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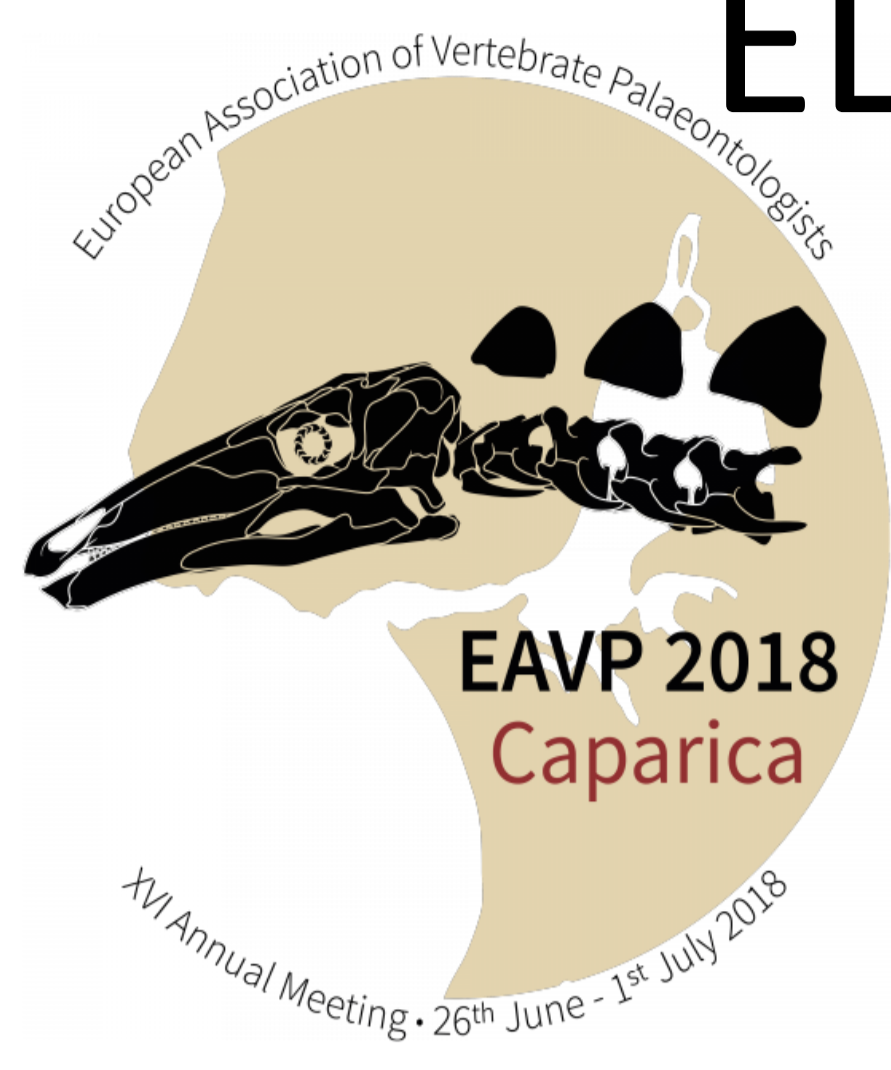
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# MICROVERTEBRATES (AMPHIBIA, SQUAMATA, LAGOMORPHA, RODENTIA AND INSECTIVORA) FROM STRATIGRAPHICAL UNIT XB OF EL SALT (MIDDLE PALAEOOLITHIC; ALCOI, SPAIN)



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## INTRODUCTION

The locality of El Salt (Middle Paleolithic, Alcoi, Spain) is mainly known by having one of the youngest Neanderthals records of the Southeastern Iberian Peninsula. The upper part of stratigraphic unit Xb, dated at  $52.3 \pm 4.6$  ka (MIS 3), is characterized by the presence of several archaeological assemblages, comprising vertebrate faunal remains, lithics elements and anthropogenically modified cobbles. The stratigraphic column of El Salt consists of 6.3 m-thick of sediments divided in 13 lithostratigraphic units (Fumanal, 1994). The field campaign of 2013 in unit Xb, have yielded for the first time in this locality nearly 1,000 small vertebrates' remains studied in order to reconstruct the palaeoecological conditions during the human occupation of this unit.



