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Project NAT2CARE
Mobilisation of citizenship
for the recover and the conservation
of the Natura 2000 transboundary areas

SPECIES IDENTIFICATION GUIDE

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The overall objective of the **project NAT2CARE - Mobilisation of citizenship for the recover and the conservation of the Natura 2000 transboundary areas** – is to improve the status and the presence of the biodiversity within the project partners' Natura 2000 areas (the Julian Prealps Nature Park, the Triglav National Park, and the Friulian Dolomites Regional Natural Park) by implementing Natura 2000 habitat and species measures, by improving their integrated and cross-border management, by raising environmental awareness and training, and by increasing the promotion of ecosystem services.

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INTRODUCTION

This guide is aimed to raise people's awareness on the species monitored and on the cross-border cooperation within Nat2Care project.

These species are important as they represent the characteristics of the mountainous territory situated on the border between Italy and Slovenia. As such, they deserve everyone's full attention.

In the guide you will find useful information on their main biological characteristics, their behaviour and habitats. The photographs you will find in the guide will help you in understanding and recognizing presence signs.

To find out more about the Italian-Slovenian transboundary area, where the described species live, you can access the online cartography (webGis) mentioned on page 3.

You may also communicate your sightings directly from your smartphone, using the iNaturalist® app. The reports will be checked by our experts and then published on webGis.

We hope this publication, prepared in Italian, Slovenian and English, together with the other tools provided by Nat2Care project, will stimulate your curiosity and your desire to learn more, as well as encourage you to visit, with the essential passion and respect, the sites where these species live.



Photo credit Davorin Tome

CORN CRAKE (*Crex crex*)

DIMENSIONS

Body length	Up to 30 cm
Wingspan	42–53 cm
Weight	♂ 130–210 g
	♀ 145–164 g

The Corn crane is a medium-sized bird in the rail family, similar to the common moorhen, with tawny-brown plumage, reddish iris, and sharp beak. The colour of the feathers is not even: face, neck, and chest are grey-blue, the abdomen is white, white and brown stripes mark the sides and the rump while the upper parts of the wing are hazel coloured with some white lines. Wings are rounded as well as the tail, which is used as a rudder when flying. Legs and feet are very robust, suitable for life on the ground. There is no sexual dimorphism: the female is smaller than the male, and warmer tones characterise the plumage.

It prefers grassland environments, such as valley floors in mountainous and hilly areas and territories in which meadows are regularly mown (e.g., near alpine pastures) (Figure 1). This bird is not present in abandoned, uncultivated meadows, as it cannot move easily and nest. During

spring, summer, the breeding season, and in the late spring-summer period it is present in areas belonging to the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park.

It is an omnivorous species. It mainly feeds on invertebrates (earthworms, snails, spiders, dragonflies, grasshoppers, and other insects). Still, it can also capture small mammals and frogs, while seeds of herbaceous plants and cereals mainly represent the plant component.

The corn crake is a solitary, terrestrial animal; it walks by raising its legs considerably. It is reluctant to fly but still able as, during migrations, it travels long distances.

Spring represents the mating season: to attract females, the male uses a distinctive sound and performs a "love dance" by straightening the plumage. The male always prepares the nest, generally hidden by grass or shrubs, near a tree or a bush at altitudes that can even reach 1400 m above sea level. Every other day, the female lays from 8 to 12 cream-coloured oval eggs, slightly shiny or with green, blue or grey tones, speckled with brown. At the end of the laying, male abandons the female which broods the eggs until hatching, which takes place 19–20 days after the last laying. Chicks leave the nest after 3–4 days, and after a month they begin to fly.

SIGNS OF PRESENCE

Vocalisation: The male sound attracts females and marks the territory; it is emitted in spring nights and resounds like a loud "crex crex" which can be heard miles away. The female emits a similar call and also a kind of bark.



Figure 1. Corn crake habitat (*Photo credit Davorin Tome*).



Photo credit Paolo Da Pozzo - AFNI

WESTERN CAPERCAILLIE (*Tetrao urogallus*)

DIMENSIONS

Body length	♂ 86–102 cm
	♀ 57–67 cm
Wingspan	to 1.30 m
Weight	♀ 2-2,5 kg
	♂ up to 4-5 kg

The western capercaillie is the largest member of the grouse family, showing evident sexual dimorphism between male and female. Males have black neck and tail, brown wings and greenish reflections on the breast; it has two white spots on the wing bow and a red spot above each eye (also called caruncle). The female, on the other hand, has brown feathers with white and black barring and reddish reflections on the breasts. Despite seasons, their appearance remains unchanged.

They have brown feathered legs and their toe rows of small, elongated horn tacks provide a snowshoe effect. They are equipped with four toes: 3 at the front, with angles of almost 90°, and a raised one in the back.

The distribution of this species is decreasing throughout Europe. It is present in the Alpine area, at the altitude between 800 and 2000 meters; it is more common in the Eastern Alps, while in the

Western and Central Alps the distribution has undergone a substantial decline. It is present in areas belonging to the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park. It generally lives in extensive coniferous or mixed forests with broad-leaved trees (especially in the Eastern Alps or pre-Alpine areas), providing a good shrub coverage (especially *Vaccinium* sp.), which is essential for its nutrition, and open areas. It is highly susceptible to environmental changes, mainly attributable to anthropogenic activities and climate change.

Its diet is very varied: in the spring-summer season it consists mainly of berries, seeds, buds, leaves, insects, and snails; in autumn it may also feeds on mushrooms, while during winter it feeds primarily on conifer needles or twigs.

It is a sedentary species with promiscuous behaviour in autumn and winter and solitary life in spring and summer, except for females with offspring.

The breeding season runs from early April to late May. During this period, males become territorial and perform parades on open courting grounds (singing arenas). They show their tails, turn their heads back and sing a characteristic song to impress the females. Male mates with several females. After copulation, hens move away to lay their eggs on the ground hidden in the bushes. They usually lay from 5 to 14 eggs and brooding lasts about four weeks. The chicks are immediately able to follow their mother and, in autumn, the family starts to dissolve: first, the young cocks disperse, then the young hens.

SIGNS OF PRESENCE

Footprints: They measure 10–12 cm in length and 7–11 cm in width in the male, while those of the female are one third smaller. The outer toes form an angle of about 150°–160° with the inner one, and the so-called "courting tacks" make a clear track in the snow.

Tracks: With sustained walking, the step measures 20–25 cm; during the parade, footprints are closer, and the signs left by the primaries flight feathers are evident on the sides (Figure 2).

Excrements (Figure 3): Yellow-brown with a cylindrical shape in autumn-winter, greenish-yellow with a soft texture in spring, purple in summer (if it feeds on strawberries and raspberries). It is easy to find them on the ground, under perches. They have a cylindrical shape and a slightly arched shape, measuring 4–8 cm in length with a diameter of 10–13 mm.

Vocalisation: During the breeding season, the male emits characteristic vocalisations to impress and attract females to the courting ground. Cocks remain perched on the branches of trees around the area or on elevated points of the courting ground. Even though they are large birds, their singing could be heard from not more than 100 m. The typical song is rhythmic and categorized into four phases. The first phase consists of a series of doubled-noted clicks, which merges in the main, loudest note, and is completed when the bird utters 3 to 5 notes. It sounds like a "tic-ap, tic-ap, tic-ap" and ends with a sudden "pop"; like a cork coming of a bottle; this is then followed by a series of hissing and scraping sounds.

The females manifest their presence with a slight cooing and a begging sound, recalling the black woodpecker song.

Scratches: Depressions in the ground impressed in correspondence with feeding points or with sand and soil baths points.



Figure 2. Footprints of western capercaillie (photo Matteo De Luca).



Figure 3. Western capercaillie faeces (photo credit Danilo Bevk).



