

Daily Behaviour of Javan Langur (*Trachypithecus auratus* Geoffroy) Post Rehabilitation and Release at Biru Mountain, Batu, East Java

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Manuscript received:2015. Revision accepted: 2015.

ABSTRACT

Javan langur is an endemic species in Indonesia and listed as vulnerable species by International Union for Conservation of Nature. Their population decreases because of deforestation and illegal poaching. Rehabilitation program is held to keep them from extinct. Group of rehabilitant javan langur are released at Biru Mountain, Batu, East Java. This study aims to monitor the condition and obstacle possibilities of javan langur group pasca release.

Behaviour of javan langur was observed using focal animal sampling combine with scan sampling method. Monitoring objects were on a group consists of one male named Bobby and three females named Rus, Diamond, and Linseed. This study was divided to 4 activities: feeding, moving, resting, and social. Observation was held at 06.00-17.30 (+7 GMT) with 5 minutes interval for 30 days. Data were analysed descriptively.

Bobby group used 44.22% of their time for feeding; 9.75% for moving; 43.58% for resting; and 2.45% for social activity. The highest activity of feeding is at 08.00-09.30, 12.30-13.00, and 15.00-15.30. The highest moving activity is at 06.00-06.30, 07.00-08.00, 14.30-15.00, and 16.00-17.00. The highest resting activity is at 10.00-12.30 and 17.00-17.30. The highest social activity is at 10.00-11.00 and 13.00-14.00. This group mostly prefer *Eupatorium* sp. leaves, *Ficus* sp. flowers, *Ficus montana* fruits, and *Saurauia* sp. fruits for their diet. Bobby group often sleeps at *Trema orientalis* and *Quercus sondaicus* because those trees are relatively high and have dense canopy.

Key words: behaviour, javan langur, rehabilitation, release, *Trachypithecus auratus*

Running title: Post-release behaviour of rehabilitant javan langur

INTRODUCTION

Javan langur (*Trachypithecus auratus*) or ebony leaf monkey is an endemic primate species in Indonesia. Javan langur can be found in the eastern part of Java Island, Sempu Island, Nusa Barung, Bali, and Lombok. Javan langur (*T. auratus*) is an arboreal animal. It has a habitat ranging from mangroves, beaches, freshwater swamp forest, deciduous forest, and plateau forest with an altitude up to 3500 masl (Nijman 2000; Roos et al. 2014).

Javan langurs are folivore or leaf-eating animals (either young or old leaves). This species also feed on flowers, flower buds, seeds, fruit (mature and immature), and insect larvae (Kool 1993; Nijman 2000). Javan langurs are social animals who generally live in groups with an adult male as the leader of the group. One group can consist of 6-21 individual langur with one or two adult males (Kool 1991). Javan langurs are diurnal animals. Its activity is mostly done during the day. Javan langur group generally

starts its activity before sunrise and stops before it gets dark (Suwelo 1982).

The large number of forest clearing for residential and plantation made the habitat of javan langur decreased and isolated. These condition will encourage the scarcity of food and access to meet their mates for the javan langur. Langur reproduction rate which only gave one birth per pregnancy also makes the population of these species tend to decline. International Union for Conservation of Nature (IUCN) status javan langur in the category of vulnerable species (Nijman and Supriatna 2008 in IUCN 2012). Javan langurs are hunted to serve as pets and consumed by the public as a drug (Wedana et al. 2013).

The decrease population rating of javan langur encourage efforts to conserve these animal, one of them is with rehabilitation. Javan langur rehabilitation aims to train its natural instinct in order to survive when released back into their natural habitat. Rehabilitated langurs are javan langurs which formerly living with human as a pet or langurs from the zoo. Javan langurs will be trained in its

locomotion skill, how to select food, and interact socially by its natural behaviour. Langurs who have formed a group will be released. Thus javan langur population is expected to increase in the wild and can be conserved as an endemic species in Indonesia.

