ABUNDANCE AND CURRENT STATUS OF *CHAZARA PRIEURI* POPULATIONS IN THE NORTHEASTERN IBERIAN PENINSULA

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EXECUTIVE SUMMARY

1. The Southern Hermit *Chazara prieuri* (Pierret, 1837) is a butterfly of rocky grassland and dry gulleys confined to Spain and north Africa, which is thought to be in decline.
2. To update the status of the species, searches for *C. prieuri* and habitat assessments were conducted in north-eastern Spain in 2024 in its former strongholds in the autonomous communities of Castilla-la-Mancha and Aragón.
3. A total of seventy 10 km squares where the species had been recorded were visited, with 143 separate 15-minute timed counts conducted in available habitats, in a first survey period (late June to early July; 76 timed counts) and a second period (late July to early August; 67 timed counts). The counts were conducted in a range of available habitats between 322 m and 1649 m altitude.
4. Adults of *C. prieuri* were encountered in only ten of the 144 timed counts, in six of the 10 km squares visited. All of the observations of the species were at altitudes between 1154 m and 1296 m altitude, in a restricted region of calcareous geology in the Iberian System of mountains between central and western parts of the province of Teruel and the eastern border of Cuenca. This region appears to represent the core distribution of the species in Spain.
5. The species was not seen in former localities to the north, south or west of its apparent core, despite the larval host plant *Lygeum spartum* being present in many places (especially in Huesca and Zaragoza).
6. The species was found in habitats characterized by minimal herbaceous vegetation and exposed substrates. These habitats include open areas with bare soil and sparse grass tussocks, cleared forests of Kermes oak (*Quercus coccifera*) interspersed with scattered shrubs such as *Genista*. Additionally, the species was found on small rocky hills amidst agricultural fields. Notably, observations were made in locations lacking nectar plants, where individuals were seen resting in the shade of shrubs, trees, or rocks.
7. Forty-seven sampling points were identified as optimal for future surveys. These points are characterized by patchy herbaceous vegetation, particularly grass tussocks, with scattered shrubs and trees (holm/kermes oak), creating the open habitat structure favorable to *C. prieuri*.
8. The main other butterflies found in the same locations as *C. prieuri* were other grass-feeding Satyrinae associated with rocky open habitats.
9. The dry, open habitats in the Iberian System near the borders of Teruel and Cuenca are crucial for the monitoring and conservation of *C. prieuri*. The apparent fragmentation of populations, likely due to agricultural expansion and grassland abandonment, highlights the need for targeted future surveys. Recommendations include focusing on areas within the identified core region, using satellite or aerial imagery to identify suitable habitats, and investigating the impact of anthropogenic factors on habitat quality and species distribution.

INTRODUCTION

European butterfly populations have experienced a significant decline over the past decade (European Environment Agency, 2023). This trend is primarily driven by habitat loss and fragmentation due to land-use changes (Badii et al., 2015), particularly in grasslands and agricultural regions (Herrando et al., 2016). Climate change has exacerbated these impacts, particularly in Mediterranean temperate zones, where substantial declines in butterfly populations have been documented (Melero et al., 2016).

The Iberian Peninsula is of particular ecological interest due to its species richness and high degree of endemism (Williams et al., 2000). This is attributed to the peninsula's unique geographical position, acting as a transitional zone between the African continent and Western Europe, its historical role as a refuge during the Quaternary glacial periods, and its orogenic complexity (García & Arsuaga, 2003; Hewitt, 2011).

Chazara prieuri (Pierret, 1837) is a satyrine butterfly (Nymphalidae: Satyrinae) with an Iberian-Maghreb distribution. The Iberian populations are characterized by an orange chromatic variant known as the *uhagonis* form (Oberthür, 1875), which is absent in African populations (Fig. 1). This butterfly is typically associated with substeppe, xerophilous, and calcicolous habitats, favoring rocky slopes and ravines with sparse tree cover (García-Barros et al., 2011). The larval host plant is primarily *Lygeum spartum*, though other grasses, such as *Stipa tenacissima*, are also suspected to serve as hosts (Mariposas de Cuenca, n.d.). The species is classified as Least Concern (LC) on the European Red List of Butterflies (Van Swaay et al., 2010), Near Threatened (NT) in the Spanish Red Data Book of Invertebrates (García-Barros et al., 2011), and of Special Interest in the Autonomous Community of Castilla-La Mancha, Spain (Verdú et al., 2011).

However, the distribution of *Chazara prieuri* has declined in recent years. Preliminary data from the Butterfly Atlas Research Group at the Universidad Autónoma de Madrid indicates that the species has disappeared from 44 out of the 46 10 x 10 km grid squares in which it was recorded before 2004 (95.7% of the previously recorded squares). Additionally, since 2004, the species has been newly recorded in 20 grid squares, bringing the current known distribution to 66 squares. Despite these findings, the precise distribution of the species remains uncertain due to potential mislabeling in museum specimens, and its elusive and low-abundance nature, which complicates population trend assessments and hinders effective conservation planning.

OBJECTIVES

- To update and refine the current distribution of *C. prieuri* populations in the northeastern Iberian Peninsula, based on recent field surveys.
- To assess the abundance and population structure of *C. prieuri* within its suitable habitats.
- To identify potential environmental and anthropogenic factors contributing to the decline or stability of *C. prieuri* populations.
- To evaluate the species richness of other butterflies (Papilionoidea) associated with *C. prieuri* habitats, using them as auxiliary bioindicators of habitat quality.
- To prioritize areas for future monitoring and conservation actions based on the analysis of habitat suitability and observed population trends.

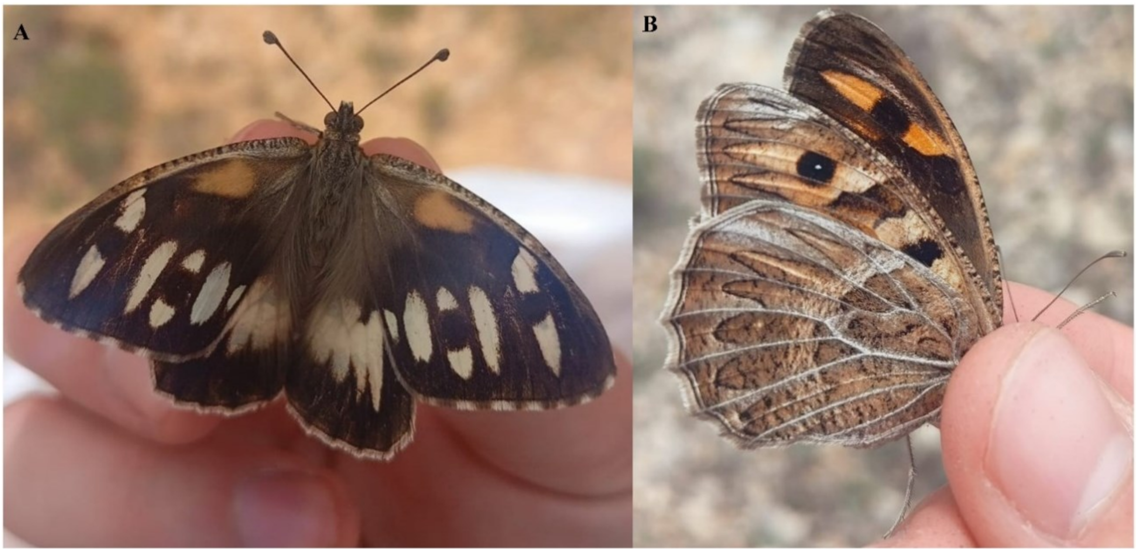

Figure 1. *Chazara prieuri*. **A** - Male ♂. B – Female, *uhagonis* form ♀

METHODS

This study focused on *C. prieuri* populations in the northeastern Iberian Peninsula, specifically in the provinces of Huesca, Zaragoza, Teruel (in the Autonomous Community of Aragón), and Cuenca and Guadalajara (in Castilla-La-Mancha).

