Developing a Separator for Juvenile Lamprey

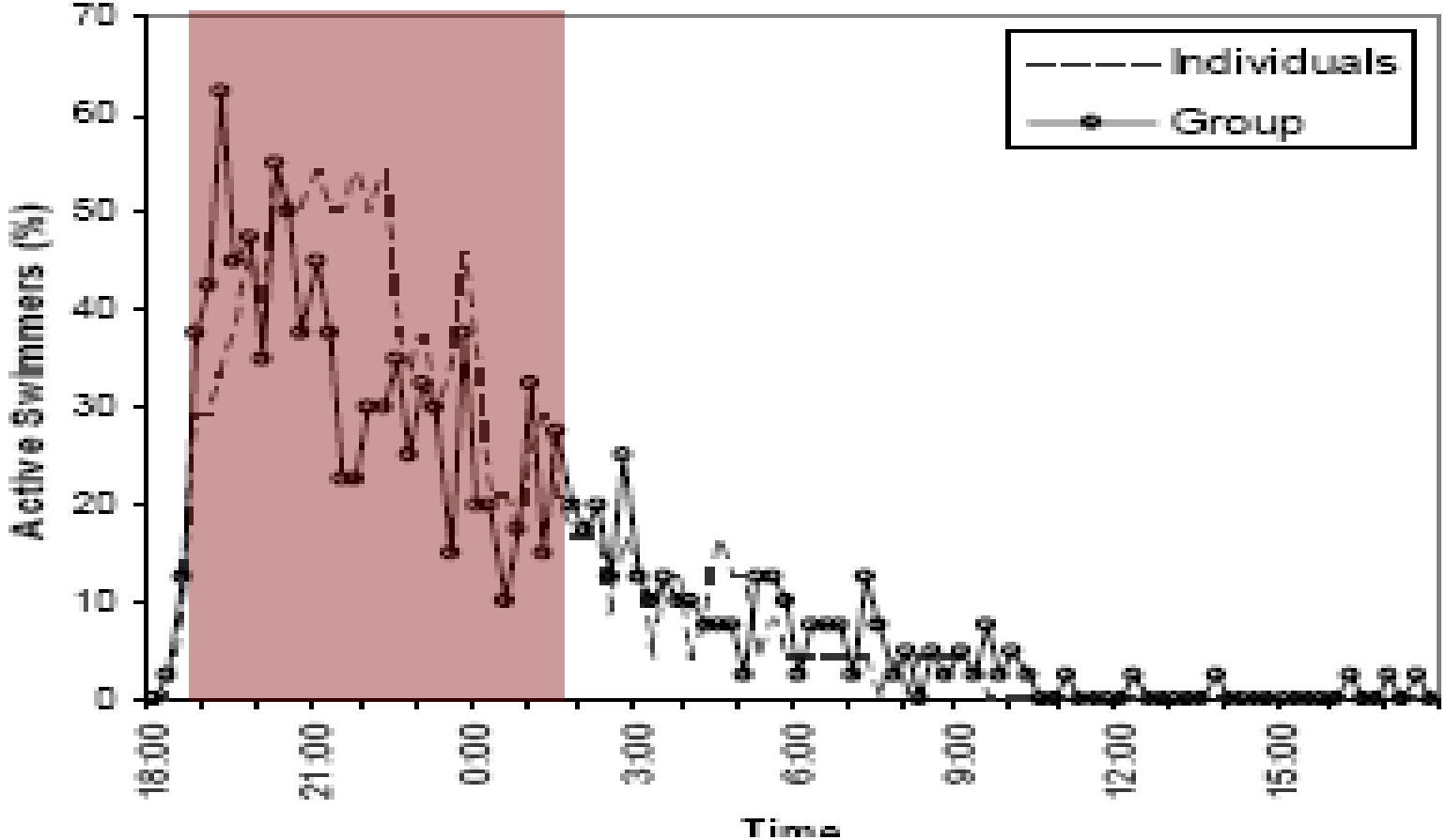
Photo Courtesy of Hiram Li

Objectives

Determine the effects of light and flow on juvenile lamprey behavior.

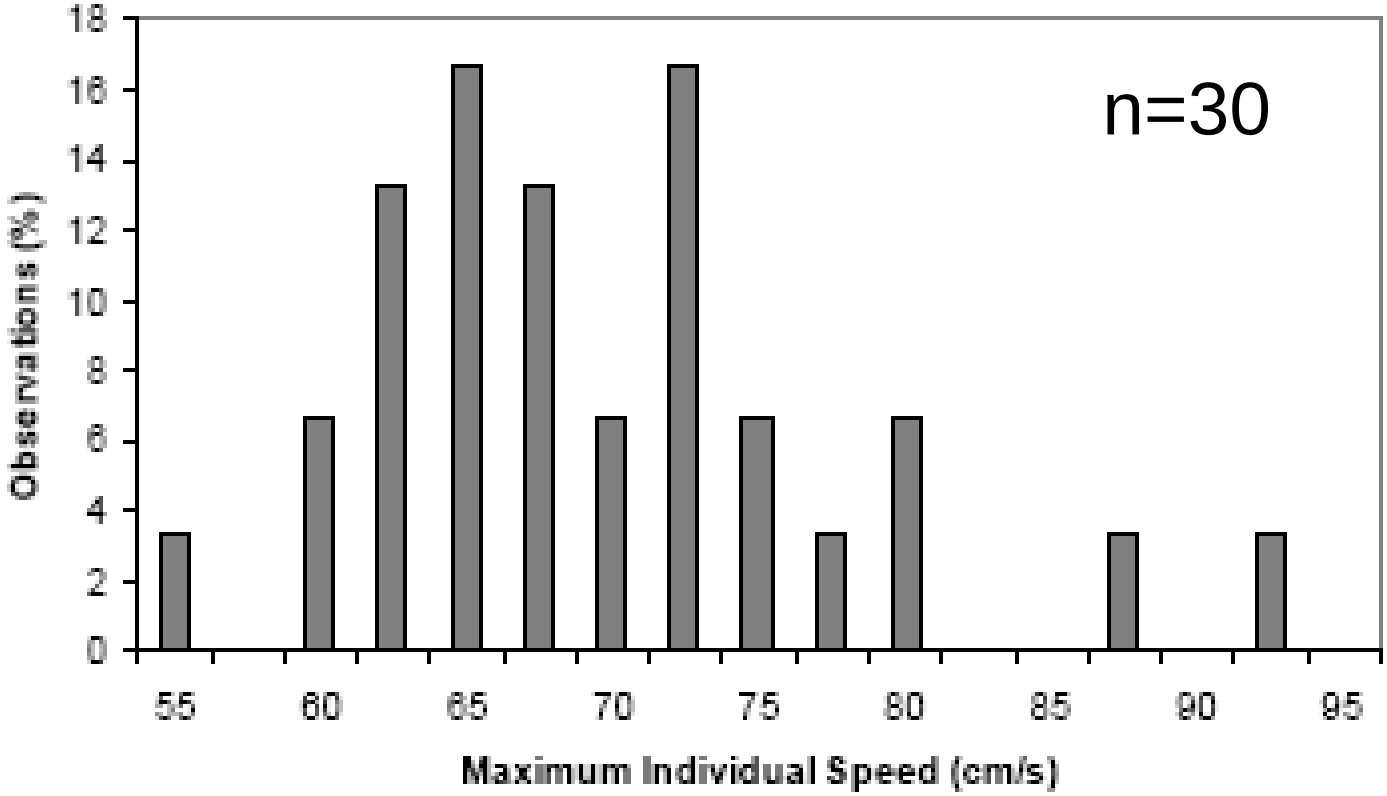
Examine the effect of screen orientation on juvenile lamprey behavior.

