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ASSESSING BIODIVERSITY IN PĂDUREA CRÂNG (CODRII VLĂSIEI, BUZĂU, ROMANIA): A BASELINE STUDY FOR NATURA 2000 PROTECTED AREAS

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Abstract

Pădurea Crâng (Buzău County) is a valuable remnant of the former Codrii Vlăsiei forest, designated a county-level natural reserve in 1995. This study provides the first comprehensive assessment of its biodiversity and conservation value, establishing a scientific baseline for potential designation as a Natura 2000 site. Field surveys indicate high conservation importance, reflected by mature forest structures dominated by old-growth oak stands and the presence of rare, vulnerable, and protected species. The priority habitat 91I0 (Euro-Siberian steppic woods with Quercus spp.) was confirmed, underscoring the site's European significance. The flora includes notable species such as Tulipa sylvestris* subsp. *australis, Klasea bulgarica, Dianthus guttatus, Chaerophyllum nodosum, and Fraxinus pallisiae. Invertebrate fauna comprises Habitats Directive species (Cerambyx cerdo, Lucanus cervus) and nationally protected taxa, indicating structurally complex forests. Avifaunal surveys recorded several Birds Directive species, while the presence of Emys orbicularis confirms reptile conservation value. Overall, Pădurea Crâng represents a key biodiversity refuge in southeastern Romania and strongly merits designation as a Natura 2000 Site of Community Importance.*

Key words*: Codrii Vlăsiei, conservation value, Euro-Siberian steppic oak woods, forest biodiversity, Natura 2000.*

INTRODUCTION

Anthropogenic land use is the main cause of change in terrestrial ecosystems and has altered over half of the Earth's land surface (Vitousek et al., 1997; Foley et al., 2005). Forest ecosystems support a disproportionate amount of global biodiversity and provide essential services such as carbon sequestration, water regulation and nutrient cycling, that are vital for human welfare (Goodale et al., 2002; Millennium Ecosystem Assessment, 2005). In Europe, lowland deciduous forests have been particularly vulnerable to agricultural expansion, urbanisation, and drainage over the past two centuries. This has resulted in severe habitat fragmentation and the loss of old-growth structural attributes across much of the continent (Angelstam et al., 2004; Hanski, 2011).

In Romania, intensified land use from the early 19th century onwards has profoundly altered and fragmented the lowland forest ecosystems of the southern plains (Geacu et al., 2018). The Codrii Vlăsiei, a continuous deciduous forest complex that once covered much of the Wallachian Plain, was progressively cleared for agriculture and urban development. Only scattered fragments remain today, serving as ecological relics of the formerly extensive woodlands (Geacu et al., 2018). These remnant patches contain flora and fauna characteristic of the original forest, but their small size and isolation make them sensitive to edge effects, changes to the water cycle and recreational pressure (Laurance et al., 2002; Fischer & Lindenmayer, 2007).

Remnant lowland oak forests act as vital refuges for species that have disappeared from the surrounding agricultural landscape. These include flora specialized in old-growth forests, saproxylic invertebrates, cavity-nesting birds, and freshwater herpetofauna (Siitonen, 2001; Gutowski et al., 2005; Lindenmayer et al., 2012). Veteran trees (large, old individuals with structural features such as cavities, deadwood, and loose bark) are critical for biodiversity, supporting a disproportionately high number of species of conservation concern per unit area

(Ranius et al., 2009; Sebek et al., 2015). The conservation value of such fragments is further enhanced when mature stand structure coincides with rare or priority habitats, providing grounds for the formal protection of multiple taxa (Franc et al., 2007).

One of the most threatened forest types in Central and Eastern Europe is the Annex I priority habitat 91I0*, Euro-Siberian steppic woods with *Quercus* spp. (Habitats Directive 92/43/EEC). At the EU biogeographical level (2013-2018 assessment cycle), this habitat type has an unfavourable conservation status in both the continental and steppic biogeographical regions (EEA, 2020), primarily due to its rarity, ongoing hydrological impoverishment, and the progressive loss of veteran oak trees (EEA, 2024).

