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## **Excerpts from: Emergency Salvage Procedures for Wet Items**

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### **ARCHAEOLOGICAL: GENERAL CONSIDERATIONS**

**Priority:** The actual priority of drying treatment will vary according to the nature of the material and the specific object. In general, organic materials should be moved and treated first (within 24 hours). The order of priority should be: botanical and plant materials; leather and skin; textiles; bone, antler, horn, teeth, shell; non-glazed ceramics; reconstructed glass and ceramics; glazed ceramics and glass; untreated metal; conserved metal and lithics. An essential general priority is the retention of provenance information from the objects or packaging materials associated with the objects.

**Handling Precautions:** Refer to the sheets for specific object materials for actual handling precautions. Many archaeological objects, such as lithic collections, have multiple objects that may be stored in the same box or bag belonging to one provenance. Wrap fragile and/or fragmented artifacts individually to keep the parts together and to help prevent further fragmentation. Each individual artifact may or may not be labeled. When the bags and boxes become wet or damaged in some way, the labeling information on the object or package may become lost during the recovery process. Keep each lot/catalog number of artifacts together if the original packaging container is damaged beyond use. Create a duplicate label with the provenance information on it and place it with the objects. Noting the shelf location would also be helpful before the materials are moved for drying.

**Packing Method:** Varies with the fragility of the material. In general, pack in such a manner so that provenance lots will not get intermixed during unpacking and drying.

#### **Supplies Needed**

soft bristle brushes	clean water	sponges	clean towels	paper
portable dehumidifier	labels	towels or unused newsprint		fans

**Preparation For Drying:** Varies with the specific material, however, in most for cases, archaeological materials will tolerate sponging with clean water or a slightly damp soft bristle brush to remove surface mud.

**Drying Procedure:** Again, make certain that provenance information is kept intact and with the artifacts throughout the drying process. Most artifacts and materials can be dried using fans that are set up so as not to blow directly upon the objects. Excess moisture can be absorbed by sponges, clean towels, paper towels or unused newsprint. Check daily to make certain that mold growth has not occurred. A portable dehumidifier should be set up to slowly bring the relative humidity in the room down to 50%.

### **ARCHAEOLOGICAL: BONE AND SHELL**

**Priority:** These materials are susceptible to water damage if allowed to be wet for extended periods of time. Treat within 48 hours, if possible. Mold growth will occur in packages that contain excess moisture. Handling Shells with powdery surfaces will be readily affected by water, whereas mammalian long bones will be relatively unaffected.

**Handling Precautions** Move items only after a place has been prepared to receive them. Empty bags and boxes of excess water and extraneous debris before moving.

**Packing Methods:** Varies with the fragility of the objects. Wet bone and shells should be kept wet until controlled drying procedures are begun. Pack each object separately on damp absorbent materials such as paper towels, acid-free tissue, etc. Label decorated and objects with fragile surfaces to go to the Objects Conservator for drying and treatment.

#### **Supplies Needed**

clear water	plastic for wrapping	sponges	clean towels	clean paper towels
	fans		labeling supplies	or unused newsprint
	dry blotting materials			

**Preparation For Drying:** Rinse or sponge stable objects with clear water to remove mud and extraneous dirt. Be careful to preserve provenance information, especially where the labels on the objects have been abraded or dissolved off. Keep these objects moist by wrapping in plastic until they can be treated.

**Drying Procedure:** Sponges, clean towels, or unused newsprint may be used to absorb excess moisture. Exchange wet for dry blotting material at least daily until items are dry. Check daily for mold growth. Air dry, using fans to keep air moving without blowing directly on the pieces. Place items on propped up window screens if drying racks are not available. This will allow air to circulate on all sides of the objects. Use portable dehumidifiers to slowly remove moisture from the area and objects. Bring relative humidity down to 50%.