Fig. 1. A, Geographical location of El Salt archaeological site. B, General view of the locality. C, Stratigraphic column of El Salt showing the different lithostratigraphic units described by Fumanal (1994). Modified form Galván et al. (2014)



AMPHIBIANS AND SQUAMATE FOSSILS	DEPTH (m)	UNIT	LITHOLOGY	GRAIN SIZE	DATES (TS/USL)	HEINRICH EVENTS
	0	IV	clay	clay		
	1	V	very fine sand	very fine sand	44.7 ± 3.2 Ka	H4
	1.5		medium sand	medium sand	45.2 ± 3.4 Ka	
	2	VI	coarse sand	coarse sand	47.2 ± 4.4 Ka	H5
	2.5	VII	fine sand	fine sand	49.2 ± 4.8 Ka	
	3	VIII	very fine sand	very fine sand		
	3.5	IX	clay	clay		
	4	X	clay	clay	52.3 ± 4.6 Ka	
	4.5	XI	clay	clay		
	5	XII	clay	clay	60.7 ± 8.9 Ka	H6
	5.5	XIII	clay	clay	80.1 ± 4.0 Ka	
	6	XIV	clay	clay	81.5 ± 2.7 Ka	

## A BESTIARY

The small mammal assemblage comprises (Fagoaga et al., 2017): *Microtus arvalis*, *M. agrestis*, *M. (Terricola) duodecimcostatus*, *M. (Iberomys) cabrerai*, *Arvicola sapidus*, *Eliomys quercinus*, *Apodemus sylvaticus*, *Erinaceus cf. europaeus*, *Crocidura sp.*, *Sorex sp.*, *Talpidae* indet. and *Oryctolagus cf. cuniculus*. Among the amphibians and reptiles have been identified (Marquina et al., 2017): *Alytes obstetricans*, *Bufo bufo* s. l., *Epidalea calamita*, *Blanus cinereus* s. l., *Chalcides bedriagai*, cf. *Acanthodactylus erythrurus* and cf. *Rhinechis scalaris*.

## RESULTS

Applying the Mutual Ecogeographic Range (MER) method separately to small mammals and herptiles, a wide selected geographical area are obtained in both cases, resulting in wide distributions of values for each climatic parameter (Fig. 2). Moreover, the selected geographic ranges of both faunas show a clearly differentiated; thus the mammal fauna is mainly distributed in the North of the Iberian Peninsula, whereas the fauna of reptiles and amphibians is located mainly in the Eastern and Southeastern Spain. Nevertheless, calculating jointly the MER of both types of faunas, it allows us to discriminate much more the distribution of values. Our preliminary results show a reduction of 98% of the geographical area selected for herptiles and 99% for small mammals. On the other hand, the palaeoclimatic parameters calculated in Unit Xb suggest a mean annual temperature (MAT) of  $11.84 \pm 0.54$  °C and a mean annual precipitation (MAP) of  $526.95 \pm 31.32$  mm (Table 1). The new result for the MAP is lower than those obtained with herptiles and small mammals alone. The MAT shows a significantly lower value than those obtained with herptiles, whereas it is slightly higher than the results obtained in the small mammal study. Compared to the current climate in Alcoi, these results points to a colder climate and a similar rainfall. The surrounding area of El Salt would be dominated by bushland and forest, alternating with open areas (Fig. 3).

Table 1. Estimated climatic parameters for El Salt Xb site using MER method. It is included the results obtained using only herptile fauna (Marquina et al., 2017), small mammal one (Fagoaga et al., 2017) and a combination of both. Finally, the present climatic data of Alcoi is included. MAT: mean annual temperature; MAP: mean annual precipitation; ΔMAT: difference between the current values and the results obtained for the MAT in the different works; ΔMAP: difference between the current values and the results obtained for the MAP in the different works.

	MAT (°C)	MAP (mm)	ΔMAT	ΔMAP
Both faunas	$11.84 \pm 0.54$	$526.95 \pm 31.32$	-1.8	-16.51
Herptiles	$14.00 \pm 2.40$	$665.20 \pm 219.6$	+ 0.3	+ 122.8
Small mammals	$10.3 \pm 1.10$	$656.80 \pm 136.91$	-3.34	+113.34
Alcoi (today)	$13.64 \pm 0.83$	$543.46 \pm 32.29$	---	---

## CONCLUSIONS

The palaeoclimatic context where Neanderthals developed around  $52.3 \pm 4.6$  ka at El Salt was characterized by a MAT of  $11.84 \pm 0.54$  °C and a MAP of  $526.95 \pm 31.32$  mm. The climate would be colder (-1.8 °C) and slightly drier (-16.51 mm) than nowadays. These conditions point to a temperate moment (comparing with the whole MIS 3), coinciding probably with the DO 14.

