Tree Climbing Methodology for Orangutan Conservation

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Abstract: Habitat loss, poaching and the pet trade have resulted in thousands of orangutans being rescued and taken to rehabilitation centers, many of them infant or juvenile orphans. Besides caring for them, the goal of these centers is to train them for release back into the wild, and critical to the success of post-release survival is their competence in moving through the forest canopy. Orphaned orangutans need regular practice at tree-climbing in order to prepare them for their future life in the wild. Training for this is lacking at rehabilitation centers, however, because caregivers engage with the orphaned orangutans largely on the ground. Orangutan rehabilitation can be greatly improved by training orangutan caregivers in a standardized and safe method of tree climbing so that they can encourage and accompany orangutans to spend more time in the trees. Caregivers trained in tree climbing can also help in wild orangutan rescues, in center maintenance and, through arboreal data collection, in scientific research. We discuss the practical solution of implementing a standardized tree climbing method to orangutan caregivers. Professional climbers have volunteered with the nonprofit Tree Monkey Project to teach orangutan caregivers in Bornean Indonesia and Malaysia. The tree-climbing training program has been successful in allowing caregivers to climb trees alongside orphaned orangutans, encouraging the orangutans to increase the time they spend in the trees and allowing them to hone their agility and skills in moving about in them.

Key words: Orangutan, tree climbing, rehabilitation, arboreal locomotion

Introduction

Orphaned orangutan post-release survival is substantially dependent upon their receiving proper training at their rehabilitation centers. It is vital that they be prepared for an arboreal life, yet orangutan training at rehabilitation centers is largely at ground level or only limited heights above the ground. A survey of survival rates from reintroduction showed that it ranges from 20\% to 80\%, providing a realistic average of 40\% successful survival (Russon 2009). One of the critical skills determining survival is competence in travelling in the tree canopy to explore their home range, to make nests to rest and sleep in (Descovich et al. 2011) and, most particularly, to find food sources (Rosen and Byers 2002) and have the agility and skill to reach and feed on them (Russon 2002; Descovich et al. 2011). It has been shown that captive orangutans that build complex nests for a more comfortable sleeping environment sleep better (Samson and Shumaker 2013). Enhanced arboreal skills enable orangutans to build more complex nests, and nests higher in the canopy where they are better protected from tigers (Riedler et al. 2010).

Common practice at orangutan rehabilitation centers and their forest schools is for the human caregivers to interact with orangutans while at ground level where the humans are most comfortable. Caregivers may also encourage the orphans to explore constructed wooden jungle gyms of limited height. Much better would be to have the caregivers climb the trees and/or rest on arboreal platforms. This would encourage the orangutans to follow their mother substitutes to higher up in the trees, and thus make them exercise better their natural climbing abilities. The climbing technique for human caregivers we describe here is synthetic-rope-supported access to the canopy. The aim is not to teach locomotion techniques to orangutans but for the caregivers to get up into the canopy and encourage and motivate the orangutans to follow them, navigating the trunks, branches and lianas to acquire and practice the necessary skills. Climbing towers and canopy decks should be constructed if there are insufficient or no trees in the training areas.

There are other advantages to tree climbing competency. Staff could use the skill to improve the rehabilitation center’s outside facilities through maintenance such as trimming trees
around enclosures and pens to keep animals from escaping. When forests are being clear-cut for oil palm plantations or being degraded and fragmented by logging and mining operations, orangutans are often stranded and unable to escape, and personnel from orangutan rehabilitation and rescue organizations are then asked to rescue them. Rescuers dart the orangutan and are generally able to catch it in a net as it falls, but sometimes, the drugged orangutan becomes stuck in the tree, and a rescuer then has to climb up, without safety equipment, to release it (IAR 2015). Technical tree-climbing techniques using ropes, harnesses and the appropriate equipment would benefit rescuers in safely retrieving and rescuing orangutans.

