ELEPHANT CARE AND MANAGEMENT

A GUIDE FOR ELEPHANT HANDLERS

Editors
Parag Nigam
Ramesh Pandey

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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Contributors

Dr. N.S. Manoharan, MVSc
Addl. Director (Retd.), Veterinary Services
Govt. of Tamil Nadu

Dr. Bhaskar Choudhary, BVSc & AH
Head, Veterinarian, Centre for Wildlife
Rehabilitation & Conservation,
Wildlife Trust of India, Bokahhat, Assam

Dr. N. Kalaivanan N., BVSc & AH
Forest Veterinary Officer, Srivilliputhur Megamalai
Tiger Reserve, Tamil Nadu

Dr. Giridas P.B., MVSc
Elephant Expert,
Advanced Elephant Clinic,
Thiruambady, Thrissur, Kerala

Dr. N. Lakshminarayanan, PhD
Former Consultant C
Elephant Cell, WII

Dr. Aju Mathew George, PhD
Scientist – C, (PT&E)
Ministry of Environment, Forest & Climate
Change, Govt. of India

Dr. Parag Nigam, PhD
Scientist G & Head, Dept. of Wildlife
Health Mgmt. & Nodal Officer, Elephant Cell,
Wildlife Institute of India, Dehradun, Uttarakhand

Additional inputs(s)
Dr. V. Clement Ben, IFS, IG (PT&E), Ministry of Environment, Forest & Climate Change, Govt. of India
Sh. Suneet Bhardwaj, IFS, AIGF (PE), Ministry of Environment, Forest & Climate Change, Govt. of India
Dr. Rajendra Kumar, Scientist D, (PT&E), Ministry of Environment, Forest & Climate Change, Govt. of India
Dr. Anukul Nath, Scientist C, Dept. of End. Sp. Mgmt.& Assoc. NO, Elephant Cell, WII

Advisors
Sh. Ramesh Pandey, IFS, ADGF (Wildlife), Ministry of Environment, Forest & Climate Change, Govt. of India
Dr. Gobind Sagar Bhardwaj, IFS, Director, Wildlife Institute of India

Conceptualisation and Visualisation
Sh. Ritesh Vishwakarma, Senior Project Associate, WII


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मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
भारत सरकार

सत्यमेव जयते

भूपेन्द्र यादव
BHUPENDER YADAV

MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA

FOREWORD

India's connection with the elephant is profound and ancient, celebrating this magnificent animal as an intrinsic symbol of wisdom, strength, and cultural reverence. As the custodian of the world's largest population of the Asian elephant, the responsibility we bear for their welfare in the wild and in captive settings is immense. Since its inception in 1992, "Project Elephant" has championed the integrated cause of elephant conservation, welfare, and humane management across the nation.

Captive elephants are invaluable national assets, serving crucial roles in religious ceremonies, supporting forest management and protection, and enriching tourism and conservation education. The well-being of these animals, however, rests squarely upon our commitment to provide scientifically informed, compassionate care tailored to their complex physical, psychological, and social requirements. In this process, the role of the Mahout and the Elephant Handler is indispensable. They are essential, first line of care and often the lifelong companions of these majestic animals.

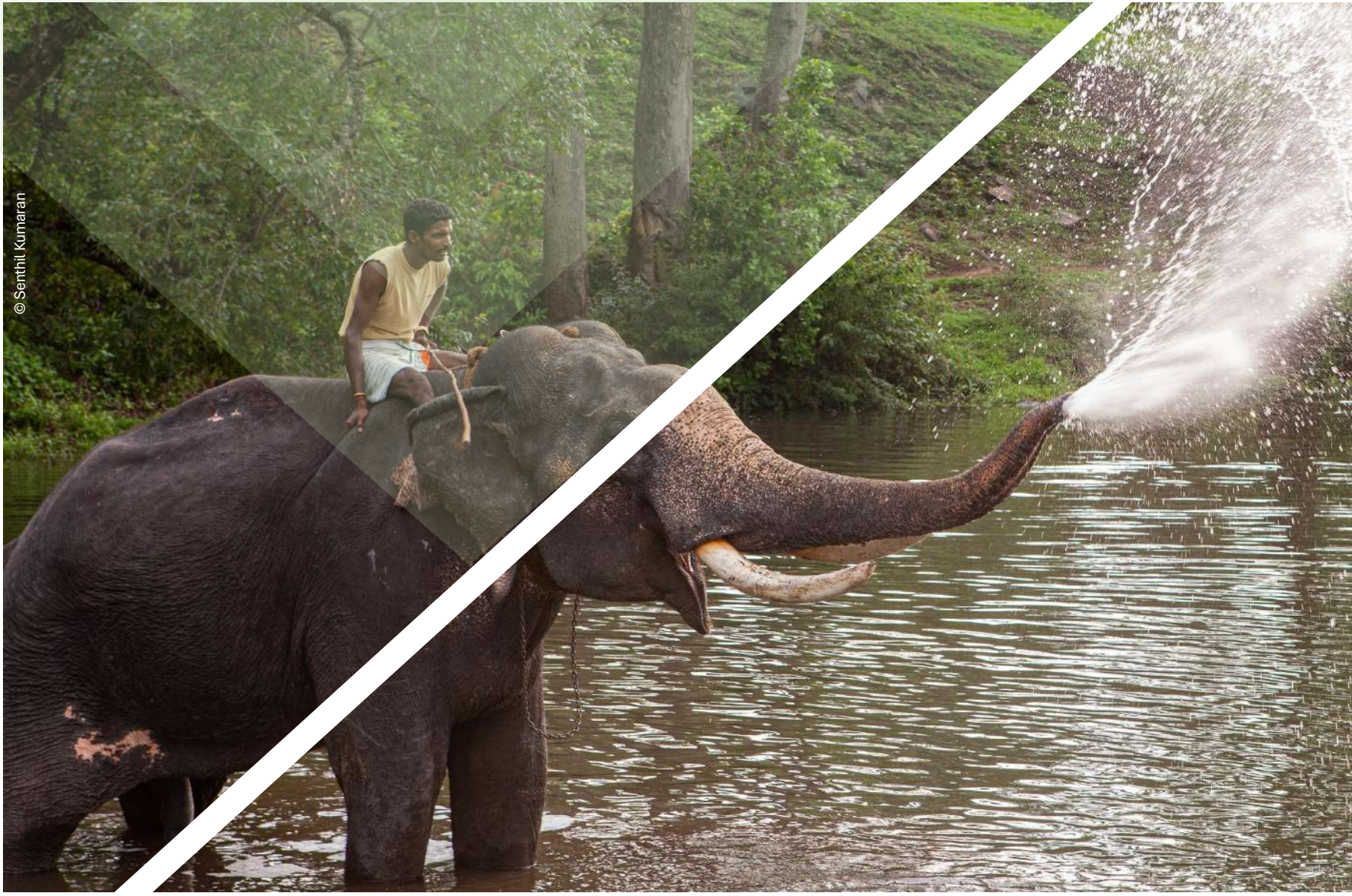
This document, "*Elephant Care and Management: A Guide for Elephant Handlers*", is a vital resource that consolidates expert guidance across all critical aspects of elephant management. By offering a structured, practical, and field-oriented approach, it addresses basics of fundamental husbandry and behaviour to advanced training methodologies and veterinary health care.

I wholeheartedly commend the "Project Elephant Division" of the Ministry of Environment, Forest and Climate Change, Government of India for taking the initiative to develop this comprehensive, evidence-based guide in collaboration with the "Elephant Cell" at the Wildlife Institute of India. This publication would help in regulating humane practices and empowering handlers with the best possible knowledge and tools.

Let us commit to continue our legacy of leadership in elephant conservation, ensuring that our elephants, in captive settings, are managed and cared for with the dignity, respect, and expertise they truly deserve.

(Bhupender Yadav)

पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110003, फोन : 011-20819190, 011-20819187, फैक्स: 011-20819299
Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003, Tel.: 011-20819190, 011-20819187, Fax : 011-20819299
ईमेल / E-mail : mefcc@gov.in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एक कदम स्वच्छता की ओर

कीर्तवर्धन सिंह
KIRTI VARDHAN SINGH

राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
विदेश मंत्रालय
भारत सरकार
MINISTER OF STATE
ENVIRONMENT, FOREST AND CLIMATE CHANGE
EXTERNAL AFFAIRS
GOVERNMENT OF INDIA

FOREWORD

Elephants are an integral part of India's ecological and cultural identity. Their significance goes beyond symbolism they are ecosystem engineers and sentient beings that require sensitive and informed care, especially in captive settings. As a country with the largest population of Asian elephants, our responsibility extends to ensuring their well-being under human care with empathy, expertise, and consistency. Captive elephants serve important roles across forest departments, temples, conservation programs, and tourism. However, their welfare depends greatly on the commitment and capability of their primary caregivers- the mahouts and handlers who share a unique, enduring bond with the elephants in their charge. Supporting these caregivers with the right knowledge and tools is vital to improve welfare standards across the country.

I am pleased that the "Project Elephant Division" of the Ministry of Environment, Forest and Climate Change, has taken the initiative to develop this comprehensive guide titled "Elephant Care and Management: A Guide for Elephant Handlers" in collaboration with the "Elephant Cell" at the Wildlife Institute of India. This guide addresses key areas such as behaviour, health, husbandry, training, enrichment, and safety, combining field experience with scientific principles.

It serves not only as a training resource but also as a step toward harmonizing care protocols across elephant-holding institutions. By standardizing best practices, it will help elevate the quality of management, improve handler-elephant relationships, and foster a culture of responsible stewardship.

I commend all experts, veterinarians, and institutions involved in this initiative and trust that this manual will contribute meaningfully to our collective effort to enhance the care and dignity afforded to captive elephants in India.

(KIRTI VARDHAN SINGH)

कार्यालय: 5वां तल, आकाश विंग, इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली-110003, दूरभाष: 011-20819418, 011-20819421, फैक्स: 011-20819207, ई-मेल : mos.kvs@gov.in
Office : 5th Floor, Aakash Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003, Tel.: 011-20819418, 011-20819421, Fax : 011-20819207, E-mail : mos.kvs@gov.in
कार्यालय: कमरा नं.141, साउथ ब्लॉक, नई दिल्ली-110001, दूरभाष: 011-23011141, 23014070, 23794337, फैक्स : 011-23011425, ई-मेल : mos.kvs@gov.in
Office : Room No. 141, South Block, New Delhi-110001, Tel. : 011-23011141, 23014070, 23794337, Fax : 011-23011425, E-mail : mos.kvs@gov.in
निवास: 23, बी.आर. मेहता लेन, नई दिल्ली-110001, दूरभाष: 011-23782979
Residence : 23, B.R. Mehta Lane, New Delhi-110001, Tel.: 011-23782979


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तन्मय कुमार
TANMAY KUMAR

सत्यमेव जयते

सचिव
भारत सरकार
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

FOREWORD

The management of captive elephants in India presents a unique set of responsibilities scientific, ethical, and cultural. The Ministry of Environment, Forest and Climate Change, Government of India has long recognized the need for structured, standardized, and humane protocols in the care of elephants under human custody. Captive elephants play diverse roles in our society from participation in conservation education and patrolling duties in forest areas to their deep integration in temple traditions and cultural heritage. However, their welfare requires consistent attention to health, behavioural needs, housing conditions, enrichment, and the capacities of those entrusted with their care.

It is in this spirit that the Ministry, through its "Project Elephant Division", and in partnership with the "Elephant Cell" at the Wildlife Institute of India, has developed the document titled "Elephant Care and Management: A Guide for Elephant Handlers". This resource is the outcome of extensive consultation with field experts, veterinarians, researchers, and experienced mahouts. It aims to provide clear, actionable guidance for elephant handlers and institutional managers alike.

The document addresses every critical dimension of captive elephant management ranging from understanding elephant biology and behaviour to daily husbandry, veterinary care, enrichment activities, and safety. It also recognizes the importance of building respectful and trusting relationships between elephants and their caregivers, and of ensuring that welfare standards are grounded in both scientific rigour and cultural sensitivity.

I extend my sincere appreciation to all those who contributed to this important initiative. This document is not only a tool for field-level implementation but also a reflection of our collective commitment to the ethical stewardship of elephants in India. I am confident that it will strengthen the framework of captive elephant care across states and institutions, and serve as a benchmark for policy, training, and practice.

17/12/25
(Tanmay Kumar)

Place: New Delhi
Dated: December 17, 2025

इंदिरा पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110 003 फोन : (011)-2081-9408, 2081-9308, फैक्स : (011)-2081-9238
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI-110 003, PH. : 011-2081-9408, 2081-9308, FAX : 011-2081-9238
E-mail : secy-moef@nic.in, Website : moef.gov.in


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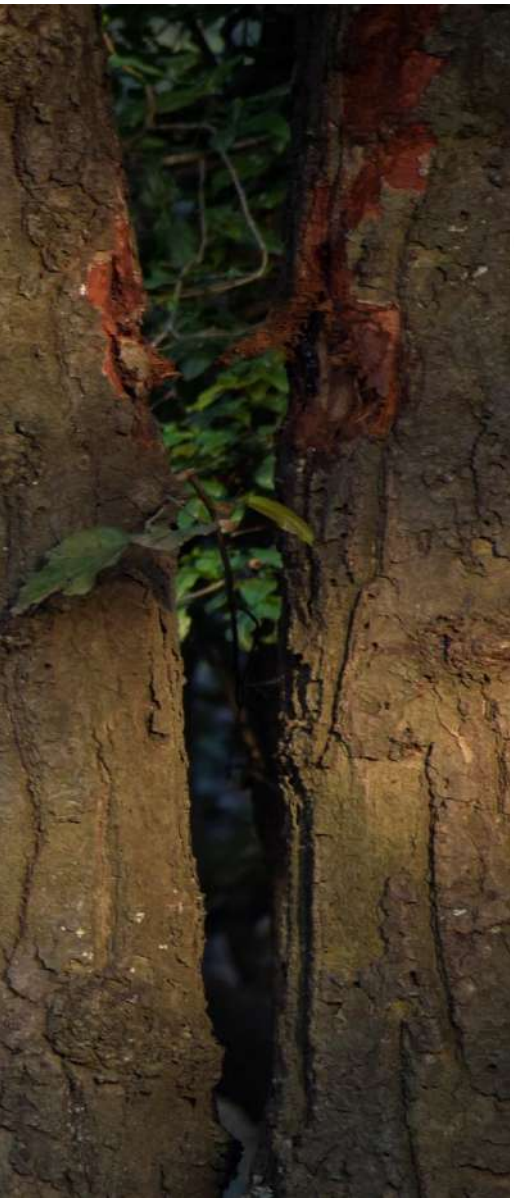

सुशील कुमार अवस्थी
Sushil Kumar Awasthi

सत्यमेव जयते

वन महानिदेशक एवं विशेष सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
DIRECTOR GENERAL OF FORESTS & SPL. SECY.
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT FOREST AND
CLIMATE CHANGE

FOREWORD

The elephant occupies a unique and revered place in India's cultural and ecological landscape. As the nation housing the largest population of the Asian elephant, the Government of India, through the Ministry of Environment, Forest and Climate Change (MoEF&CC), holds the enduring commitment to ensure the protection and compassionate management of this charismatic megafauna, both in the wild and in captivity. Since its launch in 1992, Project Elephant has been the flagship initiative driving this commitment. The MoEF&CC recognizes that captive elephants employed across state forest departments, temple management, and responsible tourism require a statutory framework and scientific guidance to ensure their well-being. This effort is integral to the broader objective of human-elephant co-existence and effective wildlife conservation.