Our preliminary results show a clear differences in the palaeoclimatic reconstructions by the use of a combination of small vertebrates' paleocommunity versus the use of micromammals or herptiles' ones alone. These differences are relates with the extension of the selected geographical area and, relates to that, the values of temperature and rainfall obtained.

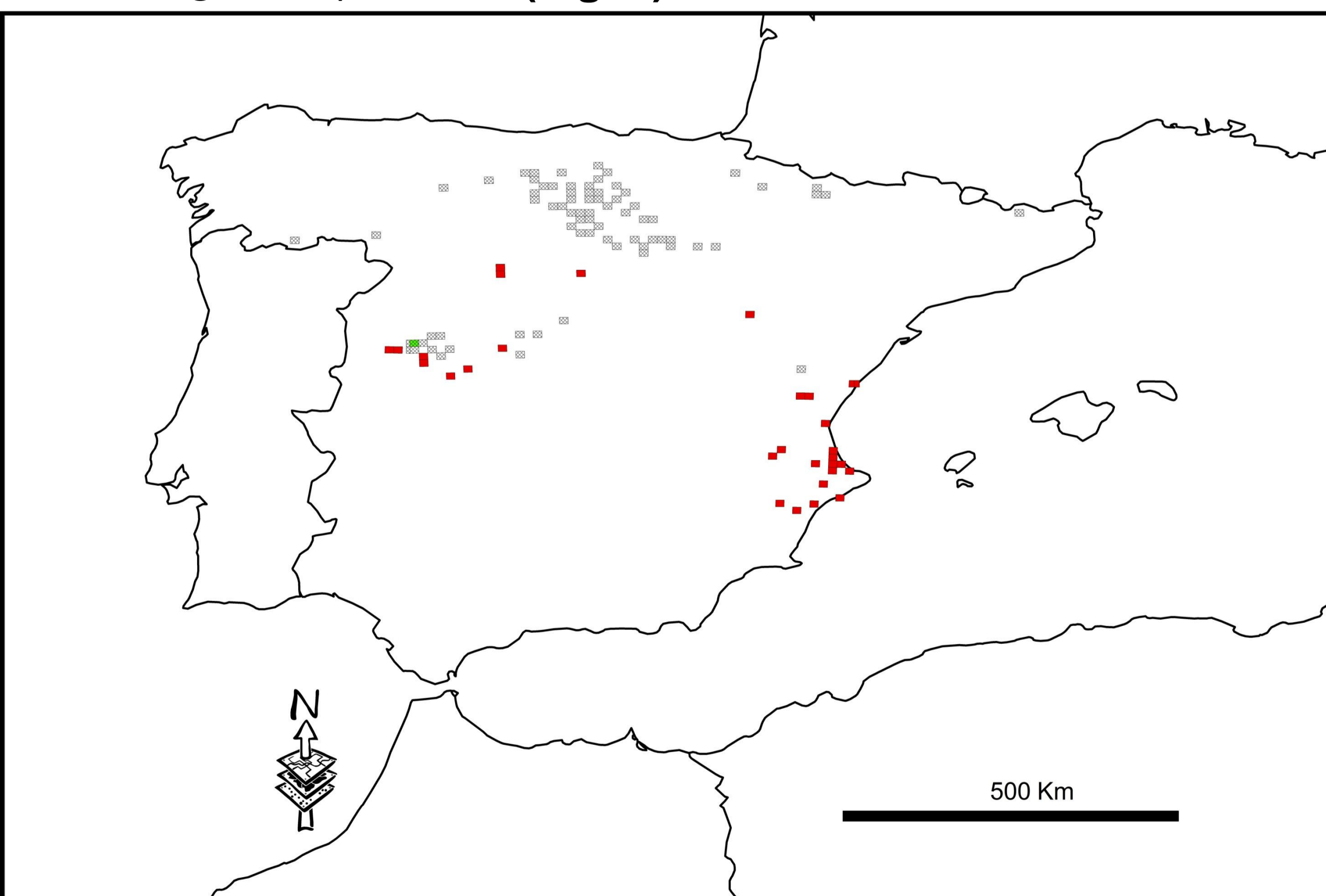


Figure 2. Mutual distribution range of the small mammals (grey squares) and herptiles (red squares) present al El Salt Xb site. The green square indicates the mutual geographical range of both faunas.

