

ENRICHMENT MANUAL

PRACTICAL HUSBANDRY INTERVENTIONS FOR IMPROVED ANIMAL CARE AND WELFARE



BANNERUGHATTA BIOLOGICAL PARK, BENGALURU
2026

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BANNERUGHATTA
BIOLOGICAL PARK
BENGALURU

2026

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Enrichment Manual: Practical husbandry interventions for improved animal care and welfare

Photo credits

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Some illustrative visuals included in this manual were generated using AI-assisted design tools to support conceptual visualisation. All enrichment items were reviewed, adapted, and validated for practical application by the workshop team.

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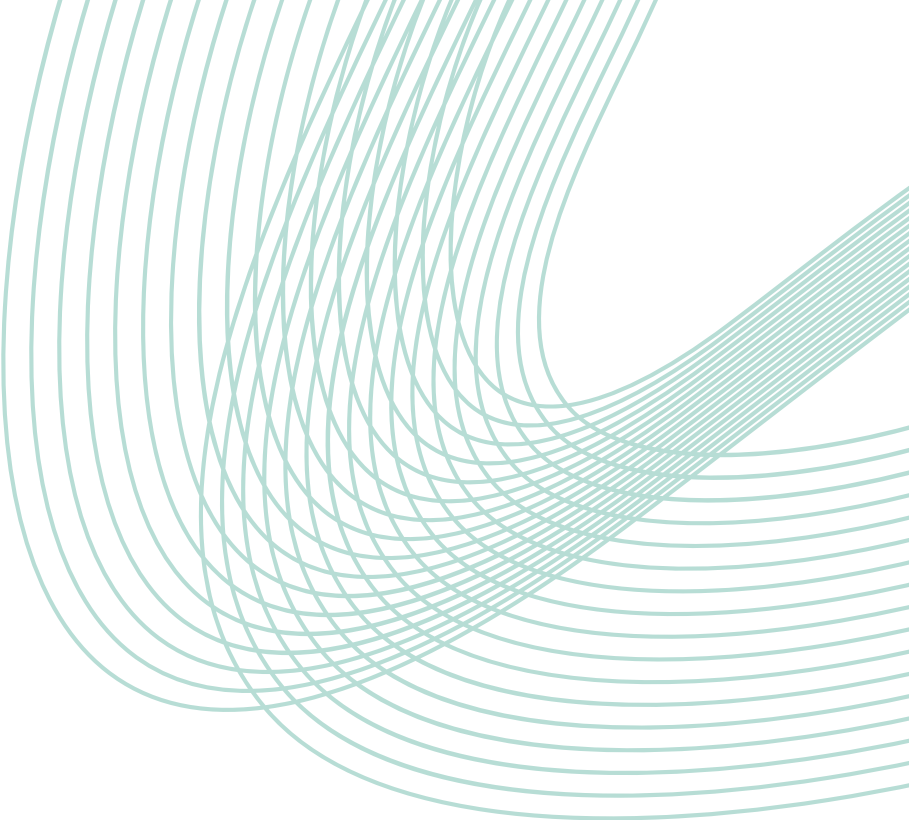
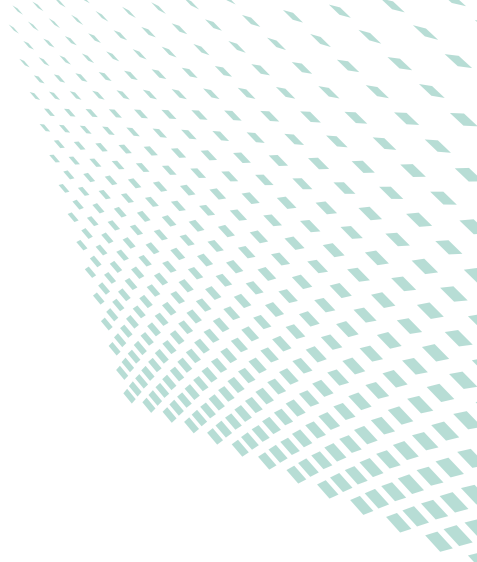


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Introduction



Animal care in captivity requires keepers to understand how animals behave, use space, respond to routine management, and adapt to the conditions of a managed environment. The quality of daily husbandry directly affects an animal's health, comfort, activity patterns, and behavioural stability. Modern zoo-keeping is therefore not limited to feeding, cleaning, or routine observation, but requires continuous attention to whether animals are able to express key natural behaviours such as foraging, resting, exploring, thermoregulating, and interacting appropriately with conspecifics.

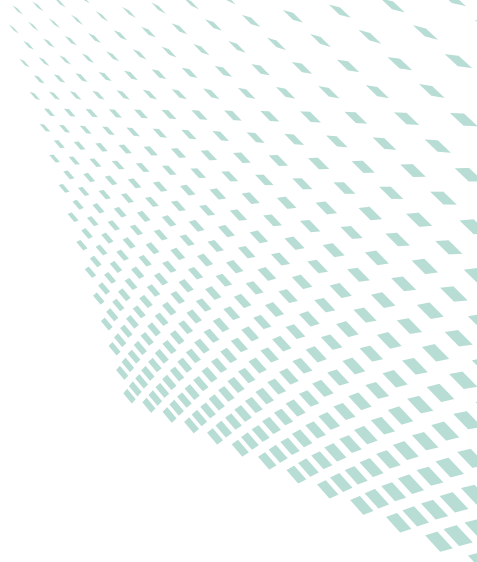
In captive settings, animals depend on their caregivers not only for physical survival but also for the environmental conditions that support psychological wellbeing. Many welfare problems in zoos arise not from deliberate neglect, but from predictable environment where animals experience limited stimulation, restricted choice, and minimal opportunity to engage in biologically meaningful behaviour. Such conditions may contribute to behavioural abnormalities such as pacing, repetitive movements, excessive inactivity, withdrawal, aggression, or reduced feeding interest.

For this reason, the present document uses the term *husbandry interventions* to describe small, practical, and deliberate changes made to enclosure conditions and daily routines to improve animal welfare. These interventions include adjustments to feeding methods, enclosure furnishings, resting areas, shade, privacy, substrate, cleaning routines, and the placement of resources. Enrichment is treated as a component of this broader approach, rather than as an isolated activity.

This manual has been developed as an outcome of the five-day workshop titled *Practical Husbandry Interventions for Improved Animal Care and Welfare*, conducted at Bannerughatta Biological Park from 27 to 31 October 2025. The workshop was designed as a field-based capacity-building initiative for keepers, and the manual consolidates the principles, frameworks, and practical approaches introduced during the programme.

The objective of this manual is to serve as a practical reference that can guide consistent implementation of husbandry interventions and enrichment practices beyond the workshop period, and support long-term improvements in animal care standards at Bannerughatta Biological Park.

Background



Zoos and biological parks hold a diverse range of taxa, each with distinct behavioural, ecological, and physiological requirements. Captive environments cannot fully replicate wild habitats; however, they must provide animals with sufficient complexity, predictability where needed, and variation where beneficial, to support natural behavioural expression and reduce chronic stress.

In many zoos, enrichment is commonly interpreted as the periodic introduction of toys or novel objects. While such items can be useful, they have limited value if the foundational husbandry conditions remain weak. For example, enrichment devices may not compensate for inadequate shade, lack of resting platforms, insufficient hiding opportunities, poor substrate, inappropriate enclosure zoning, or unsuitable feeding practices. Meaningful welfare improvement requires a structured approach in which daily husbandry itself becomes a welfare tool.

Bannerughatta Biological Park houses a wide variety of carnivores, primates, ungulates, birds, reptiles, and other taxa. Keepers routinely observe behavioural patterns such as pacing, withdrawal, excessive resting, increased aggression, or reduced feeding response. These behaviours may have multiple causes; however, they are often associated with environments that do not provide adequate opportunities for movement, exploration, foraging, privacy, or species-appropriate resting and social behaviour.

Recognising these challenges, the workshop was designed to introduce a practical approach to welfare improvement that can be implemented by keepers using locally available resources. The emphasis was on interventions that can be designed, constructed, deployed, and maintained at section level, without dependence on high-cost infrastructure modifications. The workshop also aimed to establish simple monitoring habits so that the impact of interventions can be observed, documented, and refined over time.

