1 **Title**

2 **Temporal overlaps of feral cats with prey and competitors in primary and human-**

3 **altered habitats on Bohol Island, Philippines**

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Abstract

The vertebrate fauna of the Philippines, known for its diversity and high proportion of endemic species, comprises mainly small- to medium-sized forms with a few large exceptions. As with other tropical ecosystems, the major threats to wildlife are habitat loss, hunting and invasive species, of which the feral cat (*Felis catus*) is considered the most damaging. Our camera-trapping study focused on a terrestrial vertebrate species inventory on Bohol Island and tempo-spatial co-occurrences of feral cats with their prey and competitors. The survey took place in the Rajah Sikatuna Protected Landscape, and we examined primary rainforest, its border with agricultural land, and rural areas in the vicinity of villages. Altogether, over 2,885 trap days we captured 30 species of vertebrates – 10 mammals (including *Sus philippensis*), 19 birds and one reptile, *Varanus cumingi*. We trapped 81.8% of expected vertebrates. Based on the number of events, the most frequent native species was the barred rail (*Gallirallus torquatus*). The highest overlap in diel activity between cats and potential prey was recorded with rodents in rural areas ($\Delta=0.62$); the lowest was in the same habitat with ground-dwelling birds ($\Delta=0.40$). Cat activity was not recorded inside the rainforest; in other habitats their diel activity pattern differed. The cats' activity declined in daylight in the proximity of humans, while it peaked at the transition zone between rainforest and fields. Both rodents and ground-dwelling birds exhibited a shift in activity levels between sites where cats were present or absent. Rodents tend to become active by day in cat-free habitats. No cats' temporal response to co-occurrences of civets (*Paradoxurus hermaphroditus* and *Viverra tangalunga*) was found but cats in diel activity avoided domestic dogs (*Canis lupus familiaris*). Our first insight into the ecology of this invasive predator in the Philippines revealed an avoidance of homogeneous primary rainforest and a tendency to forage close to human settlements in heterogeneous habitats. A detailed further investigation of the composition of the cat's diet, as well as ranging pattern, is still needed.

Introduction

The Philippine Archipelago is considered a global biodiversity hotspot, known for its high proportion of endemic species (Ambal *et al.* 2012). The terrestrial vertebrate taxa, which primarily encompass small to medium sized species, inhabit more than 7100 islands. These species include at least 213 mammals (Heaney *et al.* 2010), 674 birds (Lapage 2015), 270 reptiles and 111 amphibians (BREO 2015).

Similar to other oceanic islands, the predominantly small fauna of the Philippines suffers from the presence of competing invasive species, such as *Rattus* spp., and the feral cat (*Felis catus*). The cat is listed as the most widespread and probably most damaging of the four carnivores included on the list of the 100 worst invasive species (Lowe *et al.* 2000). At least 175 vertebrates are threatened or have been driven to extinction by feral cats on at least 120 islands (Medina *et al.* 2011). Meta-analysis has revealed that the negative impact of feral cats is largest for insular endemic mammals, and is exacerbated by the presence of invasive cat prey species such as mice (*Mus musculus*) or rabbits (*Oryctolagus cunuculus*) (Nogales *et al.* 2013). The cat is widely kept as a pet by people throughout the Philippines and can be found foraging in every habitat (Duffy & Capece 2012). Despite the general prevalence of cats in the Philippine landscape, there is a noticeable lack of knowledge regarding the cat's impact on the biodiversity of this archipelago.

Cats feed on a wide range of animals, from arthropods, reptiles and birds to mammals the size of a rabbit (Pearre, Maass & Maass 1998). In Australia alone, with a variety of animals of similar size such as those found in the Philippines, 400 prey species consumed by cats have been recorded (Doherty *et al.* 2015). In the Philippines, members of the orders Chiroptera and Rodentia are the most numerous mammalian species (Heaney *et al.* 2010). A wide range of terrestrial and arboreal rodents with body mass ranging from the 15-g *Musseromys* spp. to the 2.6-kg *Phloeomys* spp. risk predation by cats. Only adult individuals

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76 of *Phloeomys* and *Hystrix pumila* (Heaney *et al.* 2010) exceed the potential prey dimensions.