Determine screen material that juvenile lamprey will pass through.

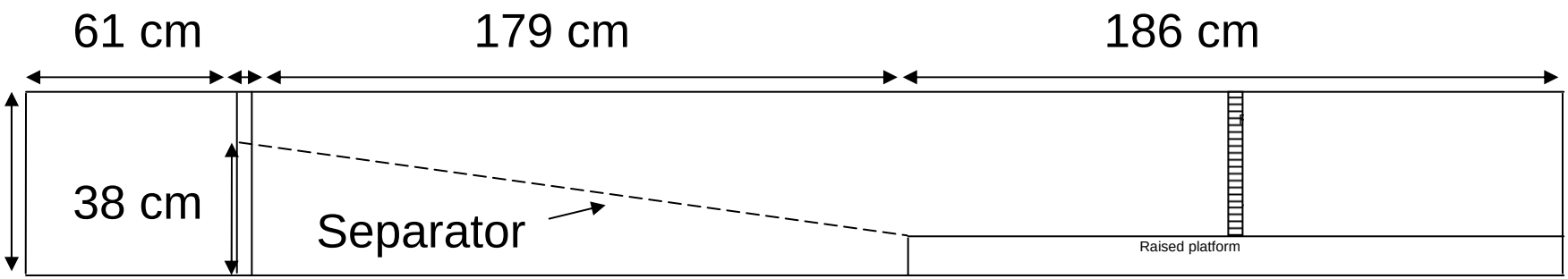


From Dauble et al. In Press

Low Flow = < 25 cm/s

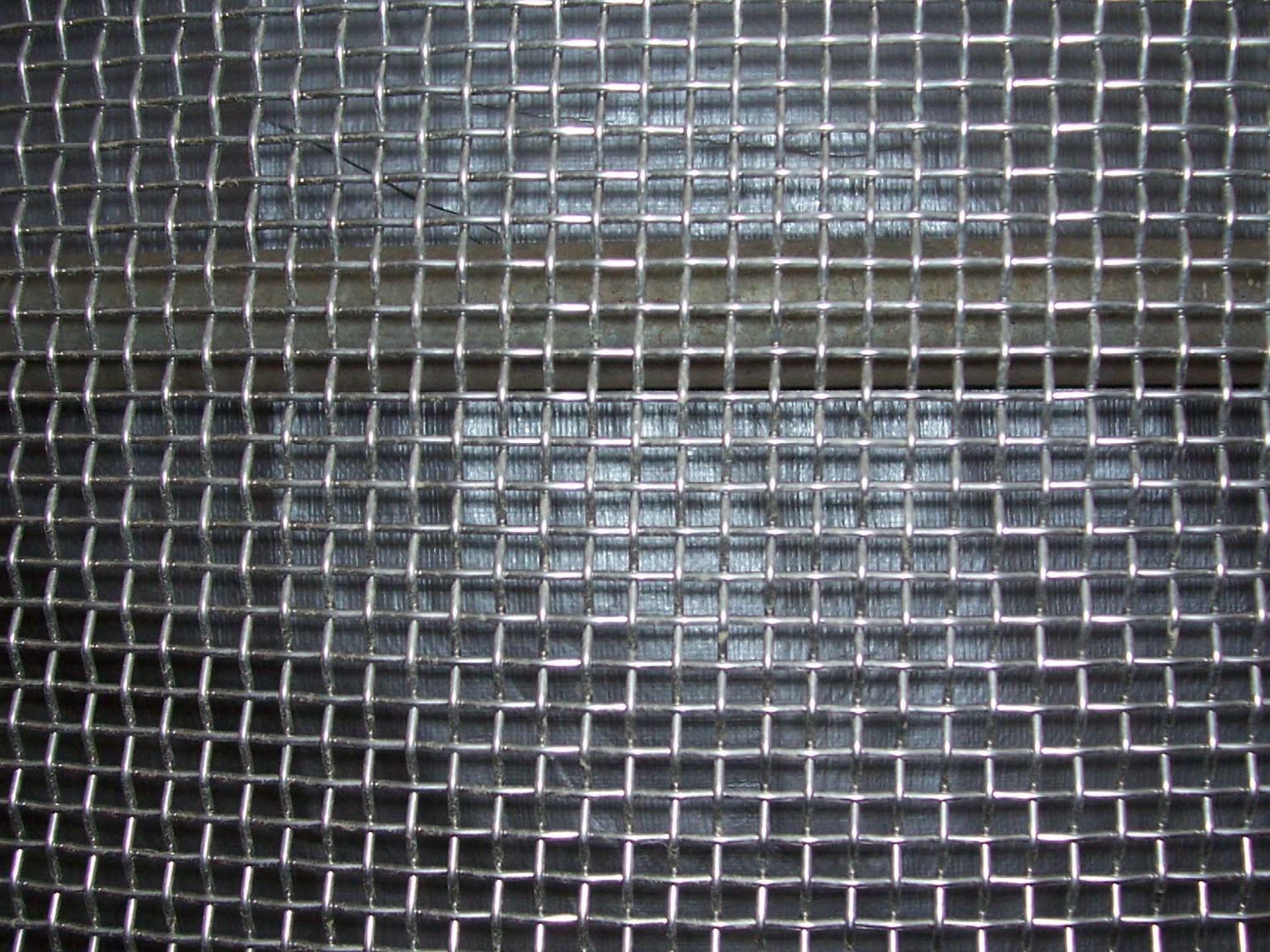


From Dauble et al. In Press

