

WORLD WATER DAY 2013 REPORT













Focus Activity:

The National Environment and Planning Agency (NEPA) and the Mitigating the Threat of Invasive Alien Species (MTIASIC) Project hosted an Exhibition Booth and participated in a Speakers Forum in Observance of World Water Day 2013 Exposition, South Lawn, Devon House Complex, Kingston in support of the invasive alien species "Prevent the Spread" campaign.

Objective:

To share information and raise awareness among local and other stakeholders on invasives affecting water quality and quantity, encourage participation in Invasive Alien Species (IAS) identification and control; and, provide support to partner agencies mandated to the protection and management of Jamaica's water resources.

In addition to those enities and educational institutions invited by the Ministry of Water Land Environment and Climate Change; special invitations were extended the University of the West Indies, Bodles Research and Development and Veterinary Services Divisions within the Ministry of Agriculture and Fisheries, Portmore Municipal Council, and Northern Caribbean University.

Background:

The National Environment and Planning Agency - NEPA, under the auspices of the Ministry of Water, Land, Environment and Climate Change and in collaboration with partner agencies, observed World Water Day on Friday March 22, 2013.

Through NEPA, the MTIASIC Project has identified and targeted several plant species identified as posing a direct threat to the protection of our water resources.

The focus of the MTIASIC projects on these invasive plant species is manifested in the project's pilot site located in the Black River Lower Morass in St. Elizabeth.

The importance of the Black River Lower Morass lies in its:

- Being recognized as the largest freshwater wetland in the English Speaking Caribbean
- Designation as a RAMSAR site.
- Support of important indigenous species and tree stands

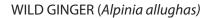
NEPA/MTIASIC and Water Resource Preservation

The MTIASIC Project is presently investigating through research conducted by the University of the West Indies, effective methods of eradicating where possible and controlling invasive plant species impacting on our water resources. These are the:



MELALEUCA (Melaleuca quinquenervia)

• Commonly known as Bottlebrush or Paperbark Tree, an aggressive and highly invasive plant which depletes the wetlands of water and displaces local species.



 Originally from South East Asia is yet another invasive plant which is found throughout Jamaica and is impacting water quality and displacing local species.





WATER HYACINTH (Eichhornia crassipes)

 The Water hyacinth is a tropical/sub tropical water plant found in lakes, ponds, rivers and stream. It clogs waterways, changes water habitat and reduces species diversity by blocking sunlight, oxygen and nesting sites. The Water Hyacinth has proven expensive to control where it has proliferated.

The IAS Project has undertaken several interventions in the Black River Lower Morass. These include the continuing tracking of invasive species in the project pilot site, strategies of invasive control using eco-friendly or bio-control methods and, a range of public awareness activities within communities and schools where information on the importance of preserving **water resources** such as the Black River Lower Morass against the spread of invasive species is disseminated.

World Water Day – "International Year of Water Cooperation"

Theme: "Partnering for Sustainable Development."

MTIASIC World Water Day Activities

In keeping with the theme partnering for sustainable development, the NEPA/MTIASIC Project joined with lead agencies under the Ministry of Water, Land, Environment and Climate Change to celebrate World Water Day 2013 on March 22 and 23 2013 at the Devon House complex in Kingston.

Information, Promotion and Awareness building

Speakers Forum:

The National Environment and Planning Agency facilitated three (3) of the main presentations at the World Water Day Speakers Forum, copies of which are at Annex 1.

This forum provided a platform to share information on the role of the MTIASIC Project in the identification of invasive alien species, research and data on interventions to date in the IAS Project sites and, methods of control being studied for implementation by the Project with an emphasis on bio-control.



Dr. Dwight Robinson, Department of Life Sciences, UWI, Mona, at the World Water day 2013 Speakers Forum

In his presentation titled, "The use of biological control agents in the Control of the spread of Invasive Alien Species", (Appendix 1a) Dr. Robinson highlighted the following points:

- The Institute of Jamaica records over 84 invasive alien species (IAS) in Jamaica
- The impact of IAS as a direct threat to native species and bio-diversity
- Reduction in steamflow and water availability

Biological Control was defined as the use of organism (natural enemy) to suppress the population of another (host).