Objectives

The purpose of this manual is to provide Bannerughatta Biological Park with a structured, practical, and keeper-oriented framework for planning and implementing husbandry interventions and enrichment activities that promote natural behaviour, reduce stress, and enhance animal welfare.

The manual is intended to serve as a working reference for keepers, biologists, and veterinary staff. It provides guidance on designing interventions, constructing enrichment items using locally available materials, deploying them safely, and monitoring animal responses in a consistent and measurable manner.

Given this, the manual is designed to support the following objectives:

- Strengthen keeper capacity to recognise behavioural indicators of welfare through routine observation of posture, activity levels, enclosure use, feeding interest, and social interactions.
- Improve daily husbandry practices by demonstrating how small modifications in feeding strategies, enclosure furnishings, shade, privacy, and cleaning routines can improve animal comfort and activity.
- Support the planning and construction of simple enrichment and husbandry items using locally available, animal-safe materials such as bamboo, rope, tyres, wood, and natural substrates.
- Establish basic record-keeping and monitoring practices so that the effectiveness of interventions can be evaluated and refined over time.
- Encourage collaborative implementation by strengthening coordination between keepers, biologists, and veterinary staff in planning and reviewing welfare interventions.
- Improve motivation and professional confidence among keepers by reinforcing their role as primary caregivers and key contributors to animal welfare outcomes.

Workshop outline

A five-day workshop was conducted at Bannerughatta Biological Park from 27 to 31 October 2025. The workshop focussed on practical husbandry interventions pertaining to the major taxa, including carnivores, primates and omnivores, herbivores and rodents, birds, and reptiles.

The workshop was conducted entirely within the animal sections, without classroom-based lectures. Concepts were introduced directly at enclosures using real animals and existing housing systems as reference points. For each taxonomic group, welfare needs and practical husbandry interventions were discussed, followed by hands-on construction of enrichment items using locally available materials. These items were then deployed within enclosures, allowing keepers to observe animal responses in real time and make adjustments where required.

The programme was designed to align with routine keeper duties and to ensure that interventions introduced were realistic, low-cost, and sustainable. The workshop also emphasised that enrichment is most effective when it is embedded into daily husbandry systems, rather than implemented as occasional or irregular activities.

The approach of conducting the workshop at a single zoo ensured that all activities remained directly relevant to the animals, enclosure designs, and operational constraints of Bannerughatta Biological Park. It also enabled broader participation of section staff, reduced logistical disruptions, and ensured continuity of interventions after the workshop period.





Definitions

Husbandry Interventions

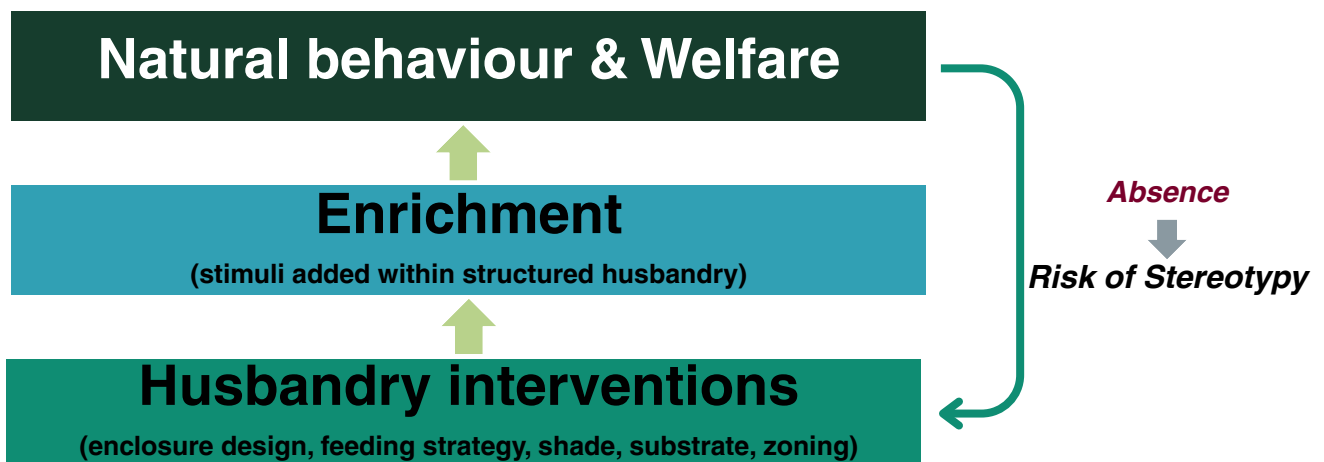
Husbandry interventions refer to deliberate changes made to enclosure conditions or daily management routines to support improved welfare outcomes. These interventions may include modifications in feeding strategy, substrate use, resting and shelter provisions, enclosure zoning, access to shade, placement of water points, privacy structures, climbing and perching opportunities, or adjustments in cleaning routines.

Husbandry interventions are considered foundational because they influence the animal's daily experience continuously, rather than intermittently. Well-designed husbandry interventions ensure that the enclosure itself supports natural behaviour and reduces welfare risks.

Enrichment

Enrichment refers to the planned introduction of stimuli or resources that encourage animals to engage in species-typical behaviour. Enrichment can be feeding-based, structural, sensory, cognitive, or social in nature. Enrichment is most effective when it is linked to clear behavioural goals, introduced safely, and rotated systematically to prevent habituation.

Enrichment should be implemented as a structured component of husbandry, rather than as occasional novelty.





Natural Behaviour and Welfare

The reference point for husbandry intervention planning is the natural behavioural repertoire of the species. Captive animals remain motivated to perform behaviours such as foraging, exploration, resting in secure locations, climbing, grooming, thermoregulation, nesting, and social interaction. However, when captive environments lack the corresponding features for the expression of these natural behaviours, animals may exhibit reduced activity, abnormal behaviour, or heightened stress responses.

Examples of key behavioural needs include:

- *Carnivores*: exploring, stalking, tearing, scent investigation, resting on elevated platforms.
- *Primates*: climbing, balancing, manipulation, problem-solving, social contact, retreat opportunities.
- *Ungulates*: grazing or browsing, movement across space, resting in shaded secure areas.
- *Birds*: perching at varied heights, preening, nesting, bathing, exploration.
- *Reptiles*: basking, hiding, thermoregulation, substrate interaction.

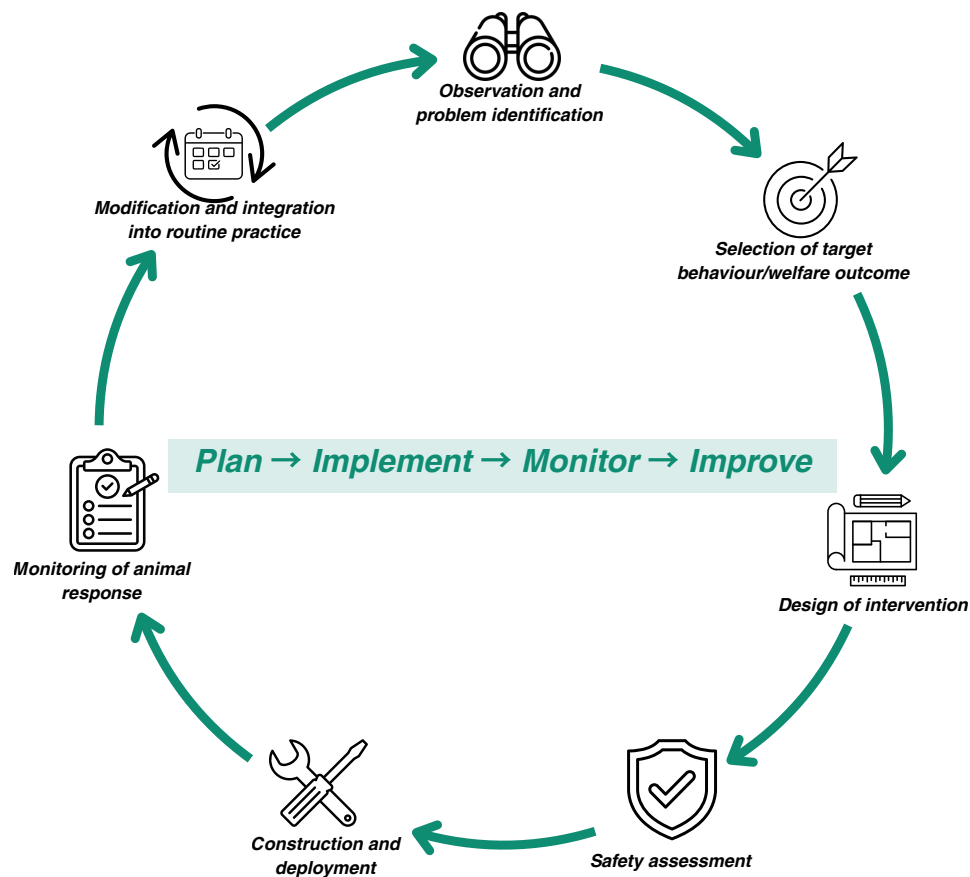
Stereotypic and Abnormal behaviours

Stereotypic behaviours are repetitive, apparently functionless behaviours such as pacing, circling, head-bobbing, over-grooming, or repetitive movement patterns. These behaviours may arise due to chronic frustration, restricted behavioural opportunity, lack of environmental complexity, or inadequate control over key resources. While the causes of stereotypy can be complex, such behaviours are frequently associated with barren or highly predictable environments.

