VELUTINA TASK FORCE

Majorca, Spain, 22th - 23th June 2017

V. velutina, passing from a mean density of 5.0 ± 2.9 nests/km^2 in core areas with a total surface of 54 km^2 in 2015 to 6.6 ± 3.1 nests/km^2 in core areas of 125 km^2 in 2016. Moreover, the population in the south of Piedmont is confirmed by the discovery of adults in predation in 2016 and the detection of a nest in 2017. In addition, a new Italian population has been reported between Veneto and Lombardy regions, where a nest and adults were discovered at a distance of about 280 km from the previous Italian records.

Finally, the predictive models of expansion developed by the project in 2015 to evaluate the spread of the species in 2016 were confirmed: 98.3% of the nests discovered outside the 2015 range were located inside the predicted areas of expansion for the scenarios that considered the altitudinal limits of 900 and 1200 m a.s.l.

The strategy already developed by STOPVESPA as soon as implemented with the radar prototype under development should form the basis of an Early Warning and Rapid Response System for *V. velutina*.

Design and testing of an harmonic radar for the tracking of the yellow-legged Asian hornet

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We developed and tested an harmonic radar capable of tracking the flying trajectory of the yellow-legged Asian hornets, once equipped with a small transponder, in their natural environment. This radar is, to the best of our knowledge, one of the most effective ways to follow the hornets to their nests.

Several hornets were captured close to the clusters of honey bee hives, tagged with vertical polarized transponders and then released in order to follow the flight towards their nest. Extensive field testing proved that the flying capabilities of the hornets were not reduced and we were able to record an important collection of data. The installation of the radar on a telescopic tower drastically improved the maneuverability of the system and the capability to follow the insects preferential flying directions. The system was able to produce continuous traces with a clear indication of the most probable position of the nest. The maximum range of detection was about 150 m in all directions. The designed system has three major advantages over conventional harmonic radars. Firstly and most importantly, it adopts advanced processing techniques to suppress clutter and to improve target detection. Secondly, it allows radar operations in complex environments, generally hilly and rich of vegetation. Finally, it can continuously track tagged insects (24/7) and in any meteorological condition, providing an effective tool in order to locate the nests of the yellow-legged Asian hornet. A major upgrades of the system is under development and will be adopted in the forthcoming 2017 field test campaign.

Where is *Vespa velutina* in Europe? Distribution data collection, reliability, availability and depiction

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Vespa velutina has been spreading in Europe since 2004 when it was first discovered in France and it is now present in seven countries. Official agencies, research centres, beekeeper associations, beekeepers and common people are all concerned by its spread throughout Europe, and all of them are collecting data on its actual distribution. Despite the many efforts in monitoring