

Adoption of a Juvenile by Breeding Spanish Imperial Eagles During the Postfledging Period

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Fostering and crossfostering of nestlings are management techniques that have been widely used in the field with different endangered raptor species (Meyburg 1977; Temple 1978; Olendorff et al. 1981). However, we know of only 2 published reports on adult breeding raptors feeding fledglings that were not their own (Ellis and Groat 1982; Poole 1982). Since this kind of adoption does not take place naturally in territorial species, these have probably not developed an intolerance of intruder fledglings (Wilson 1975). In this paper we describe the introduction of a fledged Spanish Imperial Eagle (*Aquila heliaca adalberti*) into a family group consisting of 2 adults and 2 young.

The experiment was carried out during a study of the post-fledging behavior of Spanish Imperial Eagles in the National Park of Doñana, SW Spain, during the summer of 1984. A young female fledgling that had lost its parents from electrocution was found starving on 31 July at 91 d of age and weighing 2300 g (the age of young was calculated from hatching dates). She was housed and fed for 9 days and reached a weight of 3550 g. Once recovered, the young female was released at an age of 100 d into the home-range of a family group with 2 young approxi-

mately 99 d of age and already out of the nest. Both the normal young and the introduced one were provided with radio-transmitters and wing-tags for visual identification. At the moment of release 2 dead rabbits were left near the young. Approximately 11 min after the fostered eaglet was released, she began feeding on one of the rabbits. She was soon joined by the 2 original young and all 3 fed together without obvious aggressive interactions. For the first 3 d after release, the fostered young remained perched near its stepbrothers. From the fourth day, it started to use the same perches as they did, being fed by the adults, without any evidence of rejection or aggression (Table 1). It seemed to be totally adopted, and followed the normal process of transition to independence. Unfortunately, on 19 August (age 109 d) one of the true young died in collision with an electric powerline. The data for this bird have been included in Table 1. Prior to dispersal, both the original and the adopted fledgling were fed and simultaneously chased by the adults (Table 1). Both made long distance flights on 30 August (age 120 d) and 16 September (age 138 d) respectively, and finally left on 1 September (age 122 d) and 20 September (age 142 d). Chasing consisted of stoops towards the young,

Table 1. Summary of feeding and chasing flights of adult Spanish Imperial Eagles towards young. The dates of final dispersal were 1 September for the original young and 20 September for the adopted young.

DATE	NO. OF FEEDINGS			NO. OF CHASING FLIGHTS BY ADULTS		
	ORIGINAL YOUNG A	ORIGINAL YOUNG B	ADOPTED YOUNG	ORIGINAL YOUNG A	ORIGINAL YOUNG B	ADOPTED YOUNG
11 August	2	0	1	0	0	0
18 August	0	1	0	12	0	2
19 August	0	0	0	0	0	0
22 August	1	*	1	4	*	4
24 August	1		2	0		0
26 August	1		1	4		2
30 August	0		0	0		1
8 September	-		0	-		0
10 September	-		1	-		1
16 September	-		0	-		0
20 September	-		0	-		0

* Died on 19 September.

sometimes when they were perched, but mostly flying; often the adults hit the young, with their talons interlocked, making them lose their balance and to lose height.

On 2 September the introduced young (age 124 d) was seen trying to kleptoparasitize a Booted Eagle (*Hieraaetus pennatus*) which had caught a rabbit. On 8 September, one adult was seen eating in an oak tree 200 m from the fostered juvenile, which begged but was not fed. Two days later it was flushed from the ground while it was feeding on a rabbit, but we cannot be sure whether the rabbit had been killed by the eaglet or brought to it by the adults. These observations are in accordance with the decreasing feeding rate of the adults to their offspring which occurred during the postfledging period in other family groups studied (González et al. in prep.).

In conclusion, these observations proved that the introduction was successful, and the adopted young reached independence and dispersed normally. This kind of fostering during the postfledging period could be a valuable management technique useful in reintroducing salvage or confiscated young raptors or for the release of captive bred birds.

We thank L. García, M. Ferrer, M. de la Riva and the Conservation Staff of the National Park for their help during the field work. Financial support was provided by ICONA and CAYCIT.

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Received 15 August 1985; Accepted 1 January 1986

Harrir Kills Mobbing Willet

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On 2 July 1984, while studying the breeding biology of the Northern Harrier (*Circus cyaneus hudsonius*), on a Long Island, New York barrier beach, I saw a female harrier kill one of two mobbing Eastern Willets (*Catoptrophorus semipalmatus*). The incident took place on a tidal salt marsh where both species breed. Vegetation is predominantly *Spartina* grasses interspersed with marsh elder (*Iva frutescens*) in the slightly elevated, drier areas where willets nest. Dense stands of common reed (*Phragmites communis*) flank the marsh and provide nesting habitat for the harriers. I witnessed frequent encounters between harriers and willets, especially as the breeding season progressed. Female harriers hunted over the marsh areas adjacent to nests, which usually brought them near to, or over, willet nests. When this occurred, willet pairs mobbed the intruder. Prior to this observation, however, such incidents had failed to elicit more than a mild response (e.g., head-turning to look at the mobbers and/or leg-dropping) from a harrier.

Generally, harriers respond to mobbing by increasing their flight speed while moving away from the disputed area (Bildstein 1982; M. England pers. obs.). Sometimes a particularly persistent or bold assault is acknowledged with short bursts of chattering, a vocalization similar to "kekking", which I have heard used during nest defense. Avoidance maneuvers, such as those described by Bildstein (1982) for harriers being mobbed by passerines were also observed. These include "rolling", a change in flight elevation, and a shift from the "to and fro" pattern of "quartering" flight to straight-line flight, again while moving away from the area.

On 2 July, a female harrier, hunting low over the marsh, apparently passed close to a willet nest, as both members of the pair flew up and began mobbing the harrier. At first, the harrier continued moving in her original direction. Then, as one of the willets flew under the harrier from behind, the harrier slowed, then suddenly, at high speed, seized the willet in mid-flight in one foot. With the