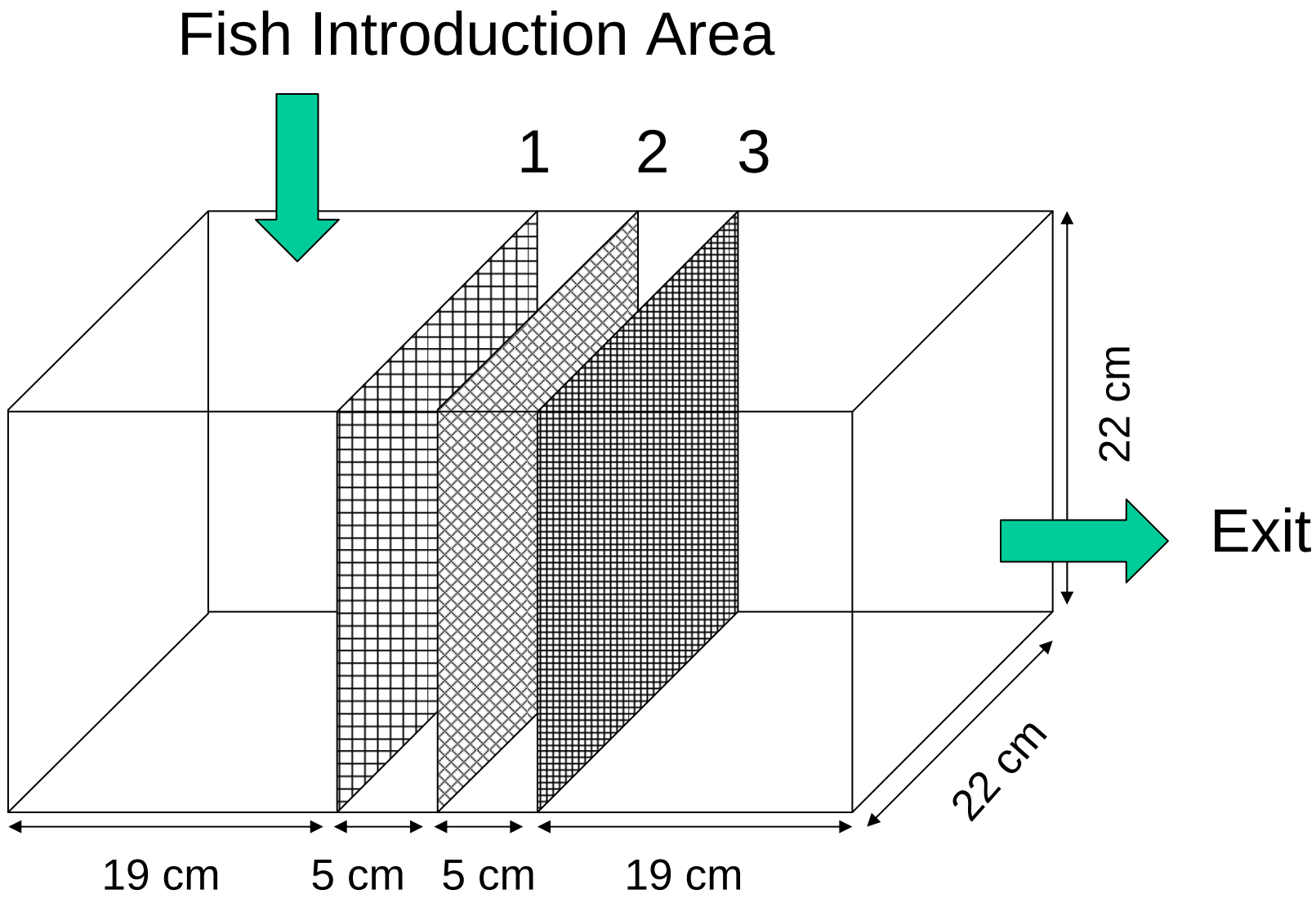


Side View

Top View



Low Light = 100-250 L/m^2 High Light = 1500-2500 L/m^2


Fish Introduction Area
1
2
3
22 cm
Exit
22 cm
19 cm
5 cm
5 cm
19 cm

1 = 12 mm
2 = 9 x 7 mm
3 = 6.5 mm

Total Length (mm)

Interorbital Width (mm)

