

**Establishment of an International Center for the Study of Bird Migration and Flight Safety at Latrun, Israel, as a Model for Regional Activity**

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In 1995 the Society for the Protection of Nature in Israel (SPNI) and Tel Aviv University initiated the establishment of the International Center for the Study of Bird Migration located at the Armored Corps Memorial in Latrun. The site is in the heart of Israel midway between Tel Aviv and Jerusalem. The site will house a field study center and hostel, an auditorium, a radar for monitoring birds and weather, and a museum on bird migration with an emphasis on flight safety. An inter-university center for migratory research concerned with practical aspects of flight safety will also be established. Finally, a network of bird and weather radars will be developed in Israel and the Middle East. The database will be centered at Latrun and real-time information will be transferred to the air force and civil aviation of participant countries. We believe that this multi-disciplinary project proposed here combining scientific subjects with flight safety, education, eco-tourism and nature conservation -- goals common to many Middle East countries -- can help promote the peace process in this region and will be used as a model for other areas around the world.

**Keywords:**

Asia and Middle East,  
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Feathers, Conservation,  
Aircraft, Airline,  
Civil Aviation,  
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Low level,  
Risk Assessment





## Introduction

Latrun is situated in the heart of Israel, midway between Tel Aviv and Jerusalem, next to the main highway (Route 1), and 18 km southeast of Ben-Gurion Airport (figure 1). The site is located at the foot of the Jerusalem Hills, overlooking the Ayalon Valley and the Coastal Plain.

The site has been an international crossroads throughout history: nearby, Joshua Ben-Nun's famous battle took place during which "the Sun stood still in Giv'on, and the Moon in the Valley of Ayalon" (Joshua 10:12), as did Judah the Maccabee's Battle of Emaus. A Crusader castle was built close to the site -- one of the largest in the Middle East -- and the first armored battle in Israel's history was fought over the control of the strategically located British police fort at Latrun. Accordingly, the Armoured Corps decided to establish a memorial at Latrun to honor the memory of the 4,823 soldiers of the Armored Corps who gave their lives in Israel's wars, as well as a museum with an open display of 133 tanks, one of the largest of its kind in the world. The site has been very well developed due to both its unique history and its convenient location. In 1995 alone, 500,000 people -- families, soldiers, schoolchildren, and tourists -- visited the site.

Israel's unique location at the junction of three continents makes it an international crossroads for migrating birds: some 500 million birds cross Israel's skies heading south to Africa in autumn, and then flying north to Europe and Asia in the spring. Latrun is located at the very heart of the western migration route, which stretches the length of the foothills of the Judaeac and Samaritan mountain ridge (figure 1).

The directors of the Armored Corps Memorial at Latrun have allocated Tel Aviv University and the Society for the Protection of Nature in Israel (SPNI) an area of 8 acres on the western side of the site in order to establish an international bird migration research center. The complex will include an inter-university research institute, a field study center, hostel, and a large auditorium which will combine a museum and a radar to display to the public the phenomenon of bird migration. The radar will also be used to increase civil and military flight safety.

The conceptual purpose of the project is to combine history -- the Armored Corps Museum and the battles fought around Latrun in the past -- with the future: bird migration, flight safety, environmental protection, and education aimed at learning to love the land and to examine nature conservation issues. A campground will be built next to the Field Study Center, and will serve as a focal point for youth and adult activities including birdwatching, hikes, navigation, archaeology, and conservation of the surrounding environment. Landscaping at the Field Study Center will focus on bird-attracting trees and bushes. Additionally, nest boxes and feeding perches will be placed throughout the area, following the tradition developed in Europe and North America. In memory of the late Prime Minister Yitzhak Rabin, a park with trees native to Israel and trees mentioned in the Bible will be planted on a 55 acre area next to the site.



