

## DISTRIBUTION OF THE JUNGLE CROW (*Corvus levaillantii* LESSON, 1831) AND THEIR POTENTIAL THREATS TO BIODIVERSITY IN HORTON PLAINS NATIONAL PARK, SRI LANKA.

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**ABSTRACT - Distribution of the Jungle Crow (*Corvus levaillantii* Lesson, 1831) and their potential threats to biodiversity was studied at the Montane Cloud Forests of Horton Plains National Park, of the Nuwara Eliya District at the Central Highlands of Sri Lanka, from September 2015 to March 2017. This species is distributed in every terrestrial habitat throughout Sri Lanka. To study distribution of the crow, three main habitats were identified as Forest habitat, Grassland habitat, and Human-induced habitat. Three, 100 m fixed line transects were marked in each of the habitats using a global positioning system device (GPS). Field observations were conducted on three consecutive days each month, while travelling along transects, from 0600h to 1800h. Birds were observed directly or through a 10x50 binocular. Meanwhile, number of visitors walked through transects was counted. Opportunistic observations were carried out, to investigate threats for the other animals. Maximum population of *C. levaillantii* was present at Human-induced habitat,  $45.95 \pm 18.59$  (Mean  $\pm$  Standard deviation). Minimum population was recorded from Grassland habitat  $30.26 \pm 16.93$  (M  $\pm$  SD). In the Forest habitat *C. levaillantii* population was  $33.05 \pm 16.97$  (M  $\pm$  SD). Population of *C. levaillantii* recorded at Human-induced habitat, positively correlated with the number of visitors per hour (Pearson correlation= 0.887, p-value < 0.05). Though there were sign boards and garbage bins, crows always inhabited in Human-induced habitat. Endemic lizards; *Calotes nigrilabris*, *Ceratophora stoddartii* and *Cophotis ceylanica* are highly attacked and endemic birds such as *Gallus lafayettii*, *Eumyias sordidus* and *Pycnonotus penicillatus* were harmed by *C. levaillantii* in high numbers. Raptor birds such as *Haliastur indus*, *Circus macrourus*, *Pernis ptilorhynchus* and *Falco tinnunculus*, were attacked by the crow. According to present findings it can be concluded, that the Horton Plains National Park is invaded by Jungle Crow. Large number of crows is a major threat to endemic animals. Increased number of crows is an indicator of pollution, because they are scavengers in the food chain. To establish the protection of fauna in this important Montane Cloud Forest, admissible methods to control the number of *C. levaillantii* are needed.**

**KEY WORDS :** *Corvus levaillantii*, distribution, Horton Plains National Park, Tropical Montane Cloud Forest, threats.

### INTRODUCTION

In Sri Lanka there are two species of crows. They are commonly known as House Crow and Jungle Crow. The Jungle Crows (*Corvus levaillantii*, Synonym: *Corvus macrorhynchus*) are very adaptable to human habitats and are

able to survive on a wide range of food sources (Higuchi, 1979). This species has an extremely large range in Terrestrial, Freshwater, and Marine habitats (BirdLife International, 2016). Moreover, they are distributed in every terrestrial habitat throughout Sri Lanka

(Harrison and Worfolk, 2011). *C. levaillantii* is categorized as a Least Concerned (LC) species in Global Conservation Status and National Conservation Status (MOE, 2012). It is known to be an opportunistic omnivore (Henry 1998), feeding on just about everything edible, animal or vegetable, and has a distinct taste for carrion. However the *C. levaillantii* is feeding on endemic animals (Karunaratna and Amarasinghe, 2008).

The study area, Horton Plains National Park is well known as a saddle shaped highland plateau (Pethiyagoda, 2012), which occupies an area of 3,160 ha and contiguous with Peak Wilderness Sanctuary to the west, in Nuwara Eliya District (DWC, 2007). This area harbors a large number of endemic and endangered animals (Pethiyagoda, 2012). It important to mitigate threats to the fauna in this Tropical

Montane Cloud Forests of HPNP. Objective of the study is to determine distribution of *C. levaillantii* and to find out threats to the endemic fauna for future conservation and protection of biodiversity within HPNP.

MATERIALS AND METHODS

This study was conducted from September 2015 to March 2017 at HPNP, located at 6°47’-6°50’N, 80°46’-80°50’E (Green, 1990). To study distribution of the crow, three main habitats were identified as Forest habitat, Grassland habitat, and Human-induced habitat. Undisturbed old-growth forest and Cloud Forest Die-back (DWC, 2007) was considered as Forest habitat. Within Grassland habitat there were three different habitat types as; Dwarf Bamboo, Tussock Grass and Carpet Grass. Buildings, walking paths, washrooms and all