Daily behavior research of post-released javan langurs is necessary to monitor the condition of the langur groups. This research aims to know whether the langurs that have been long time on the outside habitat can be survive in the wild. Research also allows identification of the obstacle possibilities of the rehabilitant langur groups after released. These are expected to be an evaluation and recommendation for javan langur rehabilitation centre to improve the quality of the training.

MATERIALS AND METHODS

Study area

Study was held in November 1st until December 4th 2014 at Biru Mountain, Raden Soerdjo Forest Park, Batu, Malang, East Java with GPS coordinate 7° 47' 9.34" South and 112° 29' 50.28" East. The average rainfall is 6,600 mm (Wedana and Kurniawan 2011) (Figure 1).

Procedures

Monitoring of daily behaviour

Monitoring objects were on a group of javan langur aged 6-7 years old. This group consists of one male named Bobby and three females named Rus, Linseed, and Diamond. Bobby and Rus were pet langurs and have been rehabilitated since November 2009. Linseed and Diamond

were born and grew at Howllets zoo, UK and have been rehabilitated since July 2013.

Behaviour of javan langur was observed using focal animal sampling combine with scan sampling method. Bobby, as the leader of the group, was the focal individual. Observation was held at 06.00-17.30 (+7 GMT) with 5 minutes interval for 30 days. This study was divided into 4 activities: (1) feeding (); (2) moving; (3) resting; and (4) social. Activity percentages were measured by this formula:

$$\text{Activity percentage} = (A/B) \times 100\%$$

A = time used for one activity

B = total time observed (Altman 1974; Martin and Bateson 1988; Wirdateti et al. 2009).

Plants identification

Species of plants fed by Bobby group was identified by taking a sample of leaves, fruits, and flowers of the plants. Identification of the plants using Guide Book of Plantae at East Java and List of Javan Langur Natural Food Plants in Biru Mountain (Kurniawan 2014; Pombo et al. 2004).

Determining of territory area

Territory area was determined by listing the coordinates of tree used by Bobby group to sleep. Territory area was calculated using ArcView (Bottin et al. 2007).

Data analysis

Data were analysed descriptively.



Figure 1. Location of javan langur (*T. auratus*) release site of Bobby group at Biru Mountain, Batu, East Java; point X (7° 47' 9.34" S and 112° 29' 50.28" E)

RESULTS AND DISCUSSION

Bobby group released on Monday, October 27th, 2014 in the Biru Mountain. Bobby as the focal of the observation because group leader will regulate all movements and activities in groups so that behaviour of Bobby can represent the behaviour of the group as a whole. Bobby sometimes was not visible because it was in a high canopy. If Bobby was not visible, then the behaviour observed is the behaviour of the other group members in general. Below is the daily behavior of post-released Bobby group at the Biru Mountain, Batu, East Java.

1. Feeding Activity

Bobby groups mostly consume young leaves, shrubs, flowers, and fruits. Langur ate shoots and soft leaves entirely. Old leaves were generally only eaten in parts near the base that contains a lot of water. The most eaten plant by Bobby group was *Eupatorium* sp. The most eaten fruits were the fruit of *Ficus montana*, *Ficus* sp.1, *Ficus fistulosa*, and *Saurauia* sp. Those fruits will be eaten whole. As for fruit of *Aglaia* sp. was only part of the white flesh is eaten while the seeds and the skin of the fruit were thrown.

Bobby group were observed down to the forest ground for several times to eat fruit or plant that was located on or fell down to the ground, such as *Ficus montana* fruits and *Dendrocalamus asper* leaves. Bobby and Linseed was seen drinking river water. Linseed and Bobby had seen creeping down from the tree and then put its mouth to the fountain of the pipe hole and drank the water. Bobby also had been seen drinking water from river by dipping palm of its hand into the river and drank the water that collected in its palm.

