

Int. Zoo Yb. (2008) **42**: 1–7

DOI:10.1111/j.1748-1090.2007.00031.x

The processes for releasing a zoo-bred Sumatran orang-utan *Pongo abelii* at Bukit Tigapuluh National Park, Jambi, Sumatra

L. COCKS & K. BULLO

Perth Zoo, South Perth 6151, WA, Australia

E-mail: leif.cocks@perthzoo.wa.gov.au

Perth Zoo released a sub-adult ♀ Sumatran orang-utan *Pongo abelii* in November 2006 into the protected Bukit Tigapuluh National Park in Jambi, Sumatra, where the Sumatran Orang-utan Conservation Programme (SOCP) is trying to re-establish an orang-utan population. This was the first release of a captive-born orang-utan into the wild. Temara is being closely tracked and monitored by Perth Zoo and SOCP staff. The aim is that she will be followed for at least 2 years. This paper describes: the pre-release preparation, the release process, the benefits of the programme, the monitoring process and the post-release results.

Key-words: captive-bred; orang-utan; release; Sumatra; zoo.

INTRODUCTION

Sumatran orang-utan *Pongo abelii* populations are <7% of what existed in 1900. There are *c.* 7300 left in the wild and the current rate of loss is *c.* 1000 year⁻¹. Unfortunately, 80% of the remaining Sumatran orang-utan habitat is covered by timber concessions in the troubled province of Aceh. The species is listed as Critically Endangered by the International Union for Conservation of Nature and Natural Resources (Eudey & Members of the Primate Specialist Group, 2006).

Sumatran orang-utans are the slowest reproducing species in the world (Galdikas & Wood, 1990). Females have their first infant at 15 years of age and then every 9 years thereafter. Even if habitat destruction could be stopped, without human intervention the recovery of the species would be *c.* 0·006% year⁻¹. Unlike the problem with numerous Bornean orang-utans *Pongo pygmaeus* in care centres in Kalimantan, owing

to the extinction of Sumatran orang-utan populations in the south of Sumatra after hunting pressure, there are only a small number of ex-pet Sumatran orang-utans available for re-introduction into the wild compared with the amount of vacant orang-utan habitat available. The release of zoo-bred Sumatran orang-utans has the potential to assist with the establishment of new Sumatran orang-utan populations in the wild and to increase gene diversity.

As the Sumatran orang-utan is Critically Endangered, it is imperative that viable released populations are built up outside the Aceh province. The Bukit Tigapuluh National Park (BTP NP) (144 000 ha) in the eastern province of Jambi in Sumatra contains the most intact examples of the entire mega fauna of Sumatra. Although orang-utans did historically occur in Bukit Tigapuluh and there are reliable reports of orang-utans persisting in the area up until the 1830s (Beccari, 1904, in Rijksen & Meijaard, 1999), they are now extinct in this area (Pratje, unpubl.). Negotiations are currently near finalization to expand the Park to at least 250 000 ha and there is also discussion about the Park becoming a world heritage site (P. Pratje, pers. comm.).

BTP NP is an extremely important area of land as it contains the Sumatran tiger *Panthera tigris sumatrae*, Asian elephant *Elephas maximus*, Sun bear *Helarctos malayanus*, Malayan tapir *Tapirus indicus* (Franklin, 2004; Save the Tiger Fund, 2004; Sumatran Tiger Trust, 2007), possibly still

some Sumatran rhinoceros *Dicerorhinus sumatrensis* and, now, re-introduced Sumatran orang-utans. These charismatic species upgrade Bukit Tigapuluh to the only National Park in Sumatra with a complete collection of the entire Sumatran mega fauna.

Logging and poaching activities within the Park boundaries have been stopped as a result of Orang-utan Protection Units (OPU) that are funded by the Australian Orang-utan Project. The OPUs also monitor and guard re-introduced orang-utans. A comprehensive orang-utan re-introduction project has been established by the Sumatran Orang-utan Conservation Programme (SOCP). To date, over 80 orphaned and pet-trade orang-utans have been released into the BTP NP under the auspices of SOCP's re-introduction project. The survival rate of the released animals is 77%, which is very high for orang-utan releases (P. Pratje, pers. comm.). The aim of the project is to re-establish a viable orang-utan population in BTP NP. This is carried out with the agreement and support of the Indonesian Government. *IUCN/SSC Guidelines for Re-introductions* (IUCN/SSC, 1995) require that orang-utans are not re-introduced into areas where there are existing wild populations.

