

# EAZA Best Practice Guidelines

## Asiatic golden cat (*Catopuma temminckii*)



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Best Practice



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## **EAZA Preamble**

Right from the very beginning it has been the concern of EAZA and the EEPs to encourage and promote the highest possible standards for husbandry of zoo and aquarium animals. For this reason, quite early on, EAZA developed the “Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria”. These standards lay down general principles of animal keeping, to which the members of EAZA feel themselves committed. Above and beyond this, some countries have defined regulatory minimum standards for the keeping of individual species regarding the size and furnishings of enclosures etc., which, according to the opinion of authors, should definitely be fulfilled before allowing such animals to be kept within the area of the jurisdiction of those countries. These minimum standards are intended to determine the borderline of acceptable animal welfare. It is not permitted to fall short of these standards. How difficult it is to determine the standards, however, can be seen in the fact that minimum standards vary from country to country.

Above and beyond this, specialists of the EEPs and TAGs have undertaken the considerable task of laying down guidelines for keeping individual animal species. Whilst some aspects of husbandry reported in the guidelines will define minimum standards, in general, these guidelines are not to be understood as minimum requirements; they represent best practice. As such the EAZA Best Practice Guidelines for keeping animals intend rather to describe the desirable design of enclosures and prerequisites for animal keeping that are, according to the present state of knowledge, considered as being optimal for each species. They intend above all to indicate how enclosures should be designed and what conditions should be fulfilled for the optimal care of individual species.

## Preface

The present Best Practice Guidelines comprises the actual knowledge on husbandry of Asiatic golden cats (*Catopuma temminckii*) in captivity. Although all available data and experiences of holders have been taken into consideration, this document makes no claim to be complete. It should be seen as a living document, regular updates are intended.

In 2010 the first edition of the EEP-Husbandry Recommendations for Asiatic golden cats (*Catopuma temminckii*) was published. This Best Practice Guidelines are the enhancement with updated data from the wild and from captivity. Furthermore, it is converted into the official template for Best Practice Guidelines, specified by EAZA.

The EEP for the Asiatic golden cat (*Catopuma temminckii*) is a challenging one with several problems. Little available data from the wild on biology and behavior, discussion on taxonomy, only a few founder animals, a small living population in zoos, and especially not enough breeding makes it difficult to maintain a healthy population in our zoos. Therefore, it is of particular importance to use the existing knowledge and experience on husbandry and handling of this beautiful cat as good as possible.

The recommendations you will find in this document are based not only on published data on golden cat husbandry, but mainly on experiences holding institutions made when they kept this complicated species in their zoos. The document was developed in close cooperation with the EAZA Felid TAG and especially with the EEP Species Committee for Asiatic golden cats. Therefore, I would like to thank all colleagues for their helpful and valuable input during the last months – I'm sure that we have now a document which helps to share our experiences and knowledge about this wonderful cat species within the EAZA community.

I hope you enjoy reading the Best Practice Guidelines for the Asiatic golden cat!



Sandra Reichler, February 2018

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## Summary

The Asiatic golden cat (*Catopuma temminckii*) is a medium-sized wild cat, distributed along East and Southeast Asia. It is classified as Near Threatened (NT) by the IUCN. However, there is a general paucity of data for this species, with no density estimates or population data, making an assessment of the true status of the species difficult.

Individuals with a variety of coat colors have been reported, including gold, brown, black, fox red and grey. Asiatic golden cats have white and black lines that run vertically from the top of the head to the medial side of the eye and downwards across the neck. Females are in general smaller than male Asiatic golden cats.

They are most likely solitary, nocturnal and terrestrial, but are good climbers as well. There is a huge lack of information about their natural behavior and social structures. The mating system and sexual behavior of Asiatic golden cat is relatively unknown as well. But it is suggested that males could have an active role in rearing.

There are not many institutions which keep the Asiatic golden cat, even if it's a public favorite. Keeping them needs experience and a well-coordinated enclosure and environment. Most important aspect is the shy character of the Asiatic golden cats. As the cat is very sensitive about noises and disturbances, the enclosure has to be in a quiet area of the zoo. Inside the enclosure should be possibilities to hide.

Breeding success is influenced by that as well. It seems like the more hiding possibilities are offered to the cats, the more it shows itself to the public and the more success is reached with breeding programs. However, as breeding was difficult during the last years, more research has to be done to optimize the keeping conditions of the Asiatic golden cat.

## 1. Biology and Field data

### 1.1. Taxonomy

Taxonomic classification of the Asiatic golden cat is still being under discussion. Based on genetic analysis some authors group it in genus *Pardofelis*, but because of different skull structure and the lack of flexible ankle joint, IUCN SSC Cat Specialist Group retains the Asiatic golden cat in genus *Catopuma*.

