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MANUAL

How to protect Curlew nests from ground predators by an electrical fence

1. Finding the nest:

In my opinion the most time consuming part. I do it by watching a pair of Curlews as long as one goes to the nest, or as long as they show nest building behavior (that's only possible a couple of days before they start to breed, so it's a matter of good timing to watch them actually build the nest). If I see a bird going to its nest, starting breeding, I simply remember the position, go there and mark the nest with two wooden sticks, 5-10 meter away from the nest (figure 1). If I see birds building a nest, I draw a sketch of the position and come back 2-3 days later to (hopefully) find and mark the nest there. Don't go to investigate the nest too early, or the birds might move to another place or leave.

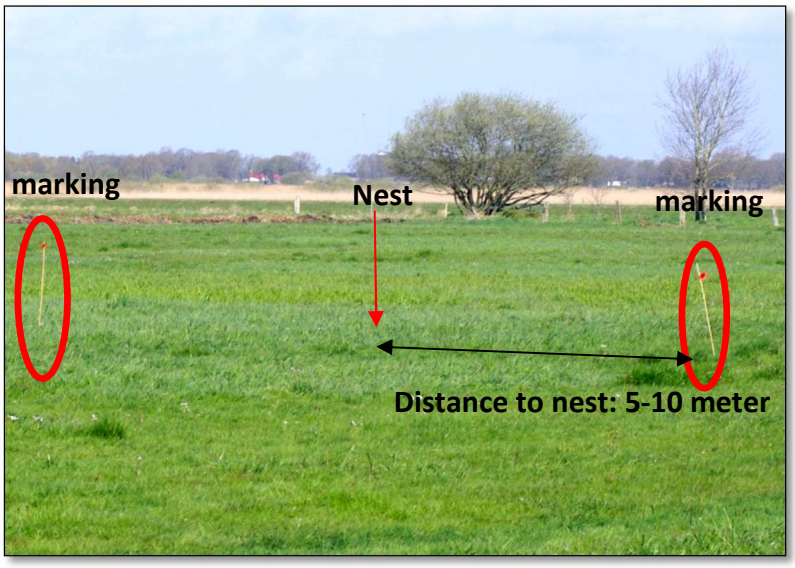

Figure 1: Nest site (red arrow) and nest marking (red circles) of a Curlew nest in a meadow.

2. Waiting until clutch completion:

To make sure the birds are fixed to their nest and will accept the fence, I wait until a clutch is complete (4 eggs). Sometimes a clutch is already full with three eggs. So if a clutch is not increasing for two days, I decide it's full.

3. First step of fence habituation (optionally)

We use a 100 meter cattle fence, so that the nest is surrounded by 25 to 25 meter fence (figure 2 and 3). At one day we lay the material in the correct position around the nest. Keep in mind that you don't leave open spaces for predators to enter (cross the ends of the fence and push it tight to the ground, figure 2). We leave the area and watch the nest from a hide (car) until one bird comes back to breed. We wait for a maximum of 90 minutes. If no bird comes back during this time, we remove the material (that normally doesn't happen). Other projects don't do this first step of habituation, but I'm afraid of disturbing too much if I deploy the fence right away.

4. Second step of fence habituation/fence deploying

On the next day (after step 3) we deploy the fence: we hammer four stakes at each of the corners of the fence. We attach the fence to the stakes with some ropes, to tension it (figure 4). We put the points of the fence into the floor and use plastic pegs (or hazel pegs) to fix the fence on the floor to prevent predators from crawling underneath (figure 4). We connect the fence with hot shocker and car battery to bring electricity to it. Again we wait (in the car), until birds accept it and come back to breed. If they don't come back in 90 minutes, we remove the fence and go back to step 3.

From this year on we want to use solar energy to supply the energy needed. If you don't have a constant energy supply, you have to change the car battery every 5-7 days. We don't mow the grass around the fence, because of lack of time. This method could help to prevent energy being deduced from the vegetation.

(a) **(b)**

Figure 2: First step of fence habituation. (a) The material is laid around the nest to make the birds get used to it. (2) Over cross ends of the fence to make a first barrier, don't leave open areas for predators to enter.

