

Hologram from Dr. Maria Berhart, UNESCO International Biosphere Reserve Director for Robinson Crusoe Island, Chile. 4 OCT 2060:

Greetings, Future Problem Solvers - once again from Robinson Crusoe Island. Ten years ago we asked for your assistance, and your response was invaluable. Thanks to you, our national treasures are well preserved and protected, especially the historic camp of Alexander Selkirk. If you remember, the Scotsman Selkirk was marooned on our island for over four years. His story inspired Daniel Defoe to write the famous book *Robinson Crusoe* – the ultimate survival story. Unfortunately, another story of survival from this island hangs in the balance.

Not only is Robinson Crusoe Island historically significant, it offers one of the most unique and awe-inspiring ecosystems on the planet! As you may recall, in the early part of this century ecological restoration efforts began in earnest on the island. In spite of those efforts, our island's ecosystem is still in great danger.

Using Google Earth satellite mapping, we now have a census of our national forest's flora and fauna and are especially tracking the status of the 70% that are endemic to the island. In addition, animals like the Juan Fernandez fur seal and several bird species exist only on our island. The once endangered fur seal still faces potential dangers, especially from climate change, but its numbers are in the acceptable range. We fear more for our threatened bird species, especially the Juan Fernández Firecrown Hummingbird. This rare hummingbird, the male a vibrant red, is considered one of the most beautiful bird species living today; unfortunately, it has been Critically Endangered for over half a century. The IUCN (International Union for Conservation of Nature) Critically Endangered classification is the highest threat category given. Firecrows once numbered at well over 10,000, but in 2008 island ornithologists estimated the number at 1,000. At that time, we were able to save a good deal of the native habitat necessary for their breeding, but those efforts unfortunately proved to be short term. Current counts show fewer than 50 of these magnificent birds in existence. We fear imminent global extinction.



The firecrows are facing threats from bioinvasion in several ways. Goats and pigs were released on the island as early as the 1500's and along with invasive rabbits have steadily over-eaten the island's native vegetation. The bird habitat is also being degraded by the spread and dominance of invasive plants, most prominently by elm-leaf blackberry and maqui which out-compete the native plants that supply nectar and nesting sites. We thought we had these invasive plant species eradicated, but they have come back with a vengeance. In addition, island residents who have supported our conservation efforts in the past are conflicted about our efforts to destroy the maqui as it is thought to be a "super-berry," full of a variety of healing powers. Even international botanists consider the maqui to have untapped medical value.



Predators threaten the firecrown species as much as the invasive plants and changing habitat. Rats, which used to flourish on the firecrows' eggs and nestlings, have declined significantly due to the increase of feral cats and the most recent addition of the coati. Brought in fifty years ago to counteract the rat population, the coatis (relative of the raccoon) unfortunately raid the firecrown nests themselves. The coatis have few predators. Their strong jaws, sharp teeth, and fast claws make them difficult to control and their numbers seem to be increasing at an alarming rate.

Biotech specialists have been quite successful in the use of genetically modified parasitic nematode worms in controlling the overpopulation of goats, rabbits, and cats. The microscopic nematodes have been injected by way of dart guns or hidden in tempting food particles left in common feeding areas. The nematode larvae enter an animal's bloodstream and infect its vital organs, causing death. However, the coatis appear to be immune to the nematodes and continue to thrive and deplete the forest's bird population. Having no native predators on this isolated ecosystem, the firecrows have not developed an instinct for danger, making them extremely vulnerable. Even the island's many tourists report approaching within centimeters of the birds. In the ten years since the museum's restoration, increased tourism has unfortunately hindered our efforts toward restoring the firecrown population.

The International Biosphere Reserve of UNESCO fears that the firecrows are serving as an indicator species – reflecting how changes in habitat and introduced predators affect not only the hummingbird but the demise of the entire forest ecosystem on Robinson Crusoe Island. The IUCN continues to list the forest as one of the most threatened national parks in the world. So, we turn to you, Future Problem Solvers. You helped save our historical treasures ten years ago. Now, we are asking you to examine the invasive species impact on the island's ecosystem and apply the FPS process to once again help us – this time to protect our living national treasures.