Migration of Birds

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1. Abstract

Our project, “migration of birds” is a highly motivating topic, that describes how the birds migrate and the type of problems they face, while migrating and how to get rid of all the hazards they face while completing process of migration. We have specifically selected this project, because migration is one of the most important processes in the life of birds, as it connects them with the process of reproduction and hence continuation of their own progeny. If the process of migration stops, one day, we will have our world all free of birds and one can also imagine, how bizarre and tasteless our life would be without the presence of birds around us.

2. Description of a domain
Birds make seasonal journeys to long distances, which is called “Bird Migration.” Birds migrate towards the south in the winters. Scientists estimate that about 9,000 species of birds exist worldwide and approximately 660 species of birds breed in North America alone. Some, which are termed resident birds, stay in one area all through the year, while others migrate as the seasons change over. Some travel for very short distances and remain within the United States, while the others migrate longer distances and travel deep into South America.

In the long hot and humid days of summer, breeding birds have an opportunity to feed their newly-hatched young ones. As the days are short in autumn and winter, the food supplies becomes scarce, hence birds travel to warmer places of equator, where the availability of food varies very little with the season.

Death during migration takes a heavy toll. It is estimated that half of all migrants heading south for the winter, will not return to breed in the spring. Collisions with tall buildings, windows, and other structures, being shot or trapped by hunters, and getting struck by automobiles are a few of the numerous human-made dangers.

### 2. Block diagrams

![Block Diagram](image)

### 3. Description of the program that is wanted

Our program should achieve the following goals.
1. Tracking the migratory patterns will allow us to keep track of bird populations, which in turn help us to properly conserve and protect bird species. This baseline information is very crucial for bird conservation and also to know how to direct our efforts.

2. Co-ordination between various governments and government agencies.

3. The system also deals with disbursement of funds from the government to the agencies.

4. Educate people how to preserve the bird’s habitats.

5. Eliminate or minimize the hazards of bird migration, which are caused by human factors

### 5. Detailed requirements

1. **Migration Tracking using radars:**

   The migration tracking can be carried out by using radars, and with this procedure, we will know the possible routes that the birds follow during migration, their food habits, the climatic and the energetic conditions.

2. **Awareness:**

   After identifying the factors that are effecting the migration, we need to conduct surveys and educate people about the causes, that create problems with the migration of birds.

3. **Controlling deforestation:**

   The forest officers have to take the responsibility of identifying where the trees are being cut illegally and avoid these illegal activities. The government of the regions where the bird migration is affected, should work on the enforcement of the laws in avoiding illegal cutting of trees.

4. **Controlling Pollution:**

   Environmental researcher has to identify and maintain the records of all kinds of pollutions, which cause problems for birds and protect the birds from being affected.

5. **Preparation of the Proposal:**

   The ornithologists have to communicate with the government authorities in order to track the information relating to bird migration. He/she also prepares the approximate budget, in order to perform all the operations.

6. **Budget Management:**

   The budget department is responsible for collecting funds in order to carry out the research and successfully complete the project.

7. **Elimination of Hazards:**
The government has to carry out surveys in order to avoid bird hunting and should punish the hunters.

The government should not give permission to construct tall buildings and windmills in the areas and regions where birds migrate.

6. Use cases and User Context:

6.1 Use Case Name: Migration Tracking

**Actors:** Ornithologist, radars

**Use case Description:**
The ornithologists in the different parts of the world, study the different migration patterns, the routes of the migrating birds, food habits, climatic and energetic conditions by using sophisticated radars.

6.2 Use Case Name: Identify factors effecting migration

**Actors:** Ornithologist, forest officers, residents

**Use case Description:**
An ornithologist does the necessary research and identifies different problems that birds are facing at different locations, and which has affected the migration of birds. The ornithologist, along with the forest officers, conducts surveys and involves the residents in identifying the factors.

6.3 Use Case Name: Preparation of proposal

**Actors:** Ornithologist, Government official.

**Use case Description:**
The ornithologist, who does the research on the migration of birds, also analyses the locations where the bird migration is effected and prepares a proposal for the concerned government, to preserve the areas of bird migrations and the concerned government official, approves the proposal.

6.4 Facilitating of suitable conditions

6.4.1 Use Case Name: Control deforestation

**Actors:** Forest officers, Residents.

**Use case Description:**
The government officers of the concerned areas enforce a ban on any type of tree cutting (legal or illegal) in their vicinity, as the cutting of trees has a great effect on the climate in the nearby regions, which in turn effects the migration of birds. The residents of the nearby areas are involved in the process of tree plantation in the areas, which are the victims of uncontrolled deforestation.

6.4.2 Use Case Name: Control pollution

**Actors:** Government officials, environmentalists, residents.

**Use case Description:**
The pollution of all kind, near the sanctuaries, is controlled by the government agencies and residents of the areas also participate in the control of the pollution.
6.4.3 Use Case Name: Develop wild life sanctuaries
   **Actors:** Government officials, forest officers, infiltrators.
   **Use case Description:**
   Government develops wild life sanctuaries in the areas, where the birds migrate, to give them protection from any and every kind of dangers they may face. A wild life management department is prepared by the government officials, which deploys forest officers to keep an active check on the infiltrators.

6.5 Use Case Name: Educate people living in nearby areas
   **Actors:** Residents, Experts.
   **Use case Description:**
   The experts conduct special events to create awareness about importance of birds and bird migration in human life. The media i.e. the television and the newspapers publicizes these events.

6.6 Use Case Name: Coordination between governments of different countries
   **Actors:** Governments officers, ornithologists, project teams.
   **Use case Description:**
   Migrating birds knows no national boundaries, so together, the different governments deal with personnel recruitment, financial management and auditing and also with providing full support to the body, which takes care of the bird migration in their own countries.

6.7 Eliminate Hazards
   6.7.1. Use Case Name: Control Air traffic
   **Actors:** Government Officers, Airline officers.
   **Use case Description:**
   The government officers pass the laws for the air traffic to be detoured, during the time of migration of the birds. The airline officers coordinates with the government, as a collision of birds with the aircraft is dangerous for birds, as well as the people and the aircraft.

   6.7.2. Use Case Name: Ban hunting
   **Actors:** Hunters, Government officers.
   **Use case Description:**
   The hunting of the migratory birds is banned by the government officers and an organization is formed to catch and punish the hunters.

   6.7.3. Use Case Name: Reduce man made hazards
   **Actors:** Government officials, Citizens (owners of the windmills and the buildings)
   **Use case Description:**
   Windmills, tall buildings, and high voltage wires can be dangerous, if they are in the way of the migration route of the birds. So, the government officers pass the necessary laws for fixing the heights of the buildings and the windmills.
6.8 **Use Case Name:** Budget management  
**Actors:** Treasurer, Ornithologist, Project Staff  
**Use Case Description:**  
A department is created, which handles the disbursement of funds from the government and takes care of the different financial needs. It also divides the whole process into sectors, and allocates a certain amount of money for a particular sector.

7. **Interfaces**

- Interface between different governments
- Interface between media and the citizens
- Interface between ornithologists and citizens
- Interface between ornithologists and the government

8. **References for further study**

1. [http://www.turnerlearning.com/efts/species.970730/adv2.html#top](http://www.turnerlearning.com/efts/species.970730/adv2.html#top)

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