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Attranctants of Birds

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***Abstract*— Bird attractants significantly influence diverse ecosystems, including aviation, agriculture, and natural biodiversity. This study examines the elements that attract birds, their effects, and management techniques to alleviate adverse impacts. In aviation, the avian species present risks through bird strikes, resulting in financial losses and safety issues. Recognizing and mitigating avian attractants at airports, including food sources, water, and shelter, is essential for limiting dangers.**

Ketwords- Attractants; Biodiversity, Strikes, Hazards, Avws; Milvusmigrans

I. INTRODUCTION

Birds are a group of warm-blooded vertebrates constituting the class Aves /ˈeɪviːz/, characterized by feathers, toothless beaked jaws, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, a strong yet lightweight skeleton. Birds live worldwide and range in size from the 5.5 cm (2.2 in) bee hummingbird to the 2.8 m (9 ft 2 in) ostrich. There are about ten thousand living species, more than half of which are passerine or "perching" birds. Birds have *wings* whose development varies according to species; the only known groups without wings are the extinct moa and elephant birds. Wings, which evolved from forelimbs, allowed birds to fly, although further evolution has led to the loss of flight in some birds, including ratites, penguins, and diverse endemic island species. The digestive and respiratory systems of birds are also uniquely adapted for flight. Some bird species of aquatic environments, particularly seabirds and some water birds, have further evolved for swimming.

II. BIRDS STRIKES HAZARDS

Birds are a serious hazard to aviation. A bird or a flock of birds that suddenly rise from a runway or surrounding areas may collide with landing or departing aircraft and cause it to crash and may cause human loss (Godin, 1994).

Centre for Transportation Studies at the University of Minnesota, 2002. Damage to aircrafts results from collision with the engine and/ or fuselage. Although most bird strikes do not result in crashes, they do involve extensive structural and mechanical damage to aircraft. This makes bird strike a serious economic problem. In the USA up to $300 million in losses every year (Minnesota University Studies, 2002). It is also a safety concern for airports and can cost in delayed schedules that result in lost revenue. From 1985 to 2011 USA air force had 95383 wildlife strikes; loss of 38 aircrafts and damage to aircraft resulting in 33 fatalities and loss of 820 million USD. Since the first airstrike in 1905, birds strike increased for two reasons: 1) The environment is cleaner and 2) airplanes are quieter so birds have less ability to detect and avoid airplanes. Birds strike happen mostly during takeoff, climb, approach and landing (96%). Most birds strike large birds such as geese, gulls, vultures etc. During the early days of aviation, when aircraft fly at low speeds birds can get out the way. Bird strikes were infrequent and damage was mainly confined to cracked windshields.

A. Bird species causing serious bird strikes

Common English Names	Scientific Names
1.CattleEgret (flying across) , Little Egret	*Bubulusibis ibis,Egrettagarzetta*
2.Pelicans and Storks e.g. Great White Pelican, Pink-Backed Pelicans, Marabou Stork	*Pelecanusonocrotalus, Pelecanusrufescens, Leptoptiloscrumeniferus*
3. Abdim'sStork(2.2).	*Ciconiaabdimii.*
4. Ducks and Geese e.g. Fulvous Duck, White-FacedDuck, Spur-winged Goose	*Dendrocygnabicolor, Dendrocygnaviduata, Plectropterusgambensis*
5. Black kite (1,2,4,5,6,3) inside the airport (on runway)	*Milvusmigrans.*

soaring above and below taking off planes.	
6. Vultures and Eagles e.g.Ruppell'sVulture, Brown snake Eagle	*Gyps ruepellii, Circaetuspectoralis*
7. Cranes e.g. Common (Eurasian) Crane, Demoiselle Crane, Crowned Crane	*Grusgrus, Anthropoidesvirgo, Balearicapavonina*

III Bird Attractants at Airports

Airports provide a wide variety of natural and human-made habitats that offer food, water, and cover. Many airports are located along migratory routes used by birds. One of the first steps in reducing bird hazards is to recognize these attractants. Usually, several attractants acting in combination are responsible for the presence of birds and their behavior at an airport.