Reduction of stereotypic behaviour requires more than introducing objects into the enclosure. Sustainable improvement typically requires strengthening the overall husbandry environment by increasing complexity, providing appropriate choice, and improving daily management routines.

Implementation framework

Effective enrichment and husbandry intervention planning should follow a structured cycle. This ensures that interventions are purposeful, measurable, and safe, rather than ad hoc. The recommended intervention cycle includes the following steps:



This cycle ensures that interventions remain relevant, effective, and sustainable over time.



Toolkit

Husbandry interventions and enrichment activities must be treated as planned management tools that support animal welfare on a routine basis. Interventions should be practical, safe, and linked to clear behavioural outcomes rather than introduced as occasional novelty.

The following principles should guide all enrichment and husbandry intervention planning at Bannerughatta Biological Park:



Species relevance:

Interventions must reflect species biology and behaviour



Clear welfare objective:

Each intervention must address a defined welfare need (foraging, rest, exploration, etc.).



Husbandry first:

Enrichment cannot compensate for poor shade, substrate, water, or resting provisions.



Safety and hygiene:

Avoid injury, ingestion, entanglement, and contamination risks.



Simple and sustainable:

Prefer low-cost designs that keepers can repeat and maintain.



Planned placement:

Placement should improve enclosure use and promote natural behaviours.



Rotation and variation:

Rotate items to prevent habituation and maintain engagement.



Monitor and improve:

Observe animal response and refine interventions based on evidence.



Enrichment and husbandry intervention toolkit

Standard item library for field implementation and monitoring

How to read the toolkit?

Identifies the husbandry intervention

*Difficulty indicator -
Low, Moderate,
Advanced*

*Details on item,
construction, use, risk
checks and safety
requirements*

Hanging treat

TARGET SPECIES

TARGET BEHAVIOUR

CATEGORY

FREQUENCY

PLACEMENT

Description

Use

Construction

Safety & Maintenance

- Species for which the item is appropriate
- Target behaviours
- Type of enrichment
- How often the item should be used?
- Where to place in the enclosure?

*Reference photo or
illustration*

Hanging treat



TARGET SPECIES



Felids, Canids

TARGET BEHAVIOUR



Climbing
Jumping
Simulated hunting
effort

CATEGORY



Feeding
enrichment

FREQUENCY



1-2x per week

PLACEMENT



Varied height &
location

Description

A piece of meat suspended from a rope or chain in the enclosure at varying heights.

Construction

Use durable rope or chain to suspend a large meat piece from a branch, platform, or enclosure ceiling. Vary height and location periodically may be using a pulley.

Use

Deployed during feeding time/ad libitum to encourage animals to explore, jump, stretch, and work for food.

Safety & Maintenance

- Ensure rope or chain is secured and cannot entangle limbs or neck.
- Inspect knots and fastenings daily.
- Clean/replace as needed to avoid bacterial build-up.
- Rotate locations to prevent boredom.



Scent trails



TARGET SPECIES



Felids, Canids,
Ungulates,
Snakes

TARGET BEHAVIOUR



Exploration
Scent-marking
Increased
enclosure use

CATEGORY



Sensory
enrichment

FREQUENCY



1x per week

PLACEMENT



Varied height &
location

Description

A scent trail involves applying natural or artificial scents along surfaces within the enclosure to stimulate exploratory and scent-marking behaviors.

Construction

Use cloth or dispenser to apply scents (e.g., herbs, food, prey/predator scents). Drag or rub the material across rocks, logs, platforms, and other surfaces. Avoid overuse - rotate scents to retain novelty.

Use

Deployed periodically to simulate presence of prey/predator or unfamiliar individuals, encouraging animals to investigate, rub, roll, or scent-mark.

Safety & Maintenance

- Avoid irritants or harmful chemicals.
- Monitor animal reactions closely.
- Replace or rotate scent sources regularly.
- Ensure application sites (logs, rocks) are clean and secure.
- Watch for parasite loads in dung.



Bamboo puzzle feeder



TARGET SPECIES



Felids, Canids,
Ungulates,
Primates,
Squirrel

TARGET BEHAVIOUR



Foraging
Dexterity
Exploratory
behaviour

CATEGORY



Sensory/Cogniti
ve enrichment

FREQUENCY



1x per week

PLACEMENT



On ground or at
varied height

Description

Hollow bamboo segments are modified to create compartments that hold food, requiring animals to manipulate or extract the food through small holes or slits. This simulates natural foraging and extends feeding time.

Construction

Dry bamboo sections are cut retaining nodes, cleaned, and smoothed. Small holes or slits are drilled along the sides - just large enough for food to fall out or paws, beaks, or snouts to access the food inside.

Use

Stuffed with meat, fruits, or seeds depending on species. Placed on the ground (e.g., for bears or jungle cats or zebra) or suspended using ropes (e.g., for leopards or parakeets).

Safety & Maintenance

- Check for splinters or sharp bamboo edges before and after use.
- Ensure openings are not too small.
- Clean and dry thoroughly between uses to prevent mould.
- Rotate designs and contents to maintain novelty.



Barrel puzzle feeder



TARGET SPECIES



Felids, Ursids
Primates

TARGET BEHAVIOUR



Foraging
Physical activity
Increase feeding
duration

CATEGORY



Cognitive
enrichment

FREQUENCY



Daily

PLACEMENT



Fixed to the
ground

Description

A wooden rotating barrel with multiple holes, mounted on a pole. Food is released gradually as the animal rolls or manipulates the barrel, encouraging active foraging and problem-solving.

Construction

Construct a barrel using two hexagonal wooden end plates and wooden side panels (as per reference photo). Provide one hinged access panel with a latch for loading and cleaning. Drill a central hole in both end plates to pass a hardwood pole through, allowing free rotation on a sturdy support frame. Drill multiple 2–3 inch feeding holes along the panels for gradual dispensing.

Use

Fill with dry or semi-dry food items (fruit/vegetable chunks, pellets, kibble, boiled egg). The animal rolls or bats the barrel to release food.

Safety & Maintenance

- Ensure pole and frame are firmly secured.
- Smoothen all holes/edges to prevent injury and splinters.
- Avoid sticky or wet foods that leave residue.
- Clean and dry thoroughly after each use.
- Inspect hinges, latches, and barrel rotation regularly.



Forage feed bundle



TARGET SPECIES



Felids, Ursids
Canids,
Primates,
Ungulates

TARGET BEHAVIOUR



Foraging
Shredding/Tearing
Reduce feeding
monotony

CATEGORY



Feeding
enrichment

FREQUENCY



1-2x per week

PLACEMENT



Placed on
ground

Description

Food items wrapped inside bundles of hay or straw and secured loosely to encourage tearing and exploration.

Construction

Place food items at the different places within the clump of dry hay or straw that is loosely tied using natural jute rope. The bundle should be soft and easy to shred.

Use

Placed in different parts of the enclosure during feeding time to encourage natural behaviours such as exploratory behaviour and simulate tearing of prey.

Safety & Maintenance

- Use clean, dry hay/straw; avoid mouldy material.
- Remove leftover organic material daily.
- Secure with biodegradable, nontoxic materials.
- Avoid hard bindings that may cause injury.
- Rotate placement to increase novelty.



