



Birth Management Plan for Sumatran Orangutan 'Tara'

Angie Selzer – Primary Orangutan Keeper

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Fort Wayne Children's Zoo Orangutan Birth Management Plan

(Final Draft)

By Angie Selzer, Primary Orangutan Keeper

Overview

0.1 Sumatran Orangutan, Tara (Studbook #2708) is currently housed in a group of 1.2 orangutans. Pregnancy was confirmed on 6 April 2014 and estimated to deliver her infant between **11 November 2014** and **5 December 2014**, with a due date of 23 November (+/-12d) based on copulation dates and her last observed menstruation, as well as onset of labial swelling. Tara has had no prior experience around infants or younger siblings.

Event Dates

- **6 March 2014 – Last observed menses**
- **6 April 2014 – Labial Swelling observed in pairing with nipple enlargement**
 - **Positive Clear Blue Easy test confirmed pregnancy**
- **13 April 2014 – Small amount of blood present in daily urine test strip – possibly due to egg implantation**
- **April, May and first half of June – Decreased activity level and appetite**
- **10 June – Increased activity level to pre-pregnancy levels**
- **2 May, 18 June and 28 June – Melati showing aggression toward Tara and Tengku breaking up any altercations**

Objectives

- ✓ Promote the maternal care of Tara's infant
- ✓ Prevent medical complications through careful observation and emergency preparedness
- ✓ Formulate protocols for both anticipated outcomes and "plan B" scenarios
- ✓ Establish staff roles and a chain of command

General Species Information

(Taken from Orangutan SSP Husbandry Manual)

Gestation

Female orangutans become sexually mature around 7 to 10 years of age, which is indicated in the individual animal by the beginning of a monthly menstrual cycle. In the wild, females do not generally give birth until 12 to 15 years old, although in captivity they may reproduce as young as 7 years old. The duration of an average menstrual cycle is approximately 23 to 33 days in length, with menses lasting from 1 to 4 days.

The most obvious sign of pregnancy is the swelling of the labia majora; this occurs abruptly over several days around 2 to 4 weeks after conception. The swelling will remain until after parturition, and may continue to enlarge throughout the duration of the pregnancy. Though there is some variety in appearance and size between individuals, this is the most easily observed indicator of pregnancy, and the best method for confirmation according to the Orangutan Species Survival Plan (SSP)©. In addition, human test kits that

detect the presence of human chorionic gonadotropin (HCG) in urine and ultrasound may also be used to confirm a suspected pregnancy.

Gestation lasts an average of 8.16 months (245 days, +/- 12 days), and is frequently accompanied by both behavioral and physiological changes. Loss of appetite, lethargy and personality changes are all reported by the SSP© Orangutan Husbandry Manual as having been observed in pregnant orangutans. It is also noted that “during the later stages of pregnancy, females may appear agitated, restless, [. . .] avoiding interactions with conspecifics” (Sodaro et al, 2006). Around one month into gestation, the mammary glands begin to enlarge and the nipples swell. Some females have been observed to self nurse. Constipation has also been observed during the later stages of pregnancy.

Parturition

Reports on the duration of labor vary from 25 minutes to 4 hours, depending on the health and reproductive status of the female, as well as the number of offspring she is carrying (although twinning is rare). The labor process is generally comprised of three stages. During the first stage, the female shows signs of discomfort, her activity level increases, and a clear vaginal discharge may be observed. The second phase constitutes the actual birthing process: the frequency of the contractions increases, the female may lie down (dorsally or ventrally), and the infant is expelled in a head-first orientation. The umbilicus is usually severed by the female with her teeth. Finally, during stage three, the placenta is passed. This may occur immediately, or as late as several hours after parturition. It is not unusual for the female or other members of the orangutan group to eat the placenta. Minor vaginal bleeding or continued contractions may be observed for up to several days after the birth (Sodaro et al, 2006).

Mothers generally clean the mucus from the infant’s face immediately following parturition, usually with either their fingers or by sucking. Sexual behavior may also be exhibited by the female towards her neonate, such as “dorsal-dorso mounting, oral-genital inspection and manipulation and insertion of fingers into ano-genital areas” (Sodaro et al, 2006). Infants should begin to nurse within 4 to 6 hours after birth, but in some cases it has been observed to take up to 2 days. The female should keep the infant clinging to her body at all times, usually either to her upper back and head or to her side. She may also spend more time resting than usual during the first few days after parturition, and changes in appetite (either increases or decreases) have been reported (Sodaro et al, 2006).

Infant birth weights vary considerably, ranging from 1420 – 2040 grams with an average of 1720 grams. They have minimal body fat at parturition, so “the rib cage is prominent and the abdomen may appear sunken” (Sodaro et al, 2006). Passage through the birth canal may cause the infant’s head to initially appear slightly misshapen (Sodaro et al, 2006). The first bowel movement is usually composed of meconium, a thick, dark stool produced *in utero*. Once the infant begins nursing, the stool becomes softer and pale yellow.

History of the Expectant Female

Relevant Social History

Tara (#2708) was parent-reared at the Albuquerque BioPark (formerly, The Rio Grande Zoo), which makes her a likely candidate for being a successful mother. Unfortunately, Tara never had the opportunity to interact with a younger sibling, as her mother had no other offspring while the two were together. Tara is subordinate to our other female Melati (SB #1987) and is quite aware of where Melati is at all times. Early in the pregnancy it had been observed that the two females had stopped spending time near each other, as previously it was a common occurrence. Melati has shown numerous bouts of slight aggression toward Tara where she will go after Tara across the exhibit. Tengku has been doing a good job of halting Melati's behavior, but Tara is allowed to come off exhibit if it becomes too much for her.

Reproductive/Health History

Tara is currently 19 years old and has been in consistent good health. She was moved from the Columbus Zoo to the Fort Wayne Children's Zoo for a breeding recommendation with Sumatran male Tengku (SB #2069) on 16 April 2013. She had been implanted with an MGA implant on 11 Jan 2011 which was removed during her pre-shipment physical in December 2012. At the time of her arrival to FWCZ she showed signs of menses. From that point on she was on a regular 21-28 day cycle and visible menses was apparent each month. She is also very reliable at giving a daily urine sample, so urine test strips were also used to determine start of menses each month even when it became not as visible. After her initial quarantine period she was started on an oral contraceptive Safyral (drospirenone/ethinyl estradiol/levomefolate calcium and levomefolate calcium) to give her some time for introductions and getting used to her new surroundings. Copulation between Tara and Tengku occurred on a regular basis almost daily from the first introductions. In January 2014 administration of Safyral was halted and she continued to have monthly menses. Her last observed menses was on 6 March 2014. By 6 April 2014 she had yet to show signs of menses and labial swelling was observed as well as nipple enlargement. Urine was collected and pregnancy was proven positive by administration of a Clear Blue Easy pregnancy test stick. A week or so later urine testing showed trace signs of hemolysed blood. After consulting with Orangutan SSP Husbandry advisor Carol Sodaro, it is believed that could be due to egg implantation and not atypical. No further blood has been seen in daily urine testing.

Current Status of Expectant Female

Present Social Group Considerations

Currently Tara is held with an adult male: Tengku/Patong #2069 (the sire of her pregnancy); and one other adult female: Melati #1987. Tara is a subordinate group member and is particularly fearful of Melati, the dominant female. Tengku and Melati have been housed together since 1995 when the exhibit opened. Tara's relationship with Tengku is generally amicable; when Melati is separated Tara often solicits interaction and offers food to him. She is generally more on alert when Melati is present. Prior to onset of pregnancy, Melati and Tara had been seen regularly grooming each other. Tara currently keeps to herself to avoid any altercations or intimidation by Melati and Melati has never been physically aggressive to Tara, but has been observed chasing her for short spurts on occasion. One altercation (5/2/14) between all three orangutans led to a short period of lameness in Tara's left foot, most likely due to a pulled muscle after being yanked on by either Melati or Tengku. Subsequent altercations included one where Melati chased Tara

to the flooded exhibit floor, since that incident, Tengku has been diligent about breaking up any altercations between the females. Tengku and Tara have been known to wrestle at times, but she also submits regularly to his copulation advances and cooperates with him.