Bobby and Diamond was observed eating soil. Both consumed soil by taking some soil and balled up. The soil ball then eaten for several bites and then the rest of the soil is disposed of. The leaves are eaten Primates may contain toxic secondary metabolic compounds such as tannins. Iron and kaolin contained in the red soil help neutralize tannins, phenolic acids, and alkaloid from the leaves; help metal absorption; and prevent dehydration in the dry season. The soil also contained ants, termites, and other insects, which is one source of protein (Bolton et al. 1998; Burton et al. 1999; Mahaney et al. 1995; Zuhra et al. 2009).

Table 1. Species of plants consumed by Bobby group of javan langur (*T. auratus*) at Biru Mountain, Batu, East Java

Familia	Species	Part of plants were consumed			
		Leaves	Fruits	Flowers	Other part
Actinidiaceae	<i>Saurauia</i> sp.		√	√	
Araliaceae	<i>Macropanax dispermus</i>	√			
	<i>Schefflera</i> sp.	√			
	<i>Trevesia sundaica</i>	√			
Aspleniaceae	<i>Asplenium</i> sp.	√			
Asteraceae	<i>Eupatorium</i> sp.	√			Stalk
Cannabaceae	<i>Trema orientalis</i>	√			
Celastraceae	<i>Lophopetalum</i> sp.	√			
Cucurbitaceae	<i>Gynostemma pentaphyllum</i>	√			
Cyatheaceae	<i>Cyathea</i> sp.	√			
Elaeocarpaceae	<i>Elaeocarpus sphaericus</i>	√			
Euphorbiaceae	Not identified	√			
	<i>Homalanthus giganteus</i>	√			
Fabaceae	<i>Erythrina fusca</i>	√			
Fagaceae	<i>Quercus sundaicus</i>	√			
	<i>Quercus teysmannii</i>	√			
Lauraceae	<i>Neolitsea</i> sp.	√			
Meliaceae	<i>Aglaia</i> sp.	√	√		
	<i>Dysoxylum densiflorum</i>	√			
Moraceae	<i>Ficus fistulosa</i>	√	√		
	<i>Ficus montana</i>	√	√		
	<i>Ficus padana</i>	√			
	<i>Ficus</i> sp.1	√	√	√	
Orchidaceae	Not identified			√	
Pandanaceae	<i>Freycinetia insignis</i>	√		√	
Poaceae	<i>Dendrocalamus asper</i>	√			
Rosaceae	<i>Prunus</i> sp.	√			
	<i>Rubus</i> sp.	√			
Rubiaceae	<i>Neonauclea</i> sp.	√			
Urticaceae	<i>Debregeasia</i> sp.1	√			
	<i>Debregeasia</i> sp.2	√			
Vitaceae	<i>Tetrastigma papillosum</i>	√			

Table 2. The way to eat plants by Bobby group of javan langur (*T. auratus*) at Biru Mountain, Batu, East Java