TARGET SPECIES	TARGET BEHAVIOUR	CATEGORY	FREQUENCY	PLACEMENT
 Felids, Ursids Canids, Primates, Rodents, Ungulates	 Foraging Cooling Increase feeding time	 Feeding enrichment	 1x per week	 Placed on clean ground/at varied heights

Description

Blocks of frozen meat, fruit juice, blood, or diluted meat broth (sometimes with small meat chunks) that serve as a cool treat and encourage licking and exploration.

Construction

Freeze blood, meat broth, or fruit juice in plastic containers of size appropriate to the target species. Optionally add small meat pieces, fruit pieces or kibble before freezing. Use round-edged moulds and avoid sharp containers.

Use

Placed in shaded areas to provide thermal relief, sensory engagement, and feeding enrichment.

Safety & Maintenance

- Use clean, food-safe containers.
- Ensure ice block edges are not sharp.
- Provide on a clean surface or platform.
- Monitor consumption and remove any leftovers promptly.
- Introduce new flavours or smells to maintain interest.



Scratch posts



TARGET SPECIES



Felids, Ursids
Canids

TARGET BEHAVIOUR



Claw maintenance
Territory marking
Stretching/muscle
engagement

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Fixed to the
ground

Description

Upright logs or poles, or wooden planks wrapped with rough texture are installed within the enclosure. These surfaces may be used for scratching, scent marking, and stretching.

Construction

Use sturdy vertical logs (natural wood or debarked trunks) or planks of hard wood fixed securely in the ground or to enclosure walls. Wrap the middle portion of the log or the entire plank with coir rope, jute fibre, or coconut brushes to provide texture. Anchor using nails.

Use

Installed in different parts of the enclosure, preferably near resting or activity areas. Scents can be applied to the posts to attract interest.

Safety & Maintenance

- Ensure log or plank is stable and anchored deep.
- Replace or rewrap worn-out coir or rope.
- Inspect regularly for splinters or loose nails.
- Clean periodically to avoid faecal or urine build-up.
- Avoid using chemically treated wood.



Feed skewers



TARGET SPECIES	TARGET BEHAVIOUR	CATEGORY	FREQUENCY	PLACEMENT
 Psittacines, Hornbills, Phasianids, Tortoises, Ungulates	 Foraging Exploratory behaviour	 Feeding enrichment	 2x per week	 Anchored to cage furniture at varying heights

Description

Cut fruits and vegetables threaded onto bamboo skewers/jute thread and hung at varying heights within the enclosure or the skewers may be fixed on the ground.

Construction

Use smooth bamboo skewers. Thread bite-sized pieces of safe fruits and vegetables (e.g., Papaya, Cucumber, Apple, Melon, Beetroot, Sweet potato). Suspend from mesh or perches using natural fibre string or metal hooks or firmly embed them in the soil/substrate.

Use

Deployed during feeding times. The skewers that are placed at different heights encourage active foraging, pecking and manipulation.

Safety & Maintenance

- Ensure skewers are securely fixed and cannot injure the animals (entanglement).
- Use food-safe bamboo (no sharp edges); avoid metal.
- Rotate fruit and vegetable types to prevent monotony.
- Remove leftovers before spoilage.



Climbing structures



TARGET SPECIES



All scansorial species

TARGET BEHAVIOUR



Enclosure use
Exploratory behaviour

CATEGORY



Structural enrichment

FREQUENCY



Permanent fixtures

PLACEMENT



Varying heights in the enclosure

Description

Natural wooden branches or logs placed horizontally or diagonally within enclosures to provide resting, roosting and climbing opportunities.

Construction

Use untreated, pesticide-free hardwood branches of varying thickness (2–6 cm diameter depending on species). Fix securely to walls, mesh, or frames using rope, nail, or brackets. Vary height, angle, and placement. Install multiple perches at different heights and angles to provide animals with resting and roosting options across the enclosure.

Use

Provide both open and sheltered perch locations, and ensure adequate spacing to allow simultaneous use by multiple individuals. Perches should be arranged to encourage movement through vertical space.

Safety & Maintenance

- Ensure branches are firm and stable; avoid wobbly or splintered wood.
- Replace worn-out or mouldy wood periodically.
- Use species-appropriate perch diameter to prevent foot strain.
- Space perches to allow multiple individuals to access without crowding.



Fire hose hammock



TARGET SPECIES



Felids, Ursids,
Primates

TARGET BEHAVIOUR



Resting
Climbing
Vantage
Thermal regulation

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
installation

PLACEMENT



Anchored to the
ground in
shade

Description

A hammock made from retired fire hoses tightly woven together, suspended securely within the enclosure. Provides elevated resting space that promotes natural climbing and resting behaviours.

Construction

Cut fire hoses to equal lengths. Weave in crisscross pattern through a sturdy frame (treated wood). Anchor all corners to strong, weight-bearing supports using bolts, chains, or carabiners. Height and position should suit target species.

Use

Animals use it as an elevated resting spot, often choosing it for lounging, grooming, or as a lookout.

Safety & Maintenance

- Check anchors and weaving integrity regularly.
- Remove sharp edges or frayed sections.
- Ensure weight limits are not exceeded.
- Clean as part of routine enclosure maintenance.



Hessian feeder



TARGET SPECIES



Ungulates

TARGET BEHAVIOUR



Foraging
Browsing

CATEGORY



Feeding
enrichment

FREQUENCY



2x per week

PLACEMENT



At varied height

Description

A large hessian sack modified with a woven openings to allow animals to forage for leafy greens placed inside. Mimics the effort of selective browsing in the wild.

Construction

Repurpose durable hessian sacks (such as grain sacks). Cut a section and weave coir ropes into a loose net-like pattern to create feeding gaps. Reinforce edges with stitching or knots. Securely stuff the sack with greens or dry foliage and hang or fix it vertically to a tree trunk or wall at animal head height.

Use

Filled with seasonal greens or chopped browse material. Designed to slow down consumption and promote sustained interaction by requiring animals to pull or tug at the foliage.

Safety & Maintenance

- Ensure the sack is securely fastened to prevent collapse or ingestion of non-edible material.
- Watch for entanglement in the horns.
- Regularly inspect for fraying or damage.
- Clean or sun-dry the sack regularly to prevent mould or bacterial growth.



Hanging hay feeder



TARGET SPECIES



Ungulates

TARGET BEHAVIOUR



Foraging
Browsing
Stretching &
postural movement

CATEGORY



Feeding
enrichment

FREQUENCY



2x per week

PLACEMENT



At varied height

Description

Suspended forage unit constructed with interwoven fire hoses, forming a spherical structure with openings that allow animals to pull out leafy greens or hay. It mimics a natural browse challenge and encourages prolonged feeding.

Construction

Cut used fire hoses into strips and form two circular frames: one longitudinal and one equatorial. Interlace the hoses at right angles to form a spherical or semi-spherical structure. Secure the intersections with bolts or rivets for stability. Leave sufficient gaps between hose bands for animals to nibble through. Suspend from a tree or frame using a sturdy chain or rope at head height.

Use

Filled with fresh grass, leafy branches, or chopped browse and hung in the enclosure during the day. The swinging motion adds a physical and cognitive challenge, simulating natural foraging dynamics

Safety & Maintenance

- Ensure all bolts are tight and flush to prevent injuries.
- Use durable, clean hoses free of frayed edges.
- Inspect regularly for wear and damage.
- Clean and air out the feeder periodically to prevent mould



Hanging puzzle feeder



TARGET SPECIES



Ursids,
Primates

TARGET BEHAVIOUR



Foraging
Exploration
Increase food
engagement

CATEGORY



Feeding/Cogniti
ve enrichment

FREQUENCY



1x per week

PLACEMENT



At varied height

Description

A suspended enrichment toy made of hollow bamboo segments threaded together in a loosely stacked arrangement. Dry food items or treats can be inserted inside to encourage foraging and manipulation.

Construction

Cut bamboo into short hollow segments (approximately 6–8 inches). Drill small holes through the bamboo for threading. String 4–6 segments loosely on a strong rope or chain to allow movement. Thread the bamboo sections to be placed as horizontal and vertical sections alternately. Tie securely at top, ensuring adequate swing and reach for target species.

Use

Deployed during feeding times or midday. Movement and unpredictable rotation simulate natural food searching challenges.