The Pink Hibiscus Mealy Bug (*Maconnellicoccus hirsutus*) and the Christmas Bush or Jack in the Bush (*Chromolaena odorata*) were presented as case studies for which biological control was successfully introduced through the Wasp (*Anagyrus kamali*) and moths which attacks the Pink Mealy Bug and the Christmas Bush, respectively.



Dr. Kurt McLaren, Department of Life Sciences, UWI, Monapresenting at the World Water Day Speakers Forum, 2013

Dr. McLaren's presentation (Appendix 1b) on: "Biological control of invasive plant species" highlighted the Water Hyacinth and the Melalueca/ Paper Bark Tree.

He indicated the most successful biocontrol of these invasive plants as being due to three weevils:

- Neochetina eichhorniae and Neochetina Bruchi for the Water Hyacinth
- These were not always successful for

example, in Australia and North America. South America and Africa had benefitted however from their being introduced.

The Melalueca Weevil was introduced in Florida as a control agent to the Paper Bark tree with some success as it reduced the flowering capacity of the plant by up to 90% thus helping to prevent the spread of this highly invasive plant.

Mrs. Lisa Kirkland gave a presentation (Appendix 1c) on general IAS highlighting those impacting water quality and quantity.



Lisa Kirkland, Coordinator , Ecosystems Management Branch, NEPA presenting on the MTIASIC activities in the preservation of Jamaica's important water resources at the World water Day Speakers Forum, Devon House, Kingston.



Awareness Building

The NEPA/MTIASIC Project mounted a display featuring educational material on several invasive species with an emphasis on those directly impacting on water quality. Brochures, posters and magnets were produced and distributed to patrons visiting the MTIASIC booth.

IAS Booth Activities





Patrons receiving tokens informing on IAS affecting biodiversity and water quality.





Promotion

In strengthening the MTIASIC Projects promotional efforts, a number of items carrying the "Prevent the Spread" IAS slogan were developed for use as tokens for World Water Day.

Persons visiting the IAS booth who engaged in discussions with IAS team members through questions comments or observations were presented with one of a number of attractive tokens (Appendix 2) as a reminder of the IAS message.

These were:

• Tote Bags • Car Sun Shades

MagnetsNotebooks

These were very well received.









Use of Media

One Newspaper Article titled: "Do your Part.....Prevent the Spread" was prepared and appeared in The Gleaner on Thursday, March 21, 2013 (Appendix 3). An advert promoting the "Prevent the Spread" IAS campaign was also carried in the Gleaner. (Appendix 4).

Members of NEPA's technical team were also interviewed during a live broadcast of the Hotline Programme on Radio Jamaica, in recognition of World Water Day 2013 and the agency's role in the preservation of water resources.



Hon. Robert Pickersgill delivering the Keynote Address at the Opening Ceremony, World Water day 2013

In his address at the Opening Ceremony of World Water Day 2013, the Minister of Water, Land, Environment and Climate Change, the Hon. Robert Pickersgill observed that in keeping with the theme for World Water Day 2013 –" Partnering for Sustainable Development", the day's Exposition reflected a true example of the importance of Public/Private partnerships and collaboration.

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Pictorial of Days events

















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Conclusion

The MTIASIC Project under the auspices of NEPA used the opportunity of World Water Day and World Meteorological Day to present to a wide cross section of the public, partners and stakeholders, the message of the threat of IAS to our biodiversity. Approximately 250 patrons were impacted through direct conversation with Project Staff at the IAS Booth over the two day period (Appendix 6)

The Project shared in practical ways, identification, impact and safe methods of control of invasive alien species which impact on our water resources.

Date: March 25, 2013

THE USE OF BIOLOGICAL CONTROL AGENTS IN THE CONTROL OF THE SPREAD OF INVASIVE ALIEN SPECIES

The use of biological control agents in the control of the spread of Invasive Alien Species

Introduction

- Jamaica has been dealing with Invasive Alien Species (IAS) for decades
- The institute of Jamaica has records of over 84 IAS in Jamaica
- Most persons are familiar with the Indian Mongoose (Herpestes javanicus), that was brought in as a biological control agent

Impact of IAS

- Changes to trophic structures
- Loss of biological diversity
- Direct threat to native species
- Unsuitable habitats for native animal species
- Reduction in stream flow and available water
- Changes in soil nutrient status

Why are IAS so successful?