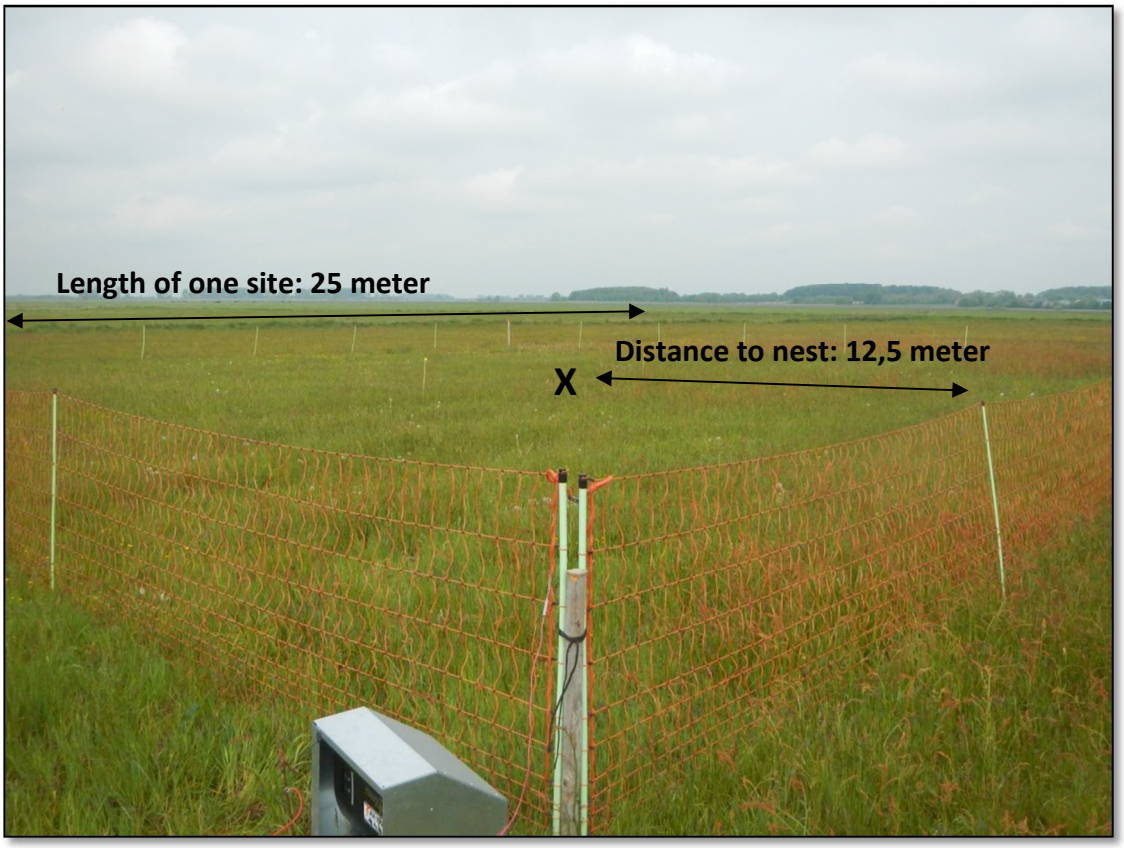

Figure 3: Electric fence (length: 100 meter; site length: 25 meter; distance to nest: 12,5 meter) around a Curlew nest on a meadow.

Figure 4: (a) Stakes and fixing of the fence. (b) fixing the fence on the ground with plastic pegs to prevent predators from crawling under.

5. Fence depletion

After chicks hatch we switch off the electricity (we never had problems with chicks getting hurt by it, figure 5, so we don't need to know the exact date of hatching). To not disturb too much, we deplete the fence after families moved away. Sometimes it's not possible, because farmers need to work on the fields. But most of the time we leave fences until the field has been abandoned by the birds.

Figure 5: Curlew chick and adult. The chick just slipped through the fencing material.

General Information:

Each and every step is in agreement with the farmer. In our area they get a monetary compensation for yield deficiencies (150-350 Euro, depending on which measure they have to undertake). In other areas they don't want to be compensated, or the farmers are even able to build a fence themselves.

Time and rough estimates of money needed is listed in table 1. The amount of money is only calculated for the first year (costs of equipment). This amount decreases after the first year. What's not included in the costs are paying of employees and compensation for farmers (these costs greatly depend on the country, area, persons involved, etc). Not included in the time is the time needed to find nests, which can exceed easily 3 hours/nest, but greatly depends on the experience of the searcher (so decreases with time and experience).

Table 1: Estimation of time, persons and money needed to maintain a fence for a single Curlew nest.

Event	Persons needed	Time needed (h)
Fence laying & habituation (+ observing)	2	1,5
Fence installation (+ observing)	2	1,5
Battery change (every 5 days for a breeding period of 30 day)	1	0,5 (3,0)
Fence depletion	2	1,5
Total		**9,5 – 12,0**

Event	Amount	Costs (€)
Fence	2	~ 75,00
Battery	2	~ 40,00
Spile	4	~ 2,50
Plastic pegs	~ 120	~ 11,00
Hot shocker	1	~ 100,00
Total		**~ 374**