



THE SAN SIRO STADIUM, ITS SWIFTS AND OTHER SPECIES

Situation, recommendations, hints

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1. FOREWORD

The value of biodiversity and ecosystem services is also relevant in the urban environment as described by various studies (Kumar et al., 2024; Tratalos et al., 2007; Reynolds et al., 2021; Ziter C., 2015)

Among the most characteristic species of inhabited centers, even large ones, are the Swifts (**Aves, Apodidae**).

In the city of Milan, there are three species of swifts:

- **Common swift** *Apus apus*
- **Pallid swift** *Apus pallidus*
- **Alpine swift** *Tachymarptis melba*

The swifts that nest in Europe are long range migratory birds that reach European latitudes from African wintering quarters in spring for breeding season. They are great fliers, strictly insectivorous and have evolved to search for and capture insects in flight and constitute an important control factor of the entomofauna mass.

On the San Siro Stadium do nest regularly the following species:

- **Alpine swift** (*Tachymarptis melba*), with a large colony, **Fig. 1, 2**
- **Pallid swifts** (*Apus pallidus*), with a small colony



disponibile al n° 45 su https://www.festivaldeirondoni.info/documenti_scaricabili

and other interesting species such as

- **Peregrine falcon**(*Falco peregrinus*) (**Fig. 3**)
- **Kestrel** (*Falco tinnunculus*)
- **Black redstart** (*Phoenicurus ochruros*)

The aforementioned species constitute an ornithic community that make **the stadium an important site and an icon of the biodiversity of the city of Milan**, but **this document focuses on alpine swifts**, because of its characteristics.

The alpine Swift **arrive in Milan from the end of March and stay to the beginning of October** and are known as **nesting species in the building of the Stadio di S. Siro** (also known as the Meazza Stadium) **since at least 2003** when it was perhaps at the beginning of the settlement. **Since 2012**, the presence of alpine swifts in the stadium has been **recorded on the www.ornitho.it database** during the Atlas of nesting species in Italy project, totaling about ca.**160 observations**, many of which on the basis of objective details relating to reproductive activity (**Fig. 4-10**). It is estimated that **at least 90 alpine pairs** nest in the structure, making up **the largest known colony** on buildings in Italy for this species. But the overall number of alpine swifts present in the colony, breeding and subadults, is much larger. In fact, on the basis of the data on ornitho.it, after the first few tens observed in the first years, the swifts flying around the structure at the beginning of summer were already indicated **in 2013 as "about 200"** while **in 2016 they rose to "about 400"** at the beginning of August, that is, in a period of coexistence of breeding swifts, subadults visiting from Africa and newly fledged juveniles.

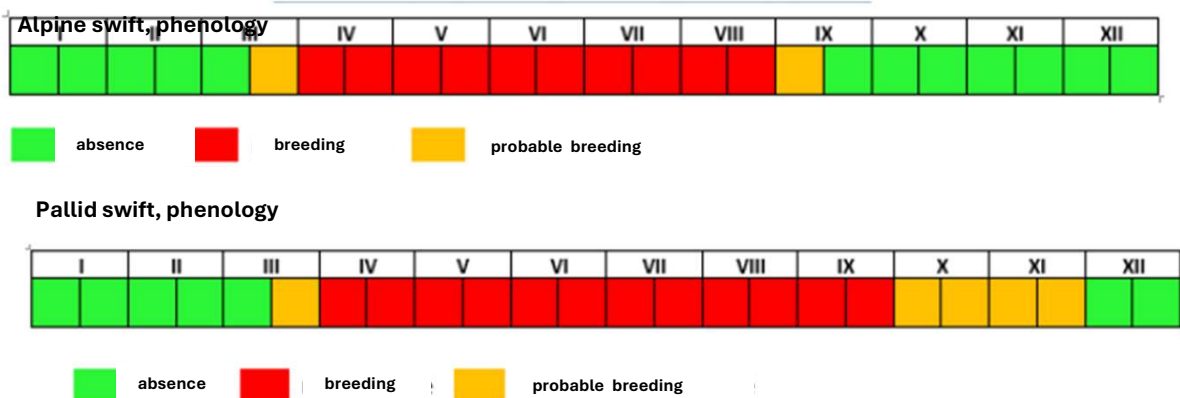
Regarding the quantity of swifts, it is necessary to take into account their particular sociality based on the breeding adults who, after about 1-2 months from their arrival, are visited by young and subadults born in the previous 1-3 years and who come to visit the colonies where they can reproduce at maturity (at 2-3 years old). These swifts (referred to as “bangers” (Figs. **17, 19, 23**) are not reproductive and do not enter the spaces with nests but visit them in groups, crowding, fluttering outside the inhabited cavities, shouting in front of the entrances and following the development of the nestlings which in turn will join the flocks of bangers when they leave the nest, immediately autonomous. Then, from the end of June and the beginning of July onwards, the parties of birds flying around the stadium mix adult swifts still engaged in feeding, visitors from Africa and youngs newly fledged. This would explain the estimate of about 90 breeding pairs compared to about 400 swifts in group flight observed.

2. THE ALPINE SWIFT, INFORMATION ON THE SPECIES

- **The Alpine swift** *Tachymarptis melba* **is the largest swift in Italy.**
- **Dimensions:** **20-22 cm long**, a **wingspan of 34-60 cm** and a **weight of 75-125 gr.** (Demongin, 2016).
- **Plumage:** the **black dorsal plumage** and the **white area** on the belly and throat make it easily distinguishable from other species.
- **Flight:** The wings are very long, and the flight is vigorous and powerful. It reaches speeds higher than those of the Common Swift and the Pallid Swift (Cramp, 1985): between 60 and 100 km/h during normal flight, up to 250 km/h during fast flight (Arn, 1960). Like the other two species breeding in Italy, the Alpine Swift is also closely adapted to continuous flight. It spends **most of its life on wings:** on wings it hunts, drinks, sleeps, socializes and mates; He descends into buildings to lay eggs, to incubate and to feed the young, but (unlike the other two species) in buildings it also constitutes gatherings of birds (**roosts**) for the night or during bad weather.
- **Voice:** The main call is a high-pitched **trill** (Cramp, 1985).
- **Life span:** It is a long-lived species, it can reach **26 years** of age (Arn, 1960).
- **Migration:** After breeding, European Palearctic populations move to western and eastern sub-Saharan Africa (Engeler, 2025) to winter. The spring migration back to the nesting sites begins in March and can last until June; the beginning of the departure to Africa is influenced by the length of the breeding season, and locally can vary from the end of August to September but also until October and November (Spina e Volponi, 2008).
- **Area:** The Alpine Swift is traditionally widespread in the Mediterranean basin (North Africa, Southern Europe), Asia Minor and North-Western Iran (Spina e Volponi, 2008) but the species has been expanding in Switzerland and western Germany for some time.
- **Distribution in Italy:** In Italy alpines nest on the rocky coasts of the whole peninsula, on the major islands and on some small islands, and also on cliffs of the inland reliefs generally below 500 m. above sea level but they can reach 2400 m. (Boano, 2022). In recent years the species has also been colonizing many cities (Boano 2022) where it settles in historic palaces, religious buildings and palaces and more recently also in road viaducts even in areas far from cities. The tendency to prefer synanthropic situations has long been the norm even to the detriment of rock sites once exclusive to the species (Boano e Malacarne, 1999). To date, there are about ca. 90 cities in Italy where there are colonies, from small villages to large cities such as Milan, Turin, Catania, Catanzaro (Boano, 2022). The largest number of urban colonies is recorded in Piedmont and Lombardy.
- **Number of couples in Italy:** The national population is estimated between 6000 and 12000 couples (Brichetti e Fracasso 2020).

- **Population trends:** due to the habits of the species and the difficulties of study, it is not easy to assess with certainty a demographic trend (Vigorita, 2008) which still lacks reliable data.
- **Alimentazione:** The Alpine Swift is a strictly insectivorous bird. Its diet includes a wide variety of arthropods, mainly hymenoptera, diptera, homoptera, orthoptera, odonata, plecoptera, beetles and spiders (Cramp, 1985). Hunting takes place during daylight hours.
- **Sociality:** The Alpine swift is a gregarious species (Fig. 21). During feeding and migration, it forms flocks of varying sizes, from a few units to a few dozen specimens (Arn, 1960).
- **Intraspecific aggression:** Tolerant towards conspecific birds and also other taxa (bats, geckos), it does not show particularly developed threatening attitudes, limiting itself to calls or short chases to defend the nest. Fights rare.
- **Nesting takes place in colonies.** The nests are built in cracks and ravines of mountain rock walls and maritime cliffs, or in cavities on buildings within inhabited centers, safe from predators. For reproduction, it prefers elevated places with easy access and free from obstructions, so as to allow safe departure and arrival.
- **Sexual maturity:** it is usually reached around **2-3 years** of age. Immature swifts spend most of the breeding season building their nest in preparation for the next season (Cramp, 1985). These, moreover, are used to aggregate in dozens clinging to the external vertical walls of the colony, forming, especially in the post-reproductive period, collective dormitories (Casola *et al.*, 2022) But about urban biodiversity, new behaviors are recently becoming important that lead swifts to form roosts in covered spaces accessible through cracks such as traditional floors, roof cavities, expansion joints between prefabricated elements (buildings, viaducts), roller shutter coffers and even between the aerial counterweights of construction site cranes, all situations where nesting is also found (posts and images in the Facebook Group «Swifts and living monuments» 2016-2025).
- **Nests:** basket-shaped nests are built in suitable spaces, of the diameter of **12-13 cm** (Engeler 2025), of variable depth according to the contexts, built with material collected in flight (dry grass, pens, ...) **and cemented with saliva**, a structure often much more voluminous than that of common and pale swifts. The eggs are white, with a smooth, opaque appearance and an elongated shape; Medium weight 6,2 g. The most experienced breeders **lay 3 - 4 eggs**, those at their first experiences usually 2. The eggs are **incubated for about 20 days** by **both parents**, and the hatching of all the eggs almost always takes place within 24 hours. (Cramp, 1985). At the time of birth, the young are altricials and nestlings, but thanks to assiduous parental care they fledge in 53-68 days(Engeler 2025) and from that moment they are totally independent.