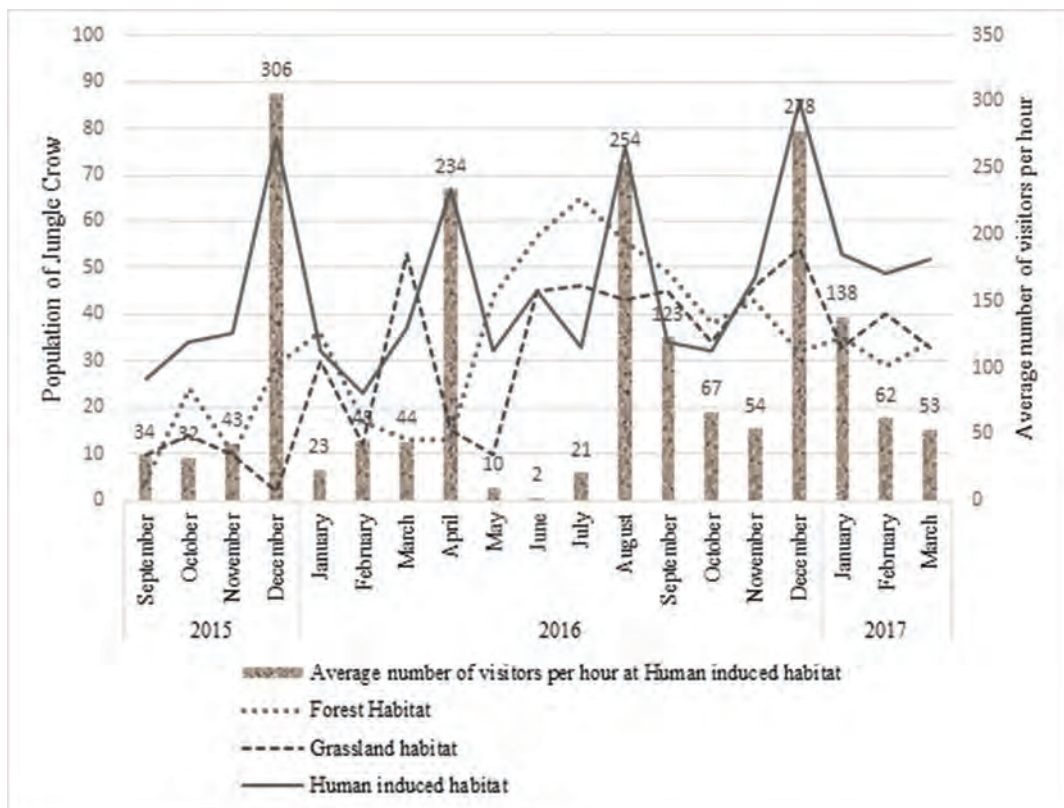


FIGURE 1: Population of Jungle Crow (*C. levaillantii*) in three habitats and Number of visitors per hour at the human induced habitat of HPNP.

the other modified surroundings were considered as the Human-induced habitat.

Three, 100 m fixed line transects were marked in each of the habitats using a global positioning system device (GPS - Garmin™ eTrex 10). Field observations were conducted on three consecutive days each month, while travelling along transects, from 0600h to 1800h. Field observations were taken directly or through a 10x50 binocular. Meanwhile, the number of visitors walked through the Human-induced habitat was counted and averaged into the number of visitors per hour. Opportunistic observations were carried out, to investigate threats for the other animals while casual walks.

**RESULTS**

Maximum population of *C. levaillantii* was present at Human-induced habitat (Figure 01),  $45.95 \pm 18.59 \text{ ha}^{-1}$  (Mean  $\pm$  Standard deviation). Minimum population was recorded from Grassland habitat  $30.26 \pm 16.93 \text{ ha}^{-1}$  (M  $\pm$  SD). In the Forest habitat *C. levaillantii* population was  $33.05 \pm 16.97 \text{ ha}^{-1}$  (M  $\pm$  SD).

Furthermore, at the Human-induced habitat, population of *C. levaillantii*, highly increased at the months of April, August, and December which were the months with vacation. Population of *C. levaillantii* recorded at

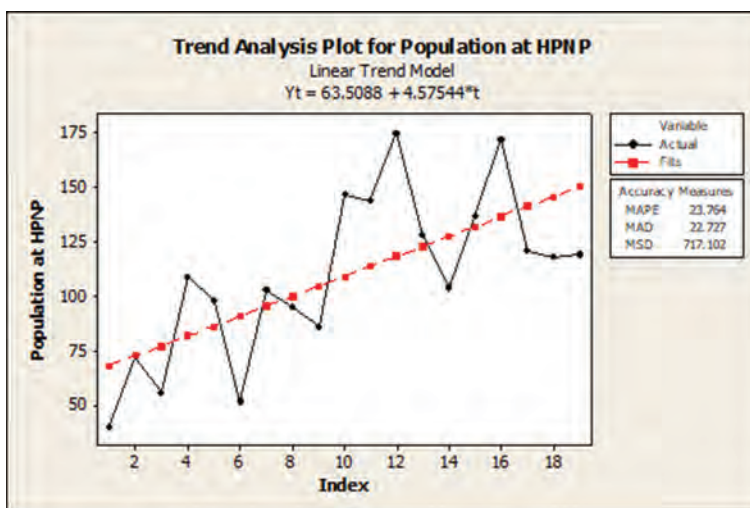
Human-induced habitat, positively correlated with the number of visitors per hour (Pearson correlation= 0.887, p-value < 0.05).

