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THE USE OF A HELIGOLAND TRAP AND MIST-NETS AT LONG POINT, ONTARIO[1]

By D. J. T. HUSSELL and JAMES WOODFORD

INTRODUCTION

Although Heligoland traps are in extensive use at Bird Observatories and elsewhere in Europe, very little use has been made of them in North America. As far as the writers are aware the only full size Heligoland trap constructed in North America before 1960 was the one at Point Pelee, Ontario (Gunn, 1954; Woodford and Wasserfall, 1958). The design, construction, and operation of Heligoland traps have been described in detail in many European publications (see Woodford and Hussell (1961) for a list of references) and the advantages and disadvantages of Heligoland traps versus mist-nets have been discussed by Williamson (1957) based on experiences at Fair Isle, and by Woodford (1959) at Point Pelee.

During the spring of 1960 a Heligoland trap was built by members of the Ontario Bird Banding Association at Long Point, Ontario. Since the dismantling of the Point Pelee trap, it is believed that this is the only Heligoland trap in use in North America, and the additional experience gained may be of some interest to banders operating co-operative stations similar to that at Long Point.

LOCATION

Long Point consists of a sandy bar jutting out for about twenty miles into Lake Erie. It lies approximately on an East-West line, while the northern shore of Lake Erie, although somewhat irregular, runs predominantly E.N.E.—W.S.W. Much of the point is wooded, and there are large expanses of marshland, but the extreme eastern end where the trap is situated is an area of dunes with a thin cover of poplars and willow generally not more than 30 feet in height. Long, narrow marshes lie between the dunes, which tend to form long ridges in a S.W.—N.E. direction.

The end of the Point is very exposed, being situated near the middle of Lake Erie, and strong winds occur frequently.

DESCRIPTION OF THE TRAP

Photographs of the trap are shown in Figures 1 and 2. The design of the trap follows the general plan described by Brownlow (1952). It consists of a wooden framework covered with wire-netting (½" mesh, except the main roof section which is 1" mesh). Much of the framework was built from driftwood, which considerably reduced the cost.

[1]A publication of the Long Point Bird Observatory, of the Ontario Bird Banding Association.

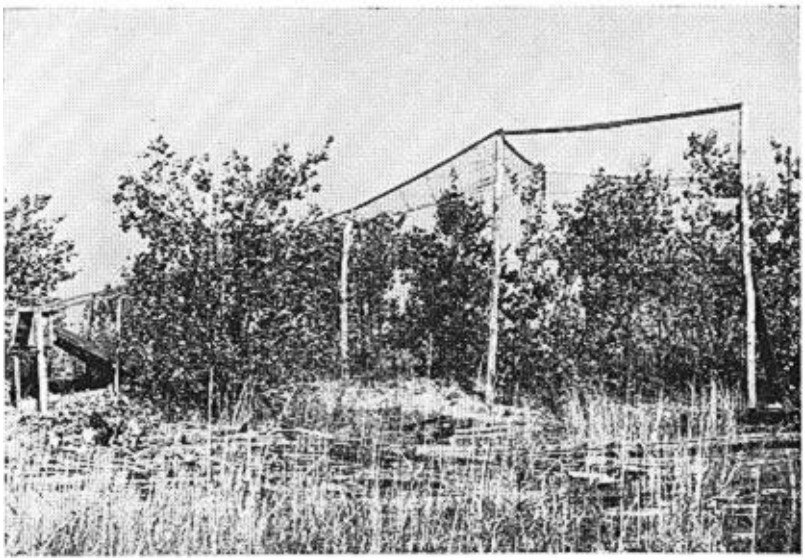


Figure 1. The Heligoland Trap at Long Point, Ontario—side view.