Saproxylic beetles, particularly those listed in Annex II of the Habitats Directive, have emerged as reliable indicators of the structural quality of forests and their management history (Siitonen, 2001). *Cerambyx cerdo* and *Lucanus cervus* are obligate associates of veteran oaks with decaying heartwood, and their presence indicates the persistence of old growth conditions that benefit a wide variety of co-occurring species (Buse et al., 2008; Thomaes et al., 2008). The occurrence of these saproxylic species, combined with Habitats Directive reptiles, such as *Emys orbicularis*, and Birds Directive Annex I taxa, provides particularly robust justification for site-level protection, an approach increasingly recognised as central to Natura 2000 site selection. The umbrella effect of such flagship invertebrates and reptiles thus strengthens the conservation case for habitats where they co-occur alongside rare or relict plant assemblages (Buse et al., 2007).

Despite the ecological importance of lowland forest remnants, the Natura 2000 network in Romania exhibits significant gaps at low elevations; protected areas represent less than 10% of the land surface at altitudes between 0 and 200 m a.s.l., making this the least represented elevation band in the national network (Iojă et al., 2010). The designation gap is particularly acute in the Wallachian Plain, where the few surviving forest fragments lack the formal European protection status that would trigger obligation-based management and long-term monitoring. This structural under-representation of lowland habitats in the Natura 2000 network has been identified as a key deficiency in biodiversity conservation policy in south-eastern Romania (Iojă et al., 2010).

Pădurea Crâng in Buzău County is one of the last surviving fragments of the Codrii Vlăsiei forest and has been recognised for its botanical significance since at least the late 19th century. In 1898, Grecescu recorded the presence of *Tulipa sylvestris* subsp. *australis* in the forest. The reserve was formally designated a county-level botanical nature reserve in 1995 (HCJ No. 13/1995) due to its wild tulip populations, veteran oak stands, and cultivated *Taxodium distichum* specimens. The site's floristic value has been further corroborated by the recent documentation of a genetically intact wild leek (*Allium scorodoprasum*) genotype within the forest (Vînătoru et al., 2025), attesting to the long-term ecological continuity of its herbaceous layer. Despite its recognised value, no systematic, multi-taxon biodiversity baseline had been compiled for the site prior to this study. Furthermore, Pădurea Crâng had not been evaluated for potential designation as a Natura 2000 Site of Community Importance.

This study aims to address this gap by providing the first comprehensive biodiversity assessment of Pădurea Crâng, integrating data on vascular plant flora, priority habitat occurrence, the dendrometric structure of veteran trees, and the herpetofauna, avifauna, and saproxylic Coleoptera. Specifically, the study aims to: confirm the presence of, and characterise the conservation status of, priority habitat 91I0*; document species of European conservation concern, as well as nationally rare taxa, across multiple taxonomic groups; provide the scientific basis for proposing 'Crângul Buzăului' as a Natura 2000 Site of Community Importance, thereby ensuring the long-term protection of its habitats and species.

MATERIALS AND METHODS

Study Area

The study was conducted in Pădurea Crâng, a county-level botanical nature reserve (HCJ no. 13/1995) situated within Buzău Municipality, southeastern Romania (45°08′42″N, 26°47′40″E). The reserve covers approximately 189 ha, of which some 178 ha constitute the

