



The Status and Breeding Population of the Spur-winged Lapwing *Vanellus spinosus* in Cyprus

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Abstract

We present here the first island-wide assessment of the status and breeding population of the Spur-winged Lapwing *Vanellus spinosus* in Cyprus from July 2007 to June 2009. This survey was carried out at 27 wetland areas and more than 200 individuals were recorded at 10 wetlands during autumn passage while at least 50 over-wintered at five wetlands. Approximately 100 individuals were recorded at 12 wetlands during spring passage, and the breeding population was estimated at 61–68 pairs scattered among 15 wetlands. The population of this species has increased since the 1990s, probably as a consequence of population growth in the Middle East as well as increasingly warmer winters in Cyprus and the creation of water reservoirs, particularly sewage lagoons. The most important sites are concentrated in central and eastern Cyprus.

1. Introduction

The Spur-winged Lapwing *Vanellus spinosus* is primarily an Afro-tropical species, occurring in Sub-Saharan Africa, Egypt, southeast Europe and the Middle East (Snow & Perrins 1998). In southeast Europe and the Middle East, it is found breeding in Greece (Makrigianni *et al.* 2008), Turkey (Eken 1997), Lebanon (Ramadan-Jaradi & Bara 2009), Syria and Jordan (Snow & Perrins 1998), and it both breeds and overwinters in Cyprus (Kassinis *et al.* 2010), Israel (Al-Safadi 1997), Egypt (Goodman & Meininger 1989), Iraq (Salim *et al.* 2009) and Iran (Ayé & Salmanzadeh 2007). The population in southeast Europe, the Middle East and Egypt is estimated at 25,000–100,000 individuals (Wetlands International 2006). The European breeding population is estimated at 1,000–1,600 pairs, with 94% concentrated in Turkey and the remainder scattered in small colonies in Greece and Cyprus (BirdLife

International 2004).

The Spur-winged Lapwing was first recorded in Cyprus in 1820 (Bannerman & Bannerman 1958). It has been classified as a common spring and scarce autumn migrant with few winter records and one breeding record in 1988 (Flint & Stewart 1992). However, recent data suggest that it is a common spring and autumn migrant and regular winter visitor and breeding bird (Kassinis *et al.* 2010). Despite the relatively small size of Cyprus (9,250 km² in area), no island-wide assessment of the distribution and population size of this species has ever been carried out.

The Spur-winged Lapwing, which is listed in Annex I of the EU Birds Directive, is one of the defining species for the identification of wetlands as part of the Natura 2000 network (Iezekiel *et al.* 2004). In addition, it is a species to which the Agreement on the Conservation of African-Eurasian Migratory Waterbirds applies

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(AEWA 2008). Therefore, detailed knowledge of this species is vital for the effective conservation of waterbirds and their wetlands in Cyprus, and of the Middle East flyways in general.

2. Study Areas and Methods

2.1. Study areas

Cyprus has a Mediterranean climate with dry, hot summers and rainy, mild winters. The island's proximity to the Middle East makes it one of the hottest parts of the Mediterranean. From May to September, temperatures are over 30°C, with cloudless skies and virtually no rain. Spring temperatures average between 23°C and 27°C. The winters see milder weather, occasionally reaching lows of 17°C. Most rain falls between December and February, with an average of 40 days of rainfall annually.

The monitored wetlands included 27 areas which consisted of coastal salt lakes, artificial dams, brackish and freshwater inland and coastal lakes and marshes, and sewage treatment plants (Table 1, Fig. 1). Three of the areas (i.e. Akrotiri, Famagusta and Larnaca wetlands) were wetland complexes consisting of many wetland sites. Akrotiri Wetlands included six sites, two of which, Akrotiri Salt Lake and Fassouri/Livadhi Marsh, are a Ramsar site. The four remaining sites included two freshwater coastal lakes, i.e. Zakaki Marsh and Bishop's Pool, and two coastal salt marshes, i.e. Lady's Mile and the shipwreck area. Famagusta Wetlands included four coastal salt marshes. Larnaca Wetlands included six sites, one of which, Larnaca Salt Lake, is a Ramsar site. The five remaining sites included four brackish coastal lakes and one sewage treatment plant. Of the remaining 24 wetland areas, 19 were dams, four were natural, shallow, seasonal lakes which hold water only in winter depending on rainfall, and one at Mia Milia was a sewage treatment plant. Overall, Larnaca Salt Lake, Achna Dam, Evretou Dam, Asprokremmos Dam, Paralimni Lake and Oroklini Lake form part of the Natura 2000 network, while Agia Eirini, Panagra and Kalo Chorio Dams are potential Natura 2000 sites. Three of these wetlands, Achna Dam and Oroklini and Paralimni Lakes, have been designated as sites supporting the most important breeding

populations of Spur-winged Lapwing in Cyprus.