77 According to size and niche, members of the Tupaiidea (treeshrews), Erinaceidae (moonrats)

78 and Soricidae family (shrews) should be listed as mammalian prey for cats. Similarly, the

79 smallest Philippine primate, *Tarsius syrichta*, which inhabits Bohol and other islands of the

80 Mindanao faunal region, can be included (MacKinnon & MacKinnon 1980).

81 On Bohol Island (3,269 km^2), as on the other Philippine islands, bats and rodents

82 dominate among local mammals. The small mammalian fauna consists of one insectivorous

83 species and nine species of rodents, including the introduced *Mus musculus, Rattus rattus,*

84 *Rattus norvegicus, Rattus tanezumi* and *Rattus exulans* (Heaney *et al.* 2010). The avifauna of

85 Bohol numbers 235 species, with Passeriformes forming the largest sub-group at 83 species.

86 Bohol is also home to 14 ground-dwelling bird species inhabiting the woody or bushy inland

87 habitats potentially affected by cats (Kennedy 2000).

88 Along with dogs (*Canis lupus familiaris*), possible competitors of cats on Bohol

89 include two mammalian carnivores, Asian palm civet (*Paradoxurus hermaphroditus*) and

90 Malayan civet (*Viverra tangalunga*) (Heaney *et al.* 2010) and two reptile species: yellow-

91 headed water monitor (*Varanus cumingi*) and reticulated python (*Python reticulatus*) (BREO

92 2015). To our knowledge, no predation between cat and civets has been published.

93 The t~~T~~iming of activity of mammalian predator~~'s~~ ~~activity~~ is a ~~largely~~ well discussed

94 topic (e.g. Palomares & Caro 1999; Tambling *et al.* 2015). Time-stamped records from

95 camera traps allow for detailed insights into the time budget and temporal coexistence of

96 animals across trophic guilds, seasons, etc. (Rowcliffe *et al.* 2014), and ~~r. R~~ecent camera

97 trapping studies have successfully examined ~~the potential of analysis based on the~~

98 ~~overlapping~~ overlaps in~~of~~ diel activity patterns (Ridout & Linkie 2009), confirming ~~. Among~~

99 ~~others,~~ significant activity~~'s~~ overlap between carnivores and their preferred prey ~~was~~

100 ~~confirmed~~ (Harmsen *et al.* 2009; Lucherini *et al.* 2009; Sweitzer & Furnas 2016)~~. which~~

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101 ~~could~~and suggesting~~indicate an effort of the~~ predator behaviour to reduce foraging energy

102 expenditure (Foster *et al.* 2013). In their role as m~~M~~esopredators, ~~role predestines~~ cats ~~to~~

103 ~~utilize~~must optimize their use of time not only ~~not only according~~ to encounter prey but also

104 to cope with a sympatric superior predator (Brook, Johnson & Ritchie 2012). The

105 combination of partitioning of habitat, prey size and the 24-hour daily cycle is thought to be

106 a~~As a~~ complex mechanism allowing competing felids² to coexist~~ence is believed to be the~~

107 ~~combination of partitioning of habitat, prey size and a 24-hour daily cycle report~~in~~ed from~~

108 different animal communities (Di Bitetti *et al.* 2010; Foster *et al.* 2013; Silmi, Anggara &

109 Dahlen 2013; Sunarto *et al.* 2015). For example, l~~The~~ low overlap in ~~ping~~ activities ~~were~~has

110 been found between ~~e.g.~~ marbled cat (*Pardofelis marmorata*) and clouded leopard (*Neofelis*

111 *nebulosa*) in Thailand (Lynam *et al.* 2013). ~~Also~~ Wang & Fisher (2012) also confirmed ~~a~~

112 higher segregation of diel activities of cats with respect to dingoes during wet months. The

113 p~~P~~articularly suppressive effect of an apex carnivore on invasive populations of cats is

114 considered an important conservation~~al~~ issue (Brook, Johnson & Ritchie 2012; Lazenby &

115 Dickman 2013; Doherty, Bengsen & Davis 2015).

116 We conducted a camera-trap survey on Bohol Island in an attempt to uncover tempo-spatial

117 co-occurrences of terrestrial vertebrate species on regularly used trails and to confirm the

118 presence of cats in the protected primary rainforest (Zone I), a transition zone along the

119 border of the primary rainforest with the agricultural landscape (Zone II), and inside the rural

120 landscape in the proximity of human settlements (Zone III). Our objectives were to: (1) create

121 a general inventory of camera-trapped taxa; (2) model the species accumulation curve using

122 previous   knowledge of the possible number of mammalian, avian and reptile species

123 detectable by camera-traps; and (3) compare the diel activity levels of cats with those of

124 potential prey and competitors.

