

Part 7

Population Ecology of Owls

Tengmalm's Owl *Aegolius funereus*



Conveners:

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Territorial Behaviour and Habitat Selection by the Scops Owl *Otus scops* in a Karstic Valley (NE Italy)

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INTRODUCTION

The Scops Owl (*Otus scops*) is a small-sized predator which feeds almost exclusively on invertebrates.

In Italy, it is a summer breeder in the North, arriving in late March-early April and leaving in early September, while it is resident in the South (Fig. 1). Little is known about its status, except for a more or less marked decrease in the mixed farmland of the Po Valley. Furthermore, we have no data on territorial behaviour and habitat selection (Cramp 1985) by this species. We present data collected during a preliminary study of the territorial behaviour and habitat selection by Scops Owls in a karstic valley near Trieste (Northeastern Italy)

STUDY AREA AND METHODS

The Rosandra Valley has a surface area of 460ha, and varies in altitude from 100 to 500m; the vegetation cover is mainly deciduous brushwood (*Ostrya carpinifolia* and *Quercus pubescens*), and the valley is crossed by a small river (which is the only river on the karst plateau.) Habitats included in the valley are shown in detail in Figure 2. The climate of the study area is sub-Mediterranean with rainfall concentrated in spring-autumn and a mean yearly temperature of 12°C.

We censused the Scops Owl population using the playback method for mapping territories (Falls 1982; Forsman *et al.* 1984; McGarigal & Fraser 1984). We carried out a census at fortnightly intervals, from March to October 1991, eliciting owl calls from 11 spots fixed along a 11.5km transect. We broadcast playbacks of Scops, Tawny and Eagle Owls in succession.

The territories with a minimum of three observations were considered stable and their boundaries were projected using the "minimum convex polygon". Habitat breadth was calculated

using the B-Index (Feinsinger *et al.* 1981):

$$B = 1/R \sum p_i^2$$

where

R = number of habitat types

p_i = use-ratio of each habitat

Owl habitat preference was determined considering the area of different habitats in the territories in relation to the total availability of the same habitats in the study area, using Chesson's (1978) electivity Index (W):

$$W = \frac{p_i/r_i}{\sum p_i/r_i}$$

where

p_i = use-ratio of each habitat

r_i = availability-ratio of each habitat

Figure 1. Breeding distribution of the Scops Owl in Italy (E= possible breeding; P= probable breeding; C= certain breeding).

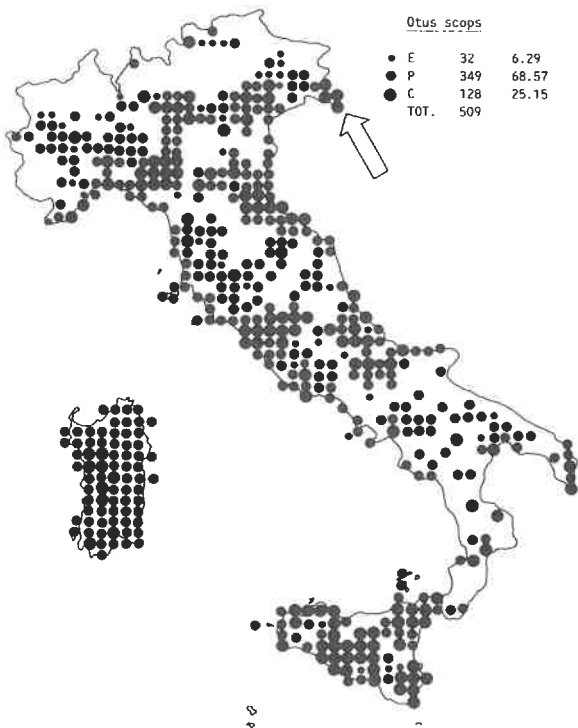
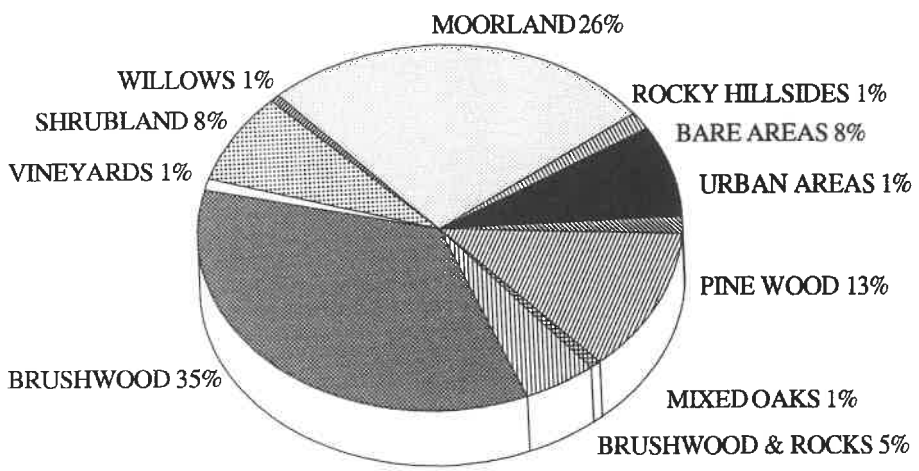


Figure 2. Habitat composition of the study area.