Sampling sites were selected based on historical records of the species and current habitat suitability. A total of 70 UTM grid cells (10 x 10 km) were chosen, comprising 24 cells with pre-2004 presence records, 16 cells with post-2004 records, and 30 new cells without any previous records. Within each grid cell, sampling sites were identified using information from published sources and personal communications regarding historical locations of the butterfly, supplemented by visual inspection of similar habitats using satellite imagery. In each grid, the most suitable area was selected based on key habitat features: sparse, medium to tall woodlands with patchy soils, featuring vegetation associated with alkaline-tolerant species (e.g., junipers, *piornales*, holm oaks, and thyme) and tussocks of herbaceous plants, considered as potential larval host plants. Priority was given to natural habitat fragments with the highest landscape continuity, avoiding small isolated patches in favor of larger, well-connected areas, often bordered by agricultural fields.

Given that each grid cell was surveyed for the most viable potential habitat, not all sampling points conformed to optimal habitat parameters. Therefore, exploratory sampling was conducted in additional areas within each grid cell to identify potentially suitable habitats that might not have been initially apparent. This approach ensured a thorough assessment of habitat conditions and improved the chances of detecting *C. prieuri* in varied environmental contexts.

Once potentially suitable habitats were identified, 15-minute counts were conducted and geolocated using GPS (eBMS, 2024a) to record population abundances. Additionally, butterfly species richness (Papilionoidea), defined as the total number of species observed, was recorded for each count, along with detailed habitat description in each sampling area.

Sampling covered a wide range of potential and exploratory habitats, including low, medium, and high scrublands; mixed holm oak (*Quercus ilex)* and kermes oak (*Quercus coccifera*) forests; open scrub dominated by broom ("*piornales*") with and without scattered Juniper ("*sabina*") (*Juniperus thurifera*) and pine; closed pine and olive groves; dense pine forests with clearings and understory; and riparian forest areas with open grassland. Various types of thyme-dominated habitats with differing edaphic conditions were also investigated. The study sites ranged in altitude from 322 to 1.649 m. Habitats exhibited a range of anthropogenic impacts, including goat grazing, fallow lands, sunflower crops, and cereal cultivation. This diversity in habitat types and altitudinal range provided a comprehensive spectrum of conditions for assessing the presence and distribution of *C. prieuri*.

For each sampling site, the following habitat characteristics were recorded:

- **Altitude**: The elevation of the habitat.
- **Herbaceous Cover**: classified as either patchy soils, where herbaceous vegetation only partially covers the surface (Patches herbaceous cover), or full cover, where herbaceous plants completely cover the soil (Full herbaceous).
- **Sparse Tussocks of Grasses**: presence of potential larval host plants.
- **dominant vegetation**: the predominant plant species or communities, such as oak forests, riparian forest-scrubland, pinewood, grassland, *Genista* scrubland, holm (and kermes) oak forest, *piornal*, thyme scrubland, scrubland (with less frequent species like retamas, lavenders etc.), or juniper woodland.
- **Habitat Type**: Categories based on vegetation structure and habitat, including scattered shrubby patches, open scrubland, dense scrubland, woodland edge, scattered arboreal patches, open woodland, and dense forest.

- **Anthropogenic Impacts**: Signs of human activity or influence, including herbaceous crops, tree crops, grazing, gravel pits (areas with significant soil disturbance), livestock waste (nitrate-enriched areas near farms), and wind farms.

Two sampling periods were established to align with the species' flight period and detect fluctuations in their abundances. The first sampling took place from June 25 to July 2 (76 timed counts), and the second from July 26 to August 2 (67 timed counts), 2024. Sites where the species was not detected during the first visit were revisited at different locations within the same grid cells to increase the chances of detection. Additionally, during the second period, previously positive locations were resurveyed to refine abundance estimates. New sampling points within grid cells where *C. prieuri* had been detected in the first period were also established to better delineate the species' geographic distribution and presence.

A Multiple Correspondence Analysis (MCA) was conducted to identify the habitat characteristics associated with the sampling points, with the aim of determining the key variables present in *C. prieuri* habitats and identifying areas of special interest for future surveys. Each sampling site was also categorized based on field observations (personal criteria), and these categorizations were then compared with the distribution of points in the MCA to ensure consistency. The MCA included binary variables representing habitat characteristics such as herbaceous cover, sparse tussocks of grasses, dominant vegetation, habitat type, and anthropogenic impacts. A value of 1 indicated the presence of a specific environmental characteristic at a sampling site, while a value of 0 indicated its absence. It is common in MCA for the initial components or dimensions to explain only a small percentage of the total variance, reflecting the complexity of categorical data and the distribution among the variables involved (Greenacre, 2017; Díaz Monroy & Morales Rivera, 2009). Axes with an R^2 greater than ≅15% were selected for interpretation, and environmental variable vectors were included if their R^2 exceeded 10%, offering insights into the most influential habitat characteristics for the species.

RESULTS

-*Chazara prieuri: Distribution and Abundance* **-**

A total of 143 15-minute counts were conducted, covering 117 sampling points with an area of 336.051 m². *Chazara prieuri* was recorded in six 10 km grid cells in seven different localities (Figs. 2, 3). Among these, the species was found in four grid cells with records of presence after 2004, one grid cell where it had not been recorded since before 2004, and one newly surveyed grid cell. A total of 17 individuals were observed within the sampled area (Table 1), with a maximum of 4 individuals recorded in a single count (Table 1, Fig. 3). The species was detected in transects covering a total surface area of 24,822 m², corresponding to an average density of one individual per 1,460 m².

-Habitat Characteristics-

The specimens were found at altitudes ranging from 1,200 to 1,300 m on calcareous hills surrounded by flat areas used for agriculture (Fig. 4). The identified habitats share common features of low vegetation cover and exposed substrate, with specific variations:

(A) An open area with bare soil and minimal herbaceous vegetation, highlighting the sparse distribution of larval host plant across the landscape (Fig. 4A).
(B) A cleared forest of Kermes oak (*Quercus coccifera*), interspersed with sparse shrubs of *Genista*, thymes, and lavenders. The soil remains relatively exposed due to the limited vegetation cover (Fig. 4B).
(C) A sclerophyllous grassland with scattered *Genista* shrubs. This habitat also features significant patches of bare soil, similar to the other areas (Fig. 4C).
(D) Sparse tussocks of grasses scattered across the ground, with large patches of bare soil lacking vegetation (Fig. 4D).