125 **Materials & Methods**

126   *Study site*

127   Our study was conducted under research permit No. 2014-04, issued by DENR,

128   Region VII, Philippines, between July 2nd and December 4th, 2014 in the surroundings of the

129   town of Bilar, Bohol Island, Philippines. The landscape consists of a mixture of distinctive

130   flat rural areas near human settlements, used as rice fields and plantations for various crops,

131   steep karst hills covered by brush and secondary forest, and primary rainforest in protected

132   areas. The town of Bilar lies between two conservation areas, the Rajah Sikatuna Protected

133   Landscape (RSPL) and the Loboc River Watershed Forest Reserve. RSPL is the second

134   largest protected sanctuary on Bohol, covering 11,034 ha of a mostly hilly limestone

135   environment rich in characteristic landforms such as ravines, sinkholes and caves. The

136   altitude in RSPL varies between 300 and 826 m above sea level. The forest canopy is multi-

137   layered, with trees reaching up to 20 m in height. Members of the families Dipterocarpaceae,

138   Moraceae and Melicacea dominate the canopy. Certain regions of RSPL have been reforested

139   with white teak (*Gmelina arborea*) and Honduras mahogany (*Swietenia macrophylla*)

140   (Barcelona *et al.* 2006). The average annual precipitation reaches 1,600 mm; the rainy season

141   typically lasts from June to December, with an increase in precipitation to 200 mm per month.

142   The driest month is April when approximately 40 mm of rain falls.

143   *Sampling design*

144   We monitored three types of landscape typical of tropical regions and deployed

145   cameras in groups, one camera per location, at eight trapping sites (Fig. 1): Zone I – protected

146   primary rainforest including the Watershed Forest Reserve (site WS), interior of RSPL (site

147   SP) and abandoned farms in the early stages of succession into RSPL (site SF); Zone II –

148   transition zone between the primary rainforest of RSPL and rice fields close to the village of

149   Bulak (site BU), transition zone between RSPL and rice and corn fields close to Logarita

150   Springs (site LS), and transition zone between RSPL and the farms of the village Binantay

151 (site BI); Zone III – mixture of brush and degraded forest and plantations on the edge of the

152 village of Subayon (site SU), and at Bohol Habitat Conservation Center on the edge of the

153 town of Bilar (site HB). Details on camera traps' deployment and duration of sampling are

154 shown in Table 1.

155 *Sampling procedures*

156 We used 41 weatherproof infrared digital camera traps – 29 units of Ltl Acorn

157 5210MC (Shenzhen Ltl Acorn Electronics Co., Ltd.) and 12 units of SPYPOINT IR7

158 (SPYPOINT[MD], G.G. Telecom). Prior to the study, we tested both types of cameras in a week-

159 long trial which was focused on the difference in detection rates for moving objects. No

160 difference larger than 10 % between numbers of independence events was found. Both types

161 of cameras were also used in every habitat to avoid a bias from site-specific detection rates.

162 Cameras were set up to perform the same delay between recordings – SPYPOINT to take two

163 images with a delay of 10 s between consecutive triggering, and Ltl Acorns to take one

164 picture followed by a 5 s video, with a 5 s delay between triggering. Video sequences served

165 as an additional tool for the identification of species.

166 We placed all cameras opportunistically on the most frequented trails or their

167 junctions and, according to the expected size of target vertebrates, we fastened cameras with a

168 belt onto the trunks of trees or bushes nearest to the trail, at a height of up to 0.5 m, with a

169 focal point approximately 2 m from the lens. All cameras were active 24 hours a day; all

170 records in infrared mode were available only in a black-and-white version. No bait was used.

171 *Identification of taxa*

172 Two observers, VB and TJ, independently identified all species visually from images

173 and videos; the results were mutually crosschecked, and disagreeing or unidentifiable records

174 were excluded from the analysis. Based on available databases (Heaney *et al.* 2010; BREO

175 2015; Lapage 2015), we made a list of terrestrial mammalian and avian ground-dwelling

176 species known or expected to occur on Bohol (Table 2). From reptiles, we included only the

177 largest four-legged taxon, the yellow-headed water monitor (*Varanus cumingi*). Members of

178 the order Chiroptera and the strictly arboreal Philippine colugo (*Cynocephalus volans*) were *a*

179 *priori* omitted. The conservation status of each species was assessed following IUCN (2015).

