

**STATUS OF POPULATION, OCCUPATION AND SEASONAL HABITAT
DISPLACEMENT OF ALIEN BIRD SPECIES IN WEST JAVA TROPICAL FOREST,
INDONESIA**

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ABSTRACT

“Invasive Species” is defined as an alien species that is non-native (non-indigenous, foreign or exotic) to a particular ecosystem. Commonly, they are intentionally or unintentionally introduced into an ecosystem. It is suspected that the discovery of a population of Finch-billed Myna in the forest of West Java resulted from the indirect influence of the bird trade. This bird is one of the endemic birds in Indonesia. Commonly, the Finch-billed Myna is a resident bird in Sulawesi islands. However, we found them in Tangkuban Parahu Mount, West Java. The population of Finch-billed Myna in Tangkuban Parahu Mount is 17-24 individual of three group colonies.

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The occupation areas are Abria, Awi leuga and Manggu. The vegetation density is higher than Myna's former habitat (0,055 ind/m²) and Myna's recent habitat (0,028 ind/m²).

Keyword: Alien species; Finch-billed Myna; population; habitat; resources.

1. INTRODUCTION

Each bird has a wide spread of different areas. The determining factor for a broad spread of bird species is the ability to fly and the existence of barriers that prevent the birds from an area. However, recently the bird has turned out many of these limitations since they were found in non-initial habitat, though they are categorized as endemic. For an example Javan Munia (*Lonchura leucogastrides*) and Bar-winged Prinia (*Prinia familiaris*) were found in Borneo [1], Finch-billed Myna (*Scissirostrum dubium* Latam 1902) was found in the tropical forests of western Java [2-5]. Others, such as house sparrows (*Passer domesticus*) and European starlings (*Sturnus vulgaris*) were originally introduced for aesthetic reasons or to control agricultural insect pests. The establishment of alien bird populations through purposeful or accidental introductions has resulted in numerous problems including crop damage, transmission of disease [6] and adverse impacts to the native species [7].

Alien species can thrive population well, especially when the new place has a resemblance to their original habitat. In addition, the alien species are known to have high adaptability. As an example, Finch-billed Myna "*Scissirostrum dubium*" is one of the biological riches that exist only in Indonesia. It is categorized as Sulawesi island endemic bird because of its spread is very limited [8]. It is found thriving populations in the forests of West Java [4]. In 2005, this bird was first discovered in Panaruban areas, Tangkuban Mt, West Java. But, there is no exact information on the number individual of the population. Besides that, the spare Sturnidae bird is found again in the same location as many as 20 individual in 2007 [4-5]. But, until recently, the number of individuals of the population in Sulawesi and surrounding islands has not been recorded.

Bird populations in the habitat can change according to the habitat conditions and changes in quality and quantity of resources [4, 9]. Whenever there are changes that are very different from the initial habitat, the birds will look for more suitable and occupied habitats [6, 10]. Vegetation is one of the factors which are normally affecting the habitat changes is the vegetation.

Vegetation structure affects habitat selection by birds [3, 11-12]. The relationship between vegetation structure and bird community structure is sometimes difficult to be observed [13] because of the relationship varies among the communities [14] and the seasons [10]. Changes in the vegetation structure could interfere the bird species diversity [11] and patterns of use [12]. This disorder allows the forest bird and forest edge bird species live together (co-existence) in one area [15]. As far as we know, the Finch-billed Myna have differences in the location as it was discovered during the period of 2007 to 2009-2010. In the meantime, the home range of bird changed their habitat to the other area. The objectives of this study are to define the population, occupation and seasonal habitat displacement of the alien species namely the *Scissirostrum dubium* in the tropical forest of West Java.

2. RESULTS AND DISCUSSION

2.1. Finch-Billed Myna Population

The total number of population individual of Finch-billied Myna found in the study site is estimated between 17-24 individuals who were divided into 3 colonies. Out of 8 block areas, Finch-billed Myna has been observed in three locations namely in the block of Pentog hill, Manggu and Gamblok (Table 1 and Fig. 1).

Table 1. The population of Finch-billed Myna in Panaruban area

No.	Colonies	Site of Colonies
1.	3-6 individual	Pentog hill*, Awi Lega and Golosor hill
2.	9-13 individual	Manggu*, Legok Sereh, and Lame
3.	5 individual	Gamblok*, Abria

*Found Finch-billed Myna.

