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Red Deer: Central Alps, Italy & Switzerland

Migration Description


Across this alpine ecosystem, red deer migrate along steep elevational gradients in response to changing seasonal snow cover and vegetation. In harsh winters, red deer find refuge in lower elevations close to valley bottoms, bringing them in closer proximity with human development. However, in milder conditions, deer can remain on forested southern slopes at an intermediate elevation throughout the winter. In some more agro-pastoral sections of the area, several groups heavily use agricultural resources close to human development. Spring migration kicks off as green up begins in the valleys. Deer move up in elevation, quickly reaching summer range in high elevation forests and pastures. Their summer range is heterogenous, and deer are able to exploit areas that green up at different times. For example, in the Swiss National Park, deer migrate from winter ranges outside the park to resource-rich spring and summer ranges within the Park, where they also benefit from the park's strict protection. A similar dynamic occurs in Stelvio National Park. Migration routes are heavily influenced by local topography and seasonal habitat availability. Groups of females and young males often show substantially different migration tactics than groups of adult males.

Threats to Migration

Red deer migrate along topographic gradients in and out of large protected areas, including Stelvio National Park (IUCN category 4, but with no hunting permitted, as in category 2) and Swiss National Park (IUCN category 1a), where their summer ranges are protected from hunting pressure. On the Italian side of the ecosystem, hunting strongly affects red deer distribution and deer typically avoid moving through open habitat. As a consequence, there is a marked truncation of spring migration routes with respect to the park borders (deer move towards the park's interior but not far outside the borders) and a distinction between migration tactics inside versus outside the park. For example, red deer outside the park migrate predominantly inside forests. Linear infrastructure causes significant mortality for migrating red deer. Though the parks' locations offer a degree of habitat connectivity with nearby protected areas, major roads with crossing structures result in frequent instances of deer-vehicle collisions during the migration period. Additionally, climate change has caused the winter snowline to recede upslope, along with the timberline and alpine grassland communities. These shifts are slowly conditioning red deer's winter and summer range distribution, and are potentially altering migratory routes. However, it is unlikely that migrations would be completely disrupted due to climate change in this region.

Local Population Facts

Migration

Elevational  800–2,700 m ASL
Short 17.5 km (avg.)

Threats

-  Climate change
-  Energy dev.
-  Urban sprawl
-  Linear barriers
-  Agriculture
-  Livestock
-  Illegal killing
-  Other

Species Facts

Common name: Red deer
Species name: *Cervus elaphus*
Range: Eurasia
Diet: Mixed-feeder herbivore
Global population: ~3 million