Photo credit Paolo Da Pozzo - AFNI

BLACK GROUSE (*Lyrurus tetrix*)

DIMENSIONS

Body length	♂ 57–65 cm
	♀ 40–46 cm
Wingspan	over 90 cm
Weight	0.8–1.5 kg

The black grouse is a large game bird in the grouse family. It is named after its lyre-shaped tail, but it is also known as blackgame. Black grouse is considered as a species with "vulnerable conservation status in Europe", presenting a generalised decline throughout the Alps, especially in Italy. Main threats derive from their habitat destruction, fragmentation, and transformation, but also poaching and excessive hunting pressure. Climate change plays a significant role in the decline of this species, too. Sexual dimorphism is remarkable: the female is much smaller, it has yellow-orange feathers with brown reflections, and it does not have the lengthy and forked tail typical of the male. The latter has shiny black plumage with blue shades in the lower part of the back, and in the neck, its tail and wings (rather short) have white areas in contrast with the rest of the body; above the eyes, it has two red spots, called caruncles, most evident during the mating. They

have feathered legs; toes are laterally equipped with comb-shaped appendages, extending from the base of the toes to the black and robust claws.

Its characteristic habitat is located between 1600 and 2000 meters above sea level, in mixed and coniferous forests; it is also attracted by marshes, clearings, prairies and moors. It is present in areas belonging to the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, as well as the Triglav National Park.

It feeds on berries, leaves, buds, seeds and small invertebrates such as worms, larvae, ants, etc.; in winter it feeds mainly on conifer needles or twigs.

It is a shy, sedentary and gregarious animal; it can live in large mixed groups or lead a solitary life. During the mating period, which begins in mid-March and lasts for about two months, males gather in the "singing arenas"; early in the morning or at sunset, they perform parades in which they show females their undertail and red caruncles. They make various guttural sounds and murmurs; gatherings can also become very violent. Black grouse is a polygamous species. After attending the show, the female chooses the winning male to mate with; for a few days, the hen autonomously prepares the nest trying to hide it in the bushes. It lays a maximum of 12 eggs, and it broods them for four weeks, until hatching. During the first month of their life, chicks learn how to fly but stay with their mother for a few months, until adult plumage has appeared.

SIGNS OF PRESENCE

Footprints (Figure 4): Similar to the Western capercaillie's ones but smaller; they measure 7–8 cm in length and 6–7 cm in width. On the snowy ground, it is possible to distinguish the two lateral toes facing forward (35–47 mm) and creating an angle of about 55°-60° concerning the central one (50–75 mm).

Tracks: The distance between single footprints measures 10–14 cm.

Excrements (Figure 5): They can be fibrous (hard and cylindrical) or soft (without form and semi-liquid). When they are hard and cylindrical, they measure about 5 cm in length and 1 cm in diameter; when they are fresh, they have a greyish-yellowish colour, which then turns grey-brown. It is easy to find them near the arenas.

Vocalisation: In the male vocal manifestations are hissing and rustling, emitted not only during the mating period but also in autumn and winter. During the flight, the female emits a "cok-cok" sound.

Arena: Area where male parades take place during the mating season.

Scratches: Holes in the ground used for soil or sand baths that grouse carries out to remove parasites from the plumage; it is possible to find feathers in there. Scratches can also be found near anthills.



Figure 4. Black grouse tracks (*photo credit Fulvio Genero*).



Figure 5. Black grouse faeces (*photo credit Fulvio Genero*).



Photo credit Tanja Menegalija

ROCK PTARMIGAN (*Lagopus muta*)

DIMENSIONS

Body length	♂ 36–42 cm
	♀ 36–40.5 cm
Wingspan	up to 70 cm
Weight	♂ 420–520 g
	♀ 400–470 g

The Rock Ptarmigan is the smallest bird in the grouse family. In winter, to perfectly blend in the environment, it becomes white. An exception is black rectrices and, in the male, a black mask around the eyes. In the warmer seasons, feathers moult to a darker colour.

The neck, breast and upper parts of the male body are black with white speckles, while the lower part of its body is white with black remiges. It is generally larger than the female, and the latter has a more brownish plumage, with lighter speckles and a black tail.

They have thickly feathered legs and toes so that they can easily walk on soft snow and increase and maintain insulation.

During the year this species is present in several high-altitude habitats, preferring stony grounds and stony grassy areas; during the reproductive period, it is present in areas full of shrubs. In summer it can move beyond 3000 meters above sea level, and in winter it can reach the upper limit of the tree vegetation.

In the Alpine area, this species is in decline due to several factors (climate change, poaching, numerical fluctuations intrinsic to the species). Its distribution is characterised by small and fragmented populations, exacerbating conservation problems. However, it is present in the Regional Natural Park of the Friulan Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park.

This species is mainly vegetarian, and it feeds on buds, leaves, flowers and berries that, in wintertime, are generally hidden under the snow. A small part of the diet is supplemented with animal foods such as arthropods and gastropods, especially for chicks.

Sedentary or slightly erratic, before the reproductive period, the Rock Ptarmigan can also live in small groups formed by both sexes. It is a monogamous species, and couples are formed at the end of winter when gregarious habits are still present. Subsequently, in May, couples isolate themselves, males become territorial and perform songs and parades to defend the chosen place for the laying. Between May and June, female lays 5–8 cream-coloured eggs speckled with brown in a hole in the ground protected by bushes or rocks. Brooding, carried out by the female alone, lasts about 23 days. The offspring becomes completely independent after 10–12 weeks from hatching.

SIGNS OF PRESENCE

Footprints (Figure 6): On the snow, footprints commonly have blurred outlines due to feathers covering toes. The footprint has a length of 32–36 mm.

Tracks: Characterised by a sinuous gait, the distance between the footprints measures 4.5 cm. Trails are sometimes left by an alternation of claws and wings marks.



Figure 6. Footprints of Rock Ptarmigan (*photo credit Sanja Behrič*).

Excrements (Figure 7): 6–7 cm long with a diameter of 1.5–2 cm, very compact, dark brown; they are deposited in small groups near the areas where they live in.



Figure 7. Rock Ptarmigan faeces (*photo credit Al Vrezec*).

Vocalisation: During the flight, the male emits a loud and deep sound, similar to "crrr". The singing produced during the parades is made up of several guttural sounds.



Photo credit Fulvio Genero

GRIFFON VULTURE (*Gyps fulvus*)

DIMENSIONS

Body length	100–110 cm
Tail length	30 cm
Wingspan	250–280 cm
Weight	7–11 kg

The Griffon Vulture is a large vulture with tawny-brown plumage, white head and neck and a neck ruff whose colour varies according to age: in young specimens, feathers are white and soft, but they become brown and lanceolate in adults. Wings are expansive, deeply indented at the ends and with visibly protruding primary remiges. The tail is short and rounded. There are no apparent differences between sexes. Bigger than the golden eagle, if not seen at a great distance, it is difficult to confuse it with other species. It usually flies gliding and keeps its neck retracted (it only stretches it to inspect the territory and check other birds). Its shape resembles that of a rectangle.

The remarkable wingspan and the broad wings allow it to fly long distances, taking advantage of winds and thermal currents.

It lives and nests in inaccessible overhanging cliffs rich in recesses.

It is possible to observe it flying over mountain ridges within the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park, looking for carcasses of dead animals in the pastures or preyed on. During seasonal movements, it is present in the Hohe Tauern, the Julian Pre-Alps and the Dalmatian Islands.

It always lives and moves in a group, even during the search for food and reproduction places. Weather conditions, winds and thermal currents influence the search for food: if they are unfavourable and with no winds or thermal currents to exploit, it can fast even for a month.

It feeds only on carrion, searched by observing the territory while it circles in the sky, having no claws to prey on live or wounded animals. Unlike the Bearded Vulture, it prefers eating the soft parts of the carcasses belonging to medium and large mammals (sheep, goats, cattle, chamois, deer). It does not transport preys to the nest, but it feeds the chicks by regurgitating the semi-digested flesh amassed in the crop directly in their peak.

When searching for food, it uses a unique system of collaboration with other members of the group: together they form an "air network", made up of different specimens observing the underlying territory and keeping themselves in sight; when the prey is located, it descends quickly with tight turns, and it visually warns the flock that reaches it. Once on the ground, a hierarchy is established through challenges and duels to define the order in which the various specimens will be able to eat.

The Griffon Vulture lays a single egg (typically in January-February) which is brooded for 52–58 days; both parents participate in the care of the chick that starts flying at 110–120 days of age and abandons the nest in the summer period.