Way to eat	Part of plants were consumed
Pick leaf then eat it one by one.	<i>Eupatorium</i> sp. leaves, <i>Ficus</i> sp. 1 leaves, <i>Ficus montana</i> leaves, <i>Quercus sundaicus</i> leaves, <i>Quercus teysmannii</i> leaves, <i>Homalanthus giganteus</i> leaves, <i>Erythrina fusca</i> leaves, <i>Trevesia sundaica</i> leaves, <i>Trema orientalis</i> leaves, <i>Debregeasia</i> sp. leaves, <i>Freycinetia insignis</i> leaves, <i>Ficus fistulosa</i> leaves, <i>Gynostemma pentaphyllum</i> leaves, <i>Neolitsea</i> sp. leaves, <i>Tetrastigma papillosum</i> leaves, <i>Macropanax dispermus</i> leaves, <i>Rubus</i> sp. leaves, <i>Elaeocarpus sphaericus</i> leaves, <i>Ficus padana</i> leaves, <i>Neonauclea</i> leaves, <i>Cyathea</i> sp. leaves, <i>Prunus</i> sp. leaves, <i>Dysoxylum densiflorum</i> leaves, <i>Schefflera</i> sp. leaves
Pick a few leaves, hold it, then eat slowly until depleted.	<i>Eupatorium</i> sp. leaves, <i>Ficus</i> sp.1 leaves, <i>Ficus montana</i> leaves, <i>Debregeasia</i> sp. leaves, <i>Gynostemma pentaphyllum</i> leaves, <i>Tetrastigma papillosum</i> leaves, <i>Dendrocalamus asper</i> leaves, <i>Lophopetalum</i> sp. leaves
Crept down, break the stalk, climb back to the tree, then eat the leaves and stalk until depleted.	Leaves and stalks of <i>Eupatorium</i> sp.
Crane mouth approach stalks, eat leaves directly from the stalk without being picked.	<i>Eupatorium</i> sp. leaves, <i>Ficus</i> sp. 1 leaves, <i>Ficus montana</i> leaves, <i>Debregeasia</i> sp.1 leaves
Hold the stalk, pick the leaf, then it the leaf one by one.	Flowers and fruits of <i>Ficus</i> sp.1, fruits of <i>Ficus montana</i> , flowers and fruits of <i>Saurauia</i> sp., <i>Ficus fistulosa</i> fruits, <i>Dendrocalamus asper</i> leaves, orchid flowers
Hold the stalk, bite the tip of the stalk and shift to the other side until all parts are eaten into the mouth like a human eating satay.	<i>Ficus</i> sp.1 flowers, <i>Saurauia</i> sp. flowers, Euphorbiaceae leaves
Crane mouth to the stalk or crane stalk closer to the mouth, eat the leaves directly from the stalk without being picked.	<i>Ficus</i> sp.1 flowers, <i>Ficus montana</i> fruits, <i>Saurauia</i> sp. flowers, <i>Freycinetia insignis</i> flowers
Pick fruit, bite fruit to open it skin. Eat the fruits and throw the seeds.	<i>Aglaia</i> sp. fruits
Pick fruit, open the fruit by hand. Eat the fruits and throw the seeds.	<i>Aglaia</i> sp. fruits
Break the stalk. Crane stalk near to the mouth and eat the leaves one by one.	Euphorbiaceae leaves, <i>Asplenium</i> sp. leaves

Food competitor during the study was not observed. Wild javan langur wild and long-tailed macaque (*Macaca fascicularis*), which lives near Bobby group did not enter into the territory of Bobby group. The predator that threatens Bobby group was not found either. Some of eagles passed over the area Bobby group but not threaten the existence of this group.

The average of feeding activity by Bobby group during the observation is $44.22 \pm 7.80\%$. It is the highest activity of behaviour observed. The abundance and high diversity of the food plants makes Bobby group can find food easily. The cold temperature also make langurs eat a lot for generating of heat for its body.

2. Moving Activity

Moving activities on Bobby group were observed consist of walking, running, jumping, climbing, and creeping down. Moving activity not only occur in the tree but also on the forest floor. Langurs walk with quadrupedal position or using all four extremities. When its left anterior extremity move forward, the right

posterior extremity will followed, viceversa. Langur ran a manner as walking but with a higher speed and the posterior extremity beats more powerfully. Langurs jump performed by move back the posterior body first and then use the posterior extremities as booster. Langur body will be pushed ahead. While jumping, langur anterior extremities were swinging to prepare for gripping a tree branch in front of it. The posterior extremities were swinging to preparing land on the branch of a tree or the forest ground. Cauda swang when the langurs were in the air to help maintain balance.

Langurs are climbing using all four extremities in turn. Anterior extremities are used to pull up the body while the posterior extremities are used to push the body from below. Creeping down is done using all four extremities alternately. One of the anterior extremity will move downward and then followed by one of the posterior extremity. Anterior extremities are used to push the body down while the posterior extremities are used to hold the body in order not to fall.

