



## Division of Paleontology Integrated Pest Management Procedures

### Prevention

#### A. Containment of collections and collection areas

1. *Building structure.* Areas for or near collections must be inspected for damage (e.g., holes, cracks) and repaired immediately. Drop ceilings should be avoided or eliminated in collection areas because they hide problems and are difficult to monitor. The junction between walls and floors should be sealed – baseboards can shelter pests.
  - conduct a professional building survey
  - repair walls and roofs as necessary
  - block holes in floors, ceilings
  - eliminate inaccessible space in collection areas (e.g., drop ceilings)
  - seal floors
  
2. *Doors and window seals.* Doors should be closed to outside areas to prevent the introduction of pests, either from outside or public areas. All doors in collections or rooms that are potential problems (e.g., live animal room, multiple-person offices) should have door sweeps. Windows in or near collection areas should remain closed at all times. Doors and windows should be inspected frequently and problems, such as with seals and access (e.g., damaged A/C units), corrected.
  - fit door sweeps
  - conduct a professional survey of windows
  - repair/replace damaged A/C units
  
3. *Cabinets.* Cabinets protect collections from light as well as pests. Cabinets should be designed to exclude pests. They should be regularly monitored for faulty seals and maintenance problems. Doors should remain closed at all times except when working on specimens in the cabinet. Specimens in offices and preparation areas should be kept in cabinets when not in use.
  - set standards for cabinet construction (e.g., gaskets, caulking)
  - survey and record cabinet types/numbers
  - eliminate inaccessible spaces within cabinets
  - where possible, raise cabinets 6" from floor

#### B. Environment of collections areas

1. *Temperature and Humidity.* High temperature and relative humidity (RH) promote pest activity. Fluctuations in temperature and RH can also cause damage to collections. The ultimate goal for the division and Museum should be climate control in all collections areas. As a first step, dataloggers should be placed throughout the collection areas to monitor the environment (number per room dependent on size and shape of room).
  - set parameters (65F +/- 5F for collection spaces, RH 50% +/- 5%)
  - survey and overhaul independent A/C units
  - conduct feasibility study to initiate environmental controls
  - comprehensive HVAC as ultimate goal for all collection areas

2. *Cleaning.* Cleaning the cabinets and collection area removes shelter and food for pests. Clutter or trash should not be allowed to accumulate, and packing “peanuts” made of cellulose should be discarded. Collection areas should be cleaned regularly. A major cleaning should be arranged annually in the spring for all spaces in all departments and should include non-collection areas, such as stairways, elevators and landings, emergency egress routes, etc. as a precaution prior to bug season.
  - regular cleaning of all departmental spaces
  - "spring clean"
  - do not allow organic material build-up on surfaces, especially floors
  - remove "clutter" from floors

### C. Contamination

1. *Isolation of collections.* Collection areas should be separate from other department functions, especially offices. Food and drinks should be prohibited in the collection areas. In all other departmental areas (including offices) particular care must be taken concerning food/drink; 1) food containers should not be left open, 2) dropped food should be *cleaned up immediately*, and 3) all food products should be thrown away in designated food disposal points.
  - aim to completely separate office and collections space
  - physically isolate collection spaces
  - do not house new staff or students in collections spaces
  - control eating and drinking in department
    - install designated food disposal points
    - do not place potted plants in collections areas
2. *Accidental introductions.* All dry specimens arriving from outside the department (e.g., new, loan, loan return) should be inspected for signs of pests. Packing materials should be discarded and new specimen trays and conservation-grade padding provided if necessary. Minimize the risk of pests entering the building by keeping windows closed and switching off lights when rooms are not in use. Maintain barriers between pests and specimens by keeping cabinets closed.
  - keep all windows closed at all times
  - do not leave lights on
  - treat all incoming and outgoing specimens
  - provide holding cases for staff, and others as appropriate
  - do not leave cases open

## Monitoring, Deterrence, and Elimination

### A. Collection Area

1. *Trapping.* Insect traps should be placed throughout collection areas and corridors and in other problem areas throughout the Division. If necessary, other traps (e.g., mammal) should also be used. These traps should be inspected and contents noted on a regular basis.
  - conduct regular, systematic trapping
  - record all incidents, set up ID pathway for pests trapped
  - central register of incidents as ultimate goal
2. *Tempo.* If evidence of regular infestation emerges from trapping, the affected collection areas and corridors should be sprayed with a chemical deterrent (e.g. Tempo) approximately every three months. The collections should be thoroughly cleaned before the perimeter of the floor is sprayed.
  - use Tempo in all collections areas and corridors where evidence of infestation is discovered

### B. Collections

1. *Freezing*. Freezing should be used as the main elimination (e.g., control of pest outbreak) procedure.
  - shift towards use of freezing for treatment of all outbreaks
  - make arrangements to use Mammalogy ultra cold freezer whenever possible
  - for large-scale outbreaks: make arrangements to use -20°C freezer walk-in in the VZ osteology lab
  
2. *Naphthalene*. Where recent materials are stored in cabinets, this chemical should be used as a day-to-day deterrent placed directly within the cabinets.
  - use as day-to-day deterrent (ca. 10g/ft<sup>3</sup>)
  - eventual aim: high quality cabinetry will make naphthalene redundant

## **Reporting**

Any sightings of known pests (e.g., cockroaches, dermestid beetles, silverfish, book lice, mice, rats), mold outbreaks, or unusual insects should be reported.