

Where have 30,000 Lesser Spotted Eagles *Aquila pomarina* gone?

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INTRODUCTION

Israel is well known as a bottleneck for migrating Palearctic birds, particularly soaring birds, migrating from their breeding grounds in Eastern Europe and Western Asia to their wintering grounds in Africa and back (Leshem & Yom-Tov 1996, Alon *et. al.* 1992). Medium to large soaring birds avoid crossing large bodies of water such as the Mediterranean during migration and hence use land bridges, such as Israel, to reach their destinations.

Autumn migration of Palearctic soaring birds over Israel has been surveyed by ground observers systematically since 1977 (Dovrat 1991, Tsoval & Alon 1991, Leshem & Yom-Tov 1996). From 1977 - 1987, surveys were conducted over the central part of Israel (Kefar Kassem) (Dovrat 1991). As of 1988, the autumn soaring bird migration survey is conducted across the Northern Valleys. Both surveys were and are conducted by the Israeli Ornithological Center. In autumn, the majority of soaring birds pass Israel along two major flyways, the western flyway along the central mountain range and the eastern flyway along the Jordan Rift Valley (Leshem & Yom-Tov 1998). Thirty-five species of birds of prey (Accipitriformes) were observed, along with two species of storks *Ciconia ciconia*, *C. nigra* and White Pelicans *Pelecanus onocrotalus*.

Unlike in the spring, the southern route through Eilat is almost inactive in autumn. The only species with significant numbers migrating along the southern route at that time of year is the Steppe Eagle *Aquila nipalensis* (Shirihai & Christie 1992).

The Lesser Spotted Eagle *Aquila pomarina* is one of the predominant migrating birds of prey during autumn migration in Israel along the western flyway (Dovrat 1991, Tsoval & Alon 1991, Leshem & Yom-Tov 1996). There are five bottlenecks along their migration route (Burgus, Bosphorus, Belen Pass, Iscadron Gulf, Israel and the Suez Gulf) (Meyburg *et. al.* 1997, 1995). Lesser Spotted Eagles pass through Israel from the third week of September to the second week in October. According to most studies the entire population of Lesser Spotted Eagles passes through the above-mentioned migration route, except for a few individuals that were recorded crossing the Mediterranean Sea through Cyprus (Meyburg *et. al.* 1995).

Although autumn counts have been conducted in other regions, in contrast to this survey, they are only conducted at a few stations, over only a few years, or both.

METHODS

This study is based on annual autumn counts conducted between 1982-1997 in Israel. From 1982-1987 counts were conducted in the Kfar Kassem region. Since 1988 counts have been conducted across the Northern Valleys.

The Autumn Migration Soaring Bird Survey across the Northern Valleys begins each year on 1 August with the beginning of the White Stork migration and in the past on 20 August in Kfar Kassem. Until 25 August, 3-4 stations are opened from the Jordanian border (61 km from the coast) to 54 km from the coast. During the migration season, as the species composition changes, the survey moves west. During the period of Lesser Spotted Eagle migration (25.9-15.10), the stations are run between 11-46 km from the coast in the Northern Valleys and 5-30 km from the coast in Kfar Kassem.

Station locations

Stations occur more or less in a straight line across the migration front and at a distance which will allow maximal identification of all the raptors crossing the front. For minimal coverage of a 35 km wide migration front, at least 12 stations, placed 3 km apart, are used.

All stations are opened approximately 1 hour after sunrise, as raptors start taking off, and close an hour before sunset, as diurnal migration stops. The bird watcher at each station is equipped with binoculars, a telescope and radio communications. The bird watchers record the following information: hour, species, number, distance from station, estimated altitude, direction of migration. This helps in learning about hourly changes in the migratory axis and facilitates the elimination of duplications (those birds that were recorded in two or more different stations).

