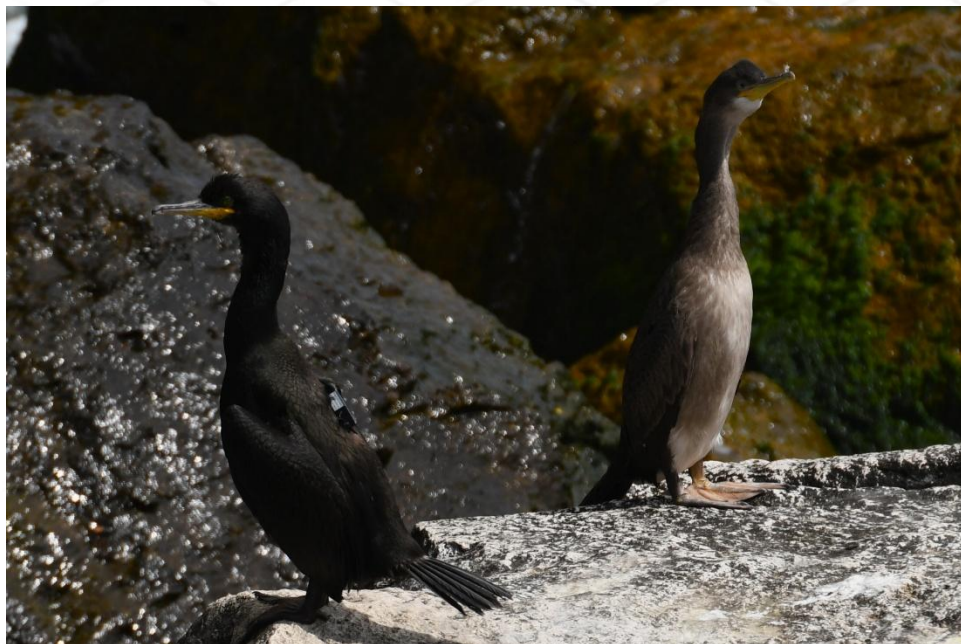




The LifeWatch ERIC Biodiversity
& Ecosystem eScience Conference

PLOVDIV, BULGARIA

7-10 JULY 2026



Satellite telemetry of European Shags along the Bulgarian Black Sea coast

Presenter: Gradimir Gradev

9 July 2026



Dimitar Popov & Galina Meshkova
Green Balkans NGO, Bulgaria

EUROPEAN SHAG (*GULOSUS ARISTOTELIS*)

European Shag (*Gulosus aristotelis*) is in Annex I of the EU Birds Directive 2009/147/EC, requiring designation of Special Protection Areas (SPAs). In Europe, it is found along the Atlantic coast, the Mediterranean, and the Black Sea. The Black Sea population is estimated at 2,000–2,500 pairs and belongs to the subspecies *Gulosus aristotelis desmarestii*. It is breeding in colonies in rock niches and caves, along cliffs. The main food consists of demersal fish species caught at depths up to 60 m. The species is protected in Bulgaria by the Biodiversity Law and is listed in the Red Data Book as "Vulnerable".

