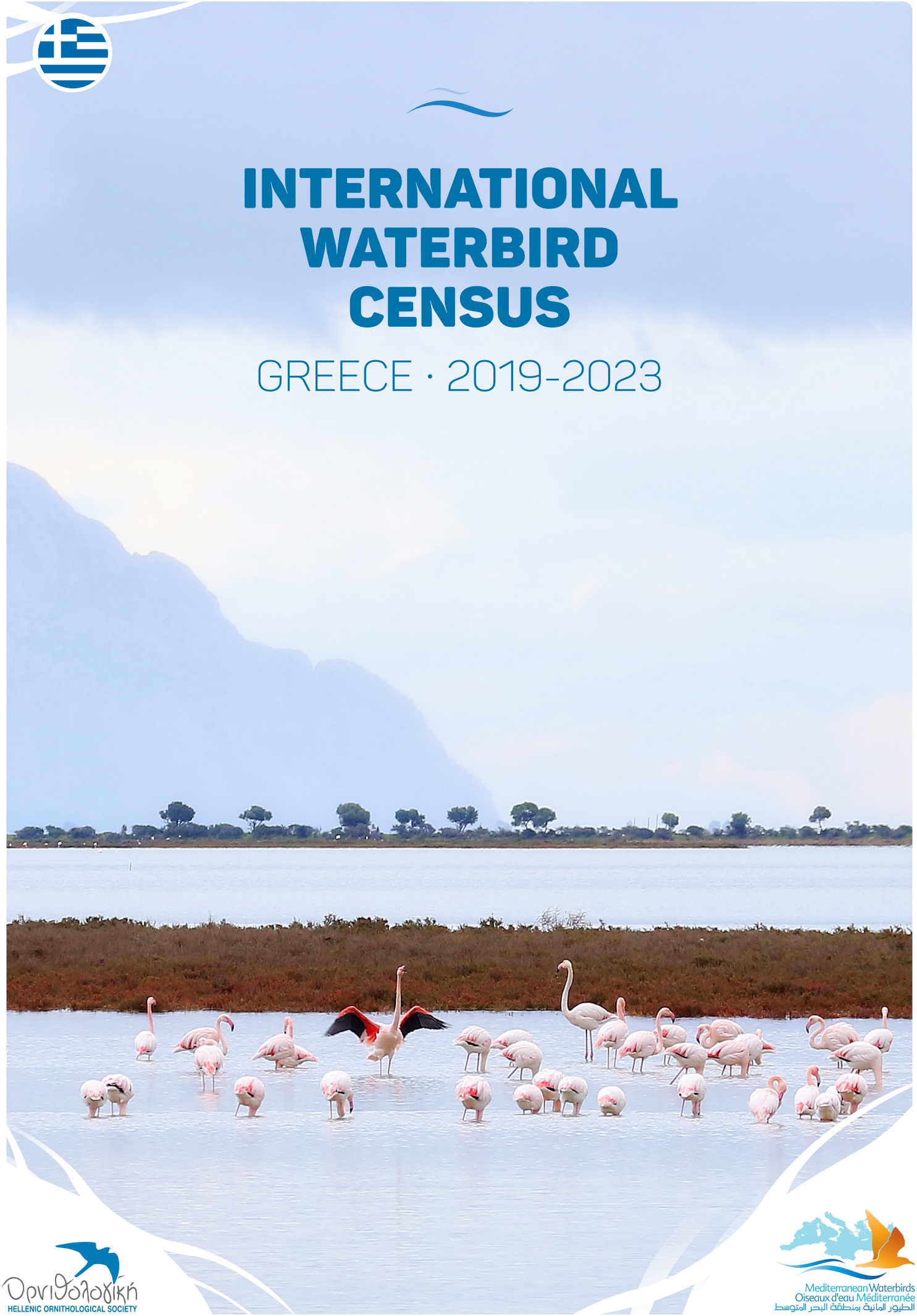
INTERNATIONAL WATERBIRD CENSUS

GREECE · 2019-2023



Ορνιθολογική
HELLENIC ORNITHOLOGICAL SOCIETY

Mediterranean Waterbirds
Oiseaux d'eau Méditerranée
الطيور المائية بمنطقة البحر المتوسط

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AND LIST OF PARTICIPANTS

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General report
(2009-2018)

Greece report
(2009-2018)

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International waterbird census. Greece report (2019-2023). Medwaterbirds Network, Tour du Valat, 12 p.

