INTRODUCTION

As a group, tapirs are relatively easy to maintain and breed in captivity, provided one has a good working knowledge of their biology and behavior. It is this lack of information that is largely responsible for many of the medical and behavioral problems that captive tapirs have experienced.

When designing husbandry standards for tapirs, one must allow for individual variables in behavior, compatibility, and degree of keeper interaction. While there will always be a great deal of variability between holding facilities, this list of husbandry standards should be used as the foundation for any program of successful and humane tapir management.

TAXONOMY

The family Tapiridae is represented by four living species, one from Southeast Asia and three from Central and South America. Two species, Baird’s and mountain tapirs, are classified as Endangered by IUCN; Asian and lowland tapirs are considered Vulnerable by IUCN. All but the lowland or Brazilian tapir are regulated by CITES as Appendix I species. Scientific names and wild distributions are listed below:

*Tapirus indicus* Asian or Malayan tapir. Southern Burma, Malay Peninsula, S.E. Thailand and Sumatra.

*Tapirus bairdii* Baird’s or Central American tapir. Southern Mexico to Northern Colombia and Ecuador west of the Andes.

*Tapirus terrestris* Lowland or Brazilian tapir. Colombia and Venezuela to northern Argentina and southern Brazil.

*Tapirus pinchaque* Mountain or woolly tapir. The Andes from northwestern Venezuela, Colombia and Ecuador, to northwestern Peru.

Environmental Variables

**Temperature:** In general, tapirs are relatively heat tolerant and outside temperatures in excess of 100° F. are tolerated although they should be protected if exposure above 95 degrees F is prolonged. Off-exhibit stall
temperatures should offer protection (shade and water) from temperatures above 95° F. if exposure is prolonged.

**Light and Shade.** Because of their large size, tapirs are typically kept outside where natural light is available. Being forest animals, however, they require access to shade at all times of the day and all outdoor enclosures should have sufficient shade, factors that are particularly important in zoos located in warmer climates. Asian tapirs are especially prone to eye problems if inadequate shade is available. Tapirs may be diurnal, crepuscular and/or nocturnal in nature and have no specific lighting requirements, nor are their breeding habits associated with photoperiod length.

**Space**

**Outdoor enclosures:**
Tapirs are relatively inactive but do require ample space for exercise and breeding activity. Enclosures should provide at least 600 sq. ft. for each animal. Tapirs can be easily maintained in shallow dry slanted moats with a 2 meter vertical outer moat wall. Enclosures without moats should also have a minimum of 2 meter high barriers. Fences can be wood or chain link (gauge 10 or heavier). Tapirs do not jump up but can easily climb over vertical walls as high as 4 feet. Also, tapirs are powerful animals that can push under chain link if not properly secured. All zoo visitors should be kept at least one meter away from the primary enclosure. Visual barriers within this space are encouraged to allow animals to voluntarily separate themselves from one another, whether a subordinate animal from a dominant animal or for females to isolate prior to parturition. Outdoor exhibits should be relatively flat and designed to eliminate narrow spaces and 90-degree angles. The substrate should be hard-packed soil or grass. Tapirs do not seem to be particularly sensitive to noises outside their enclosures.

**Stalls:**
Tapirs should have off-exhibit components to their exhibit areas, each of which should measure at least 12’ x 15’ (180 sq. ft.). Stalls should be interconnected by 4 foot wide sliding gates that can be operated without placing the keeper at risk. Holding areas should be accessible directly from the primary enclosure and arranged in a way to facilitate introduction of animals to each other. There should be one stall for each animal so that animals can be separated for birth, medication or behavioral problems. One larger stall measuring at least 16 x 16 ft. should be present that can hold both a female and one offspring. Shade should be added if not naturally available. For keeper safety, animals should be transferred to an adjacent pen prior to cleaning.
Stall substrates and walls: Off-exhibit stall walls should be a minimum of 2 meters high and should be either solid (wood or concrete) or vertical steel bars with less than 8 inches between verticals. Horizontal bars should not be used in order to prevent tapirs from climbing. If concrete floors are used, they should be slightly sloped to large covered drains. Floor surfaces should not be rough (i.e. heavy brush finish) in order to avoid abrasions to their soft footpads. Some bedding materials such as grass hay can ease the effects of slick surfaces if a sufficiently thick layer is applied but thin layers of bedding may also exacerbate the hazards posed by slick surfaces. Regardless, if “hay” is used as bedding, course hay should be avoided as tapirs are prone to lumpy jaw syndrome if ingested.