Order: Carnivora  
Family: Felidae  
Genus: *Catopuma*  
Species: *Catopuma temminckii*

Synonyms: *Felis temminckii* (Vigors & Horsfield, 1827)  
*Pardofelis temmicnkii* (Vigors & Horsfield, 1827)

Common Names: English – Asiatic Golden Cat, Asian Golden Cat, Temminck’s Cat  
French – Chat de Temminck, Cat doré d’Asie  
German – Asiatische Goldkatze  
Spanish – Gato Dorado Asiático

Formerly three subspecies of *Catopuma temmincki* have been described:

*C. t. temminckii*: Sub-Himalayan region from Nepal, India, Bhutan to Malaysia and Sumatra  
*C. t. dominicanorum*: South China  
*C. t. tristis*: highlands of Southwest China

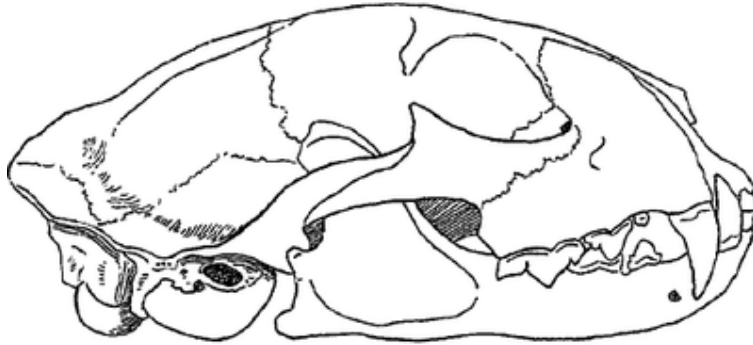
Some authors assumed that *C. t. temminckii* can be probably even divided into more subspecies. All classifications mainly based on distribution and morphological characteristics, mainly differences in coloration and body size.

A new study on taxonomy of genus *Catopuma* (PATEL, R.P. et al, 2016) analysed not only morphological data, but combined also molecular data and species projections. Results show a low nucleotide diversity in *C. temminckii* with moderate distinction between animals from north of the Isthmus of Kra and Peninsular Malaysia. The Asian golden cat seems to be a widespread habitat generalist, with high adaptive potential. Therefore authors recommend to classify *C. temminckii* as a monotypic species or distinguish only two subspecies:

*C. t. moormensis*: Indochina, China, Tibet, Nepal, India  
*C. t. temminckii*: Peninsular Malaysia and Sumatra

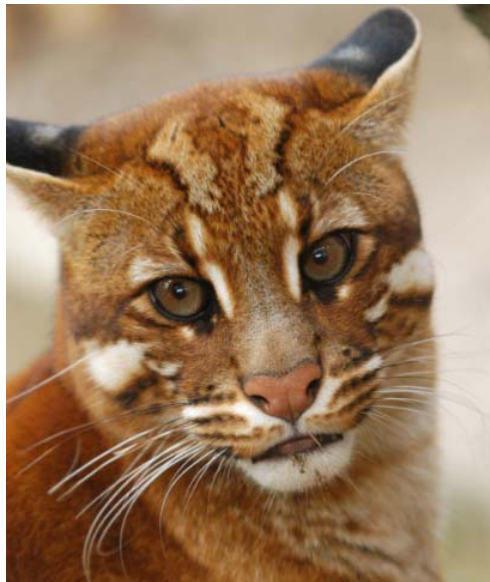
### 1.2. Morphology

With a body weight of 8-16 kg *Catopuma temminckii* ranks among the medium-sized wild cats with a considerable sexual dimorphism in size. Females usually weigh 8-10 kg, whereas adult males mostly have a weight of 12 – 15 kg. The total length differs between 110 and 160 cm whereas the tail represents one third of the total body length.



Skull of adult *Catopuma temminckii*

The fur is mostly fox-red to golden brown or gray with a brighter underpart with some dark spots. But black individuals or color variants with ocelot-like rosettes and spots are also known, especially from the northern part of the range. The ears are small and rotund. The back of the ears are black with grizzled centers. The face of the Asiatic golden cat is marked with white and black lines running across its cheeks and from one corner of the eyelid up to the top of its head. On the ventral side of the tail is a white streak, which is easily visible towards the terminal part of the tail.



*C. temminckii* at Heidelberg Zoo





*C. temminckii* at Heidelberg Zoo

### **1.3. Physiology**

Little is known about physiological parameters of Asian golden cats. Normal body temperature is between 37 °C and 40 °C like in most cat species. No data about heart rate and breath rate in Asian golden cats could be found, but studies in other cat species of similar size show heart rates of 140 – 160 beats/min and respiratory rates of 20-40 breaths/min (all taken from anaesthetized animals in captivity).

### **1.4. Longevity**

Asiatic golden cats have been reported to live 17 to 20 years in captivity, reliable data about longevity in the wild are not available.