Cover image: Greater flamingo in Messolonghi lagoons © Morten Ekker / **Photo p.2:** © Tasos Bounas
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"**This report is dedicated to Yiannis Rousopoulos, who loved and protected wetlands in Greece.**""

MOBILIZED **NATIONAL OBSERVERS**

The Greek International Waterbird Census (IWC) is the oldest long-term bird monitoring programme in Greece, covering mainly wintering waterbirds but also raptors. The IWC commenced in 1968, and until 1976 was carried out exclusively by international ornithologists, mainly from the Tour du Valat in France. Counts were discontinued from 1977 to 81 and resumed in 1982 by Greek ornithologists. Since 1997, the IWC has been coordinated by the HOS, at times in collaboration with the Hellenic Bird Ringing Centre (HBRC), under the auspices of the Ministry of Environment and Energy.

NUMBER OF VOLUNTEERS:

700
INDIVIDUALS
(2009-2023)
OVERALL

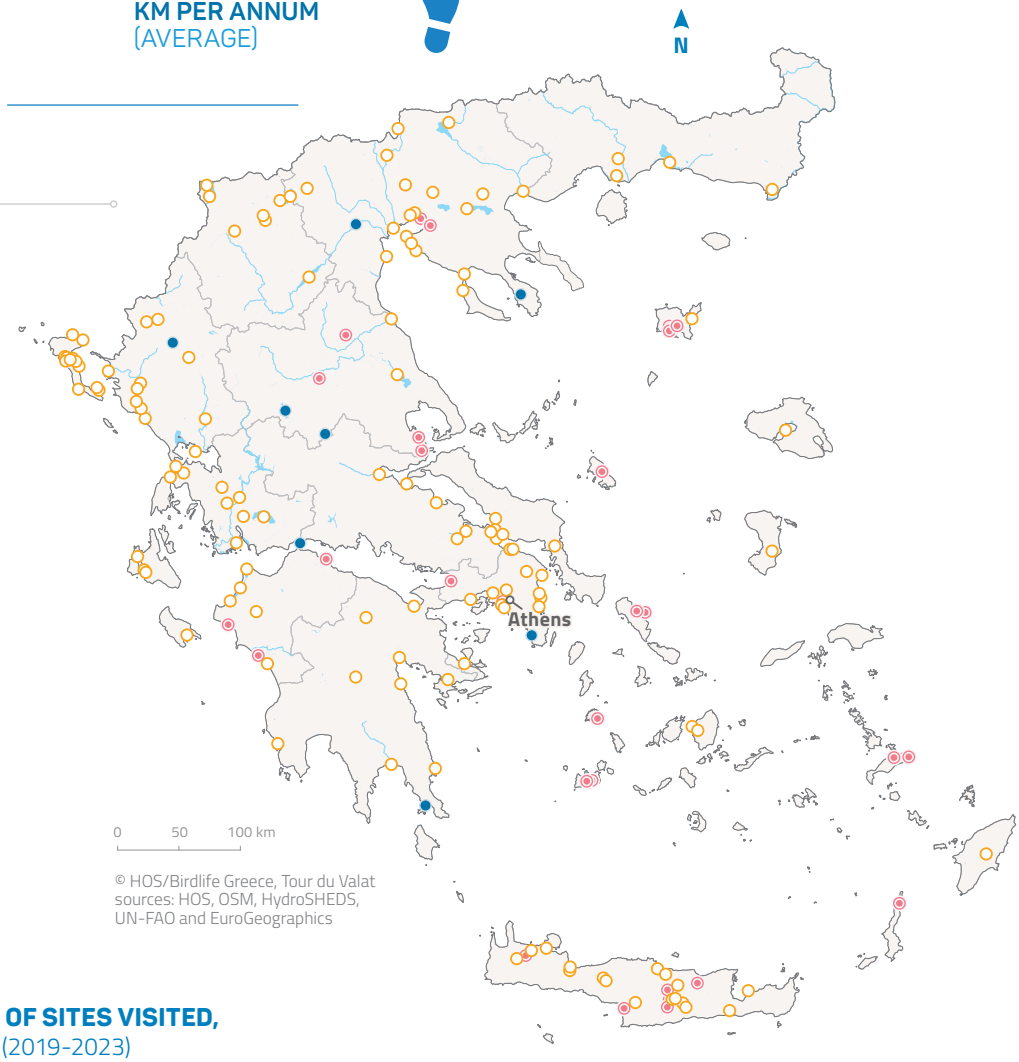
NUMBER OF KM TRAVELLED:

6,000-7,000
KM PER ANNUM
(AVERAGE)

WETLANDS COUNTED
in Greece (2009-2023)

- Regularly visited sites *(at least 7 times during 2009-2023)*
- Newly visited sites *(visited only during 2019-2023)*
- Earlier sites *(visited only during 2009-2018)*
- Bodies of water
- Rivers

229 wetland sites are covered in the Greek IWC Database. 175 of these sites (76%) were counted at least once during the 2019-23 period, covering an area of 310,000 hectares. 80% of the wetlands covered (141 sites) were counted at least 7 times during 2009-23.