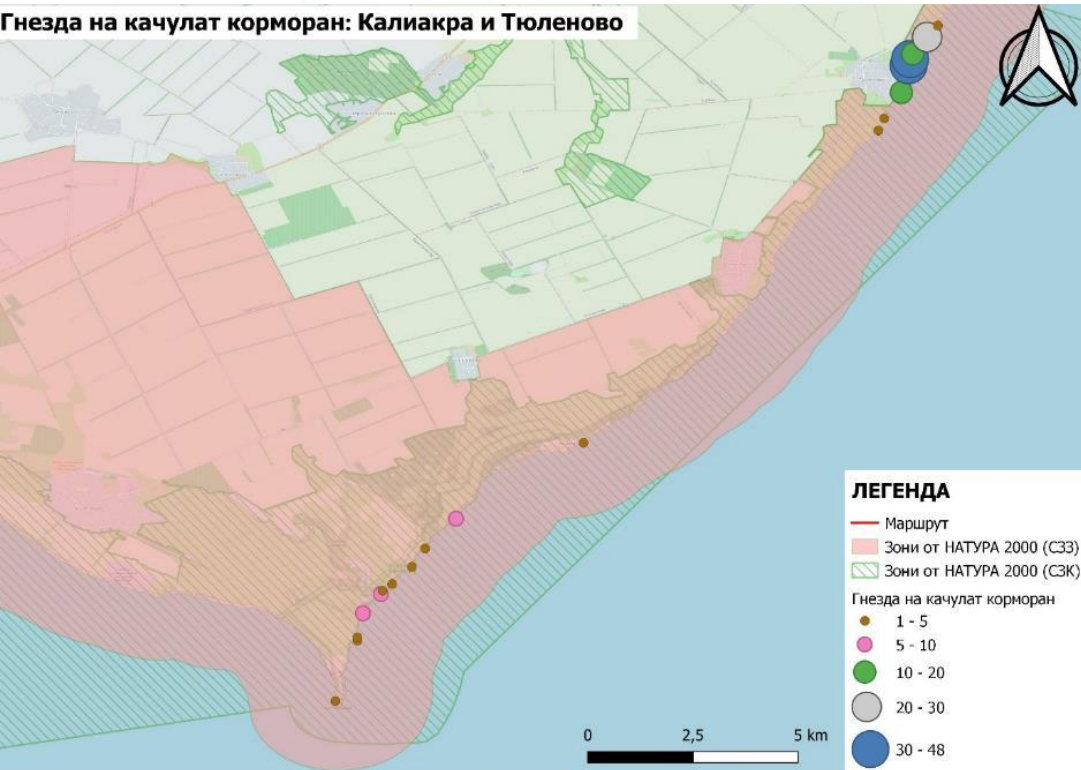


Distribution of the European shag's *desmarestii* subspecies (*Gulosus aristotelis desmarestii*), yellow = summer visitor, green = nesting, blue = wintering. (source: http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/p/Gulosus_aristotelis_desmarestii_en.htm)

EUROPEAN SHAG IN BULGARIA

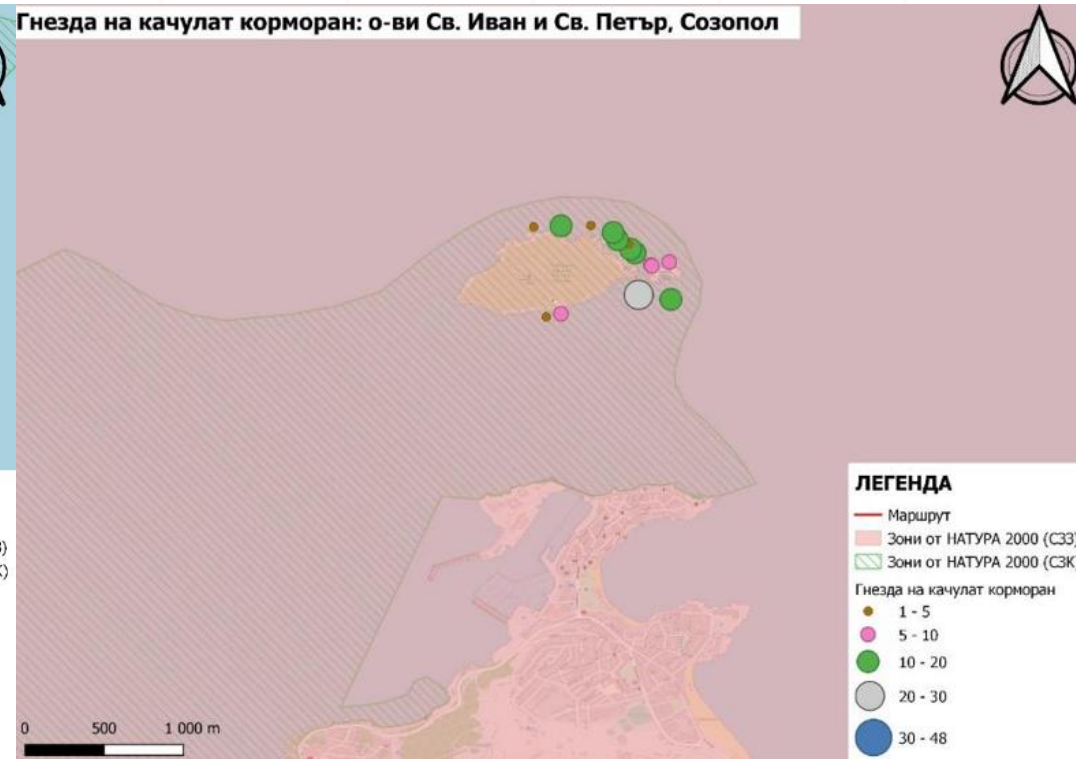
Two main breeding colonies are found in Bulgaria. The older one is along the northern coast between Cape Kaliakra and Tyulenovo village (approx. 210-220 pairs). The second one is situated on the Isles of St. Ivan and St. Peter near Sozopol along the southern coast (approx. 190-200 pairs) in 2021. In 2022, the sizes of the colonies were 230-240 in the north and 150-180 in the south.

