

## **The Pallid Swift in Italy: fifty years long lasting research**

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After the discovery of a large breeding population in Turin and surrounding cities (NW Italy) in the seventies, we started a program of research on the breeding biology and eco-ethology of this species, which was little studied until then.

The main effort was conducted between 1975 and 1995 in collaboration with the team of Giorgio Malacarne and Marco Cucco (Turin University). This research highlighted many interesting aspects of this species, including its distribution in NW Italy, its choice of nesting sites in buildings and cliffs, the early arrival and late abandonment in autumn of the colonies, the reproductive phenology and the peculiarity of the double annual laying, the moult pattern, the differences in diet in comparison with the Common Swift, the influence of climate on breeding success, the genetic difference to the Common Swift. Thanks to the ringing of 1205 chicks and 480 adults we could assess adult survival rates in relation to the climatic conditions in the wintering areas and the age at first breeding.

Despite this ringing effort, almost no information on migration routes and actual wintering range was available until a tracking program was started using GLS (since 2011) and GPS (since 2018) loggers (183 birds tagged) in collaboration with Susanne Akesson (Lund University).

Thus, the migratory routes and wintering areas of many birds was followed throughout the entire annual cycle, also identifying how individuals adapt to the more or less favourable environmental conditions of transit and/or wintering areas in relation to winds and rainfall patterns.

Recently, the new Atlas of Breeding Birds in Italy has outlined the distribution of the species at the national level; this highlighted further questions on the ecology of the species, which nests in extremely diverse situations, ranging from small islands and rocky Mediterranean coastlines, to the large cities of the Po Valley surrounded by intensive cultivation, to the small villages of the central Apennines and Sila between 1000 and 1600 metres immersed in vast coniferous forests. Largely different environmental and climatic conditions are present across this breeding range.

Furthermore, a careful collection of first observation and nesting data from over 770 published and unpublished records of breeding Pallid Swifts, from the first record in 1874 to the present, showed an apparent positive range and population trend; however, unexpectedly, there is no evidence of a Northwards spread. Probably, many colonies that was only recently discovered settled well before the first reported observation: likely only very recently have many observers learnt to reliably identify Pallid Swifts in nature.