- **Appearance of young birds:** In flight they look very similar to that of their parents. The most evident difference is observed in the median and major upper wing coverts, which, unlike those of the adult, have fringed edges of white, like the feathers of the crown and hind neck.
- **Nesting period:** in Milan the alpien swifts generally arrive at the end of March and remain until **September-October (Fig. 24, 25)**, with wide variability especially for the departure of the colony for the return to Africa, which can be partial and leave in place breeding breeders who have yet to finish raising the brood. Pale swifts have a similar reproductive phenology but much later on their return to Africa. *The image below allows the comparison between the two phenologies.*



3. ADVANTAGES OF THE MEAZZA STADIUM FOR THE ALPINE SWIFTS AND OTHER SPECIES

The structure of the stadium is:

- **elevated and isolated**, therefore, easily identifiable even from a long distance
- with **walls similar to the rocky cliffs** that swifts and other species use in the wild
- with **large concrete elements**, separated by **joints of expansion** which within the structure correspond to **horizontal, inclined** or even **vertical spaces** that can accommodate nests and roosts for both alpine and pallid swifts
- **contiguous to large agricultural areas** to the western and southern Milan, plenty of rice paddies, crops and spontaneous vegetation, providing suitable foraging territories.

In this context, it is the intrinsic nature of the stadium that is particularly attractive to alpine and pallid swifts. In fact, the 4 cylindrical corner bodies and the 7 intermediate ones, the rings and the cornice are made up of reinforced concrete elements that draw a complex three-dimensional network of expansion joints, characterized by deep internal surfaces (horizontal, oblique and vertical) that are very suitable for hosting nests or roosts, where the dimensions fit for alpine swifts (not less than 4,5 cm). Actually, it's well known that both and pale swifts do settle well in viaducts and bridges where the prefabricated beams and elements are rest on pylons and are connected each other with similar joints (**Fig. 11, 12, 13**).

Obviously, from the outside and from the ground it is not possible to have an idea of the development of these internal surfaces and also due to the size of the joints, not being able to make measurements, we limit ourselves to appreciating that where they are suitable for letting the swifts enter, as it is shown by the unmistakable signs of use by splashing excrement just before entering or exiting (**Fig. 11**, arrows).

To fix solid references, **alpine swifts** use slots with walls **no less than 4.5 cm apart** (**Fig. 10, 28**) while **pale swifts** only need **at least 3 cm** (Scholl 2004, 2005, 2016) while the inner volumes can be useful for them at the same conditions.

It is also important to remember that both alpine and pallid swifts, in addition to gluing their nests on horizontal surfaces and adapting them to very inclined ones, are very efficient also to adapt to extreme oblique and even vertical spaces where they not only **can glue the nests to partial supports** but can glue them **as hammocks**, partial or integral, in corners or between walls not too far from each other (**Fig. 14, 15, 24, 25**).

In addition, the alpine swifts has a marked tendency to breed in common areas where the minimum distances between nests can often be very small, i.e. 30 cm (Engeler 2025) or even less (Ferri & Lonati, 2016, Facebook).

In addition, the stadium also houses **a pair of peregrine falcons**, and **kestrels**, and for them **standard artificial niches** for the species can be easily placed in the new structure. Regarding **bats**, there are no objective elements about the presence of particular species, but intuitively the wide availability of accesses and **internal spaces** useful for swifts **can be exploited also by bats, even in cohabitation**, in situations elsewhere documented thanks to the **citizen science** as in the screenshots below. But of course, specialists with suitable equipment such as ultrasonic recorders, endoscopes, suitable cameras and special lighting equipment could be more effective.

- **Geckos:** geckos **cohabiting with swifts** are also documented in Milan (screenshot below)



↖ Droppings of bat *Eptesicus serotinus* in a shutter roller box. Pic by A. De Bassa, 2025

↑ Resident bat in a nest box with common swifts. Bolton And Bury Swifts, 2022, Facebook

← Gecko resident in roller shutter box with two pairs of pale swifts. Frame da webcam. Lina dei Rondoni pallidi, Milano. 2023

4. NESTS AND ROOSTS OF THE ALPINE SWIFTS

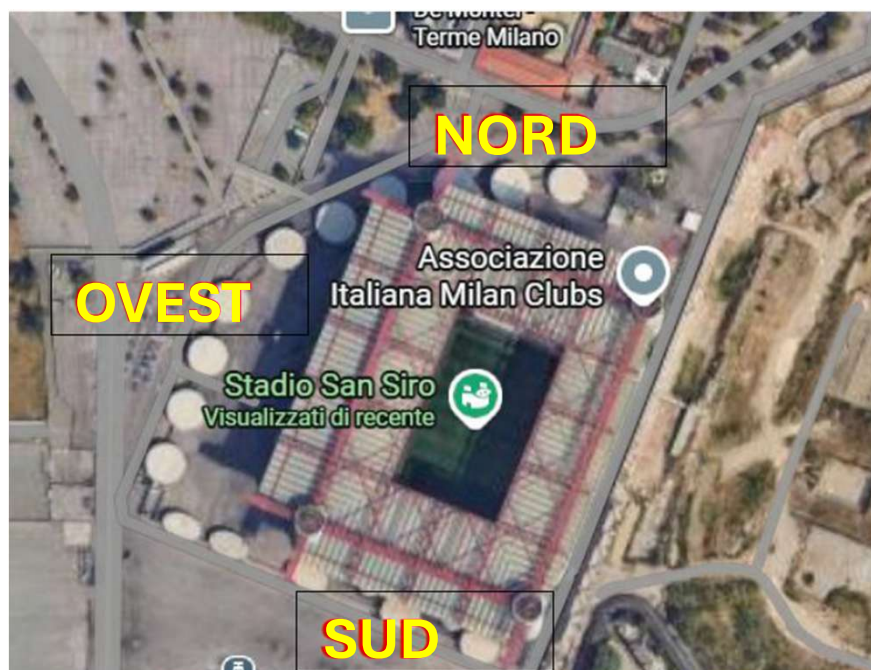
ON THE STADIUM OF S. SIRO

The alpine swifts have found in S. Siro spaces to nest and where to gather (roosting) during the night and during cold or rainy days, thanks to the abundance of cracks constituted by the expansion joints, between prefabricated elements of various shapes that make up the building. The connections between the various elements identify different types of empirically identifiable spaces on the outside of the stadium, in particular:

- **Horizontal or sawtooth cracks**, between prefabricated elements that overlap (**Figg. 16, 17, 18, 19, 20/2**)
- **Vertical slots**, between the sections of the bleachers of the third ring (**Figg. 10, 20/1, 21**)
- **slots at the base of the bleachers** of the third ring under the vertical ridges of the bleachers (**Fig. 20/3**)
- **Niches in correspondence with the support of beams on the towers**(**Fig. 17**)

Although they are structural elements present on all sides of the stadium, various observations agree that the alpine swifts exploit *above all* the sides at **NORTH, WEST and SOUTH** (see image below).

But an exhaustive examination of the current state of the colony, systematic and critical updating of the previous list, can only be done with access to the structures, for example by monitoring the various components during the next demolition operations, looking for signs of nesting and/or roost (nests, eggs, nestlings and deceased and dried adults, excrement).



The sides of the S. Siro Stadium used by the Alpine Swifts for nesting and roosting

5. DEBRIS FALL: EFFECTIVE AND INEFFECTIVE NETS

In connection with the fall of debris that occurred in 2023 and 2024, large nets were placed on the external surfaces of the third ring.

The intervention is illustrated in **Figg. 24, 25, 26, 27, 28, 29**, and it can be concluded that:

- **Null results on debris** result where the nets left gaps free at access, **Fig. 26**
- **Nets often prevented the swifts** from accessing the nests, causing mistreatment and deaths, which often could not be verified from the outside when the pose blocked injected nestlings, which then died of starvation
- **Mistreatment and deaths** resulted on swifts where the installation has left gaps that have caused a “**trap effect**”, **Figg. 27, 29**. In this case, the photos documented that the swifts returning to the nests were able to go beyond the nets through gaps left during laying or opened by wind pressure. But what complicated the situation was the laying of nets during nesting, with the amplification of mistreatment because:
 - There is a **lack of information on chick mortality** in nests because the sites are inaccessible.
 - Episodes have been documented with adults and/or young **swifts fluttering without being able to understand the situation** caused by the networks
 - The **incoming swifts, in front of insurmountable nets**, insisted on looking for a gap to get to “their” slots they saw in front of them. A particularly stressful situation because the animals insisted to the **bitter ending**.
 - Or, the **incoming swifts**, easily exploited any useful gaps between the edges of contiguous nets to get to their access slot to the nests, but **at the exit**, finding themselves against the light and with the mesh of the net not very visible, **suffered the trap effect** because they did not easily or not at all identify the gaps between the nets and got lost in the space between them and the walls of the stadium, suffering **strong stress, damage** to the plumage, but also **dying of starvation** in the event of being unable to go out, deprived of food and water.

From the images it is possible to understand that where the work has been meticulous, swifts have been trapped but where it has not been, accesses have continued, albeit forcing the swifts to travel between the nets, sometimes remaining trapped.

The causes of the trap-effect already explained above are highlighted.

6. THE LEGAL STATUS OF THE SPECIES

The main regulatory references regarding wildlife and urban biodiversity are reported.