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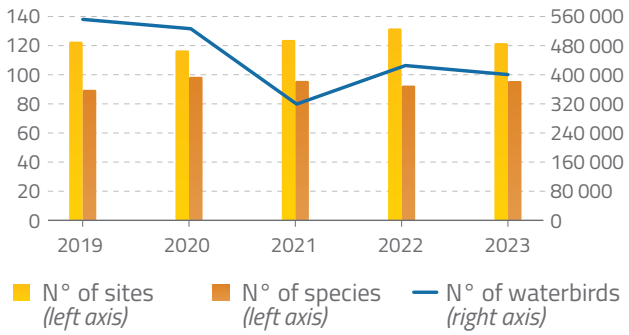
sources: HOS, OSM, HydroSHEDS, UN-FAO and EuroGeographics

EVOLUTION IN THE NUMBER OF SITES VISITED,
counted species and waterbirds (2019-2023)



The number of wetlands covered during 2009-23 has increased by 28%, although in terms of area, this represents only a 10% increase. Every year more than 150 volunteers participate in the IWC counts from the HOS volunteer network, local NGOs, and staff from the 24 NECCA Management Units. During 2019-23, more than 2,235,000 waterbirds were recorded from 113 species. Although the number of sites covered did not vary significantly (even during covid), waterbird numbers show a slight decline following 2021, mainly due to very mild and dry winters.

MAIN TRENDS (2019-2023) IN WATERBIRD POPULATIONS

DECLINING SPECIES, DURING THE ASSESSMENT PERIOD (2019-2023)

SPECIES		VALUES			
English name	Scientific name	Average nb. of birds	Nb. sites	Magn.*	±ES**
Northern Pintail	*Anas acuta*	4 068	47	-0.17	0.08
Dunlin	*Calidris alpina*	10 227	46	-0.25	0.07
Black-necked Grebe	*Podiceps nigricollis*	2 311	67	-0.42	0.08
Velvet Scoter	*Melanitta fusca*	10	5	-0.47	0.16
Eurasian Bittern	*Botaurus stellaris*	8	13	-0.53	0.23

SPECIES		VALUES			
English name	Scientific name	Average nb. of birds	Nb. sites	Magn.*	±ES**
Great White Pelican	*Pelecanus onocrotalus*	50	9	-0.60	0.26
Red Knot	*Calidris canutus*	59	6	-0.74	0.35
Little Gull	*Hydrocoloeus minutus*	471	25	-1.32	0.56
Greater White-fronted Goose	*Anser albifrons*	1 969	8	-2.19	0.88
Common Coot	*Fulica atra*	89 278	100	-0.16	0.07

* **Magn.:** Magnitude / ** **±SE:** Standard error. The trends shown in the tables are at least significant at an alpha risk of 5%.

Ten species exhibited a significant decreasing trend during this period. Of these, the Velvet Scoter and Red Knot, are rare wintering visitors, while the IWC is not considered the best method for estimating Eurasian Bittern populations. Declining trends for the Dunlin, Black-necked Grebe, Common Coot and Little Gull are of particular concern.

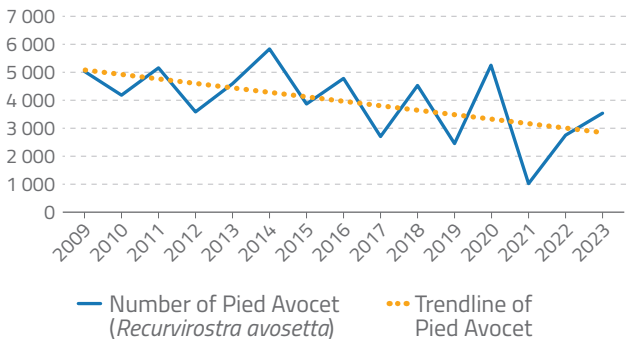
PIED AVOCET

The **Pied Avocet** (*Recurvirostra avosetta*) did not produce a significant short-term trend within the 2019-23 period; however, the species exhibits a long-term decreasing trend.

In addition, the species failed to satisfy Ramsar Criterion 6 for any of the 5 wetlands which used to host significant numbers in the past (Evros Delta, Lake Vistonis, Lake Ismaris, Porto Lagos and lagoons, Lake Kerkini, Amvrakikos Gulf and Vonitsa Bay and Messolonghi and Aetoliko Lagoons). Possible reasons for this decline include nesting habitat deterioration, human disturbance, and predation by corvids, gulls, and stray dogs.