- Undisturbed ecosystems are usually balanced (homeostasis)
- In their new environment, the ecological associations that limit the dominance of IAS are usually absent
- This results in them dominating the ecosystem, thus creating an ecological imbalance

Restoring ecological balance

- Physical control
- Chemical control
- Biological control

Biological Control

- Use of one organism (natural enemy/biocontrol agent) to suppress the population of another (host)
- The form of biological control used in the control of IAS is termed classical biological control

THE USE OF BIOLOGICAL CONTROL AGENTS IN THE CONTROL OF THE SPREAD OF INVASIVE ALIEN SPECIES

Biological Control

- Classical biological control involves:
 - Identification of the geographical origin of the IAS
 - Exploration of the geographical origin to determine the natural enemies of the IAS
 - Introduction of the natural enemy into the new environment

Case Studies

- Pink Hibiscus Mealy Bug (Maconellicoccus hirsutus)
- "Christmas Bush" and "Jack-inthe-Bush" (Chromolaena odorata)

Pink Hibiscus Mealy Bug

- It was discovered in the Caribbean in 1994 (Grenada, St. Kitts, Nevis, Trinidad and Tobago)
- •It was discovered in Jamaica in 2007

Pink Hibiscus Mealy Bug



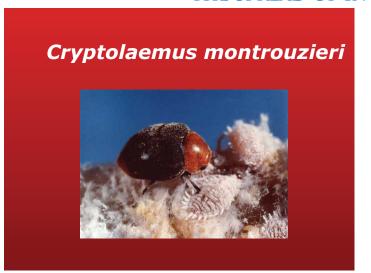
Pink Hibiscus Mealy Bug

- Parasitoid
 - Wasp Anagyrus kamali
- •Predator
 - Ladybird Beetle *Cryptolaemus* montrouzieri

Anagyrus kamali



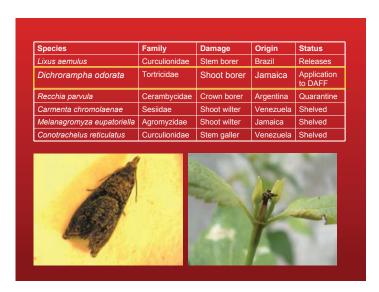
THE USE OF BIOLOGICAL CONTROL AGENTS IN THE CONTROL OF THE SPREAD OF INVASIVE ALIEN SPECIES



Chromolaena

- IAS in South Africa
- Thought to have been introduced from Jamaica





Species	Family	Damage	Origin	Status
Lixus aemulus	Curculionidae	Stem borer	Brazil	Releases
Dichrorampha odorata	Tortricidae	Shoot galler	Jamaica	Application to DAFF
Recchia parvula	Cerambycidae	Crown borer	Argentina	Quarantine
Carmenta chromolaenae	Sesiidae	Shoot wilter	Venezuela	Shelved
Melanagromyza eupatoriella	Agromyzidae	Shoot wilter	Jamaica	Shelved
Conotrachelus reticulatus	Curculionidae	Stem galler	Venezuela	Shelved

Biological Control

- Proven to be the most effective means of controlling some IAS
- Requires proper research and monitoring prior and after introduction

WORLD WATER DAY 2013 APPENDIX 1B BIOLOGICAL CONTROL (BIOCONTROL) OF INVASIVE PLANT SPECIES

Biological control (biocontrol) of invasive plant species

Presented by Dr Kurt McLaren Department of Life Sciences, UWI

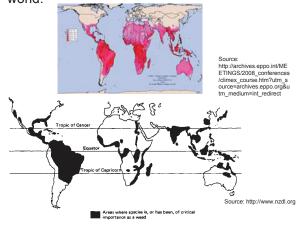
Water hyacinth

- · Water hyacinth, Eichhornia crassipes.
- It is an aquatic plant native to the Amazon Basin





It has been introduced to many parts of the world.



