**Interactions Within an Ecosystem**

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| **Vocabulary**  Spawn 生成 logging 伐木 gravel streambed 砂砾溪床 carbon and phosphorous 碳和磷  leftovers 遗留物 hibernate 冬眠 nitrogen氮 |

**1. What is the focus of this lecture?**

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| **Notes:**    The reliance between salmon, trees, and bears.  The danger among salmons |

interactions between \_\_\_animals\_\_\_\_\_, interactions between \_\_\_\_living\_\_\_\_and \_\_\_\_\_nonliving things\_\_\_\_\_ and so on.

Now these interactions can be \_\_\_\_fairly simple\_\_\_\_\_\_ and \_\_\_\_\_\_\_straightforward\_\_\_\_\_\_\_. Ah, there are certain species of \_\_\_\_\_\_ants\_\_\_\_\_ and \_\_\_\_\_rodents\_\_\_\_\_ sharing \_\_\_\_\_\_a desert ecosystem\_\_\_\_\_ in Arizona, and they compete for \_\_\_\_\_\_\_\_\_the same plant seeds\_\_\_\_\_\_\_. And the competition influences is not only the \_\_\_\_size\_\_\_\_ of the ant and rodent \_\_\_\_\_\_\_\_populations\_\_\_\_\_\_\_\_, but also the number of \_\_\_\_\_\_\_ but also the number of eventual plants \_\_\_\_\_\_\_. Now this interaction is easy to see, right? However, there’re many other interactions within ecosystems that are not so apparent and require closer examination.And the example from your reading was the forest ecosystem along the Pacific coast of North America…um… **specifically the role of \_\_\_\_\_salmon\_\_\_\_**.

**2. What is the living requirement for salmon to reproduce?**

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| **Notes:**  **They need cold, clear streams to ensure the survival of their eggs** |

OK. As you probably know, salmon are born in \_\_\_\_\_\_fresh water steams\_\_\_\_\_\_, they migrate to oceans where they spend most of their lives, and then they return to the same streams where they were born to reproduce… or \_\_\_\_\_spawn\_\_\_\_\_\_. In order to \_\_\_\_\_\_spawn\_\_\_\_\_\_, salmon need cold, clear streams to ensure \_\_\_\_\_the survival of their eggs\_\_\_\_\_\_… and trees in the surrounding forest play an important role here.Their leaves provide \_\_\_\_\_\_shade\_\_\_\_\_from the sun. When \_\_\_\_\_\_logging\_\_\_\_\_\_\_removes the trees, the streams are open to the sun and the water becomes \_\_\_\_warmer\_\_\_\_\_.When the water \_\_\_\_warms up\_\_\_\_, the concentration of \_\_\_\_\_\_dissolved oxygen\_\_\_\_\_ in the water \_\_\_\_\_decerases\_\_\_\_… and this reduces \_\_\_\_\_\_the chance that salmon eggs will survive\_\_\_\_\_\_\_\_And the trees also help keep the soil on the banks of the stream \_\_\_\_in place\_\_\_\_.Salmon cannot spawn in streambeds clogged with sediment, dirt, from the surrounding area… they need a \_\_\_\_clean\_\_\_\_, gravel streambed.

Brad?

MALE STUDENT: I’ve read that salmon also help keep streams healthy.

FEMALE PROFESSOR: Right. Salmon contribute important \_\_\_\_nutrients\_\_\_\_\_\_\_\_ like \_\_\_\_carbon\_\_\_\_\_ and phosphorous\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and these nutrients promote \_\_\_\_\_diversity\_\_\_\_\_\_ in the stream environment.

**3. What is another function/ role of salmon to the environment?**

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| **Notes:**  **To provide nutrients to trees**  **Why did the bears bring the salmon so far into the forest?**   |  | | --- | | **Notes:**  **When a bear got a salmon, others will come and steal the salmon, by going deeper in the forest can provide bears an uninterrupted environment** | |

OK. Um, so salmon need trees to successfully reproduce. But surprisingly, trees also need salmon… and \_\_\_\_\_bears\_\_\_\_\_ play an important intermediary role. So in the autumn, bears are busy \_\_\_\_\_\_\_putting extra weight\_\_\_\_\_\_\_\_ as they prepare to \_\_\_\_\_\_\_hibernate\_\_\_\_\_\_\_. Each bear catches an estimated 700 fish during the 45 days that \_\_\_\_\_\_\_\_\_the salmon are spawning\_\_\_\_\_\_\_\_.The bears catch the salmon in the streams, and then they \_\_\_\_\_\_\_carry them back into the forest\_\_\_\_\_\_\_\_\_to eat… sometimes as much as \_\_\_\_\_800 meters\_\_\_\_\_ from the streams.And since the bears only eat about half of each fish they catch, other animals like eagles, crows, and insects feed on the leftovers. Maria?