- Behavioral Observations -

Behaviorally, individuals were not observed in flight but were found resting on bare soil or in the shade of medium-sized herbaceous tussocks or trees.

Table 1. 15-minute counts in which *Chazara prieuri* was found. The ID_Count identifier provides additional geographic and environmental data for these counts, available in eBMS (2024b). M - Nº of male individuals, F- Nº of female individuals.

ID_Count	Grid reference	Locality	Date	Time	TºC	Altitude	M	F	Total count
26347302	40.6090643, -0.9546130	Orrios	27-VI-2024	12:11	24	1.218	3	1	4
26348678	40.6812965, -0.9528323	Fuentes calientes	27-VI-2024	13:15	24	1.296	1	-	1
26348679	40.6822798, -0.9506538	Fuentes calientes	27-VI-2024	13:32	24	1.293	2	-	2
26394201	40.7305971, -1.4766317	Ojos negros	30-VI-2024	14:23	27	1.161	-	1	1
26395201	40.6873970, -1.4397631	Villar del Saiz	30-VI-2024	15:55	27	1.154	2	-	2
26854330	40.5800201, -1.0018072	Orrios	28-VII-2024	11:40	26	1.166	1	1	2
26854327	40.6098451, -0.9533072	Perales de Alfambra	28-VII-2024	12:17	29	1.226	1	1	2
26854613	40.6829723, -0.9486970	Fuentes Calientes	28-VII-2024	13:14	28	1.251	1	-	1
26911273	40.7740063, -1.5481670	El Pedregal	31-VII-2024	12:57	30	1.221	1	-	1
26911784	40.6854469, -1.4725902	Villar del Saiz	31-VII-2024	14:35	32	1.279	1	-	1

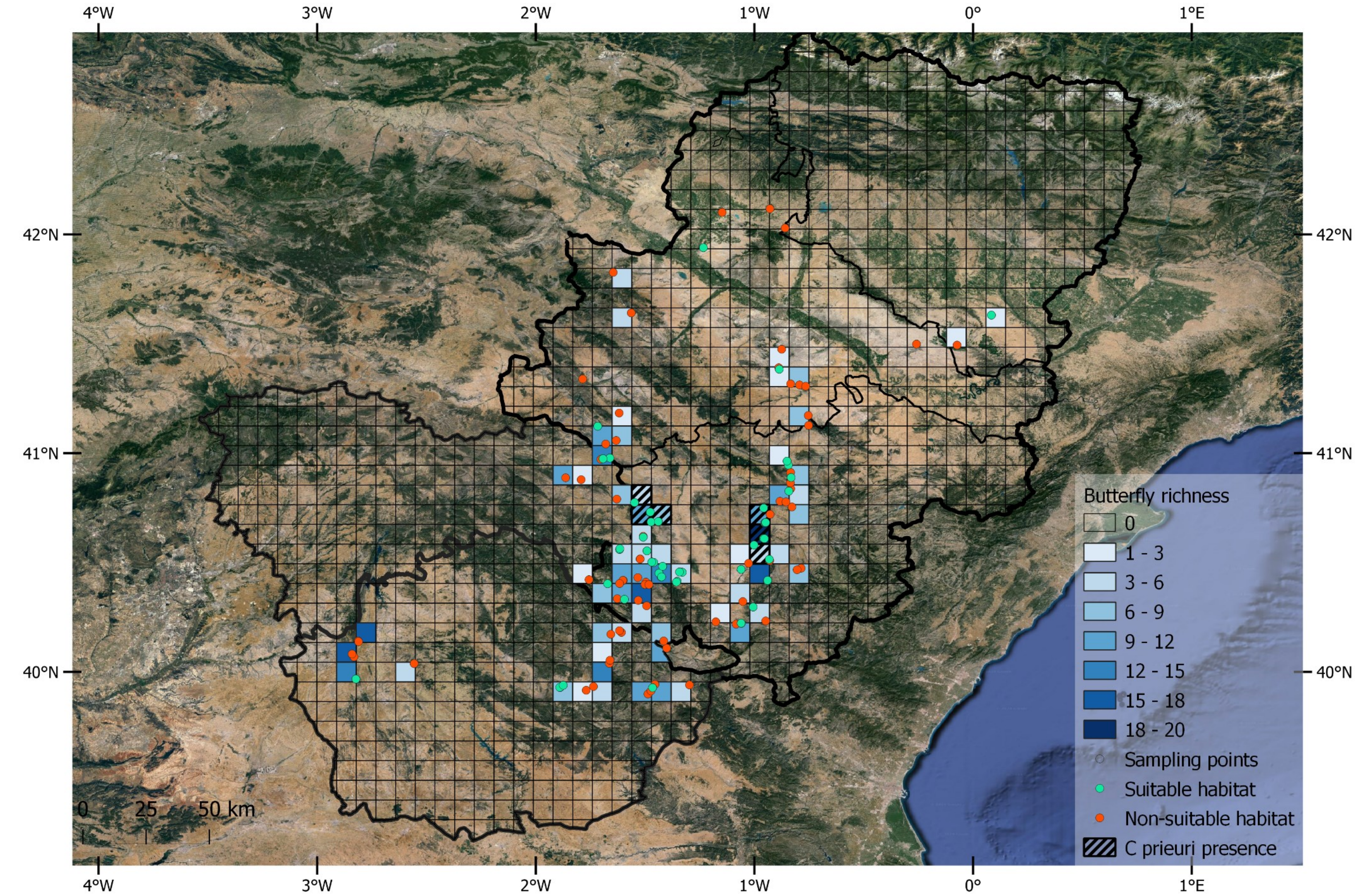

Figure 2. 10 x 10 km grid map displaying butterfly species richness, *Chazara prieuri* presence grid cells, and sampling points from the 15-minute surveys.