After much consideration and discussion about the conservation programme at BTP NP, including the safety of the release site, confirmation that the project met the IUCN/SSC guidelines (IUCN/SSC, 1995) and with the endorsement of the Perth Zoo Board and the Western Australian Minister for the Environment, Perth Zoo committed to embark on a pilot project to release a suitable Perth Zoo-born orang-utan into this protected area. The first release animal, 'Temara', was to be ready for re-location from Perth Zoo to Indonesia in October/November 2006.

TEMARA'S PROFILE

Temara was chosen for release based on her gender, age, health and temperament. Temara was born on 14 September 1992, to 'Puteri', who naturally raised her infant, and 'Hsing Hsing'. Temara's older half-sister 'Utama' was also housed with Puteri and Temara for

numerous years. When she was 13 years old, which is the natural age of dispersion from the family group, the decision was made to release Temara at BTP NP and preparations for release began almost immediately (Table 1). Temara had a secure and nurturing upbringing and she was an intelligent and independent orang-utan who was active and showed good problem-solving skills. Temara ate a wide variety of food, including meat, and was always keen on her fodder feed (a mixture of different vegetation, including *Hibiscus* spp and *Ficus* spp). She was used to human company, although she was still wary of keepers when they entered her enclosure for contact sessions. These were all positive traits in terms of releasing an orang-utan. It was expected that Temara's intelligence and curiosity would encourage her to explore the forest, travel, construct sleeping nests and eat a variety of food including leaves. Her wariness of humans and independent nature would hopefully encourage her move away from the release station over time and not be reliant on the trackers for extra food.

HUSBANDRY

Perth Zoo has one of the most successful orang-utan breeding programmes in the world. The husbandry and enclosures at Perth Zoo promote natural behaviours, including nest building, foraging and tool use. Overall, the daily management routine for the orang-utans at Perth Zoo provides a stimulating environment and gives a solid basis for adaptation to a wild habitat. The orang-utans are physically and mentally healthy, and display numerous wild behaviours, such as nest building and good foraging skills, despite being in a captive environment. These natural behaviours give the orang-utans a very high chance of being successful in a wild habitat as the behaviours are transferable to that environment. Infant orang-utans at Perth Zoo are raised naturally by their mothers with no human interference. This puts mother-reared ♀ orang-utans in a strong position to raise their own offspring successfully if released into BTP NP.

DATE OF COMPLETION	ACTION
19 Apr	separate Temara from Puteri in late April to allow her to become accustomed to not being with her dam
21 Apr	introduce Temara to her half-sister Utama so that she is exposed to being with a different orang-utan, allowing her to develop social skills and increasing the chance of positive interactions with unknown orang-utans in Sumatra
6 May	Temara's diet (as well as all other orang-utans at Perth Zoo) changed to reflect a more wild diet
Jun	enclosure assessed as future quarantine exhibit for Temara
Early Jul	review Temara's body mass (target 42 kg)
11 Jul	Temara goes into the quarantine exhibit by herself (this process was originally planned for mid-July–August) to spend 2–3 months to become used to being by herself in preparation for being in quarantine at BTP NP and after her release
Aug–Oct	keepers start conditioning processes (almost daily), such as encouraging Temara to come down the climbing frame to receive food (once released in Sumatra, Temara will be offered supplementary food) and speaking some Indonesian to her so she becomes used to some key words that will be spoken around her at BTP NP
19 Aug	Temara enters pre-export isolation 60 days before departure (original expected departure date 19 Oct); general anaesthetic scheduled to carry out health assessment within the first month of this period so that all test results could be returned in a timely fashion, as per Veterinary Procedural Sheet for Orang-utan Release 2006
30 Aug	Temara had general anaesthetic and was given measles/mumps/rubella, polio and rabies vaccinations and X-rays were taken
10 Oct	second general anaesthetic completed and final vaccinations given
1 Sep	access given to large fig <i>Ficus</i> sp tree in exhibit by connecting the rope from the tree to the climbing frame, giving Temara practice at climbing in trees
31 Oct	Temara leaves Perth
1–15 Nov	14 days in quarantine in BTP NP in Sumatra
16 Nov	released into BTP NP during the fruiting season

Table 1. Summary of preparations for a captive-bred Sumatran orang-utan *Pongo abelii* from Perth Zoo due to be released into Bukit Tigapuluh National Park (BTP NP) in Sumatra.

