

Ecology and Population of Pygmy Owls *Glaucidium passerinum* in the Black Forest (S.W. Germany)

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The Pygmy Owl was widespread in the Black Forest before the 2nd World War. After the war large areas were deforested. This led to a drastic change in the whole ecosystem, above all because of the vast clearings, breaking up the extended forests. So the population of voles increased, and an aggressive predator immigrated from the lowlands, which had formerly been absent in the higher parts of the mountains: the Tawny Owl *Strix aluco*. Deforestation, pesticides against voles and the influence of an enormously increasing population of Tawny Owls finally led to a dramatic decrease of the Pygmy Owl, which apparently became extinct in 1967.

However, reforestation of the clearings lead to a decrease of voles and thence also to a reduction of Tawny Owl populations. This encouraged us to make an experiment: the reintroduction of captive-bred Pygmy Owls. This was started in the autumn of 1968, in close co-operation with the forestry department. Initially we released 22 birds (all trained to catch live prey) in 1968, and 13 more between 1969 and 1971. All 35 specimens had been ringed before release.

In the following years we got records of those birds at several places in the Black Forest; even a successful breeding already in 1970. The population has been censused every year up to now. And today it comprises more than 150 territories occupied by Pygmy Owls in the whole Black Forest. This is one of the very few cases of successful reintroductions by releasing captive-bred birds!

The Black Forest Pygmy Owls inhabit extended coniferous forests with old trees, small clearings and reforested areas with spruce thickets. In such areas the Pygmy Owl is now once again found throughout the Black forest, above all between 800 and 1200m NN (Fig.1). Today the population is rather

Figure 1. Female Pygmy Owl throws feathers out of nest hole.

Photo: C. König.



Figure 2. Artificial nestbox for Pygmy Owls.

Photo: C. König.



dense. In a study area of about 100km² in the northern Black Forest, 26 territories are occupied. Within this the highest density is found at one locality: 3-4 pairs on 10km²!

The size of the territories varies between nearly 1 and 1.6km², according to habitat topography. Song may be heard year-long with peaks in late winter, spring and autumn. The owls are territorial all through the year and many seem to pair for life. Copulations may be observed many weeks before the nest-hole is occupied by the female. In the early stages of nuptial activity, the birds copulate at different localities in the territory, quite often near the border, later only near the future breeding-place. Copulations probably have - beyond reproduction - two purposes:

1. fixing the pair-bond
2. territorial effects, as being accompanied by vocal activities of both sexes.

But birds may also copulate in stress-situations.

All nests found were in holes of the Great Spotted Woodpecker *Picoides major*.

Once (1994) a pair nested in a nest-box made of a tree-trunk with a cavity excavated by that woodpecker. Among the trees with holes Spruce *Picea abies* are preferred as breeding sites. Next, Fir *Abies alba* and Pine *Pinus silvestris* are chosen. Deciduous trees (e.g. *Fagus sylvatica*, *Betula pendula*) have been chosen only very seldom. Even if we found most nests in live trees, dead trunks of every species of tree were accepted as well. The opening of the nest-hole has been found in general about 3-7m above the ground, but we also found nests from only 2m up to more than 12m above the forest floor. Laying was normally in late March or early April. After hard winters it began up to 4 weeks later, in mild ones already in mid-March (e.g. 1993).

Fledging of young in general took place in late June or early July. In 1993 most young left the nest-hole in the first decade of June. In 1995 fledging was somewhat later than normal (between 23rd June and 15th July). It took in general 2-4 days until all the young of a clutch had left the nest. Most birds fledged between 9 and 14 h. Normally 1-2 young left the nest on the same day.

Regarding food (according to pellets and other refuse found below the nest-hole), in general birds made up about of the total prey. Only where larger clearings existed in the territory was the amount of rodents (especially voles) more than 50%. The largest bird found as prey of the Pygmy Owl was a young Ring Ouzel *Turdus torquatus*, the largest mammals a Forest Dormouse *Eliomys quercinus* and a Water Vole *Arvicola terrestris*. Two species of reptiles were found among the prey: Mountain Lizard *Lacerta vivipara* and once a young Adder *Vipera berus*. The adder is probably the first record as prey of the Pygmy Owl in Germany. Beyond the vertebrates a few beetles and small snails were found.

After the experience gathered in more than 30 years of research, we can speak today of an intact population being actually at its optimum. But we don't know what may happen in the future. The influence of acid rain on the forests is obvious and the trees are growing weaker, so that storms have produced rather large clearings during recent years. Here Tawny Owls are beginning to move in again. If this development continues, we fear it might lead to a situation similar to what we had after the war, when the Pygmy Owl became virtually extinct in the Black Forest due to such factors.

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