

## **The Sustainable Aquaculture Program at Home Edition Case Studies- Answers**

**Case #1: Open ocean mussel farm-** Sustainable. Mussel farming is one of the most sustainable forms of aquaculture. Mussels are filter feeders, filtering out plankton from the ocean, so farmers do not need to feed their crop. Along with filtering for food, mussels filter the ocean of pollutants. Other organisms can grow on the ropes and amongst the mussels, creating a habitat. Mussels produce thousands of offspring, which grow much more quickly than most fish. Their gametes spread through the water, creating genetic diversity.

**Case #2: Enclosed open ocean salmon pen-** Unsustainable. In this scenario more than one species is being fished because the salmon food is made of other fish. This food is then processed by machines and shipped to wherever the buyer is. A monoculture means that only one species is being farmed. A monoculture can be unsustainable because there is usually no other species to clean up the fish waste. Fish waste that is left in pens can flow into the surrounding environment and cause disease that can spread to the wild fish outside the pens. When there is little genetic variation amongst the fish, one disease can kill the entire yield.

**Case #3: Seaweed Farm-** Both sustainable and unsustainable practices. Seaweed farms are usually sustainable and certainly some of the practices in this scenario are. Seaweeds grow very fast, much faster than fish, and do not require food because they get their energy from the sun. The growing seaweed is also beneficial to the environment by creating a habitat for other animals and producing oxygen. However, the farmers had to clear the area to build the farm, so habitat destruction was involved. So one of the practices in this farm is unsustainable, but everything else about this farm is sustainable.

**Case #4: Aquaponics-** Sustainable. Aquaponics includes the raising of two species, some kind of aquatic species and a vegetable. Polycultures are usually a sustainable choice because there is more than one species being raised and depending on the design, one of those species may either feed on or use the waste from the other to grow. In the case of aquaponics, the waste from the tilapia is used as fertilizer for the plants. It is necessary to purchase fish food, but the plants get their energy from the sun. Small scale aquaponics can be done in your backyard or classroom and large scale aquaponics can be done indoors.

**Case #5: Man made trout farm-** Sustainable. These trout ponds were built with minimal habitat destruction. These farmers take very good care of their fish by cleaning waste out of the ponds, feeding them sustainably sourced food, and regularly checking their health. All of these practices would be considered sustainable.

**Case #6: Shrimp ponds-** Unsustainable. Habitat was destroyed to create the farm and when the conditions in the pond are unsuitable for life, a new pond is created. The shrimp live in their own waste, this makes them prone to disease. To prevent disease, shrimp are injected with antibiotics, pesticides, and hormones all of which are then consumed by the people eating the shrimp. This species of shrimp is not native to this part of Thailand. Due to overcrowding, it is likely that individuals may escape into the surrounding habitat and outcompete the native species, becoming an invasive species.