Township of Tavarnelle Val di Pesa

The Working Papers of the Protected Natural Area of Badia a Passignano

MAMMALS AND BIRDS

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Knowing in order to build consciences and to manage. A phrase that fully sums up the reasons that have led to the drafting of these working papers. We are currently in a historic phase in which we need to re-launch the sense of knowledge as an indispensable tool for understanding humanity and its actions, and in which (re)discovering the territory in all its components, including animals, represents a crucial step for attaining this goal.

Knowledge is the result of experience; however, it cannot do without the scientific method, in other words the one that entails the observation in nature, the collection of data and its processing, the formulation of hypotheses and, lastly, the possibility to reproduce that same experience in the laboratory, so as to verify whether or not the hypothesis is correct. This is the method that was followed, with competence and responsibility, by those who conducted the surveys in this delicate and interesting area of "our" Chianti region, which never ceases to amaze us and which offers unexpected chances for building scenarios that can be projected in time.

We need to realise that, in order to guarantee a future for our communities, a new pact must be drawn up between man and the territory and the ecosystems that inhabit it: a pact that is more responsible and more respectful vis-à-vis the environment, based on the awareness of the great value possessed by each species and by the macro system it belongs to, and, above all, a pact that is the result of a newfound humility on the part of man, a humility that leads him to revise its anthropocentric view of the Universe.

Indeed, as everyone knows our species is quite intrusive, and in many cases it interferes with natural balances to the point of taking them to the edge of deterioration. Once Homo sapiens reaches this historic awareness, it is necessary to know the natural species that, through their relationships, constitute the dense fabric of any ecosystem on this planet. Mammals and birds are also integral part of this complex and fascinating system, and knowledge of the species that inhabit a given area as well as their numerical presence is a crucial step in order to (re)discover Nature's balances and their irreplaceable value. But that's not all!!! Knowing the biodiversity of a territory represents a tool for proper management and preservation of these unique and irreplaceable "life experiences". Lastly, even if it seems rather strange and difficult to accept, knowing the habits of these "warm-blooded species" contributes to rediscovering a valuable part of ourselves which we often forget about or dangerously confine to the margins of our being.

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Mammals

The class of mammals, together with the classes of “fish”, amphibians, reptiles and birds, belongs to the phylum of vertebrates, in other words animals equipped with an internal support skeleton mostly made up of bone tissue but also by cartilage. The natural history of mammals digs its roots in the beginnings of time. It was only thanks to the disappearance of the large reptiles, which took place 65 million years ago, that the evolutionary luck of this class began. This is widely demonstrated by the large variety of shapes taken on and by their ability to colonise very different environments. They became skilful swimmers with the whales and dolphins, excellent flyers with the group of bats, in addition to all the terrestrial forms with the most disparate and curious eating styles that followed one another in space and time. However, among the characteristics shared by mammals, the most important one is the mammary gland, which gives the class its name. This gland allows a prolonged mother-offspring relationship through suckling, a strategy that definitely increases the period of parental care and the offspring’s survival probability. Another typical trait of mammals is homeothermy, in other words the ability of maintaining a constant internal body temperature through a complex and wasteful energy strategy that requires the animal to eat continuously. This strategy, shared with birds, allows mammals to colonise a wide variety of environments, including those dominated by the harsh winter conditions. In spite of their diffused presence, the mammals in our areas, including large-sized ones, are more difficult to observe compared to, for example, birds, also due to the fact that many species are more active from sunset to dawn. Hence, their presence may often go unnoticed even in a protected natural area, and different methods may be necessary in order to have an overall picture of the composition in species, such as monitoring at different times of the day, capturing using specific traps and searching for prints, faeces and hair.

The species observed in the Protected Natural Area (ANPIL) of Badia a Passignano are illustrated here below in their general morphological and eco-ethological characteristics.

In the order of the **ERINACEOMORPHA,** we find one of the more common and well-known species among the small mammals: we are talking about the **West European hedgehog** *(Erinaceus europaeus*). The most evident characteristic are its spines, which are actually transformed hair and subject to constant renewal (every 18 months on average) and can be made to stand up or smooth back down thanks to the presence of erector muscles. As a further defensive system, a special oval muscle allows it to close up into a ball. It is present in a large number of environments, and it is also common around the suburbs of large cities, especially near yards and vegetable gardens. This species is largely nocturnal, and moves by even several hundred meters in search of insects, worms and small fruits; it is also able to climb and swim. Unfortunately, it is the small mammal with the highest mortality rate due to impact with vehicles, since it often crosses busy roads and gets dazzled by the headlights, relying on its “rolled-up like a ball” defence strategy rather than getting out of the way. This species is highly immune to viper venom. In the ANPIL, it can be found in croplands, in the vegetable gardens of the Badia and at the margins of woods.

The species of the order of **SORICOMORPHA** are less visible than the European hedgehog. These species include forms with primitive traits, with long and mobile snout, short hair and ears and beady eyes, which is compensated with a highly developed sense of smell. In this group, we find the **European mole** (*Talpa europaea*), also known as common or northern mole, whose strictly underground habits are known to everyone. It has black hair and it is 12-15 cm long, excluding the short tail of 2-3 cm. Its front paws are large, strong and equipped with long fingernails, and serve as a tool with which to dig long tunnels; the presence of these tunnels can be ascertained by observing the small mounds of dug up soil. The mole eats invertebrates present in the ground, worms in particular, which it finds using its sense of touch: indeed, it is equipped with a large number of sensitive bristles and vibrissae, or whiskers. The mating period is between March and May and the offspring, which are born naked and blind, are weaned after one month. This is a solitary and territorial species found in meadows, pastures, cropland and woods. Its survival is threatened by

the use of pesticides and by intensive machining activities. The order of the **Soricomorpha** also includes small mammals which all fall under the common name of “shrew”. At a first glance, they remind one of rats, but they have a long snout, a prominent nose and beady eyes. They are predators and feed on invertebrates: their small size determines a high body heat loss, so their metabolism is high all year long. Their presence can often be inferred only by the sound made by the dry leaves of the soil litter, as they quickly move around in the woods. The **Bicoloured shrew** (*Crocidura leucodon*) was observed at the ANPIL: compared to the other forms of shrews, they feature prominent ears and a non-compressed tail with a few long and sparse hair.

The **LAGOMORPHS** (rabbits and hares) have a set of teeth that is apparently similar to that of Rodents but, in reality, they have four incisors in the upper jaw, with the rear smaller pair covered by the front pair (this is why they are also called Double-toothed). In the ANPIL, they are represented by the **European** or **Brown hare** (*Lepus europaeus*): today the members of this species, which was naturally present in the history of the territory, are the result of numerous repopulation campaigns carried out for hunting purposes. It prefers mosaic-like farming environments featuring different types of cultivations, pastures, hedges and small woods; it can be preferably observed at dawn or at sunset.