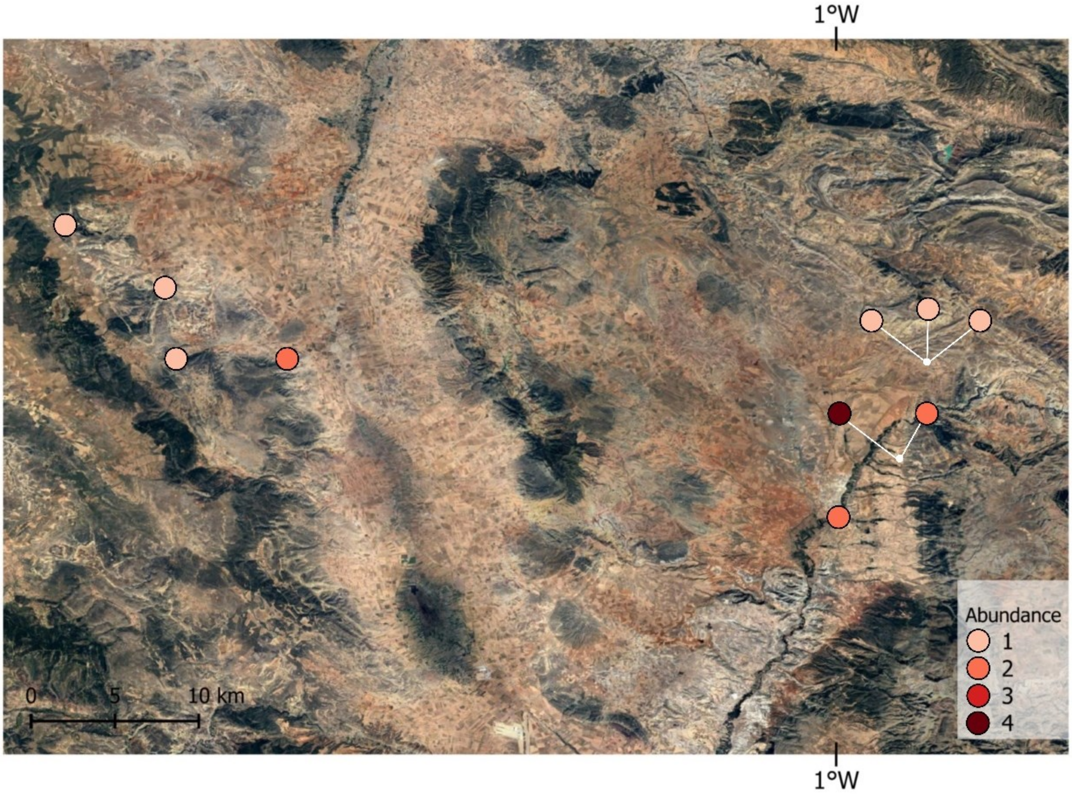

Figure 3. Sampling points where *Chazara prieuri* individuals were observed. The colors represent the number of individuals recorded per 15-minute count.

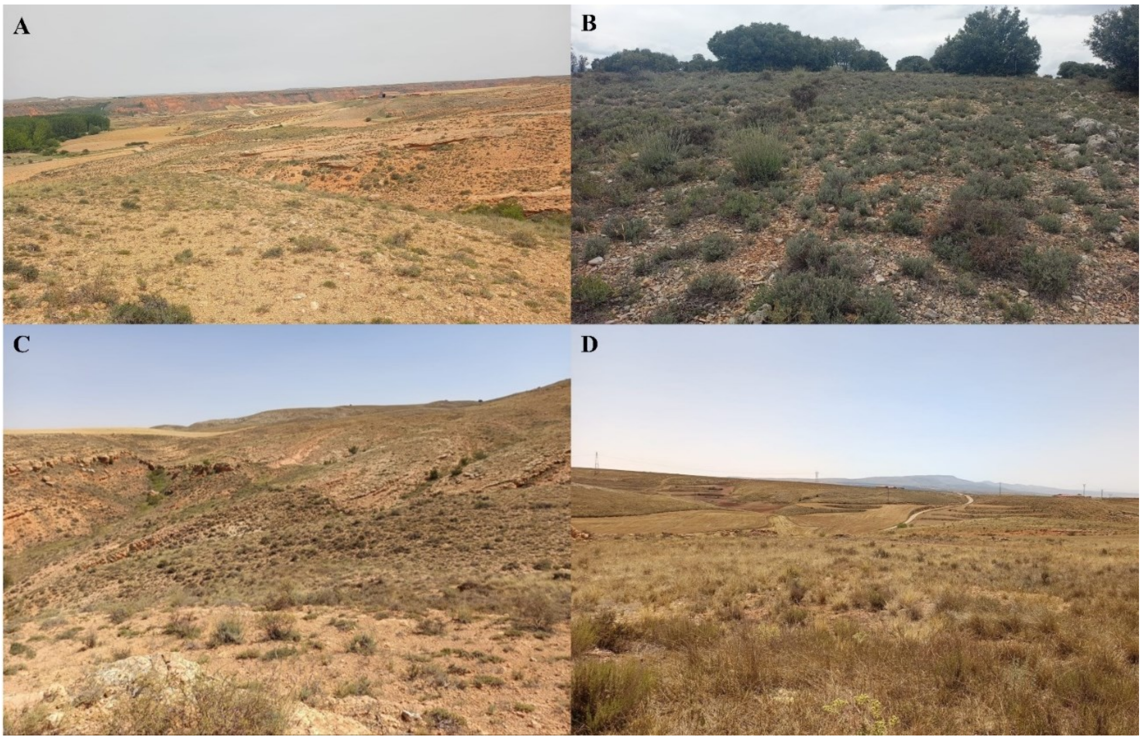

Figure 4. Habitat of *Chazara prieuri*. **A** - Orrios, Teruel **B** - Fuentes Calientes, Teruel **C** - Perales de Alfambra, Teruel **D** - Villar de Alsaiz, Teruel.

-Habitat Viability and Multiple Correspondence Analysis (MCA)-

The two dimensions explaining the highest percentage of variance accounted for 20.3% of the total (Fig. 5). The variables contributing most to Dim1 were patchy herbaceous cover, fully herbaceous soils, woodland edges, pinewoods, scattered shrubby patches, holm oak forests, and dense forests. Dim2 was primarily influenced by open scrubland, grass tussocks, herbaceous crops, tree crops, dense scrubland, scattered arboreal patches, and scattered shrubby patches.

A total of 47 sampling points were identified as areas of particular interest for future surveys (Fig. 2, Table 2). These points, which range in altitude from 322 to 1,634 m, exhibited a correlation with the presence of *C. prieuri* (Fig. 5). They are characterized by patchy herbaceous vegetation, especially grass tussocks, with scattered shrubs and trees (holm/kermes oak), creating an open habitat structure that is favorable for the species.

In contrast, non-optimal habitats for *C. prieuri* were found at altitudes ranging from 361 to 1,632 m and are characterized by dense forests, forest edges, pinewoods and areas with moderate to extensive shrub cover that cover the soil surface. Areas near woodlands and regions dominated by agricultural fields, whether herbaceous or tree crops, should also be avoided in future surveys, as they do not provide suitable conditions for the species.

