

## Short Communication

### Changes to the Checklist of the Birds of Muzaffarabad City, Azad Jammu and Kashmir, Pakistan

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#### Abstract

A study was conducted from June 2007 to May 2008 on monthly basis and the changes in bird diversity were determined after the earthquake in the Muzaffarabad city on 8 October 2005. A total of 93 species were recorded: two species were passage migrants, 36 residents, 40 summer visitors and the remaining 15 species were winter visitors. About 36 species were new in the present study. Illegal hunting, unawareness and urbanization were main threats to the species and education at school level and enforcement of the legislation are the major conservation measures suggested in the study.

#### Introduction

Azad Jammu and Kashmir (AJ&K) (73°–75°N, 32°–35°E), the part of great Himalayas, covers about 13,297 km<sup>2</sup>. Azad Kashmir has various types of forest ranging from tropical thorn forest to cold desert forest. The territory of Azad Jammu and Kashmir encompasses a diversity of climates and ecozones. Different biotopes provide suitable habitat for wildlife species in Muzaffarabad City (Awan *et al.* 2004).

A devastating earthquake measuring 7.6 on the Richter scale hit Northern Pakistan on 8 October 2005. The October (2005) earthquake had its epicenter in the district of Muzaffarabad, AJK. Almost 500,000 housing units, destroyed, 800 health facilities and 7,669 schools were destroyed fully or partially. The catastrophe resulted in over 73,000 deaths and about 128,300 injured. About 500,000 families were directly or indirectly affected. The initial damages were further compounded by aftershocks which

continued until the end of March 2006 resulting in heavy landslides, damage to roads and further disturbing the already unsettled slopes (ERRA 2006). In Muzaffarabad, the total number of landslides was 337 sq km and the total area affected by landslides was 9,638 sq km. 0.48% of the district were covered by (ERRA 2007). The total area of Muzaffarabad is 238,080 ha out of which forest cover amounts to 88,314 ha (37%). Due to the earthquake about 76% of the total forest area of Muzaffarabad has been damaged (Forest Department 2006).

The rivers Neelum, Jhelum and a small lake called Subri Lake in the Muzaffarabad city support a variety of birds. Many migratory birds use the rivers and this lake as their resting place during their migration. In some parts of the city, people have their own agricultural land where crops like wheat, rice, maize, *etc.* are cultivated. Due to these agricultural fields and vegetation along the rivers, the area is rich in avifauna (Awan *et al.* 2004). However the earthquake has caused a high pressure of population influx to the city of Muzaffarabad due to which the avifauna of the city has been stressed because of the loss of habitat. The government has included more surrounding settlements into the city area by increasing the limits of the municipal corporation for development purposes. Muzaffarabad city is surrounded by high mountains which were shocked by the earthquake in 2005 and the human community settled on these mountains moved down to the city in search of safe places. As more and more people get

down to the city, they occupy the agricultural land for their houses, as a result, the bird's habitat is reduced in size. Rapidly increasing population and urbanization has resulted in the destruction of and disturbance to avifaunal habitat. This survey was conducted to find out the change of the avifauna of Muzaffarabad city due to habitat devastation by the earthquake of 2005, urbanization, developmental activities, hunting and to identify threats to different families of birds in Muzaffarabad city.

### Methods

This survey was conducted from June 2007 to May 2008 once a month after the completion of relief operations and the removal of debris from the city of Muzaffarabad. Data were collected by following Awan *et al.* (2004) and compared with the past records (Awan *et al.* 2004) to find out the changes in the avian diversity of the area. The size of the study area, Muzaffarabad city, was 80 sq km before the earthquake (Awan *et al.* 2004) which is now expanded to about 280 sq km (MDA 2007). Major plant species of the city are *Dalbergia sissoo*, *Olea ferruginea*, *Gravia villosa*, *Pinus roxburghii*, *Ailanthus ailanthus*, *Acacia modesta*, *Melia azedarach*, *Ficus palmata*, *Morus alba*, *Acacia arabica*, *Punica granatum*, *Xanthoxylum alatum*, *Dodonea viscosa*, *Berberis lycium*, *Brassica compestris* and *Rumex hasitatus*. Choosing areas based on habitat type, the study area was divided into 10 regions based on habitat types and each region was visited once a month to record bird species (total, 120 field visits). Species were scored as present or absent in each region and finally in the study area. Observations were made using binoculars (12×50) and species were identified following Wood Cock (1980), Kazmierczak (2000) and Mirza (2007). All birds sighted/heard were recorded and these data were mainly used for the preparation of the checklist of the birds of the area. A common bird in this study was a species which was recorded in almost 75% of the survey visits; *e.g.* a bird species which was recorded in 90 out of 120 field visits was considered as common. Total number of birds of a particular species recorded from the study area during the whole survey was used to calculate the relative

