SOARING MIGRANTS AND THE 1% PRINCIPLE

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ABSTRACT

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The conservation of biological biodiversity has taken on international significance – examples of these are: Ramsar Convention, Bonn Convention, Earth Summit in Rio de Janeiro, or Important Bird Areas (IBAs). The IBA is defined as an area, which can be managed for wildlife conservation and provides all the requirements of birds that it is important for, alone or with other sites, at the appropriate season. Among the criteria for IBAs is „1% principle", which was developed to ensure the protection of important staging areas for waterfowl on their migration routes.

We have analysed the numbers of soaring migrants counted at three major bottlenecks of the Palearctic-African migration system during the spring: Gibraltar on the western flyway, Messina on the central flyway, and Eilat on the eastern flyway. Total numbers of raptor species were – 26 at Gibraltar, 25 at Messina and 39 at Eilat. The comparison of the three regions showed that soaring birds mainly cross to Europe and Asia in spring at Eilat. These contain more than 10 raptor species, which can be included in the 1% principle, and some of them even approach or exceed (*e.g.* Honey Buzzard – *Pernis apivorus*, Levant Sparrowhawk – *Accipiter brevipes*, Steppe Eagle – *Aquila nipalensis*) total breeding populations of Europe, what suggests that large proportions of Asian soaring birds also migrate through Eilat, or that not all the breeding estimates in Europe are accurate.

It is imperative that global environmental agencies stress not only the conservation of breeding and wintering grounds, but also the conservation of staging areas, which can be critical for the survival of Eurasian bird populations.

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INTRODUCTION

The conservation of biological biodiversity has become important not only to individuals or small groups, like in the early decades of this century, but has taken on

international political significance and has become socio-economically viable. The increased extent of awareness is evident in the growing numbers of summits, conventions and programmes that are contracted in the World – examples of these are the Ramsar Convention in 1971, Convention for the Conservation of Migratory Species in 1983 (better known as the Bonn Convention), and recently – the 1992 Earth Summit in Rio de Janeiro. All of these international agreements pertain to either conservation of specific species, or guild related habitats, or migratory corridors. Today we have a situation wherein we can have a combination of several agreements being relevant to a given area. An example of this can be that of a high proportion of a migratory species, designated as endangered, passing through an „Important Bird Area" (*cf.* Evans 1994).

The first strategy included the assigning of threat status and categories to all known avian species of the World (*e.g.* Collar *et al.* 1994). This strategy was initiated in the 1960s and since then, a wide range of strategies has been employed in order to try to save remains of our global natural heritage. The „World Heritage Convention" in 1975 stressed the conservation of „natural features consisting of physical and biological outstanding universal values from the aesthetic or scientific point of view". The „Ramsar Convention" in 1971 was the first global treaty that dealt with the habitat conservation – although limited to wetlands only. The „Bonn Convention" came into force in 1983 and its objective has been to protect migratory species (Boere 1991). The step up from the species-concept to the ecosystem-concept has become evident since the „Biodiversity Convention" in 1993 (de Klemm and Shine 1993).

In addition to all of the fore-mentioned conventions, one of the most recent examples of assigning status to a region of biological importance is the global program implemented by BirdLife International and known to all as the IBAs (Important Bird Areas – Grimmett and Jones 1989, Evans 1994). The IBA was defined as an area, which can be managed for wildlife conservation and provides all the requirements of birds that it is important for, alone or with other sites, at the appropriate season (Evans 1994). Six categories of sites were developed. One of the categories is for sites where birds concentrate in important numbers – either when breeding, or on passage, or wintering.

The criteria for inclusion in this category states that the site must hold 1% or more of a seabird or waterfowl species' biogeographical flyway or population; or the site must hold an average of 20 000 or more waterfowl; or the site must be a migratory bottleneck, where, on average, more than 5000 storks or 3000 raptors or 2000 cranes pass during spring and/or autumn migration. Here we concentrate on the 1% principle, which was developed to ensure the protection of important staging areas for waterfowl on their migration routes.

STUDY AREA AND METHODS

We have analysed the numbers of soaring migrants counted at three major bottlenecks of the Palearctic-African migration system during the spring (pre-

breeding) movements, in order to evaluate their relative importance in comparison to recent European breeding population estimates (about 2 000 000 *bp* – Tucker and Heath 1994). We have made the comparison of the migration volumes during the spring because in autumn, other than in Israel, no visual migration surveys are conducted in the Mediterranean basin. Besides, a greater proportion of the volume in autumn consists of freshly fledged juveniles. This proportion is diminished considerably by natural selection in the autumn migration to the wintering grounds and the trials of survival in Africa.

There has been made a comparison of visual migration surveys during the spring migration season at the three major crossings from Africa to Europe and Asia: Gibraltar on the western flyway, Messina on the central flyway, and Eilat on the eastern flyway that circumvents the Mediterranean Sea. The comparison clearly showed a very strong bias towards significant proportion of concentration of European species of conservation concern, which migrate through Eilat (Table 1). The most obvious is total number of raptor species that concentrate at each of the bottlenecks – 26 species at Gibraltar, 25 at Messina and 39 at Eilat. As previously stated, in present conservation practices, great importance is attributed to areas that include or can influence the fate of minimum 1% of the entire population of a given species. The „1% principle" has been found in long experience to be useful in giving appropriate degree of protection to populations and in the definition of ecologically sensible and sensitive sites.

Table 1

Comparison of raptor migration at Eilat, Messina and Gibraltar. „Europe *bp*" denotes estimated European breeding pairs; „*% Ebi*" denotes the ratio between migration volume and number of European breeding individuals (2**bp*); bold highlights species that conform to the 1% principle.