Fig. 1. Map of Cyprus showing the wetland areas (blue dots) and their codes that were surveyed for Spur-winged Lapwing *Vanellus spinosus* from July 2007 to June 2009. For an explanation of the codes see Table 1.

Table 1. List of wetland areas in Cyprus surveyed for Spur-winged Lapwing *Vanellus spinosus* from July 2007 to June 2009.

District	Code	Wetland Site
Famagusta	AC	Achna Dam
	FW	Famagusta Wetlands
	FL	Famagusta Freshwater Lake
	GA	Galateia Lake
	GY	Gypsou Dam
	OV	Ovgoros Dam
Larnaca	KAL	Kalavassos Dam
	LW	Larnaca Wetlands
	LE	Lefkara Dam
	OL	Oroklini Lake
	PL	Paralimni Lake
	PA	Partenitis (Aradippou) Dam
Limassol	AW	Akrotiri Wetlands
	DD	Dipotamos Dam
	KD	Kouris Dam
	PO	Polemida Dam
	YD	Yermasoyia Dam
Kyrenia	AE	Agia Eirini Dam
	KC	Kalo Chorio Dam
	PAN	Panagra Dam
Nicosia	KAN	Kanli Dam
	KI	Kioneli Dam
	MM	Mia Milia Sewage Treatment Plant
Paphos	AD	Asprokremmos Dam
	ED	Evretou Dam
	MD	Mavrokolympos Dam
	KA	Kannaviou Dam

2.2. Spur-winged Lapwing Surveys

From July 2007 to June 2009, the 27 wetland areas (Table 1, Fig. 1) were monitored for Spur-winged Lapwing. Not all areas were monitored every month. From July 2007 to June 2008, 24 of the areas were monitored monthly. From July to December 2008, 6 areas were monitored

monthly and from January to June 2009, 25 areas. Counts were made using the ‘look-see’ methodology (Bibby *et al.* 1992) whereby the observer conducted point counts with a spotting scope and binoculars. The point counts were performed at vantage points where the observer could see all birds present in the area, although it is possible that a few incubating birds may have been concealed by nearby vegetation and therefore not counted. Counts were conducted once every month, ideally on predetermined ‘priority dates’. When it was not possible to carry out a count on a ‘priority date’, counts were conducted as near those dates as possible, with an average deviation of 3 days earlier and later from the ‘priority date’. Additional data on Spur-winged Lapwing numbers at these areas were obtained from published records.

Evidence of breeding was based on a bibliographic study and on breeding surveys conducted from April to August 2005, 2006, 2007 and 2008 ($N=14$ wetlands) and in 2009 ($N=27$ wetlands). During the breeding surveys, observers located birds and searched for nests. Breeding was confirmed when birds were observed incubating, and/or nests were located containing eggs, and/or one or two agitated adult birds flew around giving alarm calls and diving towards the observers, and/or chicks and fledglings were seen.

3. Results

Spur-winged Lapwings were recorded at 12 of the 27 surveyed wetland sites and were present every month throughout the year (Tables 2a, 2b). The highest numbers (99 to 227 individuals) were recorded from July to November 2007, while fewer individuals (22 to 82) were counted from July to November 2008 because fewer wetlands were monitored in that year (Table 2a).

Over-wintering birds were recorded in December 2007 and January 2008 at five wetlands, with a maximum count of 41 individuals at Famagusta Freshwater Lake. In December 2008 and January 2009, up to 47 individuals were recorded at three wetlands, with a maximum count of 35 individuals at Mia Milia Sewage Treatment Plant (Tables 2a, 2b). During spring passage, from February to May, groups of more than 15 individuals were regularly recorded at six sites, while six other

sites occasionally supported fewer individuals (Table 2b).