EVOLUTION OF COUNTS OF PIED AVOCET

(*Recurvirostra avosetta*) in Greece



A Pied Avocet feeding © L. Stavrakas

HIGHLIGHTS

Two species from the above list of declining species remain on the huntable list of waterbird species in Greece: the **Northern Pintail** and the **Greater White-fronted Goose**.

Most Northern Pintail overwinter in large wetlands and particularly the Axios, Loudias and Aliakmnon River Deltas, Evros Delta, Lake Kerkini and Amvrakikos Gulf. The Greater White-fronted Goose has a more restricted distribution within Greece, mainly wintering in Evros Delta and Kerkini Lake, and its decreasing trend could be attributed to the milder winters in the region.

With respect to the Northern Pintail, a hunting ban in Greece and elsewhere would be a beneficial conservation measure in combination with wetland restoration efforts across the species' range.

INCREASING SPECIES,
DURING THE ASSESSMENT PERIOD (2019-2023)

SPECIES		VALUES			
English name	Scientific name	Average nb. of birds	Nb. sites	Magn.*	±ES**
Cattle Egret	*Bubulcus ibis*	246	22	0.58	0.23
Eurasian Golden Plover	*Pluvialis apricaria*	1732	21	0.46	0.17
Eurasian Spoonbill	*Platalea leucorodia*	1064	35	0.34	0.10

SPECIES		VALUES			
English name	Scientific name	Average nb. of birds	Nb. sites	Magn.*	±ES**
Eurasian Curlew	*Numenius arquata*	653	26	0.22	0.08
Common Shelduck	*Tadorna tadorna*	6914	54	0.11	0.06
Grey Heron	*Ardea cinerea*	2773	127	0.08	0.03
Greater Flamingo	*Phoenicopterus roseus*	27297	55	0.17	0.07

* **Magn.:** Magnitude / ** **±SE:** Standard error. The trends shown in the tables are at least significant at an alpha risk of 5%.

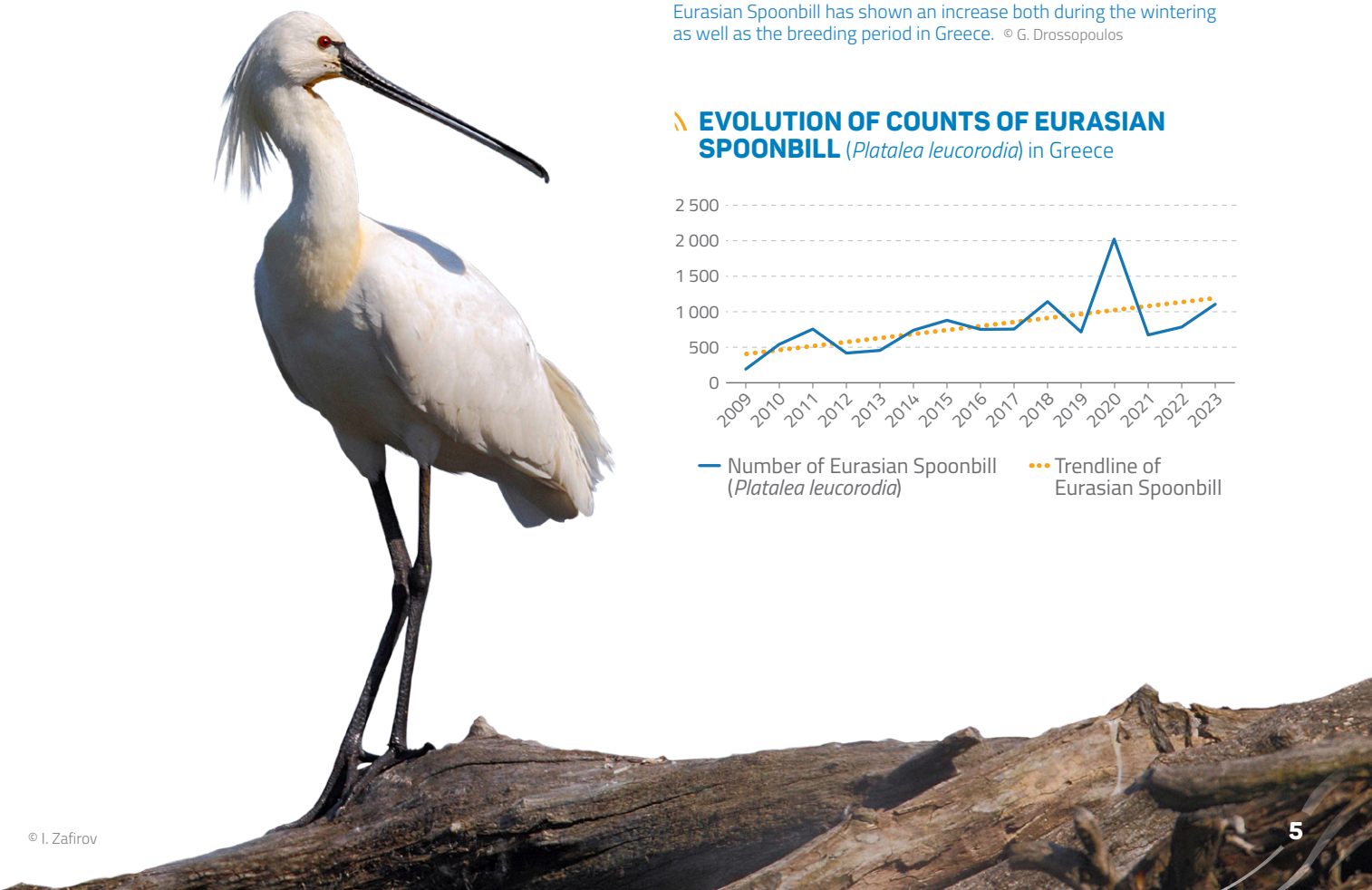
Seven species exhibit a significantly increasing trend during the 2019-23 period. Many of these comprise heron species, such as the Cattle Egret, the Eurasian Spoonbill, and the Grey Heron, as well as the Greater Flamingo, which seem to be on the rise throughout Greece. In addition, the Eurasian Curlew and the Common Shellduck populations seem to be recovering during this period.