A safe method for climbing trees would enable expanded and improved research on the ecology of orangutans. Monitoring orangutan numbers and distribution could be more precise if there were better measures of nest decay. Current research relies on ground and aerial surveys (Ancrenaz et al. 2004) and getting close up to the nest would yield more accurate results. Access to canopy nests could allow for research on long-term stress levels of orangutans. The Department of Biopsychology at the Dresden Technical University in Germany has a laboratory that analyzes hair cortisol, the primary stress hormone and a crucial indicator of animal welfare and survival. Hair taken from captive orangutans has yielded cortisol data correlated to stress levels, showing stress history over several years. Yet the department has not collected hair cortisol data from any wild or reintroduced orangutans (Carlitz 2016). Technical tree climbing could enable access to wild nests to directly retrieve hair samples for examining stress history and for genetic analyses. Hair samples from nests could identify reintroduced orangutans, contributing to monitoring their ranging and survival and, as indicated by Houle et al. (2004; p.237), “primate ecological studies can benefit from accessing the canopy to estimate intra-tree and inter-tree variation in food availability and nutrient value, patch and subpatch depletion, foraging efficiency, as well as nest structure and nesting behaviors, parasitic transmission and predator detectability.”

A way to enhance orangutan rehabilitation, rescue, and scientific research is to train orangutan caregivers and conservation staff in safe, technical tree-climbing methods.

**Tree-climbing Courses**

Modern tree-climbing methodologies and reliable climbing gear are already available. Using climbing methods derived from those of arborists, rock climbers, and speleologists (Houle et al. 2004) allows for access to the tree canopy for scientific research and data collection (Lowman and Whitman 1996). We have given courses to orangutan caregivers during four trips to Indonesia and Malaysia—early 2016, early 2018, late 2018, and early 2019 (Fig 1). The instructors completed official training from Tree Climbing International (TCI) and/or had significant field experience in the arborist industry. The methodology these instructors taught to the orangutan caregivers is the standard method used by TCI, which is intended for recreational tree-climbing purposes. The recreational method provides climbers with a simple and basic system to climb trees and maneuver within them. More advanced techniques used by experienced professional arborists for large limb removal, arboreal chainsaw work, and for the use and maintenance of a much larger assortment of equipment are not necessary for initial training and tasks for orangutan conservation. The basic recreational method is quicker to learn, simpler to remember, and has less equipment involved. Members of the Tree Monkey Project have found it to be fully suitable for the orangutan caregivers to accomplish and safely succeed in the conservation tasks discussed in this article. We emphasize, however, that this article is not an instructional climbing manual. A multi-day, hands-on climbing course supervised by experienced instructors is essential to achieve safe climbing practices. Here, we simply provide a basic overview of the methodology we have taught.

The climbing courses taught by the Tree Monkey Project instructors to the orangutan caregivers consisted of about five full days of field instruction. The first day begins with an introduction to the environment and the gear. Each orangutan conservation organization was given one or two, full sets of climbing gear (donated by the Tree Monkey Project), consisting of arborist climbing rope with a storage bag, auto-locking carabiners, additional gear carabiners, an arborist climbing saddle (harness) with side D rings for flipline attachment, flipline, lanyard for foot ascent, mechanical foot ascender, helmet, throwline cube with throwline, throwline bag with throwline, throw weights, slingshot on six foot pole, gloves, and a whistle (Fig. 2). All gear provided was new, certified climbing equipment. The students were told that if replacement gear is required in the future, then it is mandatory for arborist climbing rope, carabiners, arborist climbing saddle, and helmet to be purchased as new certified climbing equipment.
Tree climbing to help orangutan orphans

Figure 2. Tree-climbing gear provided to orangutan rehabilitation centers. Photograph by Judah Epstein.

equipment. Climbing equipment that is used or not certified for climbing is not authorized for use. Students were also instructed to wear boots for footwear. They were familiarized with the gear and proper gear inspection such as checking for cracks, fraying, worn materials, and cuts. All climbing gear has to be inspected prior to each use to ensure that it is clean and in suitable condition. After each use, all gear has to be cleaned and dry before properly storing.

Next, the site environment is inspected for hazards such as power lines, structures, and other hazards or fallen trees near the tree. The ground below the tree is inspected for indications of tree health, such as root flare, soil mounding, and standing water, and the tree is carefully checked for its health and the possibility that it presents personal hazards—the natural strength of the species, poisonous vines, insects, animals, cracks and splits, bark, fungus, rotting, dead and weak branches, and potentially falling branches. When the gear, the environment, and the tree are approved for scaling, the team then develops a climbing plan and begin setup for tree entry. The students are instructed with details regarding anchor (branch) selection, considering tree type, angles, branch union placement, and minimum diameter.

