

EB Montseny

SEGRE Project in Montseny Natural Park – report 2024

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Introduction

Monitoring ecosystems is important for understanding their long-term dynamics, regulations, and health parameters, but monitoring every species would be exhaustive and very challenging. Therefore, choosing indicator species allows us to observe changes in the environment through their presence or absence, population increase, or decline over time. Apex predators could be potential indicator organisms since they are at a high trophic level in the food web¹. Changes in their populations can indicate changes in their prey species, which can be caused by environmental changes such as alterations in vegetation structure or non-organic environmental shifts. Raptors, in particular, could be potential indicator organisms for studying an environment. Most raptors are territorial, with territory sizes dependent on habitat quality. Many species reproduce slowly. They need several years to reach maturity and establish their own territories, and they raise a small number of offspring, which they care for over an extended period². Therefore, changes in their populations and territory sizes can indicate changes in their habitat.

Due to their crucial role in the ecosystem, it is important to monitor raptor populations, especially after the decline of many species across Europe and globally due to their intensive persecution and indirect harm (e.g. habitat loss) in the 20th century³. For a long time, there was no standardized monitoring method in Catalonia. Because of their low density, raptors are hard to detect, and although there were areas with their own monitoring schemes, the different methodologies meant that results could not be compared on a region-wide scale, especially for forest raptor species. To address this issue, the Institut Català d'Ornitologia (ICO) established a new monitoring scheme in 2019 to survey forest species in Catalonia: the SEGRE project (general raptor monitoring in specially protected areas, in Catalan: SEguiment General de Rapinyaires en Espais naturals protegits) with the support of the Provincial Council of Barcelona and the Department of Climate Action, Food and Rural Agenda of the Generalitat of Catalunya^{4,5}.

The aim of the project is to carry out standardized monitoring of various species of forest raptors in Catalonia. Besides the raptors, four corvid species are also included in the project: the northern raven (*Corvus corax*), the carrion crow (*Corvus corone*), the alpine chough (*Pyrrhocorax graculus*), and the red-billed chough (*Pyrrhocorax pyrrhocorax*). The project seeks to determine long-term trends in raptor populations and the number of breeding pairs. Additionally, it aims to detect population changes over time and establish comparable patterns of abundance between SPAs (Special Protected Areas) and at the regional level. By achieving these objectives, the project will fill knowledge gaps and contribute to the conservation of raptor populations in Catalonia. The EB Montseny participates in this project in three sampling areas in the Montseny Natural Park and Biosphere Reserve. Our goal is to continue the project in these sampling areas by following its protocol in 2024, contributing to the long-term goals of the SEGRE Project.

Materials and methods

The SEGRE Project uses the 2.5x2.5 km UTM grid system of Catalonia to determine sampling areas (squares) over SPAs. Within these squares, a single point is chosen to provide the best potential visibility of the area. While the highest point often offers the best visibility, it is essential to prioritize points that allow for better contrast with the background, because raptors

are more easily seen against the sky than against a forest canopy. Additionally, the points should preferably be oriented to the northwest to avoid facing the sun. Some general aspects of the project must be taken into account for the census. The four surveys, one within each period (1 March – 15 April, 15 April – 15 May, 15 May – 15 June, and 15 June – 15 July) must always be repeated at the same observation point, at least 14 days apart between two surveys. Observers should remain consistent throughout the year and between years as much as possible to reduce observation bias. Observations must be made from distances that do not cause discomfort to the specimens. Although detecting active nests is not the project's aim, nests may sometimes be observed from the observation point. In such cases, unnecessary approaches to the nests should be avoided, and the number of eggs or chicks should not be checked beyond what can be observed from the observation point.

We followed the protocol of the SEGRE Project in our three squares. The observation points were: Montsoriu Castle (code: DG62_02), St. Pere Desplà (code: DG53_20), and Fontmartina (code: DG52_11). Because of the structure of the ESC volunteering, the observers were different this year from the previous two years. However, to maintain a consistency throughout the year, at least one of the volunteers (Péter) was present in all surveys. The use of spotting scope is not obligatory, but this year we used Péter's scope in all surveys. In each survey, the observers wrote down the date, name and code of the squares, participants, and whether spotting scope was used or not on the field sheet. Furthermore, the weather conditions (cloud cover, precipitation level, temperature range, wind direction, and intensity (Picture 1) at the end of the survey, even if they did not detect any raptors or corvids during the three-hour survey period, which lasted from 9 am to 12 pm. If the survey could not start at 9 am due to weather conditions or external reasons, or if a break was needed, then the survey time had to be extended by the same amount of time as the delay or interruption. Whenever a raptor or one of the listed corvids was seen or heard within the survey time, the observers noted the species name, number of individuals, start and end time of the observation, and the behavior code. They then indicated the location of the observation on the map using the observation's number. The location was marked where the highest-ranking behavior (Picture 2) was observed. If the individual(s) were migrating, the mark was placed around halfway along their trajectory within the square. If birds likely to be local were observed in the appropriate habitat or exhibited particular breeding behaviors, we marked the spot on the map where we observed the behavior. After the survey, the data was uploaded to the website of the project.