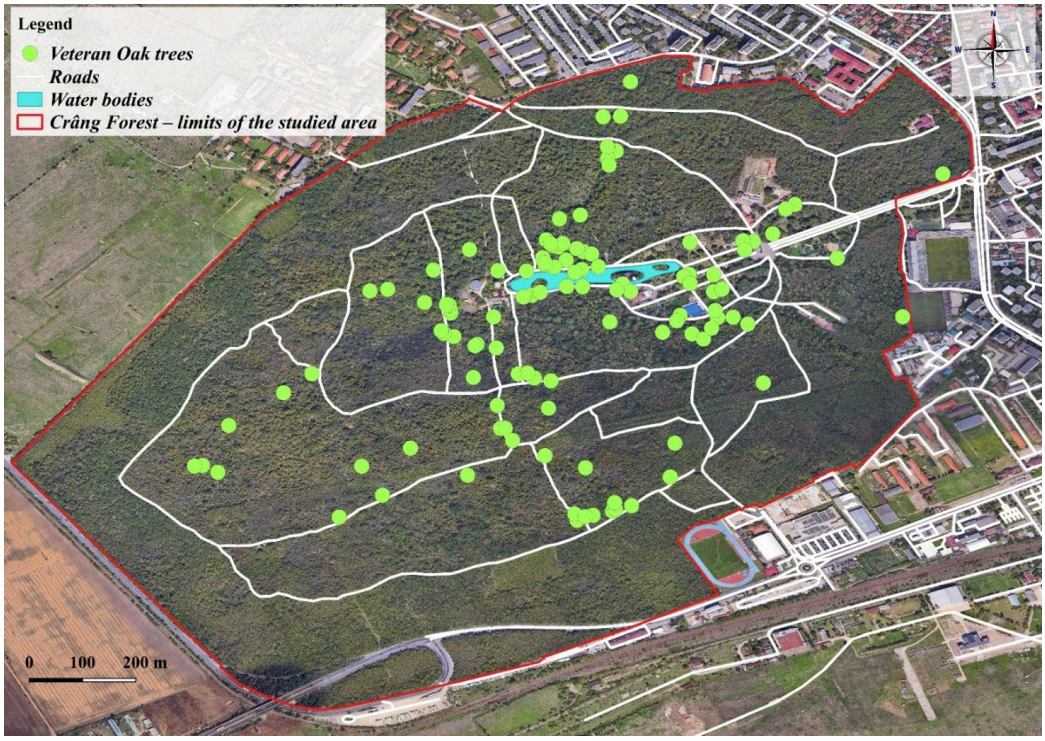


Figure 1. The spatial distribution of inventoried *Quercus robur* individuals within the Pădurea Crâng nature reserve in Buzău Municipality, Romania. Green circles indicate veteran oak trees (estimated age ≥100 years; n = 113). White lines show the internal road network and forest alleys. Blue polygon: pond (helești) and associated water bodies. The red boundary shows the limits of the studied area (approximately 189 ha)

actual forested area; the central-eastern sector is occupied by Parc Crâng, a managed recreational parkland. Elevation ranges from 89 to 107 m a.s.l. (Figure 1).

Floristic Surveys and Habitat Characterisation

All field and laboratory work was carried out between December 2024 and November 2025, encompassing bibliographic and herbarium analysis, repeated field campaigns across the principal phenological windows (March-November 2025), species distribution mapping and data processing. The floristic inventory relied on systematically distributed transects covering the full extent of the study area; species were identified in situ or, where necessary, in the taxonomy laboratory of the Institute of Biology Bucharest, using the determination keys of Săvulescu (1952-1976), Ciocârlan (2009) and Sârbu et al. (2013). Nomenclature was verified against the Euro+Med PlantBase and the Plants of the World Online database (POWO, Royal Botanic Gardens Kew). The inventory was complemented by a systematic review of published botanical literature, herbarium records and archival data, providing a long-term floristic baseline for the site. Taxa cited in the original reserve decree (HCJ 13/1995), but unconfirmed in the recent literature, were specifically targeted during seasonally appropriate surveys (March-May 2025), ensuring that non-detection reflects a deliberate, phenologically appropriate search effort.

Conservation status was evaluated against national Red Lists (Oltean et al., 1994; Boşcaiu et al., 1994; Dihoru & Dihoru, 1994; Dihoru & Negrean, 2009) and relevant legislative instruments (OUG 57/2007; HCJ 13/1995). Phytosociological surveys followed the two-stage analytical-synthetic methodology of Cristea et al. (2004), applying the Braun-Blanquet relevé method (Braun-Blanquet, 1951). Habitat identification and classification adhered to the *Interpretation Manual of Natura 2000 Romanian Habitats* (Gafta & Mountford,

2008) and the *Synthetic monitoring guide for habitats of Community interest* (Biriş et al., 2013).