• It forms dense mats that interfere with navigation, recreation and irrigation.



Source: http://dnr.state.il.us/stewardship/cd/images/768x512/0002100.jpg

- · The mats also out-compete native aquatic plants.
- Low oxygen conditions develop under water hyacinth mats and the dense floating mats impede water flow and create good breeding conditions for vectors of human and animal diseases (CSIRO, 2011).

Biological Control

- Introduce a pest or pathogen that affects the species in it's native range.
- Biocontrol of water hyacinth has been successful in some countries, but not in others.
- Most success to date are due to two weevils,
 Neochetina eichhorniae, and Neochetina bruchi.



WORLD WATER DAY 2013 APPENDIX 1B BIOLOGICAL CONTROL (BIOCONTROL) OF INVASIVE PLANT SPECIES

Examples of successful biocontrol

Sepik River lagoons in Papua New Guinea





Before Three years after the introduction of the chevroned water hyacinth

Another example...

 Lake Victoria (specifically the three lake countries of Kenya, Uganda and Tanzania)





Source: http://www.csiro.au/Outcomes/Food-and-Agriculture/water-hyacinth-control.aspx



Source: http://www.abc.net.au/science/slab/hyacinth/default.htm

Biological Control

 Used successfully in other countries such as Benin, West Africa. South Africa and Thailand.

Melaleuca sp.

- An invasive woody plant that is native to Australia, New Guinea, and the Soloman Islands.
- · Melaleuca is also known as the paper bark tree.
- Grows mainly in wetlands or sites with a high water table.
- Melaleuca threatens the integrity of freshwater ecosystem processes by altering soil chemistry, reducing decomposition rates and modifying hydrology and fire regime (ISSG, 2010).
- A stand of melaleuca may transpire (loose) more water than the sawgrass communities it replaces, thereby lowering the water table (ISSG, 2010).

 It has been introduced to a number of different countries, including Jamaica, mostly as an ornamental



WORLD WATER DAY 2013 APPENDIX 1B BIOLOGICAL CONTROL (BIOCONTROL) OF INVASIVE PLANT SPECIES

Biological control

• The Melaleuca weevil, which is native to Australia.

 This insect was released in Florida in 1997 after Australian field studies and laboratory testing demonstrated the weevil would reproduce only on Melaleuca.





Source: https://edis.ifas.ufl.edu/in36



Impact

- Reduced flowering (up to 90%) at several sites in south Florida where the weevil is established.
- This type of feeding damage will help to reduce seed production and prevent further spread of this highly invasive plant.

Unintended consequences of biocontrol!

Biocontrol without borders: the unintended of introduced weed biological control agent

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Keywords Dispersal Invasion pathways Dayson ritins - Berningly-copic melalisacio

Introduction

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Table 1	Adventive populations of the	Australian tree Melaleuca quie	ngwenervis and the	years monitored for	colonization by the
biologica	d control agents Oxyopa vition	and Boreloglycuspis metalesc	ue .		