**ARCHAEOLOGICAL: CERAMICS** (earthenware, terra cotta, unglazed stoneware, and sunbaked earth)

**Priority:** Sunbaked earth and terra cotta objects should be dried within 24 hours to prevent loss of surface detail and disintegration. Begin drying within 48 hours to prevent mold growth and softening if objects have been saturated.

**Handling Precautions:** Reconstructed vessels may become unstable at the joins, especially if water permeable adhesives were used (e.g., Elmer's Glueall). Keep pieces together in a plastic bag or box. Be careful to retain provenance information.

**Packing Methods:** Some low-fired ceramic objects may contain soluble salts that will migrate to the surface when the object dries, causing loss of surface detail due to recrystallization and subsequent spalling. Separate those objects and very low-fired ceramics. Keep moist by packing in damp toweling and plastic bags.

**Supplies Needed**

plastic bags or boxes	damp toweling	distilled water
blotting material	soft bristle brushes	portable dehumidifier
fans		

**Preparation For Drying:** Have a place set up where pieces can be laid out for maximum air flow to allow for even drying. Place objects on raised screening to distribute air flow. Salt containing objects may have to be soaked to remove the salts by diffusion into distilled water; consult a Conservator.

**Drying Procedure:** Blotting material can be used to absorb excess moisture. Gently brush off excess mud and dirt if it can easily be distinguished from the object (e.g., in the case of low fired prehistoric material and sunbaked earth). Dry slowly with fans blowing above the surface of the objects. A portable dehumidifier should be set up to slowly bring the relative humidity in the room down to 50%.

**ARCHAEOLOGICAL: METALS**

**Priority:** Unstable (i.e. actively corroding, heavily mineralized, and copper chloride involved objects) should be treated with 48 hours since they can suffer damage from long term exposure to water. Stable and treated artifacts can be dealt with last.

**Handling Precautions:** Move items only after a place has been prepared to receive them.

**Packing Methods:** Water sensitive artifacts, such as copper alloys should be packed with silica gel in individual containers. Metal artifacts with textile or leather remnants and pseudomorphs must be wrapped quickly to retain the moisture. Letting these objects dry out without proper treatment may cause the loss of the pseudomorphic evidence. Previously treated objects (e.g., tannic acid and wax may exhibit "flash" rusting under the wax coating. These objects should be packed with silica gel to stabilize the rust until the wax can be removed and the tannin treatment reapplied. The same is true for artifacts that have been treated and coated with an acrylic resin.

**Supplies Needed**

silica gel	plastic wrapping materials or bags	soft bristle brushes
clear water	blotting material	portable humidifier
fans	heat gun	

**Preparation For Drying:** On most metal artifacts that have become wet, the mud or dirt can be gently removed with clear water and a soft brush. If previously dry, composite objects such as a jackknife with bone handles should be kept moist and taken to a Conservator for treatment or advice.

**Drying Procedure:** Blotting material can be used to absorb excess moisture. Exchange wet for dry blotting material at least once daily until artifacts are dry. Check daily for increased corrosion, shrinkage and fragmentation. Air dry, using fans to keep air moving without blowing directly on the artifacts. Raise items off the floor or work surface on trestles, pallets, or lumber to allow air to circulate underneath the items. Smaller artifacts such as nails can be placed on drying screens. Metal pieces that have not previously been coated with a thermoplastic resin can be dried with moderate heat (90-100 degrees F) in an oven or with a hand held heat gun. Use portable dehumidifiers to slowly remove moisture from the objects and area. Bring the relative humidity down to 50%, although the optimal range for completely metal objects is 30%-35%.

**LEATHER AND RAWHIDE**

**Priority:** Begin drying within 48 hours to prevent mold growth. Leather with the condition known as "red rot," will be irreversibly stiffened and darkened by exposure to water if not treated quickly.

**Handling Precautions:** Wet leather may be fragile; leather with red rot or which is torn will require support to transport safely. Move items only after a place has been prepared to receive them.