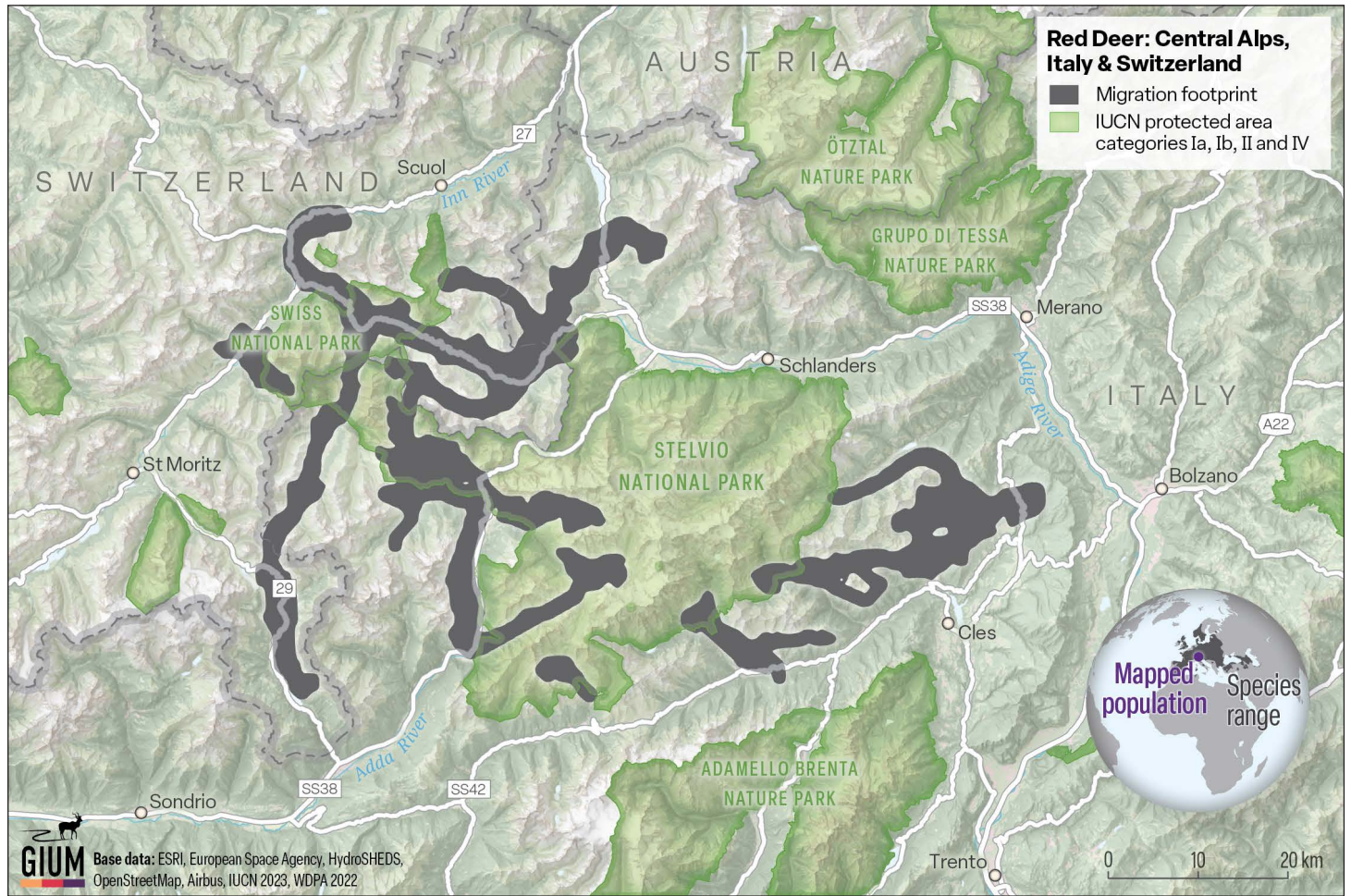
IUCN Conservation Status

LC Least concern

CMS Status

Not listed

Red Deer Migration



Study Information

Sample size

61 individuals

Relocation frequency

Variable 24h to hourly

Project duration

20 years, between 2005–2024

Data Analysis

Delineation of migration periods

Net squared displacement to delineate migration between winter and summer ranges

Models derived from

Line buffer, 1.5 km width

Route Summary

Migration start and end date (mean)

- Spring: May 12–May 19
- Fall: October 15–October 23

Average number of days migrating

- Spring: 6 days, (± 17 days)
- Fall: 8 days, (± 22 days)

Migration route length

- Min: 1.5 km
- Mean: 17.5 km, (± 14.5 km)
- Max: 85.7 km

Data Providers

Data were collected and provided by Luca Pedrotti with the Office of Scientific Research and Conservation of Stelvio National Park, Francesca Cagnacci, principal investigator with Fondazione Edmund Munch, and Thomas Rempfler with the Research & Monitoring Department of Swiss National Park.

In partnership with:



The Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the Bonn Convention, is an environmental treaty of the United Nations that provides a global platform for the conservation and sustainable use of terrestrial, aquatic and avian migratory animals and their habitats.



The Global Initiative on Ungulate Migration (GIUM) was created in 2020 to work collaboratively to: 1) create a Global Atlas of Ungulate Migration using tracking data and expert knowledge; and 2) stimulate research on drivers, mechanisms, threats and conservation solutions common to ungulate migration worldwide.



View and Download Map Data from the GIUM Migration Atlas

Cagnacci, F., L. Pedrotti, and T. Rempfler. 2024. Red Deer: Central Alps, Italy & Switzerland. Global Initiative on Ungulate Migration, editors. *Atlas of Ungulate Migration*. Convention on the Conservation of Migratory Species of Wild Animals.