Rus is the most active individuals in Bobby group. In the early weeks of observation, all four langurs were still several times fall from the tree. It can be caused by a

fragile tree branches and the locomotion capability of those langurs was not good yet so the footrests less steady. In the first week of the observation, the movements of Bobby group were very visible because each langur was still causing a noisy sound and crowd clamorous movement while jumping. But entering the fourth week of observation, the movements of langurs were difficult to be seen and heard.

Javan langur movements were very dependent on the group leader. Bobby acted as a seeker of food trees, trees for sleeping, and guides the movement for all members of the group. In the early weeks of the study, the movement of Bobby groups tend to spread in all directions. This was because the langurs still roam to explore and adapt to their new habitat.

Bobby group spent $9.75 \pm 3.74\%$ of its active time to move. Bobby and Rus have locomotion capability better than Diamond and Linseed. This is because Bobby and Rus are formerly wild langurs before it were caught by hunters, while Diamond and Linseed were born and grew at the zoo.

3. Resting Activity

Activities included into the resting category includes relax sitting, vigilant sitting, standing, sprawling, prone, and sleeping. Bobby group woke up at around 05.30 and started to move around at 06.00. Langurs will move toward the open tree canopy to warm themselves or sunbathing. After sunbathing, langurs began to move in search of food.

Relax sitting is a sit position with both legs closed. Javan langur relax sitting was done by sitting on a tree branch and its posterior extremity position were hanging down. Langur also sat with both feet extended forward, sometimes right and left foot crossed each other.

Vigilant sitting is sit position with both legs open so the penis can be seen clearly. Vigilant sitting was done only by the male leader of the group. Vigilant sitting was done to monitor members of the group and observe the possibility of competitors and predators presence in the neighborhood. Bobby usually vigilant sitting in the canopy of trees where visibility becomes more widely than in the middle strata. Bobby would speak "ok ek, ek ok" occasionally while vigilant sitting.

Standing can be done with two posterior extremity and with all four extremities. When standing, the langurs will be grounded in the branches of trees or on the ground. If the langur stand with its posterior extremities, its anterior extremities will be holding on to a branch to balance the body.

Sprawling was a resting activity with lying position on the tree branch and looks lazy but eyes not yet closed. When creeping down, the four extremities of langurs will hang down. Langurs noted to sleep when the eyes were closed. This can be seen when the eyes look white which means the eyelids already closed. Langur can sleep on

sprawl position, prone position, or lean on the other langurs.

Bobby group also did some activities such as scratched around the eyes, shaken its cauda, or cleaned itself (autogrooming) while resting. The body parts are cleaned such as extremities, ventrum, caudal, dorsum, waist, genitals, cheek, and gluteal. Autogrooming can also be done by licking and nibbling a certain body part to get rid of lice or dirt.

The observation was conducted during the rainy season so that almost every day the weather was cloudy and rainy. If the rain was coming, Bobby group did not observe eating and moving. Javan langur was looking for tidy part on the branch of a tree with relax sitting position or sleeping with hands flanking to a tree branch and feet overlap each other (Idris 2004). After the rain, langurs will start to move again.

Bobby group began looking for a tree to sleep at around 17:00 and began to sleep at around 17:30. But if the weather was cloudy or rainy, at 16:00 langurs were already in the trees where they slept. Trees used to sleep in general have the characteristics of relatively large size, height, dense, and relative highly branched. Those trees were suitable as a place to sleep because the group can hide behind the thick leaves, the branches can be used for sprawl and lean, and Bobby can still kept an eye around from the tree canopy. Trees to sleep can be used as a territory marker because langurs will disposal its urine and faeces on it so that would leave a smell in the tree.

Bobby group spent $43.58 \pm 7.94\%$ of its active time for resting activity. The high percentage of resting activity was because the observation was conducted during the rainy season where the langurs only performed relax sit and sleep when it was rain.

