

## ISSUES & CRITICAL THINKING:

1. Research the impact of the non-native Crazy Ants on the native species of Christmas Island. What plants and animals are affected by the introduction of the ants? What steps are being taken to protect the crabs?
2. Often human populations disturb the natural migrations of animal species. Provide three examples of animal migrations that are interrupted by human activity in your local environment. Compare the strategies employed by the Christmas Island inhabitants to coexist with the migrating crab populations. Are the humans in your local environment as tolerant as the Christmas Island residents?
3. One variable mentioned in the potential for a successful Red Crab migration is rainfall. How does rain influence the migration and mating of the crabs?

## GLOSSARY

**Arthropod:** Any invertebrate of the phylum Arthropoda, having a segmented body, jointed limbs, and usually a chitinous exoskeleton that undergoes moltings, including insects, spiders and other arachnids, crustaceans, and myriapods.

**Endemic:** Native to or confined to a certain region.

**Larva:** Any animal in an analogous immature form.

**Megalopae:** After growing through several larval stages, red crab larvae develop into these prawnlike animals, gathering in pools close to the shore for 1-2 days before changing into young crabs and leaving the water.

**Spawn:** Depositing a mass of eggs directly into the water.

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# Show Me Science

## The Amazing Red Crabs of Christmas Island

**K4572DVD**

**Advanced Teachers Guide**

## SYNOPSIS:

Christmas Island is only around 135 square kilometers and was named after the day of its discovery – December 25th, 1643. Sixty Three percent of the island is a protected National Park. The park offers the perfect forest ecosystem for the Christmas Island Red Crab, which is endemic to the Cocos Islands and Christmas Island, both in the Indian Ocean. The Red Crabs rely on the rainy season that comes in November or December to initiate their migratory journey from the forests to the coasts. Their timing must be precise because the breeding sequence is also linked to the phases of the moon. Although the Red Crabs live inland, they require a certain level of moisture on their gills to survive. Their journey is filled with many obstacles. The risk of dehydration, predators and automobile traffic cut the migration short for many crabs. However, locals on Christmas Island have built fences and tunnels to corral the crabs and help funnel them safely under roads to their final breeding destinations on the coasts.

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## CURRICULUM UNITS:

- Biology
- Ecology
- Environmental Science
- Marine Biologist

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## CAREER OPPORTUNITIES:

- Biologist
- Environmentalist
- Marine Biologist

## PROGRAM OVERVIEW:

Christmas Island was formed by a series of geological uplifts. Surrounded by reefs and a number of cliffs and terraces descending to a rugged shore line with few beaches, the island was difficult for explorers to reach in the past. In the heart of the island, a central plateau rises up 200 meters above sea level. This is where the majority of the protected National Park is located and serves as a home to millions of Red Crabs.

For most of the year, the red crabs keep a low profile under the forest canopy. Their burrows have a single entrance tunnel leading down to a chamber. They will usually block off the entrance with leaves and debris to hold moisture in. Living solitary lives, each burrow usually houses one crab.

Once the rainy season comes, they make a dash for the coasts to breed. As the most abundant of the fourteen species of land crabs on the island, there is an estimated 120 million inhabitants. As they make their way to the coasts, they are in danger from dehydration, predators, and human traffic.

The red crabs are members of the arthropod family, the same as insects and spiders. They have an exoskeleton and jointed limbs. Most crab legs are designed to move up and down rather than forwards, which is why they often walk sideways. Their rounded shell can measure up to 12 centimeters and encloses their lungs and gills. They mature and reach full size in three to four years and can live over ten years. Christmas Island is also home to the largest land crab in the world, the coconut crab. It is also referred to as the robber crab because it has an unusual attraction to shiny objects and has been known to sneak into houses and tents to steal pots and pans and silverware. The coconut crabs can grow up to a meter in length and weigh almost 4.5 kilograms or ten pounds.

They are similar to the red crabs in their diets as they primarily eat fruits and leaves – but will also eat carrion and sometimes even feast on their red crab neighbors and their shells, possibly for calcium. The local residents have an affinity to the crabs. Unfortunately, some of the migratory routes come through the towns and across roads, making it very difficult for people to avoid them altogether. To round up and divert millions of these crustaceans, they started by putting up fences. The fences divert them along the side of the road to places where the road is blocked off or underground tunnels have been built for them to cross underneath the roads safely.

They will gather on the shores for days. After mating, the males will return to their original forest homes, while the females will remain for several weeks to spawn. The female releases the eggs into the ocean and they hatch immediately on contact with the water. Waves and tides push and pull the clouds of larvae in all directions. A large percentage of their offspring will not survive. Sea conditions, ocean predators such as manta rays and huge whale sharks, and possible lack of rains will affect the chances that the larva will survive. However, it only takes two successful years out of every ten to keep their populations healthy.