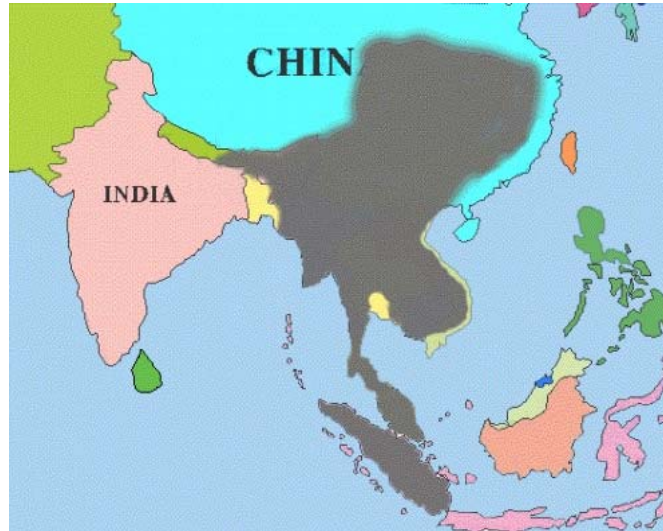
The oldest known individual in captivity became 23 years old.

### **1.5. Conservation status/Zoogeography/Ecology**

Asiatic golden cats live in tropical lowland rainforest and sub-tropical moist evergreen and dry deciduous forests, but also in more open habitats, such as shrub and grassland.

The species is distributed from India and Bhutan in the west, southern China in the north, Vietnam in the east, to Sumatra in the south. In the Himalayas, cats are found in altitudes of over 3000 m. The climate in their different habitats varies from all-season tropical moist to drier regions with high differences in temperature throughout the year. Generally, the northern populations live in a colder climate.

The Asiatic golden cat is still distributed widely throughout Bhutan, Bangladesh, Myanmar, Thailand, Malaysia, and Sumatra, but not present on other Indonesian islands. It is infrequently common in eastern Cambodia, Lao PDR, Nepal, Vietnam, and southern China. Extensive surveys in Vietnam and China indicates, that the species may face extirpation in these two countries in the next few years.



Geographic range of the Asiatic golden cat

The Asiatic golden cat is current standing on Appendix I (CITES) and its IUCN status is NT (Near threatened) with a decreasing population trend. However, there is a general lack of data for this species, making an assessment of the true status difficult. Extensive habitat loss and poaching led to a population decline of 20 – 30% in the last years. Therefore, the Asiatic golden cat is close to a vulnerable status (IUCN 2015).

There are no known predators for Asiatic golden cats. It is threatened primarily by habitat loss due to deforestation and loss of its prey due to illegal hunting. Regular poaching of Asian golden cats for consumption, their pelts and body parts is also reported from several countries across its range.

### **1.6. Diet and feeding behavior**

The Asiatic golden cat is primarily a terrestrial hunter, but it can climb trees when it needs to. It preys mainly on large rodents, but their diet also includes amphibians, insects, birds, leaf monkeys, reptiles and small ungulates. They have also been reported to prey on larger animals like wild pig, sambar deer and young calves.

### **1.7. Reproduction**

Males attain sexual maturity at 24 months, females at about 18 months old. Oestrus is 5-7 days long. Gestation period is 70-83 days. Common litter size is one to two kittens with a weight about 250 g. At about 9 months old, kittens are weaned and leave their mother (and father). Litters are born throughout the year in captivity, with a small peak in early spring.

### **1.8. Behavior**

Little is known about the ecology and behavior of the Asiatic golden cat. There are only a few in situ studies about the species, most knowledge was gained by observations in captivity. It was thought Asian golden cats are primarily nocturnal, but recent data indicate that it may be more crepuscular or diurnal. They live solitary, but some observations suggest that pairs seasonally live together and males could play an active role in rearing young. Home ranges of 30 – 50 km<sup>2</sup> are described.

The mating system of Asiatic golden cat is relatively unknown, as they are difficult to observe in the wild.

Their vocalizations include hissing, spitting, meowing, purring, growling, and gurgling. Other methods of communication observed in captive Asiatic golden cats include scent marking, urine spraying, raking trees and logs with claws, and rubbing of the head against various objects, much like a domestic cat. Studies in captivity show that weather impacts on cat's behaviour intensely, so that during rainy and cold weather Asiatic golden cats show more aggression.

## 2. Management in Zoos

### 2.1. Enclosure

#### 2.1.1. Boundary

Barriers between cats and visitors can be netting wire or glass. Concrete or wooden walls are also suitable, but shouldn't be around the whole enclosure, to give the cats the possibility to look out of their exhibit. But visitors should be able to look into the enclosure only at a few points, and cats should have many possibilities to hide. Enclosures should have a wire meshed roof or must be well protected by electric wires at the top. There are no experiences in keeping Asiatic golden cats on islands or behind water moats.