In almost all habitats, the order of mammals with the largest number of shapes is the **RODENTS** one, and this rule also applies at the ANPIL, with the presence of 11 species, distributed over sizes that range from the 20 grams of the small house mouse to the 20 kg of the porcupine. Rodents have incisors that grow continuously, and feed mainly on seeds: many have the tendency to accumulate food in excess in reserves. The **Red squirrel** *(Sciurus vulgaris*) is probably the best-loved rodent, with the unmistakeable tail which is about as long as the entire body (20 cm). The populations found in central Italy feature a coat that ranges from reddish-brown to dark brown, with a white underside. It is an excellent climber, runs quickly and jumps from tree to tree and down to the ground using its tail as a parachute. It prefers wooded areas where it can find plenty of pine kernels, acorns and hazelnuts, along with small fruits and bird eggs. For reproduction and sleeping purposes, it builds a drey (nest) out of twigs with a side entrance at the fork of the highest branches. It is very widespread and quite sure of itself at the ANPIL. Other arboreal Rodents are found in the Gliridae family, of which the **Edible** or **Fat dormouse** (*Glis glis*) is the best known and largest member (with a body length of 13-21 cm). It has a rounded head with bulging eyes and small ears, ash-grey fur and a white underside, with the tail fur slightly darker than the body. It lives in familial groups both during the active life and during the hibernation period, which lasts quite a long time, from October to April (this is reason for the adage “to sleep like a dormouse”). The dormouse is nocturnal, and spends the day in tree cavities, old woodpecker nests, cracks in walls or in attics of old buildings. When it is active, its presence is revealed by the various sounds it makes as it moves from tree branch to tree branch, a sort of “snuffling” hiccups, which can be heard more often at the end of the summer. The **Hazel** or **Common dormouse** (*Muscardinus avellanarius*) is smaller than the edible dormouse and features a golden-brown fur and a large white spot on the underside. This species is more demanding than the previous one, and settles down only in larger woods with diversified and well-developed underbrush. It builds its subspherical nest on shrubs, and it is never seen on the ground. It eats a wide variety of fruits and flowers, and it particularly enjoys hazelnuts. Another member of the Gliridae family that lives in the protected area is the **Garden dormouse** (*Eliomys quercinus*), which features characteristic black eye markings and a brown-reddish coat with a white underside. Its tail ends with a white tassel. As its scientific name indicates (“quercinus” meaning oak) this species prefers oak woods in hilly areas, however it does not quite like the forest as the other members of the Gliridae family, and can also be found in shrubby or cultivated areas with dry stone walls. Although it is a good climber, it spends less time on trees compared to the edible dormouse or the hazel dormouse**,** staying on the ground most of the time. The Cricetidae family includes mouse-like species that distinguish themselves from the actual mouse due to the stockier body and snout, the different pattern of the molar surface and their shorter tail in proportion to their body. The **Bank vole** (*Myodes glareolus*) features red-brown fur and can be found mainly in woodland areas, where it digs burrows connected by tunnels which it uses as a nest and to store

food. Its activity is mostly nocturnal, nevertheless it can also be observed in the woods during the daytime more often than other small rodents. Rodents known as mice and rats belong to the Muridae family, which includes the species which are best known to man and against which man "fights" the most. The **Wood mouse** (*Apodemus sylvaticus*) features a body size of 8-9 cm, with a tail that is just as long: the upperparts are dark brown, while the underparts are dirty-white in colour. It frequents a wide variety of habitats: it is widespread in woods, but can also be found in marginal areas, in fields and in gardens. It has a high reproductive potential, since it is able to produce up to 4-5 litters per year with 5-6 offspring each. Closely related to the wood mouse is the **Yellow-necked mouse** (*Apodemus flavicollis*) which, compared to the previous species, is slightly larger and features upperparts that are brighter in colour and paler underparts. It has a characteristic ochre-coloured patch of fur between its forelegs, larger than the one that can sometimes be found on the wood mouse as well. Compared to the latter, it has greater needs, frequenting only wooded areas where little or no cutting activity is being carried out, and is a more frequent climber. Like the wood mouse, it has a habit of storing seeds in underground tunnels; during the years when this store of seeds is not eaten, this behaviour promotes germination and the renewal of certain forest species. The mouse that is most frequently found in manmade constructions is the **House mouse** (*Mus musculus*). This mouse varies in colour from light to dark, and possesses an excellent ability to adapt to the most diverse environmental conditions. In the ANPIL, it is present with "commensal" populations, however in Tuscany there are also "wild" populations, in particular in areas with a Mediterranean climate. It is mainly a nocturnal animal, but it can be occasionally observed during the day as well. It is a lively and agile rodent, capable of using the smallest of crevices to hide and escape from danger. It lives in groups in burrows obtained in wall cavities, under shelters and in cellars. The mating period goes from March until October, and the female gives birth 3-4 times a year to a litter of 4 to 7 young. The pups are born completely blind and stay blind for the first two weeks, and become independent when they are around 4 weeks old. Sexual maturity is reached when they are just 2 months old, which explains their great reproduction potential. The discussion of the Muridae family ends with two species that belong to the rat group, known in the local dialect by the incorrect name of "talpe", meaning "moles". The **Brown rat** (*Rattus norvegicus*) is present in large numbers in areas inhabited by man, or in any event wherever food and shelter can be found. The distribution and large populations of this species have been deeply influenced by human travels and activities: starting from Asiatic areas with its initial historical presence, today the brown rat can be found all over the world thanks to involuntary transport, even on the smallest islands. It is active all year long, especially at night, and it is an excellent swimmer and climber: it is often found near bodies of water. The **Black rat** (*Rattus rattus*) differs from the brown rat due to its more rounded head, larger ears, a tail that is at least as long as the body (in the previous species, the tail is generally shorter than the body) and a uniform colour (the brown rat is darker on top). Although darker in general, the black rat exhibits several colour forms which are not always discriminating. The black rat is a species that can adapt to different kinds of environmental situations: indeed, it inhabits marginal areas of forests of various types and nature, rural areas, parks and gardens. It can also be found around human settlements, where it likes to spend its time inside rural buildings and, more specifically, in attics, cellars and farm buildings. Its habits are the same as the brown rat, the only difference being that it is a better climber. It usually builds its nest above ground, taking advantage of roof beams and wall cavities. The last family of rodents present in the ANPIL is the Hystricidae family. The **Crested porcupine** (*Hystrix cristata*) is the largest rodent present in Italy, with a length of 50-70 cm, tail excluded (4-6 cm) and a weight that can reach up to 20 kg. It is unmistakeable due to the presence of large quills on its back, from 3 to 30 cm long and known in the local dialect as "pinne" (meaning "fins"), which are actually modified hair. Its presence can be easily ascertained precisely from the finding of these quills – which it loses due to a natural renewal process – along the paths regularly travelled by the porcupine in its territory. The upperparts of the head, neck and shoulders are dark-brown in colour with dirty-white bristles that form a small white collar under the throat, while the bottom body parts and the sides of the paws are blackish-brown. The crested porcupine can be found mostly in the plans and in hilly areas, in particular in Mediterranean woods and in

oak forests, which are rich in shrubs spaced out by clearings. It lives alone or in family groups of 4-6 members, in burrows dug in sand or clay soil. It is for the most part herbivorous, eating bark, roots, tubers (very appetising), fruit and cereal.

A rather peculiar order of mammals due to its adaptation for flights is the order of **CHIROPTERA** (bats): the interest for the preservation of this group of mammals has increased considerably in the last few years, in connection to a general reduction of many species at the European level. **Kuhl's pipistrelle** (*Pipistrellus kuhlii*), a member of the Vespertilionidae family, is one of the species that are still very widespread, and it is the most frequent one in human settlements, including large cities. It is a small bat, with a head-body length of 4-5 cm and a "wing" span of 20 cm. The colouring ranges from brown to rusty-brown, with the underparts paler than the back: some specimens feature a characteristic white line on the rear edge of the cutaneous membrane that forms the "wing" (called "patagium"). It is found both in the plains and in hilly areas, and it uses both natural crevices and a large variety of holes and gaps in buildings for shelter purposes. It hunts at heights of just a few metres, often around lampposts. The reproduction colonies generally consist of females only, while the adult males lead a solitary life or live in small groups for most of the year.