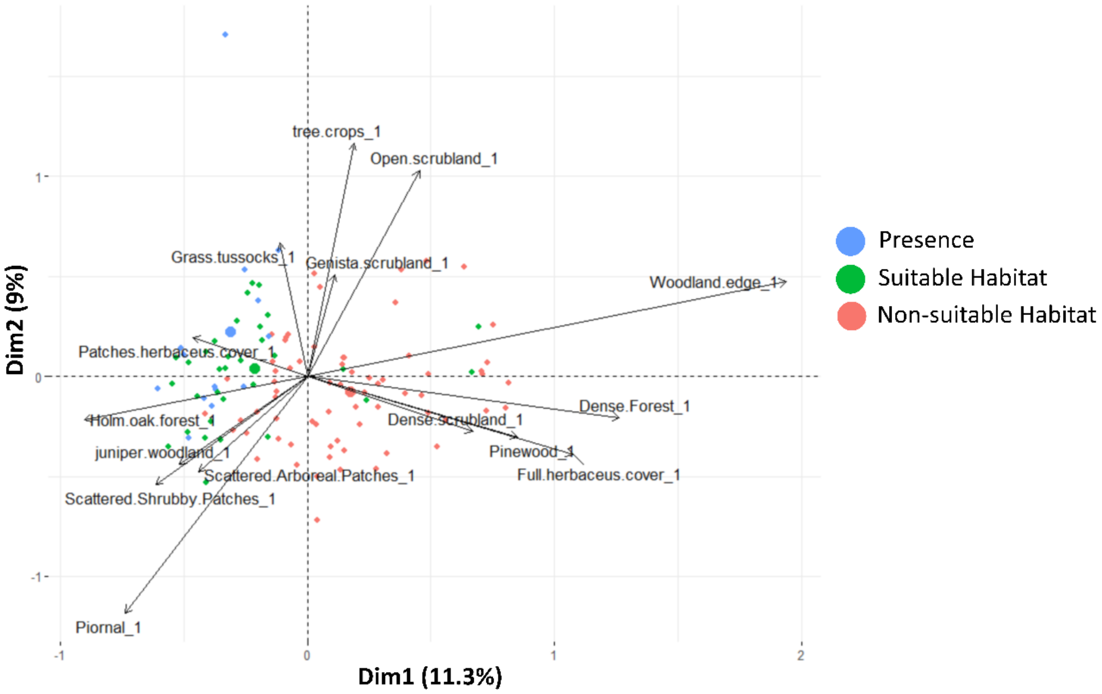

Figure 5. Multiple Correspondence Analysis (MCA) Biplot showing the distribution of *C. prieuri* sampling points in relation to key environmental variables (arrows) influencing habitat composition and structure with the greatest impact on Dim1 and Dim2. Includes suitable habitats for *C. prieuri*, presence locations, and low-priority resampling sites.

-Butterfly Richness-

A total of 63 butterfly species were recorded (Table 2, Fig. 2), with *Hipparchia semele* being the most widely distributed, present in 50 grid cells, followed by *Melanargia lachesis* (47 grid cells), *Colias crocea* (36 grid cells), and *Pieris rapae* (34 grid cells).

Chazara prieuri predominantly shared its habitat with the following species: *Hipparchia semele*, *Brintesia circe*, *Satyrus actaea*, *Hipparchia statilinus*, *Chazara briseis*, *Melanargia lachesis*, *Pieris rapae*, *Colias crocea*, *Pontia daplidice*, *Melitaea phoebe*, and *Polyommatus icarus*.

DISCUSSION

Following a survey in the northeastern Iberian Peninsula, 70 grid cells were visited, covering a total of 117 sampling points, of which 47 exhibited optimal conditions for *C. prieuri*. The species was detected at 7 of these points. Favorable habitats were characterized by sparse herbaceous vegetation, mainly grass tussocks, with scattered shrubs (*genista*) and trees (holm/kermes oak, juniper), creating an open habitat structure. In contrast, non-optimal habitats featured dense forests, forest edges, pinewoods, and areas with extensive shrub layers covering most of the soil surface. Additionally, areas near woodlands and regions dominated by agricultural fields, both herbaceous and woody crops, did not provide suitable conditions for the species, suggesting these should be avoided in future surveys.

-Distribution-

The potential disappearance of northern populations, along with the decline of those in Cuenca, may lead to significant fragmentation of *C. prieuri*'s range, disrupting gene flow between southern and northern populations. Conservation strategies should treat these populations as separate management units to prevent further isolation. The current distribution appears concentrated in a core population within the Iberian System, while northern regions, such as southern Huesca and northeastern Zaragoza, face a scarcity of suitable habitats due to vast expanses of cultivated land, despite the widespread presence of the larval host plant (*Lygeum spartum*). This suggests that any remaining populations in these areas are likely small and fragmented. Although some natural habitats were sampled, future surveys should leverage satellite or aerial imagery to better target suitable areas within these highly modified landscapes. More balanced sampling efforts across regions are necessary to accurately assess the species' true distribution.

-Phenology and Population Fluctuations-

Low abundances of *C. prieuri* in this study could be attributed to unfavorable conditions during the survey year. As insect populations can fluctuate significantly between years (Barnes, 1935), it is important to note that no significant differences in abundance were observed between sampling periods. However, the overall abundance of *C. prieuri* was low, with only 1-2 individuals recorded per count. Notably, some locations where the species was observed in June showed no presence in July, likely due to the low population density. Additionally, most sampled habitats exhibited a notable absence or scarcity of nectar resources, with no flowering plants found where *C. prieuri* was recorded. Summer-flowering plants, such as those in the genus *Carduus*, were dried up during both sampling periods. This suggests a possible phenological shift, with the flowering period potentially occurring earlier than usual. Such shifts could have severe implications for butterflies like *C. prieuri*, which rely on limited resources in xeric environments. This underscores the importance of long-term monitoring, especially for species in xeric regions facing desertification and rising temperatures. Climate change-driven phenological shifts might require earlier surveys in northern arid regions, particularly in early June, to capture the species' activity at its peak.

-Habitat suitability-

Our findings suggest that the structure and composition of the vegetation are key factors in determining *C. prieuri*'s presence. Suitable habitats for *C. prieuri* are characterized by open landscapes with minimal shrub and tree cover, offering refuge from high temperatures. These areas feature sparse vegetation and grass tussocks, which are essential for larval development. However, elevation does not appear to be relevant for *C. prieuri*'s presence, despite finding specimens within a narrow altitudinal range of 1200 to 1300 m. Both viable and non-viable habitats shared similar altitudes. Additionally, specimens were recorded in *piornal* vegetation at 1500 m during this year of sampling (Juan José Lucas López, personal communication, 2024). It is also noteworthy that temporary ponds were observed in some habitats where the species was detected, suggesting that water availability might play a supporting role in habitat and phenology suitability.

Although *C. prieuri* is known to exhibit hill-topping behavior (García-Barros et al., 2011), individuals in this study were found on small hills surrounded by flatlands largely used for cultivation. This suggests that hilltops in such modified landscapes may serve as critical refuges for the species in areas where suitable habitat is scarce. The reduction of suitable habitats due to agricultural expansion likely contributes to this behavior, as the species seeks out the few remaining open spaces.

-Anthropogenic Impacts-

The loss of optimal habitat due to agricultural practices appears to have significantly reduced the availability of suitable environments for *C. prieuri*. However, this could be linked to rural abandonment, where less optimal areas have transitioned into dense or intermediate shrublands, reducing the amount of exposed soil. This shift may be a consequence of the decline in extensive grazing, which historically maintained open grassland habitats. The resulting ecological succession towards shrub-dominated landscapes further limits the availability of habitats suitable for *C. prieuri*. Continued research is needed to better understand the factors influencing the species' distribution, with multi-year monitoring essential for determining long-term trends, particularly in xeric regions.

