One Health 1 (2015) 24–30

Contents lists available at ScienceDirect

One Health

journal homepage: http://www.journals.elsevier.com/one-health

Flying-foxes in the Australian urban environment—community attitudes and opinions

Nina Y. Kung [a,*], Hume E. Field [a,c,*], Amanda McLaughlin [a], Daniel Edson [a], Melanie Taylor [b]

[a] Queensland Centre for Emerging Infectious Diseases, Biosecurity Queensland, Department of Agriculture and Fisheries, Brisbane, QLD, Australia
[b] Centre for Health Research, School of Medicine, University of Western Sydney, Sydney, NSW, Australia
[c] EcoHealth Alliance, New York, NY, USA

ARTICLE INFO

Article history:
Received 30 April 2015
Received in revised form 22 July 2015
Accepted 23 July 2015
Available online 7 August 2015

Keywords:
Bat
Flying-fox
Hendra virus
Urban
Wildlife
Management

ABSTRACT

The urban presence of flying-foxes (pteropid bats) in eastern Australia has increased in the last 20 years, putatively reflecting broader landscape change. The influx of large numbers often precipitates community angst, typically stemming from concerns about loss of social amenity, economic loss or negative health impacts from recently emerged bat-mediated zoonotic diseases such as Hendra virus and Australian bat lyssavirus. Local authorities and state wildlife authorities are increasingly asked to approve the dispersal or modification of flying-fox roosts to address expressed concerns, yet the scale of this concern within the community, and the veracity of the basis for concern are often unclear. We conducted an on-line survey to capture community attitudes and opinions on flying-foxes in the urban environment to inform management policy and decision-making. Analysis focused on awareness, concerns, and management options, and primarily compared responses from communities where flying-fox management was and was not topical at the time of the survey. While a majority of respondents indicated a moderate to high level of knowledge of both flying-foxes and Hendra virus, a substantial minority mistakenly believed that flying-foxes pose a direct infection risk to humans, suggesting miscommunication or misinformation, and the need for additional risk communication strategies. Secondly, a minority of community members indicated they were directly impacted by urban roosts, most plausibly those living in close proximity to the roost, suggesting that targeted management options are warranted. Thirdly, neither dispersal nor culling was seen as an appropriate management strategy by the majority of respondents, including those from postcodes where flying-fox management was topical. These findings usefully inform community debate and policy development and demonstrate the value of social analysis in defining the issues and options in this complex human–wildlife interaction. The mobile nature of flying-foxes underlines the need for a management strategy at a regional or larger scale, and independent of state borders.

Introduction

Flying-foxes are nomadic fruit- and blossom-eating bats (family *Pteropodidae*) that forage by night and roost in arboreal colonies by day. Some Australian species can weigh up to 1 kg, with a wing-span of 1.2 m. Contemporary colonies generally comprise thousands or tens of thousands of bats, although historically, colonies of hundreds of thousands or millions of bats have been recorded [1–3]. They are protected under state and/or national legislation. In eastern Australia, flying-foxes have become increasingly urbanised in the last 20 years, putatively reflecting landscape change in both rural and urban environments. Paradoxically, food resources have increased in urban and peri-urban environments as a result of human demographic and lifestyle changes, but decreased in rural environments predominantly as a result of natural habitat loss associated with land-use change [4–8]. While small colonies in remnant urban and peri-urban bushland are generally tolerated, the influx of larger numbers of flying-foxes (most often associated with the large-scale nomadic movements of little red flying-foxes (*Pteropus scapulatus*)) often precipitates some community angst [9]. The reasons for this are broadly twofold: firstly, nuisance and loss of social amenity, and secondly, health concerns [10]. The former is a consequence of the noise, soiling and smell typically attendant with large numbers of flying-foxes; the latter primarily reflects public concern about bat-mediated zoonotic diseases such as Hendra virus and Australian bat lyssavirus, both of which have caused sporadic human fatalities. In fruit-growing areas, an additional trigger for public concern is the threat of crop damage and associated economic loss. Thus, local authorities and state wildlife authorities are increasingly asked to approve the dispersal or modification of flying-fox roosts to address expressed concerns [11], yet the scale of this concern within the community, and the veracity of the basis for concern are often unclear.

* Corresponding authors.
E-mail address: nina.kung@daff.qld.gov.au (N.Y. Kung).

http://dx.doi.org/10.1016/j.onehlt.2015.07.002

The situation highlights the frequently complex nature of human, wildlife and ecosystem interactions, and the need for information-based decision-making. In this context, we conducted a survey to capture community attitudes and opinions about flying-foxes in the urban environment to inform community debate and to support management policy and decision-making. This paper presents the key survey findings.

Methods

Study population

Our target study population was the residents of the eastern Australian state of Queensland where flying-fox management is topical. While we accepted responses from other Australian states, our analysis included responses from Queensland only.