TRAVEL TO BTP NP

Temara was flown from Perth to Jakarta on 31 October 2006 and then flown from Jakarta to Jambi. From Jambi domestic airport, a police helicopter transported Temara, Leif Cocks (L. C.; Exotics Curator, Perth Zoo), Kylie Bullo (K. B.; Senior Orang-utan Keeper, Perth Zoo) and Peter Pratje (Director of the programme at BTP NP) to BTP NP (a 45 minute helicopter trip). Although subdued by the time she arrived at the Park, Temara's demeanour improved dramatically when she was released into her quarantine enclosure in the mid-afternoon. She ate food and took fluids almost immediately and that night made a sleeping nest with leaves.

QUARANTINE

On arrival at BTP NP, Temara was put into a holding enclosure for a 2 week quarantine period. During this time, Temara's main keeper from Perth Zoo (K. B.) spent considerable time with her. Having a familiar keeper available at this time appeared to be very valuable as Temara was often quite subdued and showed aggression towards the Indonesian keepers at times. Temara's behaviour could be explained to the Indonesian keepers and K. B. helped to settle the orang-utan down when she became agitated (mainly during the cleaning regime). K. B. could also explain how to behave when close to Temara and how to hand feed her without being grabbed.

While Temara was in quarantine, she was introduced to her two Indonesian trackers: Herman and Perihshal. K. B. showed the trackers how to feed Temara treats and explained that they should speak to her quietly and say her name to achieve positive results. All interactions between Temara and her two trackers were kept positive and were carried out before the cleaning regime began at 1630 hours. These interaction sessions ensured that Temara was familiar with the two trackers before being released. Temara became accustomed to seeing the trackers in Perth Zoo uniform and related them to receiving food treats, such as boiled eggs and rice.

Temara was exposed to a range of wild fruits and leaves while in quarantine. She was also given large leaves to use as nesting material. Every afternoon, she made a nest in the back corner of the release enclosure. Other young orang-utans that were being looked after at the release station were brought within visual range of Temara, allowing her to observe them interacting with the BTP NP staff, climbing in the nearby trees and carrying out other natural behaviours.

While Temara was in quarantine, L. C. and K. B. spent considerable time becoming familiar with the marked trail system within BTP NP. Numerous trails are maintained and used by the trackers to reach their orang-utans every morning. These trails are marked every 10 m on a tree with red paint. There is a metal tagging system with the trail name (e.g. Trail Z) and the number in metres of where you are on the trail every 50 m. The authors trekked with Peter Pratje, who was very confident using the trail system and could provide guidelines and advice on the best trails to take.

We also practiced using a global-positioning system unit and compass while travelling in the trail system. The overall aim of these training sessions was to familiarize K. B. with the trail system and navigation techniques as much as possible so she could track Temara for an initial period after her release before handing over to the Indonesian trackers. After the release, K. B. often had to travel to Temara's nesting site by herself in the morning and so these familiarization sessions were very beneficial.

RELEASE

Temara was released on 16 November 2006 at 1100 hours. The release site was the same location as the majority of previous orang-utan releases. She was released in the late morning and so she would have a short first day in the jungle that would reduce the distance she could travel away from the release enclosure area on the first day. Temara's enclosure door was opened at 1100 hours. Within 30 seconds, Temara left the enclosure and began to climb the rubber rope that led from the enclosure to

a large nearby tree. An Australian film crew was present for the release to film the process for a current-affairs story. Other people present were the authors, Peter Pratje and the two trackers. Temara remained calm and decisive in her choices and actions. She returned to the enclosure twice and then moved into the forest area. Around 1 hour later, Temara moved to the ground and began travelling quickly away from the enclosure area. The film crew went back to the station to reduce the potential for stress for Temara, who travelled quickly along the ground for around 40 minutes before climbing a large tree. She was then hand fed by the authors and seemed quite relaxed while taking food. It was very positive that she accepted food while in a new and stressful situation. Temara foraged into the early evening on her first day in the forest until it became dark. She then became agitated and tried to come down to the ground. She seemed confused and agitated when it became dark but eventually made a quick sleeping nest at 1845 hours.

The plan is to follow Temara each day and closely monitor her for at least 24 months. This monitoring is being funded by Perth Zoo. L. C. remained at BTP NP for 9 days until it was established that Temara's release was going well. K. B. remained for 8 weeks. A daily protocol was kept by the trackers, who recorded the behaviour of all released orang-utans at 2 minute intervals to obtain a complete overview of their daily activity patterns. The orang-utans are followed each day until they make a sleeping nest in the late afternoon/early evening. The trackers only leave the site once their orang-utan is settled in its nest. They return by 0545 hours the following morning before the orang-utans have left their nest to begin foraging. Once the project director and trackers are confident that an orang-utan is self-sufficient, this tracking routine is no longer followed.

