As a GEARNET pilot project, this study was proposed by NEFS 11, and in particular Capt. Jason Driscoll (F/V Karen Lyn). The project was coordinated by Ken La Valley (University of New Hampshire / Seagrant) in collaboration with Shelly Tallack (GMRI). GEARNET is funded by NOAA Fisheries Cooperative Research Program.

**Research question**

Under the ‘catch shares’ and sector management system that now regulates the Northeast groundfish fishery, fishermen will benefit more than ever by improving the selectivity and thus, efficiency of their fishing operations. For example, for a number of fishermen in NEFS 11, to fish within the species allocations that they have, their goal is to maximise their catch of high-allocation species (e.g. pollock) while minimizing their catch of low-allocation species (e.g. cod). The specific objectives of this study are:

- Evaluate differences in catch composition (i.e. selectivity) between gillnets placed 2, 4 and 6 feet off the sea floor, compared to a control net; and
- Use this information to identify potential gillnet designs that may reduce cod and other non-target groundfish landings while targeting pollock.

**Study design and approach**

The study took place between August and November of 2011, on board three commercial gillnet vessels based out of New Hampshire.

- All experimental strings were set in the same area, and soaked for 12 or 24 hours.
- All net panels were 100 feet long and 6 1/2” mesh (Table 1).
- A randomized block design was used to place control and experimental panels within a string (Table 2).
- This design was used to minimize between-panel and positional effects on the data.
Table 1: The randomized block design for the placement of experimental panels within a string during field trials.

<table>
<thead>
<tr>
<th>String #</th>
<th>1st Position</th>
<th>2nd Position</th>
<th>3rd Position</th>
<th>4th Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>D</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

A = control net, B = 2 ft norsel height, C = 4 ft norsel height, D = 6 ft norsel height

The control panel was constructed of 6.5” diamond mesh, and was 25 meshes deep with each panel being 100 feet in length (Figure 2A). In contrast, each experimental panel was constructed of 6 1/2” mesh for the upper section of the panel, and 12” diamond mesh for the selectivity panel. The selectivity panel was constructed at 2 ft, 4 ft and 6 ft for the three different experimental designs (Figure 2B, Table 2).

Figure 2: The design of the Control (A) and Experimental (B) nets.

Table 2: Experimental net configurations

<table>
<thead>
<tr>
<th>No. of nets per string</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net length</td>
<td>100 ft</td>
</tr>
<tr>
<td>Webbing height</td>
<td>12 ft</td>
</tr>
<tr>
<td>Norsel height</td>
<td>2, 4 or 6 ft</td>
</tr>
<tr>
<td>Mesh size</td>
<td>6 1/2”</td>
</tr>
<tr>
<td>Vertical mesh count</td>
<td>25</td>
</tr>
</tbody>
</table>

Figure 3: Relative catch composition by gillnet type.

Results

In total, 39 vessel trips were completed (~13 trips/vessel), resulting in 29 replicate sets. However, catch rates were low, which meant that statistical power was poor and it was difficult to compare individual sets by vessel or across vessels. Despite this, an apparent trend was observed (Figure 3) with a significant difference (P<0.05):

- Cod % landings were highest (~70%) and pollock % landings were lowest from the control net;  
- The highest % pollock landings and lowest % cod landings (~6%) were achieved by the 2 ft norsel height.

Summary

Preliminary conclusions

Based on these observations in this pilot-scale study, we believe that cod can be avoided and pollock selectively targeted by raising the fishing panel height of a gillnet.

- Our observations suggest that a 2 ft norsel height or large mesh panel below the regulated gill net mesh will significantly reduce cod catch while landing pollock.
- More extensive field trials are necessary in combination with higher catch rates to conclusively recommend an alternative gill net configuration.

Management implications

There are a number of potential management implications for this research:

- There is the potential for increased capacity of gillnet fishermen to harvest their individual (and sector wide) allocations of pollock and other regulated groundfish;
- More selective gillnets will lead to reduced mortality of non-target species; and
- There is potential for increased operational efficiency and profitability, by using more selective gillnet designs.

Contact and further information

For greater detail on this project’s findings, please contact Dr. Kenneth J. La Valley (ken.lavalley@unh.edu, 603-862-4343).

For more information about GEARNET in general, please visit our official GEARNET website (www.gearnet.org). This website will also provide access to detailed reports for each individual GEARNET project (www.gearnet.org/projects.html) once they are completed.