Bird Migration

RESEARCHER: Dr. Titus Imboma

TOPIC: Bird Migration

THEME: Birds

DEPARTMENT: Ornithology

Ringing of European Migratory birds in Tsavo National Park in Kenya, An annual monitoring event.
Source: NMK - Ornithology

Lesson Objectives

- The participant shall explore birds' migration appreciating reasons for migration, the migratory species, the migratory routes and challenges birds face while migrating.

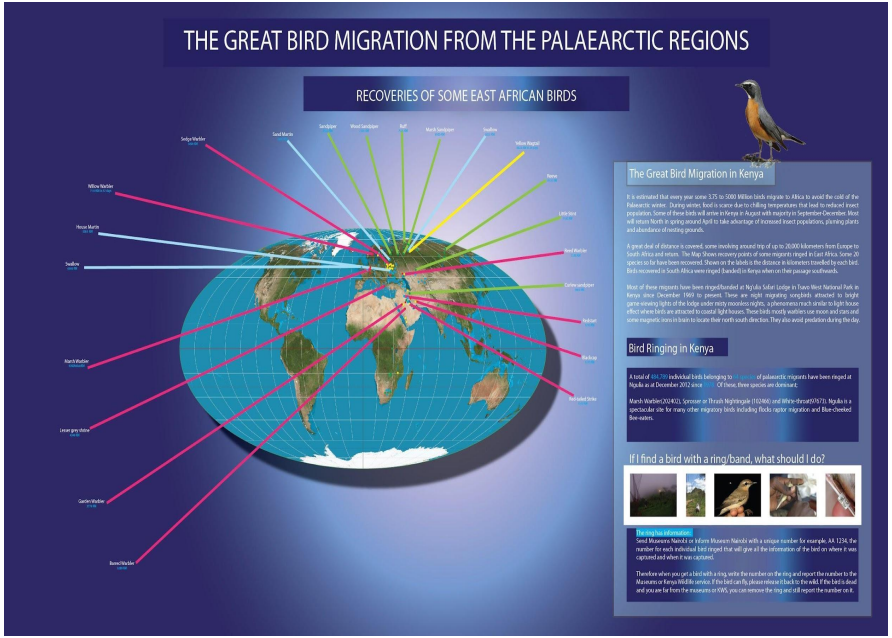
Learning resources

1. Text
2. Video
3. Photo

Overview of Bird Migration

Bird migration is the regular and seasonal movement of all or part of a population of birds to and from a given area. Bird migration occurs annually between breeding and wintering seasons. Every year, millions of migrating birds leave their Palearctic breeding grounds in Europe and Asia and fly south into Sub-Saharan Africa. East Africa has one of the richest avifauna in the world with close to 200 Palearctic migrants having been spotted in the region. In Kenya, migratory birds can be spotted from September to April. They include European White Storks, Black Storks, European Golden Orioles, Eurasian Rollers, Yellow wagtails and Roch thrush among many others.

Birds are the best known migrants from temperate regions to the tropics where climate is warm and food is readily available. Other organisms such as the Monarch Butterflies in northern America, Wildebeest in Serengeti, Maasai Mara and some species of fish are also known to migrate.



Migration Chart at the Bird gallery Nairobi National Museum showing different species of birds and where they fly from Europe to Africa. Source: NMK - Ornithology

Reasons for bird migration

Birds migrate to move from areas of low or decreasing resources to areas of high or increasing resources. Migration therefore enables birds to access the best resources for their survival. Birds primarily migrate to search for food and nesting or breeding locations. They also migrate to escape from cold weather.

Birds that nest in the Northern Hemisphere tend to migrate northward in the spring to take advantage of increasing insect populations, budding plants and an abundance of nesting locations. As winter approaches and the availability of insects and other foods drop, the birds move south again.

Through migration, birds provide a link between tropical and temperate regions and also between nations. Birds are a shared heritage therefore their conservation, both along migration routes and wintering grounds, must be a collaborative effort between the affected nations.

Types of Migration

Bird migration can be classified according to the distances travelled. There are short, medium and long distance migrants.

Short distance migrants make relatively small movements such as from higher to lower elevations on a mountainside, for example Lesser flamingos.

A flock of European White Storks on migration, near Kisima Farm, Laikipia, Kenya.
Source: NMK - Ornithology

Medium distance migrants such as Starlings, Cranes, Wild geese and Skylarks cover distances that span a few hundred miles. They rarely travel more than 2,000 kilometres to reach their wintering grounds.

Long distance migrants are birds that cover particularly long distances during migration. Their wintering grounds are usually many thousands of kilometres away from their breeding grounds. For example, Palearctic migrants who come from Europe and Asia into Africa and back. These include: Swifts, White stocks, Swallows and Cuckoos.

The Eurasian Oriole (Left) with long wing feathers is a long distance migrant compared to Grey-headed Kingfisher to the right with short rounded wing feathers that are not adapted for long distance migration. Source: NMK - Ornithology

How do birds find their way?

Migrating birds can detect the magnetic field generated by the Earth's molten core, and use it to determine their position and the direction of the poles. They also use celestial cues such as the sun, moon and stars to navigate.

Birds also have a biological clock function that controls their daily changes in sleep, wake, visual function, song, and also help migrating birds to locate places.