Safety & Maintenance

- Inspect bamboo for splinters or cracks; smoothen the edges if needed.
- Check ropes or fastenings for wear or tangling risks.
- Replace or disinfect regularly to prevent bacterial build-up.
- Suspend at a safe height to avoid injury on hard surfaces.



Self-grooming brush



TARGET SPECIES



Ungulates

TARGET BEHAVIOUR



Grooming
Rub/Scratch

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



At varied height

Description

A circular array of coir brushes fixed around a tree trunk at animal shoulder height. Designed to provide tactile enrichment and allow animals to rub or scratch their bodies, mimicking natural self-grooming behaviours such as rubbing against trees or rough surfaces.

Construction

Coir brushes are repurposed by removing handles and binding multiple brushes together using rope or jute twine. The brush assembly is then securely fastened in a band or partial ring around a tree trunk or a sturdy vertical post, positioned at a height appropriate for the target species.

Use

Left in the enclosure for passive access. Animals are naturally drawn to rub, scratch, or lean against the textured surface, particularly during moulting, shedding, or to relieve irritation.

Safety & Maintenance

- Ensure brushes are securely fixed and do not come loose and prevent entanglement.
- Avoid using brushes with metal or plastic parts that could injure skin.
- Inspect regularly for wear or broken fibres that may pose a hazard.
- Clean or replace periodically to maintain hygiene and functionality.



TARGET SPECIES



Snakes

TARGET BEHAVIOUR



Climbing
Elevated resting
Muscle
engagement

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



At varied height

Description

A vertical panel embedded with pegs of varying diameters at varied heights to encourage, climbing, and resting mimicking branches or uneven natural terrain.

Construction

A durable plywood sheet is fitted with sanded, cut log segments, PVC pipes of varied diameters wrapped in coir rope for rough texture and wooden planks arranged irregularly across its surface. The pegs, pipes and planks are fixed at varying heights to allow multiple contact points for the snake's body.

Use

The entire panel can be mounted upright or inclined against a wall.

Safety & Maintenance

- All pegs, pipes and planks must be firmly secured with no sharp edges or splinters.
- The surface should be regularly inspected and cleaned to prevent bacterial build-up.
- Ensure the base panel is anchored securely and not prone to tipping or warping.
- Avoid excessive height that might risk falling injuries during movement.



Square-knot browser



TARGET SPECIES



Primates,
Ungulates

TARGET BEHAVIOUR



Increased feeding
duration
Exploration

CATEGORY



Feeding/Cogniti
ve enrichment

FREQUENCY



2x per week

PLACEMENT



At varied height

Description

A suspended enrichment device made from interwoven firehose strips, with openings that allow animals to pull out fruits, vegetables, or browse, promoting prolonged feeding and manipulation.

Construction

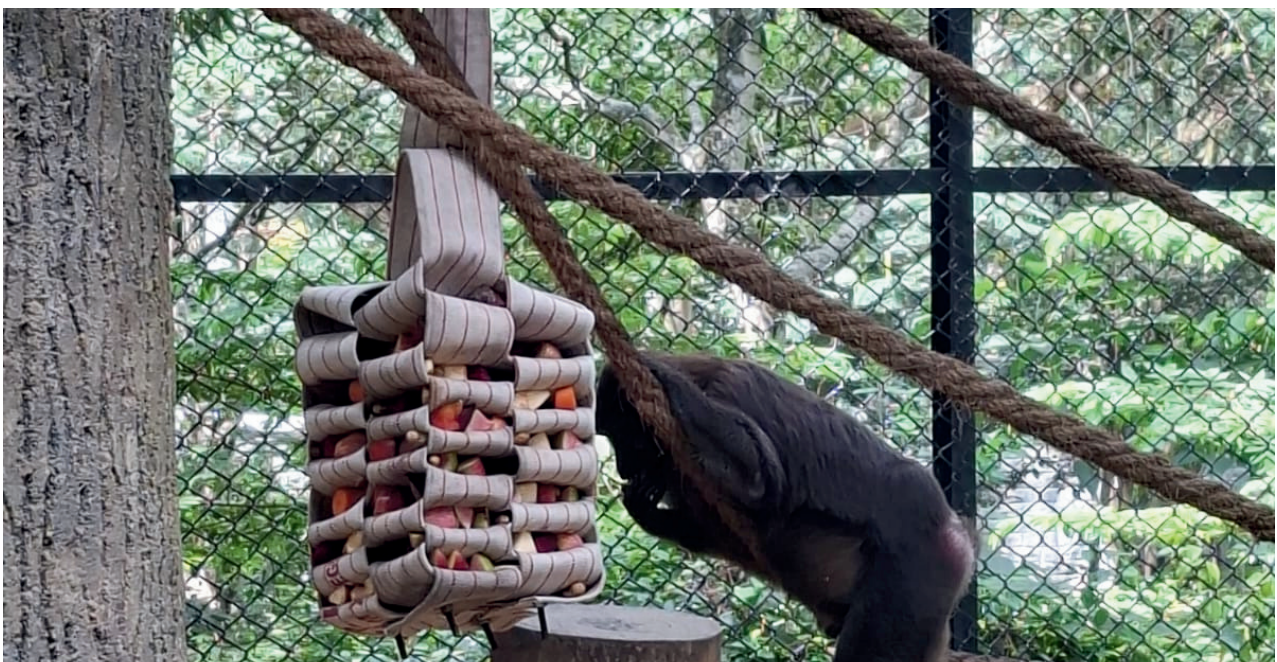
A square knot can be used to securely join two ends of firehose material. To tie the knot, cross the right end over the left and pull it through, then cross the left end over the right and pull it through again. Tighten the knot by pulling both ends evenly so that it sits flat and symmetrical. If the knot appears twisted or uneven, retie.

Use

Installed in the enclosures to provide food- based enrichment.

Safety & Maintenance

- Ensure all bolts are tight and flush to prevent injuries.
- Use durable, clean hoses free of frayed edges.
- Inspect regularly for wear and damage.
- Remove any leftover food regularly and clean and air out the feeder periodically to prevent mould.
- Rotate contents and hanging spots to keep animals engaged.



Indoor ledges



TARGET SPECIES



Felids, Canids,
Ursids,
Primates

TARGET BEHAVIOUR



Elevated resting
Refuge

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



At varied height

Description

Raised wooden platforms or ledges inside night houses or holding areas to promote climbing and resting.

Construction

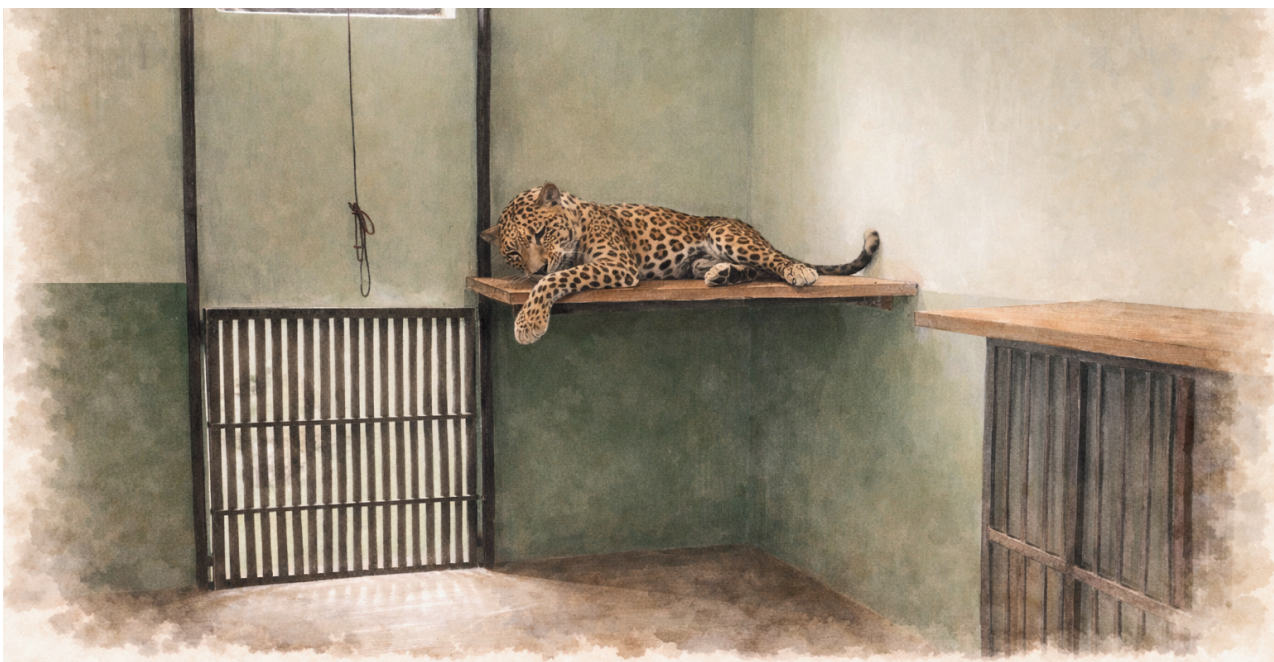
Made from smooth, untreated wooden planks supported by metal brackets or wooden beams. Should be elevated at least 2–3 feet, with room for animals to climb and lie down comfortably.