"Elephant Care and Management: A Guide for Elephant Handlers" is a rigorous compilation of best practices, translating complex biological and veterinary science into practical, field-oriented knowledge. It systematically addresses the critical aspects of husbandry, health care protocols, ethical training, and understanding the complex behavior of captive elephants.

The document draws expertise from a spectrum of experts from across the country, and I would like to thank all the contributors for providing their valuable input. I congratulate the authors of the document and commend the dedicated efforts of "Project Elephant Division" and its partners in bringing out this important publication. This document serves as a tangible expression of the Government of India's proactive role in elevating the standards of care and empowering the Mahouts and Elephant handlers who are at the very heart of effective captive elephant management. This guide marks a significant step towards ensuring that every elephant under human care is treated in accordance with the highest standards of animal welfare science, reflecting our national pledge to treat all wildlife with the dignity and respect they deserve.

(Sushil Kumar Awasthi)

Place: New Delhi
Date: 17th December, 2025

इंदिरा पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110 003
फोन : 011-20819239, 20819209

Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003
Ph. : 011-20819239, 20819209, E-mail : dgfindia@nic.in


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रमेश पाण्डेय, भा.व.से.
RAMESH PANDEY, I.F.S.

सत्यमेव जयते

अपर वन महानिदेशक
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
ADDITIONAL DIRECTOR GENERAL OF FORESTS
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

FOREWORD

India's bond with elephants is profound, symbolizing wisdom, strength, and reverence. As custodians of the largest population of Asian elephants, there is a tremendous responsibility to ensure their protection and welfare. "Project Elephant" has worked tirelessly since 1992 to promote conservation, welfare, and humane management of elephants.

As the nodal authority overseeing wildlife conservation and management in the country, the Ministry of Environment, Forest and Climate Change, Government of India, places strong emphasis on ensuring that elephants under human care receive management that is both scientifically sound and ethically grounded. Captive elephants contribute in diverse ways from assisting frontline forest staff and supporting conservation initiatives to participating in regulated tourism and cultural traditions. Safeguarding their welfare demands an in-depth understanding of their behavioral, ecological, and physiological needs. In this continuum of care, mahouts and elephant handlers play a pivotal role, drawing upon generations of traditional knowledge and daily interaction to serve as the primary caregivers for these animals.

To overcome this concern, the "Project Elephant Division" along with the "Elephant Cell" at the Wildlife Institute of India constituted an expert committee with in-depth field experience along with the scientific acumen to come up with a guide titled "Elephant Care and Management: A Guide for Elephant Handlers" that is practical to use in the field, and comprehensive in scope. This document leverages the collective expertise of professionals from across the country, bringing together diverse perspectives and knowledge to advance the well-being of captive elephants. This manual is oriented towards enhancing the capabilities of elephant handlers and aims at supporting captive elephant management and fostering better handler-elephant relationships.

I commend the efforts of all involved and trust that this manual will contribute to enhancing the care and dignity afforded to captive elephants in India. I am confident that this manual will serve as a valuable resource for elephant handlers, managers, and conservationists, and contribute to advancing captive elephant management practices in India.

(Ramesh Pandey)

जल विंग, पंचम तल, इंदिरा पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110 003, फोनः 011-20819180
Jal Wing, 5th Floor, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003, Ph. : 011-20819180
E-mail : ramesh.pandey@nic.in

आज़ादी का अमृत महोत्सव


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भारतीय वन्यजीव संस्थान
Wildlife Institute of India
(An Autonomous Institute under Ministry of Environment, Forest & Climate Change, Govt. of India)
पत्रपेटी सं/Post Box No. 18, चन्द्रबनी, देहरादून/Chandrabani, Dehradun - 248001, उत्तराखण्ड, भारत/ Uttarakhand, INDIA

Azadi Ka Amrit Mahotsav

FOREWORD

The long-standing relationship between humans and elephants in India has evolved across centuries of coexistence. Today, managing captive elephants requires an intersectional approach one that blends traditional knowledge with modern animal welfare science. With increasing public awareness, judicial scrutiny, and institutional accountability, it is imperative that we implement consistent, science-based, and welfare-oriented protocols across all settings where elephants are held in captivity.

The role of mahouts and elephant handlers remains central to this endeavour. Their day-to-day interaction, caregiving, and behavioural understanding of individual elephants significantly influence long-term health and welfare outcomes. However, these responsibilities must be guided by structured training and supported through updated, evidence-driven guidelines.

The manual titled "Elephant Care and Management: A Guide for Elephant Handlers." developed under the guidance of the Project Elephant Division in collaboration with the Elephant Cell at the Wildlife Institute of India, represents a vital resource toward professionalising and harmonising captive elephant care across the country. It draws upon field experience, veterinary expertise, ethology, and welfare science to provide a comprehensive framework for daily and specialised management. Particular attention has been given to core aspects such as nutritional regimes, early disease recognition, enrichment-based interventions, and musth management. Furthermore, the emphasis on record-keeping, safety protocols, and handler-elephant relationship dynamics reflects an evolved understanding of both operational efficiency and humane treatment. As we continue to strengthen our national policies and capacities under Project Elephant, this manual will serve not only as a field-level guideline but also as a strategic tool for reinforcing compliance, improving institutional accountability, and fostering best practices in alignment with national and international welfare norms.

I extend my appreciation to all subject experts, veterinarians, and contributing institutions whose efforts have culminated in this timely and impactful publication. It is my sincere hope that this manual will not only empower those directly involved in elephant care but also inspire ongoing dialogue, training, and innovation in captive elephant management practices across the country.

(Gobind Sagar Bhardwaj)
Director
Wildlife Institute of India

ई.पी.ए.बी.एक्स/EPABX : +91-135-2640114, 2640115, 2646100; फैक्स/Fax : 0135-2640117 ई-मेल/Email: wii@wii.gov.in वेब/Website www.wii.gov.in Twitter: @wiiofficial1

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PREFACE

Captive elephants occupy a unique and significant place in India's cultural heritage and conservation ethos. Elephant welfare both in the wild and directly under human care is a national priority. While conservation is a priority for wild elephant populations, welfare is the priority for elephants managed in captivity. Elephant welfare in captivity hinges on providing social and environmental conditions conducive for elephants along with humane approaches in training and handling. It is timely to integrate the best of scientific knowledge into traditional elephant management with an objective of improving the overall welfare conditions.

The document titled "*Elephant Care and Management: A Guide for Elephant Handlers*" has been prepared through collaborative efforts involving elephant handlers, wildlife biologists, veterinarians, wildlife managers and conservation professionals. It draws upon traditional knowledge, hands-on experience, and also recent advancements in elephant biology and medicine to have a comprehensive, user-friendly reference for elephant handlers and facility managers engaged in the daily management of elephants in captivity. The objective of the manual is to guide elephant handlers and others concerned in elephant management to provide basic information on themes foundational for elephant welfare in captivity.

The manual comprises six broad sections. The first introduces the biological and behavioural attributes of elephants for handlers better understand species-specific needs and natural behaviours. The second section focuses on building and maintaining strong handler-elephant relationships, emphasizing trust-building, effective communication, and the use of positive conditioning techniques. Subsequent sections provide detailed guidance on husbandry, nutrition, health care, and hygiene, along with specialized topics such as foot, tusk, and skin care; management during *musth*; and care during pregnancy, lactation, and neonatal stages. Recognizing the dynamic nature of elephant management, the manual also covers essential topics like training, enrichment, transportation protocols, and safe handling practices. A dedicated section addresses occupational safety for handlers, and the annexures provide practical tools, checklists, and record-keeping formats to support daily management and monitoring.

This manual is intended to serve as both a training resource and an operational reference for improving captive elephant management across various institutions and facilities. It advocates preventive care, empathetic handling, and scientifically informed husbandry routines to ensure optimal welfare outcomes. We hope that this guide empowers elephant handlers with the knowledge and confidence to adopt humane, effective, and standardized practices in their work. The welfare of captive elephants is inseparably linked to the capacity and care extended by their handlers, and this manual is a step towards strengthening that critical interface.

We extend our sincere appreciation to all contributors and reviewers who provided their time, expertise, and field experiences towards the preparation of this manual. It is our hope that this initiative contributes meaningfully to the long-term welfare and dignified care of captive elephants in India

Editors

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CONTENTS

INTRODUCTION

1. INTRODUCTION

Elephants are the largest land mammals on Earth. In the wild, elephants live in a complex and dynamic social system performing critical ecological roles. Among the Asian countries, elephants are also conservation icons that help in conserving biodiversity for the larger good of mankind. Elephants lead a fulfilling life in the wild, however, due to myriad reasons they are also under direct human care in relatively confined environments. In such environments, elephants could suffer many deprivations such as nutritional, psychological, social, and environmental, which compromise their overall welfare and longevity. Thus, welfare remains a central challenge in captivity. When it comes to elephant welfare in captivity, the role of elephant handlers assumes critical importance. In addition to providing food and performing basic upkeep activities, elephant handlers also act as critical social companions for elephants. The handler-elephant relationship is continuously evolving and involves complex interpersonal equations. Despite the recognition of the importance of humane elephant management in captivity, maintaining and handling elephants in captivity is a challenging endeavor, which requires a deep understanding of their anatomical features, temperament, behavioral dynamics, physiology, health issues, social and welfare needs. In India, the elephant management has evolved as utility and functional role of elephants in captivity have considerably transformed overtime. There is a growing recognition of the importance of providing high-quality care and welfare for elephants, which is also one of the stated objectives of the Project Elephant, Government of India.

While there is broad recognition that elephant handlers form the backbone of captive elephant care and welfare, the task of handling elephants remains inherently challenging, even for the most experienced personnel. Managing elephants is fundamentally different from handling other domestic livestock and pets. Through domestication, these animals have undergone substantial behavioural and physiological modifications over generations, making them more amenable to human interaction. Elephants, however, are not domesticated animals. They remain essentially wild, and their ability to live and work in captivity is the result of targeted conditioning, predominantly through operant conditioning techniques. Even elephants born in captivity cannot be considered domesticated, as domestication is an inter-generational, human-driven process involving the selection of desired traits and behaviours.

Compounding this primary challenge are the elephant's exceptional size, strength, intelligence, and independent decision-making abilities. Their moods and temperaments can vary widely and may change rapidly. In addition, their behaviour is influenced by multiple factors, including diet, physical activity, housing conditions, and social interactions. Handling elephants, therefore, is a process of continuous learning that is strengthened through the transfer of knowledge across generations of handlers and further enhanced by scientific understanding. At the same time, elephant management in captivity involves significant physical risk to handlers. These risks must be minimized through sustained learning, regular refinement of practices, and the implementation of management techniques designed to reduce stress and improve welfare for elephants in captivity.

Being in the forefront of captive elephant management, the elephant handlers perform a range of tasks including feeding, cleaning, exercising, and monitoring their respective elephants. The handlers are also expected to recognize and respond to behavioral anomalies and health issues. Therefore, effective captive elephant management involves a multifaceted approach prioritizing welfare, safety, and well-being of both elephants and handlers. This includes providing safe, secure, and spacious enclosures catering to physical and behavioral needs, offering a nutritious and balanced diet tailored to individual requirements, delivering regular health checks and preventative care, providing opportunities for social interaction, exercise, and mental stimulation, and developing safety protocols and emergency procedures to protect both elephants and handlers.

Implementing standard and validated practices in captive elephant management would be essential in both improving the physical and psychological well-being of elephants and at the same time minimizing the risks facing handlers through better safety protocols and emergency procedures. One way to achieve this twin objective is to empower elephant handlers with state-of-the-art knowledge by amalgamating information on field practices and supplementing them with details on biology, behavior, and health.

This document elucidates the standard practices in captive elephant management, which would enhance elephant welfare in captivity. It covers a range of topics such as housing and enclosures, diet and nutrition, health care, behavioral management, and safety and emergency procedures. The ideas discussed in the manual could empower elephant handlers in better assessment of various situations involving their elephants so as to plan appropriate interventions therein. Given the heterogeneity of situations in which captive elephants are maintained and managed in India (unlike that of Western countries where elephants are mostly managed in zoos endowed with protected contact facilities), the document is intended for elephant handlers working in zoos, Forest Department facilities in the field, and rescue and rehabilitation centers across India. The document doesn't specifically delve into situations involving individually managed elephants in private facilities, religious institutions and individual owners. Although targeted at elephant handlers, the document would also be beneficial for veterinarians, curators, and other professionals involved in captive elephant management.