Water:
Fresh drinking water should be available at all times. If a pool is not available, water buckets or drinkers should be secured so that they cannot be overturned.

Pools:
Pools should be large enough for two adult tapirs and their half grown offspring to completely submerge their bodies. This is important not only from a health standpoint but also from a behavioral one. Tapirs frequently defecate in their pools and the inability to do this could increase the incidence of rectal prolapses. Pools should have gently sloping sides with wide entrances and non-skid surfaces. Pool depths of 4-6 feet with a 1:8 slope at the sides are best in order to allow for total submersion. Entrances should be wide to provide access by more than one adult animal. The pool should be cleaned and refilled with fresh water once daily; the use of chlorine in filtered systems should be avoided. Tapirs can hold their breath underwater for as long as 2-3 minutes.

Transportation:
In order to reduce the risk of animal and keeper injuries during tapir transfers and shipments, a few basic features should be incorporated into the holding area and into the design of the shipping crate. Tapirs should not be immobilized for shipments but should be properly crate trained prior to the anticipated date of transfer. Tapir calves should not be shipped before the age of six months and should be completely separated from their dam at least one week prior to shipment.

Loading:
All tapir holding areas should be connected to a transfer alley that facilitates the safe and easy transfer of the tapir into a crate or animal trailer. Tapirs should be given free access to the transfer alley and shipping crate several weeks (longer if possible) before the Scheduled shipment day.
Crates: Tapir crates should be large enough for the animal to stand up and lie down but not wide enough to encourage the animal to turn around. The crate should be constructed of one-inch solid wood or metal parts, bolted or screwed together. Metal bracing must be present around the whole container and the interior must be completely smooth and free of potential hazards to the animal. Crates should have numerous ventilation holes with a maximum diameter of 2” along the top and above eye level. Food and water containers must be provided with outside access. Tapir crates should have removable guillotine doors at both ends.

Trailers:
Stalls or crates should be darkened in order to reduce the effects of visual stimuli. When a trailer is used for transport, animals should be singly stalled in the trailer, each stall partitioned in such a way that the animal has enough room to lie down and stand up, but not turn around. Too much room allows the animal to turn around or jump up, potentially injuring itself. Food and water should be provided to animals during transit. Because the animal(s) are likely to be excitable or even aggressive, it is best to affix a water container in the trailer stall or crate ahead of time. A trap door or opening should be available to add water or food during transit. The entire stall door should not be opened in order to provide food or water.

Because capture and transport are among the most stressful events in an animal’s life, ambient noise during transport should be minimized. Most tapirs tend to lie down during transport and may develop lameness after lying for extended periods so it is important to encourage them to their feet 2-3 times a day. For animals confined to a crate, the transport time should be considerably shortened, two days at a maximum unless international shipments are involved, because their ability to move about is much more restricted.

Bedding:
Bedding or other substrate should be placed in either a trailer stall or crate in order to provide traction for the animal. If the trailer floor does not have rubber matting to prevent animals from slipping, thick grass hay or other suitable substrate can be spread over the trailer floor. Transport of tapirs in hot temperature extremes is not recommended as it poses a risk to the animal. General upper temperatures permitted for shipment by airlines for live animals are 85° F. It must be noted that even if ambient temperatures are not considered extreme, the temperature inside a trailer or crate can be as much as 10° F. warmer and that transports should probably not be undertaken at prolonged ambient temperatures above 90° F.

Crate training:
All tapirs should be properly crate trained prior to shipment. Crate training involves several weeks of giving the tapir access to the shipping crate, not setting up the crate (or trailer) so staff can trap the animal inside the first time it enters the crate. Several tapirs have died in shipping crates when not properly acclimated. If the tapir is with its mother, it should be gradually separated from its mother well before shipping. Animals should not be shipped until they are totally comfortable being inside the shipping crate although some animals may never be completely calm inside a crate. For extremely hyperactive animals, it may be necessary to lightly sedate the animal prior to shipment but this should only be done in the presence of an experienced veterinarian who is familiar with the drug and dosages for tapirs.

