

Charles Darwin Research Station Fact Sheet

Eradication of fire ants

The little fire ant, *Wasmannia auropunctata*, is one of the most aggressive invertebrate species ever introduced to Galapagos. Together with the tropical fire ant, *Solenopsis geminata*, fire ants greatly affect native invertebrates and vertebrates, presenting a serious threat to fragile Galapagos ecosystems. Their control is a priority project for the Charles Darwin Foundation (CDF).

Arrival in Galapagos

W. auropunctata is native to Central and South America, but was introduced to Galapagos during 1910-1920. It first colonized Santa Cruz, but is now widely distributed on eight islands: Floreana, Isabela, Marchena, Pinzón, San Cristóbal, Santa Cruz, Santa Fé, and Santiago, and five islets.

Historically, *W. auropunctata* was probably transported between large islands on plants or in soil, and to small islands on equipment carried by people.

S. geminata is native to regions of the Americas. It was first reported in San Cristóbal in 1891. It has been recorded on six islands: Floreana, Isabela, San Cristóbal, Santa Cruz, Santa Fe, and Santiago, and five islets.

S. geminata is harder to control than *W. auropunctata* as new colonies are founded by winged females that can fly over long distances. *W. auropunctata*, on the other hand, radiates outwards from the original colony on foot to occupy extensive areas. This process is called budding.

Impact on Galapagos

W. auropunctata reduces ground and tree-dwelling invertebrate species diversity in areas where it is dominant, causing a marked reduction of native scorpions, spiders and ant species. *S. geminata* is also a voracious feeder of invertebrates but its effects are patchier because of the way it colonizes new areas.

W. auropunctata attacks tortoise hatchlings and adult tortoises. *S. geminata* affects the nesting behavior of land iguanas and tortoises, and threatens hatchling success of endemic reptiles as well as birds.

W. auropunctata can form an extensive colony over an entire small island putting at risk endemic species that are restricted to only one island (single island endemics).

CDRS Research Activities

In 2000, the CDF began an eradication program for *W. auropunctata* on Marchena Island, working with the Galapagos National Park Service (GNPS) and fire ant specialist Sanford Porter (ARS-USDA, Gainesville).

W. auropunctata was first reported on Marchena in 1988. The vegetated area of Marchena is small (32.8 km²) compared with the size of the island (130 km²), and *W. auropunctata* could easily have wiped out species

CDF FOCUS: RESTORATION



Key Facts

Species: *Wasmannia auropunctata*

Common name: Little fire ant

Origin: Central and South America

Class: Invasive

Impact: Affects native invertebrate populations and reptile and bird breeding

Range: Extensive, spread to eight islands and five islets

Action: Control and eradication

Species: *Solenopsis geminata*

Common name: Tropical fire ant

Origin: New World

Class: Invasive

Impact: similar to *W. auropunctata*

Range: Extensive, spread to six islands and five islets

Action: Control and eradication

restricted to this island.

The CDF developed a two-phase strategy:

1. A control program using the specific non-residual insecticide AMDRO - *W. auropunctata* carry this poison to their nests, where they eat and feed their queen.
2. A monitoring program of *W. auropunctata* and other invertebrate communities to estimate relative species abundance and response to the eradication program.

The infested area was originally found to be 21 hectares (approximately 52 acres). The number of native species was lower than in unaffected areas. Monitoring showed that the size of the infested area reduced significantly during the course of the eradication program.

W. auropunctata appears to have been completely eradicated from Marchena. No ants were found during monitoring visits carried out during 2003, 2004, 2005 and 2006. Native communities have re-established and are comparable to those in the original unaffected area. Monitoring will continue for another year before the program is announced a success. If it is, it will be the largest, successful fire ant eradication program in the world.

The methods used in the *W. auropunctata* eradication program are so effective that they may be used on other islands where this ant is found. A smaller project using a similar method was also effective in eradicating *W. auropunctata* from 3 hectares on Santa Fé Island during the 1990's.

For the Future

With these results from Marchena and Santa Fé, the GNPS has initiated control programs against *W. auropunctata* at San Pedro, a tortoise nesting area on Isabela island, and for *S. geminata* on the Mariela islets, a nesting area of penguins.

It is not possible to completely eliminate *W. auropunctata* from Galapagos, or from larger islands where *W. auropunctata* is distributed over hundreds of hectares. Eradication programs are expected to be more successful on smaller islands or in isolated areas where distributions are less than a few dozen hectares. Researchers are now investigating the possibility of using natural enemies of fire ants (biological control) in order to control the fire ant over larger areas.

With the support of the CDF, the GNPS will continue to carry out control and eradication programs for both species. Treated islands must be monitored periodically to ensure that there are no new accidental introductions. Controlling these invasive species will help restore the equilibrium in favor of the native and endemic species that are critical to the unique ecology of Galapagos.