The breeding season extended from March to early August, with second and possibly third clutches laid at some areas. From 2003 to 2009, the estimated number of breeding pairs increased from 10 to 68 (Table 3). Ten sites regularly supported one to six breeding pairs. Three wetlands (namely Oroklini and Paralimni Lakes and Famagusta Freshwater Lake) regularly supported up to 10 breeding pairs, while Mia Milia Sewage Treatment Plant supported up to 24 breeding pairs in 2009 (Table 3).

4. Discussion

Spur-winged Lapwings were present in Cyprus throughout the year and were recorded at 12 of the surveyed sites. Small numbers of individuals have been reported at Sotira pools, Kato Moni pig farm, and Paphos Sewage Plant (Gordon 2004, Richardson 2005, 2006, 2007, 2008, 2009), and also at various migration hotspots along the south coast, such as Cape Drepanum, Cape Greco, Ezousa, Mandria and Paphos Headland (C. Richardson, pers. comm.), particularly during autumn and spring passage. However, the largest populations were concentrated in central and eastern Cyprus at seven of the surveyed sites (Figs. 2–3).

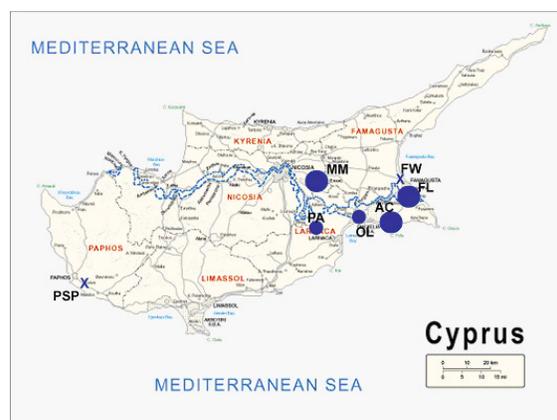


Fig. 2. Map of Cyprus showing the over-wintering sites (blue circles) of Spur-winged Lapwing *Vanellus spinosus* from 2003 to 2009. Large circles denote sites regularly supporting groups of at least 25-50 individuals; small circles denote sites regularly supporting groups of up to 15 individuals; crosses denote sites occasionally supporting groups of up to 10 individuals.

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Table 2a. Monthly counts (C) of Spur-winged Lapwing *Vanellus spinosus* from July to December 2007 and 2008 at 12 wetland areas in Cyprus. Counts in parenthesis (Lit) are taken from the published literature. NS = not surveyed; ¹ = Richardson 2008; ² = Richardson 2009.

Site	Year	Jul C (Lit)	Aug C (Lit)	Sep C (Lit)	Oct C (Lit)	Nov C (Lit)	Dec C (Lit)
MM	2007	20	45 (36) ¹	50	55	34	9
	2008	23	NS	NS	NS (32) ²	NS (38) ²	NS (29) ²
FL	2007	23	43 (68) ¹	76 (104) ¹	12 (74) ¹	27 (81) ¹	41
	2008	NS (10) ²	NS	NS (62) ²	NS (55) ²	NS (33) ²	NS (17) ²
AC	2007	15 (13) ¹	30 (36) ¹	10 (62) ¹	20 (45) ¹	29 (40) ¹	0
	2008	19 (16) ²	13 (33) ²	9 (31) ²	18 (20) ²	0 (33) ²	0 (15) ²
OL	2007	11 (30) ¹	13 (36) ¹	25 (40) ¹	5 (12) ¹	0 (6) ¹	0
	2008	21 (18) ²	5 (10) ²	0 (5) ²	0	0 (7) ²	0
PA	2007	5	9	23	38	18	0
	2008	7	9	13	8	0	28 (30) ²
PL	2007	1 (17) ¹	7	2	1	0	0
	2008	2	0	0	0	0	0
FW	2007	7	20	30	0	15	2
	2008	NS	NS	NS	NS	NS	NS
LW	2007	4	13	3	0	1	0
	2008	10	30	0	0	0	0
KC	2007	9	5	4	3	0	0
	2008	NS	NS	NS	NS	NS	NS
KI	2007	4	4	4	0	0	0
	2008	NS	NS	NS	NS	NS	NS
AW	2007	0	0	0	0	0	0
	2008	0	0	0	0	0	0
KAN	2007	0	0	0	0	0	0
	2008	NS	NS	NS	NS	NS	NS
TOTAL	2007	99	189	227	134	124	52
TOTAL	2008	82	57	22	26	0	28

Table 2b. Monthly counts (C) of Spur-winged Lapwing *Vanellus spinosus* from January to June 2008 and 2009 at 12 wetland areas in Cyprus. Maximum counts taken from the published literature are in parenthesis (Lit). NS = not surveyed; ¹ = Richardson 2009.