Temara began to adapt to forest life very quickly. On day 3, she constructed a very good sleeping nest 15 m high at a reasonable time (1745 hours). On day 4, she found numerous different forest fruits of her own accord and took food readily from L. C. and

K. B. On day 7, Temara's trackers began giving her supplementary food. Temara was wary at times but reasonably confident when taking food from the trackers.

During the first 5 weeks of Temara's release, she encountered many swarms of bees that were in great abundance, more than had been observed in the past (P. Pratje, pers. comm.), owing to an extended dry season. The bees proved to be a source of stress to Temara as she was often chased and stung repeatedly. When she encountered the bees, her tactic was to move to the ground and run away. At times, Temara would run very quickly and for quite long distances before being forced to climb a tree by the trackers, who were extremely proficient at keeping up with her. Other released orang-utans in BTP NP were also chased and stung by bees at times and these orang-utans also came to the ground as a means of escape. Most of the bees had gone by week 6 when the rainy season started. Temara very rarely came to the ground once the bees disappeared and was much more relaxed, only coming down to the ground for very brief moments when the canopy did not allow her to move to an appropriate tree. When she came to the ground, she would look at the trackers and was very wary, which was a positive behaviour. Temara appeared to choose to remain high in the canopy for the majority of the day.

On numerous occasions in the first few weeks, Temara travelled to areas within the trail system that had little fruit or very rough terrain. When this occurred, K. B. used food treats to coax Temara out of the area. She would usually travel along the ground when following K. B. and this behaviour was not discouraged because it was the quickest way to move her away from an inappropriate area. This proved how beneficial it was to have a familiar keeper with Temara for the initial release period, as she showed great trust in K. B. in many situations and would follow her for long periods of time. At this early stage, Temara would not have followed the trackers as she was not very familiar with them. Temara also allowed K. B. to check her closely after a bee attack, as well as perform



Plate 1. Kylie Bullo feeding and completing a health check on Temara, a captive-bred Sumatran orang-utan *Pongo abelii* released into Bukit Tigapuluh National Park, Sumatra. Perth Zoo.

other regular routine checks (Plate 1). Over time, the trackers began to feed Temara more and to coax her to a new area if needed. Temara responded particularly well to one tracker, who was very soft spoken. She was more wary of the other tracker, who was quite loud and extroverted.

FOREST ROUTINE/STRATEGIES

During the first few weeks after release, Temara often slept or stayed in her nest until late morning and even early afternoon and did most of her foraging in the mid- to late afternoon, often nesting quite late at 1830 hours (Plate 2). Most other released orang-utans settled into their night nests by 1700 hours. Over time, Temara's routine began to change and then she often left her nest by 0900 hours (sometimes before 0700 hours) to begin foraging in nearby trees. She then rested for a long period during the middle of the day and foraged again in the mid- to late afternoon before making her night nest at about 1700–1730 hours.

After following Temara for 8 weeks, it was clear that she had developed some definite routines and survival strategies. She would stay in a small area for up to a week at a time and would often use the same nest, adding extra bedding material (leaves and small



Plate 2. A large nest built by Temara in week 6 of release. Perth Zoo.

branches) when settling down for the evening or during the day. An excellent nest builder, she often constructed large nests that took up to 30 minutes to complete.

From week 5 onwards, Temara often foraged during the day, collecting food and then returning to her nest, where she could be heard eating. She would also leave her nest, go to a nearby tree and feed for around 10 minutes. She would then store as much fruit as she could in her mouth, return to her nest and eat the fruit there. In two areas she used in weeks 6 and 7, she had two nesting trees at each site. She often moved between these nests during the day and sometimes transferred nesting material between the nests, which were up to 30 m apart. This was unusual orang-utan behaviour but was not negative and was very interesting for her trackers to observe.

Temara stayed in the same area for 9 days during week 6. She had a very large nest in a 40 m-high tree and a second nest around 30 m away in a smaller tree. There was an abundance of fruit in the trees near her large nesting tree. Temara only travelled a minimal amount during this time. She seemed to move on from the area once she had eaten all of the nearby fruit. She then stayed in the next area for a week before moving on. Since that time, reports indicate that Temara is continuing to stay in a small area for up to a week at a time and only moving on once the food supply has



Plate 3. Temara, a captive-bred Sumatran orang-utan *Pongo abelii* released into Bukit Tigapuluh National Park, Sumatra, eating wild fruit in a tree. Perth Zoo.

been exhausted (Plate 3). Despite the fact that most orang-utans travel more than this, Temara appears to be succeeding with this strategy and is often rejecting food offered to her by her trackers at the end of the day. This indicated that Temara was not hungry as she had exhibited this behaviour towards keepers offering her food in her exhibit at Perth Zoo once she had access to a fruiting fig tree.

