The foldable "Ottenby" walk-in trap: a handy and efficient wader trap for expedition conditions

ÅKE LINDSTRÖM[1], MARCEL KLAASSEN[2] & RICHARD LANCTOT[3]

[1]*Department of Ecology, Animal Ecology, Lund University, Ecology Building, S-22362 Lund, Sweden*
Ake.Lindstrom@zooekol.lu.se
[2]*Centre for Limnology, Netherlands Institute of Ecology (NIOO-KNAW), PO Box 1299, 3600 BG Maarssen, the Netherlands*
[3]*U.S. Fish and Wildlife Service, Migratory Bird Management, 1011 East Tudor Road, MS 201, Anchorage, AK 99503, USA*

Lindström, Å., Klaassen, M. & Lanctot, R. 2005. The foldable "Ottenby" walk-in trap: a handy and efficient wader trap for expedition conditions. *Wader Study Group Bull.* 107: 50–53.

Keywords: shorebird, walk-in trap, catching methods, ringing, banding

We describe the history, construction, and use of a portable walk-in wader trap (i.e., modified Ottenby trap) designed to be used in field expedition conditions. It is rectangular-shaped, 120 × 41 × 32 cm when operational, weighs between 1.5 and 2 kg (depending on materials used) and can be folded flat for easy transportation. It consists of several metal frames filled with fishing net, and has a netted roof attached by an elastic chord. Traps are placed either singly or in groups, with the optimal trapping situation occurring when birds are *feeding* along some kind of *leading line* such as the edge of a estuary, lake, or other water body. The trap is highly efficient for waders up to around 100 g, but is also suitable for ground-feeding passerines.

INTRODUCTION

A wide variety of methods have been used to capture waders (Bub 1991, Stroud & Davidson 2003). Adults are frequently caught in cannon-nets and multi-shelf mist nets at estuarine areas during migration and heart-shaped cages, clap nets, and trap-door traps at nest sites during breeding. The method of choice is typically dependent on the environmental and logistical conditions present. Despite the wide number of available trapping techniques, unique conditions frequently demand new methods to be developed (Tulp & Schekkermann 2001).

The "Ottenby" trap is a walk-in trap designed to capture feeding birds during migration (Lessells & Leslie 1977, Bub 1991). In this paper we describe a modified version of the Ottenby trap that is light-weight, compact, and as such, works exceptionally well in field expedition conditions. It has proven to be very practical to use and also highly successful in catching waders.

HISTORY

At Ottenby Bird Observatory in south-east Sweden, thousands of migrating waders on stopover are trapped yearly in walk-in traps on the non-tidal shores of the Baltic Sea (e.g. Blomqvist *et al.* 2002). The trap type used has changed little over the years. The trap used since the mid 1970s is described by Lessels and Leslie (1977, p. 18) and Bub (1991, p. 69), and is based on the same principal as the small round walk-in trap used to trap waders on their nests, familiar to many waderologists. However, the Ottenby-trap has a rectangular shape, has two openings and is normally used by placing several traps together in unique configurations (see more below). The Ottenby trap has proven to be very successful at catching waders. With the 100 traps normally used at Ottenby, hundreds of waders are regularly trapped in a day, with a recent daily record of 1,117 birds, 1,054 which were Dunlin *Calidris alpina alpina*.

To trap migrating waders with Ottenby traps during the ship-borne Swedish-Russian Tundra Ecology expedition of 1994 (Grönlund & Melander 1995, Lindström 1998), we modified the original trap design to make them foldable and less bulky. The traps had to be compact so as to fit into the helicopters used for transporting people and supplies from the boats to the shore. They also had to be easy to carry around to allow opportunistic trapping during our short stops. Forty new foldable traps were brought on the expedition. Around 300 waders were trapped during eight two-day stops along the arctic coast of Eurasia in August 1994. The most successful event was when E. Lappo, V.I. Pavlenko and E.E. Syroechkovski Jr. trapped 55 Little Stints in a single trap over a period of two days.

