2025

POLICY GUIDELINES

PLACEMENT & MANAGEMENT OF RESCUED ANIMALS IN INDIAN ZOOS

Central Zoo Authority
केन्द्रीय चिड़ियाघर प्राधिकरण

Policy Guidelines

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Contents

1 Statement of purpose

The Central Zoo Authority (CZA) is a statutory body of the Ministry of Environment, Forest, and Climate Change (MoEFCC). It carries out functions assigned to it under Section 38-C of the Wild Life (Protection) Act, 1972, hereinafter, referred to as the Act.

According to the National Zoo Policy, 1998, one of the objectives of Indian zoos is "*...to function as rescue centers for orphaned wild animals subject to the availability of appropriate housing and upkeep infrastructure*". *Rescued animals* includes orphaned, seized, rescued, and injured wild animals[1].

Rescued animals received by zoos broadly fall into two categories: wild animals[2] captured according to provisions of Section (11) or (12) of the Wild Life (Protection) Act, 1972, and native/non-native animals confiscated from illegal trade. The term *rescued animal(s)* in this document primarily refers to these two categories which could result from any of the following scenarios:

i) Animals injured due to natural disasters (e.g., floods, earthquakes, or forest fires) or human-induced activities (e.g., road accidents, habitat destruction) and subsequently rescued by forest departments or other authorities.

ii) Orphaned young animals that are rescued to ensure their survival.

iii) Animals that are voluntarily surrendered by private individuals or institutions, often due to the inability to care for them adequately or legal prohibitions on their ownership.

iv) Animals that stray into human settlements and pose a threat to themselves or humans, such as leopards, elephants, or bears entering villages or urban areas, often necessitating their capture and placement in zoos or rescue centers.

v) Animals used in circuses, films, or other entertainment sectors that are confiscated due to legal violations.

vi) Non-native animals abandoned by owners or rescued from environments unsuitable for their survival (e.g., pet or illegal exotic species trade).

[1] Page 9 of Guidelines for the Establishment and Scientific Management of Zoos in India
[2] Section (2), subsection (36) of the Wild Life (Protection) Act, 1972

vii) Animals retired from use in research or experiments, especially when their welfare is compromised.

Besides off-display rescue facilities set up as part of recognized zoos, there are nearly 20 exclusive rescue centers currently operating in the country. Zoos accept rescued animals[3] and are permitted to house them in off-display facilities, in accordance with the National Zoo Policy, 1998[4].

Over the years, it has been noticed that off-display facilities designated for housing rescued animals in recognized zoos and exclusive recognized off-display rescue centers have reached their target capacity. This may be a result of the relatively longer lifespans of animals in captivity[5]. To address this issue, the acquisition of rescued animals is conditional on not permitting them to breed. However, congestion is further exacerbated by the increased incidence of rescued animals accepted by zoos.

Consequently, permissions for transferring rescued animals between zoos, including cases such as off-display facilities between zoos, off-display facility from zoos to exclusive rescue centers, and moving animals from off-display facility to display facility (off-display to display enclosures within the same zoo/exclusive off-display rescue centers to display in other zoos) have been granted on a case-to-case basis.

To establish uniformity in decision-making, the Central Zoo Authority constituted a committee[6] to review and develop policy guidelines for the placement and management of rescued animals in Indian zoos. These guidelines were developed based on the committee's final report, adopted during the 107th Meeting of the Technical Committee, and subsequently approved by the CZA in its 40th meeting.

2 Definitions

1) *Rescue Centre* – An establishment for the long-term care of animals specified in the Schedules of the Act[7].

[3] As per provisions of Rule 10 (3.7) and (3.8) of Recognition of Zoo Rules, 2009

[4] Para 3.2 of National Zoo Policy, 1998

[5] Tidière, M., et al. (2016). Comparative analyses of longevity and senescence reveal variable survival benefits of living in zoos across mammals. Scientific Reports, 6, 36361. https://doi.org/10.1038/srep36361

[6] Vide Office Order bearing Computer No: 188229 dated 20/10/2022

[7] Rule 2(j) of Recognition of Zoo Rules, 2009

2) *Rescued animal* – Wild animals[8] captured as per provisions of Section (11) & (12) of the Wild Life (Protection) Act, 1972 and/or native species to India/non-native animals confiscated from illegal trade resulting from the scenarios listed above.

3) *Short-term care* – Duration for which rescued animal(s) is placed under observation for health monitoring or assisted rearing or treatment. The period for short-term care shall not exceed the quarantine duration of the respective species.

4) *Long-term care* – Duration of care which requires housing animals in captivity for a period longer than short-term care.

5) *Quarantine* – The prescribed period for which animals are housed in a quarantine facility for observation and testing (as appropriate) immediately upon acquisition (also see Appendix A).

6) *Quarantine facility* – An off display facility for undertaking quarantine that enables isolation of newly acquired animals from the established collection in such a manner as to prohibit physical contact, to prevent disease transmission, and to avoid aerosol and drainage contamination.

7) *Hatchling/offspring* – Recently-born or young animals which are dependent on parental care for nourishment

8) *Weaned/fledged* – Young animals which are not dependent on parental care for nourishment. However, the young may still be associated with parents beyond the time of weaning (i.e. after becoming nutritionally independent) which may provide formative social experiences.

9) *Adult* – Fully grown, sexually mature (where appropriate); an animal so described.

10) *Colour-morphs* – Phenotypic variants as a consequence of genetic variation within a single animal species resulting in individuals displaying different colors or patterns in their physical appearance, such as a leucistic tiger or a color mutation in a parakeet. Color morphs are different from subspecies or separate species, as they occur within the same species and can interbreed.

[8] Section (2), sub-section (36) of the Wild Life (Protection) Act, 1972

11) *Imprinting* – A relatively rapid kind of learning that usually occurs in young animals. It is restricted to a distinct sensitive period, and it is very stable, sometimes reversible, in effect.

12) *Habituation* – Stimulus-specific waning of response; learning not to respond to something on finding that nothing significant is contingent upon its occurrence.

13) *Rehabilitation* – The process of restoring an animal's physical health, natural behaviors, and ability to survive in the wild after being rescued from injury, illness, or captivity. The goal of rehabilitation is to enable the animal to return to its natural habitat and function as a healthy, self-sufficient member of its species. This process often involves veterinary care, supportive treatment, behavioural conditioning, and gradual acclimatization to the natural environment before release.

14) *Soft-release* – Gradual and carefully monitored reintroduction process that aims to improve the animal's chances of survival and successful reintegration into its natural habitat. This method often involves providing support, such as supplementary food, shelter, or medical care, as the animal adjusts to its new environment. The soft release process typically includes stages of acclimatization, behavioral conditioning, and post-release monitoring to ensure the animal's welfare and adaptation to its surroundings.

3 Extant statutory provisions

The extant statutory provisions for the acquisition/transfer of *rescued animals* is as under:

1) The acquisition/transfer of animals by/between recognised zoos (including exclusive off-display rescue centres) requires permission from the Central Zoo Authority[9].

2) The permission is accorded primarily on the basis of the following by the CZA:

    i. Approval of the Master Plan by CZA.

[9]Section 38-I of the Wild Life (Protection) Act, 1972

ii. The species in question being included in the collection plan.

iii. The availability of prescribed housing facilities (including quarantine) by the recipient zoo.

iv. The history and upkeep of the given species at the recipient zoo.

v. The climatic suitability of a species to the said region and other relevant provisions.

3) In the case of acquisition/transfer of *rescued animals* by zoos the additional provisions applicable include:

i. The acceptance of rescued animals shall be conditional on the availability of appropriate quarantine facility[10]

ii. Reporting of acceptance of animals in Schedule I & II to the Central Zoo Authority and Chief Wildlife Warden of the state and other schedules of the Act/non-native species to the Chief Wildlife Warden of the state[11].

4) The *Guidelines for Establishment and Scientific Management of Zoos in India (2009)* issued by the Central Zoo Authority, specifies the following:

i. Rescue Centre is meant for housing identified problem wild animal species and orphaned, infirm captive animals not fit for display of the area/ locality/ ecosystem the Rescue Centre is part of.

ii. All rescued sick or injured wild animals should be rehabilitated back in wild or in regular Lifetime-care Facility/Zoo/Rescue Centre within 30 days of treatment/ healing depending upon the condition/ suitability of the individuals.

iii. All seized wild animals should also be rehabilitated back in wild or in regular lifetime care facility/ zoo/ rescue centre depending upon the condition/ suitability of the individuals with 30 days of the seizure after getting permission of the court dealing with the case.

[10] As per rule 10 (3.7) of the Recognition of Zoo Rules, 2009
[11] As per, rule 10 (3.8) of the Recognition of Zoo Rules, 2009

iv. All rescued/ abandoned young wild animal should only be reared in nurseries attached to the Veterinary facilities/ hospitals of the recognized zoos/ rescue centres.

5) The current process pertaining to the grant of permission for the acquisition for rescued animals involves two steps:

i. Step–1: Intimation of acceptance of rescued animals (in the prescribed format) by zoos to Chief Wildlife Warden of the respective state, and further also to the CZA in case of species listed in Schedule I & II of Wild Life (Protection) Act, 1972.

ii. A duration of 30 days from the date of acceptance is regarded as 'short-term care'. During this period, the accepted animals are treated as deemed appropriate to enable rehabilitation.

iii. Step–2: In case, there is a need to house a rescued animal(s) beyond a period of 30 days, permission for 'long-term care' is sought from CZA[12] by respective zoo.

4 Placement and management of rescued animals

An exploratory analysis was performed to examine the population trends of select species (Appendix D) in Indian zoos. The goal of this investigation was to elucidate the factors contributing to population fluctuations, specifically focusing on growth or decline patterns. The results of this analysis provided evidence supporting the hypothesis that for numerous common native species, as well as a few non-native species frequently seized in illegal trade, population growth appeared to be predominantly driven by the introduction of new individuals (higher value of extrinsic lambda) rather than natural reproduction (lower value of intrinsic lambda).

This finding underscored the importance of developing comprehensive guidelines to assist in decision-making related to the management and placement of rescued animals within Indian zoos. To address this need, a decision tree was constructed, which

[12]Under Section 38-I of the Wild Life (Protection) Act, 1972

encompasses all potential decision points that may be encountered during the management process of rescued animals. This structured approach aims to facilitate informed decision-making and optimize the welfare and conservation outcomes for these animals.

In certain instances, zoos, whether national or international, have been observed to transfer all or part of their animal populations to another zoo due to financial or managerial constraints. This process essentially involves the relocation of animals from an institution where their care and welfare may be compromised to one that is better equipped to address their needs. The term *rescue* is often specifically associated with the removal of animals in distress from their natural habitats, typically resulting from anthropogenic disturbances or other factors. However, the relocation of animals between zoos under the circumstances described above does not precisely fit this definition. Instead, such actions are more accurately categorized as transfers of animals between facilities, rather than rescues. The justification for this argument is based on the specific usage and connotations of the term *rescue*. While rescue operations generally involve saving animals from immediate danger or life-threatening situations, the transfers between zoos in this context are primarily driven by long-term welfare considerations. The primary objective of these transfers is to improve the animals' living conditions and ensure their well-being, which distinguishes them from traditional rescue efforts.

4.1 Short-term care

The decision points pertaining to acceptance and short-term care of rescued animals as depicted in Appendix B are as follows –

1) The decision to accept rescued animal(s) should be compliant with Rule 10(3.7) of Recognition of Zoo Rules, 2009 which states – *No zoo shall accept any rescued animals unless it has appropriately designed enclosure and upkeep facilities for the animal as well as the facilities for keeping it in isolation during the quarantine period.*

2) Upon acceptance, the housing shall be first be provisioned in the quarantine facility of the respective zoo (refer to section 2 for definition of short-term care).

3) The acceptance of the rescued animal(s) shall be intimated as per Rule 10(3.8) of Recognition of Zoo Rules, 2009 (reporting of rescued animals), which states –

Whenever any zoo decides to accept any rescued animal for housing, a detailed report regarding the source from which the animal has been received, legality of its acquisition and the facilities available at the zoo for housing, upkeep and healthcare shall be sent to the Chief Wildlife Warden of the State. Provided that in case, the rescued animal pertains to an [endangered species](i.e. species included in Schedule I and Schedule II of the Act) a copy of the report shall also be sent to the Central Zoo Authority.

4) An detailed assessment shall be conducted with reference to the following -

   i. Health assessment of all the individuals as deemed necessary by the attending veterinarian including physical examination, parasite screening, urinalysis, serum biochemistry and tests for bacterial, fungal, vector-borne and viral diseases (as appropriate).

   ii. The identification of the accepted rescued animal(s) shall be ascertained to the species level using standard taxonomical methods.

   iii. The sex of the rescued animal(s) shall be ascertained using standard methods.

   iv. The life-stage of the rescued animal(s) shall be ascertained using standard methods (e.g Juvenile/adult/hatchling/neonate etc.).

5) In case of death of animals upon acceptance, necessary steps as per Recognition of Zoo Rules, 2009 and others relevant statutory provisions for its disposal shall be ensured.

6) In such a situation where rescued animals were accepted even though requisite conditions[13] were not met (especially quarantine, housing facilities for its care were not available, species were not part of the collection plan, species already housed in surplus at the zoo, personnel with requisite training for husbandry of the species not available), following immediate treatment, necessary steps shall

[13] under Rule 10(3.8) of Recognition of Zoo Rules, 2009

be initiated to transfer the rescued animals to a recognized zoo where they can be appropriately cared for.

7) In cases where rescued animals are not yet weaned, fledged, or in a life stage that requires assisted rearing or close human care, it is essential to minimize imprinting as this is crucial to ensure successful reintroduction into the wild. While, these measures are species-specific, a few important points of importance are -

   i. Minimising human interaction.

   ii. Using puppets or models resembling the animals' parent to provide care thereby avoiding the risk of imprinting[14].

   iii. Use of adult conspecifics (members of the same species) as surrogate parents to provide care and guidance, reducing the likelihood of imprinting on humans[15].

   iv. House the rescued animals in enclosures that minimize visual and auditory exposure to humans.

   v. When feeding and caring for the animals, consider wearing clothing that mimics the natural environment or the animal's parent species.

   vi. Encourage species-specific behaviors and socialization by providing appropriate environmental enrichment, such as hiding spots, climbing structures, and opportunities for foraging[16].

   vii. Release animals back into the wild at an appropriate age and stage of development to minimize the potential for imprinting and increase the likelihood of successful reintroduction[17].

8) When dealing with rescued adult animals, they are less susceptible to imprinting during human care compared to younger ones. Nonetheless, it is still vital to

[14]Dierenfeld, E.S., and Atkinson, S., 1999. "Nutrition and hand-rearing of neonatal non-domestic felids" in Nutrition Advisory Group Handbook

[15]Fowler, M.E., and Miller, R.E., eds., 2003. "Zoo and Wild Animal Medicine: Current Therapy 4" in Saunders

[16]Shepherdson, D.J., et al., eds., 1998. "Second Nature: Environmental Enrichment for Captive Animals" in Smithsonian Institution Press

[17]Griffith, B., et al., 1989. "Translocation as a species conservation tool: status and strategy" in Science

address the necessary aspects as outlined about during their care in captivity to minimize the degree of habituation.

