Policy:	SC-35-100
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Title: Husbandry Care of Frogs

I. Purpose:

The purpose of this policy is to outline the minimum standards of care for frogs.

II. Policy:

All units providing animal care for frogs must meet or exceed these minimum requirements based on the ILAR Guide for the Care and Use of Laboratory Animals (*Guide*). Deviations or exceptions must be approved by the Attending Veterinarian and the IACUC.

III. Procedure:

Daily (365 days a year without exception):

- Observe each animal and check for health concerns such as signs of illness, injury, or abnormal behavior (*Guide* pg. 112).
- Ensure adequate feed is available, though depending on the species and life stage this may be done less frequently (*Guide* pg. 65-68, 84-85).
- Ensure adequate potable water is available (*Guide* pg. 65-68, 85).
- Record sick and dead animals, and report them to Campus Veterinary Services (CVS) or designated clinical veterinarian per standard operating procedure.
- Record minimum and maximum temperatures and humidity.
    - Temperature range varies by species and life stage, but general recommendations are 63-75°F (17-24°C) for *X. laevis*, and 75-82°F (24-28°C) for *X. tropicalis.*
    - Humidity range for frogs is species- and life stage-dependent.
- Change any excessively soiled tanks (*Guide* pg. 70, 85-86).
- Clean and organize room, anterooms, and surrounding premises (*Guide* pg. 72, 86-87).
- Record daily completion of each task, initial each task, and date the log.

Weekly (not to exceed 7 days):

- Provide clean tanks for static set-ups (*Guide* pg. 70, 85-86).

    - The use of certain disinfectants may be contraindicated for some aquatic and semi-aquatic species, as residues may be highly deleterious (*Guide* pg. 71, 86).
- For aquatic species, check water quality parameters (*Guide* pg. 78-79).
    - Ranges vary by species and life stage, but *Xenopus* spp. recommendations are 50-200mg/L Alkalinity ($CaCO_3$), 6.5-8.5pH, 500-2000 µS conductivity, > 7.0 mg/L dissolved oxygen, < 0.02 mg/L Ammonia (NH_3), < 1 mg/L Nitrite (NO_2), and < 50 mg/L Nitrate (NO_3)

Biweekly (not to exceed every 14 days):

- Replace a percent of the tank or system water (ex. 10-25%) with conditioned water as determined by ammonia, nitrite, and nitrate levels, pH, and other water quality parameters.
- For filtration system and pumps, clean all filters per manufacturer's instruction.

Monthly (not to exceed every 30 days):

- Disinfect nets, shelves, racks, tank cleaning utensils, scrub brushes, and enrichment devices (*Guide* pg. 84).
    - The use of certain disinfectants may be contraindicated for some aquatic and semi-aquatic species, as residues may be highly deleterious (*Guide* pg. 71, 86).

As needed:

- Disinfect the animal room including walls, floors, and ceilings (if possible) (*Guide* pg. 72, 86).
    - Cleaning agents should be chosen and used with care to ensure there is no secondary contamination of the aquatic and semi-aquatic systems (*Guide* pg. 86).
- Remove and replace worn or damaged equipment from primary enclosures and surrounding facility (*Guide* pg. 72, 86).
- Pelleted feed must be discarded after 6 months of the milling date unless manufacturer guidelines recommend a shorter or longer expiration date (*Guide* pg. 66).
- Clean and sanitize feed storage containers (*Guide* pg. 67).
- Each facility will develop their own best practices with sanitization typically occurring every 6 months or whenever there is a change in species but may vary with facility.

Environmental Enrichment:

- Refer to the Environmental Enrichment policy (SC-30-102).
- Enrichment should elicit species appropriate behaviors and be evaluated for safety and utility. Examples of enrichment for frogs include visual barriers, hides, and shading (*Guide* pg. 83).
- Devices must be checked regularly for wear and discarded when safety hazards are observed.

Facilities:

- Temperature alarms must be installed in all rooms housing frogs (*Guide* pg. 143).
- Facilities housing certain frog species (ex: *Xenopus* spp.) must follow the conditions specified in the University of California, Davis' California Department of Fish and Wildlife Permit to import, transport, and possess Restricted Species for Research. A copy of this permit must be posted on the animal room door.
- Adequate ventilation must be provided for the health and comfort of the animal at all times.
    - A minimum of 10-15 fresh room air exchanges per hour shall be provided in animal housing areas for non-aquatic species (*Guide* pg. 46).
    - Direct exposure of animals to air moving at high velocity (drafts) should be avoided as the speed of air to which animals are exposed affects the rate at which heat and moisture are removed from an animal, which can be particularly problematic for semi-aquatic amphibians that can desiccate (*Guide* pg. 46).
    - For aquatic species, room air exchange rates are governed by thermal and moisture loads (i.e. to minimize condensation that can affect visibility for daily health checks) (*Guide* pg. 80-81, 150-151)
- Floors shall be moisture-resistant, non-absorbent, impact-resistant, and relatively smooth (*Guide* pg. 137, 150). Refer to Physical Plant SOC 50-102.
- All outlets should be rated GFCI (ground faulted conductance interrupted) (*Guide* p.150). Electrical components should be placed away from water and wet surfaces.
- Drains must be guarded with a fine mesh screen to prevent escape of detrimental, restricted or transgenic species. The mesh shall be fine enough to prevent release of viable gametes/embryos or untreated transgenic material.

Housing:

- Whenever possible, frogs should be socially housed in compatible groups (*Guide* pg. 51, 83).
- Housing density is species-dependent, age/size of the animals, life support system, and type of research. Recommend 2 liters of water per frog for adult *Xenopus laevis* (*Guide* pg. 83).