For the 1999 Swedish-Canadian expedition "Tundra Northwest 1999" that visited arctic Canada (Grönlund 2000), we constructed another 40 foldable traps, but again modified the trap design to include soft netting on the sides of the traps instead of metal chicken net used previously. More than two hundred waders of twelve species were trapped during the expedition, including mainly White-rumped Sandpipers *Calidris fuscicollis*, Semipalmated Sandpipers *C. pusilla*, and Baird's Sandpipers *C. bairdii*, Lindström *et al.* 2002). The same trap design has also been used very successfully in the littoral areas of the Yukon-Kuskokwim Delta and Point Barrow, Alaska, in August and September of 2004 to trap mainly Sharp-tailed Sandpipers *C. acuminata*, Western Sandpipers *C. mauri*, Dunlin *C. alpina articola* and Red

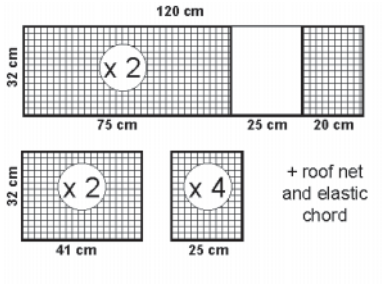

Fig. 1. The number, size and shape of the main parts needed to construct a foldable Ottenby trap.

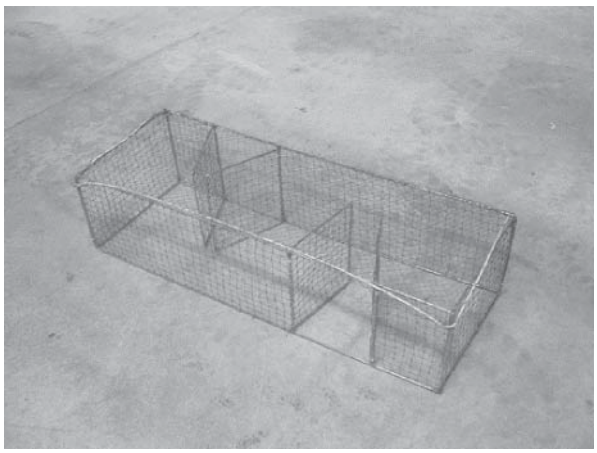

Fig. 2. Photograph of an Ottenby trap set for catching.

Phalaropes *Phalaropus fulicaria*. It is this latest version of the trap that is described below.

TRAP CONSTRUCTION

Each trap consists of eight rectangular metal frames kept together by tie wraps (also called cable ties or zip ties; Fig. 1). Each frame is "filled" with a nylon net that is secured (sown) with nylon fishing line along all four sides. The roof is a slightly softer net kept in place with an elastic cord. When operational the trap is 120 cm long, 41 cm wide and 32 cm high (Fig. 2). In its folded state it is 160 cm long, 32 cm wide and 2–3 cm thick.

The frame can be made of a 6 mm diameter stainless steel or aluminium rod. The steel rod version of the traps is stronger, but also increases the weight (2.0 kg versus 1.5 kg) of the trap. Because so much work is put into making each of the traps, the stronger, longer-lasting stainless steel material may be better, especially for expedition-like conditions that tend to be hard on equipment. We have not had problems with either material breaking, but the aluminium rods can be bent and the welding occasionally breaks (i.e., three welds broke on 20 aluminium traps used in northern Alaska in 2004). Traps that break can be easily repaired in the field, at least in a temporary sense, with an epoxy aluminium putty stick product.

To make each rectangular frame, the steel rod is bent 90° in three corners and finally welded together in the fourth corner. For the aluminium version, rods can not be bent so all parts need to be cut to length and the corners welded. The two intermittent bars on the long sides of the trap that form the door opening are attached by welding for steel and aluminium versions.

