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Kite versus kite: A retrospective analysis

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Abstract

During Sankranti/Uttarayan, a Hindu festival marking transition of the sun into the zodiac sign of Capricorn (Makar), kites are flown using *manja* or Chinese dor—a banned but illegally procured thread, across India, leading to widespread and severe injuries to birds. This study examines *manja*-related injuries in black kites (*Milvus migrans*) using 10 years of data (2013–2023) from the People for Animals Wildlife Hospital (PFA), Bangalore. Among the 840 cases that were studied, the most common types of injuries included soft tissue injuries, feather injuries, patagial lacerations, fractures, amputations and death. The highest number of injuries (11/year) occurred in June, coinciding with the fledging season, despite Sankranti falling in January. Injuries spiked in 2021 (307 cases) post-COVID-19 lockdown relaxation. The cases continued to rise despite slowing human population growth and a decline in black kite abundance index. This elucidates the importance of public awareness measures and stronger law enforcement, to help in mitigating the animal-human conflicts originating in most urban landscapes, such as the one discussed in this paper.

Keywords: *Manja* thread, black kites, patagial lacerations, fractures, imping, amputations, Bangalore, human-wildlife conflict, trends in cases

Introduction

The black kite (*Milvus migrans*) is one of India's most widespread raptors, known for its ecological adaptability and close association with human-dominated landscapes. Commonly found in urban areas, it plays a critical role as a scavenger, contributing to waste management and the overall functioning of urban ecosystems. However, recent observations suggest a declining trend in certain regions, raising concerns about increasing anthropogenic pressures and the potential cascading effects on the dynamics of synanthropic species.

While black kite populations face multiple threats, ranging from habitat destruction to toxin exposure, human-wildlife conflict remains a significant contributor. One prominent example of this conflict is injuries caused by kite flying using *manja* thread, which often results in severe and sometimes fatal injuries. The most reported cases include fractures, patagial lacerations, soft tissue injuries, feather injuries, amputations, and death.

Non-governmental organizations such as People for Animals Wildlife Hospital (PFA), Bangalore, are actively involved in both the preservation of urban wildlife and the long-term collection of data, the interpretation of which helps shed light on a plethora of issues. Their work provides valuable insights into the impacts of human activity on animals, often under the guise of development or cultural celebration.

This study was undertaken to evaluate the extent and severity of human-induced injuries in black kites over recent years from the database available with the PFA. It aims to assess the frequency and impact of these incidents, with particular emphasis on the ongoing threat posed by the illegal use of *manja*, despite regulatory bans on its sale, procurement, and use.^[3, 6]

Materials and Methods

Medical records from the database of People for Animals Wildlife Hospital (PFA), Bangalore, from 2013 to 2023 were systematically analysed to identify all documented cases of black kites (*Milvus migrans*) affected by *manja* thread injuries.

Each case was thoroughly reviewed to confirm injuries specifically attributed to *manja* entanglement. The data was then assessed on both a monthly and annual scale, with trends examined in relation to Bangalore's population growth as projected by United Nations demographic forecasts ^[10] and the data pertaining to the population trend of black kites as projected by the State of India's Birds ^[9]. This analysis aimed to identify patterns and potential correlations between urban expansion and the incidence of *manja*-related injuries in black kites.

Results and Analysis

The data for the number of *manja*-related injuries in black kites (*Milvus migrans*) is given in table 1. The cases could broadly be categorised into soft tissue injuries, feather injuries, patagial tears, fractures, amputations and deaths. Their treatments included either surgical interventions, imping procedures, or medical management, depending on the triage and the severity of the case.

The tally remained relatively low from 2013 to 2020, with an average of 27 cases per year with a sharp increase recorded in 2021, reaching 307 cases, the highest in the dataset. This

coincides with the relaxation of COVID-19 lockdown measures (Fig. 1). In contrast, the number of cases significantly declined in 2022 and 2023, with 123 and 194 cases respectively, likely due to the public resuming their daily activities.

Monthly trends indicated a peak in *manja*-related injuries in June (average of 11 cases per year), corresponding with the black kite fledging season, while the lowest cases occur in April (average of 3 per year). However, cases were consistently recorded year-round (Fig. 2). This contradicts the assumption that injuries would peak in January, during the kite-flying festival.

Bangalore's population growth rate has shown a steady decline ^[6,10]. Similarly, data from the State of India's Birds forum indicate a decrease in the black kite abundance index ^[9]. Graphical analysis reveals no direct correlation between human population trends and black kite injuries, as the number of rescues continued to rise despite a decreasing population growth rate ^[6]. However, the observed trend suggests an increase in *manja*-related cases despite both a slowing human growth rate and a decline in black kite abundance ^[8].

