Almost 80 species scavenge hunting remains worldwide

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Researchers used motion-triggered remote cameras to monitor more than 350 carcasses consisting of hunting remains of wild ungulate species. Credit: Patricia Mateo-Tomás y Pedro P. Olea

Human activities such as livestock farming, fishing or hunting yearly waste tons of food into natural ecosystems. A large part of this anthropogenic food is provided as carrion and subsidizes a wide range of vertebrate species. Spanish scientists have described for the first time the general structure of scavenger communities worldwide, which consist mainly of birds (66%) and mammals (34%).

European ecosystems are yearly subsidized with ~100 million tons of carrion from big game hunting. However, the knowledge on how these subsidies can affect biodiversity and ecosystem functioning is still scarce.

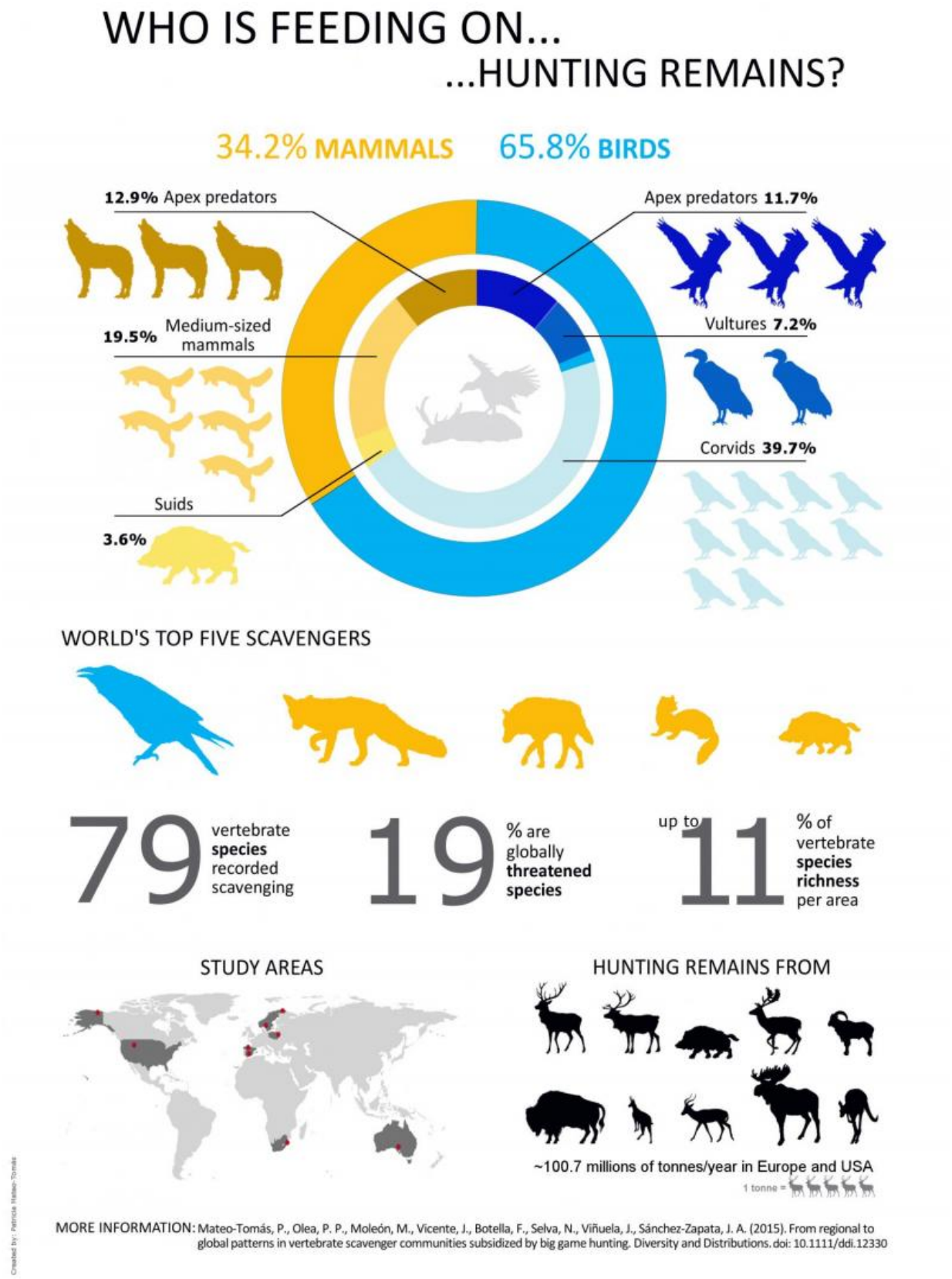
On this background, scientists of the Spanish Institute of Research in Game Resources (IREC), together with colleagues from the Autonomous University of Madrid, the Miguel Hernández University of Elche (both in Spain) and the Polish Academy of Sciences, have described a general structure for vertebrate scavenger communities feeding on hunting remains.