EURASIAN SPOONBILL

The **Eurasian Spoonbill** (*Platalea leucorodia*) was found to satisfy Ramsar Criterion 6 (over 1% of the flyway population) in 5 wetlands (Lake Vistonis, Lake Ismaris, Porto Lagos and lagoons, Kalamas Delta, Amvrakikos Gulf and Vonitsa bay, Messolonghi and Aetoliko lagoons and Spercheios delta). The increasing trend of the species' population may be the result of targeted conservation efforts, improved wetland management, or the protection of breeding colonies also supported by the expansion of the species' breeding colonies. It is possible that wintering Spoonbills are also breeding in Greece and future ringing studies should be able to confirm this. The Greater Flamingo also showed a significant positive trend yet only complied with Criterion 6 in two sites: Kerkini Lake and the Lake Vistonis, Lake Ismaris, Porto Lagos and lagoons.

Eurasian Spoonbill has shown an increase both during the wintering as well as the breeding period in Greece. © G. Drossopoulos

EVOLUTION OF COUNTS OF EURASIAN SPOONBILL (*Platalea leucorodia*) in Greece



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5 WETLANDS MAY BE DESIGNATED AS AREAS OF INTERNATIONAL IMPORTANCE

SITES OF THE WETLANDS COUNTING NATIONAL NETWORK	Ramsar code	C5 > 20 000 waterbirds	Ruddy Shelduck	Common Teal	Eurasian Wigeon	Lesser White-fronted Goose	Common Pochard	C6 White-headed Duck	Dunlin	Kentish Plover	Tundra Swan	Eurasian Coot	Dalmatian Pelican	Greater Flamingo	Eurasian Spoonbill	Great Cormorant
Number of sites		5	1	2	3	1	2	1	1	1	2	1	9	2	5	1
THRACE																
Evros delta	R1	o	o	o	o						o					
Lake Vistonis, Lake Ismaris, Porto Lagos and lagoons	R2							o					o	o	o	
Nestos delta and Keramoti lagoons	R3															
MACEDONIA																
Lake Koronia and Lake Volvi	R4	o											o			
Lake Kerkini	R5	o				o	o				o		o	o		
Axios delta, Loudias delta, Aliakmon delta	R6												o			
Lake Doirani													o			
Lake Kastoria													o			
Lake Mikri Prespa	R7															
EPIRUS																
Kalamas delta															o	
Amvrakikos gulf and Vonitsa bay	R8	o		o	o		o						o		o	
THESSALY																
Karla reservoirs													o			
STEREA ELLADA																
Messolonghi and Aetoliko lagoons, Acheloos delta and Evinos estuary	R9	o			o				o	o		o	o		o	o
Spercheios delta															o	
EPIRUS																
Kotychi lagoon / Kalogria (Metochi) lagoon	R10															

WETLANDS OF INTERNATIONAL IMPORTANCE FOR WATERBIRDS
Identification based on mid-January (2019-2023) count data for Ramsar Criteria 5 and 6.
Empty cells in the "Ramsar site" column identify sites not included in the Ramsar network.

- **Criterion 5:** A wetland should be considered internationally important if it regularly* supports 20,000 or more waterbirds.
- **Criterion 6:** A wetland should be considered internationally important if it regularly* supports 1% of the individuals in a population of one species or subspecies of waterbirds.