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**Packing Method:** Wrap items with freezer paper or plastic sheeting to prevent red-rotted leather from coming in contact with and soiling adjacent items and to keep it from drying before it can be treated. Support complex shaped objects with uninked newsprint or other absorbent material.

### **Supplies Needed**

portable dehumidifier	freezer paper or plastic sheeting	fans
pallets or lumber	sponges, clean towels, paper towels,	
clear water	or unused newsprint	

**Preparation For Drying:** Rinse or sponge with clear water to remove mud or dirt before drying. Be careful in rinsing red rotted or painted/gilded surfaces. Keep red rotted leather damp, if it is still in that condition, until proper consolidation can be done.

**Drying Procedure:** Some leather was intended to be flexible (e.g. much native tanned “buckskin,” harness leather, and some rawhide) and will need to be manipulated during drying in order to retain its flexibility. Other leather was either not intended to flex (e.g. shields, fire buckets) or no longer needs to be flexible and may be padded out and allowed to dry slowly. Sponges, clean towels, paper towels, or uninked newsprint may be used to absorb excess moisture. Pad out to correct shape using uninked newsprint or other absorbent material. Change padding material as it becomes saturated. Air dry, using fans to keep air moving without blowing directly on the pieces. Raise items off the floor on trestles, pallets, lumber, or screens to allow air to circulate on all sides. Use portable dehumidifiers to slowly remove moisture from the area and objects. Bring the relative humidity down to as close to 50% as is practical. Check daily for mold.

## **ORGANICS: BONE, HAIR, HORN, IVORY, SHELL**

**Priority:** Begin drying within 48 hours to prevent mold growth.

**Handling Precautions:** Move items only after a place has been prepared to receive them.

**Packing Method:** Individually wrap or plastic bag objects since these materials tend to split and fragment into small pieces when wet or damp.

### **Supplies Needed**

plastic sheeting or bags	clear water	sponges, clean towels, paper towels,
portable dehumidifier	fans	or unused newsprint
pallets or lumber		

**Preparation For Drying:** Rinse or sponge with clear water to remove mud or dirt before drying.

**Drying Procedure:** Sponges, clean towels, paper towels, or unused newsprint may be used to absorb excess moisture. Air dry slowly, using fans to keep air moving without blowing directly on the pieces. Raise items off the floor on trestles, pallets, or lumber to allow air to circulate underneath the items. Use portable dehumidifiers to slowly remove moisture from the area/objects. Bring relative humidity down to 50%.

## **WOOD**

**Priority:** Begin drying within 48 hours to prevent mold growth. Polychromed objects require immediate attention; notify the Conservator.

**Handling Precautions:** Move items only after a place has been prepared to receive them. Lift from the bottom of an object: tables from the apron; chairs by the seat rails, not by the arms, stretchers, slats, headpiece or crest rails; trunks from the bottom, etc.

**Packing Methods:** Partially wetted objects can be packed with dry blotting materials such as uninked newsprint or acid free blotters to remove as much moisture as possible. Thoroughly wetted, unpainted objects should be wrapped with blotting materials, then wrapped in polyethylene sheeting to retain as much moisture as possible, since fast drying will cause irreversible damage.

### **Supplies Needed**

soft bristle brush	fans	sponges, clean towels, paper towels
wooden spatula	polyethylene sheeting	or uninked newsprint
pallets or lumber	portable dehumidifier	

**Preparation For Drying:** Rinse or sponge with clear water to remove mud or dirt before drying. Be careful not to wipe or scour as grit will damage remaining finish. Use a soft bristle brush to clean carvings and crevices. If mud has dried, dampen with a sponge and remove with a wooden spatula; rinse. Remove wet contents and paper liners from drawers and shelves.

