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AVIAN ATTRITION: A CRITICAL REVIEW OF ILLICIT HUNTING AND TRAPPING PRACTICES TARGETING MIGRATORY BIRD SPECIES

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Abstract
Illegal hunting and trapping of birds are major concerns for avifauna. Guns, nets, parany tools and traps are used to trap migratory birds as a type of sustenance hunting. Drivers for the illicit hunting of birds are recreational happiness, adventure killing, gamesmanship trophy poaching, commercial gain domestic consumption, etc. In this review, we explored the illegal trapping and killing of migratory birds worldwide. This was achieved by critically reviewing published literature from resources like journals. Bird capturing occurs in the low-income countries of the Middle East as well as North Africa as well as in EU Mediterranean countries. The unlawful trapping as well as killing of birds take place worldwide, for example in Asia (songbird tapping) and in North America and Europe (shooting of raptors), etc. Between North Africa and Europe, Seasonal patterns of hunting differ markedly. Prohibited killing and capturing of birds threaten biological diversity in many ecosystems (aquatic and terrestrial) and also caused declining in their population. Agreement on the Preservation of Migratory Species of Wild Animals and sustainable use of bird population are also discussed.

INTRODUCTION

Migratory birds

When at least a part of a species' population makes seasonal, cyclic activities with a high degree of fidelity to its breeding gardens, the species are called migratory (Somenzari et al., 2018). Migratory birds contribute significantly to biodiversity indexes due to their extensive distribution, diversity, and mobility in most terrestrial and marine environments throughout the continents (Egwumah & Inah, 2015).

Illegal harvesting

In violation of local, national, or international laws, researchers defined unlawful wildlife harvesting as the taking or killing of wildlife and its parts or derivatives, except lumber (wood or tree parts used for furnishings or construction) (Janssen et al., 2024).

Illegal trapping and hunting of migratory birds

Illegal bird killing as well as hunting are two of the biggest threats to avian conservation worldwide. Species endangerment and avifauna defaunation have been caused by unmanageable bird shooting in wetland environments, especially those sideways significant flyways. Given that wetlands serve as migratory birds' principal habitats and are linked to manmade landscapes, a thorough acceptance of bird reaping and its

causes is essential to minimizing intimidation to the existing avifauna (Htay et al., 2023).

Worldwide, illegal practices that endanger biological diversity in numerous terrestrial and marine environments include poaching and poisoning wild animals (Gavin et al., 2010; John et al., 2010). One of the primary causes of bird elimination worldwide is overexploitation (Stattersfield & Allinson, 2013) as well as is the second biggest danger to migrating birds, after territory loss and deprivation caused mostly by unmaintainable agriculture (Kirby et al., 2008). Of all bird species, 37% are taken as pets or for show, 4% are used for sport and 14% are killed for food (Butchart, 2008), with a large portion of unsustainable consumption being prohibited (Stattersfield & Allinson, 2013).

Devices for hunting and trapping

About 5 billion members of 97 land bird species migrate into Africa from high-latitude regions of Eurasia to lower-latitude regions around the Mediterranean Basin (Newton, 2023). Throughout history, people have taken advantage of this vast, frequent migration by creating various techniques to catch migratory birds for recreational or sustenance hunting. In nations surrounding the Mediterranean Basin, millions of migrating and wintering birds are still targeted, mostly as a sport, using firearms, nets, traps, or lime sticks (Murgui, 2014). Some wandering species population patterns in their breeding sites may be negatively impacted by this hunting pressure (McCulloch et al., 1992; Sanderson et al., 2006)

In Comunidad Valenciana (Spain), the parany is a tool used to catch birds with limed sticks (Murgui, 2014). The *Coturnix coturnix* (Common Quail) is the main target of trammel nets, which are put throughout most of Egypt's Mediterranean coast during the autumn migration. These nets illegally catch other birds, which are then slaughtered, in addition to capturing a lot of quail. However, researchers estimate that 0.5 million other birds and 3.3 million quail were collected in 2012, following the widespread use of MPEG audio Layer-3 players to invite quail. Recently, hunters near the shore have started using mist nets to cover trees and plants to capture passerines. Seven of the 17 species of birds in three families were captured exclusively in mist nets throughout researcher survey routes between 2010 and 2012 (Eason et al., 2016).

Illegal trapping and hunting of migratory birds worldwide

Autumn as well as winter are the authorized hunting seasons in the majority of European nations (Bertelsen & Simonsen, 1989; Woldhek, 1980). Bird trapping is not limited to the Middle East and North Africa's low-income nations (Murgui, 2014), but is also common in Europe (Murgui, 2014) despite national and EU laws, particularly in EU Mediterranean countries (such as Malta, Spain, France, and Greece) (G Magnin, 1991; Murgui, 2014). Over the past ten years, bird capture has surged throughout Spain (Murgui, 2014) and is a widespread custom in many areas (Guitiérrez, 1991). At least 20 million birds are thought to be captured each year (Murgui, 2014).