		vistate City/Island GPS Coordinates of M. quinquenervia stand*		Annual survey dates ^b	(km)	Direct airline flights ^f	
Bahamas	Andros	24.713, -77.799	ASD	2005-2009	267	559.0 (221.0)	
	Grand Bahama	26.659, -78.009	FPO	2005-2009	207	5452.3 (82.2)	
	New Providence	25.058, -77.453	NAS	2005-2009	295	13982.0 (582.1)	
	Exuma	23.39, -75.48	GGT		538	1289.3 (41.0)	
	Eleuthera	24.823, -76.336	GHB + ELH		408	1436.0 (78.8)	
Cuba	Zapata Peninsula	22.30, -81.12	HAY	2007, 2011	330	1487.0 (54.2)	
Dominican Republic	Santo Domingo	18.48, -69.95	SDQ		1310	2801.3 (54.2)	
Puerto Rico	San Juan	18.395, -66.071	SJU	2005-2011	1665	5384.7 (140.1)	
Hawaii	Maui	20.89, -156.21	OGG		7520	0.0 (0)	
	Ouhu	21.547, -158.076	HNL	2006, 2011	7600	0.0 (0)	
	Molokai	21.157, -157.065	MKK		7510	0.0 (0)	
	Kauai	22.02625, -159.671	LDC		7742	0.0 (0)	
	Hawaii	19.7, -155.05	по	2006, 2011	7400	0.0 (0)	
Suriname	Albina	5.498, -54.081	PBM		3610	107.0 (10.1)	
Grenada	Harford Village	12.1, -61.67	GND		2444	31.0 (1.0)	
French Guiana	Kourou	5.17, -52.7	CAY		7331	3.0 (2.5)	
Guyana	Rockstone	5.9, -58.55	GEO		3191	61.7 (14.6)	
Honduras	Zamorano	14.2359, -87.4082	TGU		1389	483.7 (25.5)	
Costa Rica	San José	9.92, -84.07	530	2006, 2011	1716	2789.7 (230.4)	
Panama	Gamboa	9.12, -79.69	PTY		1782	2383.3 (89.7)	
Nicaragua	Managua	12.07, -86.18	MGA		1556	1101.0 (437.0)	
Mexico	Zapopan	20.72207, -103.390	GDL		2273	167.3 (13.0)	
California (USA)	Los Angeles	34.010, -118.39	LAX	2007-2011	3565	3919.0 (198.6)	
Jamaica	Kingston	18.05, -77.82	KIN	2011	807	3324.0 (242.9)	
Colombia	Medellin	6.2449, -75.58	BOG		2171	4311.7 (20.7)	
South Africa	Wolseley	-33.435, 19.144	CPT	2010	12384	0.0 (0)	
Texas (USA)	La Feria	26.19, -97.837	CRP	2003, 2009	1567	3.7 (1.5)	
Brazil	Mococa	-21.53733, -47.0893	GRU	2011	6580	1925.0 (93.4)	
Montserrat	Gages	16,723, -62,192	MNI		2110	0.0 (0)	

The linear distance from the herbivores' intended range of Florida (USA) and the number of annual flights (averaged acre 2005-2007) arriving from southern Florida airports are reported

2005–2007) arriving from southern F * Reported in decimal degrees

Surveys of M. quinquenervia stands were conducted once annually for the listed years

Mean (SE), annual number of flights that originate from all south Florida international airports: Fort Lauderdale Hollywo

IAS IMPACING OUR WATER RESOURCES: MTIASIC PROJECT PRESENTATION



EXPOSITION

Ministry of Water, Land, Environment & Climate Change



Devon House (East Lawn)

March 22, 2013

Facilitator: Lisa Kirkland

Managing and protecting Jamaica's land, wood and water

Invasive Alien Species Impacting our Water Resources







A presentation by the
National Environment and Planning Agency (NEPA) and
the Mitigating the Threat of Invasive Alien Species
in the Insular Caribbean (MTIASIC) Project













This is a Regional 4 year (2009-2013) project funded by the Global Environment Facility (GEF) and implemented by United Nations Environmental Programme (UNEP) and the Centre for Agriculture and Bioscience International (CABI).

The project is implemented in Jamaica by the National Environment and Planning Agency (NEPA).













About the MTIASIC Project, cont'd

Goals and Objectives

- To broaden the approach to dealing with invasive alien species
- Conserving globally important eco-systems, species and genetic diversity within the Caribbean
- Mitigating the threat to local diversity from invasive alien species in the Caribbean including: terrestrial, freshwater and marine eco-systems



n of a national strategy to inform and develop policies, legislation, regulations and management of Invasive Alien Species (IAS)

- Establishing regional cooperation and strategies established through the Caribbean Invasive Alien Species Strategy –CIAS
- Establishing Pilot Projects to build capacity in detecting, responding and managing the impact of IAS
- Knowledge dissemination and awareness building



MTIASIC Pilot Projects

I of IAS predators/competitors to the Iguana

<u>Partners</u>: UWI, Ja.Iguana Recovery Group, Urban Development Corporation (UDC)

- 2. Control of the Lionfish population in Jamaica <u>Partners</u>: UWI Discovery Bay Marine Laboratory
- 3. Protecting the Black River Lower Morass from plant and animal invasive alien species.

