

First estimates of Common Sandpiper *Actitis hypoleucos* and Ruddy Turnstone *Arenaria interpres* wintering along the coast of Trapani (Sicily, Italy)

Salvatore Surdo

Abstract - A census was carried out using the method of transects along stretches of coast of the Province of Trapani in order to estimate the wintering population of Common Sandpiper and Ruddy Turnstone. Although the International Waterbird Census (IWC) provides accurate estimation of wintering waders in Italy, the number of wintering individuals of Common Sandpiper *Actitis hypoleucos* and Ruddy Turnstone *Arenaria interpres* are strongly underestimated. The reason for this underestimation lies in the type of habitat they are used to populate along with the solitary life habits of the Common Sandpiper.

To address this issue, we inspected 46.9 km of coastline where we recorded to 92 Ruddy Turnstones and 56 Common Sandpipers. For both species, the sites (coast) where bird-sightings occurred were marked with georeferenced data and classified as harbour area, sandy, rocky (including vermetid reefs) and posidonia banquettes. For each species, the IKA (Index of Abundance per Kilometer) was calculated, both global index and relative to each type of coast.

As for the Common Sandpiper we observed 87 individuals, between transects and spot observations in the province of Trapani, which is the 22% of the whole wintering population estimated in Italy. Notably, even greater is the importance of our observations of the Ruddy Turnstone, which accounting for up to 154 individuals corresponds to the 71% of the whole Italian wintering population.

Projection of these data to the entire Italian coast allows estimating a wintering population in Italy much larger than that reported so far, especially for the Common Sandpiper, which uses not only the sea coast but also inland wetlands and rivers as suitable wintering habitats for wintering.

Keywords: IKA, trottoir, vermetid reefs, banquettes, waders.

Riassunto - Primo censimento del piro piro piccolo *Actitis hypoleucos* e del voltapietre *Arenaria interpres* svernanti in provincia di Trapani (Sicilia, Italia).

È stato effettuato un censimento con il metodo dei transetti lungo tratti di costa della provincia di Trapani per stimare la popolazione svernante di piro piro piccolo e voltapietre. Sebbene il Censimento Internazionale degli Uccelli Acquatici (IWC) fornisca una stima accurata dei trampolieri svernanti in Italia, il numero di individui svernanti di piro piro piccolo *Actitis hypoleucos* e voltapietre *Arenaria interpres* è

fortemente sottostimato. La ragione di questo errore risiede nel tipo di habitat che sono soliti frequentare e nelle abitudini di vita solitarie del piro piro piccolo comune.

Per risolvere questo problema, abbiamo ispezionato 46,9 km di costa, dove abbiamo osservato e contato fino a 92 voltapietre e 56 piro piro piccolo. Per entrambe le specie, i siti (coste) in cui si sono verificati gli avvistamenti sono stati contrassegnati con dati georeferenziati e classificati come aree portuali, sabbiose, rocciose (comprese le scogliere di vermetidi) e banquettes di posidonia. Per ogni specie è stato calcolato l'IKA (Indice di Abbondanza per Chilometro), sia globale che relativo a ciascun tipo di costa.

Per quanto riguarda il piro piro piccolo abbiamo osservato 87 individui, tra transetti e osservazioni spot in provincia di Trapani, pari al 22% dell'intera popolazione svernante stimata in Italia. Ancora maggiore è l'importanza delle nostre osservazioni del voltapietre, che con 154 individui corrisponde al 71% dell'intera popolazione svernante italiana.

La proiezione di questi dati all'intera costa italiana permette di stimare una popolazione svernante in Italia molto più numerosa di quella finora segnalata, soprattutto per il piro piro piccolo, che utilizza come ambienti idonei allo svernamento non solo la costa marina ma anche le zone umide interne e i fiumi.

Parole chiave: IKA, sentiero, trottoir a vermetidi, banquettes di posidonia, trampolieri.

INTRODUCTION

Among the class Aves, Waders are one of the most frequently surveyed group of birds and accurate and precise estimations of their populations are indeed possible especially in particular phases of their biological cycle. This peculiarity offers, even at local level, an objective yardstick for the definition of priorities concerning the protection of wetlands and land management. To this end, we can rely on solid and long-term (more than thirty years) monitoring network of waterbirds, which IWC provides under the coordination of the Wetlands International organization and the Institute for Environmental Protection and Research (ISPRA) worldwide and in Italy, respectively.

