

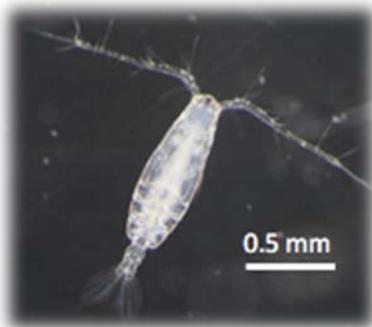
Zooplankton Migration Patterns at Scotton Landing: Behavioral Adaptations

What are Zooplankton?

Zooplankton are small organisms that live in the water column. They are weak swimmers and drift with the currents. Zooplankton feed on phytoplankton which are found at the surface of the water. Phytoplankton are like plants and make their own food from sunlight. Zooplankton migrate to the surface of the water to feed on phytoplankton.

What is a Behavioral Adaptation?

A behavioral adaptation is an action that an animal performs to increase its chances of survival. Examples of behavioral adaptations include migration and hibernation. For example, birds migrate to a warmer habitat in the winter to escape the cold weather and survive.



Acartia tonsa, pictured above, is a common species of zooplankton found at Scotton Landing on the St. Jones River in Delaware. *Acartia tonsa* is about the size of a grain of rice. *Acartia tonsa* is a **vertical migrator**. Every night, vertical migrators swim to the surface of the water to feed on phytoplankton. At night, it is dark and they cannot be seen by predators. During the daytime, the sun shines into the surface of the water, and prey becomes visible to predators. During the day, vertical migrators sink deeper in the water, where it is darker, so predators like fish cannot see them. Vertical migration is an example of a **behavioral adaptation**. By migrating and hiding from predators, *Acartia tonsa* has a greater chance of survival.

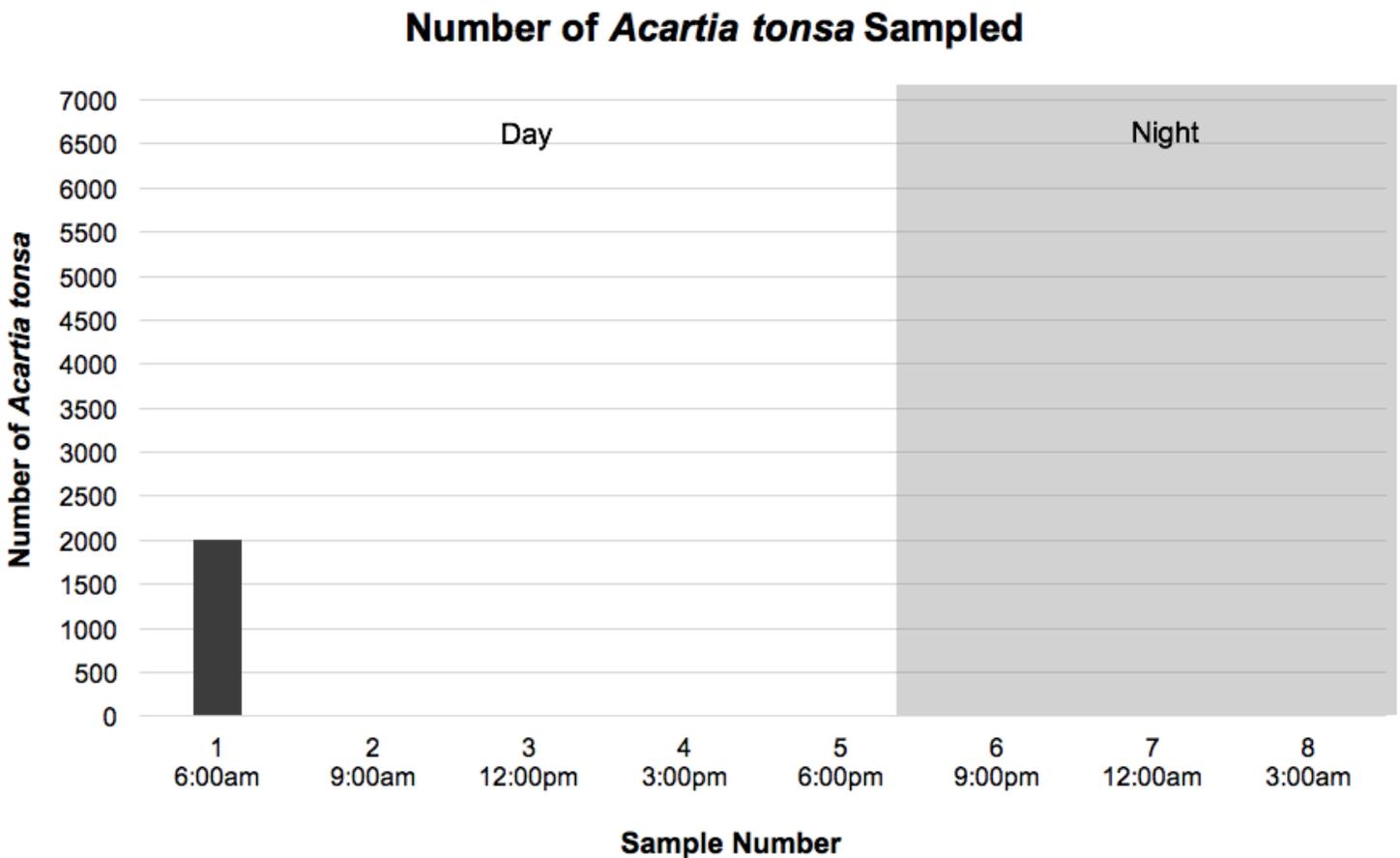
Let's get to know our zooplankton, *Acartia tonsa*. Answer the following questions.

1. *Acartia tonsa*, a type of zooplankton, eats _____.
2. To make food, phytoplankton need _____.
3. To survive and make food, should phytoplankton live at the surface of the water or deeper down?

4. Where in the water column do zooplankton need to migrate to eat phytoplankton?

Every three hours, water samples were taken from the surface of the St. Jones River at Scotton Landing. The amount of water collected in each water sample is enough to fill two large bathtubs! The total number of *Acartia tonsa* in each water sample was counted. Using the table below, plot a bar graph that shows the total number of *Acartia tonsa* in each water sample throughout the day. The first bar has been plotted for you. The shaded region of the graph represents nighttime while the unshaded region represents daytime.

| Sample Number | Time of Sample | Number of <i>Acartia tonsa</i> |
|---------------|----------------|--------------------------------|
| 1 | 6:00 am | 2,000 |
| 2 | 9:00 am | 900 |
| 3 | 12:00 pm | 100 |
| 4 | 3:00 pm | 500 |
| 5 | 6:00 pm | 400 |
| 6 | 9:00 pm | 6,500 |
| 7 | 12:00 am | 5,500 |
| 8 | 3:00 am | 5,500 |



Look at your bar graph and answer the following questions.

5. Are there more *Acartia tonsa* at the surface of the water in the St. Jones River at night or during the day?

6. Small fish eat *Acartia tonsa*. If *Acartia tonsa* wanted to avoid getting eaten by other marine animals, should it come to the surface in the daytime, when it can be seen by predators like fish?

7. *Acartia tonsa*'s migration pattern is an example of a behavioral adaptation. They migrate to the surface of the water at a certain time of day to increase their chances of survival. Why do *Acartia tonsa* come to the surface at night?

8. If *Acartia tonsa* migrated to the surface of the water during the day instead of during the night, would more *Acartia tonsa* be preyed upon? Would *Acartia tonsa*'s chance of survival increase or decrease?