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A TUNNEL FOR HIDDEN ACCESS TO BLINDS AT HIGH LATITUDE SEABIRD COLONIES

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Abstract.—We describe a tunnel made with wooden supports connected by ropes and covered with light, but waterproof material. Unlike previous designs this tunnel's flexibility allows it to be used on uneven terrain.

UN NUEVO TIPO DE TÚNEL DE ACCESO A PARANZAS PARA AVES MARINAS

Sinopsis.—En este trabajo se describe un nuevo tipo de túnel de acceso a escondites de observación (paranzas). El mismo tiene un esqueleto de madera, unido con sogas y cubierto con material liviano resistente al agua. Contrario a otros túneles, la flexibilidad de este permite su uso en terreno accidentado.

In recent years, seabird researchers have become more aware that their presence in breeding colonies can adversely affect birds' reproductive performance (Fetterolf 1983, Pierce and Simons 1986, Safina and Burger 1983). Investigator disturbance in observational studies can be reduced by reaching blinds through access tunnels (e.g., Munro and Bédard 1977). We here report field-tests of two tunnel designs: one proposed by Shugart et al. (1981), and an original design. We pay particular attention to suitability of tunnels to rough terrain and strong winds, circumstances that are common in high latitude seabird colonies.

The Shugart et al. (1981) tunnel consists of 4 or 6 mil (0.1 or 0.15 mm) plastic sheets stretched over steel hoops spaced 3.1 m apart. The plastic is sandwiched between wooden strips that provide support between hoops. Our alternate design (Figs. 1 and 2) uses ropes and wooden frames to support a covering of Fabrene, a woven plastic material supplied by a local tarpaulin shop. This material weighs 175 g/m^2 and is sold in 1.5 and 3.0 m widths. Polypropylene ropes (8 mm) were sewn in channels in Fabrene sheets (Fig. 2), using a household sewing machine with polyester thread. Channels ended about 30 cm from the frames to allow the ropes to be tied to the frames. The tunnel was assembled by placing a length of Fabrene with sewn-in ropes over a series of upright inner frames (Fig. 1) spaced 2.5 m apart, and then screwing exterior wooden slats over the Fabrene to secure it to the inner frame (Fig. 1). A top exterior slat was fastened with screws driven upward through the top member of the inner frame.

We erected the Shugart et al. (1981) tunnel at Pitsulak City (62°22′N, 78°08′W), a small island in northeastern Hudson Bay where we studied Black Guillemot (*Cepphus grylle*) feeding ecology. Because the island's rocky substrate prevented hoops from being driven into the ground as Shugart et al. (1981) suggested, we bent the bases of hoops outward and

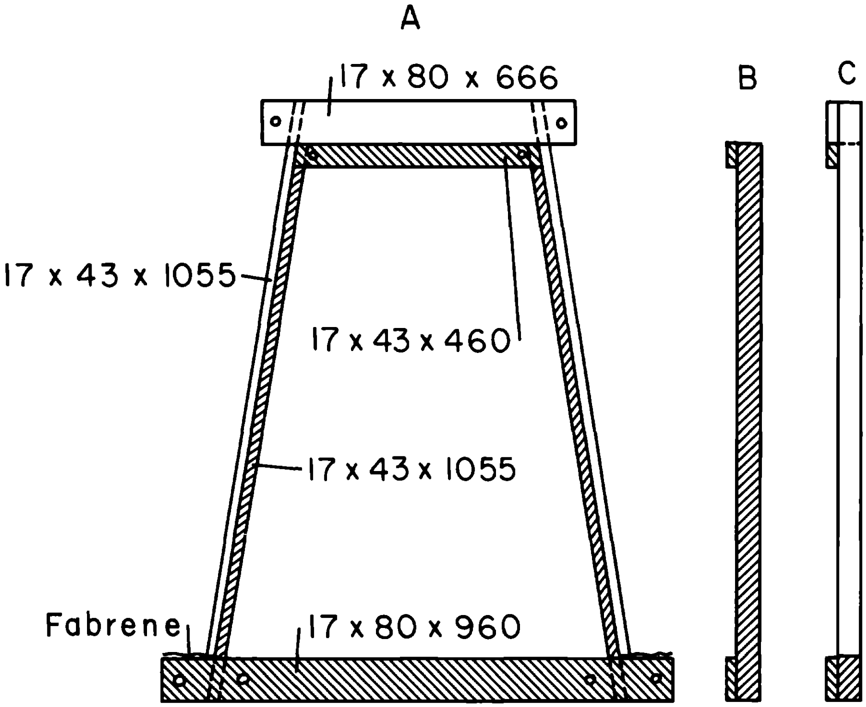

FIGURE 1. Front and side views of wooden frame for access tunnel. All dimensions are in mm. Inner frame members indicated by hatching. B shows side view of inner frame only; C shows side view of fully assembled frame.