9) To reiterate, giving precedence to the rehabilitation and timely release of rescued animals (especially in case of native species) into fitting habitats is crucial.

10) While rescued animal(s) are under short-term care at the respective zoo, it is important to simultaneously investigate potential habitat options for their eventual release.

11) In case of non-native species, steps as outlined in the IUCN Guidelines for the management of confiscated, live organisms shall be followed[18].

12) In case of native species, consequent to ascertaining the availability of suitable habitat for the release of rescued animal(s) in the wild, the zoo shall suitably comply with the CZA guidelines and IUCN protocols[19] broadly addressing the following –

    i. The relevant statutory requirements for the release of these animals in the wild may be fulfilled.

    ii. Health screening as per CZA guidelines and other relevant protocols[20].

    iii. Selection of suitable habitat.

    iv. Acclimatization to their new environment, which can be achieved through the use of soft-release techniques such as temporary enclosures or pre-release training.

    v. Actual release of the animals should be carefully planned and executed, taking into account factors such as season, time of day, and weather conditions.

    vi. After release, it is crucial to monitor the animals' survival, health, and adaptation to their new environment, using methods such as radio telemetry or direct observations.

[18] https://portals.iucn.org/library/sites/library/files/documents/2019-005-En.pdf
[19] https://portals.iucn.org/library/efiles/documents/2013-009.pdf
[20] https://core.ac.uk/download/pdf/17225994.pdf

4.2 Long-term care

During the short-term care of rescued animals, various situations may arise that prevent their immediate or delayed release into the wild, necessitating long-term captive care instead. These potential situations are outlined in Appendix B, while the decision tree for each scenario is illustrated in Appendix C. Consequent to the decision to house rescued animal(s) under long-term care, permission for acquisition shall be sought from CZA as per the prescribed guidelines (refer to guidelines here).

The decision points for long-term care of rescued animals, as demonstrated in Appendix C, are described as follows –

1) During or after the rescue process, it is possible that the rescued animals may suffer from permanent or debilitating injuries. As their chances of successful release into their natural habitat are significantly diminished, these animals should be treated, given palliative care, and housed in an off-display facility within the zoo[21].

2) In a scenario where the rescued animal(s) are colour morphs, as their prospects of survival consequent to release are low, they should be housed in off-display facility. Further, given the low educational & conservation value and that such traits arise from the expression of rare and recessive alleles, they must not be allowed to breed (a practice which is also advocated by reputed zoological organisations such as Association of Zoo & Aquariums, British and Irish Association of Zoos and Aquariums and European Association of Zoos & Aquaria).

3) In a scenario where the rescued animal(s) consist of either a single individual or a group of individuals of the same sex, after the quarantine, if the species is already present in the zoo's collection, attempts may be made to socialize the rescued animal(s) with the existing stock. Success in socializing the animals can lead to two options. If the species is suitable for display[22], they may gradually transitioned to be housed in the exhibit open to visitors. However, if the species

[21] Rule 10(1.8) of Recognition of Zoo Rules, 2009 – *Every zoo shall refrain from display of sick, injured, infirm and tethered animals to the visitors and such animals shall be housed in off-display facilities specially earmarked for and providing appropriate upkeep and healthcare for such animals*

[22] as per Rule 10(1.8) of Recognition of Zoo Rules, 2009

is a conservation-priority native species, they may be incorporated into an ongoing conservation breeding program and housed off-display, following an assessment of the fitness of the individuals. In case of a single individuals which could not be successfully socialised, action as per Rule 10(9.4) of Recognition of Zoo Rules, 2009 shall be undertaken.[23].

Assessment of fitness of rescued animal(s)

Assessing the fitness of wild rescued animals for conservation breeding purposes involves a comprehensive evaluation of their genetic, physiological, and behavioral characteristics. A scientifically acceptable method includes the following steps:

1) Genetic Assessment: Evaluate the genetic diversity of the rescued animal to ensure that it will contribute to the genetic health of the breeding population. Genetic analysis can be conducted using techniques such as DNA sequencing, microsatellite analysis, or Single Nucleotide Polymorphism (SNP) genotyping. The goal is to minimize inbreeding and maximize the genetic diversity of the population.

2) Health Assessment: Conduct a thorough health examination of the rescued animal to identify any diseases, infections, or injuries that may affect its ability to breed or compromise the health of the breeding population. This assessment may include blood tests, radiographs, ultrasounds, and other diagnostic procedures. Animals with chronic health issues or contagious diseases should not be included in conservation breeding programs.

3) Behavioral Assessment: Evaluate the animal's behavior, reproductive history, and compatibility with potential mates. An un-

[23]Rule 10(9.4) of Recognition of Zoo Rules, 2009 – *Every zoo shall endeavour to acquire mates for single and unpaired animals on priority basis and in the event of any zoo failing to find a mate for single and unpaired animal within a period of six months, the unpaired or single animals shall be transferred or exchanged or given on breeding loan to any other zoo in accordance with the norms specified by the Central Zoo Authority.*

derstanding of the species' natural history, mating system, and social structure is essential for determining the suitability of the rescued animal for breeding purposes. Animals exhibiting abnormal behaviors or those that are incompatible with potential mates may not be suitable for breeding.

4) Age and Reproductive Status: Determine the age and reproductive status of the rescued animal. It is important to ensure that the animal is of breeding age and capable of reproducing. Factors such as age-related declines in fertility, reproductive senescence, or previous breeding history may affect the animal's suitability for conservation breeding programs.

5) Environmental Suitability: Assess the suitability of the animal's housing and environment for conservation breeding. This includes evaluating the enclosure size, design, and complexity, as well as the availability of appropriate resources, such as nesting sites or breeding areas. Environmental conditions should promote natural behaviors and minimize stress, which can negatively impact reproduction.

6) Monitoring and Record Keeping: Continuously monitor the animal's health, behavior, and reproductive success throughout the breeding process. Maintain accurate records of breeding attempts, successes, and failures to inform future breeding decisions and contribute to the overall understanding of the species' conservation breeding requirements.

7) Collaboration and Coordination: Coordinate with other zoos, conservation organizations, and wildlife agencies to share information, resources, and expertise in the management of the species. Collaboration is essential for developing effective breeding strategies, maintaining genetic diversity, and ensuring the long-term success of conservation breeding programs.

By following this comprehensive method, the fitness of wild rescued animals can be scientifically assessed to determine their suitability for conservation breeding purposes, thereby contributing to the preservation of threatened and endangered species.

Single rescued animals that are naturally group-living, which cannot be socialized and are awaiting compatible mates shall be housed in off-display areas, as exhibiting such animals does not convey a positive conservation message. In contrast, for species that are naturally solitary or possess social structures that accommodate single individuals, a gradual transition to on-display enclosures visible to visitors may be considered. This approach should be accompanied by informative signage to educate visitors about the species and their natural behaviors.

Socialisation of rescued animal(s)

The important aspects of socialisation of rescued animal(s) include –

1) Health Assessment: Conduct a thorough health assessment of the rescued animal to identify any health issues, injuries, or infections. This information will help guide the animal's care plan and socialization process.

2) Behavioral Assessment: Evaluate the animal's behavior and temperament to determine its compatibility with other animals in the zoo. This assessment will also help identify any specific needs the animal may have and guide the development of an appropriate socialization plan.

3) Gradual Introduction: Introduce the rescued animal to its new habitat and enclosure gradually, allowing it time to become familiar with its surroundings, including any potential enclosure mates.

4) Monitoring: Continuously monitor the animal's behavior, inter-

actions, and overall well-being during the socialization process. This monitoring will help identify any issues that may arise and inform necessary adjustments to the socialization plan.

5) Training and Enrichment: Implement a training and enrichment program to help the animal adapt to its new environment, learn essential skills, and stimulate its mental and physical well-being. This program may include positive reinforcement training, environmental enrichment, and opportunities for natural behaviors.

6) Staff Education: Train and educate zoo personnel on the specific needs of the rescued animal, including its history, behaviors, and any medical or psychological concerns. This training will help ensure the animal receives appropriate care and support throughout the socialization process.

7) Re-evaluation: Periodically re-evaluate the animal's progress and adjust the socialization plan as needed. This may include making changes to the animal's enclosure, training program, or care plan based on its progress and well-being.

4) In situations where rescued animals exhibit a high degree of imprinting or habituation after receiving short-term care, releasing them may lead to low survival rates due to increased susceptibility to predation or ontogenic impairments, resulting in poor predator avoidance behaviors. These animals may need long-term care and behavioral training to improve their behavioral competence. Successful behavioral training can present two options –

   If the species is suitable for display[24], the animals may be gradually transitioned to an exhibit open to visitors. On the other hand, if the species is a conservation-priority native species, they may be incorporated into an ongoing conservation breeding program and housed off-display, subject to an assessment of the individuals' fitness.

[24] as per Rule 10(1.8) of the Recognition of Zoo Rules 2009

In cases where individuals display persistent behavioral issues (e.g., begging behaviors, feather plucking etc.), they should be housed in off-display facilities, as they do not convey a positive conservation message for visitors. Meanwhile, efforts should be made to address and resolve these behavioral problems.

Behavioural competence of animals under human care

Behavioral training for wild rescued animals with imprinting issues or low behavioral competence is essential to improve their chances of survival upon release into the wild. The key steps include –

1) Assessment: Evaluate the animal's current behavioral competence, health, and any existing imprinting issues. This assessment helps determine the necessary steps for behavioral training and rehabilitation.

2) Species-specific behaviors: Identify and promote the development of species-specific behaviors such as foraging, hunting, and predator avoidance. This can be achieved through techniques like environmental enrichment, problem-solving tasks, and exposure to natural stimuli.

3) Socialization: If the animal belongs to a social species, encourage interaction with conspecifics to promote social skills and natural group dynamics. This may involve introducing the animal to a compatible group or fostering relationships with other individuals.

4) Habituation to natural environment: Gradually expose the animal to its natural habitat, including elements like vegetation, terrain, and climate. This helps the animal acclimate to its surroundings and develop crucial survival skills.

5) Anti-predator training: Implement anti-predator training exercises to teach the animal how to recognize and respond to potential threats. This may involve controlled exposure to predator

cues, such as sounds, smells, or visual representations.

6) Monitoring and evaluation: Continuously monitor the animal's progress throughout the rehabilitation process. Adjust training techniques as needed to ensure the development of essential skills and minimize stress.

7) Soft-release: When the animal has reached an adequate level of behavioral competence, implement a soft-release strategy. This involves releasing the animal into a protected or semi-controlled environment, allowing it to gradually adapt to living independently while still being monitored and supported.

8) Post-release monitoring: After release, continue to monitor the animal's progress and survival to evaluate the success of the rehabilitation process. This information can help inform future rescue and rehabilitation efforts.

5) In cases where rescued animals are diagnosed with infectious, degenerative, genetic, or nutritional diseases during their short-term care, they may require intensive management and treatment under long-term care, as they are not suitable for release into the wild. In such situations, these animals may be isolated in off-display facilities during their long-term care. They should receive palliative treatment and optimal husbandry to promote their recovery.

   Conversely, if the species is a conservation-priority native species, it may be worth investigating whether the disease can be effectively managed. If so, the animals may be incorporated into an ongoing conservation breeding program and housed off-display, following an assessment of the individuals' fitness.

Diseases of concern in zoo animals

Diseases affecting zoo animals can be broadly classified into four categories: infectious diseases, degenerative diseases, genetic diseases, and nutritional diseases.

1) Infectious Diseases: Infectious diseases, also known as communicable diseases, can be of bacterial, viral, fungal or parasitic origin and can be transmitted between animals or humans. Examples include tuberculosis (TB), rabies, anthrax and foot-and-mouth disease (FMD). Infectious diseases can spread via food, water, aerosol transmission, fomite transmission, or direct physical contact.

   Some main bacterial diseases of concern in zoos include salmonellosis, shigellosis, anthrax, TB, yersiniosis, clostridial diseases, and campylobacteriosis.

   Viral diseases affecting zoo animals include rabies, herpes, and various poxvirus-caused diseases. Fungal pathogens causing health problems in zoos include Aspergillus, Candida, Cryptococcus, and Pneumocystis.

   Health problems in zoo animals can be caused by ectoparasites like ticks, fleas, lice and mite infestations (e.g. scabies); endoparasite-caused diseases include Giardiasis, Coccidiosis, roundworm, flukes and tapeworm infestations.

2) Degenerative Diseases: Degenerative diseases, such as arthritis and chronic renal disease, are relatively common in felids, canids, bears, primates, and ruminants, which are all well-represented in most zoo collections. These diseases are often age-related and can pose a particular problem in zoological collections because animals like bears and large cats may live longer in zoos than in the wild.

3) Genetic Diseases and Health Problems: Zoo populations of some endangered species are likely to be small, and the gene pool may be restricted. Although the use of studbooks limits inbreeding, genetic abnormalities do occur in zoo animals. However, these are rare. Previously noted examples include black-and-white

ruffed lemurs with congenital abnormalities, such as scoliosis and skull abnormalities. In grey or timber wolves, a hereditary form of blindness appears to be linked to inbreeding.

4) Nutritional Diseases: Common nutrition-related health problems in zoo animals include metabolic bone disease, iron storage disease (haemochromatosis), and emaciation or, more commonly, obesity.

5 Action for implementation for the said guidelines

5.1 Marking & record keeping of rescued animals accepted by zoos

All rescued animals, including native species listed under Schedule I and II of the Wild Life (Protection) Act, 1972, as well as non-native species, must be marked with species-specific identification immediately upon receipt by recognized zoos. Comprehensive Animal History records must be created at the time of admission to ensure proper identification and management.

5.2 Reporting of Rescued Animals

All rescued animals accepted by recognized zoos must be reported to the Central Zoo Authority, regardless of whether they will be held in short-term or long-term care[25].

1) For animals placed in short-term care, their acquisition and disposal must be documented in the quarterly or annual inventory, in accordance with *Rule 11. Maintenance of Records and submission of Inventory under Recognition of Zoo Rules, 2009*, as applicable.

2) For animals placed in long-term care, their reporting must continue for as long as they are part of the zoo's collection in accordance with *Rule 11. Maintenance*

[25] As per provisions of Rule 10 (3.7) and (3.8) of Recognition of Zoo Rules, 2009

of Records and submission of Inventory under Recognition of Zoo Rules, 2009, as applicable.

