

# Timed Transects Methodology

The timed transect method is simply searching in a vertical line from the low to the high tide mark. This type of sampling is ideal for locations that may not have the invader or if so, it is in low densities. This method is a great way for finding the invasive “needle” (organism) in the “haystack” (of cobblestone rocks). This monitoring strategy is an excellent compliment to monitoring by quadrat sampling since it is better for detection, instead of determining densities.

1. Lay a long meter tape (a long measuring tape) parallel to the ocean. If you are in NJ, NY, CT, RI, or MA, this should be chosen randomly. If in Maine, due to the smaller probability that the Asian shore crab (*Hemigrapsus sanguineus*) will be found, we will place the tape measure only over the area that is cobblestone or rocky; the preferred habitat of the crab. Make sure the meter tape is far enough above the water mark, so it does not get washed to sea.

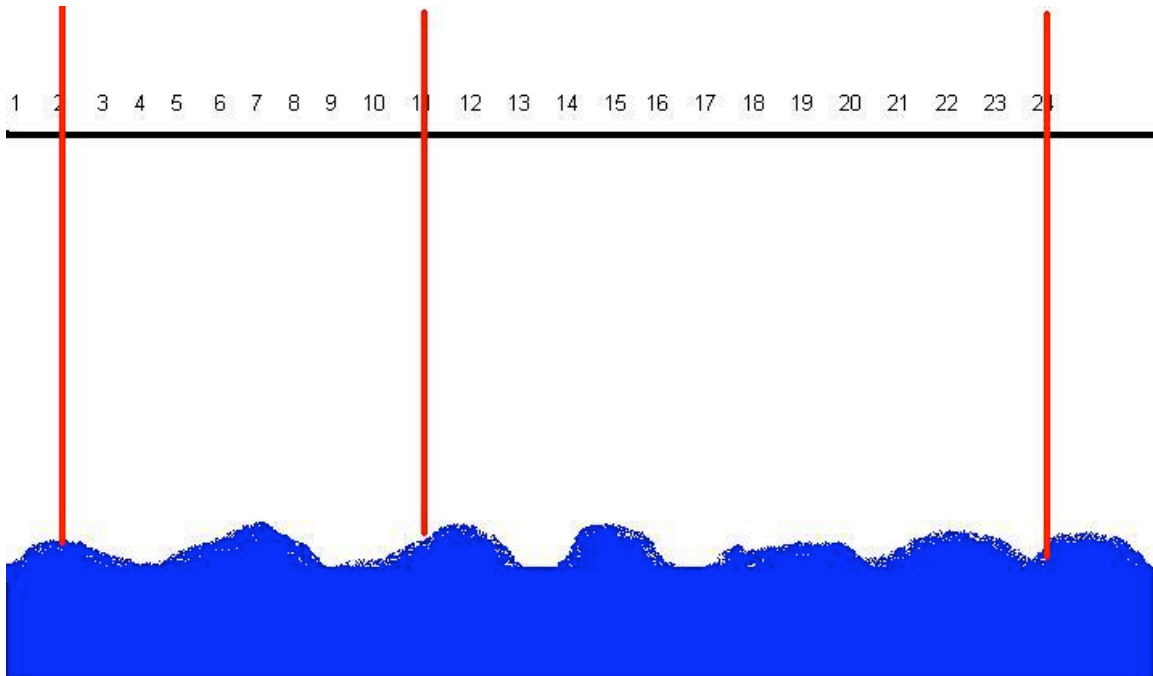
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

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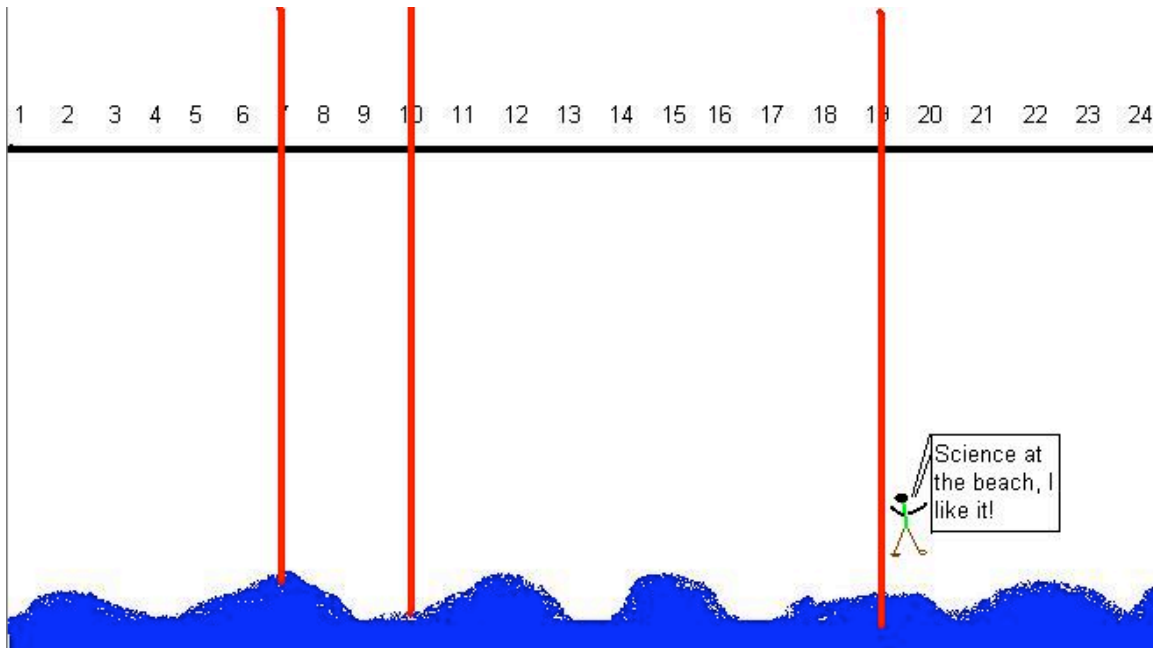