Wildlife, in Europe and Italy, even in an urban context, are protected by:

- European Parliament and Council Directive 2009/147/EC (artt. 1, 5)
- National law n. 157/92 (art. 21)
- Lombardy Region Law n. 26/1993
- Regulations for the welfare and protection of animals of the Municipality of Milan approved by resolution of the City Council n. 4/2020 (in particular art. 32)

Anyone who destroys nests and eggs or disturbs nesting is subject to criminal prosecution:

- Criminal Code art. 544-bis - Killing animals
- Criminal Code art. 544-ter - Animal abuse
- Criminal Code art. 727-bis - Killing, destruction, capture, removal, possession of specimens of protected wild animal or plant species

Regulations

The Alpine Swift is protected by national law n. 157/92 and by regional law n. 86/1983, and protected, in particular in the city of Milan, by the REGULATION FOR THE WELFARE AND PROTECTION OF ANIMALS OF THE MUNICIPALITY OF MILAN, approved by resolution of the City Council no. 4 of 3 February 2020. **In the aforementioned Regulation, explicit mention is made of the protection of Swifts in art. 31 and 32, but it is in art. 32 which specify in depth the terms of protection.**

Art. 32 Safeguarding Apodide (Swift) Colonies

1. Without prejudice to the provisions of the laws in force on the protection of wildlife, the Municipality intends to protect the colonies of swifts (Common Swift, Pallid Swift and Alpine Swift) nesting in Milan.

2. In the case of building interventions on existing buildings of any type provided for by art. 3 of Presidential Decree 380/2001, asbestos removal interventions, energy interventions, to be carried out in buildings where there are nests of Common Swift, Pallid Swift or Alpine Swift, both during the reproductive period and outside it, the interventions themselves must be carried out providing for the conservation of the nests present. In the case of interventions that for design reasons must occlude cavities, cracks, niches or scaffold holes hosting Swift nests, it will be necessary to proceed, as compensation, with the affixing of as many artificial nests, adhering to the

indications contained in the "Guidelines for the protection of swifts in the context of building interventions" filed with the Municipality of Milan. To this end, the Animal Protection Guarantor will provide any advisory assistance. The offender is punished with an administrative sanction, pursuant to art. 40.

3. In the case of building interventions on existing buildings of any type provided for in the definitions referred to in the previous paragraph, carried out during the reproductive period of the three species (Common swift: from 25 March to 30 July; Pallid swift and Alpine swift; from 25 March to 30 September), according to the provisions of national Law n. 157/92 (Rules for the protection of homeothermic wildlife and for the hunting activities (art. 21) not only the nests but also the nestlings and hatching adults present must be safeguarded. If the building interventions are to be considered of extreme urgency according to the Building Regulations (RE) or non-deferrable, recognized by the protection bodies (Municipality, Superintendencies), they must be carried out according to the provisions of the "Guidelines for the protection of swifts in the context of building interventions" filed with the Municipality of Milan. To this end, the Animal Protection Guarantor will provide any advisory assistance. The offender is punished with an administrative sanction, pursuant to art. 40.

4. The buildings that host colonies of swifts are listed in an updatable list, published on the website of the Municipality of Milan, drawn up by professionals and supervised by the Guarantor for the protection of animals, in order to provide all citizens and technicians with a tool for the protection of the colonies and for the planning of the building interventions referred to in paragraphs 2 and 3.

PLEASE NOTE: The structural aspects of the spaces occupied by swifts and other species in the Meazza Stadium are outside the scope of the cases study examined by the above-mentioned "Guidelines for the protection of swifts in the context of building interventions", while they are the specific interest of this document after documenting the situation in San Siro and quoting designed and implemented case studies.

MF & GP

7. RECOMMENDATIONS FOR CONSERVING THE COLONY

DURING WORKS (2027-2032)

7.1 Foreword

On the occasion of the sale of the stadium, an article (image below) was read in the media with the **chronogram of the various phases**: sale, project (2026), start of work (2027), end of work (2032) but other news was also spread about **the possible maintenance of a tower and some other elements**. The possibility of partial maintenance should be clarified as soon as possible, to understand how much of the colony could continue to nest during the works. Once this eventuality has been confirmed or excluded, it will be possible to predict the fate of all or part of the colony after the partial or total demolition of the Meazza stadium. And of course, the options will have to take into account the breeding season, as described in this document.



Il futuro di San Siro: passo per passo, che cosa succederà nei prossimi 7 anni

La stesura del progetto per Inter e Milan, la demolizione del Meazza, la costruzione. Una rapida guida alle tappe fondamentali per l'impianto attuale e il nuovo, dal 2025 al 2032

 **Luca Bianchin** >
Giornalista
30 settembre - 12:30 - MILANO



Step by step, what will happen in the next seven years

La Gazzetta dello Sport (on line), 30.09.2025

Basically, by resorting to a pro forma quantification, in order to simplify the various foreseeable situations, assuming that the nesting pairs can be the 90 hypothesized, the following can be envisaged:

- **In the event that "a tower and some other element" will be kept:**
 - **How many pairs will be able to continue to nest** in the preserved structure?
 - **Will these pairs be able to nest quietly from March 2027 to the end of October 2027?** le reti anti uccelli dovranno essere tolte, mancando la finalità di proteggere il pubblico dalle cadute di calcinacci
 - **Or will there be invasive interventions even in the preserved structure? And the swifts will not be able to use it.**

7.2 Timing

- **The rest or all of the colony will no longer be able to nest as early as March 2027? And where will it be able to find alternative spaces?**
- **If it does not find them, the pairs will disperse and bond with the alternative sites they have found.** Only young and sub-adult swifts born in the stadium in 2025, 2024 and 2023 will likely return visiting San Siro for 2-3 years, but adults, once settled elsewhere, will no longer change the site. So, without a corrective action, taking into account the duration of the works, the colony will disperse and will not return.

7.3 Temporary Offer of Nesting Replacement Sites

Can alternative temporary nesting sites be offered on site to compensate for those lost? Certainly, and with good results, verified.

Generally, temporary compensation nests for swifts consist of artificial nest boxes to be placed on scaffolding (Scholl, 2005, 2016) but experience teaches that extreme fidelity to the reproductive cavity already used, prevents swifts from being interested in alternatives even not far from their reproductive site and it has been verified that the swifts are guided to the temporary compensation box by the pattern of the entrances they already know. Therefore, a replacement box have to follow two principles:

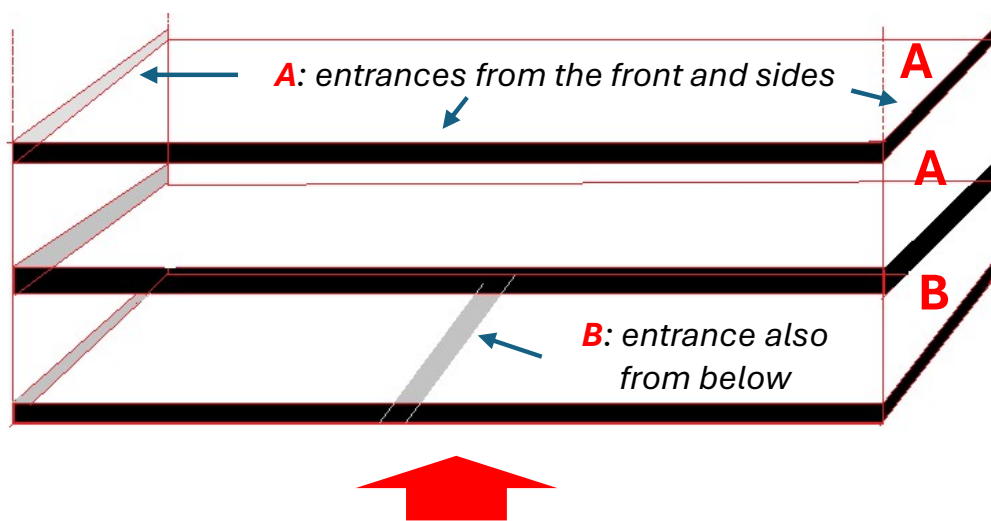
- **Temporary nests must be on site or on any scaffolding, near the natural nests;**
- **Imitate the access crack and the context in which the natural one is placed.** To this end, some case studies have been reported for the common and pallid swift, followed and verified in method and results, necessary here to explain the two aforementioned guiding principles for the development of a prototype also suitable for the case of San Siro:

- **Basilica of San Petronio (Bologna, Italy):** Species: Common Swift; project: M. Ferri; implementation: AsOER, 2017-2022. The boxes were used from the 2nd-3rd year. This was a cause for changing the design for subsequent prototypes (**Fig. 30**).
 LINK <https://www.facebook.com/photo?fbid=2291046787708644&set=oa.2681224448652583>
- **Church of S. Ignazio (Carpi, MO, Italy):** Species: Common Swift; project: M. Ferri; implementation: LIPU Carpi, 2018. The prototypes imitated the cavities under the tiles and were all immediately occupied, already while the boxes were being set up (**Fig. 31**).
 LINK <https://www.facebook.com/media/set/?set=oa.1501497023292004&type=3>
- **Spanish Tower (Carpi, MO, Italy):** Species: Common Swift; project: M. Ferri; implementation: LIPU Carpi, 2019-2022: The boxes imitate scaffold holes, immediately used (**Fig. 32**).
 LINK <https://www.facebook.com/media/set/?set=oa.1949276321847403&type=3>
- **Largo Corsia dei Servi (Milano, Italy):** Species: Common Swift; project: M. Ferri; implementation: SOS Rondoni, 2019. The boxes imitate the box of a roller shutter, immediately used (**Fig. 33**).
 LINK <https://www.facebook.com/photo/?fbid=1956766141136712&set=oa.2015501785224856>

LINK

To design a temporary replacement site suitable for the reproductive habits of the alpine swifts of the San Siro colony, it will be necessary to follow the **guiding principle of imitation** that inspired the solutions for the aforementioned case studies, **but**

it must be technically developed by imitating the current entry slots and nesting spaces, i.e. the joints and expansion cracks already documented. Obviously, to better help the species and for simplicity of design and construction, it will be advisable to develop only **slots and horizontal spaces**, avoiding vertical or diagonal ones, but in addition also slots for entrances from below could also be provided. **A guideline could create a sort of big box (A)** stackable on other equal ones and so as to leave a full-length slot of suitable height at the front and sides (**at least 4,5 cm**) . A variant of it (**B**) with also a lower median slot (or 2 or more of them) could be placed at the base of a **stack of N boxes** of the first type, in order to stimulate the swifts to enter even from below. Such a structure (**NA+B**) could be placed on poles, against the stadium, or against the scaffolding or the construction site, in suitable areas, or it could be hung from the surviving tower and other parts that may be preserved, at a height of at least 8 meters (Scholl, 20016).