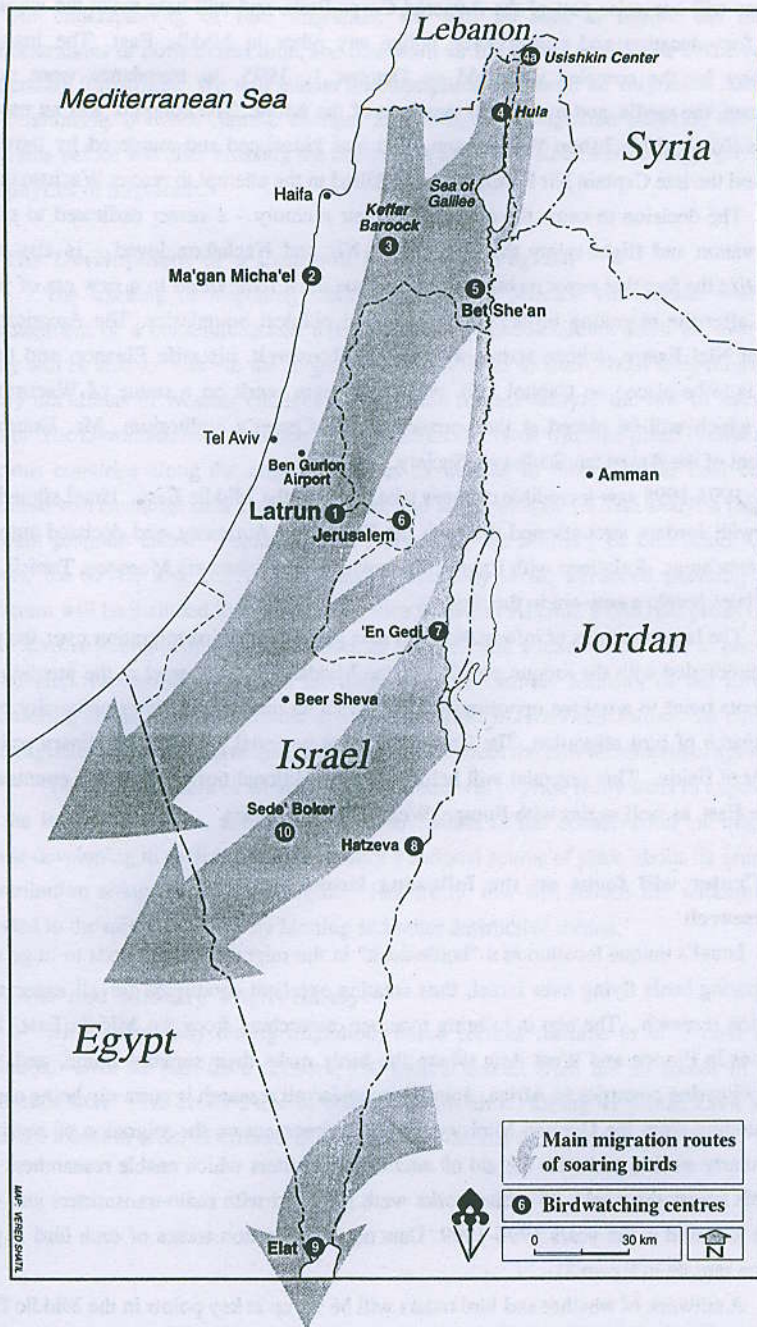


Figure 1 : The location of the Migration Research Center site at Latrun, the network of birdwatching centers in Israel, and the main migration routes of soaring birds over Israel which comprise the "Bird Plagued Zones" (B.P.Z.) of the Israeli Air Force.



The trees will comprise part of the Armored Corps Park, and will help make the whole area a center for education and conservation unlike any other in Middle East. The inauguration ceremony for the complex was held on October 1, 1995. In attendance were numerous statesmen, the media, and over 3,000 members of the public. The complex will be named after the late Corporal Nachshon Wachsmann, who was kidnapped and murdered by terrorists last year, and the late Captain Nir Poraz, who was killed in the attempt to rescue Wachsmann.