Illegal bird taking and killing happens throughout the world; in sub-Saharan Africa, for example, vultures are poisoned (Ogada, 2014), Raptors being blast in Europe (Selås et al., 2017) as well as North America (Finkelstein et al., 2014), Songbird catching in Asia (Kamp et al., 2015) and arrest for the South American bird profession (ALVES et al., 2013). Unlawful taking and killing have drawn attention from all across the world and are a threat to biodiversity. For instance, a Perseverance on the inhibition of unlawful killing, taking, trading as well as taking of migratory birds was adopted by the Convention on the Conservation of Migratory Species of Wild Animals in 2014 (Brochet et al., 2019).

Countries around the Mediterranean Sea have long struggled with overhunting of migrating birds; previous estimates indicate that one billion birds are executed there each year (Magnin, G. 1991; Brochet., et al 2019; Brochet., et al 2016). Although research on hunting in North Africa has been comparatively scant, one study found on bands collected in the Maghreb region of

northwest Africa revealed that shooting stress in this region was higher than earlier thought (McCulloch et al., 1992). At least since the Old Kingdom, people in Egypt have been trapping migratory Common Quail species *Coturnix coturnix* (Magnin, G. 1991; Brochet., et al 2019; Brochet., et al 2016).

Hunting seasons in North Africa and Europe are very different. Spain's seasonal pattern was similar to that of the three additional major shooting nations in southern Europe (Italy, France, and Portugal), where hunting peaks for all species took place in the fall or winter. However sub-Saharan wanderers were transported in the fall, and thrushes and raptors were primarily killed in the winter. On the other hand, eight out of thirteen species in North Africa displayed a clear spring hunting peak. Winter was when the lasting five species were most vulnerable to shooting stress (McCulloch et al., 1992).

Using data from ringing recovery, the shooting of 20 migrating bird species in Europe and Mediterranean countries was examined. By calculating an index that accounts for ringing effort and recording rates, the level of bird hunting intensity in each nation was determined. The western Mediterranean countries, especially, northern and southwestern Iberia, southern France, northern Italy, and northwest Africa were shown to have consistently high intensities of bird shooting. There were species-specific geographic trends in the relative amplitude of shooting indices for various breeding populations (Brochet., et al 2019; McCulloch et al., 1992). In North Africa, hunting is nearly as common in the spring as it is in Europe, where the bulk of birds are taken in the fall and winter. Except for those that continue to be legal quarry species, every species that was examined displayed an overall decline in index values following 1980. A statistically substantial whole decline in shooting of most species was found when long-standing trends in index values since 1950 were analyzed. These shifts may be a result of shifting attitudes toward recording the shooting of now-protected species, but they are also believed to be at least partially due to a genuine drop in bird taking (McCulloch et al., 1992).

Russian raptors visit the Indus River in the winter. The Arabian falconers' involvement has increased the birds' significance in Pakistan compared to earlier decades (Khan et al., 1996). Saker falcons (*Falco cherrug*) are desert and semi-arid birds. Because it is taught to kill the houbara bustard (*Chlamydotis undulata*), this falcon is in greater demand in Pakistan (Ahmad & Khan, 2020). The peregrine falcon (*Falco peregrinus*), which is located in the coastal areas of Baluchistan and the Indus plains, is another species of falcon that hunts water birds during the winter. Baluchistan, Punjab, and Sindh are home to Pakistan's native Laggar falcon (*F. jugger*) (Khan et al., 2010). The increasing demand led to the smuggling of falcons into Pakistan from Afghanistan, which accounted for almost 60% of the total land area (Fox, 1998).

Drivers of illegal hunting and trapping

A multivariate modeling method and a review of the literature revealed the financial, environmental, and societal elements that have the biggest impact on promoting this illegal behavior globally (Destro et al., 2020).

Among the deviation approach's motivators, (Muth & Bowe Jr, 1998) a thorough list of factors that contribute to illegal hunting encapsulates a large portion of the research. Moneymaking gain, domestic consumption, award poaching, adventure killing, security of oneself and property, gamesmanship, poaching as rebellion, poaching as a customary right, and disapproval of particular game as well as wildlife regulations are all listed as reasons for illegal hunting. Economic poaching, whether for domestic use or profit, takes up a sizable portion of the literature on illicit hunting (Mancini et al., 2011).

Effects of illegal hunting and trapping

Given that numerous endangered bird species have high shooting rates, it is realistic to assume that the great stress from hunting will at least hasten the already concerning population losses (Hirschfeld & Heyd, 2005).

There are good examples showing that huntable species can stabilize and even grow their local populations despite significant rates of loss, even though specific scientific data for the detrimental effects of shooting on populations of birds is generally hard to come by (Gatter, 2000; Inglis et al., 1990).

Long-lived species with a reduced yearly reproduction rate (such as gulls, geese, and curlews) and species that are hunted after nearly all of the individual-specific winter declines are already apparent are the ones that are most endangered by high hunting-related mortality (Hirschfeld & Heyd, 2005).