Site	Year	Jan C (Lit)	Feb C (Lit)	Mar C (Lit)	Apr C (Lit)	May C (Lit)	Jun C (Lit)
MM	2008	7	8	24	16	12	14
	2009	35 (25)	25 (24)	24 (26)	17 (22)	27 (19)	30
FL	2008	0 (31) ¹	3 (20) ¹	3 (22) ¹	15 (10) ¹	4 (8) ¹	5 (6) ¹
	2009	12 (14)	16 (9)	16 (38)	7 (15)	2 (8)	13
AC	2008	2 (1) ¹	0	0 (4) ¹	4 (3) ¹	2 (7) ¹	2 (13) ¹
	2009	0 (2)	0	0 (3)	0	2 (8)	6 (15)
OL	2008	0	0 (4) ¹	9 (15) ¹	7 (20) ¹	10 (15) ¹	17
	2009	0 (2)	2 (8)	14 (12)	17 (12)	15 (12)	35 (12)
PA	2008	5	2 (2) ¹	4	8	11	8
	2009	0	2	3	5	8	12
PL	2008	0	15 (15) ¹	17	18	13	5
	2009	0	3	3 (7)	15 (10)	8 (9)	12
FW	2008	0	0	0	18	5	4
	2009	0	0	3	3	6	5
LW	2008	0	0	2	4	2	5
	2009	0	0	2	11	12	9
KC	2008	0	0	0	4	4	4
	2009	0	0	0	3	6	4
KI	2008	0	0	0	0	0	0
	2009	0	0	0	9	0	4
AW	2008	0	0	0	1	1	1
	2009	0	0	0	0	0	0
KAN	2008	0	0	0	0	0	0
	2009	0	0	0	1	0	1
TOTAL	2008	14	28	59	95	64	65
TOTAL	2009	47	48	65	88	86	131

Table 3. Breeding populations of Spur-winged Lapwing *Vanellus spinosus* from 2003 to 2009. NS = Not Surveyed; CB = Confirmed Breeding (i.e. birds were incubating, and/or nests contained eggs, and/or adult birds were agitated, and/or chicks and fledglings were observed); ¹ = Gordon 2004; ² = Richardson 2005; ³ = Richardson 2006; ⁴ = Richardson 2007; ⁵ = Richardson 2008; ⁶ = Richardson 2009; * Most breeding attempts failed due to human disturbance; ** Nesting failed; *** Evidence of poaching.

Wetland	2003	2004	2005	2006	2007	2008	2009
Achna Dam	1 nest ¹	1 pair; CB ²	3-4 pairs; CB ^{3*}	3 pairs; CB ⁴	5-6 pairs; CB	2-5 pairs; CB ⁶	1 nest; CB ⁷
Athalassa Dam					1 pair; CB ⁵	1 pair; CB ⁶	
Famagusta Freshwater Lake		2 pairs ²	NS	CB ⁴	10 pairs; CB	4 pairs ⁶ ; CB	7-8 pairs; CB
Famagusta Wetlands			NS	NS	NS	NS	2-3 pairs (NS)
Kalo Chorio Dam (Kalkanli)			NS	NS	3-5 pairs; CB	2 pairs; CB	2-3 pairs; CB
Kato Moni pig farm				1 nest; CB ⁴			
Kioneli Dam				2 pairs			2-3 pairs; CB ⁷
Larnaca Wetlands			1 nest ³	3 pairs; CB ⁴	3-4 pairs; CB	5 pairs; CB	6 pairs; CB ⁷
Mia Milia			NS	NS	6-10 pairs; CB	6-8 pairs; CB	24 pairs; CB
Oroklini Lake	8 nests ¹	10 nests ²	8 nests; CB ³	10 nests; CB ⁴	15 nests ⁵ ; CB	10 pairs; CB	7-8 pairs; CB ⁷
Paphos Sewage Plant				2 nests; CB ^{4**}	1 nest ^{5**}	1 pair ⁶	2 pairs ⁷
Paralimni Lake		1 pair ²	2-3 pairs	8-9 pairs	5-10 pairs ^{***} ; CB	6-10 pairs ^{***}	4-5 pairs; CB ⁷
Partenitis Dam			NS	2 pairs; CB ⁴	1 pair	4-6 pairs	4-5 pairs; CB
Pissouri Bay			1 pair; CB ³				
Sotira Pools	1 nest ¹						
Total estimated pairs	10	14	15-17	31-32	50-63	41-52	61-68