4. Social Activity

Social activities observed were allogrooming, pre-copulation, masturbation, copulation, grinning, threatening, chasing, fighting, food snatching, and alert sounding. All four members of Bobby group can make a sound, but only Bobby that can emit a variety of sounds while the females can only squeaking. Bobby would speak "ok ek, ek ok" occasionally to call the other group members or as a sign of the power of the group. If the other animals were appears such as wild javan langurs and long-tailed monkeys, Bobby will emit sounds louder and longer until the animal was gone. Grinning was done by showing canines on another individual. Grinning was done if there was another individual from outside the Bobby group. Javan langur threatening way was by showing canines and stuck out its tongue inside and outside of the mouth to another individual in front of him. Chasing was a follow-up activity of the threatening. It was done by chasing the target individual to make it leave the area.

During the study there was no significant food competitors but Bobby group area was surrounded by several groups of long-tailed monkeys and wild javan

langurs. There were some groups of long-tailed monkeys in Pusung Genderuwo and Pusung Watu Gedhek. Those are located on the west and east side of Bobby group area. In Pusung Watu Gedhek lived one big male wild langur with black fur. While in Pusung Genderuwo had observed one black male wild langur and a group consist of about 5 langurs.

The voice of wild langurs and long tailed macaques are a threat for Bobby. The voice sounded every day during the study. Bobby will be varied in responses to the voices and movements of other species outside the group. If there was a wild langur or macaque that sounds vague, Bobby would be indifferent because the distance between the group and the sound source was far enough.

Sometimes Bobby was also seen still continue eating activity even though the macaque voice is loud. But if the voice sounded very clear or there are movements of wild langurs, Bobby will soon climb to the top of the tree and do vigilant sitting while continuing to look to the direction of the sound or the movement. If the threatening voice sounded for a long time, Bobby will also make an alert voice until it stops its threatening voice. The alert voice can be sounds "ek ok, ek ok" or shouts "oook" very loud and repetitive. If the sound that threatens Bobby group was not stop, Bobby will chase the wild langurs but never seen both langurs fighting.

Bobby was observed twice chasing a wild javan langur. Bobby and the wild langur would perform an alert voice. Bobby would stop its voice when the wild langurs was silent and jumped away. Voice competition between Bobby and wild langur could take up to 30 minutes. As Bobby moved away to chase the other langurs, the other group members will remain in the same tree and not move anywhere. When Bobby returned after repeling the other langurs then the other group members can move to another tree.

No copulation was seen during the study but Bobby was observed perform pre-copulation movements for several times. Bobby often seen chasing Rus, Linseed, and Diamond. While chasing the females, Bobby did not make a voice, but the females will make a squeaking voice. Rus is the most common female chased by Bobby. In the third week of observation, Bobby seen sniffing the genital area of Rus but both of these individuals were not to perform copulation.

Javan langur females have estrous cycle during 21-30 days. Estrus period characterized by red patches around the genitals. Langur male would sniff the genital area of the female to know if it is entering an estrus period or not (Kurniawan 2014). During the observation, no red patches was seen around the genital of the three females in Bobby group. This was because the position of the females that sometimes closed its posterior extremities so that it was not able to see its genital. The absence of copulation behaviour for a month observation can occur because the langur has not entered an estrus period. The weather was dominated by rain and the cool temperatures can also

affect behavior of javan langurs. When it rains, langurs were prefer to rest in the shade, performed a relax sitting, or cuddling each other than do other activities.

Allogrooming is an activity performed by one langur to cleanse the body of other langurs. Allogrooming may be performed by scratching the body, cleaning the dirt, and look for lice. Besides aiming to cleanse the body, allogrooming will strengthen the bonds between the individuals and maintain the bond of the group (Serio-Silva et al. 2011).

On the Bobby group, allogrooming activities seen between Bobby and Rus; Bobby and Linseed; Bobby and Diamond; Rus and Linseed; Linseed and Diamond; Bobby, Linseed, and Diamond and allogrooming between Bobby, Rus, and Diamond. Allogrooming included cleaning the caudal, caput, dorsal, anterior extremities, posterior extremities, axilla, femur, hip, and gluteal.