**Nutrition**

**Diet:**
Tapirs are generalist herbivores that select from various parts of plants including leaves and fruits. Tapirs consume multiple small meals throughout their active periods, a behavior that is, in part, a function of their limited stomach capacity when compared to the ruminant stomach. As a hindgut fermenter, the tapir gastrointestinal tract is very similar to that of the horse. A diet of commercial herbivore pellets (15% crude protein, 0.7% lysine, 21% acid-detergent fiber [DMB]) and legume hay (18% crude protein, 30% acid-detergent fiber [DMB]), supplemented with commercially available produce and harvested plant materials appears to be adequate for maintaining captive specimens. Bananas, and other high moisture fruits are favored food items and can be used as positive reinforcement for management behaviors (e.g., crate training, administration of medication). Any standard tapir diet should consist of the following percentages of food types, as fed:

- Legume hay (alfalfa, ≤ {less than or equal to} 18% crude protein) 33%
- Nutritionally complete herbivore pellets (12-18% crude protein) 33%
- Commercial produce and/or harvest browse plants 33%

The total amount of daily intake for a mature adult tapir should be approximately 4% to 5% of the animal's total body weight.

**Average adult weights of all four species are as follows:**

<table>
<thead>
<tr>
<th>Species</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baird’s tapir</td>
<td>400-600 lb</td>
<td>500-750 lb</td>
</tr>
<tr>
<td>Asian tapir</td>
<td>650-850 lb</td>
<td>750-950 lb</td>
</tr>
<tr>
<td>Lowland tapir</td>
<td>350-550 lb</td>
<td>400-650 lb</td>
</tr>
<tr>
<td>Mountain tapir</td>
<td>300-500 lb</td>
<td>350-550 lb</td>
</tr>
</tbody>
</table>
All produce should be cut up into bite size pieces and fed fresh daily in individual containers/tubs atop a cement feeding area. All food and water containers should be durable and able to be washed and disinfected daily. To reduce risk from disease and parasites, food items should not be fed on the ground (soil) from which an animal would directly eat.

Prolapse Note - Captive tapirs have a history of rectal prolapses. The cause of this has yet to be determined but diets that are low in adequate plant fiber (e.g., excessive amounts of produce) may contribute. To minimize this risk, diets should not include large quantities of fruits and produce; these items can be used as treats, enrichment techniques and means for giving medicine.

Timing:
Scheduled feedings are often used to facilitate training and shifting of individuals, locking the animals into a holding area or for other management needs. No variations in the above diet are required, but additional foods (fresh fruit and vegetables, browse, etc.) are appreciated on a random schedule and provide stimulation and enrichment to the dietary routine. Care should be taken to ensure that food enrichment items are not offered in such quantities as to decrease consumption of the carefully balanced base diet. To avoid obesity, the caloric content of enrichment foods should be factored into the overall diet. When animals are fed together in groups, multiple feeding sites must be offered within the enclosure to prevent dominant individuals from monopolizing the feed and to reduce aggression at feeding time.

Details:
All dietary components should be wholesome and free of foreign matter, vermin, mold and chemical contamination. Uneaten items should be removed from the enclosure on a daily basis to prevent the possibility of food-borne illness. When possible, all changes to the diet should occur gradually to allow a period of transition and to reduce the risk of digestive upset. When transferring a tapir to a new institution, a supply of the currently fed diet should be shipped as well to ease any transition to a new hay or pellet. If a balanced diet is provided through the combination of commercial pellet daily ration and produce, no mineral supplementation will likely be required. However, commercial salt and/or mineral blocks can be used with tapirs if necessary.

Drinking Water:
All tapirs are dependent on water and should have clean, potable water available to them at all times for drinking. Although they will usually drink
from pools, when available, water tubs, automatic waterers and exhibit pools are all suitable for providing a source of fresh water. Tubs or waterers should be secured to prevent tipping/emptying. Water tubs or automatic waterers should be properly positioned and easily accessible to tapirs of all ages. Tubs and waterers should be cleaned and sanitized daily to ensure the availability of clean drinking water at all times. Multiple water sources may be necessary to ensure that all tapirs and other exhibit species have access to water at all times.