In terms of evaluating potential risks, both during parturition and for the new infant after it's born, the adult female Melati most likely represents the greatest concern. This is due primarily to the intimidating and passive behavior she has displayed towards Tara in the past. Melati has been visually present for the birth and hand-rearing of orphaned male Dumadi in 2006 after the dam suddenly died after giving birth. Melati had been in the process of maternal training for potential surrogacy when she fell ill and Dumadi was moved to another institution. Presumably, she would not have reason to injure an infant, but there is no way to predict exactly how she may react.

Any of the other individuals in the group also have the potential to cause harm to Tara and her infant. Tengku has never had physical experience with an infant at this institution, but had witnessed the birth and hand-rearing of infant Dumadi as well in 2006. He did witness and was present as a juvenile when his mother Sibu had an infant, Tua, at Zoo Atlanta. Keepers have reported that he would often try to playfully swing and play with the infant, but Sibu would not allow it. Time wise, he tends to spend the majority of it alone or interacting with and being groomed by Melati. A lack of attention spent on him by Tara is not expected to cause any concern at this time. Also, Tara appears fairly confident around Tengku, and so she would likely be able to express to him her distress if any behavior he exhibited represented a threat to her or her infant.

In light of these concerns, appropriate preventative measures must be taken in order to ensure the safety of Tara and her infant. The simplest method to protect them during the delivery is to house Tara alone in holding at the first signs of labor (see *General Species Gestation Information* for the specific indicators). This will also be beneficial since it allows for better access to Tara in case complications arise during or after the birth. Mesh windows between the holding and the exhibit, as well as the adjacent holdings, will allow the group to maintain some degree of visual, auditory, and optional tactile interaction during this time. This should ease the reintroduction process. The actions and time scale implemented following the birth will be highly dependent upon the health of the mother and infant, as well as the perceived success of Tara's maternal skills.

Present Medical Considerations

Strongyloides

Tara has not had any fecal samples that were positive for Strongyloides since she has been at FWCZ. It appears she had one many years ago at a previous institution. When we did the Baermann's testing on our group, only Tengku had one sample that had one suspect larva in it. However, this doesn't mean that Strongyloides isn't a problem in our group.

Our plan for management is to maintain all adult orangutans on a prophylactic monthly Ivermectin treatment. The infant will also be started on Ivermectin once old enough, but that is not as effective as preventing the adults from shedding the parasite into the environment.

Strongyloides doesn't really pose as much risk for the pregnancy. It is more of a risk for the infant as it grows up and gets exposed to the parasite for the first time.

Balantidium

Balantidium coli is considered normal flora for orangutans and other great apes. It is an opportunistic

pathogen that might overpopulate during periods of stress or other GI disturbance, but it is likely present in any orangutan group.

Tara’s training staff also began focusing on voluntary trans-abdominal ultrasound conditioning. This would allow for the veterinary staff to monitor changes in the growth of the fetus, heart rate fluctuations (indicative of fetal distress), and amniotic fluid volume.

The most imperative factor during her pregnancy will be to maintain careful observation for any signs that would indicate 1) the fetus is at risk; 2) Tara is at risk; and 3) parturition is imminent.

Signs of Potential Pregnancy Complications Previously Observed in Orangutans

Observation	Possible Problem
bloody vaginal discharge (especially large quantities observed late in pregnancy)	placenta previa or placenta abruptio
signs of labor that last more than 6 hours	dystocia or placenta abruptio
thick, creamy, odiferous, or discolored vaginal discharge	uterine infection
lethargy or anorexia that lasts for more than 6 hours, missing a meal	pregnancy toxemia

Table 1 (Wells et al, 1990)

Medical Monitoring:

Scheduled monitoring for this pregnancy includes:

- Screening for blood in urine via urine dipsticks
- Screening for urine glucose & ketones via urine dipsticks
- Weekly prenatal ultrasounds by FWCZ veterinarians
 - Document fetal heartbeat & movement
 - Track biparietal diameter (BPD) to monitor fetal growth
 - Obtain other biometric data opportunistically
 - Intermittent fetal echocardiogram studies with ultrasonographers
 - Assess amniotic fluid volume
- Consultation ultrasounds with MD obstetricians
- Regular body weight checks

In addition to these specific monitoring parameters, primate staff carefully monitors food consumption, medication consumption, and overall demeanor on a daily basis.

Current Medications:

