3.5. Quarantine

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Scope of application:

- Orphaned or not yet independent juvenile lynx and injured or sick lynx taken from the wild for temporary care (quarantine before rehabilitation). For long-term care of orphaned lynx see chapter 3.2 *Rearing orphaned lynx*.
- Lynx taken from the wild for reintroduction or population support (quarantine before translocation).

Quarantine facility and furnishing:

- To avoid stress or habituation, contact with humans (visual and acoustic) in the quarantine area should be reduced as much as possible.
- The quarantine facility is locked and not accessible to unauthorised persons. External persons have no access.
- The quarantine area must be separated from other departments where animals are kept and equipped in such a way that hygiene barriers prevent the spread of infectious agents (e.g., disinfection tubs, footbaths, dedicated material, protective clothing).
- If several lynx are housed in quarantine at the same time, they must be isolated from each other in different units, each with its own appropriate hygiene barriers (disinfection tubs, protective clothing).
- An exception may be made for social units of the same origin (mother/offspring, siblings) that are admitted at the same time.
- All surfaces (walls, floors) in the quarantine area should be easy to clean and disinfect or replace. Various infectious agents (viruses, parasite stages) can survive in the environment for long periods of time and render enclosures, in which they cannot be completely eliminated, unusable.
- Furnishings must also be such that they can be replaced or fully disinfected.
- In order to meet the comfort and protection needs of the lynx, elevated resting places, hiding places (e.g., visual barriers with conifers, sleeping box), possibility to sharpen claws, possibly a sufficiently dimensioned litter box should be available.
- Especially for adult lynx walls and doors should be lined with smooth materials preventing the animals from biting or scratching in order to avoid serious teeth and claws injuries.
- All areas must be visible and accessible for health checks and access for blowpipe or dart gun for anaesthesia.
- Each quarantine unit must be cleaned and disinfected before re-homing.

Quarantine duration:

In general, a quarantine period of 30 days is recommended to cover diseases with a correspondingly long incubation period and prepatency. This period should be strictly adhered to for lynx in rehabilitation that are possibly also to be socialised with conspecifics (young lynx).

For translocations of clinically healthy lynx, it may make sense – in order to reduce the stress burden on the lynx – to limit the quarantine period to the time when all test results are available and no positive findings speak against a release into the intended area. This is especially true for wild-caught

subadult or adult animals that are highly stressed by captivity.

In case of positive findings, the quarantine period is extended accordingly (confirmation of positive findings e.g., FeLV or FIV, therapy, follow-up examinations).

Fig. 3.5.1. Quarantine enclosure in the Natur- und Tierpark Goldau, Switzerland. © M. Wehrle

Entrance examination:

An initial examination under anaesthesia should take place as soon as possible after admission to the quarantine in order to be able to collect findings and take samples.

Sick and weakened individuals must of course be sufficiently recovered for the anaesthetic risk to be acceptable. If the lynx is put under anaesthesia during capture and transport, a complete initial examination and sampling should ideally take place immediately so that no further anaesthesia is necessary. According to the results of clinical examination, the animal will be classified as suitable or unsuitable for translocation or release to the wild (Fig. 3.5.2). The following findings and samples should be taken during the initial examination:

1. General clinical examination (with particular attention on)

- Oral health – dental & gingival condition (frontal and lateral pictures of dentition for age estimation)
- Head – skull deformities, under / overshot jaw, nasal discharges etc.
- Opthalmoscopic examination of eyes
- Otoscopic examination of ears

- Limb conformation & joint mobility
- Auscultation of the heart
- Reproduction – check females for mating bites, pregnancy and mammary gland development, males for cryptorchism.

2. Blood sample

It is recommended to take EDTA blood and serum during the initial examination.

a) **EDTA blood:** Haematology, FeLV provirus PCR, genetic analysis.
b) **Serum:** Blood chemistry, FIV western blot, FeLV ELISA.

If enough blood can be collected, it makes sense to freeze EDTA blood and serum for possible later examinations. Reference values for blood count and clinical chemistry can be found e.g., in Goettling et al. (2016).