Partners: UWI





IAS IMPACING OUR WATER RESOURCES: MTIASIC PROJECT PRESENTATION

What are Invasive Alien Species

- plants, animals or micro organisms which are introduced deliberately or unintentionally into areas where they do not belong, and whose introduction and spread threatens biological diversity.
- can be introduced intentionally by:
- smuggling
- · species being used for biological control and
- · via the pet, agricultural or horticultural trades





Invasive Alien Species, Cont'd

- Movement within and between countries is by natural events such as flooding, hurricanes and sea currents as well as transportation by trains, planes, ships and packaging material
- Poses major threat to the biodiversity of Caribbean islands and to these countries social and economic realities



Alien Invasive Species targeted by the MTIASIC project



Water Hyacinth (Eichhornia crassipies)



Wild Ginger (Alpinia allughas)



Paperbark Tree (Melaleuca quinquenervia)



Water Quality and IAS

- Jamaica, like many states, grapples with issues
 concerning the management of water resources
- Critical sectors such as agriculture, irrigation, fishing, recreation and water transportation, rely on not just the quantity but the quality of water.
- Aquatic environment supports animal and plant species which contribute to bio-diversity and the social and economic viability of communities.



Water and IAS, cont'd

The MTIASIC Project has identified invasive species which i ecosyst

MELALEUCA (Melaleuca quinquenervia)

- Commonly known as Bottlebrush or Paperbark Tree, is an aggressive and highly invasive plant.
- Originally from Australia, the Melalueca or Paper Bark Tree typically up to 3- 6 feet per year and produces dense stands, thus displacing and Flanning Agency plants.

Paperbark Tree (Melaleuca quinquenervia)



IAS IMPACING OUR WATER RESOURCES: MTIASIC PROJECT PRESENTATION

Research activity in the Black River Lower Morass







The Black River Lower Morass



systems and structures. It actively competes with other plant species for water which affects the eco-balance of wetlands and

- (b) Reduces native species biodiversity
- by reducing water.



Invasive Alien Species (IAS) include:

And Ginger (Alpinia allughas)

The Wild Ginger which is originally from South East Asia is yet another invasive plant which is found throughout Jamaica and is impacting water quality in the Black River Lower Morass.

- It forms large thickets which spread quickly smothering other plants and out- competes native species.
- Its spread is enhanced by its use as a decorative plant and for landscaping as persons are attracted by its colorful blooms.



Wild Ginger (Alpinia allughas)







WATER HYACINTH (Eichhornia crassipes)

The Water Hyacinth is considered the scourge of waterways worldwide and is described as an "aquatic terrorist".



acinth reduces water quality by:
aterways- streams and rivers and hampers
mechanical (boats, ski's) and non- mechanical (canoes,
rafts) means of water transport.

- Lessening sunlight and oxygen supply in the water thus affecting plant and animals
- Blocks fish and other animals from access to food, plants, shelter and nesting areas
- Changes water eco-systems by pushing away and crushing native plants
- Changes water temperature thus affecting species habitat





IAS IMPACING OUR WATER RESOURCES: MTIASIC PROJECT PRESENTATION



Water Hyacinth I Water Quality Impact

The Water Hyacinth is considered one of the worst problems experienced by tropical and subtropical countries.

It affects areas by:

- Inflicting damage to plants and wild life
- Incurs commercial costs for control and removal
- Demands a combination of strategies





er Hyacinth and Water Quality, (cont'd)

Control Strategies include:

- Mechanical use of harvesters which most developing countries cannot afford
- Manual High cost of large labor force being employed periodically to remove 'mats'
- Chemical control Use of herbicides which has its drawback especially for drinking water sources



Water Hyacinth trol strategies, (cont'd)

 Bio-control – considered the best method with the use of weevils (neochefina eichhornia) and moths (Samodes albiguttalis) especially in Africa and Latin America.







Do IAS impact Jamaica's water sources?