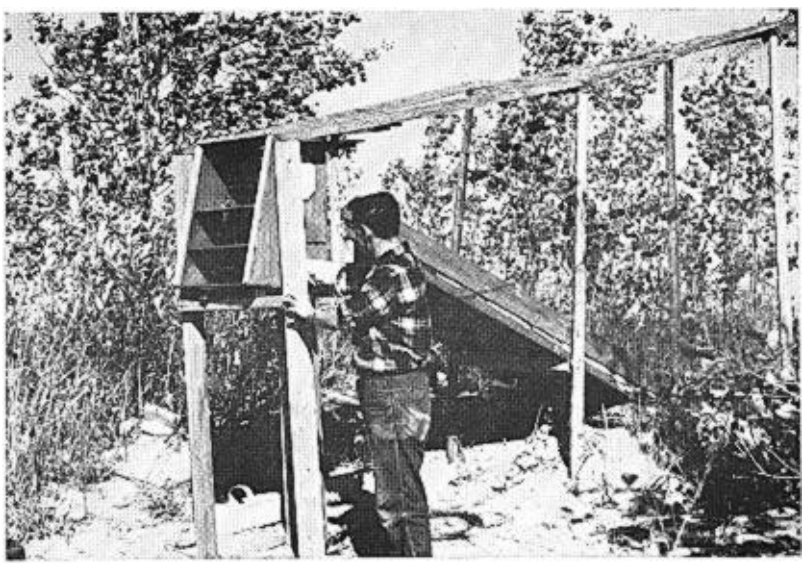


Figure 2. Removing a bird from the catching-box. Note wire-netting funnel and wooden ramp leading to entrance of catching-box.

The entrance of the trap is approximately 16 ft. wide by 14½ ft. high with wing walls of the same height about 15 ft. and 20 ft. long. The roofed section of the funnel narrows down to a cross-section of about 3½ ft. wide by 6 ft. high in a distance of 24 ft., and turns through an angle of about 50°. A baffle 18 inches in width has been constructed at the entrance of the trap, and another 10 inches in width at the 3½ x 6 ft. section. The funnel narrows down to the entrance to the catching box which is situated about 5½ ft. above the ground, a wooden ramp leading up from ground level to the catching box entrance. The usual drop door and lock-up, which was used on the Point Pelee trap, has been dispensed with; this has been made possible by the use of a very efficient catching box. Likewise a banders' door through the side of the trap has not been built, and consequently the problems of construction have been greatly simplified.

It should be noted that the entrance and roof are higher than is generally recommended for a conventional Heligoland trap. It is more usual to have a flatter roof with the entrance 8-10 ft. high, this having the advantage that fewer birds are lost flying back beneath the roof. Although the cover in the entrance of the trap was reduced in height it was felt that to take full advantage of the site a higher trap than normal was needed. In addition the long wing walls were built to the same height as the entrance of the trap and have proved very effective in guiding birds into the trap entrance.

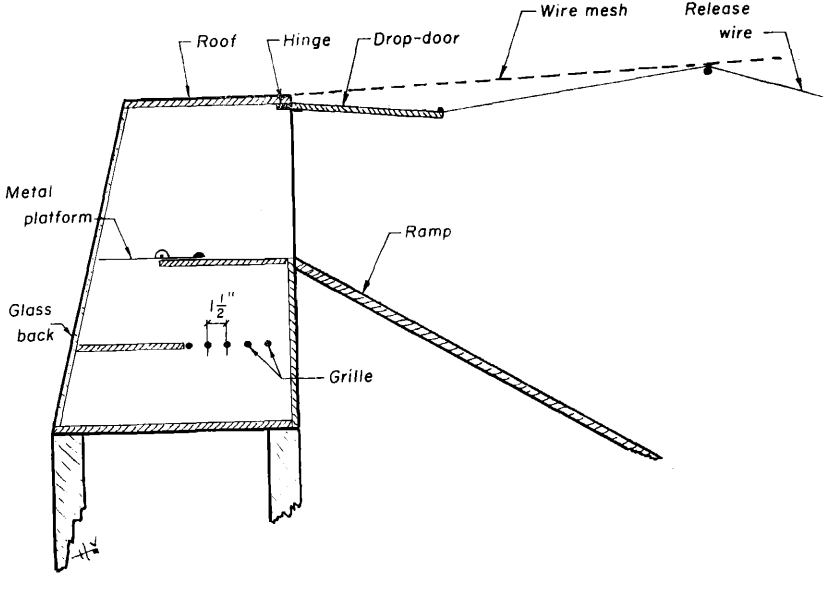
The details of the catching box are shown in Figure 3. Essentially it consists of a glass backed box divided into three compartments. Birds enter the upper compartment and land on a delicately balanced hinged metal platform, whereupon they drop down into the lower compartments. The metal platform is designed so that it hinges downwards only and birds cannot force their way out by fluttering upwards against the glass. The floor of the second compartment consists partly of plywood and partly of a grille which allows smaller birds to drop down into the third compartment. Birds are removed through sleeves in the side of the box. It is sometimes found that birds hop from one compartment to the other, through the grille, when the trapper is trying to remove them from the box. A slot in the side of the box allows a thin piece of wood to be inserted over the grille, which prevents birds moving between the two compartments.

