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With work by
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What challenges do Afro-Palaearctic migrants face and how can human action help?

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ABSTRACT

Afro-Palaearctic (A-P) migrants are in decline due to anthropogenic causes. These birds spend the winter in sub-Saharan Africa and breed in the Palaearctic region. The challenges that A-P migrants face include agriculture, climate change, and poaching. Tracking technologies (for example, the use of GPS, PTT and geolocator tags) have helped us understand migration more. Human action is helping to reduce the issues these birds face. In this paper, we discuss some of the causes of decline, what actions can help, and make recommendations for the future.

INTRODUCTION

Migration is the seasonal movement of birds or animals from one region to another. Afro-Palaearctic (A-P) migrants are species of birds that migrate between breeding areas in the Palaearctic region (including Europe, Asia, and northern Africa) and non-breeding grounds in sub-Saharan Africa every year (Vickery *et al.*, 2014). An example of an A-P migrant is the Common Cuckoo *Cuculus canorus*. It migrates either through Italy or Spain to spend the winter in Central Africa. As a result of the challenges it faces, its numbers have declined significantly, just like many other species such as the European Goldfinch *Carduelis carduelis* and European Turtle Dove *Streptopelia turtur*. To try to understand the causes of the declines, organisations have been tracking these birds since the development of GPS (Global Positioning System) tags, PTTs (Platform Transmitter Terminals - used with Common Cuckoos) tags, and geolocators (the only tag that is used on the smaller species).

METHODS

Lesley Hindley provided the information discussed below and this was reviewed in the library at BTO in order to identify the threats that A-P migrants face. Information was also given by Dr Chris Hewson, Faye Vogely, and Chris Marais. BTO and RSPB websites provided information on tracking and migration.

ISSUES FOR AFRO-PALEARCTIC MIGRANTS

AGRICULTURE

A-P migrants have to face a range of challenges during migration, breeding and foraging. These challenges arise mostly because of anthropogenic causes (Vickery *et al.*, 2014). An example of this would be farming and agriculture, which leads to a large loss of habitat for these birds. The largest decline of birds from 1970–1990 were ones that winter in the savannahs of sub-Saharan Africa and breed on farmland in Europe – an example would be the Common Cuckoo (Vickery *et al.*, 2014).

There are many drivers of change within agricultural habitats in Europe, such as pesticides which may disrupt food webs by killing insects that are essential for birds. Not only that, but over-grazing can completely remove the long grasses which certain birds live in – for example Pheasants *Phasianus colchicus* – and deforestation removes a smaller proportion of plants such as thorny trees like *Faidherbia albida* which A-P migrants prefer. This contributes to the prediction that breeding ranges in Europe could be lowered down to 89% in the future (Vickery *et al.*, 2014). These kinds of changes don't only affect one specific group of species. For example, Reed Warblers *Acrocephalus scirpaceus* are in decline and their nests are used by the Common Cuckoo. If Reed Warblers are in decline it would mean that there is a reduced number of nests available for Common Cuckoos to parasitise, contributing to the decline of Cuckoos by 21% (long distance migrant – Figure 1; Vickery *et al.*, 2014). Therefore, if one species were to be impacted, it is very likely that another will too.

CLIMATE CHANGE

Climate change forms a risk for all aspects of life for most A-P migrants. For example, a bird's migration depends on the climate and time of year. Fluctuations in rainfall can impact when a bird begins its migration and whether it will survive. This is because the timing of migration can be divided into endogenous control – which are internal clues such as those genetically programmed into the species – and exogenous control – which includes external clues such as rainfall (BTO, 'Bird tracking – a masterclass', 2023). The climate also determines when insects appear and certain birds may not have access to food while migrating. For example, the Common Cuckoo feeds on hairy caterpillars which are predominantly around in April to July. Climate change has caused droughts in southern Spain reducing the supply of insects and hairy caterpillars needed to fuel their migration.

Also, certain buildings can confuse birds into thinking that the buildings are something they aren't. For example, beams shone from lighthouses can cause birds to fly into them and it is possible for there to be hundreds of fatalities in one night (Flegg *et al.*, 2004).