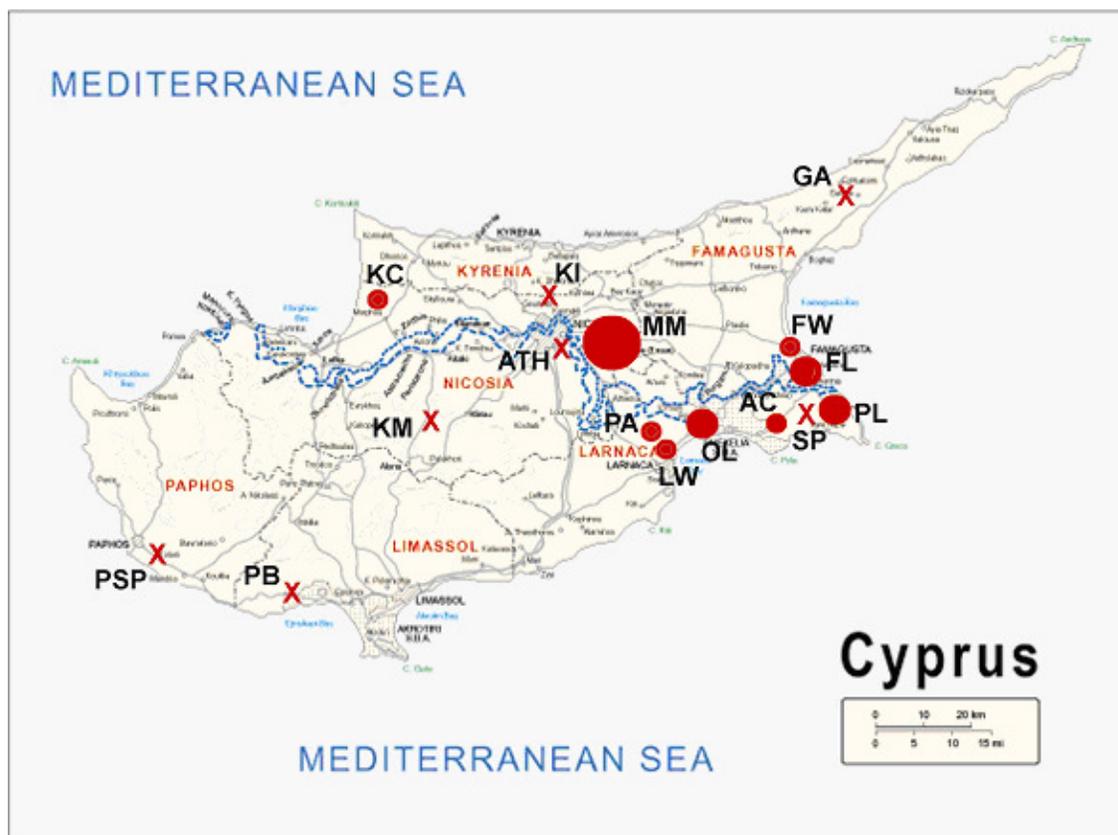


Fig. 3. Map of Cyprus showing the breeding sites (red circles) of Spur-winged Lapwing *Vanellus spinosus* from 2003 to 2009. The large circle denotes a site with up to 24 breeding pairs in 2009; medium circles denote sites regularly supporting 6-15 breeding pairs; small circles denote sites regularly supporting 1-5 breeding pairs; crosses denote sites occasionally supporting 1-5 breeding pairs.

