3.2 Rearing orphaned lynx

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If the decision has been taken that an orphaned lynx should be transferred to a rehabilitation center (see protocol *2.3 In situ management of orphaned lynx*), there are several important aspects that have to be considered for successful rehabilitation. The requirements that rehabilitated orphan lynx chosen for interpopulation exchanges should meet and the infrastructure that consequently must be available in the countries of origin are summarized in Appendix *VII Orphans checklist*.

3.2.1 Health assessment

If the lynx orphan's condition allows, a complete examination under narcosis is recommended upon arrival (see chapter 3.5 *Quarantine*). Blood samples have to be collected for haematology, biochemistry and genetics as well as for pathogen screenings and serological tests (Borel et al. 2022a). Sex has to be determined and age can be estimated based on body size and dentition (Marti & Ryser-Degiorgis 2018, see protocol *3.7 Clinical examination*). This initial clinical examination contributes to careful triage and euthanasia of individuals that are not viable, will not be able to reproduce, or may pose a health risk to the population (Borel et al. 2022a).

Before introducing the animal into the larger outdoor enclosure, it is recommended to respect a quarantine period (see chapter 3.5 *Quarantine*) until all laboratory results are available (Ryser-Degiorgis et al. 2021). Ideally, the quarantine pen should be adjacent to the outdoor enclosure and can serve as a shift yard for temporary housing for sick or injured individuals (Reiss & Woods 2011). If indicated by health concerns, netting or blowpipe/dart gun anaesthesia should be possible in the smaller pen (Borel et al. 2022a). Another efficient capture method is the use of a capture box that can be installed in the passage between enclosure compartments (Fig. 3.2.1).

Fig. 3.2.1. Capture box for juvenile lynx in quarantine.

3.2.2 Enclosure Design

As for lynx breeding in captivity, sufficient enclosure size is essential (McPhee & Carlstead 2010). Fifteen (McPhee & Carlstead 2010) to 20 m^2 for the quarantine pen (for one orphan) and at least 200 m^2 (ideally more) for the rehabilitation pen is recommended (for one or two orphans). However, the quality of the enclosure also plays a decisive role in the welfare of captive animals (McPhee & Carlstead 2010) and visual barriers, climbing opportunities, hiding places and platforms of different heights must be included in the enclosures in order to reduce stress of lynx orphans and prevent captivity-related injuries (Fig. 3.2.2; Hartmann-Furter 2009). Walls of the enclosure must hamper the animals to bite or scratch them to avoid serious teeth and claws injuries (see chapter *3.5 Quarantine*), a recurrent problem in provisory captivity of orphaned and quarantined lynx (Borel et al. 2022b). In addition, precautions must be taken to prevent lynx from escaping (see chapter 3.1.1.2 *Boundary*). As orphaned lynx can react very stressed to human presence, the location of the enclosure needs to be quiet enough and off-display (see Appendix *IV Coordination enclosures*).

Fig. 3.2.2. Orphaned lynx in the outside compartments of the rehabilitation enclosure in the Wildtier- & Artenschutzstation Sachsenhagen. © F. Brandes/M. Brücker

3.2.3 Nutrition

Free-ranging juvenile lynx usually start eating meat from the age of 9 weeks but are still suckling until the age of 5 months (Breitenmoser & Breitenmoser-Würsten 2008). However, previous experience has shown that 6–8-week-old cubs are already capable of feeding on meat only (Borel et al. 2022b). In order to substitute their mother's milk, kitten breeding milk as milk replacer can be added until the age of 12–16 weeks. For younger individuals that would need to be bottle-fed, a complete protocol has been established for the Iberian lynx (Rivas et al. 2009) that may be used for Eurasian lynx, too.

Refeeding of emaciated animals should theoretically be done gradually to avoid electrolyte imbalance or maldigestion. Suddenly adding carbohydrates to a fasting body can cause a potentially life-threatening electrolyte imbalance ("refeeding syndrome"; Mehanna et al. 2008, Tresley & Sheean 2008, Barras-Morat et al. 2011, Brenner et al. 2011). For refeeding severely emaciated individuals, easily digestible proteins like chicken are recommended. Wet cat food is not suitable for refeeding wild felids and can lead to diarrhea. Once the animal's status allows it, it is important to progressively strive for feeding a diet with a composition and presentation close to natural conditions. This shall promote consumption of similar food when the animal is released back into the wild (Combet 2009, Doussain 2018) (see chapter 3.1.2.1 *Feeding lynx for reintroduction*).

3.2.4 Behavioural enrichment

Interactions with conspecifics are important for feline cubs of all ages (Naidenko 2001, Khan et al. 2018) but particularly between 2 and 3 months old for Eurasian lynx (Alekseeva et al. 2014). Therefore, it is recommended to promote the socialization and development of an orphaned lynx by keeping it with one or two other juveniles (Rivas et al. 2009). An adult female acting as a surrogate mother (G. Moyne, pers. comm.) or housing near other adult lynx individuals (J. Kubala & S. Wölfl, pers. comm.) may also be beneficial.

If the socialization with conspecifics is not possible or feasible, it must be ensured that the orphan is kept occupied with different kinds of play utensils or arrangements in the enclosure to train muscles and foster coordination of movement and mental engagement. This physical and mental engagement by offering changing environs is, however, also valuable for a group of juveniles.

3.2.5 Handling

Measures to avoid habituation to human contact or interaction are the same as for captive-bred lynx intended for release (see protocol *3.1.4 Handling*). In orphaned lynx, restriction of human contact is not only important to avoid habituation but also to reduce stress, especially in older lynx cubs taken from the wild later in the year.

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