

# Restoration of nesting habitats for water birds at Pomorie Lagoon

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## INTRODUCTION

Pomorie Lagoon is a natural hyper saline lagoon situated along the Bulgarian Black Sea coast, partly-modified by human activities for sea salt harvest and medicinal mud use. Its position along Europe's second biggest bird flyway - Via Pontica – make it important stopover during migration. Site's checklist counts more than 270 bird species, 57 of these breeding. The wetland is the only regular breeding site in Bulgaria for Sandwich tern (*Thalasseus sandvicensis*) and second most important for Avocet (*Recurvirostra avocetta*), Black-winged stilt (*Himantopus himantopus*), Kentish plover (*Charadrius alexandrinus*), Common tern (*Sterna hirundo*), Little tern (*Sterna albifrons*), and Shelduck (*Tadorna tadorna*). The site is designated national protected area (protected site, IUCN category V); Important Bird Area; Ramsar site; SPA Pomoriysko ezero BG0000152 (EU Birds Directive) and SAC Pomorie BG0000620 (EU Habitats Directive).

Green Balkans NGO (Bulgaria) implements long-term program for restoration of water birds' habitat since 1996. Different methods and approaches were tested in this regard.



## WOOD AND SILT ISLET

In the period 2001-2008 adjacent to the concrete dike, 250 sq. m. semi-elliptical nesting islet was created by wooden stakes driven in the lagoon's bottom and filled with sediment and seashells. It was made at several levels to secure dry nesting area even in case of rapid raise of water column. The islet further evolved as a natural sand beach/bar by the action of waves.

**RESULT:** Sandwich terns: 1500 pairs in 2009; 1100 pairs in 2017; 1989 pairs in 2019; 2300 pairs in 2020; 944 in 2021; 1430 in 2022. Avocet: 65 pairs in 2009; 80 pairs in 2019; 7 pairs in 2020; 5 pairs in 2021 and 49 pairs in 2022. Little terns: 28 pairs in 2009; Common terns: 20-30 pairs in 2009; 23 pairs in 2022.



## WOODEN PLATFORMS

Final stage in the habitat restoration was creation by hand of 7 wooden platforms in the period 2012-2017 and 2022.

**RESULT:** 114 pairs of Common terns were nesting on these in 2014. In 2016, in addition to approx. 20 pairs of Common terns, 3 pairs of Little terns and 25 pairs of Avocets were recorded. 28 pairs of Avocets and 76 pairs of Common terns nested in 2019. In 2020 these numbers decreased to 17 pairs of Avocets and only 2 pairs of Common terns. In 2021 the platforms were initially occupied by 64 pairs of Common terns and 8 pairs of Avocets before these being chased away by approx. 150 pairs of Sandwich terns in start of June that a week later abandoned the site. In 2022 only 7 pairs of Avocets were detected to breed on the platforms.



## FLOATING RAFTS

6 floating wooden rafts covered with reed and anchored were created in period 1996-2001. 4 rafts were created in 2012-13 and anchored at sheltered reedbed of the lagoon.

**RESULT:** 23 pairs Common terns nested on rafts in 1997. In following years rafts were compromised by fishermen and mud bathers preventing any use by birds.



## RESTORED CONCRETE DIKE

Eroded concrete dike situated in the southeastern corner of the lagoon was restored in 1996-1999 through rebuilding concrete walls and filling the rectangle sections with pebbles, silt and shells. Estimated surface of restored habitat was 70 m<sup>2</sup>.

**RESULT:** Sandwich terns' numbers increased from 6 pairs in 1996 to 450 pairs in 2001. Avocet numbers during that period were: 10 pairs in 1996 (unconfirmed); 26 pairs in 1999 and 44 pairs in 2001. Little terns numbered 22 pairs in 2002 and Common terns were 8-10 pairs in 2001.



## GROUND AND PEBBLE ISLAND

In 2012-2013 a disused eroded earthen embankment was reconstructed into a nesting island with total surface of 4000 sq. m. situated in the very centre of the lagoon. It was created with the use of heavy machines and innovative erosion protection by geosystem covered with pebbles.

**RESULT:** 2400 nesting pairs of Sandwich terns, 120 pairs of Common terns 20-40 pairs of Little tern; 160 pairs of Avocet; 50-80 pairs of Black-winged stilt; 7 – 20 pairs of Mediterranean gulls; 2-35 pairs of Gull-billed terns; 20-40 pairs of Little terns; 3 pairs of Slender-billed gulls in 2013 and 2015. In 2017 the island was occupied by 55 pairs of Gull-billed terns together with 40 pairs of Avocets, 50 pairs Common terns and 35 pairs of Black-winged stilts. Further unsuccessful breeding attempts were made by mixed colony of Sandwich terns, Mediterranean gulls and Avocets in 2014, 2016 and 2018. In first two years disturbance by illegal fishers and kite-surfers disrupted breeding, while in 2018 cause was not identified. After 2018 no breeding attempts were observed. Partial removal of vegetation was performed in period 2017 – 2020 and in 2022 almost complete surface was cleared of vegetation but to no avail.



## CONCLUSIONS

Restoration of habitat is a useful tool for improving and maintaining secure status of ground-nesting colonial water birds. At Pomorie Lagoon, Sandwich tern is the species that benefited mostly of the efforts for habitat restoration increasing numbers from 6 to 2400 pairs in the period 1996 – 2020. Common tern has showed greatest adaptation occupying different man-made nesting habitats – rafts, islets and platforms. Most preferred nesting substrate is the one resembling closest to natural conditions. Preventing erosion is important measure to guarantee long-term use of the habitat by the target species but as important is ensuring non-disturbance by humans.

Conducted restoration in 2021 within LIFE19/NAT/BG/000804 LIFE FOR POMORIE LAGOON project has shown immediate positive result with restoring numbers of breeding birds on the wood and silt islet.