Individuals who were found in the block of Pentog hill may have the possibility of the same individuals who were found in the block of Awi Lega and Golosor hill. Individuals who were found in Manggu block have the possibility of the same individuals who were found in the block Legok sereh and Lame. Individuals who were found in the block of Gamblok were also may be the same individuals found in the block of Abria. It can be inferred from seeing flight paths of birds in each block so it can be classified into three colonies.

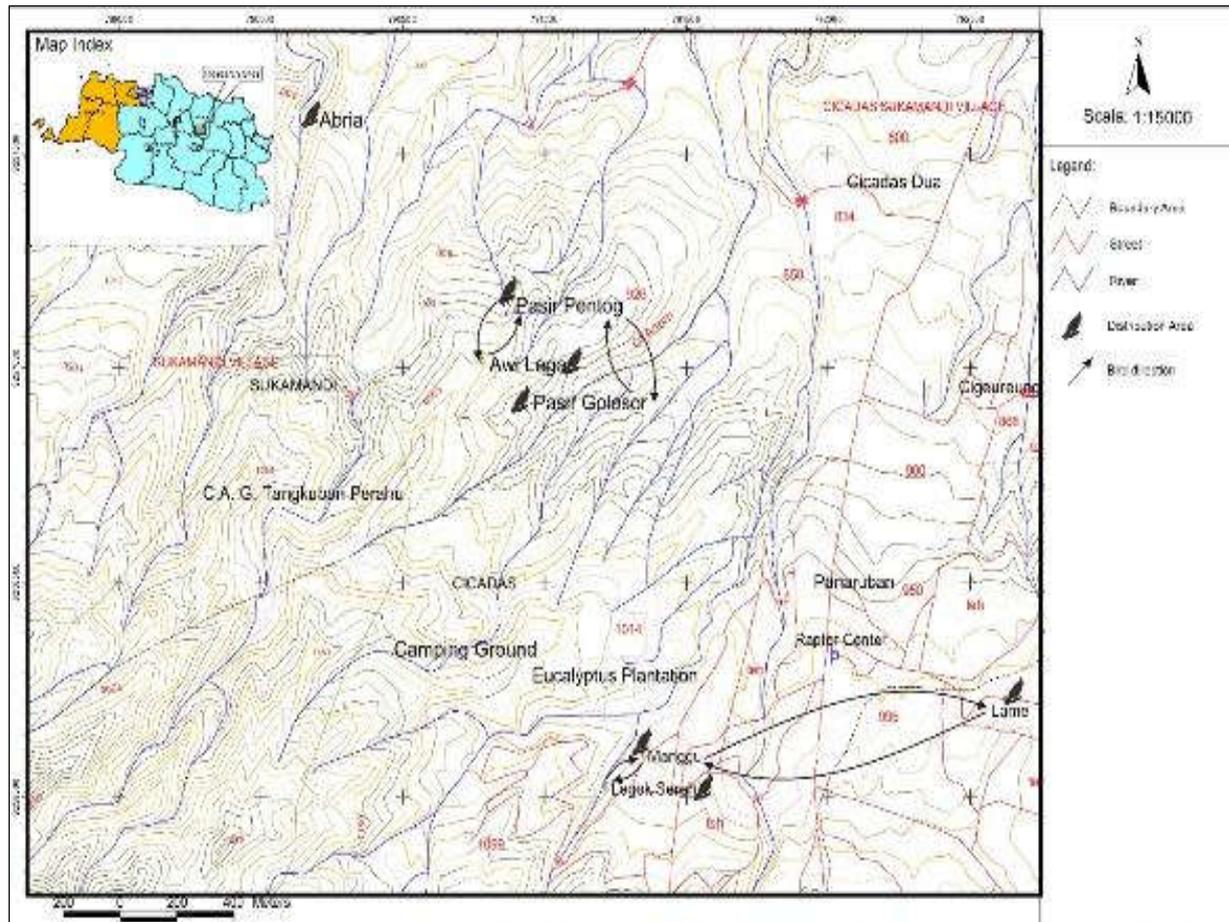


Fig.1. Flight way of Finch-billed Myna at Panaruban area, West Java Finch-billed Myna population did not have any significant changes as during 2005 with 17-20 individuals were recorded [4-5]. In the meantime during the year of 2009-2010, 17 to 24 individuals were found. This population shows a positive progress, i.e. one individual per year (ind./year). The slow growth rate of Finch-billed Myna was caused by the strong environmental pressures. The increased of the population may occur because of the birth and population growth of the immigration starlings. The starlings are not categorized as migratory bird species and there is no population increase due to the release of birds by the local residents [4].

