A portable low-cost fabric pen for temporarily confining flightless birds in New Zealand

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SUMMARY

A portable low-cost fabric pen makes it possible to 'gently release' hand-reared kakapo *Stigops habroptilus*, to confine kakapo undergoing veterinary treatment, to give supplementary food, and to settle translocated individuals into predetermined locations.

BACKGROUND

In the management of free-living threatened birds and mammals it is occasionally necessary to confine individuals to captivity for a few days or weeks. Such periods can be stressful, particularly to wild-raised individuals. However, stress can be minimized by placement of captive facilities within the animal's natural habitat – ideally within its own territory or home-range. Using conventional materials and techniques, building of even a modest sized pen in a remote location can pose logistical challenges, be time-consuming, costly and result in much disturbance to the natural environment.

ACTION

In the management of the endangered (flightless) kakapo *Stigops habroptilus* of New Zealand (a parrot which now exists only on a few small islands without predatory mammals) this problem was addressed through the use of a collapsible, low-cost, light-weight fabric pen. A pen was designed, comprising 10 x 1 m sections of light-weight, green, nylon 'jet-cloth', each with a two-way zip at either end. Jet-cloth is exceedingly strong, resilient and has an extraordinarily slick surface which animals are unable to climb or puncture. The size of the pen can be adjusted according to need by simply removing or zipping in additional sections. For kakapo, three 10 m sections (i.e. 30 m circumference) have proved adequate. Metal eyelets at 1 m spacing are set into the top & bottom edges. A 30 cm strip of jet-cloth with three eyelets per metre along its lower edge is sewn along the bottom edge to serve as a flexible skirt at ground level. Thirty 1.6 m lengths of 50 mm diameter PVC pipe driven about 30 cm into the ground, serve as uprights. Lengths of 3 mm diameter nylon cord attached to each eyelet are used to tension the fabric, and three approximately 25 cm long fencing wire pegs per metre are used to secure the bottom edge to the ground (see Appendix 1 for full guidelines on pen erection).

CONSEQUENCES

Fabric pens have been used successfully since 1994 for the "gentle-release" of hand-raised kakapo to free-range; to confine kakapo undergoing veterinary treatment; to train birds to accept supplemental food and/or to use feeding hoppers; and to settle translocated individuals into predetermined locations. Kakapos are generally held for no more than two weeks but one fabric pen was still serviceable after being erected for nine months. Birds may be released simply by un-zipping and quietly removing a section of fabric so that the bird is able to depart in its own time and to continue to feed from the feeding station set up within the pen. Although designed for kakapo, this basic design may be suitable – or adapted - for other flightless birds and certain mammals.

A cautionary note: Confinement of any animal within an open-topped pen is likely to predispose it to predation by certain mammalian and avian predators. Thus, this pen is suitable for use only for species/locations where predation is unlikely to be an issue.

Appendix 1. Guidelines for erection of fabric pen

Putting up a nylon "jet-cloth" pen so that it is adult kakapo-proof is an exacting task and is likely to take two people about two days. It is essential it is put up correctly or ***the bird will escape***.

Find a suitable site - this is the most important and generally the most difficult task. The site needs to be:

- in the area where you'd like your kakapo to settle – no guarantees, but often they do stay within the general area;
- not within any other bird's core home-range;
- >12 m diameter and flat or on a slight slope;
- location must be well drained and not at risk from flooding during heavy rain;
- good people access – i.e. handy to a track;
- dense low cover, and no/few tall trees within;
- no trees or limbs about to fall onto the site!

Tools - you may need the following:
Axe, saw, grubber, hammer, heavy-duty stapler, spade, measuring tape pocket knife, tin-snips, pliers, heavy needle and thread.