Essential details: in module A the slots must be 4.5 cm high and as long as the box (if possible and without prejudice to the needs of interruptions for structural needs), as fake expansion joints imitating the original ones. **In module B, the width of the entrance from below will also be 4.5 cm.** The height measurements refer to the 4.5x10 cm slots of the standard nest boxes for alpine swifts (Scholl 2005, 2016) but here the need is to imitate the extension of the expansion joints and therefore to attract the swifts the slots will have to be very long.

Color: The box on the outside will have to imitate the color of the concrete of the current prefabricated modules of the stadium. It is also important to paint in black the edges of the floor of the box that delimit the slot, to amplify the dark effect and make them clearly visible from afar (**Fig. 11, 17, 18, 19, 21, 32**)

Ventilation: provide slots for the discharge of hot and humid air against the ceiling of the chest of drawers, especially if the structure will be exposed to the south and/or west.

Waterproofing: prevent rain from seeping into the boxes, adopt a sheath (or similar) that protects the drawers

Separation of spaces between nests: Alpine swifts often nest in groups of pairs, keeping a distance of 50 cm between nests (Engeler 2025) ma è noto (Scholl, 2016; Ferri: Case studies 2016, 2022) and then visual separators can be adopted to reduce this distance; Therefore, it is possible to increase the density and quantity of nests by fixing wooden slats on the floor, height 6-8 cm, Joined two by two at right angles and with one side as long as an alpine swift, spread on the floor 20-30 cm from the entrances and at least 30 cm between them.

Shelves: the back wall can be equipped with shelves (ca. 10x20 cm) on one or more levels, to expand the space for the nests, in this case the wall between the floor and the shelf and any ramps will be made of raw and rough wood to facilitate the grip of the swifts' nails.

Minimum size: A box one meter wide and 40-50 cm deep could accommodate 2-3 pairs; implementing them in greater size and by stacking and/or placing them side by side, you can plan an offer larger numbers.

Other species: the walls can be equipped with slits suitable for other species, for which special **nest boxes** or **niches** (passerines, small diurnal and nocturnal predators) and even **bat boxes** can be placed inside

8. POSSIBLE SPONTANEOUS CRITICAL REPLACEMENT SITES, DURING THE WORKS (2026-2032)

- Swifts of all species are known for their marked loyalty to the colony and to the cavity in which they have reproduced, and it is in the nest that the pair reunites every year after the long period of separation during migration and wintering.
- If on the return the cavity is no longer available, for more than a month there are attempts to find it, after which in that season or the next they can adapt to something else, near. And in that case, it is known that alpine and pale swifts can adapt to alternative sites such as **crane counterweights** (Hueting et al., 2022), even over 40 m in height (France) in vertical and horizontal spaces (*images below*). Not everyone knows that in narrow spaces between vertical walls both **alpiners and pallids can glue hammock-shaped nests**. The **crane counterweights eventuality** must be taken into consideration, with reference to the period provided for the dismantling of the crane which cannot take place during the nesting of the species concerned. Therefore:
 - **In case that cranes are dismantled when the species is absent:** no critical issues
 - **In case that the cranes are to be dismantled when the species is present:** It is better to prevent birds from being attracted to the cracks between the slabs, by carefully dabbing them with suitable materials, which cannot be removed, and without leaving any space.



• **Avoid the use of anti-bird needles.** See doc n° 33 in https://www.festivaldeirondoni.info/documenti_scaricabili

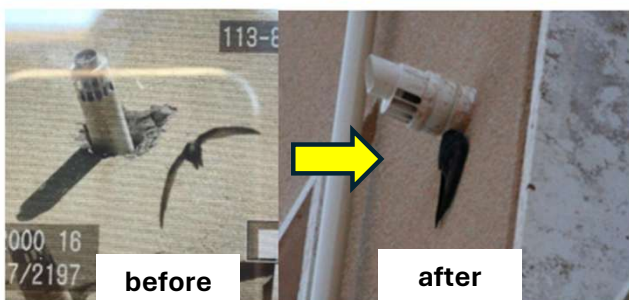
Bergamo (Italy), LIPU 2020. Alpine swifts on counterweights in horizontal layers



Spain, 2016. Web. Swifts on counterweights with vertical layers



France, 2024. Facebook of Martinets de Toulon et d'ailleurs. at a height of 40 m



Roma, 2018. Alessandra De Cesare. Once the cavity in which it nested was closed, upon its arrival from Africa a swift continued to sleep for a long time hanging on the exact point where it had been entered. Despite a new nest box placed at about 2 meters.

9. TIPS FOR PRESERVING THE COLONY ON THE NEW STRUCTURE

The colony of alpine swifts in the S. Siro Stadium must be preserved through a design strategy suitable for providing reproductive sites similar to those currently used *in situ* by the species, similar to others used in urban contexts in Italy. Considering the **national importance of this colony**, and the need to comply with national, regional, local and municipal regulations a specific design is necessary in the new project to keep nesting sites.

Hoping for the **maintenance of a tower and some other elements** of the current stadium, we reiterate the need **for the important population of alpine swifts and other species** to be **guaranteed with suitable nesting sites** also in order to **comply with current regulations**.

The new sports complex, which is expected to have high architectural and environmental content, can be further enhanced by a policy on city biodiversity that aims at **international certification standards** such as **BREEAM, LEED, BIODIVERCITY CONSTRUCTION** and a **Positive Biodiversity Project** will be able to make an important contribution to this iconic place of national and city sport.

Given the **previous situation**, the complexity of the **project** and the **long duration of the works**, for the appropriate solutions to protect biodiversity during the works and in the new structure, we recommend **specific assistance from expert personnel** in the field of **building biodiversity**, both in the **design phase** and **during the construction** site, and we remain available for any need for clarification and in-depth analysis of the aspects presented so far.

Verifiable projects for the protection of colonies of alpine swifts during restoration works on buildings, are the following

- **Luini & Viganò, 1995:** on scaffold holes in a bellfry. The alpine swifts nested in narrow tunnels, therefore in a situation very different from the architecture of the San Siro stadium
- **Ferri & Lonati, 2016.** Quarona (VC, Italy); colony of alpine swifts in the space between roof and attic, in a bellfry. Protected as it is, detecting nests even less than 30 cm apart. Therefore, useful for confirming the importance of spaces shared by several pairs for nesting. The case (**Fig. 34**) is published in detail on <https://www.facebook.com/media/set/?set=oa.3128326213869546&type=3>
- **Ferri & Facciotti, 2022.** Quarona (VC, Italy). Colony of alpine swifts preserved under two new roof-shelds, designed to optimize access slots and shared inner space for nests (**Fig. 35**). Therefore, useful for developing the design of the temporary compensation nests suggested in chapter 6. The case is published in detail on <https://www.facebook.com/media/set/?set=oa.698771571568296&type=3>



10. ILLUSTRATIONS CITED IN THE TEXT



1



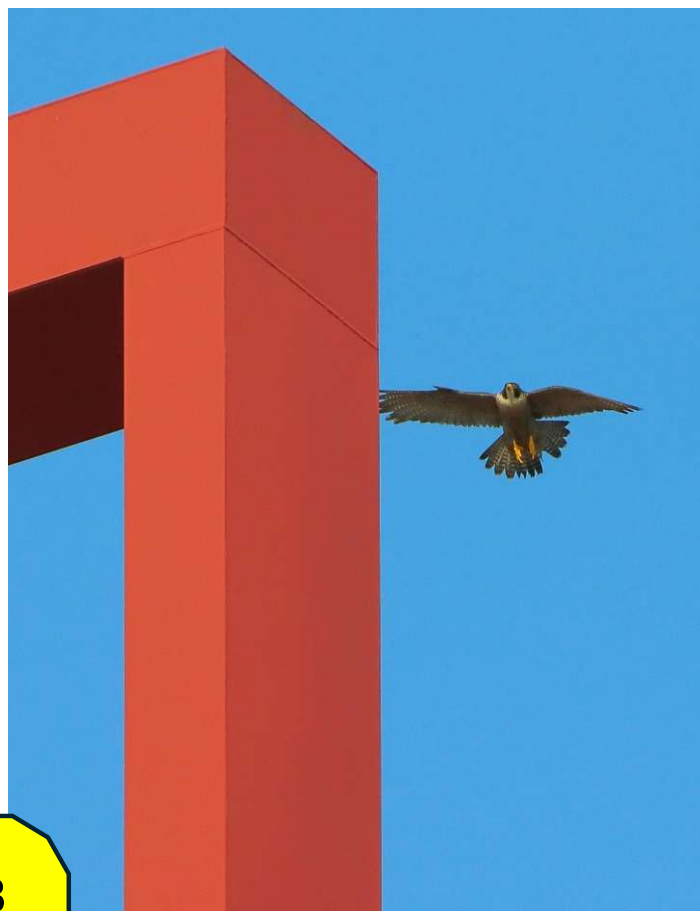
Some images of Alpine Swifts taken at the San Siro Stadium (author: Gaspare Fiorentino)



2

Some individuals of the colony of Eurasian Swift, flying outside the Stadium of S. Siro. A characteristic of this species is the formation of numerous aggregations, as evidenced by the formation of colonies of several tens or hundreds of pairs (author: Milo Manica)

On the south side of the stadium, there is also a nesting pair of peregrine falcon (*Falco peregrinus*).