Slow population growth has anticipated for many predators such as hawks and kestrel as well as egg predators such as a snake. This was observed three times encounter a snake closed to a twig where Finch-billed Myna's perch and near the suspected nest hole. In addition, the availability of nesting trees are very rare because of the trees is old and dry. The tree has a hardwood structure which is not suitable for Finch-billed Myna to build in their nest. This is

because of Finch-billied Myna are not woodpeckers. Therefore, they cannot make a nest hole easily. In some cases were observed the Finch-billied Myna acquire barbet affection. Thus, the slow population growth because of the lack of environmental capacity [16-17].

2.2. Occupation and Seasonal Habitat Displacement

Colonies of Finch-billied Myna found scattered in three blocks of edge forest in the Panaruban area. The first, second and third colony was found in the block of Pentog hill, Gamblok blocks and the block Manggu respectively. Colonies of Finch-billied Myna found at research sites occupy the same forest type which is lowland tropical rainforest.

Table 2. Distribution of accupation of Finch-billied Myna at Panaruban area

No.	Blok Name	Coordinate	Altitude (m asl)
1.	Pasir Pentog	S: 06° 42' 51.3" E: 107° 37' 31.1"	1007
2.	Awi Lega	S: 06° 42' 53.0" E: 107° 37' 32.5"	973
3	Pasir Golosor	S : 06° 42' 56.8" E : 107° 37' 37.6"	949
4.	Manggu	S: 06° 43' 33.7" E: 107° 37' 48.5"	1055
5.	Legok Sereh	S : 06° 43' 33.5" E : 107° 37' 45.8"	1038
6.	Lame	S : 06° 43' 24.6" E : 107° 38' 31.6"	1019
7.	Gamblok	S : 06° 42' 14.7" E : 107° 37' 13.3"	965
8.	Abria	S : 06° 42' 28.3" E : 107° 37' 12.9"	880

At Block Pentog hill and Manggu, the Finch-billied Myna colony was found in pairs and often fly with a large group of Short-tailed Starling birds. At Block Gamblok, they flew in colonies. All colonies were found in the lowland tropical rainforest and no group is found

occupying the highlands. In these blocks, the Finch-billied Myna was found in the altitude range of 880-1055 meters above the sea level. According to [8], the status and habitat of these birds generally inhabit the forest edge. It is areas that have rarely trees and swamp forests as well as 1100 m above the sea level but mostly below than 1000 m.

Panaruban area is also selected by Finch-billied Myna as its habitat and it is the forests bordering agricultural areas. In 2005, Finch-billied Myna used eucalyptus forests as their habitat because of the area is bordered by gardens and tea gardens, a mixture of scrubland allowed more than 5 years later, it was called as Myna Former Habitat (MFH). However, in 2007 until now, Finch-billied Myna is found again using the MFH as habitat (Table 3).

Table 3. Recapitulation of vegetation type condition

No	Category	Vegetation Type	
		MFH	MRH
2	Number of vegetation stratum	4	4
3	Number of tree spesies DBH < 5 cm	8	10
4	Number of tree spesies DBH 5-10 cm	9	8
5	Number of tree spesies DBH >10 cm	7	10
6	Density of tree DBH < 5 cm (ind/m ²)	0,039	0,032
7	Density of tree DBH 5-10 cm (ind/m ²)	0,048	0,018
	Density of tree DBH > 10 cm (ind/m ²)	0,055	0,028
8	Diversity of tree spesies DBH < 5 cm	1,30	1,53
9	Diversity of tree spesies DBH 5-10 cm	0,20	1,76
	Diversity of tree spesies DBH >10 cm	1.37	1,73
10	Coverage	Very good	Very good

Note MFH: Myna Former habitat, MRH: Myna Recent habitat

Vegetation structure in MFH and MRH are different. During 2005, the habitat conditions have a higher density than the present habitat while the diversity of plant species is low. The condition of the vegetation indicates that the current habitat has relatively more open vegetation, with a variety of tree species. This is consistent with [8] that *Scissirostrum dubium* is more like a forest habitat that is more open, located on the edge of the forest and rare trees

(Fig. 2).