The trap is sited near the end of a line of bushes on the northern shore of the point, the entrance facing southeast. The tops of some of the trees in front of the trap have been cut off so that they are about 18 inches below the roof level, with the result that fewer birds fly over the trap.

A few birds are caught automatically, but the great majority are caught by driving them into the mouth of the trap from some distance away. Grain has sometimes been placed in the entrance of the trap as bait, and has considerably increased catches of Bobolinks and sparrows.

MIST-NETS

Japanese mist-nets of three mesh sizes have been used at Long Point: 1½, 2½ and 4 inch stretched mesh. The 1½ and 2½ inch mesh nets are either 9 or 12.5 metres in length and 2 metres high with four shelves.



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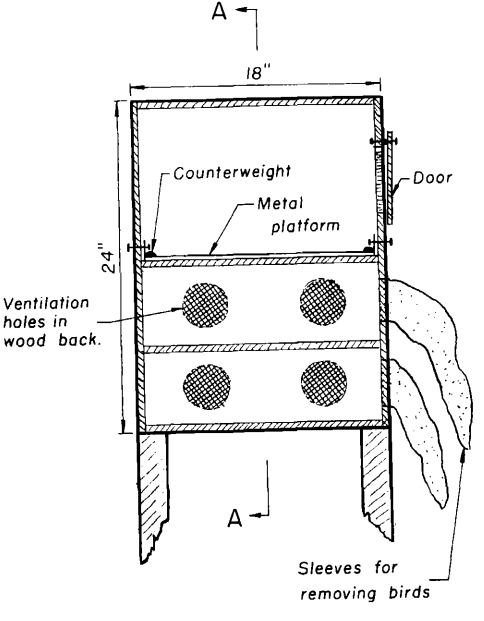

FRONT VIEW

Figure 3. Details of Catching-box.

The 4 inch mesh nets are 18 metres long and 2 metres high with either one or two shelves. The 1½ inch nets are made of silk and the 2½ and 4 inch nets are nylon.

The greatest number of birds are taken in 1½ inch mesh nets; up to 10 nets have been used at one time but the usual number is 4 to 8.

The operation of the nets is similar to that described by Woodford *(op. cit.)* for Point Pelee and no further description need be given here.

COMPARISON OF CATCHES

The Heligoland trap first became operational on May 6, 1960, although the construction was not then complete. Additions and changes were made during the summer, and the trap reached its present form in September. During the period from May 6 to November 20 careful records were kept of birds trapped and netted, most of these being caught during the migrations in May and September.

Records are available for 3,140 birds of 106 species as to whether they were taken in the Heligoland trap or mist-nets. This total represents over 96% of the birds caught by these two methods during this period. The totals are set out in Table 1. 1,513 birds of 93 species were netted and 1,627 birds of 88 species were trapped. These totals exclude re-trapped birds.

The percentage of the six commonest families in the totals trapped and netted are shown in Table 2. Looking at the same data in another way, Table 3 shows the percentages trapped and netted for the same six families, together with the total number of each family taken.

Examination of the figures in Tables 1, 2, and 3 shows that some species and families were taken much more frequently by one method than the other. Notably sparrows were taken in greater numbers in the trap and flycatchers in nets. For some species the ease of trapping or netting is particularly obvious, as can be seen from Table 2. For instance American Goldfinches tend to fly high when driven and are therefore much more readily taken in nets, while Brown Thrashers can easily be driven into a trap but seem to have a remarkable ability for bouncing out of nets.

It should be pointed out that although these figures do to some extent indicate the potentialities of mist-nets and Heligoland traps, no direct comparison can be made between the totals; they simply represent the totals of birds that were caught by the two methods during one season at Long Point, using a particular Heligoland trap, and a varying number of mist-nets. At another location the figures would probably have been quite different, and this is confirmed by comparison with the figures for Point Pelee (Woodford, *op. cit.)* which show no very obvious parallels with those from Long Point. In addition to the different locations, the periods when the two stations were manned will have had an effect on the results, while the high percentages of swallows taken at Pelee can be accounted for mainly by one exceptional movement in May, 1956.