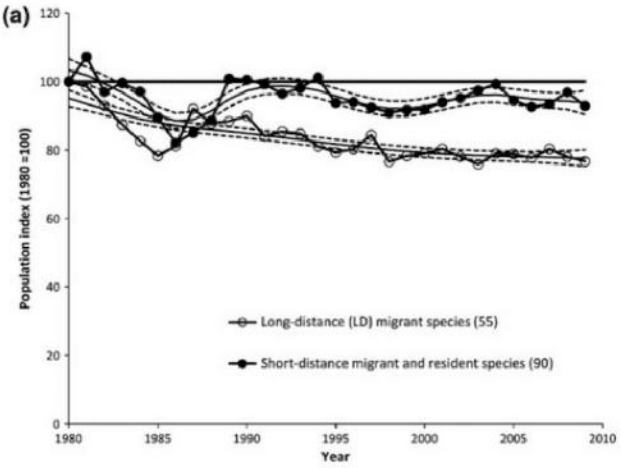

Figure 1 – The changes in the population of long-distance and short-distance migrants from 1980 to 2010 (Vickery et al.*, 2014)*

POACHING

In the Mediterranean, A-P migrants are hunted during autumn and spring (Khelifa *et al.*, 2017). An example of a bird that has been hunted for many years is the European Goldfinch. It mostly occurs in Algeria where it is illegal to catch or kills these birds (Khelifa *et al.*, 2017). They are caught for their pleasant song and are then sold as cage birds (Bird watching in Sweden, aladdin.st, 2023). These birds are caught with mist nets which can affect several migratory bird populations flying through this region. There has been a 57% decrease in the distribution of the European Goldfinch across western Maghreb during the last 26 years (Khelifa *et al.*, 2017). It has only gotten increasingly worse over time since the price of a European Goldfinch has increased significantly in the past 25 years which creates more desire for them (Figure 2).

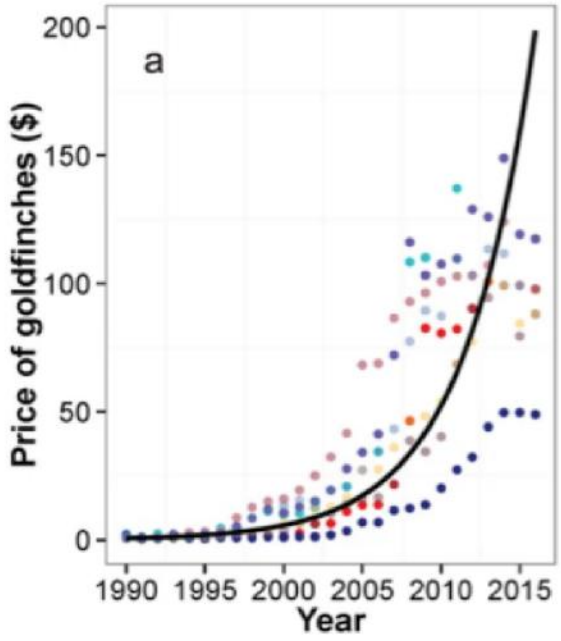

Figure 2 – The change in price of the European Goldfinch from 1990 to 2015 (Khelifa et al.*, 2017)*

TRACKING AND UNDERSTANDING MIGRATION

The main methods of tracking are GPS (Global Positioning System), PTT (Platform Transmitter Terminals), and geolocators tags. GPS devices often weigh less than 1 gram and give high precision fixes which are accurate to a few metres (Atkinson, 2018). PTT (Argos Platform Transmitter Terminals) tags use a network of satellites that, when in view of a tag that is transmitting, will pick up the signal and the Doppler effect (the change in the frequency of sound as the object moves past) will allow it to calculate its position. Geolocators record light levels every few minutes and by plotting these against time, you can estimate the time of local dawn and dusk. Using this, you can estimate the length of the day and therefore latitude. By combining longitude and latitude the location can be estimated. Also, small cameras can be fitted for a short-term solution and this shows how birds may mitigate adverse weather conditions. In recent years, 3D visualisations have been created to show the point of view of a migrating bird. All these tracking methods have helped us to better understand migration and why birds might not survive.

