Morganti M., Campobello D., Mascara R., Sara' M., 2015 – Trends of neighbouring populations of Lesser Kestrel reveal intraspecific differences in response to climate change. Abstract XVIII CIO, Caramarico Terme, pag 26.

Trends of neighbouring populations of Lesser Kestrel reveal intraspecific differences in response to climate change

Michelangelo Morganti1, Daniela Campobello1, Rosario Mascara2, Maurizio Sarà1
1Dipartimento di Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche (STEBICEF), Università di Palermo, Via Archirafi 18. 90123 Palermo.
2Fondo Siciliano per la Natura, Via Popolo 6. Niscemi

Climate change is among the main causes of biodiversity loss at a global scale. Sensitivity to climate variation is generally described as a species-specific trait although within-species differences may arise as adaptations to diverse habitats. Yet, little is known on inter-population differences in response to climate variation. This is particularly relevant for migratory birds breeding in pseudo-steppe habitats as they represent one of the avian groups most threatened by climate change. Based on a 15 years dataset on three neighbouring Sicilian populations of Lesser Kestrels (*Falco naumanni*) breeding in a gradient of habitats from lowland to mountain, and by selecting a set of climatic variables potentially affecting different phases of the life cycle (Sahel Rainfall Index, Winter NAO, NDVI during egg laying, brood and pre-migratory roosting periods), we firstly modelled trends in: (1) colony occupancy rate and colony size for each sub-population; (2) climatic parameters. As a second step, we tested whether: (3) climatic variations affected population parameters. The colony occupancy rate increased with time in all populations, while colony size increased in the lowland population but decreased in that of mountains. Sahel Rainfall Index and Winter NAO did not show any consistent temporal trend, while NDVI significantly increased for all the biological phases and populations. Mixed models revealed that Sahel Rainfall and Winter NAO had marginal but negative influence on colony rate occupancy, while NDVI at any biological phase had strong positive effect on colony occupancy. Colony size was significantly and positively affected only by the NDVI duringt the pre- migratory roost. The magnitude of climatic effects on colony occupancy rate significantly differed among populations for all the parameters. Overall, climatic variables that positively affected population parameters of Lesser Kestrel increased during time, and this might have contributed to the demographic expansion of the species in Sicily since 2000. Remarkably, we found that sensitivity to climate differed among populationsof our study species, even at the small spatial scale represented by Sicily (25 000 km2 and 1.7 decimal degrees of latitudinal range). We argue that intraspecific differences in sensitivity to climate should be carefully considered when planning conservation measures and when modelling climatic niches at the scale of species range.