Dendrometric Assessment of Veteran Trees
Tree age was estimated using two complementary methods. The indirect dendrometric method applied an age-diameter coefficient of 2.1, as established for silvosteppe oak stands (Netsvetov, 2016). For calibration, a subset of representative individuals was increment-cored using a 400 mm Pressler borer; ring counting and width measurement yielded a locally adjusted coefficient of 1.7. The discrepancy between the two estimates reflects natural variation in radial growth and enabled refinement of the age model to local site conditions. The combined approach provides a robust characterisation of the age structure of the mature and veteran oak population of Pădurea Crâng (Figure 1).

Herpetofauna
Surveys were conducted across eight field sessions between February and November 2025 (totalling 12 days, ~82 km walked), using active diurnal searching along transects, direct observation and long-range photography for subsequent taxonomic validation. A preliminary bibliographic review reconstructed the historical herpetofaunal baseline of the site. Species were identified from external morphological characters (Fuhn, 1960; Fuhn & Vancea, 1961); the *Pelophylax* spp. complex was assigned to complex level, as reliable in-field separation of *P. ridibundus*, *P. esculentus* and their hybrids requires acoustic or genetic analyses.

Avifauna
Birds were monitored over several field visits spanning February-November 2025, covering different phenological aspects (ranging from wintering to autumn). Bird surveys were conducted through visual observations with binoculars, in the morning (06:00-12:00) and in favourable meteorological conditions, following Bibby et al. (2000) and *Ghidul Standard de Monitorizare a Speciilor de Păsări de interes comunitar din România* (2020). A mix of line transects and point-counts was employed to ensure a comprehensive species inventory. Transects were drawn along the main park alleys while point counts were done in randomly selected locations (QGIS generated) inside the forested area. Counts were done with 10 x 50 Nikon binoculars, within a 150-200 m visual range. Acoustic recognition and song playback were used to confirm the presence of more cryptic species (e.g. the treecreeper - *Certhia familiaris*). Photographic documentation completed the ornithological assessment.

Saproxylic Coleoptera
Xylophagous beetle surveys were carried out between June and August 2025 along 25 transects distributed across the principal vegetation units of the reserve (oak stands of habitat 91I0*, urban park woodland with veteran oaks, and an ash plantation). Along each transect, favourable microhabitats for saproxylic species were characterised, and all encountered individuals of the four target taxa (*Cerambyx cerdo, Lucanus cervus, Oryctes nasicornis* and *Dorcus parallelipipedus*) were counted, distinguishing live adults from exuviae.

RESULTS AND DISCUSSIONS

This study provides the first systematic biodiversity baseline for the site, covering floristic composition, habitat characterization, dendrology, herpetofauna, avifauna, and saproxylic invertebrates.

Vegetation, habitat structure and flora
Pădurea Crâng is one of the last remnants of the former Codrii Vlăsiei forest complex, a lowland mixed deciduous woodland that once covered much of the Wallachian Plain. Field surveys revealed an overall mosaic vegetation structure, with natural and semi-natural forest communities alternating with planted stands, park areas, and open glades. This pattern is attributable to the site's complex land-use history and the ecological constraints of the subcontinental steppic zone.
The canopy is co-dominated by *Quercus robur* and *Q. robur* subsp. *pedunculiflora*, while the ash guild (*Fraxinus pallisiae, F. excelsior* and *F. angustifolia*) collectively accounts for around 29% of the composition of the stands, according to the forest management plan for U.P. I Pădurea Crâng (SC IRISILVA SRL, 2023). Pedunculate and sessile oak together contribute 24%, while

field elm (*Ulmus minor*) contributes a further 21%. Field maple (*Acer campestre*) and Tatar maple (*Acer tataricum*) are recurrent sub-canopy constituents, contributing 11% and 8% respectively. Deciduous broadleaves cover virtually the entire forested area (178 ha), while conifer plantations are confined to a mere 0.47 ha.