180 Due to the limited nature of the recordings, for the identification process and the

181 calculation of a species accumulation curve all taxa the size of a mouse (*Mus musculus* and

182 also the insectivorous *Crocidura beatus*) were pooled into the group called 'mice', and all

183 species of rats (*Rattus* spp. and *Bullimus bagobus*) into the group 'rats'. In addition, both

184 known species of squirrels (*Exilisciurus concinnus* and *Sundasciurus philippinensis*) were

185 grouped into one taxon: 'squirrels'. In total, the list consisted of eight taxa of mammals, 13

186 birds and one reptile. For purposes of *overlap* analyses between cats and their competitors and

187 prey, we pooled both native carnivore species into a group called 'civets' and put mice, rats

188 and squirrels into the group 'rodents'. Ground-dwelling species of birds were the second

189 analyzed group of prey; dogs were accordingly examined as competitors.

190 *Data analysis*

191 Photographs were defined as events (or activity records) when the delay between two

192 consecutive images of an individual exceeded 10 min. The same individual could theoretically

193 trigger more than one camera within 10 min. For each species and Zone, in Table 2 we

194 reported occurrences of species at cameras represented by events (Lazenby & Dickman 2013).

195 We used a species accumulation curve based on the cumulative number of camera-

196 trapping days, computed in EstimateS Version 9.1.0 (Colwell 2013), to find out if our survey

197 lasted a sufficient number of days to capture the 22 expected terrestrial vertebrate species

198 (including three pooled groups) known from Bohol. We followed Tobler *et al.* (2008) and

199 calculated well-performing estimators of species richness: the non-parametric abundance-

200 based estimator ACE, and the non-parametric incidence-based estimators ICE and Jackknife

201 1. An abundance-based rarefaction approach with 95% confidence intervals and 1,000 random

202 iterations of sample order was used.

203   The pair-wise temporal overlap of selected activity patterns was analyzed using the R

204 statistical environment package '*overlap*' (Meredith & Ridout 2014). Following Ridout and

205 Linkie (2009), we applied kernel density estimation on circular data pooled within all study

206 sites. Density of activity (y-axis) uses a von Mises kernel, corresponding to a circular

207 distribution, and is based on recorded time of each event on 24-hour x-axis. The coefficient of

208 overlap (Δ) was calculated with a smoothing parameter of 1.0. We used a smoothed bootstrap

209 of 10,000 resamples to determine standard errors and 95% confidence intervals. We only

210 analyzed combinations of pairs of species, which scored at least 30 events in the activity

211 record (Ridout, pers. comm.) in a given environment. The number of events used for

212 calculation of the activity pattern overlap for each analyzed group of animals and each

213 location is shown in Table 3.

214 **Results**

215 *Species inventory*

216   During the whole survey period, lasting 155 days, we accumulated 2,885 trap days and

217 2,034 events. The combined capture rate across all sites was 73.1 events per 100 trap days.

218 The list of all 30 animal taxa recorded is shown in Table 2.

219 The most frequent native species was the barred rail (*Gallirallus torquatus*), captured in 183

220 independence events. We did not record four expected bird species: *Megapodius cumingii,*

221 *Coturnix chinensis, Turnix sylvaticus* and *Gallinago megala.* On the other hand, we confirmed

222 the survival of the Philippine warty pig (*Sus philippensis*). Given its size, it was probably a

223 male individual that was captured, only once, on three images on August 9th (6:35 pm) in a

224 mud wallow in the interior of RSPL.

225   We found that feral cats most often occurred in the Zone II and III, and were absent

226   inside the primary forest. A similar trend was found for ground-dwelling birds. Most rats and

227   other small mammals were recorded in the transition Zone II between the RSPL forest and

228   agricultural land. Along with feral cats and domestic dogs, we also recorded all three

229   medium-sized mammals occurring on Bohol – the common palm civet (59 events), Malay

230   civet (16 events) and long-tailed macaque (*Macaca fascicularis*) (7 events). Humans were

231   also captured but excluded from the analysis.