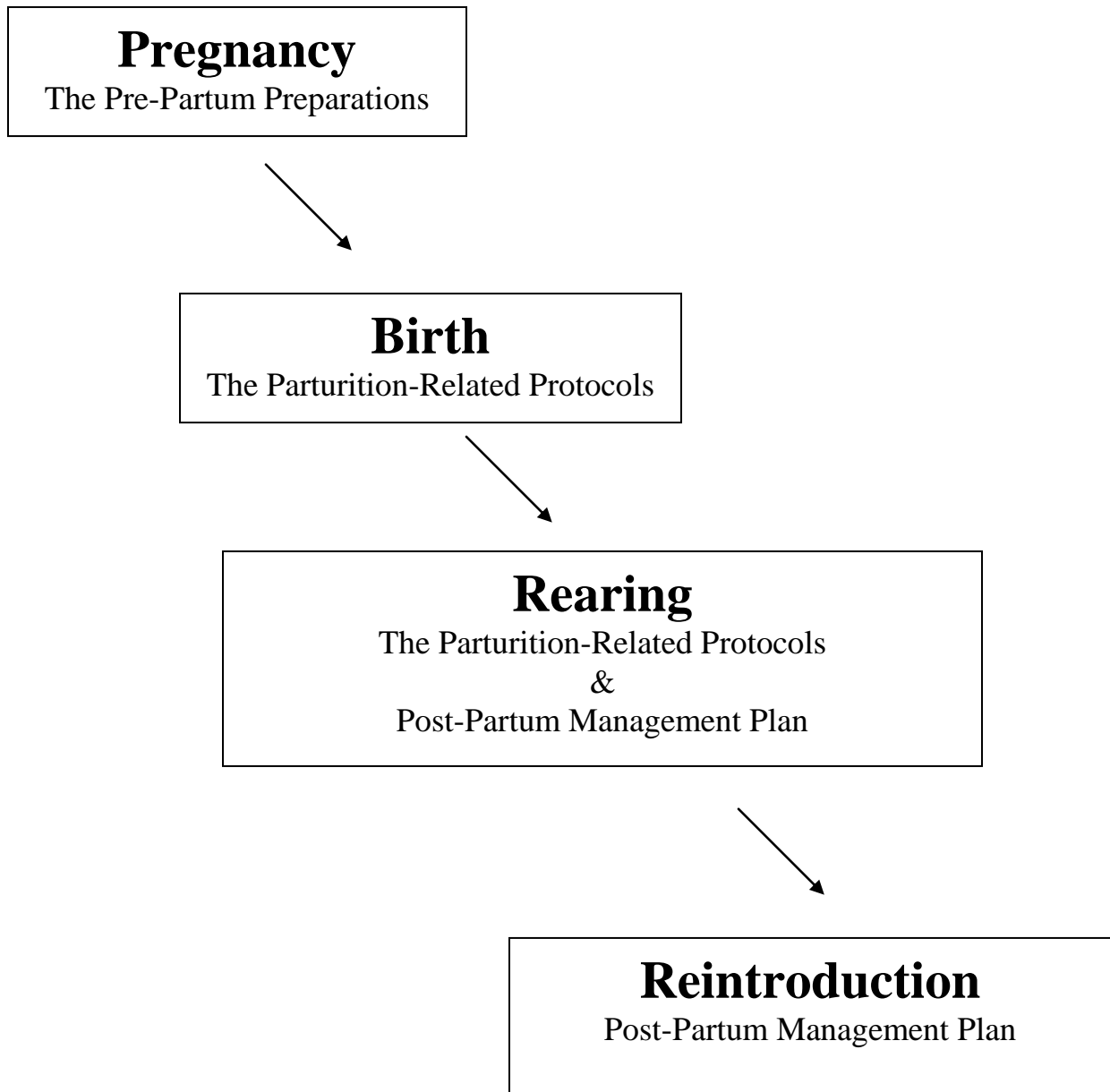
Human pre-natal vitamin: 1 PO SID

Ivermectin monthly dewormer: 0.2mg/kg PO q3od.

Overview of Preparations

There are four stages/phases that we must successfully progress through and consider:

1. Pregnancy {pre-partum preparations}
2. Birth {parturition-related protocols}
3. Rearing {parturition-related protocols & post-partum management plan}
4. Reintroduction {post-partum management plan}



Pre-Partum Preparations

Veterinary Consulting

Fort Wayne Children's Zoo's chief veterinary staff, Dr. Joe Smith will be overseeing all aspects of medical care for Tara and her infant. Dr. Kami Fox will serve as an emergency back-up and will participate in voluntary ultrasound training sessions with Tara. Dr. Jamie Stover is also available for emergency situations. Vet Tech Jen Diehl is also able to assist on abdominal ultrasounds during pregnancy.

Dr. Smith will compose a supporting team of medical professionals and an OB/GYN (Dr. Rumsey) to consult with during the pregnancy and parturition. Our plan if a C-section is needed would be to have an OB/GYN perform the surgery while FWCZ vets focus on the anesthesia. Additionally, the vet staff will consult with the SSP Veterinary Advisors (see **Professional Resources / Contacts**) regarding Tara's history and potential issues.

Physical Facility Review

The birth of Tara's infant should occur during the closed season months. This means that FWCZ orangutans will not be on public view and can have access to inside holding at any time deemed necessary. All orangutans are typically secured in holding overnight and are housed in these typical social groups, although all three are comfortable in any pen:

- INOR01: Tara
- INOR02: Tengku or Melati
- INOR04: Tengku or Melati

As of 11 November, we will raise the temperature set point in holding from 73 F to 78F, to reduce the risk of hypothermia to an abandoned infant. Overhead fans will also be turned off at night

However, there is flexibility within the group as any of the orangutans can be housed in any of the pens. Typically they are all separated each night and Tara seems to feel the most comfortable in INOR01. This pen is also the most ideal for housing her once she goes into labor. Tara, if she has the chance, would prefer to be inside so there should be no issue pulling her off exhibit once labor commences IF she is on exhibit at that time. Unless signs of labor occur early, staff will begin housing Tara alone in **INOR01** with ample amounts of bedding, **by 11/11**. Cameras will be mounted outside of Tara's holding to document the birth and resulting behavior.

If Tara chooses to remain in holding and not shift out she is allowed to stay in holding. Keeping Tara in holding at that time will be ideal for close observation during the imminent birth and post-partum care (should intervention be necessary). During this time, Tara and the other orangutans will retain visual, auditory and some tactile access through the mesh windows of the exhibit and adjacent holding shift doors.

Hand-rearing Equipment Review / Needs

All equipment required in the case of intervention and hand-rearing should be available prior to parturition (including oxygen set-up, incubator, thermometer, blankets, heating pad, sterile cotton, scale, bottles, nipples, Pedialyte, formula, and nursing record sheets). **All items are to be secured by 10/23**. Orangutan keepers, area manager and veterinary staff must review the Orangutan SSP Husbandry Manual's "Hand Rearing" chapter prior to parturition. **To be completed by 11/1**.

Nursery Equipment and Supplies

- Scrubs
- Disposable Foot covers
- Disposable Gloves
- Disposable Gowns
- Masks
- Diapers (neonatal/preemie)
- Diaper wipes
- Wet wipe warmer
- Bottles (4oz. and 8oz)
- Infant stethoscope
- Infant Thermometer
- Tape measure
- Formula (*Similac Advance (preferred), Isomil, Enfamil, SMA, Prosobee)
- Simethicone (Infant anti-gas drops)
- Sterile water
- Glucose water (D5W)
- Pedialyte
- Sheets/towels/blankets
- Chair / floor mats
- Heating pads
- Hot water bottle
- Baby cap
- Infant Tylenol
- Nipples
- Bottle sterilizer
- Drying rack for bottles
- Bottle warmer
- Infant scale
- Incubator
- Trash bin with lid

Maternal Training

Although Tara's history is suggestive of the potential for good maternal skills, maternal training still offers a proactive approach for furthering her chances of success. Tara has already achieved mastery of a number of important behaviors and is currently working on several others that will improve her maternal skills and prepare her to respond correctly and efficiently should staff need to intervene for any reason. Overall, the maternal training plan is designed to meet three main goals: 1) encourage Tara to perform maternal behaviors; 2) enable Tara to shift herself or an object upon request; 3) allow keepers to visually inspect the infant by having Tara present the baby to the mesh; and 4) prepare behaviors to lessen the stress on Tara during medical procedures. Table 2 summarizes a list of all the behaviors that will be useful, both during and after pregnancy.

Maternal Training Behaviors, Benefits & Level of Mastery

Behavior	Benefit	Level of Mastery
Present nipple and allow it to be manipulated	Desensitize nipple for nursing infant, aid in feeding through the mesh if infant must be removed	Trained
Present abdomen and allow it to be touched with probe or hands	Aid in ultrasounds and examinations	Trained
Shift into holding	Allow separation from group or infant if needed	Trained
Present arm for hand injection	Eliminate need to perform traumatic darting if	Trained

	sedation required	
Stand on scale	Non-invasive method to monitor weight and general health	Trained
Present vagina	Allow vaginal swab to be obtained	Trained
Urinate into pvc collection apparatus	Urine collection for pregnancy tests or general health monitoring	Trained
Show the baby	Teach an adult to present the infant to the mesh for visual inspection and supplemental feeding	Trained
Supplemental feeding	Allow for supplemental feeding, by a keeper, through the mesh	Trained
Feed the Baby	Ask Tara to position infant properly to her nipple	In Progress
Breast Pump	Allow end of syringe flange to be placed up around nipple for eventual pumping of breast milk if needed	In Progress

Key: Trained = only specified trainers can successfully request behavior; In progress = behavior is still in process of being shaped; Not trained = shaping for behavior has not yet begun. *Table 2*

Dietary Changes

According to the nutrition chapter of the Orangutan SSP Husbandry Manual, no dietary changes are required for females during the first trimester of pregnancy other than the implementation of a prenatal vitamin regimen. Caloric increases can be made during the second and third trimesters (by 300 – 350 kcal/day) but isn't necessarily required due to the relatively small size of the developing fetus. It is more important to ensure that the pregnant female maintains a healthy weight and does not develop risk complications due to obesity.

During her first trimester, Tara slowly was losing weight and at one point weighed in at 98lbs; this was after a 5% across the board increase of her diet. Because of this, she was approved to receive 8oz. of Ensure (1 bottle) daily as a nutritional supplement. After her first trimester her appetite improved greatly as well as her activity level. She did start refusing the Ensure and it was discontinued once she got back up to around 104lbs.