Priority Habitat 91I0* Euro-Siberian Steppic Woods with *Quercus* spp.

Field surveys confirmed the presence of Annex I priority habitat 91I0*, Euro-Siberian steppic woods with *Quercus* spp., within the reserve (Habitats Directive 92/43/EEC). According to the Romanian national forest typology (Doniţă et al., 2005), this community is classified as type R4159 - Danubian oak woodland of *Quercus pedunculiflora* and *Q. robur* with *Tulipa biebersteiniana,* and is assigned to the thermophytic steppe subzone of the Romanian Plain.

It is present in areas with a continental character, being recorded in 42 Natura 2000 sites distributed in the southern part of the country in the Danube Plain, Dobrogea, fragmented areas of Transylvania, but also in the Carei Plain in the Pannonian bioregion.

In the Crâng Forest, habitat 91I0* is confirmed by the composition of the stand, the vegetation structure and the presence of characteristic species. The defining elements of this habitat type are the pedunculate oak (*Quercus robur*) and species associated with the forest-steppe. The understory and shrub layer include *Acer tataricum*, *Ulmus minor*, *Crataegus pentagyna*, *Cornus mas*, Euonymus europaeus, *E. verrucosus*, *Pyrus communis*, *Viburnum lantana*.

The diagnostic species *Tulipa sylvestris* subsp. *australis* (syn. *T. biebersteiniana*) (Figure 2) was recorded at multiple locations during transect surveys (March-May 2025), with seven high-density population patches predominantly delineated in the central-eastern sector, near the principal access routes. This species was first reported in this area by Grecescu in 1898, attesting to over a century of floristic continuity. Given the documented anthropogenic pressures and the ongoing hydrological impoverishment of the site, the confirmed presence of this priority habitat is a strong case for strengthening existing conservation measures.



Figure 2. *Tulipa sylvestris* subsp. *australis*, flower detail showing hairy stamen filaments at the base (a diagnostic morphological character of the taxon) (left); leaf of a sterile shoot (right). Photographs by R. Nicoară (2025)

Plant Species of Conservation Concern

Floristic inventories identified several vascular plant taxa that warrant conservation attention at national and regional levels. The species were designated following an integrated assessment that incorporated national legislation (OUG 57/2007 and Law 49/2011), Romanian Red Lists, and ex situ conservation data. This approach is aligned with Romanian statutory frameworks, which evaluate rarity, endemism, relict status, and ecological function independently of IUCN global threat categories.

Klasea bulgarica (Figure 3) is the most significant floristic record of the present study. This sub-endemic taxon has a restricted range, with documented populations confined to a few localities in Buzău and Galaţi counties (Dihoru & Negrean, 2009). During the 2025 campaigns, two individuals were found in the south-southwestern part of the forest, growing on a slightly saline, light-exposed substrate alongside *Dianthus guttatus* and *Artemisia santonicum*. The species is categorized as Vulnerable across three national Red Lists (Dihoru & Negrean, 2009; Oltean et al., 1994; Dihoru & Dihoru, 1994) and is the focus of in vitro conservation programmes (Manole-Aiftimie et al., 2013; Ioniţă & Tofan-Dorofeev, 2025). It is also cultivated outside its natural habitat at the "Dimitrie Brandza" Botanical Garden in Bucharest.