The Common Cuckoo is tracked with PTT tags, which alternate between 10 hours of activity and 48 hours of downtime where a small solar panel recharges the battery. These tags have shown us that the birds migrate to the Congo Basin for the winter via Italy or Spain. Only 56% survive the Spanish route compared to 97% surviving the Italian route. Cuckoos that take the Spanish route breed in England where there are declines. Cuckoos that take the Italian route breed in Scotland and Wales where the population is stable (Atkinson, 2018).

Geolocators can occasionally be useful for seeing behavioural changes in a bird. For example, when it sits on the nest there will be a darker light level than normal. However, they are generally not very accurate since their accuracy can vary between 23–390km (Fudickar, 2011).

HUMAN ACTION AND HOW IT CAN HELP

One significant way that human action helps is by introducing legislation such as the Wildlife and Countryside Act of 1981. This protects animals, plants and habitats in the UK. Even though it is basic protection, it states that it is an offence to: intentionally kill, injure or take any wild bird; intentionally damage or destroy the nest of any wild bird while it is in use or being built. Furthermore, the International Convention on the Protection of Birds is a treaty signed in Paris stating that all birds must be protected, therefore protecting birds on a global scale.

Tracking data has shown that birds die during migration for many reasons, meaning humans need to take action on a wider scale, especially when tackling climate change. For example, the Common Cuckoo only survives 56% of the time when migrating through Spain due to drought. This drought is a consequence of global warming. Therefore, it comes down to people keeping their carbon footprint as low as