Anecdotal feedback from agencies such as the National Water Commission and the Water Resource Authority which manage our water resources indicates there is no major identifiable problem with the Water Hyacinth or other IAS.

Reference is however made to the canals and waste water channels in Portmore which are over run by the Water Hyacinth.



Water Hyacinth impact in Jamaica

There is no data available pointing to the Water Hyacinth being a major issue affecting our water ways, equipment and recreational activities.

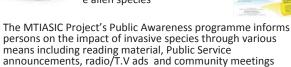






Prevent the tis commSpread!

tives aimed at preventing and re e alien species



- Maintaining critical agency/
- organizational partnerships



WORLD WATER DAY 2013 APPENDIX 2 CAR SUN SHADE & NOTE BOOK





TOTE BAG & INFORMATIONAL MAGNETS





This invasive is one of the fastest growing plants in the world and is known to double its size in six days. The Water Hyacinth clogs water-ways, streams and rivers, reduces oxygen and sunlight supply to other plant and animals in the water and displaces plants thus changing the eco-system.

For information on the MTIASIC Project in Jamaica and Invasive Alien Species, contact:

GEF/ UNEP/ CABI/ MTIASIC Project The National Environment & Planning Agency 10 Caledonia Avenue, Kingston 5 Tel : (876) 754-7540 | www.nepa.gov.jm/projects | www.ciasnet.org



Wild Ginger (Alpinia allughas)

This invasive has been steadily spreading through-out the Lower Morass. Its spread is enhanced by its use as a decorative plant by persons unaware of its rapid growth; which displaces and smothers other plants.



The Paperbark Tree, a native of Australia, is an aggressive and highly invasive plant. Its main danger to the eco-system of the Black River Lower Morass is its rapid use of water which will deplete the water available to other species.

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World Water Day 2013 Appendix 3

NEWSPAPER ARTICLE

into areas where they do not belong, and

Project has identified several invasive alien Species in the Insular Caribbean (MTIASIC) Mitigating the Threats of Invasive Alien

species which have a negative impact on

nvasive Alien Species (IAS) are plants introduced deliberately or unintentionally animals or micro-organisms which are

Keep our water sources free of Invasive Alien Species

whose introduction and spread threatens

Jamaica's water quality

biological diversity.

March 22 World Water Day on Friday Change and in collaboration with rest of the world in observing partner agencies, will join the **Environment and Climate** of the Ministry of Water, Land, During World Water Day

(NEPA), under the auspices and Planning Agency HE NATIONAL Environment

and our water resources alien species

events are organised to highlight the importance of water to the environment, agriculture, health,

Water Do

Critical sectors such as agriculsanitation, trade and recreation

ture, through irrigation, fishing

and water transportation rely c quality of the water not just the quantity but the

supports important animal and streams, wetlands and ponds, which is made up of rivers, thriving within their habitats versity, i.e., the variety of specific contributes to Jamaica's biodiplant species. This in turn The aquatic environment

SPECIES ON WATER QUALITY IMPACT OF INVASIVE ALIEN

Water Cooperation

Invasive Alien Species in the throughout the country. IAS are belong, and whose introduction plants, animals or microorganwater quality in specific sites invasive alien species (IAS) which project has identified several Insular Caribbean (MTIASIC) and spread threaten biodiversit into areas where they do not deliberately or unintentionally isms which are introduced have had a negative impact on The Mitigating the Threat of

which can affect our water fled three invasive alien species The MTIASIC project has ident





aperbark Tree

C Project in Jamaica and Inv

For information

The National Environment & Planning Agency 10 Caledonia Avenue, Kingston 5

GEF/ UNEP/ CABI/ MTIASIC Project

quinquenerva) Paperbark tree (Melaleuca

aggressive and highly invasive

Commonly known as bottle

plant is originally from Australia brush or paperbark tree, this

worldwide and is described as an

and typically grows up to three

is extremely hard to eradicate. with other plants for space and sive spreads rapidly, competes landscape artists, this hardy inva Though loved by housewives and found throughout Jamaica cal/subtropical water plant (elchhornia crassipes) nally from South East Asia, is The Wild Ginger, which is orig (3) WATER HYACINTH

found in lakes, ponds, rivers and ered the scourge of waterways streams. It grows faster than any population in as little as six days tested plant and can double its The water hyacinth is a tropi The water hyacinth is consid-