Flume Trials

5 replicates of each of five treatments

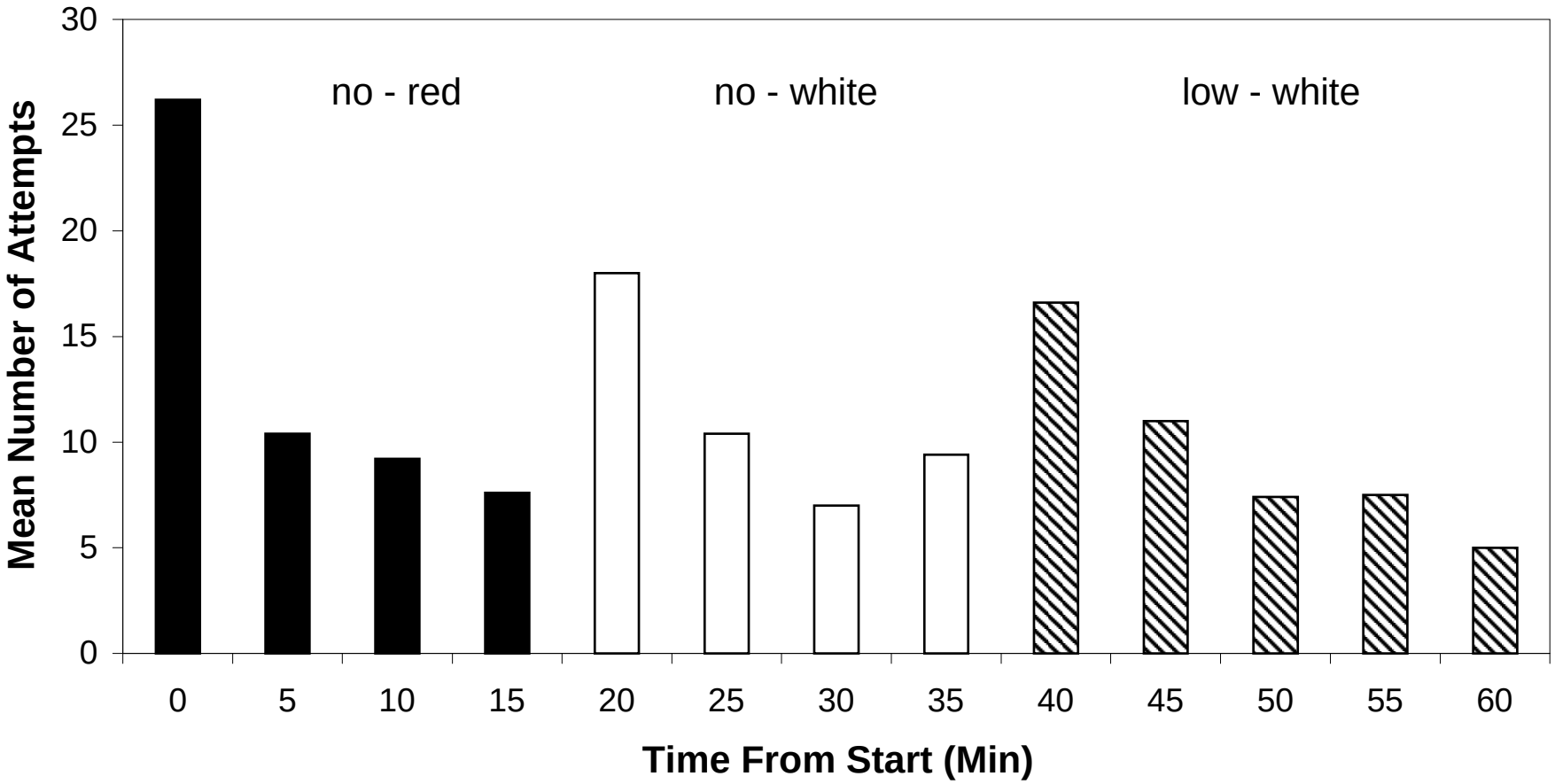
10 lamprey per replicate

Sieve Trials

5 replicates of each of two treatments

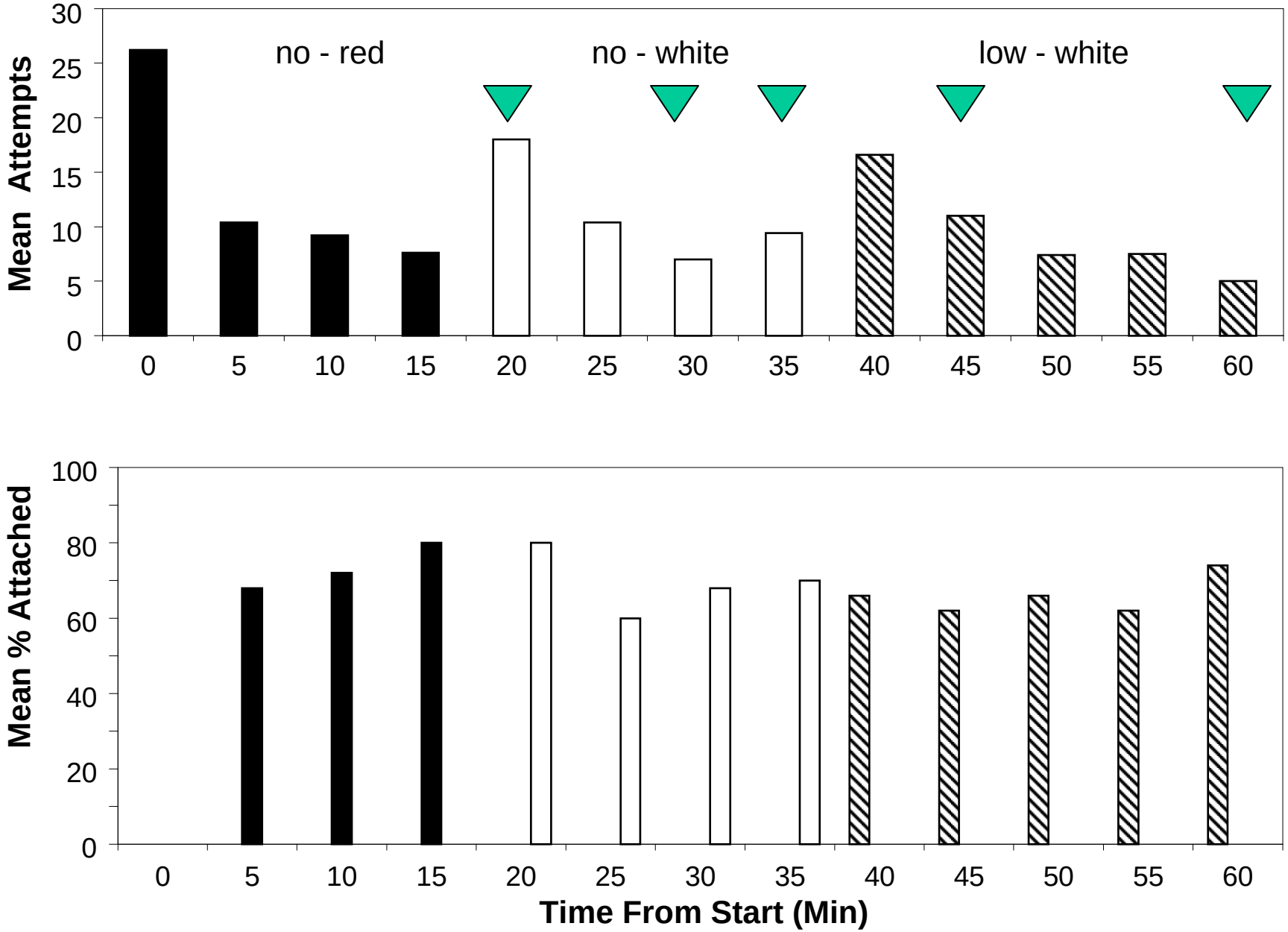
10 lamprey per replicate

Angled Plate Trial

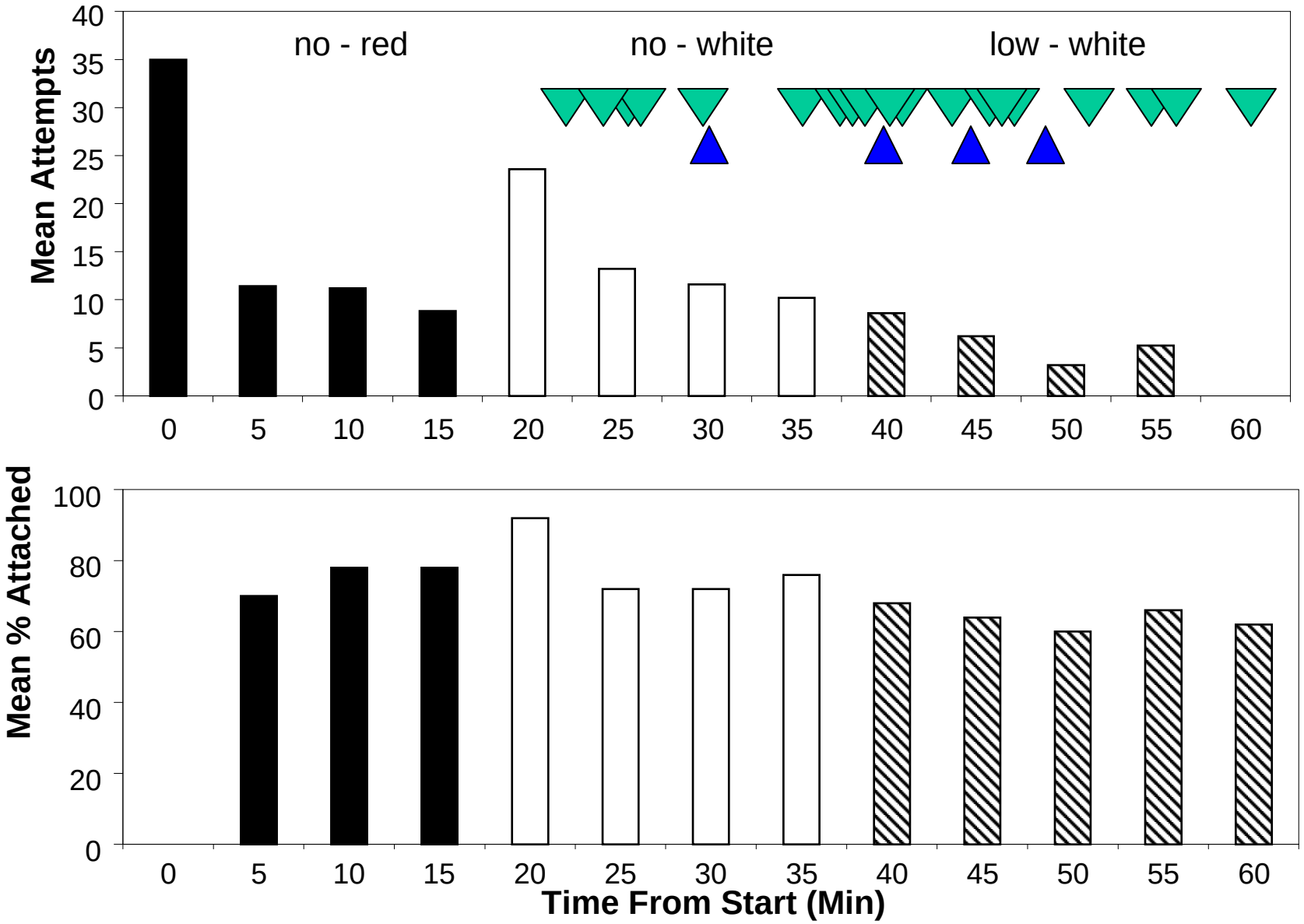