5.3 Submission of proposals for short-term/long-term care of rescued animal(s)

The following key steps should be followed when submitting proposals to the Central Zoo Authority for the short-term care/long-term care of rescued animals:

1) Prior to accepting animals, respective zoos must obtain the necessary approvals and complete the required reporting as per the statutory provisions following their acceptance (also see section 3 & subsection 4.1).

2) To decide on the placement & future management of rescued animals, it is recommended that the health advisory committee of the respective zoo shall scrutinize individual cases based on these policy guidelines. A proposal, along with recommendations and a detailed justification referring to the aforementioned points, should be submitted seeking permission under Section 38-I of the Wild Life (Protection) Act, 1972 see advisory related to submission of proposals here.

5.4 Master Plan

1) The National Zoo Policy 1998[26], para 2.1.4 emphasizes – *Besides the aforesaid objectives, the zoos shall continue to function as rescue centres for orphaned wild animals, subject to the availability of appropriate housing and upkeep infrastructure. Where appropriate housing and upkeep is not available, State Governments and the Central Government would ascertain setting up rescue facilities in off - the - display areas of the zoo, subject to the availability of land.*

2) In light of this policy, zoos must regularly assess trends in wild animal conflicts within their region and develop a perspective plan for managing rescued animals. This plan should include provisions for creating off-display facilities

[26]https://cza.nic.in/page/en/national-zoo-policy-1998

designed to accommodate both short-term and long-term care. The perspective plan must be detailed in the zoo's Master Plan and include carrying capacity considerations at an appropriate taxonomic level, such as Order or Family. Species-level planning may not be always feasible in rescue centers due to the unpredictable nature of animal rescues.

3) Additionally, the proposed actions should be integrated into the zoo's Master Plan according to existing provisions[27] and requisite approvals shall be obtained. The master plan should specifically outline the potential species and carrying capacity available in the off-display rescue center of the zoo.

4) For the financial expenses incurred in creating these facilities, the Central Zoo Authority (CZA) guidelines[28] as well as the financial guidelines from the Central Government and State Government should be followed.

[27] Rule 10(3.1) & Rule 10(3.3) of Recognition of Zoo Rule, 2009
[28] https://cza.nic.in/uploads/documents/guidelines/english/G-24.pdf

Appendices

Appendix A Quarantine

1) The quarantine process serves a dual purpose: first, it aids in the identification of animals potentially carrying diseases with a short incubation periods, and second, it facilitates the detection of clinical signs associated with diseases that have longer incubation periods. To ensure reasoned decision-making as per this guidelines, health assessments should be conducted both upon arrival in the quarantine facility and at the end of the quarantine period. Regular visual health checks are an integral part of the quarantine process.

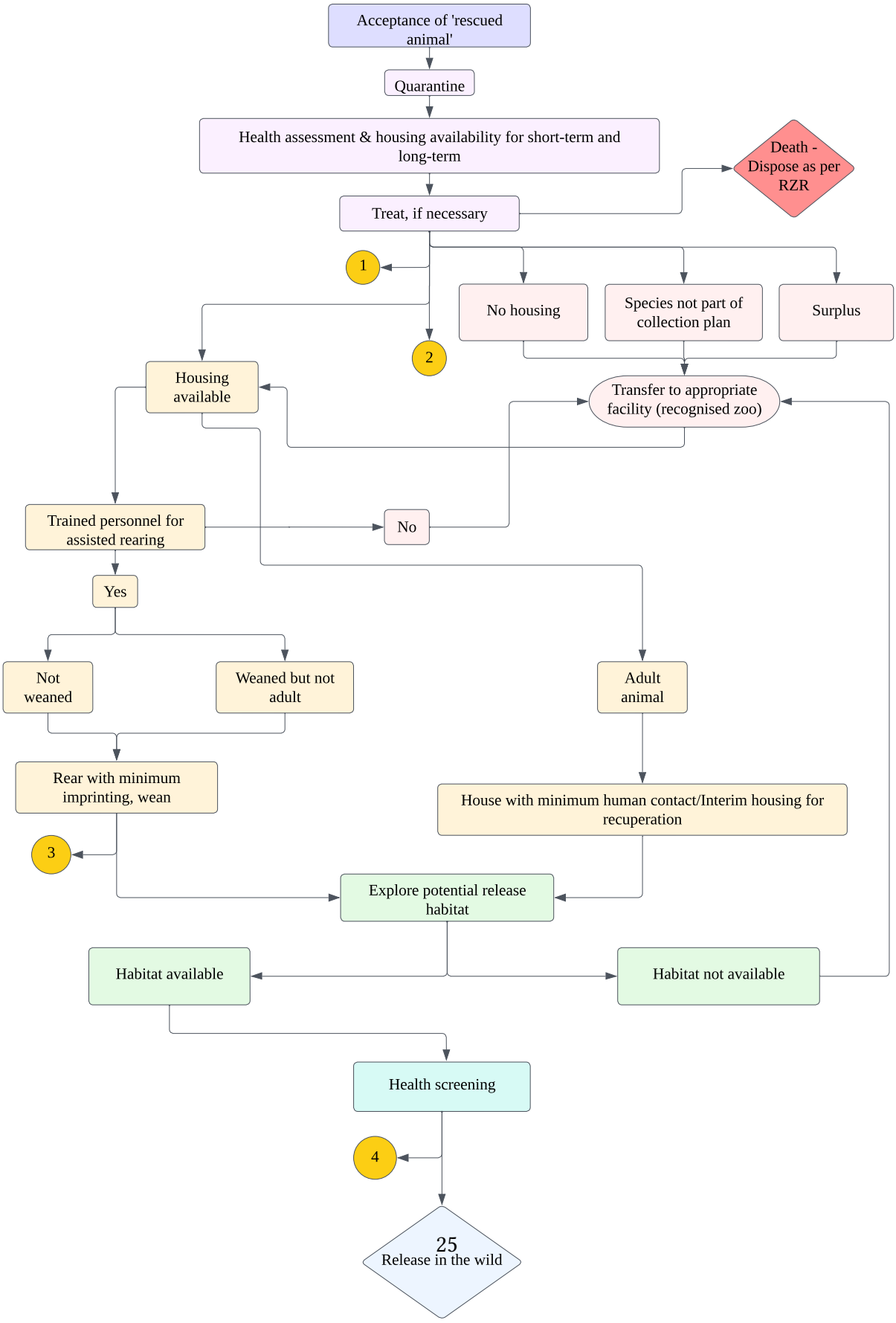
2) The *All in, All out* approach is the recommended method for conducting quarantine. If an animal within a group of the same species contracts or tests positive for an infectious disease during quarantine, it must be isolated from the group. The entire group should then undergo an additional quarantine period of at least 30 days or longer, as necessary and in accordance with the CZA guidelines, accompanied by appropriate testing. In certain case, the quarantine duration depends on the incubation period of the specific disease under investigation.

3) Prophylactic measures may be implemented during the quarantine period to minimize the risk of disease transmission. To ensure that therapeutic drugs do not mask disease symptoms and to reduce the likelihood of drug-resistant organisms developing in the release environment, animals should be free of such drugs for at least one week prior to their removal from quarantine.

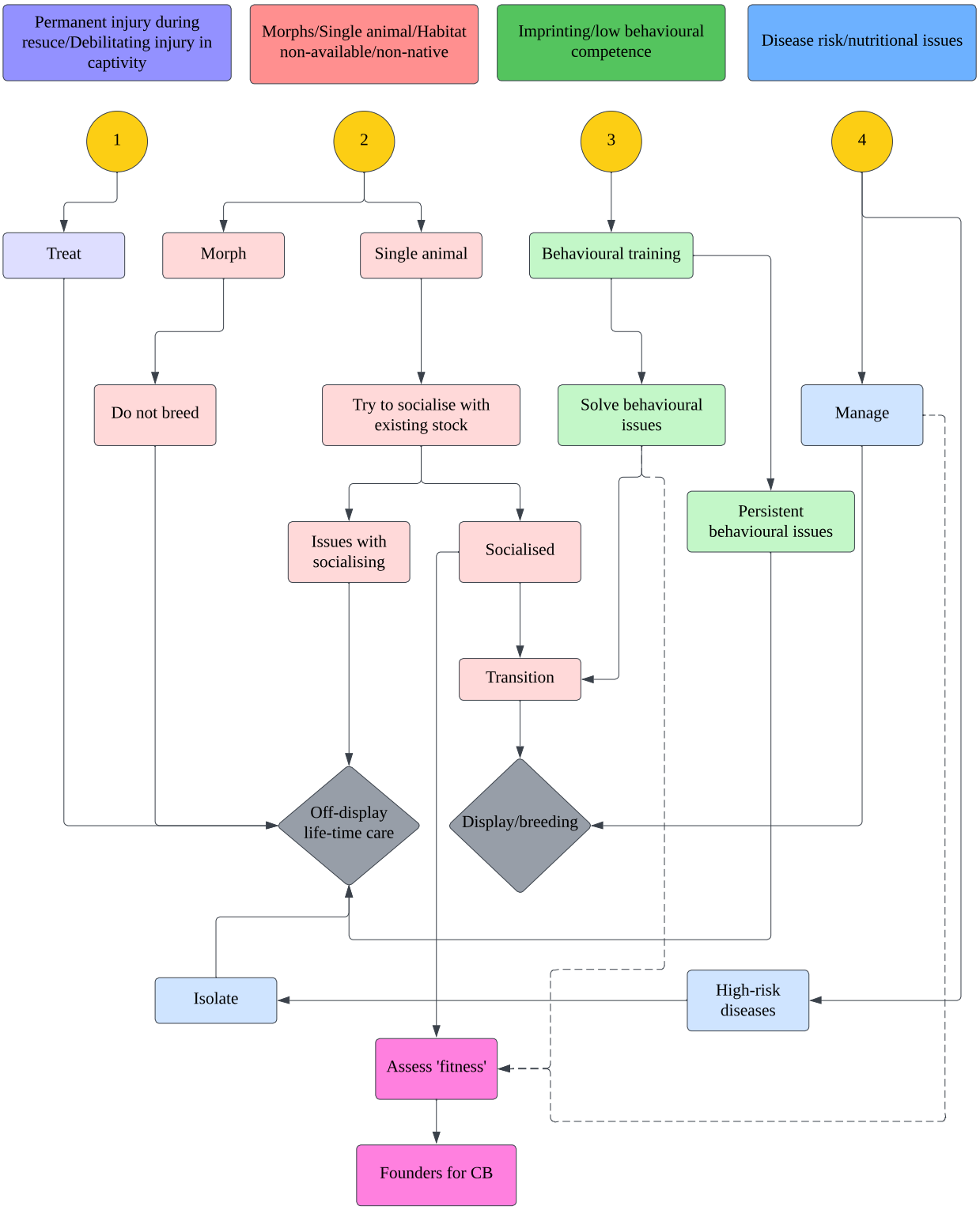
4) Compliance with the *Standard Operating Procedures (SOPs)/Check-list for Doing Quarantine of Imported Wild Animals in Zoo Facility* issued by the Department of Animal Husbandry and Dairying shall be ensured[29].

[29] https://dahd.nic.in/sites/default/filess/SOPsforquarantineofwildanimalsinZoofacility.pdf

Appendix B Decision tree for management of rescued animals in Indian zoos – Short-term care


Acceptance of 'rescued animal'
Quarantine
Health assessment & housing availability for short-term and long-term
Death - Dispose as per RZR
Treat, if necessary
1
No housing
Species not part of collection plan
Surplus
2
Housing available
Transfer to appropriate facility (recognised zoo)
Trained personnel for assisted rearing
No
Yes
Not weaned
Weaned but not adult
Adult animal
Rear with minimum imprinting, wean
House with minimum human contact/Interim housing for recuperation
3
Explore potential release habitat
Habitat available
Habitat not available
Health screening
4
25
Release in the wild

Appendix C Decision tree for management of rescued animals in Indian zoos – Long-term care


Permanent injury during resuce/Debilitating injury in captivity
Morphs/Single animal/Habitat non-available/non-native
Imprinting/low behavioural competence
Disease risk/nutritional issues
1
2
3
4
Treat
Morph
Single animal
Behavioural training
Do not breed
Try to socialise with existing stock
Solve behavioural issues
Manage
Persistent behavioural issues
Issues with socialising
Socialised
Transition
Off-display life-time care
Display/breeding
Isolate
High-risk diseases
Assess 'fitness'
Founders for CB

Appendix D Population trends of select species in recognised Indian zoos.

Population trends of select native and non-native species in recognised Indian zoos.

Table of contents

Summary

1. The comprehensive analysis of individual rescued animals in zoos necessitated the extensive compilation of data, predominantly available in paper records. Given the impracticality of this approach, annual inventory records were analyzed to establish an index of trends for rescued animals in accredited zoos.

2. Longitudinal data from the annual inventory records of selected native and non-native species housed in Indian zoos were analyzed for the period of 1995-96 to 2019-20. This analysis aimed to investigate captive stock trends, including the number of institutions and holding institutions over the years, as well as comparisons of births versus deaths and extrinsic and intrinsic growth rates[1].

3. The species selection was primarily based on a qualitative hypothesis that targeted species were either frequently rescued (e.g., Leopard, Black Kite) or frequently confiscated/seized (e.g., Green Iguana, Common Barn Owl, Bennett's Wallaby, Indian Star Tortoise), or species that are exclusively propagated in captivity (e.g., Red Panda, Tiger (leucistic), Indian Spotted Chevrotain).

4. The analysis revealed three distinct population trends: increasing (e.g., Gaur, Indian Spotted Chevrotain, etc.), relatively stable (e.g., Leopard Cat, Chinkara), and decreasing (e.g., Asian Elephant, Sloth Bear) (Figure 1).

5. Captive births and acquisitions (rescued/confiscated animals or wild-rescued animals) contribute to an increase in population size, while deaths in captivity and disposal (transfer between zoos or release to the wild) result in a decrease in population size. Consequently, a population with an optimal captive birth-to-death ratio (>=1) will exhibit a higher intrinsic lambda value than an extrinsic lambda value. If a population displays an increasing trend with a lower intrinsic lambda value than extrinsic lambda value, it suggests that the growth is primarily driven by the acquisition or addition of individuals, rather than births.

6. For example, upon examining the results for the Leopard (*Panthera pardus*), an increasing population trend is observed, despite a birth:death ratio of less than one. Furthermore, breeding is not permitted according to existing guidelines. The values of extrinsic and intrinsic lambda suggest that the increase is primarily driven by acquisitions and disposals. Consequently, it can be hypothesized that the addition of wild-rescued animals is the primary factor contributing to the population increase in this species.

7. These results should provide a baseline for understanding the population trends of select native and non-native species in recognised Indian zoos.