The climbing method taught is the Double Rope Technique (DRT). The students learn and practice the series of knots on the rope to setup the DRT system. Safety knots are always employed. The same system is used for ascent and descent. Such uniformity, with no modification to the system to switch between ascending and descending, increases safety and enables more ease and confidence to novice, and advanced, climbers. Upon sufficient repetitions to practice the basic climbing techniques, the students’ progress to more advanced climbing and maneuvering while in the canopy. They employ the same skills learned on the ground, but now implemented while in the tree. The climber learns to analyze and set a new anchor high up in the tree while connected to the initial anchor until the new anchor system has been verified, fully weight tested, and with safety knots tied. Students also learn to maneuver within the trees and among the branches, while maintaining a safety connection to the main anchor and possibly an additional line. Students learn to limb-walk along the branches. They primarily climb the rope to summit the canopy, but the branches can also be used for summiting and exploring through the height and width of the tree. They can even transfer to an adjacent tree. With the help and in-tree supervision of the Tree Monkey Project instructors, students climb various trees to experience and overcome the different challenges presented by each.

Courses given—2016

The Tree Monkey Project completed four climbing training courses to staff of eight conservation centers. The courses were not held in orangutan rehabilitation centers, and the Tree Monkey Project instructors did not meet with orangutans. In February and March of 2016, Tree Monkey Project personnel traveled throughout Borneo instructing staff of the following centers.

• The Orangutan Project: Matang Wildlife Center, Kuching, Malaysia
• Bornean Sun Bear Conservation Center (BSCC): Sepilok, Malaysia
• Tabin Orangutan Rescue: Sepilok, Malaysia
• Borneo Orangutan Survival (BOS), East Kalimantan Orangutan Reintroduction Program: Balikpapan, Indonesia
• Kawasan Wisata Pendidikan Lingkungan Hidup (KWPLH): Balikpapan, Indonesia
• Pro Natura Foundation, Sungai Wain National Forest: Balikpapan, Indonesia
• Borneo Orangutan Survival (BOS) / Orangutan Tropical Peatland Project (OUTrop): Nyaru Menteng Rescue Center- Palanka raya, Indonesia
• International Animal Rescue: Ketapang, Indonesia

Courses given—2018-2019

In February 2018, October 2018, and April 2019, we returned to the area of Balikpapan, East Kalimantan, Indonesia, specifically to train orangutan caregiver staff of Jejak Pulang, an Indonesian foundation supported by Four Paws International, Vienna, Austria (<https://www.four-paws.org/>). Initial training was provided to new students (February: five; October: five). Returning students (same as in February, plus one from KWPLH of 2016) received advanced training of split tail and flip line, which are techniques for maneuvering in the tree, along branches as well as up and down branches to reach higher and lower positions, and spiking which is a technique for ascending without using a high anchor. They were also given demonstrations of pruning and limb removal. The April 2019 course consisted of initial training to four new students, while returning students received advanced training of aerial rescue and the Single Rope Technique (SRT).
Considerations Regarding the Courses and Methods Taught

The two main methods of tree climbing with ropes are Double Rope Technique (DRT) and Single Rope Technique (SRT). The original plan of the Tree Monkey Project was to instruct all students first in DRT and then in SRT, within one week. During the first instructional week session in 2016, students successfully learned DRT and then progressed to receive initial instruction in SRT. Students had difficulty learning and achieving confidence with SRT because of the additional complexities of the mechanical equipment and varied method of ascent and descent, as compared to the simpler knot method of DRT. To maximize safety, the Tree Monkey Project leadership decided to discontinue SRT instruction for the initial one-week training sessions. The time that would have been allocated to SRT instruction transitioned to additional DRT practice, confidence building and maneuvering skills in the canopy. In April 2019, SRT was successfully instructed to returning students, after they had had months of DRT self-practice.

The expedition in 2016 trained dozens of climbers of several rehabilitation centers. Each center was left with a complete set of climbing gear. From most centers, either no climbing feedback had been received, or feedback of no ongoing climbing due to various reasons such as employee attrition of the trained climber. Positive feedback was received from KWPLH in Balikpapan, Indonesia, as one climber in the 2016 training returned for advanced training to both of the courses in 2018 with Jejak Pulang. This climber was very enthusiastic and has climbed often since the initial training in 2016. KWPLH is a center for Sun Bears, so this climber has used his abilities for center maintenance but not for orangutan rehabilitation.

