

Designing an enclosure

Aims

An enclosure must

- provide a suitable habitat for the animal to thrive and express as much of its natural behavioural repertoire as possible
- provide a safe working environment for the keeper
- be an attractive and educational exhibit for the visitor

Animals

need to consider the animal's natural habitat

temperature, humidity, day length, structure (trees, rocks, open areas, water etc)

behaviour and ecology - what is the animal designed to do and how it lives

social group - do they live alone or in groups

how active are they – when are they active

how and where do they feed

water quality/composition for aquatic species

size isn't everything – not amount of space that is important but what can be done with it

The size of a territory usually depends on the area required to obtain all the necessary resources, food, nest sites, etc. Just because animals have to roam over wide areas in the wild need not necessarily mean that they need vast amounts of space in captivity, eg. some lemurs spend their entire lives in a small number of trees.

Care of animals

When we take animals into captivity we are responsible for all their needs. We must provide:-

- food, water, shelter, health care, mates

According to species other factors include:-

- refuges – animals may need access to an area away from other animals and visitors
- visual barriers – dividers – eg. rocks, foliage – keeps out of sight/eye contact
- dens, cubbing dens, nest boxes etc. - or areas away from other animals
- safe working environment – cleaning and servicing must be safe for staff
- isolation areas for veterinary/ other access

Visitors

Visitors come to see the animals. However, they must be kept safe from the animals and vice versa.

Barriers come in different forms and some of the advantages and disadvantages are given below:-

glass not always recognised as a barrier by the animals e.g. some reptiles, birds
can invade personal space (get too close for animals comfort) eg apes
gives a good view

moats, ha-has, pits

- not good if space is a limiting factor
- looking down on animals can be a sign of dominance and stressful for the animals
give a clear view and may look naturalistic

water potential hazard for animals/people

gives a good view and can be naturalistic

bars/mesh animals can climb on them and show a clear division of territorial limits

visitors don't like them – perhaps we need to educate them

Naturalistic enclosures

Some enclosures can be made to look like a good approximation to the animal's natural habitat. But we need to be clear who benefits from this. Concrete "trees" may just be another hard surface to the animal but may help the visitor appreciate where the animal lives.

Where possible natural materials should be used such as rocks, trees, bark, sand, water.

Furniture and planting

Also useful are material such as ropes, branches, foliage etc.

Provide refuges, shade, climbing frame, travel routes, enrichment. Check on any potentially poisonous plants.

It is not usually practical to keep grazing animals in grass paddocks all year because of overgrazing, selection of grasses, parasite loads etc.

Environmental enrichment

In the wild many animals spend a great deal of time and energy in search of, catching and eating food.

The captive animal has its meals brought to it, often ready to eat. Activity can be stimulated in various ways such as scatter feeding, unpredictable feeding times, hiding food or just making it more difficult to find, not chopping food so it takes longer to eat, use of browse.

Other means of enrichment can include increasing the complexity of the environment and making as much of the enclosure accessible to the animal as possible (in all 3 dimensions).

Use of different substrates on the floor of the enclosure can provide interest, new smells, places to forage, different textures, items that can be played with, destroyed etc.

Novel objects are often introduced to stimulate a range of behaviours. The behavioural repertoire of the animal should be considered when designing an enclosure to make it as enriching as possible. If left too long objects cease to be novel.

Other means of enrichment can include puzzle feeders, ice blocks with food, etc.

For some social species having others individuals to interact with can be the very stimulating.

Enrichment should be an integral part of animal husbandry – not something that gets added in from time to time.

Building materials

Material must be:- strong and safe
non-toxic
cleanable and disposable – pathogens and parasite must be minimised
ecological sound – they should be from sustainable or renewable resources. Energy used both to build and to maintain an enclosure should be considered as well as how long the enclosure will last.

Designing an enclosure

In an ideal situation we would start with the animal and consider where it comes from and how it lives and design an enclosure from that basis. We must include access for keepers, veterinary care, isolation for moving. May need to consider quarantine and introduction areas.

In the real world there are a number of constraints on enclosure design and building:-

space – what area has been allocated for the enclosure

existing buildings – we may have to modify existing buildings rather than build from scratch

planners, regulations etc – enclosures have to conform to planning, building, fire, health and safety, zoo licensing and conservation regulations

money – must work within the set budget – it could always be better with more money

current knowledge of husbandry – as we learn more about keeping animals in captivity we can

make improvements. The best practice now may change as our understanding of the animal and its biology increases. Zoos learn from each other and exchange ideas.