Migratory Species

Migratory birds are those that regularly leave their breeding grounds once the breeding season is over, to spend the winter elsewhere and then return the following spring. Non-migratory birds such as Blackbird, House sparrow, Woodpecker and Magpie are called resident birds. Such birds stay in their breeding grounds all year round.

In Kenya, about 15% of the total 1,100 species are described as Palearctic migrants from Europe and Asia including Cuckoos, Swifts and European bee-eaters, European White Stork and Steppe buzzards. 5.5% of the species are described as Intra-African migrants, sometimes referred to as Afrotropical migrants. They migrate between June and October from the Southern tropics into East Africa. They include: Levaillant's cuckoo, Red-chested cuckoo, Black cuckoo, African cuckoo, Abdim's Stork, African open-billed Stork, Great white pelican, and Woodland kingfisher among others.

Arctic tern sterna paradisaea
Source: NMK - Ornithology

Malagasy migrants travel from the island of Madagascar and into mainland East Africa and back. They include; Madagascar squacco heron and Madagascar pratincole.

Arctic tern is known to be the migratory bird which covers the longest distance, migrating from the Arctic to the Antarctic and back. One individual ringed in North Wales in the UK was recovered in New South Wales, Australia, covering a distance of about 18,000km each way. Other small birds such as the Willow Warbler weighing less than 10g, manage a journey of about 11,500 km twice a year comfortably. It is only their journey numbers that can prove that they are really the conquerors of the world.

Migratory birds adaptations

Migratory birds have developed special adaptations to help them survive the long journeys**.** Such adaptations include:

- Hollow bones which make them lighter and therefore better at flying up high in the winds.
- Larger and powerful breast muscles with smaller non- essential organs to lighten the load.
- Long flight or wing feathers extending to the tail to help them to fly with ease compared to short rounded wing feathers in resident birds.
- Most birds fly in the prevailing winds or thermals (warm air spirals) to help gain distance and height for example, Geese fly in a 'V' shape, changing the leader at the front regularly, to reduce drag**.** They fly in each other's slipstream so it's not hard work.

Long flight or wing feathers
Source: NMK - Ornithology

- Migratory birds also change their feeding behaviour to help them prepare for migration. Most birds will build up extra fat reserves in the weeks leading up to the long journey and can even double their body weight. During travel they can make stop overs and refuel when fat runs out.
- Most migratory birds travel in large numbers for safety from predators.

Fat content that provide energy for migrating birds
Source: NMK - Ornithology

Migratory Routes

Most migratory routes follow clear landmarks such as river valleys or coastlines. Some birds take winding routes around the coast while others travel more directly, sometimes crossing dangerous stretches of desert or sea.

Sand martins fly to Africa from the British Isles over the western Mediterranean, passing to the west of the Alps, but return in a loop via the east. This is referred to as loop migration, where migratory birds return on a different route.

Most migratory birds head south for the winter. However, some migrants that breed in the southern hemisphere travel to the north. For example, the Southern carmine bee-eater leaves South Africa in March and heads to East Africa.

Migratory routes across Africa
Source: NMK - Ornithology

Challenges in Migration

Migratory birds are vulnerable to human activities and natural causes along the migration flyways. Some of these challenges include:

- Mass hunting by humans and other predators.
- Loss of habitats through fragmentations, urbanisation and climate change.
- Infrastructure such as power lines that cause electrocutions especially of eagles and storks.
- Bad weather for example storms at sea and late snow falls.
- Losing direction
- Wildfire
- Exhaustion and starvation

How can the public help migratory birds?

Citizen science enhances collection of long-term data on migratory birds through either bird census or bird ringing. The public are encouraged to take part in citizen science activities such as:

- Bird surveys, bird watching, recording and reporting to conservation authorities.
- Conserving critical bird habitats and green spaces.
- Avoid use of pesticides, which can kill birds either directly or indirectly by poisoning insects that birds feed on.
- Reduce bird collisions with windows and infrastructure including power lines.
- Be sensitised on migratory birds.
- Enforce laws that protect migratory bird species for example Convention on Migratory Species (CMS).

Bird watchers taking part in global birding events as citizen scientists.
Source: NMK - Ornithology

Role of National Museums of Kenya in Bird Migration

- The National Museums of Kenya actively contributes to the understanding of bird migration and conservation in the country through various research initiatives and programs. One such significant effort is the Bird Ringing Program, which has been ongoing since 1969. This program focuses on tracking the migration patterns of small birds like rock thrush and wobblers as they traverse Ngulia Safari Lodge in Tsavo National Park. Volunteers play a crucial role in this program, assisting in the ringing of individual birds. The process involves attaching small metal rings to the birds, enabling researchers to recapture them later and track their populations during migration. By employing this method, the museum gathers valuable information about the timing of migration, flyways, and the birds' feeding habits and locations.
- Every Tuesday, the museum conducts a bird ringing program, employing nets to capture birds for tagging. These metal rings contribute to a comprehensive database that enhances our understanding of bird migration dynamics.
- Furthermore, the Nairobi National Museum offers an excellent platform for bird enthusiasts through its Wednesday Bird Watching Program. This weekly initiative provides participants with insights into the diverse bird species found in Nairobi. It serves as an educational opportunity for bird watchers, fostering a deeper appreciation for the avian biodiversity in the region.