Most literature states that tapirs are primarily solitary and nocturnal but recent field observations have shown tapirs to be more active in daylight and more tolerant of conspecifics than previously believed. The social behavior of tapirs in captivity is largely dependent on individual animal personalities, past experiences, food availability and the size/layout of enclosure. Some zoos have problems putting just two animals together while other zoos have five to ten animals in the same enclosure. Also, some tapirs are extremely aggressive towards conspecifics and keepers while others are easily approached and enjoy being scratched. Tapir behavior can be very unpredictable and caution should always be exercised when entering an exhibit or enclosure with unseated individuals. There are numerous records of tapir attacks on keepers and veterinarians that have resulted in serious bite wounds and in some cases, the loss of fingers and limbs.

Social groups:
Most zoos maintain one adult pair of tapirs that are housed either separately or together. Females should be separated prior to birth of their offspring and not be reintroduced to other tapirs until the calf is three to four months old. Tapirs are non-seasonal breeders, therefore timing is not an issue when putting pairs together. In some cases the breeding male can be introduced earlier, while in other instances a reintroduction is not possible until the calf is permanently separated from its dam. For temporary holding and in the absence of a female, some adult males may be housed with their juvenile or sub adult male offspring but this should not be considered a permanent arrangement.

Emigration:
As with other large ungulates, adult males tend to drive out young males when they are 12-18 months. The timing of this “forced” emigration of male adolescents is often dependent on enclosure size. In smaller enclosures, the adult male tends to become intolerant of young males at an earlier age. In any case, young males should be removed from the group prior to one year of age, sooner if the male begins to exhibit signs of aggression. Adult males may chase juveniles as well as estrous females, there should be enough space for animals to voluntarily separate themselves and visual
barriers should be present to allow subordinate animals safe areas to rest. There should be no blind cul-de-sacs or other areas where animals can be trapped by conspecifics.

**Mixed species groups:**
Tapirs may be housed in mixed species exhibit if space and furnishing meet or exceed the needs of all animals in the enclosure. Successful examples of Neotropical species include: rhea, capybara, vicuna, brocket deer, waterfowl, wading birds, large tortoises, Patagonian cavius, giant anteater, primates and even maned wolf. Asian tapirs may be successfully exhibited with muntjac, waterfowl, wading birds and cranes, and primates such as gibbons, langurs and macaques.

**Introductions:**
All introductions should be closely monitored and consider the specific behaviors of the individuals involved. When introducing animals to a new facility, it is preferable to establish them in an off-exhibit holding area before releasing them into a new enclosure. During this acclimation period, the animal adjusts to its new surroundings, food items, keeper staff, and learns the daily routine.

Animals should be permitted to “drift out” into the exhibit at their own pace; they should never be forced into new enclosures, as this may needlessly stress them. The shift doors should be left open so that animals can return to the safety of the holding area.
Establishment of scheduled feeding times will facilitate this behavior.

New animals should have a period of time that allows them to familiarize themselves with the existing tapir via preliminary introductions that include olfactory, visual and limited tactile access through a protective barrier. When introducing a male to a female, there is the potential for aggression, as indicated by chasing and squealing. In general, it is best to conduct introductions in a space that is adequate for animals to get away from one another and with gates or doors that offer shifting opportunities in the event the animals need to be separated from one another.

**Human-animal interactions:**
Although animals in these taxa can become quite habituated to having humans around and give the appearance of being docile, it should be noted that any tapir may become aggressive and dangerous. It is important that caretakers not take the disposition of their charges for granted and respect their strength and power and potential to injure. Institutions should promote the perception of these animals by the public as wild, exotic species and not as domestic species or pets.

**Keeper safety:**
Adults should be worked with a “protected contact” mentality and caretakers should not share the same physical space without the benefit of some type of barrier. A two-person rule is recommended when caretakers are working in the same enclosure with adult tapirs. Caretakers should also be wary of working in close proximity to females, especially females with calves. As with other species, it is important to know your animals, be aware of any relevant special circumstances and of your surroundings, and to always have an escape route in mind if put into a dangerous situation.

Space:
The level of caretaker contact with animals should be adjusted depending on the temperament of both the species and the individuals. The larger the living space for the animal, the longer a caretaker may be tolerated in that space, as does the complexity of the exhibit, including factors like terrain changes, props, visual barriers and pools that serve a role in the space usage of the animal. Care should be taken to ensure that the animals’ living space is free from hazards.

Medical Management.