-Auxiliary Butterfly Species-

The co-occurrence of *C. prieuri* with other butterfly species such as *Hipparchia semele*, *Brintesia circe*, *Satyrus actaea*, *Hipparchia statilinus*, and *Chazara briseis* suggests that these species may serve as indirect indicators of optimal habitat conditions for *C. prieuri*. These species share similar adaptations to extreme climates, characterized by high temperatures, prolonged droughts, and limited resources. Monitoring the populations of these more common species could provide valuable insights into environmental changes affecting *C. prieuri*'s habitat, without needing direct observations of this elusive butterfly. This approach could also be useful for predicting the impacts of climate change and habitat alteration, offering an auxiliary method for assessing the conservation status of *C. prieuri*.

-Future Research and Conservation Recommendations-

Given the highly specific habitat requirements of *C. prieuri*, targeted conservation and monitoring efforts are essential. The dry, open habitats within the Iberian System, particularly near the borders of Teruel and Cuenca, are critical for the conservation of *C. prieuri* and should be prioritized for monitoring due to their favorable conditions for the species. Outside this core area, continued exploration and long-term annual monitoring are necessary, especially in regions impacted by agricultural expansion and the abandonment of grazing, which have likely led to fragmentation and altered habitat availability. Additionally, studies on the availability and use of water and nectar resources throughout the species' phenology are crucial. Developing detailed habitat suitability maps and conducting connectivity studies will be valuable tools for identifying potential habitats, refining our understanding of the species' population distribution, and informing the design of micro-reserves in habitats at risk from anthropogenic pressures. These measures will be key in mitigating the effects of habitat fragmentation and ensuring the long-term survival of *C. prieuri*.

Table 2. Butterfly Richness Associated with the 143 Sampling Points at Each Locality and 15-Minute Count. ID_Count identifier provides additional data for these counts, eBMS (2024b). Localities highlighted in green are considered viable habitats for the presence of *C. prieuri*.

ID_Count	**Locality**	**Grid reference**	**Date**	*Pararge aegeria*	*Lasiommata maera*	*Lasiommata megera*	*Arethusana aretusa*	*Argynnis addipe*	*Argynnis pandora*	*Melanargia ines*	*Melanargia lachesis*	*Coenonympha pamphilus*	*Coenonympha glicerion*	*Coenonympha dorus*	*Pyronia tithonus*	*Pyronia bathseba*	*Pyronia cecilia*	*Issoria lathonia*	*Brinthesia circe*	*Hyponephlee lycaon*	*Hyponephlee lupina*	*Maniola jurtina*	*Satyrus actaea*	*Vanessa cardui*	*Hipparchia fidia*	*Hipparchia statilinus*	*Hipparchia hermione*	*Hipparchia semele*	*Chazara briseis*	*Chazara prieuri*	*Melitaea didyma*	*Melitaea phoebe*	*Satyrium spini*	*Satyrium esculi*	*lycaena bleusei*	*Lycaena phlaeas*	*Plebejus idas*	*Plebejus argus*	*Polyommatus nivescens*	*Polyommatus thersites*	*Polyommatus ripartii*	*Poyommatus fabressei*	*Polyommatus dorylas*	*Polyommatus escheri*	*Polyommatus icarus*	*Polyommatus albicans*	*Polyommatus bellargus*	*Polyommatus caelestissima*	*Lampide boeticus*	*Aricia cramera*	*Pieris rapae*	*Leptidea sinapis/reali*	*Gonepeteryx rhamni*	*Gonepeteryx cleopatra*	*Colias alfacariensis*	*Colias crocea*	*Pontia daplidice*	*Carchadorus alceae*	*Carcharodus lavatherae*	*Thymelicus lineola*	*Thymelicus sylvestris*	*Spialia sertorius*	*Hesperia comma*	*Papilio machaon*	*Parnasius apollo*	*Iphiclides feisthamelii*
26315794 /97	Vellisca	40.1413697, -2.8119498	25-VI-2024			O					O								O		O							O						O		O									O		O				O			O		O				O						
26315650 /789	Alcázar del Rey	40.0686257, -2.8315061	25-VI-2024							O					O	O		O								O																	O		O		O		O			O		O	O			O	O			O		
26315791 /93	Rozalén del Monte	39.9669888, -2.8220211	25-VI-2024			O								O			O				O								O							O	O														O	O		O	O		O	O							O		O
26315795 /98	Cañete	40.0387573, -1.6632688	25-VI-2024			O			O		O					O			O		O	O		O										O												O		O		O	O	O		O			O	O				O				
26315792 /96	Cuenca	39.9428777, -1.4548596	25-VI-2024													O		O										O					O	O												O					O				O			O								
26324616	Fuentelespino de Moya	39.927657, -1.465967	26-VI-2024					O						O		O												O																										O	O										
26325408	Fuentelespino de Moya	40.1085614, -1.4013098	26-VI-2024			O					O					O						O					O	O					O													O		O				O					O									
26328325 /24	Veguillas de la Sierra	40.1085614, -1.4013098	26-VI-2024			O		O			O					O			O			O					O	O					O					O						O						O			O		O		O									
26333213 /11	Cubla	40.2220361, -1.060141	26-VI-2024								O					O													O					O													O					O	O			O												
26333212 /09	Teruel	40.3215996, -1.0530301	26-VI-2024			O					O					O			O									O																									O														
26339790 /88	Corbalán	40.4158563, -0.9406274	26-VI-2024		O						O					O			O			O							O	O					O													O						O													
26339789 /87	Monteagudo del Castillo	40.4740224, -0.7862069	26-VI-2024							O	O		O					O			O		O								O					O																															O	
26345999 /600	El Pobo	40.5087687, -0.9301937	27-VI-2024					O												O			O											O													O						O																
26345997	Paralejos	40.4964426, -1.0266304	27-VI-2024																																										O				O		O																
26347300 /001 / 02	Orrios	40.6103736, -0.9572007	27-VI-2024	O				O			O								O			O					O	O		O		O	O															O				O		O	O	O	O					O						