To keep more than one Asiatic golden cat, a second enclosure is necessary to separate individuals for longer periods. Both enclosures should be connected by fine-meshed wire with two sliding doors, so that cats can change enclosures by rotation.



Visitors view at Heidelberg Zoo





Visitors view at Belfast Zoo

### 2.1.2. Substrate

Asiatic golden cats should be kept in an outdoor enclosure with natural ground and vegetation. Different substrates such as sand, soil, bark mulch or grass give variety for cats. The indoor enclosures should have parts interspersed with bark mulch, sand or wood shavings.

### 2.1.3. Furnishings and Maintenance

The Asiatic golden cats should have many possibilities to hide, as they are very shy. A well structured and diversified furnishing is very important. Suitable cover includes bushes, tree trunks or dense stands of bamboo. Furthermore, wooden boxes, caves or other sheltered places give the cats safety and protection. Although Asiatic golden cats spend much of their time at ground level, they are also very good climbers. They love to rest on higher branches, rocks or shelves.

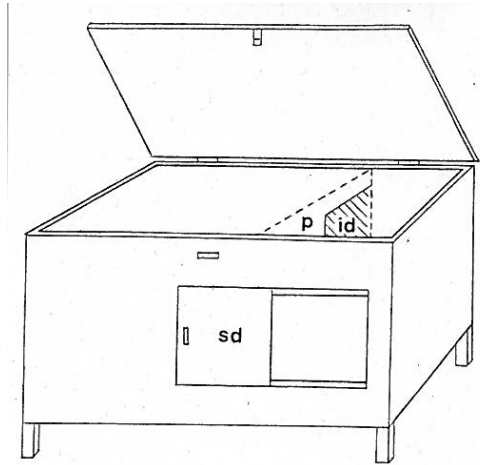


Outdoor enclosure Heidelberg Zoo



Outdoor enclosure Belfast Zoo

In the wild Asiatic golden cats live in a wide range with different habitats and climates. Northern populations can be found in colder habitats up to over 3000 m altitude, whereas golden cats in southern range occur in tropical lowland forests. The animals in captivity origin from different parts in the wild. Although Asiatic golden cats are rather adaptable to different climates and seems to be tolerant of colder temperatures, individuals in captivity should have access to an indoor enclosure or frost-protected areas, most suitable with temperatures not under 10 degrees. Indoor and outdoor enclosures should be equipped with several wooden boxes of ca. 70 cm wide, 50 cm deep and 40 cm high, which are used by the cats for breeding, but also to retire into and for sleeping, and sometimes as a toilet. Boxes should have a cover, which can be opened by the keepers, a hole of 25 cm in diameter as an entrance for cats and should be filled with wooden chips or shavings. A partition, which excludes light and draughts, provides additional seclusion for the animals (see Figure 1).



. Cubbing box (98 × 64 × 50 cm high) for Asiatic golden cat *Catopuma temminckii* at Melbourne Zoo: sd. sliding door (25 × 25 cm); p. partition; id. internal door (25 × 25 cm).

Example for wooden box at Melbourne Zoo

Cleaning procedure depends on the character of the cats. In general, Asiatic golden cats should be locked out during cleaning to minimize stress for the cats and danger for the keepers, as some (especially male cats) can react aggressive. Some individuals are used to keepers inside their enclosures and stay calm as long as they have enough space to dodge from humans.

#### 2.1.4. Environment

Golden cat enclosures should be located in a quieter and secluded part of the zoo, as animals are very sensitive to disturbance and noise (see also chapter keepers handling). Some institutions have an on show exhibit and additional breeding facilities behind the visitor area to give cats as much privacy as possible.

#### 2.1.5. Dimensions

The EEP recommends to keep Asiatic golden cats in an outdoor enclosure of minimum 150 m<sup>2</sup> and a minimum height of 2,5 m.

To keep more than one Asiatic golden cat, a second enclosure is necessary to separate individuals for longer periods. Both enclosures should be connected by fine-meshed wire with two sliding doors, so that cats can change enclosures by rotation.

More to the dimensions of an enclosure, its furnishing is important. If the Asiatic golden cat has enough possibilities to climb, hide or rest, the number of square meters is secondary.

## 2.2. Feeding

### 2.2.1. Basic Diet

Asiatic golden cats can be fed with small mammals like rats, mice, guinea pigs, and full-feathered birds like day-old chicks, chickens, pigeons, quail, or with low-fat beef or horse meat. At least twice per week, food should be supplemented with minerals (e.g. Vitakalk) and multivitamins (ADE-Bio-Weyxin®, Multi-Bio-Weyxin®). The amount of mineral supplementation should not be too high as golden cats have fragile kidneys (see also chapter veterinarian care). Grass or bamboo should be available as an aid for vomiting. One day of abstinence is recommended.