The material used to fill the frame of the traps is made of UV-resistant polyten fishing net ("Polytennot" 25 mm [but for size, see below], Lundgrens Fiskredskaps-Fabrik AB, Stockholm). Polyten is suitable because it is in principle water resistant, and therefore does not change in shape or weight. RL used a multifilament nylon gill net to fill frames (#104 Multi, Memphis Net and Twine Co., Memphis, TN) on traps made in Alaska. This netting is flexible but needs to be dyed to match the surrounding environment prior to use, and may not last as long as the UV material. We recommend a 20 mm mesh size (or if ordering within the U.S. select a ¾ inch^2 or 1½ inch stretch mesh). Larger mesh sizes will allow smaller waders such as Least Sandpipers *Calidris minutilla* and Semipalmated Sandpipers *Calidris pusilla* to escape. The netting should be attached with an elastic nylon thread (e.g., size 15 nylon seine twine) such that the mesh squares run parallel to the frame (as opposed to a diagonal attachment, Fig. 1). The elasticity on the nylon thread makes the knots stronger. The nets are attached to each frame before putting them together with two plastic tie wraps that work as hinges. Care must be taken to not tighten the tie wraps too hard, because this will make the trap difficult to fold. Cut off the excess portion of the tightened tie wraps to avoid having the long ends become entangled in the netting when the traps are laid flat and stacked upon each other. We recommend, however, leaving about one cm of excess material on the tie wraps located close to the roof as these will serve as "hooks" to keep the elastic chord for the roof net in place (more below). The plastic tie wraps (the hinges) will eventually break and have to be replaced.

The roof is also made of a polyten nylon fishing net with the same mesh-size. It is secured (sown) to the trap along the entire upper rod of one of the long-side frames. Be sure to make the roof net sufficiently large so that when evenly stretched over the trap it reaches about 5 cm down on the three remaining sides of the trap. Attach an elastic cord (e.g., 5 mm diameter bungi cord) at one corner with a simple knot and then thread the cord through the three unattached sides of the roof net about 5 cm from the edge of the net. Finally, secure the elastic chord at the last corner of the trap so that when it is stretched over the upper corners of the trap it keeps the net in place. Be sure to include enough cord so that it can be placed around the projecting part of the tie wraps.

Apart from being foldable, the construction presented here differs from the original Ottenby-trap in one more important way. The original trap has an inner set of walk-in traps, one at either end of the trap (Lessels & Leslie 1977, Bub 1991). This makes it almost impossible for the birds to find their way out again, something that does happen, although rarely, with our "single-layer" walk-in trap. This extra security simply had to be traded against having the trap foldable.

For transport we constructed bags of heavy-duty sailing-cloth, large enough to contain 6 or 7 traps. Since several traps put together are both heavy and bulky, this is about the maximum number of traps to carry in one go. The bags have handles and can be closed with a flap.

The costs for a trap will of course depend on how much work you put into it yourself. We paid for the steel frames to be made, bought the net and other gear commercially, but attached the nets ourselves. An estimated cost for each stain-

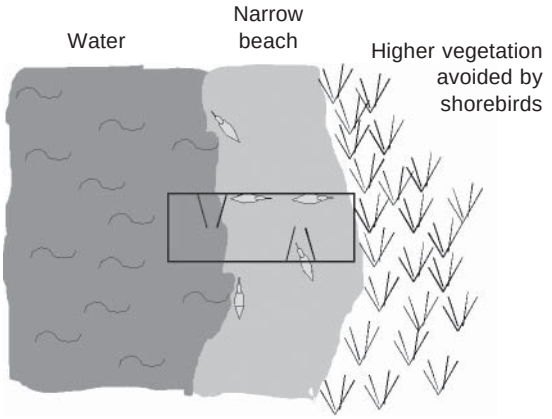

Fig. 3. Placement of a single Ottenby trap (view from above) between (deep) water on one side and high vegetation on the other side. The juxtaposition of the natural barriers and the trap prevent birds from walking around the trap.