A. Food:

Birds require relatively large amounts of food. Most airports support an abundance and variety of foods such as seeds, berries, grass, insects, grubs, earthworms, small birds, and small mammals. Seeds and berries are sought by several migratory and resident birds such as sparrows, finches, starlings, blackbirds, mourning doves, common pigeons, and waterfowl. Geese are attracted to open expanses of grasses. Gulls, starlings, robins, and crows often feed on earthworms on the surface of the ground following rain. Gulls are opportunistic feeders and frequently feed grasshoppers and ground nesting birds. Raptors are attracted to airports because of rodents, birds, and other small animals that are harbored by tall, poorly maintained grass stands and borders. Occasionally, food becomes available through careless waste disposal practices by restaurants and airline flight kitchen.

B. Water:

Birds of all types are drawn to open water for drinking, bathing, feeding, loafing, roosting, and protection. Rainy periods provide temporary water pools at many airports. Many airports have permanent bodies of water near or between runways for landscaping, flood control, or wastewater purposes. These permanent sources of water provide a variety of bird foods, including small fish, tadpoles, frogs, insect larvae, other invertebrates, and edible aquatic plants.

C. Cover

Birds need cover for resting, loafing, roosting, and nesting. Trees, brushy areas, weed patches, shrubs, and airport structures often provide suitable habitat to meet these requirements.
Almost any area that is free from human disturbance may provide a suitable roosting site for one or more species of birds. Starlings, pigeons, house sparrows, and swallows often root or nest in large numbers in airport buildings or nearby trees, shrubs, or hedges. Large concentrations of blackbirds and starlings are attracted to woody tickets for winter roosting cover. Gulls often find safety on or near runways of coastal airports when storms prevent their roosting at sea, on islands, or on coastal bays.

D. Migration:

Many airports are located along traditional annual bird migration routes. Birds may suddenly appear in large flocks on or over an airport on their annual migration, even when the airport itself offers no particular attraction. Dates of migration vary by species and area. Flock size of a given species may vary widely from year to year depending on time of year, weather conditions, and many other factors.

E. Local *Movements:*

Shorebirds, waterfowls, gulls, and other birds often make daily flights across airports from their feeding, roosting, nesting, and loafing areas. Airports near cities may experience early morning and late afternoon roosting or feeding flights of thousands of starlings.

IV. Damage Prevention and Control Methods

Bird strike hazards reoccur regularly at many airports and require constant attention. Before attempting to reduce bird hazards at an airport, it is important to assess the problem, identify contributing factors, and analyze the threat to aircraft and human safety. A wildlife hazard management plan should be implemented (and may be required by FAA) to make the airport unattractive to birds. Scaring or dispersing birds away from airports is usually difficult because birds are tenaciously attracted to available food, water, and cover. As long as these attractants exist, birds will be a problem. In most situations, a wildlife biologist trained in bird hazard assessment should be selected to conduct a thorough ecological study of the airport and its vicinity.

A. Habitat Modification

Several habitat management practices can make an airport less attractive to birds. These include eliminating standing water, removing or thinning trees, removing brushes, and managing grass height. Buildings can be modified to reduce or eliminate roosting or nesting sites. FAA Order 5200.5A provides guidelines for establishing, eliminating, or monitoring

landfills, open dumps, or waste disposal sites on or in the vicinity of airports.

B. Frightening

Frightening is a reliable and expeditious means of repelling birds. Frightening programs, however, provide only temporary relief and require constant monitoring. An early priority in reducing bird hazards is to establish a bird dispersal patrol team to harass and scare birds and provide immediate protection for aircraft within the airport perimeter. The patrol team must consist of highly motivated and knowledgeable personnel with adequate equipment, such as radio-equipped vehicles, shotguns, and frightening devices consisting of bird distress calls, live ammunition, and pyrotechnic devices (automatic gas exploders, shell crackers,and racket bomb).

C. Repellents

Research has been conducted on the efficacy of methyl anthranilate (ReJeXiT, Peter Vogt, PMC Corp., pers. commun.) for repelling gulls and waterfowl from standing pools of water on airport runways. Results are promising, and registration of ReJeX-iT by the Environmental Protection Agency is currently pending. Methyl anthranilate is a grape-flavored food additive.

Shooting birds with shotguns or rifles can be a highly selective and valuable form of hazard control under certain conditions. Federal, state, and possibly municipal permits are requiredShooting birds with shotguns or rifles can be a highly selective and valuable form of hazard control under certain conditions. Federal, state, and possibly municipal permits are required.

