, 1906); "In Italy it is a double-passage and winter species; it arrives in August-September and leaves again in March-April, very rare in the Po Valley, especially in the western part, frequent in the central provinces [...], southern ones and in Sicily" (Arrigoni degli Oddi, 1929). Referring to the eastern territories of Emilia-Romagna, where the species must have been less rare than in the western Po Valley, Zangheri (1938) reports in his 1931 first complete census of the Romagna avifauna

that SbC: "[...] is found more easily during the autumn passage (September-October, rarely earlier). But it is an infrequent species and very scarce thereafter during the winter"; forty years later, in the ornithological notebook of a "meadow" hunter from the province of Ravenna, commenting on these last words, it reads "Slender-billed Curlew = disappeared from the scene" (courtesy D. Piazza). Both two statuses would agree with the respective considerations of Scortecci (1953) and Cova (1969) reported for the entire Italian territory in the introductory notes.

It is difficult to speculate on the cause of the rapid regression of the species, as several factors were involved and cannot be prioritized: hunting (legal and illegal) may have played a significant role in the past, considering not only collection but also food use, as evidenced by specimens found in various markets; furthermore, the use of firearms may have indirectly contributed through lead poisoning in feeding areas; alongside this limiting factor, other equally important factors include the degradation and/or disappearance of preferred habitats (pollution, fragmentation and/or modification of vast areas, various anthropogenic disturbances), ongoing climate changes and, last but not least, the genetic isolation that surviving populations may have suffered (cf. Zenatello & Baccetti, 2001; Brichetti & Fracasso, 2004; Pietrelli, 2024; Buchanan et al., 2025).

We quote from Pietrelli (2024) this sad but realistic reflection: "[...] Besides being a defeat for those who consider this planet a treasure trove of precious things and strive to keep it unchanged, this extinction represents the emblematic symbol of a world that is changing faster and faster, and always for the worse. I may seem pessimistic, but it is striking to know that this is not an endemic species of a small island scattered in the vast oceans: we are talking about a species spread over three continents! This is why we are here wondering how it was possible [...]". In the case of the SbC, past events such as those of

the Passenger Pigeon *Ectopistes migratorius* or the Eskimo Curlew *Numenius borealis* (Day, 1989) should certainly have provided valuable examples to learn from, precisely because these two species also moved in very large flocks over vast geographical areas, within which identifying the causes of a rapid decline in migratory populations and providing prompt recovery solutions would be impossible even today, unless activated well in advance through coordinated actions among all interested countries. Another announced death, therefore, that of the Slender-billed Curlew, for which we can hypothesize the concurrence of multiple negative causes, but we must undoubtedly agree on one fixed point: having remained indifferent for too long in the face of the SOS launched by ornithologists well over a century ago.

## EXTINCT... AT THE MUSEUM!

"Extinction is a stern teacher," this sentiment pervades our museum (paraphrasing the title of one of R. A. Heinlein's most famous novels) when we lose a portion of the biodiversity that animates our planet. Today, more than ever, natural history museums must not forget their role as educators (in the fullest sense of the term), a role they must embrace towards visitors and the public, clearly positioning themselves through their actions as places where, through informal learning via objects, the adventure of knowledge is experienced daily. Biological evolution profoundly influences our lives, yet today, in various countries worldwide (see website 3) and even in Europe (see website 4), initiatives arise to hinder its formal teaching. We find it difficult to discuss sustainability if we continue to lose biodiversity without awareness, especially as resurgences of anti-evolutionism further obstruct the understanding of life's history on our planet. Recently, the e-book "Learning Evolution through Socio-Scientific Issues" was published in multiple languages (see website 5), representing one of the most significant outcomes of the European project COST Action EuroScitizen (see website 6), active from 2018 to 2023. This project is a clear example of how biological evolution can serve as a model to enhance scientific literacy. Scientific museums, through their preserved tangible and intangible heritage, represent a vital tool for both better understanding the world we inhabit and increasing public comprehension of science through critical thinking and approaches. Natural history museums and collections can be fully regarded as the practical component of culture and, as such, participate fully in building freer, fairer, more equitable, multicultural, and naturally sustainable societies (see website 7). The Slender-billed Curlew specimen from the Antinori Collection, despite being in excellent aesthetic and conservation condition, is not currently on display for understandable reasons related to the preserva-

tion of the specimen, which, despite itself, has become of inestimable value (Pinna, 1997). However, several projects are currently underway to enhance the specimen's educational and exhibition potential, aiming to foster within the museum a dialogue with the public regarding the issues and problems related to species extinction, including humans. In this regard, since the Natural History Gallery is also the current headquarters of the SOI (Italian Ornithological Society), a collaboration has been established between the association and the museum to revisit the exhibits and content of the exhibition "Extinction is... forever!" (Barili et al., 2008a), previously presented to the public in Perugia at the Palazzo della Penna, home of the city's Civic Museum. Tangible witnesses to extinction, such as the Slender-billed Curlew, will thus allow us to give the new temporary exhibition a format closely linked to the present and future history of extinctions on the planet. The exhibition will also serve as a platform to present to a wider audience some of the major ongoing research projects for the protection of global biodiversity, conducted in recent years in Italian museums: "VertEx" (Vertebrata Extincta) (Nicolosi et al., 2013) and "Progetto Estinzione. An exhibition, a genetic database, and researches on collections of extinct and endangered vertebrates in Italian natural history museums" (Tessa et al., 2020). Thanks to the expertise of museum staff and the scientific research and studies conducted by and in museums, they can offer the public opportunities for discussion and constructive shared planning, insights, and reflections on the topic of biological extinction, both in person and online. This is one of the commitments an active museum must include in its cultural offerings, especially today considering the ongoing global climate crisis. The topic of extinction unfortunately often concerns museums as well, often closed and/or inaccessible. However, they have to assert their strong will not to become extinct [...not even if they are killed! (Guareschi)] and instead draw new strength from the issues surrounding them to create ever more exhibits and open new museums, such as this proposal made online by the public (see website 8), to open a new museum dedicated to extinction.

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