1.1 Basic biology and behavior:

i. Elephants are the largest land mammals with three distinct species of elephants namely *Elephas maximus (Asian elephant), Loxodonta africana (African bush elephant)*, and *Loxodonta cyclotis (African Forest elephant)*.

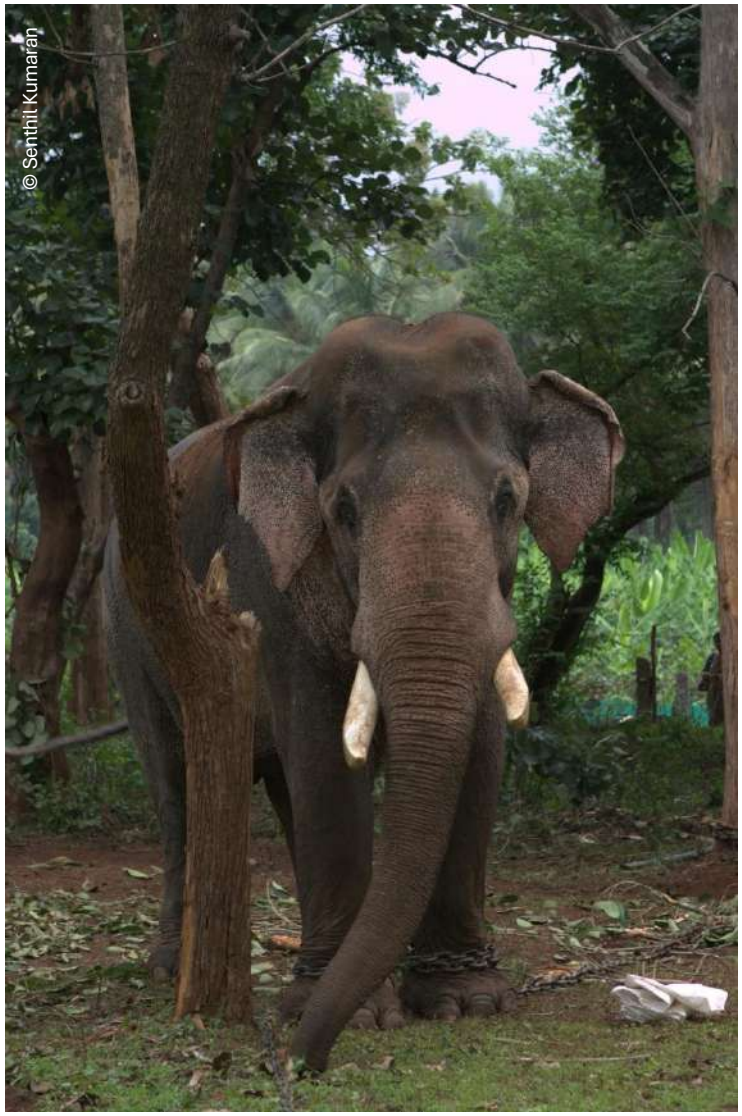
ii. There is very high individual variation in the growth patterns of Asian elephants. On an average adult bulls measure 2.5 – 3.5 meters in height and adult females measure 2.2 – 2.8 meters. The average weight of an adult bull elephants ranges from 3000 – 6000 kilograms while adult females measure 2500 – 4000 kilograms.

iii. They have a complex social structure, led by matriarchal herds, and are known for their exceptional memory and intelligence. Asian Elephants are herbivores, feeding on a wide variety of plants, including grasses, fruits, and bark. Their diet consists mainly of fibrous foods.

iv. Asian Elephants have a relatively long gestation period of almost two years, and females typically give birth to 2-4 calves in their lifetime.

v. They can live for 60-70 years or more with proper care, and their biology is influenced by factors such as diet, exercise, and socialization.

vi. Elephants communicate through several ways, which include (i) range of vocalizations such as trumpets, rumbles, roars, bellows and others, (ii) elaborate visual and tactile communication such as body postures, rubbing bodies of each other, probing with the trunk etc. (iii) subtle chemical communication involving variety of scents, pheromones and bodily secretions, which carry unique messages, and (iv) long distance communication through complex infrasonic waves and seismic vibrations that are beyond human comprehension without the aid of advanced equipment.



vii. Asian Elephants have specific ecological needs that are essential for their survival. They require large areas of habitat with adequate food, water, and shelter, as well as connectivity between habitats to allow for migration and gene flow.

viii. Captive elephants need a nutritious diet that includes a variety of fruits, vegetables, and fiber, as well as access to clean water and adequate shelter. Their enclosures should provide sufficient space for movement and exercise, as well as opportunities for social interaction and mental stimulation.

ix. In captivity, Asian Elephants are prone to health issues such as foot problems, arthritis, and respiratory diseases, which can be managed with proper veterinary care and husbandry. Regular health checks, vaccinations, and preventative care are essential to maintaining the health and well-being of captive elephants.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Facilitating elephant social behavior in captivity:

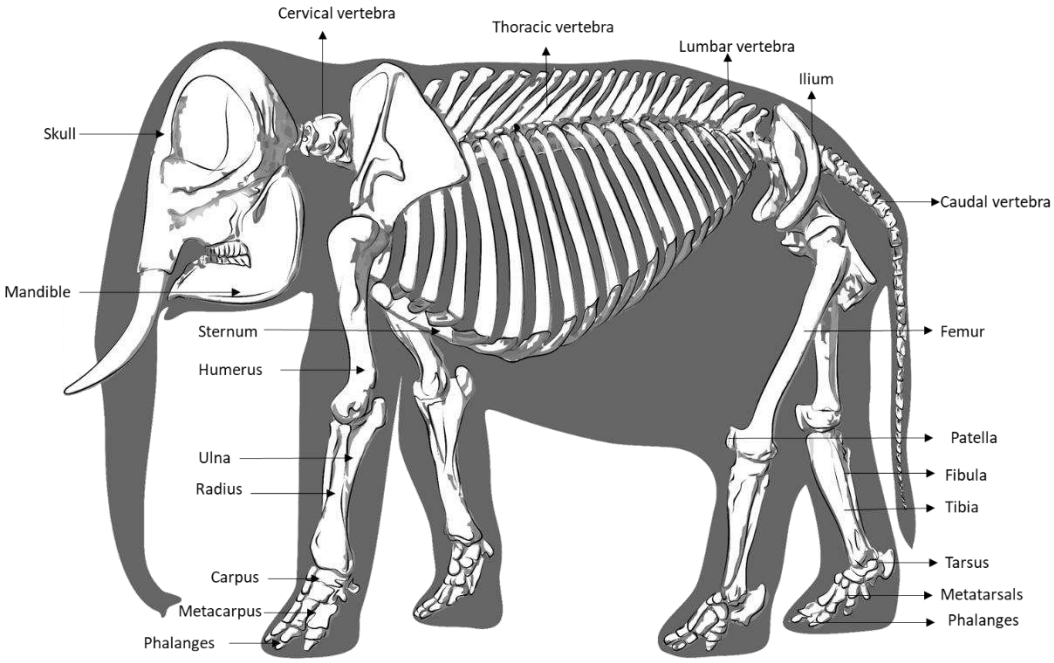
Captive conditions can lead to behavioral issues like stereotypy, aggression, and fearfulness, particularly when elephants are kept in inadequate spaces, monotonous enclosures, or chained for extended periods with limited exercise, restricting socialization and natural behaviors. Young elephants are particularly vulnerable to developing long-lasting stereotypies due to improper training. Recognizing and respecting the distinct personalities of individual elephants is also crucial in managing them effectively. Captive management should strive to meet the species' basic needs by ensuring adequate space, opportunities for social interaction, and regular exercise and mental stimulation. In well-managed facilities, elephants often display complex social behaviors similar to those seen in the wild, forming strong bonds with both handlers and other elephants. Enrichment activities—such as puzzle feeders and varied sensory stimuli—help engage their cognitive abilities, reduce stress, and improve overall welfare. Positive-reinforcement training further strengthens trust and encourages cooperative behavior. By consistently providing opportunities for socialization, physical activity, and mental engagement, caregivers can significantly reduce stress and foster positive behavioral outcomes in captive elephants.

1.2 Basic anatomy and physiology

i. Elephant have a large head and relatively short neck. The skull in the head is large and contains air-filled sinuses. The relatively large brains of the elephants are secured in their skulls. The neck is short to accommodate the overall weight of the head.

ii. Elephants have 282 bones and 61 vertebrae. Elephant bones are prone to fractures and dislocations due to their relatively low thickness. This must be considered while working with the elephants. Fractures can be debilitating for life or even life threatening.

iii. Tusks are modified upper incisors. Approximately one-third of the tusk is hidden within the skull. In general, only the males have tusks. Tusks can come in different forms, shapes and sizes. The tusk size and thickness may not be a very useful indicator of age. Rudimentary tushes may be seen in *makhnas* (males without proper tusks) and female elephants.



Mounted Skeleton of Asian Elephant

iv. Elephants have 6 sets of molars (grinding teeth) during their lifetime. These are adapted to grind tough plant material that they eat. Elephants have only two pairs of molar teeth at a time, which are replaced five times during their lifetime. In the molar tooth, there are number of ridges that gradually increase with age.

v. The elephant limbs are arranged vertically to support their weight. Their fatty footpads act as shock absorbers. Most elephants have 18 nails (5 on each foreleg and 4 on each hind leg).

vi. For elephants, trunk is the most sensitive organ. It is composed of thousands of muscles and is used for various purposes like breathing, feeding, and smelling. The trunk is a vascular organ and comprises no bone at all.

vii. Elephants have relatively poor vision in harsh light but are highly sensitive to movements. Elephants lack tear glands as they lack “naso-lacrimal duct” and there is constant water runoff from their eyes.

viii. Elephants rely more on their sense of smell.

ix. Elephants' large ears perform sharp hearing ability and can hear sounds that are not audible to humans. Any novel noise will alert them. Ears of the elephants also help them in dissipating body heat through flapping.

x. The normal body temperature of elephants is 97.6°F (36.4°C). Anything excess of 99°F (37.4°C) is considered to be fever. They have a respiration rate of 4-6 breaths/minute that varies while standing, sitting and lying. Elephants’ heart rate is typically around 25-35 beats/minute.

xi. Elephant skin is thickest on the hindquarters (up to 3.2 cm) and thinnest on the ears (a few millimeters), with normal skin being soft, pliable, and wrinkled.

xii. Elephants have a relatively simple stomach. They have a large cecum and a long, large intestine where food is processed. They have relatively low assimilation rate and consequently must eat for long hours. Elephants defecate 10-12 times a day, producing 5-10 boluses per defecation, each weighing 1-2.5 kg.

xiii. Elephants drink large amounts of water (200-250 liters/day) requiring access to clean drinking water. Healthy elephants urinate 10-15 times a day, producing 50-60 liters of urine.

xiv. There could be high inter-individual variation in the age of sexual maturity. Female elephants typically reach maturity at 10-12 years while males get sexually mature around 15-18 years of age. This may vary based on diet, social interactions, and management practice.

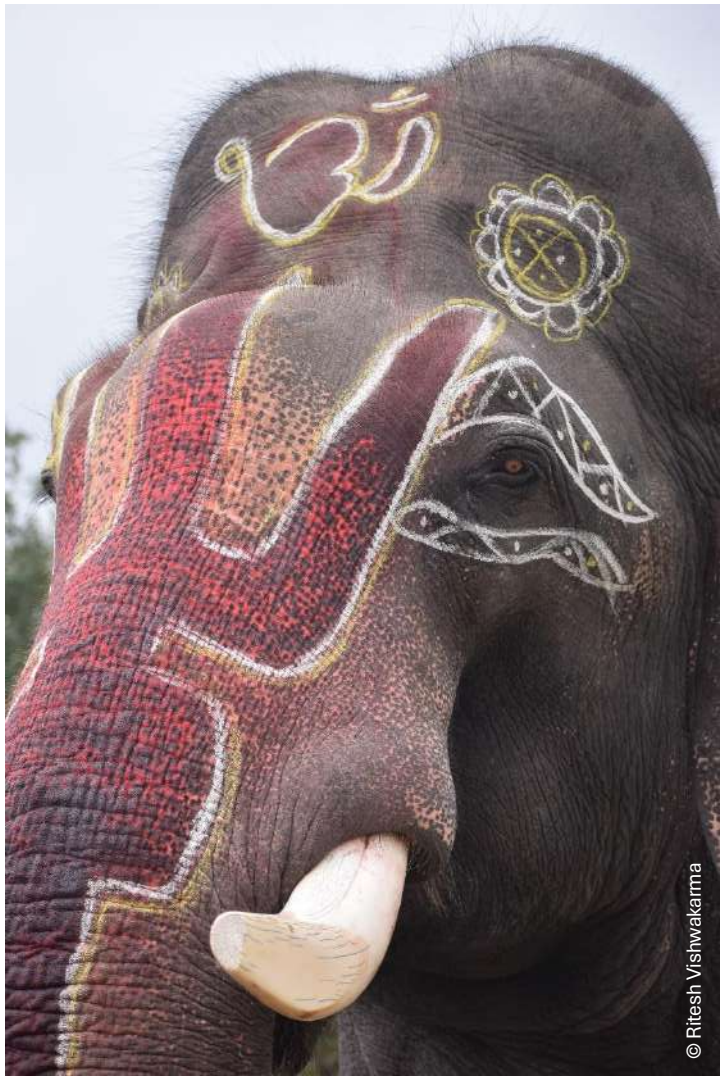
xv. Female elephants have a pair of mammary glands between their forelegs, secreting milk through small pores. They could typically suckle their offspring for at least two years and for an average 4-5 years. The gestation period is 21-22 months, with longer periods sometimes coinciding with the birth of male calves. Newborn elephant calves weigh 80-130 kg and measure 86-120 cm in height.

xvi. *Musth* is a normal physiological condition in healthy adult male elephants, characterized by temporal swelling, behavioral changes, and aggression towards mahouts. During *musth* the male hormones such as the testosterone surges in the blood.

xvii. Elephants lack pleura, and their lungs are adhered to the chest wall, making prolonged periods in the sternal / "*sambeit*" posture potentially risky.