> oxygen supply in the water and by clogging waterways, which in a reduction of native species nesting areas. Its invasion results from access to food, shelter and watercraft, lessens sunlight and nampers the movement of hyacinth reduces water quality ture, which impacts species hab and changes in water temperablocks fish and other animals

MEVENT THE SPREAD

and destroying IAS plant species. effective methods of controlling conducting research to identify hyacıntn bark tree), wild ginger and water namely the melaleuca (paper-The MTIASIC project is currently

OF LAS HELP TO CONTROL THE SPREAD

awareness programme informs various means including aware invasive alien species through persons about the impact of ness-raising publications, public The MTIASIC project's public

service announcements, meetings and events. radio/TV ads and community nelp in the control of invasive Persons are encouraged to

alien species by:

like, especially one(s) in your area ■ Learning what an IAS looks Learning about the damage

they cause by attending aware-

one place to another them into the country or from spread of an IAS by not taking ness meetings on IAS Telling your community Preventing the further

Article prepared by National Environment and Planning Agency

members about the IAS in your



Inset: close-up photo Water hyacinth (eichhorina crasspies) in the Black River

St Elizabeth, which is the largest six feet (up to 1.82 metres) per structures as it actively comof the Paperbark leads to the to this invasive plant. The spread freshwater wetland ecosystem in year and produces dense stands of seed pods which are shed at duces easily by storing millions balance of wetlands. It reprofor water, which affects the eco petes with other plant species degradation of ecosystems and Jamaica, is especially vulnerable The Black River lower morass in

allughas) (2) WILD GINGER (Alpinia



Wild ginger (alpinia allughas)

WORLD WATER DAY 2013 APPENDIX 4 **NEWSPAPER AD**



Do your part... Prevent the Spread! Keep our water sources free of Invasive Alien Species!

nvasive Alien Species (IAS) are plants, animals or micro-organisms which are introduced deliberately or unintentionally into areas where they do not belong, and whose introduction and spread threatens biological diversity.

Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MTIASIC) Project has identified several invasive alien species which have a negative impact on Jamaica's water quality.



For information on the MTIASIC Project in Jamaica and Invasive Alien Species, contact:

GEF/ UNEP/ CABI/ MTIASIC Project

The National Environment & Planning Agency 10 Caledonia Avenue, Kingston 5 Tel: (876) 754-7540 | www.nepa.gov.jm/projects | www.ciasnet.org











WORLD WATER DAY 2013 APPENDIX 5 **POSTER**











Invasive Alien Species Impacting Water Quality and Quantity



Prevent The Spread!

The Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MTIASIC) Projectis targeting invasive alien species which have had a negative impact on water quality and quantity in Jamaica.

Invasive Alien Species (IAS) are plants, animals or micro-organisms which are introduced deliberately or unintentionally into areas where they do not belong, and whose introduction and spread threatens biological diversity and socioeconomic situation.

The MTIASIC Project supports continued research into areas of bio-control and identification of IAS through investigation of methods for controlling and eradicating where possible those which directly affect our water sources.

For information on the MTIASIC Project in Jamaica and Invasive Alien Species, contact:

GEF/ UNEP/ CABI/ MTIASIC Project

The National Environment & Planning Agency 10 Caledonia Avenue, Kingston 5 Tel: (876) 754-7540 | www.nepa.gov.jm/projects | www.ciasnet.org

Water Hyacinth (Eichhornia crassipies)

- Can double its size in 6 days
- Clogs water-ways, reducing the supply of oxygen & sunlight
- Displaces other plants thus changing the ecosystem

Wild Ginger

(Alpinia allughas)

- Should not be used as a decorative
- Displaces and smothers other plants
- Is steadily spreading through-out the wetlands

Paperbark Tree

(Melaleuca quinquenervia)

- An aggressive and highly invasive plant
- It uses water rapidly which depletes the water available to other species.

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