The 2016 courses introduced the methodology throughout the island of Borneo as an innovative method to help orangutans improve their skills in moving about in the trees, and set the stage for success when reintroduced. While the 2016 courses may have had minimal direct impact towards the training of orangutans, the 2018 and 2019 courses have already made progress in this sense. The success of the 2018 and 2019 courses was in large part due to the Tree Monkey Project closely interfacing with the onsite leadership of Jejak Pulang, Dr. Signe Preuschoft, and the rehabilitation coordinator Nur Aoliya. The onsite leadership and scientists experienced the field training to understand the process and requirements. The leadership made the decisions regarding implementing forest school methods and adapting to the new procedures. Jejak Pulang is a relatively small rehabilitation center, which began operating only in 2017, and the leadership is more open and flexible to innovative methods for orangutan rehabilitation. The center currently houses only a small number of orangutan orphans with a focus solely on rehabilitation. These attributes have enabled Jejak Pulang’s initial success in implementing tree climbing at its forest school. The caregivers climb trees and the orangutans follow alongside their surrogate mothers, ascending to the canopy (Winter 2018). Caregiver climbing with orangutan orphans has been limited to infants of about 2 years of age, with high learning and high re-introduction potential (Figs. 3 and 4).

The 2016 training courses were marked by minimal interaction and first-hand climbing experience with the leadership of each organization. The instruction focused on the technique of climbing to the individual conservation staff. There was at least initial buy-in from leadership since it was the leadership that arranged for each tree-climbing training program. But we suspect that climbing may have been discontinued post-training, at least in part, due to leadership not being directly involved during the training. At Jejak Pulang, on the other hand, leadership was, and continues to be directly involved throughout.

All of the students in the 2016 courses and all of the students in the February 2018 course were men. Many of them were not the actual orangutan caregivers, but instead staff with other responsibilities at the centers. Most orangutan caregivers are women, acting as surrogate mothers,

Figure 3. The orphaned orangutan, Tegar, following her tree climbing surrogate mother, Aoliya, into the canopy. Photograph © Four Paws | Nanang Sujana.

Figure 4. Tegar, an orphaned orangutan, encouraged by caregivers, Yani and Aoliya, to climb into the canopy. Photograph © Four Paws | Nanang Sujana.
and women in Borneo, for cultural reasons, are less encouraged to participate in the tree-climbing program. The successful February-2018 training at Jejak Pulang of only male students (including actual caregivers) was followed by the October-2018 and April-2019 training at Jejak Pulang that included female orangutan caregivers. We were able to successfully engage the main caregivers, by working closely with the leadership in demonstrating the usefulness and worth of the methodology.

The October-2018 course successfully instructed caregivers in climbing trees to encourage orangutans to be arboreal, but the Tree Monkey Project also constructed two platforms high up in the trees at the forest school that could be reached with ladders. This allowed caregivers to be up in the trees without the need or expertise of tree climbing. This method improved on the caregiver interacting on the ground with the orangutan in that it led to the orangutans being higher up and spending more time in the trees, even though it lacked the maneuverability in the arboreal environment for optimum interaction between the caregiver and orangutan.

Conclusions

An orphaned and rescued orangutan’s acquisition of competence in arboreal living skills is obviously critical to its survival post-release. We have successfully taught orangutan conservation center staff throughout Borneo a standardized tree-climbing methodology for working with young orangutans in one important aspect of their rehabilitation. To enhance effectiveness, the training should be well coordinated with the onsite leadership and decision-makers of the center. The leadership must be inclined towards innovation and capable of, and committed to, adapting their existing programs. The tree-climbing training program for the conservation staff has had some initial success in so far as caregivers have climbed trees at the forest school and been able to encourage the orphaned orangutans towards arboreal activity. Time will tell if this will be significant in increasing the success rate in reintroduction as a result of what we believe will enhance their skills in moving about in their arboreal world. Next steps may be to carry out comparative studies of the well-being and skills of those orangutans that receive care that extends to providing this extra arboreal activity with those that perchance do not, and to subsequently accrue data on rehabilitation success and the benefits of tree climbing to the maintenance, rescue, and research activities of the rescue centers.

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