[1]Lynch, C. (2018). Sustainability Index (S-Index): A tool for use in the evaluation and planning of institutional animal collections. Zoo Biology. doi:10.1002/zoo.21456

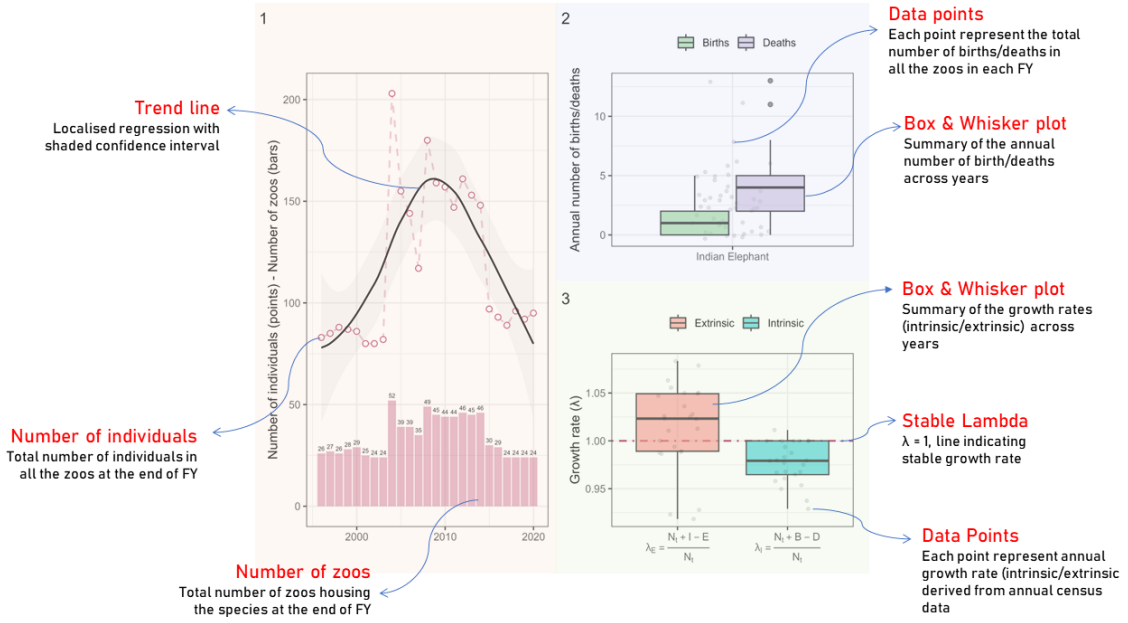
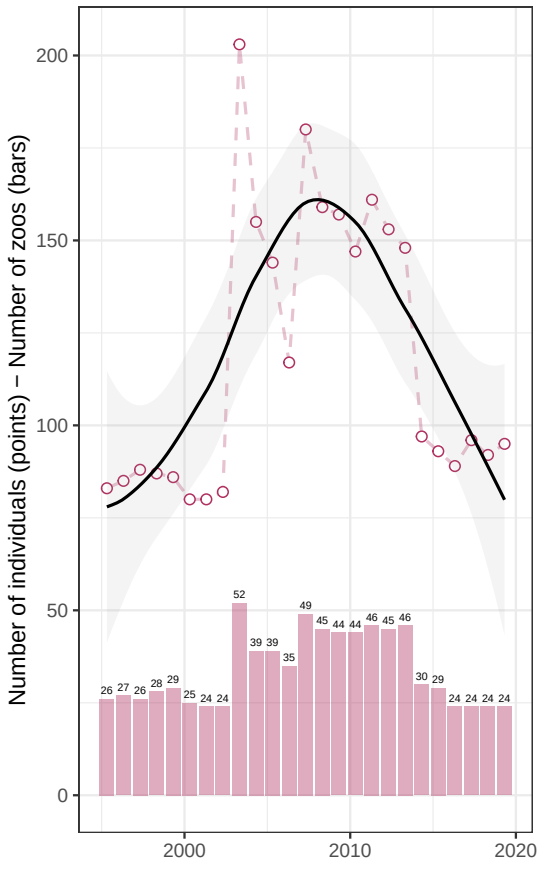


Figure 1: Key to graphs representing species-wise population trends in zoos. 1) Population trend of the species in captivity fitted with a smoothing curve and number of holding institutions. 2) Summary of births/deaths of the species in the given time period. 3) Intrinsic and extrinsic growth rates based on census of the speceis in the given time period.

Native Species

Asian Elephant (*Elephas maximus*)

1



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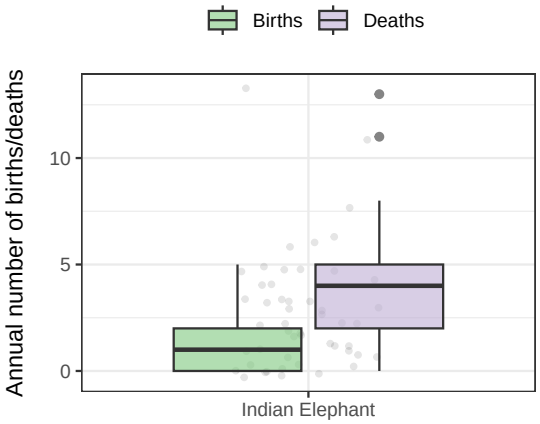

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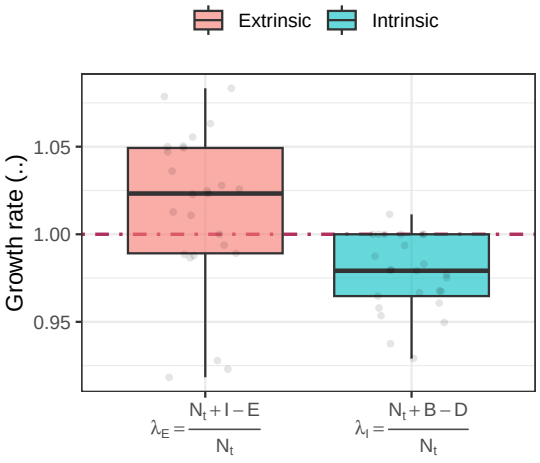
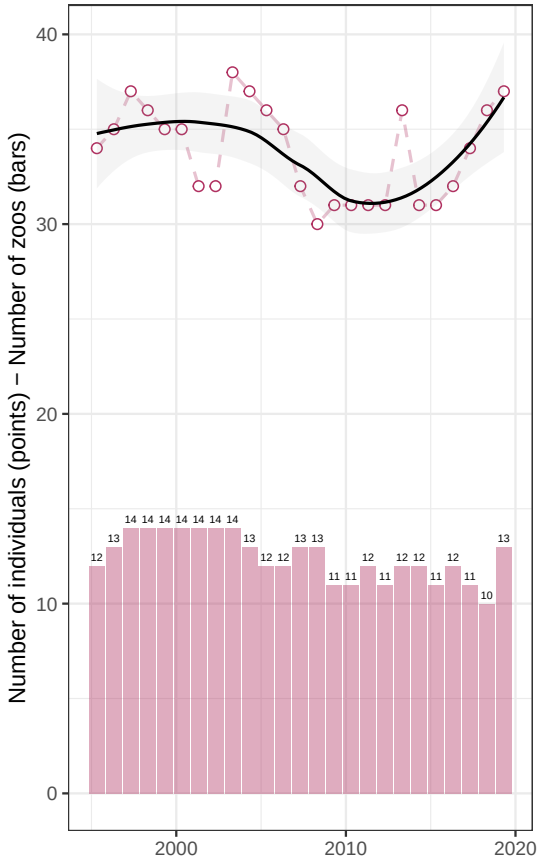


Greater One-horned Rhino (*Rhinoceros unicornis*)

1



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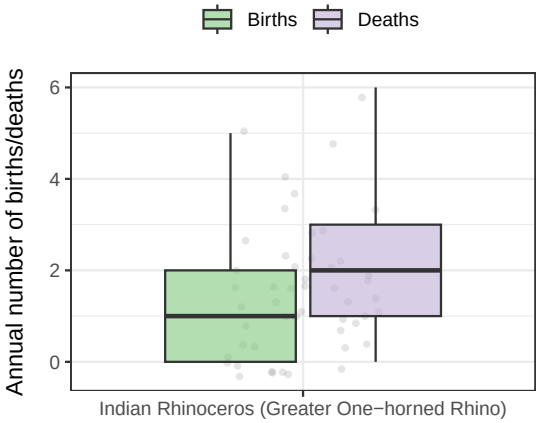

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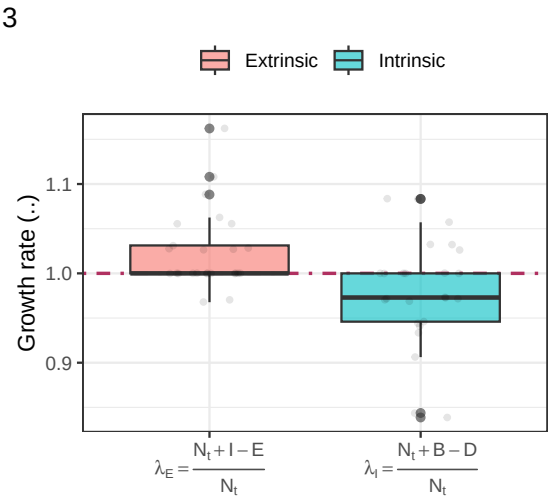
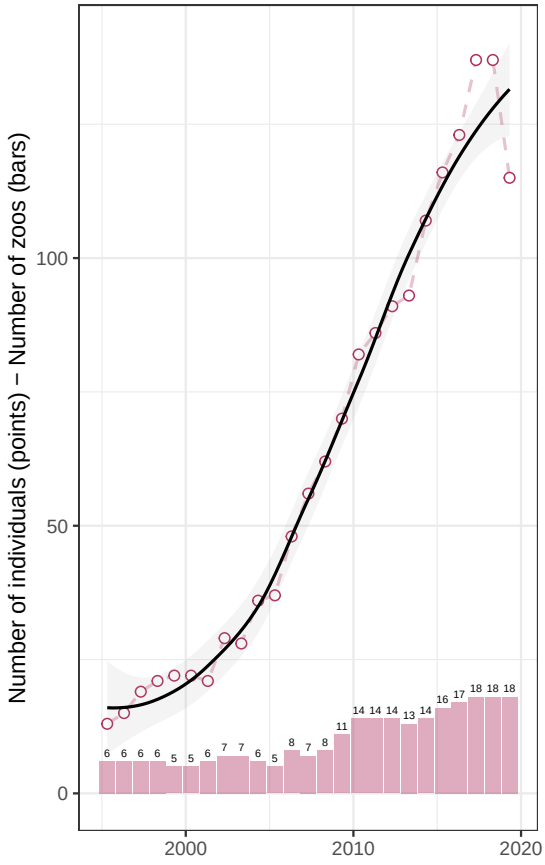


Indian Bison,Gaur (*Bos gaurus*)

1



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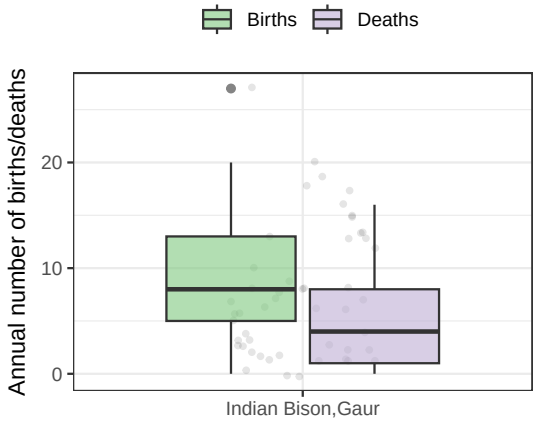

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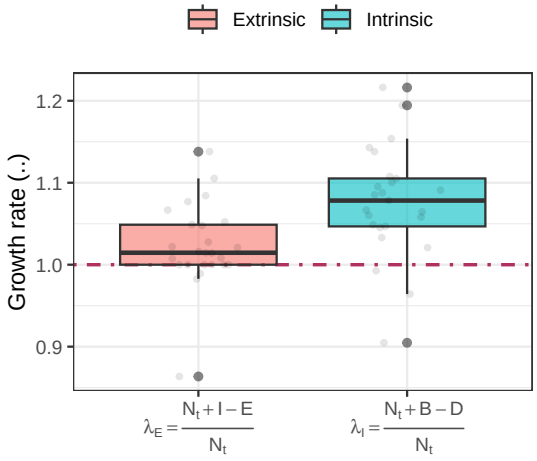
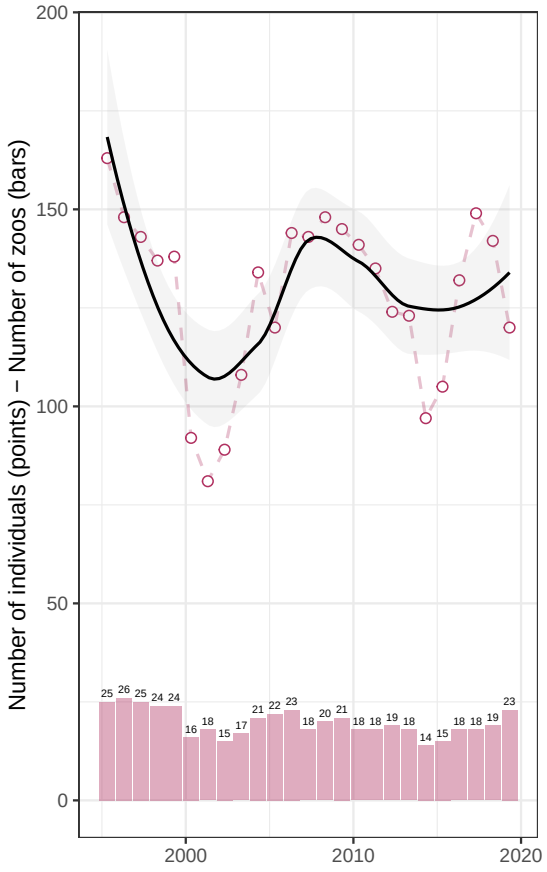


Chinkara (*Gazella bennettii*)

1



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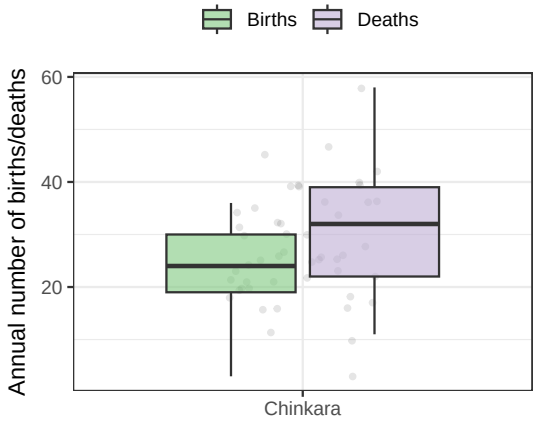

