

## Estimation of the number of female Loggerhead marine turtles in Mounda Beach in Kefalonia

### New methodology to measure the plastron drag (IN measure)

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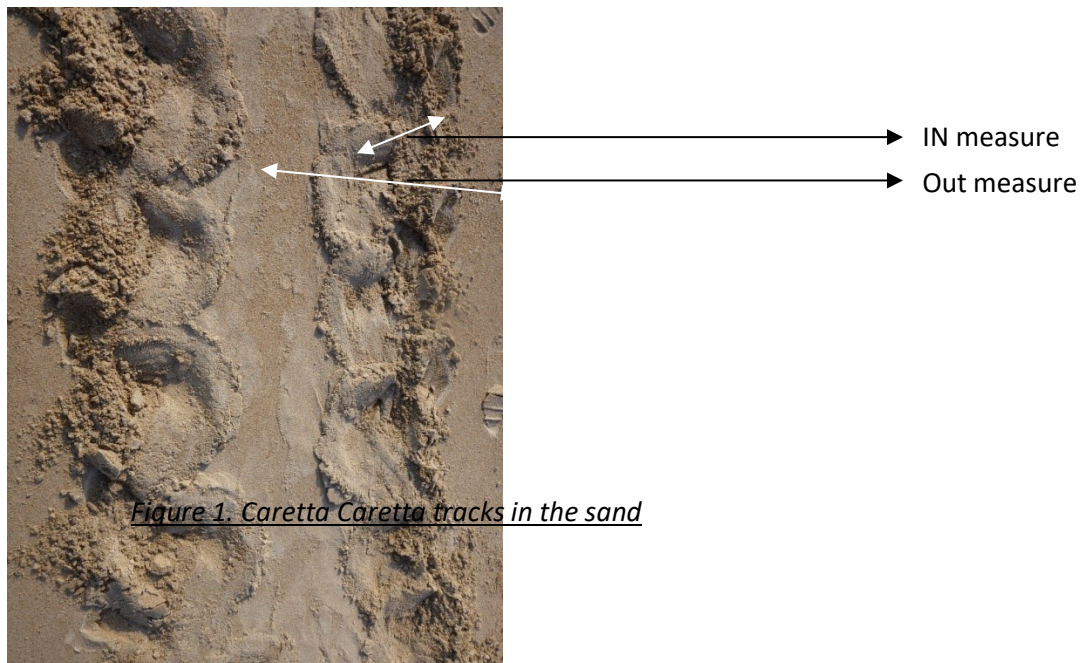
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#### ➤ Objective

During the nesting period, volunteers miss some events during night patrols because of the limited number of volunteers and the size of the beach. When volunteers do not see the turtle, the only indication of its pass through on the beach is its tracks. But one turtle can come several times during the nesting period. Consequently it is difficult to estimate the population of Loggerhead which comes in Mounda Beach. So the main objective is to try to estimate thanks to the tracks on the sand the number of different female Loggerhead marine turtles that come in Mounda beach during the nesting period.

#### ➤ The former methodology

During the morning patrol in the nesting season, the volunteers take three measurements of the width of the plastron drag (IN measure) and three measurements of the distance between the two back flippers (out measure) from the emerging crawl. Then the average of the 3 measurements is calculated.



*Figure 1. Caretta Caretta tracks in the sand*

➤ **Disadvantage of the former methodology**

- Not enough measurements for a significant average
- Different averages for the same turtle
- Different measures between the volunteers

➤ **The new methodology**

**The aim of this new method is to use photographs to measure more precisely the size of the plastron drag thanks to software. Moreover we will focus on the plastron drag (IN measure) and not on the distance between the two back flippers (OUT measure) because the IN measure seems to be more precise and characteristic.**

**Step 1**

▪ **Taking photos of the plastron drag**

Method for photographing the plastron drag

- Choose the best parts of the track in the wet sand and in the emerging crawl for a clear photograph
- Place the ruler next to the track before taking photos
- Put the camera upright of the track, approximately 35 cm between the camera and the tracks.
- Take several photos of the different parts of the tracks
- Associate the photos to the localization and the date of the nest or to the turtle tag