232   Within all eight sampling sites, we captured 18 of 22 expected target taxa, which

233   corresponds to a success rate of 81.8% of the species inventory (100% of mammals and

234   reptiles, 69.2% of birds). We used these 18 taxa for calculating the species accumulation

235   curve (Fig. 2). The mean estimated species richness computed in EstimateS was 19.7 species

236   (ACE = 19.6, ICE = 19.5 and Jackknife 1 = 20.0). We recorded 15.89 species (72.2% of

237   expected species) in 1,000 trap days. The eight target species of mammals were captured in

238   1,723 trap days; similarly, nine ground-dwelling birds were recorded within 1,435 trap days.

239   *Temporal overlaps*

240   We recorded cats only in transition Zone II and in the rural landscape close to human

241   settlements (Zone III). Diel activity patterns of cats differed among zones (Fig. 3). Cats

242   showed a decrease in late-afternoon activity near villages, whereas activity in the transition

243   area peaked right before noon. Generally, the activity of cats by daylight was higher in

244   transition zones; in Zone III cats were recorded mainly at night.

245   The highest overlap in activity patterns between cats and rodents (Table 4) was found

246   in the rural landscape of Zone III, and between cats and ground-dwelling birds in transition

247   Zone II (Fig. 4).

248   Both categories of potential prey showed shifts in temporal occurrence within sites,

249   based on the presence of cat (Fig. 5). As seen, the peaks of rodent activity decreased in the

250 hours before sunrise and increased after sunset, whereas the activity of ground-dwelling birds

251 peaked about 4 hours sooner at sites where cats were not recorded.

252   Cats showed the second lowest overlap among all groups with dogs in Zone III (Table

253 4) where dogs were dominant and~~ly~~ active during the day. ~~Also i~~In Zone II these two animals

254 appeared to peak in their activity at different times: dogs were most active in the morning and

255 late afternoon, whereas cats peaked before noon (Fig. 4).

256   The overlap between the diel activity patterns of cats and both species of civets is

257 shown in Figure 6. Cats exhibited roughly consistent activity throughout a 24-hour period,

258 with no apparent shift caused by the nocturnal occurrence of sympatric civets.

259 **Discussion**

260   According to our knowledge, to date no study of the behavior and ecology of feral cats

261 has been conducted in the Philippines, nor any camera-trap-based species inventory on Bohol.

262 With the exception of the Philippine pygmy squirrel, *Exilisciurus concinnus*, we were able to

263 capture and identify every non-volant mammalian species recorded as occurring on Bohol

264 larger than a mouse, including an individual of *Sus philippensis*, which is considered to be

265 close to extinction (Oliver 1993), even by local people. Camera traps captured 81.8% of

266 known ground-dwelling mammalian, avian, and reptilian species, similar to the 86 % captured

267 in the Amazon rain forest (Tobler *et al.* 2008) or 89% in the lowland rainforest of Borneo

268 (Bernard *et al.* 2013); both those camera-trapping studies were restricted to mammals. In

269 addition, the initially steep shape of our general species accumulation curve corresponds with

270 studies conducted in tropical ecosystems and confirms the robustness of the approach.

271 Similarly to Rovero *et al.* (2014), we captured the majority of selected species in 1,000 trap

272 days, considered a reliable threshold enabling the detection of rare species (O'Brien 2011).

273   The absence of cats in the interior of primary rainforest seems not to be driven by

274 distance from the nearest human settlements, given that all three monitored sites were up to

275   approximately 3 km from houses. We suggest that the absence of preferred features and

276   habitats in the rain forest may have resulted in camera traps failing to capture cats. Cats

277   typically use a mixture of vegetation cover at ground level which provides both cover and

278   open space for observing their prey; such habitat may increase hunting success (Doherty,

279   Bengsen & Davis 2015). The habitat heterogeneity hypothesis by Tews *et al.* (2004) predicts

280   that heterogeneous habitats offer a greater diversity and density of potential prey than

281   homogeneous ones, which could be conceivable for cats. Linear features in space (e.g. tree

282   lines, roads and other corridors) are generally considered to maximize cat's detectability

283   (Crooks 2002; Bengsen, Butler & Masters 2012). We would expect to record cats in a primary

284   forest preferably mostly on trails (Trolle & Kéry 2005; Harmsen et al. 2010; Anile et al. 2014)

285   but they could disperse into the undergrowth on paths that remained are undetected.