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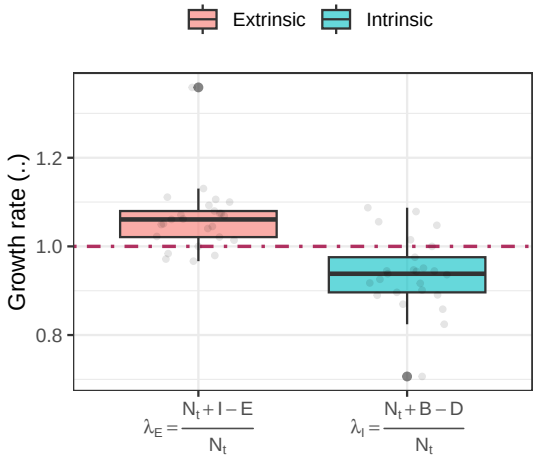
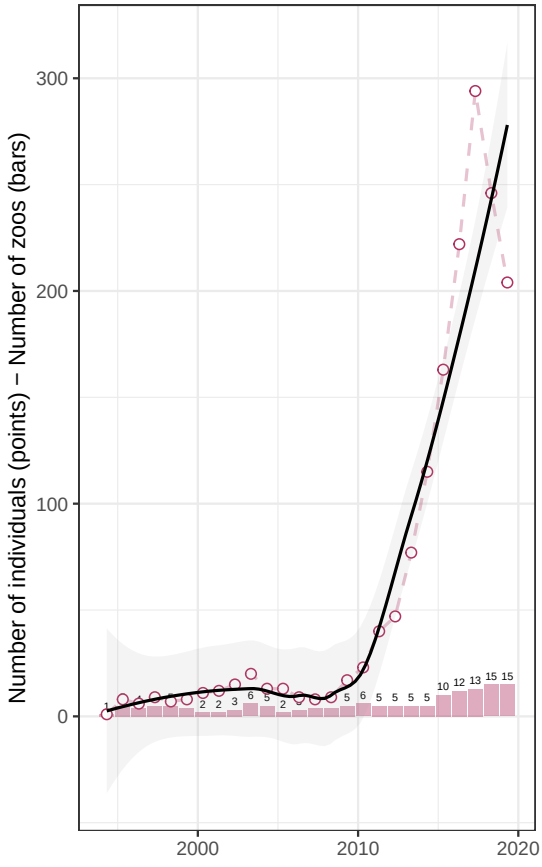


Indian Spotted Chevrotain (*Moschiola indica*)

1



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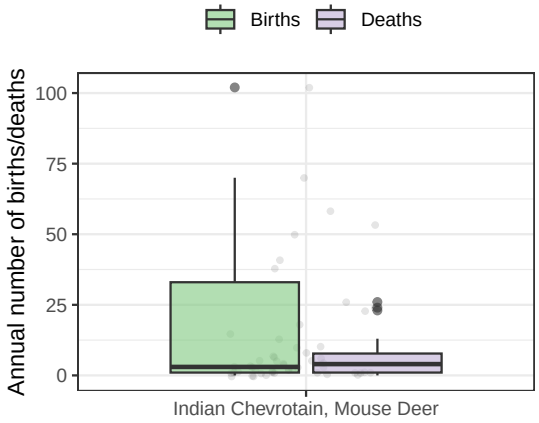

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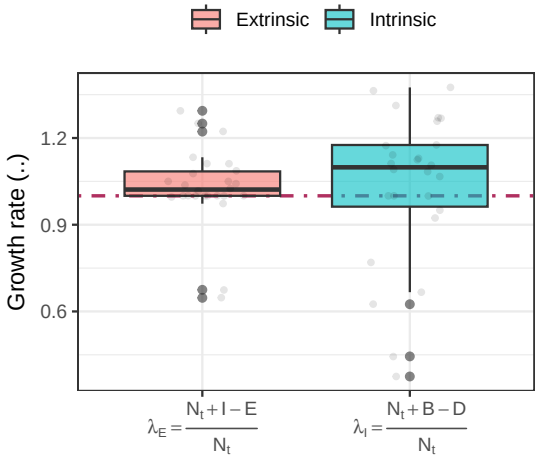
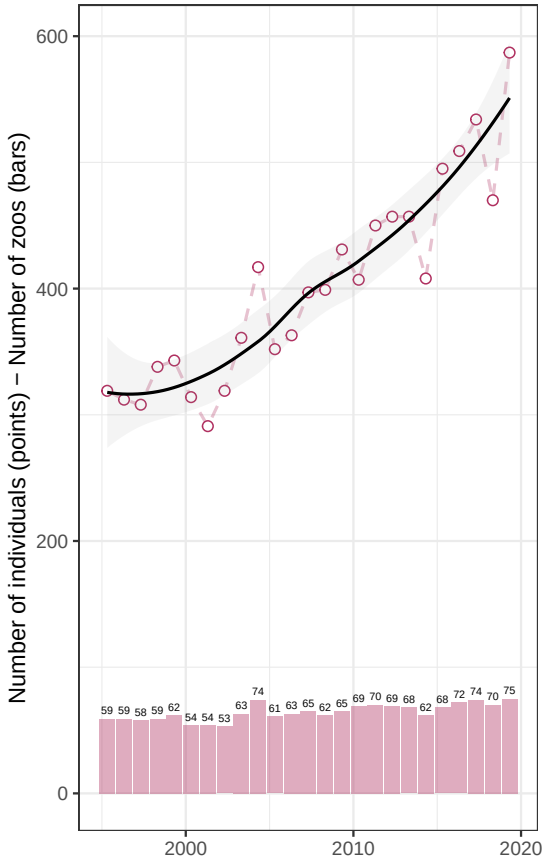


Leopard (*Panthera pardus*)

1



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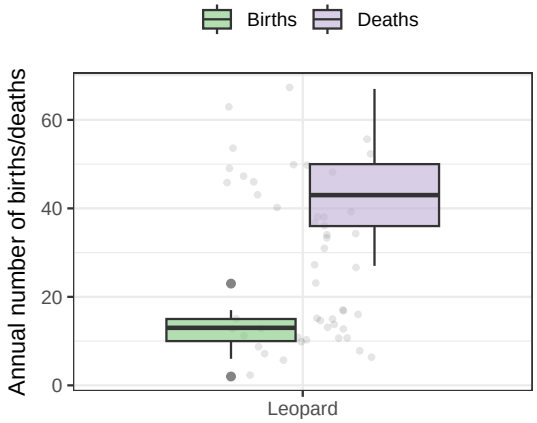

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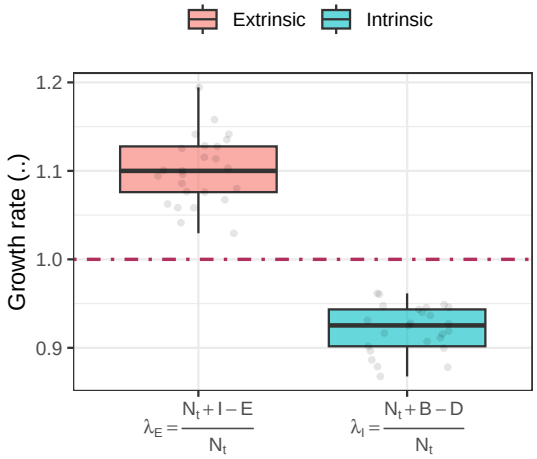
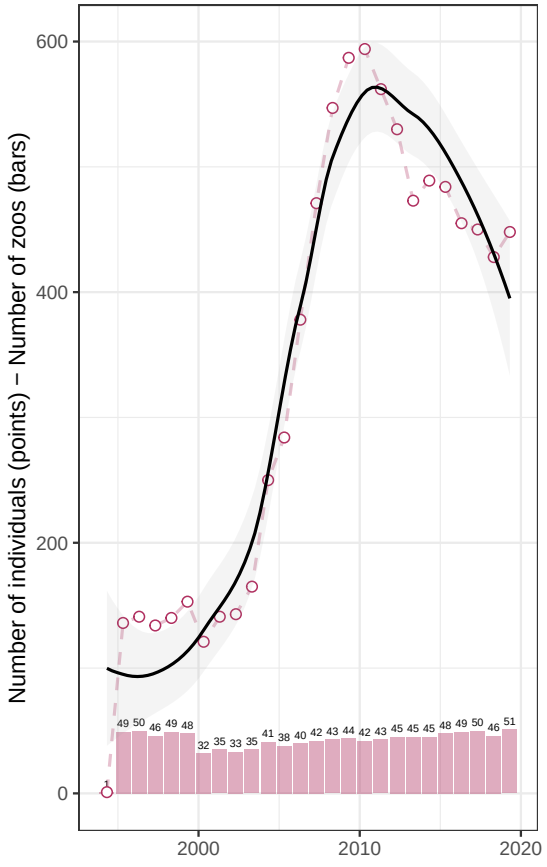


Sloth Bear (*Melursus ursinus*)

1



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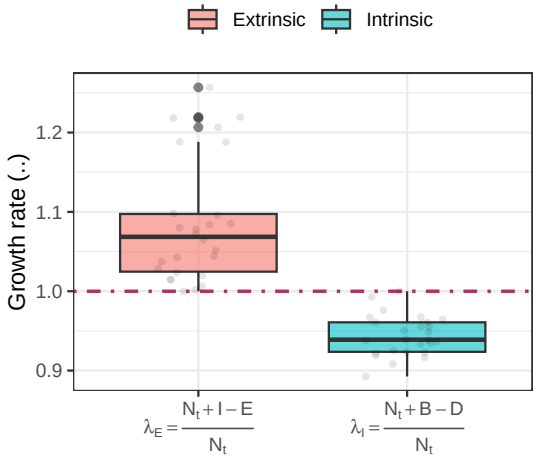
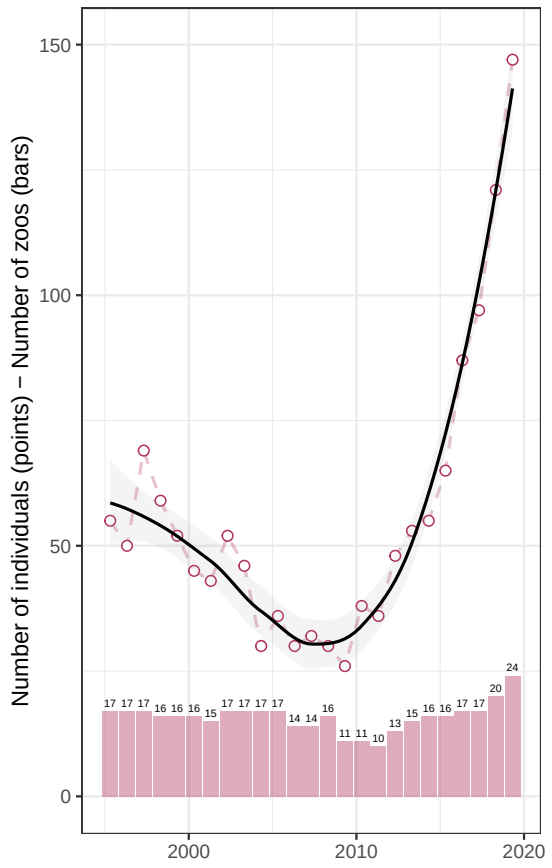


Indian Wolf (*Canis lupus pallipes*)

1



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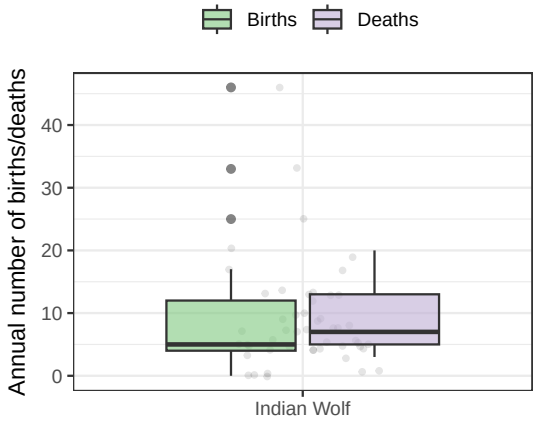

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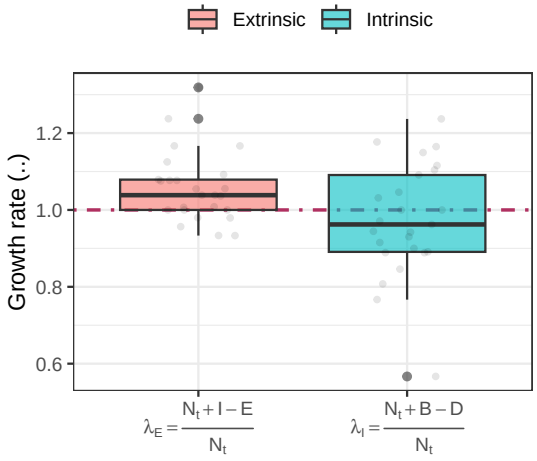

Dhole (*Cuon alpinus*)

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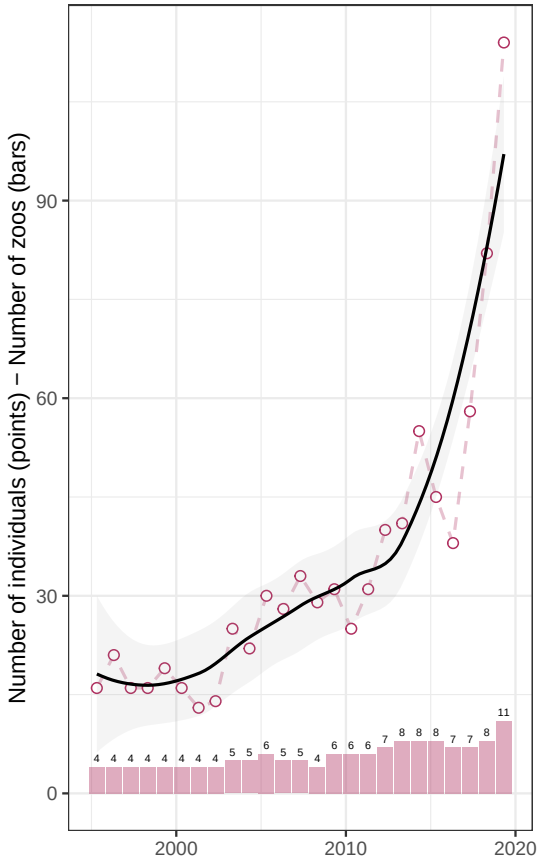

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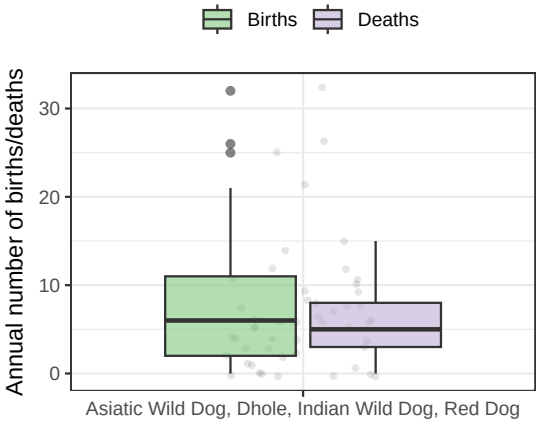