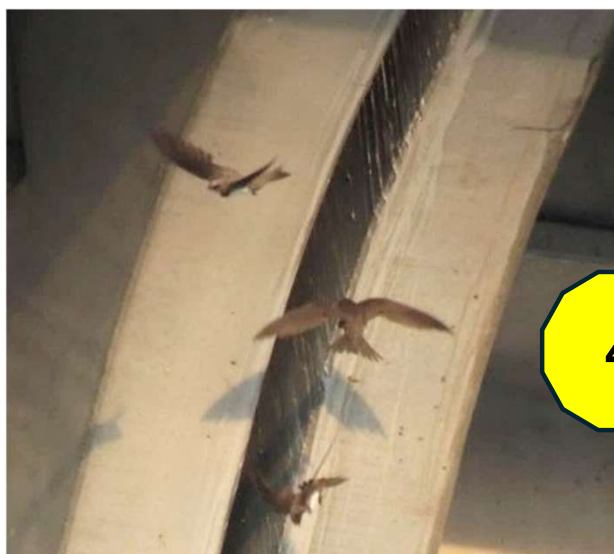
3



*Some images of young and adult individuals of Peregrine Falcon (*Falco peregrinus*) that nest on the south side of the San Siro Stadium (authors: Orietta Mercori, Gaspare Fiorentino)*

THE ALPINE SWIFTS OF THE STADIUM

records from the Data Base ORNITHO.IT, 2012-2024



4



Thierry Bara, 24.06.2012 (ornitho.it)

Dettaglio dell'osservazione	
Data	lunedì, 3. giugno 2013
Luogo	San Siro - Milano / MI
	126 m
Numero	≥12
Specie	Rondone maggiore (Tachymarptis melba)
Autore	Renato Carini
Nota	Durante il concerto di Bruce Springsteen...
Codice atlante	3 / Maschio in canto presente in periodo di nidificazione, udito richiami nuziali o tambureggiamento, visto maschio in parata.
Collegamento	https://www.ornitho.it/index.php?m_id=54&id=4179768

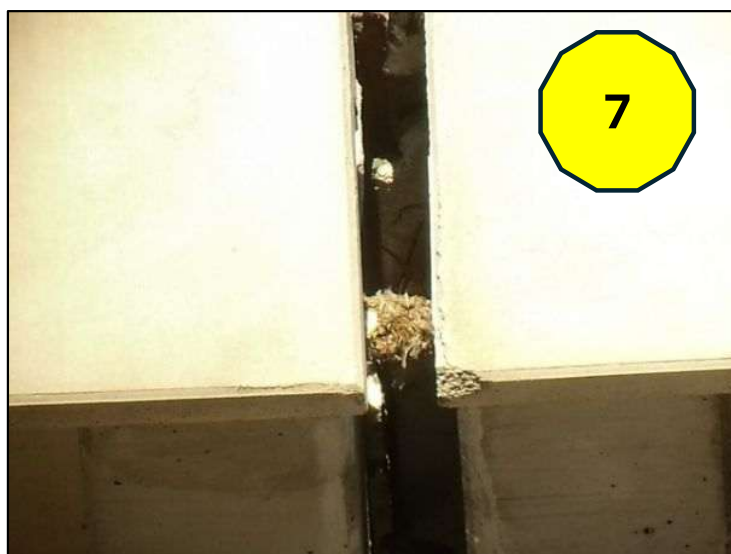
5

Renato Carini, 05.06.2013 (ornitho.it)

Dettaglio dell'osservazione	
Data	martedì, 4. giugno 2013
Luogo	San Siro - Milano / MI
	172 m
Numero	~200
Specie	Rondone maggiore (Tachymarptis melba)
Autore	Anonimo tramite Mauro Ferri
Nota	riferito da amici presenti al concerto di Sprigsteen messo come dato circa 200 ma l'impressione riferita è che potessero essere ben di più
Codice atlante	2 / Presenza nel suo habitat durante il suo periodo di nidificazione
Dettagli	200x adulti
Collegamento	https://www.ornitho.it/index.php?m_id=54&id=4355707

6

Mauro Ferri, 4.06.2013 (ornitho.it)



7

Marco Sozzi, 27.07.2014 (ornitho.it)

Dettaglio dell'osservazione	
Data	mercoledì 14 maggio 2014
Luogo	San Siro - Milano / MI
	134 m
Numero	non contato
Specie	Rondone maggiore (Apus melba)
Autore	Mauro Ferri
Confermato da	
Nota	La presenza mi fu segnalata già nel 2003 da amici modenesi che seguivano una squadra e notavano uno stormo di qualche decina di volteggiatori sullo stadio gremito. Segnalazioni ripetute da un amico nell'estate 2013, che seguiva un concerto. Il 14 maggio 2014 ho visitato di persona per altre finalità in città, ed ho verificato l'arrivo e la partenza di una 15na di rondoni maggiori sul lato entrata allo stadio nell'arco di una mezz'oretta. Con una nota ho consigliato agli amici del GOL di controllare meglio dai primi di agosto in poi, per approfittare dell'arrivo dei subadulti che segnalano le entrate alle cavità occupate, su tutte le facciate.
Codice atlante	14 / Adulto che arriva a un nido, lo occupa o lo lascia; comportamento che rivela un nido occupato il cui contenuto non può essere verificato (troppo alto o in una cavità).
Codice del progetto	[MV] Monumento Vivo
Collegamento	https://www.ornitho.it/index.php?m_id=54&id=22138516
Il numero di segnalazioni	0x

8

Mauro Ferri, 14.05.2014 (ornitho.it)

... continua: registrazioni su ornitho.it (2012-2024)

Dettaglio dell'osservazione	
Data	sabato, 6. agosto 2016
Luogo	 San Siro - Milano / MI
	126 m
Numero	≥400
Specie	 Rondone maggiore (Tachymarptis melba)
Autore	<u>Marco Sozzi</u>
Nota	alcuni esemplari tornano nei nidi a dormire, dopo il tramonto verso le ore 21.15. il conteggio è stato effettuato in occasione dell "apus dei 2106".
Comportamento	In alimentazione
Collegamento	https://www.ornitho.it/index.php?m_id=54&id=9713671

9

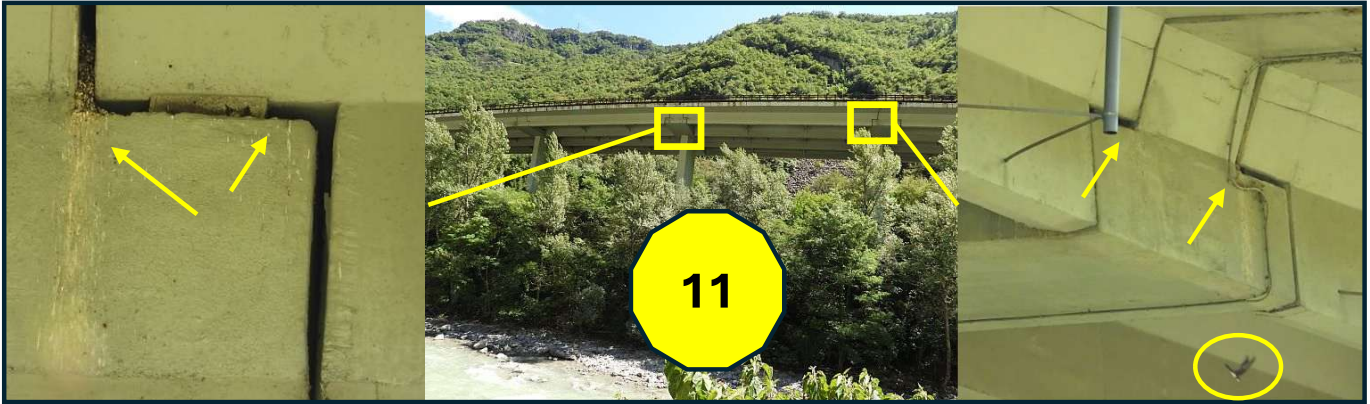
Marco Sozzi, 6.08.2016 (ornitho.it)



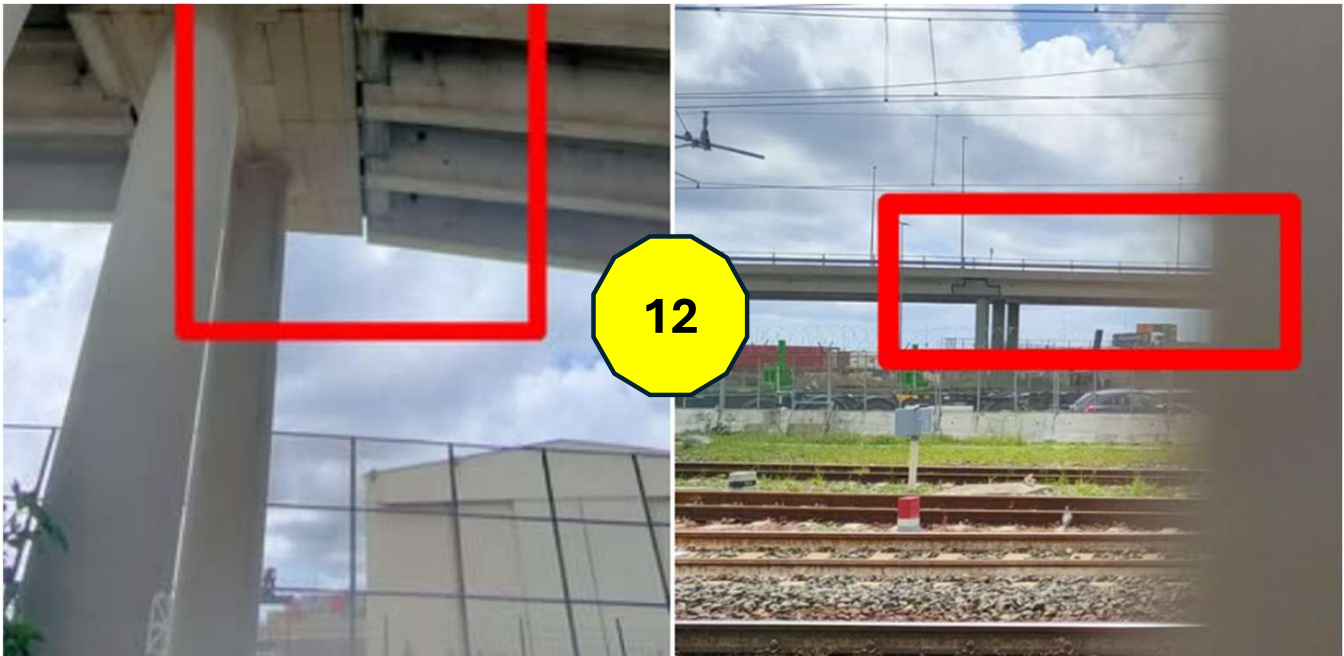
10

Daniele Ronconi, 15.07.2024 (ornitho.it)