				P.a	L.ma	L.me	A.ar	A.ad	A.p	M.i	M.l	C.p	C.g	C.d	P.t	P.b	P.c	I.l	B.c	H.ly	H.lu	M.j	S.a	V.c	H.f	H.s	H.h	H.s	C.b	C.p	M.d	M.p	S.s	S.e	I.b	L.p	P.i	P.a	P.n	P.t	P.r	P.f	P.d	P.e	P.i	P.a	P.b	P.c	L.b	A.c	P.r	L.s	G.r	G.c	C.a	C.c	P.d	C.a	C.l	T.l	T.s	S.s	H.c	P.m	P.a	I.f
26348678 /79	Fuentes calientes	40.6812965, -0.9528323	27-VI-2024								O								O									O		O		O						O													O					O										
26350776	Valdeconejos	40.7799433, -0.8830051	27-VI-2024								O											O						O																							O					O										
26355261 /62	Mezquita de Jarque	40.7542205, -0.8284532	27-VI-2024								O											O						O									O								O				O		O					O					O					
26360560 /678	Utrillas	40.8377456, -0.8340446	28-VI-2024								O			O		O												O																	O				O		O															
26360895 /1002	La hoz de la Vieja	40.9118367, -0.8344984	28-VI-2024			O					O																	O																																						
26361397	Moneva	41.1268825, -0.7521963	28-VI-2024								O						O											O																			O									O										
26361881	Belchite	41.3121369, -0.7938649	28-VI-2024																																														O		O						O									
26372773	Puebla de Albortón	41.3905223, -0.8887665	28-VI-2024														O																																O								O									
26372771 /72	Valmadrid	41.475093, -0.8753371	28-VI-2024														O																																								O									
26374584	Fuentes de Ebro	41.4987016, -0.2587864	29-VI-2024																																																O															
26375256	Peñalba	41.4939932, -0.0731491	29-VI-2024																																																O						O									
26375362	Ontiñena	41.6309795, 0.0839053	29-VI-2024														O																														O																		
26390961	Castejón de Alarba	41.1833692, -1.6186332	30-VI-2024			O																						O																																						
26391036 /036	Torralba de los Frailes	41.0579411, -1.6324014	30-VI-2024			O					O								O									O																											O	O	O				O					
26391418	Embid	40.97783, -1.6609923	30-VI-2024								O								O									O																			O								O	O										
26392117	Embid	40.9718688, -1.701657	30-VI-2024								O											O						O																							O					O										
26393496	Molina de Aragon	40.8874514, -1.8634078	30-VI-2024								O							O	O			O						O										O							O		O			O	O					O					O				
26393495	El Pobo de Dueñas	40.7898216, -1.6293951	30-VI-2024								O	O							O		O							O								O														O	O															
26394201 /00	Ojos negros	40.7305971, -1.4766317	30-VI-2024								O																	O		O															O						O					O				O						
26395201 /913	Villar del Saiz	40.687397, -1.4397631	30-VI-2024													O			O									O	O	O															O											O									
26396817 /7572	Ródenas	40.619958, -1.5087782	30-VI-2024								O																											O																		O			O						O	

				P.a	L.ma	L.me	A.ar	A.ad	A.p	M.i	M.l	C.p	C.g	C.d	P.t	P.b	P.c	I.l	B.c	H.ly	H.lu	M.j	S.a	V.c	H.f	H.s	H.h	H.s	C.b	C.p	M.d	M.p	S.s	S.e	I.b	L.p	P.i	P.a	P.n	P.t	P.r	P.f	P.d	P.e	P.i	P.a	P.b	P.c	L.b	A.c	P.r	L.s	G.r	G.c	C.a	C.c	P.d	C.a	C.l	T.l	T.s	S.s	H.c	P.m	P.a	I.f
26405042 /41	Monterde de Albarracin	40.5164986, - 1.5227496	01-VII-2024											O		O					O							O																																						
26406856	Monterde de Albarracin	40.5157885, - 1.5227547	01-VII-2024								O										O							O																																						
26406260	Monterde de Albarracin	40.5004504, - 1.4604526	01-VII-2024																				O				O	O																																						
26406259	Cella	40.4555557, - 1.330121	01-VII-2024																O																																															
26406855	Gea de Albarracín	40.4143955, - 1.3530575	01-VII-2024								O								O		O							O																	O											O										
26406854	Barranco de Monterde	40.433773, - 1.4264211	01-VII-2024																												O														O									O	O											
26407635	Albarracín	40.4511732, - 1.4365452	01-VII-2024													O			O		O	O					O	O																											O										
26408268	Torres de Albarracín	40.4103768, - 1.4963308	01-VII-2024											O									O										O																																	
26410878	Torres de Albarracín	40.4310732, - 1.5333116	01-VII-2024					O			O											O						O																	O						O					O										
26410877 /64	Tramacastilla	40.4181609, - 1.5997473	01-VII-2024								O			O				O		O							O	O					O					O						O	O		O																			
26418550	Villar del Cobo	40.4040963, - 1.6710019	02-VII-2024					O						O				O		O																									O																					
26419246	Cañada de los ojos	40.4216325, - 1.7567238	02-VII-2024																																																				O				O					O	
26419484	Frías de Albarracín	40.3343935, - 1.6273221	02-VII-2024								O							O										O																	O																					
26420751	Laguna del Marquesado	40.1721745, - 1.6567963	02-VII-2024								O							O	O									O																	O						O			O												
26420752	Zafrilla	40.1806256, - 1.6083257	02-VII-2024																																																														
26420753	Moscardón	40.327075, - 1.5316888	02-VII-2024					O			O	O				O			O			O						O					O												O				O		O		O	O		O										O
26811153	Paredes	40.0817684, - 2.8402951	26-VII-2024			O								O			O								O	O																			O																					
26812066	Vellisca	40.1379844, - 2.8106377	26-VII-2024						O		O						O				O					O					O					O											O		O	O																
26813279	Horcajada de la Torre	40.037872, - 2.556272	26-VII-2024								O																																		O		O							O												O
26817699 /702	Reillo	39.9288637, - 1.8887341	26-VII-2024																							O		O	O										O												O				O											
26817701	Pajaroncillo	39.9159774, - 1.7693742	26-VII-2024																					O																													O			O									

				P.a	L. ma	L. me	A.ar	A.ad	A.p	M.i	M.l	C.p	C.g	C.d	P.t	P.b	P.c	I.l	B.c	H.ly	H.lu	M.j	S.a	V.c
26817703	Pajaroncillo	39.9331916, -1.7361721	26-VII-2024						O															
26817704	Cañete	40.0532715, -1.6605743	26-VII-2024					O																
26828402	Manzanaruela	39.9403067, -1.2970839	27-VII-2024														O							
26829380	Fuentelespino de Moya	39.8988581, -1.487046	27-VII-2024								O			O			O							
26829379	Fuentelespino de Moya	39.9131619, -1.4732459	27-VII-2024			O								O										
26832316	Veguillas de la Sierra	40.1415054, -1.414902	27-VII-2024			O	O				O													
26832318	Villel	40.2291846, -1.1766229	27-VII-2024																					
26832317	Cubla	40.2182745, -1.0840118	27-VII-2024														O							
26834976	Castralbo	40.2966586, -1.00567	27-VII-2024																					
26845079	La Puebla de Valverde	40.2329233, -0.9484804	27-VII-2024					O																
26845078	Corbalan	40.4185601, -0.9395151	27-VII-2024			O		O			O												O	
26850892	Monteagudo del Castillo	40.4670683, -0.8048838	28-VII-2024			O					O													
26851514	Escorihuela	40.5146074, -0.9322461	28-VII-2024											O									O	
26852069	Cuevas Labradas	40.4686989, -1.0608352	28-VII-2024																					
26854330	Orrios	40.5800201, -1.0018072	28-VII-2024																					
26854327	Perales de Alfambra	40.6098451, -0.9533072	28-VII-2024																				O	O
26854613	Fuentes Calientes	40.6829723, -0.948697	28-VII-2024																				O	
26855040	Cañada Vellida	40.7201505, -0.9284082	28-VII-2024																					
26856621	Pancrudo	40.7491141, -0.9575399	28-VII-2024				O				O												O	
26857255	Escucha	40.7772227, -0.85572	28-VII-2024												O					O			O	
26869420	Utrillas	40.8265206, -0.8422729	29-VII-2024														O							