#### Exmoor Zoo Diet/animal

This is an example of Exmoor zoo's diet sheet when managing the species.

	monday	tuesday	wednesday	thursday	friday	saturday	Sunday
Rabbit			Half 330g				
Chicks	4=160g	4=160g	4=160 g	4=160g	4=160g	4=160g	
trout				Half=250g			Half=250g
Chicken							
Rat						1=250g	
Quail	150g						
Horse		1-1.5kg					

#### Heidelberg Zoo Diet/animal

This is an example of Heidelberg zoo's diet sheet.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Rabbit	1=600g						
Meat (beef or horse)		1=400g + bones			1=400g + bones		
rat			4=600g				
quail				2=300g			
chicken							½=250g
fish							1=150g
chicks				3=150g			

Two days per week supplemented with minerals (1/2 tea spoon) and vitamins

### 2.2.2. Special Dietary Requirements

Lactating Asiatic golden cats should get meat every day without a day of abstinence. After four weeks, the cubs additionally should get chopped lean meat.

### 2.2.3. Method of Feeding

Meat is usually given once or twice per day. One day of fasting per week is recommended. Beneath a piece of lean meat it is advisable to feed the Asiatic golden cats with whole birds or small rodents as it's the most natural food.

For enrichment purpose, the food can be hidden or hang up to keep the cat busy.

### 2.2.4. Water

Fresh water should be provided ad libitum.



## **2.3. Social structure**

### **2.3.1. Basic social structure**

Data from the wild are rare. Asiatic golden cats are difficult to observe as they are very shy. They live rather solitary except during mating. Males are likely to help during breeding time. Cubs leave their mother (or parents) when they are about 9 - 12 months old. Recordings of camera traps let suppose that they hunt as a couple as well.

Even if they are probably solitary in the wild, in captivity they are mostly kept in couples. But compatibility of pairs is very different and depends on individuals. Social interactions between male and female can be observed very rarely. As the cats react very sensitive to the presence of the keeper or other observer, a camera observation is recommended to see social interactions.

In captivity usually the female rears her offspring alone, less experience is made with males kept together with female and offspring.

### **2.3.2. Changing group structure**

It can be a very long process to bring a couple together. Males can display intrusive, overly eager behaviours, which can cause females to become anxious and shy. It is recommended to keep prospective pairs in separate enclosures, connected with fine-meshed wire, for the first few weeks to let animals habituate to each other. A suitable period of time should be given so both animals are well accustomed to the enclosure.

When the female is in heat, both cats should show interest in each other and this is a good time to mix them together.

During the first occasions they are mixed, they should be closely observed by an experienced keeper. The use of video cameras can be very helpful as cats react to direct observation by humans and show a lot of behaviours during the night when otherwise they would be unobserved. When both cats approach each other in an apparently friendly manner, time together can be slowly elongated.

It is advisable to keep the cats not longer alone than necessary. EEP observations suggest that the longer the Asiatic golden cat is kept alone, the more difficult it gets to socialise it again. Therefore it can be helpful to keep non-breeding pairs or two males/two females together temporarily to keep them socialized. However, single individuals (males) within the EEP are not compatible with other Asiatic golden cats, probably because of a bad socialisation. Unfortunately, killing of females, done by their males, happened several times within the EEP population. Reasons for that behaviour are not well known yet. Data of camera observation showed, that young males sometimes wants to mate too often, although the female is not be willing to do. The female try to escape and the male hold the female for mating, biting her neck or shoulder region. In such a situation the sexual dimorphism can lead to serious injuries of the female, sometimes till death.

### **2.3.3. Sharing Enclosure with other species**

Until now, there are no assertions about keeping Asiatic golden cats with other species. In general, it is not easy to socialise a predator with another species. But it is not excluded that a socialisation with the Asiatic golden cat and another species could be successful.

## **2.4. Breeding**

### **2.4.1. Mating**

The mating system of Asiatic golden is relatively unknown.

When the female is in heat, it starts typical calling and marks more frequently. Mating can be observed very rarely, because it occurs cryptic and/or during night or when the cats feel undisturbed. Camera observation can help to get more information on mating. Missing fur at the female's neck can be interpreted as a sign for mating as it's supposed that the males bite the female's neck during mating. However, it not always appears.

Daily management of a breeding pair depends on the individual cats and how well they mix together. Holders report a variety of different management strategies, which were successful. Some institutions keep male and female together day and night throughout the whole year, others only during the daytime or only if the female is in heat, and some separate individuals for feeding. Several holders describe different management techniques for different pairs/individuals. As Asiatic golden cats are predominantly nocturnal or crepuscular and sensitive of noise and disturbance, time together during the evening, night or early morning is beneficial for pairing.

Nesles had good experiences with leaving their pair together until 21.30 in the evening.