1.3 Elephants in captivity: The Indian context

Asian elephants have been maintained under human care for a very long time. The elephants were tamed as early as 4000 years ago during the Indus valley civilization and used for performing various roles. Captive elephants were used in wars to carry men and artillery, used extensively in temples and religious institutions, used in construction industry extensively to carry heavy equipment and raw materials, forestry activities, recreational activities such as hunting and tourism.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In the present, the objective of maintaining elephants is multifaceted and varied. These include utilizing elephants for forestry operations such as patrolling and habitat management, they are also used for tourism, offering rides and interactive experiences that support local economies and raise awareness about elephant conservation. Additionally, elephants are also kept in zoos for educational purposes for the public. Elephants are also used in religious institutions for ceremonies and processions. Till a few decades, elephants have been used in circuses for entertainment, which over time was phased out due to welfare concerns. Elephants are also increasingly used to tackling human-wildlife conflicts, where trained elephants deter wild elephants from human land-use areas.

Captive elephants in India face a unique set of conservation and welfare challenges shaped by their complex history, cultural significance, and management systems. Although many elephants are maintained for forestry operations, tourism, festivals, and religious institutions, their care is often constrained by limitations in skilled manpower, appropriate housing, nutrition, and healthcare. Most captive elephants are not part of scientifically managed breeding programs, resulting in an ageing population with low

recruitment. Additionally, the lack of standardized welfare practices, inconsistent regulation across states, and varying levels of handler expertise can compromise both elephant well-being and human safety.

Signs of health

i. Prominent signs of good health in an elephant include a combination of physical and behavioural indicators, such as alertness, active engagement with the surroundings, regular ear flapping, natural movement of the trunk and tail, and relaxed body swaying rather than remaining unusually still. The elephant's posture and movement should appear normal, with a clear, steady, and smooth gait, and no sign of limping or discomfort in both forward and backward movement.

ii. The skin should appear soft, black, and naturally wrinkled, with firm hair bristles across the body, and should not look dry or flaky. The skin should be resilient and elastic, indicating adequate hydration.

iii. The mucous membranes of the mouth and tongue should be a healthy, rich pink, and the tip of the trunk should also appear pinkish, moist, and free from any discharge.

iv. The eyes should be bright and clear with honey-colored hue.

v. There should be a healthy moist secretion around the nails, which should appear smooth and bright, without any cracks or deformities.

vi. A healthy elephant typically shows a strong appetite, especially for preferred food items

vii. Normal feeding habits, regular drinking of water, and free passage of dung and urine with normal color and consistency are also essential indicators of health.

POINTERS ON THE ELEPHANT-HANDLER INTERACTIONS

2. POINTERS ON THE ELEPHANT-HANDLER INTERACTIONS

Mahouts are the backbone of elephant conservation, though their profession remains underappreciated and undervalued. The art of mahoutship requires immense skill, bravery, and devotion, making it a noble and revered profession. As the saying goes, 'The elephant is as good as its mahout,' highlighting the symbiotic bond between elephants and the handlers. Traditional management systems were based on knowledge and skill earned through verbal commands, which is also a dying practice now. Hence, this chapter is aimed at giving the younger generation of mahouts the basic husbandry and management practices required to be practiced in managing elephants in captivity.

2.1 Roles and responsibilities of elephant handlers:

The mahout is the primary caregiver and thus responsible for the animal's physical and emotional well-being in all circumstances. Their roles and responsibilities include

i. Monitor the elephant health, detecting signs of illness, injury, discomfort oestrus, pregnancy, and *musth* and report them to the higher authorities and veterinary personnel.
ii. Ensure proper nutrition by providing adequate fodder as well as supplementary cooked food.
iii. Take the elephant for work, bathing, and assist in camp activities, if appropriate.
iv. Provide training to the elephant to obey basic commands that are often short verbal verses. Training is fundamental in case of "free contact", which constitutes 90% of the captive elephant management in India. Even in "protected contact" some level of basic training is critical for elephants to favourably respond to commands.
v. Provide overall care for and maintain the elephant's equipment and accoutrements.

The role of the assistants of the mahout include the following:

i. Assist the main mahout in training and handling the elephant.
ii. Learn commands and handle the elephant.

iii. Take the elephant for grazing or collect fodder.
iv. Assist with cooking and feeding the elephant.
v. Help with bathing and caring for the elephant.
vi. Assist with maintaining camp hygiene, disposing of waste, and providing water and fuel.


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2.2 Key pointers for elephant handlers on a daily basis:

i. Assessing the temperament of the elephant before approaching even if the elephant is known to be calm and obedient.
ii. Daily body inspection for early identification of illness or injury.
iii. Understanding normal vs. abnormal signs (e.g., warm ears = good, pale mouth = bad).
iv. Learn basic first aid and how to report health concerns to veterinarians.

2.3 Building mutual trust between elephants and handlers

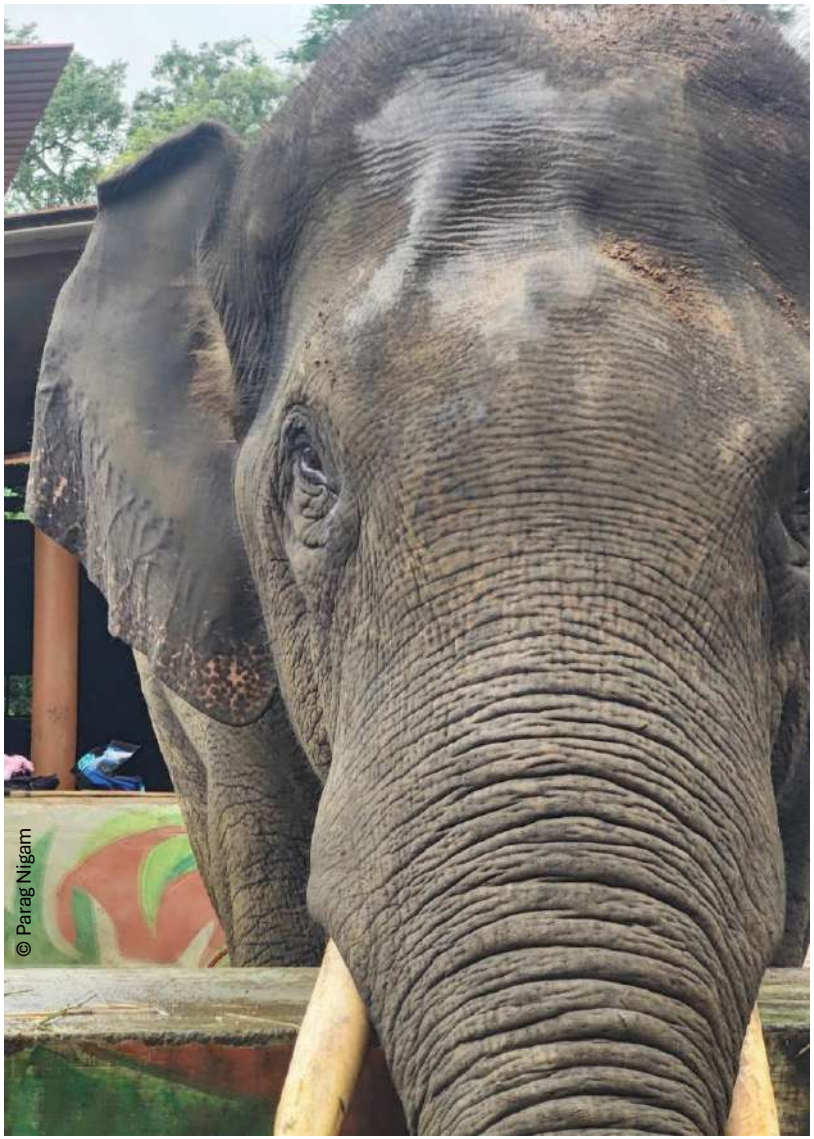
Building mutual trust between elephants and their handlers begins with the mahout's deep understanding of the elephant's individual personality, temperament, and behavioural tendencies. Mahouts and assistants spend extensive time with their elephants, often forming lifelong bonds developed through consistent routines, gentle handling, and the complete avoidance of fear-based methods. Newly assigned elephants especially those rescued or relocated require a longer familiarization period during which handlers need to focus on calm, non-threatening interactions, feeding, and grooming. Through this gradual process, elephants learn to recognize and feel secure with their

caretakers' voice, body language, scent, and overall presence. Clear and consistent communication forms the foundation of daily management activities such as bathing, feeding, medical examinations, and patrolling in forest areas. Handlers use a combination of vocal cues, body language, and touch signals that are learned and reinforced over time, with training based primarily on positive reinforcement to encourage willing cooperation. During riding, subtle foot-based commands delivered through gentle touches of the heel or toes to specific points on the elephant's body allow for effective yet quiet communication an approach that requires a calm, responsive elephant and a high degree of mutual trust.

A strong, positive bond between mahout and elephant significantly reduces stress and lowers the risk of aggressive behaviour toward handlers. Elephants managed by familiar, empathetic caretakers display calmer demeanour and greater reliability in responding to commands. By accurately interpreting changes in temperament, body language, and early signs of discomfort, handlers can intervene proactively to prevent behavioural escalation. This approach enhances the elephant's welfare while ensuring a safer, more effective working partnership.

2.4 Positive conditioning:

Positive conditioning involves reinforcing desirable behaviours in elephants through rewards such as food treats (like molasses or tamarind), verbal praise, or gentle touches, while avoiding punishment or force. This approach builds trust, cooperation, and clear understanding between elephants and their handlers. Within the structured environment of camp sheds, it provides a controlled space for consistent training and behavioural monitoring.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Mahouts and assistant who interact with the elephants daily are central to this process, as their deep understanding of each animal's temperament, habits, and preferences enables them to apply the method effectively. By using simple rewards such as fruits or other favoured items, elephants can be encouraged to respond calmly to essential commands, including lifting their legs for inspection, standing still during medical procedures, or walking without resistance.


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ESSENTIALS OF
ELEPHANT HUSBANDRY

3. ESSENTIALS OF ELEPHANT HUSBANDRY

Management of elephants in captivity has been continuously evolving, as best practices on various themes emerge from across the world. It is essential to integrate the best practices into field management so as to improve elephant welfare. Among the many important factors that could improve captive elephant welfare are aspects of housing, nutrition, and veterinary care. Essential considerations pertaining to these have been succinctly summarized.


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3.1 Housing and enclosure design

Designing and maintaining suitable enclosures need to meet elephants physical and psychological needs by considering a wide variety of factors elucidated in **Table-3.1**

Table-3.1: Essential considerations pertaining to housing and enclosure design for captive elephants

Topic	Considerations
Camp site selection	i. Camp sites should be located in areas with well-drained soil to prevent water logging, which can be harmful to elephants. ii. Camp sites should be near permanent water source. The water sources, preferably running water should be clean, free from pollution and potable. iii. Enclosures should be useful for the entire year. If the enclosure becomes too hot or lack sufficient clean water, the facility should have flexibility to move to different locations.

Topic	Considerations
	Thus, it is important to identify suitable locations during summer/ monsoon etc.
Camp infrastructure related to food preparation	i. Open-sided cooking shed should be situated on level ground, surrounded by elephant stands with timber railings that facilitates feeding and inspection. ii. Food preparation area should include stables for food preparation, a smoke-free fireplace for cooking, and utensils for forming cooked rations into cakes. iii. If many elephants are maintained in the captivity a ration chart displaying each animal's profile, prescribed food, workload, and other relevant information should be prominently displayed in the shed. iv. Food stores should preferably keep in a dry "rat-proof" shed. Rats and other rodents not only damage considerable quantity of food but may also spread diseases to both elephants and their handlers. These rodents also attract venomous snakes that can be potentially dangerous for both the handlers and young elephants. v. This shed should have a platform, scale, and separate facilities for storing gear and tack.
Residential quarters	i. Residence for the elephant handlers and their families should be located close to the elephant shelters/camps. Ideally, the elephant handlers should keep tab of their elephants all the time. ii. Waste management should be ensured in the residential complexes to prevent food and water contamination for elephants and vice versa. Also, residential complexes should be properly secured with mosquito nets.

Topic	Considerations
Veterinary care	When many elephants are housed in a camp/facility, a veterinary dispensary to attend to the day-to-day treatment of sick or injured elephants is a valuable addition.
Other miscellaneous safety considerations	i. Livestock should be excluded from the camp site areas, as much as possible as common infections affecting both are likely to spread. ii. In case a covered shed is provided for enclosure, the minimum height should be at least 4.80m meeting prescribed norms. iii. The housing should be protected from extreme temperatures and winds. iv. The floor should be dry, even, and kept clean, with elephants not made to stand on areas soiled with urine and filth. Regular disinfection of the floor is necessary, ideally once a week, and proper drainage arrangements should be made to maintain hygiene and prevent health issues.
Clearing faecal and urinary wastes	Elephants void a large quantity of both urine and faeces. The dung and urine need to be removed from time to time from the enclosure.


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3.2 Diet and nutrition

'Nutrition plays a critical role in the overall welfare of elephants. Both balanced diet and optimum nutrition are central to elephant management in captivity. Elephants are generalized feeders consuming a wide variety of plant matter. Elephants are known to consume over 100 to

400 plants in the wild fulfilling both their bulk and micronutrient need. Some essential aspects of elephant diet are as follows:

i. Elephants are bulk feeders and require 18-20 hours of daily foraging. Since elephants in captivity spend energy and time on work, bathing, and commuting, it may be essential to compensate the time and energy lost through supplementary high quality food items.
ii. The quantity of each grain is calculated based on age, size, and work requirements.
iii. It is often desirable to come up with an individual-specific diet schedule for elephants by consulting the veterinary personnel.