Angled Plate Trial

5

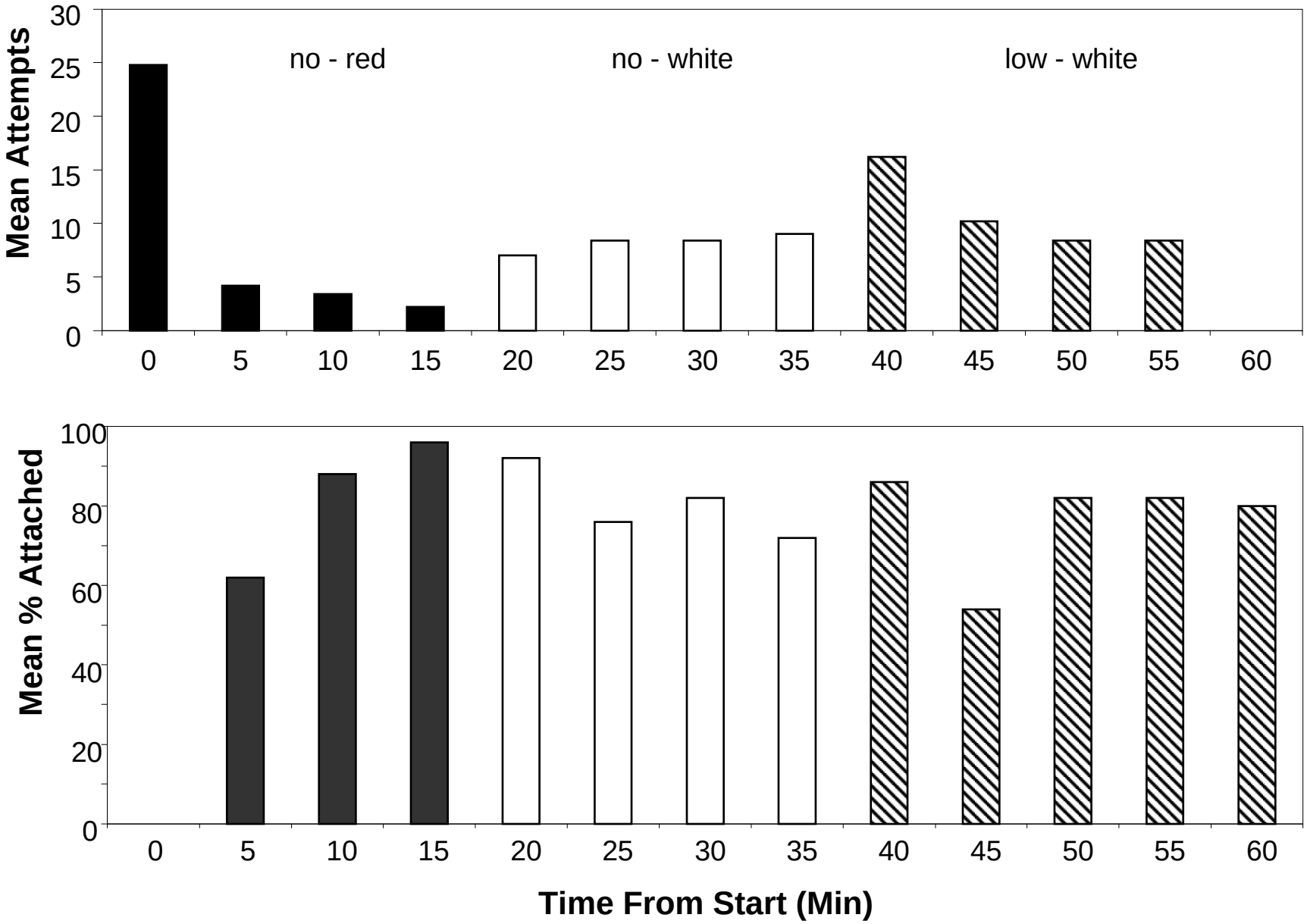


Vertical Plate Trial

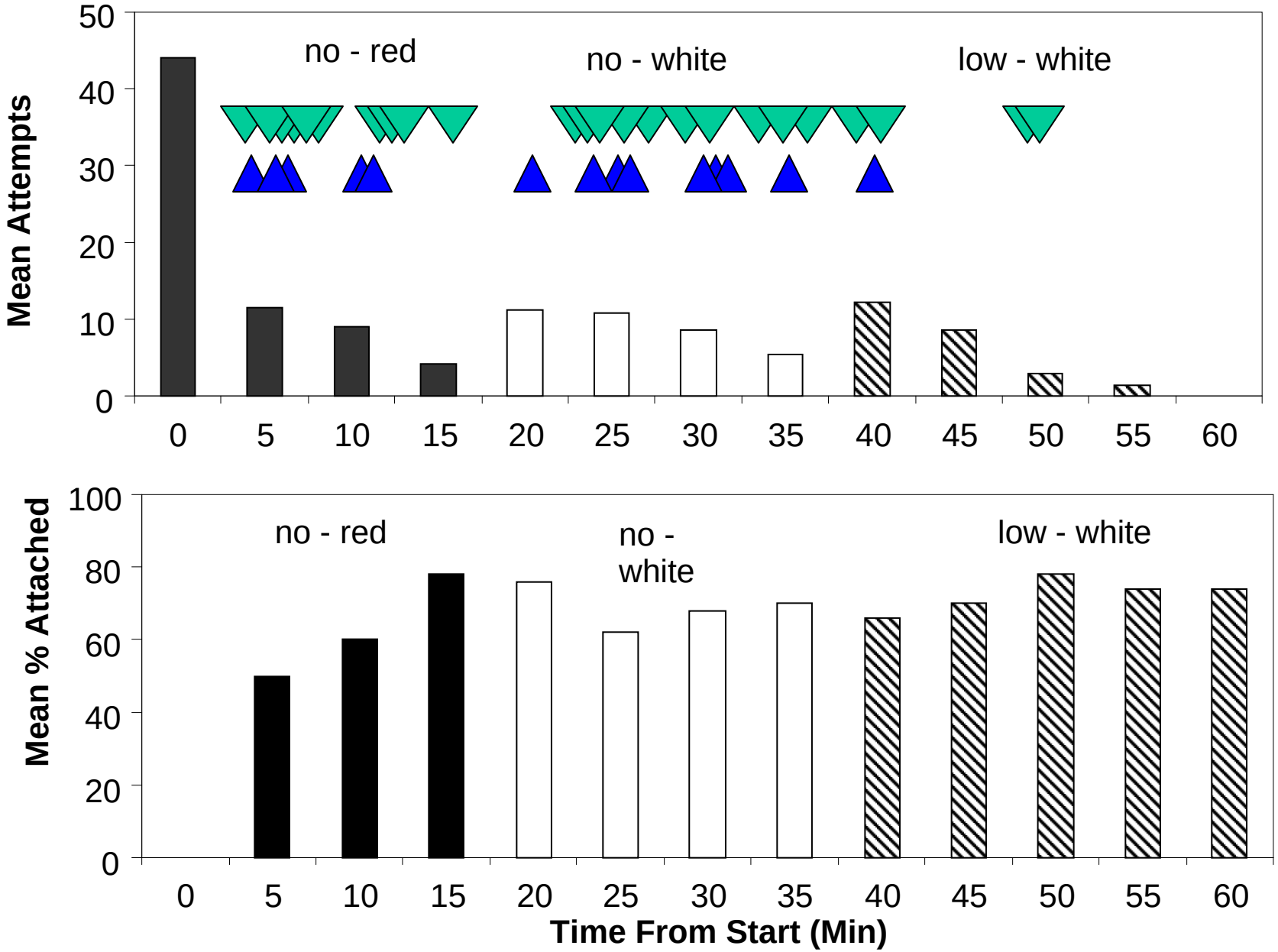


Angled Mesh Trial

0

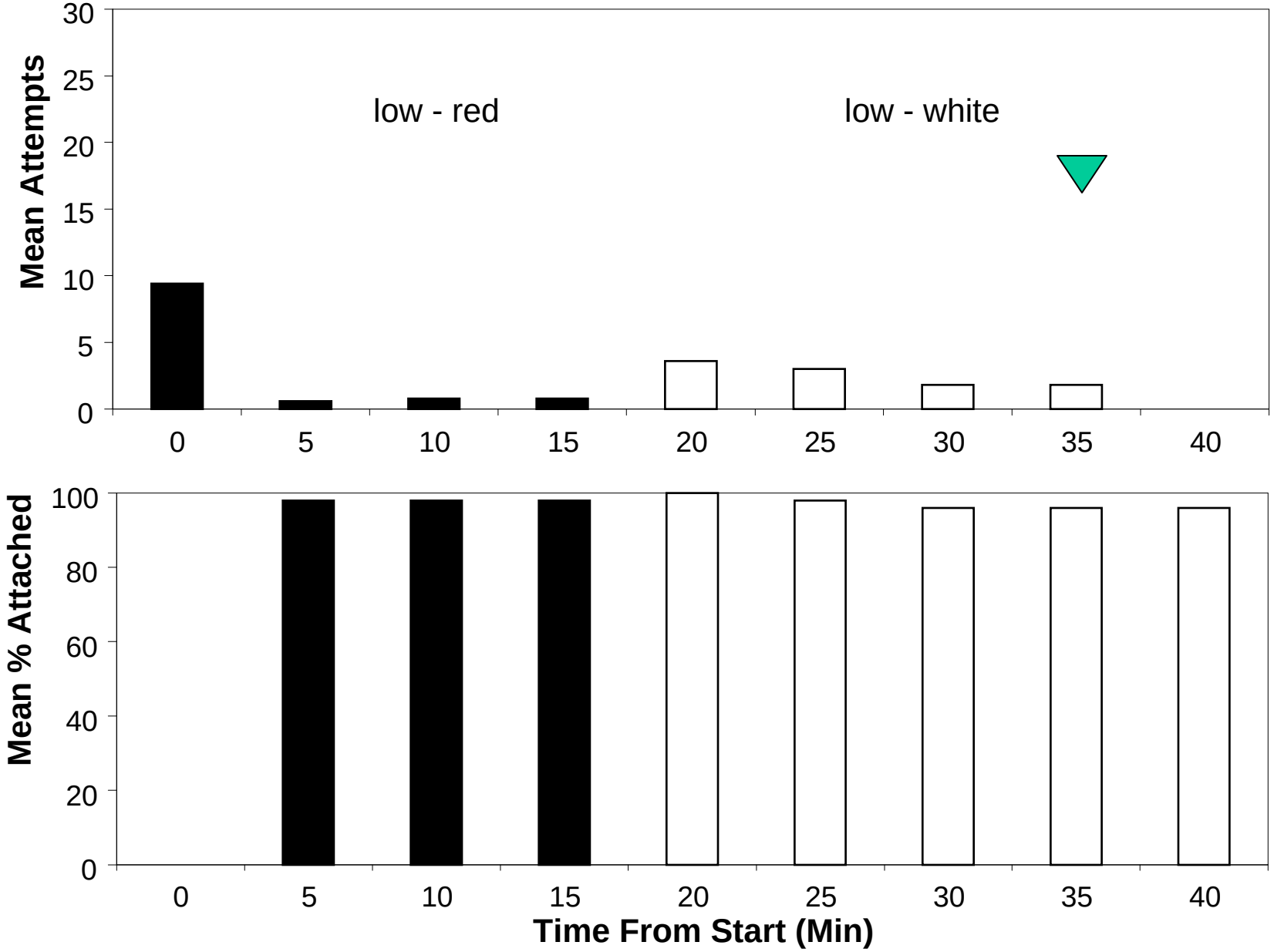


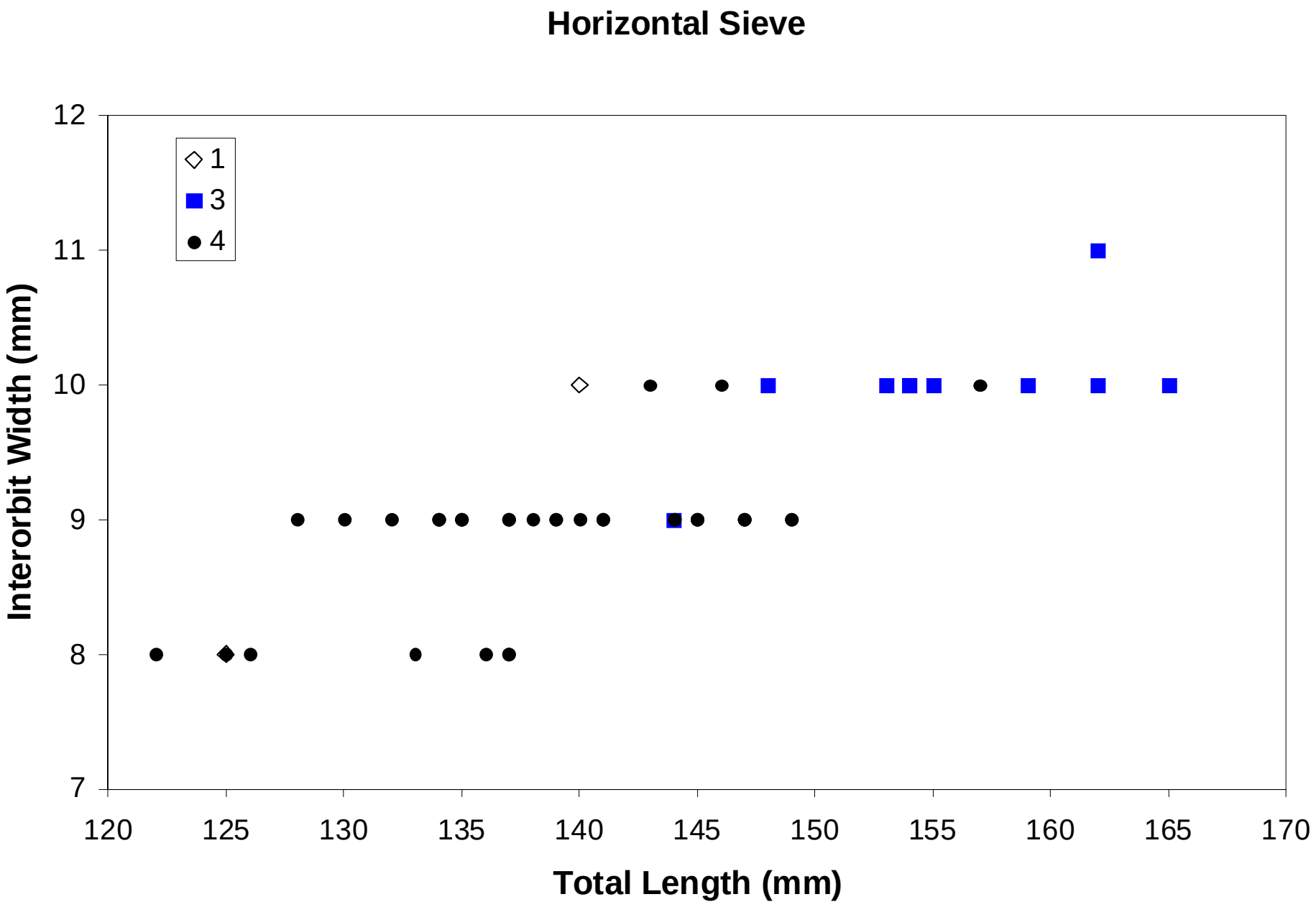
Vertical Mesh Trial