Wind intensity			
	Code	Description	Speed (km/h)
0	Calm	Smokes rises vertically	<1
1	Light air	Smoke drift indicates wind direction	1-5
2	Light breeze	Leaves rustle	6-11
3	Gentle breeze	Leaves constantly moving	12-19
4	Moderate breeze	Small branches begin to move	20-28
5	Fresh breeze	Small trees in leaf begin to sway	29-38
6	Strong breeze	Large branches in motion	39-49
7	High wind	Whole trees in motion	50-61
8	Gale	Some broken twigs from trees	62-74
9	Strong gale	Slight damage to homes	75-88

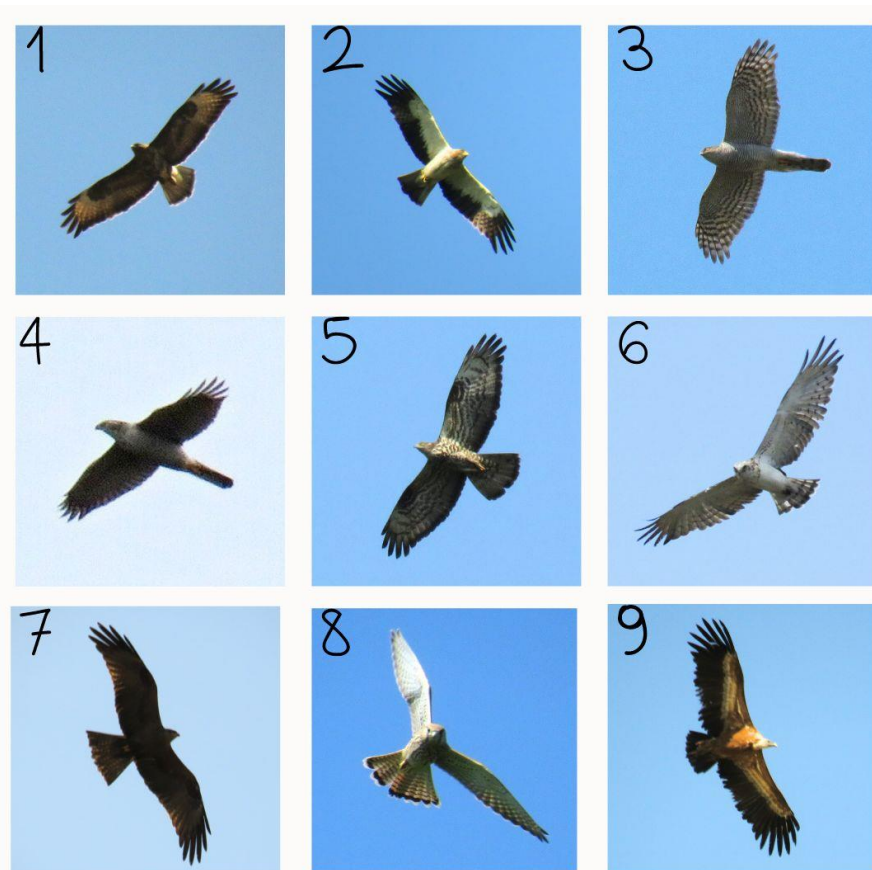
Picture 1: Wind intensity scale for the SEGRE surveys. The scale identifies 10 categories with their code, description and wind speed.

Behaviour	
Code	Description
Obs.	Observation in the adequate period and habitat.
Territ.	Territorial marking, mating flight (flight up and down and/or grabbing claws).
AdCrits.	Adult vocalizations.
Còpula	Copulating.
ConstNiu	Transporting material to build the nest.
AdNiu	If you found the nest with the adults.
PollNiu	If you found the nest with the chicks.
Poll	If you found nestlings.
AdPres	Adult bringing prey to the nest.
Migrant	Migrating (usually going in one direction, flying high, typically North).

