



# Paper BEMP Site: Teacher Resource



**Purpose:** to familiarize the students with the layout of a BEMP field-site

**Grouping:** Students work in groups of 2-4 **OR** students can work individually using the following conversion...

$$1\text{m} = 1\text{ mm}$$



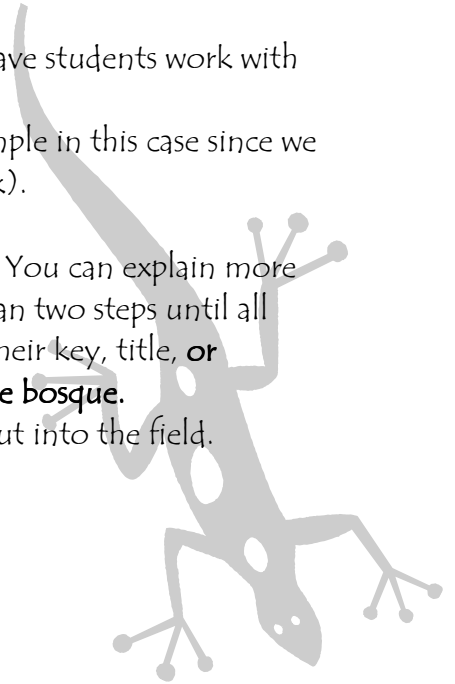
**Materials:** (per group)

- ◆ a little more than 2 meters of white butcher paper (8 1/2 x 11" piece of paper for individuals)
- ◆ markers, colored pencils or crayons
- ◆ BEMP site model student handout
- ◆ meter sticks (rulers with millimeter markings for individual work)
- ◆ random number chart or number cubes

**Procedure:**

1. Pass out BEMP site model handout. Read the information on the first page. Have groups draw the location of their BEMP site on the map and explain why they chose that particular site on the map.
2. Each group will have a spokesperson that will identify and defend the placement of the research site.
3. Pass out additional supplies. If you don't have tables to work on have students work with their groups on the floor.
4. Discuss the idea of scale. What is it? How is it used? It is pretty simple in this case since we will be working with 1 m = 1 cm (or 1 m = 1 mm for individual work).
5. Draw a rectangle on the board to model each step on the paper.
6. Explain each step of the handout and have groups complete them. You can explain more than one step at a time, but **DO NOT** let groups go ahead more than two steps until all groups have caught up. Groups that do finish early may work on their key, title, **or decorating the site with drawings of plants and animals found in the bosque.**
7. Hang the Maps in the class room to refer back to before heading out into the field.