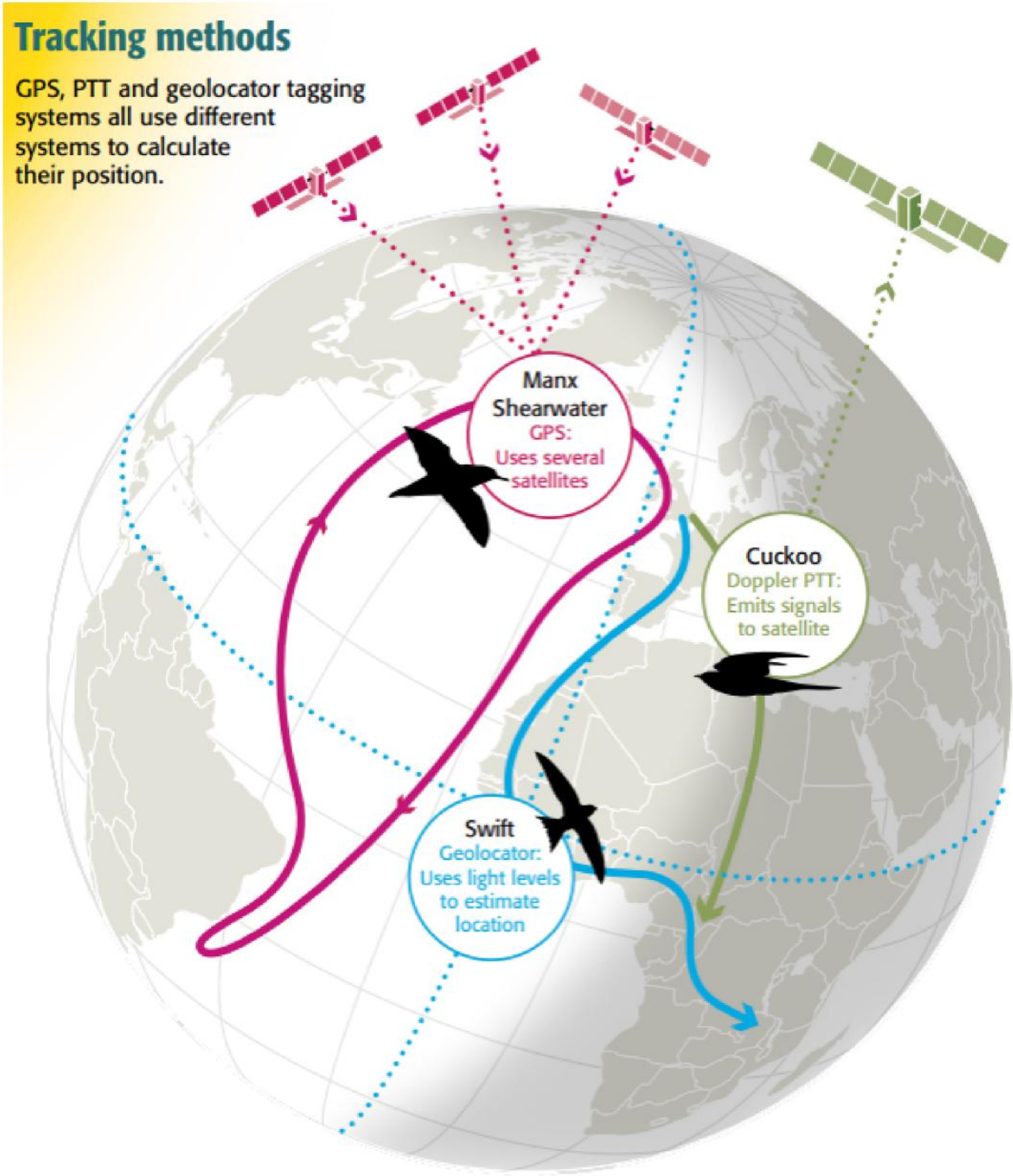

Figure 3 – Different tags use different tracking methods (Atkinson, 2018; illustration by Nigel Hawtin)

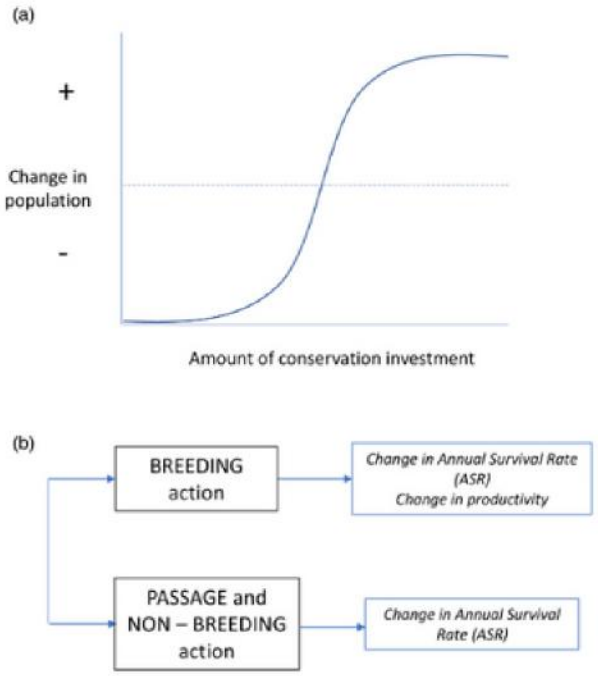

Figure 4 - How conservation will affects the population of birds (Vickery et al.*, 2023)*

possible so that they are releasing as little greenhouse gases as possible. Not only that, but hedgerow regulations in the UK mean that sections of agricultural land keep hedgerows between them and this is a vital habitat for birds such as European Turtle Dove.

A-P migrants face significant challenges through agriculture, climate change, and poaching. Each challenge presents its own difficulties and the impacts can be reduced in their own ways through legislation. Organisations like the British Trust for Ornithology have discovered these challenges thanks to their work. GPS, PTT and geolocator tags have helped us understand what impacts a bird's migration and in the future, there will hopefully be more efficient trackers that could help us further.

CONCLUSION

In conclusion, human action can certainly help to reduce the challenges that A-P migrants face when migrating. For example, ensuring that migrants have suitable habitats along their migration routes. One potential solution can be reducing carbon emissions which would help to reduce the extent of global warming. Also, legislation like the Wildlife and Countryside Act of 1981 or the International Convention on the Protection of Birds helps. Organisations like the BTO and RSBP work to find out the issues that we need to solve. But in order for birds to flourish, more people and organisations need to contribute, as at the moment, there is still a decline in many species like the Common Cuckoo, European Turtle Dove, Reed Warbler and European Goldfinch.

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