Regarding the Brent Goose's dark-breasted variety (*Branta bernicla bernicla*), (Hirschfeld & Heyd, 2005) assumes that the primary causes of the sharp drop in the winter population of former Soviet nations included trapping and hunting in the north. Little is now known about the significance of these extra population losses or how hunting migrants affect the ability of hunted individuals to reproduce in the breeding area. Nonetheless, they provide an extra possible risk to population growth. Furthermore, hunting pressure makes roosting birds more sensitive to human existence. The high disruption spaces that resulted (Bergmann, 2001; Bezzel & Geiersberger, 1998) can lead to a decrease in the density of settlements or possibly the abandonment of regions where a species' disturbance factor is high (Fenech, 1992; Gatter, 2000). The delight of the natural spectacle of migration is also significantly diminished for those who love birds and the outdoors. In Bavaria, the inferior sections on the River Inn (Reichholf, 2001) demonstrated that the shooting of ducks had detrimental effects on the "water" biological system and the cycles of nourishment it contains.

Conservation and sustainable strategies to reduce illegal hunting and trapping

Recommendations from Non-governmental organization and growing political exertion from Spanish and foreign authorities (Murgui, 2014) would assist in forcing the governments of Comunidad Valenciana to uphold the legislation, which is essential to lowering poaching (Keane et al., 2008). Expanding public involvement would be necessary, involving not only hunting management organizations and the poaching lobby (as was previously the case), but also other pertinent parties like non-governmental organizations, ornithologists, and hunting organizations.

To ensure the protection and long-term sustainability of bird populations, this collaboration could help with accurate situational analyses, improved problem identification, and the development of successful plans that should incorporate six essential components (Murgui, 2014; (Keane et al., 2008)): (i) Reliable estimations of migratory-wintering bird numbers and additional demographic factors using appropriate selection techniques that academic personnel and non-governmental organizations might create and implement. (ii) Establishing harvest levels using precise projections of harvesting work (containing not only caught birds but also those hunted by additional means) based on the data in (i). Proper limitations would probably require a significant decrease in the number of authorized trappers. (iii) The creation of methods and procedures to prevent needless suffering for birds, to prevent the mass grasping of thrushes as well as to lessen the effect of catching on species that are not targeted. Since the parany is inherently non-selective and several species that are not targeted will always be caught, this is a serious problem. In actuality, these criteria rather than the impractical presumption that selective bird capturing is feasible should serve as the foundation for the EU Birds Directive's exception permitting the use of lime sticks for bird catching. (iv) Wardens, working with NGOs, enforce strict parany control. Authorized trappers would need to work together on this, and they should also create self-policing tactics to prevent illicit trapping. (v) The appropriate organizations (government agencies, academic personnel, NGOs) keep an eye on elements (i–iv) so they may adjust protocols and strategies as needed. (vi) Raising public knowledge of bird trapping through educational initiatives and media coverage may encourage

potential trappers to use bird resources for non-consumptive purposes such as ecotourism, photography, and birdwatching (Murgui, 2014). Assuming the intense shooting stress during relocation, present attempts at conservation in Europe for a few of the bird types that fly above Egypt are probably futile, and the number of wandering birds being seized when they reach North Sinai cannot be sustained. Enhancing knowledge is the most crucial strategy to mitigate the harm that illegal shooting is affecting to bird populations, however, there are other options as well. Hiring some bird shooters as guides is another way to address the issues of overhunting and illicit hunting. This could not be possible at the moment due to recent political events that have immediately affected Egypt's tourism industry, resulting in a roughly one-third decrease in visitor numbers and a propensity for travelers to visit resorts instead of traveling the nation. If hunters received nets through bigger net sizes in return for their existing mesh, government entities or conservation groups might be able to decrease the catching of birds besides quail for the small bird species. However, there are risks related to this strategy because hunters may choose to overlap the nets or add threads inside of them, creating a new mesh with a minor useful net size. Additional such strategies rely on implementation that does not now exist. Ornamental hunting regulations and enforcing Egypt's existing environmental laws, such as the need to leave space between quail nets that enables certain birds to escape, are crucial (Eason et al., 2016)

Conclusion

We concluded that illegal bird tapping and killing raises apprehensions about avian preservation efforts worldwide. During autumn and winter, the legal hunting season occurs in most European countries. Illegal shooting and trapping of migratory birds occur throughout the world. Overhunting of wandering birds has long been problematic in countries along the Mediterranean Sea, and older assessments have proposed that one billion birds are killed yearly due to overhunting in countries along the Mediterranean Sea. Commercial poaching, whichever is for profitmaking advantage or domestic intake, inhabits a relatively large place in illegal shooting works. Illegal hunting and trapping of migratory birds caused declining in bid population, a threat to the development of the population, influenced on hunted individual's reproduction success in the breeding zone, effect on ecological system and nutritional ecological cycle. Expanding public involvement would be necessary, involving not only hunting management organizations and the poaching lobby (as was previously the case), but also other pertinent parties like non-governmental organizations, ornithologists, and hunting organizations. To ensure the protection and long-term sustainability of bird populations, this collaboration could help with accurate situational analyses, improved problem identification, and the development of successful plans. More specifically, it is not well understood where poaching is indeed occurring at a high intensity and where monitoring is limited due to lack of infrastructure. Lack of information about when and where different forms of illegality reach their pinnacle in migration cycles.

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