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Reinforcing the isolated Javan langur population in the Coban Talun Protected Forest, East Java, Indonesia

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Summary

The Javan langur (*Trachypithecus auratus*) is listed by the IUCN (2012) as Vulnerable, with the reasons for population decline identified as the illegal pet trade, hunting, and loss and fragmentation of habitat. Populations of the subspecies occurring in East Java, *Trachypithecus auratus auratus*, occur in isolated forest fragments, and in many of these appear to be at low densities or in some cases extinct. The aim of the Coban Talun langur reinforcement project is to re-establish a viable, self-sustaining population of the Javan langur (*Trachypithecus auratus auratus*) in the Coban Talun Protected Forest, East Java, Indonesia. This is being undertaken through the release of langurs held at the Javan Langur Rehabilitation Centre (JLRC) in East Java, supplemented by langurs transferred from the captive breeding colony at Howletts and Port Lympne Wild Animal Parks in the UK. The project will involve intensive pre-release preparation, and long-term post-release monitoring and release site management. The first release of 13 langurs held at the JLRC occurred in September 2012, and all 13 are still alive after the first six months post-release. Six langurs from the UK were transferred to Java in January 2013, for release later in the year.

Figure 1. Javan langurs are all born with orange fur, but most turn black at a few weeks of age. (Photo: Iwan Kurniawan)

Introduction

The Javan langur *Trachypithecus auratus* (Primates: Cercopithecidae) is endemic to Indonesia and is currently considered as Vulnerable by the IUCN (Nijman & Supriatna 2008, IUCN 2012). It is also known as “Javan Lutung” or “Ebony Leaf Monkey” (IUCN 2012), and local names include “Lutung” and

"Budeng" (Wedana & Kurniawan 2011). According to the IUCN (2012), threats "include habitat loss and degradation due to expanding agriculture and human settlements, hunting for food and increasingly for the pet trade, fragmentation, and small isolated populations".

The IUCN (2012) currently recognises two subspecies, the "Spangled Ebony Langur" *Trachypithecus auratus auratus* and the "West Javan Ebony Langur" *Trachypithecus auratus mauritius*. Subspecific taxonomy is disputed, with a first genetic study unable to differentiate any subspecies (Rosenblum *et al.* 1997 in IUCN 2012). However a newer genetic study by Roos *et al.* (2008) confirmed the presence of two (and only two) langur taxa on Java, corresponding to the two subspecies recognised by IUCN (2012). Roos *et al.* (2008) also found the genetic differences between them similar to those between other recognised langur species, and therefore recommended the two taxa on Java be considered full species. This may be widely accepted in the future, but for the purposes of this document we follow IUCN (2012) and refer to them as subspecies. The nominate subspecies is the more widespread, occurring across much of eastern and central Java, and on the smaller islands of Bali, Lombok (where it may have been introduced), Palau Sempu and Nusa Barung (IUCN 2012). The *T. a. mauritius* subspecies has a much more restricted distribution, only occurring in western and central parts of Java.

Although born with orange-coloured fur, most individuals of the species turn black at only a few weeks of age (Fig. 1). However a small proportion of the nominate subspecies do not turn black, resulting in a red "erythristic" morph which occurs within a restricted area of eastern Java between Blitar, Ijen, and Pugeran (Groves 2001 in IUCN 2012).

Rehabilitated Javan langurs have previously been released by Petungsewu Wild Animal Rescue Centre to Mt. Hyang (around the peak) and Mt. Semeru (on the south and east parts). Langurs were released to forest fragments with no evidence of extant wild populations on three occasions, including at least 54 individuals. Post-release monitoring of these langurs indicated that they were able to survive and reproduce, but monitoring ceased when funding ceased in 2006, about two years post-release (M. Wedana, pers. obs.).

The Aspinall Foundation Indonesia Programme

As specified in the Memorandum of Understanding signed in December 2009 between The Aspinall Foundation and the Directorate General for Forest Protection and Nature Conservation, of the Ministry of Forestry of the Republic of Indonesia (TAF / PHKA 2009), the mission of The Aspinall Foundation's Indonesia Programme is to work with local partners for "the conservation management of rare and endangered wild animals and their habitat in Indonesia", through the following objectives:

1. To conserve the endemic primates of Java.
2. To support the Javan Rhino Habitat Protection Program.
3. To assist in the development of a forest restoration programme designed to enhance sustainable biodiversity and ecosystem conservation.
4. To support the development of a pilot project and policy for the management of conservation areas.
5. To support additional conservation projects through an agreement by both parties.