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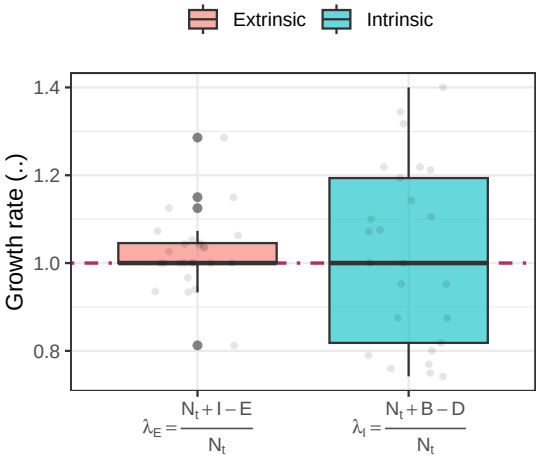
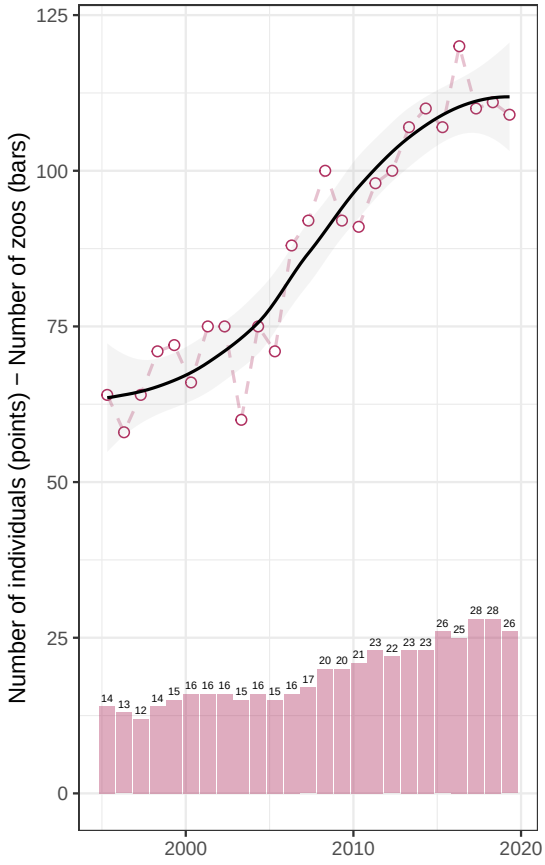


Tiger (leucistic) (*Panthera tigris*)

1



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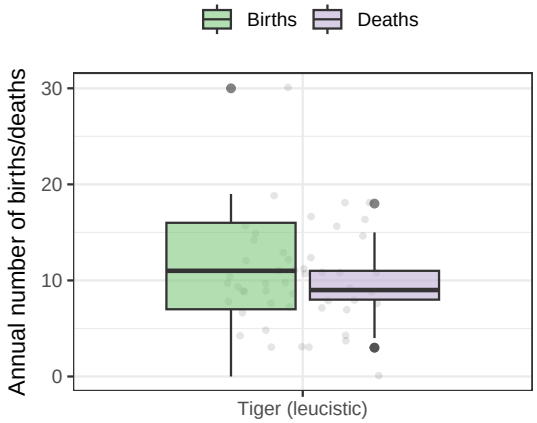

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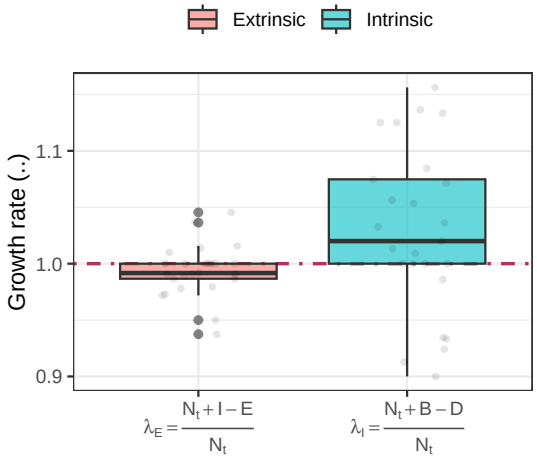
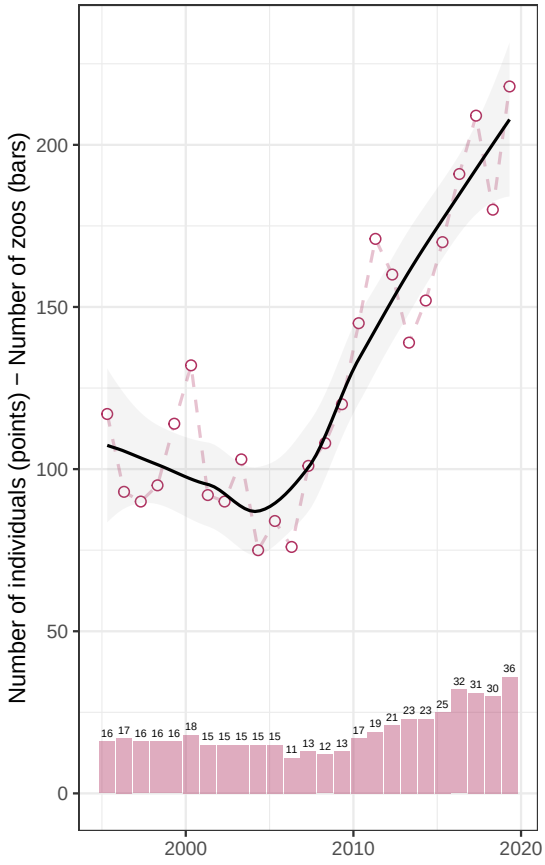


Asiatic Lion (*Panthera leo persica*)

1



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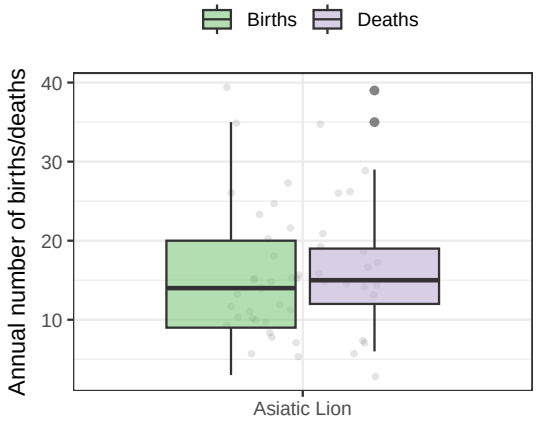

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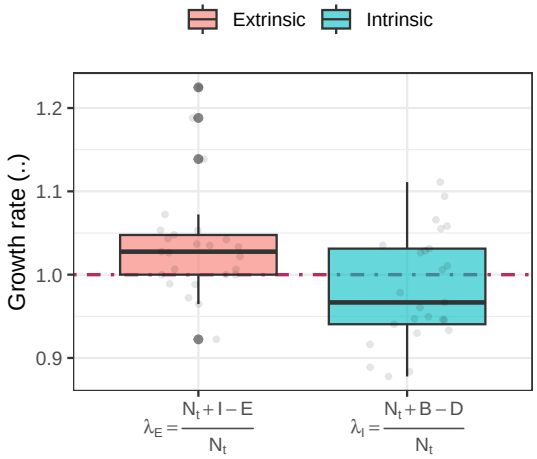
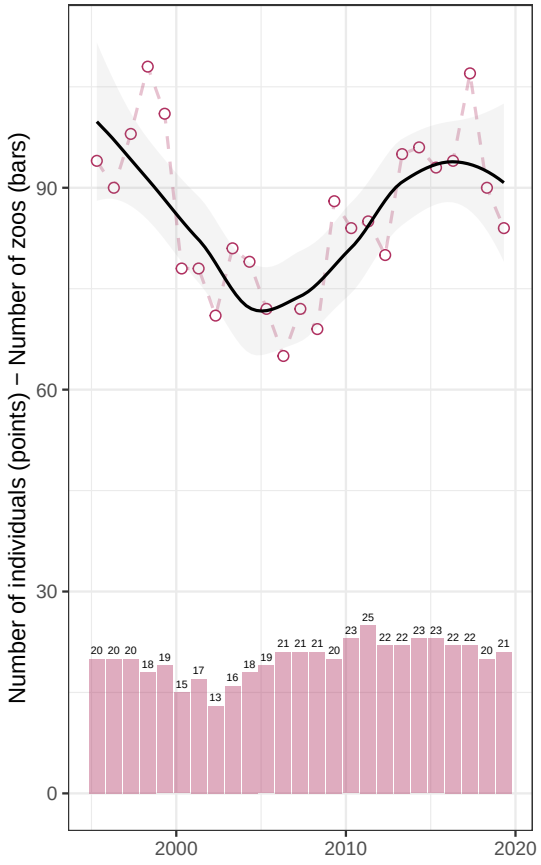


Leopard Cat (*Prionailurus bengalensis*)

1



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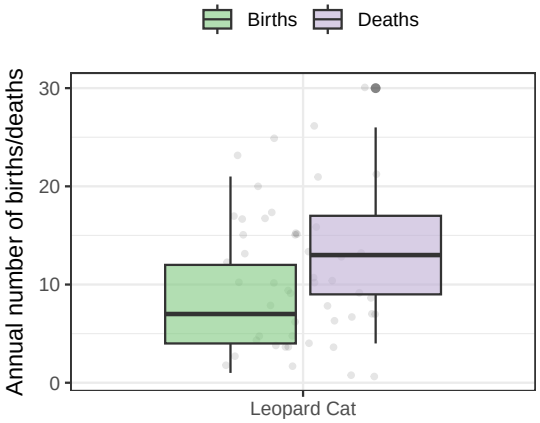

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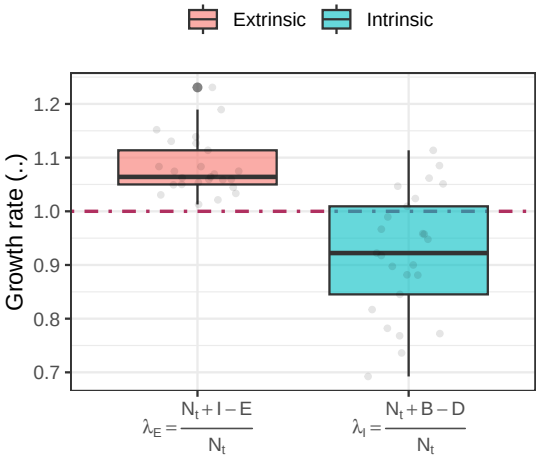
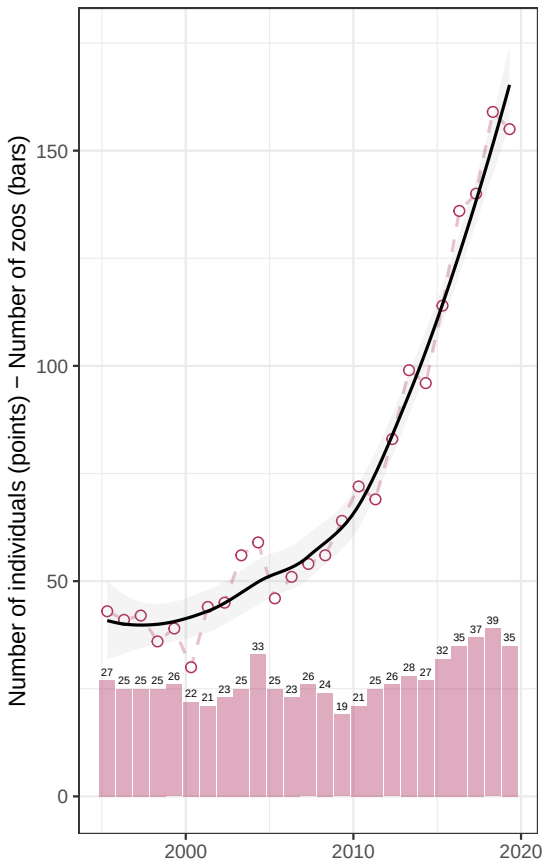


Jungle Cat (*Felis chaus*)

1



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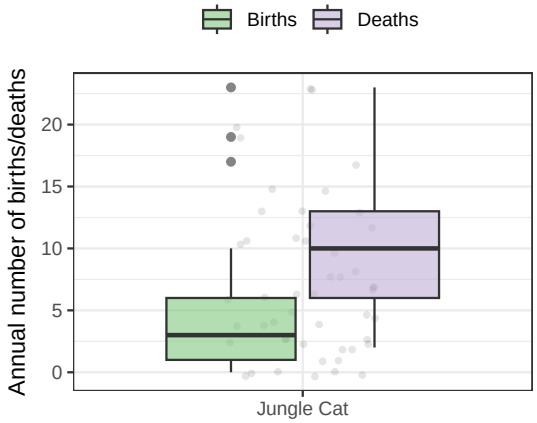

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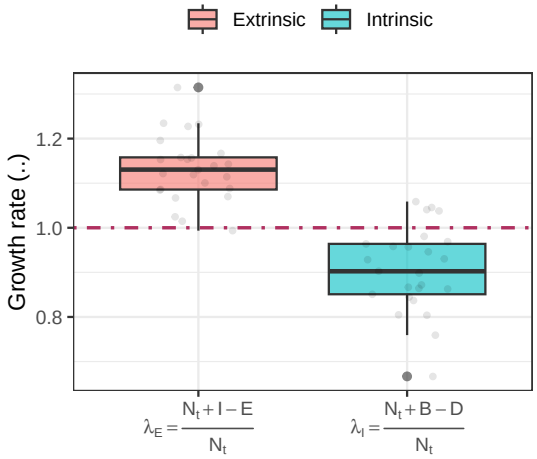
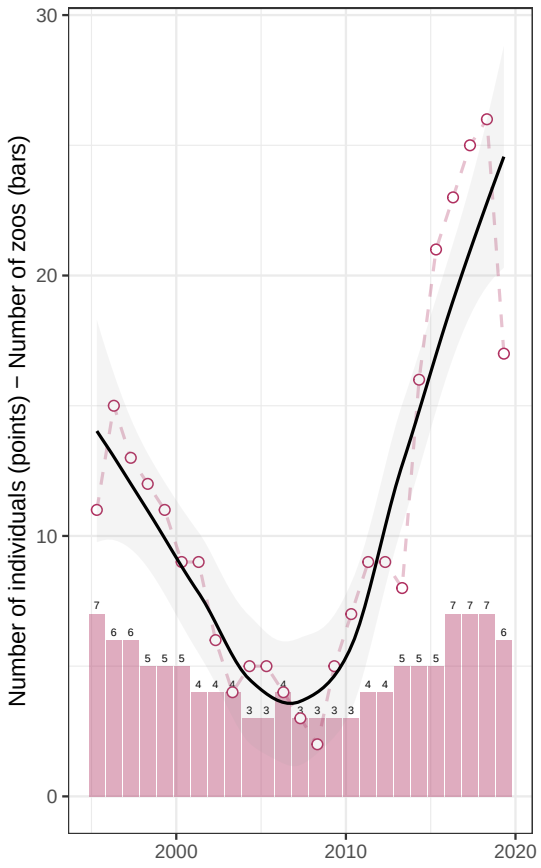