abundance of that particular species. For indirect data collection, wildlife staff and citizens of different age groups were interviewed to find out the conservation issues and the level of conservation education and awareness.

### Results and Discussion

During the survey a total of 93 species from 43 families were recorded; two species were passage migrants, 36 residents, 40 summer visitors and the remaining 15 species are winter visitors (Table 1). About 35 species were new in the present study while 58 species were common both in the present and previous studies. Only one species, White-backed Vulture (Indian White-rumped Vulture) *Gyps bengalensis* has not been recorded during the present survey from or around the city area, while it was reported in the past around the city (Awan *et al.* 2004). The relative abundance of Fork-tailed Swift *Apus pacificus* was the highest (0.157), followed by Striated Prinia (Brown Hill Warbler) *Prinia criniger* (0.138) and Indian White-eye *Zosterops palpebrosus* (0.134) (Table 1). There are a number of seasonal immigrants that breed outside our territory, mostly in the Palearctic region beyond the Himalayas, in central and northern Asia and eastern and northern Europe. The winter migrants are ducks, geese, cranes, swallows, flycatchers and finches (Ali & Ripley 1987). Rose-ringed Parakeet *Psittacula krameri*, House Crow *Corvus splendens*, House Sparrow *Passer domesticus*, Common Myna *Acridotheres tristis*, White-eared Bulbul *Pycnonotus leucotis* were common, whereas kingfishers, koel, rollers and treepie were observed in small numbers. Kingfishers, rollers and Rufous Treepie were recorded as resident species of the Muzaffarabad City (Awan *et al.* 2004). Rose-ringed Parakeets are recorded as summer visitor to the area although common while House Crows, House Sparrows, Mynas and bulbuls are still recorded as common and resident.

The Cattle Egrets are specialised and concentrated mostly around cattle; where herds of cattle commonly graze, there will this egret be found, in parties large or small, attending the cattle closely, some times perching on their backs but more generally stalking around their legs

(Whistler 1949). Cattle Egret *Bubulcus ibis* is recorded as a resident species of the city area which was not reported in the past survey. This species is recorded in close association with buffaloes grazing near the river. Two species *i.e.* Mallard *Anas platyrhynchos* and Common Teal *Anas crecca* of family Anatidae are recorded as passage migrant during the survey while none of them were recorded by Awan *et al.* (2004).

*Alectoris chukar* is very adaptable to all kinds of the arid, rocky, hilly, stony, sparsely scrub-covered hillsides, boulder-strewn ravines (Ali & Ripley 1987, Roberts 1991). During the survey it was recorded from hillsides away from human population. Chukar was not recorded in past survey from the city area (Awan *et al.* 2004). All the four species of the family Columbidae *i.e.* Collared Dove *Streptopelia decaocto*, Spotted Dove *Streptopelia chinensis*, Red Turtle Dove *Streptopelia tranquebarica* and Rock Pigeon *Columbia livia* were recorded both in present and past survey of the area (Table 1). The three species of doves *i.e.* Collared Dove, Spotted Dove and Red Turtle Dove are common summer visitors to the Pattika recreational Park, Muzaffarabad (Awan & Mir 2007) and these three species of doves are summer visitor to Pakistan (Roberts 1991). The Collared Dove is very common and familiar throughout the Pakistan except in the eastern Himalayas. Its sleepy cooing can be heard in all gardens, cultivated areas and light woodland (Woodcock 1980). All the species of doves visiting the study area in summer have an immense threat to their lives by the young hunters who shoot the doves for fun only. Blue Rock pigeon is resident to Pakistan (Mirza 2007) and it is recorded as summer visitor to the study area during the survey.