Photo credit Davorin Tome

URAL OWL (*Strix uralensis*)

DIMENSIONS

Body length	54–61 cm
Wing length	26.7–40.0 cm
Wingspan	115–125 cm
Weight	♂ 503–950 g
	♀ 568–1307 g

The Ural Owl is a bird that populated almost all of Europe in the Ice Age. Due to the thaw and the shrinking of the taiga, the Northern birds migrated northwards, including the Ural owl. Part of the population remained, despite everything, in the alpine forests in central and south-eastern Europe as a relic from the Ice Age. The southern Ural owls are larger and darker in colour than their northern relatives and are now part of the independent subspecies *S. u. macroura*, although no genetic differences have been found between the two sub-species. A distinctive feature of the southern species is the dark melanistic specimens (Figure 8), which account for 5-10 % of the entire population. The Ural owl is a typical woodland bird that shares its living environment with

its close relative the smaller Tawny owl *Strix aluco* (40–42 cm). Both species nest in the hollows of the trunks but also occupy artificial nests, where the larger Ural owl often takes out the smaller Tawny owl.



Figure 8. In the southern population of the Ural owl, subspecies *Strix uralensis macroura*, 5–10 % of the specimens are dark-coloured or melanic (photo credit Al Vrezec).

Regardless of its size, the Ural owl differs from the Tawny owl in terms of a more prominent face form (Figure 9) and especially in its singing. In spring the males mark their area with a gloomy “uu u-u-uu”, but we must arm ourselves with a lot of patience to hear it. The males of the Tawny owl are more active in vocal performances during spring-time. The high-pitched spring song of the male – “u u-u-uuuu” with a final trill, which the Ural owl does not know, is undoubtedly the most known song of the Tawny owl.

It is quite difficult to distinguish the young of the Tawny owl from those of the Ural owl. The Ural Owl is known for its distinctive yellow beak. In general, the size of the young Ural owl is larger, its plumage is darker, and its body proportions are longer, its beak and head are longer. The smaller Ural owls and the Tawny owls are difficult to distinguish by colour; usually, both are grey. A very reliable sign is given by the transversal stripes on the back and partially on the belly; in the youngest specimens of the Tawny owl these stripes are thin and thick; in the young specimens of the Ural owl, they are instead wide and sparse. If in the wild we should spend too much time around a small specimen found by chance, we shall receive a warning from the female of the Ural owl for our inadequate behaviour. Very often it emits a latent “uau” from a tall tree, but it can also get very close.

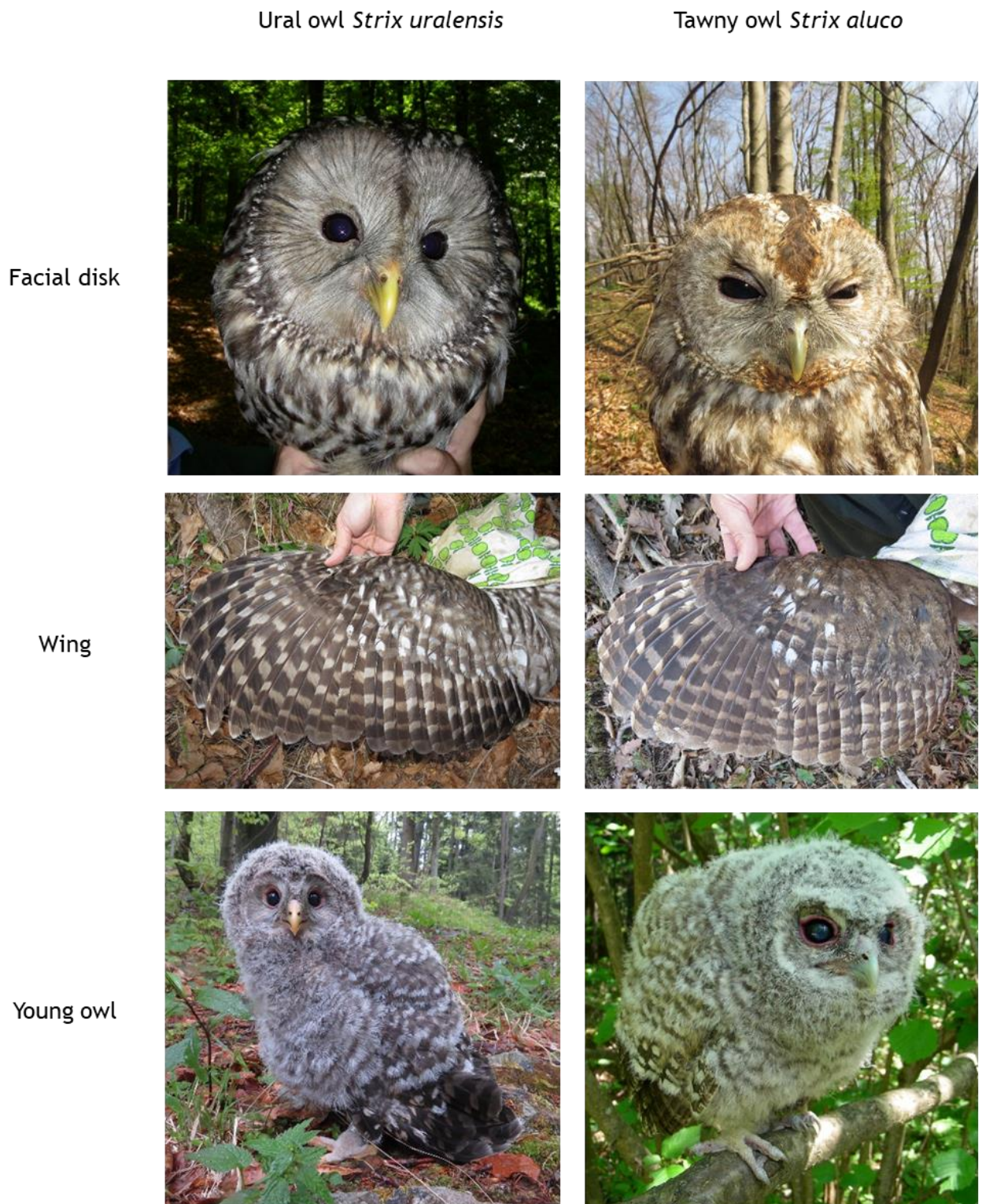


Figure 9. A comparison between the Ural owl *Strix uralensis* (left) and its close relative the Tawny owl *Strix aluco* (right) (photo credit Al Vrezec).

The owl is the most aggressive species of this animal family in Europe. If its little ones are in danger, it can attack humans and larger animals. The Ural tawny owl is active both during the day and at night, while the common tawny owl is mainly a nocturnal animal.

In Slovenia, the central part of its population is found in the Dinaric forests, while in the Alpine regions the species is less common. It mainly populates old Alpine deciduous forests and mixed forests (especially beech and beech-woods), as well as older forests on the plains, mostly oak forests (Figure 10). Even though it is a sedentary species, especially young birds prefer to live on the lowlands in winter, even in the proximity of settlements, in some cases up to 200 km away from the nest. In Italy the Ural owl is rare, and few specimens of it nest along the border with Slovenia.



Figure 10. The living environment of the Ural owl *Strix uralensis* is the old mixed alpine forests and the deciduous forests of the plain (photo credit Al Vrezec).

SIGNS OF PRESENCE

The population of the Ural owl is monitored with the help of the detection of their song during the nesting period. For this purpose, we can also use the so-called playback technique (singing reproduction) for systematic monitoring. The effectiveness of nesting is verified with the help of artificial nests.



