

## GENERAL NOTES

**A Technique for Making Least Tern Decoys.**—The implementation of plans for the population recovery of the endangered California Least Tern, *Sterna antillarum browni*, requires the protection and management of nesting areas in California. Successfully used Least Tern nesting areas are typically near coastal wetlands, lagoons, or embayments and can be characterized by sparse vegetation, light-colored, sandy substrate, and low levels of intrusion by humans, vehicles, feral and domestic mammals, and avian predators. Intense, competing human interests in the California coastal zone preclude the protection of large areas exclusively for the California Least Tern.

Decoys are used as a nest site management tool to increase the likelihood that the birds will be attracted to, and nest within the relatively small, protected, nesting areas rather than attempting to nest in physically suitable but more vulnerable locations. Though the actual attractive value of California Least Tern decoys is not rigorously established, observations of courtship displays directed at decoys, plus, roosting and nesting associations in the vicinity of decoys, indicate that decoys "attract" Least Terns (Barbara Massey and Jon Atwood, pers. comm.).

The deployment of decoys at managed nesting areas has largely followed the intuitive sense of the field worker regarding numbers, directional orientation, grouping, and spacing, such that the array appeared similar to an actual nesting colony. The importance of any of these parameters of decoy array has not been examined for the California Least Tern.

Various methods for constructing large numbers of Least Tern decoys have been explored. For example, while the papier-mâché technique is simple and the materials are inexpensive, papier-mâché decoys are not very durable. Carving wooden decoys is technically more difficult and very inefficient for producing large numbers of decoys. One technically simple and relatively economical decoy construction technique, involving a model-mold-casting sequence, is described below.

A single model in the form and size of a standing adult Least Tern must first be carved from suitable soft wood. The belly of the model should be relatively flat so that it will sit upright on a flat surface. In shaping the model, the goal should be to achieve proper proportion. Fine detail is not essential. Other previously constructed decoys can serve as the model for making molds, too.

The model should then be fixed to a piece of cardboard by pushing a tack through the cardboard into the flattened belly of the model. Liquid latex rubber, available in hobby/craft stores, is painted liberally over all surfaces of the model and onto the supporting cardboard. The liquid latex will dry to a thin, stretchy film. This painting and drying must be repeated until the rubber is 2–3 mm thick over all of the model, and forms a flange around the belly of the model. This thick rubber coating, once removed from the model and with the belly open, becomes the mold from which many castings can be made.

The mold's durability is improved by further thickening the areas which are most stretched and stressed during removal from the solidified casting, such as along the flange and breast at the front of the mold. This part of the mold must be stretched over the beak of the hardened casting. Stress at this point can be reduced if the head of the model is at a right angle to the body. Also, the filler hole of the mold, which is the belly region of the model, should be large enough to allow the extraction of the casting from within the mold by slipping the mold off, first over the head, then the tail. Our mold was about 20 cm long from beak to tail and the oval filler hole, anteriorly placed along the bird's belly, was about 8 cm long and as wide as the model (Fig. 1). If construction of many decoys is planned, several such molds should be made from the model.

Castings can be made from many types of materials which begin as powders or liquids and harden into a durable and paintable form, such as plaster of paris, epoxy resins,

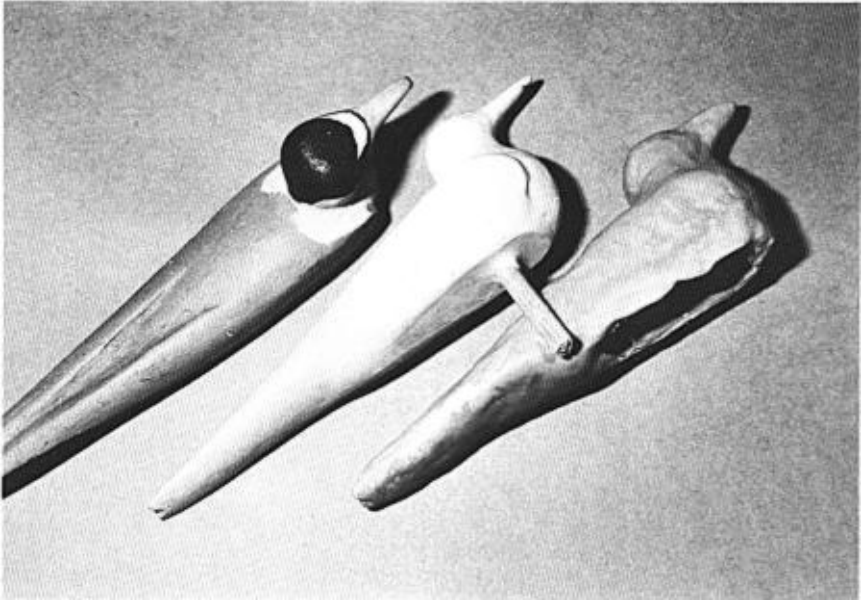


FIGURE 1. The hardened decoy casting (center) is removed from the rubber mold (right) and painted to resemble a Least Tern (left).

cement, plastic wood, and water putty. For reasons of cost, availability, and ease of finishing and painting, "water putty" was chosen. This material is readily available in hardware stores, in particular, and is used by carpenters and wood workers for filling and shaping wood. It is sold in powder form, is mixed with water to form the desired fluid or paste consistency, hardens to water insoluble form in less than 2 h, and is sanded, carved, and painted just as wood. Also, damaged or broken decoys made from "water putty" are easily glued, repaired, and repainted. (Of several brands used, "Durham's Water Putty" manufactured by the Donald Durham Company of Des Moines, Iowa, proved well suited for this method.)