The Spotted Owllet is resident and sedentary and very wide spread throughout the Indus plain, extending into extensive desert plain (Roberts 1992). It is found throughout the area except in Sri Lanka, but avoids dense forest (Woodcock 1980). Spotted Owllet was not recorded in the past (Awan *et al.* 2004) and is recorded as a resident species of the area in the present survey.

Members of family Apodidae were found to be common in the study area. In the last study only one species (House Swift *Apus affinis*) was recorded from the area (Awan *et al.* 2004) while two more species *i.e.* Common Swift *Apus apus* and Fork-tailed Swift were recorded in the present survey (Table 1). Family Alcedinidae is represented by the Pied Kingfisher *Ceryle rudis*, the White-breasted Kingfisher *Halcyon smyrnensis* and the Common Kingfisher *Alcedo atthis*. Out of these three Kingfishers, the Common Kingfisher is recorded as summer visitor to the area while the other two species *i.e.* Pied and White-breasted Kingfisher are resident. The Pied Kingfisher occurs in east Africa, the Middle East, and India to south China, distributed widely throughout the Punjab, Sind plain and ascends the Jhelum River up to the main valley of Kashmir (Roberts 1992). During the survey all the three species are recorded on water ponds, springs or riverside sitting on a stone or a wire in search of food. According to Whistler (1949), Kingfishers are always found by water, and conspicuous for their habit of hovering and plunging for fish. The Scaly-bellied Woodpecker *Picus squamatus* and the Himalayan Woodpecker *Dendrocopos himalayanensis* were also recorded during the present survey (Table 1) which were absent in the past survey. According to Mirza (2007) the Himalayan Woodpecker is distributed in northern areas of Pakistan, Neelum and Jhelum valley of Azad Kashmir up to the tree limit in summer and down to 4,500 ft in winter.

Three species of the Shrikes *i.e.* Rufous-backed Shrike *Lanius schach*, Bay-backed Shrike *Lanius vittatus* and Indian Grey Shrike *Lanius excubitor* were recorded during the survey and all the three species were as summer visitor to the city of Muzaffarabad. The Bay-backed Shrike is very widespread and common throughout the Indus basin extending north to the main valley of Swat and the Murree foot hills (Roberts 1992). The Rufous-backed Shrike is very widespread and a common breeding bird throughout the better-watered parts of the Indus plain. It is a summer breeding visitor to Baluchistan and the northern mountains of the Himalayan region.

Changes to the Checklist of the Birds of Muzaffarabad City ... – M. Naeem Awan et al.

**Table 1.** Revised Checklist of Birds of Muzaffarabad City. Key to symbols: S=Summer Visitor, W=Winter Visitor, R=Resident and P=Passage Migrant.