"We provide here a benchmark to which compare scavenger communities at other carrion types, advancing knowledge on the impacts of anthropogenic food subsidies on ecosystems," said Patricia Mateo-Tomás, the main author of this work published in the scientific journal *Diversity and Distributions*.

The results showed that anthropogenic food - mainly from hunting - subsidizes many vertebrate species from different trophic levels. The scientists identified at least 79 vertebrate species scavenging food subsidies from big game hunting worldwide.

According to Mateo-Tomás, the 19% of the species recorded at hunting remains are globally threatened - i.e. 15 species. This list includes the Spanish imperial eagle (Aquila adalberti), the Iberian lynx (Lynx

pardinus), the lion (Panthera leo), the leopard (Panthera pardus) and several vulture species. "This study shows also that the scavenger richness in a region positively correlates with its total vertebrate richness," the expert told Sinc.


WHO IS FEEDING ON...
...HUNTING REMAINS?
34.2% MAMMALS
65.8% BIRDS
12.9% Apex predators
19.5% Medium-sized mammals
Suids
3.6%
Apex predators 11.7%
Vultures 7.2%
Corvids 39.7%
WORLD'S TOP FIVE SCAVENGERS
79 vertebrate species recorded scavenging
19 % are globally threatened species
up to 11 % of vertebrate species richness per area
STUDY AREAS
HUNTING REMAINS FROM
~100.7 millions of tonnes/year in Europe and USA
1 tonne =
MORE INFORMATION: Mateo-Tomás, P., Olea, P. P., Moleón, M., Vicente, J., Botella, F., Selva, N., Viñuela, J., Sánchez-Zapata, J. A. (2015). From regional to global patterns in vertebrate scavenger communities subsidized by big game hunting. Diversity and Distributions. doi: 10.1111/ddi.12330

Who is feeding on hunting remains? Credit: Patricia Mateo-Tomás

Ravens, the world's top scavengers

The work highlights that the composition of the scavenger communities changes among world regions. Nonetheless, the scientists could describe a common structural pattern at a global scale.

"Birds and mammals dominate consumption, with birds scavenging twice more frequently (i.e. 65.8%) than mammals - but more mammal species scavenge compared to birds," highlighted the researcher. Large predators as eagles scavenged frequently (11.7%), vultures (7.2%) and corvids (39.7%). The latter dominate the consumption of hunting remains worldwide.

Other generalist species such as the red fox and the wild boar scavenge also these remains, especially in areas with low presence of vultures and top predators such as wolves, hyenas and eagles. "These two groups seem to play a key role in structuring scavenger communities," Mateo-Tomás said.

Wolf (Canis lupus) is the mammal more frequently consuming hunting remains worldwide but in South Africa. Here the hyena (Crocuta crocuta) dominates the consumption with a scavenging frequency above 82%. Large felids scavenge also at considerably frequencies in this region.

To perform this study, researchers used motion-triggered remote cameras to monitor more than 350 carcasses consisting of hunting

remains of wild ungulate species (including red deer, wild boar, chamois or Barbary sheep) in nine different ecosystems in mainland Spain.

They completed these data with information from scientific works on scavenger communities in seven different regions worldwide, from the Arctic tundra to the Australian desert.

"Scavengers support key ecosystem services such as accelerating nutrient recycling or limiting disease spreading," researcher said.

For the research group, advancing knowledge on scavenger communities is therefore "fundamental to efficiently preserve biodiversity, and the associated ecological functions and services, in increasingly subsidized ecosystems".

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