



Geo-locator dummy study on Arctic Terns 2006.

Background:

The latest development in geo-locator logger technology now allows their deployment on medium-sized birds, such as terns. At present loggers with a mass of 2.5 g are manufactured and loggers of 1.5 g are planned to be ready for use in 2007 (British Antarctic Survey - BAS).

However, it still remains unclear what is the most suitable method for attaching data loggers to terns. Studies in the USA that attached loggers to terns using harnesses (on the pelvis or back) caused impairment of mobility when adjusted tightly enough to stay on, while those attached to leg rings caused discomfort and swelling (C. Mostello, I.C.T Nisbet, pers. comm.).

We conducted a study on the effect of 1.5 g loggers on Arctic Terns in a large colony in Disko Bay, Central West Greenland in the summer 2006.

Attachment:

The logger dummies (1.5 g, delivered by BAS) had dimensions of 20 mm x 8 mm which is the approximately the scheduled dimensions of the 2007 logger (Richard Phillips, BAS pers. comm.). We attached the logger to a metal leg ring using cyanoacrylat-based “superglue” and 2 mm wide “cable strips”. The dummy logger was attached parallel with the leg of the bird. Dummy-birds were furthermore fitted with a colour ring and dyed yellow (picric acid) for individual recognition.

Eleven adult birds were caught on the nest on 21 June and dummies were attached. The nests was enclosed and subsequently visited every day during chick rearing for measurements of chick growth (mass and wing). Observations (app. 25 hours) of chick feeding and behaviour of the dummy-bird were made from a hide during chick rearing from a hide (distance 5 to 30 m from the nest).

Observations:

Some dummy-birds showed some signs of “leg lifting” (pulling up the leg when standing on the ground) especially the first 4-5 days after deployment. One individual showed a particular high degree of leg lifting on day 2 and 4 after deployment but later (day 5 to 16 – several hours of observation) ceased this behaviour.

Some dummy-birds showed signs of “leg hanging” (the leg with the dummy attached hanging slightly when flying). This however, seemed to vary with wind speeds – being strongest at low wind speeds and absent at high.

Furthermore, some dummy-birds on rare occasions showed “ring pecking” (pecking at the dummy with the bill).

The dummy birds otherwise seemed to have a “normal” behaviour – participating in social interactions and performing kleptoparasitism on few occasions.

By day 20 after attachment nine of the eleven dummy birds remained in the study plot (one nest abandoned, in one nest both chicks died). In these nine birds the dummy logger had fallen off the ring in three birds!



Day of deployment



Flying dummy



Leg lifting



Results:

One of the eleven nests with one parent equipped with a dummy (dummy-nests) was abandoned by day two after deployment and the dummy-bird was never seen again. The abandoning was most likely an effect of catching and handling the bird more than an actual effect of the dummy. The abandoned nest was the only one-egg clutch (may indicate younger, inexperienced breeders?) in the study plot.

The breeding production in the eleven dummy-nests showed no significant difference (0.91 vs. 0.83 fledglings per nest in control plot) compared to the production in a control study plot (n=35). The dummy-birds took equal share in both chick brooding and chick feeding (16 dummy feeds vs. 22 partner feeds, $\chi^2=0.947$, $p=0.3304$, n.s.).

Feeding rate (fish feeds only!) in the nests with a dummy bird was similar to the control group (1.45 (n=29) vs. 1.85 (n=100) feeds per hour respectively).

The growth rates of chicks of dummy birds were similar to those in the control plot. Mass: 5.65 g/day vs. 6.32 g/day in control plot (day 4-14). Wing: 7.94 mm/day vs. 7.93 mm/day in control plot (day 5-15).

We only managed to recapture one dummy bird. This bird was caught 21 days after attachment and did not show any kind of swelling of the leg. The bird had a small bruise at the lower part of the leg/foot but this seemed to be in the process of healing and to the best of my judgement did not seem to be a severe handicap to the bird.

The other dummy birds were watched (most of them from a close distance) from a hide and did not show swelling of the leg.

Conclusions:

- 1) The dummy nests did not express a markedly difference in terms of chick survival, feeding and growth rates compared to nest in control plot.
- 2) Although the logger dummy may have caused some discomfort for the bird in the first days after deployment it seems likely that the birds habituated to the dummy.
- 3) No swelling of the legs or severe bruises was observed.
- 4) The attachment method is not sufficiently reliable to be confident of them remaining on the bird for an entire year.
- 5) A better method for attaching the logger to the ring is needed but it seems likely that the use of metal rings may be a good idea (more rounded edges compared to darvic rings).

Overall, although there are still some uncertainties of the long-term effect of the logger, the results from this study indicate that it is worth proceeding the planning of a study with geo-locator loggers in 2007.

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Day 21 after attachment



Day 21 after attachment