To achieve these objectives, The Aspinall Foundation Indonesia Programme undertakes the following activities (TAF / PHKA 2009):

1. In-situ conservation activities including: research, monitoring, habitat assessment, identifying locations for the reintroduction of endemic primates, and habitat management and protection to conserve wild populations.
2. Ex-situ conservation activities including: managing a rehabilitation centre, captive breeding, and reintroduction of captive Javan primates to their wild habitat.
3. Habitat protection and captive breeding programme for the Javan rhino.
4. Preparing policy guidelines for a pilot project to manage conservation areas.
5. Capacity building of PHKA personnel, other project staff and communities surrounding the project site.
6. Participating in both *in-situ* and *ex-situ* conservation projects for selected species with prior written agreement by both parties regarding the plan of operation.

As noted above, the first objective of the The Aspinall Foundation Indonesia Programme is "to conserve the endemic primates of Java" (TAF / PHKA 2009). This objective is realised within the framework of the operational programme called "Conservation of Javan Endemic Primates and its Habitat in Java", officially created through the signing on 25 May 2010 of an agreement between The Aspinall Foundation Indonesia Programme, the Directorate of Biodiversity

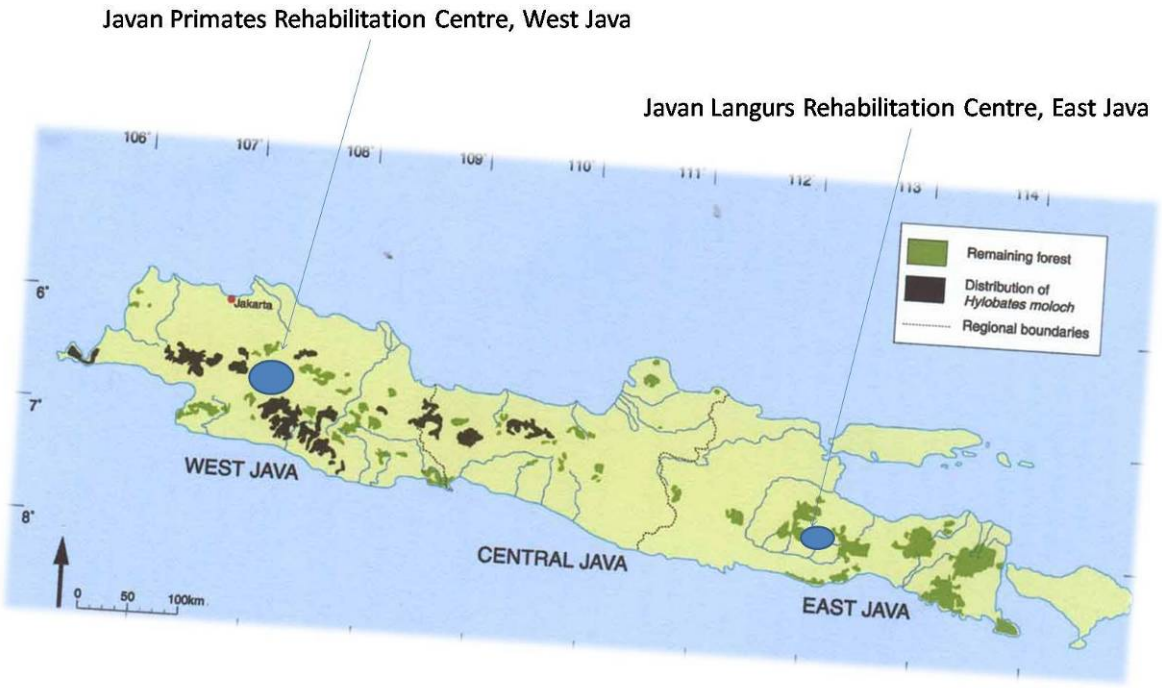

Figure 2. Map of Java with location of the two primate rehabilitation centres managed by The Aspinall Foundation Indonesia.

