Press release – 07 May 2021

Mapping ungulate migrations to improve their protection: towards the first global atlas

INRAE, CNRS and the French Office for Biodiversity (OFB) are participating in the launch of the Global Initiative on Ungulate Migration (GIUM), in partnership with the United Nations Convention on the Conservation of Migratory Species of Wild Animals (CMS). Involving an international team of 92 scientists and conservationists focused on wild animals and their habitats, this initiative aims to compile the first global atlas of the migrations of wild ungulates. The objectives of this project are presented in an article published on 7 May 2021 in *Science:* levers to better understand migrations in order to preserve wild ungulates and the social ecosystems that depend on their presence.

The Global Initiative on Ungulate Migration (GIUM) has been made possible thanks to the development of GPS tracking technologies, mapping software and data sharing platforms. These tools, combined with local and indigenous knowledge, will now enable a description and mapping of current and future ungulate migrations. The project also involves efforts to document local and historical knowledge in order to map lost migrations. The data obtained will be updated regularly on the GIUM website hosted by the CMS.

Dynamics disturbed by humans and climate change

Migratory ungulates are an essential element in natural ecosystems: they provide much of the prey for carnivores, contribute to local and regional economies through exploitation of their populations and tourism, and are woven into the culture of numerous communities. Ungulates depend on their migration to escape harsh conditions, find food, breed and rest. Today, many of these migrations are in steep decline because of the development of human infrastructures such as roads, fences and railroads.

In some cases, migrations have been lost before they could be documented, thus highlighting the magnitude of the conservation challenge. In addition, changes to the distribution of water, snow, ice and the phenology of vegetation, driven by climate change, are further complicating how the herds plan and navigate their seasonal movements.

Mapping to support conservation policies

These detailed maps of migration corridors will help to identify the threats weighing on these animal species, and to propose appropriate preservation or conservation measures. The atlas will therefore be intended for use by governments, peoples and local communities, as well as wildlife managers. Based on these data, decision-makers will

be able to determine priorities for conservation zones along migratory routes, and the related actions that need to be implemented. To attenuate or eliminate the barrier effects of existing infrastructures and render them more wildlife-friendly, these actions may result in an expansion of protected areas or the installation of road-crossing structures.

The CMS is highlighting the importance to be given to ecological connectivity, including animal migration. French scientists from INRAE, CNRS and the OFB are contributing to this initiative by studying the spatial behaviour of ungulates in heterogeneous landscapes subject to anthropogenic pressures. This work is essential to the development of management or conservation programmes for wild herbivores. It will contribute to the implementation of a new United Nations global strategy on biodiversity, which is expected to be adopted this year.

Wild ungulates are hoofed mammals that are found throughout the world. The movements of ungulates are as diverse as the species themselves, which include European roe deer and red deer, Saiga in Asia, Arctic Caribou, Mule Deer and Elk in North America, Guanacos in South America and elephants, zebra and gnu in Africa.

In mainland France, species such as ibex, chamois, mouflon, roe deer and red deer all travel along migratory corridors. It remains necessary to improve documentation of these movements so that better account can be taken of them in regional development plans.

Reference

Matthew J. Kauffman *et al. Mapping out a future for ungulate migrations.* Science 07 May 2021: Vol. 372, Issue 6542, pp. 566-569 DOI: 10.1126/science.abf0998
www.cms.int/gium

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About INRAE

Created on January 1, 2020, the French National Research Institute for Agriculture, Food, and Environment (INRAE) is a major player in research and innovation. INRAE carries out targeted research and resulted from the merger of INRA and IRSTEA. It is a community of 12,000 people with 268 research, experimental research, and support units located in 18 regional centres throughout France. Internationally, INRAE is among the top research organisations in the agricultural and food sciences, plant and animal sciences, as well as in ecology and environmental science. It is the world's leading research organisation specialising in agriculture, food and the environment. INRAE's goal is to be a key player in the transitions necessary to address major global challenges.
Faced with a growing world population, climate change, resource scarcity, and declining biodiversity, the institute is developing solutions that involve multiperformance agriculture, high-quality food, and the sustainable management of resources and ecosystems.

About the CNRS

The French National Center for Scientific Research is one of the most recognized and renowned public research institutions in the world. For more than 80 years, it has continued to attract talent at the highest level and to nurture multi-disciplinary and interdisciplinary research projects at the national, European and international levels. Geared towards the public interest, it contributes to the scientific, economic, social and cultural progress of France. The CNRS is above all 32,000 women and men, more than 1,000 laboratories in partnership with universities and other higher education institutions bringing together more than 120,000 employees and 200 professions that advance knowledge by exploring the living world, matter, the Universe, and the functioning of human societies. The CNRS ensures that this mission is carried out in compliance with ethical rules and with a commitment to professional equality. The close relationship it establishes between its research missions and the transfer of acquired knowledge to the public makes it today a key player in innovation in France and around the world. Partnerships with companies are at the heart of its technology transfer policy, and the start-ups that have emerged from CNRS laboratories bear witness to the economic potential of its research. The CNRS provides also access to research findings and data, and this sharing of knowledge targets many audiences: scientific communities, the media, decision-makers, economic players and the general public.
For more information: www.cnrs.fr

About the OFB

A government establishment set up on 1st January 2020, the mission of the French Office for Biodiversity is to produce scientific and technical knowledge on species, environments and their uses, to monitor and control environmental damage, to manage protected spaces, to mobilise society and to provide support for actors in addressing all the challenges of aquatic, terrestrial and marine biodiversity, in mainland France and overseas territories.