(a)

(b)

Fig.2. Habitat condition of Finch-billed Myna (a) MFH (b) MRH

Fig. 2(a) shows that the availability of adequate vegetation of tall trees is more compared to Fig. 2(b). However, the availability of adequate vegetation is not enough trees to serve as a suitable habitat for the Finch-billed Myna. This is because the birds use their habitat to make the selection of daily activities according to their needs. In accordance with [18], the presence of bird species in nature is influenced by the state of vegetation structure in a habitat because every species of bird has a tendency to select particular habitats based on their needs such as food, nesting places and shelter. Therefore, habitats that have a higher density of vegetation may not be the suitable habitat. Exception for the bird who is included in the group of birds that require habitat with less vegetation or more open meetings such as Finch-billed Myna [8]. Fig. 3(a)-(b) seem more preferred as habitat by Finch-billed Myna because it has tall tree vegetation as well as nesting place perch. In addition, the density of trees is relatively rare, but both have a higher diversity of tree species. The MRH is located in the area with the altitude between 950-1100 meters above the sea level. Places with an altitude about 1000 meters above the sea level are preferably habitat by Finch-billed Myna [8]. The dead trees are one of the factors that influence the selection of the habitat site for Finch-billed Myna. Birds nest hole in the tree species such as the Finch-billed Myna, Psittacidae and Picidae choose dead trees as a resource that determines the survival of their generation. The lack of nesting

availability in a habitat becomes obstacles for birds earlier. Therefore, the MRH provides a better habitat than MFH because of the presence of dead trees that strongly support their survival (Table 3). This is in agreement with [8] as the residence-red bird is a Finch-billed Myna holes in trees.