Moreover there is a tendency of increasing of the population of *C. levaillantii* within HPNP (Figure 02). Actual number of population has some variations. However the population growth is increasing.

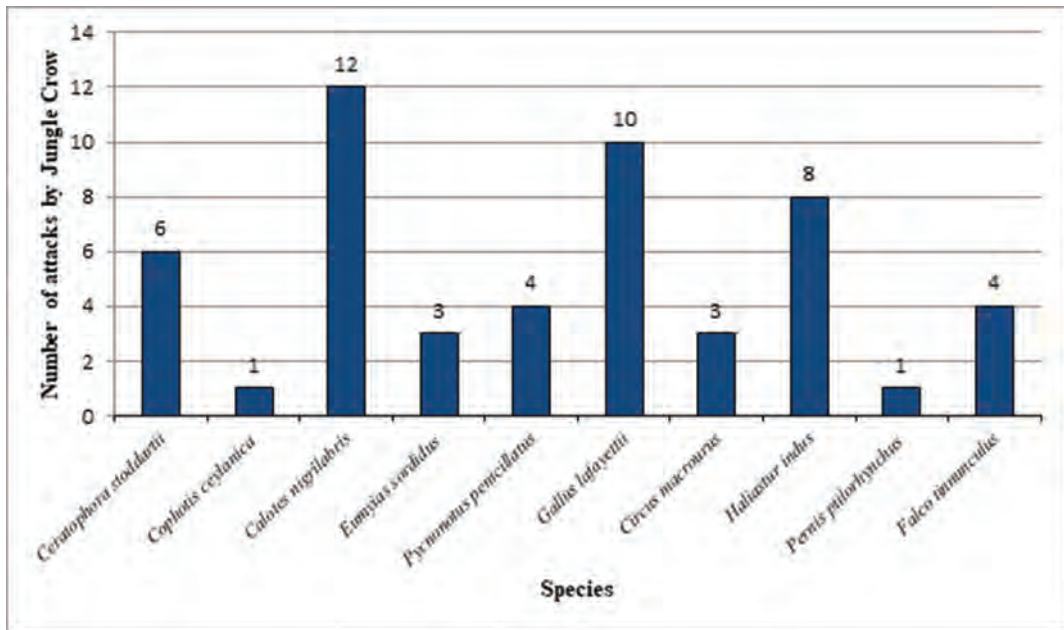
Though there were sign boards for the visitors, to control feeding the animals and garbage bins with lids to put garbage, crows always utilized the Human-induced habitat (Figure 03).



**FIGURE 3:** *C. levaillantii* and *Gallus lafayettei* feeding near a garbage bin at Human-induced habitat of HPNP.



**FIGURE 2:** Trend analysis plot of *C. levaillantii* population at HPNP from September 2015 to March 2017



**FIGURE 4:** Number of attacks by *C. leuallantii* to the fauna, observed at HPNP

During this study period *Calotes nigrilabris* was recorded as the major prey of the crow (Figure 04), 23% of the attacks were affected on this lizard species

Moreover, *C. leuallantii* consumed six *Ceratophora stoddartii* and one *Cophotis ceylanica*. Furthermore, ten *Gallus lafayetii* chicks were attacked by *C. leuallantii*. Nest predation was a common phenomenon within the HPNP. In this case nests of endemic birds such as *Eumyias sordidus* and *Pycnonotus penicillatus* has destructed by the crow. Meanwhile, raptor birds such as *Haliastur indus*, *Circus macrourus*, *Pernis ptilorhynchus* and *Falco tinnunculus*, were disturbed by attacks of *C. leuallantii*.

**DISCUSSION**

According to present findings it can be concluded, that the Horton Plains National Park is invaded by Jungle Crow with tendency to high population growth in the future. Moreover, their Generation Length (average age of parents of the current cohort) is 7.3 years (Birdlife International, 2016). Therefore within a few years there may be a large population of crows

at HPNP. They highly preferred Human induced habitat because these species usually dependent on human settlements.

Population increasing of the *C. leuallantii* is a major threat to endemic animals. Moreover, Karunarathna and Amarasinghe, (2008) previously mentioned an incident of the *C. leuallantii* was feeding on an endemic lizard *C. ceylanica*. Most of the herpetofauna in HPNP is endemic, 93% of recorded species and 83% of reptiles including a highly threatened species of agamid lizard (DWC, 2007). The overall level of endemism of birds in the national park is 20% (DWC, 2007). Therefore when the population of *C. leuallantii* increases, a large amount of endemic animals will be vanished. Furthermore raptor birds were also disturbed by the crows, therefore the food web of the environment will be destructed. Increased number of crows is an indicator of pollution, because they are scavengers.

To establish the protection of fauna in this important Montane Cloud Forest, admissible methods to control the number of *C. leuallantii* are needed. Species-specific distress calls (Naef-Daenzer, 1983) Modified Australian

crow traps (Gadd, 1996) will be very humane, target species specific and effective bird control tool.

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