

## STANDARD OPERATING PROCEDURE

### ENVIRONMENTAL ENRICHMENT FOR LIZARDS USED IN RESEARCH AND TEACHING

#### 1.0 PURPOSE:

- 1.1 This standard operating procedure (SOP) describes the methods for environmental enrichment of lizards (*Lacertilia*) used for research and teaching purposes.
- 1.2 These methods are intended to improve the well-being of these animals by increasing species-specific behaviors and reducing maladaptive behaviors.
- 1.3 This SOP is part of the UGA Environmental Enrichment Program that fully complies with the requirements of the National Research Council, *Guide for the Care and Use of Laboratory Animal*, ed8 available at <http://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf> and the Animal Welfare Act and Regulations: Public Law 99-198 – The Improved Standards for Laboratory Animal Act available at <http://www.nal.usda.gov/awic/legislat/awa.htm> .

#### 2.0 STANDARDS:

##### 2.1 Natural Behavior:

Lizards are a widespread group of squamate reptiles with more than 5600 species. (Reptile Database, 2012) They live on all continents of the world, with the exception of Antarctica and some oceanic island chains. Lizards are very similar to snakes, often having overlapping scales. However, lizards often have feet and external ears, which snakes lack. Many lizards are capable of detaching their tail to avoid capture by predators. They have particularly well developed eye site and often communicate with body language or bright colors. Some, such as the anole lizard, change body color to regulate body temperature. They also communicate through olfactory pheromones. Most lizards require sunlight or access to UVA and UVB rays typical of the sun. They also require humidity to aid in the sloughing of their skin. Most lizards are highly social communal species and do best when harem housed. Males will often fight if paired. Lizards eat a variety of plants and insects, depending on their natural habitat. Some species may even consume small animals. Due to their natural diversity, nutritional requirements should be considered based upon the species. Lizards are proficient climbers.

##### 2.2 Environmental enrichment must be evaluated by taking into account the following:

- 2.2.1 The Natural Behavior and needs of lizards (see above)
- 2.2.2 Social Enrichment – Housing of compatible co specific offers a high level of enrichment. Every effort will be made socially house social species. If social housing is not possible, animals should be housed in a manner that allows for as much tactile, auditory, visual or olfactory contact as possible. Social housing is a recognized and important part of the Environment Enrichment Program but should not be viewed as the sole means of meeting the enrichment needs of animals.
- 2.2.3 Physical Enrichment (devices, toys, etc) – Physical enrichment can be an important part of the Environmental Enrichment Program. However the selection of physical enrichment should take into account the safety of the device, its ability to stimulate and maintain the animal's interest and its impact on the research being conducted. Physical enrichment should be carefully monitored to assess its

impact of the goals of increasing natural behaviors.

2.2.4 Activity/Food Enrichment – Activity/food enrichment can be an important part of the Environmental Enrichment Program. However, the selection of activity/food enrichment should take into account the health of the animal, the limitations of its confines and its impact on the research being conducted. Any activity/food enrichment should be planned in consultation with the Attending Veterinarian (AV) and the Principal Investigator (PI).

2.3 The enrichment program is carried out by University Research Animal Resources (URAR). Specific needs and requirements should be communicated to the Assistant Director of the Animal Resources (AR) Unit.

2.4 Unless specifically justified by the PI in the Animal Use Proposal (AUP), all animals will receive enrichment. It is recognized that animal enrichment can be a research variable. In caring for the psychological well-being of animals, it is important to recognize limitations and use a balanced approach in providing the best possible care and allowing for the expression of species-typical behavior within a functioning research environment.

2.5 Abnormal Behaviors:

The Environmental Enrichment Program is a dynamic process. Ongoing evaluation is a necessary component to meeting the goal of more species-specific natural behaviors. University Research Animal Resources (URAR) will regularly monitor all enrichment, in part, by looking for stereotypical behaviors that might indicate animal stress or maladaptation to the laboratory environment.

Abnormal behaviors in lizards include:

- Darkened color when not basking
- Anorexia
- Irregular locomotion: walking or swimming
- Skin that doesn't slough

When these behaviors are observed, URAR will evaluate the need for additional environmental enrichment. All changes to enrichment will be approved by the AV and the PI. Enrichment changes will be made for all animals on study, in order to minimize research variability, even if all of the animals are not showing the stereotypical behavior.

### **3.0 PROCEDURES:**

3.1 Social Enrichment – Lizards will be group housed if possible. Lizards that are not group housed will often not thrive in captivity.

3.2 Physical Enrichment- in order of preference

3.2.1 Humid environment with live or artificial plants, regularly misted as appropriate for the species.

3.2.2 Area for basking with access to artificial light emitting UVA and UVB rays.

3.2.3 Climbing structures, such as rocks or sturdy branches for perching

3.2.4 Increased terrarium size

- 3.3 Activity/Food Enrichment- in order of preference
  - 3.3.1 Live prey mixture (e.g. crickets, small locusts, mealworms, wax worms, earthworms, flies, and moths) – include some mobile prey for exercise

#### 4.0 RECORDS:

The Animal Care Staff will log provision of enrichment daily according to their facility specific documentation records.

#### 5.0 DEFINITIONS AND REFERENCES:

##### 5.1 Definitions:

- 5.1.1 Animal Use Proposal (AUP): a detailed written description of the procedures involving the use of animals in a research or instructional project.
- 5.1.2 Attending Veterinarian (AV): the veterinarian responsible for the health and well-being of all laboratory animals used at the institution
- 5.1.3 Enrichment: a method of providing animals with the opportunity to behave as they do in the wild, playing, foraging, grooming, and interacting in other ways with one another.
- 5.1.4 Principal Investigator (PI): the scientist who plans and coordinates all phases of the research or instructional work and the protocol.
- 5.1.5 Standard Operating Procedure (SOP): a set of standardized instructions for dealing with routine laboratory procedures

##### 5.2 References:

Animal Welfare Act and Regulations: Public Law 99-198 – The Improved Standards for Laboratory Animal Act (<http://www.nal.usda.gov/awic/legislat/awa.htm>)

Kaplan, M. (1994) Melissa Kaplan's Harp and Iguana Care Information Collection at <http://www.anapsid.org>

National Research Council, *Guide for the Care and Use of Laboratory Animals*, ed 8 available at <http://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf>

Reptile Database (2013) at [www.reptile-database.org](http://www.reptile-database.org)

Veterinary Care for Birds and Exotics (2013) at <http://www.avianexoticvet.com>