Photo credit Al Vrezec

ROSALIA LONGICORN (*Rosalia alpina*)

DIMENSIONS

Body length	♂ 19–47 mm
	♀ 23–34 mm
Weight	♂ 0.12–0.7 g
	♀ 0.20–1.0 g

The *Rosalia longicorn* (*Rosalia alpina*) or Alpine longhorn beetle is a longicorn whose presence is associated with beech forests on carbonate soil (Figure 11). Although it is found in mountainous and alpine areas, it rarely lives above 1500 m above sea level; in Slovenia, it is located between 560 and 1540 m above sea level. The female lays its eggs almost exclusively in dead trunks or old, diseased European beech (*Fagus sylvatica*) very rarely in other deciduous trees such as the Elm tree (*Ulmus*), Hornbeam (*Carpinus*), Lime Trees (*Tilia*), Maple (*Acer*), Chestnut (*Castanea*), Ash (*Fraxinus*), Walnut Trees (*Juglans*), European oak (*Quercus*), Willow (*Salix*), Alder (*Alnus*) and Hawthorn (*Crataegus*). The larvae develop over three to four years. Due to its particular nature

as a species of beech trees, the *Rosalia alpina* is listed as a relict species of the primaeval forest and is a protected species under the Habitats Directive.



Figure 11. The habitat of the *Rosalia alpina* is old beech forests on carbonate soil (photo credit Alenka Žunič Kosi).

The *Rosalia alpina* is considered endangered species in Slovenia (E; OJ RS No 82/2002), and thus protected on the level of individual specimens and its habitat (OJ RS No 46/2004). In Italy, the species is considered as "possibly at risk" (NT) (Carpaneto et al. 2015). Worldwide the species has been classified as "vulnerable" (VU) (World Conservation Monitoring Center 1996). Due to its close focus on old beech trees, the *Rosalia alpina* has been defined in Central Europe as a residual species of the virgin forest and as a priority protected species under the Habitats Directive (Council Directive 92/43/EC).

A major problem for the conservation of the species are beech logs stacked in the forest and later removed for firewood or wood processing. Piles of beech logs represent a highly attractive oviposition habitat for *R. alpina* females. The piles are then removed from the forest before the species cycle is completed and the beetles are destroyed along with the wood removal. The higher threats represent log piles that are left in the forest from July to September. In order to minimise this threat. Current conservation strategies and forestry guidelines recommend avoiding stacking the logs in the forest during oviposition period (i.e June to August). On the other hand, the lack of old beech trunks in the forest is also a problem. In Switzerland, they have investigated whether, when searching for suitable oviposition sites, females prefer large and tall standing trees, which are usually very rare because they are used for economic purposes. For this reason, a protective measure has been proposed: to place logs – particularly in sawmills in the close vicinity of the forest – which could attract females *Rosalia longicorn* and thereby protect part of the brood from destruction during further processing of wood.

Based on the macro-spatial estimate of the longicorn habitat in Slovenia, it was found that the amount of deadwood mass, the slope of the ground (steeper positions), altitude above sea level (the beetle avoids the higher elevations) and proportion of coniferous trees present (since *R. alpina* is associated mainly with the European beech (*Fagus sylvatica*), determine the distribution of the species.

In other parts of Europe, too, the amount of deadwood mass has proved to be one of the key elements of the *Rosalia alpina* habitat; the results of an Italian study also highlights the great importance of a more "open" and semi-open forest with higher numbers of old or dead trees.

Recent studies in chemical ecology of *R. alpina* showed that males produce relatively large amounts of sex-specific compound that belongs to the chemical group of pyrones. The compound acts as a very efficient sex-aggregation pheromone attracting both males and females. In Europe, the use of pheromones in research and monitoring of protected, rare or endangered insect species has proved to be an essential ecological tool. Thus, it is expected that the use of pheromone traps will become a methodological standard for insect monitoring. In the future, it would also be very useful to use pheromone traps in monitoring of the *Rosalia alpina*, so to fundamentally improve the quality of the data collected, effectiveness of the monitoring, and improve assessments of the trends of the species.

SIGNS OF PRESENCE

Adult *Rosalia alpina* specimens are mainly active between July and August. They are most active during the hottest part of the day. *Rosalia alpina* is more frequent in areas exposed to the sun, where it is found on sunny trunks, on old logs or on still standing dead beech trees, on fallen deciduous tree trunks and stacked piles of freshly cut beech wood.



Photo credit Antonio Borgo

THE CHAMOIS (*Rupicapra rupicapra*)

DIMENSIONS

Body length	110–140 cm
Height at the withers	66–86 cm
Weight	25–45 kg

The chamois has specific body adaptations allowing it to live within an alpine context. The winter coat isolates it from the cold by limiting heat loss and facilitating the absorption of sunlight; blood composition (particularly abundant in red blood cells) and peculiar heart anatomy, more muscular and proportionately heavier than that of other ungulates, make him an excellent climber. It has spreading and long hooves with sharp edges, making it easier to climb on steep walls and small rock protrusions. The "rubbery" heels ensure a high grip, the fold of skin between the hooves increases the contact surface allowing it to move comfortably even on fresh snow.

It has a compact body structure, long and strong legs, short head, straight and thin muzzle. Sexual dimorphism is not very marked: both males and females have black/brown hook-shaped horns, growing for the whole life span. Year after years, horns grow from spring to autumn, when they are not thwarted by the production of sex hormones regulated by the photoperiod. The winter

interruption and the subsequent resumption determine the formation of "growth rings", continuous grooves over the entire circumference of the horn, which can be used to determine the age of the animal correctly.

During the winter season, the coat has very thick fur and twice the length of the summer one; it has a dark colour (from dark grey to almost black), with a highlighted white facial mask. The belly and anal area are white. During the summer season, it has variable shades from beige-sand to reddish-brown, with a dark backline. The dark legs and tail contrast with the anal area and the belly, both light.

The ideal environment for chamois is the medium mountain (1200–2500 m) with open spaces and stony grounds, alpine meadows interspersed with areas rich in rhododendron, mountain pine and alder bushes; at lower altitudes, there are wooded areas generally composed of conifers, rich in the undergrowth. An essential feature is the presence of rocky walls and outcropping rocks. It is present in regions belonging to the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park.

As far as feeding is concerned, this species is defined as a poorly specialised ruminant as it can graze grass, buds and young leaves. It is able of making the most of even the least attractive resources. It feeds mainly on herbaceous plants (graminaceous and leguminous plants) avoiding plants with a higher fibre content (twigs of shrubs, rhododendron, blueberry) and resinous ones (fir, mountain pine, etc.).

It is a gregarious species, scarcely territorial, living in groups whose size and composition vary according to the season and the geographical area. The largest groups are made up of females, young born throughout the year and yearling (1–2 years). Young specimens generally stay with females until new births and then they start mixed groups. Adult males are usually solitary, but they can gather in not very stable small groups until the breeding season (from late October to mid-December) when they reunite with females. The gestation period lasts from 25 to 26 weeks after which a single kid is usually born – on rare occasions, twins may be born

SIGNS OF PRESENCE

Footprints (Figure 12): It has two elongated and straight hooves that seem to be separated and leaving a rectangular footprint of about 5–6 cm in length, and 3.5–4.5 cm in width.



Figure 12. Chamois footprints (*photo credit Andrea Vendramin*).

Tracks (Figure 13): The distance between two consecutive footprints varies between 60 and 110 cm. While walking, the two halves of the hoof do not separate, but they remain parallel with a distance of about 1 cm; while running, however, the hooves tend to widen creating a V-shaped footprint, especially with the front feet. Spurs are visible only in case of snowy ground or if the animal jumps.



Figure 13. Chamois track (*photo credit Andrea Vendramin*).

Excrements (Figure 14): Similar to goat ones, their shape, aggregation and dimensions vary according to the diet. Solid winter excrements often have an elongated bullet shape, while softer summer excrements can be almost spherical and slightly flattened. The chamois excrements are 9–18 mm long and 7–11 mm thick. If fresh, they have a dark-green colour and a smooth and bright external surface; later they become lighter and brown colour.