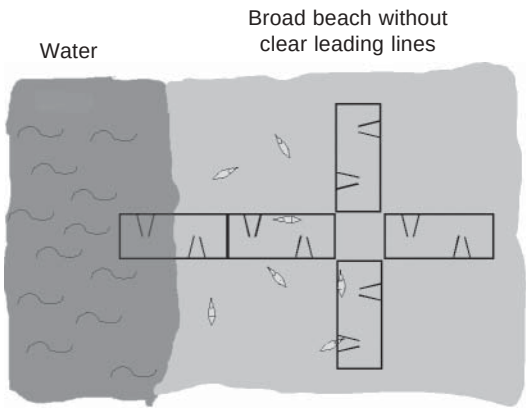

Fig. 4. Placement of a group of Ottenby traps (view from above) adjacent to (deep) water on one side and no natural barriers on the other. The trap breaks the birds' walking path along the shoreline and the "arms" of the trap group prevent the birds from walking around the traps.

less steel trap was between €50–100 in Sweden. Welding for the aluminium traps in Alaska cost US$70 (stainless steel construction was estimated at US$94; both of these prices were based on making 20–30 traps at a time). The netting, dye, tie wraps and cord material adds another $5 per trap. These costs are not negligible, but for us the traps have paid off many times since. Further, if made properly, the traps will last a long time. A Powerpoint presentation showing more details of the trap construction can be obtained from ÅL.

USING THE TRAPS

The number and configuration in which traps are placed depends on the habitat structure at the trapping site (Figs 3, 4). The optimal situation is when birds are *feeding* along some kind of *leading line*, normally at the waters edge. Then, even a single trap can be most efficient. The ideal trapping locations are typically small lakes, puddles or rivers with narrow muddy shores or, like at Ottenby, narrow strips of rotting seaweed on the beach. The traps are not very suitable in the intertidal zone, simply because the water's edge, so important for the birds and therefore for trapping, is continuously on the move. The traps are either almost immediately too far from the waters edge, especially on a fast receding tide, or become flooded on a rising tide and can be lost. The potential exception would be puddles left behind by the receding water where birds may stay behind to feed. When birds are feeding on open flat surfaces with few or no leading lines, the traps need to be put in groups. The traps are also not suitable for roosting birds. This may be because the birds simply move around less or are more wary.

If your trapping site is familiar to you, place the traps where the birds normally feed, especially if leading lines can be identified. At new locations, look for footprints and droppings indicative of bird use and place the traps there. This latter approach has worked successfully many times – frequently the first bird seen is in the trap.

Traps should be placed so that they are perpendicular to the leading edge of the water, with one end of the trap placed in the water and the other end (possibly of a second or third trap) up against high grass or a steep river bank (Fig. 3). If the path of an approaching bird is blocked by a trap, the bird will first try to find a way around the trap. Because the birds will not want to walk into the deep water or through the grass, and typically do not want to go back from where they came, they will now look for ways through the trap and may well enter it. If the habitat structure around the trap(s) does not naturally prevent the bird from circumventing the trap, you can put out blocking objects like rocks, pieces of driftwood or, even better, other traps (Fig. 4). A set of five traps in the shape of a cross works very well and has long been the classical set-up at Ottenby. The short arms of the cross should be positioned parallel to the leading line and placed so they touch the sides of the traps placed perpendicular to the water line. Placing traps in this manner will likely trap the birds in the "arms" part of the cross. Nigel Clark and co-workers have used similar traps in Delaware to catch Semipalmated Sandpipers and Sanderlings *Calidris alba* with great success. They used 30 cm high guide walls made out of stiff plastic garden mesh (square). These were up to 10 m long and aided catching on open beaches. In this way only one or two traps and a couple of guide walls are needed on a broad beach (N. Clark, pers. comm.).