Alpine and pallid swifts are attracted to the expansion joints in precast buildings THE CASE OF VIADUCTS



Mauro Ferri, 08.08.2023, Campodazzo (Atzwang), Renon, BZ (ornitho.it)



Helen Stoner, 25.05.2024, Voltri (GE), Port Viaduct (in decommissioning), Facebook



Mèrida, 2017 (Spain). A video about a case of a colony in expansion joints, in trouble because works in progress: <https://www.youtube.com/watch?v=11KYX1WLVTg>



PALE SWIFTS, LIKE ALPINES, CAN BUILD HAMMOCK NESTS



Pale swift hammock nests, Rivellino Tower, Livorno. Mauro Ferri, 26.05.2023 (Facebook)



Pale swift nest «barn swallow shaped», Calafuria Tower, Livorno. Giorgio Paesani, 2000 (ISC 2014, 2016),.

EXPANSION JOINTS AND SWIFTS AT SAN SIRO



A long slot with accesses for nests and roosts, with a horizontal first trend (from right) and then broken towards the left, sloping in height, to follow the supports of the bleachers. (photo: Milo Manica



Alpine swifts still present in S. Siro on 5.10.2025, crowding in front of an expansion joint. Frame from video short, with soundtrack. Author: Guido Pinoli, Facebook

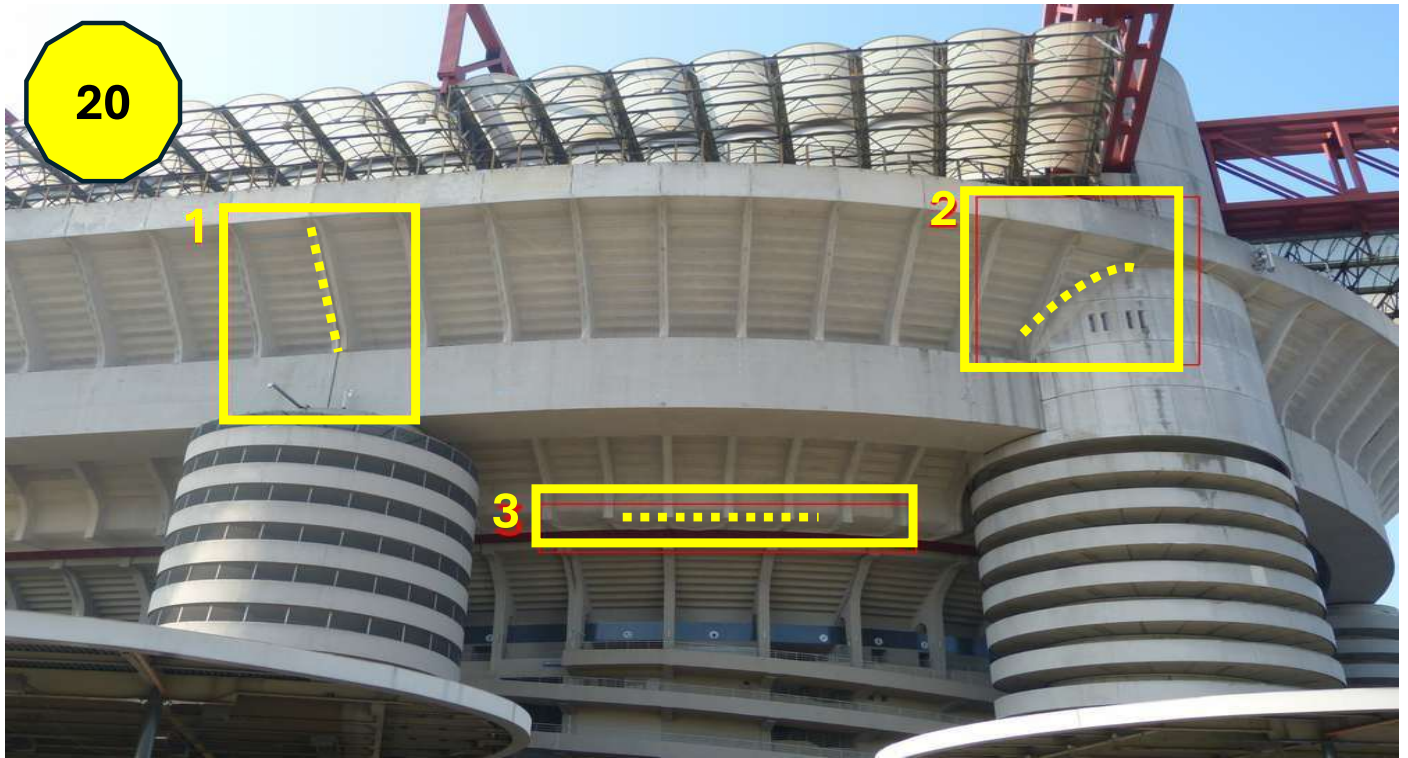


Swift using a free space just below the junction of two nets. Photo Milo Manica

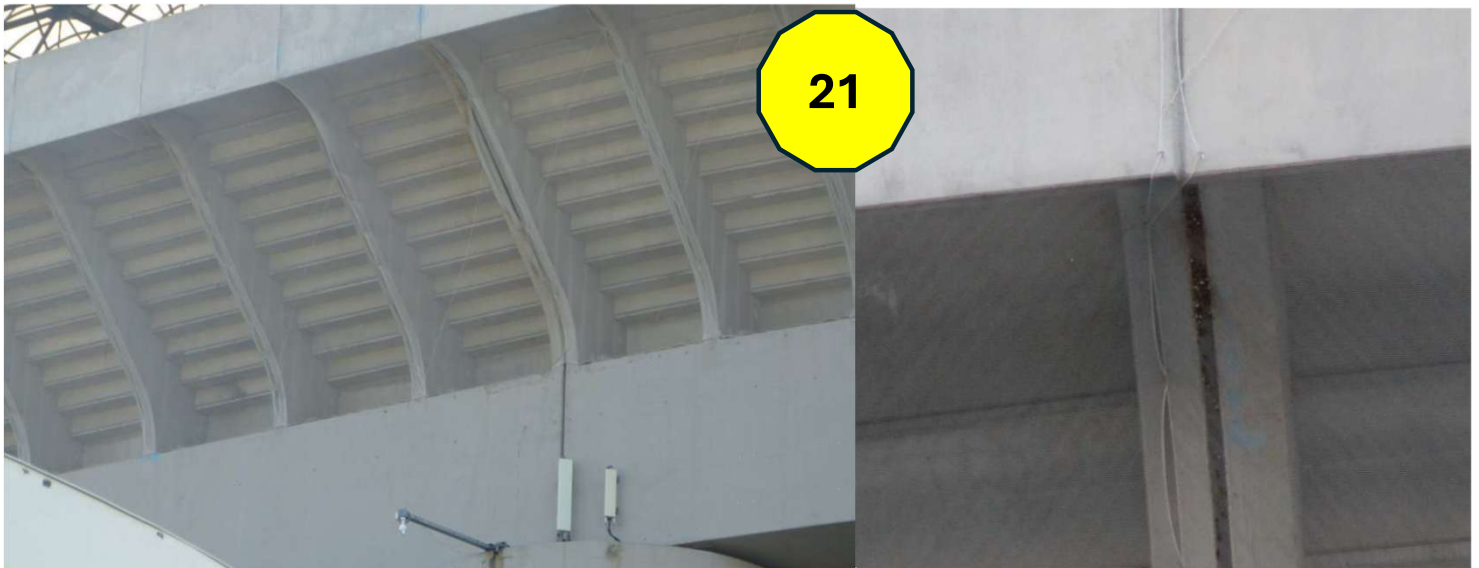


Alpine swifts crowding in front of a horizontal expansion joint. Photo Milo Manica