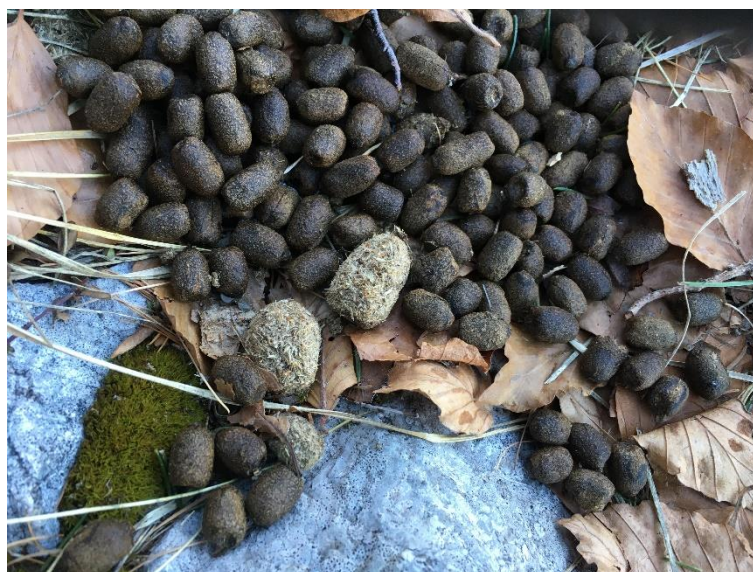


Figure 14. Chamois excrements (*photo credit Sanja Behrič*).

Rubbings: They are left by males on trees and small shrubs in the mating period, to leave scent marks.

Vocalisations: If disturbed, it can emit a kind of whistle to signal an imminent danger before fleeing. The male can grunt to keep females together.



Photo credit Yannick Fanin

ALPINE IBEX (*Capra ibex*)

DIMENSIONS

Body length	♂ 130–160 cm ♀ 120–135 cm
Tail length	8–16 cm
Height at the withers	♂ 85–92 cm ♀ 70–80 cm
Weight	♂ 65–130 kg ♀ 40–65 kg
Horn length	♂ 85–100 cm ♀ 20–25 cm
Horn weight	♂ 4.5–5 kg ♀ 100–300 g

The ibex, a skilled climber, is an ungulate with the short upper body, short and broad head and neck capable of supporting large and massive horns. They have short and pointed ears, large and yellowish eyes with protruding orbits and dark horizontal elliptical pupils.

Alpine ibex moults twice a year, first in spring-summer (April/mid-July); and then again in autumn, when they replace the short summer coat with thicker, longer and pigmented hair, and a woolly undercoat (October–December). While in spring the hair is short, beige or light brown with tufts of a white undercoat, during summertime it gets an iron-grey colour with brown and beige shades. In autumn it is replaced by a thick fur with longer dark brown almost black hairs.

As in all bovids, both sexes have grey-beige curved horns with a basal diameter of 20–25 cm (10–13 cm in females). Their development begins shortly after birth; year after year, they grow from spring to the end of autumn, and they stop in wintertime. The winter break creates an evident annular incision on the horn, called "growth ring", which allows determining the age of the animal (more visible in males). After nine years of age, their growth slows down, and it ends with the death of the animal.

Sexual dimorphism between males and females (bigger males) is due to a different body and horns dimensions. Kids are easily recognizable for their small size, closeness to the mother and playful and immature nature.

This species is present throughout the Alpine area (including the parks involved in the project). It lives above the limit of the arboreal vegetation, in rocky areas characterised by a significant slope and with rupicolous herbaceous formations – above 1600 meters above sea level. Only during spring, animals go down to lower altitudes for short periods to graze in free from snow areas. They spend wintertime on steep slopes facing south, where the snowpack remains for less time.

It is a "selective" pasture animal, highly specialised in concentrated foods but with an excellent ability to exploit roughage. In summer it is present in alpine meadows where it feeds on monocotyledon weeds; in winter it feeds on rupicolous vegetation (grasses such as fescue and lichens) and shrubby vegetation (blueberry, willow, juniper, rhododendron), even dry.

This species is typically gregarious but, apart from the mating period, males and females with their young live in separate groups. Male groups include animals older than 4–5 years and, in spring, they can even increase up to ten ibexes. On the other hand, older animals tend to live a solitary life or they gather in small groups (4–6 ibexes), also including young members. Like the chamois, during the summer period, it is possible to observe the so-called "nurseries", that is groups of kids (up to 15–20) controlled by one or two females, while the other mothers are looking for food.

Mating takes place between December and January. Before this period, dominant males actively sought females in heat, showing the characteristic courtship attitudes: horns upturned on the back, tensed neck and raised tail to show the white anal area. At the end of the gestation, lasting 160–180 days, there is the birth of a single kid that, after a few minutes, can stand up and follows its mother.

SIGNS OF PRESENCE

Footprints: Hooves have firm edges, hard and sharp points; they are rigid and allow them to climb even on almost vertical rocks. The footprint is wide, shallow, flat, with poorly defined contours; front portions are rounded, while rear parts are very close. Male footprints measure about 8 cm long and about 6 cm wide. Female ones, on the other hand, are about 7 cm long and about 4 cm wide. Footprints left by front hooves are larger than those left by hindquarters.

Tracks: The distance between two consecutive footprints varies from 60 to 120 cm. Compared to the chamois, they are stronger and more marked. While walking, rear and front hooves are partially overlapped; at faster speeds, they appear paired since rear hooves are placed in front of front ones.

Excrements (Figure 15): Deposited individually, they have variable shape and volume with a more or less cylindrical, oval or rounded section. Maximum diameter, in the central part, measures from 6 to 11 mm, the length is from 8 to 17 mm. In summer they have a uniform greenish-black colour, while in winter they appear yellowish-brown. It is challenging to distinguish them from chamois' excrements (smaller, elongated and darker) and domestic goat's ones (more voluminous, dark and rounded with a pointed end).



Figure 15. Droppings of the Alpine ibex (*photo credit Marco Favalli*).

Vocalisations: Short hissing, repeated just seconds away as a danger and uneasiness signal.



Photo credit Davorin Tome

BROWN BEAR (*Ursus arctos*)

DIMENSIONS

Body length	130–250 cm
Height at the withers	75–120 cm
Weight	♂ 70–250 kg
	♀ 70–160 kg

The brown bear is one of the largest terrestrial carnivores. It is a plantigrade with massive and heavy shapes; it has a large head and pointed muzzle with a large, mobile black nose, small eyes, short and rounded ears, robust limbs and five thick claws.

The coat is thick, generally dark brown with black or grey shades, but it can also be blond; young bears have a typical white collar. There is a sexual dimorphism between males and females and the latter are smaller.

It does not have good eyesight, and it relies more on its sense of smell and hearing to explore the surrounding environment and to warn danger.

It prefers living in mountain forests up to 1500 m above sea level, with intense forest coverage and harsh morphology, but it has an excellent ecological adaptation. Population density is very high in Slovenia and especially in the area of northern Dinarics. From there, individual bears can gradually migrate to the alpine space of the Friuli Venezia Giulia region in Italy. Brown bears are present in all the Nat2Care project partner areas, in the Regional Natural Park of the Friulian Dolomites, the Regional Natural Park of the Julian Pre-Alps, and the Triglav National Park.

Its distribution is influenced by food availability, presence of females in the area, population dynamics, presence of conspecific animals and anthropic disturbance.

Bear is an omnivorous animal. It can adapt to the various seasonal food availabilities, selecting the richest food in terms of energy according to the season. Its diet is mainly composed of vegetation (80 %) such as herbaceous plants, buds, tubers, bulbs and fruit that are consumed in large quantities (up to 15 kg per day), especially before hibernation. Animal food of the bear is mainly composed of carrion and insects (honeybees, wasps, ants). On rare occasions, it is capable of capturing wild ungulates or livestock (sheep).

The brown bear is a solitary, nocturnal and sparsely territorial carnivore; it usually lives at very low densities (2–3 adult bears per 100 km² in an alpine area), and its home-range can overlap with that of other animals. Tolerance between males is low, higher between males and females. During the mating period (between May and July), males can make long journeys to mate with one or more partners, unlike the females who are much more tied to their native territory.

The gestation period generally lasts 7–8 months. The implantation of the egg in the uterine membrane takes place only in late autumn when the female prepares for overwintering. The actual gestation lasts only two months because fertilised eggs stop their development for about five months (diapause). Cubs, generally from 1 to 3, are born in January in the den. At birth, cubs weigh about 300 g, they are blind, deaf, hairless and definitively abandon the den between May and June, when they are already able to walk. They are breastfed for 6–7 months and, at one year of age, they can reach 30–40 kg. They stay with their mother till their second year of age, and then they abandon her, to search for their area. It is the mammal with the greatest weight difference between birth and adulthood.