Survey delivery and sample selection

We presented the survey in an on-line format using the Survey Monkey™ platform, but also advertised the availability of paper copies. The on-line platform was configured to prevent multiple responses from the same device. The survey ran from 27 August to 12 October, 2012. It was promoted by the Queensland government via conventional media release and social media in weeks one and six, and via multiple radio and print media interviews in the intervening period. A number of horse industry and wildlife interest groups posted the survey URL on their official websites. Respondents were self-selected.

Questionnaire

We posed 37 questions within four sections, capturing respondent demographics, flying-fox knowledge, opinions and concerns, and management options. Questions were typically closed, though we provided

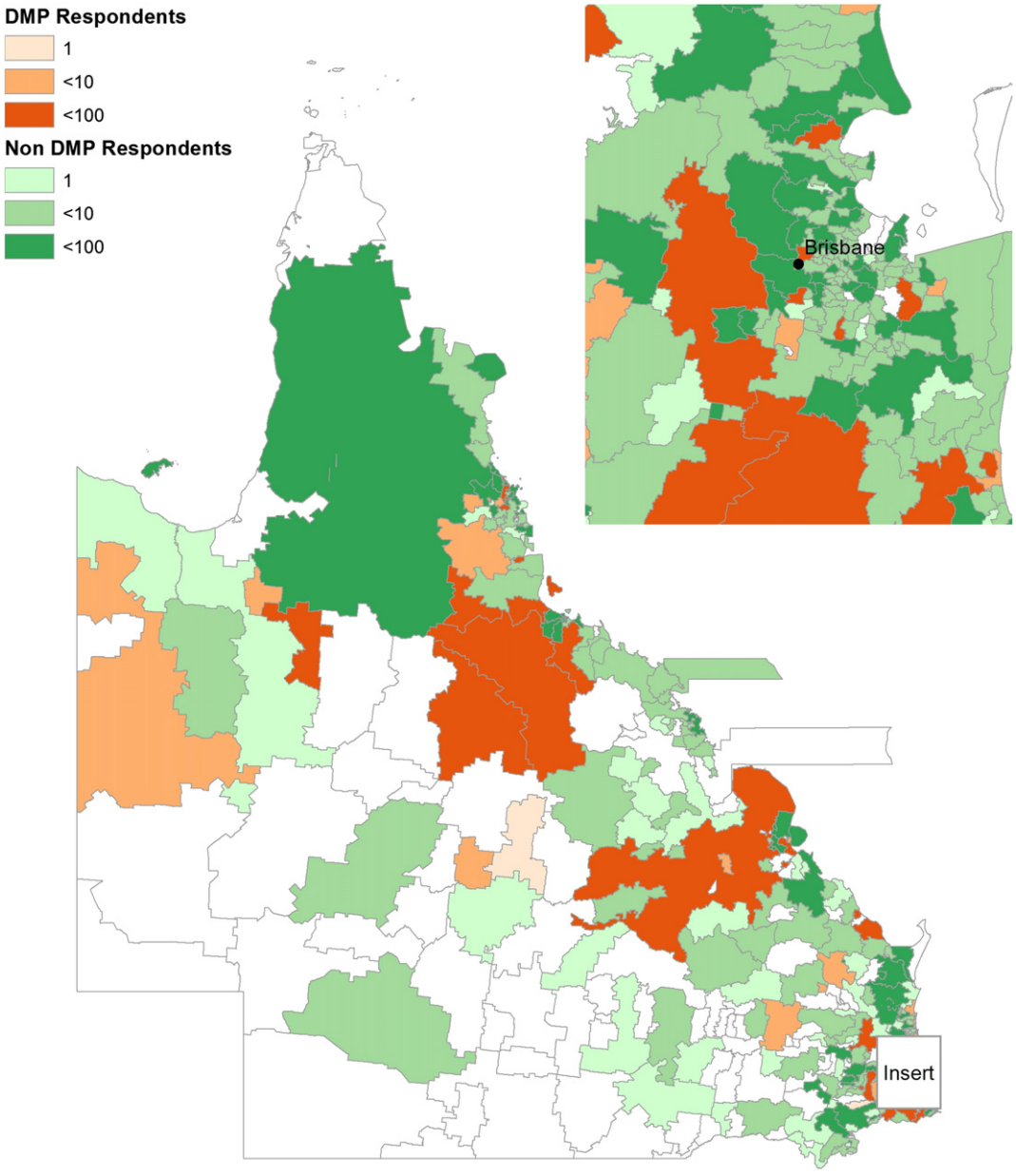

Fig. 1. Location and number of survey responses by postcode. Postcodes that contained roosts for which damage mitigation permits had been sought, granted or existed in the six months prior to the end-date of the survey are indicated by red toning.