**Bigger Fish to Fry**

By: Morgan Karnes

*The recent rise in popularity of oceanic fishing has led to large declines in species populations, leaving the apex predator in possible danger.*

**Food Chain Versus Food Web: What’s the difference?**

From the time you are a second grader, until the time you are a senior in high school, you learn about producers and consumers and where they fall within the food chain. You learn about a linear chain of energy flow that is at most five trophic levels, in which producers are at the bottom and consumers are at the top. Although producers are typically at the bottom and consumers are typically at the top, the flow of energy is not just a single linear chain. In a real ecosystem, the flow of energy is much more complex; like a web.

The flow of energy in an ecosystem controls how that system will function; so different ecosystems have different flows of energy, which means they function differently. In ecological and environmental sciences, a common debate amongst experts is whether the flow of energy is controlled from the “bottom-up” or from the “top-down”. Recently, more studies have been conducted to try and solve the mystery of how the webs are controlled.

**Are sharks the greatest fish in the tank?**

In each ecosystem, at the top of the food web, you have what is called the apex predator. In a study conducted in 2007, Baum and colleagues found that in a marine ecosystem, the apex predators are the great sharks. Since there are hundreds of different species of sharks, it is important to note, great sharks, are defined as those whose diets consist of things such as rays and other small sharks such as white sharks. These great sharks have been viewed as viscous killers, the focus of horror films, and feared by many throughout history. Even though these great sharks are feared by most, to some they are a delicious meal or a trophy catch.

Shark is a delicacy in some cultures such as Japan. In Japan, shark is the main ingredient in many meals; one dish in particular is shark fin soup. When Japanese fisherman catch sharks, they usually cut off the shark’s dorsal fin and then throw them back into the water; a term known as finning. In order for a shark to move its gills to maintain oxygen levels, a shark must constantly be swimming, so without their dorsal fins sharks are unable to properly swim. This can lead to lack of oxygen which overtime leads to fatality or can make them vulnerable to other predators.

**Are there plenty of fish in the sea?**

In the past sixty years there has been a large increase in oceanic fishing, which has led to a large decline in the population of shark species. It is only recently that scientific studies have begun to focus on the effects of this overfishing. In a study conducted by Baum and colleagues, they analyzed several different shark species for a number of years in order to understand the impact that overfishing has had on shark species. They found that all species, with the exception of one, had declined by more than half their population sizes.

This study led to the authors to question, how does this overfishing effect the food web? Prior to these studies, most experts supported the idea that the bottom of the food web controlled the flow of energy and that the top of the food web only controlled the flow of energy at a community level. However, Baum and Worm’s evidence found that the overfishing of the apex predators has led to an alteration of prey populations throughout the whole marine food web. This evidence supports the idea that the top-down does not only effect at a community level, but can affect at any level. This may mean that the flow of energy in an ecosystem can be controlled by both extremes of the food web, nevertheless, since the decline in the shark populations is so recent, not enough studies have been conducted to confirm just how these rapid declines will affect the marine ecosystems. More studies will hopefully help to answer this question.

Literature Cited

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