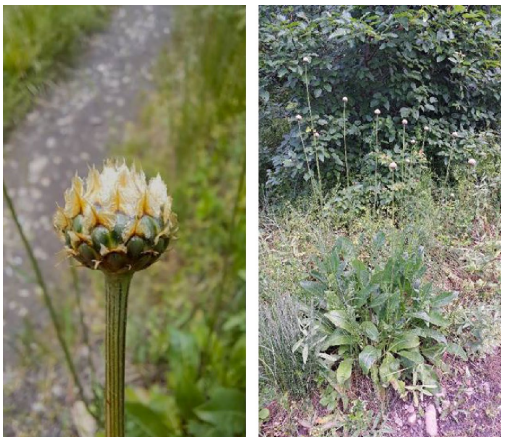


Figure 3. *Klasea bulgarica* in Pădurea Crâng: pre-anthesis stage (left); general habit of the species (right). Photographs by R. Nicoară (2025)

Dianthus guttatus was recorded at four locations in the southern and south-western parts of the reserve. It is assessed as Vulnerable (Oltean et al., 1994) and Endangered (Dihoru & Dihoru, 1994). *Chaerophyllum nodosum* (Figure 4), assessed as Vulnerable by Oltean et al. (1994), occurs consistently throughout zones of partially open canopy. *Fraxinus pallisiae*, a Pontic-Pannonian species with a limited natural distribution in Romania, plays a significant role in the structure of the canopy and is representative of the 91I0* habitat.



Figure 4. *Chaerophyllum nodosum* in Pădurea Crâng: detail of stem with inflated nodes (left); *C. nodosum* within the herb layer of the forest (upper right); detail of fruits (lower right). Photographs by R. Nicoară (2025)

The occurrence of *Fritillaria meleagris*, cited in the original nature reserve decree (HCJ 13/1995), could not be confirmed during the 2025 surveys. In ecological terms, however, its former presence is plausible given the historical hydrological continuity between Pădurea Crâng and the adjacent Pădurea Frasinu, where the species has been recorded (Zahariadi, 1962). Its apparent local extinction is most likely due to the progressive desiccation of the water table caused by deep borehole drilling and the construction of drainage canals for the Buzău municipal water supply, which eliminated the microhabitats essential for this species.

Old-Growth Trees and Stand Structure

A total of 139 veteran trees belonging to *Quercus robur* were inventoried within the reserve (Figure 1). The stem circumferences spanned a wide range, from 80 to 438 cm, corresponding to calculated diameters of 25-139 cm (mean: 75 cm). Age estimates derived from the relationship between diameter and growth rings range between 45 and 285 years, with an average for the stand of around 150 years. The individuals in the 200-250 year cohort are ecologically irreplaceable; they harbour cavity microhabitats and supply coarse deadwood for saproxylic assemblages. They also serve as refugia for arthropods and hole-nesting birds while bearing witness to the original structure of the Codrii Vlăsiei forest.

The spatial distribution of the oldest individuals is notably diffuse, with the largest specimens dispersed across the central and north-western sectors rather than concentrated in a single area. This pattern suggests a multi-generational relict origin rather than a single plantation event. A secondary cluster of very old trees around the pond and the central park area is most plausibly explained by selective retention during the conversion of part of the forest into a public park in the late 19th-early 20th century, when large-crowned oaks were deliberately preserved for their aesthetic qualities and ability to provide shade. Thus, the dendrometric dataset confirms that Pădurea Crâng is an important lowland refuge for veteran *Quercus robur*, with direct implications for the conservation of saproxylic invertebrate communities and cavity-dependent avifauna (Figure 5).



Figure 5. Veteran *Quercus robur* individuals inventoried in Pădurea Crâng nature reserve, Buzău, Romania. Photographs by R. Nicoară (2025)

Herpetofauna

A total of five taxa were identified in the surveys: three species of community interest, two reptiles and one amphibian, and two non-native aquatic species, which were most likely introduced through the intentional or accidental release of captive individuals. This phenomenon has been documented in urban parks throughout Romania (Iftime & Iftime, 2021).

