



SUNTRUST PIER 225

California sea lions are a species of mammals that live along the shore of the eastern Pacific. Since 2013 this species has been experiencing what has been referred to as an “unusual mortality event”. This means that there has been a large increase in the number of pups stranding compared to past averages. It is likely that there are several factors causing these strandings, but the most significant and likely reason is due to warming ocean waters. Some of these temperature changes can occur around El Niño, but this only explains an increase for 2015, when the last El Niño occurred.. When the water temperature goes up, the fish with the highest fat content move further out to colder water and nursing mothers have to go further from shore to hunt for food. This puts them at greater risk of predators as well as greater time away from pups, which can cause the pups to become stranded without a food source. In recent years there has been a decline in fish that are fattier and a better fit for nursing mothers.

If the “unusual mortality event” is not over by the next El Niño, what is likely to occur? Besides prey moving further from shore, what other effects could increasing ocean temperatures have on sea lions? Along with the changes in water temperature, sea lions are also facing competition for certain food resources with other species, what might this mean for juvenile sea lions?



DOLPHIN COAST

The common bottlenose dolphin is considered “Least Concern” due to a healthy global population. Even though dolphins are not considered a high concern species, they are a good species to examine how humans can impact a species and the habitat it lives in. Dolphins face several location specific threats from human activities including being fished as food or to be used as bait, hunted so they are not in competition with fisheries or being involved in unintentional injuries, or worse, with fishers. The ethics of hunting whales or dolphins can vary from culture to culture, making international conservation laws more challenging. However, research into how dolphins could be an indicator species for coastal environments has been conducted through the HERA (Health and Environmental Risk Assessment) project since 2003. Researchers chose to study dolphins because they are a predator that is high on the food chain, live comparably long to humans and have a unique fat storage that can give good information about toxin absorption.

How can humans help protect dolphins while fishing? What are some reasons dolphins may need protections if they are a “Least Concern” species? How can studying dolphins help humans? “least concern” species? How can studying dolphins help humans?

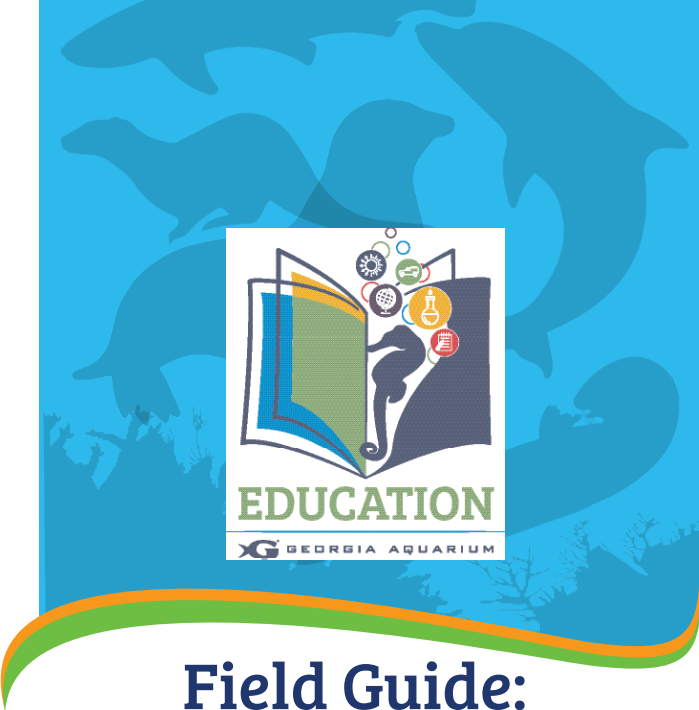
WORD SCRAMBLE

- 1. ALIMSTTUU
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- 2. AFGHILPS
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- 3. EEEGINNR
Ø_____
- 4. ACDIINORT
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- 5. ADFINNOOTU
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- 6. ABELLMRU
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- 7. EEKNOSTY
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Answer: _____



Checkout these resources for more information!
• <https://www.nationalgeographic.org/encyclopedia/keystone-species/>
• https://www.youtube.com/watch?v=spTWwqVP_2s