Гнезда на качулат корморан: Калиакра и Тюленово



Colonies along the northern coast

Гнезда на качулат корморан: о-ви Св. Иван и Св. Петър, Созопол



Colonies along the southern coast





SATELLITE TELEMETRY

In 2024, two birds have been tagged with GPS transmitters to study their movements and diving. The first one was a breeding adult from the colony near Tyulenovo village on the northern coast, and the second a juvenile from the colony on the Isle of St. Ivan near Sozopol on the southern coast. Ornitela OT-20D-4GEC-S 20g tags with a depth sensor were used, attached with a Teflon ribbon backpack harness.



RESULTS – Adult, Tyulenovo colony

The bird was tracked for 270 days.

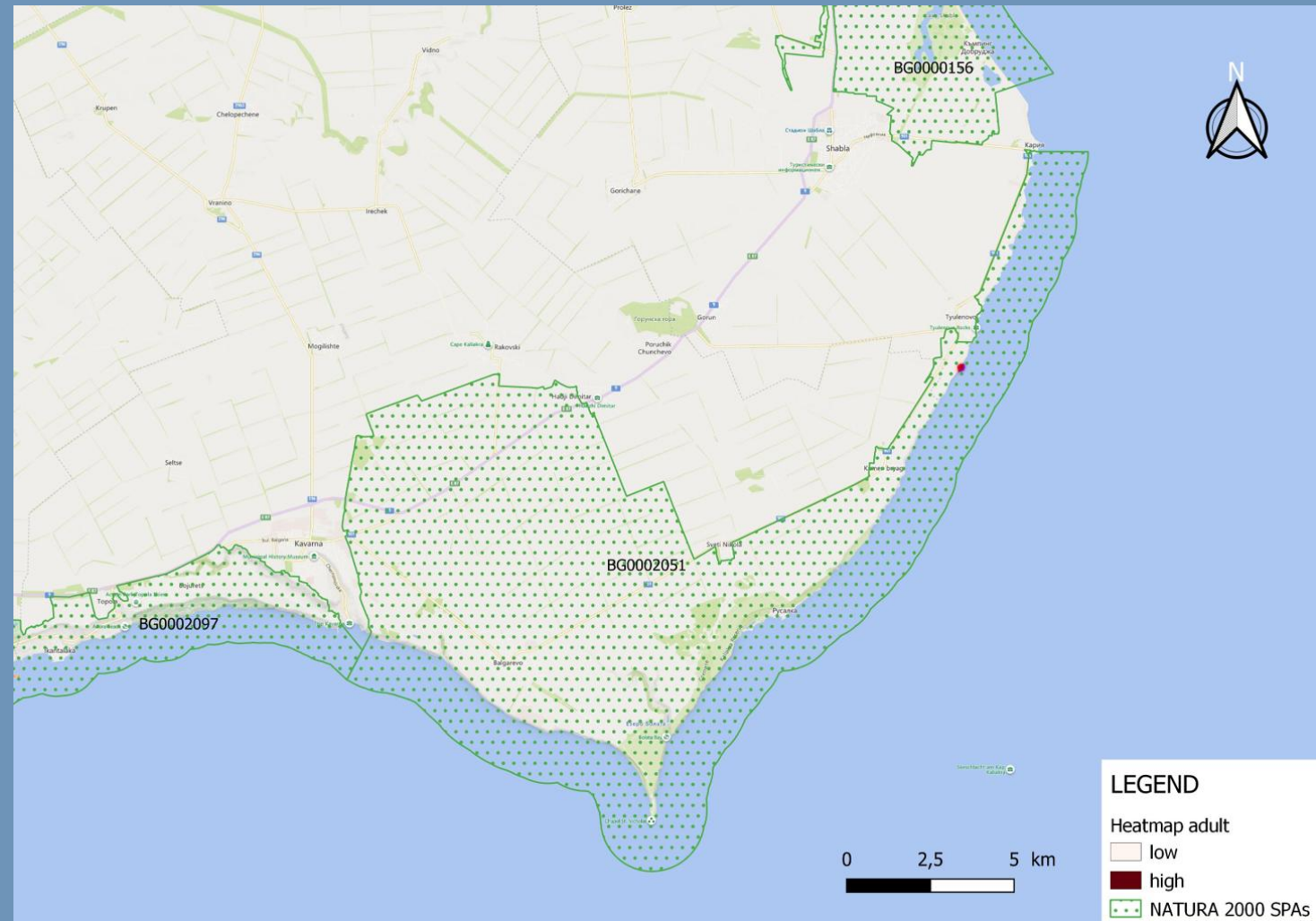
Diving data of the adult Shag included 37,130 dives with a total duration of 247:49:47 hours (mean = 00:24 minutes).