General: Tapirs generally have few health problems. The most common health problems that occur in zoo tapirs are ulcerations and infections of the foot, respiratory diseases, rectal prolapse, eye and skin problems, mandibular swellings, dental ailments and parasitic infections. Tuberculosis has been recorded in some animals. Fecal parasite examinations should be made at least twice yearly. Many of these common health problems can be alleviated or eliminated by good husbandry practices including a suitable diet, non-abrasive substrate, adequate outdoor shade, indoor heating and sanitary conditions.

A condition of unknown etiology has been recorded in a number of zoos. It presents as an acute illness that results in blistering and superficial skin sloughing of the dorsal midline of the animal. In some cases the animal is weak in the rear limbs and may collapse when attempting to walk. With supportive care most animals recover fully. Biopsy of the skin lesions is helpful in characterizing the nature of the disease. The skin lesions heal rapidly but residual scarring may last for several weeks.

Preventive Medicine.
Standard laboratory tests for equine diseases have not been validated for tapirs, however it is reasonable to assume that they may be valid. Tapirs can be moved to hospital locations for health care or quarantine purposes as required by the animal’s conditions and available facility. However if medical care can be provided without disrupting the pair or group dynamics, it is preferred to allow the individual to remain within or near its social unit.
Physical Exam: Complete physical exam by a veterinarian. This should include a review of all systems including oral, ophthalmic and food pad inspections, and body weight – actual or estimated. A permanent identification method (microchip, tattoo, etc.) should be utilized.

Blood collection:
Complete blood count (CBC) including fibrinogen, serum chemistry panel. Bank minimum of 10 ml serum – all banked samples should be labeled with species, studbook #, age, sex and date collected. Fecal analyses. A parasite screen should be made that includes fecal samples should be direct and floatation to detect intestinal parasitism. In addition, an enteric pathogen screen should be performed that includes at least one culture of feces for enteric pathogens.

TB testing: Tuberculosis (*Mycobacterium tuberculosis* complex) has been seen in North American tapirs. Although no validated ante mortem test is available, we recommend the following: Flush 20 ml sterile saline in one nostril, collecting the rinse by gravity or aspiration, in a collection vial. Request mycobacterial culture with speciation. Veterinarians from recipient and shipping institutions should determine whether it is necessary to wait for culture results prior to shipment. (May depend on factors such as group history and quarantine capability at recipient institution). Option: Perform an intradermal tuberculin test using 0.1 ml ppd bovis in the soft skin in the inguinal region near the nipples. Read the response by palpation in 72 hours.

Vaccination: Vaccinations are indicated regionally for tetanus, other clostridial diseases or equine encephalitis. Rabies vaccination may be appropriate in some areas. Encephalomyocarditis virus (EMC) has occasionally been a problem in zoos in warm climates, with death occurring in some instances. Because no licensed vaccine is available, the only prevention of EMC is good hygiene, feeding practices and pest control.

Preshipment and quarantine recommendations. Whenever possible, preshipment testing should be performed within 30-90 days of the anticipated shipping date (note: mycobacterial cultures require 60 days for final results). The following protocol advises that specific baseline laboratory tests be performed for the purpose of evaluating current health status. Additional tests are recommended to increase baseline information to determine their significance to tapir health. The final decision for specific procedures should be made in partnership between the shipping and receiving institutions. Any
significant abnormal findings should be communicated to the receiving institution in a timely manner.

History: Summary of information regarding previous health screens, medical problems, diagnostic test results and treatment should be provided to the receiving zoo. A hard copy and disc of the complete medical record should be sent prior to shipment.

Quarantine: It is suggested that newly acquired tapirs be isolated for a quarantine period prior to introduction to the established collection. Typically the quarantine period for a newly acquired tapir is 30 days though this period may be longer if health concerns arise. Though quarantine procedures vary from institution to institution, additional examinations, testing and prophylaxis is typically performed during this quarantine period to assure that the newly acquired individual is healthy prior to introduction to the collection. The following list of veterinarians has considerable experience with the health care of tapirs and may be consulted for the most recent recommendations with respect to preventive medicine, immobilization or current disease status.