In general, estimates of the waders populations are highly accurate with a few exceptions, namely, the Common sandpiper, Green sandpiper *Tringa ochropus*, Sanderling *Calidris alba*, Wood Sandpiper *Tringa glareola*, Ruddy Turnstone, Common snipe *Gallinago gallinago*, Eurasian woodcock *Scolopax rusticola* and Jack snipe *Lymnocyptes minimus*. Possible sources of error in surveying these species include the peculiar habitat frequented, their elusive behaviors, or solitary habits that have so far impeded building reliable censuses on the real extent

Dipartimento di Scienze Agrarie, Alimentari e Forestali,
Università degli Studi di Palermo, Viale delle Scienze, Edificio
4, 90128 Palermo, Italia.
E-mail: salvatore.surdo@unipa.it

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of their wintering populations (Baccetti *et al.*, 2002; Zenatello *et al.*, 2014).

Monitoring trends and changes in animal populations, not only is mandatory as for the international and national legislations, but is key for the implementation of efficient fauna conservation strategies (Thompson *et al.*, 1998; Williams *et al.*, 2002). In this regard, rigorous and quantitative analytical indices are necessary to successfully monitor population changes over time. Among others, the IKA index is a widely accepted and reliable estimator of the abundance of wintering waders (Bibby *et al.*, 2000).

The goal of this work is to derive linear estimates of the wader's density through the IKA index in order to extrapolate more accurate data about the Italian wintering population.

MATERIALS AND METHODS

The data set of this study was built by systematic observations along portion of the Sicilian coastline along with causal observations in sparse coastal sites. Yet, to get a more accurate estimation of the wintering population, data of the digital database Ornitho.it were also consulted on July 20, 2023.

Direct observations of both the Common Sandpiper and Ruddy Turnstone were carried out using the method

of transects. The observation was facilitated through the exploitation of optical instruments, namely a binoculars 10x42. The sites of the observation were precisely mapped with geo-coordinates and classified according to the following groups: low rocky coast (including vermetid reefs); sandy coast; harbour areas including breakwaters and banquettes of posidonia. A map of the site of observation (Fig. 1) was then constructed with an open source software (QGIS 3.22).

The coastline of this census was 46.9 km long and located in the province of Trapani, precisely, between Castellammare del Golfo and Marsala. We spanned the entire length of the coastline by walking. The observations were conducted in 17 days, between December 2022 and January 2023, from one hour after sunrise to one hour before sunset. The environmental conditions for the observations were either no or light wind and rain, respectively. Portions of either highly rocky coast or heavily urbanized areas, which made accessing the coastline difficult, were avoided. Each transect was covered on foot (at a speed of ~2 km/h) forth and back, though, only one route was used for building the census, namely the route (i.e., round, trip) leading to the highest number of observations. To estimate relative abundance of each species, the IKA Indices Kilometricques d'Abondance (Ferry & Frochet, 1958) was calculated.

