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Aliens of Xamayca

a newsletter on non-indigenous species in Jamaica

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Food fish introductions in Jamaica

Jamaica's inland fisheries are small in geographical size and production levels relative to marine fisheries. In addition, native freshwater fish and shellfish are believed to be too small and difficult artificially breed to be raised through aquaculture.

This has instigated the introduction of aquatic animals with clear advantages over native species in that they can be easily cultivated, grow to large sizes, and are fecund (produce many offsprings). However, there is historical and anecdotal evidence that inland fisheries might have played a significant role in the Jamaican culture.

Late 19th century records characterize some of Jamaica's inland villages as "fishing villages" where entire communities lived on freshwater fish and shellfish. Today, in the 21st century, there are still elders who reminisce about rivers teeming with fish which provided food and water for domestic use.

This scenario of abundant inland fisheries has changed drastically, probably due to Jamaica's population increase, which surpassed the capacity of inland fisheries to support the growing number of people. Additionally, the domestic and industrial pollution, dredging, damming and sedimentation that followed the country's economic development ultimately degraded the aquatic habitats; watersheds, rivers and wetlands that sustain inland fisheries.

Understandably, decision-makers sought ways to improve nutrition and food security especially for the vulnerable poor. One means of achieving this was to provide high quality protein with cultured fish and to stock food fish directly to inland waters. This is also known as *fishery enhancement*.

Several food species were introduced to Jamaican waters, two of which are examined in this article.

It is important but not always possible to differentiate between deliberate and accidental introductions of food fish to Jamaica's inland waters. However, this overview will refer to exotic fish and shellfish that are now harvested from the wild.

Fishery enhancement started with the introduction of two African cichlids. The first occurred in the 1950's with the introduction of *Oreochromis mossambica* which was followed by *Tilapia nilotica* in the mid-1970's.

Oreochromis mossambica
Photo © http://parisaramahiti.kar.nic.in/fish/imagefm/84.gif

Tilapia nilotica
Photo © http://www.pathfoot.demon.co.uk/tilapia.jpg

Both these fishes are commonly called tilapia and local fishermen refer to them as perch although there are life cycle, size and taste differences between them.

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Food fish introductions in Jamaica cont'd

Several species of carp, native to Asia, were also brought in for food and to control weeds. The Silver Carp (*Hypophthalmichthys molitrix*) and the Common Carp (*Cyprinus carpio*) were introduced but were not accepted by consumers.

Although it is not clear whether the Carps were deliberately released into the wild, but today, these fishes have established thriving populations in the Black River and its wetlands.

Black River fisherman displaying two of the dozens of Carp that were caught in the Maggotty Dam, St. Elizabeth (circa 2004)
Photo © John Kerr, TNC

Besides fish, an amphibian, the American Bullfrog (*Rana catesbeiana*) was introduced in Black River to provide cheap protein to the rural-poor. The frog is only a minor food source in a few parts of the United States and not surprisingly, never caught on as part of the Jamaican diet.

Another notable introduction was the Australian Red-claw Crayfish (*Cherax quadricarinatus*), which was initially intended for aquaculture but invariably settled into natural habitats. The Crayfish is now abundant in Black River and other southern and western watersheds.

Australian Red-claw Crayfish caught in the Maggotty Dam, St. Elizabeth (circa 2004)
Photo © John Kerr, TNC

"Tilapia" has been promoted around the world as a solution to the problem of providing affordable sources of protein to rapidly growing human populations. This is attributed to their ease of culture, ability to tolerate a wide range of water quality, fast growth and reproduction.

However they have a mixed record, particularly with respect to their effects on natural habitats and native fish populations.

The same traits that make Tilapia ideal for aquaculture can disrupt the balance of natural ecosystems. There are case studies of Tilapia out-competing native fish populations for space and other resources; decimating aquatic plants through voracious herbivory then switching to omnivory (when the plants ran out and eating the young of native species).

They have also been implicated in the introduction of the eye-fluke disease, which caused widespread blindness among native fish in Lake Apoyo, Nicaragua in 2001.

After more than 50 years of residence, the Tilapia are a widespread, abundant and heavily harvested fish in Jamaica's rivers, ponds and wetlands. There are well-established populations in most rivers except fast-flowing Blue Mountain streams.

There is small comfort in the fact that no negative impacts have been recorded in Jamaica. This might be because no one is monitoring Tilapia or any fishery enhancement species except for the crayfish, *Cherax*.

