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MIAMI

Investigating the Impact of Intentionally Introduced *Melaleuca*

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Melaleuca Hammock in the Florida Everglades.
Photo: Randy Westbrook, U.S. Geological Survey

Problem Statement:

What impact has the intentionally introduced *Melaleuca* had on South Florida?

Background

Invasive species are brought into ecosystems deliberately or unintentionally. Whatever the case may be, these organisms can drastically affect the biotic and abiotic factors of an area. South Florida is one of the homes of many invasive species that alter our natural environment. Invasive species are mainly uncontrollable due to the fact that they do not have natural predators that will keep their populations in check like they do in their native homes. Invasive species are usually species that can withstand very broad ranges of abiotic factors such as temperature, salinity, and

soil. As these generalist species increase in numbers they can compete with and take over populations of native species and disrupt the ecological balance of an ecosystem.

An invasive species that South Florida is currently battling with is the *Melaleuca quinquenervia*. Often referred to as the Paperback, Cajeput, or the Punk Tree, it is a fast-growing and hardy tree that has a layered, peeling-paper like white bark whose native habitat is in Australia, New Guinea, and the Solomon Islands. They were brought to Florida to use as a landscape ornamental tree and a wood source. They can grow to around 33 meters at a rate of about 1 or 2 meters a year. They withstand fires, and freezing temperatures and they have an extremely high reproductive rate. They can have up to 20 million seeds stored in the seed capsules of a single tree and take over 14-15 acres

a day. They are classified as a noxious weed by the federal government and the state of Florida. They have displaced native species, dried up wetlands, and created a fire threat in South Florida's Everglades.

Implications and Conclusions

These invaders are mostly a direct threat to species diversity and endangered flora and fauna in South Florida. The tree causes as much as \$168 million in economical damage. The melaleuca's high oil content causes vast fires during South Florida's dry season. Also, with the uncontrolled expansion of the species, South Florida's ecotourism income would be greatly reduced. The means of controlling melaleuca is very intricate and expensive, as well.

Biological, mechanical, and chemical controls are being used to try to eradicate the species but the major problem is that any stress on the tree will cause it to release its massive amounts of seeds to the environment. If the trees experience fire, cut-

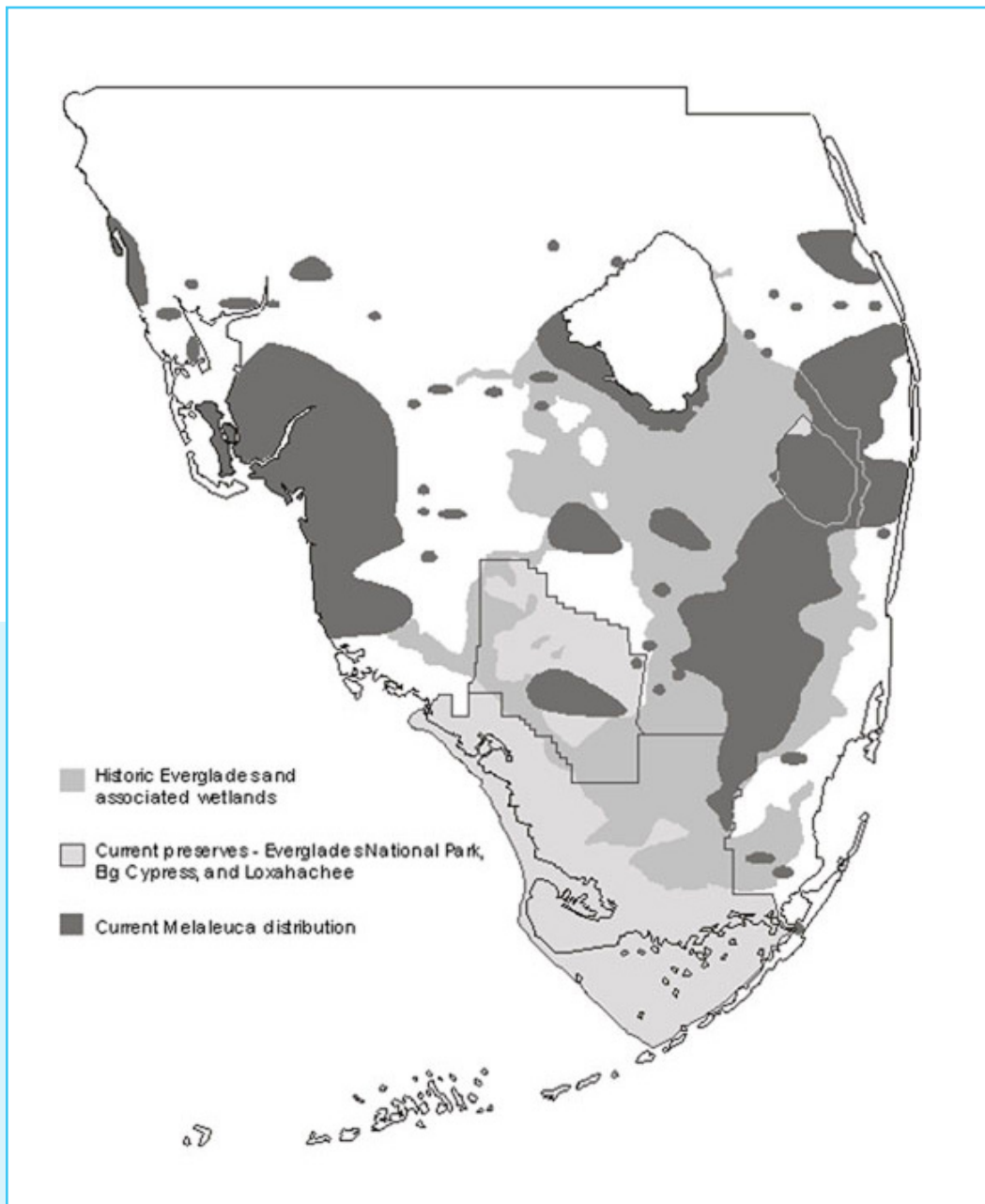


Forms dense forests that can reach heights of over 20 meters.
Photo: Stephen Ausmus, USDA Agricultural Research Service



Aerial application of herbicide by helicopter.
Photo: Stephen Ausmus, USDA Agricultural Research Service

ting down, or temperature change, they will release their seeds. The chemical control includes herbicides that are sprayed on large, remote areas of trees. However, they cannot keep up with seed production and herbicides do not work against the seeds. Their natural predators were brought from Australia as a biological control. They include the melaleuca leaf weevil, *Oxyops vitiosa*, the psyllid, *Boreioglycaspis melaleucae*, and the melaleuca bud gall fly, *Fergusonina turneri*. The insects eat the leaves of the melaleuca tree, feed on the tree's sap, and lay eggs in young buds of the plant causing them to form galls. Biological and chemical methods are not enough to control the rapid spread of this tree. The mechanical control of this pest includes sawing off the tree at the trunk, applying herbicides to kill it and also a grinding machine that converts the trees into mulch.



Distribution in Florida, Photo: Min B. Rayamajhi, USDA Agricultural Research Service