Picture 2: Behaviour categories for the SEGRE surveys. If the observed individual shows multiple breeding related behaviour categories during the time of observation, the stronger category needs to be indicated.

Results

During the 2024 census, we conducted 12 surveys in total, 4 in each square. Break was not needed during the surveys, but 6 surveys started later than the defined starting time, in the Sant Pere Desplà for the 3rd and 4th survey due to unforeseen travel conditions, and for all four surveys in the Castell de Montsoriu, because of the opening hours of the castle. It effected seriously the timing of the 2nd, 3rd and 4th surveys at this square, each of these surveys started more than 1 hour 13 minutes after 9am. Despite the difficulties, we made 92 observations of 9 raptor and 2 corvid species (Figure 1), not counting the 6 observations in which we could not determine the species. The most frequently seen raptors were the common buzzard (*Buteo buteo*) (25), the booted eagle (*Hieraaetus pennatus*) (11), and the Eurasian sparrowhawk (*Accipiter nisus*) (9). Among the corvids, the northern raven had the most observations, with 22 observations. Compared to the previous years data, three species were not detected; the peregrine falcon, western marsh harrier (*Circus aeruginosus*) and osprey (*Pandion haliaetus*), but a new species, the black kite (*Milvus migrans*) was observed in one of our squares.



Picture 3. The nine raptor species which have been observed by the EB Montseny volunteers in 2024. In order: common buzzard, booted eagle, Eurasian sparrowhawk, Northern goshawk, European honey buzzard, short-toed snake eagle, black kite, Common kestrel, Eurasian griffon. Photos taken by Péter Imre Fábíán.

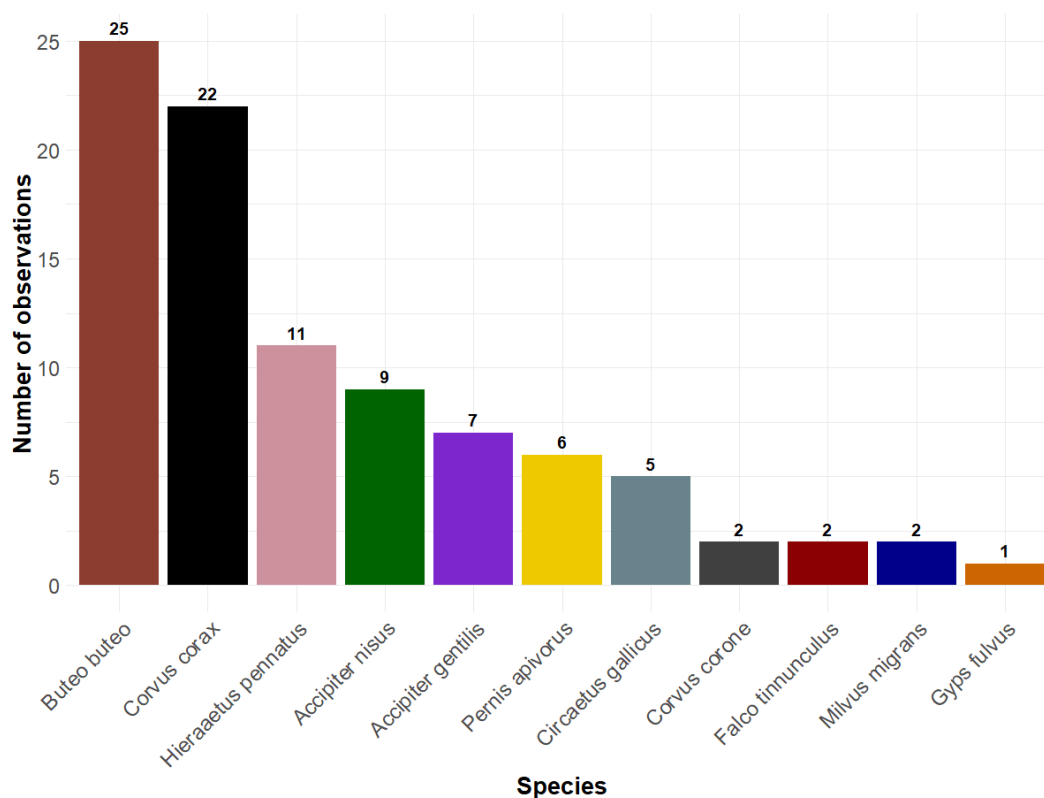


Figure 1. Frequency of all observed raptor and selected corvid species in all three squares combined within the 2024 census period.