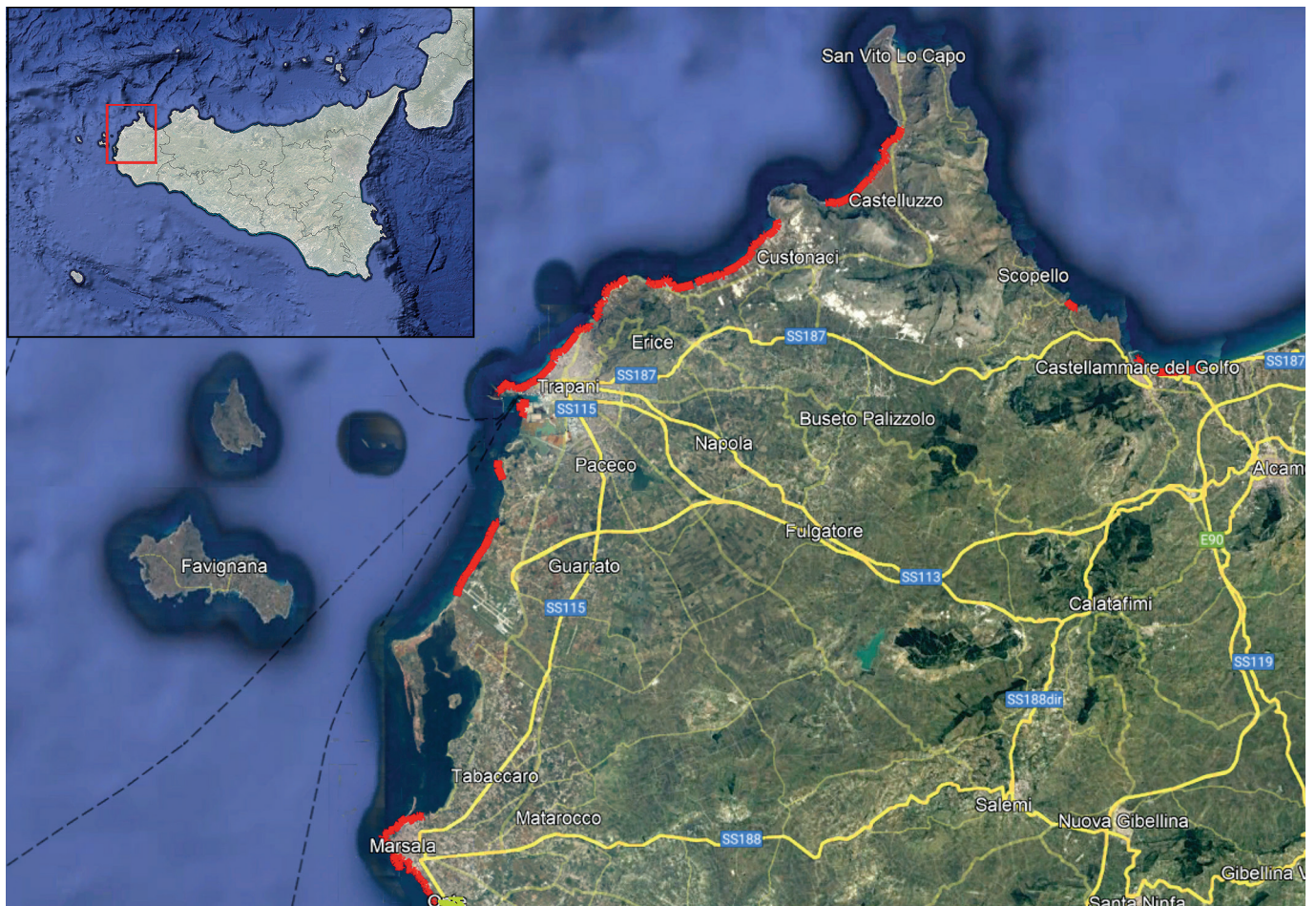


Fig. 1 - Map of the sites of this study with highlighted in red the walked transects. / Mappa dei siti di questo studio con evidenziati in rosso i transetti percorsi a piedi.



Fig. 2 - Trapani coastline. / Litoranea di Trapani. (Photo: / Foto: Salvatore Surdo).

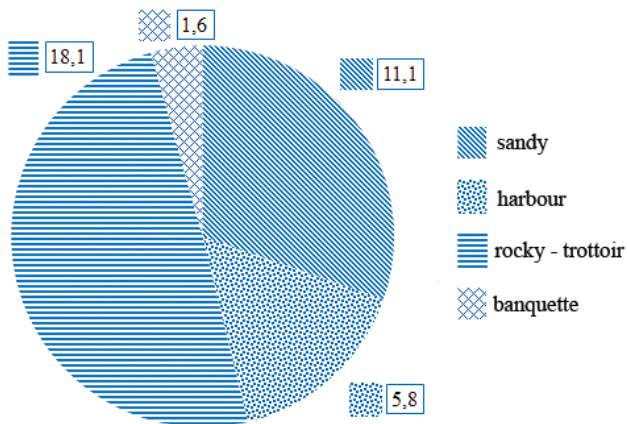


Fig. 3 - Distribution of coastal habitat investigated through the transect method. The values shown indicate the km of sandy coast, rocky including vermetid reefs, harbour area and posidonia banquettes, respectively. The graph refers to 36.6 km of coastline over a total of 46.9 km walked. / Distribuzione dell'habitat costiero studiata con il metodo del transetto. I valori riportati indicano rispettivamente i km di costa sabbiosa, rocciosa, compresi i reef a vermetidi, l'area portuale e le banquettes di posidonia. Il grafico si riferisce a 36,6 km di costa su un totale di 46,9 km percorsi.

RESULTS AND DISCUSSION

Result of this census about the wintering of Common Sandpiper and Ruddy Turnstone, two species ecologically comparable in some aspects, confirm the analogy between *Arenaria interpres* and *Actitis hypoleucos* as the frequented habitat, which mainly comprises partially either rocky or pebbly coasts and degraded areas (e.g. adja-

cent to harbor areas) as well. Notably, this latter habitat may be a primary source of error in up to date census—this habitat is indeed little investigated during the IWC and, hence, small nuclei of waterfowl could have been missed during the survey (Baccetti *et al.*, 2002; Zenatello *et al.*, 2014).