In the **CARNIVORA** order, four species have been identified in the ANPIL. The presence of the **Red fox** (*Vulpes vulpes*) is the one that can be most easily identified, through observations at dawn or at sunset or through the finding of its typical excrements on the rocks of the paths. This canid has a head-body length of 55-80 cm and measures up to 40 cm high at the shoulder, with an average weight of 7-8 kg. The red fox features a slender shape, a pointy and elongated snout, large and erect ears and a long and fluffy tail. The upperparts of the body are covered in a bright tawny-red fur, with grey shadings on the flanks, while the underparts are whitish in colour. The tail is a reddish brown with a white tip. The fox is a very adaptable species, commonly found in all habitats and at all altitudes, even frequenting the suburbs and parks of large cities. The populations are formed in part by territorial individuals, usually organised in pairs, and by a more "itinerant" portion, mainly consisting of young males with no fixed abode. Their diet varies quite a bit, according to what is available at the moment, and includes food found in waste dumps. Mating takes place in January and the gestation period lasts 51-52 days: the average litter size consists of 4-5 kits, which become independent at three months of age.

The **Beech marten** (*Martes foina*) belongs to the Mustelidae family. It has an elongated, slim body with short paws: indeed, its head-body length can reach 50 cm, while it is only 10 cm high at the shoulder. The beech marten features a characteristic throat patch that is generally white in colour – at times yellowish – and which has two projections extending backwards to the base of the forelegs, in addition to the light-pink colour of the snout between the eyes and the nose. These traits distinguish the beech marten from another similar species, the **European pine marten** (*Martes martes*), at present not reported at the ANPIL, whose throat patch is instead smaller and yellow-orange in colour, with a brown-blackish snout. The beech marten is one of the members of the Mustelidae family that can be found closest to man: indeed, in rural areas it frequents attics, hay lofts or abandoned buildings, although it is also present in the woods, and has even been spotted in large city centres. It is mainly a nocturnal animal, and during its active time it can even travel distances of a few kilometres. It feeds on insects, amphibians, birds and their eggs, rats, dormice as well as domestic animals, breaking into henhouses. The mating takes place during the summer, but the offspring are not born until the spring of the following year. This long gestation period, also found in other mammal species, is actually due to the fact that the fertilised egg implants itself in the uterus only after 8-9 months from the fecundation. The **Least weasel** (*Mustela nivalis*), smaller than the beech marten, is the smallest carnivore present in Italy: this species of the Mustelidae family also features a thin, greatly elongated body, able to slip into the tightest of crevices. It frequents different habitats such as farmland, edges of ditches, hedges, fringes of wooded areas, from the plains to the mountains: it can also be observed during the day along paths, at times in the typical "sentry" position, erect on its rear limbs. Very lively, it can climb and dig burrows in the ground. It mainly feeds on small rodents. The mating period goes from March to August, with

1 or 2 litters consisting of 5-6 kits, which are born after a 35-day gestation period. The largest representative of the Mustelidae family found at the ANPIL is the **European badger** (*Meles meles*), which can reach a body length of 75 cm and a weight of 16 kg. Its shape differs from the shape of the previous species, as it reminds one of a small bear instead: it has a stocky and powerful body, with an elongated and pointy snout; the eyes are beady and the ears are short and round. The fur is grey on the back, lighter on the flanks and black on the belly. The head is white with two characteristic black bands along the sides. The European badger can be found in the plains up to 2000 metres in altitude, and its stable presence is tied to the presence of well-drained and easy-to-dig soil where it can build its burrow. These burrows, which may house badger families of 10-15 members, have a complex system of underground passages connected by multiple entrances. It has an omnivorous diet, with a preference for insects, worms and fruits.

The last order of mammals present in the protected area of Badia a Passignano is the one of the **ARTIODACTYLA**. Their distinguishing feature is the special shape of their foot: the name "artiodactyla" means "with an even number of toes for each foot". Indeed, these mammals are missing the first toe, and often the second and fifth toes are also quite rudimental, so that the foot actually rests on the ground by means of the two middle toes only. Among the species that belong to the order, the **Wild boar** (*Sus scrofa*) is the most widespread in Tuscany. It belongs to the Suidae family, which is included in the group of Artiodactyles that are not ruminants (known as Bunodonta). It can be up to 150 cm long, with a height between 60 and 90 cm at the withers. Its body is stocky and stouter in the front compared to the rear, and the larger male specimens can reach a weight of 180 kg. One should nevertheless keep in mind that the current populations of this species are the result of a large number of "introductions" for hunting purposes which occurred starting from the 1960s (the original Mediterranean populations were smaller in size). The snout is almost entirely hairless and, particularly in the males, two well-developed canine teeth (tusks) protrude from the top lip. The limbs are short and stocky, with the rear ones shorter than the front ones. The coat, consisting of "coarse" hair and bristles, is generally dark, with a dark brown-blackish or greyish colour. Wild boards can be found everywhere, from sea level up to the fringes of woods. Large maquis areas, woods with rich underbrush, thick scrubs and shrubs, combined with water and farmland in the vicinity, represent the ideal conditions for the members of this species, which can take advantage of what the woods can give them (such as acorns, chestnuts, beechnuts and berries) as well as the cultivations. They are nevertheless omnivorous, and their diet ranges from tubers, bulbs, turnips, grains and fruits, up to include small invertebrates, eggs, bird nests and organic remains in general. Wild boars are mostly active at twilight and at night, but they also graze in isolated areas during the daytime. Adult males often live alone and join the females, usually gathered in small sounders, during the mating period only. The breeding period lasts from November to January, and the farrowing takes place after 4 months in a den hidden in the thick of the forest and carefully lined with leaves. New-born piglets are covered by a tawny coat with dirty-white stripes, and become permanently independent between 5 and 6 months of age. In the Cervidae family, we find the **Fallow deer** (*Dama dama*), which is smaller than the deer and with antlers that take on the typical "shovel" shape (palmate) in adults at least 3 to 4 years of age. The coat of the fallow deer varies in colour during the course of the year: in the summer it is reddish-brown with white patches on the back and on the flanks, while in the winter it is greyish-brown. This cervid is present in areas with alternating woods, plain meadows and hills: it is only in the mountains that it does not find suitable living conditions since it cannot endure long periods of snow. It is observed in herds, subdivided by gender in the warm season or mixed up during the winter. The fallow deer feeds on leaves, wooden shoot apices including with buds, wild fruits, herbaceous plants and grass. During the summer period, their eating habits focus on cultivated fields, especially grains and legumes. Mating takes place between the end of September and October, with a single fawn being born in June and able to run after just 24 hours from birth. The other member of the Cervidae family present in the ANPIL is the **Roe deer** (*Capreolus capreolus*): it is smaller than the fallow deer and its coat changes from a reddish colour in the summer to grey-brown in the winter. Compared to the other Italian members of this family, it is less social: it can be seen in small family groups (consisting of one female with the previous

year's fawns) during the winter only. During the spring, the males establish a hierarchical relationship one with the other, which towards May becomes necessary in order to define territorial limits. The dominated area, protected against the other male adults, is marked with a glandular secretion carefully spread on branches, shrubs and trees, as well as by vocal emissions: the more typical one is the "bark" that sounds much like a yelping puppy. It feeds on sprouts, buds, leaves and herbaceous plants, and it is more selective when it comes to plants compared to the fallow deer and the deer.