Feeding patterns of elephants in forest camps: insights from South India and North-East India

South

- The diet includes grains like ragi or finger millet *(Eleusine coracana)* and horse gram (*Macrotyloma uniflorum*), chosen for their high nutritive value, palatability, and local availability. Special diets are prescribed young calves and lactating mothers who receive rice in addition to the above. Jaggery and salt are also added in limited quantities to improve the overall nutritive value of the diet.
- Elephants are fed cooked rations in the morning and evening, with standard-sized moulds used for easy distribution and verification. In forest camps, elephants are allowed to graze, promoting natural behavior and socialization. However, certain animals, such as those in *musth*, newly weaned calves, and sick or incapacitated animals, are not sent for grazing. Instead, they are provided with cut fodder, which should be at least 5% of their body weight.

Rationing Practices for Forest Department Elephants across South India, Central India and the North-East

Captive elephants maintained by State Forest Departments in India are typically managed under semi-intensive systems that combine free foraging with prescribed supplementary rations supplied at camp sheds; these rations are intended to meet shortfalls in digestible energy, protein and micronutrients that cannot be obtained from restricted access to natural forage alone. National and state guidance therefore emphasises a mixed-ration approach with large quantities of green and fibrous roughage as the dietary base, together with measured concentrates (cereals, cooked grains), fruit/plant treats and mineral supplements to support maintenance energy needs, promote gut motility and reduce risk of nutritional pathology.

Regional implementation varies according to forage availability, climate, and operational role (patrol, tourism, cultural duties). In Kerala and parts of South India, official schedules specify minimum wet-weight green fodder allowances scaled to animal height/body mass (commonly 100–250 kg wet fodder/day or ≈5% body weight), with succulent feeds emphasised during hot seasons to limit dehydration and thermal stress. These administrative norms are paired with routine concentrate rations (rice, cooked grains, pulse-based mixes) and treats (sugarcane, banana, molasses, tamarind) used both for nutrition and positive conditioning. In contrast, Forest Department elephants in Central India and the North-East often have greater access to natural foraging during night releases, so supplementary rations are adapted (reduced concentrate, higher reliance on local browse and bamboo), but concentrates are still used to maintain body condition during lean seasons and for working animals.

From a nutritional science perspective, Asian elephants require diets high in fiber with moderate crude protein and energy content aligned to body mass and activity level. Empirical studies indicate captive elephants commonly consume 1.0–1.9% of body mass as dry matter daily, with dry matter intakes and crude protein often falling below recommended maintenance levels in some collections; digestible energy requirements vary with activity, while fibre and forage bulk are critical for rumen/cecum function and microbial fermentation. Failure to supply adequate low-calorie high-fibre roughage alongside concentrates predisposes elephants to obesity, poor dentition wear, gastrointestinal dysfunction and metabolic imbalance. Thus, ration design must prioritise quantity and quality of roughage, balanced concentrate dosing, and attention to Ca:P ratios and micronutrients where local forage is deficient. Operational recommendations for Forest Department camps include: (1) base rations on *ad libitum* access to diverse green fodder (reed, grasses, crop residues, banana stem, bamboo where available) scaled to body size and season; (2) limit concentrates to prescribed portions targeted to physiological state (work, pregnancy, growing calf) and avoid high-starch treats in sedentary animals to reduce obesity risk; (3) incorporate mineral licks or formulated mineral mixes where forage analyses indicate deficiencies; (4) individualise feeding (particularly concentrates) to body condition score (BCS) and monitor weight proxies and dung characteristics regularly; and (5) use feed as a tool for positive conditioning and veterinary care while ensuring total daily dry matter and fibre targets are met. These recommendations integrate state prescriptive norms with captive-nutrition literature.

Key monitoring metrics for effective rationing are simple, field-applicable: body condition scoring, assessment of dung (consistency, undigested fibre), frequency of feeding and time spent foraging, foot pad and dental condition, and records of work output and reproductive performance. Where feasible, periodic proximate analysis of commonly used roughage and concentrate mixes and veterinary surveillance for metabolic or micronutrient imbalances will strengthen evidence-based ration adjustments.

The welfare outcomes (reduced stereotypy, improved mobility, reproductive success) are tightly coupled to appropriate rationing: nutritional management must therefore be integrated with husbandry practices (exercise, enrichment, hoof care) and local ecological realities to optimise health across the diverse Forest Department contexts of South, Central and North-Eastern India.

3.3 Health and veterinary care

Ensuring the health and well-being of captive elephants is a core responsibility in elephant husbandry and management. Mahouts and assistants must work closely under supervision of veterinary professional to monitor physical condition, detect early signs of illness, provide routine care, and implement preventive health measures. Effective preventive care depends on identifying potential problems before clinical signs appear.


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Some of the signs of an ill elephant are as follows:

i. Loss of appetite or reduced food intake and overall lethargy
ii. Movement of trunk, tail, ears and legs slows down or ceased completely.
iii. Lower flap of the ear is cold to touch.

iv. Mucous membrane of mouth and tongue changes to muddy or deep red colour with or without blotches on the palate or pale.
v. Eyes dull, appears retracted, abnormal flow of water from eyes.
vi. Skin grey, hangs loosely, dry and sometimes scaly. Trunk shrivelled appearance.
vii. Frequent groaning, putting the trunk in its mouth, biting tip of the trunk indicates pain or discomfort. Excessive lying down or reluctance to move, signs of pain, aggression, or lethargy and not sleeping for days. Swelling of limbs or joints
viii. Abnormal stool or urine patterns (Urine only small quantity with unpleasant smell. Dung hard and coated with mucous or diarrhoea present.)

Recognizing illness from body points: Easy approaches in the field

Topic	Description	Notes for handlers
Foot and nail care	Learn to trim nails, clean soles, and spot infections	The most common cause of pain
External Parasite check	Identify signs of ticks, mites, and wounds	Daily oiling and brushing
Internal parasites and gastro-interstinal disorders	Elephants with significant gastrointestinal issues or nutritional deficiencies due to parasites may develop a habit of eating mud. In cases of severe worm infection or after deworming treatment, adult worms or segments of tapeworms may be observed in the dung. Foul "foetid" smell or an abnormal consistency (loose, watery, or diarrheic), blood or mucus may be noticed.	Regular and detailed inspection of dung
Mucous membrane	Observe the oral cavity and trunk tip colour	Pale = anaemia; yellow = jaundice
Body condition score (BCS)	Use visual and touch indicators to assess weight and health	Overweight and underweight should be reported to the veterinarian for further prognosis.

3.4. *Constituents of routine care*

Daily routine of an elephant in a forest camp

i. In a typical forest camps managed by State Forest Departments in India, elephants are maintained under a semi-intensive management system that provides a combination of controlled care and free-foraging opportunities. Each camp functions according to a fixed routine prescribed by the competent Forest Department authority. Typically, elephants spend the night foraging in nearby forest areas and are

brought to the camp by the mahout and assistant in the morning for special rationing and routine care. On arrival, elephants are dusted, groomed, and paraded for inspection by on-duty forest officials.

ii. Healthy elephants are then taken for their daily bath, usually lasting 1–1.5 hours. Bathing provides an opportunity for building relationship and for thorough physical examination including close inspection of the feet and other body parts. Elephants may defecate during bathing, allowing mahouts to assess dung quality as an indicator of gastrointestinal health.

iii. After bathing, elephants return to the camp to receive their ration of concentrate feed. Patrol duties—an integral part of forest protection operations—are typically carried out in the early morning and, if required, during the late afternoon. Work during the hottest hours of the day is strictly avoided. Elephants are expected to work in sessions not exceeding three hours at a stretch. During breaks, they may be hobbled and allowed to graze freely within the work area.

iv. At the end of the day, elephants are brought back to the camp where they receive their evening ration, commonly consisting of cooked grains, followed by an optional light bath depending on climatic conditions.

v. At dusk, mahouts lead the elephants back into the forest for nocturnal grazing. To prevent them from straying long distances, elephants are hobbled and fitted with a trailing chain of approximately 15–20 metres (weighing 80–100 kg). This facilitates easy retrieval of the animals the following morning in time for their daily routine and assigned duties.

3.5 Preventive health measures

Preventive care plays a key role in minimizing the occurrence of diseases and ensuring long-term health. As part of the preventive health care, the following measures can be undertaken:

i. Regular deworming schedules as prescribed by veterinarians

ii. Periodic vaccination against diseases like Haemorrhagic Septicaemia, Foot & Mouth and others that are of potential concern for elephants

iii. Regular foot care and use of antiseptic washes to avoid infections

iv. Seasonal care such as protection from heat stress during summer, preventing water logging during monsoon, and preventing excessive exposure to frost and cold particularly in the northern and central Indian regions.

v. Periodic vector control activities around camp sheds to prevent parasite infestations.

vi. Veterinary teams should conduct scheduled health check-up camps at each elephant camp for updating the medical records and administering required preventive treatments.

vii. Annual or bi-annual measurement of body weight, height and other morphological measurements.

3.5. Coordination with Veterinarians

Effective and structured coordination between elephant handlers and veterinary officers is essential for ensuring comprehensive health care in captivity. This collaboration includes regular health examinations by qualified veterinarians, prompt response to illness or injury, and ongoing training programs that equip mahouts and assistants with skills in basic first aid, early recognition of illness, and supportive care. Veterinary officers also work closely with forest authorities to plan appropriate nutrition strategies, provide geriatric care for ageing elephants, and address stress-related behaviours, thereby strengthening overall welfare and management outcomes.

3.6 Identification of common ailments and diseases

Although hardy animals in the wild with relatively minimal diseases and infections, in the captivity elephants are prone to various diseases caused by Bacteria, Virus, Fungi, Parasites and others. Elephants will suffer from certain metabolic and non-specific diseases also. A fundamental knowledge of common diseases, symptoms, and basic first aid medicines would be essential for elephant handlers to initiate proper treatment. Information on some of the important diseases and disorders is provided below:

Diseases	*Common ailments*
Anthrax	Anthrax is a highly fatal bacterial disease caused by long-lasting spores in the environment, and affected elephants may show signs such as high fever, reddening of the eyes and mouth, difficulty breathing, weakness, sudden collapse, reduced appetite, bloody diarrhoea, swelling under the skin, and bleeding from body openings. If anthrax is suspected, the elephant must be isolated and immediate veterinary attention sought, while providing supportive care such as soft, nutritious food and keeping the animal in a clean, shaded, and quiet area. In the event of death, the carcass should never be opened; instead, it must be burned completely along with the tusks using proper protective gear to prevent disease spread.
Clostridial infection	Clostridial infections are a serious threat to captive elephants, often arising from contaminated food or water, environmental exposure, or untreated wounds. These bacteria can cause life-threatening conditions such as gas gangrene, tetanus, and enterotoxaemia, making early recognition and treatment essential. Handlers should watch for signs like lethargy, loss of appetite, or swelling around wounds, and maintain strict hygiene practices, ensure clean food and water, and seek prompt veterinary care for any injury or illness to prevent infection and safeguard elephant health.
Salmonellosis	Salmonellosis is a major health concern for captive elephants, with symptoms ranging from mild depression and diarrhoea to severe septicaemia and even death. The infection can spread through contaminated food or water, contact with infected animals, or poor hygiene practices among handlers. Key signs include loss of appetite, abdominal discomfort, and persistent

Diseases	*Common ailments*
	diarrhoea, all of which require immediate veterinary attention. Preventive measures such as strict hygiene, clean feeding and watering practices, and timely treatment of any illness are essential, while regular faecal testing helps detect Salmonella early and reduces the risk of transmission within the camp.
Haemorrhagic septicaemia	Haemorrhagic septicaemia is a highly contagious and often fatal bacterial disease that can spread quickly among elephants, typically originating from contact with cattle or buffalo, and is more likely to occur during periods of stress, poor nutrition, or sudden weather or diet changes. Affected elephants may develop high fever, bright redness of the eyes and mouth, swelling, listlessness, loss of appetite, and difficulty breathing. Suspected cases require immediate veterinary attention and strict isolation, with the elephant kept in a clean, quiet, shaded area, given separate water, and offered soft, nutritious foods such as bananas, sugarcane, and fresh grass. Preventive measures include strong hygiene and biosecurity practices and regular vaccination, while carcasses of animals that die from the disease must be safely buried or burned to prevent further spread.
Tetanus	Tetanus is a serious bacterial disease caused by long-surviving bacteria in soil and moist areas, typically entering the body through deep wounds, especially in the feet. After an incubation period of about 15–20 days, the bacteria produce toxins that affect the nervous system, leading to high fever, red eyes and mouth, muscle stiffness, listlessness, and spasms that worsen when the elephant is startled. If tetanus is suspected, the elephant should be isolated and a veterinarian consulted immediately, with supportive care that includes keeping the animal in a clean, shaded shelter, cleaning and disinfecting wounds, and hand-feeding soft, nutritious foods such as ripe bananas and sticky rice. Daily wound care and timely tetanus toxoid vaccination—especially after fresh injuries—are essential preventive measures.
Tuberculosis	Tuberculosis is a chronic bacterial disease that affects the respiratory system and can spread between elephants, humans, and other animals through respiratory droplets, contaminated food or water, and bodily secretions. Clinical signs develop slowly and may include weight loss, weakness, poor appetite, coughing, and breathing difficulties. If TB is suspected, the elephant should be separated from others and a veterinarian consulted immediately, who will perform a trunk wash to confirm the diagnosis. Supportive care—such as rest in a clean enclosure, nutritious food, and clean water—is essential. It is also important for mahouts and caregivers to undergo annual health checks, and any infected person must avoid contact with elephants until fully treated.
Elephant Endotheliotropic Virus (EHV)	This highly contagious and often fatal disease affects young Asian elephants—usually under 10 years of age—while African elephants may act as carriers. Affected animals may show bluish discoloration of the mucous membranes, small haemorrhages on the tongue, swelling, dullness, and sometimes convulsions before death, with symptoms more likely in elephants that are weak or in poor condition. Mahouts should be trained to check the mouth regularly and recognise early