**Step 2**

▪ **Measure the size of plastron drag thanks to piximetre software (free software)**

- In "Parameters" of the Formulator, check the "Graphical" mode if it is not already
- Click on "Open" to add an image
- Click Calibrate the image (each new photo need to be calibrate)

1-click on Calibrate

2- Choose "In this single image"

3- Draw a reference axis on the reference rule visible on the image, click on both ends of the rule

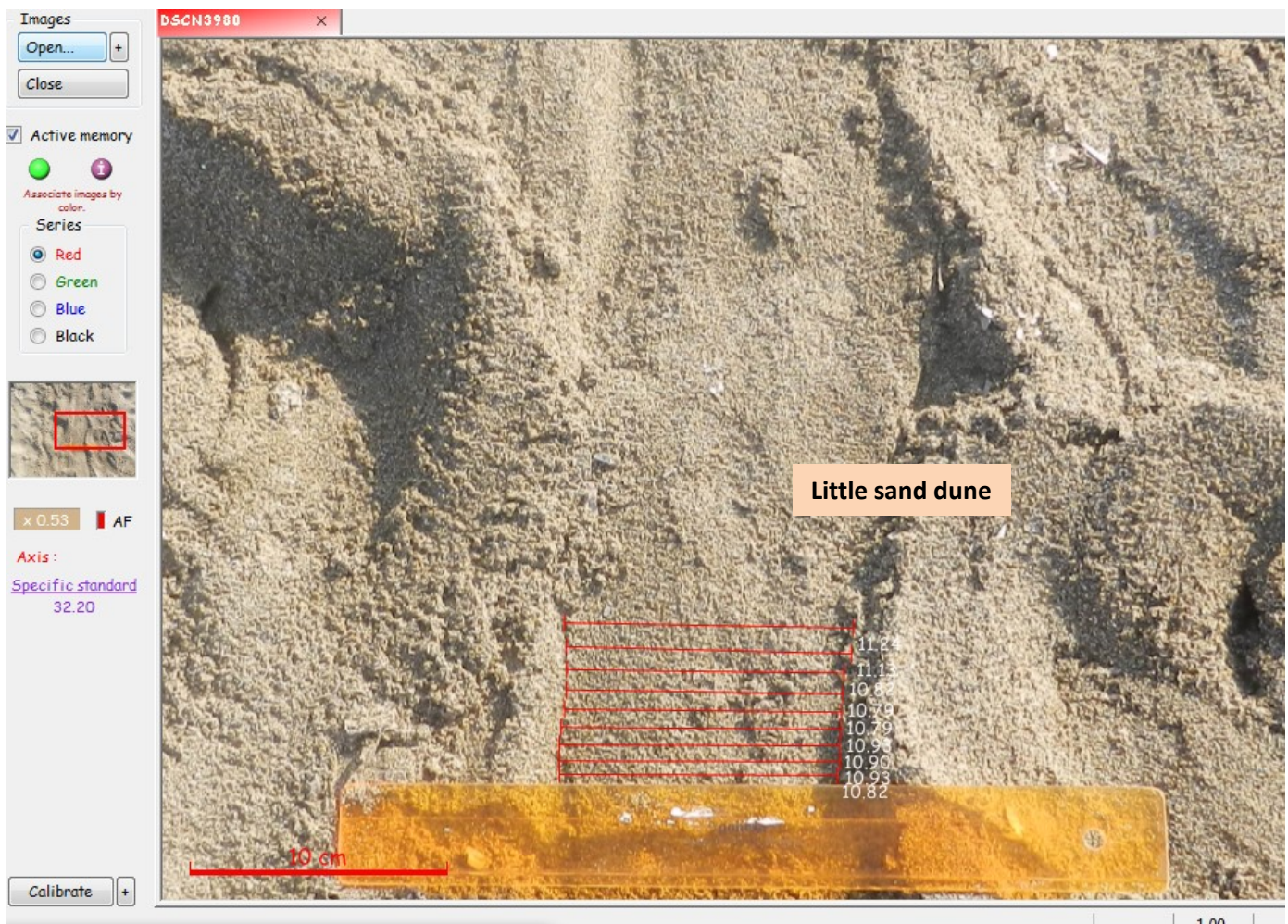
4-Indicate the real length of the rule and validate