Wintering population of Common Sandpiper Bibliographical data

In this section the literature about the wintering data of Common Sandpiper are briefly listed for various areas of interest, namely, Sicily, the province of Trapani, and Italy.

Sicily: scarce wintering (Iapichino & Massa, 1989); common wintering but never abundant (Corso, 2005). For western Sicily, 6 individuals recorded in 1992 (Baccetti *et al.*, 1996).

Saline of Trapani: 5 individuals (on average) counted between 2006 and 2010, with a peak of 10 individuals in the 2009 (Zenatello *et al.*, 2014). Moreover, 29 wintering individuals were counted in the coastal wetlands of Trapani in 2015 and 2016 (Surdo, 2016). Notably, such a large number of individuals made the Saline di Trapani a widely accepted site for the observations and surveying of these species.

Italy: widespread species. Estimates in 1992, between 97 and 230 individuals (165 on average) (Baccetti *et al.*, 1996). Estimate 2001-2005: 353 individuals (148 sites), Estimate 2006-2010: 382 individuals (150 sites), including an island (Elba) among the sites where the species was found (Zenatello *et al.*, 2014).



Fig. 4 - Ruddy Turnstone perfectly camouflaged on a posidonia banquette. Voltapietre perfettamente mimetizzato su una banquette di posidonia. (Photo: / Foto: Biagio Barbera).

Data of this study

In this study, 56 Common Sandpipers were counted along 46.9 km of coastline, which resulted in an IKA index as high as 1.19 individuals per km. Figure 5 details the IKA index distribution for various coast morphologies identified in this study. A detailed description of the observations is reported here below.

The counted individuals include 8 Common Sandpipers observed near 6 mouths of various rivers (i.e., Baiata, Birgi, Forgia) and other watercourses along the selected transects. No individuals were observed near the mouths of the San Bartolomeo and Guidaloca streams. Notably, the majority of the observations occurred in sites where the mouths of the inspected rivers are surrounded by sandy beaches. This result is agreement with the literature – Galasso *et al.* (2021) and Zafarana (2017) reporting Common Sandpiper wintering in the sandy coasts only near the river outlets. As such, the IKA indexes of this study were calculated only for areas with high density of counts. This choice resulted in significant IKA values (Fig. 5). The higher concentration of observations in such limited areas could be ascribed to the eutrophic level of water. Common Sandpiper is, indeed, already known to be versatile in feeding (Surdo & La Mantia, 2017) and the present study further confirms this result – during the surveys indeed, an individual was seen feeding near an overflowing waste bin, one in a garden and, a third, together with a Ruddy Turnstone, near a shredder of a fish (i.e., tuna) finishing industry.

Notably, the wintering population of Common Sandpiper results even larger if individuals censused by means of spot observations are considered. The sites of these observations included the salt pans of Trapani, Marsala, and Isola Lunga, along with the islands of Pantelleria, the island of Favignana, Mazara del Vallo, Triscina and mouth of Belice river. The number of additional individuals was 31, which elevated the total number of wintering individuals in the province of Trapani to 87, namely, 22% of the entire estimated wintering population in Italy (Zenatello *et al.*, 2014).

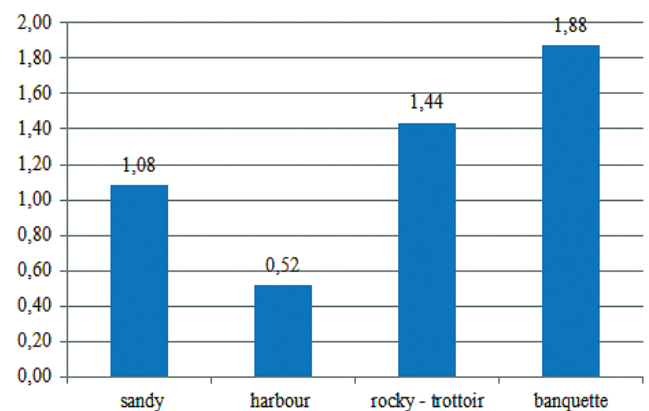


Fig. 5 - IKA of the Common Sandpiper for each coastal habitat. / IKA del piro piro piccolo per ciascun habitat costiero.



Fig. 6 - Common Sandpiper. Piro piro piccolo. (Photo: / Foto: Davide D'Amico).

Wintering population of Ruddy Turnstone Bibliographical data

Here, the literature about the wintering data of Ruddy Turnstone is briefly listed with specific reference to the following geographical areas, Sicily, the province of Trapani, and Italy.