During winter (the period between November and March), usually bear naps, which is not hibernation in its real sense. For winter sleeping, the bear finds a den, which can be a rocky and dry cavity which is exposed to south/south-east (the warmest side). During this period it lowers its vital parameters to limit energy losses as much as possible and consumes the previously accumulated fat reserves. The duration of this period varies according to environmental conditions (geographical latitude, snow cover, food availability, temperature).

PRESENCE SIGNS

Footprints (Figure 16): They are the biggest living mammal footprints identified in Europe. They have a flattened shape (hence the name plantigrade), and five claws characterise them. The front leg footprint is shorter and broader (approximately 17 x 11.5 cm) than the rear one (11.6-17 x 17-28 cm), which vaguely resembles the shape of a human foot where, however, the largest toe is the external one.



Figure 16. Brown bear rear print (left) and front print (right) (*photo credit University of Udine archive*).

It generally has a "swinging" gait: it raises a rear leg and then the front one on the same side, placing all the weight on the legs of the opposite side, firmly on the ground. The step measures 80–110 cm but can go up to 150 cm, and footprints always converge towards the centre (Figure 17).



Figure 17. Brown bear tracks on snow, where it is possible to observe the overstep of the rear foot (left); and on mud (right) (photo credit University of Udine archive).

Excrements (Figure 18): They are easily recognizable from other species because of their size; colour, smell and consistency vary concerning the food (if not well digested it will be possible to find it inside the stools). They can be found in the territory where the bear lives.



Figure 18. Brown bear faeces (photo credit University of Udine archive).

Vocalisations: Called growl, the bear's sound can vary in intensity and tonality depending on the situation. It is, however, difficult to hear it, since it is a silent animal.

Scratchers (Figure 19): Debarkings made with claws, even in places where the animal feeds.



Figure 19. Brown bear scratcher (photo credit University of Udine archive).



Photo credit di Yannick Fanin

GOLDEN JACKAL (*Canis aureus*)

DIMENSIONS

Body length	90–100 cm
Tail length	20 cm
Height at the withers	45–50 cm
Weight	10–18 kg

Often confused with a small wolf or a large fox, the golden jackal is a medium-sized canid with a slender body and a short tail. The muzzle is sharp, and the auricles are large and triangular, ending in a red tip. The winter coat is generally reddish-grey with black or rusty red ends of the longest hairs. The face mask, except for the muzzle, is rusty red and ocher; above the eyes, it has a black stripe. The lips, cheeks, chin and throat are off-white. The summer coat is more sparse, coarse, shorter and it has the same colour as the winter one, but shinier and less dark. The dorsal area has long streaked grey-brown hairs, getting more black in three different areas: the neck (from the nape to the scapular area), the back and the caudal apex. Sexual dimorphism is poorly marked, but females are generally around 12 % smaller than males.

It finds ideal living conditions in plains, hills and mountains, with a preference for open ecotonal regions, characterised by alternation between meadows and shrubs or sparse woods. It adapts to

live close to anthropic settlements by taking advantage of the availability of trophic sources offered by men, such as the abandonment of livestock waste and crops.

The distribution of the species is in dynamic evolution, as in the last decades the population has undergone significant variations both in distribution and in abundance. The diffusion in Italy is still underestimated, but jackal presence is ascertained within the Regional Natural Park of the Julian Pre-Alps, as well as in the Regional Natural Park of the Friulian Dolomites. In Slovenia, distribution of the jackal is closely monitored, and its presence was also confirmed within the Triglav National Park.

The golden jackal is a polyphagous animal and an opportunistic carnivore. Its diet may vary depending on the habitat, the season and the availability of food. The animal origin intake is made up of rodents, micro-mammals, birds, reptiles, placentas of domestic and wild ungulates, wild boar carcasses and entrails of culled ungulates. Predation events involving medium-sized ungulates such as roe deer and sheep are possible, especially to the detriment of the weakest individuals (young, injured, and old animals). It can also feed on insects, especially during weaning, and on plant material (sweet fruit, roots, tubers, herbaceous plants).

The social structure is based on the pack, similar to that of wolves, but the groups are smaller. The pack consists of a male and a female, a reproductive couple, and offspring. Additionally, a young jackal born in the previous year may also be present in the pack, that performs the function of helper in caring for the offspring.

Reproduction occurs between monogamous couples during February and March. Before giving birth, the female takes refuge in burrows about one meter deep and 2–3 m long. After a gestation of about 60–63 days, it gives birth to 3 to 6 pups. Pups born in spring remain in the pack until October/November when the dispersion begins. The dispersion refers to the estrangement of the animal from the family group, and it can travel many kilometres before finding a suitable area where to settle and give life to a new pack.

SIGNS OF PRESENCE

Footprints (Figure 20): They are 6–7 cm long and about 4.5 cm wide; they always show the claws (as they're non-retractable) and, in general, they are larger than the fox ones.

Tracks: Step length (distance between the footprints of the same limb) ranges from 40 to 60 cm, and it usually is well-aligned along an imaginary straight line. The trot has a loose, poorly ordered gait and limbs are very close together. Its gait is similar to the wolf's one, but it appears lighter.



Figure 20. Golden jackal footprints (*photo credit Yannick Fanin*).

Excrements (Figure 21): They are generally left in stacks of several segments (from 4 to 6) at the edge of the territory, in visible areas. They are similar to dogs' stools, but the diameter is half-way between that of a fox and a wolf. They contain hair and part of the ingested food; they are about 4 cm long with a diameter of 3 cm.



Figure 21. Golden jackal faces (*photo credit Yannick Fanin*).

Vocalisations: There are four common categories of vocalisations, including the bark (a short emission to express threat or alarm signal), the bark-howl (short series of close barks to communicate the presence of a significant threat), the single howl (vocalisations of high intensity to maintain contact between individuals), the group howl (more individuals emit simultaneous or alternating howls, used to strengthen the bonds within the group and to defend the territory).



Photo credit Gabriele Bano

EURASIAN LYNX (*Lynx lynx*)

DIMENSIONS

Body length	80–130 cm
Tail length	15–20 cm
Height at the withers	55–75 cm
Weight	♂ 20–30 kg
	♀ 15–20 kg

The Eurasian lynx is an elegant medium-sized feline with a "tall rear" posture, long legs and narrow thorax. It has a small skull with a round muzzle, characterised by the presence of a facial beard made up of long white hairs. The eyes are positioned frontally to allow an excellent night vision.

The ears are triangular, thin, fleshy and equipped with characteristic black apical tufts, about 5 cm long. The tail is short, almost cut off, with a typical apical black band.

In summer the coat is reddish-yellow with evident spots on the back; in winter it gets more grey with less visible spots. Spots are highly variable between animals and, even in our areas. It is possible to find spotted-coat lynxes (round spots), tabby-coat lynxes (pseudo-streaks) or lynxes

with almost homogeneous colouring. The lower part of the body, the throat, the lips, the contour of the eyes and the inside of the ears are white.

The typical habitat in which it lives is the mixed forest, with abundant clearings and many other ungulates; however, its territory also includes small inhabited areas and abandoned ruins. The density of preys, the structure of the forest (source of refuge and hunting area), the presence of the rocky regions, the presence of other predators and the quantity and type of precipitation profoundly influence the habitat choice. It can travel long distances within the same valley just to follow prey, and it can reach 2000 m above sea level.

The lynx from the alpine population is present in areas belonging to the Regional Natural Park of the Friulian Dolomites, but also in the Regional Natural Park of the Julian Pre-Alps. Consequently, it is essential to encourage connectivity between this population and the Dinaric population, also present within the Triglav National Park.

The lynx is at the top of the food chain, it has highly developed senses (mainly sight and hearing), and it is capable of making great leaps and quick shots. It is a tight carnivore that hunts, especially during twilight hours. Once the prey animal is captured, it first turns the skin inside out and then it begins to eat the prey, starting from the hindquarters. Its preferred prey is the roe deer, but its diet also includes insects, reptiles, birds, small mammals (dormouse) and other ungulates, such as red deer and chamois.