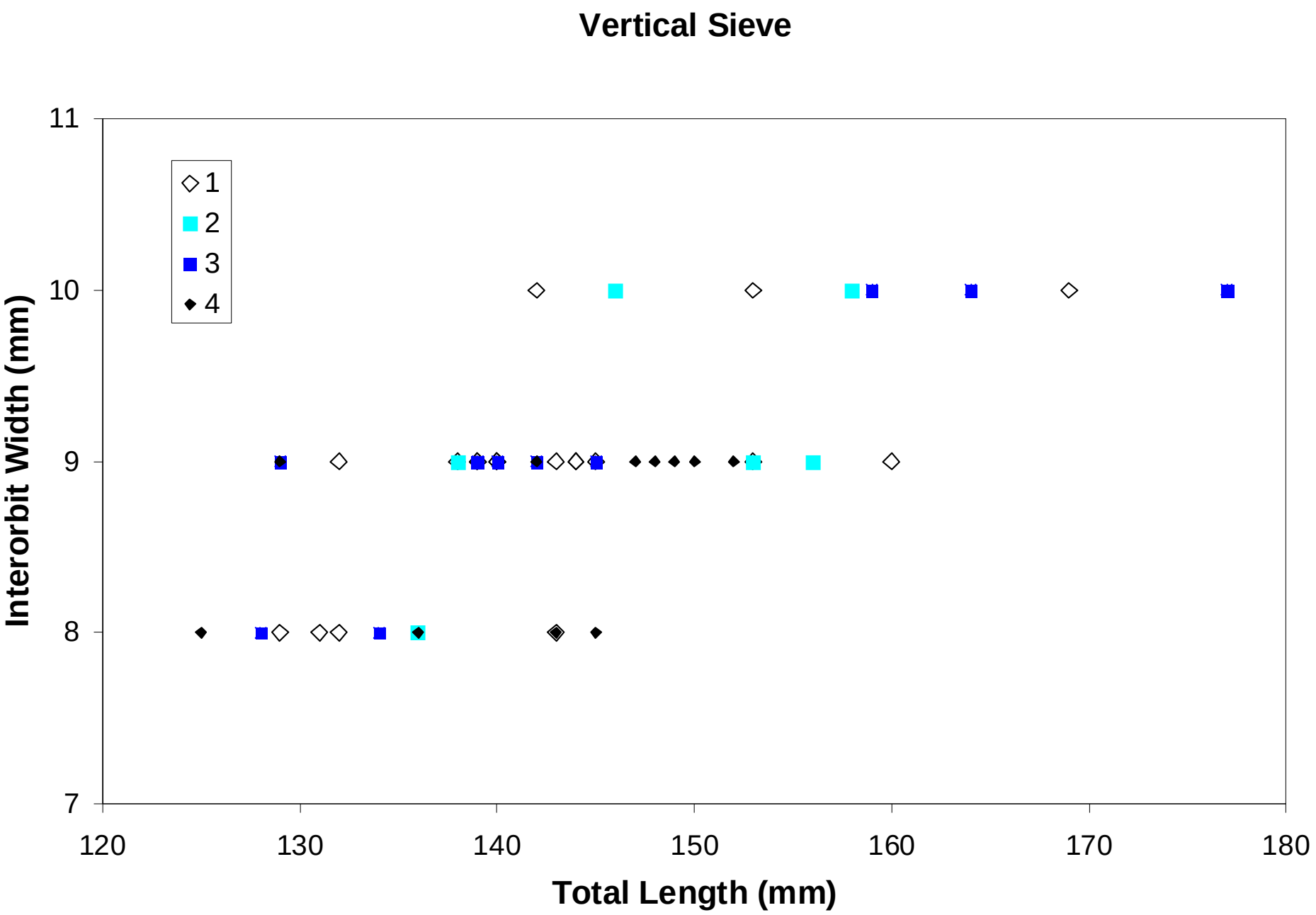


Upstream Angled Mesh Trial

1




Horizontal Sieve
1
3
4
Interorbit Width (mm)
Total Length (mm)
12
11
10
9
8
7
120
125
130
135
140
145
150
155
160
165
170


Vertical Sieve
Interorbit Width (mm)
Total Length (mm)
11
10
9
8
7
120
130
140
150
160
170
180
1
2
3
4