Most of the dives (95%) were shorter than 1 minute.

Most of the dives (59%) were below the mean depth of 6.52 m.

The longest dive was recorded on 15 June 2024 and lasted 1:45 minutes, reaching a depth of 32 m.

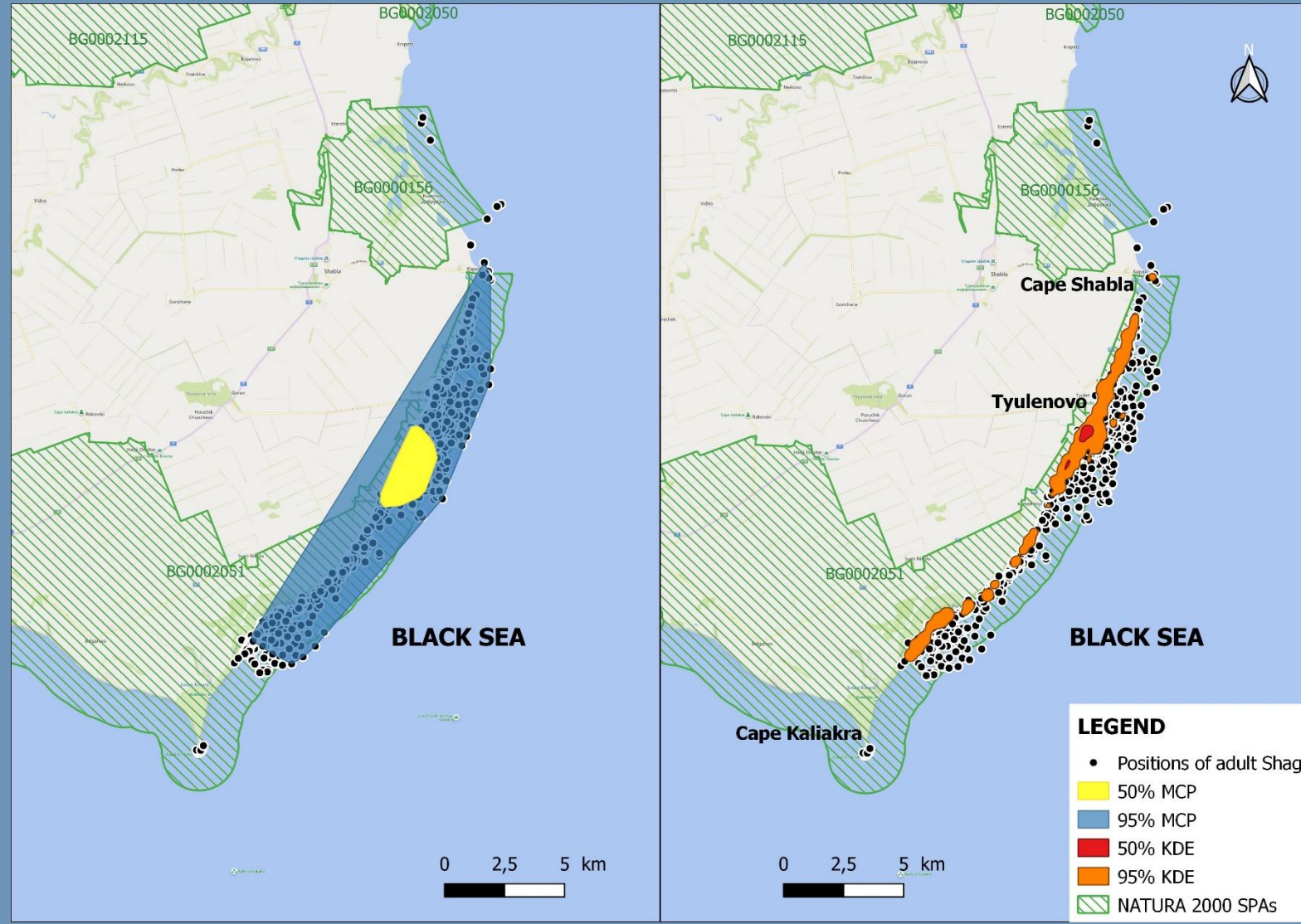
The maximum recorded depth was 34.84 m.