It is a territorial and solitary feline, easily recognizable (larger than the wildcat) but rarely spotted. Apart from the reproductive period, it avoids contact and proximity to other specimens. The mating season takes place between the end of January and March and the gestation period of the female lasts about ten weeks. Between April and May, it gives birth to 2 kittens on average (from a minimum of 2 to a maximum of 4) and they are weaned after 12 weeks.

SIGNS OF PRESENCE

Footprints (Figure 22): They're very similar to those of the wildcat, but larger (6–8 cm). The rear footprint is 1 cm shorter than the front one. Its footprint is made up of 4 fingers and has an oval shape. A plantar pad is slightly asymmetrical, advanced and moved laterally, and it shows the claws (retractable) only on the hostile, frozen or muddy ground. Compared to those of the canids, in addition to the fact that the claws are not visible, it has asymmetrical fingers, and the plantar pad is three-lobed. Length: 5–8 cm; width: 5–9 cm.



Figure 22. Lynx footprint on mud (left) and snow (right) (photo credit University of Udine archive).



Figure 23. Left: Lynx footprints at unregistered pace. Left-handedness is evident. Right: Lynx footprints at perfectly registered pace: this means that the rear footprint overlaps the front one (photo credit University of Udine archive).

Footprints run in a straight or slightly winding line (Figure 23). The length of the step, i.e. the distance of the footprints left by the same paw, ranges from 75 to 120 cm. While running, it can reach 250 cm. The gait of the lynx is called left-handed because the footprints diverge from the centre outwards.

Excrements (Figure 24): They are composed of several cylindrical segments, which measure about 2–3 cm in diameter and 3–5 cm in length. However, they can also expel whole excrements with a length of 20–30 cm. Hairs or bone fragments, feathers and such are often visible. In winter, stools can be shapeless and almost liquid. They are usually covered with snow, dirt or foliage, preventing them from being identified.



Figure 24. Lynx faeces (photo credit University of Udine archive).

Vocalisation: Screams, purr, growl, hisses are characteristic for lynx. Communication between lynxes takes place with shrill vocalisations repeated 3–4 times, especially during the reproductive period and in the relationship between mother and baby.



Photo credit Paolo Da Pozzo - AFNI

EURASIAN OTTER (*Lutra lutra*)

DIMENSIONS

Body length	60–85 cm
Tail length	55 cm
Height at the withers	30 cm
Weight	6–15 kg

The otter is a lively medium-sized mammal belonging to the weasel family and characterised by a hydrodynamic structure with a large, rounded head, flattened muzzle, short neck, cylindrical and very elongated upper body, short limbs with fingers joined together by a hairless membrane. The tail is more than half of the body length, and it's robust and muscular. The eyes are small, and the auricles are rounded and short and completely hidden in the fur. The coat consists of a thick fluff holding air bubbles inside and making it waterproof, allowing it to maintain ideal body temperature. In the upper parts, the coat is dark brown with grey reflections on the back and the sides; in the lower parts, it has a lighter shade, getting more white-fawn or cream. Sexual dimorphism is not very accentuated: females are slightly smaller and lighter. When in the water it can be confused with coypus because swimming and shape appear similar.

Closely linked to water, it lives near rivers, streams and mountain lakes up to an altitude of 2000 m. We can also find it near ponds, marshes, lagoons and river mouths where there is an alternation of calm waters and currents with the presence of fish. It requires a thick herbaceous and shrubby vegetation along the banks, allowing it to create shelters that are essential for its survival and puppies; it usually uses reeds to create pallets. Otters are present in all the Nat2care project partner areas, but it is not easy to spot them.

The otter is a carnivore and feeds mainly on fish, amphibians, reptiles and aquatic insects. It has almost exclusively nocturnal habits, but it can also be active during the day in areas with little disturbance; during those periods, it mainly moves along waterways and then it travels long distances on the ground. It is a territorial and solitary animal, except for the mating season (which occurs regardless of the season) and the weaning of puppies. Gestation lasts about nine weeks, and it ends with the birth of 1–5 blind puppies inside a den; they are breastfed for 7 to 14 weeks. During weaning, they learn hunting techniques from their mother and start swimming when they are three months old. Offspring become independent when they are ten months old and, after a year, they abandon their mother to go looking for their territory.

SIGNS OF PRESENCE

Footprints (Figure 25): They are easily visible near watercourses (especially under bridges), where the substrate is muddy or sandy. The footprint is rounded with visible fingertips and claws: the front one is more rounded (length and width of 5–7 cm) while the rear one is more elongated (length 6–9 cm, width 6 cm). The interdigital membrane and the thumb are not always visible.

Tracks (Figure 26): The Otter can stride, trot, leap or gallop. When walking, rear footprints overlap front ones, resulting in side by side. The distance between footprint groups is approximately 35 cm. When running, four footprints are visible and do not overlap, and the distance increases up to about 50 cm. When galloping, footprints are placed obliquely next to each other: the front one is the right front footprint, followed by the right rear one, the front and the left rear ones. When jumping, however, it leaves ordered groups of 4 footprints on the ground with a distance between 80 and 100 cm.



Figure 25. Otter footprints (photo credit University of Udine archive).



Figure 26. Otter track (photo credit Lorenzo Frangini).

Excrements (Figure 27): They create clearly visible and recognizable heaps; they can contain prey remains, including flakes, and they are always left in the same places – along watercourses where they live or at the entrance of the den. If fresh, they are black and give off a strong and unpleasant smell of fish oil; over time, the colour fades, and they become similar to cigar ash.



Figure 27. Otter faeces (photo credit University of Udine archive).

Vocalisation: Otter produces different sounds, such as squeaks, barking, high-pitched and modulated hissing used as amorous calls, dull laugh, rumblings, puffs, peeps.

Slides: They are long smooth channels on the banks of the watercourses, used daily for sliding in the water. They are visible since the grass is crushed or missing.

Shelters: They can differ. Pallets are open-air shelters where they usually rest (e.g., reed pallets); shelters are located in holes between large rocks or under trees and bushes roots, and they are used for daytime, night time rest and for reproduction; dens are used for childbirth and breeding puppies; they do not usually build them themselves, but they use and readjust existing ones (e.g. fox or badger).



Photo credit Paolo Da Pozzo - AFNI

EUROPEAN WILDCAT (*Felis silvestris*)

DIMENSIONS

Body length	45–60 cm
Tail length	25–34 cm
Height at the withers	35–40 cm
Weight	3–5 kg

The wildcat is a small felid similar to the domestic cat, being sometimes challenging to distinguish them. Unlike the latter, the wildcat is more robust, with thicker and longer fur. The coat presents the main feature to consider: four black lines on the nape, another central one which is sometimes slightly visible, one single dorsal black line, two scapular black lines and a short, stocky tail with a thinned apex with evident separated black rings. Paws are partially black. It has a round skull with a short muzzle and large eyes. The coat is yellowish-grey with a whitish throat, breast and chin. Sexual dimorphism is not marked: the male is bigger, and its head is more massive. The distribution area is fragmented, and in fact, it is considered a rare species in all the areas where it is reported.

It lives mainly in forest environments, especially deciduous forests and at altitudes ranging from 1000 to 1500 m above sea level. It usually avoids areas subject to excessive snow. It is a solitary, nocturnal and territorial species, which defends the borders of its territory with odorous and visual markings. Strictly carnivorous, it prefers mice and voles, but it also feeds on hares, birds, reptiles or insects. The mating season is in spring. After a gestation of about two months, the female gives birth to 1–6 kittens. After one year, they reach sexual maturity and abandon their mother to discover new territories.

SIGNS OF PRESENCE

Footprints (Figure 28): They are rounded and without retractable claws. First footprints have five fingers, rear ones only four. The footprint is slightly wider than the domestic cat ones, and they're more similar to the lynx ones, even if smaller. Rear and front footprints sizes are almost identical: length 4 cm, width 3–4 cm.



Figure 28. Wildcat footprint (*photo credit University of Udine archive*).