Fishing Cat (*Prionailurus viverrinus*)

1



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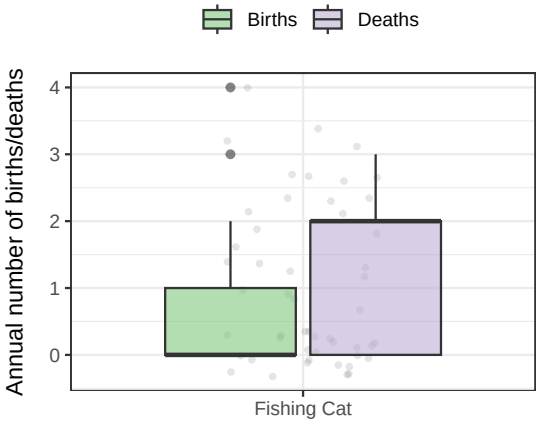

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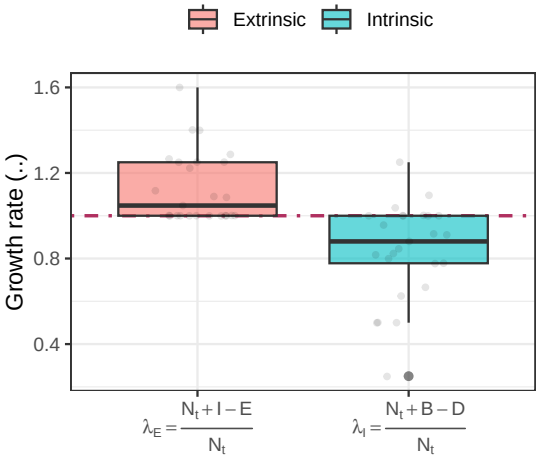
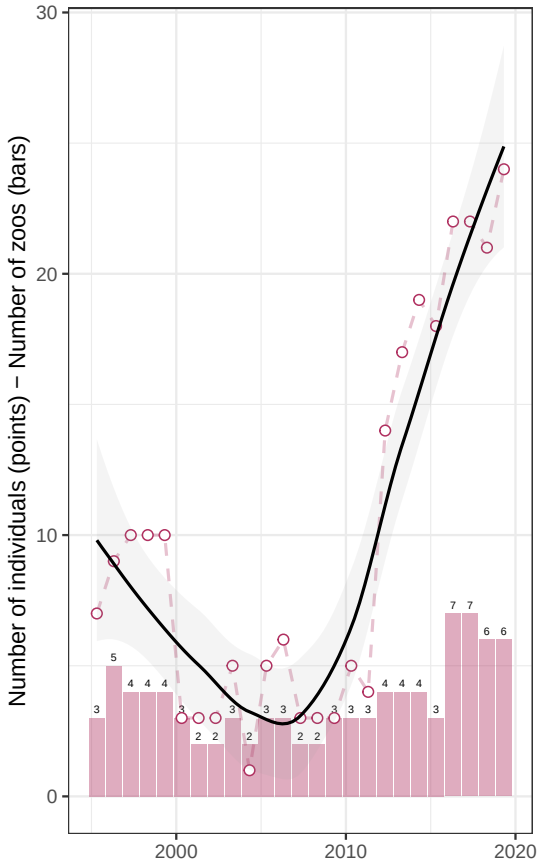


Smooth-coated Otter (*Lutrogale perspicillata*)

1



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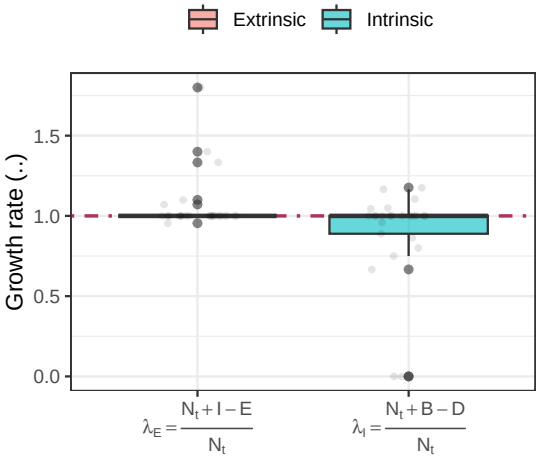
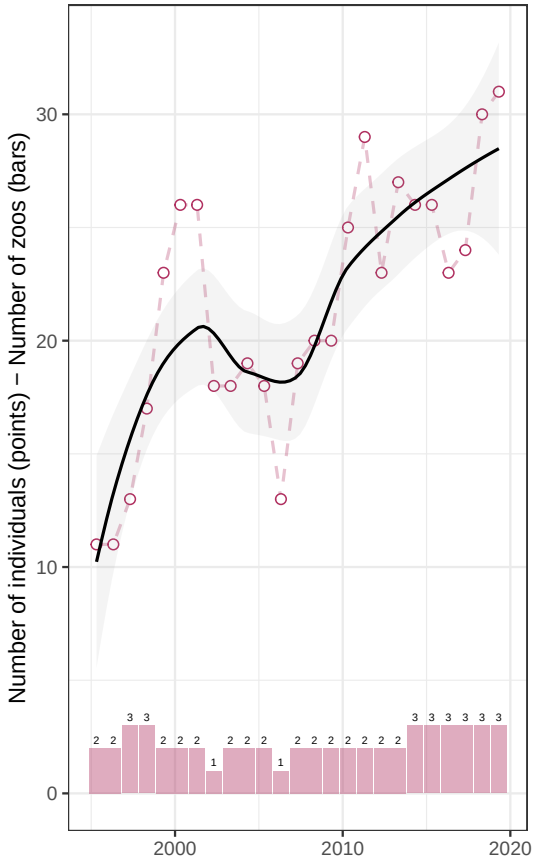


Red Panda (*Ailurus fulgens*)

1



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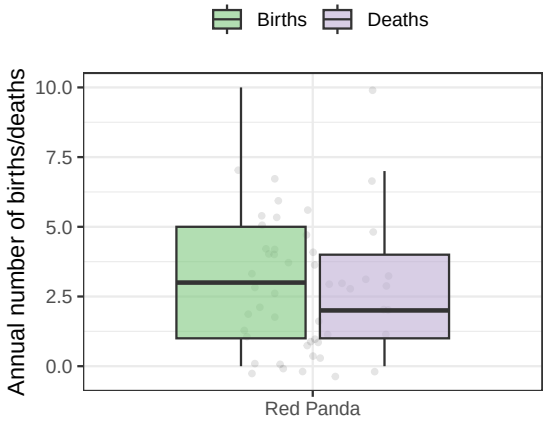

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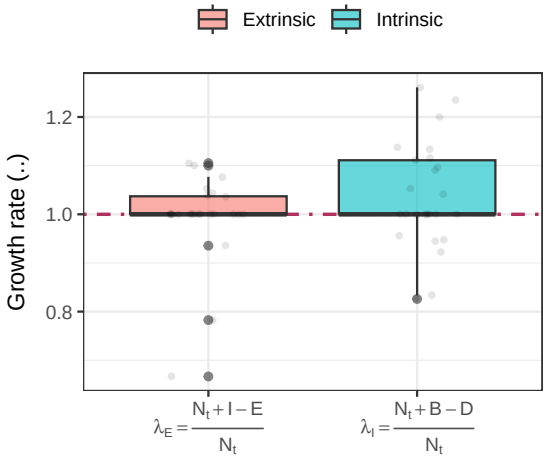
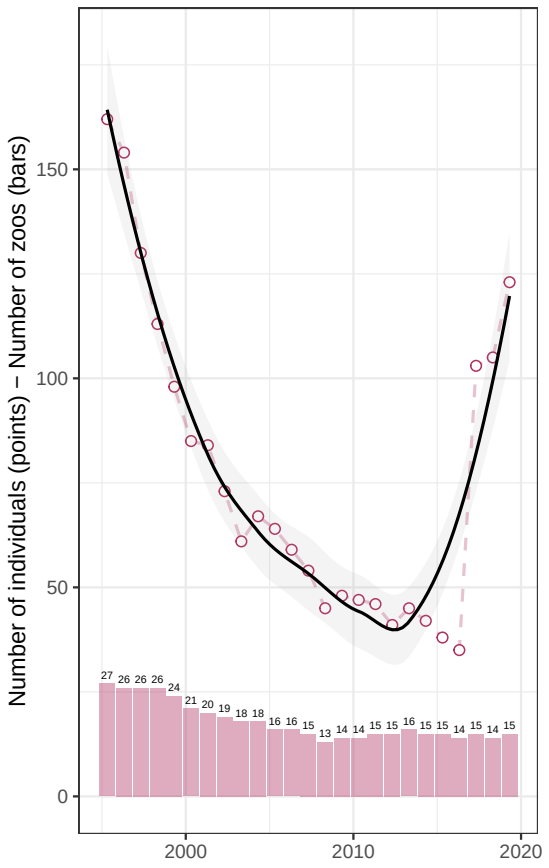


Bar-headed Goose (*Anser indicus*)

1



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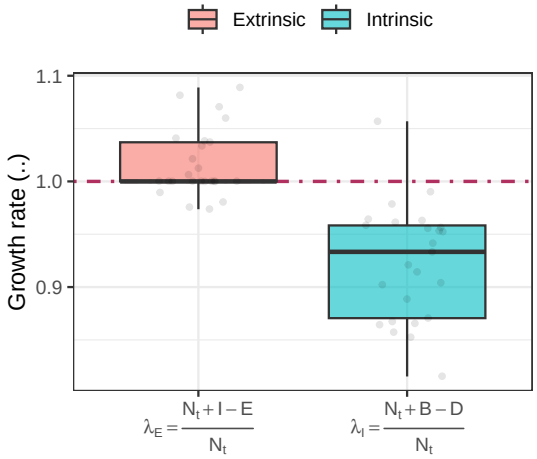
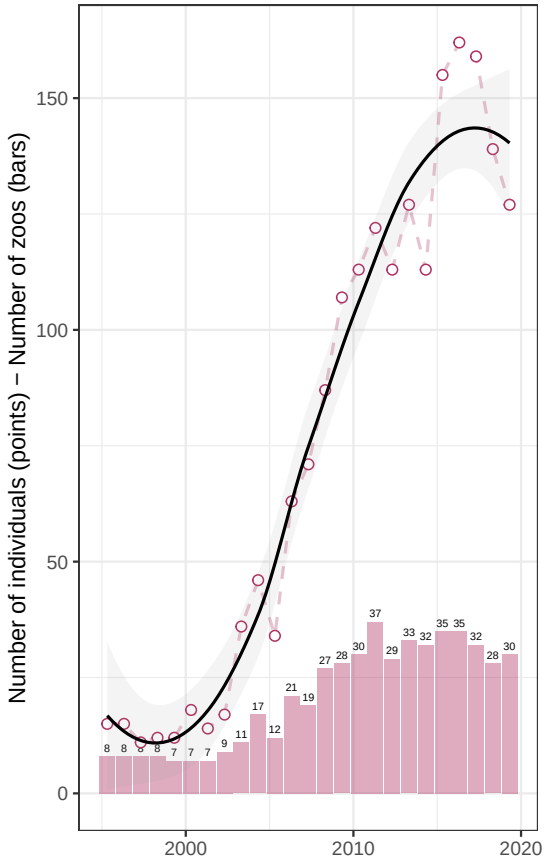


Common Barn Owl (*Tyto alba*)

1



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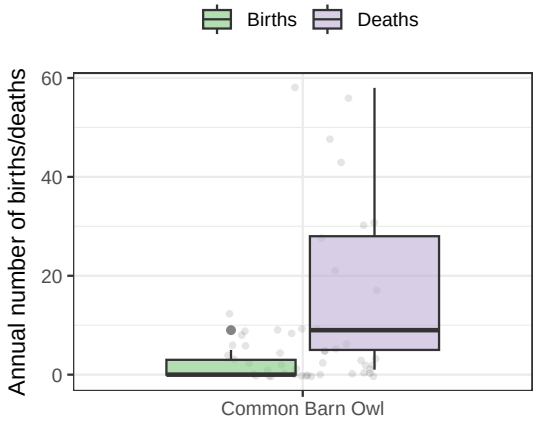

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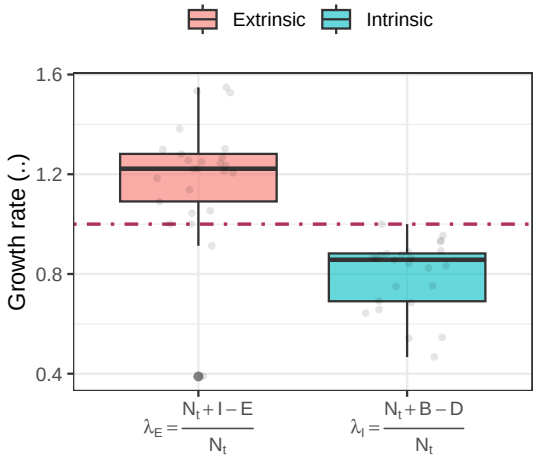
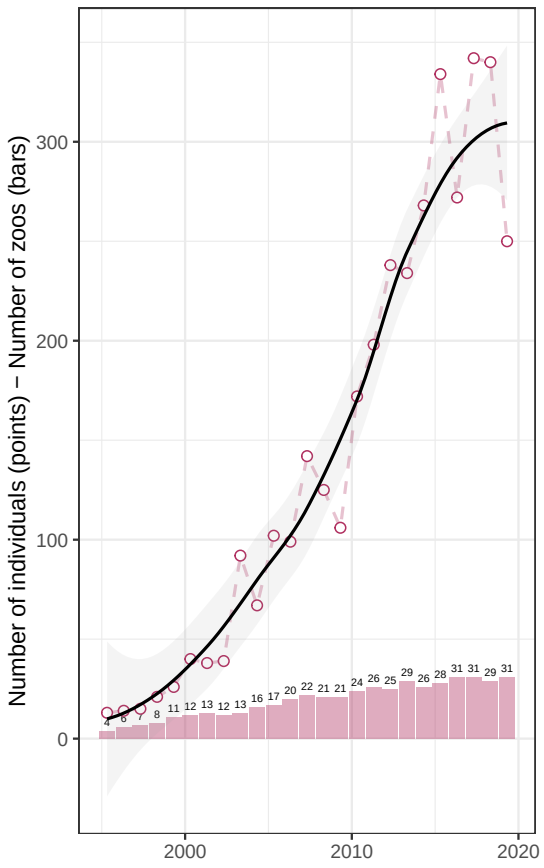