Marco Lebboroni
The Birds

While most mammals are present all year round in a specific territory, the great ease with which birds move from place to place due to their ability to fly determines the presence of different species during the course of the year, in connection with environmental adaptation and the migratory habit. From the standpoint of alternating presences during the different seasons, in addition to sedentary species (which are present all year long), we can distinguish between the summer nesting birds (generally present from spring until summer), the wintering birds (generally from November until February), and the birds passing through and/or stopping to rest (generally for very short periods from March to May and from September to November). Hence it becomes necessary to detect the presence of the avifauna during all seasons, in particular in the protected natural areas, for the purpose of targeting as best as possible the preservation measures. In this sense, starting from the establishment of the Protected Natural Area of Badia a Passignano, different monitoring activities of the avifauna have been carried out with the aim of obtaining a comprehensive knowledge framework from the standpoint of both the changes during the course of the year and of the differences between the various habitats comprised in the territory of the ANPIL.

FOREST AREAS
The presence of a large wooded area characterises the landscape of the natural protected area of Badia a Passignano. Generally speaking, like all the woods located in the Chianti region, the woods of the ANPIL are in the hilly band of the "Sub-Mediterranean horizon", in other words in the transition zone between the coastal and the Apennine areas, where the dominant species are the Downy Oak and the Turkey Oak. The oak forests are usually not too thick and rich of shrubs, a characteristic that allows the presence of a discrete number of bird species, including the more Mediterranean ones, while the typical mountain species of the Apennines are missing. In the woods, the turnover of species is very low during the year: the more numerous species are the sedentary ones, including those that are prevalent in the spring, such as the Blackcap, the Blue Tit, the European Robin, the Eurasian Wren and the Blackbird. The **Blackcap** (*Sylvia atricapilla*) has a uniform grey plumage, with slightly paler underparts. The most evident trait is the contrast with the colour of the "cap", which is black in the male and reddish-brown in the female. It is one of the most common species in the order of Passeriformes, also present along hedgerows and in the shrubs among cultivations, in parks and in gardens, as long as there are trees and a rather thick shrubby vegetation. In the woods, it prefers the cooler areas, rich in ivy: during the spring it feeds on insects, while during the autumn and winter seasons its diet consists of various types of berries and fruits. As all the species that belong to the Sylviidae family, it spends most of its time sheltered by the thick vegetation, which is the reason why it is easier to identify it by its song, which is loud, strong and a bit melancholy. The **Blue tit** (*Cyanistes caeruleus*) features very bring colours, with a yellow underside and bluish upperparts, a head with a light blue top and a white and black face pattern: it is agile and active, constantly hopping from branch to branch. This species, originally tied to oak forests, has also adapted to living in city parks and gardens. Like the other tits, it nests in natural cavities such as holes in trees or in artificial ones such as wall crevices: the number in the clutch is often very large, and it is mainly fed with worms. The **European robin** (*Erithacus rubecula*) is characterised by the rusty-red

colour of its face and breast: the legs and feet are thin and quite long. When on the ground, it jumps around keeping its body erect and using the legs as springs. It is very common in the woods, even in the deeper areas, and prefers humid sectors. In the wintertime, this species is more numerous due to the afflux of northern populations, and becomes less demanding in terms of habitat, also frequenting parks and gardens. The **Eurasian wren** (*Troglodytes troglodytes*) is one of the smallest species of our avifauna, with a ball-like body shape and the tail that is often in the upright position: the colour of the upperparts is reddish-brown. It stays well hidden among the vegetation for most of the time, almost always near the ground, and it frequents woods with rich underbrush, bush gardens and riparian zones. Its song is very powerful considering its small size. The **Blackbird** (*Turdus merula*) is well known by city residents as well; the adult male is all black except with a yellow bill, while the female has mainly brown plumage with weak striping on the breast. A species originally tied to the fringes of woods, over time it has adapted to a large variety of habitats, with numerous populations also present in city centres. It has a fluted, melodious and slow song, which can be heard more frequently before sunrise.

Many other sedentary species, although with smaller populations, can be found in the woods of the Badia a Passignano. The “real” woodpeckers (order Piciformes) are a group of birds skilled in the use of tree trunks. This adaptation reveals itself in a morphology that is functional to the ability to stand stably, with short feet featuring two claws facing forwards and two facing backwards, and stiff, pointy tail feathers. The beak is long and sturdy, and it is used to dig up the nests, as well as for hunting and percussion purposes, and continually grows, faster than that of other birds in order to compensate for its wear. The tongue is long, mobile and sticky, and changes according to the eating habits of the different species, starting from the search for insect larvae inside the tunnels of old tree trunks, or under the bark. They are territorial birds that tend to take up the same area for the entire course of the year. Though we commonly associate woodpeckers with a woods habitat, the fours species present at the ANPIL actually show a different degree of reliance on forests. The **Great spotted woodpecker** (*Dendrocopos major*) is the species that mostly inhabits the woods, frequenting both broad-leaved trees and conifers. Its dimensions are about the same as the blackbird, and it features a wave-like flight pattern. The dominant colours of the plumage are black and white: the male features a red nape, while the female a black one. It is generally shy, and when perched on trees it tends to move to the other side of the trunk when the observer passes by. It is easier to detect its presence through its drumming, a vibrating sound made by the beak that repeatedly hits the trunk of a tree and which is used as a territorial signal. Similar to the previous bird but as small as a sparrow is the **Lesser spotted woodpecker** (*Dendrocopos minor*): it is not easy to see it since it mainly frequents the top part of trees, and it is also rather silent, except at the start of the spring. The **European green woodpecker** (*Picus viridis*) occupies habitats that include woods of broad-leaved trees spaced out by clearings or alternating with cultivated fields. Indeed, this species feeds mainly on the ground, searching for ants in particular. The song is a strong “laugh” of 10-18 notes, that can be heard at quite a distance more or less throughout the year, while the colour and the wave-like flight make it easily identifiable even in case of a fleeting passage. The male has a black moustachial stripe with a red centre at the base of the beak, while in the female this stripe is solid black. The **Eurasian wryneck** (*Jynx torquilla*) is the smallest species: slightly larger than a sparrow, with a pale, grey-brown colour and shy habits, it draws attention thanks to its song, more than anything else. The call of the Eurasian wryneck consists of a series of 8-12 nasal and slightly whiny notes, which can be heard after the middle of March until June. Its common name originates from its behaviour, since it stretches its neck moving it in a snake-like fashion when it feels it is in danger, for example if caught by surprise in its nest. The Eurasian wryneck has less functional features compared to the other species, including a thinner beak which is not able to dig a nest, so it relies on the natural or manmade cavities it can find. Like the European green woodpecker, its diet mainly consists of ants and their larvae, so it needs open spaces and shows a poor tendency to go into the woods: instead, it frequents its fringes, as well as olive groves, hedges with old trees and riparian formations. At the ANPIL, it frequents the olive groves around the cemetery of the Badia. The birds of prey of our regions include the **Eurasian sparrow hawk** (*Accipiter nisus*), which is the one most