Family	Scientific Name	Common Name	Local Name	Recorded earlier, Awan et al. (2004)	Recorded in this survey	Status	Relative Abundance
Ardeidae	<i>Bubulcus ibis</i>	Cattle Egret	Bagla		+	R	0.009
Anatidae	<i>Anas platyrhynchos</i>	Mallard	Murghabi		+	P	0.006
	<i>Anas crecca</i>	Common Teal			+	P	0.003
Accipitridae	<i>Circus macrourus</i>	Pallid Harrier	Hel	+	+	W	0.002
	<i>Gyps bengalensis</i>	White-backed Vulture	Hel ganja	+		-	0.000
Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	Basha	+	+	R	0.003
Phasianidae	<i>Alectoris chukar</i>	Chukar	Konk		+	R	0.012
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	Bagla	+	+	R	0.004
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper		+	+	S	0.005
Columbidae	<i>Streptopelia decaocto</i>	Collard Dove	Fakhta	+	+	S	0.020
	<i>Streptopelia chinensis</i>	Spotted Dove	Fakhta	+	+	S	0.022
	<i>Streptopelia tranquebarica</i>	Red Turtle Dove	Fakhta	+	+	S	0.017
	<i>Columbia livia</i>	Blue Rock Pigeon	kabooter	+	+	S	0.010
Cuculidae	<i>Eudynamis scolopacea</i>	Asian Koel	Kali kawal	+	+	R	0.014
Psittacidae	<i>Psittacula krameri</i>	Rose-ringed Parakeet	Tota	+	+	S	0.020
Strigidae	<i>Athene brama</i>	Spotted Owlet	Ulloo		+	R	0.010
	<i>Strix leptogrammica</i>	Brown Wood Owl	Ulloo	+	+	R	0.006
Apodidae	<i>Apus affinis</i>	House Swift	Terni	+	+	S	0.020
	<i>Apus apus</i>	Common Swift	Terni		+	S	0.018
	<i>Apus pacificus</i>	Fork-tailed Swift	Terni		+	S	0.157
Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher	Dada maroo	+	+	R	0.011
	<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	Dada maroo	+	+	R	0.011
	<i>Alcedo atthis</i>	Common Kingfisher	Dada maroo	+	+	S	0.015
Coraciidae	<i>Coracias bengalensis</i>	Indian Roller	Neel kant	+	+	S	0.010
	<i>Coracias graculus</i>	European Roller	Neel kant	+	+	R	0.020
Upupidae	<i>Upupa epops</i>	Hoopoe	Hud-hud	+	+	S	0.007
Picidae	<i>Picus squamatus</i>	Scaly-bellied Woodpecker	Tuktuka		+	R	0.007
	<i>Dendrocopos himalayanensis</i>	Himalayan Woodpecker	Tuktuka		+	R	0.005
Hirundinidae	<i>Hirundo rustica</i>	Common Swallow	Terni	+	+	R	0.007
Motacillidae	<i>Motacilla flava</i>	Yellow Wagtail	Chidi mabola	+	+	W	0.015
	<i>Motacilla citreola</i>	Yellow-headed Wagtail	Chidi mabola	+	+	W	0.011
	<i>Motacilla moderospatensis</i>	Large Pied Wagtail	Chidi mabola	+	+	W	0.009
	<i>Motacilla alba</i>	White Wagtail	Chidi mabola	+	+	W	0.017
Laniidae	<i>Lanius schach</i>	Rufous-backed Shrike	Lindey		+	S	0.011
	<i>Lanius excubitor</i>	Indian Gray Shrike	Safaid Lindey		+	S	0.009
	<i>Lanius vittatus</i>	Bay-backed Shrike	Choti Lindey		+	S	0.017
Cinclidae	<i>Cinclus palasii</i>	Brown Dipper	Niki jal kukri	+	+	R	0.008
Pycnonotidae	<i>Hypsipetes madagascariensis</i>	Madagascar Black Bulbul	Ainak		+	R	0.010
	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Bul Bul	+	+	R	0.015
	<i>Pycnonotus leucogenys</i>	White-cheeked Bulbul	Bul Bul	+	+	R	0.016
Prunellidae	<i>Prunella collaris</i>	Alpine Accentor	Chidi		+	W	0.006
	<i>Prunella himalayana</i>	Himalayan Accentor			+	W	0.004
Turdidae	<i>Copsychus saularis</i>	Oriental Magpie Robin		+	+	W	0.009
	<i>Saxicola ferreus</i>	Dark Gray Bushchat			+	S	0.006
	<i>Monticola solitarius</i>	Blue Rock Thrush	Dora	+	+	S	0.004
	<i>Saxicola torquatus</i>	Common Stonechat		+	+	S	0.003
	<i>Oenanthe oenanthe</i>	Wheatear	Tirki	+	+	S	0.009
Turdidae	<i>Monticola cinclorhynchus</i>	Blue-caped Rock Thrush			+	S	0.004