Questions on the effect of Tilapia on Jamaica's freshwater ecology will be difficult to answer because there is so little information on conditions before their introduction and spread, apart from historical and nostalgia-laced anecdotal reports of rivers "teeming" with (native) fish.

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KIDS

Familiar aliens - mammals

There are some mammals in Jamaica that play a part in the family structure and in agriculture that are aliens. These include "Man's Best Friend", the Dog (*Canis familiaris*), the Cat (*Capra hircus*) and the Goat (*Felis catus*).

Dogs and cats remain loyal to their masters for many generations. Dogs when abandoned will revert to their instinctive behaviour in forming packs to scavenge and hunt, thus becoming a nuisance to humans and livestock as well as can become a public health risk.

Cats, whether cared for or abandoned will hunt for food, including baby iguanas and ground-dwelling birds. Like dogs they can become a public health risk and threaten humans.

Goats provide milk but also eat the seedlings and understorey of forested areas. While they may know how to cross streets, they are a nuisance to farmers, homeowners (e.g. hedges) and forested areas chosen for regeneration projects.

Contributor: Shakira Azan, NEPA

SHORT-WINGED MOLE CRICKETS (*SCAPTERISCUS ABBREVIATUS*)

An adult *Scapteriscus abbreviatus*,
©Paul Choate

There are no native mole crickets in Jamaica. The short-winged mole cricket (*Scapteriscus abbreviatus*) is a species native to southern South America. Unlike most other mole crickets, the adults have short wings, cannot fly and thus have limited mobility.

The short wings, however, did not stop this species from reaching Cuba, Jamaica, Hispaniola, Puerto Rico and St. Croix; not by flight, but as a contaminant of solid ballast of ships before the days when most ships were fitted to use liquid ballast.

Its date of first arrival in Jamaica is unknown. Though it would clearly have to be before 1926 when Catalogus Insectorum Jamaicensis was published by C.C. Gowdey, entomologist of the Jamaica Department of Agriculture. The catalogue only listed *S. didactylus*, which was a misidentification.

It is fortunate that the mole cricket that reached Jamaica was not *S. didactylus*, as this species became a serious pest of many cultivated crops in islands that it reached, such as Puerto Rico.

In Florida, where *S. abbreviatus* was first detected in 1899, it damaged the roots of turf-grasses on golf courses and lawns within a few miles of the coast. In Cuba, where *S. abbreviatus* also arrived, the consensus is that it is only a minor crop pest.

In Jamaica, *S. abbreviatus* is known only from a few specimens from the parishes of Kingston and Portland. Very likely the curators of the insect collection at the Institute of Jamaica (IOJ) would welcome additional specimens and information, especially from other parishes, in order to obtain a better picture of the species, current distribution in the island and what it might be feeding on.

The life cycle is adult to egg to nymph (7 or more sizes increasing at each moult) to adult, which takes many months. Fully-grown adult specimens are the most useful for insect collections; they are over an inch long but with short wings. The nymphs are smaller, harder to identify, and have wing stubs or no wings at all.

Mole crickets spend most of their lives underground, burrowing in soil as the name implies, but will sometimes emerge at night in warm, wet weather to roam about on the soil surface.

They are not harmful in any way to people, as they are eaten as food in Thailand and the Philippines, but they damage the underground parts of selected plants.

More information on the short-winged mole crickets can be sourced at http://www.fcla.edu/FlaEnt/fe86p484.pdf

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MELALEUCA QUINQUENERVIA

Melaleuca quinqunervia is native to Australia and is a highly invasive plant found in the United States, US Virgin Islands, Bermuda, the Atlantic Ocean and the Caribbean.

Melaleuca invades areas with a tropical to sub-tropical climate, seasonal changes in hydrology and frequent fires or other disturbances. They grow very quickly, producing dense stands that displaces native plants and animals. They also alter water flow in wetlands and can produce hot crown fires that result in native tree mortality.

The trees are approximately 19.8 - 30.5m (65 - 100 ft) in height. The bark is whitish-brown, paper-like and is layered and peeling. The tree bears creamy white flowers five (5) times per year.

The seeds of *Melaleuca* are found in woody capsules. The capsules contains about 200 - 300 tiny brown seeds which can remain viable for 10 years and are wind and water dispersed. A single tree can store about 2 - 20 million seeds. Fires, freezes and stress on the tree can promote seed release.

In Jamaica, *Melaleuca* trees have been seen in the Black River Upper and Lower Morasses, St. Elizabeth.

