

Name: \_\_\_\_\_

## Calculating the Range


*(Classified Information: From Dominance to Destruction Activity)*

### PART I: Calibrating “ImageJ” Software

#### Image and Measurement Set-up

1. Open ImageJ
  - a. The ImageJ tool bar should appear at the top of the screen.
2. Click **File** on the ImageJ menu bar.
3. Click **Open** from the pull down menu.
4. Locate and open the **Chestnut map range** file (images must be opened in ImageJ to be analyzed).
5. Click **Analyze** on the ImageJ menu bar.
6. Click **Set Measurements** from the pull down menu.
  - a. Check only the **Area** box.
  - b. Enter the number **2** in the **Decimal Places** box.
  - c. Click **OK**.
7. Zoom on the ruler.
8. Click **Image** on the menu bar and then scroll down to **Zoom** and select **In [+]**.
  - a. Click on the **Hand** tool on the tool bar. Drag the ruler to the center of the window.

#### Calibrating the Scale with the Ruler

9. Click on the **Straight-Line** selection tool  on the tool bar.
10. Click at the start of the scale bar and drag a line to the end of the scale bar.

*You should see a line that looks exactly the same as the scale bar.*

**MAKE SURE YOU ARE PRECISE AS THIS MEASUREMENT WILL BE USED TO SET THE SCALE FOR THE ACTIVITY**

11. Click **Analyze** on the menu bar
12. Choose **Set Scale** from the drop down menu.
  - a. Enter the number **207** in the **Known Distance** box.
  - b. Enter **Km** in the **Unit of Length** box.
  - c. Click **OK**.

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## **PART II: Calculating Area Instructions**

### **Taking Measurements with the Freehand Selection Tool**

1. Use the **Freehand Selection** tool found on the ImageJ tool bar.



To use the Freehand Selection tool for area measurement:

- a. **Click** and **hold down** the cursor on a starting point of the area to be measured and then drag the cursor around the perimeter of the area being measured – ending at your starting point. A line will appear as you outline the perimeter.
- b. Click **Analyze** on the menu bar and then click **Measure** from the pull down menu. A results table will appear.

### **Calculate Historical Range of the American Chestnut**

1. Using the Freehand Selection tool calculate the area of the historical range of the American chestnut.
2. Outline the area in blue with the freehand selection tool as carefully as possible.
3. In the results table the area value is actually Km<sup>2</sup>.
4. Convert from Km<sup>2</sup> to Acres and see how close you have come to the actual number of acres historically occupied by the American chestnut- 200 million acres!