commonly found in forests: it has short, broad wings and a long tail, and captures small birds in flight. However, it easily hides by taking shelter in the trees. The **Common buzzard** (*Buteo buteo*), on the other hand, is easier to observe. It is a medium-sized bird of prey, with broad wings and short head and neck. Its plumage varies considerably, from the lighter shades to the darker ones. There is usually a light-coloured band on its breast, while the tips of the flight feathers and the rear edge of the wings are black. The younger specimens feature a densely striped breast. The common buzzard can be observed at the hottest times of the day as it circles above the knolls, keeping its wings slightly raised (like a shallow V). Its presence can be detected by its call, which consists of a powerful whistling sound similar to a "meow" (which is however imitated very well by the jay). The nocturnal raptors that frequent the woods are represented by the **Tawny owl** (*Strix aluco*), which is definitely bigger than the owl, with varying colours, no ear tufts and a black iris. The tawny owl is more numerous in mature woods due to the availability of cavities suitable for nesting purposes, but can also be found in city parks. The **Common wood pigeon** (*Columba palumbus*) is also present all year round at the ANPIL, constantly moving between the woods and the cultivated areas. It is larger than a regular pigeon, with a tail that is proportionally longer and a thinner head, thus with a more elongated contour. When in flight, the white spot at the sides of the neck and the white transversal bands on the top part of the wings stand out. It builds its nest on trees, in woods adjacent to farmland. In recent years it has increased as a nesting bird in the area, also using conifers in proximity to human settlements for reproduction purposes. During the reproductive season, its song can be heard quite frequently, a characteristic cooing that is similar to the pigeon but deeper and with five syllables. The **Eurasian jay** (*Garrulus glandarius*) is the corvid of the woods, particularly with oaks: its plumage is a pinkish brown grey, with a white rump and a black tail. It is less social that the other family species. The list of sedentary species that inhabit the woods ends with a few small passerines, commonly found in all woods of the Chianti region. The **Great tit** (*Parus major*) is larger than the blue tit, with white cheeks that stand out against the black head and the yellow breast: like its congeneric species, it can also use special cavities, such as mail boxes, to build its nest. The **Long-tailed tit** (*Aegithalos caudatus*) is unmistakeable due to its small size, ball-shaped body and a very long, narrow tail. At the ANPIL, it is more easily observed during the winter, when many individuals gather in small "groups" that relentlessly explore trees and shrubs. The **Common firecrest** (*Regulus ignicapilla*) is even smaller, with its short tail and striking head pattern against which the white eyebrows stand out. Its call is an acute tone consisting of a series of accelerated notes, and it can be observed as it moves nonstop, exploring the branches. Very widespread in broad-leaved and mixed woodland, it is also frequently present in cypress rows and in the park of the Badia. The larger oaks, on the other hand, provide the habitat for the **Eurasian** or **Wood nuthatch** (*Sitta europaea*) which, despite its Italian name "picchio", meaning woodpecker, is actually a passerine bird, but it is a skilled and active climber, able to lower itself down tree trunks with its head pointing downwards. Another frequenter of the trunks is the **Short-toed treecreeper** *(Certhia brachydactyla)*, small and with a curved and long bill in proportion to its body, which looks paunchy when observed climbing tree trunks, from the top towards the bottom and with a spiralling movement.

In the springtime, there are few migratory species that join the sedentary ones of the woods. One of these is the **Eurasian golden oriole** *(Oriolus oriolus)*, unmistakeable due to its bright-yellow colour alternating with the black of the male, even if this species, slightly smaller than the blackbird, easily eludes contact by staying hidden between the foliage of the trees. In addition to the woods (oaks), it also inhabits fruit plants and the poplars of the riparian band of the river Pesa. In September it regularly visits fig trees (its name in the local dialect is 'beccafico' or fig picker). Another guest which can be observed at the ANPIL from April to August is the **Common cuckoo** *(Cuculus canorus):* in flight, it resembles a small hawk due to its long tail and pointy wings; unlike the hawk, however, the cuckoo has a slender head profile, and keeps its bill pointing upwards. It lays its eggs in the nests of other small passerine birds, which raise them until the little guests, which are much bigger than their hosts, learn how to fly. It feeds mainly on the larvae of nocturnal moths. Its well-known song is formed by two (sometimes three) repeated syllables, with the accent

on the first one.

In the wintertime, the taller trees of the woods of Poggio al Vento are used as night-time resting sites (roosts) by large groups of **Common chaffinches** *(Fringilla coelebs)*, which during the day move among the cultivations in search of food. The common chaffinch is the same size as a sparrow, although it is slimmer and with a longer tail. The breast and sides of the head of the reproductive male are red-rusty, while the upperparts and the nape are grey-blue. The female is much duller in colouring: in flight, the white at the sides of the tail and the white wing-bars are noticeable. It builds its nest in the park of the Badia and in olive groves.

SHRUBS AND HEDGEROWS

At the border between the woods and the vineyards, in areas not suited for cultivation, on escarpments and, generally speaking, where the natural non-arboreal vegetation is not altered by human intervention, we mainly find brooms, sloes and blackthorns, brambles and many other shrubs, forming thick and intricate habitats with a few sparse trees. Many bird species live in this area, rarely coming out into the open: the best example of this is the **Nightingale** (*Luscinia megarhynchos*), which delights us with its pleasant song during the night as well, but that stays almost always hidden in the bushes. In the Sylviidae family, we find several species tied to these types of habitats. The **Sardinian warbler** (*Sylvia melanocephala)* is similar to the blackcap, with the difference being that the black colour on its head is much more extended and the outer tail feathers are white. It is a Mediterranean species that frequents low hedges, evergreen shrubs and olive groves. It can be identified by its song, which consists of a series of harsh and scratchy notes. Where the shrubs are taller, and in particular in broom brush with small sparse downy oaks, we can find the **Subalpine warbler** *(Sylvia subalpina*): the male has a grey head and back, brick-red underparts and white malar streaks (“moustaches”), while the female features a paler colouring. The **Common whitethroat** (*Sylvia communis*) was observed during the reproductive period along the low hedges of the small valley downstream the lake: it has a brown-grey head, a well-visible white throat, and a rather long tail with light outer rectrices. The song is fast, short and hoarse, and it is emitted from the top of the shrubs. In broom brush and in small hedges along the ditches with the presence of weeping willows, one can observe the **Melodious warbler (***Hippolais polyglotta*), which is more visible compared to the previous species when it sings from high positions. Its upperparts are brown-grey, the bottom parts are yellow, more or less pale, and the tail features squared edges; it is a migratory bird that settles late in the nesting territories, sometimes even in late May. Another elusive inhabitant of the shrubby areas is the **Cirl bunting** (*Emberiza cirlus*): although it is a rather common species, it is very distrustful and ready to take refuge under shelters. It prefers scrub at the fringes of the woods, at the border with vineyards, and with good exposure to the sun. Its song is a monotonous trill, which is frequently repeated. The **Red-backed shrike** (*Lanius collurio*), locally known as 'velia', on the other hand, shows itself off by perching on top of a shrub in order to scout the ground in search of large insects and lizards. In the summertime, the general colour of the male’s upperparts is brown-reddish; it has a grey head with a black “mask” and lighter underparts that make it look entirely white from a distance. The female features a paler colouring. The powerful bill with a hook-like tip makes it similar to a small raptor. The **European turtle dove** *(Streptopelia turtur*) builds its nest on sparse trees among the shrubby areas. It has a pigeon-like body but it is smaller and slimmer, with brown plumage featuring a reddish border and blackish centres on its back. Compared to the Eurasian collared dove, it is darker, smaller and the tail is not as long: in flight, with quick and wave-like beating of its wings, the dark underside of its wings is visible.