Sicily: Rare wintering mainly observed multiple times in the same site in December (Massa, 1978); only one winter report for Sicily (Iapichino & Massa, 1989); occasional wintering in the area of the mouth of the Simeto river (Ciaccio & Priolo, 1997); an average of 1 wintering (max observations 6) in eastern Sicily in the period 1990-2004 (Corso, 2005); No wintering was reported in 1992 (Baccetti *et al.*, 1996). Other sites have been reported in 2014 in Scoglitti (RG), where regular wintering of 1-5 individuals was observed (Zafarana, 2017). Rare wintering and scarce migrant (Massa *et al.* 2021).

Saline of Trapani: largely reported site, together with the salt pans of Marsala, for the wintering of Ruddy Turnstone in the years 2006-10, with an average of 2 individuals (max individuals 6) in 2009; no individuals reported in previous years. 101 wintering individuals were also observed in the coastal wetlands of Trapani in 2015/16 (Surdo, 2016).

Italy: Coastal species with scattered distribution. Estimates of 27 individuals in the period 1991-1995 (5 sites) and of 29 individuals in the period 1996-2000 (10 sites) (Baccetti *et al.*, 2002); estimate of 134 individuals in the period 2001-2005 (17 sites) and of 218 individuals in the period 2006-10 (17 sites) (Zenatello *et al.*, 2014).

Data of this study

The survey of this study accounted, in the province of Trapani only, 92 individuals with the method of transects, which resulted in an IKA index as high as 1.96 individuals per km. Figure 7 details the IKA index distribution for various coast morphologies identified in this study. Additional 62 individuals due to spot observations resulting in a total number of individuals 154, equal to 71% of the Italian wintering population (Zenatello *et al.*, 2014).

Although Common Sandpiper and Ruddy Turnstone share the same coastal environment, they are hardly com-

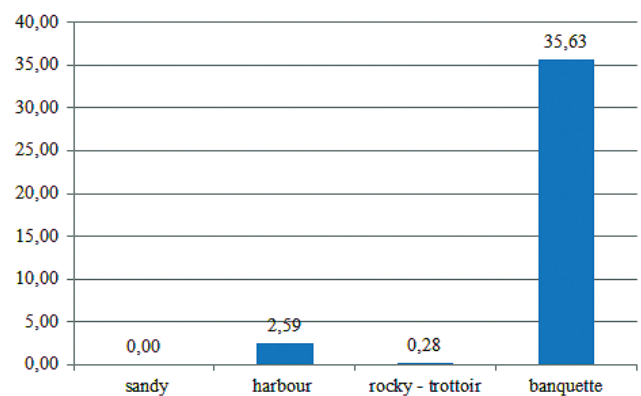


Fig. 7 - Plot of the IKA indexes for Ruddy Turnstone and divided per coastal habitat. / Grafico degli indici IKA per il voltapietre e diviso per habitat costiero.

mensal (see Tab. 1). Moreover, such costal environment is rarely used by other species of wintering waders (see Tab. 2). It should be noticed that the banquettes of posidonia result the favorite environment by the Ruddy Turnstones (see Fig. 7). This could explain the under evaluation of IWC census about the wintering of this species. Indeed, this little environment poorly exploited in IWC censuses and, hence, a significant number of individuals wintering in this habitat could have been missed.

Notably, this work is in line with both our previous works about the Wood Sandpiper *Tringa glareola* (Surdo *et al.*, 2018; Surdo & Biondi, 2019), and future contributes about the Sanderling *Calidris alba* (in print) and the Jack Snipe *Lymnocyrtus minimus* (in preparation). This choice is motivated by the long-term goal that aims at better understanding the consistency of wintering waders, which are under evaluated in traditional IWC surveys.

Tab. 1 - Interspecific associations and percentages of the numbers of observations relative to a total of 57 records. / Associazioni interspecifiche e percentuali del numero di osservazioni rispetto a un totale di 57 osservazioni.

Species association	Records	% on total
<i>Actitis hypoleucos</i> with <i>Arenaria interpres</i>	2	3,5
Species observed alone		
<i>Actitis hypoleucos</i>	46	80,7
<i>Arenaria interpres</i>	9	15,8

Tab. 2 - Other species of waders observed during IKA censuses. / Altre specie di limicoli osservate durante i censimenti IKA.

Other species observed	Records	N. ind.
<i>Numenius arquata</i>	1	21
<i>Pluvialis apricaria</i>	1	7
<i>Burhinus oedicnemus</i>	1	1

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