### Little sand dune

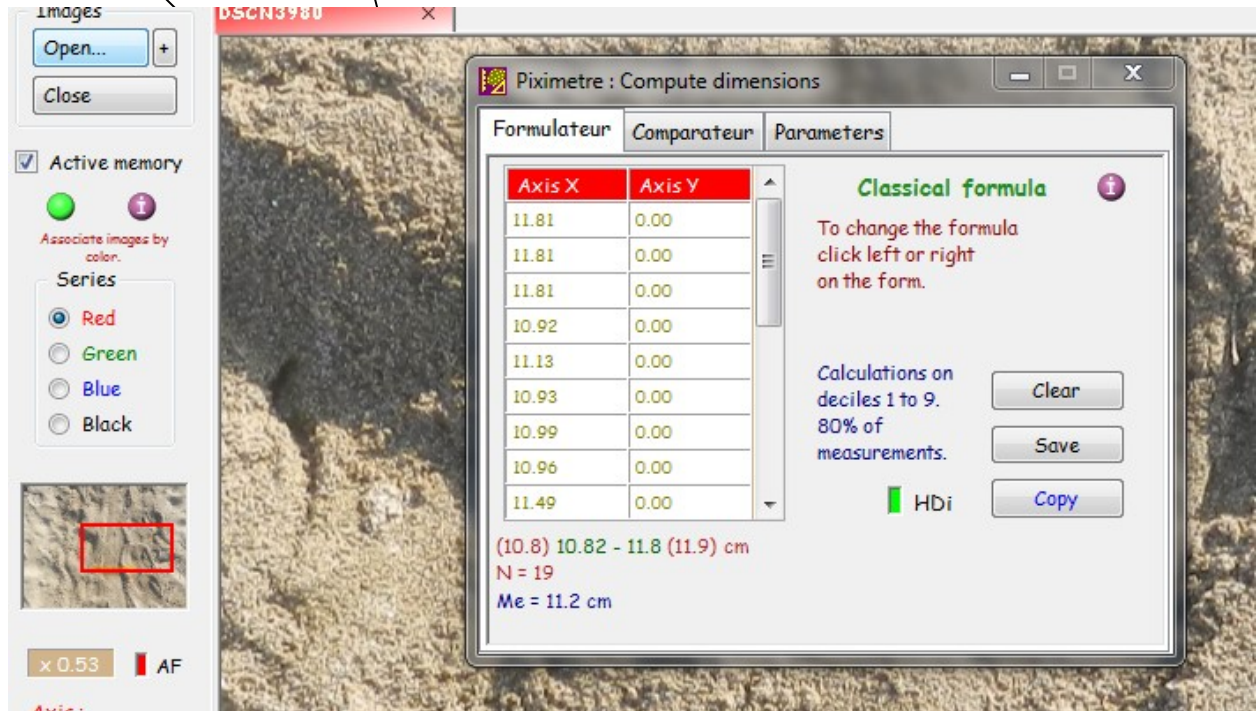
- Measure the width of the plastron track at different places of the photo (Example below)

- 1- Draw axis on the plastron drag → click on the beginning of the small sand dunes of each side of the plastron drag (see on the example)  
Use the zoom for more details

### Example



4- All measurements and the average appear in the formulator



➤ Advantages and disadvantages of the new methodology

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>- getting a lot of measurements quickly to obtain a significant average</li> <li>- more accurate measurement</li> </ul>	<ul style="list-style-type: none"> <li>- get good pictures of the tracks</li> <li>- sometimes difficult to see the beginning of the small sand dune</li> </ul>

➤ Conclusion

To know if this new method is effective, it will be necessary to compare the averages for the same turtle that has been seen several times during the season. It will also be useful to find a confidence interval (uncertainty on the measurement).