... continued from: EXPANSION JOINTS

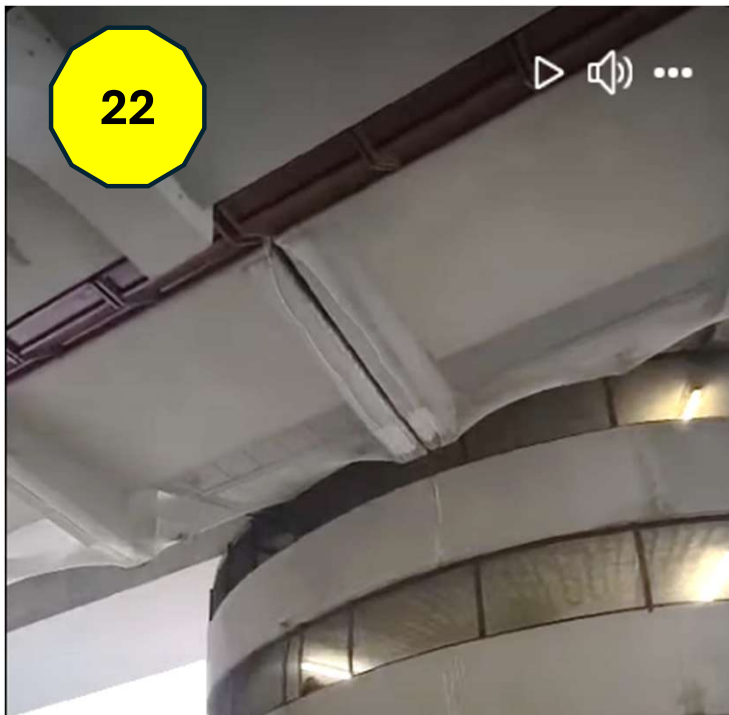


Junction joints used as accesses by swifts: horizontal, vertical and oblique. Edits on photos by Milo Manica

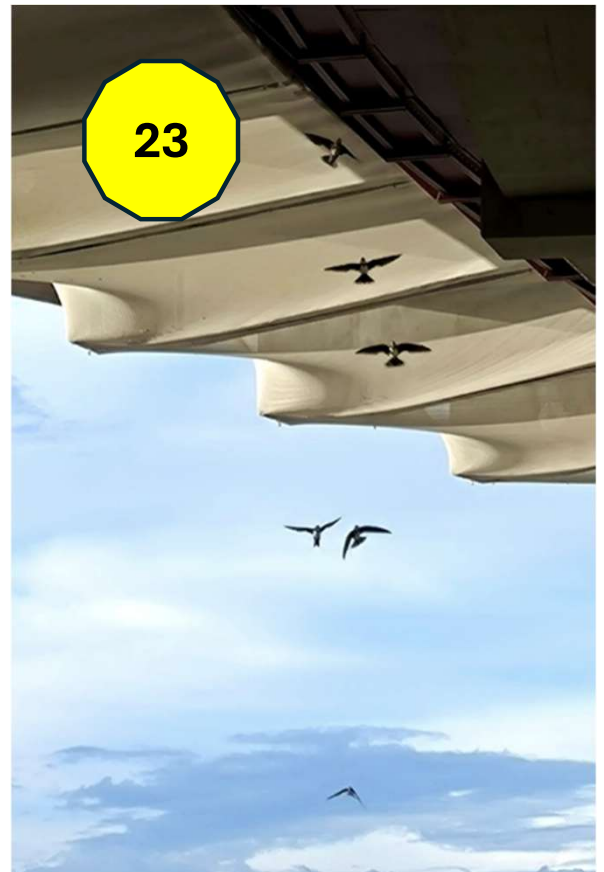


Vertical slots used for nesting and roosting

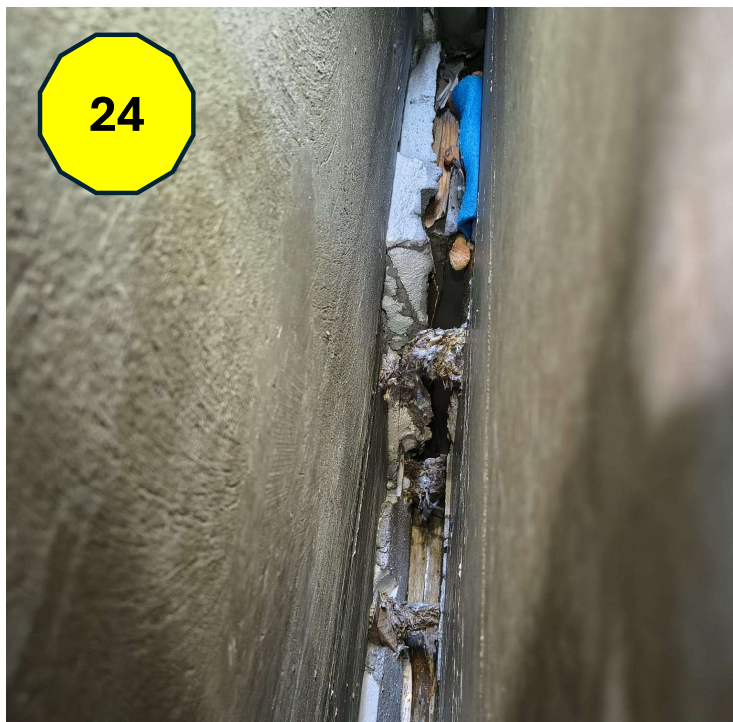
... continued from: EXPANSION JOINTS



Slots for access from below. Short video frame with sound, alpine swifts still present on S. Siro. Guido Pinoli, 5.10.2025, Facebook



Alpine swifts crowding in front of accesses from below and horizontally. Thelma Alienad, 25.06.2024, Facebook

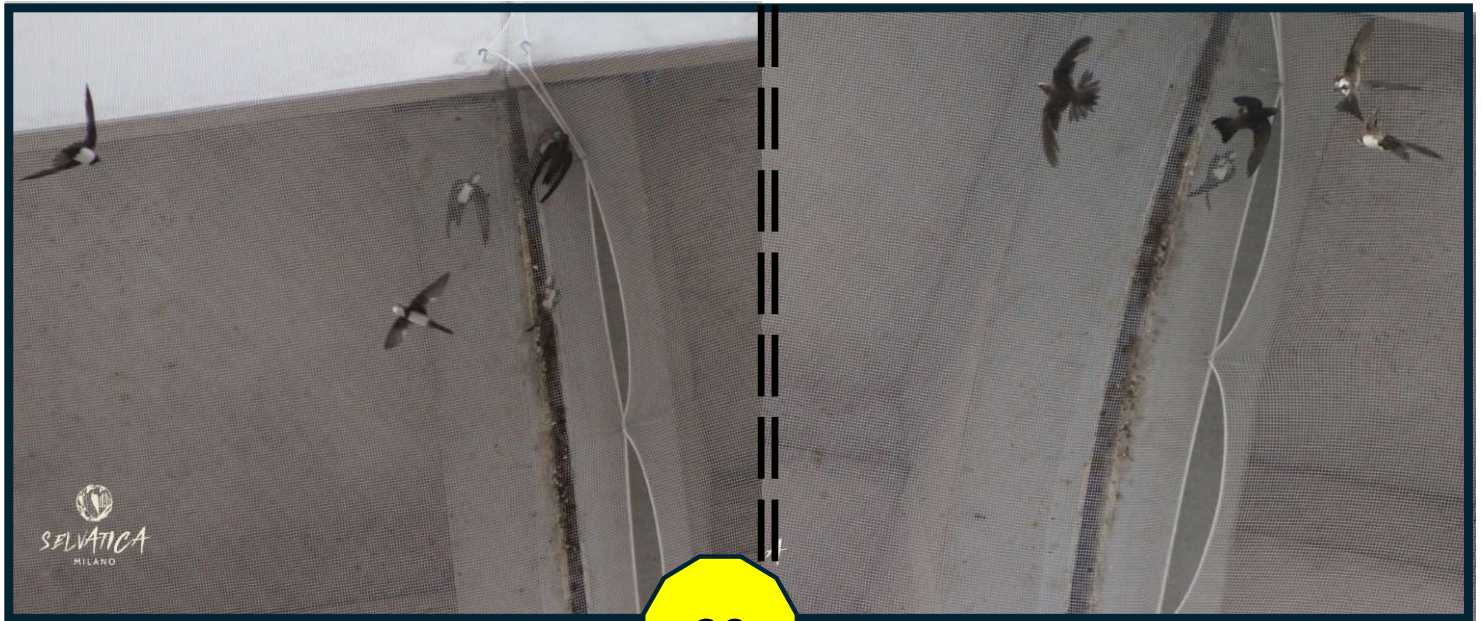


Panoramic view of 6 great swift nests, laid out "like hammocks" in a vertical expansion joint. The tower was still frequented by at least 3 swifts, at 21:30 on 10.10.2026. Guido Pinoli e Marco Toffanello,