Post-parturition, Tara's diet **will** need to be raised due to the increased energy demands of nursing. The SSP manual suggests following the recommendation for human females by increasing the new mother's diet by 500kcal/day during the first six months of lactation- if the female is healthy and has not put on an excess amount of weight during her pregnancy. The Zootrition software will be used to determine her current diet's kcals and how best to meet these increasing needs. It is imperative that Tara receives adequate concentrations of vitamin D, calcium, and phosphorus for milk production and other biological needs. Fortunately, these requirements are typically met through commercially produced primate biscuits which are a normal part of her current diet.

The scale will serve as a good indicator of whether or not Tara's dietary needs are being met. Therefore, it will be important to routinely monitor her weight. Her pre-pregnancy weight is in the 104-106 lb. range. First trimester weight is around 102lbs.

Other staff preparation

Beginning the week of 11 November, begin having a keeper stay for 1-2 hours after the end of the normal workday, to be present in the orangutan holding area with lights on. This should help minimize novelty if/when we need a keeper to remain present after hours to monitor Tara in labor or post-partum. Keeper activity during these after-hour sessions should reflect what a keeper would be doing if Tara were indeed in labor or post-partum (occasional close inspection, use of flashlight, sitting in chair in keeper area). Once this has become routine, it is not necessary to have it occur every night. We will also begin early morning checks (6am and 7am shifts). This will be a proactive approach to any events that occur that require overnight/early am attention.

Parturition-Related Protocols

Overall, intervention will be based on physical condition and behavior of mom and baby!

Animal Management Plan for Onset of Labor

Some observed signs of onset of labor:

- Refusing to go on exhibit and remaining in holding
- Spending more time in a lateral position, both in her hammock and on the floor of holding
- Clenching her hands and feet in response to contractions
- Increased agitation/activity

Presumably Tara will behave similarly when nearing parturition for this pregnancy; therefore, preparations for delivery should be taken if any of these behaviors are observed. If none of them are observed prior to November 11th, preparations should begin at that time.

Preparations for delivery include the following:

- Housing Tara in holding alone at night – INOR01
- Setting up observation cameras linked to the computer's hard drive
- Heavily bedding Tara's cage with wood wool, other substrate and blankets
- Allowing Tara to remain in holding during the day if she doesn't express an interest in going out on exhibit
- Continuing maternal training sessions
- Intensive observation of Tara and notification of veterinary staff at first indications of labor
- Increase temperature in orangutan holding to prevent hypothermia in case of infant abandonment

At the first signs of labor, the phone tree will be activated. Dr. Joe Smith will ensure that all of the emergency vet staff is contacted regarding the imminent birth. Fort Wayne Children's Zoo staff will ensure that the green stretcher, a table and all other immobilization materials are on hand.

If unable to separate Tara from Melati or Tengku

If Tara is in labor and attempts to separate her from Tengku and Melati are unsuccessful, veterinary staff should make preparations for sedation of Tengku or Melati, in case either becomes a serious problem peri- or post-parturition. If they behave appropriately post-parturition, we will decide whether to separate them if an opportunity presents itself based on details of the situation. Aspects to be assessed include: 1) Tara's own behavior – if it is in some way poor, it is more important to try to separate her, as Tara may have to be separated to remove the infant; 2) Tengku and Melati's own behavior – if their attentions appear to disrupt Tara's behavior, then it will be important to continue to try to separate them; 3) Tara's behavior toward

Tengku and Melati – whether she appears to be trying to avoid them or, alternatively, seems to want to be near them; 4) the infant’s status – early confirmed nursing and apparent good health would reduce the chances we’ll have to intervene and thus the urgency of separating Tengku and Melati.

Notifications of Impending Birth

Once signs of labor occur and the birth is imminent, the following notification tree will be used to alert all relevant staff to the situation:

- If any of the signs of labor occur
 - CALL Angie – she may not hear a text.
 - She can verify whether labor is in effect
 - She will call Nisha and Joe if labor is verified
 - Once labor is verified Angie and Nisha will come in to start videotaping and observing
 - Angie will contact night watchman by cell or McGowin to let them know we will be on grounds

Orangutan Keepers:

Angie Selzer – (cell)

Kristin Sliger – (cell)

Taylor Muzzillo – (cell)

Zoo Managers:

Mark Weldon – Curator – (cell) / (home)

Tanisha Dunbar – Area Manager -

Veterinary Staff:

Dr. Joe Smith –

Dr. Kami Fox –

Dr. Jamie Stover –

Zoo Security:

Brenden Mensch

Kevan Mensch – zoo cell

Day/Night of Birth:

1. If Tara goes into labor during the day, keepers will immediately separate her from the group.
2. All individuals on the notification tree (see next section) will be notified and equipment for an emergency intervention will be gathered and set-up. The stretcher and table will be at the ready. Zoo Security must also be notified of keeper activity on-site after hours, between 4pm and 8am.
3. If Tara is in labor or there are signs that labor may be imminent at the end of the workday, at least one keeper staff member will remain after hours to provide continuous observation. The need for

other (e.g. veterinary) staff to remain on site will be decided at the time based on the details of the situation.

4. Keepers will begin videotaping the birth, if possible.
5. Time contractions if possible; offer drinks (juice etc.) if it does not stress dam – she is allowed to have clear liquids (ie, water, Pedialyte)
6. Keep in mind it is normal for orangutans to become sexually aroused during or after the birth process. Monitor each animal’s behavior and a keeper will separate others if necessary.
7. Once labor begins or the infant is born, we will start a 24 hour watch on Tara and her baby. Traffic through the Orangutan Holding (including window of door) will have extra restrictions during this time as to not distract or disturb Tara, her infant, and the rest of the orangutan group. Keeper presence and activity should remain as close to “normal” as possible to avoid creating a situation that might alarm or disturb Tara. Keepers have been successful at acclimating the orangutans to having people present during both normal and unusual situations, which will be very useful. Melati and Tengku may very well need attention during/after parturition, to keep them from making excessive noise and thus disturbing Tara.
8. Orangutan staff will monitor and notify zoo management and the veterinary staff once Tara and her infant’s conditions are assessed.
9. Orangutan and/or appropriate veterinary staff will observe Tara continuously during regular work hours on the first day post-partum, in particular to monitor for appropriate general maternal behavior and nursing. We will need to assess whether Tara gets “tired” of continuous observation and balance the benefits with any discomfort this causes her (e.g. if there are no worrisome signs and regular nursing has been confirmed, continuous monitoring may be less important). Need for continuous monitoring after the first day post-partum will be decided based on details of the situation.

Unless Tara’s behavior dictates otherwise, at least one keeper staff member will remain after hours to provide extended observation on the first day post-partum. Duration of observation and the need for after-hours monitoring on subsequent nights will be decided based on the situation. The need for other (e.g. veterinary) staff to remain on site on the first and subsequent nights will be decided at the time based on the details of the situation.