TABLE 1. Species and Individuals taken in Mist-Nets and Heligoland Trap, 1960

Species	M.N.	H.T.
Least Bittern	1	
Sharp-shinned Hawk	22	2
Cooper's Hawk	1	
Marsh Hawk	1	
Common Snipe	2	
Spotted Sandpiper	5	
Short-billed Dowitcher	1	
Semipalmated Sandpiper	2	
Sanderling	6	
Mourning Dove		4
Yellow-billed Cuckoo	2	1
Black-billed Cuckoo	1	
Long-eared Owl	1	
Saw-whet Owl	1	1
Whip-poor-will	2	1
Belted Kingfisher		1
Yellow-shafted Flicker	23	
Red-headed Woodpecker	23	2
Yellow-bellied Sapsucker	13	3
Downy Woodpecker	2	3
Eastern Kingbird	6	
Great Crested Flycatcher	3	3
Eastern Phoebe	2	4
Yellow-bellied Flycatcher	40	9
Acadian Flycatcher	3	
Traill's Flycatcher	3	3
Least Flycatcher	21	4
Empidonax sp. (unidentified)	33	16
Eastern Wood Pewee	35	3
Horned Lark	1	
Barn Swallow	11	
Blue Jay	10	7
Black-capped Chickadee	16	1
Brown Creeper	67	8
House Wren	8	7
Winter Wren		2
Catbird	20	18
Brown Thrasher	5	23
Robin	1	1
Wood Thrush	3	3
Hermit Thrush	6	14
Swainson's Thrush	50	34
Gray-cheeked Thrush	8	9
Veery	7	4
Eastern Bluebird		1
Blue-gray Gnatcatcher	2	3
Golden-crowned Kinglet	25	42
Ruby-crowned Kinglet	50	41
Cedar Waxwing	3	7
Solitary Vireo	1	2
Red-eyed Vireo	23	6
Philadelphia Vireo	10	1
Warbling Vireo	7	
Black & White Warbler	6	7
Tennessee Warbler	10	19
Orange-crowned Warbler	1	2
Nashville Warbler	22	32
Yellow Warbler	7	6
Magnolia Warbler	41	29

Species	M.N.	H.T.
Cape May Warbler	51	50
Black-throated Blue Warbler	8	1
Myrtle Warbler	57	62
Black-throated Green Warbler	8	6
Blackburnian Warbler	8	2
Chestnut-sided Warbler	10	2
Bay-breasted Warbler	18	5
Blackpoll Warbler	97	103
Palm Warbler	25	58
Ovenbird	7	4
Northern Waterthrush	9	5
Connecticut Warbler	2	4
Mourning Warbler	1	1
Yellowthroat	17	20
Yellow-breasted Chat	3	6
Hooded Warbler		1
Wilson's Warbler	11	3
Canada Warbler	5	3
American Redstart	24	7
House Sparrow		3
Bobolink	4	72
Eastern Meadowlark	2	
Redwinged Blackbird	55	22
Orchard Oriole		1
Baltimore Oriole	17	5
Rusty Blackbird		10
Common Grackle		3
Brown-headed Cowbird	1	11
Scarlet Tanager	6	3
Rose-breasted Grosbeak	19	10
Blue Grosbeak		1
Indigo Bunting	2	3
Dickcissel	2	2
Purple Finch	2	
American Goldfinch	68	6
Rufous-sided Towhee	14	9
Savannah Sparrow	12	10
Grasshopper Sparrow		1
Slate-colored Junco	11	58
Tree Sparrow		6
Chipping Sparrow	6	17
Field Sparrow	6	6
White-crowned Sparrow	73	301
White-throated Sparrow	122	307
Fox Sparrow		1
Lincoln's Sparrow	29	12
Swamp Sparrow	11	2
Song Sparrow	14	13
Total	1513	1627

MIST NETS VERSUS HELIGOLAND TRAPS

The advantages and disadvantages of mist-nets and Heligoland traps have been discussed by Williamson *(op. cit.)* and Woodford *(op. cit.)*, and may be summarized as follows:

Mist nets have the advantage of being portable and easily set up, able to cover a wide area, and be moved to take advantage of local movements; a large number of nets can be operated by a single person

TABLE 2 Family percentages of Birds taken in Mist-Nets and Heligoland trap

Mist-Nets		Heligoland Trap	
1. Parulidae	29.6%	1. Fringillidae	47.0%
2. Fringillidae	25.8	2. Parulidae	26.9
3. Tyrannidae	9.6	3. Icteridae	7.6
4. Icteridae	5.2	4. Sylviidae	5.3
5. Sylviidae	5.1	5. Turdidae	4.1
6. Turdidae	5.0	6. Tyrannidae	2.6
Others	19.7	Others	6.5
	100.0		100.0

and they are low in initial cost. Their disadvantages are that they are rendered inoperable by strong winds and wet weather, they cannot be left unattended, each bird must be removed individually, which takes time and requires an experienced operator, birds may lose parasites or old feathers, and they have a limited period of usefulness.