	Europe *bp*	Avg. Eilat	% *Ebi*	Avg. Messina	% *Ebi*	Max. Gibraltar	% *Ebi*
Pernis apivorus	110000	389269	**176.9**	8857	**4.0**	4480	**2.0**
Elanus caeruleus	1100	0	0.0	0	0.0	2	0.1
Milvus migrans	75000	28418	**18.9**	370	0.2	9950	**6.6**
Milvus milvus	19000	0	0.0	5	0.0	76	0.2
Haliaetus albicilla	3300	0	0.0	0	0.0	0	0.0
Gypaetus barbatus	200	0	0.0	0	0.0	3	0.8
Neophron percuopterus	2800	426	**7.6**	5	0.1	82	**1.5**
Gyps fulvus	9300	11	0.1	0	0.0	873	**4.7**
Aegypius monachus	1000	0	0.0	0	0.0	2	0.1
Circaetus gallicus	5900	171	**1.4**	2	0.0	760	**6.4**
Circus aeruginosus	48000	179	0.2	865	0.9	127	0.1

	Europe *bp*	Avg. Eilat	% *Ebi*	Avg. Messina	% *Ebi*	Max. Gibraltar	% *Ebi*
Circus cyaneus	22000	2	0.0	31	0.1	13	0.0
Circus macrourus	1000	56	2.8	7	0.4	0	0.0
Circus pygargus	26000	24	0.0	215	0.4	80	0.2
Accipiter gentilis	130000	2	0.0	0	0.0	4	0.0
Accipiter nisus	270000	165	0.0	4	0.0	523	0.1
Accipiter brevipes	3600	20316	282.2	0	0.0	0	0.0
Buteo buteo	740000	334420	22.6	31	0.0	59	0.0
Buteo rufinus	2000	49	1.2	3	0.1	0	0.0
Buteo lagopus	91000	0	0.0	0	0.0	0	0.0
Aquila pomarina	6700	55	0.4	2	0.0	0	0.0
Aquila clanga	860	6	0.3	0	0.0	2	0.1
Aquila nipalensis	15000	28484	94.9	0	0.0	0	0.0
Aquila heliaca	320	47	7.3	0	0.0	0	0.0
Aquila h. adalberti	150	0	0.0	0	0.0	2	0.7
Aquila chrysaetos	5000	8	0.1	4	0.0	0	0.0
Hieraaetus pennatus	2800	138	2.5	7	0.1	288	5.1
Hieraaetus fasciatus	820	4	0.2	0	0.0	2	0.1
Pandion haliaetus	7100	85	0.6	10	0.1	37	0.3
Falco naumanni	10000	130	0.7	37	0.2	178	0.9
Falco tinnunculus	290000	63	0.0	434	0.1	62	0.0
Falco vespertinus	18000	3	0.0	326	0.9	0	0.0
Falco columbarius	34000	2	0.0	2	0.0	1	0.0
Falco subbuteo	58000	22	0.0	127	0.1	15	0.0
Falco eleonorae	3800	11	0.1	12	0.2	15	0.2
Falco biarmicus	200	7	1.8	1	0.1	0	0.0
Falco cherrug	370	3	0.4	1	0.1	0	0.0
Falco rusticolus	1300	0	0.0	0	0.0	0	0.0

RESULTS AND DISCUSSION

The comparison of the three major bottleneck regions (Table 1) shows that soaring birds over-whelmingly cross to Europe and Asia in spring at Eilat. These contain more than 10 raptor species, which can be included in the 1% principle, and some

of them even approach or exceed (*e.g.* Honey Buzzard – *Pernis apivorus*, Levant Sparrowhawk – *Accipiter brevipes*, Steppe Eagle – *Aquila nipalensis*) total breeding populations of Europe. The latter suggests that large proportions of Asian soaring birds also migrate through Eilat, or that not all the breeding estimates in Europe are accurate.

One should keep in mind that the concept of staging should not be taken carelessly and is crucial for the migrants to reach their breeding grounds. It has been shown that staging during spring migration not only is important for individuals' survival but also determines the size of clutch laid by the female upon arrival at the breeding grounds. In addition, researchers have found that spring weights of birds caught further north in the Mediterranean basin were considerably greater than those from the northern edge of the desert. This implies that birds need to feed after crossing the desert. This also explains why a great number of migrants stopovers at Eilat in spring. These individuals have survived the hardships of autumn migration, over-wintering in Africa, and the first half of the spring migration. They are the fittest of their populations and comprise substantial proportion of the breeding population of birds of Europe and Asia.

The conservation of staging areas is of the utmost importance for the populations of migrants, even if birds may only use them for short periods each year. This is especially true for Arctic breeding or trans-Saharan migrant species that have a very short potential breeding period, and nesting is critically timed. Failure to arrive on the nesting grounds in suitable conditions, or at the right time, may mean not only that breeding may not be possible, but also that death may ensue. Thus, timing of migration by these migrant species reflects their need to arrive with adequate reserves at precisely determined time in spring. One of the best examples is their use of the Eilat region as a staging area.

Environmental changes have always occurred, influencing the evolution of the current patterns of bird migration, and the species that are present today are those, which best adapted to the changes. However, the pace, at which modern man changes terrestrial habitat, is so fast that the evolutionary processes could not keep up with. The inability to cope with constant human induced changes is possibly leading to drastic declines in populations, or maybe even to extinctions. We stress the importance of effective conservation at these few and small places that are, nevertheless, critical for the survival of Eurasian bird populations. It is imperative that global environmental agencies stress not only the conservation of breeding and wintering grounds, but also the conservation of critically located staging areas in order to ensure that the species concerned can continue their traditional migrations without additional, human-induced complications on these evolutionarily evolved flyways.

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