Post-Partum Management Plan

Assessing the Condition of the Infant (should all go well and no surgical intervention is required)

1. If the infant is strong and alert, a continuous watch will be done through the night.
 - Evaluate Infant
 - Breathing – get respiration rate if possible
 - Good grip – is infant able to hold onto dam’s hair
 - Alertness – is infant looking around at all, looking at dam or sleeping
 - What is the condition of the umbilical cord
 - Evaluate Dam
 - Breathing – get respiration rate

- Discharge – stool, urine, blood
 - Alertness
 - Was placenta delivered
2. If Tara is not nursing the infant and the condition of the infant remains stable (and Tara is not harming the infant) it can remain in holding until morning.
- Observe dam/infant interactions – watch for and evaluate
 - Good eye contact between infant and dam
 - Rooting and suckling behaviors from infant
 - How does the dam respond to rooting
 - If nursing occurs, time each occurrence (in minutes and seconds) and record
 - Position of infant on dam
 - Vocalizations
 - Grooming/touching
 - Genital inspection
 - Play
 - Urine/stool/blood/discharge – dam and baby
 - Dam may clean out the infant’s mouth or suck the birth fluids/mucous off of the infant’s face immediately post-partum
 - Sexual behaviors of dam toward infant (monitor closely but is not abnormal)
 - Refer to positive and negative behaviors listed further
3. Although we will have to use physical condition and behavior as determinants, initial intent will be to wait for about 48 hours post-partum before considering removal of the infant, if nursing has not been seen. (Note that the 72 hour protocol sometimes used has resulted in the loss of at least one gorilla infant at another institution.) At about this point, or earlier if the infant appears to become weaker or otherwise deteriorate, we will remove the infant for an examination, which will most likely require a chemical sedation of Tara. We will encourage the infant to nurse from Tara (while she is under sedation), if possible. If not, we will attempt to bottle feed and ensure that the infant receives colostrum. We will pursue acclimating Tara to a breast pump. (Note that early post-partum breast milk may only be colostrum and appear thin and watery. Some institutions have interpreted early milk as being poor quality, expecting it to look like cow’s milk. It may take a few days to get “real” milk in and for breast tissue development).
4. Behaviors to look for if the dam is uncomfortable or stressed
- May appear agitated, antsy; pacing a lot
 - Putting the infant down then picking up frequently
 - Putting the infant down and leaving it
 - Non-attentive
 - Dragging the infant
 - Non-responsive to infant’s cries
 - Excessive shaking
5. If nursing has not occurred by morning, then we will use training techniques to encourage Tara to nurse the infant.

- **Healthy** infant orangutans should have brief, periodic times of alertness and should be able to grip properly to the dam
 - An infant that is **not thriving** – and needs immediate assistance – may seem unable to wake up and may have limp limbs with little or no grip
 - If the infant’s condition appears to deteriorate through the night, we will notify the vets and remove the infant for an examination. We will encourage the infant to nurse from Tara’s breast (while she is under sedation), if possible. If not, we will attempt to bottle feed
 - Keep staff/participants at a minimum
 - Glucose level on infant
 - Weigh infant (2.9 to 4.5 (1.3 to 2kg) = normal)
 - Facilitate nursing for at least one hour, both breasts; give infant fluids while nursing if needed
 - Weigh dam if possible
 - Recover female with infant in ventro-ventral position
6. If the infant’s condition seems to improve after feeding, we will put the infant back in holding with Tara and continue to observe and document.
 7. If at any time, Tara becomes aggressive to the infant and begins to injure it, we will remove the infant.

Additional Considerations

There is the possibility that the infant may be compromised medically. If this is the case, we will wait for the veterinary evaluation of the infant’s condition. If it becomes necessary to treat the infant, we will proceed with a reintroduction of Tara to her infant as soon as possible. We will continue to train Tara focusing on breast manipulation and milk collection (if possible) during the time the infant is being treated. This will allow us to feed the infant Tara’s breast milk. If the infant’s condition is stable, we may be able to let the infant nurse from Tara’s nipples through the mesh. The infant will be housed in a holding area as near as possible to Tara’s (to encourage maternal bonding and interest) unless there is a medical concern. Keepers will temporarily serve as surrogates and will model orangutan-specific parenting behaviors for Tara to observe during this critical time. We will follow our hand-rearing procedures at this stage.

Other considerations:

- If infant is a disposition (not viable)
 - Retrieve at the first opportunity with as little stress to dam/group as possible
 - If body is being carried, re-evaluate every 24 hours
 - If animals are behaving inappropriately toward infant’s body discuss with animal management and vet staff

Post-Partum Training Plan (As adapted by Brookfield example in SSP Husbandry Manual)

Assuming the infant’s condition is stable and no nursing is observed, the following may occur:

- Infant born at night: keepers’ monitor; training session attempted early to mid morning

- Infant born in early morning: keepers' monitor; training session attempted in early to mid afternoon
- Infant born in afternoon: keepers monitor; training session may be attempted later in early evening or may wait until early AM dependent on infant's condition

Behaviors Needed to Accomplish:

Scenario: Tara holding infant but not nursing infant; Infant strong/alert

- Hold hands so arms are away from infant
- Scratch and touch abdomen
- Target nipple to cage mesh
- Work with two trainers at once so one trainer can do hand hold and other trainer can position infant to her breast
- Working with surrogate stuffed animal through cage mesh getting her accustomed to being touched by surrogate, allowing her to touch surrogate in a gentle manner and training her to release her hold on surrogate on cue

Other problems associated with above scenario:

- Infant carrying position may be improper
- Tara could be jealous of the attention given to her infant. This *could* be overcome by feeding and talking to her.

Scenario: Tara ignoring infant or Tara interested in infant but not carrying it

- Retrieve infant
- Hold infant (object)

Once Tara retrieves the infant and holds infant at cage mesh, the trainers will try to position it to her breast.

Scenario: Tara carries and nurses infant but is mildly aggressive to infant

Trainers will try to calm Tara down through stroking, positive keeper interactions and food. If this fails, we may want to consult with veterinarians about the possibility of using a sedative to relax her.

Scenario: Tara carries infant, does not nurse infant and is mildly aggressive towards infant

Trainers will try to calm Tara as above. Tara will then be asked to bring the infant to the holding mesh and two trainers will work with her to position the infant to her nipple.

- Hold hands so arms are away from infant
- Scratch and touch abdomen
- Target nipple to cage mesh

- Nipple stimulation
- Work with two trainers touching her at once so one trainer can do hand holds while other trainer can position infant to Tara's breast

Scenario: Another orangutan has infant, is harming infant, and Tara is not interested in infant

Remove infant from the orangutan as quickly as possible. Separate infant from group. Have veterinarians examine infant for injuries. If no serious injury to the infant, the infant will be reintroduced to Tara and, at some point, the other orangutans.

- Tara retrieve and pick up infant, position it to abdomen

Scenario: Another orangutan has infant, Tara wants infant

We would monitor this situation closely as there could be a possibility of injury to the infant if Tara attempts to take the infant from the other orangutan.

Scenario: Tara feeling poorly after giving birth, exhibiting less than optimal maternal care

We would continually monitor this situation and a plan of action would be dependent on the infant's physical condition and Tara's behavior.

Plan B – If All of the Prior Scenarios Fail

If we are unable to get Tara to take care of her infant, we have the following options to pursue:

1. Sedate Tara, put the infant on her breasts to nurse and allow her to recover from anesthesia with the infant clinging to her. During Tara's recovery, a continual watch would be done to assess the infant's condition and Tara's maternal skill level.
2. Remove the infant for hand rearing. Begin working with the infant to take a bottle through the cage mesh. During the infant's training, we would work with Tara to allow us to feed the infant through the cage mesh. This may take several months of hand-rearing and infant training prior to reintroduction.
3. Consider Melati as a potential surrogate for the infant. Begin training and prepare an introduction plan.
4. Send the infant to another institution for surrogate rearing. Will need to consult with SSP and current surrogate list

Surrogate Training

Melati has witnessed the birth and hand-rearing of a previous infant born at FWCZ in 2006. During that time she had begun a surrogate training program. Due to health issues on her part, it was determined to not pursue the option of her surrogacy any further when her pneumonia flared up. During this pregnancy, we will also start training Melati on being gentle with a stuffed surrogate as well as targeting the surrogate to the trainer's bottle at the cage mesh. This will hopefully allow staff to feed the infant in the even that Melati needs to carry it because Melati would be unable to nurse it. Once the infant is born and it is decided for

whatever reason that Tara is unable to care for the infant, the infant will be started on training to take a bottle through cage mesh in preparation of surrogacy.