Field Guide:
Ecological Equilibrium
Grades 3-5

The earth is full of many different kinds of environments, each filled with hundreds or thousands of different animals. Ecology is the study of the relationship between animals and their environment. An important aspect of ecology is understanding how changes to the environment impact the ecosystem as a whole including the species living there. Several species here at Georgia Aquarium are considered keystone species, meaning they have a significant effect on their ecosystem. Keystone species are so critical to the their environment that without them, the entire ecosystem would be thrown out of balance. One way keystone species help maintain the balance of their ecosystem is through their role in the food-web. By preying on other animals or plants, keystone species keep other populations in check. Other noteworthy types of species at the Aquarium include indicator, invasive and foundation species.



TROPICAL DIVER

Corals, often thought of as a plant, are actually a colony of hundreds of individual animals, called polyps, that have built the structure they live on. A coral reef is made up of a variety of species of coral that contribute to the overall growth of the reef. With that in mind, some people may think corals are a keystone species, since they build the environment that houses hundreds of different species. Corals are actually considered a foundation species, meaning they are instrumental in the development or continuation of an ecosystem. However, not all corals are positive for an ecosystem. Keep an eye out for the orange cup coral habitat along with more information about invasive species.

What is an invasive species? What are some ways an overgrowth of orange cup coral can affect native corals? How does that impact other species in the ecosystem?



OCEAN VOYAGER: BUILT BY THE HOME DEPOT

The zebra shark is a bottom-dwelling species that can be found in the Pacific and Indian oceans. Zebra sharks are an endangered species but only in certain parts of the world. The zebra shark population in Indonesia and Thailand have become endangered due to fishing practices and habitat destruction. Zebra shark pups live in mangroves, specialized trees that can live in salt and fresh waters. Removal of these trees and chemical changes introduced by human pollution have been reducing the zebra shark pup's habitats in these areas. Whereas zebra sharks found near Australia would be considered "Least Concern" on the IUCN Red List. This difference in status can be derived from human methods of fishing, including trawl fishing which is a method involving dragging a net along the bottom of the water, and development of land resulting in habitat loss relative to location.

Why would removal of mangrove trees impact zebra sharks? Trawl fishing has a major impact on zebra sharks, what are some ways people can help these populations? What makes zebra sharks particularly vulnerable to trawl fishing?



COLD WATER QUEST

Southern sea otters are considered a keystone species, helping protect the kelp forests of the Pacific Ocean. Kelp forests are a habitat filled with kelp, a brown algae that can grow to 150 feet tall. The strands of algae can be similar in looks to trees so they became referred to as forests; housing many different species of animals. Just like coral reefs, kelp forests are an important nursery for many species. Sea otters help protect the kelp forests by eating a large amount of sea urchins which keeps their population in check. Because of a reduced number of sea otters the sea urchins have been reproducing in greater numbers and eating greater amounts of the kelp, causing increased habitat loss for many other animals. Keep an eye out for the ochre sea stars, another keystone species. They can be identified by their white spots and are often found at the touch pool or the Alaska Rocky Reef habitat!

With increased numbers of sea urchins and reduced kelp, what will happen to the sea urchins if nothing keeps their population in check? What could happen if people introduced another predator to the kelp forests? What are other instances of humans attempting to control a species population through introducing predators or hunting?



SOUTHERN COMPANY RIVER SCOUT

Asian small-clawed otters live in freshwater wetlands and marshlands and are considered an indicator species. Feeding primarily on crabs, these otters have lost many of their natural feeding areas due to human developments, pollution and increased silt runoff. This loss of habitat has led to increase in otters attempting to live in rice fields which have a variety of crabs and offer adequate shelter. While these otters have shown adaptability in diet and finding adequate shelters to survive, the species has moved from "Low Risk" to "Vulnerable" in the last 20 years. Don't forget to keep an eye out for the American alligators, another keystone species, located in Peterson Preserve in Aquanaut Adventure: A Discovery Zone!

If these otters are vulnerable even with their adaptability, what could happen to a less adaptable species in the same situation? Can humans include spaces specific for animals to thrive in city planning or agricultural development?