SUMMARY REPORT A3

Study area

The study area concerns a total of 48 Natura 2000 sites in Emilia-Romagna, 38 survey sites for *O. eremita* and 18 sites for *R. alpina*. This extensive field operation involved simultaneously more than 10 entomologists in two annual growth seasons of 2016 and 2017.

The evaluation of the ecological functionality of the trees for the purpose of the survey was carried out following the protocols specifically set up during the initial phases of the LIFE Eremita project.

For *O. eremita* transects were walked and identified on the basis of the presence of habitats suitable for the species. These habitats are large and veteran broadleaved trees, even centenary, alive, with hollows and large cavities rich in wood boring dust and rotting wood. These include *Quercus* spp*., Castanea sativa, Tilia* spp*., Salix* spp*., Populus* spp*., Fagus sylvatica, Morus* spp*., Platanus* spp*., Aesculus hippocastanum*, as well as cultivated and wild plants of the Rosaceae, family, *Pyrus* spp*., Malus* spp. *and Prunus* spp. (Ranius & Nilsson, 1997; Ranius, 2002; Oleksa *et al*., 2007; Dubois, 2009; Dubois *et al*., 2009).

Along the transect, a metal plate bearing the identification code has been applied to each habitat tree; each tree was geo referenced via a GPS device (model Garmin 62s), photographed, and the specific survey card was compiled.

The main morphological and ecological factors used to identify habitat trees are the following:

- Diameter of the habitat plant at chest height (DBH -Diameter at Breast Height);
- Cavity height from the ground;
- Cavity width;
- Quantity of soil (in litres) present in the cavity;
- Any disturbance factors;
- Distance from other plants of the same size;
- Distance from other hollow plants.

With regard to *R. alpina* the transects were identified with the same modalities used for *O. eremita*. The main morphological and ecological factors used to evaluate the functionality of the plant are:

- Presence and quantification of the dead wood parts of the plant;
- Presence of fungal fructifications;
- If the plant is dead, indication of the position: standing, on the ground, broken stump;
- Distance between the habitat plants
- Presence of woodpiles;
- Presence or absence of eclosion holes on the trunk;
- Presence of larval galleries with boring dust and pupation cells.

For both species, the measurements were made by an expert entomologist, covering the transects. The suitability assessment was carried out in the field on the basis of the morphological and ecological factors listed on the survey card, expressing them on a scale of values ranging from high, to medium, low and no suitability, according to the judgment of the surveyor.

All the data collected on the field survey cards were subsequently uploaded to Excel archives and inserted into the project databases.

Results

Osmoderma eremita

Data was catalogued on the ecological function of 1,760 trees on 130 transects in the 38 Natura 2000 sites that were investigated. Each tree was assessed on the basis of its suitability to host the

species and was mapped with a chromatic scale: green= high suitability; orange= medium suitability; yellow= low suitability; black=no suitability.

Rosalia alpina

Data was catalogued on the ecological function of 1,112 trees on 88 transects in the 18 Natura 2000 sites that were investigated. Each tree was assessed on the basis of its suitability to host the species and in this case also it was mapped using the same chromatic scale as for *O. eremita*.

In the following Table, data are summarized according the suitability of habitat trees.

Species	**Natura 2000 sites (N)**	**Transects (N)**	**Habitat trees registered (N)**	**High suitability (N)**	**Medium suitability (N)**	**Low suitability (N)**	**No suitability (N)**
Osmoderma eremita	38	130	1760	283	605	125	747
Rosalia alpina	18	88	1112	318	198	491	105

Conclusions

Thanks to the extensive field operation that was carried out, it was possible to identify and map the habitat trees of the two target species of saproxylic beetles of the Life Eremita project on a large-scale.

The effort put forth in the 48 Natura sites of the region represents the first survey of this magnitude carried out in Emilia - Romagna, both in terms of territorial extension and in terms of precise return of technical results (number of trees individually assessed to determine their ecological functionality).

The results of this analysis confirm, for both species, the scarce presence in both primary and secondary habitats of conditions favourable to the expansion of their distribution area, due to the rarity of suitable habitat trees, which were found only in small and local environment matrices.

The survey has prepared a catalogue with a high number of evaluated trees (1,760 for *O. eremita* and 1,112 for *R. alpina*) in terms of ecological functionality, mapped on a GIS basis, which can be used to speed up processes of natural senescence or intervene ex-novo (e.g. with the production of cavities) to create conditions that can favour habitat expansion for the two species.

Superimposing the data of the species reports with those of the suitability of the trees makes it possible to provide a priority of intervention, applied with some of the actions of the LIFE Eremita project. The expansion of the available habitats favours the expansion of populations along the new ecological corridors thanks to the first interventions carried out. The cataloguing even of scarcely suitable habitat trees, for which it is necessary to increase the suitability, allows for the planning of new interventions in the medium and long term, also based upon the first evolution set off by the actions of the Life project. In fact, the trees with medium and low suitability on which interventions were carried out, once colonized by the species, can become themselves the barycentre for new expansion matrices.