In Zoo Melbourne, female is separated from male after 70 days, to guarantee that birth isn't giving while housed with male. Australian colleagues reported of cubs being cannibalised when the male remains with the female and cubs. When the pair is harmonising well European holding institutions usually separate the male short time before birth or directly after the female has given birth. In summary, management depends on individuals, most important is a close screening of the pair and especially the female's behaviour.

During the last few years, artificial insemination of Asiatic golden cats became an option of managing within the EEP. Even if natural insemination is preferred, it is sometimes not possible. There were a few male individuals which showed aggressive behaviour against females and some females which were really shy and did not interact with males. As the population of Asiatic golden cats is small, each individual is needed to keep the genetic diversity upright. For further questions about that topic please contact Sandra Reichler (EEP Coordinator, contact information see cover).

### **2.4.2. Pregnancy**

Gestation period is about 70 – 83 days. As mating can be observed very rarely, exact time of pregnancy is not easy to determine. Visual confirmation of pregnancy is also often difficult. Keepers may only be alerted when a female ceases to eat and becomes aggressive or nervous when the breeding box is inspected.

### **2.4.3. Contraception possibilities**

The following described contraception possibilities are used in most felids. Special research for contraception possibilities in Asiatic golden cats has not been done yet. GnRH agonists are considered the safest reversible contraceptives, but duration of efficiency can be unpredictable. To date, data for carnivores indicate time to reversal is extremely variable, with time from implant insertion to birth of offspring ranging from 1 to 6 years. Side effects are especially the potential for weight gain unless diet is controlled. Another safe and effective method is an Ovariohysterectomy or castration. This option is a permanent sterilization.

For more detailed information on contraception, please contact EGZAC (EAZA Group on Zoo Animal Contraception) <http://www.egzac.org/>.

### **2.4.4. Birth**

Usually the cat doesn't change its behaviour much before giving birth. Some females are a bit more nervous or remains in the breeding boxes more often. In the last few days before birth, it is sometimes possible to see the nipples more clearly as some hair loss around them is a little more apparent.

For giving birth, a number of boxes (descriptions see under housing) should be offered to the mother, in a variety of places and at different heights throughout the enclosures. Cameras in the nest boxes allow observing the mothers behaviour with her kittens remotely.

### **2.4.5. Development and Care of Young**

Mothers are even more sensitive to disturbance when caring for young kittens, therefore cleaning and other keepers work should be reduced to an absolute minimum during the first four weeks at least. In Zoo Heidelberg and Zoo Melbourne, keepers only enter the enclosure for the first 1-2 weeks for providing the cat with food and water. Only experienced keepers, which are well known by the cats, work in and around the golden cat enclosure during that time. Carrying the kittens from one breeding box to another too often can be a sign for too much disturbance.

The female is offered as much food as can be eaten, although it is not unusual for her to refuse to eat in the first week following parturition.

A cub should not be disturbed or handled until it is 8 weeks old. At this time the first vaccination can be done.

At about 9 months old, kittens are weaned and can be separated from mother (and father). However, it is the best to keep the kitten as long as possible with the parents to minimize the time they spend alone before they are socialized with another individual.

### **2.4.6. Hand-Rearing**

Although parent rearing is highly preferable, handrearing of Asiatic golden cats can become necessary and is recommended by the EEP when kittens are rejected or when a female has repeatedly failed to rear in the past (e.g. carries her kittens too intensive). Please contact the EEP-coordinator immediately when you think about hand-rearing your kittens.

Bottle-fed kittens can easily be fed with industrial milk replacements for house cats (e.g. Esbilac). Rearing by a domestic cat, if available, is also a good option for orphaned golden cats. Minced low-fat meat mixed with milk should be offered when cats are four weeks old. Contact with keepers has to be reduced as early as possible and limited to bottle-feeding when cats are about five weeks old. Rearing two or three cubs together leads to a better socialisation of the animals. House cats or dogs can be used as play partners for young hand-reared golden cats, however reintroduction to a conspecific should be pursued as soon as possible and depends on the individual character of the adults.

Successful handrearing of golden cats is reported for example from Zoo Heidelberg and Zoo Wuppertal. These institutions can be contacted for more details when necessary.

#### **2.4.7. Population management**

Population size within the EEP alternated around 20 individuals during the last years. A population increase is highly recommended to keep the EEP healthy. At least 50 individuals are strove as target population. Unfortunately breeding until now has not been quite successful. There are still more successful breeding pairs needed to keep at least population stable. The number of animals is still too low and animals with new blood lines are necessary to keep population genetically healthy. Since 2016 all individuals within the EEP are managed together without separating different subspecies any longer. New studies on taxonomy but also the small number of individuals lead to this decision. Each animal within the EEP is under management and necessary to maintain a population of this species in European zoos.

#### **2.5. Behavioural enrichment**

Asiatic golden cats can be enriched quite easily. Hidden or hanging food items, domestic cat toys, cardboard boxes, dispersed spices, perfume or smell from prey or conspecifics give cats many stimuli. Some individuals also like water basins filled with fish or other food.