RESULTS

Figure 1. Annual counts of Lesser Spotted Eagles, 1982 - 1997

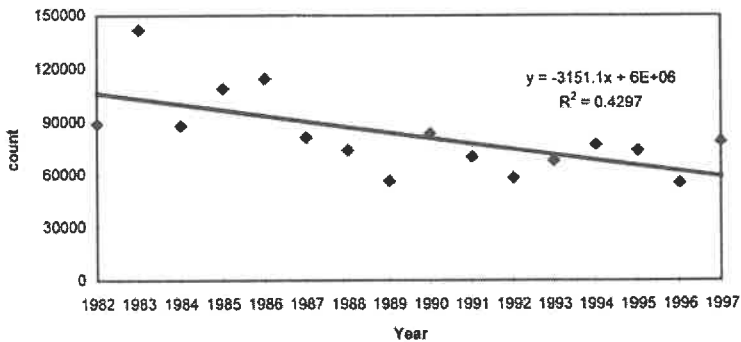


Figure 2. Annual counts of Lesser Spotted Eagles, 1982 - 1986

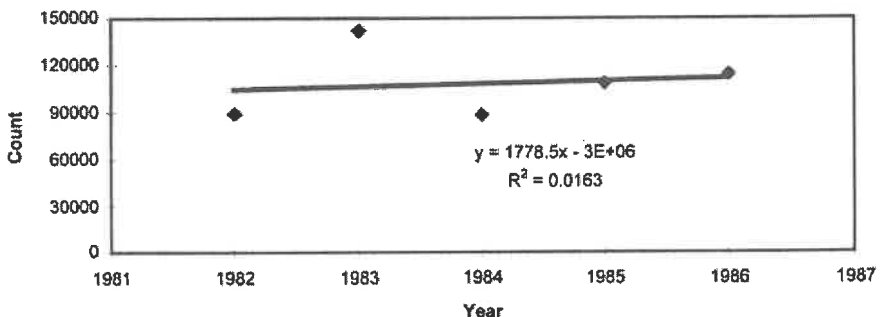


Figure 3. Annual counts of Lesser Spotted Eagles, 1987 - 1997

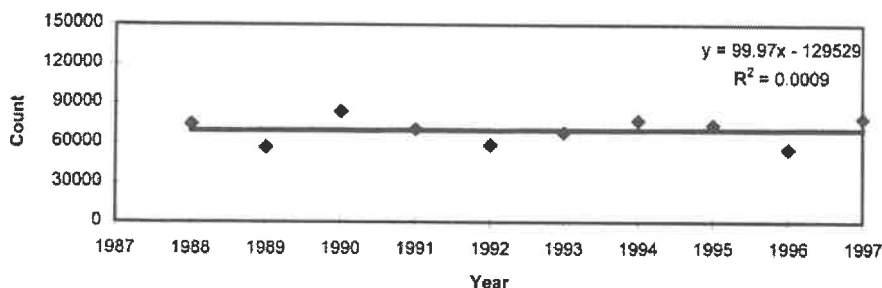


Figure 4. Annual counts of Lesser Spotted Eagles, 1985 - 1990

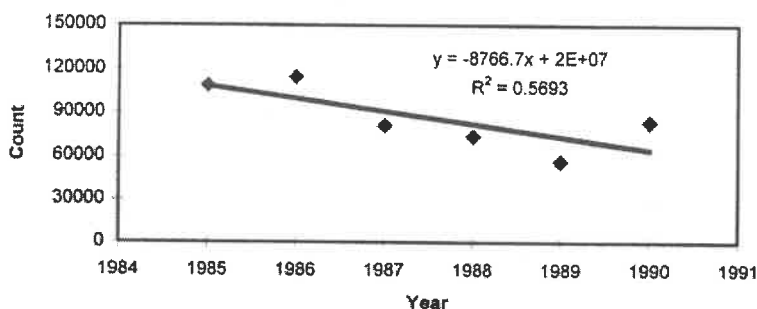
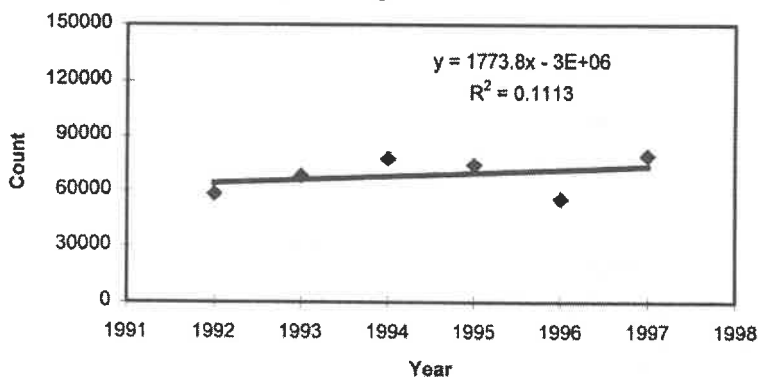


Figure 5. Annual counts of Lesser Spotted Eagles, 1992 - 1997



DISCUSSION

Figure 1 shows a clear decline in numbers of Lesser Spotted Eagles from 1982-1997. However, no decline is noted between the years 1982-1986, in fact a slight increase may even be seen (Figure 2). The same is true for Figure 3, regarding the years 1987-1997, with almost no change between the years. The average count for 1982-1986 is significantly higher than the average for 1987-1997. Figure 4, summarizing 1985-1990, shows a sharp decrease in numbers from 1987 onwards. From 1992-1997, a slight positive trend is seen (Figure 5).