Use

Permanently fixed in night shelter /off display holding. Helps animals express their natural tendency to seek elevated, secure places for resting and observation.

Safety & Maintenance

- Smooth edges; no nails or screws protruding
- Strong support to hold weight safely
- Clean regularly to prevent buildup of hair/faeces
- Use rot-resistant wood if exposed to moisture
- Position to allow easy access but avoid conflict zones.



Fire hose ledges



TARGET SPECIES



Felids, Ursids,
Primates

TARGET BEHAVIOUR



Elevated resting
Refuge

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



At varied height

Description

A resting ledge constructed using retired firehose woven together and fixed on a square or triangular frame which is then mounted onto the wall/mesh on the sides of the enclosure at appropriate heights.

Construction

Build a suitable frame using solid wooden planks. Cut firehose strips to fit the frame and weave them tightly in a crisscross grid. Pull each strip taut and secure firmly to the frame using sturdy nails. Cover the nail line with an additional firehose strip for protection. The ledge can then be securely mounted onto the enclosure structure.

Use

Permanently fixed in off display holding/display areas. Helps animals express their natural tendency to seek elevated, secure places for resting and vigilance.

Safety & Maintenance

- Check anchors and weaving integrity regularly.
- Remove sharp edges or frayed sections.
- Ensure weight limits are not exceeded.
- Clean as part of routine enclosure maintenance.



Hiding/denning boxes



TARGET SPECIES



Small felids,
Canids,
Rodents,
Primates

TARGET BEHAVIOUR



Resting
Breeding
Refuge

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



On ground or at
varied height

Description

Wooden boxes that provide a safe, sheltered, and dry space for animals to hide and retreat from view. Some animals may use this for birthing and nursing young.

Construction

Box made from smooth, untreated wood with one main entry/opening. Can be placed on the ground or at a height based on species. Should be placed away from open views and with room for animals to turn and lie down comfortably. Bedding material like hay or dried straw must be used for the animals.

Use

Permanently placed in enclosures. Helps animals seek dark, secure places for resting and refuge or birthing and caring for young.

Safety & Maintenance

- Smooth edges; no nails or screws protruding
- Strong support to hold weight safely
- Clean regularly to prevent buildup of hair/faeces; replace bedding if soiled.
- Use rot-resistant wood if exposed to moisture
- Position to allow easy access but avoid conflict zones.



TARGET SPECIES



Emu, Select
Ungulates

TARGET BEHAVIOUR



Resting
Dust/mud bathing
Thermoregulation

CATEGORY



Habitat
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Ground level;
partial shade

Description

Shallow depressions or mud puddle created in the enclosure to allow animals to sit, rest, or cool off. Wallows mimic the natural behaviours of lying in moist or soft substrates, for skin protection and for thermoregulation particularly in hot weather.

Construction

Select a flat or gently sloped area in the enclosure. Dig a shallow depression (depth to be decided based on target species) and line it with soft soil or sand. Water it lightly to maintain a damp, cool patch; avoid waterlogging.

Use

Sit, rest in the wallow often in the warmer parts of the day. This helps for thermoregulation and comfort. Choose a partially shaded spot or shade the area if possible, to enhance usability during peak sun hours.

Safety & Maintenance

- Prevent water stagnation to avoid mosquito breeding
- Refresh soil and moisture levels as needed
- Ensure drainage is adequate to avoid foul smells or slipperiness
- Maintain hygienic conditions—do not allow faecal buildup.



Gnawing



TARGET SPECIES



Porcupines

TARGET BEHAVIOUR



Gnawing
Sensory
stimulation

CATEGORY



Oral enrichment

FREQUENCY



2x per week

PLACEMENT



Ground

Description

The naturally shed deer antlers can be provided in the enclosures for controlled chewing/ gnawing and manipulation activities. Shed antlers are hard, durable and contain bioavailable minerals.

Construction

Naturally shed deer antlers are used and can be placed at different locations in the enclosure to promote foraging. While selecting ensure that the appropriate size of antlers is provided for the animal to prevent choking or tooth fractures.

Use

Animals can engage with the antlers for long periods by chewing/gnawing them. They are good source of bioavailable minerals. The chewing/gnawing helps maintain the teeth and helps reduce stress.

Safety & Maintenance

- Ensure that the naturally shed antlers are free of debris
- Inspect regularly for excessive wear or sharp fragments.
- Discard when reduced to a swallowable or hazardous size.
- Ensure compliance with statutory provisions when using animal articles.



Honeycomb feeder



TARGET SPECIES



Small felids,
Primates,
Canids

TARGET BEHAVIOUR



Foraging
Increase feeding
behaviour
Manipulation

CATEGORY



Feeding/Cogniti
ve enrichment

FREQUENCY



1-2x per week

PLACEMENT



Ground or
varied height

Description

Multi-chambered enrichment devices designed to encourage natural foraging behaviours by hiding food in small, accessible, holes or pipes placed to mimic a honeycomb.

Construction

Create a hardwood frame with a plywood base. Cut PVC pipes of varying diameters into equal lengths matching the frame depth, and sand all edges smooth. Arrange the pipes vertically in a tight honeycomb pattern and ensure they sit flush and stable. Fix the pipes securely to the base using non-toxic adhesive.

Use

Deployed during feeding times or midday. Encourages prolonged feeding behaviour, increases mobility, encourages social interaction.

Safety & Maintenance

- Inspect for protruding screws or sharp wood edges.
- Clean and dry regularly to avoid bacterial buildup.
- Suspend at a safe height to avoid injury on hard surfaces.



Foraging trays



TARGET SPECIES



Galliformes

TARGET BEHAVIOUR



Foraging
Dig/Explore
Increase foraging
time

CATEGORY



Feeding
enrichment

FREQUENCY



1-2x per week

PLACEMENT



Ground

Description

Shallow wooden or bamboo trays or cane baskets filled with a mix of grains, dry leaves, chopped greens, and other natural items to promote natural foraging.

Construction

Low raise trays (2–4 inches deep) with smooth inner edges or small cane baskets. Fill with grain, hay, shredded leaves, or chopped vegetables. Natural substrate (sand or soil) may be added to hide small food items.

Use

Placed in sunlit or shaded zones of the enclosure to encourage animals to scratch, pick, sniff, or dig for food.

Safety & Maintenance

- Use smooth, non-toxic wood or bamboo.
- Clean and dry after each use to prevent mould.
- Replace substrate if wet or contaminated.
- Monitor to prevent dominance or crowding.
- Ensure trays do not tip easily or trap limbs.



TARGET SPECIES



Felids,
Primates,
Ursids

TARGET BEHAVIOUR



Exploration
Manipulation
Sensory
stimulation

CATEGORY



Feeding
enrichment

FREQUENCY



1x per week

PLACEMENT



At varied
heights

Description

A dense, ball-shaped knot made from thick cotton rope. The knot can be used as a durable manipulable object and may enclose a bell or ball for sound, or allow small food pieces to be inserted between the weave.

Construction

Use a 1-1.5 m long thick cotton rope. Wrap the rope 3 - 5 times around two fingers to form the first set of loops. Turn the bundle sideways and wrap the rope the same number of times across the loops. Turn again and wrap through the centre in the third direction. Tighten gradually by pulling the rope along its path until the knot forms a compact, firm sphere.

Use

Installed at varied heights in the enclosure to provide prolonged engagement with food material or encourage play behaviour with use of bells in the core for sound. Further can encourage social interaction and mobility.