V. IMPORTANT OF BIRDS ATTRACTANT IN AGRICULTURE

Birds can help you or your farm neighbor keep pests, insects, rodents, and birds at bay. Beneficial birds assist with production in the same way as beneficial insects. You increase your pest control services when you provide habitat for beneficial birds and bring them closer to your crops. Pest birds seem to get most of the attention today, but that wasn't always the case. Researchers in this country and worldwide are partnering with farmers to use new science and build on more than 130 years of past studies. These partnerships help us understand birds' role in pest control and the relatively few but significant bird species that are pests themselves.

Management Steps to Take

Making Plans for Scouting and Flexible Management

Long before the pest birds arrive, a management plan suited to the farm and the neighboring lands should be in place. Once the birds eat the crop, they are much harder to discourage. This plan includes scouting for the presence of birds and using several types of deterrents. Scouting should begin before the crop is ripe (possibly when it is still green) and continue through the harvest. Birds are often most active early in the morning or around dusk so that scouting can indicate bird pressure. It is important to identify the species you see and observe the birds for signs of whether they are damaging the crop or consuming pest insects. Sometimes, it is easy to assume that birds in a ripening field are there to consume the crop, but in some situations, they may be there to hunt insects attracted by the ripening crop.

VI. Discouraging Pest Birds with Cultural Practices.

A. Exclusion from the Crop

Of all the pest-bird management strategies, exclusion works best. Netting can be very expensive and time-consuming to put up and take down annually, which means additional costs. However, where there is heavy bird pressure, it may be warranted. Before using netting, consider the costs and durability over time versus the damage caused by birds. If a decision is made to purchase netting, spacers may be needed to keep birds from pecking through the nets. Besides the downside of expense, netting can alter light and airflow and be troublesome to work around. Growers also use floating row cover fabric to protect crops from bird damage. According to some, if they leave the row cover all season, rodents have been known to increase because the cover limits access to raptors and other predators.

B. Placing a Buffer between the Crop and Habitat .

To discourage birds from damaging the first few rows of a crop next to the habitat, some growers reserve the strip between the crop and habitat for grass or dirt road buffers or crops the birds will not eat. Since these birds are using the habitat for cover from predators, they are reluctant to venture far from it.

C. Attracting Birds Away from Crop

Farmers and scientists have found that damage by pest birds can be lessened by feeding them. Growers reduce damage to young crops planted next to natural habitat by letting the first few crop rows go to seed. This could allow birds to forage on a few rows and dissuade them.

From venturing out to forage on the rest of the crop. Other ways to reduce damage to a target crop include offering alternate feeding sites, such as leaving oat and wheat stubble or unplowed early-harvested sweet corn while later-maturing corn ripens. Providing cover crops that Sparrows prefer over commercial crops may reduce the incidence of damage to plants in the Cole crop family.

VII. The importance of bird's attraction in a natural ecosystem

Birds and humans have been interconnected for thousands of years. Birds inspire, entertain, feed, and clothe humans. Throughout the evolution of modern humans (Finlayson et al., 2012; Hardy & Moncel,

2011) and the cultural development of our societies (Cocker & Tipling, 2013; Mynott, 2009; Podulka et al., 2004), birds have mattered. Ecosystem services, as recognized by the Millennium Ecosystem Assessment (MEA 2005), fall into two primary categories. Cultural and provisioning services accrue directly; these services are themselves products. For instance, Bird art and eggs can be bought and sold. Regulating and supporting services, in contrast, accrue indirectly; they are not themselves commodities, but instead, they help maintain other components of the world's ecosystems upon which humans depend for both goods (food, shelter) and other services (disease management pest control).

A. Behavior-driven Services.

Most of the ecosystem services we consider here result from bird behavior, specifically, foraging behavior. Among the nearly 10,000 bird species on the planet, we find species that consume virtually every imaginable resource in aquatic, terrestrial, and aerial environments, from remote oceanic islands to every continent. Many services and ecosystem functions are thus the consequence of resource consumption.