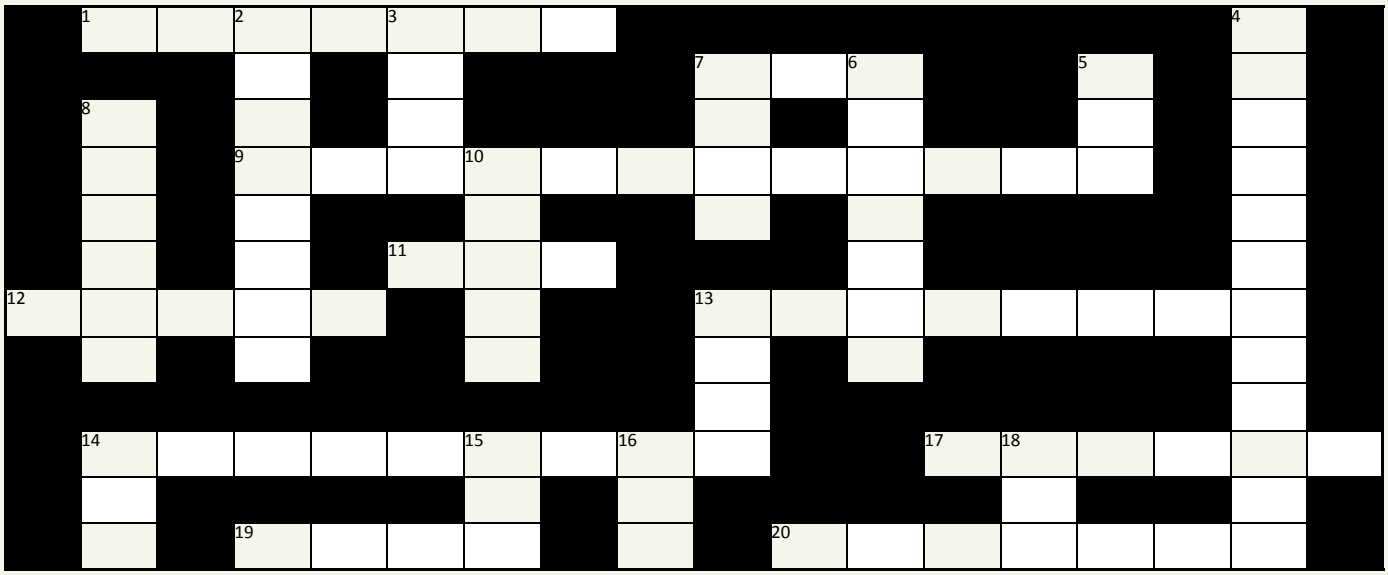
Extracted from 'Weeds of Natural Areas: Melaleuca', 'Florida Department of Environmental Protection Weed Alert: Melaleuca' and Global Invasive Species Database

***Melaleuca* leaves**
(©Forest & Kim Starr)

***Melaleuca* flowers and bark**
(©G.D. Carr & David Nance)

CHILDRENS' CORNER

Crossword Puzzle



Across

1. Wetlands provide a ____ for many plants and animals
7. ____ falls in the early morning
9. Wise use and protection of natural resources
11. The most destructive animal in the world
12. Wetland with herbaceous plants
13. Plant with stilt-like roots
14. A local name for one of the rarest ducks in the world
17. A soil that is regularly soaked with water is _____
19. This animal can live in water and on land
20. A wetland may be a _____ for young fish

Down

2. Water that is slightly salty
3. A type of seabird
4. The variety of living things
5. The source of light and energy
6. Land covered with shallow water
10. A ____ may be more salty than the sea
7. White-winged _____
8. An international convention that protects wetlands
10. Wetland with mostly woody plants
13. Irish ____ is a type of seaweed, used to make drink
14. Wetlands are _____
15. From a distance a crocodile may look like a _____
16. The ____ carries diseases and is a nuisance in houses and wetlands
18. Can we save our wetlands if we work together?_____

Answers - Across and Down

1. Habitat
2. Brackish
3. Tern
4. Biodiversity
5. Sun
6. Wetland
7. Dew/Dove
8. Ramsar
9. Conservation
10. Swamp
11. Man
12. Marsh
13. Mangrove/Moss
14. Whistlers/Wet
15. Log
16. Rat
17. Hydric
18. Yes
19. Frog
20. Nursery

The Aliens of Xamayca is a quarterly newsletter of the Ecosystems Management Branch of NEPA that features non-native species in Jamaica.
Persons interested in writing articles for the newsletter may submit them to the editor at sazan@nepa.gov.jm.