The European pond turtle, *Emys orbicularis* (Linnaeus, 1758) is the herpetofaunal species of greatest conservation importance. It is assessed as Near Threatened by the IUCN (Cox & Temple, 2009) and as Vulnerable in the Red Book of Vertebrates of Romania (Botnariuc & Tatole, 2005). The species is strictly protected under OUG 57/2007 (Annexes 3 and 4A) and is listed in Annexes II and IV of the Habitats Directive. An individual was previously reported in the forest pond in 2020 (Iftime & Iftime, 2021) and was observed again near the pond island during the 2025 surveys, though the distance precluded definitive visual confirmation. The habitat requirements of this species, which include good water quality, adequate basking substrates and suitable oviposition sites on adjacent land, appear to be met at this location.

The green lizard, *Lacerta viridis* (Laurenti, 1768), which is protected under Annex IV of the Habitats Directive (IUCN: LC) and Annex 4A of OUG 57/2007, was the most consistently recorded terrestrial reptile and was present throughout glades, ecotones and areas of open canopy. The *Pelophylax* spp. complex (encompassing *P. ridibundus* and the hybrid *P. esculentus*) was detected in both the pond and its supply canal. However, specific identification in the field was hindered by the close morphological affinity between the different species.

Avifauna

Bird surveys recorded 67 taxa belonging to 29 families. The families *Muscicapidae* (8 taxa) and *Fringillidae* (6 taxa) displayed the greatest species richness; *Picidae* and *Corvidae* each accounted for five species.

Seven species are listed on Annex I of the Birds Directive (2009/147/EC): *Dryocopus martius, Picus canus* (Figure 6)*, Dendrocopos syriacus, Dendrocoptes medius, Ficedula parva, Ficedula albicollis* and *Lanius collurio*.

Confirmed seasonal occurrence of 3 woodpecker species (the grey headed woodpecker, the Syrian woodpecker, the middle spotted woodpecker), with the added occasional observation of *Dryocopus martius*, is a direct reflection of the abundance of large diameter trees, sensible amounts of decaying matter and ground branches that offer both shelter and foraging opportunities (Czeszczewik et al., 2013; Fröhlich & Ciach, 2020).

Two species are protected under the National Red List (OUG 2015/2022): the barn swallow (*Hirundo rustica*, Near Threatened nationally) and redwing (*Turdus iliacus* Near Threatened globally).

The dominance of insectivorous oscine taxa (Goldcrest, Eurasian wren, Blackcap, Red-breasted flycatcher - Figure 7) is an expression of habitat diversity and structural heterogeneity (Shaw et al., 2024).



Figure 6. *Picus canus* (grey headed woodpecker) male and female, Pădurea Crâng nature reserve, Buzău, Romania. Photographs by A. & M. Ciobotă (2025)



Figure 7. *Ficedula parva* (red-breasted flycatcher) recorded in Pădurea Crâng nature reserve, Buzău, Romania. Photograph by M. Ciobotă (2025)

Saproxylic Coleoptera

Four species of xylophagous beetle with recognized conservation value were recorded in the forest, including two taxa listed in the Habitats Directive: *Cerambyx cerdo* (Annexes II and IV) and *Lucanus cervus* (Annex II). Two further species of ecological significance, *Oryctes nasicornis* and *Dorcus parallelipipedus*, were also detected. All four species are obligate saproxylic beetles, meaning their life cycles depend on large-diameter oak trees with decaying wood or root systems. Consequently, their presence is closely linked to the availability of deadwood and veteran trees (De Groot et al., 2016). Surveys covered 25 transects, 22 of which contained favourable saproxylic microhabitats. A clear positive relationship was observed between mean tree circumference and beetle abundance. Transects with the highest coleopteran densities were characterised by mean stem circumferences of 206-320 cm compared to 92-184 cm in transects with low abundance.

Cerambyx cerdo (Figure 8) was recorded throughout the study area, yielding a total of 40 individuals, including live adults and exuviae. Comparisons with data from two Natura 2000 reference sites (ROSCI0359 Prigoria-Bengeşti and ROSCI0354 Platforma Cotmeana; Manu et al., 2017; Bărbuceanu & Truță, 2021) indicate that the Crâng population is numerically viable. All detections were made within the 91I0* habitat, which is consistent with the well-documented dependence of this species on old-growth oak. *Lucanus cervus* (Figure 8) was equally widespread, with 45 individuals recorded across the same proportion of surveyed transects.