Diseases	*Common ailments*
	signs, reporting them to veterinarians immediately. Famciclovir should be kept in stock and given only under veterinary supervision, and any infected elephant must be isolated to prevent further spread.
Foot and mouth disease (FMD)	Foot-and-mouth disease (FMD) is a highly contagious viral infection in elephants, spread through direct contact with infected sores and bodily secretions, contaminated food or water, or even airborne transmission. Affected elephants may show fever, listlessness, mouth and foot blisters, excessive salivation, and limping. If FMD is suspected, the elephant should be isolated immediately and given soft, nutritious food, and mahouts who handled the animal must avoid contact with others until they bathe and change clothing. Veterinary consultation is essential for treatment and for assessing whether uninfected elephants require vaccination. Regular vaccination of nearby livestock also helps prevent outbreaks, and coordination with the district Livestock Department veterinarian is advised, especially when working near border areas.
Elephant pox	Elephant pox is a serious infectious viral disease that affects Asian elephants more severely than African elephants, with wild rodents believed to be the main reservoir. It spreads through direct contact with infected sores or mucous, and humans can also become infected. Common signs include high fever, lameness, eye infections, skin pustules, and discharge from the temporal gland. If the disease is suspected, the elephant should be isolated immediately, provided with nutritious food, and mahouts must bathe and change clothes before handling other elephants. Prompt veterinary attention is essential to manage the infection and prevent dangerous complications such as nail and sole undermining, which can be fatal.
Rabies	Rabies is a fatal viral disease in elephants, usually transmitted through dog bites, and often leads to paralysis and death once symptoms appear. Affected elephants may show listlessness, aggression, loss of appetite, unsteady walking, paralysis, and excessive salivation. Because treatment is ineffective after symptoms develop, prevention is essential and includes controlling stray dogs, vaccinating local dogs and cats annually, and vaccinating elephants, with post-bite vaccination given immediately after any dog bite. Prompt wound care—washing the bite thoroughly with soap and water and applying iodine or 1% povidone-iodine—is critical to reduce the risk of infection.
Papillomavirus	Papillomavirus can affect captive elephants, leading to benign wart-like growths on the skin or mucous membranes that may cause discomfort and sometimes lead to secondary infections. Handlers should watch for small, cauliflower-like growths and report them promptly, as early detection allows for better management. Although papilloma are usually not life-threatening, regular veterinary check-ups and monitoring are important to prevent complications and maintain the elephant's overall health and well-being.
Internal parasites	Common internal parasites in elephants include roundworms, liver flukes, amphistomes, and larvae, which can cause poor appetite, weight loss, mud eating, pale mucous membranes, changes in stool colour and consistency, flatulence, and fluid swelling under the jaw, neck, or belly. Regular deworming every three months—after a veterinarian examines the dung—is

Diseases	Common ailments
	essential, though dosing can be difficult because elephants often detect and spit out medicines. Since force-feeding is possible only in very young calves, deworming drugs must be mixed with preferred foods such as molasses or ripe bananas and given in divided doses. Harmful substances like tobacco or red chilli should never be used. External parasites such as *Cobboldia elephantis* flies may lay eggs around the tusks, tushes, or mouth, causing gastric myiasis, so daily cleaning of tusks is important to prevent infestation. Filarial worms can also cause bleeding nodules that may progress to ulcers or abscesses; these require veterinary treatment, along with fly-repellent creams or sprays to protect affected areas.
External parasites	External parasites such as lice, ticks, and fleas commonly affect areas like the neck, belly, ears, and tail switch of elephants, causing irritation, scratching, bleeding wounds, and loss of tail bristles. Ectoparasiticide sprays can help control these parasites but must be used carefully, as they are harmful if swallowed or if they contact the eyes. Regular bathing with neem leaves and thorough scrubbing also helps reduce and prevent infestations.
Blood protozoans	Trypanosomiasis is a blood parasite disease transmitted by biting flies, commonly affecting elephants that are heavily worked, especially during the rainy season. Signs can be subtle at first and may include gradual weight loss, pale mucous membranes, abdominal discomfort, dullness, and coarse hair, with infected elephants often becoming progressively weaker and sometimes dying within 2–4 months. If the disease is suspected, the elephant should be separated, kept in a clean and quiet environment, and a veterinarian consulted for proper diagnosis and treatment. Prevention focuses on protecting elephants from biting flies through regular insecticidal spraying and maintaining clean living conditions.
Arthritis	Arthritis in elephants can result from injuries, overwork, or poor management, and is characterized by pain during movement, dragging of the legs, swollen joints, and difficulty bearing weight—sometimes causing the elephant to use its trunk for support. Management begins with cold compresses to reduce swelling, followed by warm compresses or fomentation if the condition persists. External treatments such as iodine ointment, ichthammol glycerine, or infrared therapy may also provide relief. Rest is essential, and prompt veterinary consultation is necessary to prevent worsening of the condition and ensure proper care.
Corneal opacity	Corneal opacity in elephants can result from Vitamin A deficiency or eye injuries, often linked to improper ankush use, and may present as eye discharge, whitish patches or ulcers on the cornea, and vision problems. Management includes keeping the elephant in a shaded area, washing the affected eye with a cleaning solution or boric acid, and applying antibiotic eye drops or ointment as advised. If medical supplies are not available, traditional remedies such as gently blowing smoke from a heated castor oil plant stem or a mixture of charred snail shell and thatch grass into the eye may offer temporary relief. Persistent cases require prompt veterinary attention for proper treatment.

Diseases	*Common ailments*
Major Foot diseases	Long hours of standing on hard substrates, improper enclosure surface, and contamination resulting from standing in their own dung, excessive moisture, and lack of exercise, and poor/inadequate nutrition are the main causes of elephant foot problem in captivity. Foot rot (podo-dermatitis) is a common problem in captive elephants, usually caused by poor hygiene and prolonged chaining, and is characterised by black patches, dead skin, ulcers, and excessive granulation tissue that bleeds easily, leading to pain and lameness. Treatment includes cleaning the footpad with potassium permanganate, providing antiseptic footbaths with formalin or gentian violet, and applying dressings such as triple sulphate in neem oil or Wakazol lotion, with 4–5% formalin footbaths after saline cleaning offering additional benefit. Preventive care includes maintaining good hygiene, regular foot cleaning, and proper enclosure conditions is essential. Elephants may also develop cracked soles and heels from standing in moist, unsanitary areas or from abnormal behaviours like pacing, which can lead to deep, difficult-to-treat infections, while overgrown nails and cuticles increase the risk of split nails. Routine trimming of overgrown tissues and maintaining clean, dry environments are key to preventing these painful foot problems and ensuring good mobility and overall well-being.
Nutritional disorders	Captive elephants are prone to nutritional disorders when their diets are poorly balanced, leading to deficiencies or excesses of essential nutrients. Improper calcium-to-phosphorus ratios, too much energy-rich food, and insufficient dietary fibre can result in problems such as metabolic bone disease, obesity, and digestive disturbances.
Gastro-intestinal disorder	Gastrointestinal disorders are a common health issue in captive elephants and can result from sudden dietary changes, stress, or bacterial infections. Signs include diarrhoea, constipation, abdominal pain, and reduced appetite. Handlers should monitor these symptoms closely and prevent problems by providing a balanced diet, clean drinking water, and a low-stress environment. Regular veterinary checks and routine monitoring of faecal quality help detect issues early, allowing timely treatment and reducing complications. Proper diet and good management are essential for maintaining healthy digestion in captive elephants.
Impaction of colon	Impaction colic is common in captive elephants and often results from feeding overly fibrous diets, especially when elephants are fed immediately after long walks in hot, humid conditions. The large intestine can become packed with a heavy mass of fibrous material—sometimes up to 100 kg—leading to signs such as repeated lying down and getting up, absence of faeces,

Diseases	Common ailments
	and abdominal bloating, with death possible if the colon ruptures. Mahouts should prevent the elephant from rolling and must never apply pressure to the abdomen by climbing or pressing on it, as this can worsen the condition.
Abscesses	Abscesses in elephants can form beneath their thick skin due to trauma, parasitic infections, or unsterile injections, and may spread if not treated properly. Hot compresses can help bring the abscess to a head, but it must be incised and drained aseptically, followed by regular cleaning with lukewarm saline and proper wound dressing. Topical antiseptics such as povidone-iodine should be applied under veterinary supervision to ensure safe and effective healing.
Metritis	Metritis, or inflammation of the uterus, can occur in captive elephants due to reproductive problems or infections. Handlers should watch for signs such as vaginal discharge, lethargy, and reduced appetite, and seek prompt veterinary attention to prevent serious complications.
Decay of tusk (Dental) pulp	Decay of the tusk pulp is a major dental problem in captive elephants, typically resulting from trauma, infection, or excessive wear. Handlers should watch for signs such as discoloration of the tusk, swelling, or signs of pain. Regular veterinary dental examinations are essential for early detection and treatment, helping prevent more serious complications.
Sunburn and heat stroke	Captive elephants are prone to sunburn, especially on sensitive areas like the ears and back, so handlers should provide adequate shade, use protective measures such as sunscreen or cloth coverings, and avoid exposing elephants to direct sunlight during peak hours. Signs of sunburn include redness and blistering, and severe cases can progress to sunstroke or heatstroke, which may be fatal without immediate care. If overheating is suspected, the elephant should be moved to a shaded area and gently hosed with cold water until veterinary assistance is available.
Frost bite	In cold weather, captive elephants—especially older ones—can develop frostbite wounds along the edges of their ears. Cleaning the area with lukewarm water and gently applying an antibiotic powder mixed with warm coconut oil or liquid paraffin can help soothe and heal the affected skin.

3.4 Hygiene sanitation and waste disposal

Effective cleaning and disinfection are crucial for maintaining elephant shelter hygiene. Elephants produce 60-100 kg of dung and 50 litres of urine daily, making regular cleaning essential to prevent exposure to their own waste. The cleaning process involves removing visible debris by wiping, brushing, and sweeping, followed by washing with high-pressure water or soap/detergent and water. Mechanical scrubbing helps loosen dirt and debris, especially in areas with cracks or irregularities. Heavy equipment like skid steers or manure scrapers may be needed to handle large quantities of material. Cleaning is a critical step that removes over 90% of bacteria, ensuring effective disinfection. After cleaning,

areas should be thoroughly rinsed and allowed to dry completely before disinfection. This process may be time-consuming, but it's essential for maintaining hygiene and preventing disease transmission.

Proper disposal of debris in an elephant camp is essential to maintain hygiene and prevent the spread of disease. Large volumes of dung, urine-soaked bedding, leftover fodder, and other organic waste must be collected regularly and handled as potentially contaminated material. Debris should be removed using appropriate tools or machinery and transported to a designated disposal site. Safe disposal methods—such as controlled composting, deep burial, or closed burning should be followed in accordance with local regulations. Effective waste management not only protects elephant health by reducing exposure to harmful pathogens but also ensures a cleaner, safer environment for caretakers and visitors.


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3.5 Husbandry practices

3.5.1 Recommended practices

i. It is important to establish mutual trust and respect between mahouts/assistants and elephants as it helps creating a safe and healthy environment for both humans and elephants. Positive interactions through reinforcing desirable behaviour through food rewards and verbal praise rather than punishment or force results in developing such associations.

ii. Provide fresh, clean, and balanced diets as per the nutritional requirements of each elephant, including green fodder,

concentrates, and supplements. Ensure daily cleaning of the elephant shed, timely removal of dung and urine, and regular bathing of elephants to maintain hygiene and cleanliness.

iii. Monitor physical condition, signs of illness, and arrange for periodic veterinary check-ups, deworming, and vaccinations. Provide elephants with sufficient time for rest and ensure regular walks or free movement in open areas to promote physical health. Any sign of illness, injury, or behavioural change must be reported promptly to the concerned forest officer or veterinary team. Ensure access to fresh, clean water at all times.

3.5.2. Practices to be avoided:

i. Avoid beating, shouting, or using painful tools to control elephants as such actions lead to stress, fear, and aggressive behaviour.
ii. Failing to clean and inspect the feet regularly can lead to infections, cracks, or foot rot hence regular foot care practices should be followed.
iii. Avoid overburdening elephants with long hours of walking, patrolling, or carrying loads, especially during extreme weather.
iv. Avoid provisioning of spoiled food as can cause digestive issues and infections. Ensure food is clean, fresh, and stored properly.
v. Avoid long hours of chaining or tethering as it can lead to joint problems and behavioural issues. Periodic free movement is necessary.
vi. Avoid delays in reporting or treating health issues as it can result in situation aggravating even leading to serious medical complications.
vii. Prevent public teasing or feeding, as it can disturb the elephant's behaviour and lead to conflict.
viii. Avoid isolation of the animals ae it causes stress and behavioural disorders. Elephants are social animals and need interaction.

CAPTIVE ELEPHANT HEALTH CARE AND OTHER MANAGEMENT ESSENTIALS IN CAPTIVITY

4. CAPTIVE ELEPHANT HEALTH CARE AND OTHER MANAGEMENT ESSENTIALS IN CAPTIVITY

This chapter focuses on the essentials of basic health care for captive elephants, covering key areas such as routine assessment of specific body parts, monitoring physiological changes and providing timely attention, reproductive and lactation care, neonatal care, and the management of young elephants. It also outlines the fundamentals of training and describes the equipment commonly used for safe and effective elephant handling.

4.1 Skin, tusk and foot care:

Routine and preventive care of the skin, tusks, and feet are a critical aspect of elephant husbandry. These three physical components are not only vital to the elephant's health and mobility but also serve as indicators of the animal's overall well-being.

4.1.1 Skin care

Elephants have sensitive skin that is prone to dryness during winters, fungal infections, and parasitic infestations if not properly cared.

i. Daily bath is a good option to keep animal clean. While bathing, the mahout should scrub the entire body to remove dirt and ecto-parasites on the skin folds, facilitating better blood flow to each parts. During this time, they should also detect and clean small cuts and remove thorns.

ii. Coconut husk, pumice stone or dried grass can used for scrubbing. Scrubbing different body parts should be guided by thickness of the skin. The skin over the forehead, face, ears, back, legs, tail and toe require careful but firm scrubbing whereas gentle rubbing should be done over inner thighs, belly, neck.

iii. The scrubbing time is the perfect opportunity to check the soles of the feet for thorns, embedded sharp stones and cracks that may lead to an infection. Minor wounds, if any, should be cleaned with a solution of potassium permanganate, then diluted iodine, followed by an application of antiseptic ointment.

iv. The elephant should be made to stand, allowing for thorough scrubbing of its legs, tail, and trunk. Verbal commands can be used to encourage the animal to stretch and position its legs, trunk, and tail for effective cleaning.

v. A proper bath should last no less than one hour and both the mahout and assistant should participate. It is better to avoid any soap or detergent.

vi. Adequate facilities for bathing should be arranged for all temple, circus, zoo and private elephants.

vii. Neem oil (or equivalent) should be applied on the base of the tusks and lightly spread on the belly to repel flies and other insects.