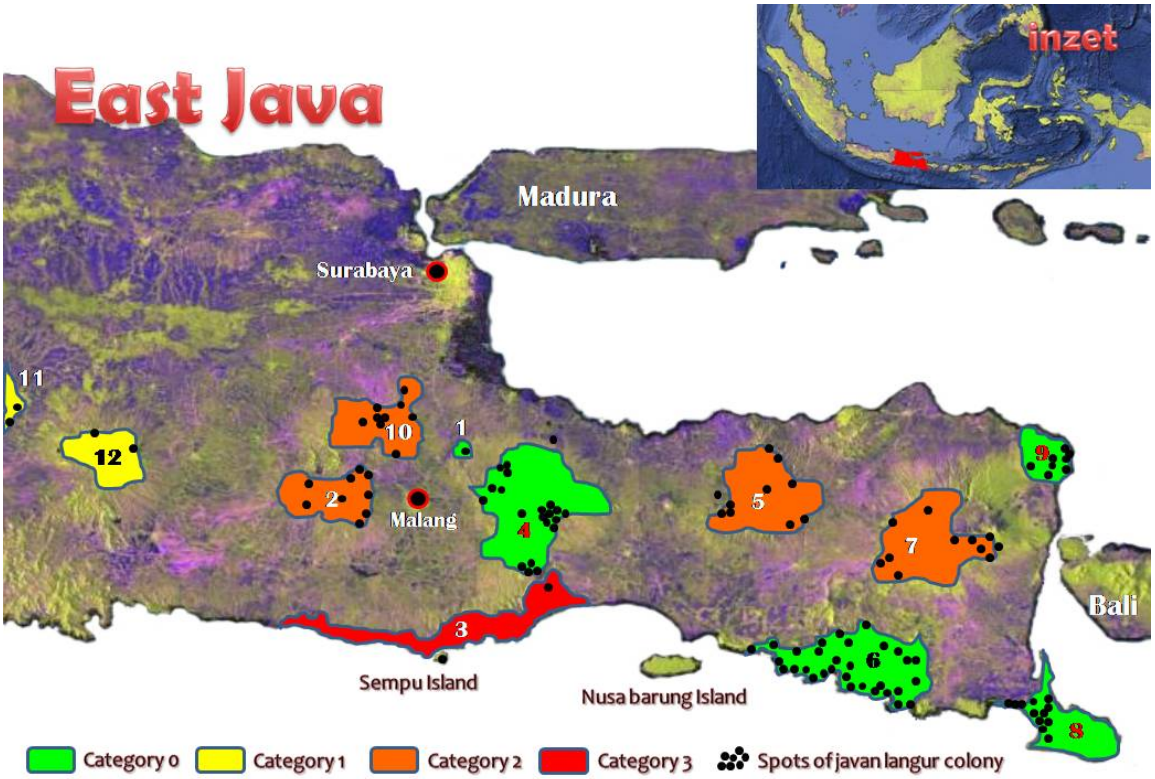

Figure 3. Sites in East Java surveyed by Wedana & Kurniawan 2011, with observations of Javan langurs (black dots) and levels of threats to the sites (no disturbance (green) to low-, mid- and high-levels of disturbance (yellow, orange and red respectively)). Site names: 1: Mount Baung; 2: Mount Kawi – Butak – Kelud region; 3: Blitar – Malang – Lumajang; 4: Tengger – Semeru mountains; 5: Hyang mountain; 6: southern Jember; 7: Ijen - Raung mountain area; 8: Alas Purwo NP; 9: Baluran NP; 10: Arjuna – Welirang – Anjasmara – Penanggungan mountain (including Raden Soerjo Grand Forest Park); 11: Lawu mountain area; and 12: Willis – Liman mountain area.

Figure 4. The JLRC (pre-release site) in the foreground and the Coban Talun Protected Forest, including the peak of the Gunung Pusungrawung release site, in the background. (Photo: Made Wedana)

Conservation, Directorate General Forest Protection and Nature Conservation, Ministry of Forestry of the Republic of Indonesia, and the State Owned Forestry Enterprise (Perum Perhutani), Ministry of Enterprise, Republic of Indonesia.