The decision to name the complex in their memory - a center dedicated to education, conservation and flight safety the land which Nir and Nachshon loved - is also meant to symbolize the fact that terror must stop and that we must look ahead to a new era of peace, by taking after the migrating birds, which know no political boundaries. The American Jewish sculptor Niel Estern, whose statue of President Roosevelt, his wife Eleanor, and their dog, Fella, is to be placed on Capitol Hill, will soon begin work on a statue of Wachsmann and Poraz which will be placed at the entrance to the Center's auditorium. Mr. Estern is also president of the American Sculptor's Society.

1994-1995 saw incredible changes take place in the Middle East. Israel signed a peace treaty with Jordan, strengthened ties with the Palestinian Authority, and declared autonomy in many new areas. Relations with Egypt are improved, and links with Morocco, Tunisia, and the Gulf States herald a new era in the region.

The large amounts of information and data gathered on bird migration over the past two decades coupled with the unique position of the Middle East and Israel at the junction of three continents point to a unique opportunity to establish an international inter-university center for the research of bird migration. The Center has great potential for interdisciplinary activity in a number of fields. This potential will help promote additional ties between the countries of the Middle East, as well as ties with Europe, West Asia, and Africa.

**The Center will focus on the following issues:**

**1. Research**

Israel's unique location as a "bottle-neck" in the migration route leads to huge numbers of migrating birds flying over Israel, thus creating excellent conditions for all aspects of bird migration research. The aim is to bring together researchers from the Middle East, from the countries in Europe and West Asia where the birds make their summer home, and from the birds' wintering countries in Africa. Joint German-Israeli research is currently being carried out with funding from the German Ministry of the Environment on the migration of soaring birds (particularly storks) and with the aid of satellite transmitters which enable researchers to track the birds across the world. 25 white storks were followed with radio-transmitters and 40 more will be followed in the years 1996-1999. Data on the migration routes of each bird is gathered (see one sample in figure 2).

A network of weather and bird radars will be set up at key points in the Middle East, and will feed into a central database at Latrun. This information will enable us to make huge strides



in our understanding of bird migration: we will be able to follow the movement of concentrations of birds in real time, and thus warn air forces and civilian air traffic controllers of impending birdstrikes. We will initiate interdisciplinary research on migration issues, such as the relationship between climatic changes and changes in migration patterns, the behavior of migrants before and after crossing the desert belt, as well as studies in ecology, physiology, and the physics of migration.

## **2. The Development of a Common Education Program**

The tracking of migrating storks, eagles, and pelicans via satellite will enable the development of a communications network, linking schoolchildren from all over the world. They will be able to "talk" to the migrating birds in order to learn about their migration routes, study the effects of weather changes on migration routes, analyze the rate of movement, and more. The communication between schoolchildren and birds will take place between schools in various countries along the migration routes as well as in other Middle East countries; the children will exchange data and information, and will cooperate on data analysis (see figure 3). A joint program called "Tomorrow '98", involving the Ministry of Education, Culture, and Sport, the SPNI, and Tel Aviv University is already in the advanced planning stages. The program will be included in United States Vice President Al Gore's GLOBE project, whose aim is to involve young people in environmental research and conservation, and to encourage them to develop responsibility for their environment. The German Ministry of the Environment is sponsoring an international seminar in September 1996 in Israel and Jordan. 25 countries along the migration route will participate in order to learn about the new development system.

The establishment of an international center will provide many tools to expose the public to the issues, problems, and scientific achievements in the conservation of migrating birds while developing in each participant country a national source of pride about its unique role and contribution along the migration route. Hopefully, this will reduce the widespread damage caused to the migrating birds by hunting and other destructive means.

## **3. Civil and Military Flight Safety**

Birds, especially during migration, cause serious damage to both civil and military aviation. Over the past three decades, 130 fighter aircraft from the air forces of 10 Western countries alone have crashed due to collisions with birds, killing 41 pilots. Civil aviation also accrues losses in order of billions of dollars every decade (Richardson, 1994).