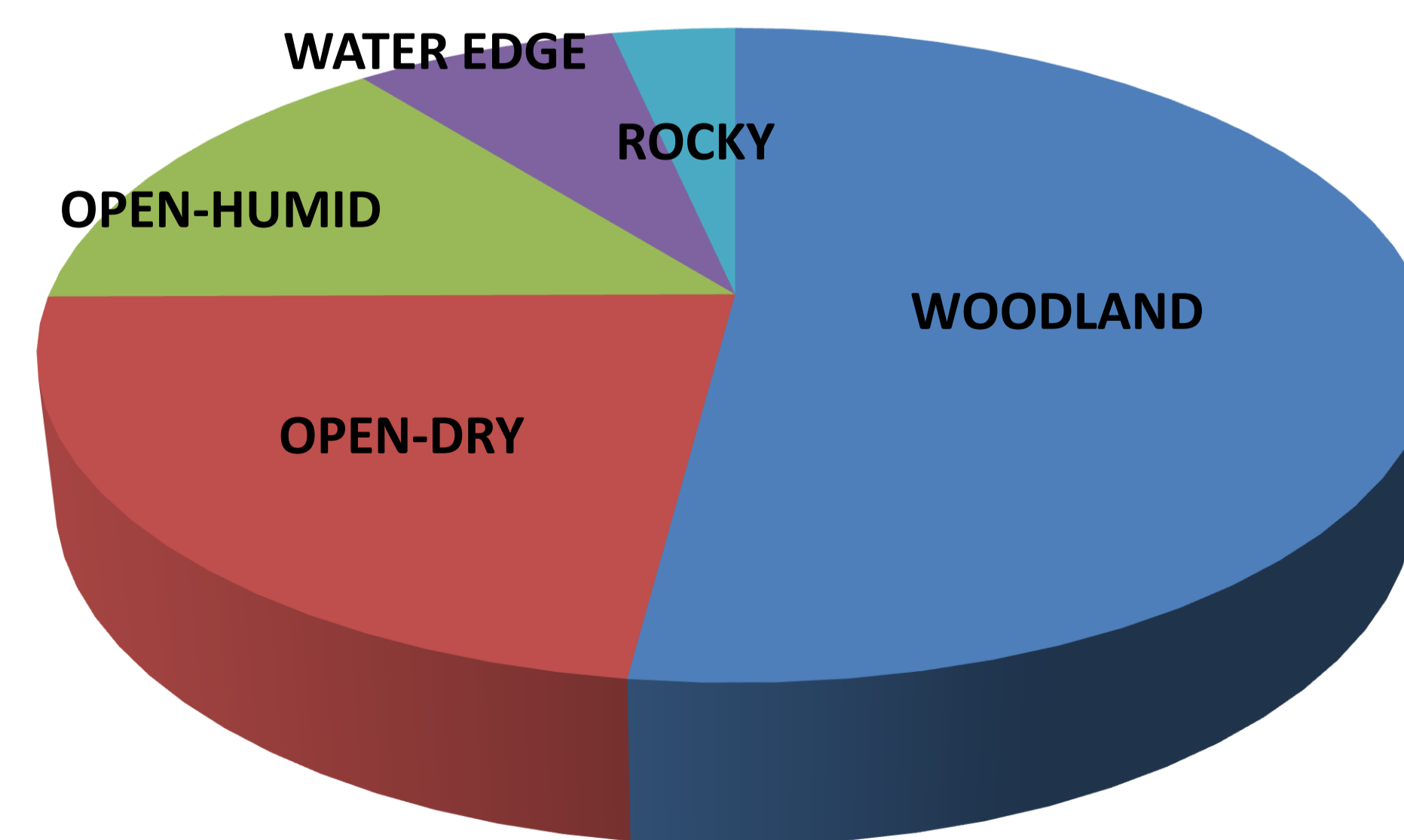


Figure 3. Reconstruction of landscape of El Salt Xb site by applying the Habitat Weighting Method on the small mammals and herptiles communities.

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