The number of species observed in each square was the same, with 7 species in each (Figure 2). However, the composition of species differed between squares. The common buzzard, booted eagle, and Eurasian sparrowhawk were present in all squares. Three species were seen in two out of three squares: the European honey buzzard (*Pernis apivorus*) and carrion crow (*Corvus corone*) were detected only in Castell de Montsoriu and Sant Pere Desplà, and the short-toed snake eagle (*Circaetus gallicus*) in Sant Pere Desplà and Fontmartina. Among the potentially local species, the common kestrel (*Falco tinnunculus*) and northern goshawk (*Accipiter gentilis*) were observed in Fontmartina. Two species were present only as migratory species: the black kite was observed in Sant Pere Desplà, and griffon vultures (*Gyps fulvus*) in Castell de Montsoriu. In each square, the buzzard was the most frequently seen raptor, followed by the booted eagle and northern goshawk in Fontmartina, European honey buzzard in Castell de Montsoriu and Eurasian sparrowhawk in Sant Pere Desplà.

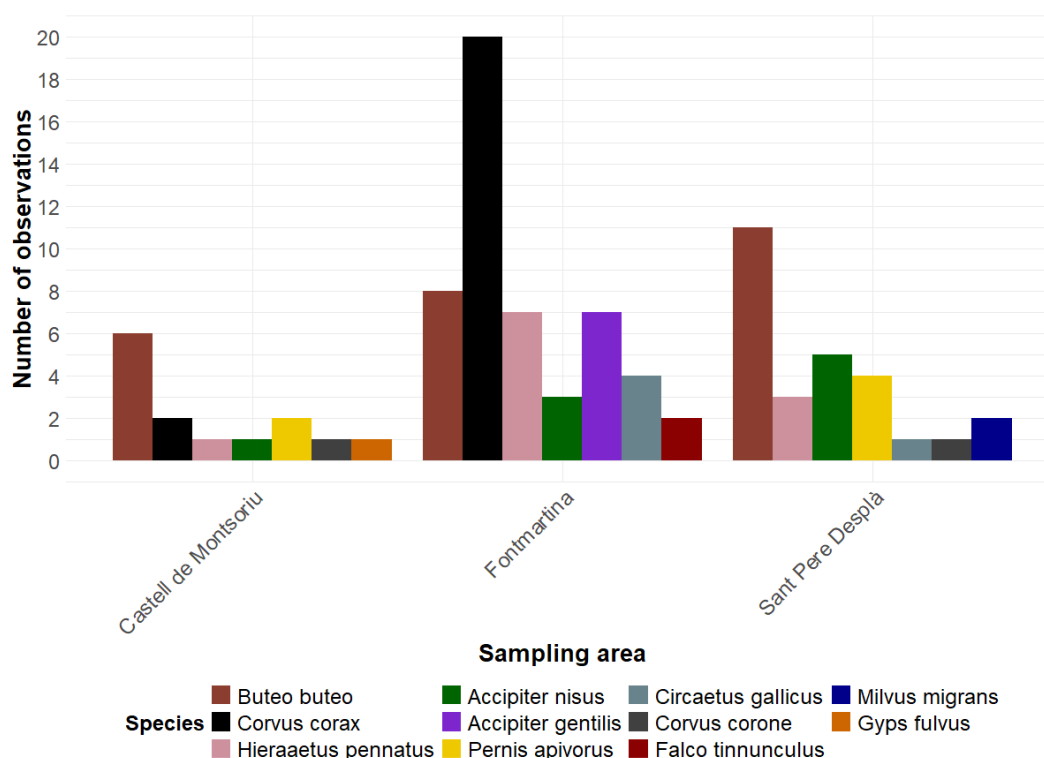


Figure 2. Frequency of all observed raptor and selected corvid species, separated by the three squares combined within the 2024 census period.

The number of observations was similar over the first three surveys across the three squares. Fontmartina had the most observations, with 20 in the first two surveys and 10 in the third survey. Sant Pere Desplà had 7-10 observations, and Castell de Montsoriu had 4-5 observations in the first three surveys. However, in the fourth survey period, we observed a significant drop in the number of observations. Sant Pere Desplà had only 2, while Fontmartina and Castell de Montsoriu had only 1 observation each during this period.