RESULTS – Adult, Tyulenovo colony

LEFT: The entire area of the habitat range was 50.44 km² (95% MCP) with a core area of 4.71 km² (95% MCP), almost completely within two SPAs: Kaliakra (BG0002051) and Shablenski ezereen kompleks (BG00000156).

RIGHT: The calculated home range (95 % KDE) of the adult Shag was 8.16 km² with a core area of 0.3 km² (50 % KDE).



RESULTS – juvenile, Isle of St. Ivan, Sozopol

The juvenile Shag's first departure from the natal isle was at the end of June.

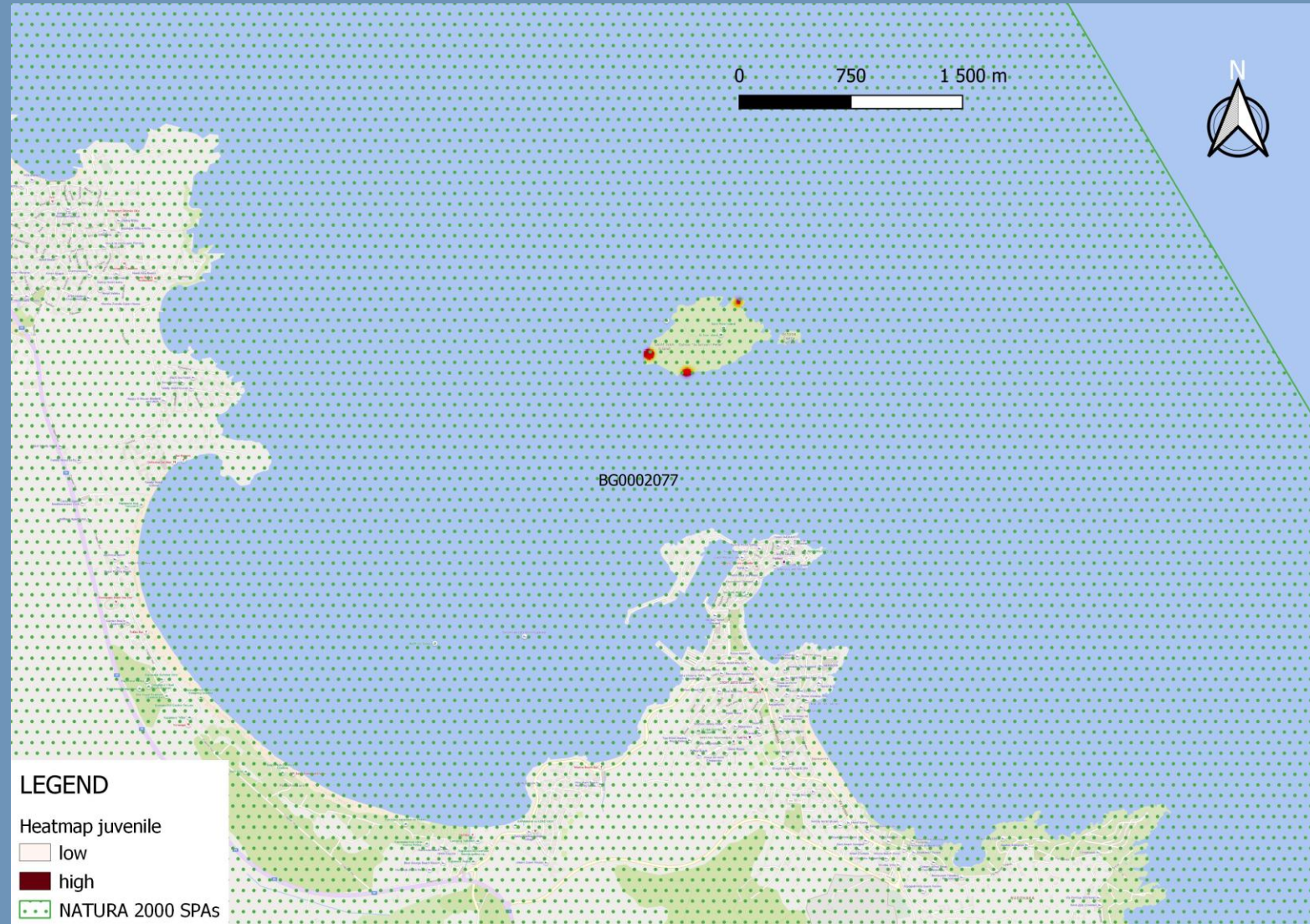
Diving data of the juvenile Shag included 51,846 dives with a total duration of 341:32:34 hours (mean = 00:24 minutes).

Maximum recorded depth was 25.88 m (mean = 4.67 m).

Most of the dives (69%) were below the mean depth.

Most of the dives (92%) were shorter than 1 minute.

The longest dive was recorded on 14 July 2024 and lasted 1:49 minutes, reaching a depth of 16.21 m.