Family	Scientific Name	Common Name	Local Name	Recorded earlier, Awan <i>et al.</i> (2004)	Recorded in this survey	Status	Relative Abundance
	<i>Phoenicurus phoenicurus</i>	Common Redstart			+	R	0.013
	<i>Chaimarrornis leucocephalos</i>	White-caped Water Redstart	Chano Cheri	+	+	R	0.014
	<i>Turdus ruficollis</i>	Black-throated Thrush			+	W	0.005
Sylviidae	<i>Phylloscopus affinis</i>	Tickell's Leaf Warbler	Pitha		+	S	0.010
	<i>Seicercus xanthoschistos</i>	Grey-headed Flycatcher Warbler	Pitha		+	S	0.009
	<i>Phylloscopus trochiloides</i>	Greenish Warbler	Pitha		+	S	0.009
	<i>Phylloscopus collybita</i>	Common Chiffchaff	Pitha	+	+	W	0.013
	<i>Primia criniger</i>	Striated Prinia	Pitha	+	+	R	0.138
	<i>Orthotomus sutorius</i>	Common Tailor Bird	Pitha	+	+	R	0.011
	<i>Cisticola juncidis</i>	Streaked Fantail Warbler	Pitha	+	+	S	0.010
Zosteropidae	<i>Zosterops palpebrosa</i>	Indian White-eye	Tessa	+	+	R	0.134
Muscicapidae	<i>Culicicapa ceylonensis</i>	Grey-headed Canary Flycatcher			+	S	0.006
	<i>Ficedula tricolor</i>	Slaty Blue Flycatcher			+	S	0.004
	<i>Muscicapa thalassina</i>	Verditer Flycatcher			+	S	0.007
Dicaeidae	<i>Dicaeum agile</i>	Thick-billed Flowerpecker		+	+	R	0.008
Monarchidae	<i>Terpsiphone paradise</i>	Asian Paradise Flycatcher	Dood Malai	+	+	S	0.009
Rhipiduridae	<i>Rhipidura albicollis</i>	White-throated Fantail	Pitha		+	S	0.005
Enicurinae	<i>Enicurus scouleri</i>	Little Forktail		+	+	R	0.008
	<i>Enicurus maculatus</i>	Spotted Forktail			+	R	0.007
Campephagi dae	<i>Pericrocotus flammeus</i>	Scarlet Minivet	Guddi	+	+	S	0.007
Remizidae	<i>Cephalopyrus flammiceps</i>	Fire-capped Tit			+	S	0.005
Paridae	<i>Parus major</i>	Grey Tit	Chilchil pitha	+	+	R	0.013
Nectariniidae	<i>Nectarinia asiatica</i>	Purple Sunbird	Sona pitha	+	+	S	0.010
Timaliidae	<i>Garrulax lineatus</i>	Streaked Laughing Thrush	Shoar	+	+	R	0.015
Certhiidae	<i>Certhia himalayana</i>	Himalayan Tree Creeper	Tuktuka	+	+	R	0.007
Emberizidae	<i>Embriza cia</i>	Rock Bunting			+	W	0.009
	<i>Embriza leucocephalos</i>	Pine Bunting			+	W	0.007
	<i>Emberiza stewarti</i>	White-caped Bunting			+	S	0.009
	<i>Melophus lathami</i>	Crested Bunting	Kundku		+	S	0.007
Fringillidae	<i>Carduelis spinoides</i>	Himalayan Greenfinch	Sabaz pitha		+	S	0.007
	<i>Carpodacus erythrinus</i>	Common Rosefinch			+	S	0.008
Passeridae	<i>Passer domesticus</i>	House Sparrow	Gar Cheri	+	+	R	0.003
	<i>Passer rutilans</i>	Russet Sparrow	Chidi		+	S	0.010
Orilidae	<i>Oriolus oriolus</i>	Golden Oriole	Peel waru	+	+	S	0.010
Sturnidae	<i>Sturnus vulgaris</i>	Common Starling	Tiliar	+	+	S	0.011
	<i>Sturnus pagodarum</i>	Brahminy Starling	Turk sharik	+	+	R	0.013
	<i>Acridotheres tristis</i>	Common Myna	Sharik	+	+	R	0.027
Dicruridae	<i>Dicrurus macrocercus</i>	Black Drongo	Kal Cheet	+	+	R	0.013
Corvidae	<i>Dendrocitta vagabunda</i>	Rufous Treepie	Matta	+	+	W	0.010
	<i>Corvus macrorhynchos</i>	Jungle Crow	Jungli Kagh	+	+	W	0.018
	<i>Urocissa flavirostris</i>	Gold-billed Magpie	Chinkara		+	W	0.010
	<i>Corvus splendens</i>	House Crow	Kagh	+	+	R	0.026
	<i>Corvus monedula</i>	Eurasian Jackdaw			+	R	0.013
<b>TOTAL</b>	<b>94 species</b>			<b>59</b>	<b>93</b>	<b>2 P, 36 R, 40 S, 15 W</b>	

The Yellow-billed Blue Magpie is a Sino-Himalayan endemic species occurring across the Himalayas from Pakistan to southwestern China, northern Burma, Assam and southern Tibet (Goodwin 1976). The Gold-billed Magpie *Urocissa flavirostris* is recorded as winter visitor while it was not recorded in the past survey (Awan *et al.* 2004).