CULTIVATIONS

The Protected Natural Area mainly features vineyards and olive groves which are frequented by species originally tied to sparse and sun-filled woods and which have adapted to the agricultural landscape modified by man. The **Hoopoe** (*Upupa epops*) is instantly recognisable due to its shape and colouring, and to the typical crest which it raises when alarmed; during its flight, which is irregular and undulating, like that of a giant butterfly, the black and white pattern of the plumage can be observed. It has a thin tapering bill that bends slightly downwards. It builds its nest in tree cavities (olive trees, mulberries, oaks), but it also uses crevices in buildings or in brick walls: it is a migrating species, present from the middle of March until August. Its typical onomatopoeic song consists of three syllables repeated in a low tone ('oop-oop-oop'). In the olive groves towards Casa La Selva, there are a few pairs of **Woodlarks** *(Lullula arborea):* it is a small lark with a short tail and white eyebrows, with an undulating flight and a tail with a white tip. The woodlark is mainly dark-brown above and pale below, with dark-coloured stripes. The Alaudidae family includes ground-dwelling species, however the woodlark is special since it requires the presence of trees in its territories which it uses as roosting places and as singing perches. It migrates down to lower altitudes during the winter, but in February it already reoccupies the nesting territories: it is locally known by the name of 'mattolina'. The **European greenfinch** *(Carduelis chloris*) inhabits the fringes of woods, thick tree-lined hedges between olive groves and vineyards, parks and gardens with conifer cores. Compared to the other species of finches, it is stockier and more heavy-set, with a large head and a short tail. The basic colour of the upperparts is greyish-green in the male, and more on the brown side in the female, with evident yellow in the wings and at the sides of the tail: its name in the local dialect is 'calenzolo'.

In the winter season, the olive groves become the natural habitat of a large number of Red-breasted robins coming from central and northern Europe. The **Dunnock** or **Hedge sparrow** (*Prunella modularis*), with its thin bill and grey-dark brown plumage, can also be observed at this time of the year.

The vineyard is the habitat with the smaller number of species during the reproductive period, mainly hosting Goldfinches and Serins, which build their small nests in the branch-forks of the vines. The **European serin,** or just **Serin** (*Serinus serinus*) is smaller and more common than the greenfinch. The back and lower parts are dark-streaked while the rump is yellow. In the reproductive male, the breast and most of the head is brighter yellow, easily visible even from a distance when it sings perched on treetops or on TV antennas. Its song is a continuous and monotonous buzzing, similar to the jingling of a set of keys, and it is emitted while the serin is on a perch or during short circular singing flights. This species loves the heat and sunlight: it builds its nest in vineyards, in olive groves and in cypresses, and it is known locally by the name of 'raperino'. The **European goldfinch** (*Carduelis carduelis*) is a very active, mobile and loud finch that can often be observed in small groups; these characteristics and its particular plumage make it easy to identify during its frequent flights, during which the yellow wing stripes stand out. It frequents vineyards, parks and open areas with the presence of spaced-out trees, avoiding thick and dense woods. It is specialised in extracting seeds from thistles and other composites directly from their pods.

In the wintertime, in vineyards, one can often observe the **Black redstart** (*Phoenicurus ochruros*), with its dark colouring and a red-orange tail.

Uncultivated areas with grassy vegetation in proximity to cultivations cover a rather important role since they can encourage the presence of additional species. The **African** or **Common stonechat** (*Saxicola torquatus*) is a small member of the Turdidae family that perches in full sight on top of shrubs or short stakes. It has a small body with a large, round head and a short tail. The reproductive male has a black head with a white collar and a reddish breast, while the female features a paler colouring. The **Zitting cisticola** or **Streaked fantail warbler** (*Cisticola juncidis*) is characteristic for its singing flight, during which it repeats the same note for long periods of time, moving at a good altitude with a zigzagging trajectory. It is more common in the large cultivated areas along the River Pesa, and is present off and on at the ANPIL. The **Corn bunting** (*Emberiza calandra*) looks like a large sparrow, with a plumage with no distinctive markings that can be seen from a distance: its song is a repetitive sound, usually given from a high perching place. Up until

a few years ago, it was present in the uncultivated area below the lake of Badia a Passignano. Uncultivated areas, arable land and pastures are hunting territory for the **Common kestrel** (*Falco tinnunculus*), a raptor that is much smaller than the buzzard, with long, pointy wings and a long tail. In the adult male, the head is greyish in colour, while it is brown in the female. Its flight is agile with quick beatings of the wings, but it is often observed while it is still in the air, as if suspended, a position which it is able to keep either by quickly beating its wings with the tail open or with no beating of the wings by changing the angle in order to stand still. It builds its nest in rocky walls and in abandoned or isolated buildings.

BUILT-UP AREAS

Residential areas and farms represent a particular habitat since, albeit not of natural origin, they recreate conditions for the presence of different bird species. Indeed, the walls of older buildings offer cavities which are used for nesting purposes by those species that, under natural original conditions, lay their eggs in the crevices of tree trunks or rocky walls. In the built-up area of Badia a Passignano, the following species can be easily observed all year long: the Jackdaw, the Starling, the Eurasian collared dove and the Italian sparrow. The **Jackdaw** *(Corvus monedula)* is similar to the carrion crow, but it is smaller and with plumage that seems solid black from a distance, although it is actually dark grey with the nape and the sides of the neck of a lighter colour. This species has a complex social structure in which the couples stay together for life. The **Common** or **European Starling** *(Sturnus vulgaris)* is smaller than the blackbird, with a stockier and more powerful body and a shorter tail: in flight, its wings look triangular in shape and the profile is a little hunched. Its plumage is dark, spangled with white spots in the winter. Some couples reproduce in the cavities of the boundary wall of the Badia. The **Eurasian collared dove** (*Streptopelia decaocto*) is larger and lighter than the turtle dove, with a sand-coloured plumage featuring a black collar and a longer tail. It can be seen perching on rooftops (including TV antennas) or on cedar trees and cypresses. In the well-known sparrow of the local areas, the Italian sub-species of the **House sparrow** (*Passer domesticus*), the sexes exhibit strong dimorphism: the male has white cheeks, a red-brown top and a black throat, while the female's plumage is more uniform and features more stripes. It builds its nest in proximity to man, in large groups, however in rural areas it regularly frequents cultivations where it gets its food. The Swallow, the House martin and the Swift live close to buildings for reproductive purposes. These species carry out a crucial environmental role due to their specialisation in the in-flight capture of insects. The **Barn swallow** *(Hirundo rustica)* has steel-blue-black upperparts, breast and wings, white underparts and a brick-red throat. In flight, the long and deeply forked tail is clearly visible in the adults, with the side feathers (outer rectrices) longer in the males. The nest consists of a cup made of mud, built on an internal wall, for example under porticos, inside stables, loggias, farming appurtenances and abandoned homes. It is present in the ANPIL from the middle of March until the end of September, when large flocks can be seen perched on power lines prior to their departure for the wintering areas, which are located in Sub-Saharan Africa. This species is affected by the use of insecticides and phyto-pharmaceuticals, by the modernisation of stables and by the building renovations which leave no suitable places where to build its nest. The **Common house martin** (*Delichon urbicum)* is smaller than the swallow, with black upperparts against which the white rump stands out; the underparts are also completely white. Its tail is not as forked as that of the swallow, and its flight is slower and more 'whirring", with long glides with the wings still. The nest is also different in terms of shape (it is more spherical and not completely open on top) and position (almost always on the exterior walls of buildings). The **Common swift** *(Apus apus)* has the general appearance of a large swallow, however its wings are narrower and more elongated, and its colouring is a uniform brown. A skilled flyer, it is capable of veritable aerial acrobatics as it hunts for insects. It builds its nest in colonies which are at times very large, the presence of which was often encouraged in Tuscany in order to take the young swifts from their nest before they learned how to fly (since they were considered a tasty dish due to the large quantity of accumulated fat). A coloured presence at the ANPIL is the **Common redstart** (*Phoenicurus phoenicurus*), a species which has undergone a strong expansion in Tuscany in recent years, and which settles, from the end