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**Drying Procedure:** Absorb excess moisture with sponges, clean towels, paper towels, or uninked newsprint. Blot, do not wipe, to avoid scratching the surface. Air dry, using fans to keep air moving without blowing directly on the pieces. Tent the objects with polyethylene sheeting to slow the drying. Raise items off the floor on trestles, pallets, or lumber to allow air to circulate on all sides. Open doors and drawers slightly to allow air to circulate inside the items. Use portable dehumidifiers to slowly remove moisture from the area and objects. Drying quickly will cause warping and cracking. Bring relative humidity down to 50-55%.

### **TEXTILES AND CLOTHING**

**Priority:** Dry archaeological textiles and textiles with bleeding dyes as quickly as possible, all other textiles within 48 hours to prevent mold growth.

**Handling Precautions:** Move textiles only after a place has been prepared to receive them. Handle wet textile objects only when necessary and as little as possible because textile materials are weaker when wet and can be easily damaged or torn. Be particularly careful with wet archaeological textiles, which can be extremely weakened by contact with water. It is important to support wet textile objects thoroughly when moving them, either on a solid support or in a sling made from a length of fabric, because the added weight of the water increases the possibility of damage. Wet hanging costumes should be carried on a sling and not re-hung. Be sure that all identifying information, such as accession number tags, is retained with the objects, and label any parts that become detached. If it is possible to do so without excessive handling, remove all wet packing materials such as cardboard and tissue from contact with the textiles. Do not unfold or spread out wet textiles at this time, and do not stack wet textiles on top of each other. Textile objects often have associated non-textile materials such as metal and leather. See the salvage instruction sheets for these materials, keeping in mind that the textile component will probably be the most vulnerable.

**Preparation for Drying:** A large area is needed to dry wet textiles, as they cannot be placed on top of each other. Floor space can be used; if possible, clean floors before using the space. Table and floor surfaces should be covered with clean polyethylene sheeting, and then with clean blotters or other absorbent material. Fans can be used to increase air circulation and speed drying; place them so that air flow goes across the surface of the textiles for optimal drying.

#### **Supplies Needed**

polyethylene sheeting	blotters	cheesecloth
terry cloth toweling	sponges	muslin or boards for carrying

**Drying Procedures:** Quick drying is essential for best recovery of wet textile objects. Excess water can be removed from very wet textiles in good condition by gentle blotting with sponges. Absorbent materials such as blotters or terry cloth toweling should then be placed on top of the objects, removed when saturated, and replaced with dry ones. When the textiles have dried to an appreciable level, they can be gently handled to open out folds and expose new areas to the air. Costumes can be padded out slightly with acid-free tissue, polyester batting, or nylon tulle to speed drying and prevent creasing. Textiles with bleeding dyes should be dried first and as quickly as possible; use absorbent materials to remove as much water as possible. Concentrate drying activity on the areas that are bleeding so that they will dry before the surrounding areas; hair driers on low heat can be used. Cover the textile with cheesecloth and be sure the cheesecloth is in close contact with the textile; leave the cheesecloth undisturbed until the textile is completely dry.

### **TEXTILES: COSTUME ACCESSORIES**

**Priority:** Begin drying within 48 hours to prevent mold growth.

**Handling Precautions:** Support all accessories when moving them; use a solid support. Keep handling to minimum as these complex objects can be greatly weakened by water.

**Preparation for Drying:** Prepare the room and surfaces for drying as for textiles and clothing.

#### **Supplies Needed**

polyethylene sheeting	blotters	cheesecloth
terry cloth toweling	sponges	muslin or boards for carrying

**Drying Procedures:** Do not attempt to open fans or parasols, and do not reshape hats while wet. Gently blot water from the objects with sponges, blotter, terry cloth toweling, or paper towels. As hats dry, they can be gently reshaped and padded with acid-free tissue or polyester batting for drying. Shoes and gloves should be treated as for leather historical objects; in general gloves do not need to be padded out for drying. Fans and parasols should be dried as is; do not attempt to open or reshape them. If any of the objects have bleeding dyes, follow the procedure outlined under Textiles and Clothing.