Conclusions

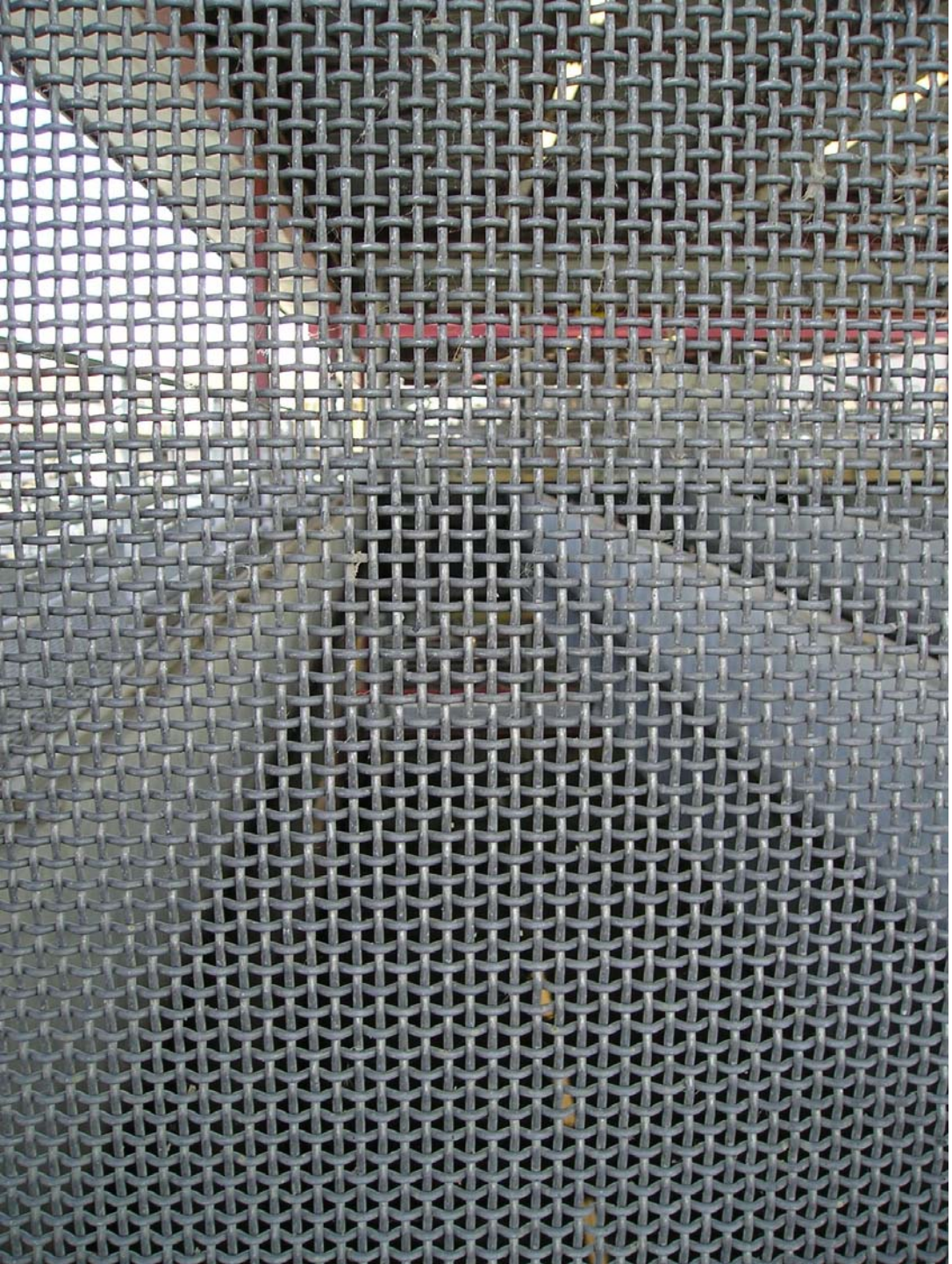
Both bright lighting and increased flow elicited short term increases in activity.

Greater activity when lamprey were moving in the direction of the flow.

Lamprey passed through both vertically-oriented perforated plate and woven mesh.

Juvenile lamprey were reluctant to move through any material oriented horizontally.

Acknowledgements
Mike Gessel, Jim Simonson, Jeff Moser, Brad Eby, Paul Kemp, Eva Enders, Rosanna Tudor, and the McNary smolt monitoring crew.
U.S. Army Corps of Engineers, Walla Walla



Raceway screen