3. Dry swabs for virological examinations & genetic analysis:

a) Conjunctival swab: FHV, *Chlamydia felis* (PCR)
b) Oropharyngeal swab: CDV, FCV (PCR)
c) Rectal swab: FPV, FCoV (PCR)

4. Parasitology

During the initial examination, the coat and skin are examined for **ectoparasites**. Sarcoptic mange is a common parasitic disease in lynx.

Sampling:

a) **skin scrapings** in case of suspected mite infestations (sarcoptic mange)
b) **faecal sample** from the first droppings in the enclosure for examination by flotation. In order to detect lungworms (e.g., *Aelurostrongylus abstrusus*, *Angiostrongylus chabaudi*, *Troglostrongylus brevior*), an additional examination with the emigration method is recommended.

Prophylaxis: Prophylactic treatment with ivermectin or doramectin and praziquantel is recommended for clinically healthy lynx for translocation already during the initial examination.

For lynx for rehabilitation that are sick or weakened, antiparasitic treatment should be targeted after diagnosis.

5. Identification by means of a **transponder** placed subcutaneously in the centre of the left side of the neck. Since lynx can be individually identified by their coat pattern, **pictures of both flanks** for subsequent identification during camera-trap monitoring should also be taken.

Notice for international translocation: If the transponder is registerd on a CITES document only inject it when the quaratine results confirm that the transport can be carried out. For transport of Lynx between countries a rabies vaccination can be required!