### Threats

According to hunters, Mallard's population has declined in the last three years and only few birds use this route for migration which is on high risk due to uncontrolled hunting. The Chukar *Alectoris chukar* is found to be under high pressure due to over-hunting and mostly young or adolescent hunters are involved in its hunting (Table 2). Hunters use traditional traps for its hunting. According to Awan *et al.* (2006), the Chukar is common in Machiara National Park and is hunted by the locals declining its population. Three species of the doves recorded were found to be under high threats due to over and illegal hunting. During the survey it was observed that the most important factor involved in the diminution of avifauna from the city area is

the lack of awareness about the conservation of birds and their habitat.

Table 1 shows the number of bird species increased (from 59 to 93 species) after the earthquake. The increase in the species number mostly is related to the expanded area of the city (80 sq km to 280 sq km) and). Meanwhile people are getting down to the main city area and parts of the city such as Panjgran, Makery, Challa Bandi as well as some parts of Jhelum Valley. The crowded areas may have some negative effects on birds by means of habitat loss and being disturbed. Other threats were found to be the developmental activities started for the reconstruction of Muzaffarabad city after the earthquake, urbanization, dumping of garbage in the river, which not only affect the birds but also the entire ecological system of the area. Another factor is the weak law enforcement for the protection of birds. Unfortunately, the majority of the people living in the city are ignorant to the importance of the birds in the ecosystem. They are also unaware about the conservation of birds and their habitat in general. The teenagers were found to be involved in the hunting of the migratory birds, especially doves and waterfowls during their migration.

**Table 2.** Threats to different families of birds in the Muzaffarabad city.

Family	Threat Category	Habitat destruction	Illegal hunting	Urbanization	Others
Ardeidae	Low	Diminishing agricultural land			
Anatidae	High		+ involvement of immature hunters in the hunting		lack of Conservation education and awareness community especially teenagers
Accipitridae	High	+		+	
Phasianidae	High	+	+ and hunting for fun by young people	+	
Recurvirostridae	Low	+			
Columbidae	High	+ conversion of agricultural land for urbanization	Over- and illegal hunting, involvement of immature hunters in hunting		
Psittacidae	Medium	+		+ removal of agricultural land	
Sterigidae	Medium	+			
Alcedinidae	Medium		Hunting for Fun by young people	+ on river side and in Nallahs and water pollution	
Picidae	Medium	+		+	
Laniidae	Medium	+	Hunting by young people	+	
Turdidae	Medium			+ on river side and in Nallahs and water pollution	
Enicurinae	Medium	+		+ and diminishing water resources	

### Conservation measures

The first and the most important issue is the education of the human community, especially school children about the conservation of the birds and their habitats. It will definitely causes profound impact on the clear minds of children, urging them to involve themselves in the conservation of birds living in their neighbourhood. Although some Nature Clubs in few schools have already been established by the Birds Conservation Society of Azad Kashmir (BCSAK), however, such activities should extended further to involve the school children actively in conservation programmes. Ward level Conservation Committees/organizations could also play a very positive role in the conservation of species of the city, especially in the stop over areas of the migratory birds. As the city is being expanded and heavily populated day by day and dumping of the increasing garbage is polluting the habitats, causing the avifauna to diminish gradually from the area. Therefore, conservation education is necessary to save the environment from pollution and ultimately to conserve the birds' habitats. Beside a strong conservation awareness campaigns, the community must also be educated about the protected bird species and poachers must be punished for their illegal acts. The Wildlife Act of 1975 is implemented in Azad Jammu and Kashmir for the protection of wildlife, but many protected ducks, doves and partridges are shot every year without legal permits. A strong legal action against the poachers might be effective to stop the others from illegal hunting of the birds. Building capacity for the wildlife staff is also needed for proper law enforcement.

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