Heligoland traps can be operated in any weather conditions, and are made operational simply by setting the catching-box, from which birds may be easily and quickly removed. Frequent inspection is not necessary, the occasional bird caught automatically will remain quietly in the box until removed. The disadvantages are that they are usually beyond the resources of individual banders due to the high initial cost and time needed for construction, they operate in a fixed position and cover only a limited area, and a crew of 2 to 4 is preferable (although not essential) for their operation.

Williamson *(op. cit.)* particularly emphasized the advantages of traps on an exposed island. It should not be thought, however, that this means that traps have no application in less severe climatic conditions than those found on Fair Isle. The trap site at Long Point is in an exposed situation with relatively thin cover, and on some days mist, rain or strong winds either rendered mist-nets inoperable, or substantially reduced their efficiency without adversely affecting trap use.

For instance, on the 18th of May, although a heavy fog dampened the nets and made them virtually impossible to use, the one bander present was able to take 67 Bobolinks in the Heligoland trap, from an influx that took place early in the day. However, conditions such as these were exceptional at Long Point and on most days both the trap

TABLE 3 Percentages taken in Mist-Nets and Heligoland trap for six commonest families

	Total	% M. N.	% H. T.
1. Fringillidae	1156	33.8	66.2
2. Parulidae	886	50.5	49.5
3. Icteridae	203	38.9	61.1
4. Tyrannidae	188	77.7	22.3
5. Sylviidae	163	47.2	52.8
6. Turdidae	141	53.2	46.8
Others	403	73.7	26.3

and nets could be used, and it will be shown that both methods played an important part in the numbers of birds taken.

An important advantage of nets is that on a quiet day one man can conveniently operate a large number of nets, possibly up to 25 or 30, while it is preferable to have more than one trapper to operate a Heligoland trap effectively. On the other hand it has been found that when there are many birds present, one man can handle more birds by using a Heligoland trap than mist-nets, although a higher proportion of birds are lost in driving into the trap than would be the case if there had been several trappers.

No attempt was made at Long Point either to trap particular species or to standardize trapping methods, but rather banders operating the station were left to catch as many birds as possible by the methods available. On most days weather conditions allowed the use of both nets and the trap. Banders soon discovered that on days when there were few birds present driving the trap would produce only a small number of birds, and it was easier to set up several nets and wait for birds to get caught in them. On the other hand when there was a large influx of migrants so many birds were caught both in the trap and in nets that it was often found necessary to furl some of the nets in order to keep up with them. In some cases all the nets were furled and only the Heligoland trap used, the reason being that it takes less time to handle birds taken in the trap than those taken in nets. A full-scale drive of the trap takes about 15 minutes to complete including removal of the birds from the catching-box and placing them in gathering cages. The largest single catch recorded during the year resulted from one drive by two men on September 27: 107 birds were caught including 74 White-throated Sparrows. Catches of this size should be avoided if possible; catches of 20 or 30 birds are more conveniently handled, and are quite common at Long Point.

As previously mentioned an average of 4-8 nets was used at Long Point, together with the Heligoland trap, and over the season as a whole approximately the same number of birds were caught by the two methods. It might therefore be thought that they were roughly equivalent in trapping value; however, the manner of operation indicates that no such conclusion can be drawn, since the amount of effort expended on each method varied according to the number of birds present. In fact, at Long Point mist-nets and the Heligoland trap were used as complementary techniques. If there had been no trap, more nets would have been used on peak days and consequently more birds would have been netted. On the other hand if no nets had been available more effort would have been put into driving the trap on days when few birds were present. It is equally difficult to suggest any general figure for the number of nets that can be considered equivalent to one Heligoland trap since their value will vary according to the location. Experience of both techniques and an appreciation of their relative capabilities will be helpful in deciding on their suitability in a particular location.