Dr. Don Janssen, San Diego Zoo, Ph: 619-557------, e-mail: -------@sandiegozoo.org
Dr. Sonia M. Hernandez-Divers, Ph: 706-548-----, e-mail: -------@aol.com
Dr. Scott Citino, White Oak, Florida, Ph: 904-225-----, e-mail: -------@wo.gilman.com
Dr. Doug Armstrong, Omaha Zoo, Ph: 402-733-----, e-mail: -------@omahazoo.com
Dr. Joe Flanagan, Houston Zoo, Ph: 713-533-----, e-mail: -------@houstonzoo.org

Significant diseases: Infectious diseases, parasitic diseases and non-infectious diseases of tapirs are summarized in the references below. Most neonatal deaths are due to stillbirths, drowning, and maternal neglect and trauma. In adults, most mortalities are due to gastrointestinal diseases including intestinal accidents resulting in colic. Mandibular abscesses are common in tapirs. Respiratory diseases are also a significant cause of disease in tapirs. Pneumonia is a common cause of illness. Several cases of pulmonary tuberculosis have been reported in tapirs in North American zoos. Problems related to the skeleton including foot abscesses; arthritis, osteomyelitis and degenerative joint disease were commonly reported in North American institutions. One condition of unknown etiology that has been recorded in a number of zoos is an acute illness that results in blistering and superficial skin sloughing of the dorsal midline of the animal. In some cases the animal is weak in the rear limbs and may collapse when attempting to walk. With supportive care most animals recover fully. Biopsy of the skin lesions is helpful in characterizing the nature of the
Captured and Restraint. Many tapirs can be habituated to being touched and scratched. Some individuals will even lie down, allowing physical examination and venipuncture. Temperaments of individuals vary greatly, however, and one should exercise caution when working with any tapir that is being “scratched down” as they are capable of inflicting serious injury with their teeth.

A variety of anesthetic drugs have been shown to successfully immobilize tapir species. Prior to the last decade, tapirs were most commonly anesthetized using etorphine. Other anesthetic regimens that include a mixed opioid agonist (butorphenol) and an alpha-2 adrenergic agonist work well in tapirs under a variety of circumstances. Good relaxation occurs after about 10 minutes. Intravenous ketamine can be given if necessary for further restraint. Alpha-2 and narcotic antagonists readily reverse the effects. The recovery is generally rapid and complete, and the transition from recumbency to standing is smooth and uncomplicated. See references below for further information including suggested dosages. Sedation of tapirs to facilitate introductions or for minor standing procedures has been accomplished with azaperone or less reliably with xylazine.

Death: It is recommended that a gross necropsy be performed by an experienced veterinarian. Samples for histopathology and other diagnostic testing should be collected during the post-mortem examination. A detailed assessment of major systems and organs and the histopathology findings should be used to guide further studies of post-mortem collected samples.

Reproduction

Birth and Maternal Care: All species of tapirs are very similar in their reproductive biology and behavior. Typically tapirs cycle every 28-31 days and give birth to a single offspring after a gestation of 13 months. Males will copulate with estrous females at least once during the cycle, and intromission can last as long as 15-20 minutes. The age of sexual maturity is related to environmental factors, nutrition and medical conditions. Females have bred as young as 13 months of age, and males as young as 24 months. Given the early age of female maturation, females should be separated from males (siblings, sires or any other male) by the age of 15 months. There appear to be no seasonal affect on reproduction. If breeding is desired, adults should be introduced during estrus to insure reproduction.
Breeding behavior varies greatly and depends on age, experience and compatibility of the breeding pair. Many pairs of tapirs run and nip prior to copulation and precautions should be taken to avoid injuries. Breeding/introduction areas should be free of potential trip hazards and small openings where a head or leg could become caught. Some tapirs breed while standing in shallow water while others will breed on dry land. Female tapirs can exhibit post-partum estrus and are capable of conceiving within one to three months after giving birth. Female tapirs may exhibit post-partum estrus and are capable of conceiving within one to three months after giving birth. The inter-birth interval can be as short as 14 months in captive tapirs. Tapir calves are completely weaned (on solid foods) by four months of age.

All newborn tapirs have a natal coat of white stripes and spots and are completely white on the belly, chest and throat. This serves as camouflage against predation in the wild. This coloration begins to fade at 3 months and should have completely disappeared 6 months of age after birth.

**Prepartum husbandry:** Females should be separated from the male(s) several weeks before parturition. Pools should be barricaded to prevent accidental drowning of the neonate. Depending on personalities of the parents, females with young can be reintroduced with the male 1-3 months after birth after reintroduction that allows visual and olfactory contact.

