Migratory species

DEFINITION

Any species or lower taxon of wild animals, in which a significant proportion of the members of the entire population or any geographically separate part of the population cyclically and predictably crosses one or more national jurisdictional boundaries.

Adapted from Convention on Migratory Species (CMS) 1979[1]

FURTHER DEFINITIONS

Behavioural scientific definition of Migration

Sustained directional movement by an animal that takes it out of one habitat and into another.

Dingle (1996), Migration The Biology of Life on the Move[2]

KEY POINTS

- The internationally agreed definition of migration was developed for the purpose of legal protection and therefore focuses on movement across political boundaries. Scientific definitions focus more on the behavioural traits of the migration process.
- Migratory species are a 'living thread' which connect habitats and people across the world
- The Convention on Migratory Species is the international instrument which governs protection of migratory species.
- Key threats to migratory species include habitat destruction, hunting and overexploitation in congregation areas, and climate change which can cause timing mismatches.

CONCEPT DESCRIPTION

Migratory species can be found in all major groups of animals but take many different forms and can occur in many different environments[3]. The Convention on Migratory Species (CMS) is particularly

concerned with species of wild animals which cross national jurisdictional boundaries. This focus explains why the CMS definition of 'migratory species' involves political boundaries rather than using purely biological criteria. The result of the CMS definition is that species which do not move in a typically migratory fashion, such as gorillas (*Gorilla gorilla* and *Gorilla beringei*), are included under Appendix I of the CMS because their otherwise small movement take them across national borders [4]. In contrast to the convention, the behavioural definition generally focuses on movement between habitat for a biological purpose. These resulting types of movement do not necessarily fit the CMS definition being described as migration, for example the migration of birds to different altitudes (e.g [5]) or the vertical migration of aquatic organisms within a water column [6] because the animals do not always cross international political boarders. The behavioural definition was developed further by Dingle to include a number of concepts including the type of movement; the scale and duration of the activity (in contrast to daily movement); and, the seasonality of the moment to make use of seasonal resources or climate conditions [3].

IMPORTANCE OF MIGRATION

Migration is a spatial and temporal type of behaviour that increases the chance of species survival e.g. allowing species to use resources which are only available in a particular window of time thus allowing greater densities of animals to come together over a shorter temporal scale than the habitat would be able to support on a permanent basis. Migratory animals are essentially "part-time" components of ecosystems. Often migratory species also fulfill important seasonal ecological functions. They can connect different areas and perform key ecosystem functions such as pest control [7], seed dispersal [8] and pollination [9]. Migration moves energy and matter between ecosystems [10]. For example, salmon transfer energy from the marine environment to inland streams when they migrate to spawning areas [11]. Migratory species may also exploit seasonally abundant local food resources, thereby contributing to the biological balance of a local ecosystem [12]. Many human communities rely on migratory species as a seasonal resource on which to base subsistence, recreational or commercial harvesting activities. These activities often represent a seasonally predictable resource shared by geographically remote communities. They can also serve as a basis for tourism, and therefore are economically important, as seasonal aggregations of species can provide spectacular visual sights [12].

CONVENTION ON MIGRATORY SPECIES

The UN, during the 1972 Conference on the Human Environment, recognised the difficulty in protecting species which move across political boundaries. This triggered the German government, working with IUCN's Environmental Law Centre, to develop the text for the Convention on Migratory Species which was signed in 1979 and came into force in 1983 [13]. The aim of the CMS is to conserve terrestrial, aquatic and avian migratory species throughout their range through international cooperation. Migratory species which are threatened with extinction are listed on Appendix I of the Convention, while other species that require international cooperation are listed on Appendix II. The CMS currently has 119 Parties (mostly governments). In addition, some countries have signed Memoranda of Understanding (MoU) with The Convention despite not being a Party. The MoUs and Agreements, conducted under the auspices of the CMS, generally focus on particular geographic areas and species (e.g. Agreement on African-Eurasian Migratory Waterbirds -AEWA-, MoU on the Saiga Antelope). In the case of the gorillas, there were ten range states included in the negotiation of the Gorilla Agreement (2008) under the auspices of the CMS to help in their protection [14]. The CMS has a Memoranda of Cooperation with the Convention on Biological Diversity (CBD) which provides a formal communication and coordination process between these bodies. "While CBD focuses on the maintenance of biological diversity on genetic, species and ecosystem levels, CMS uses migratory species as a "living thread" to link ecosystems functionally through networks, corridors and pathways over large geographic areas, cutting across national, regional and continental boundaries." [12] The CMS also has a joint work programme with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which

aims to increase the synergies between the two Conventions where there are overlapping interests, such as trade controls of migratory species [15]. In addition to the CMS, there are other global agreements which identify migratory species such as the Ramsar Convention which cooperates on migratory bird issues, including flyway policies, with CMS [16] and an agreement under United Nations Convention on the Law of the Sea (UNCLOS) which focuses on highly migratory fish stocks [17].

THREATS

Many migratory species, particularly long-distance migrants, are recognised as suffering serious population declines [18]. There are a number of specific threats faced by species which migrate directly linked to their migratory behaviour. Their mobile nature mean migratory species are often exposed to a potentially wide array of threats across their range such as habitat destruction to key staging sites (resting and feeding areas), hunting and overexploitation at sites where they gather in large numbers, and the impacts of climate change. The rate of climate change may vary in different areas of habitat used by migratory species making it particularly hard for species to adapt and often leading to phenological (timing) mismatches [19]. The main driver of terrestrial migratory mammal extinctions is considered to be habitat loss, fragmentation and degradation. Following this, unsustainable harvesting is identified as a major threat to many CMS listed species [20]. In the marine realm, similar threats (such as over-harvesting, habitat loss, pollution and climate change) are encountered [21].

CONSERVATION

Specific conservation strategies exist for certain migratory species, focused on identifying key sites along migration routes for protection, or highlighting important migration paths, such as particular flyways. Traditional conservation measures such as protected areas can be effective for migratory species if they target these key staging sites along a migration path. The importance of sites for the survival of migratory species is recognised through their incorporation into criteria for designations of important biodiversity areas, such as BirdLife's Important Bird Areas (IBAs) [22] and IFC's Critical Habitat [23].

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The humpback whale (Megaptera novaeangliae), a migratory

species. Philip Dyhr Hobbs/Shutterstock.com

Category:

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