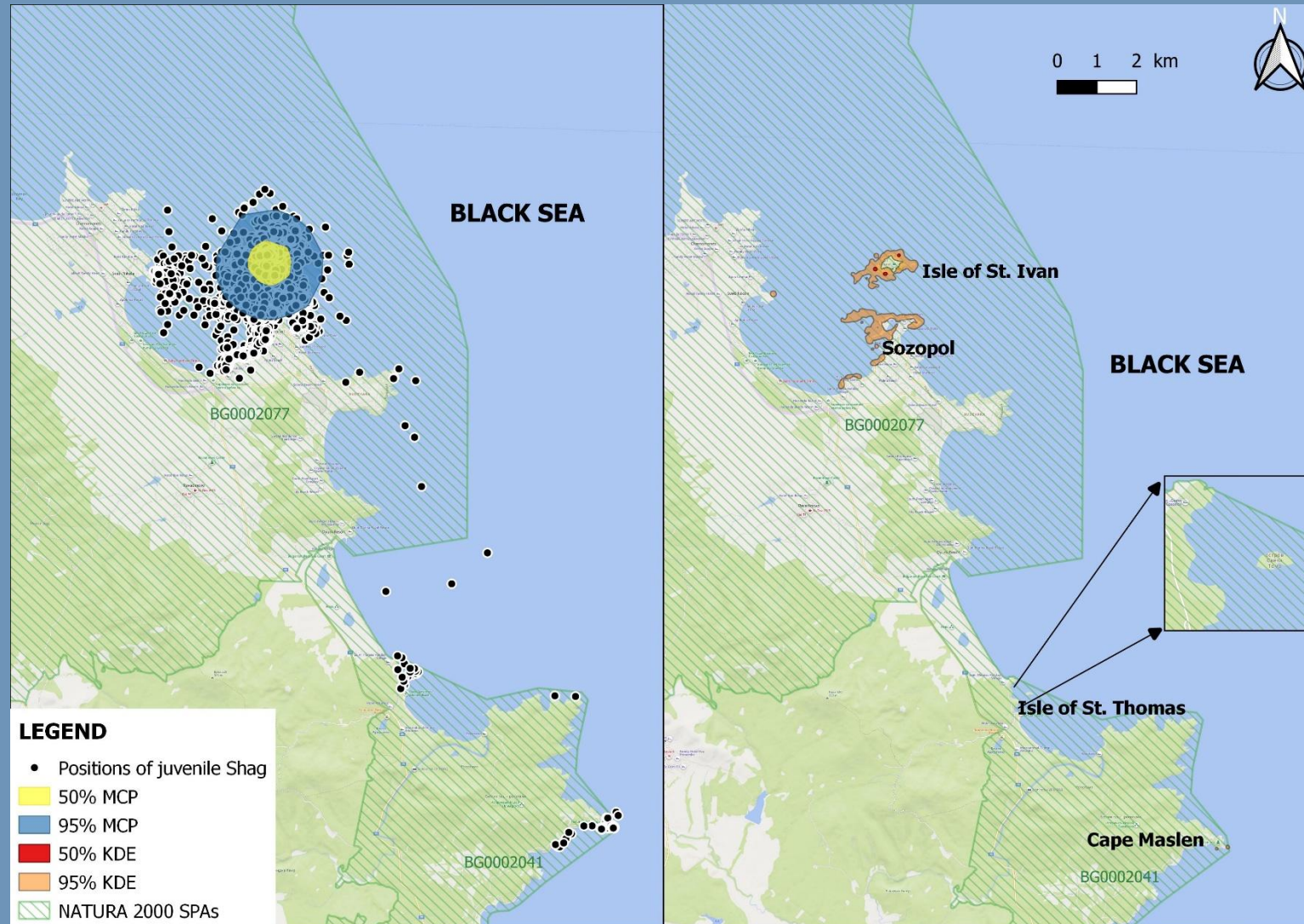


RESULTS – juvenile, Isle of St. Ivan, Sozopol

The most distant point reached was the bay south of Cape Maslen, reached at the beginning of January 2025.

LEFT: The entire size of the habitat range was 5.7 km² (95% MCP) with a core area of 0.9 km² (95% MCP), almost completely within two SPAs: Bakarlaka (BG0002077) and Kompleks Ropotamo (BG0002041).

RIGHT: The calculated home range (95 % KDE) was 1.43 km² with a core area of 0.02 km² (50 % KDE).



- The tracked European Shags have shown a strong preference for the coastal habitat and waters: the maximum recorded position was 2 km offshore.
- Designated SPAs of NATURA 2000 almost completely (99% of positions) overlapped with the entire area of the habitat used by both birds.
- Core area, used by both birds, was completely within the SPAs.
- The tracked Shags have not undergone any long-distance migration.
- Movements of the juvenile Shag revealed a new breeding location of the species along the Bulgarian coast – the Isle of St. Thomas.



Nest with chicks at the new breeding site – Isle of St. Thomas, June 2025



The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

PLOVDIV, BULGARIA

7-10 JULY 2026

THANK YOU!

Questions?

dpopov@greenbalkans.org

Dimitar Popov & Galina Meshkova
Green Balkans NGO, Bulgaria
Website: greenbalkans.org

Acknowledgements: This study was made thanks to financial support from EAF, EuroNatur, FZS, and CABS.

RED-BREASTED GOOSE PROJECT



eurolatur

EAF
EECONET
ACTION
FUND



ПРОГРАМА ЗА ОПАЗВАНЕ НА
ЧЕРВЕНОГУШАТА ГЪСКА