CONCLUSION

Although it will be a long time before we can establish firm conclusions, the release of Temara, a captive-bred Sumatran orang-utan from Perth Zoo, into the jungles of Sumatra has so far proven to be successful. Temara has exhibited numerous behaviours that indicate she will be able to survive successfully in the wild, including:

- good foraging skills;
- travelling to new areas to find varied food sources;
- successful and appropriate interactions with other orang-utans in the area;
- excellent nest-building skills.

Temara has also shown a good balance between healthy curiosity and being wary of new things. She is relaxed and confident in her forest environment, very rarely comes to the ground, spends most of her time high in

the canopy and is becoming familiar with a larger area of forest around the release station that may well become her home range. Consistent with the solitary nature of wild orang-utans, Temara appears to be seeking to establish her own territory.

Temara is not reliant on human contact, although she is closely monitored from the ground. She will be offered supplementary feeding while going through the adaptation period but, as yet, little has been required. At the time of writing (7 months after Temara's release), the non-fruiting season has just started and so far she is doing well. Temara has semi-regular encounters with other released orang-utans of various ages, some with advanced forest skills. This is providing Temara with the opportunity to observe additional wild behaviours, such as exploiting new food sources, including bark. To date, she has shown little interest in actual social interactions, as would be predicted for a sexually mature ♀. She has not encountered any mature ♂♂ since being released.

Temara has already demonstrated that even if an orang-utan has never experienced life in the wild, if mentally and socially healthy, they should possess the skills, curiosity and intelligence to adapt to living in a wild habitat with the appropriate support. Although it is currently not possible to make a direct comparison with ex-pet orang-utans, owing to the small sample size, preliminary observations appear to show that the better mental health of appropriately raised captive-bred orang-utans may give them an advantage over their ex-pet counterparts that have been raised under less than ideal circumstances.

REFERENCES

- BECCARI, O. (1904): *Wanderings in the great forests of Borneo: travels and researches of a naturalist in Sarawak*. London: A. Constable & Co. Ltd. [Cited in Rijksen & Meijaard (1999).]
- EUDEY, A. & MEMBERS OF THE PRIMATE SPECIALIST GROUP (2006): *Pongo abelii*. In *2006 IUCN red list of threatened species*. Gland and Cambridge: IUCN. <http://www.iucnredlist.org/>
- FRANKLIN, N. (2004): *Expanding Bukit Tigapuluh National Park to create the largest protected lowland tiger habitat in Sumatra*. Dalton in Furness, Cumbria, UK: Sumatran Tiger Trust. <http://www.tigertrust.info/documents/expandingbukitlargestlowland.pdf>
- GALDIKAS, B. M. F. & WOOD, J. W. (1990): Birth spacing patterns in humans and apes. *American Journal of Physical Anthropology* **83**: 185–191.
- IUCN/SSC (1995): *IUCN guidelines for re-introductions*. Gland and Cambridge: IUCN.
- PRATJE, P.-H. (Unpublished): *Fruit tree availability in Bukit Tigapuluh National Park as an estimator of orangutan capacity*. Survey Report for the Indonesian Ministry of Forestry, Department of Nature Conservation, 2000.
- RIJKSEN, H. D. & MEIJAARD, E. (1999): *Our vanishing relative: the status of wild orangutans at the close of the twentieth century*. Wageningen, the Netherlands: Tropenbos Publications.
- SAVE THE TIGER FUND (2004): *Integrated tiger protection and monitoring in Bukit Tigapuluh National Park of Sumatra, Indonesia: Part 1. A project of the Sumatran Tiger Conservation Program*. Washington, DC: Save The Tiger Fund, in collaboration with Directorate General of Forest Protection and Nature Conservation, Ministry of Forestry RI, The Tiger Foundation (Canada) and Sumatran Tiger Trust (UK) with the Management Unit of Bukit Tigapuluh National Park, Riau & Jambi Provinces, RI. <http://www.savethetigerfund.org/AM/Template.cfm?Section=Home&CONTENTID=2234&TEMPLATE=/CM/ContentDisplay.cfm>
- SUMATRAN TIGER TRUST (2007): *Bukit Tigapuluh National Park*. Dalton in Furness, Cumbria, UK: Sumatran Tiger Trust. <http://www.tigertrust.info/fieldbukit.htm>

Manuscript submitted 6 March 2007; revised 20 June 2007; accepted 26 June 2007