**Time:** depends on student productivity – 30 minutes to 2 hours



# Paper BEMP Site: Student Handout

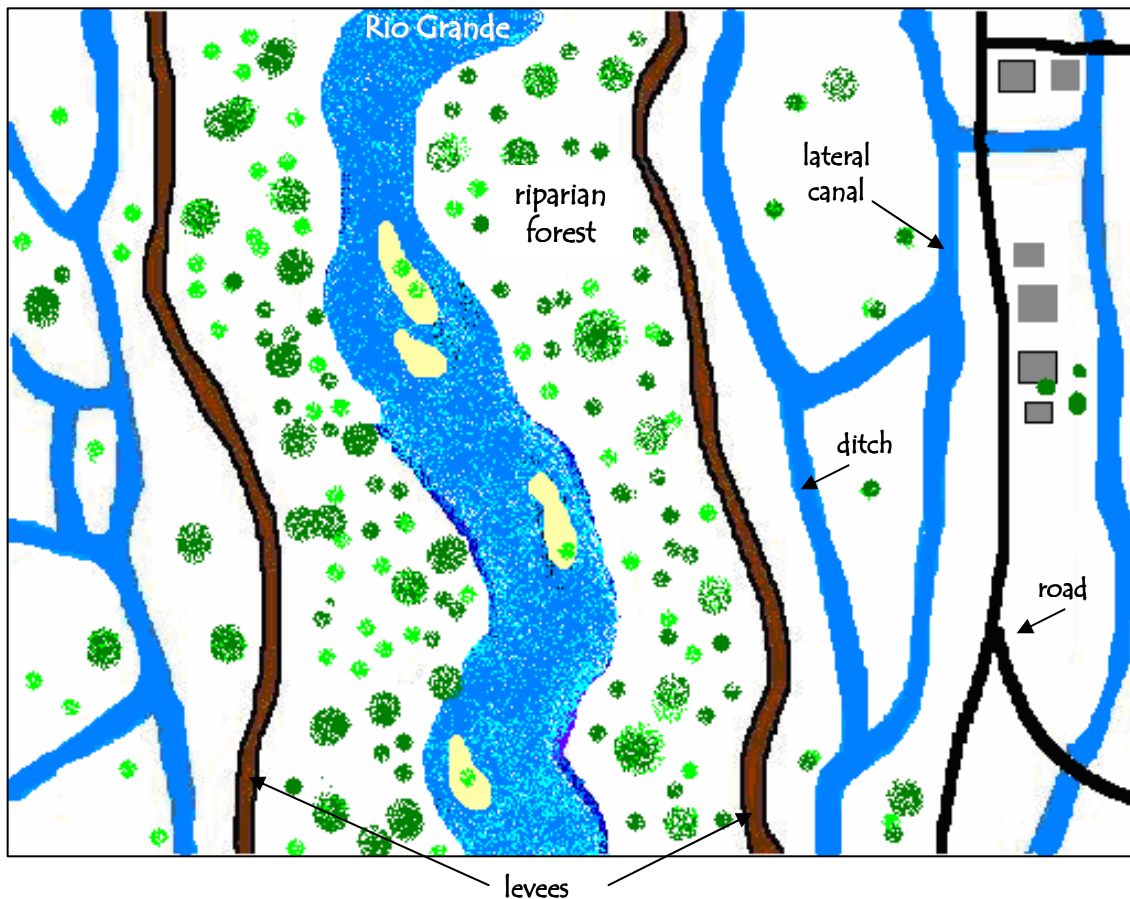


Following recent fires in the bosque, your team of scientists has been asked to set up a NEW monitoring site in the middle Rio Grande floodplain. After reading the field site requirements listed below... draw a rectangle (2 cm x 1 cm) on the picture showing where you would put the new site. Explain why you put it at this location.

## Field Site Requirements

- ◆ each field site is set up as a rectangle: 200 x 100 meters long; the long side runs parallel with the river
- ◆ the site is located between the river and levee if local conditions permit
- ◆ there should be a buffer zone of at least 20 meters between the levee and the river in case of levee construction or meandering river channels
- ◆ field sites should be located in areas of low human impact to reduce the potential for vandalism

~ overview of middle Rio Grande floodplain ~



## WHAT IS A LEVEE?

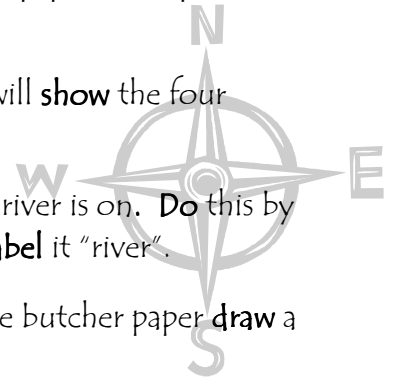
A levee is a natural or artificial slope or wall, usually earthen and often parallels the course of a river.



## Instructions for making a BEMP site Model

The scale for  
this activity is:  
1m = 1cm

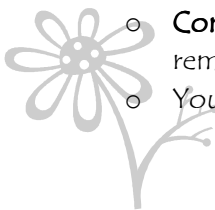
1. You will use the butcher paper in front of you to map out your new research site. As a group, you will need to **decide** which end of your paper will represent North.
2. **Draw** a compass in the upper right hand corner of the paper which will **show** the four cardinal directions: North, South, East & West.
3. Based on your previous choice, **indicate** which side of the paper the river is on. **Do** this by drawing an arrow to one side of the paper under the compass and **label** it "river".
4. **Each site is 200m long by 100 m wide and has 10 transects.** On the butcher paper **draw** a rectangle that is 200 cm long and 100 cm wide.
  - o Now **make** marks at 20cm intervals along both of the long sides of your field site, starting at the north. **Connect** the marks from the East to the West side to create 10 transects.