2. Then choose a random number. If possible, please use the random number generator that will be put on the webpage. If this is not a possibility, just ask the participants to generate a set of random and non-repeating set of numbers.
3. Get a long piece of rope and find that number on the tape measure that is already laid on the beach. Then place the rope so it is perpendicular to the water's edge and the tape measure so it crosses on the number that was randomly chosen.

Say we have three groups conducting timed transects, what could it look like?



Or this, because the location are based off random number generator that doesn't repeat!



4. Now, starting from low to high tide line, a group of two or more should turn over rocks and search the area under or right near the rope.
5. All crabs that are found should be place in your bin or ziplock bags. If you use ziplock bags, please label the bag with a black marker so it indicates all relevant information (collectors name, the number that determined the place of the transect rope, etc.)

6. Repeat step # 5, Continue searching until the time (e.g. 1 or 4 or 15 minutes) you have for that transects ends. The temporal length of your transects will be determined by David Delaney before the day of your sampling and assigned by the lead scientist (i.e. your teacher, volunteer groups leader, etc.) on the day of sampling.
7. The most important part: Now you will take your bag or bin of crabs and assign a data recorder and the rest will take the crabs one by one and determine their species, sex, and size. Accuracy of each of these is crucial, so make sure the group agrees on the data, esp. the species of the crab.
8. One person should be data keeper while the others should be crab measurers. The measurer will take one crab, identify its species (European green, Asian shore, Jonah, rock, etc.). If not sure, ask the other group members. If there is not a unanimous consensus, then ask the group leader or consult labeled crab molts and / or field guides to answer these questions. Then the sex of the crab can be determined by flipping the crab over and examining the underside of the crab's carapace (exoskeleton or "suit of armor") determined by the shape of the abdomen (tail flap). The male has a tail flap that looks like a light house or a thin triangle or a Washington monument, while, the female has a larger and rounded tail flap.

Then the crab's carapace will be measured at it widest section (the 5th spine, the one furthest from the eye to the other corresponding 5th spine). The data keeper records this information for each crab. Do this for each crab, until all crabs have been counted. Record, on the data sheet, the time it took to sample that quadrat. Do not worry, it is not a race; please do a through and meticulous job. We need this information for analysis of efficiency of various monitoring techniques. Also do not worry if you find few or no crabs, these data are also very important to the research project. Another caveat, when you tell the data to the data recorder, if the group is larger than two, please be careful not to have any miscommunication by having more than one person give data to the recorder at the same time. This data can be written on the corresponding data sheet.

Example:

| Species                | Sex    | Size    |
|------------------------|--------|---------|
| European Green Crab    | Male   | 45 mm   |
| Asian shore Crab       | Female | 22.5 mm |
| Carcinus maenas        | F      | 35mm    |
| Hemigrapsus sanguineus | M      | 20mm    |
| Hemi                   | F      | 10mm    |
| Rock crab              | M      | 55mm    |
| Green Crab             | F      | 57mm    |

All are correct documentation since all names are clear, even if abbreviated. Since there are no other crabs along the coast of New England in the genus of Hemigrapsus, so Hemigrapsus or Hemi is acceptable. Please be careful that you label all the measurements, for example, the size was 10? 10 cm? 10 mm? Scientists must play close attention to details like this, so other scientists can understand their field data and can incorporate into the larger sets of scientific standardized sets of data.

Totals:

| Species                 | Greer | Asian | Rock | Jonah | Blue  |
|-------------------------|-------|-------|------|-------|-------|
| Total # in this quadrat | 3     | 3     | 1    | 0     | 0     |
| # of Males /            | 1 / 2 | 1 / 2 | M    | N/A   | N / A |
| # of females            |       |       |      |       |       |

9. Complete the datasheet and hand it into the lead instructor and get a new data sheet, random number, and the number of minutes your transect hunting should last.
10. Ask the leader if the crabs can be returned to the rocks or if they will be needed for further activities. If they can be released, bring them to the area they were found and release into the rocks. Please treat the animals with care. What do you think we should do with the invasive crabs? Tough call. We will discuss and decide as a group.