**Above left:** 1.4.96 Mr Ezer Weizman, President of the State of Israel, and Mr. Yossi Sarid, Minister of the Environment, at the inauguration ceremony for the new Russian Radar MRL-5 at Latrun. **Above right:** Attaching a radio-transmitter to a migrating white stork in the Beit Shean Valley, Israel. The signals are received by Argos Satellite. **Below:** The MRL-5 Radar at the Armoured Forces Memorial, Latrun.







Above: Mr. Yossi Sarid, Minister of the Environment, and Miki Ron, General Director of Delek Motors Mazda, watching 14,000 wintering common cranes (*Grus grus*) in the Hulah Valley at the dedication ceremony of an MPV car, donated by Mazda to the Migration Research Center at Latrun. Below: At the "Education 2000" exhibition in Jerusalem in memory of the late Yitzhak Rabin (31.12.95-12.1.96). We presented our project in which kids follow bird migration via satellite and communication with computers. 120,000 people visited the exhibition.

Bottom: Yossi Leshem explains the new project to Mrs. Lea Rabin, Rabin's sister Rachel and the Minister of Education, Prof. Amnon Rubinstem.

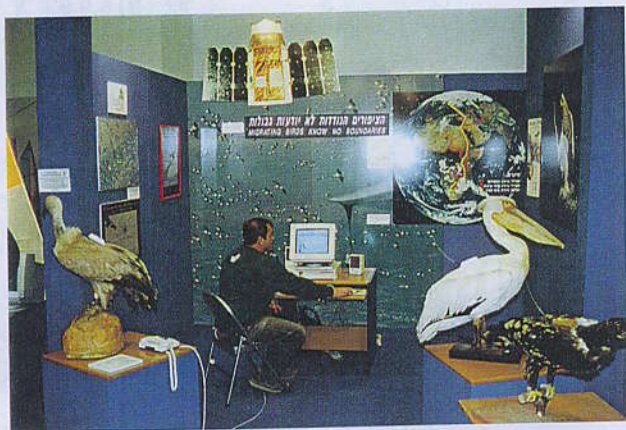
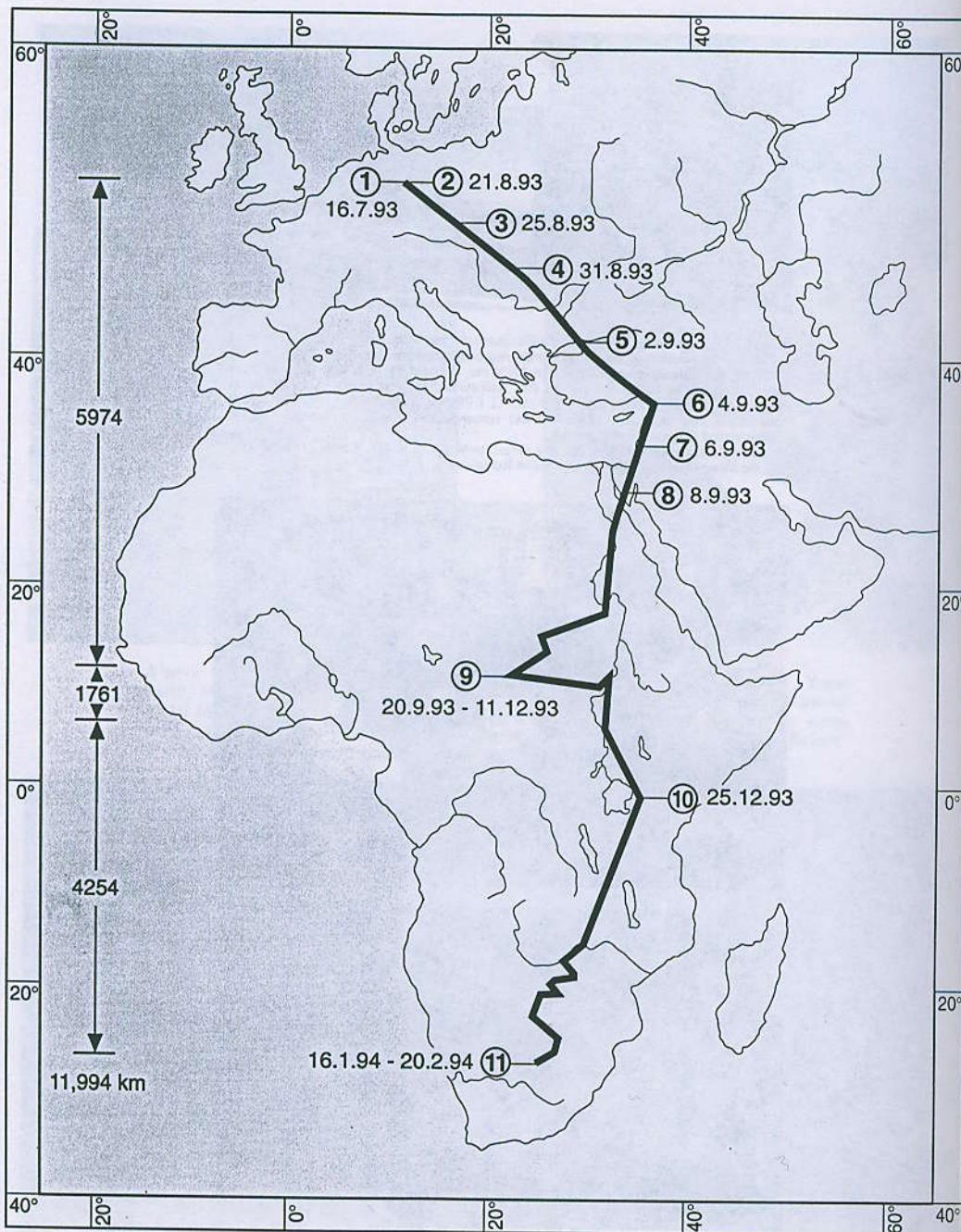