### WHAT IS A TRANSECT???

A **transect** is an imaginary line drawn through an area in order to help scientists sample and monitor organisms or conditions along the line. The results obtained from samples along the line give an indication of the organisms or conditions in the entire area.

- o **Label** each line A – K, starting at the northern most boundary line.
  - o Using your random number table or number cube **list** ten numbers between 1 and 70. These numbers will be the starting point of your vegetation plots that lie between each transect.
  - o Starting with the A line - **measure** the distance of the first random number along this transect and **make** a mark. **Make** another mark 30 centimeters past your first mark. **Repeat** this step for the next 9 transects (A-J) using the random numbers you listed in the step above (K will be left as it is).
5. Each site has 10 Vegetation plots.
  - o **Go** to the first random number mark on the A transect. Keeping the ruler parallel to the long side of the paper, **measure** 7.5 centimeters below this mark and **place** a mark here.
  - o **Make** a second mark 5 centimeters below the previous mark.
  - o **Go** back to the B line and **find** your second mark, 30 cm along the transect. **Measure** and **mark** 7.5 cm below and then another 5 cm below that mark.
  - o **Connect** these four dots to outline your vegetation plot. **Repeat** these steps for the remaining 9 transect lines and sections.
  - o You should have a rectangle within each section that is 30x5 centimeters.





6. **Each site has five groundwater wells.** One is located at the center of the study site (between the E & F lines) and the other four wells are 40 centimeters away in each of the cardinal directions. **Choose** a symbol to represent your wells, **mark** and **label** the 5 wells on your map.
7. **Each site has 10 litter fall tubs.** **Choose** a symbol to represent your litter fall tubs. **Find** the midpoint of the southern line of the A vegetation plot. Keeping the ruler parallel to the long sides of the site, **measure** 1cm below this spot and **mark** the location. **Repeat** this step for the remaining 8 transect sections. **Label** the tubs A-J.
8. **At each site we monitor precipitation (rainfall) using two rain gauges.** One of the rain gauges is located in an area under the forest canopy and the other gauge is located in an open area. **Choose** a symbol and **mark** the location of your two rain gauges. You will also need to **indicate** which is "open" and which is "canopy".

Can you think of a reason **WHY** we would have **TWO RAIN GAUGES**?  
Why is one under the trees and the other out in an open area?  
Will the rain gauges have the same values? Why or why not?

9. **We also have 20 pitfall traps at each site.** Pitfall traps are used to capture the creepy, crawly and Oh-so-cool arthropods that live on the forest floor!
  - o The traps are arranged in sets of four, in the B, D, F, H & J sections.
  - o **Choose** a symbol to represent your pitfall traps.
  - o **Find** the B litter fall tub and **measure**, parallel to the transect line, out 5 cm to *each* side. **Mark** these spots as pitfall traps. **Measure** an additional 10 cm out from each of those traps and **mark** these as the final pitfall traps – you should have 4 per section.
  - o **Repeat** this procedure in transect sections E, F, H and J!



**WHAT IS AN ARTHROPOD???**

Arthropods have segmented bodies and hollow jointed legs and are made up of spiders, insects and crustaceans. Arthropods are also *invertebrates* i.e.; they have no backbone or spinal column.



10. **Name** your site and **create** a legend (or key) showing the symbols for vegetation plots, Groundwater wells, litter fall tubs, rain gauges and pitfall traps.
11. Add trees, shrubs, flowers, animals, wetlands, etc. to complete your bosque field site! Don't forget your "canopy" rain gauge will need a "canopy" of trees!

**YOUR' DONE! GREAT JOB!**