As part of the programme, The Aspinall Foundation Indonesia manages two rehabilitation centres in Java for primates previously illegally held in captivity, the Javan Primates Rehabilitation Centre (JPRC) in West Java Province and the Javan Langur Rehabilitation Centre (JLRC) in East Java Province (Fig. 2). The larger western JPRC caters for three species (Javan gibbon, Javan grizzled langur and the western subspecies of Javan langur), while the eastern JLRC caters for just one (the eastern subspecies of Javan langur).

The Coban Talun langur reinforcement is based out of the JLRC in East Java, and is managed within the context of the Javan Langur Conservation Programme (JLCP), run by The Aspinall Foundation Indonesia Programme in partnership with the Ministry of Forestry cq. Balai Besar Konservasi Sumber Daya Alam (BBKSDA) East Java, the provincial representative of the Directorate General for Forest Protection and Nature Conservation (PHKA) of the Indonesian Ministry of Forestry, and the State Owned Forestry Enterprise (Perum Perhutani) of East Java region.

Habitat and release site

The release site was selected following population and habitat surveys by The Aspinall Foundation Indonesia Javan Langur Conservation Programme, East Java, at numerous sites. Sempu Island Nature Reserve was surveyed in June and July 2010 (Kurniawan & Wedana 2010), and a further 12 sites from December 2010 to April 2011 (Wedana & Kurniawan 2011; Fig. 3). Following these surveys, the final choice of release site was the Gunung Pusungrawung forest block of the Coban Talun Protected Forest in Batu, Malang, East Java, located within the Raden Soerjo Forest Park (survey site 10 of Wedana & Kurniawan (2011); see Fig. 3). The Coban Talun Protected Forest is managed by a state owned forestry enterprise (or PERUM PERHUTANI - RPH Punten, BKPH Pujon, KPH Malang, Perum Perhutani Unit II Jawa Timur).

The Raden Soerjo Forest Park is mountainous (Fig. 4) and includes several forest fragments of 1,000 to 3,350 m altitude spread across an area of around 28,000 ha. Vegetation can be classified as “sub-montane forest” (1000 to 1500 m) “montane forest” (1500 to 2400 m), and “sub-alpine” (>2400 m) (Wedana & Kurniawan 2011). Annual rainfall is 6,600 mm.

The survey by Wedana & Kurniawan (2011) found the Javan langur population of Raden Soerjo Forest Park to be approximately 207 individuals in 25 groups, scattered across the isolated slopes of Mt Arjuno, Mt Welirang, Mt Anjasmara, and Mt Biru, at altitudes of 1,000 to 2,500 m. In the area of Mount Anjasmara to the top of Coban Talun waterfall, langurs were found to be rare despite previously being common according to previous data and information from local communities (Wedana & Kurniawan 2011). Conversion of forest land into agricultural land was identified as the major cause of declines of langur populations in the region, although hunting with modified pellet guns is also still occurring (Wedana & Kurniawan 2011).

The survey team found no langurs in the Gunung Pusungrawung forest block, with local information suggesting that they had been hunted (M. Wedana, pers. obs.). Follow-up surveys found three groups of langurs, with an average of six individuals per group, separated in the northern and eastern part of the mountain (M. Wedana, pers. obs.). A follow-up survey of the Gunung Pusungrawung forest block was undertaken in March 2012 to conduct detailed studies of biodiversity, threat potentials and vegetation (including wild food abundance) (Kurniawan 2012). The best part of Gunung Pusungrawung for langur releases was found to contain 150 ha of forest. Based on an average home-range for Javan langur groups of 20 to 25 ha (Wedana & Kurniawan 2011), the carrying capacity of the release site can be estimated as seven groups.

In addition to Javan langurs, one other primate species occurs in Gunung Pusungrawung, the long-

tailed (or crab-eating) macaque *Macaca fascicularis*. This species is omnivorous but with a diet consisting primarily of fruits (IUCN 2012), whilst Javan langurs are mostly (but not entirely) folivorous (Kool 1992, 1993). Therefore inter-specific competition should be minimal. No large mammalian predators appear to occur in Gunung Pusungrawung, but some birds of prey (black eagle and serpent eagle) have been recorded which could potentially take young langurs.