Figure 2: Migration route of one of 25 storks, followed with satellites over the Middle East





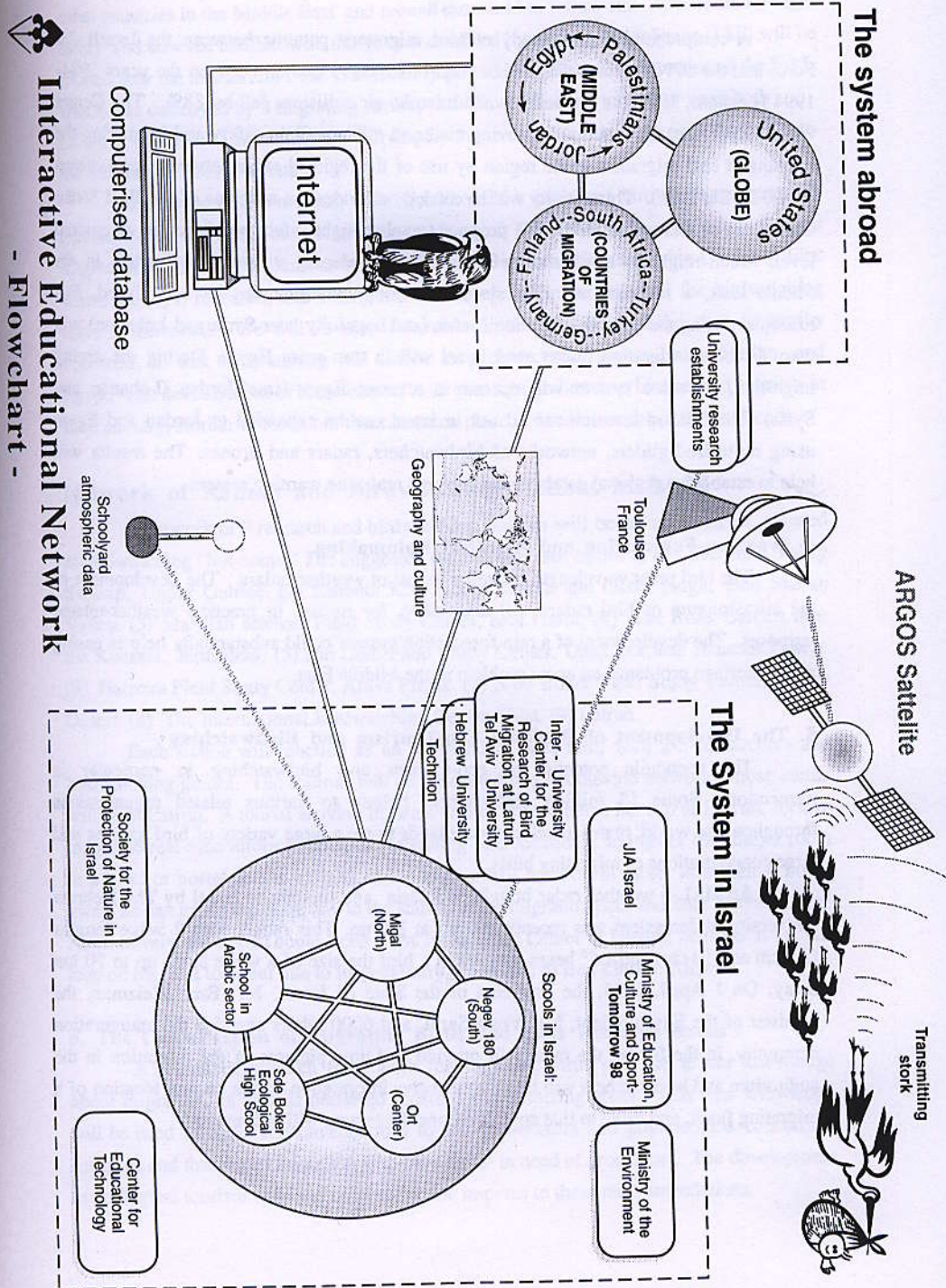


Figure 3: Flowchart of the interactive educational networks of pupils in schools following satellite-tracked bird migration.



A comprehensive joint study of bird migratory patterns between the Israeli Air Force and the SPNI led to savings of lives and over \$300 million between the years 1984-1994 (Leshem, 1994) as the number of birdstrike air collisions fell by 88%. The Center will conduct research aimed at improving civil and military flight safety and improving the tracking of bird migration in the region by use of the regional radar network (see Leshem WP50 BSCE 1996). This activity will be carried out under the auspices of the Bird Strike Committee of Europe (BSCE). We propose to solve flight safety problems on a regional level, which might be much more effective. By developing a network of radars in the Middle East, a real-time warning system between countries can be established. For example, during the autumn migration Jordan (and hopefully later Syria and Lebanon) will warn Israel of migrating flocks, and Israel will in turn warn Egypt. During the spring migration, the same system will operate in reverse: Egypt-Israel-Jordan (Lebanon and Syria). The detailed research carried out in Israel can be expanded to Jordan and Egypt using motorized-glidern, networks of birdwatchers, radars and drones. The results will help to establish a regional database and regional real-time warning system.

#### **4. Weather Forecasting and Artificial Rainmaking**

The bird radar wavelength is similar to that of weather radars. The development of the infrastructure of bird radars will also allow for its use in practical weather-related purposes. The development of a rain forecasting system could substantially help in easing water shortage problems, an acute problem in the Middle East.

#### **5. The Development of Regional Eco-Tourism and Birdwatching**

The economic potential of eco-tourism and birdwatching in particular is tremendous. Some 13 million birdwatchers belong to various related organizations throughout the world; many travel to distant lands to see a large variety of bird species and large concentrations of migrating birds.