4.1.2. Tusk care:

i. The base of the tusks is embedded deeply in the elephant's skull, set in sockets under the eyes. Tusks are very strong and in a mature male elephant grow on average about 15-17 centimetres per year.

ii. In specific cases where tusk trimming is essential, the task should be undertaken under the supervision of a veterinarian. A hollow inside the tusk [pulp cavity] contains blood vessels and a nerve. Therefore, trimming an elephant's tusks it is critical to know how much is to be cut off in order to avoid any cut to the blood vessels and the nerves. Opening the pulp cavity can cause severe pain to the elephant and it is prone to infection.

iii. Eggs of *Cobboldia* fly *may* be examined over the base of the tusks/tushes and removed manually


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4.1.3. Foot care:

In general, the Asian elephant has 18 toenails, with 5 in each foreleg and 4 in each hindleg. The nails are shaped as elongated semicircles and emerge from the skin spaced apart. The bottom of the elephant foot has a thick footpad (1 –2 centimetres).

Following are essential when animals are maintained in captivity.

i. Elephant feet require daily inspection and regular care to prevent overgrown soles; foreign body penetration; overgrown, cracked, or ingrown nails; overgrown cuticles; abscesses; and foot rot.
ii. The sole should be rough and with a texture known as buttons. A completely soft sole indicates that the elephant is kept on hard ground such as stone or concrete, which should be changed.
iii. Long nails show that the elephant is not given the opportunity to walk sufficiently. Avoid having the elephant walk and work on rough surfaces, areas with sharp rocks and steep hills. Avoid very dry and hot areas as it makes it easy for nails to peel, split, or fall off.
iv. In night shelter, flooring can be earthen or cemented. For earthen flooring, it is necessary to keep it dry by spreading sand. Concrete floors may be used for treatment sheds especially in chronic wounds, foot rot/ pododermatitis conditions where elephants cannot soil the wounds after dressing. A foot bath at the entry of the shed will help in application of medication regularly and keeping in contact with the legs without chances of soiling
v. Floor should not be slippery, hard, uneven or abrasive surface can cause abnormal wear and tear on the nails and soles, leading to discomfort and potential injury. Uneven surface with deep cracks, pits, pores, or other surface irregularities can be a place for accumulation of organic materials, dung, urine debris and dirt.
vi. Elephant foot soles can become dry and cracked, especially in arid climate or if elephant spends lot of time on hard surfaces.

Well-maintained toenail and sole of forest camp elephant. (© Rajeshkumar, K)

vii. After through bathing, application of medicated oil over the foot and nails helps to prevent splits and cracks, strengthening cuticles, prevent excess cuticular growth, act as a fly repellent, act as an antiseptics to prevent foot rot and abscess.

Ideal Foot Characteristics

Ideal elephant feet in captive conditions should exhibit key characteristics, including well-shaped, flat, and evenly formed footpads without overgrowth or cracking, smooth toenail surfaces that are trimmed and free from cracking or splitting, healthy skin with no cracks, fissures, or lesions, good foot conformation with well-aligned and symmetrical feet, adequate cushioning and elasticity in the footpads for shock absorption, and no signs of pain or discomfort while walking or standing. Additionally, the elephant's weight should be evenly distributed across all four feet without favouring any one foot, and the feet should be free from signs of infection or inflammation, such as swelling, redness, or discharge, ensuring the elephant's overall comfort and mobility.

4.2. *Musth* and its management:

Musth is physiological phenomena occurring in male elephants. *Musth* occurs more regularly in well-nourished elephants between the age group of 20 to 60 years (and even beyond if elephant survives in good condition). Adolescent *musth* was observed in elephants of age group 15 to 20 years, which typically lasts for just a few days. The average duration of *musth* in adult elephants could range from 1 - 4 months (and even more) based on the animal's body condition and dominance status. *Musth* (in dominant animals) occurs mostly in cold season however elephants can come into *musth* all through the year. Elephants become aggressive and difficult to manage if not handled appropriately. Each bull could exhibit different behaviour in *musth*, therefore, understanding individual temperaments is critical for effective management of bulls during *musth*. This period can be classified into 3 phases. *Premusth, midmusth* or *violent musth* and post *musth*.

4.2.1. Pre-*musth* stage:

- Enlargement of temporal glands. Discharge observed at the temporal gland openings. Initial discharge is a muddy brown viscous fluid with a strong smell (though highly variable). In young bulls, the secretion sometimes blocks the slit opening of temporal gland. In this case, the *musth* fluid accumulates resulting in swelling and discomfort to elephant. Elephants use objects like twigs to scratch the temporal gland area and also press against trees to release the fluid held in the glands leading to inflammation and abscess.

- Perineal region below the tail gets enlarged. Penis will emerge its full length, strikes against the stomach resulting in ejaculation of seminal fluid.
- Elephant exhibits a tendency to gore any moving or non-moving object that catches its attention. This is also a time when elephant could be aggressive even towards handlers.

4.2.2 Mid musth:

- During the initial phase of mid or violent *musth*, the elephant exhibits distinct behavioural and physiological changes. The secretion from the temporal gland is slow and viscous in nature. The elephant becomes disobedient, reacting violently to the mahout's voice, and displays a stretched, taut, and stiff body posture. The trunk is extended forward, ears are spread out, and the elephant may appear restless.
- In the middle phase of mid or violent *musth*, the elephant's appetite decreases, and the temporal fluid flows faster. Some elephants may exhibit redness around the temporal regions. Aggressive behaviour continues, with the trunk being beaten on the ground as a sign of discontent and anger. The elephant may also pull violently on chains and tethers.
- The final phase of mid or violent *musth* can last for about a month. During this phase, the gland reduces in size, and the flow of *musth* fluid subsides. The elephant's urination returns to normal, and it becomes less aggressive and violent, starting to obey commands again.

4.2.3 Post musth (withdrawal phase):

After *musth*, for the first few weeks, the gland regresses, and the flow of fluid stops completely. Urination returns to normal, and the elephant's behaviour reverts to its


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usual state. However, mahouts must continue to exercise caution while handling the elephant, ensuring it wears restraining chains while being moved around, especially immediately after *musth*.

4.2.4. Precautions during musth management:

i. Leave the elephant undisturbed, minimizing external noise from traffic or people that may agitate it.
ii. If tethering is needed, then it must be on a strong/sturdy tree as the elephant will exhibit the tendency to break free. However, it is important to regularly move the chains up and down the leg to prevent chain sores from prolonged chaining.
iii. Provide a water tank with a constant water supply within reach of the elephant's trunk, but at a safe distance to prevent damage. Shower the elephant with water at least 2-3 times a day to keep it cool. For some bulls, *musth* can be an uncomfortable and exhausting experience for elephants. Thus, spraying water over them during this period helps to cool them down and facilitates the flow of *musth* fluid, potentially reducing the duration and severity of *musth*.
iv. The mahout should present in the vicinity throughout the *musth* period.
v. Offer green fodder from a distance.
vi. It's advisable to avoid working the elephant during the *musth* time. Post *musth*, appropriate food is required to assist the elephants in recovering.

4.3. Pregnancy and lactation

Cows managed in semi captive condition in forest camps invariably mate with wild bulls and rarely with captivity ones. Mating can be identified by the presence of scars or marks from the bull's feet on the cow's back, as well as remnants of seminal fluid along the inner thighs and around the vulva. In elephants, mating usually continues over several days, and females in estrus may temporarily leave the camp to join wild bulls, returning later, sometimes even with a calf at foot. When a cow and bull are observed staying close together for extended periods, repeated mating can be assumed. The gestation period ranges from 18 to 22 months.

4.3.1. *Care during pregnancy*

From the first month after mating, pregnant cow elephants begin to show gradual physical and behavioural changes. First-time mothers may exhibit enlargement of the breasts, and as pregnancy advances, their gait becomes slower, reducing their work efficiency. During the later stages, a viscous fluid may be released from the breasts when squeezed, and the mammary glands start tilting outward. From the 13th month onward, foetal movements can be felt, and once detected, the cow must be taken off all work and provided complete rest. At this stage, a special diet prescribed

by the Forest Veterinary Officer should be introduced. Most of the calvings occur at night, and when possible, the presence of a calm, non-lactating female can help reassure the pregnant cow during parturition.

After the 13th month of gestation, the cow should not be used for any major physical work, as stress can trigger premature calving. Preterm calves have a lower chance of survival and require intensive care. Therefore, preparations for calving must begin early ideally from the 13th month ensuring that the camp environment is safe, comfortable, and familiar, especially for first-time mothers or cows with previous calving difficulties. Experienced mahouts and grass cutters should always remain available in the camp around the expected date. The surroundings must be quiet, free from unfamiliar smells, adult males, dogs, and anything that might cause fear or panic during labour. Facilities should be stocked with dry thatch, grass, blankets, and firewood when calving is expected in winter, as newborns require warmth like that provided by a wild elephant family.

Throughout the pregnancy, the cow should receive adequate exercise and bathing, even up to the day of calving, and sufficient lighting must be arranged in advance since most births occur between late night and early morning. Herbal preparations such as turmeric, special post-calving foods, 5% iodine solution, fly repellents, and lukewarm drinking water should be kept ready at least three to four weeks before the expected delivery. Keeping two adult females with the pregnant cow during the last three months can provide companionship and emotional support. Mahouts should closely observe swelling of the perineal area, increased movement, and behavioural changes as indicators of imminent calving. Ropes and spades must be on hand, as inexperienced mothers may sometimes kick the newborn; in such cases, the timely intervention of mahouts and grass cutters is crucial to ensure the safety of both mother and calf.

4.3.2. Care after calving

Calving in elephants typically progresses slowly, with labour and delivery lasting 8–12 hours, during which the camp team must remain calm and patient. Once the calf drops, the amniotic sac usually bursts, and experienced mothers will clean the newborn, stimulate it to stand, and naturally sever the umbilical cord. In rare cases, assistance from mahouts or grass cutters may be required, and such help should be gentle and minimal to avoid distressing the mother, who is already highly stressed during this period. After delivery, the placenta is normally expelled within 12–24 hours; the mother should then be cleaned with lukewarm water, particularly around the hindquarters. The expelled placenta must be buried deep with disinfectants to prevent flies and scavengers, and the camp area should be cleaned frequently during and for at least a week after calving.

Newborn calves usually locate the udder within 30 minutes, though sometimes assistance is needed to help the calf access the teat or to calm an inexperienced mother. In cases where the calf is short, the mother may need to be positioned so the calf can reach the udder safely. Patience is essential, and all interventions must be quiet and reassuring so as not to alarm the mother or calf. Once calving is complete, the pair should be brought to the camp and closely observed to ensure the calf is active, suckling well, and accepted by the mother. Fly repellent oil should be applied around the umbilical cord, and veterinary support must be readily available. The nursing mother should receive a special diet rich in vitamins, minerals, soaked green gram, and coconut or its equivalents; coconut milk is especially valuable for enhancing milk quality. In the wild, pregnant and lactating elephants browse tree bark during the dry season as a natural source of calcium, and such nutritional considerations should be incorporated into captive diets where possible. The veterinarian is responsible for recording the birth height and weight of the calf and monitoring growth monthly through body measurements. They must also confirm complete placental expulsion, assess milk adequacy, and observe feeding frequency. The mother should be given complete rest until the calf reaches one year of age; limited light work may be permitted only after weaning. Calves sleep frequently between feeds, so dry thatch or grass bedding should be provided around the mother and calf to ensure comfort and warmth. Together, these measures help ensure a safe, stress-free environment for both mother and newborn during the critical post-calving period.


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4.4 Management of calves

Caring for orphaned or rescued elephant calves is a demanding task that requires patience, experience, and constant attention. The first step is accurate ageing of the calf, as those below two years need an appropriate milk formula along with small


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amounts of concentrated feed. Because separation from the mother and herd is highly distressing, companionship is critical, especially for calves under three months; ideally, another calm camp elephant should be provided. Aggression of other females towards the calf is natural, hence the foster mother may be carefully selected based on experience. Strict hygiene is vital—feeding bottles must be cleaned with warm water and mild detergent before and after every use, hands washed thoroughly, sheds cleaned daily with disinfectants, and leftover milk or bulk preparation must be strictly avoided. Elephant milk has a specific nutrient composition, and diluted cow or buffalo milk is not suitable; instead, formulas (Spray-dried infant formula with low lactose content) can used for hand-rearing calves. Initially, a weak mixture with lukewarm water and added glucose and coconut milk (capric acid and caprylic acid) can be offered until digestion stabilises, after which concentration is gradually increased and cooked brown rice can be introduced. Milk must always be served at body temperature (about 38°C) and should never be poured directly into the mouth to avoid aspiration pneumonia; instead, a conical bottle with a long soft-rubber nipple should be used. The calf will take time to learn how to suckle. During this phase, only ORS (Oral Rehydration Solution) may be given till the calf learns to suckle completely. It may take few hours to few days depending on the age of the calf and its condition on arrival.

Young calves cry for feed frequently, which is a good sign, and should be fed on demand—then every 3–4 hours as they grow. Regular veterinary check-ups are essential to monitor health, stool quality, and nutritional adequacy, and to administer deworming as needed.

Housing and environmental care plays a major role in the calf's survival and development. Calves must not be kept tied continuously, as this can trigger behavioural problems later in life; instead, a well-ventilated bamboo-and-thatch shed (around 5 × 5 m) with a natural slope and clean flooring should be prepared in advance. The walls should be high and secure enough to prevent climbing, and the shed must allow early morning sunlight while keeping the calf safe from rain, wind, and predators.