Release stock

The first release was undertaken on the 15th September 2012, consisting of 13 Javan langurs previously held at the JLRC in East Java (Table 1), aged from 2 months to 12 years at the time of release. Eight of these are thought to be wild-born, the five others are their captive-born offspring. Future releases will include new arrivals to the centre in the future, plus appropriate langurs from the captive colony at Howletts and Port Lympne Wild Animal Parks in UK. On the 31st January 2013, six langurs were transferred from Port Lympne and Howletts to Java, to be released later in 2013. They included one single male, and a newly mixed group of five females, aged from 5 to 14 years (Table 2). Samples from the Javan langurs held at Howletts and Port Lympne in UK were included in the genetic assessment of the *Trachypithecus* genus by Roos *et al.* (2008), and were confirmed as representing the east Javan taxon. In Java, only langurs of the east Javan subspecies will be held at the JLRC in East Java, or considered for release in East Java.

Disease risk and veterinary requirements

A veterinary protocol has been established for all langurs arriving at the JLRC, comprising four distinct phases during a quarantine period of at least three months following arrival (see TAF / PHKA 2012 for details), followed by a captive training and family forming period. For the langurs transferred from UK, all tested negative in virology exams (TAF / PHKA 2012), and they had further testing pre-transport for TB, faecal cultures, parasitology etc. Less than 30 days prior to any release, a final pre-release testing under sedation is undertaken to ensure that the langurs are fit and healthy, and not carrying novel and exotic diseases into the wild population (TAF / PHKA 2012).

Release implementation (including pre-release phase)

The transport of the langurs transferred from UK to Java in January 2013 included a flight to Jakarta then transport by vehicle to the quarantine area of the JPRC in Bandung, West Java (Figs. 5-8), and is described by Wedana (2013; WildCry no. 38). A pre-release phase for all langurs considered for release is undertaken at the JLRC in East Java, located only 4 km from the release site (Fig. 4).

Table 1. The 13 Javan langurs released from the Javan Langur Rehabilitation Centre to the Gunung Pusungrawung forest in East Java, 15 September 2012.

Name	Sex	Est. DoB	Age Mar 2013	Transponder ID	Notes
Tukul	M	13/06/2007	5.8	00066726C1	Born to Rojali & Nunuk
Minul	F	01/06/2000	12.8	000667433E	Delivered by owner 14 Jun 2007
Mentari	F	01/08/2005	7.6	070831289	From Bali 1 Feb 2008
Embun	F	01/02/2005	8.1	0006710038	From Bali 1 Feb 2008
Dian	F	01/04/2003	10.0	000670A03C	From PPS Jogja, 26 Mar 2008
Memey	F	01/03/2005	8.0	000670A061	Delivered by owner 7 Mar 2011
Rojali	M	01/11/2002	10.4	000630F39B	Confiscated 11 Mar 2003
Nunuk	F	01/01/2005	8.2	00067099E1	From Malang 26 Apr 2005
Andin	F	01/07/2006	6.7	000666FF01	From Lumajang 10 Dec 2006
Pepi	M	01/05/2009	3.9	000670B16A	Born to Rojali & Nunuk
Mandy	F	06/03/2011	2.0	0006709FCE	Born to Rojali & Nunuk
Philips	M	22/12/2011	1.2	956000002684170	Born to Rojali & Andin
Slamet	M	15/07/2012	0.7		Born to Tukul & Embun

Table 2. The six Javan langurs transferred from UK to Java in January 2013.