It is of interest to look more closely at typical examples of the complementary use of mist-nets and the trap. On May 16 there was a heavy influx of White-crowned Sparrows. One bander was present and he furled all nets at noon. Up to that time 66 birds had been caught in nets at 1.6

birds/net-hour. By contrast on the following day, May 17, the same bander caught 56 birds in mist-nets at 0.8 birds/net-hour and 42 birds in the Heligoland trap at 3.5 birds/trap-hour. Similarly on September 26 there were few birds present and one bander caught 29 birds in nets at 0.9 birds/net-hour and 34 birds in the trap at 6.8 birds/trap-hour. On the following day, September 27, there was a large increase in the numbers of White-throated Sparrows and other migrants. With the exception of one 4 inch mesh net, no nets were set up, and 160 birds were caught in the Heligoland trap at approximately 60 birds/trap-hour, with the assistance of one cooperator.

Although the figures quoted for birds/trap-hour should not be taken too literally, as it is difficult to decide for how long the trap is operating and the numbers caught depend largely on the number of drives made, the general trend is indicated and it is clear that at Long Point the Heligoland trap is much more efficient than mist-nets in dealing with large waves of migrants. This also accounts in part for the predominance of sparrows amongst birds trapped, since during 1960 large peaks of White-crowned and White-throated Sparrows occurred on a few days when nets were only sparingly used.

The success of the trap at Long Point has resulted in plans being made to build others, and two are at present under construction. It is anticipated that mist-nets will continue to be used extensively at Long Point in order to take advantage of their greater versatility, as evidenced by the greater number of species taken in nets; but it is thought that as more traps are built the use of 1½″ mesh nets for general trapping of small birds will be greatly reduced, the larger mesh nets being used to take species, particularly shore birds and hawks, which are not readily caught in Heligoland traps.

It seems probable that Heligoland traps would be equally effective at other locations in North America where conditions are similar to those at Long Point. Exposed coastal areas with thin cover, which are subject to large waves of migrants, are ideal for their use.

ACKNOWLEDGMENTS

Our thanks are due to the Canadian Department of Transport, the Long Point Company, and the Ontario Department of Lands and Forests for granting permission to trap and band birds on their properties. The Federation of Ontario Naturalists has provided financial assistance.

The results described in this paper represent the combined work of many members of the Ontario Bird Banding Association, who have cooperated in establishing the Long Point Bird Observatory.

The sketch of the catching box shown in Figure 3 was drawn by Mr. Harold Vanstone.

SUMMARY

1. A Heligoland trap was built at Long Point, Ontario, during the spring of 1960.
2. In general the trap is of conventional design, consisting of a large wire-netting funnel erected over a line of bushes. An automatic catching-box proved to be very efficient, and consequently the usual "drop door" and "lock-up" were not utilized.

3. Japanese mist-nets of 1½, 2½ and 4 inch stretched mesh were used in the same area.
4. Records are available for 3,140 birds of 106 species caught between May 6 and November 20, 1960, as to whether they were taken in nets or the trap. 1,513 birds of 93 species were netted and 1,627 birds of 88 species trapped.
5. A comparison was made of the species and families of birds caught by the two methods and it was found that some were taken much more frequently by one method than the other. In particular 66.2% of the sparrows taken were trapped, while 77.7% of the flycatchers taken were netted.
6. The operation of the Heligoland trap and mist-nets at Long Point is discussed, and it is concluded that the trap was more efficient in dealing with large influxes of migrants, but that the nets were more versatile. Heligoland traps should be advantageous in exposed situations with thin cover, where sizeable waves of migrants occur.

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17 Farnsworth Drive, Weston, Ontario, Canada.,
Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada.

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CONSTRUCTION AND USE OF HELIGOLAND TRAPS*

BY JAMES WOODFORD AND D. J. T. HUSSELL

The Heligoland trap, a large wire-netting funnel, has been used in Europe for many years to catch large numbers of birds, principally migrants. Despite a greater number of co-operators and of birds banded in North America, the Heligoland trap was apparently not used until 1954, when one was constructed at Point Pelee, Ontario (Gunn, 1954). There were reviews of reports of the stations at Heligoland and Rossitten in *Bird-Banding* (C.L.W. [Whittle], 1930 *et subsq)*, in which the traps were mentioned. Lincoln and Baldwin (1929) did not mention Heligoland Traps in "*Manual for Bird Banders.*"

The purpose of this paper is to review the techniques of construction and operation of Heligoland traps in the light of recent experience at Point Pelee (Woodford, 1959) and Long Point, Ontario (Hussell and Woodford, 1961), and to discuss their possible further application to

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