#### **2.6. Handling**

##### **2.6.1. Individual Identification and Sexing**

Individuals can easily be differentiated. The coat pattern of each cat is unique. Additionally there is a huge sexual dimorphism. However, a transponder chip should be placed for individual long-term identification. Sexing is, as with other felids, only difficult during the first days after birth.

##### **2.6.2. General Handling**

Asiatic golden cats are very shy and sensitive to disturbance. Therefore keepers should be experienced and not change too often. Usually cats don't have to be separated before keepers enter the enclosure, but animals should have good opportunities to avoid the keeper and retire. However some holders report single (male) individuals which are peculiar

and not shy when keepers approach during routine cleaning of the enclosures, and with individuals such as these, greater caution is necessary. Separation before entering the enclosure can be recommended to avoid conflicts.

A lot of routine in keepers work is very important and will give the cats a feeling of security.

### **2.6.3. Catching/Releasing**

Asiatic golden cats can be captured with a robust net, for vaccination or loading before transport. However, it is very difficult, even for experienced keepers, to hold a cat by the neck, as is common with other cat species. Therefore, cats should be kept in the net for some veterinarian treatments or transfer into a transport box. Some individuals are very sensitive to direct contact and handling by keepers, to the point of serious stress symptoms, like staggering. In such cases, vaccination by blowgun and other treatment only when the animal is sedated is recommended.

### **2.6.4. Transportation**

The cats can be transported in common crates measuring about 80 x 50 x 60 cm (length x width x height). The crates should ideally be constructed of metal, aluminium, heavy plastic, while wooden crates should be made of a solid material or be lined with metal sheeting. The crates should be constructed according to the Live Animal Regulations of the International Air Transportation Association (IATA). Ideally, wood wool or dry straw should be provided as bedding material in the crate. In the event of a longer journey exceeding 24 hours, some meat and water should be supplied for the animal within the transport crate.

### **2.6.5. Safety**

As mentioned in 2.6.2., each individual behaves different. If the keepers are unsure if the cats are calm enough to go inside they should be locked out before entering the enclosures. In general Asiatic golden cats are able to cause serious injuries. However, until now there have not been such a serious case recorded.

A direct physical interaction between visitors and Asiatic golden cat should not occur.

## **2.7. Veterinary: Considerations for health and welfare**

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Asian golden cats tend to diseases of their genito-urinary system, as most cats do, mainly when they grow older. Kidney failure and especially bladder cancer appeared within the EEP population, regularly, and led to loss of valuable individuals. Therefore, please monitor your golden cats closely, early treatment of kidney or bladder problems could at least prolong the lifespan of the individual.

### Vaccination

It is recommended to vaccinate the cats for:

Feline panleukopenia, which is caused by feline parvovirus (FPV).

Feline viral rhinotracheitis, caused by feline herpesvirus-1 (FHV-1), and feline calicivirus (FCV).

The first vaccination should not be before 8 weeks of age;

Booster vaccination 4 weeks after the first injection; then yearly booster vaccination.

A killed vaccine should be used.

The species seems to be prone to acute kidney failure. One case of an acute kidney failure after vaccination is reported.

### Viral disease

If blood is taken, the sample should be checked for FeLV, FIP and FIV

### Deworming

Deworming and faecal control for parasites twice a year.

Deworming with Fenbendazol (Panacur®) or Praziquantel/Pyrantelmonat orally (Drontal®) or Selamectin spot on (Stronghold®)

### Urine samples

Due to the fact that *Catopuma temminckii* seems to be more prone to (squamous cell) carcinomas of the bladder and acute kidney failure, urine samples should be taken on a regular basis and examined for blood in the urine as well as pH, spec. gravity and leucocytes. This could be done for example with a common urine stick.

If blood is found in the urine, further diagnostic tests concerning tumor of the bladder and kidney failure should be initiated. This could include for example blood sampling, x-ray of the abdomen (bladder, kidneys), ultrasound of the bladder and kidneys.

Easy and stress free sampling of the urine can be done with a special designed plastic plate. When the cat urinates against the plate, the urine goes down into the basin where it can be sucked into a syringe for examination (see photo).



Plastic plate for urine samples

### Necropsy protocol

On every cat that dies, a necropsy should be made. Special investigation should be performed on the urogenital tract.