To activate the trap, unfold it and secure the roof net. Set the doors inwards in a V-shape, with the opening being about the body width of the bird you want to trap. The birds will not hesitate to enter the narrow opening. The larger the opening the more likely the birds are to walk out again. Gently press the whole trap half a centimetre or so into the sediment. If the ground surface is uneven, so that the doors hang in the air, you can secure them to the roof net by using clothespegs.

When a bird becomes trapped it appears to increase the odds of catching additional birds. This may happen simply because of its presence, or probably more likely, because the bird's escape behaviour (i.e., intense probing through the net) may be interpreted by other birds as intense feeding in a good spot.

The traps should be checked and emptied at least every hour, but in principle can be emptied as often as you like. If the spot is good the birds you scare off will soon return. To cease trapping temporarily without moving the cages, for example when traps are left over-night or during heavy rains, simply close the entrances by moving one of the doors. To remove captured birds, lift the elastic cord holding the roof

net in one corner and grab the bird. This has to be done carefully so the whole roof doesn't come off at once. Practice before you trap the first precious bird.

SUITABLE SPECIES

Smaller waders (<100 g) are trapped readily, especially those species that typically walk close to higher vegetation. Larger birds like godwits *Limosa* spp. and curlews *Numenius* spp. are trapped only rarely, but possibly a larger version of the trap would work. At Ottenby, we also capture open habitat species such as Starlings *Sturnus vulgaris*, wagtails *Motacilla* spp., pipits *Anthus* spp., and Wheatears *Oenanthe oenanthe*. If the traps are baited with seeds they are very suitable for trapping seed-eating birds that are difficult to trap in mist-nets, such as Snow Bunting *Plectrophenax nivalis* and Twite *Carduelis flavirostris*.

ACKNOWLEDGEMENTS

We are most grateful to Alf Andersson and Jan Pettersson at Ottenby Bird Observatory for help constructing the first set of foldable traps, to Ola Haraldsson at Lund University for help building the second generation of traps, and A. Taylor and the Barrow field crew for building traps in Alaska. We also thank Nigel Clark for comments on an earlier draft of this paper. ÅL got funding for traps from the Swedish Natural Science Research Council. Funding and logistical support for the Alaskan studies was provided by the U.S. Fish and Wildlife Service, University of Alaska Coastal Marine Institute, and the North Slope Borough Wildlife Department. This is contribution no. 204 from Ottenby Bird Observatory and publication 3613 of the NIOO-KNAW.

REFERENCES

Blomqvist, S., Holmgren, N., Åkesson, S., Hedenström, A. & Pettersson, J. 2002. Indirect effects of lemming cycles on sandpiper dynamics: 50 years of counts from southern Sweden. *Oecologia* 133: 146–158.

Bub, H. 1991. *Bird Trapping & Bird Banding*. Cornell University Press, New York.

Grönlund, E. (ed.). 2000. *Polarforskningssekretariatets årsbok 1999*. Swedish Polar Research Secretariate, Stockholm.

Grönlund, E. & Melander, O. (eds). 1995. *Swedish-Russian Tundra Ecology-Expedition 1994. A cruise report*. Swedish Polar Research Secretariat, Stockholm.

Lessells, K. & Leslie, R. 1977. Alternative wader catching. *Wader Study Group Bull.* 20: 17–21.

Lindström, Å. 1998. Mass and morphometrics of Little Stints *Calidris minuta* on autumn migration along the Arctic coast of Eurasia. *Ibis* 140: 171–174.

Lindström, Å., Klaassen, M., Piersma, T., Holmgren, N. & Wennerberg, L. 2002. Fuel stores of juvenile waders on autumn migration in high arctic Canada. *Ardea* 90: 93–101.

Stroud, D.A. & Davidson, N.C. (eds). 2003. Catching and handling birds, and data: practical papers published in the Wader Study Group Bulletin. *Wader Study Group Bull. 69, Special Issue. International Wader Studies 6.*

Tulp, I. & Schekkerman, H. 2001. Studies on breeding waders at Medusa Bay, Taimyr, in summer 2001. Alterra-report 451, Wageningen. 113 pp.