286   The presence of competing, potentially dangerous predators in primary forest is

287   unlikely to explain the absence of cats. Dogs and both species of civets were equally present

288   in all three zones. The common palm civet and Malay civet are omnivorous with a distinctive

289   nocturnal activity pattern (Jennings *et al.* 2009) but they forage in the habitat of cats, and

290   given their size we consider them to be competitors of cats. Nonetheless, cats do not show any

291   temporal avoidance, indicating no interspecies competition, which has evolved during almost

292   a 500-year co-existence (Jubair 1999). For a more comprehensive view of possible niche

293   partitioning, as found for example between felids on Sumatra (Sunarto *et al.* 2015), a camera-

294   trapping study should be conducted on Negros, where the Visayan leopard cat (*Prionailurus*

295   *bengalensis* ssp. *rabori*) occurs as a regional direct competitor (IUCN 2015).

296   Our results (Tables 2 and 3) show that the species richness and availability of both

297   prey categories (rodents and birds) was higher, nearly by orders of magnitude, in both human-

298   altered zones than in primary rainforest. We attribute this to the variety of vertebrate and

299   invertebrate prey, which is more abundant in heterogeneous landscapes. In addition, as

suggested by Lozano *et al.* (2003), feral cats use a wide range of habitat components to meet their different activity requirements (e.g. hunting, resting), and this landscape offers a mixture of agricultural features with secondary growth, infrastructure and potential human subsidies (Ferreira et al. 2011). Our data clearly support such a tendency to forage relatively close to human settlements, however we were not able to determine from our records whether a photographed animal was feral or domestic.

Although the diel activity pattern of cats was roughly consistent over 24-h periods (Fig. 6), a detailed analysis of zones revealed a decline in diurnal activity in the vicinity of villages, in contrast to an apparent activity peak before noon in Zone II (Fig. 3). Both Zones II and III offered more-or-less the same number of prey species (Table 2). Compared with Zone II, we hypothesize that more uniform diurnal activity of relatively abundant dogs dissuaded cats from daytime foraging in Zone III (Fig. 4). Also subsidies provided by humans in villages could influence cats to remain inactive in shelters and forage at night. We did not trace detect any signs of cats being spatially excluded 's spatial exclusion by dogs, but our results support findings that cats optimize their timing of hunting behavior to when dogs are less active, hence avoiding potentially dangerous encounters is avoided (Brook, Johnson & Ritchie 2012; Wang & Fisher 2012). Cats were more diurnal in Zone II. This could be explained by the same factor, because the zone zone-specific relative abundance index of dogs was 2 two times lower relative than o the index of cats than in Zone III (Table 3). So cats could respond both to lower disturbance from dogs and to higher diurnal availability of rodents in Zone II (Fig. 4). Other prey not detected by cameras such as insects or lizards might also be present (Bonnaud *et al.* 2011).

Prey species showed shifts in diel activity patterns between sites where cats were, or were not, present (Fig. 5). When cats were absent, rodents tended to forage visibly by day, while the activity of ground-dwelling birds peaked about 4 hours later. It is difficult to

interpret the shift in bird activity; data from sites without cats ~~could be~~were considered too scarce to perform a reliable analysis. Rodents shift their activities to become nocturnal if cats are present and more diurnal (Doherty *et al.* 2015). This raised the question of whether almost 500 years of cat presence in the Philippines has driven adaptive mechanisms of prey and competitors to cope with a new predator or not. Our results suggest that this already happened, similarly to the 4000-year history of the dingo in Australia (Carthey & Banks 2012). Nevertheless, we believe that further research is needed, especially throughout all seasons.

Knowledge of feral cat diet is paradoxically the least researched in tropical habitats with the richest terrestrial biodiversity (Doherty *et al.* 2015; Doherty, Bengsen & Davis 2015). Our findings reveal the first tempo-spatial co-occurrences between feral cats and their potential prey in a typical mixture of Philippine landscapes. Among others, we suggest their temporal avoidance of dogs as the apex predator. We confirm that camera traps are capable of capturing small-bodied fauna, ground-dwelling birds and highly elusive species, such as *Sus philippensis*, as well. Endangered Philippine fauna exposed to invasive species should rapidly become the target of a broad and long-term camera-trapping inventory survey. For an in-depth knowledge of the dietary intake of feral cats in the Philippines, DNA analysis of scat is recommended as a priority for researchers (Nogales *et al.* 2013). In addition, collared and GPS-tracked cats would provide information about habitat use and the size of home ranges. Finally, attention should be paid to the cultural value of cats kept as pets within Philippine society, to inform eradication strategies.

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[Commented [YvH1]: Among other what? It is not clear.]

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