Table 1: Black kites affected by *manja* in the city of Bangalore (PFA database)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sum
2023	31	26	30	15	4	12	5	8	7	15	16	25	194
2022	6	5	15	7	3	4	5	13	12	8	19	26	123
2021	14	17	5	10	22	86	64	16	27	10	21	15	307
2020	0	2	ND	ND	1	4	12	7	17	13	8	3	67
2019	6	0	2	2	1	0	1	1	0	ND	ND	ND	13
2018	0	0	0	0	1	0	0	0	1	1	7	1	11
2017	1	0	0	0	0	0	0	0	1	0	0	ND	2
2016	12	7	7	0	0	0	2	1	0	0	0	1	30
2015	6	3	0	1	3	0	0	0	12	13	8	6	50
2014	6	1	0	0	0	0	0	0	ND	ND	0	1	8
2013	0	0	3	0	2	1	0	1	0	7	8	13	35
Sum	82	61	62	35	37	107	89	47	76	66	87	91	840

ND = Data not available for the corresponding month.

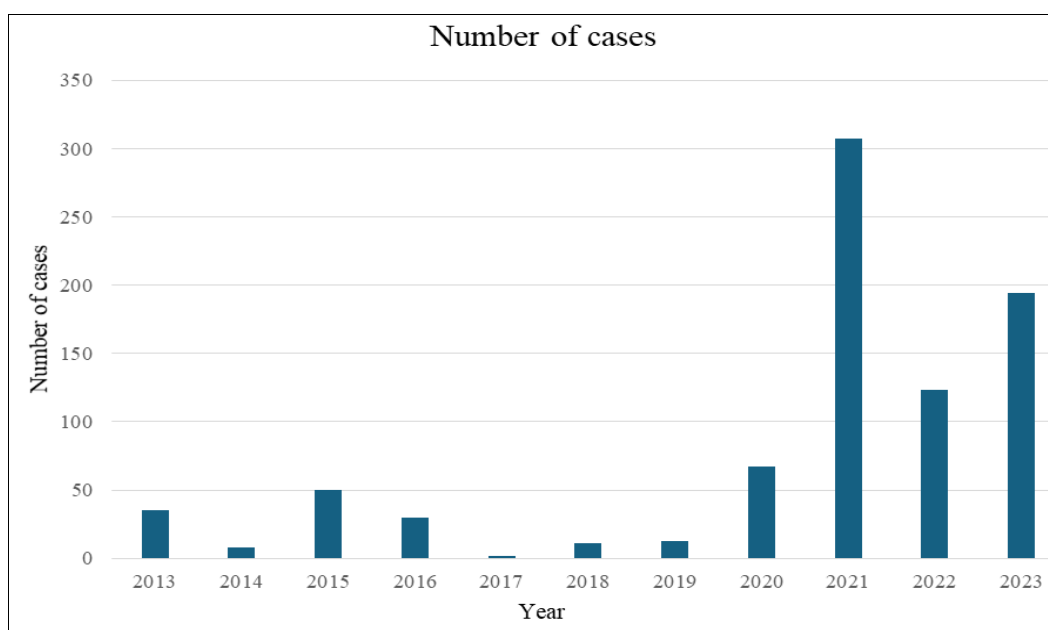


Fig 1: Annual trends in *manja* related wounds in black kites (2013-2023)