Castings are made by mixing the water putty powder with water until a very thick fluid, much like cake batter, is achieved. This batter is poured into the inverted rubber mold through the filler hole and allowed to harden. The mold must be properly supported during this phase or the weight of the batter may deform the mold and resultant casting. Small bean bags, or the like, are suitable for this support. Great care must be taken when the batter is first poured into the mold to avoid retention of small bubbles, particularly in the beak, as they will flaw the appearance and weaken the structure of the decoy.

Two optional structural features may be added after the batter is poured into the mold, but before it has hardened. First, a standard #1 paper clip, unbent at its middle bend, may be inserted inside the casting's head so that the wire extends into the beak. This provides reinforcement to a vulnerable section of the decoy and also later facilitates repairs should the beak be broken. Second, a peg or large nail may be inserted in the filler hole, so that upon hardening, the decoy has a "leg." This "leg" provides support when shoved into soft sand, thus reducing the likelihood of the decoy being blown or knocked over. However, if ambient moisture is expected at the nest site, wooden dowels should not be used since they absorb water, swell, and may split the decoy. The leg incidentally provides a convenient grip while the casting is being painted.

Following the hardening of the batter and removal of the casting from the mold, the unpainted decoy may be sanded, carved, or otherwise shaped as necessary. The decoy is then hand painted to the general appearance of an adult tern. Excessive detail is apparently unnecessary, as well as inefficient to achieve. However, the minimum level of detail is unknown. Flat finish acrylic artist's paints are suggested. A final coating of a clear, flat finish sealer offers additional protection from weathering.

In 1982, the cost of materials came to less than \$.50 per decoy. This technique is also appropriate for the manufacture of decoys for larger birds, but at higher cost due to the larger rubber mold and greater casting volume necessary.—JACK M. FANCHER, *Fish and Wildlife Service, 24000 Avila Rd., Laguna Niguel, California 92677*. Received 4 Apr. 1983; accepted 24 Jan. 1984.

**Cayenne × Sandwich Terns Nesting in Virgin Islands, Greater Antilles.**—Recent sightings of Cayenne Terns (*Sterna sandvicensis eurygnatha*) on the Puerto Rico Bank (Heilbrun et al. 1981; Norton 1981, 1982, 1983) stimulated speculation on attempted breeding with Sandwich Terns (*S. s. acuftavida*) which nest locally from Culebra, Puerto Rico, to Anegada, British Virgin Islands (Fig. 1). The two forms are nearly identical in appearance except the Cayenne Tern typically has a straw-yellow bill and the Sandwich Tern has a black bill tipped with yellow.

Sandwich Terns have been expanding their range southeasterly through the Caribbean (Table 1) since the 1960's, albeit unnoticed until the 1970's. The Cayenne's range

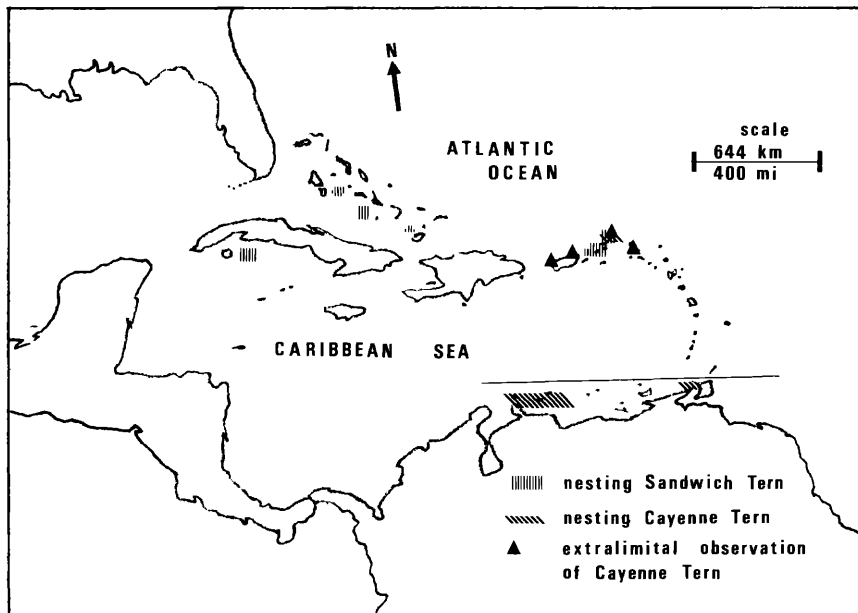


FIGURE 1. Map of the Bahamas and the Caribbean Basin showing normal breeding ranges of Sandwich Terns (above line), Cayenne Terns (below line), and extra-limital sites of breeding and non-breeding Cayenne Terns in the area of the Virgin Islands, Greater Antilles.