Birds were present in their highest numbers from July to November, with up to 189 individuals in August and 227 in September, corresponding to the end of the breeding season and the start of autumn passage. Some were probably local individuals together with surviving young from the breeding season. The maximum counts from September to November suggest passage migration and are in agreement with Richardson (2008, 2009). Famagusta Freshwater Lake, Achna Dam, Mia Milia Sewage Treatment Plant and Oroklini Lake regularly supported 30 to 50 individuals. Furthermore, at least 47–52 individuals overwintered in Cyprus, with the largest groups frequenting Mia Milia Sewage Treatment Plant and Famagusta Freshwater Lake, on occasion Achna Dam (Richardson 2008, 2009), and to a lesser extent Oroklini Lake and Partenitis Dam. The same sites together with Paralimni Lake were also used during spring passage, from February to May. In general, the numbers on spring passage were lower than those recorded in autumn.

The increasingly higher estimates of breeding pairs, from 10 in 2003 to between 61 and 68 in 2009, are mainly due to increased effort and wider coverage of wetland sites since 2007 (Kassinis 2007, 2008), particularly Mia Milia Sewage Treatment Plant and Famagusta Freshwater Lake. Compared to the 1990s (Flint & Stewart 1992), the breeding population in Cyprus has increased considerably, probably as a consequence of population growth in the Middle East and increasingly warmer winters in Cyprus (Tsiourtis 2002). Significant population increases have occurred in Israel since the 1960s (Hatzofe & Yom-Tov 2002), and recent range expansions have been documented in Iran (Ayé & Salmanzadeh 2007) and Lebanon (Ramadan-Jaradi & Bara 2009). In Israel, extended breeding ranges are partly due to the creation of water reservoirs (Hatzofe & Yom-Tov 2002), particularly sewage lagoons (Al-Safadi 1997). In Cyprus, sewage treatment plants provide important habitats for Spur-winged Lapwings. The Sewage Treatment Plants at Mia Milia, Larnaca (at Larnaca Wetlands) and Paphos guarantee a stable and reliable source of water throughout the year.

Threats and Conservation

While Spur-winged Lapwings have been quick to take advantage of these permanent waterbodies, some major threats for the conservation of this species need to be addressed, e.g. poaching, predation by foxes and feral dogs, and non-compatible activities such as motocross and fishing during the breeding season (Iezekiel *et al.* 2004). In the past, control of feral dog populations has been attempted in Cyprus for the control of diseases (Polydorou 1992, Mazeris *et al.* 2010). Much wetland habitat in Cyprus has been and is being lost or degraded, primarily due to the damming of rivers and housing development, and secondarily due to agriculture. Most importantly, unsustainable agricultural practices, habitat change, human encroachment and unpredictable water flow due to frequent droughts are some of the major problems faced at wetlands throughout the island. Consequently, populations of many species of waterbirds are affected, while there is little direction for island-wide waterbird conservation planning or management. With such a multitude of threats, the establishment of management priorities can be a difficult task. In this regard, Salafsky *et al.* (2003) have provided a standard nomenclature and system for measuring the ‘magnitude’ of threats which can be used to define priorities in management strategies adopted by nature reserves, such as wetlands in fragmented landscapes. We propose that the use of treated water in sustaining some small but critically important breeding habitats for the species in drought years must be considered.

Raising awareness among the public is another crucial issue. A better understanding of individuals’ awareness of biodiversity issues, which is linked to their attitudes towards biodiversity management, is essential for the design of policies that are supported by the public (Fischera & Young 2007). Notably, Miller (2005) argues that the case for preserving biodiversity must be made compelling and appealing to a wider audience. He suggests that ecologists can help restore human connections with the natural world by affording the possibility of meaningful interaction with nature in close proximity to places where people live and work. Ecotourism

may also have a significant role to play (Krüger 2005). Promotion of the Spur-winged Lapwing as a flagship species in ecotourism is worth investigating as a possible contribution towards nature conservation in Cyprus.

According to BirdLife International (2004), since the 1990s the European breeding population of the Spur-winged Lapwing has undergone a moderate decline (>10%), particularly in its Turkish stronghold. As a consequence of this continuing decline and its small population in Europe, the species has been evaluated by BirdLife International as Vulnerable.

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