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## BIRD STRIKE PREVENTIVE MEASURES IN THE ISRAELI AIR FORCE

Lieutenant Mirav Saqi and Corporal Judy Shamoun  
Israeli Air Force

### ABSTRACT

As a result of physical and ecological conditions in Israel there is a large quantity of birds of a large variety of species, that live in, visit, and migrate over Israel. Since air space is quite limited in Israel, birds form a serious hazard for the Israeli Air Force (IAF). Therefore, the IAF designated a team of female soldiers who's work strictly involves bird strike prevention in and around military airfields. Their work involves both bird hazard avoidance and real time dispersal.

# BIRD STRIKE PREVENTATIVE MEASURES IN THE ISRAELI AIR FORCE

## 1. INTRODUCTION

There are several reasons for the large amount of bird strikes in Israel during both high and low altitude flight.

1. Israel's unique position as a corridor between 3 continents: Europe, Asia, and Africa results in the migration of millions of birds every fall and spring over Israel.
2. The Syro-African fault, where temperatures are relatively high and the large differences in topological altitude, create ideal conditions for thermics, and hence the passage of soaring birds.
3. Our rich and diverse natural habitats and a widespread consciousness of nature preservation, create habitats with excellent conditions for an extended stay of more and more migrating birds, as well as a high level of reproduction among local birds.
4. After Sinai was returned to Egypt, air space for training was greatly reduced, increasing the probability of a bird strike.
5. Air force bases form ideological habitats. Birds are not bothered by their enemy, man, and therefore find a comfortable shelter, nesting and roosting sites.

## 2. Bird Strike Prevention Measures

All year round there are 3-4 million birds in Israel and their numbers on airfields may reach the thousands. As a result, the IAF designated a team of female soldiers whose job it is to reduce bird strike hazards in Air Force bases. In addition, the IAF is also working with the Society for the Protection of Nature on avoiding bird strike hazards in the air during migration.

Our work on, and a radius of 5km around each airfield is divided into 2 categories:

1. bird hazard prevention
2. real time dispersal

### 2.1 Bird Hazard Prevention

For bird hazard prevention the team must reduce or eliminate the development of ecological conditions which attract birds to the airfield.

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Several factors in the environment are treated:

- 1) **Agriculture** - in several of the bases there are agricultural fields taken care of by a farmer according to a contract made with the defense ministry/ The IAF receives the farmer's annual plan and approves the types of growths and cultivation procedures. The team of soldiers, in parallel, inspects the work done by the farmer.
- 2) **Wild vegetation** - In undeveloped fields there is often a problem with wild flora. The IAF has a budget set aside for the extermination of flora in "sensitive" areas and follows the efficiency of elimination (chemical or organic) as well as interactions between plants and birds, in and passing the base.
- 3) **Waste dumps** - the soldiers constantly check that the dumps on base are free of organic waste.
- 4) **Oxidation pools and drainage canals** - these habitats are rich in vegetation, insects and birds: Organic content is high. IAF takes care of proper drainage and plant extermination when necessary.
- 5) **Trapping during breeding** - entails the finding of active nests and moving eggs and chicks to zoological gardens.

## 2.2 Real Time Dispersal

Bird strike prevention also entails the dispersal of birds from the airfield. Dispersal occurs on several levels. Firstly, there is real time dispersal working on the different birds' senses. Acoustic communication between birds is the most highly developed form of communication. Therefore, different vocal techniques are used.

1. artificial techniques include: gas tanks, scare cartridges, sirens.

2. bioacoustic - taped distress or alarm calls of different birds are used.

Visual techniques:

1. artificial - brightly colored models of birds of prey, and mimicry of their eyes to disperse small birds.

2. natural - hanging of bird carcasses in problematic areas. Finally, working on their sense of touch, there are different types of glues and sprays which cause bird claws to stick, these are used in buildings and closed places.

Another level of action is population reduction by trapping and hunting.

### 3. Problematic bird species in Israel

- There are several bird species in Israel which are problematic, and pose a hazard to flight.
- During migration there are paths at different heights where pelicans, storks and raptors fly. Pelicans and storks stop for a rest in attractive areas and sometimes stay in Israel for the winter and even to nest.
  - Israel has a rich variety of Charidiiformes some of those found on airfields are the spur-winged plover as well as lapwings.
  - Several types of ducks stay for the winter such as: mallards, garganeys, and teals.
  - Gulls as well as meadow larks (*Haplopterus spinosus*), spend the winter in Israel and pose a serious problem in airfields.
  - During the different seasons there are also various species of passerines which are problematic.
  - In addition, there are desert strips which attract sandgrouses (*Pterocles coronatus*), and houbara (*Chlamydotis undulata*).
  - Stable birds include: the stone curlew (*Buhalus oerthonemus*), and chukars (*Alectoris chukar*), which are hazardous both when they flock as well as when they are territorial during nesting. Hooded crows (*Corvus corone*) appear in large numbers on the bases and are extremely hazardous.
  - Pigeons in Israel are considered pests and a sanitary problem.

### 4. Summary

The bird strike crew work according to instructions given to them by their officer in the air force as well as advice given to them by the nature preserve authority. Every problem is dealt with according to the ecological causes and bird behavior. Our methods of work are first precautionary and then dispersive using different resources together at alternating frequencies to avoid letting the birds habituate to our procedures.

Lately we are working on new projects such as: identification of feather remains after bird strikes, and dog training in order to disperse birds as well as find nesting sites.

Statistically, most of the bird strikes occur at speeds of 50-300 knots and at low level-flying. Most of the strikes are with fighter aircraft. Helicopters and transport aircraft have approximately the same amount of incidents, most of which occur during the morning (until 11:00). It should be noted that most of the bird strikes occur in the air, and not within the airfield range.

In 1947, entered a flock apparently hurt wing, dove with the last plane the pilot ejected

The IAF is constantly investigating additional bird airfields. Results show that

In 1947, at 400 feet and 420 knots, a fighter aircraft entered a flock of pelicans - one hit the canopy and apparently hurt the pilot. The plane seemed to drop the left wing, dove with the nose down and crashed. The last plane which was abandoned and crashed was in 1980 - the pilot ejected safely.

The JAF and the bird strike avoidance crew are constantly investing a great deal of effort to avoid additional bird strikes with planes in both the air and the airfields. Results show that our efforts are fruitfull.