Surrogate Training Behaviors, Benefits & Level of Mastery

Behavior	Benefit	Level of Mastery
Present nipple and allow it to be manipulated	Desensitize nipple for nursing infant if we are able to stimulate lactation; aid in feeding through the mesh during introduction	Trained
Shift into holding	Allow separation from group or infant if needed	Trained
Present arm for hand injection	Eliminate need to perform traumatic darting if sedation required to retrieve infant	Trained
Present the baby	Teach an adult to present the infant to the mesh for visual inspection and supplemental feeding	In Progress
Supplemental feeding	Allow for supplemental feeding, by a keeper, through the mesh	Not Trained

Key: Trained = only specified trainers can successfully request behavior; In progress = behavior is still in process of being shaped; Not trained = shaping for behavior has not yet begun. *Table 3*

We will also consult with the SSP and other institutions that have successfully introduced an infant to a surrogate and utilized operant conditioning techniques in the resulting care and management of the infant.

Hand-Rearing

Hand-Rearing will only be performed as a temporary solution in the event that Tara does not initially display appropriate maternal skills and the condition of the infant is (or will soon be) compromised. The infant will then be reintroduced to either Tara, or an appropriate surrogate, depending on the situation (see *Reintroductions* for the details of the introduction process). The infant should be removed if any of the following conditions arise. Unless Tara can be otherwise separated from the infant, sedation will be required in any of these circumstances:

- Tara is aggressive towards the infant
- Tara does not clear the infant’s face (nose & mouth) of mucous- this should occur immediately after parturition
- The infant is unable to nurse for whatever reason for more than 36-48 hours. This is mostly dependent on the behavior and physical appearance of the infant as it is hard sometimes to determine if nursing is occurring
- The infant is left on the floor and there is concern of hypothermia
- The infant appears critically ill: if it is limp, unable to cling, or blue/grey in color
- Tara develops medical complications

The veterinary staff will need to evaluate the medical state of the infant in order to determine the immediate course of action. If incubation is required, the temperature should be set to 30°C. Human formula may be bottle fed if it appears the infant is receiving insufficient nutrition from nursing. Special care should be kept to limit infant to exposure to disease so the number of humans it has contact with should be kept as small as possible. Protective equipment (gloves, face masks and surgical gowns/scrubs) will be worn by staff when

in close proximity to the infant to prevent the transmission of germs/illnesses to the infant, especially if handling.

Although the particular situation will have to be assessed at the time, the default intent will be to reintroduce the infant to Tara without resorting to sedation. If this does not seem possible or advisable for any reason, we have the following options to pursue, which we will have to assess based on the particulars of the situation.

The decision will be made based on assessment of what is best for the infant

1. Sedate Tara. Put the infant on Tara to nurse and allow her to recover from the anesthesia with the infant clinging to her. During Tara's recovery, a continual watch would be done to assess the infant's condition and Tara's maternal skill level.
2. Remove the infant for hand-rearing, with the intent of later reintroduction. Begin working with the infant to take a bottle through the cage mesh. During the infant's training, we would work with Tara to allow us to feed the infant through the cage mesh. This may take several months of hand-rearing and infant training prior to reintroduction.
3. Send the infant to another institution for surrogate rearing.

Initial hand-rearing will be carried out by keeper staff and vet staff if needed overnight and by keeper staff and veterinary staff during the day. Overnight care will most likely occur at the vet hospital. Work day care will take place in the orangutan holding area as much as possible, in sight of Tara. Intent during this period is to maintain essentially continuous human contact with the infant. If extended hand-rearing becomes necessary, a plan will be developed detailing procedures and responsibilities. Nursery will be in INOR04 like in 2006.

NURSERY PROTOCOL

Formula Handling

- Table in nursery is for clean nursery supplies only.
- Dirty bottles, nipples, pacifiers etc. should be placed in the tote beside the kitchen sink and not directly in the sink. All supplies should be cleaned with hot soapy water, rinsed well with hot water and placed on designated nursery drying rack only.
- Bottles for the day's formula must be cleaned and then sterilized by microwave rack daily. Once sterilized, the bottles, nipples and caps should be placed on counter to allow to cool to room temperature. Pour measured formula into bottles and place the nipples on the bottles using tongs and without touching the rubber with fingers. Screw the nipple ring on and place cap over nipple securely. Label bottles with time and date made and place bottles in the nursery refrigerator.
- At each mealtime, pull a ready-made bottle from the nursery refrigerator and warm the formula by placing the bottle in a mug of heated water. Use the microwave to warm the water.
- 30 mins after formula has been heated, it should be discarded. Measure and record any uneaten formula.

Laundry

- Nursery staff is responsible for maintaining baby laundry.
- Use only "free of dyes and perfumes" laundry soap and fabric softeners.
- Only wash and dry nursery laundry with other nursery items.

- Discard blankets and towels if they become worn, unraveled or develop holes, as these items are unsafe.

Nursery Keeper Gear

Keepers need to wear scrubs, clean clothes or gowns (that are provided and laundered at the vet clinic), gloves, masks and foot covers or no shoes or shoes designated as nursery shoes only. Designated shoes cannot be worn outside of the nursery door. Nursery shoes must remain inside the room. If shoe covers are worn, they must be put on/taken off as you enter/leave nursery room every time

Visitors

- Visitors may look into the nursery through the door anytime.
- Zoo photographers and preapproved VIP visitors may enter the nursery but must wear a gown, gloves, mask and shoe covers.
- If the baby is out of the nursery room and someone needs to enter the room (i.e. for restocking, cleaning or maintenance), the individual only needs to wear shoe covers.
- If visitors approach the baby while outside the nursery room they must remain a minimum of 10 feet back.

Guidelines

- The doors to the nursery should be kept closed at all times to reduce the contamination from routine hospital traffic and dirt.
- The baby is to remain inside the nursery room unless going to a prearranged photo event or up to orangutan holding. The baby is not to be carried out into the hospital or kitchen area.
- When it is necessary to take the baby out of the nursery, the keeper must continue to wear full gear minus nursery shoes. They should have a second pair of street shoes to wear outside. Until further notice the baby must be driven up to orangutan holding in a zoo animal vehicle. The driver needs to wear a mask. All keepers working in the animal area should stay 10 feet away from visiting infant.
- In order to reduce the infant’s stress, the baby should be carried as much as possible unless the baby appears content to be laid down or placed in the swing for short periods of time.
- There will be a scheduled time once per day where 2 nursery keepers will overlap by an hour to provide time for formula preparation, dish and laundry cleaning.
- Nursery keeper staff is responsible for ordering/acquiring all necessary baby supplies
- No human eating or drinking in the nursery room. Place the baby in swing or in incubator when taking your break. If the baby becomes fussy, anyone approved for nursery duty may gear up and hold the baby until the keeper’s break is finished.

Fort Wayne Children’s Zoo staff will follow the protocols set forth by the Orangutan SSP Husbandry Manual’s “Hand Rearing” chapter.

Reintroductions

Regardless of the outcome of Tara’s pregnancy, she will likely be separated from the rest of the orangutan group at some point, and a reintroduction plan will be necessary. Fortunately, all group members will retain

audible, visual and some limited tactile access through the mesh windows between holding rooms and the exhibit with Tara at all times. This will allow all members of the group to witness the birth and initial rearing of the new group member from day one.