Figure 8. *Lucanus cervus* (Linnaeus, 1758), male (left), and *Cerambyx cerdo* (Linnaeus, 1758), female (right), on the bark of *Quercus robur* in Pădurea Crâng nature reserve, Buzău, Romania. Photograph by M. Manu (2025)

Although the absolute number of individuals is lower than that recorded in the larger reference sites (228 and 314 individuals, respectively), the population density relative to the restricted area of Pădurea Crâng is considered satisfactory. The spatial co-occurrence of *C. cerdo* and *L. cervus* at forest ecotones and clearings around veteran trees (a pattern previously noted in Romanian oak forests (Panin & Săvulescu, 1961;

Bărbuceanu & Truţă, 2021) was also evident here. *Oryctes nasicornis* was widespread (44 individuals, principally exuviae), while *Dorcus parallelipipedus* was recorded as two isolated live individuals, reflecting its generally low density in inland oak forests.

Overall Conservation Assessment

Taken together, the results of this baseline study demonstrate that Pădurea Crâng supports a biologically diverse and structurally complex assemblage of flora and fauna of national and European conservation significance. The confirmed presence of priority habitat 91I0*, Habitats Directive species (*Cerambyx cerdo*, *Lucanus cervus* and *Emys orbicularis*), seven Birds Directive Annex I taxa and a variety of nationally rare or vulnerable plants, including the sub-endemic *Klasea bulgarica*, collectively provide robust scientific justification for designating this site as a Natura 2000 Site of Community Importance. Much of this biodiversity is underpinned by the old-growth *Quercus robur* stand, which has a mean age of around 150 years and includes specimens dating back 285 years. This stand functions as the principal structural and ecological foundation of the reserve. The long-term retention of veteran trees and coarse deadwood, combined with effective management of hydrological impoverishment, invasive species and recreational pressure, is essential for the sustained conservation of this forest remnant. Without such interventions, the ecological integrity of this irreplaceable lowland forest in south-eastern Romania cannot be guaranteed.

CONCLUSIONS

This baseline assessment confirms that Pădurea Crâng is home to biodiversity of national and European conservation importance across multiple taxonomic groups. Priority habitat 91I0*, Euro-Siberian steppic woods with *Quercus* spp., was identified and characterised. This is underpinned by a veteran *Quercus robur* stand with an estimated mean age of around 150 years, with some specimens reaching 285 years. The flora includes the sub-endemic *Klasea bulgarica*, which is assessed as Vulnerable in three national Red Lists and is the subject of active in vitro conservation programmes. Other species of regional conservation concern include *Dianthus guttatus*, *Chaerophyllum nodosum* and *Fraxinus pallisiae*. Habitat Directive species that were recorded include *Cerambyx cerdo* (Annexes II and IV) and *Lucanus cervus* (Annexes II), both of which have numerically viable populations, as well as *Emys orbicularis* (Annexes II and IV). Seven species listed on Annex I of the Birds Directive were documented, including four woodpecker species of European conservation concern. Their simultaneous occurrence within a single, small area can reflect advanced stand maturity. The presence of a priority habitat, Habitats Directive invertebrate and reptile species, Birds Directive Annex I taxa, and nationally rare plants collectively provides a robust, multi-taxon scientific basis for designating Pădurea Crâng as a Natura 2000 Site of Community Importance.
Given that fewer than 10% of the land surface at altitudes of 0-200 m a.s.l. in Romania is covered by protected areas (Iojă et al., 2010), the formal designation of this site would address a structural gap in the national Natura 2000 network while ensuring obligation-based management of one of the last remnants of the Codrii Vlăsiei. Long-term conservation will require strict retention of veteran trees and coarse deadwood, control of invasive alien species and regulation of recreational pressure. Without these measures, the ecological integrity of this irreplaceable lowland forest in south-eastern Romania cannot be guaranteed

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