Female tapirs are usually good mothers but first time mothers and hand-raised mothers have a higher incidence of maternal neglect of their young. Tapirs give birth after a short labor period. Calves are relatively small at birth and usually weigh between 11 and 25 pounds. Calves are usually able to stand within one to two hours after birth and should make frequent attempts to find the mother's nipple. Mothers must lie on their sides to allow the calf to nurse. Inexperienced mothers may need to be scratched down on their sides and the calf manually positioned on the nipple.

Mothers nurse their calves five to ten times every 24 hours. Each nursing bout can last as long as 10-15 minutes. It is common for both calf and dam to fall asleep in the nursing position. New-born tapirs grow very rapidly and should double their body weight within 14-21 days of birth. They can be offered tiny pieces of fruit and vegetables as early as two weeks of age.

Newborn calves must be provided with a warm enclosure (70-85 degrees) and should never be left to lie on bare (cold) concrete. Hard packed dirt floors or hay bedding provides insulation and a non-slip surface for the unstable newborn. Tapir calves should not have access to a pool for at least one week after birth.
4.3 **Calving.** Precisely predicting the time of birth is difficult in tapirs. Vulvar edema and a mucoid discharge may precede parturition by 2 to 3 weeks. The udder will also become enlarged in the last few weeks. The female should be isolated from the male shortly before birth and remain separate with the calf for at least one week. Tapirs usually give to a single calf although twinning does occur and may result in dystocia. Labor is usually short and healthy calves should be standing within a few hours of birth. The birthing environment is critical for neonatal survival. Neonatal deaths from hypothermia, trauma, drowning and septicemia are preventable. A proper substrate of compacted soil, rubber pads or straw bedding is important to prevent hypothermia and splaying. Nursing occurs with the dam in lateral recumbency and should start within the first 2 to 5 hours after birth.

Neonatal examinations can be useful for assessing general health and determining the success of immunoglobulin transfer from the dam. It can be a challenge to collect blood from a struggling newborn tapir. The jugular vein is usually the best site for venipuncture in a neonate. Glutaraldehyde coagulation performed on serum will test for the presence of adequate immunoglobulins. In cases where the calf fails to nurse, it is often possible to encourage the female to lie down and then place the calf on the nipple.

**Hand-rearing:** Although females should be allowed to raise their young if possible, new born tapirs can be hand-reared where females show no interest in nursing. Hand-raised young are still likely to breed and behavioral problems are not as likely as with other, more social species. Regardless of rearing technique, hand or parent, a general health exam should be conducted 1-3 days after birth to assess overall condition of the neonate, including heart and lung auscultation, hydration, suckling response, temperature (hyper- or hypothermia), herniated umbilicus, blood values, and immunoglobin status. The umbilicus should be dipped in a solution of 3% iodine in order to prevent infection. Calves should be weighed on a regular basis to monitor growth.

**Contraception:** In some cases it is desirable to prevent reproduction in tapirs. If possible, separating the male from the female is the simplest approach. Castration, melengestrol acetate implants, medroxyprogesterone acetate (Depo-Provera, Upjohn) injections (5.0 mg/kg every 3 months), and altrenogest (Regumate) 0/22 % orally at standard equine dose) have been used with varying degrees of success in tapirs.

**Behavior management**

**Husbandry techniques:** Tapirs are easily trained through behavioral enrichment in order to examine most parts of the body, dentition, draw
blood and perform vaccinations. This can involve food but tapirs also respond very positively to being scratched in order to accomplish many physical examinations. Tapirs can also be taught to step onto a large scale for regular weighing.

**Safety**: Tapirs show little expression and generally exhibit peaceful behavior. However individuals can attack without warning and cause serious injury to personnel. Certain individuals may be extremely aggressive and it may be necessary to shift animals prior to servicing their enclosures, especially smaller ones. If it is necessary to enter an enclosure with an animal, there should be a minimum of two individuals, one of whom must be familiar with the animals and the facility, and have a radio.

**Introductions**: Tapirs should not be introduced until they have seen and smelled each other for several weeks through a “howdy” unit. Even when two animals seem compatible, staff should have water hoses and fire hoses available to separate fighting animals during initial introductions. It should be noted that either gender can be the more aggressive, and size is not a determining factor.
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