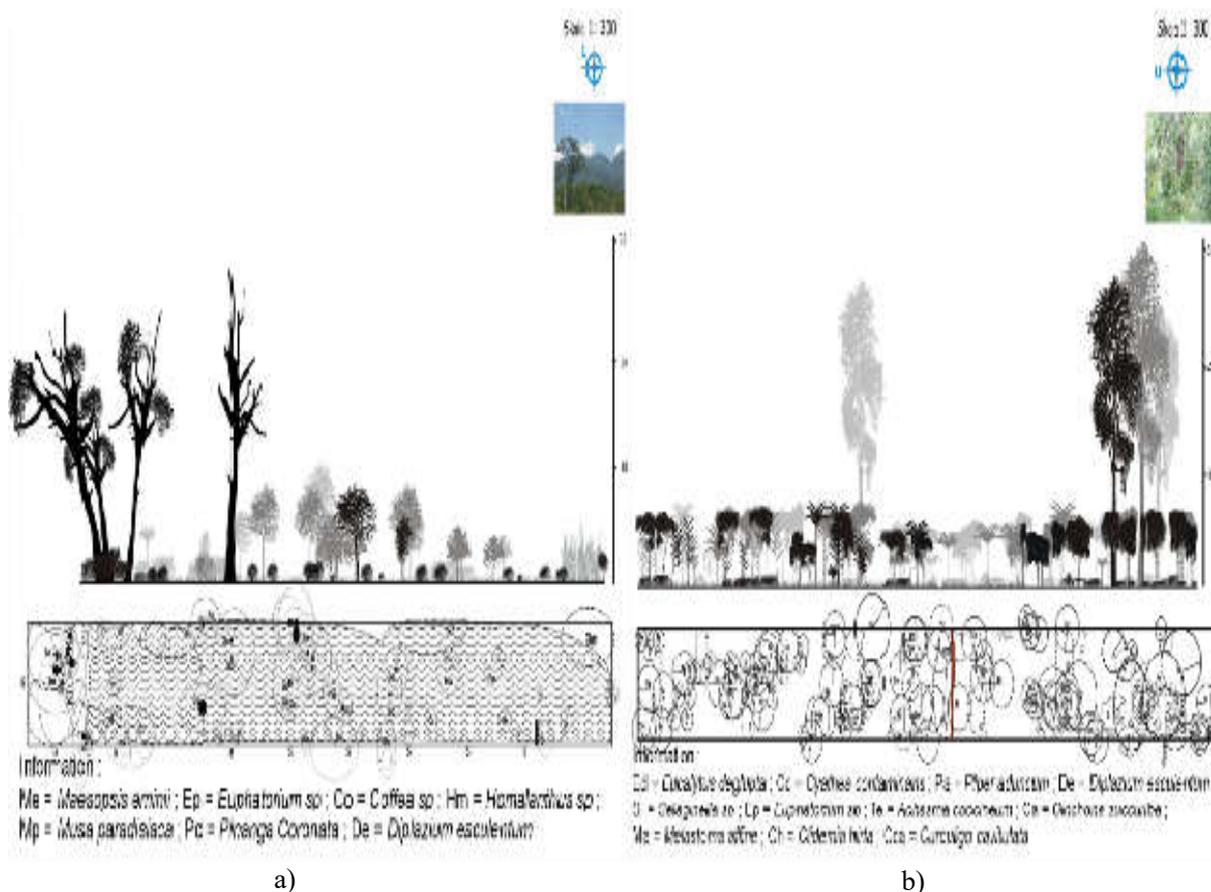


Fig.3. Habitat profile diagram of Finch-billed Myna (a) MFH (b) MRH

Habitat conditions that seem not depend on the density of tall trees, shelter, places to eat and perch. Besides the availability of nesting sites, factors that determine the presence of birds is the security and comfort of the disorder including predators and human disturbance. Predator interference can be caused by the size of its potential as a prey. This is because birds such as Finch-billed Myna have a body size of ± 25.5 cm [8]. The size is considerable potential prey for predators of alpha group or an eagle. In addition, Finch-billed Myna lives in packs and commonly creates a very loud voice when perched on an old tree. These characteristics are easily recognizable by humans or predators; therefore they are easy to become prey for the

predators [18].

In the flocking birds, they are commonly communicated with other and form a behavioral anti-predator strategy. It is an early detection of the presence of predators and gives an alarm to the members of the group [18]. Anti-predator behaviors that look very effective on Finch-billed Myna makes very sensitive to the presence of predators. During the several times of observation, it is found that while some individual birds were perched on a tall tree and boisterous voice, then suddenly there are eagles flying closed towards them. The Finch-billed Myna flew quickly to a lower perch but still making some noise. The presence of Finch-billed Myna in more open habitats appeared to have no effect because it has anti-predator behavior, even in the presence of predator habitat kestrel and the eagle more often than MFH.

Finch-billed Myna is very sensitive to human disturbance. The presence of humans in their habitat is a serious threat to the birds comfort. It is evident in some very difficult times encounter shows that the observation at distances more than 50 m. Thus, the presence of human activities in the surrounding habitat is affecting the continuity of the place which will serve as habitat. This is shown in MFH area as it is used as habitat since 2007 because many farmers cultivating activity present in the area, as well as the firewood and grass collection for their daily basis. The increased in human activity could cause the bird did not choose this place for their daily activities. This is in accordance with [18] which stated that birds make habitat selection according to their need. Habitat MRH is commonly used as a place of daily activities because it is very rare in the area of human activity. This is evident in the gardens bordering the habitat MRH not much over-grown with shrubs.

3. METHODOLOGY

3.1. Study Site

The study was conducted in a mix secondary forest and agroforestry ecosystem, Cicadas Village, Sagalaherang Sub-district, Subang District, West Java, Indonesia (Fig. 4). The study site is approximately 29 km from the town of Subang and approximately 38 km from the city of Bandung. Geographically, the study site is located at $6^{\circ}11' - 6^{\circ}49'S$ and $107^{\circ}31' - 107^{\circ}54' E$ at an altitude of 880-1100 m above the sea level. This area was selected because it

has a secondary forest, eucalyptus plantation and agroforestry; the common place where Finch-billed Myna can be found.