of March until September, in the built-up area of Badia a Passignano and in the farms, close to large shady trees. One species that can be seen perched on rooftops, as well as in cultivated areas, is the **White wagtail** (*Motacilla alba*), with its long tail featuring white outer feathers that is often shaken during movement on the ground (this is what gives it its local dialect name of 'batticoda', or tail beater). During the autumn migration (October) it can be observed in small groups while it feeds among the clods of the ploughed fields.

Two species of nocturnal birds of prey frequent the buildings: the more common **Little owl** (*Athene noctua*), featuring a large, rounded head, stocky body, yellow iris and no ear tufts, and the rarer **Barn owl** (*Tyto alba*), with a very light-coloured plumage, slim body and long wings and legs, a heart-shaped face pattern and eyes with a black iris. The little owl is partly active during the day, so it can be observed at sunset perched on poles or buildings. The barn owl hunts in particular along the uncultivated sides of the roads, where it captures mice, voles and shrews. This is the reason why it is often run over by passing vehicles. A few observations of this species around the Badia, in Rignana and Pugliano, make the presence of at least one nesting couple likely.

WET AREAS

The Badia Lake and the Rimaggio stream, which crosses the ANPIL, represent the main wet areas; nevertheless, they do not host a typical avifauna, except for short periods of time during migrations. Indeed, the lake only has a very narrow and discontinuous strip of marsh vegetation, with bare banks that are not suited for building shelters. From autumn to winter, certain specimens of **Grey heron** *(Ardea cinerea)* use the tallest trees around the lake for their nocturnal rest, while the **Mallard** (*Anas platyrhynchos*) and the **Common moorhen** (*Gallinula chloropus*) have been observed only during the migration period. A more constant presence during the winter is the **Grey wagtail** (*Motacilla cinerea*), a more colourful relative of the white wagtail.

MIGRATION

During the spring and autumn seasons, large numbers of birds move from the nesting areas to the wintering areas, following migratory routes that are better and better defined by scientific research. These movements, which may take place along a wide and irregular front, in some locations are concentrated through more defined paths that make it possible to cut down on the costs of the flight (for example, Alpine and Apennine passes). In autumn, the ANPIL's territory is concerned by a secondary route that links the valley of the river Pesa with the one of the river Greve, by flying over the mountain ridges along a route that goes from North-East to South-West. The more numerous species is the wood pigeon, which flies across the ANPIL using in particular the aerial corridor with entrance between Case Pugliano and Podere Monte and exit between Poggio al Vento and Case Pietto. The migration takes place between September and November, with a peak during the last ten days of October. Most wood pigeons migrate in groups that may consist of more than 100 individuals moving during the early hours of the day. To observe the migration of the wood pigeon from a comfortable and easy-to-reach position, you can stop along the road that leads to Rignana, in the stretch just below Badia a Passignano, prior to the climb that goes into the middle of the woods, from which you have a good view of the migratory route. Some species of Turdidae can also be observed during the migration. The **Song thrush** (*Turdus philomelos*), smaller than the blackbird, has a brown plumage on the upperparts and a white-yellowish plumage with black spots on the underparts. Its song is quite powerful, with a tendency to repeat the notes three times. Some members of this species spend the winter in the olive groves of the ANPIL, while for some years now a few couples have been building their nests in neighbouring areas, settling down in the more humid places of the woods. The **Redwing** (*Turdus iliacus*), less common than the previous species, has been observed in the vineyards during the month of November; however, the presence of this species is usually more common outside the ANPIL and at higher altitudes. The **Fieldfare** (*Turdus pilaris*) on the other hand, is irregularly present when it returns in the spring. As regards the birds of prey, during the month of March at the ANPIL one can observe the passage of a few specimens of **Short-toed**

snake eagle (*Circaetus gallicus)*, great predator of snakes. For this species, certain areas of the ANPIL are also included in the hunting territory of the couples that build their nests in the Chianti district.

PRESERVATION AND BIODIVERSITY

(MAMMALS AND BIRDS)

As for mammals, there are currently 23 species present at the protected natural area; however, the actual number is probably higher, and additional investigations should result in the addition of a few species of micromammals (Soricomorpha, Rodents and Bats). Three of the observed species (European mole, garden dormouse and hazel dormouse) are of regional interest and have been included in Annex A of Regional Law no. 56/2000. In particular, the hazel dormouse requires quite extensive woods with a good diversity in terms of structure and composition, characteristics that can be found in certain spots of the protected natural area. At the general level, well-structured and stratified woods can host a good number of species of forest mammals and, in this sense, it appears to be favourable for preservation purposes to carry out the coppicing with longer shifts and to start a conversion into tall timber trees in some plots.

The bird species observed at the ANPIL amount to a total of 77, of which 46 regularly build their nest in the protected area. The preservation of uncultivated land, hedges and shrubs should favour the stable presence of the Red-backed shrike, while the positioning of nesting boxes may offset the lack of natural cavities for species such as the Lesser spotted woodpecker.

The following pages contain a list of the mammal and bird species observed during the 2000-2014 period.

List of mammal species observed during the 2000-2014 period

Order	Family	Common name	Scientific name
Erinaceomorpha	*Erinaceidae*	West European hedgehog	*Erinaceus europaeus*
Soricomorpha	*Talpidae*	European mole	*Talpa europaea*
	Soricidae	Bicoloured shrew	*Crocidura leucodon*
Lagomorpha	*Leporidae*	European or brown hare	*Lepus europaeus*
Rodentia	*Sciuridae*	Red squirrel	*Sciurus vulgaris*
	Gliridae	Edible or fat dormouse	*Glis glis*
		Hazel or common dormouse	*Muscardinus avellanarius*
		Garden dormouse	*Eliomys quercinus*
	Cricetidae	Bank vole	*Myodes glareolus*
		Wood mouse	*Apodemus sylvaticus*
	Muridae	Yellow-necked mouse	*Apodemus flavicollis*
		House mouse	*Mus musculus*
		Brown rat	*Rattus norvegicus*
		Black rat	*Rattus rattus*
	Hystricidae	Crested porcupine	*Hystrix cristata*
Chiroptera	*Vespertilionidae*	Kuhl's pipistrelle	*Pipistrellus kuhlii*
Carnivora	*Canidae*	Red fox	*Vulpes vulpes*
	Mustelidae	Beech marten	*Martes foina*
		Least weasel	*Mustela nivalis*
		European badger	*Meles meles*
Artiodactyla	*Suidae*	Wild boar	*Sus scrofa*
	Cervidae	Fallow deer	*Dama dama*
		Roe deer	*Capreolus capreolus*