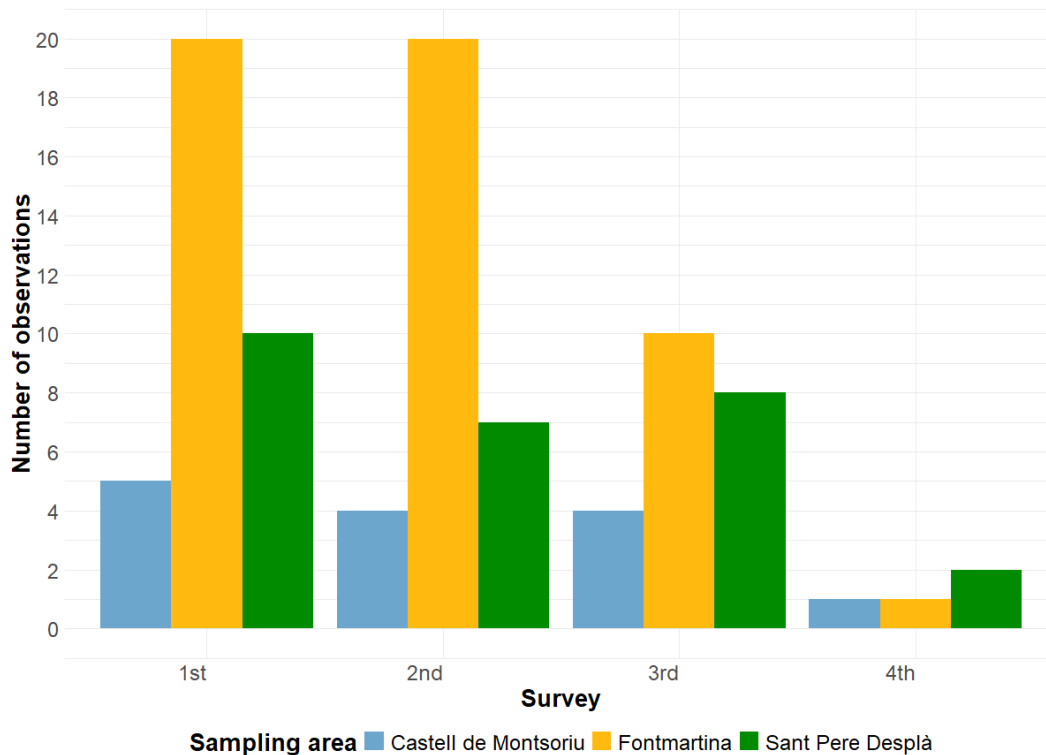


Figure 3. Total number of observations in each site in each census period in the SEGRE census 2024.

Conclusion

During the 2024 census, we conducted all the 12 surveys in our three squares in the Montseny Natural Park and Biosphere Reserve, following the SEGRE Project protocol. We recorded 92 observations of 9 raptor and 2 corvid species. The most frequently observed raptors were the common buzzard (25 sightings), booted eagle (11 sightings), and Eurasian sparrowhawk (9 sightings), while the northern raven was the most observed corvid with 22 sightings. Notably, the black kite was a new species observed this year as a migratory species in Sant Pere Desplà, whereas the peregrine falcon, western marsh harrier, and osprey were not detected compared to previous years. Although, Eurasian griffon (*Gyps fulvus*) is regularly observed in the Montseny Natural Park and Biosphere Reserve⁶, there are no known suitable cliffs for breeding and existing colonies of the species in the natural park. Therefore our observation of the vultures, similar to other vulture observations of the previous years, was noted as migratory individuals. In each square we recorded 7 species, but species composition varied between squares. The common buzzard, booted eagle, and Eurasian sparrowhawk were present in all squares. Some species, like the European honey buzzard and carrion crow, were observed in two squares, while others like the common kestrel and northern goshawk were site-specific. Although, we do not have long-term data from the SEGRE project yet, it is possible that subhabitat preferences will be identified for these local species based on their distribution in the studied areas.

Observation numbers were consistent in the first three surveys across all squares, with Fontmartina having the highest counts. However, the fourth survey period showed a significant drop in observations across all squares, indicating potential seasonal or environmental influences. To understand better if it was just exceptional pattern in this year, or it is a regular pattern of the raptor detectability, more censuses need to be done.

Overall, the SEGRE Project's standardized monitoring has provided valuable data on raptor populations, highlighting the importance of ongoing, systematic observation to understand and conserve these species.

In the next years, we will compare the data between years.

Reference

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