RESULTS

We identified 10 stable territories defended by a pair of Scops Owls and 5 territories with less than 3 contacts defended by a single Scops Owl, with density varying from 2.2 to 3.3 terr/km².

We also found 4 Tawny Owl territories and 1 Eagle Owl territory (Fig. 3). All Scops Owl territories had a SW exposure.

Figure 3. Territories of Scops Owls, Tawny Owls und Eagle Owls.

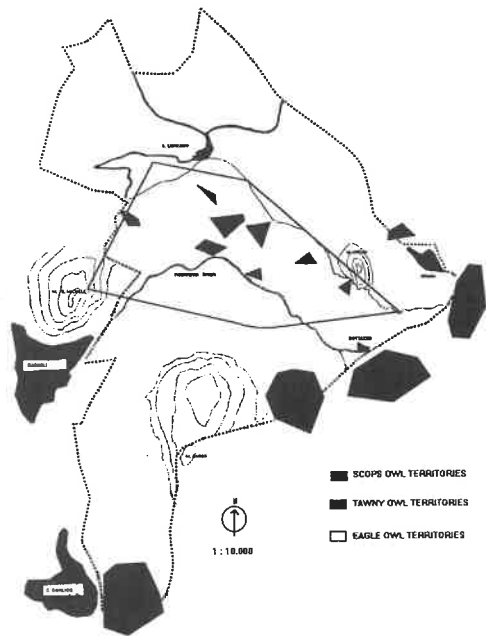


Figure 4. Availability and use of each habitat type by Scops Owls.

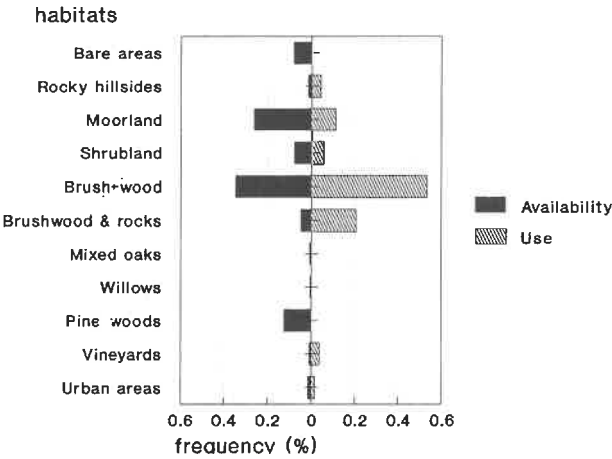


Table 1. Size (ha) of Scops Owl territories (D = mean distance between territories; B = niche-breadth).

Territories	ha	D	B
T1	0.5	204.86	0.26
T2	0.4	169.11 SD	
T3	1.56	12-472 Range	
T4	0.89		
T5	0.79		
T6	0.17		
T7	0.39		
T8	0.47		
T9	0.29		
T10	0.51		
Mean	0.60		
SD	0.38		
Range	0.17-1.56		

Surprisingly, while 9 Scops Owl territories were within the Eagle Owl’s territory and were concentrated close to its nest (in which 3 owlets fledged), at a mean altitude of $269.1 \pm 80.58\text{m}$, the Tawny Owl territories were located well outside the breeding range of the Eagle Owl and at a lower altitude (100-150m). The surface area of Scops Owl territories, mean distance between neighbouring territories and habitat breadth are shown in Table 1.

Habitat use by Scops Owls reflects clear preference toward 3 habitat types: rocky hillsides, brushwood with rocks and vineyards. (Table 2). These are the rarest habitats in the Valley (Fig. 4). On the other hand, bare areas, moorland, mixed oaks, willows and pine woods were used less than their availability.

Table 2. Electivity Index values (W; Chesson 1978)

HABITATS	W
BARE AREAS	0.00 -
ROCKY HILLSIDES	0.19 +
MOORLAND	0.03 -
SHRUBLAND	0.05 -
BRUSHWOOD	0.10
BRUSHWOOD & ROCKS	0.29 +
MIXED OAKS	0.00 -
WILLOWS	0.00 -
PINE WOODS	0.00 -
VINEYARDS	0.26 +
URBAN AREAS	0.08

+ indicate preference
- indicate avoidance

DISCUSSION

Our data show that the Scops Owl breeding territories we studied are in general small, but we have no other information on this topic (Cramp 1985). The population density we found is similar to that observed on the Mediterranean island of Port-Cros (France: 1.8-2.3 pairs per km²; Glutz & Bauer 1980) and higher than that found in central Europe (Czechoslovakia: 0.7 territory per km²; Randik 1959, in Cramp 1985); on the other hand, in Roumania (Kalabér 1971, in Cramp 1985), southern Tyrol (Austria) and southern France (Glutz & Bauer 1980) Scops Owl densities are on average higher (5 pairs per km²) than in our study area.

The complementary distribution of Scops and Tawny Owls, and the close vicinity of Scops Owl territories to the Eagle Owl nest, suggest that, apart from feeding habits and habitat requirements, other factors such as microclimate preferences and predation are also involved, the Tawny Owl often preying on the Scops Owl and being preyed on in turn by the Eagle Owl.

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