There are three possible reintroduction scenarios that may arise:

- 1) Tara's pregnancy is not successful and she must be introduced to the rest of the group alone;
- 2) Tara successfully delivers a healthy infant and displays competent maternal skills and so both she and the neonate must be reintroduced to the group together; or
- 3) Tara successfully delivers a healthy infant but does not demonstrate proper maternal skills and so the infant must either be reintroduced to Tara at a later point or introduced to the surrogate.

The third circumstance would also later require another introduction similar to the protocol outlined for the second scenario. Strategies for the first two situations are essentially the same. For both, the order in which other members of the group will be reintroduced is as follows: Tengku, Melati.

Based on the current group dynamics (see *Present Social Group Considerations*), this is the order that presents the least risk to Tara and her infant; the hope is that the group members that are the least aggressive will become comfortable with the transition first, and then they can help mediate in the event that the more risky group members begin to display violent or dangerous behaviors. In either situation, the vet staff has approved the use of anxiolytics/sedative options for the adults in the group (except for Tara) in order to help reduce aggression. Vet staff will research what options we will be using if needed. Also, the liberal use of popular environmental enrichment, such as browse, treat tubes, and foraging for diet will help redirect attention during all introductions. The only concern in the case of Tara and her infant being reintroduced together would be enrichment items that have a potential to hurt a neonate (such as tubs of water or heavy branches), so these enrichments would not be used in that particular introduction scenario.

As previously stated, the first full access introduction will involve Tengku. This will take place in holding between at least two rooms. Creep access for Tara and the infant to escape will be provided. An introduction in holding will allow for close observation and more ease in intervention, if necessary.

Introductions to Melati will be trickier as Tara does not feel completely comfortable around her most of the time. In the past, Tara has been cautiously uncomfortable when Melati has entered or crossed through her holding space. We want to ensure that holding continues to be Tara's "safe place" and remains positive since it is extremely important that we maintain her cooperation in shifting off exhibit for the necessary monitoring of Tara and her baby's health. Therefore, the intros involving the adult female will need to take place in the indoor holding with keepers on close standby to operate holding doors at a moment's notice if necessary. Due to the potential for other members of the group to inflict bodily harm to mother and baby, precautions must be taken so that staff will be prepared if an intervention appears necessary. A carbon dioxide fire extinguisher can be kept in orangutan holding; this leaves open the possibility that it may be sprayed at aggressive individuals as a distraction during the introduction if it appears any other group members pose a risk to Tara and the infant. The similar use of hoses has also been suggested (and will be made available). All orangutan spaces (indoor exhibit and holdings) will be heavily bedded with wood wool to prevent injury from any potential falls.

In the event that the infant needs to be reintroduced to either Tara or the surrogate, a different approach is demanded. The condition/age of the infant, previous behavior of maternal figure (Tara or surrogate) and the amount of time the two have been separated will all have to be factored into an introduction plan. While a

specific procedure will need to be formulated depending on the scenario, several key strategies may be implemented. First of all, an acclimation phase during which the infant and the mother (either Tara or the surrogate) are encouraged to engage in and rewarded for all positive interaction through the mesh will be necessary prior to allowing them full access to each other. This process is also vital for better discerning how the mother is likely to act towards the infant. When a full introduction is performed, creep doors may be used if the infant is mobile enough to take advantage of such a strategy.

The use of anxiolytics/sedatives to facilitate introductions is currently under review by FWCZ vet staff and will be considered once the health of the infant is assessed.

Timeline of events leading to birth

3 months prior to first possible due date: AUGUST 12, 2014

- Evaluate facility
 - Doors – operational and able to creep – DONE 8.29.14
 - Identify best nursery location and make plans to modify as needed (INOR4)– near conspecifics is best
- Select enclosure where birth will take place and stick with those enclosure well before and after birth (INOR01)
- Any changes in routine should be implemented with as much time as possible for orangutans to get accustomed to them, prior to the birth
- Go through nursery supply list
- Inform all staff that no after-hours functions should be scheduled in orangutan hall starting 6 weeks prior to first due date (September 30).

6 weeks prior to first due date: SEPTEMBER 30, 2014

- Have cameras and monitors up for remote viewing
- Have birth protocol, hand-rearing protocols and birth watch protocols and forms finalized
- Have hand-rearing team designated
- Set up training for birth watch volunteers, distribute guidelines and protocols

4 weeks prior to first possible due date: OCTOBER 14, 2014

- Train hand-rearing team. Meet as a group. Distribute protocol
- Start 24 hour birth watch. Some gaps in schedule are ok. The purpose is to collect baseline data on Tara
- Have nursery supplies in stock and ready for possible hand-rearing
- Make sure there is an oxygen tank in Indo and keepers are trained to use it
- Have hand-rearing forms and computer programs in place
- Have post birth observations forms finalized and in place

1 week prior to first possible due date: NOVEMBER 4, 2014

- Make sure that 24 hour birth watch is in place. The purpose is to observe and watch for signs of possible labor and impending birth.
- Make sure all staff are familiar with signs of impending birth
- Add more wood wool, and other substrate to INOR01

TARA BIRTH PLAN CHECKLIST & STAFF ASSIGNMENTS

Pre-Parturition Needs

1. Notification of pregnancy to the Orangutan SSP
2. Assignment of OB/GYN to Tara's case regarding reproductive history and medical concerns and for monitoring and counseling of current pregnancy
3. Begin pre-natal supplementation and termination of oral contraception\
4. Development of birth management plan document
5. Facility review and procurement of necessary hand-rearing supplies
6. Development of surgical intervention plan, should dystocia occur. Focus on maternal training behaviors, especially ultrasound work

Day of Birth

When labor is confirmed:

1. Separate Tara from group, preferably in bedded down INOR01
2. Keepers begin continuous observations, take detailed notes, videotape birth
3. Keepers notify zoo management, veterinarians, primate staff (off-duty) & interns
4. Vet cart, ape crate and transport vehicle is brought to Indo
5. Restrict access to service area to "as needed basis"
6. Vet Staff begin to warm incubator

When infant is born:

1. Continue to monitor Tara and baby, take detailed notes
2. Notify zoo management, veterinarians, primate staff (off-duty) & interns

After Hours Birth

Same as above but zoo managers will dictate after-hours shifts and assign keepers

Post-Partum

If the infant is medically compromised:

1. Meet with keepers, managers and veterinarians to formulate an action plan

If Tara is aggressive towards the infant:

1. Separate infant from Tara
2. Meet with keepers, managers and veterinarians to formulate an action plan

If Tengku and/or Melati is present for birth and is aggressive towards the infant:

1. Separate Tengku and Melati from Tara and infant
2. Give Tengku access to Melati

If Tara is ignoring the infant or interested in the infant but not carrying it:

1. Attempt training session to encourage Tara to pick up the infant and hold it in a nursing position to her breast

If the infant nurses within 24 hours:

1. Document all bouts/lengths of nursing
2. Maintain continuous observations and take detailed notes

If the infant does not nurse within 24 hours:

1. Maintain continuous observations, closely monitoring condition of infant as well as Tara's behavior, take detailed notes
2. Notify veterinarians to assess medical condition of infant
3. After 24 hours (or time to be determined), attempt a training session with Tara to encourage maternal behaviors (refer to Post-Partum Training Plan)

If the infant's condition deteriorates:

1. Maintain continuous observations, take detailed notes
2. Separate Tara from infant
3. Notify veterinarians to assess medical condition of infant
4. Feed infant (if there are no medical concerns)
5. Meet with keepers, managers and veterinarians to decide on how to proceed with the introduction (if infant is healthy)