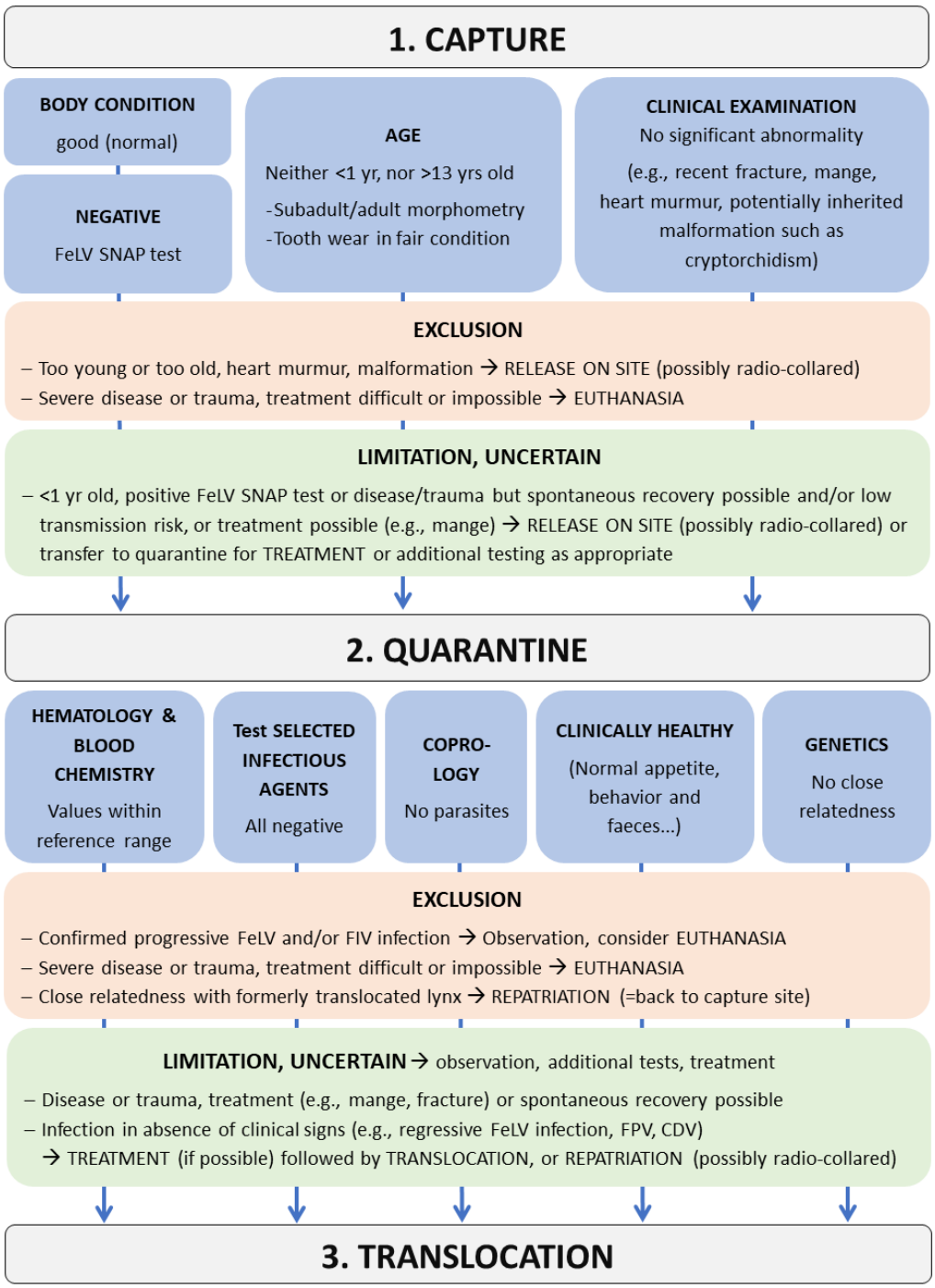

Fig. 3.5.2. Flow chart for selecting suitable animals for release (Ryser-Degiorgis et al. 2021). [selection criteria under revision by health working group]

References & Further Reading:

Goettling K. Goeritz F., Jewgenow K. & Painer J. 2016. Serum chemistry and haematology for female Eurasian lynx (*Lynx lynx*). European Journal of Wildlife Research 62, 365-367

Ryser-Degiorgis et al. 2002: Veterinary supervision of Lynx translocation within the Swiss alps. Proceedings Europ. Ass. Zoo- and Wildlife Veterinarians, 2002, Heidelberg, 147-153

Ryser-Degiorgis et al. 2021: Health surveillance in wild felid conservation: experiences with the Eurasian lynx in Switzerland. Cat News Special Issue 14, 64–75.

Woodford (ed.) 2001: Quarantine and health screening protocols for wildlife prior to translocation and release in to the wild. Office Intern. des Epizooties (O.I.E.), Veterinary Specialist Group SSC IUCN

Quarantine protocol Lynx **Ident.-Nr._____**

Quarantine start, date: _____ End of quarantine, date: _____

Initial Examination

Date: _____ Weight: _____

Age: _____ sex: male ☐ female ☐

Findings general examination: _____

_____

Transponder: _____ other individual markings: _____

Photo documentation on both sides ☐ Photo documentation Teeth ☐

Sampling

Blood: EDTA blood ☐ serum ☐ **Dry swabs:** oropharyngeal ☐ conjunctival ☐ rectal ☐

DNA-sample: hair ☐ blood ☐ mucosal swab ☐

Other: _____

Results

	Date	**Date**	**Date**
Parasitology: Faeces→ flotation + emigration method			
Parasitology: Skin scraping→ native, KOH procedure or PCR			
Feline Leukemia Virus: EDTA/Serum→ FeLV-Provirus-PCR, in case of positive results follow-up examination → p27-AG-ELISA			
Feline Immundodeficiency Virus: Serum→Westernblot, if result is positive confirmation by →FIV provirus PCR			
Feline Coronavirus Faecal sample or rectal swab → PCR or AG rapid test			
Feline Parvovirus Faecal sample or rectal swab → PCR or AG rapid test			
Canines Distemper Virus throat swabs → PCR + Serum→ CDV-AB			
Feline Calicivirus conjunctival- or throat swabs→ PCR			
Chlamydia felis			

Conjunctival- swab → (PCR)			
Feline Herpesvirus conjunctival- or throat swabs → PCR			
abnormal findings Blood count			
abnormal findings clinical chemistry			