* **To define the notion of "regularly,"** we have applied the following rule (currently under review by COP15 RAMSAR, 2025): A wetland is considered to regularly support a population of waterbirds of a given size if either of the following conditions is met:

1. The average of the annual maxima recorded over a period of at least five years reaches or exceeds the required threshold; or
2. The required number of birds is recorded in at least two-thirds of the years for which adequate data are available, provided that data are available for at least three years in total.

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SUGGESTED ACTIONS

During the 2019-23 monitoring period, **twelve wetlands** met Criteria 5 and 6 of the Ramsar Convention and thus can be classified as wetlands of international importance. Seven of those sites are already listed as Ramsar wetlands in Greece.

With respect to Criterion 5, six wetlands met the threshold of regularly supporting 20,000 or more waterbirds. Most waterbirds were counted in Messolonghi wetlands followed by Amvrakikos Gulf, Evros Delta, Lake Kerkini, Lake Volvi and Axios wetlands.

With respect to Criterion 6, 14 species met the threshold in any one wetland compared to 19 species in the previous period. Overall, 12 wetlands regularly support 1% of the biogeographic populations of these 14 waterbird species, Messolonghi wetlands being by far the most important site with 7 species, followed by Amvrakikos Gulf and Lake Kerkini with 5 species, and Evros Delta and Lake Vistonis, Lake Ismaris, Porto Lagos lagoons with 4.

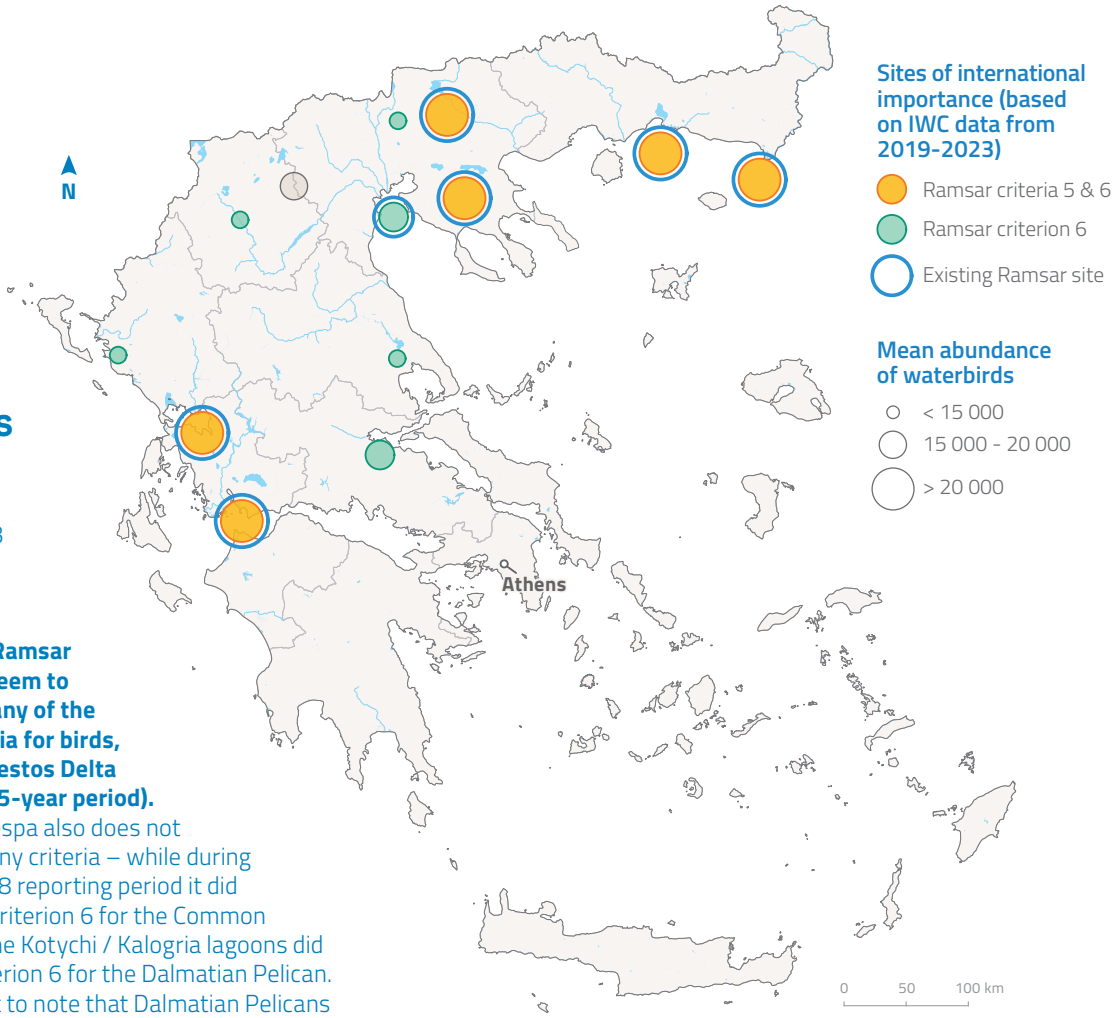
As in the previous reporting period, the **Dalmatian Pelican** was the most highly represented species. A notable increase was observed with the **Spoonbill** that met Criterion 6 in 5 wetlands during this reporting period in comparison to 2 sites during that of 2013-18. The **Pied Avocet** no longer met Criterion 6 in any wetland (5 wetlands during the 2013-18 period). Interestingly, the **White-headed Duck**, the **Great Cormorant** and the **Ruddy Shellduck** met Criterion 6 for the first time during the 2019-2023 period.