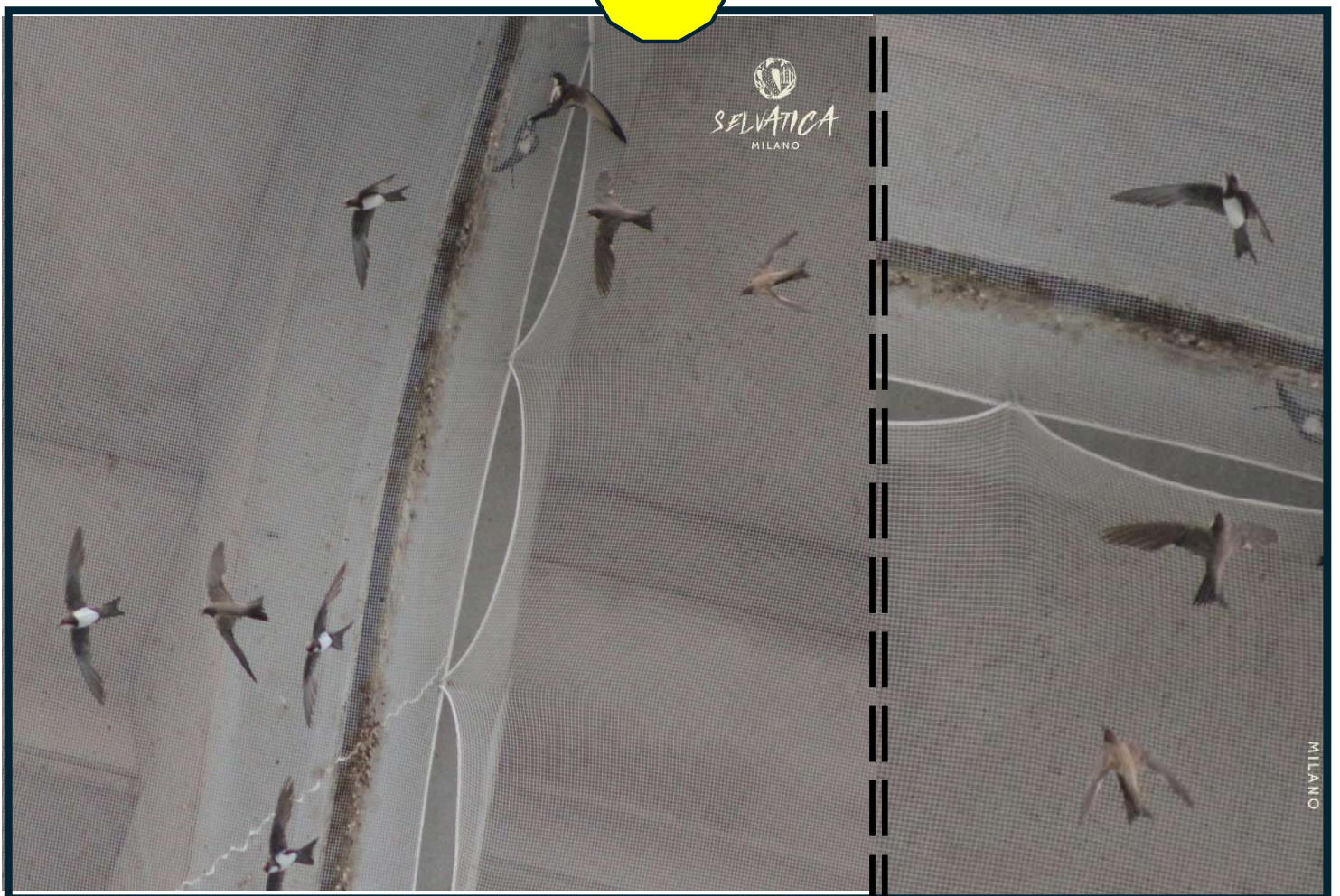
Detail of the situation in photo 24.



ANTI-BIRD EFFECTS OF NETS FOR DEBRIS



26



Selvatica Milano , 24.07.2024 (Facebook), San Siro. Alpine swifts trapped by anti-bird nets

...continued .. ANTI-BIRDS EFFECTS OF NETS FOR DEBRIS

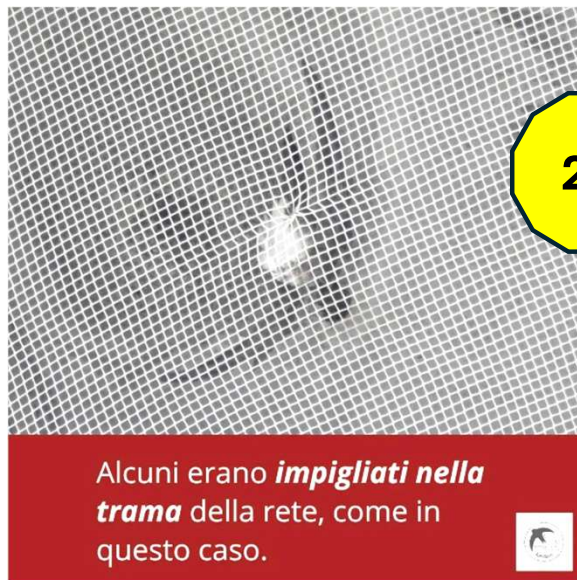


alpine swift flying out of the gap between the nets and an alpine trapped. photo Gaspare Fiorentino



In this image the edges of the two nets that should have prevented access to the crack are evident but leave it free, and the swifts have occupied it. photo Gaspare Fiorentino

...continued .. ANTI-BIRDS EFFECTS OF NETS FOR DEBRIS



Adriana Balboni, 12.07.2024
(Facebook), San Siro. Alpine swifts
trapped by anti-bird nets

Examples of temporary compensation nest boxes



Basilica di San Petronio (Bologna): Species: Common Swift; project: M. Ferri; implementation: AsOER, 2017-2022. The boxes were used from the 2nd-3rd year. This was a cause for reflection for subsequent prototypes (Fig. 26).

LINK

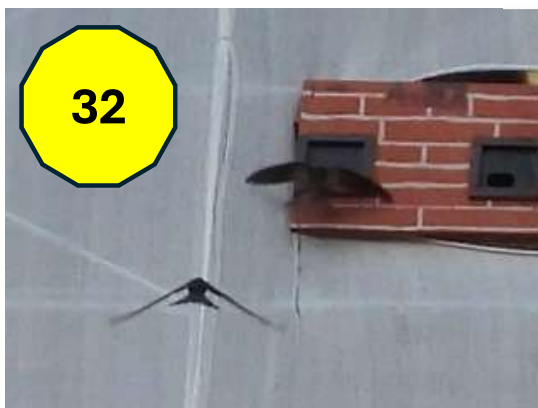
<https://www.facebook.com/photo?fbid=2291046787708644&set=oa.2681224448652583>



Church of S. Ignazio (Carpi, MO, Italy): Species: Common Swift; project: M. Ferri; implementation: LIPU Carpi, 2018. The prototypes imitated the cavities under the tiles and were all immediately occupied, already while the boxes were being set up (Fig. 27).

LINK

<https://www.facebook.com/media/set/?set=oa.1501497023292004&type=3>



Spanish Tower (Carpi, MO, Italy): Species: Common Swift; project: M. Ferri; implementation: LIPU Carpi, 2019-2022: The boxes imitate pontae holes, immediately used (Fig. 28).

LINK

<https://www.facebook.com/media/set/?set=oa.1949276321847403&type=3>



Species: Common Swift; project: M. Ferri; implementation: SOS Rondoni, 2019. The boxes imitate the box of a roller shutter, immediately used (Fig. 29).

LINK

<https://www.facebook.com/photo/?fbid=1956766141136712&set=oa.2015501785224856>

alpine swifts: protection and implementation of collective spaces for their nesting



Ferri & Lonati, 2016. Quarona (VC, Italy). Quarona (VC, Italy); colony of alpine swifts in the space between roof and attic, in a bellfry. Protected as it is, detecting nests even less than 30 cm apart. Therefore useful for confirming the importance of spaces shared by several pairs for nesting. The case (Fig. 30) is published in detail

<https://www.facebook.com/media/set/?set=oa.3128326213869546&type=3>



Ferri, Facciotti & Lonati, 2022. Quarona (VC). Colony of alpine swifts preserved under two new roofshields, designed to optimize access slots and shared inner space for nests (Fig. 31). Therefore, useful for developing the design of the temporary compensation nests suggested in chapter 6. The case is published in detail on

<https://www.facebook.com/media/set/?set=oa.698771571568296&type=3>



11. BIBLIOGRAPHY & SITOGRAPHY

- Arn, 1960
- Boano, 2022
- Boano e Malacarne, 1999
- Bricchetti e Fracasso, 2020
- Casola et al., 2022
- Cramp, 1985
- Demongin, 2016
- Engeler, 2025
- Ferri & Lonati, 2016, *Facebook*
- Kumar et al., 2024;
- Luini & Viganò, 1995
- Reynolds et al., 2021;
- Scholl 2004, 2005, 2016
- Spina e Volponi, 2008
- Tratalos et al., 2007;
- Vigorita, 2008
- Ziter C., 2015



- Basilica of San Petronio, Bologna:
<https://www.facebook.com/photo?fbid=2291046787708644&set=oa.2681224448652583>



- Church of S. Ignazio, Carpi (MO):
<https://www.facebook.com/media/set/?set=oa.1501497023292004&type=3>



- Spanish Tower, Carpi (MO):
<https://www.facebook.com/media/set/?set=oa.1949276321847403&type=3>



- Largo Corsia dei Servi (Milano):
<https://www.facebook.com/photo?fbid=1956766141136712&set=oa.2015501785224856>

- Parish bell tower, Quarona (VC):
<https://www.facebook.com/media/set/?set=oa.3128326213869546&type=3>

- Condominium, Quarona (VC):
<https://www.facebook.com/media/set/?set=oa.698771571568296&type=3>

12. ACKNOWLEDGMENTS AND CREDITS

The documentary part of this dossier, in addition to the experiences and materials of the authors, is also based on

- ***Bibliography and web pages*** quoted in the text and listed in the chapter 12
- ***database of Ornitho.it*** whom we thank
- ***images and notes*** of the ***authors*** in the caption, which we thank and summarize here:

- | | |
|--|---|
| • <i>Adriana Balboni, RondoMI ETS</i> | • <i>Lina dei Rondoni pallidi</i> |
| • <i>Alessandra De Cesare</i> | • <i>Marco Sozzi</i> |
| • <i>Alessandra Facciotti</i> | • <i>Marco Toffanello</i> |
| • <i>Alessandro De Bassa</i> | • <i>Mauro Ferri</i> |
| • <i>AsOER (Assoc. Ornitologi Emilia Romagna)</i> | • <i>Martinets de Toulon et d'ailleurs</i> |
| • <i>Bolton And Bury Swifts</i> | • <i>Milo Manica</i> |
| • <i>Daniele Ronconi</i> | • <i>Orietta Mercori</i> |
| • <i>Gaspere Fiorentino</i> | • <i>Ornitho.it</i> |
| • <i>Giorgio Paesani</i> | • <i>Pieve di S. Alessandro a Giogoli</i> |
| • <i>Guido Pinoli</i> | • <i>Renato Carini</i> |
| • <i>LIPU Bergamo</i> | • <i>Simone Lonati</i> |
| • <i>LIPU Carpi</i> | • <i>SOS Rondoni</i> |
| • <i>Helen Stoner</i> | • <i>Thelma Aleinad</i> |
| • <i>Ilaria Mariani</i> | • <i>Thierry Bara</i> |