anchored the tunnel by piling rocks on the hoop-ends and by tying the tunnel to large boulders. The wood and Fabrene tunnel was erected on a rocky seaward slope adjacent to the mainland Northern Gannet (*Sula bassanus*) colony at Cape St. Mary's, Newfoundland (46°50′N, 54°12′W).

Two problems were encountered with the Shugart et al. (1981) tunnel that would reduce the utility of this design for most northern seabird colonies. Because the steel hoops are connected by wooden strips, the tunnel forms a rigid three-dimensional structure that does not sit flat on irregular terrain. This difficulty could only be partly overcome by changing the attachment points of the strips at the hoops. The second problem was that the plastic cover tore. This was exacerbated by the difficulty in adapting the tunnel to the irregular substrate, because adjusting the position of the wooden strips often stressed the plastic at specific points which ripped in winds above 40 km/h. About 50% of plastic panels were extensively damaged by wind during each of two field seasons (June–August 1982 and 1983).

Because it lacked rigid connections between frames, the wood and Fabrene tunnel was easy to set up on the rough terrain at Cape St.

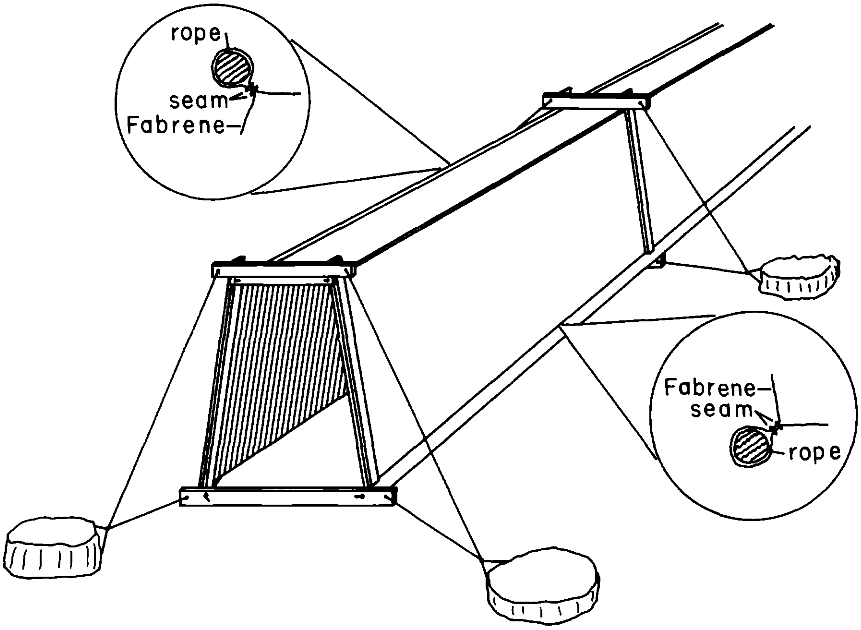

FIGURE 2. Wood and Fabrene tunnel, showing cross-sections of rope channels that run between frames.

Mary's. We erected it by setting frames in an upright position, guying them to large rocks, and then tightening the ropes between frames. The tunnel was erected on 31 May 1985. Exterior ropes were tightened on 16 June, but the tunnel received no other maintenance until it was dismantled on 23 November. Although winds often exceeded 60 km/h during this period, the tunnel sustained no damage other than a small hole caused by the Fabrene rubbing against a boulder. The tunnel led to a blind adjacent to the colony, and the gannets appeared to be unaware of traffic through the tunnel to and from the blind.

The wood and Fabrene tunnel here described is suited to rugged and exposed terrain, and offers a practical solution to the need to reduce investigator disturbance in observational studies of seabirds at high latitudes. The design is particularly appropriate for very sensitive colonies where disturbance is not permissible during the breeding season, since the tunnel can be erected before egg-laying and needs no further attention until it is dismantled after the breeding season.

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