Normal behaviours such as consuming small amounts of adult dung at 2–3 months should not be discouraged, as this helps establish gut microflora necessary for digesting greens, but only if adult elephants are properly dewormed. Mud eating may indicate worm infestation, requiring treatment under veterinary supervision. As the calf begins to take greens, tender succulent grass should be provided freely. Daily walks and opportunities to play with natural objects like logs and twigs are essential for physical and psychological stimulation, and regular mud baths help control parasites and maintain skin health. Calves must be protected from direct sun and cold; blankets may be used in winter with care to keep them clean. Handlers should avoid putting fingers into the calf's mouth or over-pampering it and must discourage visitors from giving sweets or pushing its head, as such habits can lead to unsafe behaviours later. Additionally, the calf's resting place must always be clean and dry, free from foreign objects like plastic or rubber, with gunny bags for bedding and additional warmth provided during winter often by housing the calf in the cooking shed at night.

4.4.1 Weaning and training of calves

The calves are weaned usually at the age of 18 to 20 months. However, this depends on the status of individuals and their ability to process external food. During weaning, the diet changes as per local veterinarians' choice and advice and should be supplemented with other vitamins and minerals.

4.4.2. Enrichment and socializing of calves:

Captive born calves are known to be troublemakers in later life if not handled properly. A disciplined calf handled gently but firmly will be a healthy elephant with great temperament in future. Captive born calves should be raised with a social groups and opportunities are plenty in captive born calves raised in forest camps. Handling calves by tourists, feeding titbits should be avoided. Too habituated calves normally grow as troublemakers as it considers people as "toys" to play with. Training methods of calves vary across the country, and there are no good or bad methods. Training at

appropriate age is a key element in managing weaned calves. Separation from the mother should be a gradual process and sudden separation may lead to stress which is sometimes fatal.

4.5 Essentials of transportation

At times, transportation of elephants becomes important. Whenever need arises and after duly fulfilling the legal requirements, the following points can be considered:


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i. The transport crates play important role for safe and secure journey of elephant in the trucks. The standing area for an adult elephant should be not less than 20 feet.
ii. The truck should have strong side support (6 feet height minimum or more as per local requirements).
iii. The vehicle may have hydraulic ramps 2.45 m height/ 2.75 m width (or other specification locally appropriate). The inside of the holding area should be free of sharp and protruding objects.
iv. Adequate drainage for urine and faeces should be ensured. The floor should be non-slippery preferably wooden based.
v. The transportation should commence soon after loading and assessing the animal condition.
vi. Transportation route should be selected in the advance to avoid rough road surface which may increase physical stress.
vii. Steady and cautious driving should be ensured for the well-being of the elephant. Elephant should not be allowed to lie down during transport.
viii. Frequent examination during the transport is essential to be tackle any issues.

ix. Vehicle stoppage should occur away from human habitation as far as possible.

x. Necessary equipment and veterinary drugs should be carried for any intervention during transport. Water and fodder provisioning should be ensured.

xi. Proper makeshift ramp arrangement should be made for loading and unloading. Vehicle's road worthiness and fuelling should be ensured

5. SAFETY CONSIDERATIONS WHILE WORKING WITH ELEPHANTS

Working with elephants entail considerable risks to handlers and also to others in the surrounding. These risks must be acknowledged and precautionary measures, as appropriate should be earnestly taken. Being extremely powerful and sometimes highly temperamental, elephants should not be taken lightly. Handlers should always approach elephants with caution, but without letting down their confidence. Some of the main risks facing elephant handlers have been described as follows:

5.1 Occupational hazards (Zoonoses/physical injuries)

Personnel involved in the management, care, and handling of elephants such as the handlers, veterinarians, and others are exposed to a range of occupational hazards.

5.1.1 Zoonotic diseases:

The risk of contracting zoonotic diseases arise from close physical interaction with elephants and exposure to zoonotic pathogens. Furthermore, close proximity to elephants increases the risk of zoonotic transmission, as they may harbour pathogens transmissible to humans, especially in shared habitats or during medical treatments. Diseases that can be transmitted include Tuberculosis (TB) through aerosolized droplets, Salmonellosis through contact with infected dung, Leptospirosis through urine-contaminated water or surfaces, and fungal Infections through contact with infected skin or hair. Additionally, Anthrax can be contracted through spores entering open cuts or sores or by inhalation during carcass disposal. Internal parasites should also be considered, with precautions taken during post-mortems and handling of infected animals or carcasses. Thus, before handling elephants, the following are to be considered:

i. Wear rubber gloves while handling elephants with suspected infections. It is also advised to wash hands thoroughly with antiseptic soap.
ii. Inspect carefully for cuts and sores in the elephant and as well as oneself. Cover them with bandage before handling elephants

iii. Any workers ill or not feeling well should refrain from handling elephants as their immune systems can potentially be compromised, making them more vulnerable to pathogen attack. It is advisable to use a mask or cloth to cover the nose and mouth.

5.1.2 Physical Injuries:

Handling elephants poses significant physical injury risks due to their size, strength, and unpredictable behaviour. Potential hazards include trampling or charging, especially during stress, mating season, or perceived threats, which can cause fractures, internal trauma, or fatal incidents. Accidental hits from the trunk, tusks, or tail can occur during daily routines, while falls from height while mounting or dismounting can result in spinal, head, or limb injuries. Additionally, equipment-related hazards from tools like *ankush*, chains, or sharp implements can cause cuts or entrapment injuries, and improper saddle or harness handling may lead to muscle strain or falls.

5.1.3. Handling elephants with unpredictable temperament:

i. When handling elephants, the handlers should exercise caution and take all necessary precautions to avoid accidental attacks. This includes training elephants with positive commands and affection, understanding their nature and past behaviour, being aware of predictable and unpredictable traits, and knowing when they are in *musth*. Mahouts should also be prepared for emergencies, knowing escape routes and taking necessary precautions when handling potentially aggressive animals. They should develop quick reflexes and respond to unpredictable behaviour spontaneously.

ii. When handling *musth* elephants, the handlers must know the elephant's *musth* period, duration, and temperament, and take necessary precautions, such as tethering the animal in early stages of *musth* itself. Mahouts should be able to read symptoms of *musth* and exercise caution, as elephants can exhibit unpredictable behaviour. During *musth*, elephants can


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possibly exhibit aggressive behaviour, which the handlers should be prepared to manage. After the *musth* subsides, mahouts should exercise caution when unchaining the elephant, and it's essential for them to stay with the elephant throughout the *musth* period to maintain their bond and control.

5.1.4. Precautions while bathing elephants:

When bathing an elephant in any waterbody, precautions include leaving one chain fastened to the hind leg as a safety measure. There should be at least two personnel doing this task (preferably the mahout and the assistant). Mahouts should also keep sticks, hooks, etc. within reach for handling exigencies. When washing the belly portion while the elephant is lying down, the mahout should position themselves carefully to avoid getting trapped or drowned if the elephant rises abruptly. Additionally, mahouts should be patient when introducing elephants to unfamiliar water bodies and avoid trimming coconut husks on the elephant's body unless experienced.

BASIC AND COMMON RECORD TO BE MAINTAINED

Maintaining accurate and up-to-date records is essential in the scientific management of captive elephants. These records help in monitoring health, behaviour, nutrition, treatment, and overall welfare. They also serve as official documents for inspections, audits, and future reference. The following are the basic and commonly used registers maintained in elephant care facilities:


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1. **Individual register:** Every individual elephant should have a register containing information on his/her history, temperament, identification mark or microchip number, record on reproduction like calving in female and *musth* in male etc. Medical records can be incorporated in this register like date and period of illness, treatment, date of recovery etc. A Service Record alternatively contains essential details about the mahout or caretaker assigned to each elephant, including their name, ID, shift timings, attendance, training credentials, and duration of bonding with the elephant. This record helps ensure that elephants are paired with qualified and experienced caretakers, promoting effective care and management. Date of arrival/birth, provide valuable information into the elephant's overall well-being.
2. **Observation Register:** This Register is used to record daily behaviours, activity patterns, and general demeanour of the elephant, helping to detect early signs of stress, illness, or behavioural changes. Entries typically include observations on the elephant's mood and attitude, appetite, sleep and rest duration, as well as interactions with other elephants and handlers.
3. **Feeding Record:** This record documents an elephant's daily feed intake, including the type, quantity, quality and timing of food, includes feeding

supplements like vitamin and minerals prescribed by veterinary official, helping to plan balanced diets and monitor changes in appetite. This record is particularly essential during periods of illness, pregnancy, or other special needs, ensuring the elephant receives the necessary nutrients for optimal health and well-being.

4. **Growth Record for Neonates (Calves):** A Growth Record for neonates (calves) tracks regular updates on development, including body weight, height at shoulder, and milestone achievements such as standing, walking, and feeding. This record is crucial for evaluating the calf's nutrition and health during the early stages of life.
5. **Skin and Foot Care Record:** A Skin and Foot Care Record tracks an elephant's foot care schedule, including trimming, washing, oiling, and treatment, while noting any issues like cracks, abscesses, infections, or lameness. This record is essential for preventing conditions like pododermatitis and improving mobility.
6. **Work Record:** A Work Record tracks an elephant's workload and daily duties, including hours worked, type of work (such as patrolling, timber operations, or tourism rides), and rest days and holidays. This record helps prevent overwork and ensures compliance with welfare standards.
7. **Treatment Register:** A treatment Register logs all medical treatments and interventions for an elephant, including the date and symptoms, diagnosis by a veterinarian, medication and dosage, vaccination, deworming, and response to treatment, as well as follow-up visits.

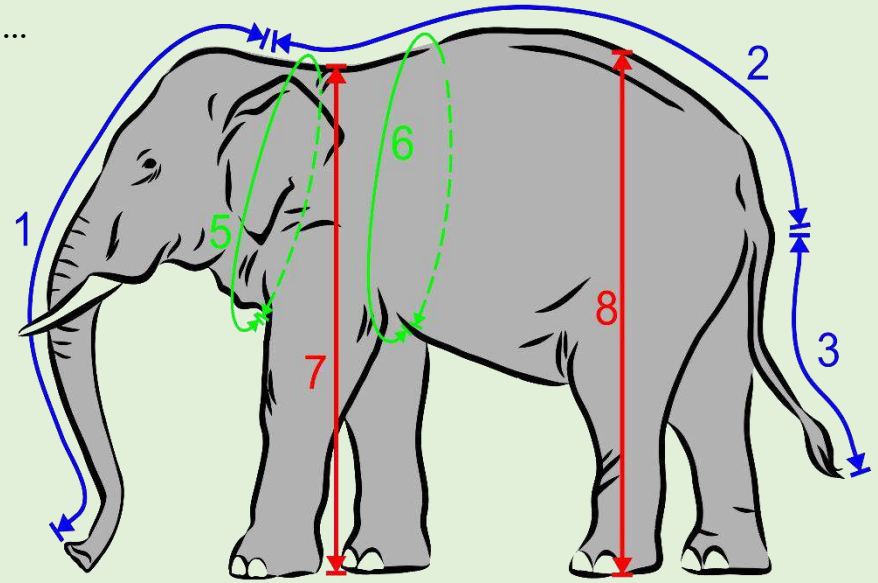
Proper record maintenance is vital for ensuring the health, welfare, and longevity of captive elephants. It also fosters transparency, supports research, and aids in policy decisions. Institutions must train staff to maintain these records diligently and digitally archive them wherever possible for efficient data retrieval and analysis.

ANNEXURE

ANNEXURE

Bodily Measurements and Weight estimation in elephants

1) Trunk tip to base of Occiput.....
2) Body length (Base of occiput to base of tail).....
3) Tail Length.....
4) Tail Description (Full/ broker/ kinked) Tail tip ...
5) Neck Girth.....
6) Chest Girth .....
7) Shoulder Height .....
8) Hind limb length .....



Weight (Kg)=12.8 (G +Ng)-4281
Weight (Kg)=8.2 G + 18.4 Ng
Weight (Kg) (Male)=18 (HG)-3336
Weight (Kg) (Female)=15(HG)-2562
Weight (Kg)= 1010 + 0.036 (LXG)

G =chest girth in cm I Ng=neck girth in cm I HG=heart girth in cm
L= Body length (cm) from base of forehead to the base of tail, G= Chest girth (cm) measured just caudal to elbow

Reference: Chowta P. (2010) Elephant Code Book, Published in India by ANCF and Aane Mane Foundation, Bangalore, India, ISBN 978-81-909731-0-6.

Estimation of Height

Height = Double the circumference of the front foot

Body Points Inspection Checklist:

Body Part	Normal Observation	Observation Today	Action Needed
Trunk	Flexible, moist, no injury or discharge	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Eyes	Clear, bright, no discharge	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Ears	Warm lower flap, flapping regularly	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Tusks/Tushes	Clean, no cracks or signs of damage	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Mouth & Tongue	Rosy pink, no foul smell or ulcers	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Feet & Nails	No cracks, injuries, or swelling	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Skin	No dryness, sores, parasites or fungal signs	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Tail	Moves freely, no hair loss or sores	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Breasts (Females)	No unusual swelling or discharge	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Genital/Anal Area	Clean, normal urination and defecation	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Body Condition	Not too thin or fat, good muscle tone	☐ Normal ☐ Abnormal	☐ Yes ☐ No
Temporal Glands	Slight secretion during stress/*musth* only	☐ Normal ☐ Abnormal	☐ Yes ☐ No

Drafting Sub-Committee constituted vide PT&E Division, MoEFCC, GoI letter no. 14-2/2019-PE (Part II) dated 3rd December 2024 as per the decision of 4th Captive Elephant Healthcare & welfare Committee (CEHWC) meeting held on 7th August 2024: [Chairman: Dr. N.S. Manoharan, Member: Dr Giridas P.B, Dr Bhaskar Choudhury, Dr Kalaivanan, N., Dr. Utkarsh Shukla, Dr. Lakshminarayanan N., Dr. Aju Mathew George / Coordinator: Dr Parag Nigam

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भारतीय वन्यजीव संस्थान
Wildlife Institute of India