Safety & Maintenance

- Ensure knots is secure and the cord is not fraying.
- Remove any leftover food regularly and clean and air out after use to prevent mould.



Cargo net feeder



TARGET SPECIES



Select
ungulates,
Elephants

TARGET BEHAVIOUR



Exploration
Manipulation
Prolong feeding
duration

CATEGORY



Feeding
enrichment

FREQUENCY



2-3x per week

PLACEMENT



At varied
heights

Description

A strong hanging net used to hold browse or food items, encouraging prolonged feeding. Animals must reach, pull, and manipulate the food through the openings, promoting natural foraging behaviour.

Construction

Commercially available heavy-duty cargo nets (used for domestic livestock/hoofstock) can be used. Select appropriate size of the opening based on the target species. The net can be hung as a flat panel or gathered into a pouch-style feeder.

Use

Secure the net using strong rope, carabiners, or shackles fixed to stable enclosure structures. Ensure it is positioned at a safe height and cannot detach under pulling force.

Safety & Maintenance

- Monitor regularly for wear and tear, knots coming loose and frayed ropes.
- Clean and air out the feeder regularly to prevent mould



Haul outs



TARGET SPECIES



Aquatic reptiles

TARGET BEHAVIOUR



Thermoregulation

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Ground

Description

A heavy-duty rubber mat is installed along the pond margin to provide secure traction during haul-out for turtles and for crocodilians.

Construction

A textured heavy-duty rubber mat is placed at a designated thermoregulation site, with one end extending over the pond edge. It is anchored into the substrate using treated hardwood pegs at regular intervals, driven fully so peg heads remain flush with ground level. The mat must be firmly tensioned and secured to prevent shifting under animal weight.

Use

The textured surface of the mat reduces slipping when animals move from water to land. The mat also buffers against abrasive or irregular concrete edges, preventing injuries. Haul out mats make predictable access points, improving animal safety and enclosure management.

Safety & Maintenance

- Clean and disinfect regularly to avoid algae build up
- Check the anchoring so that mat does not slip and cause injuries
- Check for wear and tear



Shell scratcher



TARGET SPECIES



Turtles and
Tortoises

TARGET BEHAVIOUR



Shell rubbing
Tactile stimulation
Control of algal
growth

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Ground

Description

A low-mounted horizontal scrub brush fixed securely between wooden posts to allow turtles and tortoises to rub their carapace against the bristles.

Construction

Made using durable wooden poles and stiff natural-fibre coir or synthetic scrub brushes. The brush is mounted horizontally at a height aligned with the tortoise or turtles's shell level, fixed securely using screws or brackets between two upright supports planted firmly in the ground.

Use

Installed permanently or semi-permanently in tortoise/turtle enclosures to provide tactile stimulation. Encourages natural shell scraping behaviour, especially useful during shedding.

Safety & Maintenance

- Ensure brushes are made of nontoxic, durable fibers that won't splinter.
- Check regularly for wear or loose bristles.
- Clean and disinfect periodically to avoid parasite build-up.
- Avoid sharp edges or exposed nails/screws.



Hides/Thermal niches



TARGET SPECIES



Reptiles

TARGET BEHAVIOUR



Resting
Hiding
Thermoregulation

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Ground &
varied heights

Description

Hides and thermal niches create warm, cool, and humid microhabitats within the enclosure, allowing reptiles to regulate body temperature and moisture needs. Together, these zones form a thermal gradient that supports digestion, shedding, and overall physiological stability.

Construction

Provide enclosed hide boxes (hardwood) with a single entrance and removable lid. Place a warm hide near the heat source, a cool hide away from heat, and a humid hide with damp hay or moist hessian. Provide a basking spot using a heat lamp. Use thermohygrometers (probe type) to monitor temperature and humidity gradients.

Use

Reptiles shift between warm, cool, and humid zones to regulate body temperature, avoid overheating, support digestion, and facilitate shedding. Hides also provide security and reduce stress.

Safety & Maintenance

- Replace bedding regularly to prevent mould and waste buildup
- Inspect daily for pests and water seepage
- Clean and dry hides weekly
- Ensure no sharp edges, splinters, or exposed screws
- Check thermohygrometers periodically for functionality and accuracy.
- Ensure heating elements are positioned to prevent heat injury



Feeding platforms



TARGET SPECIES



Psittacines, and other birds that feed off-ground

TARGET BEHAVIOUR



Feeding
Rodent-free feeding station

CATEGORY



Structural enrichment

FREQUENCY



Permanent fixture

PLACEMENT



Above ground, not below perch, covered area

Description

A wall-mounted feeding platform designed to provide stable access to food and water while preventing bowl tipping and rodent access.

Construction

Construct a rectangular plywood platform (12–15 inches projection) fitted within a metal L-angle frame and securely fixed to the enclosure wall. Cut circular openings to hold stainless-steel bowls snugly, with retaining rings or clamps to prevent flipping. Ensure the unit is firmly anchored and stable. Provide a stable landing perch at the front edge for safe access.

Use

Place food and water in fitted bowls. Elevated, fixed placement reduces spillage, discourages contamination, and limits rodent access.

Safety & Maintenance

- Ensure brackets and screws are corrosion-resistant and secure
- Smooth all wood edges and bowl openings
- Use stainless-steel bowls only
- Clean bowls and platform daily
- Inspect regularly for loosened fittings or chewing damage



Elevated browse rack



TARGET SPECIES



Ungulates

TARGET BEHAVIOUR



Browsing
Prolong feeding
time

CATEGORY



Feeding
enrichment

FREQUENCY



Daily

PLACEMENT



Shaded stable
ground

Description

A raised A-frame browse rack designed to hold leafy branches and browse material. The structure allows animals to pull and strip browse gradually, extending feeding duration and encouraging natural browsing behaviour.

Construction

A sturdy wooden A-frame rack with slatted sides and an open top for loading browse. The base may include mesh support to hold browse securely. The structure must be stable and capable of withstanding pushing and pulling by animals. The legs may be wrapped with GI sheet to prevent damage,

Use

Fill with fresh browse branches or fodder bundles. Arrange material to allow gradual extraction through slats. Refill as required and rotate placement to promote enclosure use.

Safety & Maintenance

- Ensure rack is heavy and stable; prevent tipping
- Remove protruding nails, sharp edges, or splinters
- Maintain safe slat spacing to avoid horn/leg entrapment
- Clean regularly and remove leftover browse to prevent mould
- Inspect weekly for structural damage and loosened joints



Tilt feeder



TARGET SPECIES



Small
Canids/Felids

TARGET BEHAVIOUR



Manipulation
Prolonged feeding
time
Problem-solving

CATEGORY



Feeding/Cogniti
ve enrichment

FREQUENCY



2x per week

PLACEMENT



Ground

Description

A pivot-based puzzle feeder that releases dry food gradually when the animal pushes or tilts the device. It encourages repeated interaction and prolongs feeding time.

Construction

Cut a PVC pipe to the required length and seal one end using a cap or folded firehose secured with screws. Drill a pivot hole slightly off-centre in the pipe and a matching hole in a vertical wooden post. Insert a strong metal rod or bolt through the pipe and post to form a smooth tipping axis. Fix the post firmly onto a heavy plywood base to prevent movement during use.

Use

Fill with dry kibble or small treats and place the feeder in the enclosure. The animal must push or manipulate the pipe to tip it and release food intermittently, increasing engagement and reducing rapid feeding.

Safety & Maintenance

- Use only dry food to avoid residue buildup
- Smoothen all edges and drilled holes
- Ensure screws and pivot rod are secure and not protruding
- Clean and dry after each use
- Inspect regularly for cracks, loose fittings, or sharp ends
- Discontinue use if instability or breakage is observed



Teepee hides



TARGET SPECIES



Galliformes

TARGET BEHAVIOUR



Dust bathing
Forage
Retreat/Refuge

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Shaded area,
Ground

Description

Semi-enclosed shelter structures that provide shade, refuge, and a protected area for exploratory foraging.

Construction

Arrange 4 - 6 wooden poles of 3-4in. diameter in a circular pattern, leaning inward, and anchor the bases firmly into the ground. Secure the poles at the top using coir rope. Wrap paddy straw around the frame, leaving entry gaps and partial visual access. Fix the straw using twine or thin coir rope. Place feed trays (on bricks) under the structure with grains, hay, and chopped greens.