Name	DOB	Age Mar 2013	Sire	Dam	Stdbk No.	Transponder ID
Single male						
Adzuki	01/01/1999	14.2	?	?	314	0001FCDC2A
Group of females						
Tango	19/11/1998	14.3	H91049	Amber	334	956 000 002 407 123
Dwale	26/06/2004	8.7	Buck	Belladonna	443	956 000 001 838 815
Tequila	05/03/2007	6.0	Vodka	Lima	525	956 000 002 365 611
Diamond	02/08/2007	5.6	Vodka	Treacle	542	956 000 002 669 489
Linseed	01/03/2008	5.0	Mangrove	Poppy	580	956 000 002 367 473

Figure 5. The first group of Javan langurs arriving from UK at Jakarta International Airport, Java, February 2013. (Photo: Made Wedana)

Figure 6. The Javan langurs from UK arriving at the JPRC in Bandung, West Java, February 2013. (Photo: Made Wedana)

Figure 7. The Javan langurs from UK arriving at their quarantine facility at the JPRC in Bandung, West Java, February 2013. (Photo: Made Wedana)

Figure 8. The Javan langurs from UK settling in to their quarantine facility at the JPRC in Bandung, West Java, February 2013. (Photo: Made Wedana)

Figure 9. The welcome sign for the Javan Langur Rehabilitation Centre (JLRC), East Java. (Photo: Made Wedana)

Figure 10. The transport of 13 Javan langurs from the JLRC to the release site one week prior to release, September 2012. (Photo: Iwan Kurniawan)

Figure 11. The cage at the final release site used as part of a soft-release process for the first group of Javan langurs released in 2012. (Photo: Made Wedana)

The diet of the langurs during the pre-release phase includes food plants present at the release site. All necessary pre-release procedures, such as final veterinary exams and behavioural observations, are undertaken during the pre-release phase at the JLRC.

Transport to the release site from JLRC is in individual cages, carried for the one to two hour journey (Figs. 9-10). For the group released on 15 September 2012, a simple wooden cage was constructed at the final release site to allow a soft-release process (Fig. 11), where the langurs were held for one week prior to release. The staff of The Aspinall Foundation Indonesia have experience of three previous releases of Javan langurs, and use this experience to ensure the best possible release implementation.

Post-release monitoring

Staff of The Aspinall Foundation Indonesia with prior experience of langur releases are responsible for the post-release monitoring. Two local guides are employed to patrol the release site, and students from local Universities sometimes join the patrols and help the team to collect data. Unfortunately, no forestry rangers are currently involved on a daily basis in this patrol programme. Initial results show that all 13 langurs released in September 2012 were still alive six-months post-release (Figs. 12-13).

All released langurs will be monitored on a daily basis for the first year post-release. The frequency of monitoring after one year post-release will be determined by the project management team. Health checks will be carried out regularly, at one-month, three-months, six-months and one-year post-release, and then at least once a year for as long as the langurs can still be monitored. In a similar manner to post-release monitoring analysis that we have developed for reintroduced gorillas (King *et al.* 2012, in press), particular attention will be given to collecting data on demographic parameters such as survival, dispersal and reproduction, to aid assessment of initial reintroduction success and to develop a model of population dynamics for predicting future population viability and advising on the most effective strategies for subsequent releases. We will provide detailed evaluations of the post-release monitoring results from one-year following the first release, publishing in both national and international journals.

Conclusions

The Javan langur (*Trachypithecus auratus*) is listed by the IUCN (2012) as Vulnerable, with the reasons for population decline identified as the illegal pet trade,

Figure 12. One of the first released group of Javan langurs in Gunung Pusungrawung in March 2013, six months post-release. (Photo: Iwan Kurniawan)

Figure 13. One of the first released group of Javan langurs in Gunung Pusungrawung, feeding on leaves of a Kecubung tree post-release. (Photo: Iwan Kurniawan)

hunting, and loss of habitat. Populations of the subspecies occurring in East Java, *Trachypithecus auratus auratus*, occur in isolated forest fragments, and in many of these appear to be at low densities or in some cases extinct. The Gunung Pusungrawung forest block within the Coban Talun Protected Forest in East Java is one example of a forest fragment where the Javan langur appears to have been hunted virtually to extinction. The project to reinforce the currently very small Javan langur population in Gunung Pusungrawung will not only result in the re-establishment of a viable population at this site, but will also have secondary conservation benefits including increasing the protection of the forest and the Raden Soerjo Forest Park within which it is located, increasing the potential to conserve the species through finding solutions to the illegal pet trade, increasing public awareness of primate conservation issues in Java, and providing opportunities to national students to study issues relative to primate conservation as part of their University training.

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