Black Kite (*Milvus migrans*)

1



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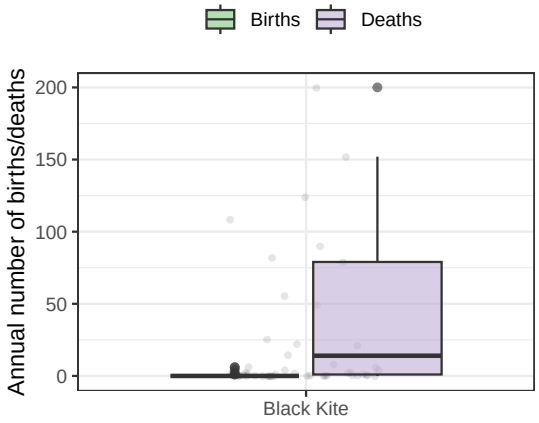

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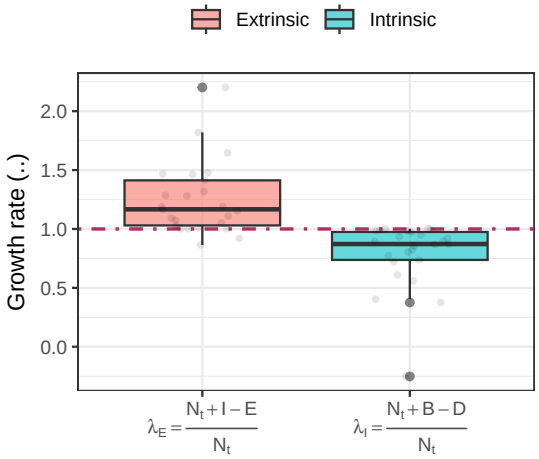
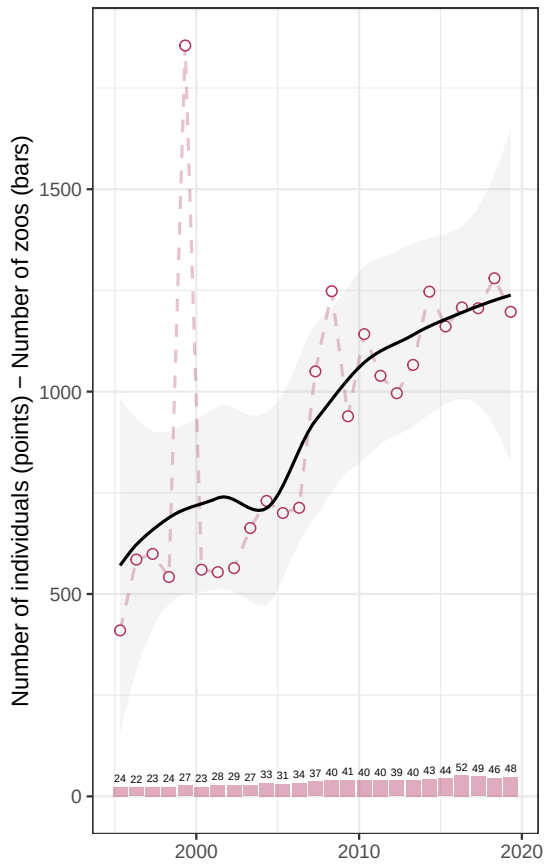


Indian Star Tortoise (*Geochelone elegans*)

1



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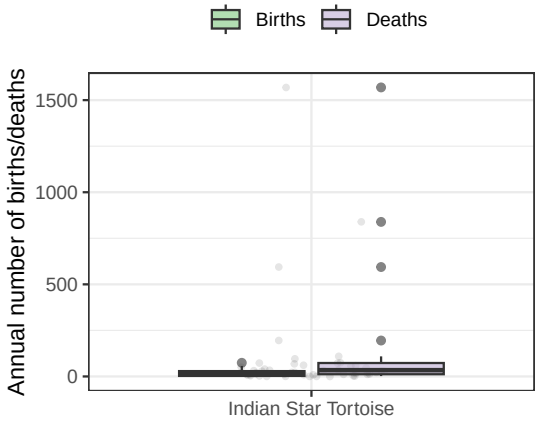

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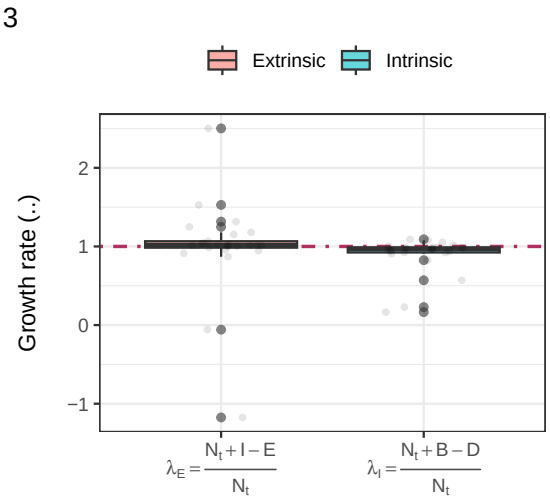
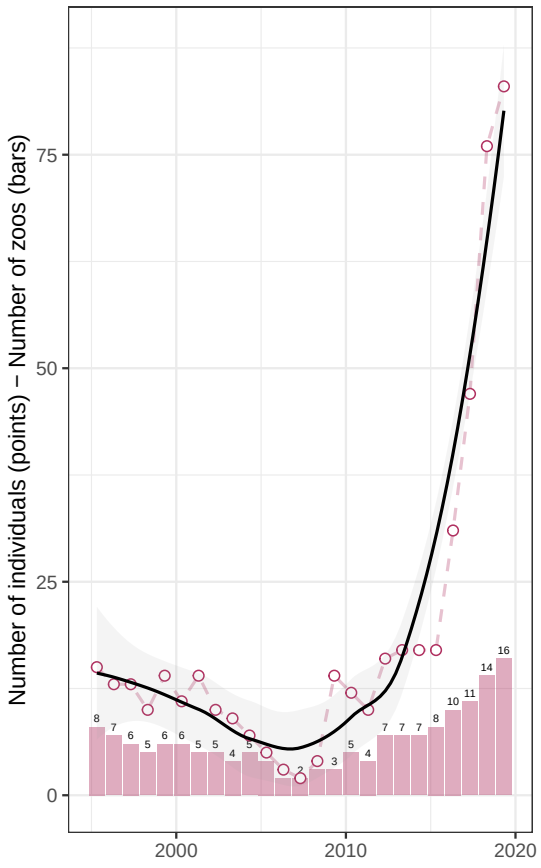


Non-native Species

Green Iguana (*Iguana iguana*)

1



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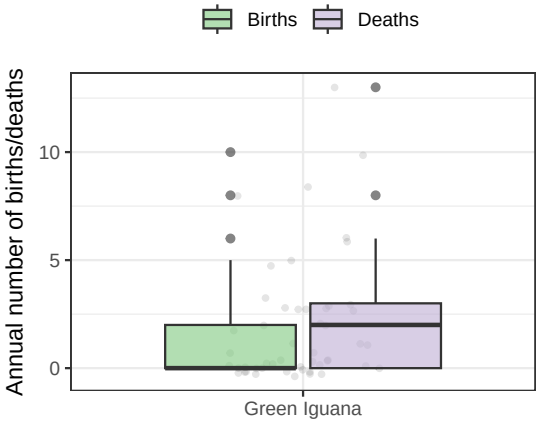

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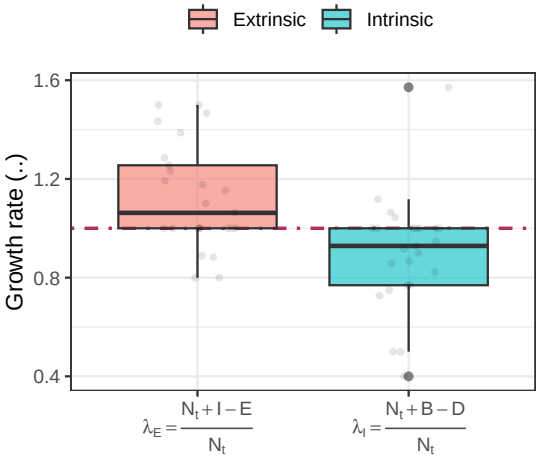
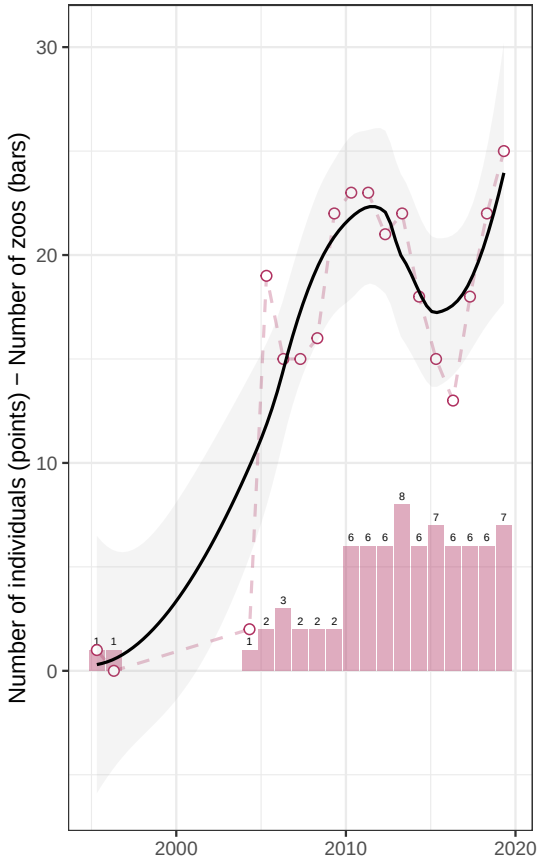


Common Marmoset (*Callithrix jacchus*)

1



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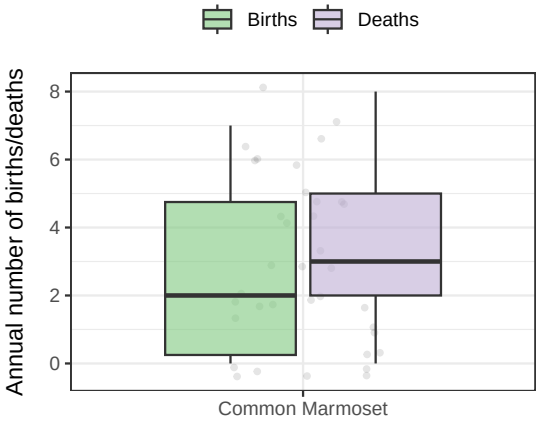

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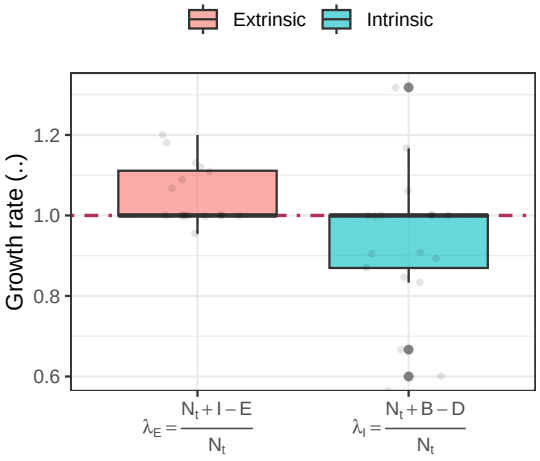
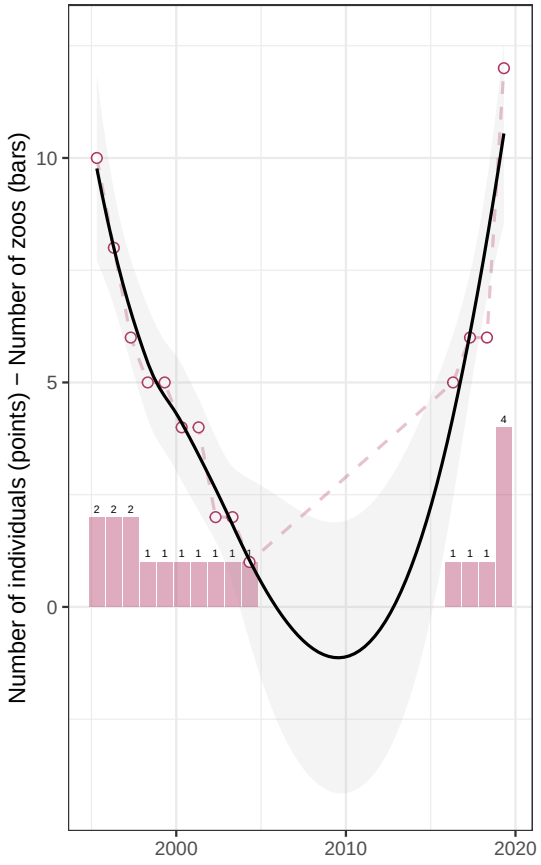


Bennett's Wallaby (*Macropus rufogriseus*)

1



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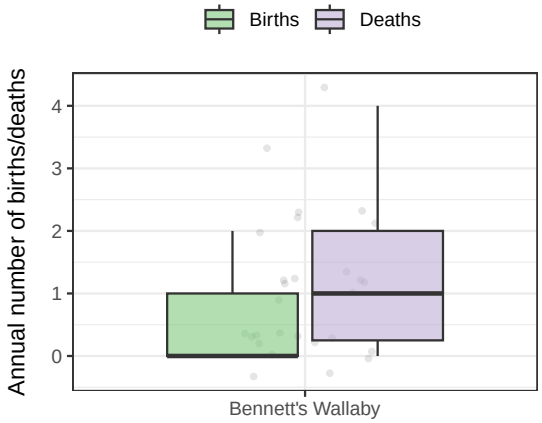

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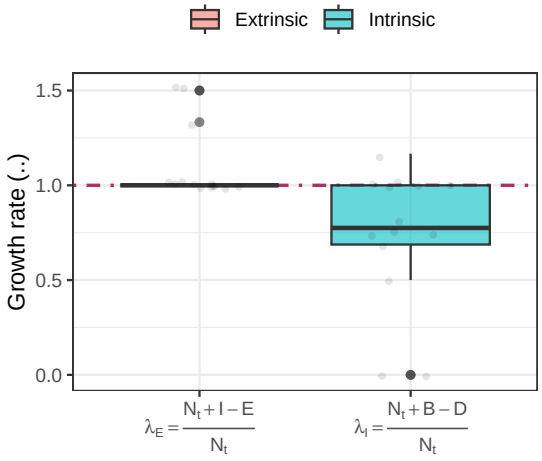

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CGO Complex, Lodhi Road, New Delhi-110003
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