Use

Provides a secure refuge zone and encourages natural pecking and foraging behaviour. Helps reduce aggression and feed scattering while promoting enclosure exploration.

Safety & Maintenance

- Ensure the structure is stable and cannot collapse
- Replace straw regularly, especially if damp, to prevent fungal growth
- Remove leftover feed and clean trays routinely
- Monitor for rodent and pest activity
- Shift placement periodically to maintain novelty



Browse feeder



TARGET SPECIES



Giraffe

TARGET BEHAVIOUR



Foraging
Selective feeding
Prolong feeding
time

CATEGORY



Feeding
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Placed at a
comfortable
browsing
height.

Description

A heavy-duty cube-shaped browse feeder designed to hold browse securely and allow gradual extraction. It encourages prolonged feeding and natural browsing behaviour.

Construction

Constructed as a cube using folded stainless-steel mesh (approx. 8–10 inches on each side) and securely fastened for strength. One side functions as an opening lid, secured with ties for loading browse.

Use

Fill with fresh browse/food items and position at browsing height. Rotate placement periodically to encourage enclosure use.

Safety & Maintenance

- Ensure secure fastening and stable placement
- Avoid sharp mesh edges or protruding wire ends
- Remove leftover browse daily
- Inspect regularly for damage, rust, or loose ties



Nest box



TARGET SPECIES



Giant Squirrel

TARGET BEHAVIOUR



Breeding
Retreat

CATEGORY



Structural
enrichment

FREQUENCY



Permanent
fixture

PLACEMENT



Elevated
position within
enclosure

Description

A wooden nest box providing a secure resting and nesting space. Designed to simulate natural tree cavities and support resting and breeding behaviour.

Construction

Constructed from durable, untreated hardwood (approx. 20 × 20 inches, 24 inches high). The base is drilled with small drainage holes. A front entrance with a small sitting ledge is provided, along with side ventilation gaps (2–4 inches). The top panel allows keeper access for inspection and maintenance. The box must be securely fixed at height and stable.

Use

Installed in a quiet, elevated area of the enclosure to provide refuge and nesting space. Bedding material (dry leaves or hay) may be provided.

Safety & Maintenance

- Ensure secure mounting at height
- Avoid sharp edges, exposed screws, or splinters
- Replace bedding periodically
- Inspect regularly for moisture, pest infestation, or structural damage



Choosing the right interventions



While the enrichment toolkit provides a standard library of interventions, effective implementation requires species- and section-specific application. Different taxa vary in their feeding strategies, enclosure use, activity cycles, locomotor patterns, and sensitivity to disturbance. For this reason, interventions must be selected based on biological relevance and practical suitability for each animal group.

This section provides general guidance for applying the toolkit interventions across major taxonomic groups housed at Bannerughatta Biological Park. It is intended to assist keepers and section staff in selecting appropriate interventions, ensuring safe deployment, and maintaining variety through rotation.

Carnivores (Felids, Hyaenids, Canids)

Carnivores require interventions that promote active feeding effort, scent investigation, and environmental exploration. Feeding-based enrichment and olfactory stimulation are particularly effective. Structural interventions such as elevated platforms, shaded resting zones, and privacy screens also support welfare by increasing enclosure complexity and allowing animals to regulate exposure and resting comfort. Recommended interventions include hanging meat feeders, carcass feeding, scent trails, varied feeding locations, and improved resting platforms.

Primates and Omnivores (Ursids)

These species require interventions that encourage climbing, manipulation, foraging, and cognitive engagement. Enclosures should provide sufficient vertical complexity and multiple resting and retreat options. Puzzle feeders, suspended food devices, and scattered feeding are effective tools to increase feeding duration and reduce inactivity. Recommended interventions include puzzle feeders, scatter feeding, climbing structures, and structural modifications to increase positional choice.



Ungulates and Rodents

These species require continuous feeding opportunity, movement across the enclosure, and access to shade and resting comfort. Browse-based enrichment, feeding racks, substrate variation, and multiple feeding points help encourage natural grazing and browsing behaviour while reducing crowding and competition.

Recommended interventions include browse racks, feeding rotation, scatter feeding, substrate enrichment, and shade improvement.

Birds

Bird welfare is strongly influenced by perch quality, perch variety, nesting provision, bathing opportunities, and feeding distribution. Interventions should promote natural perching, preening, foraging, and flight-related movement where enclosure design permits.

Recommended interventions include varied perch installation, suspended feeding devices, bathing pans, and scatter feed in safe substrate areas.

Reptiles

Reptiles require interventions that support thermoregulation, hiding behaviour, substrate interaction, and enclosure zoning. Improvements in basking sites, shaded retreat areas, and substrate variety are often more important than novelty objects.

Recommended interventions include basking platform upgrades, hide provision, substrate enhancement, and improved enclosure microclimate management.

Monitoring

Monitoring is essential to ensure that enrichment and husbandry interventions are effective, safe, and consistently implemented. Simple record-keeping helps identify which interventions work well, which require modification, and which should be discontinued. Monitoring should focus on observable animal response and practical safety outcomes.



What was provided?

- Item name/Category
- Enclosure
- Date & Time



Animal response

- Used/not used
- Duration of engagement
- Behaviour



Risks/Issues

- Aggression/conflict
- Damage to item
- Injury/Ingestion risk
- Hygiene concern



Action taken

- Modified
- Removed
- Repeated
- Discontinued

Daily

Keeper notes



Weekly

Section review



Monthly

Rotations/updates

Monitoring templates



Each section should maintain a simple monthly enrichment plan, ensuring variation in intervention type and preventing repeated use of the same items. Rotation should ensure that interventions alternate between feeding-based, structural, sensory, and substrate-based enrichment, depending on taxon requirements. Feeding enrichment should be rotated carefully to avoid dependency or excessive reliance on novelty feeding methods.

A practical enrichment plan should define:

- intervention type and schedule
- enclosure location for deployment
- responsible staff member
- monitoring method and frequency
- replacement and maintenance requirements

Periodic review meetings are recommended to ensure continuity, address operational challenges, and share successful interventions across sections.

Daily enrichment log					
Date	Enclosure/species	Item used	Response (Y/N)	Duration	Notes/Concerns

Weekly review sheet				
Week	Items implemented	Effective items	Issues observed	Action required

Safety notes				
Date	Item	Issue observed	Action taken	Follow-up needed

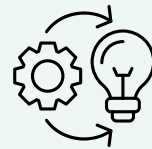
Key rule: Any item causing injury risk, aggression, entanglement, or ingestion hazard must be removed immediately.

Roles & Responsibilities



Zookeepers

- *deploy enrichment items*
- *maintain hygiene and cleanliness*
- *observe animal response*
- *record notes and report concerns*



Biologists

- *plan enrichment schedule and rotation*
- *guide item selection*
- *review monitoring records*
- *recommend modifications*



Veterinary Staff

- *provide inputs on health and safety risks*
- *provide veterinary concurrence (as required)*
- *advise on special conditions*
- *support welfare evaluation*



Section in-charge

- *ensure continuity and follow-up*
- *coordinate staff roles*
- *ensure materials availability*
- *monitor implementation consistency*

Safety

All enrichment interventions must be evaluated for safety before deployment. Items must not create risks of entanglement, ingestion, injury, enclosure damage, or increased aggression. Materials used must be animal-safe, durable, and suitable for cleaning.

Food-based enrichment must avoid items that rapidly spoil or leave residues. Where wet or sticky food is unavoidable, items must be cleaned immediately after use.

All items must be removed promptly if damage occurs, if aggression increases, or if the animal shows avoidance or abnormal response.

A simple risk checklist should be used before introducing new enrichment items, and veterinarian/biologist approval should be obtained where required.



Way forward



To sustain the outcomes of the workshop and ensure long-term welfare improvement, the following measures are recommended:

- establish section-wise enrichment calendars and rotation plans
- maintain a central inventory of enrichment materials and tools
- assign responsibility for monitoring and record review at section level
- conduct monthly review meetings involving keepers, biologists, and veterinary staff
- integrate enrichment monitoring into routine husbandry practices
- encourage keeper-led innovation while ensuring safety review and documentation
- conduct periodic refresher training to reinforce best practices

Long-term welfare improvement depends on consistency, observation, and continuous refinement. By treating husbandry interventions as routine management tools, Bannerughatta Biological Park can strengthen animal care standards and ensure sustainable welfare gains.



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