Materials:

- 3 x 10 m sections of green jet-cloth nylon (with zips in working order and any tears mended);
- If the ground is seriously uneven you will need one or more triangular shaped sections of jet-cloth to zip in at the junctions (i.e. to change the angle at the joins);
- <30 1.6 m poles; <90, ~20 cm long wire pegs to secure the bottom. In some cases you will be able to use cord to tie the bottom edge to roots;
- ~100 m of 3 mm diameter nylon cord;
- Several sheets of thin metal ~40 cm wide or equivalent heavy canvas to fasten around any trees growing in the pen to stop the kakapo from climbing out through the canopy, or trying to jump over the side from an elevated position;
- Big stapler or brads/short flat-head nails to fasten the above in place;
- A couple of sheets of non-treated ply and/or ~2 x 2 m canvas sheet to make a dry shelter within the pen;
- Assorted nails;
- Items needed for a feeding station, including water hopper.

Putting it up:

- Select the site;
- Mark the precise boundary of the proposed pen with poles or tape. Aim for a circular or oval shaped pen with ***no corners*** (where birds might climb out);
- Clear a strip at least 1 m wide to bare earth along the line of the fence;
- Rake litter & loose soil from along the line *into* the pen-site – this is needed later to cover the toe of the skirt once the fence is up;
- Cut vegetation within ~2 m of the inside of the line to less than 1 m high;
- Assemble the fabric – i.e. zip the three sections together – (the 30 cm skirt goes on the inside, bottom);
- Stitch top and bottom ends of zips so as to take the strain off the zips when the fence is tensioned;
- Erect the poles (at this stage drive them into the ground just far enough for them to remain upright) and using trees as tie-backs for poles, temporarily tie each back with a nylon cord stay – use trees in place of poles where possible;
- Lay out the fabric so that the skirt is on the inside, bottom edge of the fence, and using eyelets along the top edge, tie the barrier to the top of the poles using ~40 cm lengths of ~3 mm diameter nylon braid configured into a simple pulley system (see illustration);
- Using the eyelets along the lower (*outside*) edge of the fabric, secure the bottom of the fence to the base of the poles or to roots/pegs in the ground, so that the fabric is tensioned downwards and outwards at each pole **without creases**, and the lower edge of the skirt hangs to ground level;
- Adjust tension of stays and all tie-backs so as to reposition and tension the fence as necessary (the nylon barrier **must be vertical – or leaning very slightly inwards, it must be tight with no creases and stretched to its maximum height (>1.2 m).** (Poles must protrude >1.3 m above ground level, and the cord at each tie-back configured into a simple pulley system so as to tension the top of the fabric upwards as well as outwards, and the bottom downwards and outwards at each pole);
- Secure the bottom of the skirt tightly to the ground with wire pegs/nylon cord through eyelets and tied to roots. The skirt needs to be a little slack (i.e. with no tension), and should slope inwards at a steep angle (~45º). [Note: vertical tension must be maintained by the tie-downs on the lower *outside* edge of the fabric – not by the skirt]. Although kakapo do not burrow they will enlarge any existing small hole, so it is important that the lower edge of the skirt follows the contours of the ground and that there are *no gaps beneath it*;
- Cover the bottom of the skirt liberally with litter and soil;
- Make any adjustments to the fence and tension it at each pole – so that it is at max height (>1.2 m), tight and *without creases* – this is particularly important at the zips. Zips must lean slightly inwards;
- Make an access point at some convenient spot by arranging ~3 of the ties attached to the top of the fabric so that they can be quickly & easily tied and untied, allowing you to step over the collapsed fabric into the pen;
- "Tin" any trees within the pen with flat-metal or tightly stretched canvas (i.e. wrap a 40 cm strip of thin gauge flat metal, canvas, jet-cloth or heavy plastic sheet around the trunk ~1 m from the ground and secure in place with staples or flat-head nails);
- Set up a simple A-frame shelter near the centre, with a stump, branch or rock as a perch and lots of cover to keep the interior dark and secluded by day. An automatic electronic scales unit can be positioned within the roost or at the feeding station to remotely monitor the bird's weight;
- Set up the feed station;
- Thoroughly check the entire pen for weaknesses - fabric barrier for height (especially on the lower side), tension and for holes in or beneath the barrier. Check that there is no woody vegetation within one meter of the inside of the fence, and that any vegetation within 2 m of the barrier is no more than 1m high. Also that there are no hazards e.g. metal off-cuts, wire, nails, loops of cord, sharp sticks etc;
- Release your bird into the pen and monitor it effectively throughout its stay.