Coyotes (Canis latrans) are the main source of sea turtle nest depredation on Bald Head Island, NC despite the use of predator exclusion cages (PEC).

PECs are common in sea turtle conservation and historically, the Bald Head Island Conservancy (BHIC) used welded wire (A) but adopted a PVC geogrid (B) model after research on the effects ferrous material has on hatchling navigation was published. (2,3,4)

In 2019, coyotes mastered infiltrating the geogrid PEC, resulting in the largest loss of sea turtle eggs in BHIC history (Table 1), motivating BHIC to design and test the efficacy of a new PEC against PECs commonly used in the sea turtle nest monitoring community.

<table>
<thead>
<tr>
<th>Table 1. 2019 Coyote Depredation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depredation Attempts</td>
</tr>
<tr>
<td>Failed</td>
</tr>
<tr>
<td>132</td>
</tr>
</tbody>
</table>

BHIC designed a PEC using a PVC frame & MasterNet® fencing (C), commonly used to protect nests in Georgia. (1) We predicted that the MasterNet® cage would be more effective than previous PECs.

Methods – Baited Nests

Four PEC models (D) were selected to protect baited nests along 3 transects on BHI & Fort Fisher (E). Four of each model and 4 controls were placed along each transect for two 14-day trials in 2020.

1 camera (F) was paired with each of the 4 PEC models and 1 control along each transect to catalog species.

Efficacy: Effectiveness of reducing depredation.
Success: Successful depredation. Failure: Failed depredation.

Species Observed: Coyote & Red Fox (Vulpes vulpes).
MasterNet® & welded wire cages were the most effective (Table 2) and were used to protect live nests in 2021.

Methods – 2021 Live Nests

MasterNet® & welded wire PECs used over live nests
- Randomized cage installation
- Night patrols for nesting mothers were conducted
- 18 cameras paired with 9 of each PEC
- Identify predator species & PEC efficacy

Results – Live Nests

<table>
<thead>
<tr>
<th>Table 2. Baited Nests Depredation Activities</th>
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<tbody>
<tr>
<td>Welded Wire</td>
</tr>
<tr>
<td>Fail</td>
</tr>
<tr>
<td>Success</td>
</tr>
</tbody>
</table>

Efficacy: MasterNet® Cage – 97%; Welded Wire – 95% (Figure 2).
No significant difference in efficacy between the two models $X^2(1, N=150) = 1.4, p = 0.2373.$

Management Recommendations

- The MasterNet® cage showed similar, strong efficacy against consistent coyote depredation pressure to the welded wire cage.
- The MasterNet® cage is a suitable replacement for welded wire until its effects on hatchling navigation can be confirmed.
- PEC models need to continuously adapt, as predators do. For now, these two models will keep the loss minimal.
- Our findings and continued research will aid managers in their depredation mitigation strategies protecting endangered sea turtles.

Acknowledgments: 2020 & 2021 Bald Head Island Conservancy interns, Emma Phillips & North Carolina Sea Grant