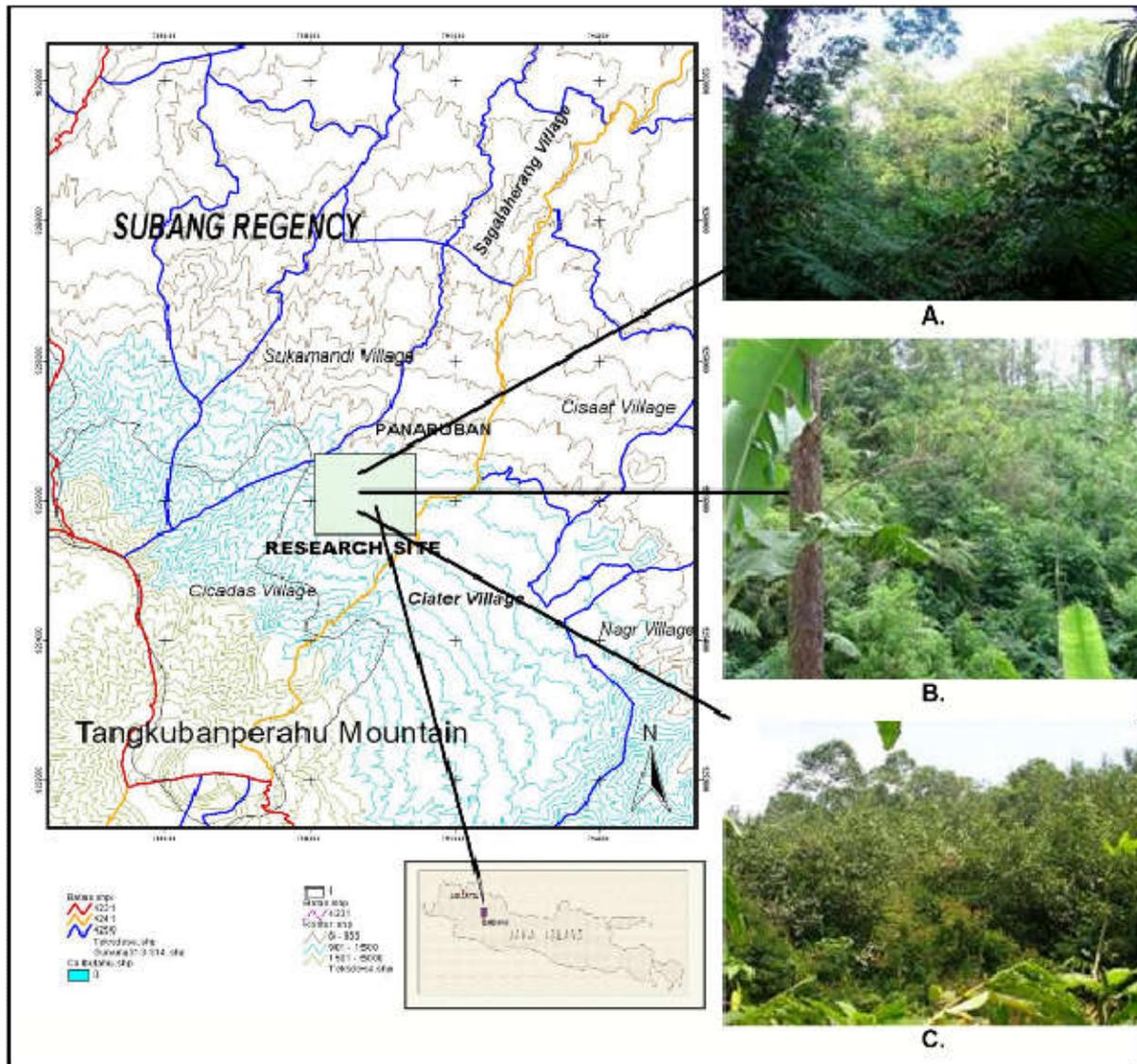


Fig.4. The location of study in Panaruban (A. secondary forest, B. Eucalyptus plantation, C. agroforestry)

Population calculation of Finch-billed Myna at Panaruban area, Tangkuban Parahu Mt was calculated using total count. Based on a preliminary survey showed that the Finch-billed Myna was commonly found at block Awi Lega, Golosor hill, Pentog hill, Manggu, Legok Lemongrass, Lame, Gamblok and Abria. Observations were carried out during the early morning (6:00 to 10:00 a.m.) and afternoon (14:00 to 18:00 p.m.).

Habitat conditions were measured using the square method, including abundance, distribution, density and importance value index. Data was collected by plot size of 2 x 2 m for trees with

DBH < 5 cm and height below than 1.5 m; 4 x 4 m for trees with DBH 5-10 cm as well as 10 x 10 m for trees with DBH > 10 cm. Qualitative data was collected using a method of habitat condition profile diagram both vertically and horizontally. The number of plots per habitat type is 10 spaces. Stratification of the vegetation is divided into 4 strata namely stratum I with a height of 0-5 meters of vegetation; stratum II (5-10 m), stratum III (10-20 m) and strata IV (> 20 m). Plant species diversity index is calculated using Shannon's formula [19, 20].

4. CONCLUSION

The population of on Finch-billed Mynain Panaruban area is 17-24 individual and it is divided into three colonies. They are an occupation in Pentog hill, Gamblok and Panggu area. The tree species diversity index increased in MFH (1.37) and MRH (1.73), but contrary to the density of plants shrubs decreased MFH (0.055 ind./m²) and MRH (0.028 ind./m²). Vegetation strata showed no difference, but it looks more homogeny vegetation complexity in MFH than the MRH. In general, the MFH and MRH are almost the same, except for the availability of nesting places as more in the MRH and disruption of human activity in MRH is smaller.

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