The **Bewick Swan** remained the only swan that meets Criterion 6 in Lake Kerkini and Evros Delta, whereas during the 2013-18, the **Mute Swan** and the **Whooper Swan** also met that criterion. Bewick Swan numbers during the IWC showed a significant increase in the Evros Delta in particular, where numbers can exceed 9,000 birds. Counts of the species in both the Greek and the Turkish part of the river have reached up to ca. 12,000 individuals (2024) highlighting that the Evros Delta is the most important wintering area for the species in Europe. It is unclear where these high numbers originate from; however, it is possible that the increase arises from a redistribution either from the NE/NWE Bewick's Swan population or the East population, an underestimation of the Northwestern Siberia/Caspian population, or even an increase in the breeding success of the species as well as a reduction in mortality.

Five wetlands which have not been designated as Ramsar sites meet Criterion 6 and HOS will examine if and when it will be suitable to recommend these sites to be nominated as Ramsar sites for Greece in collaboration with the Greek Ramsar focal point.

GREEK WETLANDS

responding to Criteria 5 and 6 based on 2019-2023 IWC data.



A number of Ramsar sites do not seem to comply with any of the Ramsar criteria for birds, such as the Nestos Delta (for a second 5-year period). Lake Mikri Prespa also does not comply with any criteria – while during the 2013-2028 reporting period it did comply with Criterion 6 for the Common Merganser. The Kotychi / Kalogria lagoons did not meet Criterion 6 for the Dalmatian Pelican. It is important to note that Dalmatian Pelicans in Greece can breed as early as late December, and thus the IWC counts do not reflect wintering population numbers.

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sources: HOS, OSM, HydroSHEDS, UN-FAO and EuroGeographics

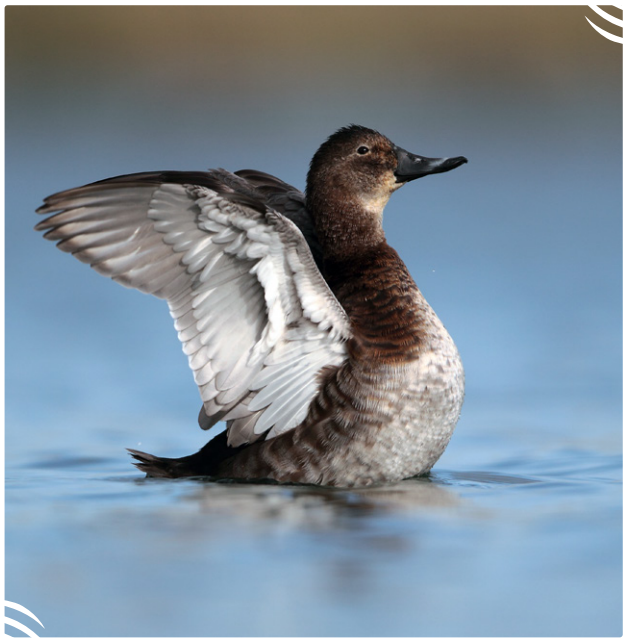
FOCUS ON A COUNTRY'S FLAGSHIP SPECIES: THE COMMON POCHARD *(AYTHYA FERINA)*

The Common Pochard (*Aythya ferina*) is a diving duck that frequents lakes, reservoirs, ponds, and marshes with abundant aquatic vegetation. It is a migratory duck with a wide range, breeding in northern and eastern Europe (including Greece) and overwinters in southern Europe and north Africa. The eastern part of the Common Pochard range can reach as far east as India and Japan. In Greece, wintering Common Pochards use numerous wetlands; however, significant numbers gather in the large wetlands of northern and western Greece, such as Kerkini Lake and Amvrakikos Gulf.

