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Management of grey squirrel in Umbria: conservation of red squirrel and preventing loss of biodiversity in Apennin

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The LIFE STOPVESPA project: establishment of an Early Warning and Rapid Response System and spatial containment of *Vespa velutina*'s populations in Italy

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The yellow-legged hornet *Vespa velutina* Lepeletier 1836 is an invasive alien species in Europe that is colonizing Italy and many other countries at impressive speed. This hornet preys honeybees and other native insect species (e.g. wild bees, other wasp species), thus creating serious economic impacts on beekeeping, risks for the biodiversity and the pollination services associated with wild bees activity. Moreover, *V. velutina* create colonies of great size in urban areas more frequently than native hornet species do, so citizens could be exposed to this hornet with more probabilities.

Because of the issues posed by this hornet, Europe is considering *V. velutina* as an invasive alien species of union concern (IAS Regulation – EU 1143/2014), and member states should act to prevent, contain and limit its spread. Within this contest, the European LIFE STOPVESPA project is acting in Italy to contain its spread and to establish a national Early Warning and Rapid Response System (EWRRS).

The pillars on which the project is building the surveillance part of the EWRRS are the beekeepers and their associations. In Italy, 48.889 beekeepers owning 98.217 honeybee colonies are capillary distributed in each regions (data updated to 10/2017). This already existing network could monitor the environment in a simple and sustainable way, by observing and communicate the presence/absence of *V. velutina* when preying honeybees in their apiaries and by displacing economic traps for hornets.

In the first years of the project, an EWRRS has been established in Liguria and Piedmont regions throughout the development of a strategy and new tools to rapidly detect and remove nests of the species, preferably before its autumn reproductive period. In particular, LIFE STOPVESPA has developed a harmonic radar prototype able to track in real time tagged hornets when flying back to their nests, with a detection range up to 470 meters from the radar. This system is extremely useful because nests are often covered by leaves and unseen until late autumn and winter, and could be implemented in a rapid response system to remove new colonies of *V. velutina* in new invaded areas.

Teams of trained people act within the developed strategy to remove both nests detected with the radar and those reported by citizens. The strategy allowed detecting and removing 419 nests in 2017, this contribute to the reduction of the exponential trend of the species, started in Liguria in 2013 with the detection of the first colonies.