

# GPS telemetry of Mediterranean Shags (*Phalacrocorax aristotelis desmarestii*) at Slovenian sea

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**Mediterranean Shag** is a subspecies of European Shag (*Phalacrocorax aristotelis*) distributed solely in the Mediterranean and Black Seas. It is listed on Annex I of the Birds Directive. A large portion of Adriatic breeding population summers in the North Adriatic. **Marine IBAs and Natura 2000 sites** will be designated for conservation of the subspecies at Slovenian sea (project SIMARINE-NATURA, LIFE10NAT/SI/141). Photo: Tone Trebar



More than **1500 Mediterranean Shags** gather at **communal roosting sites** during summer and autumn at three locations near Slovenian coast (left). They roost on **buoys of mussel farms** (right). During the day they **disperse out to sea to forage** on fish, mostly bottom-dwelling species. Large groups of Shags occasionally follow flocks of pelagic fish, especially in shallow coastal waters. Photo: Bia Rakar, Gregor Šubic



## Preliminary results



**GPS telemetry of Mediterranean Shags** is being implemented in Slovenia as part of research actions of the project SIMARINE-NATURA (LIFE10NAT/SI/141) that aim to identify marine IBAs for the subspecies at Slovenian sea. Two individuals named Ari and Šime were equipped with ECOTONE DUCK-3 loggers in autumn 2012. This is the first case of GPS telemetry on birds in Slovenia. Photo: Urška Koce

### Tagged Mediterranean Shags – pioneers of bird GPS telemetry in Slovenia

Two Mediterranean Shags were caught at sea using a modified clap-trap mounted on a buoy, and have been equipped with GPS loggers. One individual (Šime, probably subadult) was roaming coastal waters of Slovenian sea up to 15 m in depth and roosted mostly at one location until mid December 2012. It then undertook a two-day migration to traditional subspecies breeding area in Croatia 200 km away. It has been staying in the remote area between two Adriatic islands, Molat and Sestrunj, since then. There has been no physical observation of the bird since it left Slovenian sea. The other individual (Ari, 1Y) died soon after it had been equipped with the logger, due to a severe leg injury of unknown source and subsequent starvation. There was no indication that the GPS logger had been anyhow involved in this injury.

### Attachment of loggers

The loggers were mounted on birds permanently as backpacks with teflon ribbon harness. They were additionally wrapped in plastic to assure waterproofness in deep sea since Shags are deep divers. There was no problem with feathers covering the solar panel. The Shags accepted the loggers well. Compared to their conspecifics no change in their flying or diving behaviour was observed, at least not in the shallow Slovenian sea (max. depth is 25 m).

### Choice of loggers

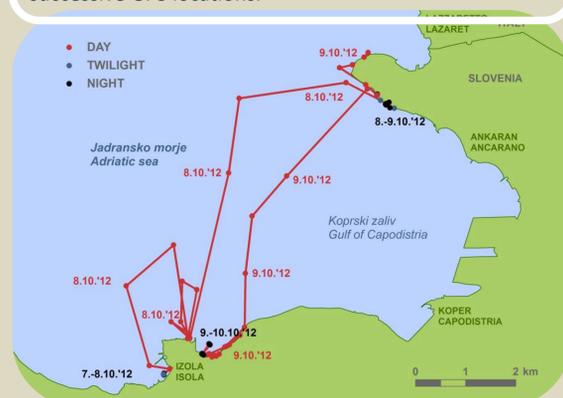
Our choice of the telemetry devices was based on the following demands: 1] Shags cannot be re-caught when away from nesting sites thus remote data download is needed, 2] GPS locations must be fixed while the Shags are on the water thus backpack mounting is needed to expose GPS above water level, 3] extended period of data collection is preferred thus rechargeable batteries are needed. The used loggers are functionally a state-of-the-art, however, their reduction in size is necessary in order to lower their effect on birds.

### Future

The project's scope is to track at least 18 more individuals in summer 2013. Smaller loggers with the same functionality will be used.



**Maps of movements** of two Mediterranean Shags at Slovenian sea in October 2012, Šime (top) and Ari (bottom). Red dots represent their daily foraging sites, black dots represent their roosting sites, lines connect successive GPS locations.



ECOTONE GPS TELEMETRY WORKSHOP  
Conference Center „Wierzba“ (Polish Academy of Sciences)  
Wierzba Village, Masurian Lake District, Poland  
5.-9. April 2013

**SIMARINE-NATURA (LIFE10NAT/SI/141)**

Preparatory inventory and activities for the designation of marine IBAs and SPAs for *Phalacrocorax aristotelis desmarestii* in Slovenia

[www.ptice.si/simarine-natura](http://www.ptice.si/simarine-natura)

Coordinator Associated beneficiaries

Co-financers



The project is co-financed by LIFE, the financial instrument of European Union for the environment.