B. Pest Control

A pest-control agent must do more than consume the pest species. The control species must affect the population of the pest species sufficiently that there is a positive impact on the resource that the pest itself consumes. The impact should be evident either through some measure of the abundance and/or the fitness of the resource, or, when the resource is an agricultural crop, as an increased yield and or economic profit derived from the crop. Bird–crop interactions fall under the domain of "economic ornithology." Economic ornithology was launched in the United States in 1885 with a small Congressional appropriation within the USDA for "the study of the interrelation of birds and agriculture, an investigation of the food, habits, and migrations of birds concerning both insects and plants" (Henderson & Preble, 1935). Early efforts focused on food habits of species presumed to be either beneficial or detrimental to agriculture, including granivorous and insectivorous songbirds as well as birds of prey (Fisher, 1893; Weed & Dearborn, 1903; Errington, 1933; McAtee, 1935; Martin et al., 1951).

C. Herbivorous Insects.

Quantifying the impact of bird predation on arthropods typically involves cages that exclude birds from their foraging substrates or, less commonly, deploying perches and nest boxes to increase their abundance. Askenmoet al. (1977) used net enclosures to determine that bird predation decreased the densities of overwintering spiders in northern spruce forests. Solomon et al. (1977) placed logs containing coddling moth (Cydia pomonella) cocoons in apple orchards. They found that logs caged in wire netting to exclude birds experienced almost no losses of cocoons over winter and spring, but losses on uncaged logs accessible to birds exceeded 90%. Holmes et al. (1979) used experimental ex-closures to assess the impact of birds on arthropods during the breeding season.

D. Rodents

In the late nineteenth century, many people believed that birds of prey were detrimental to agriculture through predation of poultry or game birds (Allen, 1893). Early reports from the USDA Division of Ornithology and Mamma Logy on food habits of the common hawks and owls of the United States (e.g., Fisher 1893) helped to change that perception: most hawks and owls were far more helpful than injurious to the farmer or "poulterer." Rodents, rabbits, hares, snakes, and insects were more important prey than chickens or game. Given the preponderance of rodents in the diets of many raptors (both hawks and owls), it seems reasonable to assume that these birds benefit agriculture. Moreover, several raptor species readily occur in agricultural landscapes (Williams et al., 2000). However, few studies have directly assessed the effects of birds of prey as agricultural rodent-control agents, and the results are somewhat ambiguous. Although rodent-control measures (such as rodenticides and integrated pest management) are used widely, surprisingly few studies have assessed the effects of rodents on agricultural production (Brown et al., 2007). Nonetheless, there are examples of rodents having strong effects on crops (Brown et al., 2007), natural plant communities (Ostfeld & Canham1993; Cote et al., 2003; Lopez & Terborgh, 2007), and newly established synthetic prairie gardens (Howe & Brown 1999, 2001; Howe et al., 2002).

E. Seed Dispersal

Seed dispersal is among the most important ecosystem services provided by birds. Seed dispersal by birds is geographically widespread; both the bird and plant participants are taxonomically diverse. Plants and their avian dispersers form a complex mutualistic network fundamental to maintaining biodiversity and community structure (Bascompte &Jordano, 2007). Ecological and evolutionary aspects of seed dispersal have been reviewed several times (van der Pijl, 1972; Howe, 1986; Willson, 1986; Jordano, 2000; Willson & Travaset, 2000; Herrera, 2002). Most bird dispersal activities likely fall into the category of supporting services. When birds disperse seeds of plants of economic significance (lumber and landscape species), their activities may represent provisioning services. Birds disperse seeds by various

mechanisms. In the most common endozoochory, the bird consumes a fleshy fruit (or analogous structure) and regurgitates or defecates the seed(s). One variation of endozoochory is waterfowl and shorebirds dispersing aquatic plants and invertebrates, many of which are ingested inadvertently. Another variation is when raptors secondarily disperse seeds ingested by their prey (Nogales et al., 2002). Birds also cache seeds (synzoochory), primarily pines (Pinus spp.), and oaks (Quercus spp.) in the North Temperate Zone. frequently, birds disperse seeds by adhesion (epizoochory) to feathers or in mud adhered to the legs or bill.

Conclusions

Bird attractants should be seen as resources rather than pests. However, they cause much damage to the economy and livelihood, but birds generally are also a good source of protein and could serve as food in some parts of Africa. The birds also help in nutrient recycling and serve as seed distributors. More efforts can be put in place to ensure sustainable economic bird utilization.

There should be more effort to protect the crops and provide a better solution to how best birds could be repelled from farmland.

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