List of bird species observed during the 2000-2014 period

Order	**Family**	**Common name**	**Scientific name**	**P**
Pelecaniformes	*Phalacrocoracidae*	Great cormorant	*Phalacrocorax carbo*	Ma
Ciconiiformes	*Ardeidae*	Grey heron	*Ardea cinerea*	M,W
Anseriformes	*Anatidae*	Mallard or wild duck	*Anas platyrhynchos*	Mp
		European honey buzzard	*Pernis apivorus*	Mp
Accipitriformes	*Accipitridae*			
		Short-toed snake eagle	*Circaetus gallicus*	Ne*
		Eurasian sparrow hawk	*Accipiter nisus*	NS
		Common buzzard	*Buteo buteo*	NS
Falconiformes	*Falconidae*	Common kestrel	*Falco tinnunculus*	NS*
Galliformes	*Phasianidae*	Common pheasant	*Phasianus colchicus*	NS*
Gruiformes	*Rallidae*	Common moorhen	*Gallinula chloropus*	Ma
Charadriiformes	*Scolopacidae*	Eurasian woodcock	*Scolopax rusticola*	W*
		Common wood pigeon	*Columba palumbus*	NS,Ma
Columbiformes	*Columbidae*			
		Eurasian collared dove	*Streptopelia decaocto*	NS
		European turtle dove	*Streptopelia turtur*	Ne
Cuculiformes	*Cuculidae*	Common cuckoo	*Cuculus canorus*	Ne
	Tytonidae	Barn owl	*Tyto alba*	NS*
		Eurasian scops owl	*Otus scops*	Ne*
Strigiformes	*Strigidae*			
		Little owl	*Athene noctua*	NS
		Tawny owl	*Strix aluco*	NS
Apodiformes	*Apodidae*	Common swift	*Apus apus*	Ne
	Meropidae	European bee-eater	*Merops apiaster*	M
Coraciiformes				
	Upupidae	Hoopoe	*Upupa epops*	Ne
		Eurasian wryneck	*Jynx torquilla*	Ne
Piciformes	*Picidae*			

		European green woodpecker	*Picus viridis*	NS
		Great spotted woodpecker	*Dendrocopos major*	NS
		Lesser spotted woodpecker	*Dendrocopos minor*	NS*
		Woodlark	*Lullula arborea*	NS
	Alaudidae			
Passeriformes				
		Eurasian skylark	*Alauda arvensis*	M
		Barn swallow	*Hirundo rustica*	Ne
	Hirundinidae			
		Common house martin	*Delichon urbicum*	Ne
		Meadow pipit	*Anthus pratensis*	W
	Motacillidae			
		Grey wagtail	*Motacilla cinerea*	W
		White wagtail	*Motacilla alba*	NS
	Troglodytidae	Eurasian wren	*Troglodytes troglodytes*	NS
	Prunellidae	Dunnock	*Prunella modularis*	W
		European robin	*Erithacus rubecula*	NS,W
	Turdidae			
		Common nightingale	*Luscinia megarhynchos*	Ne
		Black redstart	*Phoenicurus ochruros*	W
		Common redstart	*Phoenicurus phoenicurus*	Ne
		African stonechat	*Saxicola torquatus*	NS
		Common blackbird	*Turdus merula*	NS
		Fieldfare	*Turdus pilaris*	Mp*
		Song thrush	*Turdus philomelos*	Ma,W
		Redwing	*Turdus iliacus*	W*
	Muscicapidae	Spotted flycatcher	*Muscicapa striata*	Ne

Passeriformes			
	Common firecrest	*Regulus ignicapilla*	NS
Regulidae			
	Goldcrest	*Regulus regulus*	W*
Cisticolidae	Zitting cisticola	*Cisticola juncidis*	NS*
	Melodious warbler	*Hippolais polyglotta*	Ne
Sylviidae			
	Subalpine warbler	*Sylvia subalpina*	Ne
	Sardinian warbler	*Sylvia melanocephala*	NS
	Common whitethroat	*Sylvia communis*	Ne*
	Eurasian blackcap	*Sylvia atricapilla*	NS
	Common chiffchaff	*Phylloscopus collybita*	NS
	Coal tit	*Periparus ater*	W
Paridae			
	Eurasian blue tit	*Cyanistes caeruleus*	NS
	Great tit	*Parus major*	NS
Aegithalidae	Long-tailed tit	*Aegithalos caudatus*	NS
Sittidae	Eurasian nuthatch	*Sitta europaea*	NS
Certhiidae	Short-toed treecreeper	*Certhia brachydactyla*	NS
Oriolidae	Eurasian golden oriole	*Oriolus oriolus*	Ne
Laniidae	Red-backed shrike	*Lanius collurio*	Ne*
	Eurasian jay	*Garrulus glandarius*	NS
Corvidae			
	Eurasian magpie	*Pica pica*	NS*
	Western jackdaw	*Corvus monedula*	NS
	Hooded crow	*Corvus cornix*	NS
Sturnidae	Common starling	*Sturnus vulgaris*	NS
Passeridae	House sparrow	*Passer domesticus*	NS
	Common chaffinch	*Fringilla coelebs*	W,NS
Fringillidae			
	European serin	*Serinus serinus*	NS
	European greenfinch	*Carduelis chloris*	NS

	European goldfinch	*Carduelis carduelis*	NS
	Eurasian siskin	*Carduelis spinus*	W*
	Common linnet	*Carduelis cannabina*	Ma
	Hawfinch	*C. coccothraustes*	W*
	Cirl bunting	*Emberiza cirlus*	NS
Emberizidae			
	Corn bunting	*Emberiza calandra*	NS*

Table legend
***P:** Species phenology. **NS:** sedentary nesting species, **Ne:** summer nesting species, **M:** migratory (A autumn, P spring), **W:** wintering, ***:** irregular species whose presence is not constant through the years, or that mainly frequent adjacent areas.*

Bibliography

AMORI G, CONTOLI L, NAPPI A. (by), *Fauna d'Italia*. Vol. XLIV. *Mammalia II. Erinaceomorpha – Soricomorpha – Lagomorpha – Rodentia*. Ministry of the Environment and Territorial Protection, Edizioni Calderini, Bologna 2008.

BACCI F. *I Mammiferi, Badia a Passignano tra storia e ambiente*. Legambiente. Tipolitografia CIEVU, Florence, 2005.

BOITANI L, LOVARI S, VIGNA TAGLIANTI A. (by), *Fauna d'Italia.* Vol. XXXVIII. *Mammalia III. Carnivora – Artiodactyla*, Ministry of the Environment and Territorial Protection, Edizioni Calderini, Bologna 2003.

BRICHETTI P. & FRACASSO G. *Ornitologia Italiana*, Vol. I-VII. Oasi Alberto Perdisa Editore, Bologna, 2003 – 2011.

CENTRO ORNITOLOGICO TOSCANO (Tuscan Ornithological Centre), consultation of "Cronaca" database, December, 2013.

LEBBORONI M. *Gli Uccelli. Badia a Passignano tra storia e ambiente*. Legambiente. Tipolitografia CIEVU, Florence, 2005.

Website of the Natural Protected Area:
www.tavarnellevp.it/areanaturale

Websites on environmental, territorial and landscape planning and Protected Natural Areas:
www.minambiente.it
www.regione.toscana.it
www.provincia.fi.it - www.cittametropolitana.fi.it
www.arsia.toscana.it
www.parks.it

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