**(4. Why did the bears bring the salmon so far into the forest?**

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| **Notes:**  **As mentioned in the previous blank.** |

FEMALE STUDENT: Why did the bears bring the salmon so far into the forest? Why not just eat the fish near the streams?

<-FEMALE PROFESSOR:-> Well, imagine \_\_\_\_\_\_several hungry bears looking for salmon\_\_\_\_\_\_.When\_\_\_\_\_\_\_\_\_\_\_one bear catches a fish\_\_\_\_\_\_\_\_\_\_\_\_, it’s not uncommon for another bear to try stealing it.These confrontations can be pretty intense, so it’s ­­­­\_\_\_\_\_\_\_\_safer to bring it back into the forest\_\_\_\_\_\_\_\_to bring it back into the forest… to a place where the bear can eat \_\_\_undisturbed\_\_\_\_\_.

MALE STUDENT: Um, you said that the bears only eat half of each fish they catch?I mean if I were a bear preparing to hibernate, I probably eat everything I could catch.

<-FEMALE PROFESSOR:-> Well, certain parts of salmon are more \_\_\_\_\_\_\_\_nourishing…fattier\_\_\_\_\_\_\_\_ than others. It’s actually more efficient for a bear to \_\_\_\_\_\_\_\_\_only eat some parts of the fish\_\_\_\_\_\_\_\_\_, and then try catching another one, instead \_\_\_\_\_\_\_\_\_\_\_\_of eating the whole fish\_\_\_\_\_\_\_\_\_\_.)

OK. So after the scavengers have eaten the leftovers, only the fish’s \_\_\_\_\_skeleton\_\_\_\_\_\_ remains.Now, salmon contain nitrogen, so their \_\_\_\_\_\_\_\_\_decomposing bodies\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_skeletons\_\_\_\_\_\_ provide a lot of nitrogen to the \_\_\_\_\_\_\_\_surrounding forest\_\_\_\_\_\_\_\_. Plants \_\_\_\_\_\_absorb\_\_\_\_\_ this nitrogen, which they need to grow, so the transfer of this nitrogen to the forests is important. Forests near \_\_\_\_\_streams\_\_\_\_\_\_\_ with \_\_\_\_\_\_\_\_salmon\_\_\_\_\_\_\_\_ actually reach \_\_\_\_\_\_maturity\_\_\_\_\_ faster than other forests.

**5. Conclusion**

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| **Notes:**  Salmons are in trouble, because of logging and overfishing, some species became extinct and others are near the edge of becoming extinct. Scientists can forbid overfishing but may not be that effective in forbidding logging near the streams. |

OK. So, why’s all this important? Well, salmon are in trouble.Some of their populations have gone extinct, and most of the remaining populations have been significantly reduced by overfishing and environmental challenges. Now, conservationists can try to prevent overfishing, but, well, I mean you can see the interconnections within this ecosystem.We've already talked about the importance of trees to salmon, and the negative effect that something like logging can have.So you can see that protecting this ecosystem is going to take a broad effort.

1.What is the lecture mainly about?

A. A new approach to ensuring the survival of a forest ecosystem

B. Similarities between desert and forest-stream ecosystems

C. Interactions that take place within a North American forest ecosystem

D. Factors that have contributed to the preservation of salmon populations in forest ecosystems

2.Why does the professor mention ants and rodents competing for food?

A. To make sure the students understand the different components of an ecosystem

B. To point out the limited resources available to organisms in a desert ecosystem

C. To illustrate how different species adapt to extreme temperatures

D. To provide an example of an easily understood interaction within an ecosystem

3. According to the professor, how do trees contribute to the successful spawning of salmon?”)

Click on 2 answers

A. They provide streams with nutrients that the salmon need.

B. They provide shade that keeps streams sufficiently cool.

C. They help salmon avoid predators by providing camouflage.

D. They reduce the amount of sediment entering streambeds.

4. What point does the professor make about bears carrying salmon away from streams?)

A. It results in bears eating fewer fish.

B. It reduces the amount of food available to scavengers.

C. It improves the health of the surrounding trees.

D. It improves the water quality of the streams.

5. what does the professor imply about overfishing?

A. It is one of several reasons that the bear population has declined.

B. It is difficult to prevent in both oceans and streams.

C. It cannot be the sole focus for those working to prevent salmon depletion.

D. Its impact is minor compared to the problems caused by logging.

6. Why does one of the students say this:

A. To provide support for a hypothesis mentioned by the professor

B. To suggest that a bear behavior mentioned by the professor seems improbable

C. To explain why confrontations take place between bears

D. To explain why bears eat so much in a short time span