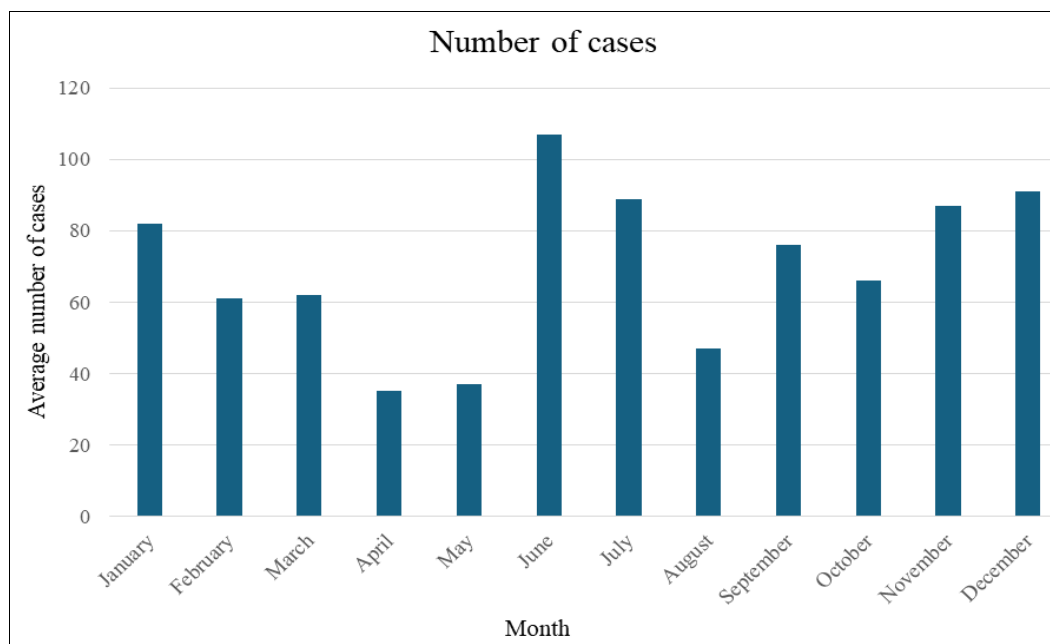


Fig 2: Monthly trends in *manja* related wounds in black kites

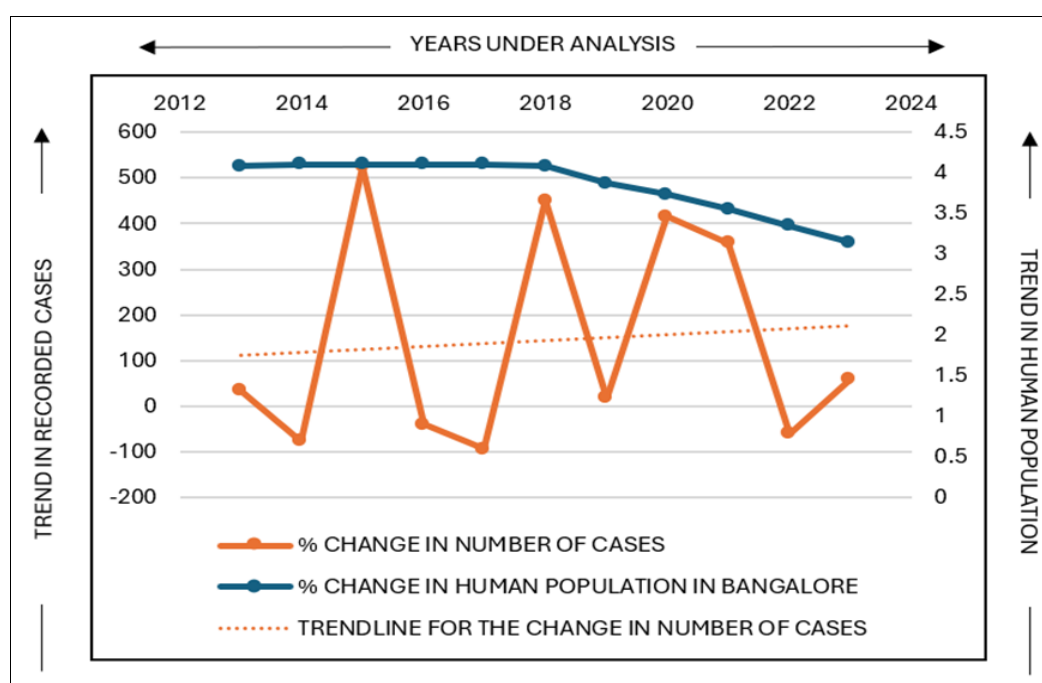


Fig 3: Population comparison between black kites and humans

Discussion

Soumya (2013) ^[8] documented the rescue and rehabilitation efforts for black kites in Hyderabad. Despite kite flying being most prevalent during the summer and less common in other seasons, black kites remained vulnerable to injuries throughout the year from severed *manja* strings criss-crossing the tree canopies and powerlines.

Babu et al. (2015) ^[1] reported that black kites accounted for 182 out of 268 birds rescued in central Bangalore, highlighting their high susceptibility to *manja*-related injuries. According to a 2021 report in Deccan Herald ^[4], the rampant use of *manja* strings for competitive kite flying led to a 104% increase in avian injuries and rescues in Bengaluru following the onset of the COVID-19 pandemic. The report further stated that in 2019, two wildlife rescue organizations—People for Animals (PFA) and the Avian and Reptile Rehabilitation Centre (ARRC)—rescued 606 birds entangled and/or injured

in *manja* strings. However, from January 2020 onwards, this number surged to 1,240 cases.

Prasher (2022) ^[2] reported a 40% decline in *manja*-related incidents in 2022 compared to 2021. In a similar study, ARRC4, noted that there was a significant increase in *manja*-related injuries following the second lockdown (June–August 2021). However, cases began to decline steadily from September onward, eventually returning to pre-lockdown levels. This reduction was attributed primarily to the resumption of routine activities, including in-person schooling, which decreased the frequency of kite flying.

Soft tissue injuries, feather injuries, patagial tears, fractures, amputations and deaths were the most common sequelae of *manja* injuries. Lacerations of hands, face and throat have been documented as the common injuries in humans too due to *manja* thread ^[5].

Summary and Conclusion

Following the relaxation of the second COVID-19 lockdown and the shift to remote work, *manja*-related injuries surged but later declined, though they have yet to return to pre-pandemic levels. Retrospective analysis reveals that the highest number of cases consistently occurred between July and September, coinciding with the black kite fledging season, with residual *manja* threads entangled in trees and electrical wires acting as key hazards. Despite a decline in both human and black kite population growth rates post-2018 and 2015, respectively, no correlation was observed with injury trends. Stricter enforcement of bans on *manja* use, public outreach programs, and promoting biodegradable cotton threads are essential for mitigating this issue at its root.

Conflict of Interest

Not available

Financial Support

Not available

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