The Common Pochard is a globally threatened species and in Greece its wintering population exhibits a decreasing long-term trend. Additionally, it is nationally classified as EN (Endangered) in the 2024 Red list assessment of Greece (NECCA 2024).

Conservation and policy action is urgently needed for this species in Greece, as it is still included on the national list of huntable species, and no conservation measures have been proposed recently for the species. Efforts are currently taking place at the EU level on Annex II birds with a non-secure status, such as the Common Pochard, and recommendations include the establishment of disturbance-free zones in sites that hold internationally and nationally important populations, such as Amvrakikos Gulf, Lake Kerkini, Lake Kastoria, and Lake Volvi.

Being a diving duck, the Common Pochard is highly susceptible to lead (Pb) poisoning from gun-shot pellet ingestion since the use of lead-containing ammunition is still frequently, yet illegally, used in Greece. National law enforcement efforts must be intensified to minimize lead deposits in waterbodies.



A female Common Pochard © P. Peradonakis

A male Common Pochard in Kastoria Lake © A. Tsaknakis

Dalmatian Pelican
with the breeding
bright red pouch
© T. Naziridis

THE AVIAN INFLUENZA DISASTER IN THE LARGEST COLONY OF THE DALMATIAN PELICAN IN 2022

A few weeks after the Dalmatian Pelicans arrived as usual in the Lesser Prespa Lake to breed in the early months of 2022, the first incidents of avian influenza were detected. What followed was considered the largest wildlife disaster in Greece and led to the devastating loss of ca. 60% of this pelican colony. Casualties were also recorded in a total of 13 Greek wetlands and the total death toll reached 2,286 Dalmatian Pelicans. It will most likely take at least a few decades for the population to recover to pre-outbreak levels (Alexandrou *et al.* 2022, 2023).

In 2022, highly pathogenic avian influenza (HPAI) H5N1, clade 2.3.4.4b, spread across Europe, with devastating effects on the **Dalmatian Pelican** (*Pelecanus crispus*). Greece hosts about one-fifth of the global breeding population, with key colonies at Lesser Lake Prespa, Lake Kerkini, Lake Chimaditida, Lake Karla, Messolonghi lagoons and Amvrakikos Gulf. In early 2022, the Lesser Prespa Lake colony—the largest Dalmatian Pelican breeding site globally with approximately 1,200–1,600 breeding pairs—was hit by a catastrophic outbreak. The first deaths were observed in mid-February, soon after the return of breeding adults, and peaked in March. By late April 2022, an estimated 1,734 adult pelicans had died—a loss of around 60% of the colony.

Aerial footage of the Dalmatian Pelican colony in Lesser/Mikri Prespa in 2022 where casualties can be observed. © O. Alexandrou / SPP Archive

Additional colonies across northern and central Greece (Chimaditis Lake, Karla Reservoir, and Kerkini Lake) recorded further losses (181, 103 and 90 respectively), bringing the national total to 2,286 dead pelicans in 13 wetlands. An additional 190 casualties were recorded in Albania, Montenegro, and Romania. This represents over 40% of the southeastern European population and about 10% of the global population. Carcasses collected in March and April 2022 in Prespa exceeded 1,400 and removal operations were crucial in reducing the viral load in breeding sites. These measures followed ***biosecurity recommendations from CMS/AEWA*** task forces.

Interestingly, no Dalmatian Pelican casualties were recorded in the colonies of the species in western Greece, in Amvrakikos Gulf and Messolonghi lagoons, supporting partly the hypothesis that the populations that breed and winter on the west coast of Greece have very limited contact with those in the central/eastern colonies.

No mass casualties of Dalmatian Pelicans were recorded in Greece in 2023.

The 2022 outbreak in Greece is considered the worst wildlife disease disaster in the country's history and perhaps Europe's, with Dalmatian Pelicans being especially susceptible. Factors include early breeding in cold temperatures, high nesting density, and possible contamination from migratory waterbird faeces. Long-term population recovery will likely span over decades. The crisis revealed the need for robust surveillance, carcass management and further research.

Immediately after the 2022 outbreak, a research project commenced aiming to shed light on the disease and a summary brief has been published by the Society for the Protection of Prespa and can be accessed through the following link: ***Ecoepidemiology of Avian Influenza and other diseases in Dalmatian Pelicans (Alexandrou et al. 2025)***.

The IWC had a significant role to play in the surveillance of wetlands that was crucial for the early detection of any waterbirds suspected of being infected by avian flu. Following the 2022 outbreak, the HOS released guidelines for participants prior to each annual IWC explaining how to detect potentially infected birds, how to avoid transmitting the virus, and how to alert the pertinent authorities.

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Great Egret looking for something to eat © N. Koutras

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