An MRL-5 weather radar bought in Russia and brought to Israel by The Hebrew University of Jerusalem was recently placed at Latrun. This radar, with 2 wave lengths (3.2 cm and 10 cm) and 1.5° beam, can detect a bird the size of a white stork up to 70 km away. On 1 April, 1996, the President of the State of Israel, Mr. Ezer Weizman, the Minister of the Environment, Mr. Yossi Sarid, and 6000 others attended the inauguration ceremony. In the future, the radar will provide real-time pictures of the migration in the auditorium and birdwatchers will be able to receive information on the current location of a migrating flock, and drive to that spot. We hope the system will encourage



other countries in the Middle East and around the world to follow suit. A museum on flight safety and how the conflict with the birds was solved by the Israeli Air Force (IAF) will be located near the auditorium. The IAF recently provided us with all the remains of the F-15 which was destroyed by 3 migrating strokes and whose pilot and navigator were both killed. A wall 10x10 meters in area will display the remains in order to expose the public to the dangers of birds to aviation.

In a period of two months, over 35,000 visitors came to a birdwatching viewpoint established by the SPNI near Kfar Qassem (east of Tel Aviv) during the autumn raptor migration surveys. A similar number visited the International Birdwatching Center in Eilat where surveys, research, and netting are conducted daily. The potential for birdwatching tours is unlimited. We will develop a number of central birdwatching sites in nearby countries, so that birdwatching will feature in package tours across Israel, Jordan, and Egypt. The development of these centers will give a huge boost to bird-related tourism in each country, similar to the boom that has taken place in Israel over the past two decades.

### **Network of Radars and Birdwatching Stations in Israel**

A network of 9 research and birdwatching stations will be set up in Israel, situated at birdwatching "hot-spots." The suggested stations are: (see figure 1) (1) The Hula Valley Swamp, Upper Galilee. (2) Kibbutz Kfar Rupin Station and Ganei Huga, Beit She'an Valley. (3) Ma'agan Michael Field Study Center, near Haifa. (4) The Rose Garden near the Knesset, Jerusalem. (5) Ein Gedi Field Study Center, Dead Sea and Judaean Desert. (6) Hatzeva Field Study Center, Arava Plains. (7) S'de Boker Field Study Center, Negev Desert. (8) The International Birdwatching Center, Eilat. (9) Latrun.

Each station will function as an independent field unit, with 2-3 researchers and birdwatching guides. The stations will be connected to a nationwide network whose center will be at Latrun. A tourist arriving in Israel will be able to begin his trip at Latrun, receive maps and real-time information about migrating bird locations, and order (on-line) a room in a hotel or hostel in the desired area. With every location in Israel less than 4 hours away, he can travel the same day to the station in the migration path and start birdwatching! Alternatively, the tourist could sleep at the Field Study Center at Latrun, or make it the last stop on his visit to Israel due to its proximity (15 mins.) to Ben-Gurion Airport.

### **6. The Conservation of Migrating Birds and their Roosting Areas**

A systematic research framework for migrating birds will add to our knowledge about migration, as well as preferred roosting and wintering areas. This new knowledge will be used to make recommendations to decision-makers and governments concerning sensitive and threatened migration stop-over areas in need of protection. The development of ecological tourism will lend solid economic impetus to these recommendations.



### 7. The Middle East Peace Process

"Migrating Birds Know No Political Boundaries" is a very important message for the new Middle East. The interdisciplinary program includes aspects of flight safety, scientific research, education, communication between schoolchildren from different countries via computer link, and the firm economic base of eco-tourism.

As previously stated, in the wake of the recent developments in the region, the model of Latrun and the network of stations may be copied in other neighboring countries; the entire network, once linked together, will enhance inter-country relations. Joint programs concerning flight safety, scientific research and education will then be initiated.

Prime Minister Shimon Peres is very enthusiastic about the plan and its potential. The program was presented at the Amman Economic Summit in November, 1995. New links are now being forged to aid the rapid development of the program including cooperation between the Jordanian Royal Air Force and the Israeli Air Force.

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