

# High School Marine Biology Research Projects

## Beach Seine: Sandy vs. Grassy Bottom Habitats

### I. Introduction

Covering upwards of 70% of the earth's surface the marine environment supports entire lifecycles of a multitude of organisms. Individual habitats which exist within the marine environment have unique biotic and abiotic features which affect their productivity and, their ability to support various forms of life. The characteristics of each habitat act as a major driving force in the evolution of the animals therein, providing selective pressures that lead to the differential survival within a population (Sumich, 1996). For this reason, one would expect to find, within each habitat, animals that are well suited to overcome the various challenges present and pass along their genes to the next generation.

To understand the inhabitants of any given habitat, one needs to assess the specific challenges present. By gaining an intimate understanding of these challenges, one may successfully comprehend adaptations possessed by different species and also why some species are found in on habitat and not found in another.

The Bahamas contain several different marine habitats. Two that are very important to marine life include a shallow, sandy bottom and a similarly shallow but grassy bottom habitat.

**II. Research question:** Is there a difference in the number (and diversity) of organisms that can be observed in sandy vs. grassy bottom habitats?

### III. Hypothesis

a. Null  $H_0$ : \_\_\_\_\_

b. Alternate  $H_a$ : \_\_\_\_\_

**IV. Prediction:** \_\_\_\_\_

### IV. Materials:

#### Project materials:

- Seine Net (upper deck; mesh bag)
- 2- pairs of gloves
- Data Sheets (on water proof paper)
- Pencils (extras just in case)
- Clipboard
- Orange Shore Box with radio
- Digital Camera
- Insect repellent
- Sunscreen
- Small nets
- Cooler with water
- Paper towel example

#### Student materials:

- Water Bottles (in cooler)
- Snorkel Gear
- Water Shoes
- Hats
- Insect repellent
- Sunglasses
- Personal sunscreen
- Shorts and Shirts (if needed)

## V. Procedure

### Jobs Needed:

1. 4- pullers (2 lead line: *set pace*, 2 float line→all 4 stay together)
  - tallest students should be pullers
2. 1- snorkeler
3. Remainder become splashers
  - Splashers need to be evenly spaced

\*While collecting fish, everyone should be quiet and watch where the net is going

\*Fish should be released on ocean side

\*Grass and other debris has to be removed from net

\*ZERO Mortality

\* Don't walk in test area\*

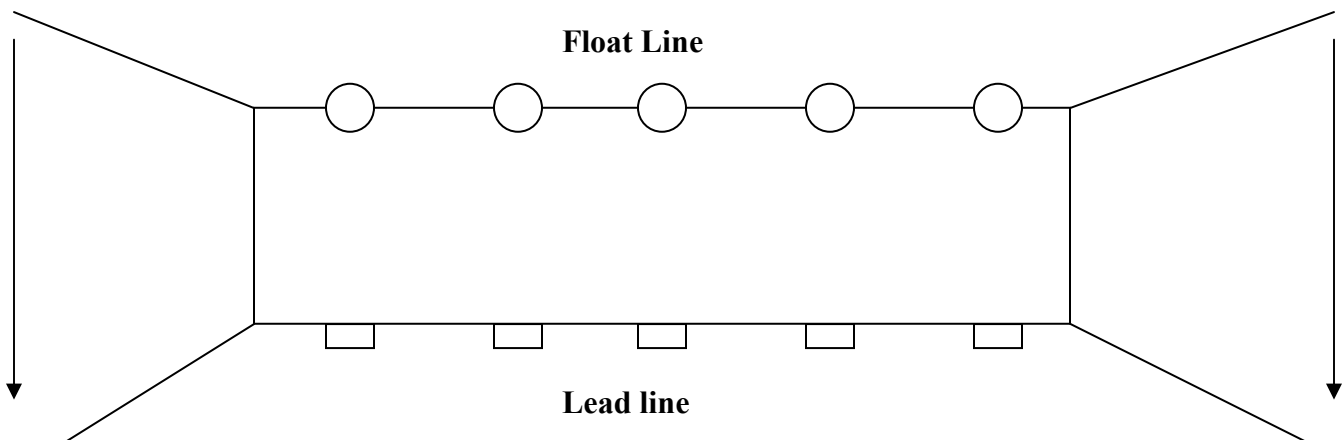


Figure 1. Diagram of a beach seine

### Methods:

1. Untangle the beach seine after removing it from the skiff. Be sure to smooth out all knots and kinks.
2. Have two people of relatively equal height take positions at the two ends of the seine (small sides of above rectangle)
3. Other members of the group should hold the seine along its length being sure to be equally spaced along the entire seine.
4. Walk the seine into the water perpendicular to the shore.
5. As the water reaches the knees of the person in front of the line, the lead (weighted or bottom) line should be dropped into the water.
6. As the water reaches the chest of the person in front of the line, the float line should be dropped so the buoys float upon the surface.

7. Maneuver the net in a long smooth swinging motion so that it is aligned parallel to the beach.
8. At this time, the group members who were holding the middle of the net should be repositioned on either side of the seine (half on each). These individuals will serve as beaters during the seining process.
9. Another individual equipped with mask, snorkel and fins should be positioned directly behind (ocean side) the seine. During the seining process, this individual will watch the lead line to insure it is not damaged on rocks or other sharp, submerged objects.
10. With the beaters and snorkeler in position, slowly begin pulling the seine towards the beach, dragging the lead line along the bottom. At this time the beaters should start to splash the surface of the water on each side of the seine to discourage the animals from escaping.
11. Upon nearing the shore, beaters should position themselves on either side of the net (both shore and open water side).
12. At the same time, the individuals on each end of the seine should begin pulling the lead line up towards the surface on the shore side. The individuals positioned on the shore and open water side of the net should lift the lead and float lines above the surface to prevent escape.
13. At this time, data can be collected and animals should be returned to the open waterside of the net by an instructor.

### **Literature Cited**

Sumich, James L. An Introduction to the Biology of Marine Life. Chicago: Wm. C. Brown Publishers; 1996.