Following a list of tissue samples that should be taken for Histopathology:

Salivary gland, Tonsil, Tongue  
Lung, Trachea, Thyroid/Parathyroid, Lymph nodes, Thymus, Liver  
Heart, Spleen, Oesophagus, Stomach, Small intestine, Large intestine  
Omentum, Pancreas, Adrenal  
Kidney, Bladder, Ureter, Reproductive tract  
Skeletal muscle, Femur and bone marrow, Skin  
Brain  
Neonates  
Blood smear

Following a list of tissue samples that should be taken for preservation frozen at your zoo:

Liver, Stomach, Small intestine, Large intestine, Adrenal  
Kidney, Bladder  
Femur and bone marrow, Fat tissue, Eye  
Serum, Plasma

## **2.8. Recommended Research**

There is a huge lack of information regarding the Asiatic golden cat. Especially studies in the wild are missing. To gain more information about their social behaviour, their prey preferences, their sexual and mating behaviour, and their physiology and veterinary problems, more studies are needed. Ex situ studies might fill a few of these gaps, but in situ studies are necessary to learn more about the natural behaviour of this species.

### 3. References

- BROCKLEHURST, M. (1997). Husbandry and breeding of the Asiatic golden cat (*Catopuma temminckii*) at Melbourne Zoo. *International Zoo Yearbook* **35**, 74-78.
- CHOUDHURY, A. (2007). Sighting of Asiatic golden cat in the grasslands of Assam's Manas National Park. *Cat News*, No. 47, 29
- DARBOWSKA, A. & SMIELOWSKI, J. (2001). Some observations on the behaviour of the Chinese golden cat *Catopuma temminckii tristis* (Milne-Edwards, 1872) at Wassenaar Wildlife Breeding Center. *Der Zoologische Garten N.F.* **71** 6. 394-402.
- EATON, R. (1976/197). *The World's Cats*. Vol. I-III. Seattle.
- EHLERT, T. (2013). Untersuchungen zur Ethologie von Asiatischen Goldkatzen (*Pardofelis temminckii*) in Menschenobhut unter Anwendung chronoethologischer Methoden. Dissertation. Johann Wolfgang Goethe-Universität Frankfurt/Main.
- FIGURA, I. & REICHLER, S. (2007). Erfahrungen in der Handaufzucht von Asiatischen Goldkatzen (*Catopuma temminckii*) und Sumatra-Tigern (*Panthera tigris sumatrae*) im Tiergarten Heidelberg. *Der Zoologische Garten N.F.* **76** 5-6, S.345-356.
- IUCN Red List of threatened species (2017). *Catopuma temminckii*. [www.iucnredlist.org](http://www.iucnredlist.org).
- LOUWMAN, J.W.W. & OYEN, W.G. VAN (1968). A note on breeding Temminck's golden cat (*Felis teminckii*) at Wassenaar Zoo. *Ibid.* **8**, 47-49.
- MACDONALD, D.W. & Loveridge A.J. (2010). *Biology and Conservation of Wild Felids*. Oxford University Press. 27-28
- MÜLLER, A. & MÜLLER, U. (1989). Mutterlose Aufzucht von Goldkatzen (*Profelis temminckii*) im Tierpark Görlitz. *Der Zoologische Garten N. F.* **59** 3, 195-200.
- MONIRUL H. KHAN, M. (2008). The neglected Asiatic golden cats of Bangladesh. *Cat News*, No. 48, 20-21
- NOWAK, R. M. (1991). *Walker's Mammals of the World*, Volume II. Fifth Edition, 1199.
- NOWELL, K. & Jackson, P. (1996). *Wild Cats. Status Survey and Conservation Action Plan*. IUCN/SSC Cat Specialist Group. Gland.
- ODA, S.G.S. et al (2009). Standardization of Some Electrocardiographic Parameters of captive Wild Cats (*Leopardus wiedii*, *Leptailurus serval* and *Oncifelis colocolo*). *World Small Animal Veterinary Association World Congress Proceedings*.
- PATEL, R. P. et al (2016). Two species of Southeast Asian cats in the genus *Catopuma* with diverging histories: an island endemic forest specialist and a widespread habitat generalist. *The Royal Society Open Science* **3**: 160350.
- POCKOCK, R. (1939). *The Fauna of British India*, vol. 1, Taylor and Francis, Ltd., London, 259-264.
- REICHLER, S. (2010). EEP-Husbandry Recommendations for Asiatic golden cats (*Catopuma temminckii*).
- REICHLER, S. (2018). EEP Studbook for the Asiatic golden cat (*Catopuma temminckii*) 2017.
- WANGYEL WANG, S. (2007). A rare morph of the Asiatic golden cat in Bhutan's Jigme Singye Wangchuck National Park. *Cat News*, No. 47, 27-28
- WEIGL, R. (2005). Longevity of mammals in captivity; from the living collection of the world. *Kleine Senckenberg-Reihe* **48**
- WILSON, D. E. & MITTERMEIER, R. A. (2009). *Handbook of the Mammals of the World*. 1. Carnivores, 141.
- WILTING, A., HEARN, A., ROSS, A. (2010). "Pardofelis temminckii" (On-line). Accessed January 30, 2017 at <http://www.iucnredlist.org/apps/redlist/details/4038/0>