	H.f	H.s	H.h	H.s	C.b	C.p	M.d	M.p	S.s	S.e	L.b	L.p	P.i	P.a	P.n	P.t	P.r	P.f	P.d	P.e	P.i
26817703	O	O			O																
26817704																					
26828402		O																			
26829380	O		O	O																	
26829379	O			O												O					
26832316	O	O		O																	
26832318	O																				
26832317																					
26834976																			O		
26845079																					
26845078			O														O		O		
26850892				O																	
26851514	O																				
26852069																					
26854330						O															
26854327					O	O															
26854613						O															
26855040																					
26856621																					
26857255																					
26869420	O	O	O																		O

	P.a	P.b	P.c	L.b	A.c	P.r	L.s	G.r	G.c	C.a	C.c	P.d	C.a	C.l	T.l	T.s	S.s	H.c	P.m	P.a	I.f
26817703						O					O										
26817704						O					O										
26828402											O	O									O
26829380			O						O												
26829379											O										O
26832316																		O			
26832318						O															
26832317			O									O									
26834976			O																		
26845079											O	O									O
26845078											O										
26850892			O																		
26851514																					
26852069																					
26854330			O																		
26854327																					O
26854613																					
26855040																					
26856621												O									O
26857255																					
26869420				O																	

				P.a	L.ma	L.me	A.ar	A.ad	A.p	M.i	M.l	C.p	C.g	C.d	P.t	P.b	P.c	I.l	B.c	H.ly	H.lu	M.j	S.a	V.c	H.f	H.s	H.h	H.s	C.b	C.p	M.d	M.p	S.s	S.e	I.b	L.p	P.i	P.a	P.n	P.t	P.r	P.f	P.d	P.e	P.i	P.a	P.b	P.c	L.b	A.c	P.r	L.s	G.r	G.c	C.a	C.c	P.d	C.a	C.l	T.l	T.s	S.s	H.c	P.m	P.a	I.f
26869699	Montalbán	40.8642982, -0.8354244	29-VII-2024														O								O																																									
26871312	La hoz de la Vieja	40.8886287, -0.8321976	29-VII-2024				O										O								O	O																									O																O
26871311	Cortes de Aragón	40.9634704, -0.8507696	29-VII-2024				O																		O																																									
26872054	Lécera	41.1721665, -0.7538348	29-VII-2024																						O	O																																								
26873211	Belchite	41.3061206, -0.7656683	29-VII-2024																																																					O										
26882682	Cabezo de la Cruz	41.31678, -0.8342812	29-VII-2024								O						O								O	O																									O					O								O		
26882681	Puebla de Albortón	41.3836254, -0.8865388	29-VII-2024																																																															
26889034	Las Pedrosas	42.0289725, -0.8596982	30-VII-2024														O																																																	
26889571	Erla	42.1172885, -0.92913	30-VII-2024														O																																																	O
26890187	Ejea de los Caballeros	42.1008299, -1.1478086	30-VII-2024																																																															
26890982	Tauste	41.9393783, -1.233373	30-VII-2024																																																															
26893243	Vera de Moncayo	41.8262495, -1.645933	30-VII-2024														O									O																									O						O	O						O		O
26893750	Tierga	41.6410761, -1.56321	30-VII-2024																						O			O																													O										O
26895479	Tierga	41.6410761, -1.56321	30-VII-2024																							O		O																																O							
26895966	Ateca	41.3387893, -1.7856639	30-VII-2024																																																															
26908372	Abanto	41.1229709, -1.7165693	31-VII-2024			O					O						O								O																				O						O					O	O									
26908371	Torralba de los Frailes	41.0415928, -1.68011	31-VII-2024						O		O														O	O		O	O																																					
26909139	Embid	40.9744213, -1.6923644	31-VII-2024																				O		O	O																			O					O							O									
26911274	Cubillejo del Sitio	40.8788437, -1.7924492	31-VII-2024																O												O																										O									
26911273	El Pedregal	40.7740063, -1.548167	31-VII-2024				O																			O				O										O																	O									
26911275	Ojos negros	40.7293934, -1.4775791	31-VII-2024																																																															

				P.a	L.ma	L.me	A.ar	A.ad	A.p	M.i	M.l	C.p	C.g	C.d	P.t	P.b	P.c	I.l	B.c	H.ly	H.lu	M.j	S.a	V.c	H.f	H.s	H.h	H.s	C.b	C.p	M.d	M.p	S.s	S.e	I.b	L.p	P.i	P.a	P.n	P.t	P.r	P.f	P.d	P.e	P.i	P.a	P.b	P.c	L.b	A.c	P.r	L.s	G.r	G.c	C.a	C.c	P.d	C.a	C.l	T.l	T.s	S.s	H.c	P.m	P.a	I.f
26911784	Villar del Saiz	40.6854469, -1.4725902	31-VII-2024																						O	O				O																											O							O		
26921666	Ródenas	40.6159636, -1.5086479	31-VII-2024																																							O																								
26921667	Pozondón	40.5534828, -1.4915505	31-VII-2024																							O																																								
26926260 /259	Orihuela del Tremedal	40.5594746, -1.6169811	31-VII-2024				O												O	O						O		O	O																																					
26945968	Albarracin	40.3996275, -1.5007748	01-VIII-2024			O					O																O	O														O								O																
26945967	Albarracin	40.3992303, -1.4824994	01-VIII-2024																						O																																	O							
26945966	Albarracin	40.4343787, -1.4247739	01-VIII-2024														O						O																						O						O					O							O			O
26945970	Gea de Albarracín	40.4108456, -1.3566839	01-VIII-2024																																																														
26945969	Cella	40.4567751, -1.3425456	01-VIII-2024																																																														
26945971	Monterde de Albarracin	40.4826007, -1.4198775	01-VIII-2024								O																	O																																						
26945972	Monterde de Albarracin	40.502127, -1.4692435	01-VIII-2024																									O	O																																					
26945973	Tramacastilla	40.418463, -1.601695	01-VIII-2024								O																O																													O										
26945974	Tramacastilla	40.4040116, -1.6166291	01-VIII-2024								O									O							O																												O								O	O		O
26945975	Villar del Cobo	40.403208, -1.6713734	01-VIII-2024					O											O	O							O	O	O																											O										
26952079	Frías de Albarracín	40.3316782, -1.5944643	02-VIII-2024								O			O														O																											O	O										
26952078	Terriente	40.3021942, -1.4930074	02-VIII-2024								O				O																																O																O			
26955704	Zafrilla	40.1884167, -1.6171947	02-VIII-2024			O					O				O					O																									O																					
26955703	Reillo	39.9390085, -1.8744722	02-VIII-2024												O										O	O			O																	O																				

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