Titus *et al.* (1989) suggested that the main factors affecting the difference in counts between migration survey years are the quality of observers and changes in the weather. These factors do affect seasonal counts; however, long term studies decrease the significance of the between year variance. Leshem and Yom-Tov (1998) doubt the applicability of annual counts in estimating

population size because of this variance. For short term surveys, lasting only a few years, this may be true (their paper dealt with nine years compared to fifteen in this study). Survey counts may not be an efficient tool to monitor changes in population size immediately, as long-term monitoring is needed to draw firm conclusions regarding population changes.

The change in the Lesser Spotted Eagle population size, according to the survey counts in this study, occurred suddenly and was first apparent in the count of autumn 1987. Only an extreme event can cause such a drastic drop in numbers, unlike many cases where a gradual decrease in numbers is a result of the gradual destruction of habitat. The breeding distribution of Lesser Spotted Eagles includes West Germany eastwards to Russia and the largest concentration of birds is found in Belorussia.

One event that could have caused such a dramatic and sudden decrease in May 1986 indeed occurred during the Chernobyl nuclear disaster in the Ukraine, bordering Belorussia. The area is the core nesting region of the Lesser Spotted Eagles (Meyburg *et al.* 1997) (Cramp & Simmons 1980). The Lesser Spotted Eagle is the only raptor whose central breeding region is so close to the disaster. Radioactive emissions could have affected the birds in several ways, including direct damage to the eagle's productivity, damage to food sources (rodents and amphibians), and damage to the habitat which can directly affect the breeding sites of the eagles or the habitat of the prey.

It is unclear if the slight increase in population size shown in the results indicates a recovery of the population. From personal communications, some regions, such as Latvia and Estonia, are noting an increase in populations. It is possible that this increase is being recorded in the survey and if indeed the cause of the drastic decrease is habitat destruction, the birds may be moving to other areas within their breeding range.

In conclusion, the results shown in this study show a drastic drop in the population size of the Lesser Spotted Eagle that occurred in 1987, or near that time, and not a gradual decrease that may result from gradual habitat destruction. This raises the theory that the cause of the drastic change is the disaster at the nuclear plant that occurred in the centre of the eagle's breeding region in spring 1986. These results demand in depth research, though this would be much more difficult today because of the long time that has passed since the disaster.

REFERENCES

- ALON, D., Y. LESHEM, E. DOVRAT & A. TSOVEL 1992. Autumn migration of soaring birds across Samaria and northern valleys. *Torgos* 20.
- CRAMP, S. & K. SIMMONS 1980. *Handbook of the Bird of Europe, The Middle East and North Africa*, volume 2. Oxford University Press, Oxford, London, New York.
- DOVRAT, E. 1991. The Kefar Kassem raptor migration survey autumn 1977-1987: a brief summary. Raptors in Israel, Israel Raptor Information Center and International Birdwatching Center, Eilat.
- LESHEM, Y. & Y. YOM TOV 1996. The magnitude and timing of migration by soaring raptors, Pelicans and Storks over Israel. *Ibis* 138 :188-203.
- LESHEM, Y. & Y. YOM TOV 1998. Routes of migrating soaring birds. *Ibis* 140:41-52.
- MEYBURG, B.-U., L. HARASZTHY, M. STRAZDS & N. SCHAFER 1997. European Union species action plan for Lesser Spotted Eagle (*Aquila pomarina*). RSPB.
- MEYBURG, B.-U., W. SCHELLER & C. MEYBURG 1995. Migration of Lesser Spotted Eagle *Aquila pomarina*: A study by means of satellite telemetry. *Journal für ornithologie* 136:401-422.
- SHIRIHAI, H. & D. CHRISTIE 1992. Raptor migration at Eilat. *British Birds* 85:141-185
- TITUS, K., M. FULLER & J. L. RUOS 1989. Considerations for monitoring raptor population trends based on counts of migrants. *Raptors in the Modern World*. WWGP Berlin, London, and Paris.
- TSOVEL, A. & D. ALON 1991. Soaring bird migration survey in the Northern Valleys of Israel, Raptors in Israel, Israel Raptor Information Center and International Birdwatching Center, Eilat.

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