Social activities performed by Bobby group was $2.45 \pm 2.45\%$. The activity showed a small percentage because the interference due to region and food competition from other species is not much happen. Reproductive activity was observed rarely so allogrooming was more representing of social behaviour categories than the other activities.

The most high feeding activity is in the morning and reached its peak at 08:00 to 09:30. In the morning the temperature was still cold so langurs eat a lot of plants to warm up its body. Leaves, flowers, and fruits were still fresh because of the dew in the morning. Feeding activity continue to a high peak in the afternoon at 15:00 to 15:30 as the temperature began to cool down and langurs requires a lot of energy after did a lot of moves during the day.

Moving activity of Bobby groups was fluctuative. This activity was higher in the morning at 6:00 to 6:30 when the langur just got up and moved to find a warm place to sunbathe. Moving activity also high at 7:00 to 8:00 and 14:30 to 15:00 when langurs search for its food. Bobby group also actively move at 16:00 to 17:00 when its search a tree to sleep.

Resting activity of Bobby group tend to be stable. The highest resting activity was at 10:00 to 12:30 when langurs finished eating. The highest resting activity also occurred at 17:00 to 17:30 when Bobby group has found a tree to sleep.

Social activity of Bobby group was fluctuative and could happen at any time. The highest social activity was occurred at 10:00 to 11:00 and at 13:00 to 14:00 when all langurs had finished eating and was followed by resting activity while several times doing allogrooming.

The movement of Bobby group tend to spread in all directions from the release site. This was because the group still explore to know its new habitat. Exploring also done to look for locations that had lot of foods and places to hide. Territory area of Bobby group for one month observation was 7023.1 m^2 . This number is small

compared with the other rehabilitant javan langur group that released in Hyang Mountain and Bromo Tengger Semeru National Park with an area of territory 94000-213000 m² (Kurniawan and Herna 2006; Kurniawan 2007).

The narrowness movement of Bobby group was because there were already several groups of long-tailed monkeys and wild langurs around the release site. This led Bobby to be more cautious in exploring the area in order not to pass through the territory of other animal groups. Observation was also conducted during the rainy season so that Bobby group prefers spend its activities by resting.

From the research it can be said Bobby group of javan langur was ready to lead a wild life. According Kurniawan (2014), Wira group of rehabilitant javan langur which was released at Biru Mountain fed 20 species of plants during the observation conducted from May 31th to September 30th 2014. While Bobby group fed 32 species of plants in one month observation at the same release site. This shows Bobby group has no difficulty in finding food or able to take most of the plants that have been available in their habitat.

The four langurs in Bobby group were already have good locomotion ability. In the early weeks of release, the four langurs made noise in every move from a tree to another tree. While in the last week of the observation, it was very difficult to see and listen to the movements of the four langurs. All members of the group were afraid of the sound of motorcycles and crowded human voice. As if there are hunters approached, Bobby group would be vigilant and spontaneously went away.

Bobby as the leader had dominated the movement of its group, especially in terms of foraging, search for resting place, and search for a place to sleep. Bobby has also been able to protect all members of the group with did a routine monitoring and immediately made an alert voice. Bobby also would chase an animal outside of the group who came near. Allogrooming activity was also common and was done by all members of the group.

The small territory of Bobby group in the first month of release might be a recommendation for the next javan langur release. In choosing the location of the release sought in places that have less territories of other animals, especially those that could potentially be a competitor of the group such as long-tailed monkeys and wild javan langur.

ACKNOWLEDGEMENTS

We would like to acknowledge the support of The Aspinall Foundation for funding this project. We would also like to convey our thanks to Javan Langur Centre on facilities provided. Thank you to JLC team in East Java including Misdiantok, Heri Kiswoyo, Ngatiin, Heru Setiawan, Joko Suyitno, Hery Suheri, and Indah.

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