Trails (Figure 29): Footprints are crossed at stride and trot: they follow a zig-zag line with rear footprints overlapping front ones. The step measures 50–60 cm. At a gallop, footprints are grouped by four, and they follow an arched line in which rear footprints are close to first ones along the same side (Figure 30).



Figure 29. Wildcat trail (*photo credit University of Udine archive*).

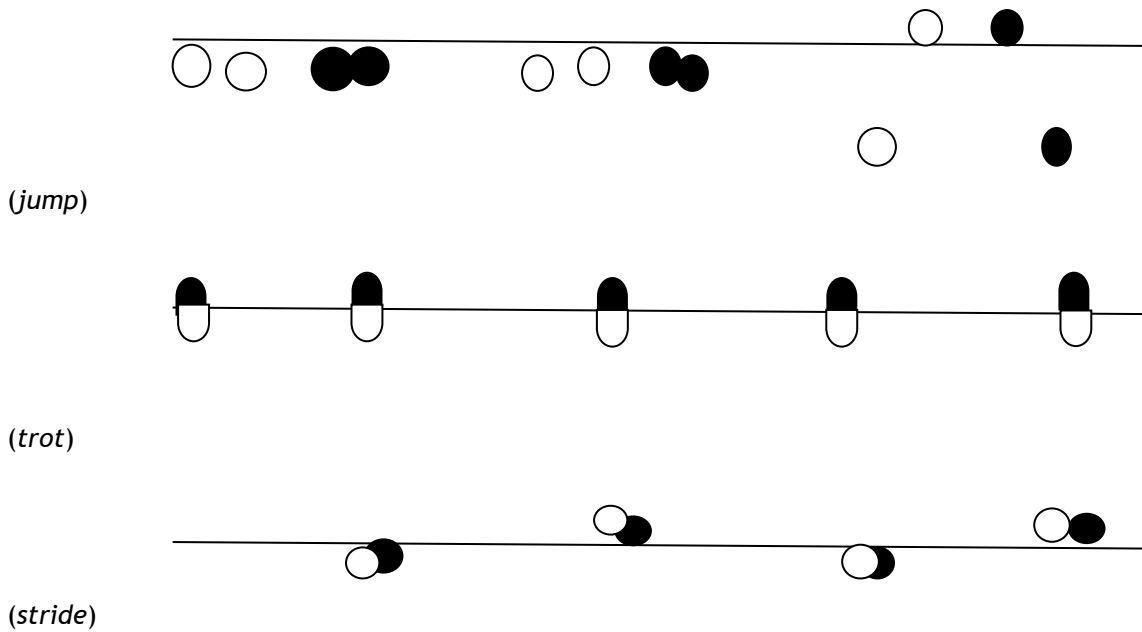


Figure 30. Wildcat gait pattern. Black circle: front paw; white circle: rear paw.

Excrements (Figure 31): Stoods are cylindrical, pointed at the end. They have a diameter of 1.5 cm, and they are similar to the fox ones. They have a strong and unpleasant smell, such as the domestic cat ones. They are often covered.



Figure 31. Wildcat faeces and detail of the tail (photo by Andrea Vendramin).

Vocalisation: It is similar to the domestic cat one. It emits prolonged meows, screams, and deep murmurs during the mating season.



Photo credit Paolo Da Pozzo - AFNI

GREY WOLF (*Canis lupus*)

DIMENSIONS

Body length	90–150 cm
Tail length	30–40 cm
Height at the withers	50–70 cm
Weight	♂ 25–45 kg
	♀ 23–30 kg

The wolf is a large canine with slender shapes, short ears and a short tail. Its morphological characteristics vary according to the environment, but the primary colour of its coat is yellowish-brown with tawny areas in spring and greyish in winter; it also has typical black bands and the black tail tip, lasting throughout the year. The size mainly gives the difference between sexes: the male is stronger than the female.

The wolf can be easily confused with some domestic dog breeds, such as the Czech Wolfhound, from which it stands out because of some coat features, often difficult to notice. It can also be sometimes confused with the golden jackal, another canid species present in Italy and Slovenia but smaller in size and with a more reddish ocher coat.

The characters identifying this species are: yellow eyes, triangular ears, short cylindrical tail kept low and parallel to legs, coordinated movements and a white mask colouring the muzzle and cheeks.

It lives in hilly and mountainous areas from 300 m to 2500 m above sea level; those territories are characterised by the alternation of pastures and woods, with a reduced human presence. Its presence is confirmed in Slovenia, within the Triglav National Park, in the Friuli Venezia Giulia region, also within the Regional Natural Park of the Friulian Dolomites and in the Regional Natural Park of the Julian Pre-Alps.

Its home range can vary from 100 km² up to a maximum of 450 km²; the size of a territory depends on the trophic availability, the number of individuals in the herd and the presence of nearby packs, while the morphology of the territory itself mainly influences the shape. Besides, the occupied territory undergoes seasonal dimensional variations. In the summertime, it is mainly concentrated around the so-called "rendezvous" site, that is, the place where the offspring born during the year are kept.

It is an opportunistic predator, capable of exploiting all the resources available in the environment supported by hearing and vision but, above all, by the smell which is a very developed sense. Ungulates represent its elective preys, but it does not disdain smaller animals as its daily intake varies between 2 and 4 kg of meat. After predation, it can endure long periods of fasting. When attacking, it aims at the throat, unlike dogs causing messy bites and wounds spread throughout the body. In the case of large animals, it can focus on rear limbs first and then biting the throat or the face, to cause deep bleeding lesions and to lacerate muscle bundles and weaken the prey. Its diet also includes a plant component and human resources, such as waste and domestic livestock, if easily accessible.

It is a highly territorial species, it lives in packs consisting of 2 to 11 wolves (on average 4–5 animals) with the leading dominant Alpha couple.

The dominant couple usually is the only one to reproduce during the mating season, between January and March, but there might be exceptions. The gestation lasts about 63 days, and it leads to the birth of 1–5 puppies inside a den dug in the ground. Until 10–12 days of life, puppies are blind, and they are breastfed for about two months; after this period, they are fed with regurgitated food, small preys or parts of larger preys. Not reproducing adults help the female to look after puppies, increasing the survival chances of the offspring. During the second year of life, sexual maturity is reached, and the Alpha couple puppies can decide whether to stay in the pack (trying to acquire the dominant position) or to start the dispersal phase. During the dispersion, they can colonise areas far away from their original one, favouring the expansion of the species.

SIGNS OF PRESENCE

Footprints (Figure 32): They are difficult to distinguish from those of a big dog, even if they have a more elongated shape. Front footprints only show four fingers because the fifth one is placed at the top and central digital pads are always united; rear footprints still have four digits, but they're shorter and narrower. However, rear footprints are not distinguishable from front ones: length 8–12 cm, width 6–10 cm. The non-retractable long claws are always visible in footsteps, as in all the canids.



Figure 32. Left: Front and rear footprint of a wolf in mud (*photo credit Andrea Vendramin*). Right: Wolf footprint in the snow (*photo credit Andrea Vendramin*).

Tracks (Figure 33): When walking, rear footprints overlap front ones and follow one single line (not a zig-zag line as in dogs). When running, footprints are grouped by four: first of all rear ones, then front ones. When a pack moves on snow, wolves retrace the same footsteps of previous specimens to limit energy waste. When finding an obstacle, the pack spreads out like a fan, allowing to count a minimum number of animals constituting the pack. The step measures 80–90 cm while walking, up to 150 cm while running and about 120–130 cm while trotting.

Excrements (Figure 34): Cylindrical, they are similar to those of a dog but with a powerful and acrid smell. They measure 10–15 cm long and 2.5–3 cm in diameter. The colour varies concerning the diet, ranging from black to whitish, and they always include hair and bone fragments. They are usually placed on the edge of the area where the individual wolf or the pack lives.



Figure 33. Left: Trails of two wolves. Right: Trails of wolves (*photo credit Andrea Vendramin*).



Figure 34. Wolf faeces (*photo credit University of Udine archive*).

Vocalisation: It includes a wide range of vocalisations such as howls, barks, yelps, and long aggressive barks.

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