If the infant is healthy and a re-introduction could take place:

1. Re-introduce the infant to Tara
2. Maintain continuous observations of infant and Tara, take detailed notes
3. If necessary, attempt a training session with Tara and infant to encourage maternal behaviors

If Tara has no interest in the infant:

1. Sedate Tara and allow the infant to nurse from both of her breasts (if infant is being bottle fed, do not feed infant prior to this)
2. Leave infant in holding during Tara's recovery period
3. Keepers begin continuous observations, take detailed notes

If all efforts to get Tara to take care of her infant fail:

1. Begin hand-rearing process
2. House infant in holding area in front of Tara's holding and begin modeling parenting behaviors
3. Determine an action plan with keepers and zoo managers

STAFF ASSIGNMENTS

Orangutan Keepers: (Angie Selzer, Kristin Sliger, Taylor Muzzillo, Tanisha Dunbar)

1. Provide daily care, observation and documentation
2. Pre and post-partum preparations for the birth:
 - Designate birthing location and set-up- **complete by 8/12**
 - Secure necessary hand-rearing supplies and protective equipment- **complete by 10/14.**
 - Develop and implement reintroduction procedures
3. Maternal training
4. Alert other staff members (vet staff, zoo managers, night security) if signs of labor or medical concerns are observed
5. Secure emergency transport needs: vet cart, ape crate and transport vehicle
6. Record birth using video camera (if possible)
7. Direct and monitor primate interns & volunteers as needed

Husbandry Trainers:

Angie Selzer

Zoo Managers: (Tanisha Dunbar, Mark Weldon)

1. Monitor and support Orangutan Keepers, as needed
2. Approval of all action plans that are developed and employed subsequent to the birth

Veterinary Staff: (Dr. Joe Smith, Dr. Kami Fox, Dr. Jamie Stover)

1. Provide medical support and services for all aspects of the birth, pre/post partum
 - Implement prenatal supplementation regimen
 - Participate in maternal training sessions (particularly voluntary ultrasound)
 - Provide medical oversight and counseling, especially during parturition
 - Develop surgical intervention plan
 - Adjust dietary needs of Tara, post parturition
2. Network with SSP veterinary advisors, neonatologist &/or OBGYN regarding medical history, subsequent health issues and overall counseling

Professional Resources / Contacts

Dr. Todd Rumsey OB/GYN - cell phone (260-414-2800) Vet staff will contact if needed

Lori Perkins, Orangutan SSP Coordinator

lperkins@zooatlanta.org
lori410@mindspring.com

****SSP Vet Advisors: The vet advisors are Dr. Joe Smith (Fort Wayne Children's Zoo, vet@kidszoo.org) and Dr. Nancy Lung (Fort Worth Zoo, nlung@fortworthzoo.org) Joe, too, though of course his experience was unexpectedly tragic, with the death of little Dumadi's mother an hour after his birth.

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Maternal Training & Hand Rearing Contacts:

- Beth Schaefer, Houston Zoo (formerly Kansas City and Disney) pongopower@earthlink.net
- Megan Fox, Los Angeles Zoo maefox@earthlink.net
- Angela Shoffstall, Busch Gardens Angela.Smith@BuschGardens.com; 813-987-5621
- Megan Elder, St. Paul's Como Park - megan.elder@ci.stpaul.mn.us; 612-419-4478
- Cindy Cossaboon, Denver Zoo – ccossaboon@dneverzoo.org; 720-215-8918
- Danielle Williams, Birmingham Zoo – dwilliams@birminghamzoo.com; 330-524-3812
- Laura Mayo, Zoo Atlanta – lmayo@zooatlanta.org; (Orang holding) 404-624-5939

September 2013 Surrogates (bold = proven)

449	Maggie	CHICAGOBR	proven	available	was a surrogate to Mukah beginning when he was 1 year old (1988); he was able to come to front for bottle; after a while began suckling on Maggie which induced her to lactate, and she nursed him for 2 more years (had not given birth for 12 years prior); Maggie is quite aged now (52+), but could be a foster-reared 2853 Kera beginning in 2000 at Cleveland (at 2 yrs).
1018	Chiquita	LITTLEROC	proven	available	surrogacy experience may have been human-assisted; not a good institutional situation for surrogating
1044	Susie	BROWNSVIL	potential	available	Sara did not care for her twins when adult male became upset with the infants' crying, staff attention directed to her. Also seemed overwhelmed/confused by 2 infants/trying to carry one and then the other. Twins were hand-reared along with male infant from other female. All 3 infants introduced to Sara at over a year of age. She mothered and cared for all 3, incl bringing them the bars for bottles. Subsequently cared for the 2nd female's next 2 offspring (Siabu and Ibu), who were hand reared for several months and then given to Sara to mother. Is currently rearing her own infant (b. 10/13/10), after having initially rejected him -- took about 6-8 weeks for reintro after birth
1100	Sara	FRESNO	proven		rearing 2006 infant; permit/quarantine issues with export if we wanted to use her
1164	Puppe	TORONTO	potential	available	prefers older kids -- beyond need for clinging -- is rearing Aurora
1235	Cheyenne	HOUSTON	proven		probably not a great institutional situation for surrogating
1402	Joy	BUSCH TAM	potential	available	has a breeding recommendation of her own
1704	Bess/Banak	PHOENIX	potential	available	may require free contact for surrogacy (at GATI, staff had planned to go in with her for surrogating)
1733	Knobi	INDIANAPL	potential	available	began being sexually abusive to 2.5 yo infant after @ 22 mos, then stopped (cycle regulated via BCP, after which she was fine); thereafter did fine with infant until his death (pneumonia) in late 2012
1781	MJ	MILWAUKEE	proven	available	potential - was nurturing and mothering with son Bemas (Junie) & Dumadi while Madu reared them; carried; seems to prefer older, less clingy kids; gave birth 5/19/11 - rejected, but ultimately re-accepted and is rearing him
1850	Daisy	SEDGWICK	potential		reared Amoi and Wgasa at Omaha, as well as her own infant Sepilok. Has a breeding recommendation of her own.
1640	Yasmin	TOLDEO	proven		potential, but not if Busar's around -- too attached to and focused on him
1920	Alexandra	FRESNO	potential	available	rearing Remy (and Dumadi); has a breeding recommendation of her own
1924	Madu	ATLANTA	proven		health issues; probably not a great institutional situation for surrogating
1943	Dixie	BUSCH TAM	potential	available	rearing 2006 infant; permit/quarantine issues with export if we wanted to use her
2024	Ramai	TORONTO	potential	available	rearing 2006 infant; permit/quarantine issues with export if we wanted to use her
2512	Sekali	TORONTO	potential	available	rearing Kaijion (started at 5mos)
1515	Jill	KANSASCTY	proven		gave birth Dec 2010; rearing infant; has had extensive maternal training
2512	Siabu	FRESNO	potential		MALE; surrogate-reared his son Bajik, born in 2004; Bajik was 1st intro'd to MJ, then the pair to the group; MJ making weird vocalization that was upsetting Boomer, leading MJ being injured. Bajik sort of got left behind in the group when MJ needed medical care, that's when Boomer picked up being the surrogate. At the time, Kutai was rearing Khalil (b. 2006).
2274	Boomer	TOLEDO	proven	available	gave birth via c-section Dec 2011, re-accepted infant perfectly, currently rearing him
1904	Lipz	BIRMINGHAM	potential		gave birth via c-section Dec 2007, re-accepted infant perfectly, currently rearing him
2116	Markisa	ST PAUL	potential		gave birth via c-section Jan 2013, re-accepted infant at 2 mos, currently rearing him
2752	Blaze	ATLANTA	potential		

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